TECHNICAL DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 26 – REVERENCE
OFFSITE IMPROVEMENTS

764-204-013

December 2015

Prepared for:

Pulte Homes
7255 S. Tenaya Way, #200
Las Vegas, Nevada 89113
Phone: (702) 437-7999
Fax: (702) 256-7900

GCW
ENGINEERS \ SURVEYORS

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin Village 26 - Reverence Offsite Drainage Improvements Date: December 2015

Location of Development: a) Descriptive (Cross Streets) North/South: CC 215

East/West: Cheyenne Road

b) Section: 14 Township: 20 Range: 59E

c) APN : 137-14-601-002; 137-14-501-004; 137-14-601-003; 137-13-101-009 137-13-101-007; 137-13-101-008

Name of Owner: Pulte Homes

Telephone No.: (702) 914-4800 Fax No.: (702) 914-3100 E-Mail Address:

Address: 7255 S Tenaya Way Las Vegas, NV 89113

Contact Person-Name: James A. Monroe, Jr. **Telephone No.:** (702)804-2133

* **E-Mail Address:** JMonroe@gcwallace.com **Fax No.:** (702)804-2299

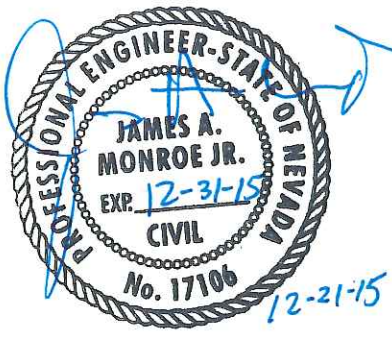
Firm: G.C. Wallace, Inc.

Address: 1555 S Rainbow Blvd. Las Vegas, NV 89146

Type of Land Development/Land Disturbance Process:

	Rezoning		Subdivision Map		Clearing and Grading Only
	Parcel Map	X	Planned Unit Development		Other (Please specify below)
	Large Parcel Map		Building Permit		

1. Total Owned Land Area: At Site: +/- 300 acres Being Developed/Disturbed: +/- 300 acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ **Yes**** ☒ **No**
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ **Yes**** ☐ **No**
4. Proposed type of development (Residential, Commercial, Etc.): Residential
5. Approximate upstream land area which drains to the subject site: +/- 4 sq mi.
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Master Conceptual Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Model Homes, Access Road, and Rough Grading), GCW Inc.; Technical Drainage Study for Village 26 at Summerlin West Offsite Improvements, GCW Inc.; 2006 Summerlin West Planning Area Flood Control Master Plan Update, Master Drainage Study for Summerlin Village 26 Reverence
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: CCRFCD MPU Facilites GOL3 0128 (Village 26 Detention Basin) and GOL4 0000 (14'X8' RCB)
8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal

Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

*New Required Field

**Review and concurrence of the Clark County Regional Flood Control District is required.

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Summerlin Village 26 – Reverence Offsite Drainage Improvements	Map ID:
Firm Name: G.C. Wallace, Inc.	Engineer: James A. Monroe, Jr.
Address: 1555 South Rainbow Blvd, Las Vegas, NV 89146	
City: Las Vegas	State: NV Zip: 89146
Phone Number: 702-804-2133	Fax Number: 702-804-2299
Property Owner: Pulte Homes	
Address: 8345 West Sunset Road	
City: Las Vegas	State: NV Zip: 89113

Reviewed By:	Date Received:	Date Accepted for Review:

The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (MANUAL).

This document is intended as an aid in preparing Technical Drainage Studies. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT

Yes	No	
X		Design Manual **Standard Form 1** with the engineer's seal and signature.
X		Design Manual **Standard Form 4**.
X		2 copies of the 24" x 36" Drainage Plan.
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

II. MAPS AND EXHIBITS

Yes	No	
X		A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.
X		A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

Yes	No	
X		Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.
X		On-site drainage basin maps for existing and proposed conditions showing the existing topography, basin boundaries, concentration points, and on-site and off-site flows in cfs.
X		Vicinity Map with local and major cross streets identified and a north arrow.

III. DRAINAGE PLAN

Yes	No	
X		Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada.
X		Minimum scale: 1" = 60'.
X		Project name.
X		Vicinity Map with local and major cross streets.
X		Revision box.
X		North arrow and bar scale.
X		Engineer's/consultant's address and phone number.
X		Elevation datum and benchmark.
X		Legend for symbols and abbreviations.
X		Cut/fill scarps, where applicable.
	N/A	Street names, grades, widths.
	N/A	Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street.
X		Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where appropriate.
	N/A	Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
	N/A	Proposed typical street sections.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
____	N/A	Streets with off-set crowns.
X	____	Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
X	____	Property lines.
X	____	Right-of-way lines and widths, existing and proposed.
X	____	Existing improvements and their elevations.
X	____	Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
____	N/A	Concentration points and drainage flow direction with Q100 and V100 and D100 in streets.
X	____	Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
X	____	Location and cross-section of street capacity calculations.
X	____	Cross-sectional detail for channels, including cutoff wall locations.
X	____	Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
X	____	Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
____	N/A	Location and detail of existing, proposed, and future block wall openings. Minimum size is 16" x 48". Wrought iron gate is required for flows > 10 cfs.
____	N/A	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.
X	____	Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
____	N/A	Building and/or lot numbers.
X	____	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
N/A	____	Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
____	N/A	For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table. Finish floor elevations must be a minimum of 18 inches above BFE.
____	N/A	Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q100 flows.
X	____	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
____	N/A	Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required).

IV. HYDROLOGIC ANALYSIS

Yes	No	
X	____	Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
X	____	Input and output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
X	____	Input and output information for future conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
X	____	Use of correct precipitation values in and around the McCarran Airport rainfall area.
X	____	A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations.
X	____	A summary table of stormwater flows showing basin area, Q10 and Q100 for both individual basins and combined basin flows, where applicable.
X	____	Copies of supporting technical information referenced from a previously approved study and a statement accepting these results.
X	____	On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.
N/A	____	Calculation for impervious area for parking lots and LIDs (if required).

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
N/A	____	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
N/A	____	Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q100 and Q10 flows representing the worst case for interior and all perimeter streets. Q100 d x v < 8. Q10 d x v < 6 and 12 foot dry lane for rights-of-way > 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
N/A	____	A summary table of interior and exterior street capacity calculations showing the street name, Q100 flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
N/A	____	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
N/A	____	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
X	____	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q100 weir height or flow depth, whichever is greater.
N/A	____	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. • Field survey data. • Input and output information. • Plotted cross-sections based on survey with proper encroachments. • A map showing the location of the cross-sections. • Analysis of both sub and super-critical flow segments. • A summary table and a discussion of the results in the text of the report.
N/A	____	Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
X	____	Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
X	____	The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.
N/A	____	Provide BMP type, size and supporting calculations for parking lots and LIDs (if required).

REFERENCE:	STANDARD FORM 2

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I. INTRODUCTION

Pulte Homes is proposing to construct major flood control facilities to protect the Summerlin Village 26 - Reverence (hereinafter referred to as Reverence) master planned community. The proposed 300-acre master planned community is located within the Summerlin West Planning Area west of I-215 between Cheyenne Road (located north of the site) and Lake Mead Boulevard (located south of the site). The proposed flood control facilities will consist of a debris basin, RCB storm drain facility within the Reverence site, and a newly proposed rectangular concrete-lined channel. This study also proposes modifications to the existing Western Beltway Channel adjacent to the Reverence site within an existing 62-foot drainage easement and modifications to the existing Village 26 Detention Basin.

GCW, Inc. (GCW), has reviewed previously approved master and technical drainage studies for the project site and adjacent developments. Hydrologic and hydraulic information from the following studies have been referenced for the purposes of this report:

The *Technical Drainage Study for Village 26 at Summerlin West Offsite Improvements* (Reference 1, hereinafter referred to as the V26 Offsites Study) was conditionally approved by the City of Las Vegas (CLV) on June 28, 2007. The V26 Offsites Study presented major offsite flood control facilities required to protect Reverence. This study updates the information presented in the V26 Offsites Study. Pertinent reference material from the V26 Offsites Study has been included in Appendix C.

Clark County Regional Flood Control District (CCRFCD) comments for the V26 Offsites Study were issued on September 4, 2007. The *Response to the CCRFCD Comments on the Technical Drainage Study for Summerlin Village 26 at Summerlin West Offsite Improvements* was submitted to CLV on November 7, 2008. Additional CLV comments for the study were issued on December 2, 2008. This study and accompanying grading plans serve to address the CLV comments issued on December 2, 2008. A copy of the CCRFCD V26 Offsites Study and the CLV comment letters have been included in Appendix C.

The *2006 Summerlin West Planning Area Flood Control Master Plan Update,* August 2006 (Reference 2, hereinafter referred to as the 2006 Update), defined the 100-year

flow rates that are expected to impact the Village 26 site, Western Beltway facilities, Village 26 Detention Basin, and facilities downstream of the Village 26 site. The 2006 Update was approved by CLV on December 11, 2006. CCRFCD concurrence was received on February 5, 2007.

A comprehensive master drainage study for the Reverence development entitled: *Master Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Model Homes, Access Road, and Rough Grading)* (Reference 3, hereinafter referred to as the Village 26 Study) was conditionally approved by CLV on April 2, 2007. Concurrence for the study was issued by CCRFCD on March 12, 2007, and Clark County Public Works (CCPW) on March 14, 2007. The Village 26 Study defined ultimate condition flows generated by Reverence on a more detailed level. Additionally, the Village 26 Study included conceptual sizes for facilities that are required to protect the Reverence site. Pertinent reference material from the Village 26 Study has been included in Appendix C. Updates to the Village 26 Study included the following:

- *Update to the Master Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Model Homes, Access Road, and Rough Grading)* (Reference 4) – Conditionally approved by CLV on October 8, 2007, with concurrence issued by CCRFCD on July 31, 2007.

- *Update #2 to the Master Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Model Homes, Access Road, and Rough Grading)* (Reference 5) – Conditionally approved by CLV on April 29, 2008.

- *Update #3 to the Master Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Reverence Interim Berm)* (Reference 6, hereinafter referred to as the Interim Berm Study) – Approved by CLV on March 14, 2013, with concurrence issued by CCRFCD on February 28, 2013, and CCPW on February 15, 2013.

- *Master Drainage Study for Summerlin Village 26 Reverence* (Reference 7, hereinafter referred to as the Master Study) – Submitted to CLV for review on September 15, 2015. CLV comments on the Master Study were received on

October 22, 2015. A meeting was held with CLV, Pulte, and GCW on November 12, 2015, to discuss the comments for further clarification and coordination. GCW submitted response to CLV comments on the Master Study on November 24, 2015. Please note this report is consistent with the *Response To Comments on the Master Drainage Study for Summerlin Village 26 Reverence* (hereinafter referred to as the Master Study Response to CLV Comments). A copy of the responses included with the Master Study Response to CLV comments has been included in Appendix C.

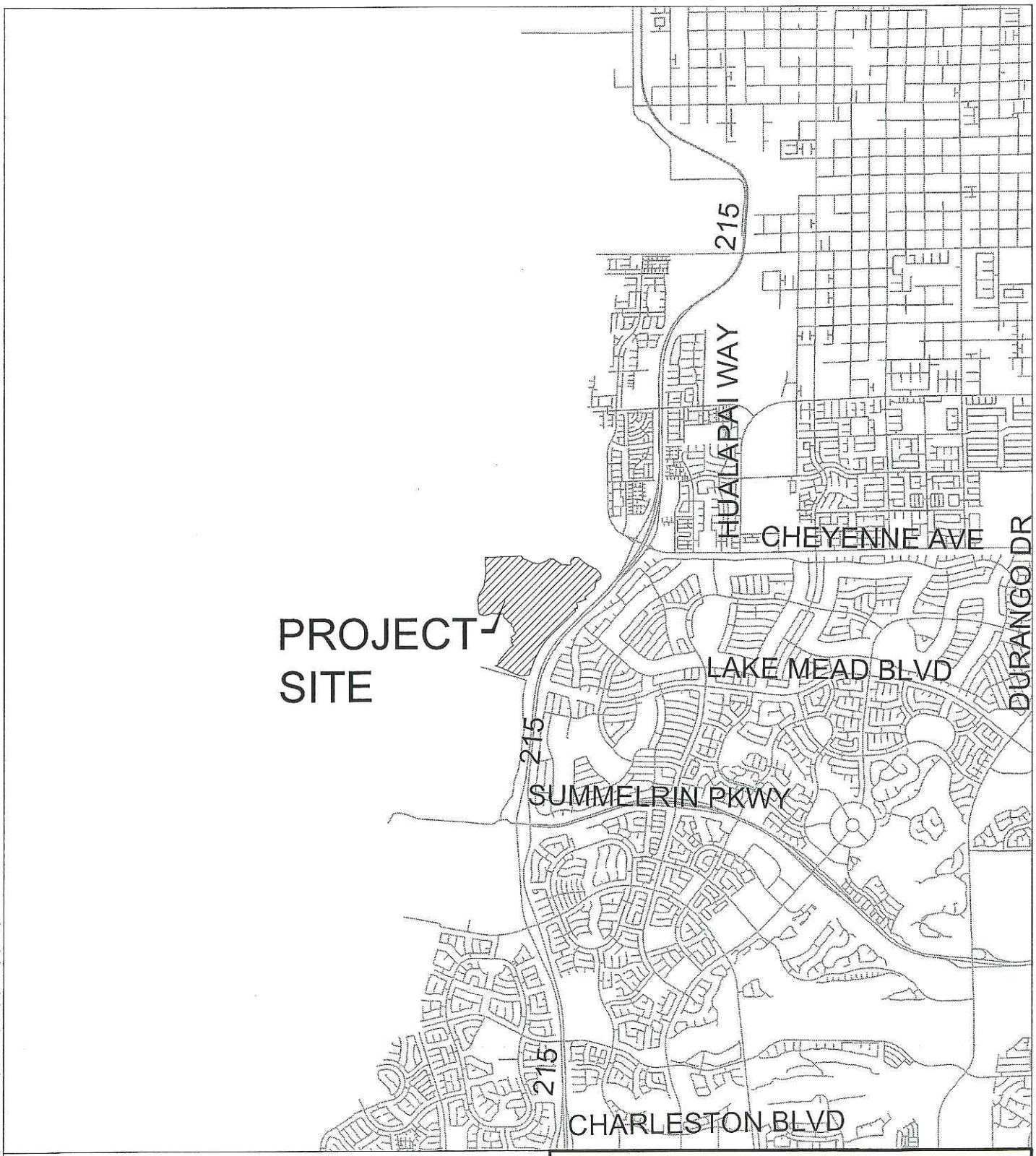
The site layout, access roadways, drainage patterns, and grading plans presented with this study are consistent with the Master Study.

The purpose of the report is to accompany the grading plans and to provide detailed hydrologic and hydraulic for the proposed facilities. The following tasks were performed in the preparation of this report.

- Identify previous drainage studies for the area surrounding the project site.
- Identify the FEMA floodplain designation for the project site.
- Identify existing and proposed regional drainage facilities adjacent to the site.
- Estimate peak runoff generated for the offsite and onsite 10-year and 100-year return period storms for interim conditions.
- Recommend drainage facilities to protect the project from storm runoff.
- Provide a geometric layout and hydraulic design for the proposed debris basin, the Village 26 and Western Beltway Channels, and modification to the existing Village 26 Detention Basin.
- Recommend drainage facilities to protect the proposed project from storm runoff.

II. LOCATION AND DESCRIPTION

Reverence is bordered by Cheyenne Avenue to the north, Bureau of Land Management (BLM) land to the west, Lake Mead Boulevard to the south, and the Western Segment of the Clark County Beltway to the east. The master planned community is located within Sections 13 and 14, Township 20 South, Range 59 East, M.D.M. Presently, the site is mass graded to convey offsite and onsite flows north into an existing wash or into the existing Village 26 Detention Basin. Please refer to



GRAPHIC SCALE

5000 0 2500 5000

(IN FEET)

1 inch = 5000 ft.

NORTH

PULTE HOMES INC.

REVERENCE OFFSITE IMPROVEMENTS

FIGURE 1

VICINITY MAP

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

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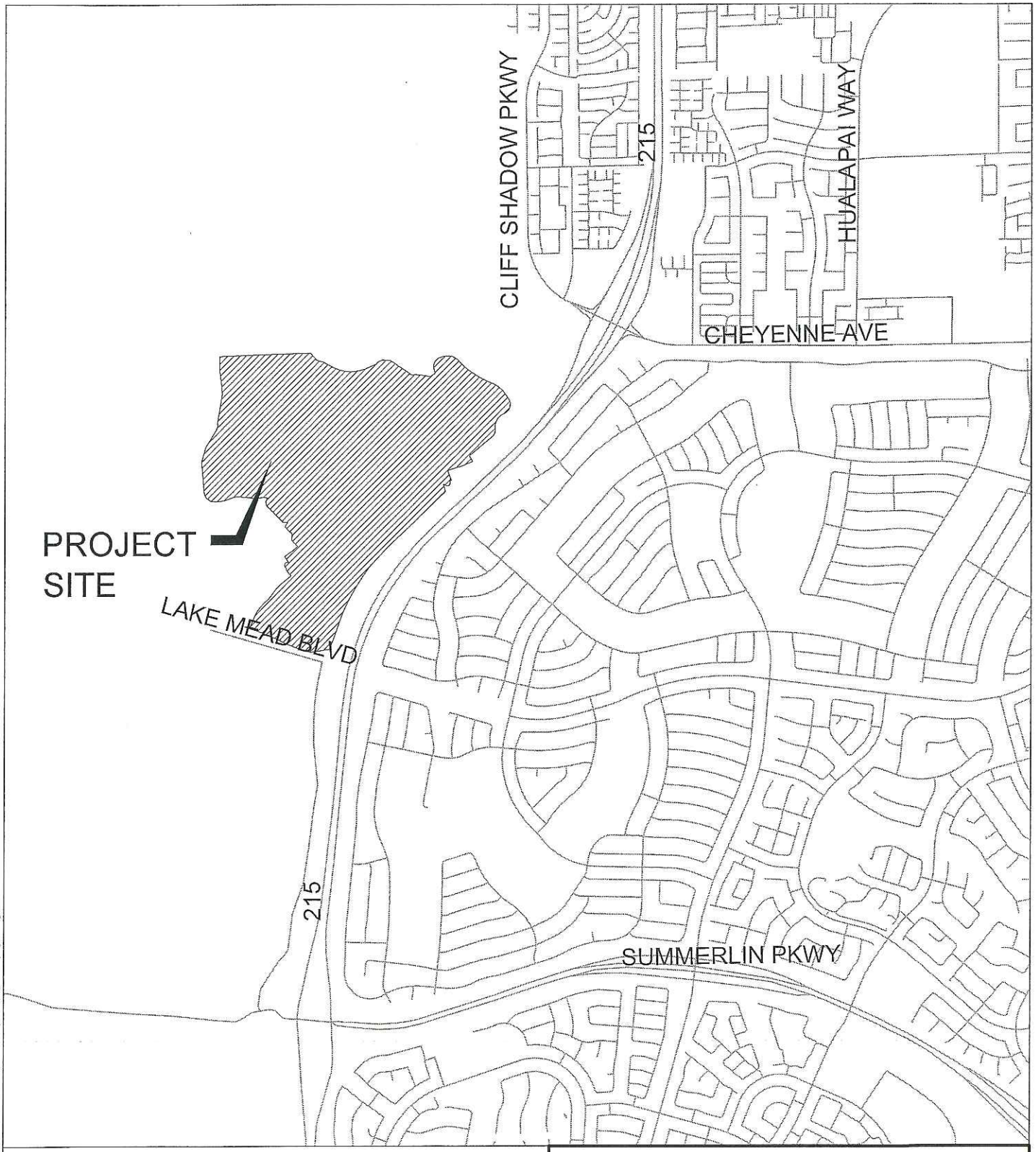

GRAPHIC SCALE

2000 0 1000 2000

(IN FEET)

1 inch = 2000 ft.

NORTH

PULTE HOMES INC.

REVERENCE OFFSITE IMPROVEMENTS

FIGURE 2

LOCATION MAP

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

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III. FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD HAZARD ANALYSIS

Figure 3 is a portion of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) containing Community Panel Number 32003C 2150 E, dated September 27, 2002. Review of the FIRM shows that the project is located within FEMA Zone "X" (areas outside the 500-year flood plain).

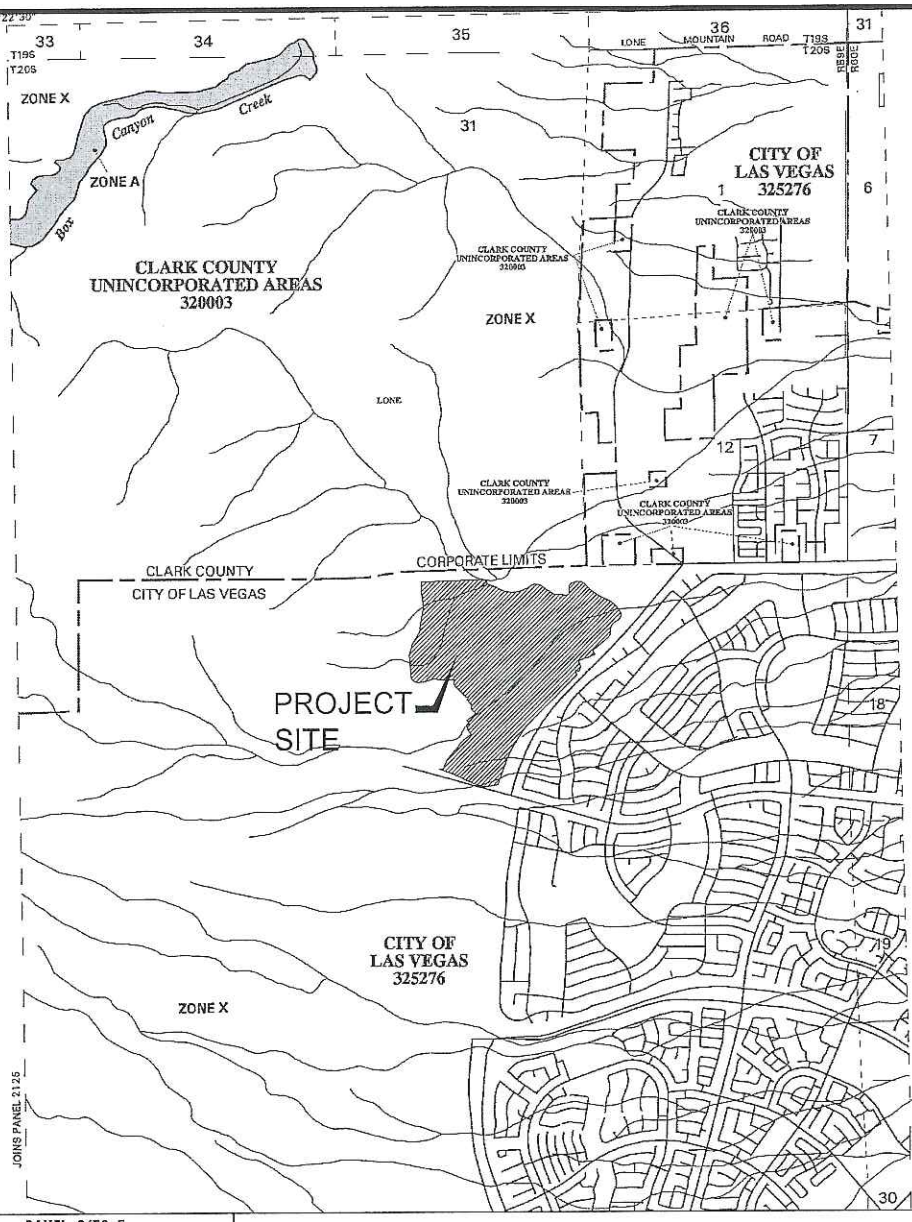
IV. CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT (CCRFCD) FACILITIES

Figure 4 is a reproduction of Figure F-24 of the *2013 Las Vegas Valley Master Plan Update* (Reference 8, hereinafter referred to as the 2013 MPU). The figure depicts the project site in relation to existing and proposed CCRFCD facilities. As shown on Figure 4, the following facilities are within or adjacent to the project site:

- Gowan Lone Mountain System 3 Beltway (GOB3 0000-0035)
- Gowan Lone Mountain System Beltway (GOBE 0000-0002)
- Gowan Lone Mountain System – Branch 3 (GOL3 0070-0216)

CCRFCD Facilities GOB3 0000-0035 will be constructed prior to or concurrently with this project. CCRFCD Facilities GOBE 0001-0065 will be removed and replaced with this project. CCRFCD Facilities GOL3 0128-0137 will be modified and/or constructed with this project. Upon receipt of conditional approval from CLV, the study will be submitted to CCRFCD for review and concurrence.

A portion of the proposed Gowan Lone Mountain System Branch 3 (GOL3 0137) is located within the Village 26 boundary. A proposed debris basin will capture the sediment load from flows impacting this facility. The proposed facility will consist of a 14-foot wide by 14-foot high RCB storm drain with trash rack and 20-foot wide by 14-foot high RCB improved inlet, 20-foot bottom width rectangular channel, and 20-foot wide by 7-foot high RCB. It is proposed to route portions of this facility within the drainage easement adjacent to the Western Beltway alongside the proposed modified Western Beltway Channel. This facility will outlet flows to the Village 26 Detention Basin (GOL3 0128). The debris basin and Village 26 Detention Basin will include concrete stepped inflow structures for energy dissipation.



THIS AREA IS SHO

PANEL 2150 E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2150 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAS VEGAS, CITY OF	325276	2150	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	2150	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 32003C2150 E

MAP REVISED: SEPTEMBER 27, 2002

Federal Emergency Management Agency

GRAPHIC SCALE

4000 0 2000 4000

(IN FEET)

1 inch = 4000 ft.

NORTH

PULTE HOMES INC.

REVERENCE OFFSITE IMPROVEMENTS

FIGURE 3

F.I.R.M.

GCW ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
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gcwengineering.com

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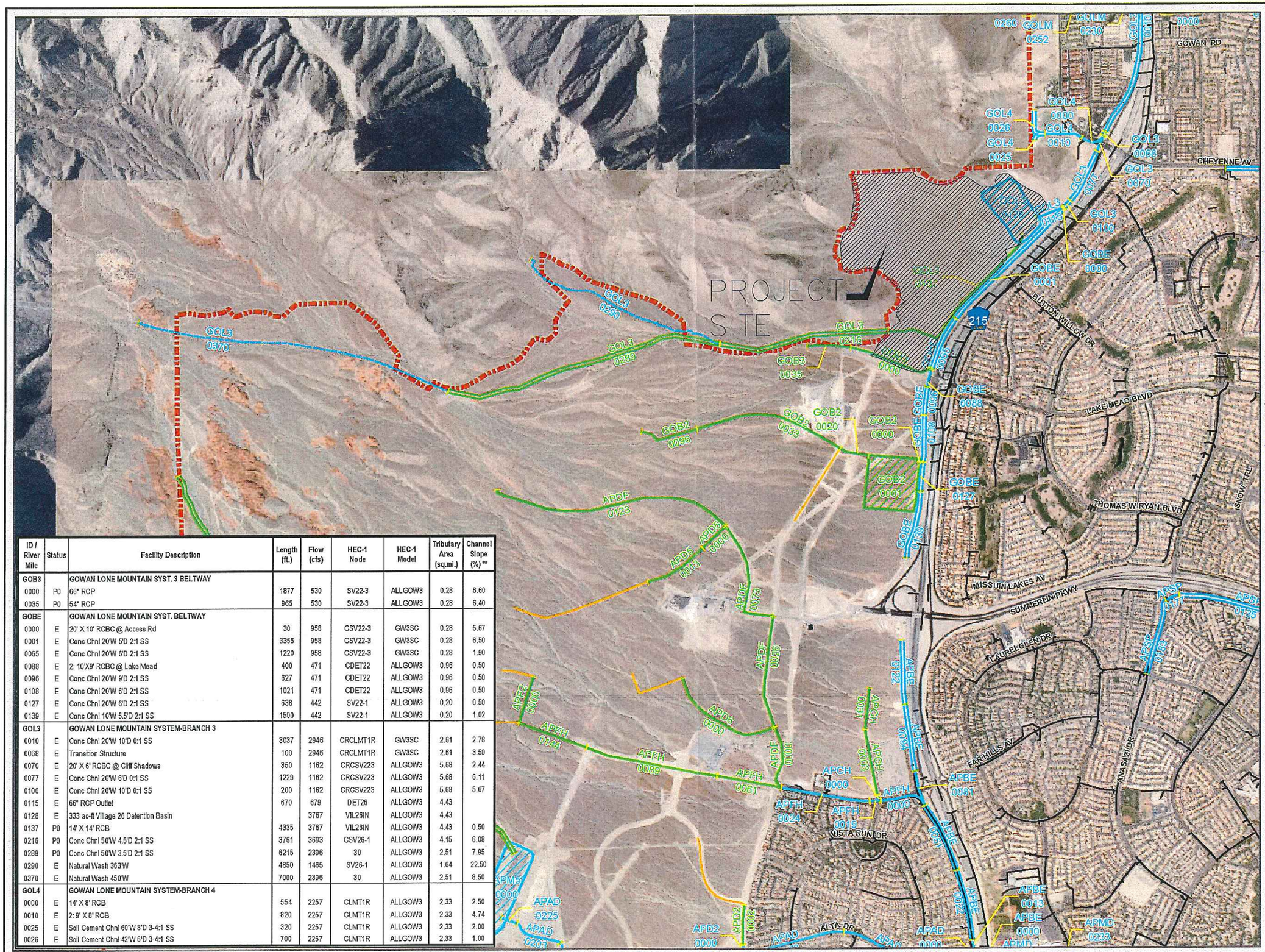


ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
GOB3		**GOWAN LONE MOUNTAIN SYST. 3 BELTWAY**						
0000	P0	66" RCP	1877	530	SV22-3	ALLGOW3	0.28	6.60
0035	P0	54" RCP	965	530	SV22-3	ALLGOW3	0.28	6.40
GOBE		**GOWAN LONE MOUNTAIN SYST. BELTWAY**						
0000	E	20' X 10' RCBC @ Access Rd	30	958	CSV22-3	GW3SC	0.28	5.67
0001	E	Conc Chnl 20'W 5'D 2:1 SS	3355	958	CSV22-3	GW3SC	0.28	6.50
0065	E	Conc Chnl 20'W 6'D 2:1 SS	1220	958	CSV22-3	GW3SC	0.28	1.90
0088	E	2: 10'X9' RCBC @ Lake Mead	400	471	CDET22	ALLGOW3	0.96	0.50
0096	E	Conc Chnl 20'W 9'D 2:1 SS	627	471	CDET22	ALLGOW3	0.96	0.50
0108	E	Conc Chnl 20'W 6'D 2:1 SS	1021	471	CDET22	ALLGOW3	0.96	0.50
0127	E	Conc Chnl 20'W 6'D 2:1 SS	638	442	SV22-1	ALLGOW3	0.20	0.50
0139	E	Conc Chnl 10'W 5.5'D 2:1 SS	1500	442	SV22-1	ALLGOW3	0.20	1.02
GOL3		**GOWAN LONE MOUNTAIN SYSTEM-BRANCH 3**						
0010	E	Conc Chnl 20'W 10'D 0:1 SS	3037	2946	CRCLMT1R	GW3SC	2.61	2.78
0068	E	Transition Structure	100	2946	CRCLMT1R	GW3SC	2.61	3.50
0070	E	20' X 6' RCBC @ Cliff Shadows	350	1162	CRCSV223	ALLGOW3	5.68	2.44
0077	E	Conc Chnl 20'W 6'D 0:1 SS	1229	1162	CRCSV223	ALLGOW3	5.68	6.11
0100	E	Conc Chnl 20'W 10'D 0:1 SS	200	1162	CRCSV223	ALLGOW3	5.68	5.67
0115	E	66" RCP Outlet	670	679	DET26	ALLGOW3	4.43	
0128	E	333 ac-ft Village 26 Detention Basin		3767	VIL26IN	ALLGOW3	4.43	
0137	P0	14' X 14' RCB	4335	3767	VIL26IN	ALLGOW3	4.43	0.50
0216	P0	Conc Chnl 50'W 4.5'D 2:1 SS	3761	3693	CSV26-1	ALLGOW3	4.15	6.08
0289	P0	Conc Chnl 50'W 3.5'D 2:1 SS	6215	2396	30	ALLGOW3	2.51	7.95
0290	E	Natural Wash 363'W	4850	1465	SV26-1	ALLGOW3	1.64	22.50
0370	E	Natural Wash 450'W	7000	2396	30	ALLGOW3	2.51	8.50
GOL4		**GOWAN LONE MOUNTAIN SYSTEM-BRANCH 4**						
0000	E	14' X 8' RCB	554	2257	CLMT1R	ALLGOW3	2.33	2.50
0010	E	2: 9' X 8' RCB	820	2257	CLMT1R	ALLGOW3	2.33	4.74
0025	E	Soil Cement Chnl 60'W 8'D 3-4:1 SS	320	2257	CLMT1R	ALLGOW3	2.33	2.00
0026	E	Soil Cement Chnl 42'W 6'D 3-4:1 SS	700	2257	CLMT1R	ALLGOW3	2.33	1.00

REGIONAL FLOOD CONTROL DISTRICT

2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 24
FLOOD CONTROL FACILITIES

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Stormdrain
- Lined Channel
- Unlined Channel
- Levee/Dike
- Natural Wash/Floodway
- ID-Mile Separator

Remove & Replace/Parallel Facilities

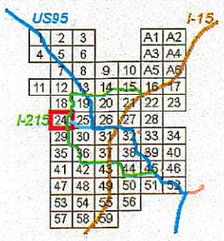
Category A	Category B
Channel	Channel
Stormdrain	Stormdrain

FIGURE 4

N

0 500 1,000 2,000 3,000
Feet
Scale: 1 Inch = 2,000 feet

Refer to Figure G-2 for Aerial Source(s)



The Gowan/Lone Mountain System Beltway (GOBE), known as the Western Beltway Channel, is located within a drainage easement along the eastern boundary of Village 26 between the Lake Mead Boulevard and Cheyenne Avenue. It is proposed to replace the existing 20-foot wide trapezoidal channel with a rectangular concrete-lined channel between Lake Mead Boulevard and Cheyenne Avenue.

A portion of the proposed Gowan Lone Mountain System 3 Beltway (GOB3) is within future Lake Mead Parkway alignment located along the southern boundary of Reverence. The *Technical Drainage Study for Summerlin Lake Mead Boulevard Improvements* (Reference 9, hereinafter referred to as the Lake Mead Study) was submitted to CLV on September 10, 2007, and comments were received on November 1, 2007. Based on discussions with the developer and for the purposes of this report, CCRFCD Facilities GOB3 0000-0035 will be constructed prior to or concurrently with Reverence. Pertinent reference materials have been included in Appendix C. The CCRFCD GOB3 Facilities drain to the existing Gowan Lone Mountain System Beltway (GOBE), known as the Beltway Channel, between the east boundary of Reverence and I-215. A portion of the proposed Gowan Lone Mountain System 3 Beltway (GOL3) is located within Reverence and drains to the existing 333 acre-foot Village 26 Detention Basin (GOL3 0128). These systems ultimately discharge into the Gowan Lone Mountain Detention Facility (GOLM 0146).

V. HYDROLOGY/HYDRAULICS

The methodology presented in this study is in compliance with the *CCRFCD Hydrologic Criteria and Drainage Design Manual* (Reference 10, hereinafter referred to as the Manual).

Model Description – The watersheds were modeled using the SCS Unit Hydrograph method within the U.S. Army Corps of Engineers *HEC-1 Flood Hydrograph Package* (Reference 11). Since the drainage area for the project is less than 8 square miles, an SDN 3 design storm was selected for use in the HEC-1 computer model. Note that hydrologic parameters included in this study have been referenced from the Master Study. Pertinent reference material from the Master Study has been included in the Appendix C.

Offsite properties southwest of the proposed debris basin were analyzed using the FLO-2D Program (Reference 12) with rainfall and infiltration parameters calibrated to

be consistent with the SCS methodology in the HEC-1 Flood Hydrograph Package. Although the use of the FLO-2D Program is not addressed in the Manual, FLO-2D is listed by FEMA as an accepted numerical model for two-dimensional flow analysis on alluvial fans. The FLO-2D analysis was used to determine hydrologic and hydraulic parameters used to quantify 100-year scour depths along a 1180-foot long proposed retaining/scour wall located along the southwest property boundary line.

Hydraulic modeling for the proposed channel improvements were performed within the U.S. Army Corps of Engineers HEC-RAS River Analysis System computer program version 4.1.0 (Reference 13).

Hydraulic modeling for the proposed RCB storm drain mainlines were performed with the CIVILDESIGN Corp. WSPGW Water Surface Pressure Gradient Package (Reference 14, hereinafter referred to as WSPGW).

Precipitation – The adjusted point precipitation values for Reverence have been referenced from the Master Study. The 100-year storm event point precipitation values range from 3.32 to 3.38 for onsite drainage subbasins, and 3.28 to 3.67 for offsite drainage subbasins.

The drainage areas within Reverence were less than 8 square miles; therefore, an SDN 3 design storm was selected for use in the HEC-1 computer model.

Curve Numbers (CN) – The project site lies within the area covered by the *Soil Survey of Clark County Area, Nevada* (Reference 15) and *Soil Survey of Las Vegas Valley Area, Nevada, Part of Clark County* (Reference 16). These surveys delineate families of soil types and Hydrologic Soil Group (HSG) of each family. A soils map containing the project site is included in Appendix C. The soils report shows that the project area consists of soil units 112, 152, 155, 191, 323, 351, 360, 502, 640. Soil unit 112 (Arizo) is classified as Hydrologic Soil Group (HSG) 'A'. Soil unit 152 (Cave) is classified as HSG 'D'. Soil unit 155 (Cave) is classified as HSG 'D'. Soil unit 191 (Dalian) is classified as HSG 'A'. Soil unit 323 (Boxspring-Scrapy-Rock Outcrop) is classified as HSG 'D'. Soil unit 351 (Seralin) is classified as HSG 'D'. Soil unit 360 (Rock outcrop-St. Thomas complex) is classified as HSG 'ROCK'. Soil unit 502 (Canutio-Cave) is classified as HSG 'A. Soil unit 640 (Rock Outcrop, sandstone) is classified as HSG 'ROCK'.

Curve number calculations referenced from the Master Study have been included in Appendix C. Curve numbers ranging from 84.7 to 86.3 for the offsite undeveloped subbasins, and 78.3 to 86.8 for the offsite developed subbasins were referenced from the Master Study. Curve numbers ranging from 90.2 to 93.9 for the proposed onsite rough grade subbasins have been referenced from the Master Study.

Drainage Areas and Flow Patterns – In general, the onsite and offsite drainage patterns are consistent with previously approved studies. The Village 26 Studies, Summerlin West MPU and 2013 MPU were compared with the analyses presented herein. Excerpts from the referenced studies have been included in Appendix C.

Lag Time – The lag time (TLAG) is described as the time between the center of mass of rainfall and the time of peak discharge from a basin. Lag time can be related to time of concentration (T_c) by the following relationship: TLAG = 0.6 (T_c). The time of concentration (T_c) is defined as the time required for runoff to flow from the most hydraulically distant area of the basin to the outlet of the basin or a design point. The procedure for calculating (T_c) is outlined in Section 602 of the Manual. Lag time calculations for the drainage subbasins are included in Appendix A on Standard Form 4. Lag time calculations for the offsite subbasins have been referenced from the Master Study have been included in Appendix C.

Routing – The Muskingum and the Muskingum-Cunge Routing Methods were utilized in the hydrologic models. The use of the Muskingum routing card in the HEC-1 model was limited to undeveloped areas. The Muskingum-Cunge was used for routing in improved conveyance systems, i.e., roadway, storm drain systems, etc.

VI. EXISTING CONDITIONS

The eastern half of Reverence and the portion of the Summerlin West Planning Area tributary to Reverence discharges into the existing Village 26 Detention Basin located within the northeast portion of the site. The total area tributary to the existing approximately 300-acre foot Village 26 Detention Basin consists of approximately four square miles. The existing Village 26 Detention Basin outfall storm drain consists of a 96-inch RCP that connects to the existing Beltway Channel located along the eastern boundary of Reverence. Currently, the site is mass graded. Per the Interim Berm

Study, an interim berm/channel system located at the southeast border of the project site provides protection for the adjacent Western Beltway and directs flows into the existing Village 26 Detention Basin. Pertinent reference materials have been included in Appendix C.

The existing conditions hydrology for the majority of Summerlin West was originally analyzed in the *Summerlin Stormwater Management Plan* (Reference 17). Therefore, an additional existing conditions hydrologic model has not been prepared as a part of this study.

Note that design flowrates for the revised Western Beltway Channel have been based on existing condition flowrates. These flowrates have been referenced from the *Technical Drainage Study for the Western Segment of the Las Vegas Beltway from Summerlin Parkway to Cheyenne Avenue* (Reference 18, hereinafter referred to as the Beltway Channel Study). Pertinent referenced material from the Beltway Channel Study has been included in Appendix C.

VII. ULTIMATE CONDITIONS

The ultimate conditions hydrologic calculations for the proposed debris basin, outfall facility, and Village 26 Detention Basin have been referenced from the Master Study. The referenced HEC-1 model has been revised with this study to reflect the surveyed invert elevation of 2990.14-feet. The orifice elevation has been set to the spring line elevation of the proposed 64-inch orifice elevation of 2992.80-feet (2990.14' + 64"/2). The results of the ultimate conditions HEC-1 model are summarized in Table 1. Ultimate Conditions for the proposed Western Beltway Channel Improvements has been referenced from the 2006 Update. A copy of Figures 5 and 5A referenced from the Master Study have been included in Appendix A. Pertinent referenced material from the Master Study and 2006 Update have been included in Appendix C.

TABLE 1
SUMMARY OF ULTIMATE CONDITIONS HEC-1 MODEL

SB OR CP	AREA (AC)	100 YR (CFS)	25 YR (CFS)	10 YR (CFS)
1-1A	1497.2	2289	1477	942
1-1B	111.8	226	115	63
CP1	-	2404	1549	986
1-2A	552.7	1541	938	608
1-2B	137.7	315	173	103

TABLE 1 SUMMARY OF ULTIMATE CONDITIONS HEC-1 MODEL				
SB OR CP	AREA (AC)	100 YR (CFS)	25 YR (CFS)	10 YR (CFS)
CP2	-	2941	1914	1209
1-2CR	367.6	859	503	313
CP3	-	3309	2171	1365
1-3P	16.5	63	42	31
CP4	-	3311	2179	1368
1-12P	116.6	231	128	78
CP5	-	3455	2267	1417
1-14	1.0	3	2	1
1-15	3.6	10	6	4
1-16	1.9	5	3	2
1-17	2.5	7	4	2
1-18	2.4	7	4	2
CP5B	-	3464	2273	1421
EXDB	-	661	559	457
1-4R	34.3	100	58	37
1-5R	22	63	37	24
CP6	-	163	95	61
1-6R	9.7	28	16	11
1-7R	17.3	50	30	19
CP7	-	79	46	29
1-8R	1.6	5	3	2
1-10R	35.6	101	59	38
CP8	-	106	62	39
1-11P	113.3	218	118	69
CP9	-	535	308	192
1-13	0.5	1	1	1
LMT1R	1256.6	1966	1267	821
CP10	-	2190	1422	913

VIII. INTERIM CONDITIONS

The site will be rough graded and the proposed offsite improvements will be constructed during interim conditions.

Offsite subbasins tributary to the site during interim conditions will be the same as existing conditions. The proposed onsite will be rough graded to match ultimate conditions drainage patterns. The proposed debris basin and outfall system will collect offsite flows at Concentration CP3. Figure 5 depicts the subbasins and drainage patterns used in the interim conditions hydrologic analysis for this project. The results of

NORTH

SCALE 1" = 300'

GRAPHIC SCALE

300 0 150 300

(IN FEET)

1 inch = 300 ft.

LEGEND

- 1-3P — DRAINAGE BASIN
- 3-E — PRORATED DRAINAGE BASIN
- CP3 — CONCENTRATION POINT
- BASIN BOUNDARY
- PRORATE BASIN BOUNDARY
- FLOW DIRECTION
- 1 1 — STREET CROSS SECTION

SUMMARY OF INTERIM CONDITIONS HEC-1 MODEL

SB OR CP	AREA (AC)	100 YR (CFS)	25 YR (CFS)	10 YR (CFS)
1-1A	1497.2	2289	1477	942
1-1B	111.8	226	115	63
CP1	-	2404	1549	986
1-2A	552.7	1541	938	608
1-2B	137.7	315	173	103
CP2	-	2941	1914	1209
1-2CR	367.6	859	503	313
CP3	-	3309	2171	1365
1-3P	16.5	61	40	29
CP4	-	3311	2179	1368
1-12P	116.1	291	181	124
CP5	-	3483	2295	1443
1-14	1.0	3	2	1
1-15	3.6	10	6	4
1-16	1.9	5	3	2
1-17	2.5	7	4	2
1-18	2.4	7	4	2
CP5B	-	3493	2302	1448
EXDB	-	663	561	461
1-4R	34.3	100	58	37
1-5R	22	63	37	24
CP6	-	163	95	61
1-6R	9.7	28	16	11
1-7R	17.3	50	30	19
CP7	-	79	46	29
1-8R	1.6	5	3	2
1-10R	35.6	101	59	38
CP8	-	106	62	39
1-11P	113.6	311	193	132
CP9	-	636	391	261
1-13	0.5	1	1	1
LMT1R	1256.6	1966	1267	821
CP10	-	2224	1456	945

Label	Channel Slope (%)	Discharge (ft³/s)	Normal Depth (ft)	Velocity (ft/s)	Bottom Width (ft)	Type	Side Slopes	Lining D50 (in)	Min Depth (ft)	Tributary
Cross Section 1	3.64	108	0.48	4.30	51	Trap	2:1	12	1.00	1-4R + 11-A1
Cross Section 2	0.53	189	1.20	2.96	5	Trap	1:1	12	1.50	CP6 + 11-A1 + 11-A2
Cross Section 2A	6.00	199	0.62	6.17	51	Trap	2:1	18	1.00	CP6 + 11-A1 + 11-A2 + 11-A3
Cross Section 3	6.00	235	0.68	6.58	51	Trap	2:1	18	1.00	CP6 + 11-A1 + 11-A2 + 11-A3 + 11-C
Cross Section 4	0.50	36	0.34	2.04	51	Trap	2:1	Earth	1.00	11-C + 11-A4
Cross Section 5	5.00	96	0.41	4.52	51	Trap	2:1	12	1.00	CP7 + 11-B
Cross Section 5A	4.87	299	0.76	6.39	61	Trap	1:1	12	1.00	CP7 + CP8 + 11-B + 11-D1 + 11-D2 +11-D3 11-E + 11-F
Cross Section 6	4.49	247	0.77	6.13	51	Trap	2:1	18	1.00	CP6 + 11-A1 + 11-A2 + 11-A3 + 11-A4 + 11-C + 11-K1
Cross Section 6A	13.02	247	0.82	9.56	30	Trap	2:1	36	1.00	CP6 + 11-A1 + 11-A2 + 11-A3 + 11-A4 + 11-C + 11-K1
Cross Section 6B	13.02	636	0.84	9.93	75	Trap	2:1	36	2.00	CP9
Cross Section 7	3.45	21	0.13	2.77	61	Trap	1:1	Earth	1.00	11-K2
Cross Section 8	4.75	27	0.15	3.59	51	Trap	2:1	Earth	1.00	11-H
Cross Section 9	0.98	233	1.13	3.87	51	Trap	2:1	12	1.50	CP7 + CP8 + 11-B + 11-D1 +11-D2
Cross Section 9A	2.98	12	0.10	2.26	51	Trap	2:1	Earth	1.00	11-D2
Cross Section 10	3.65	25	0.15	3.22	51	Trap	2:1	Earth	1.00	11-E
Cross Section 10A	4.99	25	0.14	3.53	51	Trap	2:1	Earth	1.00	11-E
Cross Section 11	4.90	50	0.21	4.63	51	Trap	2:1	Earth	1.00	11-E + 11F
Cross Section 12	2.35	66	0.31	4.13	51	Trap	2:1	Earth	1.00	11-E + 11F + 11-D3
Cross Section 13	0.50	41	0.37	2.14	51	Trap	2:1	Earth	1.00	11-I + 11-J2
Cross Section 13A	2.35	9	0.09	1.87	51	Trap	2:1	Earth	1.00	11-J1
Cross Section 14	4.29	15	0.11	2.75	51	Trap	2:1	Earth	1.00	12-N
Cross Section 15	1.48	412	3.27	7.63	10	Trap	2:1	12	3.50	SEC5A + 11-K2 + 11-J1 + 11-J2 + 11-I + 11-H + 11-L + 11-G
Cross Section 15A	6.50	412	1.00	7.80	83	Trap	1:1	24	1.00	SEC5A + 11-K2 + 11-J1 + 11-J2 + 11-I + 11-H + 11-L + 11-G
Cross Section 15B	5.67	382	1.05	7.74	51	Trap	2:1	30	1.50	SEC5A + 11-J1 + 11-J2 + 11-I + 11-H + 11-G
Cross Section 15C	3.39	382	1.16	6.99	51	Trap	2:1	24	1.50	SEC5A + 11-J1 + 11-J2 + 11-I + 11-H + 11-G
Cross Section 15D	3.27	305	1.02	6.33	46	Trap	1:1	12	1.50	SEC5A + 11-G
Cross Section 16	0.50	25	0.28	1.76	51	Trap	2:1	Earth	1.00	12-N + 12-M
Cross Section 17	1.22	16	0.16	1.93	51	Trap	2:1	Earth	1.00	12-K
Cross Section 18	5.03	39	0.18	4.23	51	Trap	2:1	Earth	1.00	12-I + 12-J
Cross Section 18A	5.58	39	0.87	6.65	5	Trap	2:1	12	1.00	12-I + 12-J
Cross Section 19	0.55	15	0.20	1.48	51	Trap	2:1	Earth	1.00	12-H
Cross Section 20	5.22	41	0.18	4.36	51	Trap	2:1	Earth	1.00	12-A
Cross Section 20A	5.21	56	0.22	4.93	51	Trap	2:1	Earth	1.00	12-A + 12-B
Cross Section 21	6.08	30	0.14	4.04	51	Trap	2:1	Earth	1.00	12-D
Cross Section 22	4.99	30	0.15	3.80	51	Trap	2:1	Earth	1.00	12-D
Cross Section 23	4.63	19	0.09	2.56	83	Trap	1:1	Earth	1.00	12-E
Cross Section 24	5.97	67	0.25	5.75	46	Trap	1:1	Earth	1.00	12-E + 12-F + 12-G + 12+H
Cross Section 25	22.20	31	0.20	5.90	26	Trap	2:1	12	1.00	LMT1RB
Cross Section 26	7.95	75	0.36	5.26	39	Trap	1:1	12	1.00	Referenced From the WB Study
Cross Section 27	0.40	106	1.42	4.20	15	Trap	2:1	Earth	4.50	CP8

ONSITE PRORATED FLOW SUMMARY

Subbasin	Q_{100} (cfs)	New Area	cfs/acre
1-11P	311	113.6*	2.74
1-12P	291	116.1*	2.51
Onsite Prorated Basins			
Subbasin	Q_{100} (cfs)	New Area (acres)	cfs/acre
11-A1	8	3.0	2.74
11-A2	18	6.5	2.74
11-A3	10	3.5	2.74
11-A4	7	2.5	2.74
11-B	17	6.3	2.74
11-C	29	10.7	2.74
11-D1	19	6.9	2.74
11-D2	12	4.3	2.74
11-D3	16	5.9	2.74
11-E	25	9.0	2.74
11-F	25	9.2	2.74
11-G	6	2.3	2.74
11-H	27	9.7	2.74
11-I	20	7.4	2.74
11-J1	9	3.3	2.74
11-J2	21	7.5	2.74
11-K1	13	4.6	2.74
11-K2	21	7.6	2.74
11-L	9	3.4	2.74
Total	**311**	**113.6***	**N/A**
12-A	41	16.5	2.51
12-B	15	5.8	2.51
12-C	4	1.7	2.51
12-D	30	12.0	2.51
12-E	19	7.4	2.51
12-F	17	7.0	2.51
12-G	16	6.6	2.51
12-H	15	5.9	2.51
12-I	22	8.8	2.51
12-J	17	6.7	2.51
12-K	16	6.4	2.51
12-L	54	21.5	2.51
12-M	10	3.8	2.51
12-N	15	6.0	2.51
TOTAL	**291**	**116.1***	**N/A**

*Revised from Previous Submittal

% COMPLETE

REV	DATE	DESCRIPTION	DATE	ACEN APP	DATE	GCW APP	DATE

PROJECT NO. 764-20I-013

DESIGN:
DRAWN:
CHECK:

PLOT DATE: 12-21-15
PLOT TIME: 08:59:52

GCW
ENGINEERS \ SURVEYORS
1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\Projects\700\764-204-013\Division\Fcst\Figures\Fig 5.dwg
David Clark

PULTE HOMES

SUMMERLIN VILLAGE 26 - REVERENCE OFFSITE DRAINAGE IMPROVEMENTS

INTERIM CONDITIONS DRAINAGE MAP

DRAWING
FIG-5
OF SHTS

LD #:

HTE: 00-00000

the HEC-1 model are summarized in Table 2. A copy of the interim conditions HEC-1 model is included in Appendix A.

TABLE 2
SUMMARY OF INTERIM CONDITIONS HEC-1 MODEL

SB OR CP	AREA (AC)	100 YR (CFS)	25 YR (CFS)	10 YR (CFS)
1-1A	1497.2	2289	1477	942
1-1B	111.8	226	115	63
CP1	-	2404	1549	986
1-2A	552.7	1541	938	608
1-2B	137.7	315	173	103
CP2	-	2941	1914	1209
1-2CR	367.6	859	503	313
CP3	-	3309	2171	1365
1-3P	16.5	61	40	29
CP4	-	3311	2179	1368
1-12P	116.1	291	181	124
CP5	-	3483	2295	1443
1-14	1.0	3	2	1
1-15	3.6	10	6	4
1-16	1.9	5	3	2
1-17	2.5	7	4	2
1-18	2.4	7	4	2
CP5B	-	3493	2302	1448
EXDB	-	663	561	461
1-4R	34.3	100	58	37
1-5R	22	63	37	24
CP6	-	163	95	61
1-6R	9.7	28	16	11
1-7R	17.3	50	30	19
CP7	-	79	46	29
1-8R	1.6	5	3	2
1-10R	35.6	101	59	38
CP8	-	106	62	39
1-11P	113.6	311	193	132
CP9	-	636	391	261
1-13	0.5	1	1	1
LMT1R	1256.6	1966	1267	821
CP10	-	2224	1456	945

The interim conditions flow rates of 2,224 cfs to the MPU Facility GOL4 0000 and 3,493 cfs to the MPU Facility GOL3 0128 are less than the ultimate conditions flow rates presented at these two locations in the Village 26 Study. Additionally, the discharge locations are consistent with the approved Village 26 Study. Therefore,

flows discharged from the site will not adversely impact downstream properties or facilities.

Rough Graded Channels

The future roadway rough graded trapezoidal minimum 1-foot deep sections will serve as channels to convey offsite and onsite generated flow through the site to the proposed discharge locations. Subbasins impacting the proposed rough graded channels have been prorated to determine the specific flow rates conveyed in the channels at the cross section locations. Proposed channels required to convey offsite runoff through the site are summarized on Figure 5.

Similar to the original design, as addressed in the V26 Offsites Study Response to CLV Comment #8, a temporary channel designed to direct flows onsite will provide protection for the dual channels during construction. The temporary channel is shown on Exhibit 1 in Appendix A. The temporary channel will have a 20-foot bottom width with 2 to 1 side slopes and riprap (d50 = 17 inches) and will convey the Beltway Channel Flow to the existing onsite interim berm that was analyzed as part of Interim Berm Study. The HEC-RAS analysis provided with the Interim Berm Study has been revised with this submittal reflect the combined flow rate of 4,956 cfs. The combined flow rate of 4,956 has been referenced from the Original Offsites Study Response to Comments. The revised analysis shows the combined 100-year flow rate can be safely conveyed through the site. The top of berm elevation will be a minimum 1.5 feet above the water surface elevation alongside the berm and the velocity distribution shown the flow velocity along the berm is no more than 10.62 feet per second. The proposed 64-inch restrictor plate will be added to the detention basin outlet structure after completion of the dual channel outlet structure.

IX. PROPOSED DRAINAGE FACILITIES

As previously discussed, a temporary channel designed to direct flows onsite will provide protection for the dual channels during construction. The temporary channel will be removed and the debris and detention basin improvements, and RCB storm drains will be constructed concurrently after the dual channel structure along the beltway has been constructed. The dual channel structure improvements will need to be constructed prior to the detention basin modifications and orifice plate because the beltway flows will be directed to the existing onsite rough graded interim berm channel which will temporarily increase flows to the existing Village 26 Detention Basin. The

HEC-1 model previously provided to address the combined flow to the existing Village 26 Detention during the proposed temporary conditions has been revised to reflect the surveyed invert elevation of 2990.14 feet for the existing 96-inch RCP outfall pipe. The orifice elevation has been revised from 2995.00 feet to 2994.14 feet to match the 96-inch RCP spring line elevation (2990.14 feet + ½ D). The proposed detention basin modification will include a revised footprint/shape, , concrete stepped inflow structure, USBR Type IV stilling basin, 36-inch RCP nuisance storm drain, inflow pipes w/ USBR Type VI energy dissipaters, sediment berm, trash rack, and orifice plate. The future park improvements within the detention basin will be addressed in a future technical drainage study. The approximately 300-acre mixed use detention basin proposed with this project may include a park, amphitheatre, basketball court, volleyball court, tennis courts, and soccer field in the future. The proposed debris basin will include a concrete stepped inflow structure, USBR Type IV stilling basin, sediment berm, and trash rack. The proposed debris basin outfall system will consist of approximately 1,065 linear feet of 14-foot wide by 14-foot high RCB Storm Drain, approximately 2,768 linear feet of 20-foot wide by 8- to 17-foot high rectangular concrete channel, and approximately 330 linear feet of 20-foot wide by 7-foot high RCB Storm Drain. The proposed drainage facilities are depicted on Figures 5AU and 6. A summary of the WSPGW and HEC-RAS results are shown on Figure 5AU.

The site will provide emergency overflow paths consistent with the original design. A description of the previously provided debris basin overflow paths was presented in the V26 Offsites Study Response to CLV Comment #12. The proposed interior roadways will convey flows that overtop the debris basin to the proposed detention basin.

WESTERN BELTWAY CHANNEL HEC-RAS SECTION SUMMARY TABLE

Sta	ULT Q	FL Elevation	Depth	Vel	Top Width	Froude #	Radius	Freeboard	Super-elevation	Total Depth	Interim Depth	
	(cfs)	(ft)	(ft)	(ft/s)	(ft)			(ft)	(ft)	(ft)	(ft)	Notes
03+84.04	1664	3221.97	3.04	12.06	30.98	1.39	0	1.4	0.0	4.5	4.27	
09+56.12	1664	3219.11	4.57	7.04	37.09	0.68	0	1.3	0.0	5.8	8.02	
10+06.12	1664	3218.36	3.91	11.27	20.00	1.00	0	1.4	0.0	5.4	6.72	
14+06.12	1664	3216.36	4.88	9.02	20.00	0.72	4279	1.8	0.0	6.6	7.99	Exit from RCB Structure
14+07.12	1664	3216.35	5.01	8.37	21.00	0.66	4279	1.6	0.0	6.6	8.15	
15+06.12	1664	3215.58	4.35	11.90	17.00	1.01	4279	1.5	0.0	5.8	7.11	Transition to 17' BW Channel
15+31.61	1692	3215.38	3.98	13.01	17.00	1.15	4279	1.5	0.0	5.5	6.73	Junction
21+27.53	1716	3210.70	3.13	16.53	17.00	1.65	2992	1.6	0.0	4.8	5.06	Transition to 15' BW, Grade Break
21+77.53	1716	3208.73	3.10	18.95	15.00	1.90	2993	1.7	0.0	4.8	5.26	End Transition
23+27.53	1716	3202.84	2.42	24.21	15.00	2.74	2993	1.8	0.0	4.3	4.16	
24+77.53	1716	3196.94	2.25	26.08	15.00	3.06	2993	1.9	0.1	4.2	3.78	
25+65.46	1716	3193.48	2.20	26.62	15.00	3.16	2993	1.9	0.1	4.1	3.66	Transition to 11' BW Channel
26+26.68	1716	3191.07	3.08	25.95	11.00	2.60	2993	1.9	0.0	5.1	5.18	End Transition
27+17.76	1716	3187.48	2.95	27.10	11.00	2.78	2993	2.0	0.0	5.0	4.96	Grade Break
28+00.00	1716	3182.1	2.68	29.88	11.00	3.22	2993	2.0	0.1	4.8	4.55	
29+00.00	1716	3175.56	2.51	31.93	11.00	3.55	2993	2.1	0.1	4.7	4.25	
30+00.00	1716	3169.03	2.42	33.11	11.00	3.75	2993	2.1	0.1	4.6	4.06	
31+50.00	1716	3159.22	2.35	34.09	11.00	3.92	2993	2.1	0.1	4.5	3.89	
36+00.00	1716	3129.96	2.29	34.88	11.00	4.06	0	2.1	0.0	4.4	3.69	
40+00.00	1716	3103.96	2.30	34.83	11.00	4.05	0	2.1	0.0	4.4	3.66	
44+00.00	1716	3077.96	2.30	34.84	11.00	4.05	0	2.1	0.0	4.4	3.66	
47+71.98	1769	3053.76	2.30	34.85	11.00	4.05	0	2.1	0.0	4.4	3.76	Grade Break
48+80.88	1769	3047.57	2.36	33.92	11.00	3.89	0	2.1	0.0	4.5	3.83	Beginning of Transition
49+31.11	1769	3044.82	1.63	33.95	18.05	4.99	0	2.0	0.0	3.6	2.46	
49+81.21	1769	3041.85	1.39	32.37	24.36	5.40	0	1.9	0.0	3.3	1.99	
50+31.21	1769	3038.31	1.44	31.00	24.56	5.08	0	1.9	0.0	3.3	2.05	End of Transition/Channel

WSPGW MODEL SUMMARY

14' X 14' RCB

Station	Invert (ft)	Flow Depth (ft)	HGL (ft)	Q Total (cfs)	Velocity (fps)	Froude	Facility Description
20+58.06	3208.240	9.91	3218.15	3311.10	23.86	1.34	14' x 14' RCB
19+05.20	3209.410	9.64	3219.05	3311.10	24.52	1.39	14' x 14' RCB
18+52.70	3209.935	9.68	3219.61	3311.10	24.44	1.38	14' x 14' RCB
18+47.70	3209.986	9.66	3219.64	3309.10	24.48	1.39	14' x 14' RCB
13+37.60	3215.170	11.84	3227.01	3309.10	19.96	1.02	14' x 14' RCB
12+61.10	3215.600	11.77	3227.37	3309.10	20.08	1.03	14' x 14' RCB
11+65.71	3216.145	12.02	3228.16	3309.10	19.67	1.00	14' x 14' RCB
11+15.71	3216.430	16.18	3232.61	3309.10	11.82	0.57	DUAL 10' X 14' RCBs
10+42.54	3216.837	16.02	3232.86	3309.10	11.82	0.57	DUAL 10' X 14' RCBs
10+38.41	3216.861	16.01	3232.87	3309.10	11.82	0.57	DUAL 10' X 14' RCBs
10+35.41	3216.878	16.00	3232.88	3309.00	11.82	0.57	DUAL 10' X 14' RCBs
10+05.12	3217.051	16.06	3232.88	3309.00	11.82	0.57	DUAL 10' X 14' RCBs
09+91.35	3217.130	16.02	3233.11	3309.00	11.82	-	WALL ENTRANCE

VILLAGE 26 CHANNEL HEC-RAS SECTION SUMMARY TABLE

Sta	Q	FL Elevation	Depth	Vel	Top Width	Froude #	Radius	Freeboard	Super-elevation	Total Depth	
	(cfs)	(ft)	(ft)	(ft/s)	(ft)			(ft)	(ft)	(ft)	Notes
20+38.06	3311	3208.39	10.52	22.49	14.0	1.22	3000	2.2	0.0	12.8	
20+58.05	3311	3208.25	10.56	22.40	14.0	1.22	3000	2.2	0.0	12.8	Beginning of 20' Wide Rect. Channel
20+58.06	3311	3208.24	10.53	22.46	20.0	1.22	3000	2.2	0.1	12.8	
20+70.06	3311	3208.15	5.95	27.84	20.0	2.01	3000	2.3	0.1	8.3	End of Ineffective Flow
20+83.06	3311	3208.05	5.99	27.64	20.0	1.99	3000	2.3	0.1	8.3	Drop Channel Height to 9 feet
22+25.20	3311	3206.98	6.42	25.79	20.0	1.79	3000	2.2	0.1	8.7	Grade Break
23+61.30	3311	3201.65	5.44	30.41	20.0	2.30	3000	2.3	0.1	7.9	Drop Channel Height to 8 feet
25+69.80	3311	3193.50	4.81	34.42	20.0	2.77	3000	2.5	0.1	7.4	
26+22.97	3311	3191.41	4.29	35.41	21.8	3.01	3000	2.4	0.1	6.9	
26+33.22	3311	3191.03	4.74	34.96	20.0	2.83	0	2.5	0.0	7.2	
27+23.72	3311	3187.48	4.60	35.96	20.0	2.95	0	2.5	0.0	7.1	Drop Channel Height to 6.8 feet, GB
30+00.00	3311	3169.52	3.90	42.49	20.0	3.79	0	2.7	0.0	6.6	
32+00.00	3311	3156.52	3.71	44.63	20.0	4.08	0	2.7	0.0	6.4	
33+85.00	3371	3144.50	3.68	45.79	20.0	4.21	0	2.8	0.0	6.4	
34+00.00	3371	3143.52	3.67	45.88	20.0	4.22	0	2.8	0.0	6.4	
36+00.00	3371	3130.51	3.61	46.69	20.0	4.33	0	2.8	0.0	6.4	
38+00.00	3371	3117.51	3.57	47.16	20.0	4.4	0	2.8	0.0	6.4	
40+00.00	3371	3104.51	3.55	47.44	20.0	4.43	0	2.8	0.0	6.4	
42+00.00	3371	3091.51	3.54	47.6	20.0	4.46	0	2.8	0.0	6.4	
44+00.00	3371	3078.51	3.53	47.69	20.0	4.47	0	2.8	0.0	6.3	
44+49.18	3401	3075.31	3.57	47.7	20.0	4.45	0	2.8	0.0	6.4	
46+00.00	3401	3065.51	3.56	47.78	20.0	4.46	0	2.8	0.0	6.4	
47+80.33	3401	3053.79	3.55	47.85	20	4.47	0	2.8	0.00	6.4	Grade Break
48+25.86	3401	3048.2	3.44	49.43	20	4.7	0	2.9	0.00	6.3	Beginning of 20'x7' RCB

DETENTION BASIN INFLOW HEC-RAS SECTION SUMMARY TABLE

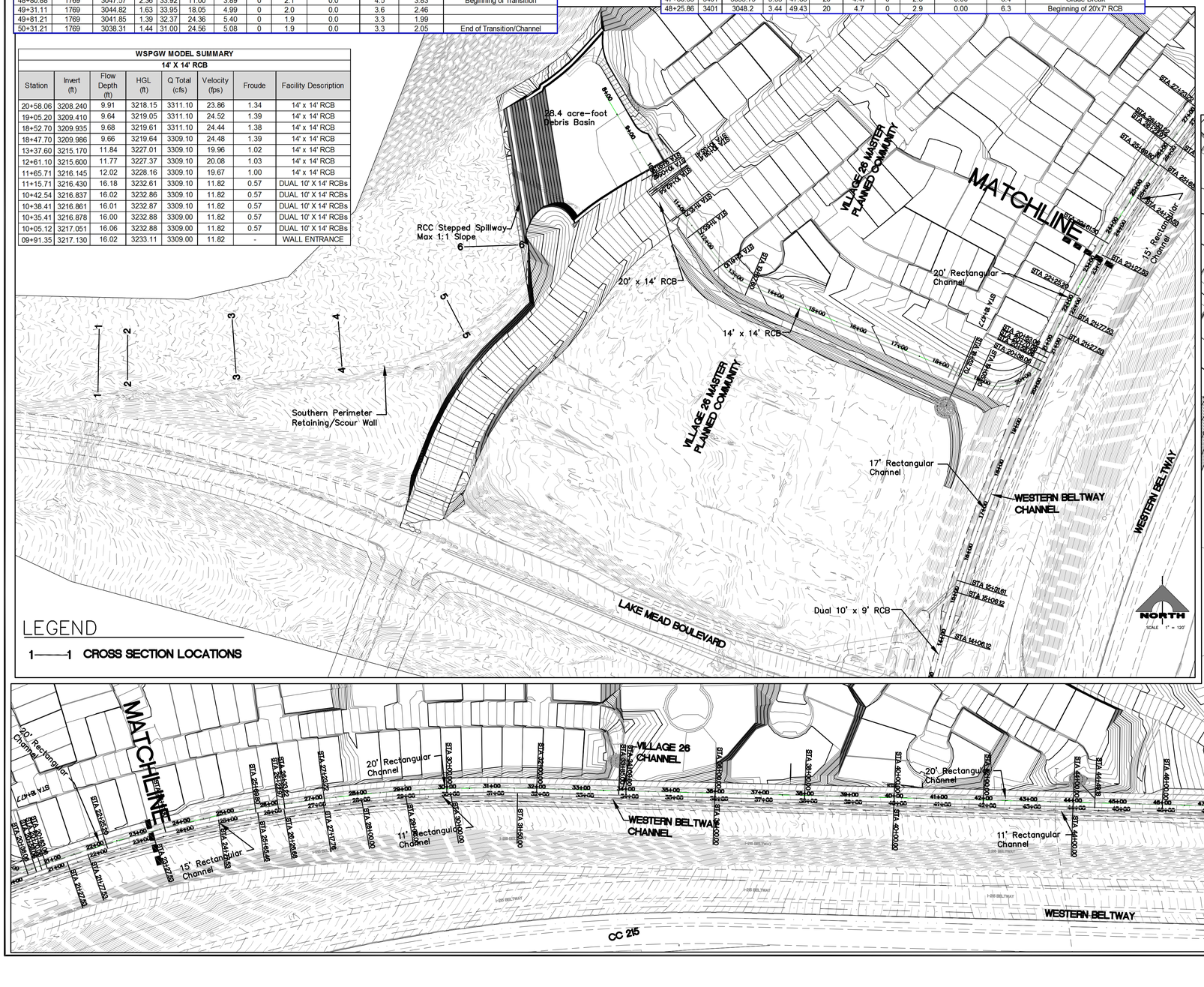
Sta	Q	Depth	Vel	Top Width	Froude #	Freeboard	Total Depth	
	(cfs)	(ft)	(ft/s)	(ft)		(ft)	(ft)	Notes
11+62.50	3492	3.89	44.88	20.0	4.01	2.8	6.7	Outlet of RCB
11+17.50	3492	2.30	36.13	42.0	4.20	2.2	4.5	Stepped Spillway
10+95.00	3492	2.07	26.21	84.5	3.21	1.8	3.9	Stepped Spillway
10+80.00	3492	1.85	21.66	87.0	2.80	1.7	3.5	Stepped Spillway
10+72.50	3492	1.64	19.43	109.5	2.67	1.6	3.2	Stepped Spillway
10+60.00	3492	1.48	17.87	132.0	2.59	1.5	3.0	Stepped Spillway
10+50.00	3492	1.40	17.11	145.83	2.55	1.5	2.9	Bottom of Stepped Spillway

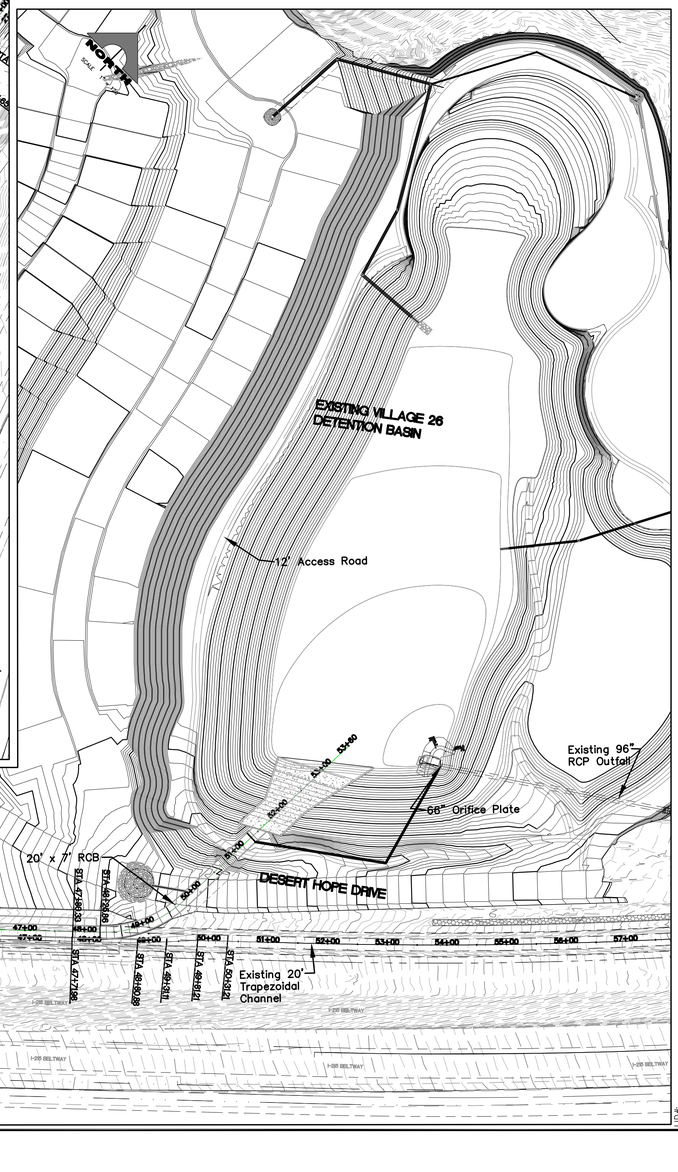
DEBRIS BASIN INFLOW HEC-RAS SECTION SUMMARY TABLE

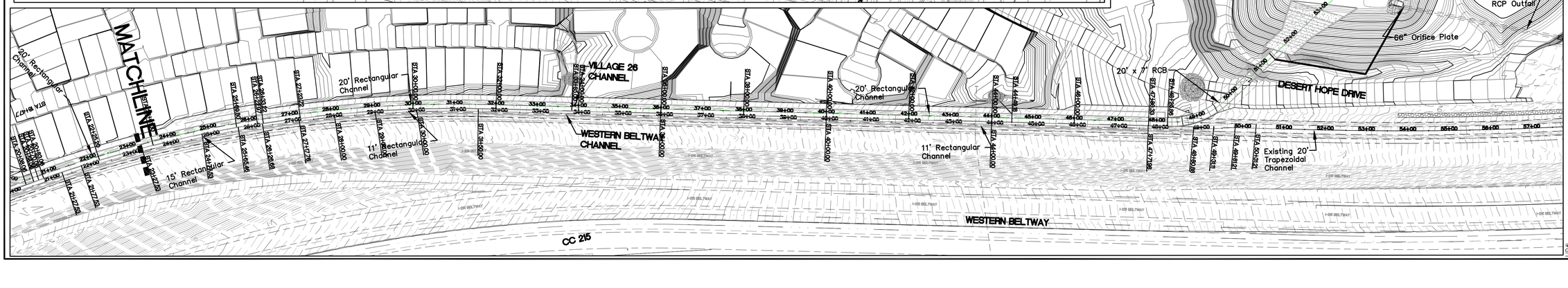
Sta	Q	Depth	Vel	Top Width	Froude #	Freeboard	Total Depth	
	(cfs)	(ft)	(ft/s)	(ft)		(ft)	(ft)	Notes
11+55.33	3503	3.03	13.09	139.77	1.67	1.5	4.5	Top of Stepped Spillway
11+43.33	3503	3.27	11.60	146.00	1.42	1.4	4.7	Stepped Spillway
11+30.00	3503	0.60	21.48	274.00	4.91	1.5	2.1	Stepped Spillway
11+16.67	3503	0.83	16.61	253.00	3.21	1.4	2.2	Stepped Spillway
11+03.33	3503	0.77	18.45	246.00	3.70	1.4	2.2	Stepped Spillway
10+90.00	3503	0.87	18.20	237.50	3.56	1.4	2.3	Stepped Spillway
10+76.67	3503	0.79	18.42	240.00	3.65	1.4	2.2	Stepped Spillway
10+63.33	3503	0.79	18.20	245.00	3.62	1.4	2.2	Stepped Spillway
10+50.00	3503	0.75	17.91	260.00	3.64	1.4	2.2	Bottom of Stepped Spillway

FLO-2D SECTION SUMMARY TABLE

Section	Q	Depth	Vel	Top Width	Froude #	Freeboard	Total Depth	
	(cfs)	(ft)	(ft/s)	(ft)		(ft)	(ft)	Notes
1	318	1.70	8.60	140.0	1.16	1.3	3.0	Use 3.0 feet above grade
2	365	1.80	10.40	100.0	1.37	1.3	3.1	Use 3.0 feet above grade
3	447	1.70	10.00	120.0	1.35	1.3	3.0	Use 3.0 feet above grade
4	447	0.70	5.90	100.0	1.24	1.1	1.8	Use 3.0 feet above grade
5	447	0.80	5.80	80.0	1.14	1.1	1.9	Use 3.0 feet above grade
6	2008	6.60	24.20	120.0	1.66	2.1	8.7	Use 15.0 feet above grade







PULTE HOMES

SUMMERLIN VILLAGE 26 - REVERENCE OFFSITE DRAINAGE IMPROVEMENTS

HYDRAULIC CROSS SECTION MAP

DRAWING FIG-5AU

PROJECT NO. 764-201-013

DESIGN:
DRAWN:
CHECK:
PLOT DATE: 12-21-15
PLOT TIME: 10:41:16

DATE: DESCRIPTION: DATE: ACEN APP DATE: CCW APP REV: DATE:

% COMPLETE

GCW ENGINEERS\SURVEYORS
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David Clark

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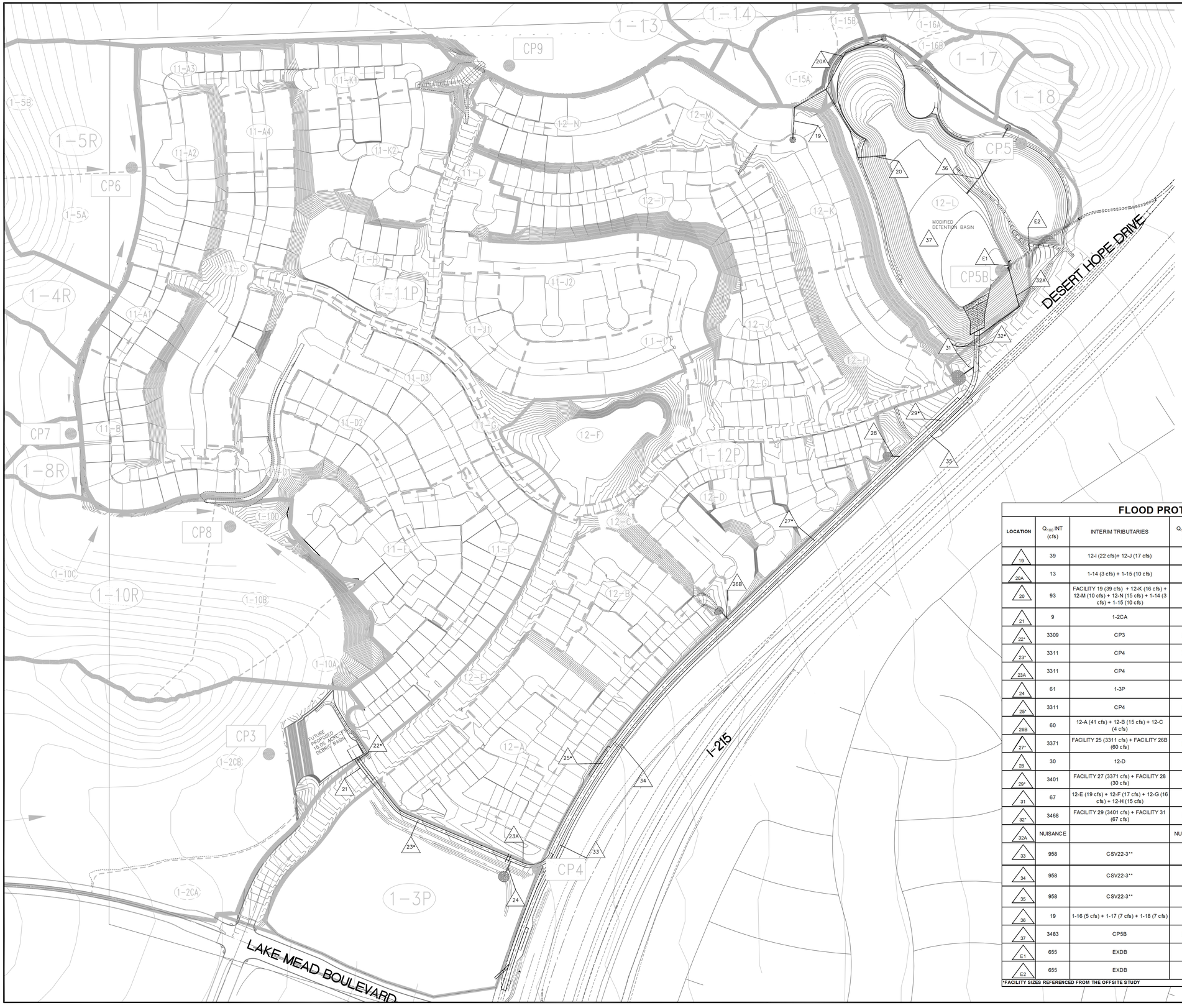

NORTH

SCALE 1" = 200'

GRAPHIC SCALE

200 0 100 200

(IN FEET)

1 inch = 200 ft.

LEGEND

- 1-18 DRAINAGE BASIN
- 3-E PRORATED DRAINAGE BASIN
- CP3 CONCENTRATION POINT
- BASIN BOUNDARY
- 1 PRORATE BASIN BOUNDARY
- FLOW DIRECTION
- 1 STREET CROSS SECTION
- 1 FACILITY IDENTIFIER

FLOOD PROTECTION FACILITIES

LOCATION	Q_{100} INT (cfs)	INTERIM TRIBUTARIES	Q_{100} ULT (cfs)	ULTIMATE TRIBUTARIES	FACILITY
19	39	12-I (22 cfs)+ 12-J (17 cfs)	30	12-I (17 cfs)+ 12-J (13 cfs)	36" RCP
20A	13	1-14 (3 cfs) + 1-15 (10 cfs)	-	-	18" RCP
20	93	FACILITY 19 (39 cfs) + 12-K (16 cfs) + 12-M (10 cfs) + 12-N (15 cfs) + 1-14 (3 cfs) + 1-15 (10 cfs)	62	FACILITY 19 (30 cfs) + 12-K (13 cfs) + 12-M (7 cfs) + 12-N (12 cfs)	42" RCP W/ 5.5' DEEP SUMP. 12" RIPRAP 5.5' HIGH
21	9	1-2CA	9	1-2CA	24" RCP
22*	3309	CP3	3309	CP3	20'X14' RCB
23*	3311	CP4	3311	CP4	14'X14' RCB (CCRFCD FACILITY GOL3)
23A	3311	CP4	3311	CP4	14'X14' RCB (CCRFCD FACILITY GOL3)
24	61	1-3P	63	1-3P	48" RCP W/ 6' DEEP SUMP. 12" RIPRAP 4' HIGH
25*	3311	CP4	3311	CP4	20' X 7.5' CONCRETE CHANNEL (CCRFCD FACILITY GOL3)
26B	60	12-A (41 cfs) + 12-B (15 cfs) + 12-C (4 cfs)	47	FACILITY 26A (33 cfs) + 12-B (11 cfs) + 12-C (3 cfs)	42" RCP W/ 5.5' DEEP SUMP. 12" RIPRAP 4' HIGH
27*	3371	FACILITY 25 (3311 cfs) + FACILITY 26B (60 cfs)	3358	FACILITY 25 (3311 cfs) + FACILITY 26B (47 cfs)	20' X 7.5' CONCRETE CHANNEL (CCRFCD FACILITY 0137)
28	30	12-D	24	12-D	36" RCP W/ 5' DEEP SUMP. 12" RIPRAP 6' HIGH
29*	3401	FACILITY 27 (3371 cfs) + FACILITY 28 (30 cfs)	3382	FACILITY 27 (3358 cfs) + FACILITY 28 (24 cfs)	20' X 7.5' CONCRETE CHANNEL (CCRFCD FACILITY 0137)
31	67	12-E (19 cfs) + 12-F (17 cfs) + 12-G (16 cfs) + 12-H (15 cfs)	54	12-E (15 cfs) + FACILITY 30 (14 cfs) + 12-G (13 cfs) + FACILITY 30A (12 cfs)	36" RCP
32*	3468	FACILITY 29 (3401 cfs) + FACILITY 31 (67 cfs)	3436	FACILITY 29 (3382 cfs) + FACILITY 30 (54 cfs)	20'X7' RCB
32A	NUISANCE		NUISANCE		36" RCP
33	958	CSV22-3**	958	CSV22-3**	17'W 7.5'-9'D CONCRETE CHANNEL (EX CCRFCD FACILITY GOBE 0065)
34	958	CSV22-3**	958	CSV22-3**	15'W 7.5'D CONCRETE CHANNEL (EX CCRFCD FACILITY GOBE 0001)
35	958	CSV22-3**	958	CSV22-3**	11'W 6.8'D CONCRETE CHANNEL (EX CCRFCD FACILITY GOBE 0001)
36	19	1-16 (5 cfs) + 1-17 (7 cfs) + 1-18 (7 cfs)	19	1-16 (5 cfs) + 1-17 (7 cfs) + 1-18 (7 cfs)	30" RCP
37	3483	CP5B	3464	CP5B	MODIFIED DETENTION BASIN
E1	655	EXDB	653	EXDB	EXISTING 65" ORIFICE PLATE
E2	655	EXDB	653	EXDB	EXISTING 96" OUTFALL PIPE (EX CCRFCD FACILITY GOL3 0115)

*FACILITY SIZES REFERENCED FROM THE OFFSITE STUDY

% COMPLETE

REV	DATE	DESCRIPTION	DATE	ACEN APP	DATE	GCW APP	DATE

PROJECT NO. 764-20I-013

DESIGN:
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PLOT DATE: 12-19-15
PLOT TIME: 18:03:25

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David Clark

PULTE HOMES

SUMMERLIN VILLAGE 26 - REVERENCE
OFFSITE DRAINAGE IMPROVEMENTS

FACILITIES MAP

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FIG-6
OF SHTS

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Debris Basin

The following debris basin sedimentation discussion has been referenced from the Master Study and has not been revised for this submittal. Supporting referenced calculations from the Master Study have been included on the referenced studies CD included in Appendix C.

The size of the debris basin was addressed in the Master Study. The Master Study showed 15.1 acre-foot debris basin is required contain the total sediment load. In general, the proposed 28 acre-foot debris basin meets the volume requirements determined in the Master Study. The proposed debris basin sides will consist of a 60-foot to 70-foot high concrete stepped inflow structure on a 1.33:H to 1:V slope along the west side and 0.5:H to 1:V sloped Mechanically Stabilized Earth (MSE) Retaining Walls along the north, south, and east sides. Additionally, a 12-foot wide access road has been included along the east side.

Subbasins 1-1A, 1-1B, 1-2A, 1-2B, and 1-2CR are tributary to the southwestern boundary of Reverence and consist of a total tributary area of approximately 4.2 square miles. A total of 3.9 square miles of that tributary area lies outside the Las Vegas Valley Ultimate Development Boundary and will not be developed in the future. Due to the amount of undeveloped land tributary to the southwestern boundary of Reverence, it has been determined that a debris basin located within the southern portion of the site will be required. Bedload calculations used to size the debris basin are based on the ultimate conditions HEC-1 model (V26ULT.OUT) included in Appendix C. Note that according to the NRCS Custom Soil Resource Report included in Appendix C, portions of the offsite undeveloped land lie within soil types that contain a signification percentage of rock outcrop. These soil types include Soil Unit 360 (50 percent rock outcrop), Soil Unit 640 (90 percent rock outcrop), Soil Unit 323 (15 percent rock outcrop), and Soil Unit351 (4 percent rock outcrop). The portion of the land tributary to the southwestern boundary that either contains rock outcrop or that will be developed in the future has not been included in the washload analysis included in this report. These calculations assume that the rock outcrop portion will not contribute to the sediment load and that the developed portion will be conveyed through storm drains with minimal debris and sediment transport. Note that the design for future developments occurring upstream of the Reverence site will need to consider the need for additional debris and sediment control. Calculations to determine the amount of rock outcrop within the

undeveloped offsite Subbasins 1-1A, 1-2A, and 1-2CR have been included in Appendix C. The undeveloped portions of offsite Subbasins 1-1B and 1-2B have been referenced from the Summerlin West MPU. The CN value of 88 used for Subbasins 1-1B and 1-2B is based on the most conservative CN (highest CN) for undeveloped land within these subbasins, which is consistent with the methodology used in the Summerlin West MPU. A HEC-1 model (REV_26ULT.OUT) that includes the areas contributing to the washload, based on the above-stated assumptions, has been included in the Appendix C.

While the debris basin is not currently shown on the CCRFCD master plan due to the magnitude of flow, it is intended for the facility to be publicly maintained and will therefore meet the CLV and CCRFCD access requirements.

Sedimentation Analysis

To determine the projected maximum sediment deposition for a 100-year storm event tributary to the debris basin, the total sediment volume was separated into two parts: washload (suspended sediment) and bedload. An approach consistent with the Manual was used to determine each component and the results were combined to determine the total projected sediment deposition during a 100-year storm event.

The washload was determined using the Modified Universal Soil Loss Equation (MUSLE) as shown in Section 1301.7.4 of the Manual. The MUSLE is of the form $Ys=\alpha (VQ_P)^{\beta}KLSCP$ (Eqn. 1307), where Y_S is the storm event sediment yield in tons, Q_P is the storm event peak flow in cubic feet per second (cfs), V is the storm-event volume in acre-feet, α and β are local coefficients, K is the soil-erodibility factor, LS is the topographic factor, C is the cropping factor, and P is a supporting conservative practices factor. These values were determined as outlined in the Manual. Q_P (1,914 cfs) and V (245-ac ft) are from the reduced area HEC-1 model (REV_26ULT.OUT) at Concentration Point CP3. The soil weight of 126 lbs/ft^3 has been based on the geotechnical report for the site. A copy of the Geotechnical report has been included in Appendix C. A copy of the referenced material from the NRCS Custom Soils Resource Report has been provided in Appendix C.

Once the average soil loss was determined, the Delivery Ratio (DR) for the drainage area and Trap Efficiency (TE) for the washload were determined based on referenced information from the National Engineering Handbook (NEH) and

represent the largest delivery ratio suggested for the tributary area. A Trap Efficiency of 0.90 is used for a dry reservoir with chiefly fine textured sediment. A copy of the NEH references and calculations has been included in Appendix C.

The bedload was determined using the power relationships between sediment transport rate, velocity and depth. These power relations were developed from a computer solution of the Meyer-Peter and Muller Bedload transport equation and Einstein's integration of the suspended bed-material discharge (SIMONS, LI & ASSOCIATES, 1982). The power relations are of the form $q_s=C_1(Y)^{C2}(V)^{C3}$ (Eqn. 704), where q_s is the Sediment Transport Rate in cfs/ft of width, Y is the flow depth in feet, V is the flow velocity in ft/sec, C_1, C_2, C_3 are local constants. Values of C_1, C_2, and C_3 for sand material are presented in Table 703A from the Manual and can be found in Appendix C. In determining the values for the constants, the largest soil size of 5 mm (0.197 inches) was assumed. The resulting bedload was added to the washload to determine the total projected sediment deposition with the debris basin for the 100-year storm event.

Based on the methodology discussed above, sediment volume for the proposed debris basin has been listed below in Table 3. A copy of the calculations used in determining the volume amount of combined sediment has been provided in Appendix C.

TABLE 3
Sedimentation Volumes for Village 26 Debris Basin

Design Point	Tributary Area (ac)	Peak 100-Year Flow (cfs)	Wash Load (MUSLE) (ac-ft)	Bedload (Meyer-Peter) (ac-ft)	Total Combined Sediment Volume (ac-ft)
CP3	2,667	3,309	11.5	3.6	15.1

Concrete Stepped Inflow Structure

Hydraulic modeling for the proposed concrete stepped inflow structure was performed with the U.S. Army Corps of Engineers *HEC-RAS River Analysis System.* The first cross section modeled is 100 feet upstream of the concrete stepped inflow structure. The last section modeled is at the toe and the northernmost (shortest)

longitudinal section of the concrete stepped inflow structure was used for the HEC-RAS model in order to have a conservative model. The first step is modeled at elevation 3284.90 feet.

Manning's "*n*" for the concrete stepped inflow structure was determined using a method outlined in a study by Sandeep Tatewar and Ramesh Ingle presented in the *Hydraulics of Stepped Spillways* (Reference 19). The method consists of equating the Manning's "*n*" to the geometry of the channel. For the calculation, the geometry of the structure was simplified to a 1.33:1 slope with 2.5-foot high, 3.33-foot long steps. A conservative width of 140 feet was used in the calculation. Using the Tatewar and Ingle method for the Design of Stepped Spillway for Skimming flow regime, "Rajaratnam (1990) developed an approximate criterion for defining the regimes of flow, which states that the ratio of critical depth to step height should be more than 0.8 for skimming flow regimes." Using this criterion and our critical flow depth of 0.75 feet as calculated with HEC-RAS, the step height needs to be 1.0 foot tall to reach a skimming regime. The Manning's "*n*" determined in the calculation was 0.146. A more conservative value of 0.060 was used in the HEC-RAS model. The manning's "n" used in the HEC-RAS model are lower than the calculated Manning's n for the debris basin inflow structure in order to be conservative. If the calculated Manning's "n" were used in the HEC-RAS model, the stilling basin design would be revised and the stilling basins would have a shorter design length. A USBR Type IX impact basin was provided at the bottom of the stepped inflow structure, with a 1-foot high sill to induce a hydraulic jump. A 50-foot long riprap pad (d50= 12 inches, thickness=24 inches) was provided at the end of the impact basin to protect the basin floor against incidental scour.

Outlet

The debris basin outlet consists of a concrete outlet structure with a trash rack and a 20-foot wide by 14-foot high RCB improved inlet. A sediment berm located near the outlet structure will help decrease sediment deposition at the system outlet. The total design flow of approximately 3,309 cfs will be conveyed through the proposed RCB at a 0.5 percent slope until discharging into a proposed open channel parallel to the Western Beltway Channel east of Village 26. The outfall pipe is designed to convey the peak flows under partial flow conditions, thus creating an inlet controlled outfall facility. Trash rack calculations have been referenced from the Original Village 26 Study and can be found in Appendix C.

Southern Perimeter Retaining Wall

The location and proposed alignment for the proposed southern perimeter retaining wall is consistent with the V26 Offsites Study. Therefore, the analysis and discussion for the Southern Perimeter Retaining Wall have been referenced from the V26 Offsites Study. Copies of the referenced calculations have been included in Appendix C.

A 1,180-foot long retaining/scour wall is proposed along the southern property boundary. 500-foot and 90-foot radii within the alignment for the retaining wall occur at the east end of the wall, near the upstream side of the proposed debris basin inflow structure. A hydrologic/hydraulic analysis using the FLO-2D two-dimensional analysis computer program was performed in order to determine flow parameters used to calculate scour depths and minimum wall heights along the proposed retaining wall. A FLO-2D exhibit that shows cross section locations, flow depths, and flow and velocity distributions has been included in Appendix B. Total scour depths were calculated using equation 724 in the Manual. Scour components consist of long-term bed elevation changes (degradation or aggradation), anti-dune trough depths, bend scour depths, contraction scour depth, and local scour at abutment depths. These components were calculated using the equations outlined in the Manual. The FLO-2D model output and scour calculations have been included in Appendix B.

Long-term bed elevation changes were calculated by calculating the total sediment transport rate of the approach channel and determining the slope for the downstream channel that yields a total sediment transport rate equal to the approach channel total sediment rate. The calculated slope for the downstream channel is called the equilibrium slope. Based on the long-term bed elevation changes calculated between Cross-Sections 1 and 2, Cross-Sections 2 and 3, and Cross-Sections 3 and 4, and the fact that the equilibrium slopes at these locations were greater than the slope for the approach channel, it was determined that the long-term bed elevation change component is not a contributing factor to the total scour depth. Normal depth calculations based on actual slopes and equilibrium slopes for the sections used in these calculations have been included in Appendix C.

Based on the results of the scour calculations, it was determined that 1.5 to 2.6 foot total scour depths occur along the straight portions of the retaining wall and that a maximum of 7.7 foot total scour depths occur along the bends near the Debris Basin inflow structure during the 100-year storm event. Footings along the straight sections of the wall will be a minimum of 5 feet deep and footings along the bends will be a minimum of 10 feet deep.

Freeboard was also calculated for the retaining wall based on parameters determined in the FLO-2D model. Based on the freeboard calculations, the majority of the wall will be a minimum of 3.0 feet above grade and the portion adjacent to Section 6 will be a minimum of 15.0 feet above grade.

Debris Basin Outfall Facility

The storm drain and open channels proposed with this project include the construction of the GOL3 facility between the debris basin outlet to the Village 26 detention basin, and replacing the existing 20-foot wide trapezoidal concrete-lined Western Beltway Channel with a rectangular concrete-lined channel. It is proposed to run a portion of these two facilities as dual rectangular open channels within an existing 62-foot wide drainage easement located between the Village 26 eastern property line and the Western Beltway right-of-way. A 12-foot-wide access road has been provided adjacent to each channel.

The portions of the GOL3 facility proposed with this project include a 14-foot wide by 14-foot high RCB Storm Drain, a 20-foot wide by 8- to 17-foot high rectangular concrete channel, and 20-foot wide by 7-foot high RCB Storm Drain. The Debris Basin Outfall Facilities are depicted on Figure 6 and are labeled as Facilities 21 thru 32. Flow rates used in the hydraulic models for these facilities have been referenced from the Master Study. Figure 6R from the Master has been included in Appendix C.

Hydraulic modeling for the 14-foot wide by 14-foot high RCB portion of the GOL3 facility (Facilities 23* and 23A) was performed with the CIVILDESIGN Corp. *WSPGW Water Surface Pressure Gradient Package.* The WSPGW model for the 14-foot wide by 14-foot high RCB is included in Appendix B.

Hydraulic modeling for the 20-foot wide open channel (Facilities 27*, 29*, and 32*) was performed with the U.S. Army Corps of Engineers *HEC-RAS River Analysis*

System. The open channel portion of the facility will consist of three wall height changes. The channel height begins at a height of 17-feet at the channel headwall at Station 20+58.06. At Station 20+83.06 the channel height will transition to 9.0 feet. At Station 23+61.30 the channel height will drop to 8.0 feet. At Station 27+23.72 the channel height will drop to 6.8 feet. The channel height will continue at 7.5 feet until reaching the 20-foot wide by 7-foot high RCB. Freeboard and super-elevation calculations are included in Appendix B. Velocities in the open channel range from 22.40 feet per second to 49.43 feet per second. A HEC-RAS model for the open channel portion of this facility is included in Appendix B. A summary of the HEC-RAS model is shown on Figure 5AU.

The 20-foot wide by 7-foot high RCB will be located under Desert Hope Drive. Flow from the future Village 26 Master Planned Community will combine in the RCB for a total flow of 3,668 cfs. The maximum flow velocity of 53.69 feet per second occurs at Station 49+81.59. The WSPGW model for the 20-foot wide by 7-foot high RCB is included in Appendix B.

Per Section 705.7.1.2 in the Manual, all concrete lining shall have a minimum thickness of 7 inches for flow velocities 30 feet per second and greater. Therefore, the invert slab thickness in the open-channel will be a minimum of 7 inches where velocities in the open-channel are 30 feet per second and greater.

In order to keep the open-channel facilities within the existing 62-foot wide drainage easement adjacent to the Western Beltway, the portion of the existing 20-foot wide concrete-lined trapezoidal Western Beltway Channel east of Village 26 between Lake Mead Boulevard and Cheyenne Avenue will be removed and replaced with a concrete-lined rectangular channel varying from a 17-foot wide section near Lake Mead Boulevard to an 11-foot wide section further downstream. Interim and ultimate HEC-RAS models were performed for the Western Beltway Channel. A maximum interim flow rate of 1,769 cfs was referenced from the Beltway Channel Study. An ultimate flow rate of 880 cfs was referenced from the 2006 Update. Transition length calculations have been referenced from the V26 Offsites Study.

The outlet of the existing dual 10-foot by 9-foot RCB under Lake Mead Boulevard (Station 14+06.12) will transition over 100 feet to a proposed 17-foot wide rectangular channel (Station 15+06.12). The channel height will be 9 feet throughout

the transition, then drop to 7.5 feet at the end of the transition. At the grade break occurring at Station 21+27.53 the channel will transition over approximately 50.00 feet to a 15-foot wide rectangular channel. At Station 25+65.46 the channel will make another transition over approximately 61.22 feet to an 11-foot wide rectangular channel. The 11-foot wide channel will continue until Station 48+81.21, where it will transition to the existing 20-foot trapezoidal channel. The maximum velocity within the revised beltway channel of 42.76 feet per second occurs during interim conditions at Station 47+71.98. HEC-RAS and freeboard calculations for the revised Beltway Channel are provided in Appendix B.

Detention Basin

The proposed mixed use detention basin will be rough graded with this project. The future park improvements within the detention basin will be addressed in a future technical drainage study. The approximately 300-acre mixed use detention basin proposed with this project may include a park, amphitheatre, basketball court, volleyball court, tennis courts, and soccer field in the future. The capacity for the proposed detention basin is based on the volume of storm water runoff generated by the 100-year storm event, with additional storage provided to accommodate the estimated sediment load generated by the 100-year storm event. The storm water runoff generated by the 25-year and 10-year storm events has also been analyzed to provide protection for the areas designated for the future play area, court games, and soccer field.

The design of the Village 26 Detention Basin was previously addressed in the Village 26 Study and the Master Study. The referenced Village 26 Study HEC-1 model shows a peak inflow of 3,643 cfs (CP5B) impacting the Village 26 Detention Basin resulting in a peak outflow of 685 cfs a peak stage elevation of 3020.18 feet during the 100-year storm event. The referenced Master Study HEC-1 model shows a peak inflow of 3,464 cfs (CP5B) impacting the Village 26 Detention Basin resulting in a peak outflow of 653 cfs a peak stage elevation of 3020.88 feet during the 100-year storm event. The revised ultimate conditions HEC-1 model presented with this study shows an inflow of 3,464 cfs (CP5B) will impact the proposed Village 26 Detention Basin under ultimate conditions resulting in a peak outflow of 661 cfs and a peak stage elevation of 3020.58. The interim conditions HEC-1 model presented with this study shows an inflow of 3,493 cfs (CP5B) will impact the proposed Village 26 Detention Basin under interim conditions resulting in a peak outflow of 663 cfs and a

peak stage elevation of 3020.78.

The proposed 100-year interim and ultimate peak outflow is less than the outflow proposed in the Village 26 Study; therefore, the proposed detention basin will not have an adverse impact to downstream facilities or properties. A comparison of the Village 26 Detention Basin parameters has been summarized in Table 4. HEC-1 model has been included in Appendix A. Pertinent reference material has been included in Appendix C.

TABLE 4
Village 26 Detention Basin Summaries

	Approved Village 26 Study Q_{100}	Revised Ultimate Conditions Q_{100}	Interim Conditions Q_{100}	Interim Conditions Q_{25}	Interim Conditions Q_{10}
Peak Storage Volume (acre-feet)	308	282	286	173	98
Peak Stage Elevation (feet)	3020.18	3020.58	3020.78	3012.92	3006.31
Peak Inflow (cfs)	3643	3464	3493	2302	1448
Peak Outflow (cfs)	685	661	663	561	461
Drain Time (hours)	17.05	16.5	16.6	12.33	12.5
Tributary Area (square miles)	4.39	4.39	4.39	4.39	4.39
Spillway Elevation (feet)	3022	3022	3022	3022	3022
Storage at Spillway Elevation (acre-feet)	335.08	304.99	304.99	304.99	304.99

The Manual requires that multiple use facilities, including soccer fields, be elevated above the water surface elevation of the 10-year pool. The proposed soccer field will be set at an elevation of 3009.00 feet. During the 10-year storm event, the HEC-1 model shows an inflow of 1,448 cfs (CP5B) will impact the proposed detention basin resulting in a peak outflow of 461 cfs and a peak stage elevation of 3006.31 feet. The soccer field is 2.69-feet above the peak 10-year stage elevation; therefore, the Manual Criteria will be met.

The Manual requires that play areas and court games be elevated above the water surface elevation of the 25-year pool. During the 25-year storm event, an inflow of 2,302 cfs (CP5B) will impact the proposed detention basin resulting in a peak outflow of 561 cfs and a peak stage elevation of 3012.92 feet. The proposed park, basketball courts, tennis courts, volleyball court and amphitheatre will be above the 25-year peak stage elevation; therefore, the Manual criteria has been met.

The detention basin modifications proposed with this project include a concrete stepped inflow structure, concrete apron, and sill at the outlet of the proposed 20-foot wide by 7-foot high RCB, a 12-foot wide maintenance road around the top of the detention basin, 36-inch RCP nuisance storm drain facilities, rockwood retaining walls along the top of the detention basin necessary to support future pad grades, and installation of the 64-inch diameter restrictor plate and headwall for the outlet facility. Note that the proposed grading within the footprint of the detention basin will not change the slope of the embankments or operating characteristics of the detention basin. Additionally, the bottom of all retaining wall footings around the detention basin will be a minimum of 8 inches above the 100-year peak stage elevation of 3020.10 feet, and the 12-foot wide access road will be a minimum of 6 inches above the 100-year peak stage elevation. All finished floor elevations for future homes adjacent to the detention basin will be required to set a minimum of 6 inches above the weir water surface elevation assuming the outlet pipe is 100 percent clogged

Concrete Stepped Inflow Structure

Hydraulic modeling for the proposed concrete stepped inflow structure was performed with the U.S. Army Corps of Engineers *HEC-RAS River Analysis System*. Manning's "*n*" for the stepped inflow structure was determined using a method outlined by Sandeep Tatewar and Ramesh Ingle in the Hydraulics of Stepped Spillways (Reference 11). The method consists of equating the Manning's "*n*" to the geometry of the channel. For the calculation, the geometry of the structure was simplified to a 3:1 slope with 2.5-foot high, 7.5-foot long steps. A 1:1 flare was provided for the total length of the inflow structure. Using the Tatewar and Ingle method for the Design of Stepped Spillway for Skimming flow regime, "Rajaratnam (1990) developed an approximate criterion for defining the regimes of flow, which states that the ratio of critical depth to step height should be more than 0.8 for skimming flow regimes." Using this criterion and our critical flow depth of 10.05 feet as calculated with HEC-RAS, the step height needs to be 12.5 feet to reach a skimming regime. The manning's "n" used in the HEC-RAS model are lower than the calculated Manning's n for the detention basin inflow structure in order to be conservative. If the calculated Manning's "n" were used in the HEC-RAS model, the stilling basin design would be revised and the stilling basins would have a shorter design length. Based on the flare, an average width of 55 feet was used in the calculation. The Manning's "*n*" determined in the calculation was 0.102. A more

conservative value of 0.150 was used in the HEC-RAS model. An impact basin was provided at the bottom of the stepped inflow structure, with a 2-foot high sill to induce a hydraulic jump. A 50-foot long riprap pad (d50= 12 inches, thickness=24 inches) was provided at the end of the impact basin. Based on the calculations, a velocity of 5.68 feet per second was achieved at the end of the riprap pad.

Nuisance Flow Facilities

Per the City's request, 36-inch RCP storm drain facilities have been provided to convey nuisance flows from the inflow structures to the detention basin outfall structure. A Neenah R-4999 AX bolted transverse drainage structure has been proposed within the 20-foot wide by 7-foot high RCB upstream of the outlet to collect nuisance flows. Neenah specifications for the Neenah R-4999 AX bolted transverse drainage structure have been included in the Appendix.

Based on a normal depth calculation, the maximum capacity of the Neenah R-4999 AX grate is 1 cfs. Therefore, 1 cfs will be conveyed from the Neenah structure to 36-inch RCP nuisance storm drain. A normal depth calculation for the 36-inch RCP nuisance storm drain shows a velocity of 9.03 fps. A 5-foot wide by 5-foot high riprap pad (D50=12-inches, Thickness=24-inches) has been provided for outlet protection. Hydraulic calculations have been included on Appendix B.

Outlet

The detention basin outlet improvements consist of a concrete outlet structure with a trash rack and a 64-inch diameter restrictor plate. A design flow of approximately 685 cfs will then be conveyed north through the existing 96-inch RCP at a 0.29 percent slope, and will ultimately discharged to the Gowan/Lone Mountain Detention Facility.

X. CONCLUSIONS AND RECOMMENDATIONS

1. Methodology used in this report is in compliance with the Clark County Regional Flood Control District (CCRFCD) criteria.

2. The site is not located in a FEMA-designated Zone A floodplain or Special Flood Hazard Area.

3. This project proposes to discharge storm drain flows at several locations to the existing approximately 300 acre-foot Village 26 Detention Basin (GOL3 0128) located within the northeast portion of the site. This drainage study will be submitted to CCRFCD upon receipt of a conditional letter of approval from the City of Las Vegas.

4. The sediment volume calculations for the debris basin have been updated based on the Las Vegas Valley Area U.S. Department of Agriculture and National Resource Conservation Service Soils Report (References 11 and 12). The updated calculation shows a 15.1 acre-feet debris basin will be required.

5. The future play area, court games, and soccer field within the Multi-Use Village 26 Detention Basin will be elevated above the water surface elevation generated by the 25-year and 10-year storm events for protection.

6. The proposed rough grading and offsite improvements do not significantly alter existing peak flow rates or the character of flow rates downstream of the proposed detention basin. Therefore, the proposed development shall not have a negative impact on downstream properties or facilities.

7. This report is consistent with the hereinafter referred to as the Master Study Response to CLV Comments submitted to CLV on November 24, 2015.

8. A 12-foot-wide access road has been provided around the entire detention basin and will be located a minimum of 6 inches above the 100-year detention basin water surface elevation.

XI. REFERENCES

1. G. C. Wallace, Inc., *Technical Drainage Study for Village 26 at Summerlin West Offsite Improvements, November 2008.*

2. G. C. Wallace, Inc., *2006 Summerlin West Planning Area Flood Control Master Plan Update,* August 2006.

3. G. C. Wallace, Inc., *Master Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Model Homes, Access Road, and Rough Grading),* April 2007.

4. G. C. Wallace, Inc., *Update to the Master Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Model Homes, Access Road, and Rough Grading),* October 2007.

5. G. C. Wallace, Inc., *Update #2 to the Master Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Model Homes, Access Road, and Rough Grading),* April 2008.

6. G. C. Wallace, Inc., *Update #3 to the Master Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Reverence Interim Berm),* March 2013.

7. GCW, Inc., *Master Drainage Study for Summerlin Village 26 Reverence,* November 2015.

8. Boyle Engineering, *Summerlin Storm Water Management Plan, August 1991.*

9. *CCRFCD 2013 Las Vegas Valley Flood Control Master Plan Update*, 2013.

10. G. C. Wallace, Inc., *Summerlin Lake Mead Boulevard Improvements, November* 2007.

11. Clark County Regional Flood Control District, Hydrologic Criteria and Drainage Design Manual. Updated August 1999.

12. U.S. Army Corps of Engineers, *HEC-1 Flood Hydrograph Package.* June 1998.

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14. U. S. Army Corps of Engineers, HEC-RAS *River Analysis System.* Version 3.1.3. May 2005.

15. U. S. Army Corps of Engineers, WSPGW *Water Surface Pressure Gradient Package.* Version 12.99. 1991-2000.

16. U. S. Department of Agriculture & National Resource Conservation Service, *Soil Survey of Clark County Area, Nevada*. August 2014. Version 10.

17. U. S. Department of Agriculture & National Resource Conservation Service, *Soil Survey of Las Vegas Valley Area, Nevada, Part of Clark County*. August 2014. Version 10.

18. G. C. Wallace, Inc., *Technical Drainage Study for the Western Segment Las Vegas Beltway from Summerlin Parkway to Cheyenne Avenue*, January 2000.

19. Tatewar, Sandeep P., and Ramesh N. Ingle. "*Design of Stepped Spillway for Skimming Flow Regime.*" Hydraulics of Stepped Spillways. Minor & Hager (eds), 2000. 195-197.

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Appendix A. Hydrologic Calculations and Information

1. Interim Conditions Onsite Curve Number Calculations
2. Interim Conditions SF4
3. Interim Conditions HEC-1 Model
4. Interim Conditions HEC-1 Model (Beltway Interim Channel Diversion)
5. Ultimate Conditions HEC-1 Model (Revised from Master Study)
6. Ultimate Conditions Drainage Map (Referenced for Master Study)
7. Exhibit – EXH1 Interim Channel During Beltway Channel Construction

Appendix B. Hydraulic Calculations and Information

1. Normal Depth and Riprap Calculations
2. Inlet Control Calculations
3. Standard Form 6 Calculations
4. USBR Type VI Stilling Basin Calculations
5. WSPGW Calculations
   a. 14-Foot by 14-foot RCB
   b. 20-Foot by 7-Foot RCB
6. HEC-RAS Calculations
   a. Village 26 Channel
   b. Western Beltway Channel
   c. Debris Basin Stepped Spillway
   d. Detention Basin Stepped Spillway
   e. Interim Berm (Combined Flow)
7. Stepped Spillway manning's "n" Calculation
8. Impact Basin Calculations
9. Channel Freeboard Calculations
   a. Village 26 Channel
   b. Western Beltway Channel
10. Neenah R-4999 Transverse Drainage Structure Specification
    a. Neenah R-4999 Capacity Calculation
11. Debris Basin Exhibit
12. Detention Basin Summary
13. Detention Basin Exhibit
14. Nomo graphs
15. D-Load Calculations

Appendix C. Referenced Material CD

1. Master Drainage Study for Village 26 Reverence
   a. Table 501 from the CCRFCD Manual
   b. Figure 503 from the CCRFCD Manual
   c. Figure 504 from the CCRFCD Manual
   d. Figure 506 from the CCRFCD Manual
   e. Table 602A from the CCRFCD Manual
   f. Table 602 – 1 of 4 from the CCRFCD Manual
   g. Table 602 – 4 of 4 from the CCRFCD Manual
   h. Ultimate Conditions Precipitation Map
   i. Ultimate Conditions Soils Map

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j. Custom Soil Resource Report
k. Soil Description Tables
l. Curve Number Calculations
m. Debris Basin Calculations
    i. Table 703A
    ii. Soil Characteristics for Loss Calculations
    iii. Area Reduction Curve Number calculations
    iv. Revised Standard Form 4
    v. HEC-1 Model – REV_V26ULT.out
    vi. Sieve Analysis
    vii. Topographic Factor
    viii. Calculations For Constant C
        a. Figure 1303b
        b. Figure 1303c
        c. Figure 1303d
    ix. Delivery Ratio Calculation
    x. Trap Efficiency Calculation

2. Response to Comments on the Master Drainage Study for Summerlin Village 26 Reverence
    a. Response to Comment Letter
    b. Zoning and Planning Approval Letter
    c. Average Lot Size Calculations
    d. Ultimate Conditions Standard Form 4
    e. Ultimate Conditions HEC-1 Analysis
    f. Figure 5R Ultimate Conditions Overall Drainage Map
    g. Figure 5AR Ultimate Conditions Drainage Map
    h. Figure 6R Flood Control Facilities Map

3. Master Drainage Study for Village 26 At Summerlin West (Technical Drainage Study for Model Homes, Access Road, and Rough Grading)
    a. CLV Approval Letter
    b. CCRFCD Concurrence Letter
    c. CCPW Approval Letter
    d. Text Excerpt – Supplement to RTC2

4. Update #2 to the Master Drainage Study for Village 26 At Summerlin West (Technical Drainage Study for Model Homes, Access Road, and Rough Grading)
    a. CLV Conditional Approval Letter
    b. Ultimate Conditions Standard Form 4
    c. Ultimate Conditions HEC-1 Analysis
    d. Figure 5AU2 – Ultimate Conditions Drainage Map
    e. Figure 6U2 – Flood Control Facilities Map

5. Update #3 to the Master Drainage Study for Village 26 at Summerlin West (Technical Drainage Study for Reverence Interim Berm)
    a. CLV Approval Letter
    b. Figure 2 – HECRAS Exhibit
    c. Interim Berm HEC-RAS Calculation

REVERENCE
APPENDIX LAYOUT

6. Technical Drainage Study for Village 26 Offsite Improvements
   a. CLV Conditional Approval Letter
   b. Text Excerpts from Response to Comments
      i. Emergency Overflow Discussion
      ii. Temporary Channel for Interim Protection Discussion
   c. Channel Freeboard Calculations – Upstream of Debris Basin

7. Response to CCRFCD Comments on the Technical Drainage Study for Village 26 Offsite Improvements (Never submitted to CCRFCD; Full Study Included)
   a. CLV Comments on the CCRFCD Response to Comments on the Technical Drainage Study for the Village 26 Offsite Improvements

8. 2006 Summerlin West Planning Area Flood Control Master Plan Update
   a. CLV Approval Letter
   b. CCRFCD Approval Letter
   c. Figure 6BR Regional Flood Control Facility Map
   d. Figure 7 Proposed Condition Drainage Map Tributary to the Beltway Channel

9. 2008 Las Vegas Valley Flood Control Master Plan Update
   a. Gowan Watershed Lag Time Calculations
   b. Composite Curve Number Breakdown
   c. Figure H-18
   d. Figure H-24

10. Technical Drainage Study for Summerlin Lake Mead Boulevard Improvements
    a. CLV Comment Letter
    b. Improvement Plans (Sheets C1, U1, U2, U3)

11. Technical Drainage Study for Western Segment Las Vegas Beltway From Summerlin parkway to Cheyenne Avenue
    a. SD Sheets SD1 thru SD13
    b. Existing Conditions Hydrology Discussion
    c. Hydraulic Calculations

12. CCRFCD Hydrologic Criteria and Drainage Design Manual
    a. Open Channel Scour Discussion
    b. Open Channel Transition Discussion

APPENDIX A

Hydrologic Calculations and Information

REVERENCE

ONSITE WEIGHTED CURVE NUMBER CALCULATIONS

GCW, INC.
DATE: 12/14/2015
FILE: CNTABLE.xls
BY: DBC

Basin	Soil	Percent	CN	Landuse	WCN
1-3P	152	1.76%	94.0	Newly Graded Areas	93.9
	155	96.82%	94.0	Newly Graded Areas	
	502	1.42%	89.3	Newly Graded Areas	
1-11P	360	53.20%	91.5	Newly Graded Areas	90.4
	502	46.80%	89.3	Newly Graded Areas	
1-12P	152	15.00%	94.0	Newly Graded Areas	90.2
	155	2.44%	94.0	Newly Graded Areas	
	360	3.12%	91.5	Newly Graded Areas	
	502	79.44%	89.3	Newly Graded Areas	

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

GCW ENGINEERS \ SURVEYORS

Summerlin Village 26
Reverence
Interim Conditions - Rough Grading

Project No: 764-204-013
Date: 12/14/15
Calculated by: JYA, DBC

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG: (1)	DEV./EX. (D or E)	CN (16)	K (2)	AREA Ac (3)	AREA Sq Mi (4)	INITIAL LENGTH Feet (5)	SLOPE % (6)	Ti Min (7)	TRAVEL LENGTH Feet (8)	SLOPE % (9a)	V1 VELOCITY fps (9b)	V2 VELOCITY fps (10)	Tt Min (11)	TOTAL LENGTH Feet (12)	Tc = (L/180)+10 Min (13)	Min (14)	Tlag = 0.6Tc/60 Hours (15)	Rainfall (in)
1-1A*	E	85.4	0.7373	1497.2	2.3394	500	34.0	4.5	14575	8.4	4.3	8.5	29.5	15075	N/A	34.0	**0.488**	3.67
1-1B*	D	78.3	0.6436	111.8	0.1747	100	1.0	8.2	4775	8.5	5.9	8.9	9.4	4875	37.1	17.6	**0.176**	3.61
1-2A*	E	85.8	0.7426	552.7	0.8636	500	56.0	3.8	5905	17.4	6.2	12.3	8.7	6405	N/A	12.5	**0.125**	3.55
1-2B*	D	82.6	0.7003	137.7	0.2152	100	1.0	7.2	5100	7.5	5.5	8.4	10.7	5200	38.9	17.8	**0.178**	3.51
1-2CR*	E	84.7	0.7280	367.6	0.5743	500	52.0	4.0	9505	16.3	6.0	11.9	14.0	10005	N/A	18.0	**0.180**	3.46
1-4R	E	86.3	0.7492	34.3	0.0536	500	60.0	3.6	1890	36.2	8.9	17.7	2.2	2390	N/A	5.9	**0.100**	3.44
1-5R	E	86.3	0.7492	22.0	0.0343	330	65.0	2.9	1160	39.0	9.2	18.4	1.5	1490	N/A	4.4	**0.100**	3.42
1-6R	E	86.3	0.7492	9.7	0.0152	360	56.9	3.1	840	34.4	8.7	17.2	1.3	1200	N/A	4.4	**0.100**	3.43
1-7R	E	86.3	0.7492	17.3	0.0271	500	72.0	3.4	1490	26.8	7.7	15.2	2.2	1990	N/A	5.6	**0.100**	3.44
1-8R	E	86.3	0.7492	1.6	0.0025	210	38.3	2.7	205	20.0	6.6	13.1	0.5	415	N/A	3.2	**0.100**	3.42
1-10R	E	86.1	0.7465	35.6	0.0556	500	24.0	4.9	1030	21.9	6.9	13.8	1.8	1530	N/A	6.8	**0.100**	3.41
1-3P	D	93.9	0.8495	16.5	0.0258	100	1.0	4.5	1190	3.7	3.9	5.9	4.1	1290	17.2	8.6	**0.086**	3.36
1-11P	D	90.4	0.8033	113.6	0.1775	100	1.0	5.3	4160	3.0	3.5	5.3	14.0	4260	33.7	19.3	**0.193**	3.38
1-12P	D	90.2	0.8006	116.1	0.1814	100	1.0	5.4	5810	4.0	4.1	6.1	16.5	5910	42.8	21.9	**0.219**	3.32
1-13	E	86.3	0.7492	0.5	0.0008	50	40.0	1.3	333	25.0	7.4	14.7	0.8	383	N/A	2.1	**0.100**	3.34
1-14	E	86.3	0.7492	1.0	0.0016	50	40.0	1.3	406	18.0	6.3	12.5	1.1	456	N/A	2.4	**0.100**	3.31
1-15	E	86.1	0.7465	3.6	0.0057	50	26.0	1.5	575	19.7	6.6	13.0	1.4	625	N/A	2.9	**0.100**	3.32
1-16	E	86.3	0.7492	1.9	0.0030	50	32.0	1.4	334	6.9	3.9	7.7	1.4	384	N/A	2.8	**0.100**	3.31
1-17	E	86.3	0.7492	2.5	0.0039	50	62.0	1.1	452	38.1	9.1	18.1	0.8	502	N/A	2.0	**0.100**	3.28
1-18	E	86.3	0.7492	2.4	0.0038	50	58.0	1.2	657	24.8	7.4	14.6	1.3	707	N/A	2.5	**0.100**	3.28

$Tc = Ti + Tt$ $Tlag = 0.6\ Tc$

$Ti = 1.8\ (1.1 - K)\ L^{1/2} / S^{1/3}$

$K = 0.0132\ (CN) - 0.39$

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing: $V1 = 14.8*(S/100)^{1/2}$ $V2 = 29.4*(S/100)^{1/2}$

Developed: $V1 = 20.2*(S/100)^{1/2}$ $V2 = 30.6*(S/100)^{1/2}$

* Basin parameters referenced from the Summerlin West MPU

REFERENCE:

STANDARD FORM 4

```
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 *                                       *                                  *                                      *
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 *              JUN   1998               *                                  *   HYDROLOGIC ENGINEERING CENTER      *
 *           VERSION 4.1                 *                                  *         609 SECOND STREET            *
 *                                       *                                  *      DAVIS, CALIFORNIA 95616         *
 *  RUN DATE   15DEC15  TIME  14:57:27   *                                  *          (916) 756-1104              *
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                                        X     X  X        X                X
                                        XXXXXXX  XXXX     X        XXXXX   X
                                        X     X  X        X                X
                                        X     X  X        X     X          X
                                        X     X  XXXXXXX   XXXXX          XXX


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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                                  HEC-1 INPUT                                                  PAGE  1

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                        *DIAGRAM
 *** FREE ***
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             2          ID   * ............................................................ *
             3          ID   * :              SUMMERLIN VILLAGE 26 REVERENCE              : *
             4          ID   * :                       OFFSITES                           : *
             5          ID   * :                  INTERIM CONDITION                       : *
             6          ID   * :        THIS MODEL DETERMINES THE RUNOFF DURING           : *
             7          ID   * :            INTERIM DEVELOPMENT CONDITIONS                : *
             8          ID   * :...........................................................: *
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            12          ID   * :              FILENAME_ _ _ _ _ _ V26INT.H1               : *
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            14          ID   * :              MODELED BY_ _ _ _ _ MMC, DBC                : *
            15          ID   * :                                                          : *
            16          ID   * :             DEPTH AREA REDUCTION FACTORS:                : *
            17          ID   * :               AREA                DARF                   : *
            18          ID   * :             0.00 TO 0.24 SQ MI     1.00                  : *
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            27          ID   * :             4.00 TO 4.99 SQ MI     0.91                  : *
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            30          ID
            31          ID
            32          IT       5       0       0     300
            33          IO       5
            34          IN       5       0       0
            35          JR    PREC     1.0    0.99    0.98    0.94    0.93    0.92    0.91    0.70    0.54
                        *

            36          KK    1-1A
            37          BA   2.339
            38          PB    3.67
            39          PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
            40          PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
            41          PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
            42          PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
            43          PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
            44          PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
            45          PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
            46          PC   .9980   .9990   1.000
            47          LS       0    85.4
            48          UD   0.488
                        *
1                                                  HEC-1 INPUT                                                  PAGE  2

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


            49          KK    1-1B
            50          PB    3.61
            51          BA   0.175
```
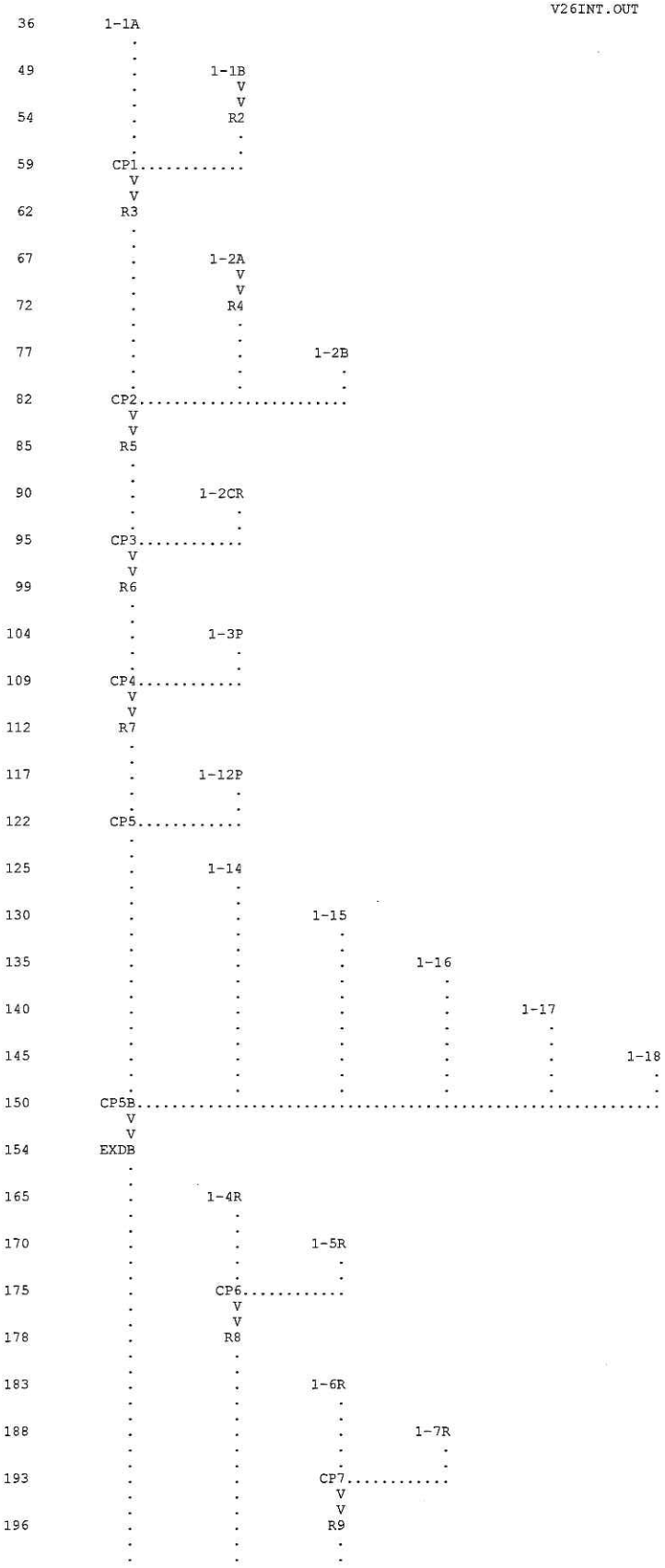

```
 52          LS       0    78.3
 53          UD    .176
             *

 54          KK      R2
 55          KM    ROUTE 1-1B THROUGH PORTION OF 1-1A
 56          KM    ASSUME EXISTING WASH
 57          KM      LEN   SLOPE     n             SHAPE      BW      SS
 58          RD     1885  0.0680    0.04       0    TRAP      20      10
             *

 59          KK     CP1
 60          KM    COMBINE 1-1A AND R2
 61          HC       2
             *

 62          KK      R3
 63          KM    ROUTE CP1 THROUGH 1-2B TO CP2
 64          KM    ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 65          KM    NSTEPS       K      X
 66          RM       1    .092     .15
             *

 67          KK    1-2A
 68          PB    3.55
 69          BA   0.864
 70          LS       0    85.8
 71          UD    .125
             *

 72          KK      R4
 73          KM    ROUTE 1-2A THROUGH 1-2B TO CP2
 74          KM    ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 75          KM    NSTEPS       K      X
 76          RM       1    .054     .15
             *

 77          KK    1-2B
 78          PB    3.51
 79          BA   0.215
 80          LS       0    82.6
 81          UD    .178
             *

 82          KK     CP2
 83          KM    COMBINE 1-2B, R4 AND R3
 84          HC       3
             *
```



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

 85          KK      R5
 86          KM    ROUTE CP2 THROUGH 1-2C TO CP3
 87          KM    ASSUME EXISTING WASH
 88          KM    NSTEPS       K      X
 89          RM       1    .087     .15
             *

 90          KK   1-2CR
 91          PB    3.46
 92          BA   0.574
 93          LS       0    84.7
 94          UD    .180
             *

 95          KK     CP3
 96          KM    COMBINE 1-2C AND R5
 97          KO       1
 98          HC       2
             *

 99          KK      R6
100          KM    ROUTE CP3 TO CP4
101          KM    ASSUME BOX CULVERT
102          KM      LEN   SLOPE     n             SHAPE      BW
103          RD     1745  0.0050   0.015       0    DEEP      14
             *

104          KK    1-3P
105          PB    3.36
106          BA   .0258
107          LS       0    93.9
108          UD    .086
             *

109          KK     CP4
110          KM    COMBINE CP3 and 1-3P
111          HC       2
             *

112          KK      R7
113          KM    ROUTE CP4 THROUGH 1-12P TO CP5 (DETENTION BASIN)
114          KM    ASSUME RCP
115          KM      LEN   SLOPE     n             SHAPE      BW
116          RD     2258  0.0050   0.016       0    DEEP      12
             *
```

```
 117          KK   1-12P
 118          PB    3.32
 119          BA   .1814
 120          LS       0    90.2
 121          UD    .219
              *
1                                    HEC-1 INPUT                                                    PAGE  4

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

 122          KK     CP5
 123          KM    COMBINE CP4 AND 1-12P
 124          HC       2
              *

 125          KK    1-14
 126          PB    3.31
 127          BA   .0016
 128          LS       0    86.3
 129          UD    .100
              *

 130          KK    1-15
 131          PB    3.32
 132          BA   .0057
 133          LS       0    86.1
 134          UD    .100
              *

 135          KK    1-16
 136          PB    3.31
 137          BA   .0030
 138          LS       0    86.3
 139          UD    .100
              *

 140          KK    1-17
 141          PB    3.28
 142          BA   .0039
 143          LS       0    86.3
 144          UD    .100
              *

 145          KK    1-18
 146          PB    3.28
 147          BA   .0038
 148          LS       0    86.3
 149          UD    .100
              *

 150          KK    CP5B
 151          KM    COMBINE CP5, 1-14, 1-15, 1-16, 1-17, AND 1-18 AT DETENTION BASIN
 152          KO       1
 153          HC       6
              *

 154          KK    EXDB
 155          KO       1
 156          KM   DETENTION BASIN CHEYENNE AND BELTWAY
 157          KM   LOW-FLOW OUTLET IS 66" PIPE
 158          RS       1    STOR       0
 159          SV       0    0.07    0.80   12.71   18.75   25.05   85.95   95.04  124.21  135.14
 160          SV  200.27  243.11  258.06  273.36  289.00  304.99
 161          SE    2990    2991    2992    2995    2996    2997    3005    3006    3009    3010
1                                    HEC-1 INPUT                                                    PAGE  5

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

 162          SE    3015    3018    3019    3020    3021    3022
 163          SL  2992.8   22.34     0.7     0.5
 164          SS  3021.9     200     2.6     1.5
              *

 165          KK    1-4R
 166          PB    3.44
 167          BA  0.0536
 168          LS       0    86.3
 169          UD   0.100
              *

 170          KK    1-5R
 171          PB    3.42
 172          BA   .0343
 173          LS       0    86.3
 174          UD   0.100
              *

 175          KK     CP6
 176          KM    COMBINE 1-4R AND 1-5R
 177          HC       2
              *

 178          KK      R8
 179          KM   ROUTE CP6 THROUGH 1-11P TO CP9
 180          KM   ASSUME RCP
 181          KM     LEN   SLOPE     n              SHAPE   DIAMETER
 182          RD    1800  0.0610   0.013       0    CIRC       4
              *
```

```
 183          KK    1-6R
 184          PB    3.43
 185          BA   .0152
 186          LS       0     86.3
 187          UD    .100
              *

 188          KK    1-7R
 189          PB    3.44
 190          BA   .0271
 191          LS       0     86.3
 192          UD    .100
              *

 193          KK     CP7
 194          KM    COMBINE 1-6R AND 1-7R
 195          HC       2
              *
1                                          HEC-1 INPUT                                          PAGE  6

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

 196          KK      R9
 197          KM   ROUTE CP7 THROUGH 1-11P TO CP9
 198          KM   ASSUME RCP
 199          KM     LEN   SLOPE     n              SHAPE   DIAMETER
 200          RD    3150  0.0400   0.013       0    CIRC     4.5
              *

 201          KK    1-8R
 202          PB    3.42
 203          BA   .0025
 204          LS       0     86.3
 205          UD    .100
              *

 206          KK   1-10R
 207          PB    3.41
 208          BA   .0556
 209          LS       0     86.1
 210          UD    .100
              *

 211          KK     CP8
 212          KM    COMBINE 1-8R AND 1-10R
 213          HC       2
              *

 214          KK     R10
 215          KM   ASSUME RCP
 216          KM     LEN   SLOPE     n              SHAPE   DIAMETER
 217          RD    2900  0.0400   0.013       0    CIRC     4.5
              *

 218          KK   1-11P
 219          PB    3.38
 220          BA   .1775
 221          LS       0     90.4
 222          UD    .193
              *

 223          KK     CP9
 224          KM    COMBINE CP6, CP7, CP8 AND 1-11P
 225          HC       4
              *

 226          KK    1-13
 227          PB    3.34
 228          BA   .0008
 229          LS       0     86.3
 230          UD    .100
              *
1                                          HEC-1 INPUT                                          PAGE  7

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

 231          KK   LMT1R
 232          KM   REFERENCED FROM LAS VEGAS VALLEY MPU
 233          PB    3.45
 234          BA   1.964
 235          LS       0     86.8
 236          UD    .447
              *

 237          KK    CP10
 238          KM    COMBINE CP9, 1-13, AND LMT1R
 239          HC       3
              *
 240          ZZ
1
          SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW
```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54 R2
59 CP1
62 R3
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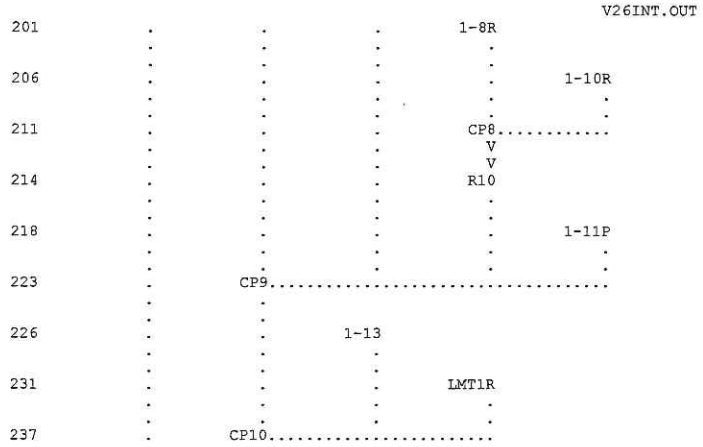
72 R4
77 1-2B
82 CP2
85 R5
90 1-2CR
95 CP3
99 R6
104 1-3P
109 CP4
112 R7
117 1-12P
122 CP5
125 1-14
130 1-15
135 1-16
140 1-17
145 1-18
150 CP5B
154 EXDB
165 1-4R
170 1-5R
175 CP6
178 R8
183 1-6R
188 1-7R
193 CP7
196 R9



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               JUN   1998              *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   15DEC15  TIME  14:57:27   *
*                                       *
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*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*    HYDROLOGIC ENGINEERING CENTER  *
*          609 SECOND STREET        *
*       DAVIS, CALIFORNIA 95616     *
*           (916) 756-1104          *
*                                   *
*************************************
```

```
************************************************************
* ........................................................ *
* :            SUMMERLIN VILLAGE 26 REVERENCE            : *
* :                       OFFSITES                       : *
* :                   INTERIM CONDITION                  : *
* :       THIS MODEL DETERMINES THE RUNOFF DURING        : *
* :           INTERIM DEVELOPMENT CONDITIONS             : *
* :......................................................: *
* :            RETURN PERIOD_ _ _ _100-YEAR              : *
* :            DISTRIBUTION_ _ _ _ 6-HOUR SDN3           : *
* :            PROJECT NO_ _ _ _ _ 764.204.013           : *
* :            FILENAME_ _ _ _ _ _ V26INT.H1             : *
* :            DATE_ _ _ _ _ _ _ _ 11/30/2015            : *
* :            MODELED BY_ _ _ _ _ MMC, DBC              : *
* :                                                      : *
* :            DEPTH AREA REDUCTION FACTORS:             : *
* :              AREA                DARF                : *
* :            0.00 TO 0.24 SQ MI     1.00               : *
* :            0.25 TO 0.49 SQ MI     0.99               : *
* :            0.50 TO 0.99 SQ MI     0.98               : *
* :            1.00 TO 1.24 SQ MI     0.97               : *
* :            1.25 TO 1.50 SQ MI     0.96               : *
* :            1.51 TO 1.74 SQ MI     0.95               : *
* :            1.75 TO 1.99 SQ MI     0.94               : *
* :            2.00 TO 2.99 SQ MI     0.93               : *
* :            3.00 TO 3.99 SQ MI     0.92               : *
* :            4.00 TO 4.99 SQ MI     0.91               : *
* :......................................................: *
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 33 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                      NMIN          5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2   0  ENDING DATE
                    NDTIME       0055  ENDING TIME
                     ICENT         19  CENTURY MARK

                   COMPUTATION INTERVAL      .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

         ENGLISH UNITS
              DRAINAGE AREA         SQUARE MILES
              PRECIPITATION DEPTH   INCHES
              LENGTH, ELEVATION     FEET
              FLOW                  CUBIC FEET PER SECOND
              STORAGE VOLUME        ACRE-FEET
              SURFACE AREA          ACRES
              TEMPERATURE           DEGREES FAHRENHEIT
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 JP          MULTI-PLAN OPTION
                 NPLAN           1  NUMBER OF PLANS

 JR          MULTI-RATIO OPTION
                 RATIOS OF PRECIPITATION
               1.00       .99       .98       .94       .93       .92       .91       .70       .54
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          **************
          *            *
 95 KK    *       CP3  *
          *            *
          **************

 97 KO          OUTPUT CONTROL VARIABLES
                    IPRNT           1  PRINT CONTROL
                    IPLOT           0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

 98 HC          HYDROGRAPH COMBINATION
                    ICOMP           2  NUMBER OF HYDROGRAPHS TO COMBINE
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HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = 1.00

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	176.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	144.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	119.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	98.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	80.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	64.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	3.	*	1		0645	82	51.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	10.	*	1		0650	83	40.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	20.	*	1		0655	84	31.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	25.	*	1		0700	85	24.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	24.	*	1		0705	86	18.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	22.	*	1		0710	87	14.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	22.	*	1		0715	88	10.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	22.	*	1		0720	89	8.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	24.	*	1		0725	90	6.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	29.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	35.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	42.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	57.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	83.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	111.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	136.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	152.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	158.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	154.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	147.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	148.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	167.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	205.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	247.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	272.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	272.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	272.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	294.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	325.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	337.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	330.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	353.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	445.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	628.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	962.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1509.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	2268.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	3079.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3618.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3812.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3787.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3685.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	3538.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	3363.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	3134.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	2826.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	2493.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	2193.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1966.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1828.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	1737.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	1643.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	1555.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	1503.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	1449.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.

1	0505	62	1358.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1234.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1109.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	988.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	874.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	768.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	665.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	566.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	478.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	410.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	351.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	298.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	251.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	212.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
	(CFS)				
+ 3812.	3.75	941.	236.	227.	227.
	(INCHES)	2.100	2.107	2.107	2.107
	(AC-FT)	467.	468.	468.	468.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .99

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	174.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	143.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	117.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	96.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	79.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	63.	1		1255	156	0.	1		1910	231	0.
1		0030	7	2.	1		0645	82	50.	1		1300	157	0.	1		1915	232	0.
1		0035	8	9.	1		0650	83	39.	1		1305	158	0.	1		1920	233	0.
1		0040	9	18.	1		0655	84	30.	1		1310	159	0.	1		1925	234	0.
1		0045	10	23.	1		0700	85	23.	1		1315	160	0.	1		1930	235	0.
1		0050	11	22.	1		0705	86	18.	1		1320	161	0.	1		1935	236	0.
1		0055	12	21.	1		0710	87	14.	1		1325	162	0.	1		1940	237	0.
1		0100	13	20.	1		0715	88	10.	1		1330	163	0.	1		1945	238	0.
1		0105	14	20.	1		0720	89	8.	1		1335	164	0.	1		1950	239	0.
1		0110	15	23.	1		0725	90	6.	1		1340	165	0.	1		1955	240	0.
1		0115	16	28.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	33.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	40.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	55.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	80.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	108.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	132.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	148.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	153.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	150.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	143.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	144.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	162.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	200.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	241.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	265.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	266.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	266.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	287.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	318.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	330.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	323.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	345.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	436.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	616.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	944.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1483.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2230.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	3031.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3564.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3756.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3731.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3631.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3488.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3316.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3090.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2787.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2459.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2163.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1940.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1804.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1715.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1622.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1536.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1484.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1431.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0505	62	1341.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1219.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1096.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	976.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	863.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	759.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	657.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	559.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	472.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	405.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	347.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	294.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	248.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	209.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
3756.	3.75		927.	233.	224.	224.
		(INCHES)	2.069	2.075	2.075	2.075
		(AC-FT)	460.	461.	461.	461.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .98

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	172.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	141.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	116.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	95.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	78.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	62.	1		1255	156	0.	1		1910	231	0.
1		0030	7	2.	1		0645	82	49.	1		1300	157	0.	1		1915	232	0.
1		0035	8	8.	1		0650	83	39.	1		1305	158	0.	1		1920	233	0.
1		0040	9	16.	1		0655	84	30.	1		1310	159	0.	1		1925	234	0.
1		0045	10	21.	1		0700	85	23.	1		1315	160	0.	1		1930	235	0.
1		0050	11	21.	1		0705	86	18.	1		1320	161	0.	1		1935	236	0.
1		0055	12	19.	1		0710	87	14.	1		1325	162	0.	1		1940	237	0.
1		0100	13	19.	1		0715	88	10.	1		1330	163	0.	1		1945	238	0.
1		0105	14	19.	1		0720	89	8.	1		1335	164	0.	1		1950	239	0.
1		0110	15	21.	1		0725	90	6.	1		1340	165	0.	1		1955	240	0.
1		0115	16	26.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	32.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	38.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	52.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	77.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	104.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	127.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	143.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	149.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	145.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	139.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	139.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	158.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	195.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	235.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	259.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	259.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	259.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	281.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	311.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	322.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	316.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	338.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	427.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	604.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	927.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1457.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2194.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2983.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3509.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3700.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3677.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3579.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3438.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3269.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3047.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2749.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2425.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2134.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1913.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1780.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1692.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1601.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1515.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1465.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1413.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0505	62	1324.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1204.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1082.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	964.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	852.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	749.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	649.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	552.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	466.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	400.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	343.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	291.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	245.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	207.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
3700.	3.75	913.	229.	221.	221.
		(INCHES) 2.038	2.044	2.044	2.044
		(AC-FT) 453.	454.	454.	454.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .94

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	163.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	134.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	110.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	91.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	74.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	59.	1		1255	156	0.	1		1910	231	0.
1		0030	7	1.	1		0645	82	47.	1		1300	157	0.	1		1915	232	0.
1		0035	8	5.	1		0650	83	37.	1		1305	158	0.	1		1920	233	0.
1		0040	9	11.	1		0655	84	29.	1		1310	159	0.	1		1925	234	0.
1		0045	10	15.	1		0700	85	22.	1		1315	160	0.	1		1930	235	0.
1		0050	11	15.	1		0705	86	17.	1		1320	161	0.	1		1935	236	0.
1		0055	12	14.	1		0710	87	13.	1		1325	162	0.	1		1940	237	0.
1		0100	13	13.	1		0715	88	10.	1		1330	163	0.	1		1945	238	0.
1		0105	14	14.	1		0720	89	7.	1		1335	164	0.	1		1950	239	0.
1		0110	15	16.	1		0725	90	5.	1		1340	165	0.	1		1955	240	0.
1		0115	16	20.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	25.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	31.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	43.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	65.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	89.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	110.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	125.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	130.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	127.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	122.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	123.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	140.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	174.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	211.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	233.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	234.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	235.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	255.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	283.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	294.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	289.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	309.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	392.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	556.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	857.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1354.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2047.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2792.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3291.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3476.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3458.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3369.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3238.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3081.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	2873.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2594.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2289.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2016.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1809.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1683.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1601.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1516.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1436.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1389.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1340.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.

1	0505	62	1256.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1142.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1027.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	915.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	809.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	712.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	616.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	524.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	443.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	380.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	326.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	276.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	233.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	196.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 3476.	3.75	858.	215.	207.	207.
		(INCHES) 1.914	1.919	1.919	1.919
		(AC-FT) 425.	426.	426.	426.

CUMULATIVE AREA = 4.17 SQ MI

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HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .93

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	161.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	132.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	109.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	89.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	73.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	59.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	1.	*	1		0645	82	46.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	4.	*	1		0650	83	36.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	10.	*	1		0655	84	28.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	13.	*	1		0700	85	22.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	14.	*	1		0705	86	17.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	13.	*	1		0710	87	13.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	12.	*	1		0715	88	10.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	13.	*	1		0720	89	7.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	14.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	18.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	23.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	29.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	41.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	62.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	85.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	106.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	120.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	126.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	123.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	118.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	119.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	136.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	169.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	205.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	227.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	228.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	228.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	248.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	276.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	287.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	282.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	302.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	384.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	545.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	840.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1329.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	2011.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2745.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3238.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3419.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3402.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3315.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	3188.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	3034.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	2830.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	2555.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	2255.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	1986.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1782.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1659.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	1579.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	1494.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	1416.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	1370.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	1321.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.

1	0505	62	1239.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1127.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1013.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	903.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	798.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	702.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	608.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	517.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	437.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	375.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	321.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	273.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	230.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	194.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3419.	3.75		844.	211.	204.	204.
		(INCHES)	1.883	1.887	1.887	1.887
		(AC-FT)	419.	419.	419.	419.

CUMULATIVE AREA = 4.17 SQ MI

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HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .92

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	159.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	131.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	107.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	88.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	72.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	58.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	1.	*	1		0645	82	46.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	4.	*	1		0650	83	36.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	9.	*	1		0655	84	28.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	12.	*	1		0700	85	21.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	12.	*	1		0705	86	16.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	11.	*	1		0710	87	13.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	11.	*	1		0715	88	9.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	11.	*	1		0720	89	7.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	13.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	17.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	21.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	27.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	39.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	59.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	82.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	102.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	116.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	121.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	119.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	114.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	115.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	131.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	164.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	199.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	220.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	222.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	222.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	242.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	269.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	280.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	275.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	295.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	375.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	533.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	823.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1303.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1974.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2698.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3184.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3365.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3348.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3263.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	3138.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	2987.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	2787.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	2516.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	2222.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	1957.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1756.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1635.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	1556.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	1473.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	1396.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	1350.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	1303.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0505	62	1221.	*	1		1120	137	0.	*	1		1735	212	0.	*	1		2350	287	0.
1		0510	63	1111.	*	1		1125	138	0.	*	1		1740	213	0.	*	1		2355	288	0.
1		0515	64	999.	*	1		1130	139	0.	*	1		1745	214	0.	*	2		0000	289	0.
1		0520	65	890.	*	1		1135	140	0.	*	1		1750	215	0.	*	2		0005	290	0.
1		0525	66	788.	*	1		1140	141	0.	*	1		1755	216	0.	*	2		0010	291	0.
1		0530	67	693.	*	1		1145	142	0.	*	1		1800	217	0.	*	2		0015	292	0.
1		0535	68	600.	*	1		1150	143	0.	*	1		1805	218	0.	*	2		0020	293	0.
1		0540	69	510.	*	1		1155	144	0.	*	1		1810	219	0.	*	2		0025	294	0.
1		0545	70	431.	*	1		1200	145	0.	*	1		1815	220	0.	*	2		0030	295	0.
1		0550	71	370.	*	1		1205	146	0.	*	1		1820	221	0.	*	2		0035	296	0.
1		0555	72	317.	*	1		1210	147	0.	*	1		1825	222	0.	*	2		0040	297	0.
1		0600	73	269.	*	1		1215	148	0.	*	1		1830	223	0.	*	2		0045	298	0.
1		0605	74	227.	*	1		1220	149	0.	*	1		1835	224	0.	*	2		0050	299	0.
1		0610	75	191.	*	1		1225	150	0.	*	1		1840	225	0.	*	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
3365.	3.75		830.	208.	200.	200.
		(INCHES)	1.853	1.857	1.857	1.857
		(AC-FT)	412.	413.	413.	413.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	157.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	129.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	106.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	87.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	71.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	57.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	1.	*	1		0645	82	45.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	3.	*	1		0650	83	35.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	8.	*	1		0655	84	28.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	11.	*	1		0700	85	21.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	11.	*	1		0705	86	16.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	10.	*	1		0710	87	12.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	10.	*	1		0715	88	9.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	10.	*	1		0720	89	7.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	12.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	16.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	20.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	25.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	37.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	56.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	78.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	98.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	111.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	117.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	114.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	110.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	111.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	127.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	158.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	193.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	214.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	216.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	216.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	235.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	262.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	273.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	268.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	288.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	366.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	521.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	806.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1278.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1938.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2650.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3129.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3309.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3294.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3211.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	3088.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	2940.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	2744.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	2478.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	2188.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	1927.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1730.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1611.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	1533.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	1452.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	1376.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	1332.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	1285.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0505	62	1205.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1096.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	986.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	878.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	777.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	683.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	592.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	503.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	425.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	365.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	313.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	265.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	224.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	189.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
3309.	3.75		817.	205.	197.	197.
		(INCHES)	1.822	1.826	1.826	1.826
		(AC-FT)	405.	406.	406.	406.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .70

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	112.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	92.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	76.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	62.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	51.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	41.	1		1255	156	0.	1		1910	231	0.
1		0030	7	0.	1		0645	82	32.	1		1300	157	0.	1		1915	232	0.
1		0035	8	0.	1		0650	83	25.	1		1305	158	0.	1		1920	233	0.
1		0040	9	0.	1		0655	84	20.	1		1310	159	0.	1		1925	234	0.
1		0045	10	0.	1		0700	85	15.	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	12.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	9.	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	7.	1		1330	163	0.	1		1945	238	0.
1		0105	14	0.	1		0720	89	5.	1		1335	164	0.	1		1950	239	0.
1		0110	15	0.	1		0725	90	4.	1		1340	165	0.	1		1955	240	0.
1		0115	16	0.	1		0730	91	3.	1		1345	166	0.	1		2000	241	0.
1		0120	17	0.	1		0735	92	2.	1		1350	167	0.	1		2005	242	0.
1		0125	18	1.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	4.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	9.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	17.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	25.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	32.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	36.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	37.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	37.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	39.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	47.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	64.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	83.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	96.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	99.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	101.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	113.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	130.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	137.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	137.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	150.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	197.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	290.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	467.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	769.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1204.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1689.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	2026.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	2164.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	2171.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	2130.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	2060.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1972.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1850.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1678.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1488.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1316.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1187.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1110.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1062.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1009.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	960.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	932.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	903.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0505	62	848.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	774.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	697.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	622.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	551.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	486.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	421.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	358.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	303.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	260.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	223.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	189.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	160.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	135.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
2171.	3.83	536.	134.	129.	129.
		(INCHES) 1.197	1.197	1.197	1.197
		(AC-FT) 266.	266.	266.	266.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .54

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	78.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	65.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	53.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	44.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	36.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	29.	1		1255	156	0.	1		1910	231	0.
1		0030	7	0.	1		0645	82	23.	1		1300	157	0.	1		1915	232	0.
1		0035	8	0.	1		0650	83	18.	1		1305	158	0.	1		1920	233	0.
1		0040	9	0.	1		0655	84	14.	1		1310	159	0.	1		1925	234	0.
1		0045	10	0.	1		0700	85	11.	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	8.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	6.	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	5.	1		1330	163	0.	1		1945	238	0.
1		0105	14	0.	1		0720	89	4.	1		1335	164	0.	1		1950	239	0.
1		0110	15	0.	1		0725	90	3.	1		1340	165	0.	1		1955	240	0.
1		0115	16	0.	1		0730	91	2.	1		1345	166	0.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1.	1		1350	167	0.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	0.	1		0755	96	0.	1		1410	171	0.	1		2025	246	0.
1		0145	22	1.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	2.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	3.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	3.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	4.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	5.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	7.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	13.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	21.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	27.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	31.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	34.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	40.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	49.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	54.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	56.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	63.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	89.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	140.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	242.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	423.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	697.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1013.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	1243.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	1348.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	1365.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	1350.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	1316.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1268.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1198.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1093.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	974.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	867.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	786.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	740.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	712.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	680.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	650.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	634.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	616.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.

1	0505	62	581.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	531.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	480.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	430.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	381.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	336.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	292.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	249.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	211.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	181.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	155.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	132.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	111.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	94.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1365.	3.83		339.	85.	82.	82.
		(INCHES)	.757	.757	.757	.757
		(AC-FT)	168.	168.	168.	168.

CUMULATIVE AREA = 4.17 SQ MI

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          *            *
150 KK    *      CP5B  *
          *            *
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152 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

153 HC HYDROGRAPH COMBINATION

ICOMP	6	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = 1.00

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	209.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	172.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	142.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	116.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	95.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	5.	*	1		0640	81	77.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	11.	*	1		0645	82	62.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	18.	*	1		0650	83	49.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	25.	*	1		0655	84	39.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	29.	*	1		0700	85	30.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	30.	*	1		0705	86	23.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	27.	*	1		0710	87	18.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	24.	*	1		0715	88	14.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	23.	*	1		0720	89	10.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	26.	*	1		0725	90	8.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	31.	*	1		0730	91	6.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	37.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	46.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	60.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	83.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	111.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	138.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	159.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	169.	*	1		0810	99	1.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	168.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	162.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	159.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	171.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	202.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	244.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	278.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	293.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	296.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	307.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	330.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	349.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	355.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	370.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	433.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	577.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0320	41	872.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1383.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2129.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2978.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3634.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3966.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	4014.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3910.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3751.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3561.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3334.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	3052.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2732.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2423.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	2170.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1994.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1876.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1779.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1690.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1618.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1552.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1470.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1356.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1227.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	1098.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	976.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	863.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	757.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	656.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	562.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	479.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	409.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	349.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	296.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	249.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
4014.	3.83		996.	250.	241.	241.
		(INCHES)	2.109	2.117	2.117	2.117
		(AC-FT)	494.	496.	496.	496.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .99

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	206.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	170.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	140.	1		1240	153	0.	1		1855	228	0.
1		0015	4	1.	1		0630	79	115.	1		1245	154	0.	1		1900	229	0.
1		0020	5	2.	1		0635	80	94.	1		1250	155	0.	1		1905	230	0.
1		0025	6	5.	1		0640	81	77.	1		1255	156	0.	1		1910	231	0.
1		0030	7	10.	1		0645	82	61.	1		1300	157	0.	1		1915	232	0.
1		0035	8	17.	1		0650	83	49.	1		1305	158	0.	1		1920	233	0.
1		0040	9	24.	1		0655	84	38.	1		1310	159	0.	1		1925	234	0.
1		0045	10	28.	1		0700	85	30.	1		1315	160	0.	1		1930	235	0.
1		0050	11	28.	1		0705	86	23.	1		1320	161	0.	1		1935	236	0.
1		0055	12	25.	1		0710	87	18.	1		1325	162	0.	1		1940	237	0.
1		0100	13	23.	1		0715	88	13.	1		1330	163	0.	1		1945	238	0.
1		0105	14	22.	1		0720	89	10.	1		1335	164	0.	1		1950	239	0.
1		0110	15	24.	1		0725	90	8.	1		1340	165	0.	1		1955	240	0.
1		0115	16	29.	1		0730	91	6.	1		1345	166	0.	1		2000	241	0.
1		0120	17	35.	1		0735	92	4.	1		1350	167	0.	1		2005	242	0.
1		0125	18	44.	1		0740	93	3.	1		1355	168	0.	1		2010	243	0.
1		0130	19	58.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	80.	1		0750	95	2.	1		1405	170	0.	1		2020	245	0.
1		0140	21	107.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	134.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	154.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	164.	1		0810	99	1.	1		1425	174	0.	1		2040	249	0.
1		0200	25	163.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	157.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	154.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	166.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	197.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	238.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	272.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	286.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	289.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	300.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	322.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	341.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	347.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	363.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	424.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	566.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0320	41	854.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1355.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2094.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2926.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3584.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3919.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3956.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3851.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3697.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3513.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3289.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	3010.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2696.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2390.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	2139.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1967.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1852.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1756.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1668.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1597.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1533.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1451.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1339.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1212.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	1084.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	964.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	853.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	748.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	648.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	555.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	473.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	404.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	345.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	293.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	246.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3956.	3.83		982.	246.	237.	237.
		(INCHES)	2.078	2.085	2.085	2.085
		(AC-FT)	487.	489.	489.	489.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .98

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	204.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	168.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	138.	1		1240	153	0.	1		1855	228	0.
1		0015	4	1.	1		0630	79	114.	1		1245	154	0.	1		1900	229	0.
1		0020	5	2.	1		0635	80	93.	1		1250	155	0.	1		1905	230	0.
1		0025	6	5.	1		0640	81	76.	1		1255	156	0.	1		1910	231	0.
1		0030	7	10.	1		0645	82	61.	1		1300	157	0.	1		1915	232	0.
1		0035	8	16.	1		0650	83	48.	1		1305	158	0.	1		1920	233	0.
1		0040	9	22.	1		0655	84	38.	1		1310	159	0.	1		1925	234	0.
1		0045	10	26.	1		0700	85	29.	1		1315	160	0.	1		1930	235	0.
1		0050	11	26.	1		0705	86	23.	1		1320	161	0.	1		1935	236	0.
1		0055	12	24.	1		0710	87	17.	1		1325	162	0.	1		1940	237	0.
1		0100	13	21.	1		0715	88	13.	1		1330	163	0.	1		1945	238	0.
1		0105	14	20.	1		0720	89	10.	1		1335	164	0.	1		1950	239	0.
1		0110	15	23.	1		0725	90	8.	1		1340	165	0.	1		1955	240	0.
1		0115	16	27.	1		0730	91	6.	1		1345	166	0.	1		2000	241	0.
1		0120	17	33.	1		0735	92	4.	1		1350	167	0.	1		2005	242	0.
1		0125	18	41.	1		0740	93	3.	1		1355	168	0.	1		2010	243	0.
1		0130	19	55.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	77.	1		0750	95	2.	1		1405	170	0.	1		2020	245	0.
1		0140	21	103.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	129.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	149.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	159.	1		0810	99	1.	1		1425	174	0.	1		2040	249	0.
1		0200	25	158.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	152.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	150.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	161.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	192.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	232.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	265.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	279.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	282.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	293.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	315.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	334.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	340.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	355.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	415.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	555.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0320	41	838.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1333.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2057.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2883.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3523.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3850.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3898.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3798.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3644.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3462.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3243.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2970.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2659.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2359.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	2112.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1941.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1827.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1733.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1647.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1577.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1513.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1433.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1322.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1197.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	1071.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	953.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	843.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	739.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	640.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	548.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	467.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	399.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	341.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	289.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	244.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
3898.	3.83	967.	243.	234.	234.
		(INCHES) 2.047	2.054	2.054	2.054
		(AC-FT) 479.	481.	481.	481.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .94

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	194.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	160.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	132.	1		1240	153	0.	1		1855	228	0.
1		0015	4	1.	1		0630	79	108.	1		1245	154	0.	1		1900	229	0.
1		0020	5	1.	1		0635	80	89.	1		1250	155	0.	1		1905	230	0.
1		0025	6	4.	1		0640	81	72.	1		1255	156	0.	1		1910	231	0.
1		0030	7	8.	1		0645	82	58.	1		1300	157	0.	1		1915	232	0.
1		0035	8	13.	1		0650	83	46.	1		1305	158	0.	1		1920	233	0.
1		0040	9	17.	1		0655	84	36.	1		1310	159	0.	1		1925	234	0.
1		0045	10	19.	1		0700	85	28.	1		1315	160	0.	1		1930	235	0.
1		0050	11	19.	1		0705	86	22.	1		1320	161	0.	1		1935	236	0.
1		0055	12	18.	1		0710	87	17.	1		1325	162	0.	1		1940	237	0.
1		0100	13	16.	1		0715	88	13.	1		1330	163	0.	1		1945	238	0.
1		0105	14	15.	1		0720	89	10.	1		1335	164	0.	1		1950	239	0.
1		0110	15	17.	1		0725	90	7.	1		1340	165	0.	1		1955	240	0.
1		0115	16	21.	1		0730	91	5.	1		1345	166	0.	1		2000	241	0.
1		0120	17	26.	1		0735	92	4.	1		1350	167	0.	1		2005	242	0.
1		0125	18	34.	1		0740	93	3.	1		1355	168	0.	1		2010	243	0.
1		0130	19	46.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	65.	1		0750	95	2.	1		1405	170	0.	1		2020	245	0.
1		0140	21	89.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	112.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	130.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	139.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	139.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	134.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	132.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	143.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	171.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	208.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	239.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	252.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	256.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	266.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	286.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	304.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	310.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	325.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	381.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	511.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0320	41	770.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1232.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1914.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2691.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3306.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3615.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3664.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3575.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3433.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3264.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3060.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2805.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2513.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2230.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1998.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1837.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1730.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1642.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1561.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1495.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1435.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1360.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1256.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1137.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	1018.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	905.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	801.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	703.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	609.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	522.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	445.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	380.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	325.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	275.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	232.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
3664.	3.83	909.	228.	219.	219.
		(INCHES) 1.923	1.929	1.929	1.929
		(AC-FT) 451.	452.	452.	452.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .93

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	191.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	158.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	130.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	107.	1		1245	154	0.	1		1900	229	0.
1		0020	5	1.	1		0635	80	88.	1		1250	155	0.	1		1905	230	0.
1		0025	6	4.	1		0640	81	71.	1		1255	156	0.	1		1910	231	0.
1		0030	7	8.	1		0645	82	57.	1		1300	157	0.	1		1915	232	0.
1		0035	8	12.	1		0650	83	45.	1		1305	158	0.	1		1920	233	0.
1		0040	9	16.	1		0655	84	36.	1		1310	159	0.	1		1925	234	0.
1		0045	10	18.	1		0700	85	28.	1		1315	160	0.	1		1930	235	0.
1		0050	11	18.	1		0705	86	21.	1		1320	161	0.	1		1935	236	0.
1		0055	12	16.	1		0710	87	16.	1		1325	162	0.	1		1940	237	0.
1		0100	13	14.	1		0715	88	13.	1		1330	163	0.	1		1945	238	0.
1		0105	14	14.	1		0720	89	10.	1		1335	164	0.	1		1950	239	0.
1		0110	15	16.	1		0725	90	7.	1		1340	165	0.	1		1955	240	0.
1		0115	16	20.	1		0730	91	5.	1		1345	166	0.	1		2000	241	0.
1		0120	17	25.	1		0735	92	4.	1		1350	167	0.	1		2005	242	0.
1		0125	18	32.	1		0740	93	3.	1		1355	168	0.	1		2010	243	0.
1		0130	19	44.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	62.	1		0750	95	2.	1		1405	170	0.	1		2020	245	0.
1		0140	21	85.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	108.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	126.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	134.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	134.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	130.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	128.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	139.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	166.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	202.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	232.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	245.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	249.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	259.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	279.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	297.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	303.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	317.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	373.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	500.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.

1	0320	41	756.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1208.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1876.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2640.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3244.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3562.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3608.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3517.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3380.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3215.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3013.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2762.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2476.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2198.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1970.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1811.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1705.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1619.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1539.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1474.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1416.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1341.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1239.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1122.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1005.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	894.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	791.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	694.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	601.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	515.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	439.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	375.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	320.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	272.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	229.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3608.	3.83		894.	224.	216.	216.
		(INCHES)	1.892	1.898	1.898	1.898
		(AC-FT)	443.	445.	445.	445.

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .92

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
					*						*						*					
1		0000	1	0.	*	1		0615	76	189.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	156.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	129.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	106.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	1.	*	1		0635	80	86.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	4.	*	1		0640	81	70.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	7.	*	1		0645	82	57.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	12.	*	1		0650	83	45.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	15.	*	1		0655	84	35.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	16.	*	1		0700	85	27.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	16.	*	1		0705	86	21.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	15.	*	1		0710	87	16.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	13.	*	1		0715	88	12.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	13.	*	1		0720	89	9.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	14.	*	1		0725	90	7.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	18.	*	1		0730	91	5.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	23.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	30.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	41.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	59.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	82.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	104.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	121.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	130.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	130.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	125.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	124.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	134.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	161.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	196.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	226.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	239.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	242.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	253.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	272.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	289.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	296.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	310.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	364.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	489.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0320	41	739.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1183.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1842.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2595.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3195.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3499.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3550.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3464.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	3328.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	3165.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	2968.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	2721.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	2440.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	2166.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1940.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1785.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	1681.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	1596.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	1518.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	1454.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	1396.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.
1		0505	62	1323.	*	1		1120	137	0.	*	1		1735	212	0.	*	1		2350	287	0.
1		0510	63	1222.	*	1		1125	138	0.	*	1		1740	213	0.	*	1		2355	288	0.
1		0515	64	1107.	*	1		1130	139	0.	*	1		1745	214	0.	*	2		0000	289	0.
1		0520	65	991.	*	1		1135	140	0.	*	1		1750	215	0.	*	2		0005	290	0.
1		0525	66	882.	*	1		1140	141	0.	*	1		1755	216	0.	*	2		0010	291	0.
1		0530	67	781.	*	1		1145	142	0.	*	1		1800	217	0.	*	2		0015	292	0.
1		0535	68	685.	*	1		1150	143	0.	*	1		1805	218	0.	*	2		0020	293	0.
1		0540	69	593.	*	1		1155	144	0.	*	1		1810	219	0.	*	2		0025	294	0.
1		0545	70	508.	*	1		1200	145	0.	*	1		1815	220	0.	*	2		0030	295	0.
1		0550	71	433.	*	1		1205	146	0.	*	1		1820	221	0.	*	2		0035	296	0.
1		0555	72	370.	*	1		1210	147	0.	*	1		1825	222	0.	*	2		0040	297	0.
1		0600	73	316.	*	1		1215	148	0.	*	1		1830	223	0.	*	2		0045	298	0.
1		0605	74	268.	*	1		1220	149	0.	*	1		1835	224	0.	*	2		0050	299	0.
1		0610	75	226.	*	1		1225	150	0.	*	1		1840	225	0.	*	2		0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
3550.	3.83	880.	220.	212.	212.
		(INCHES) 1.862	1.867	1.867	1.867
		(AC-FT) 436.	437.	437.	437.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	187.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	154.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	127.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	104.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	1.	*	1		0635	80	85.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	3.	*	1		0640	81	69.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	7.	*	1		0645	82	56.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	11.	*	1		0650	83	44.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	14.	*	1		0655	84	35.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	15.	*	1		0700	85	27.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	15.	*	1		0705	86	21.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	14.	*	1		0710	87	16.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	12.	*	1		0715	88	12.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	12.	*	1		0720	89	9.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	13.	*	1		0725	90	7.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	17.	*	1		0730	91	5.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	21.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	28.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	39.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	57.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	78.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	100.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	117.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	125.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	125.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	121.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	119.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	130.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	156.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	191.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	219.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	232.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	236.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	246.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	266.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	282.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	288.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	302.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	356.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	478.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0320	41	723.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1159.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1805.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2548.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3134.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3443.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3493.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3408.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	3275.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	3117.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	2922.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	2679.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	2403.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	2134.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1913.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1759.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	1657.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	1573.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	1496.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	1434.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	1377.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.
1		0505	62	1305.	*	1		1120	137	0.	*	1		1735	212	0.	*	1		2350	287	0.
1		0510	63	1206.	*	1		1125	138	0.	*	1		1740	213	0.	*	1		2355	288	0.
1		0515	64	1092.	*	1		1130	139	0.	*	1		1745	214	0.	*	2		0000	289	0.
1		0520	65	978.	*	1		1135	140	0.	*	1		1750	215	0.	*	2		0005	290	0.
1		0525	66	870.	*	1		1140	141	0.	*	1		1755	216	0.	*	2		0010	291	0.
1		0530	67	770.	*	1		1145	142	0.	*	1		1800	217	0.	*	2		0015	292	0.
1		0535	68	676.	*	1		1150	143	0.	*	1		1805	218	0.	*	2		0020	293	0.
1		0540	69	586.	*	1		1155	144	0.	*	1		1810	219	0.	*	2		0025	294	0.
1		0545	70	501.	*	1		1200	145	0.	*	1		1815	220	0.	*	2		0030	295	0.
1		0550	71	427.	*	1		1205	146	0.	*	1		1820	221	0.	*	2		0035	296	0.
1		0555	72	365.	*	1		1210	147	0.	*	1		1825	222	0.	*	2		0040	297	0.
1		0600	73	312.	*	1		1215	148	0.	*	1		1830	223	0.	*	2		0045	298	0.
1		0605	74	265.	*	1		1220	149	0.	*	1		1835	224	0.	*	2		0050	299	0.
1		0610	75	223.	*	1		1225	150	0.	*	1		1840	225	0.	*	2		0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
3493.	3.83		865.	217.	209.	209.
		(INCHES)	1.831	1.836	1.836	1.836
		(AC-FT)	429.	430.	430.	430.

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .70

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	135.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	112.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	92.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	76.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	62.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	1.	*	1		0640	81	51.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	2.	*	1		0645	82	41.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	3.	*	1		0650	83	32.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	3.	*	1		0655	84	25.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	3.	*	1		0700	85	20.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	2.	*	1		0705	86	15.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	1.	*	1		0710	87	12.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	9.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	7.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	1.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	2.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	3.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	4.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	7.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	12.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	20.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	28.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	35.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	40.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	41.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	41.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	42.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	49.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	63.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	82.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	98.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	107.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	111.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	119.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	131.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	142.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	148.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	158.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	191.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	265.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0320	41	409.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	673.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1091.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	1591.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	2008.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	2246.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	2302.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	2263.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	2188.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	2093.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	1974.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	1821.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	1643.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	1466.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1318.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1217.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	1150.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	1096.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	1047.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	1006.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	969.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.
1		0505	62	922.	*	1		1120	137	0.	*	1		1735	212	0.	*	1		2350	287	0.
1		0510	63	855.	*	1		1125	138	0.	*	1		1740	213	0.	*	1		2355	288	0.
1		0515	64	777.	*	1		1130	139	0.	*	1		1745	214	0.	*	2		0000	289	0.
1		0520	65	697.	*	1		1135	140	0.	*	1		1750	215	0.	*	2		0005	290	0.
1		0525	66	622.	*	1		1140	141	0.	*	1		1755	216	0.	*	2		0010	291	0.
1		0530	67	552.	*	1		1145	142	0.	*	1		1800	217	0.	*	2		0015	292	0.
1		0535	68	485.	*	1		1150	143	0.	*	1		1805	218	0.	*	2		0020	293	0.
1		0540	69	421.	*	1		1155	144	0.	*	1		1810	219	0.	*	2		0025	294	0.
1		0545	70	360.	*	1		1200	145	0.	*	1		1815	220	0.	*	2		0030	295	0.
1		0550	71	307.	*	1		1205	146	0.	*	1		1820	221	0.	*	2		0035	296	0.
1		0555	72	263.	*	1		1210	147	0.	*	1		1825	222	0.	*	2		0040	297	0.
1		0600	73	225.	*	1		1215	148	0.	*	1		1830	223	0.	*	2		0045	298	0.
1		0605	74	191.	*	1		1220	149	0.	*	1		1835	224	0.	*	2		0050	299	0.
1		0610	75	161.	*	1		1225	150	0.	*	1		1840	225	0.	*	2		0055	300	0.
					*						*						*					

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 2302.	3.83		570.	143.	137.	137.
		(INCHES)	1.206	1.207	1.207	1.207
		(AC-FT)	283.	283.	283.	283.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .54

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	101.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	85.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	71.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	59.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	49.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	41.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	34.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	1.	*	1		0650	83	27.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	1.	*	1		0655	84	22.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	1.	*	1		0700	85	17.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	13.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	10.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	8.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	6.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	1.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	1.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	1.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	2.	*	1		0745	94	1.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	3.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	4.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	5.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	5.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	5.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	5.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	5.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	6.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	8.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	12.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	17.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	24.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	29.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	35.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	40.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	45.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	52.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	58.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	65.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	78.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	112.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.

1	0320	41	192.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	349.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	604.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	928.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1217.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1391.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1448.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1436.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	1399.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	1348.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	1282.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	1192.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	1083.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	972.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	879.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	814.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	773.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	741.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	711.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	686.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	663.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	634.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	591.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	539.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	485.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	434.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	386.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	340.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	296.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	255.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	219.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	189.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	163.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	140.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	119.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*					

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1448.	3.83		362.	91.	87.	87.
		(INCHES)	.766	.767	.767	.767
		(AC-FT)	179.	180.	180.	180.

CUMULATIVE AREA = 4.39 SQ MI

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          **************
          *            *
154 KK    *      EXDB  *
          *            *
          **************

155 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                        DETENTION BASIN CHEYENNE AND BELTWAY
                        LOW-FLOW OUTLET IS 66" PIPE

               HYDROGRAPH ROUTING DATA

158 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                     RSVRIC       .00  INITIAL CONDITION
                         X        .00 WORKING R AND D COEFFICIENT

159 SV            STORAGE         .0        .1        .8      12.7      18.8      25.0      85.9      95.0     124.2     135.1
                                200.3     243.1     258.1     273.4     289.0     305.0

161 SE          ELEVATION    2990.00   2991.00   2992.00   2995.00   2996.00   2997.00   3005.00   3006.00   3009.00   3010.00
                             3015.00   3018.00   3019.00   3020.00   3021.00   3022.00

163 SL          LOW-LEVEL OUTLET
                     ELEVL    2992.80  ELEVATION AT CENTER OF OUTLET
                     CAREA      22.34  CROSS-SECTIONAL AREA
                      COQL        .70  COEFFICIENT
                      EXPL        .50  EXPONENT OF HEAD

164 SS          SPILLWAY
                      CREL    3021.90  SPILLWAY CREST ELEVATION
                     SPWID     200.00  SPILLWAY WIDTH
                      COQW       2.60  WEIR COEFFICIENT
                      EXPW       1.50  EXPONENT OF HEAD

                                   ***

                          COMPUTED OUTFLOW-ELEVATION DATA

          OUTFLOW        .00       .00    206.99    229.77    258.19    294.62    343.04    410.49    510.96    676.55
        ELEVATION    2990.00   2992.80   2995.52   2996.16   2997.04   2998.32   3000.28   3003.51   3009.40   3021.90
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OUTFLOW	676.62	676.84	677.28	678.05	679.22	680.90	683.14	686.07	689.72	694.18
ELEVATION	3021.90	3021.91	3021.91	3021.92	3021.93	3021.94	3021.95	3021.97	3021.98	3022.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.07	.80	3.98	12.71	15.87	18.75	19.74	25.05	25.34
OUTFLOW	.00	.00	.00	.00	186.02	206.99	224.35	229.77	257.03	258.19
ELEVATION	2990.00	2991.00	2992.00	2992.80	2995.00	2995.52	2996.00	2996.16	2997.00	2997.04
STORAGE	35.09	50.03	74.63	85.95	95.04	124.21	128.56	135.14	200.27	243.11
OUTFLOW	294.62	343.04	410.49	438.06	455.66	504.79	510.96	520.14	590.92	629.59
ELEVATION	2998.32	3000.28	3003.51	3005.00	3006.00	3009.00	3009.40	3010.00	3015.00	3018.00
STORAGE	258.06	273.36	289.00	303.39	303.57	303.83	304.00	304.21	304.44	304.70
OUTFLOW	641.96	654.09	666.01	676.55	677.28	679.22	680.90	683.14	686.07	689.72
ELEVATION	3019.00	3020.00	3021.00	3021.90	3021.91	3021.93	3021.94	3021.95	3021.97	3021.98
STORAGE	304.99									
OUTFLOW	694.18									
ELEVATION	3022.00									

WARNING --- ROUTED OUTFLOW (746.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (831.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (900.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (951.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (986.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1004.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1007.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (998.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (979.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (952.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (917.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (877.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (833.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (787.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (740.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = 1.00

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	590.	199.2	3014.9	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	1		0825	102	585.	195.1	3014.6	1		1645	202	1.	4.0	2992.8
1		0010	3	0.	.0	2990.0	1		0830	103	581.	191.1	3014.3	1		1650	203	1.	4.0	2992.8
1		0015	4	0.	.0	2990.1	1		0835	104	577.	187.1	3014.0	1		1655	204	1.	4.0	2992.8
1		0020	5	0.	.0	2990.2	1		0840	105	572.	183.2	3013.7	1		1700	205	1.	4.0	2992.8
1		0025	6	0.	.0	2990.5	1		0845	106	568.	179.2	3013.4	1		1705	206	1.	4.0	2992.8
1		0030	7	0.	.1	2991.0	1		0850	107	564.	175.3	3013.1	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.2	2991.2	1		0855	108	560.	171.5	3012.8	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.3	2991.4	1		0900	109	555.	167.6	3012.5	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.5	2991.6	1		0905	110	551.	163.8	3012.2	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.7	2991.9	1		0910	111	547.	160.0	3011.9	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.9	2992.0	1		0915	112	543.	156.3	3011.6	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	1.1	2992.1	1		0920	113	539.	152.6	3011.3	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	1.3	2992.1	1		0925	114	535.	148.9	3011.1	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	1.4	2992.2	1		0930	115	531.	145.2	3010.8	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	1.6	2992.2	1		0935	116	527.	141.6	3010.5	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	1.9	2992.3	1		0940	117	523.	137.9	3010.2	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	2.2	2992.3	1		0945	118	519.	134.3	3009.9	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	2.5	2992.4	1		0950	119	514.	130.8	3009.6	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	3.0	2992.6	1		0955	120	509.	127.3	3009.3	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	3.7	2992.7	1		1000	121	504.	123.8	3009.0	1		1820	221	0.	4.0	2992.8
1		0145	22	11.	4.5	2992.9	1		1005	122	498.	120.3	3008.6	1		1825	222	0.	4.0	2992.8
1		0150	23	30.	5.4	2993.2	1		1010	123	493.	116.9	3008.2	1		1830	223	0.	4.0	2992.8
1		0155	24	48.	6.2	2993.4	1		1015	124	487.	113.5	3007.9	1		1835	224	0.	4.0	2992.8
1		0200	25	65.	7.0	2993.6	1		1020	125	481.	110.2	3007.6	1		1840	225	0.	4.0	2992.8
1		0205	26	78.	7.7	2993.7	1		1025	126	476.	106.9	3007.2	1		1845	226	0.	4.0	2992.8
1		0210	27	89.	8.2	2993.9	1		1030	127	470.	103.7	3006.9	1		1850	227	0.	4.0	2992.8
1		0215	28	100.	8.7	2994.0	1		1035	128	465.	100.4	3006.6	1		1855	228	0.	4.0	2992.8
1		0220	29	112.	9.2	2994.1	1		1040	129	459.	97.3	3006.2	1		1900	229	0.	4.0	2992.8
1		0225	30	127.	9.9	2994.3	1		1045	130	454.	94.1	3005.9	1		1905	230	0.	4.0	2992.8
1		0230	31	145.	10.8	2994.5	1		1050	131	448.	91.0	3005.6	1		1910	231	0.	4.0	2992.8
1		0235	32	164.	11.7	2994.7	1		1055	132	442.	87.9	3005.2	1		1915	232	0.	4.0	2992.8
1		0240	33	182.	12.5	2995.0	1		1100	133	436.	84.9	3004.9	1		1920	233	0.	4.0	2992.8
1		0245	34	190.	13.3	2995.1	1		1105	134	428.	81.9	3004.5	1		1925	234	0.	4.0	2992.8
1		0250	35	196.	14.2	2995.2	1		1110	135	421.	79.0	3004.1	1		1930	235	0.	4.0	2992.8
1		0255	36	202.	15.1	2995.4	1		1115	136	414.	76.1	3003.7	1		1935	236	0.	4.0	2992.8
1		0300	37	209.	16.2	2995.6	1		1120	137	407.	73.3	3003.3	1		1940	237	0.	4.0	2992.8

1	0305	38	215.	17.2	2995.7	*	1	1125	138	399.	70.5	3003.0	*	1	1945	238	0.	4.0	2992.8
1	0310	39	223.	18.5	2996.0	*	1	1130	139	392.	67.8	3002.6	*	1	1950	239	0.	4.0	2992.8
1	0315	40	233.	20.4	2996.3	*	1	1135	140	384.	65.1	3002.3	*	1	1955	240	0.	4.0	2992.8
1	0320	41	250.	23.7	2996.8	*	1	1140	141	377.	62.5	3001.9	*	1	2000	241	0.	4.0	2992.8
1	0325	42	274.	29.7	2997.6	*	1	1145	142	370.	59.9	3001.6	*	1	2005	242	0.	4.0	2992.8
1	0330	43	310.	39.7	2998.9	*	1	1150	143	363.	57.4	3001.3	*	1	2010	243	0.	4.0	2992.8
1	0335	44	357.	55.0	3000.9	*	1	1155	144	357.	54.9	3000.9	*	1	2015	244	0.	4.0	2992.8
1	0340	45	412.	75.1	3003.6	*	1	1200	145	350.	52.5	3000.6	*	1	2020	245	0.	4.0	2992.8
1	0345	46	461.	98.3	3006.3	*	1	1205	146	343.	50.1	3000.3	*	1	2025	246	0.	4.0	2992.8
1	0350	47	502.	122.5	3008.8	*	1	1210	147	336.	47.8	3000.0	*	1	2030	247	0.	4.0	2992.8
1	0355	48	532.	146.2	3010.8	*	1	1215	148	328.	45.5	2999.7	*	1	2035	248	0.	4.0	2992.8
1	0400	49	557.	168.8	3012.6	*	1	1220	149	321.	43.3	2999.4	*	1	2040	249	0.	4.0	2992.8
1	0405	50	580.	190.1	3014.2	*	1	1225	150	314.	41.1	2999.1	*	1	2045	250	0.	4.0	2992.8
1	0410	51	599.	209.8	3015.7	*	1	1230	151	307.	38.9	2998.8	*	1	2050	251	0.	4.0	2992.8
1	0415	52	616.	227.6	3016.9	*	1	1235	152	300.	36.8	2998.5	*	1	2055	252	0.	4.0	2992.8
1	0420	53	630.	243.2	3018.0	*	1	1240	153	294.	34.8	2998.3	*	1	2100	253	0.	4.0	2992.8
1	0425	54	641.	256.6	3018.9	*	1	1245	154	286.	32.8	2998.0	*	1	2105	254	0.	4.0	2992.8
1	0430	55	650.	268.0	3019.6	*	1	1250	155	279.	30.9	2997.8	*	1	2110	255	0.	4.0	2992.8
1	0435	56	657.	277.8	3020.3	*	1	1255	156	272.	29.0	2997.5	*	1	2115	256	0.	4.0	2992.8
1	0440	57	664.	286.6	3020.8	*	1	1300	157	265.	27.1	2997.3	*	1	2120	257	0.	4.0	2992.8
1	0445	58	670.	294.6	3021.3	*	1	1305	158	258.	25.3	2997.0	*	1	2125	258	0.	4.0	2992.8
1	0450	59	675.	301.9	3021.8	*	1	1310	159	249.	23.6	2996.8	*	1	2130	259	0.	4.0	2992.8
1	0455	60	746.	308.4	3022.2	*	1	1315	160	241.	21.9	2996.5	*	1	2135	260	0.	4.0	2992.8
1	0500	61	831.	313.8	3022.6	*	1	1320	161	232.	20.2	2996.2	*	1	2140	261	0.	4.0	2992.8
1	0505	62	900.	318.3	3022.8	*	1	1325	162	224.	18.7	2996.0	*	1	2145	262	0.	4.0	2992.8
1	0510	63	951.	321.6	3023.0	*	1	1330	163	215.	17.2	2995.7	*	1	2150	263	0.	4.0	2992.8
1	0515	64	986.	323.9	3023.2	*	1	1335	164	206.	15.7	2995.5	*	1	2155	264	0.	4.0	2992.8
1	0520	65	1004.	325.0	3023.3	*	1	1340	165	197.	14.3	2995.3	*	1	2200	265	0.	4.0	2992.8
1	0525	66	1007.	325.2	3023.3	*	1	1345	166	188.	13.0	2995.0	*	1	2205	266	0.	4.0	2992.8
1	0530	67	998.	324.7	3023.2	*	1	1350	167	166.	11.8	2994.8	*	1	2210	267	0.	4.0	2992.8
1	0535	68	979.	323.4	3023.2	*	1	1355	168	144.	10.7	2994.5	*	1	2215	268	0.	4.0	2992.8
1	0540	69	952.	321.7	3023.0	*	1	1400	169	124.	9.8	2994.3	*	1	2220	269	0.	4.0	2992.8
1	0545	70	917.	319.4	3022.9	*	1	1405	170	107.	9.0	2994.1	*	1	2225	270	0.	4.0	2992.8
1	0550	71	877.	316.8	3022.7	*	1	1410	171	92.	8.3	2993.9	*	1	2230	271	0.	4.0	2992.8
1	0555	72	833.	314.0	3022.6	*	1	1415	172	80.	7.7	2993.7	*	1	2235	272	0.	4.0	2992.8
1	0600	73	787.	311.0	3022.4	*	1	1420	173	69.	7.2	2993.6	*	1	2240	273	0.	4.0	2992.8
1	0605	74	740.	308.0	3022.2	*	1	1425	174	59.	6.8	2993.5	*	1	2245	274	0.	4.0	2992.8
1	0610	75	693.	304.9	3022.0	*	1	1430	175	51.	6.4	2993.4	*	1	2250	275	0.	4.0	2992.8
1	0615	76	675.	301.8	3021.8	*	1	1435	176	44.	6.1	2993.3	*	1	2255	276	0.	4.0	2992.8
1	0620	77	673.	298.5	3021.6	*	1	1440	177	38.	5.8	2993.3	*	1	2300	277	0.	4.0	2992.8
1	0625	78	670.	294.9	3021.4	*	1	1445	178	33.	5.5	2993.2	*	1	2305	278	0.	4.0	2992.8
1	0630	79	668.	291.2	3021.1	*	1	1450	179	29.	5.3	2993.1	*	1	2310	279	0.	4.0	2992.8
1	0635	80	665.	287.3	3020.9	*	1	1455	180	25.	5.1	2993.1	*	1	2315	280	0.	4.0	2992.8
1	0640	81	662.	283.4	3020.6	*	1	1500	181	21.	5.0	2993.1	*	1	2320	281	0.	4.0	2992.8
1	0645	82	659.	279.3	3020.4	*	1	1505	182	18.	4.8	2993.0	*	1	2325	282	0.	4.0	2992.8
1	0650	83	655.	275.2	3020.1	*	1	1510	183	16.	4.7	2993.0	*	1	2330	283	0.	4.0	2992.8
1	0655	84	652.	271.0	3019.8	*	1	1515	184	14.	4.6	2993.0	*	1	2335	284	0.	4.0	2992.8
1	0700	85	649.	266.7	3019.6	*	1	1520	185	12.	4.5	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	645.	262.4	3019.3	*	1	1525	186	10.	4.5	2992.9	*	1	2345	286	0.	4.0	2992.8
1	0710	87	642.	258.2	3019.0	*	1	1530	187	9.	4.4	2992.9	*	1	2350	287	0.	4.0	2992.8
1	0715	88	638.	253.9	3018.7	*	1	1535	188	8.	4.3	2992.9	*	1	2355	288	0.	4.0	2992.8
1	0720	89	635.	249.6	3018.4	*	1	1540	189	7.	4.3	2992.9	*	2	0000	289	0.	4.0	2992.8
1	0725	90	631.	245.3	3018.1	*	1	1545	190	6.	4.2	2992.9	*	2	0005	290	0.	4.0	2992.8
1	0730	91	628.	241.0	3017.8	*	1	1550	191	5.	4.2	2992.9	*	2	0010	291	0.	4.0	2992.8
1	0735	92	624.	236.7	3017.6	*	1	1555	192	4.	4.2	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	620.	232.4	3017.3	*	1	1600	193	4.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	616.	228.2	3017.0	*	1	1605	194	3.	4.1	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	612.	224.0	3016.7	*	1	1610	195	3.	4.1	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	609.	219.8	3016.4	*	1	1615	196	2.	4.1	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	605.	215.6	3016.1	*	1	1620	197	2.	4.1	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	601.	211.5	3015.8	*	1	1625	198	2.	4.1	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	597.	207.3	3015.5	*	1	1630	199	2.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	594.	203.2	3015.2	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1007.	5.42		668.	248.	239.	239.
		(INCHES)	1.413	2.100	2.100	2.100
		(AC-FT)	331.	492.	492.	492.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)					
325.	5.42		242.	75.	72.	72.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)					
3023.27	5.42		3017.69	3000.84	3000.47	3000.47

CUMULATIVE AREA = 4.39 SQ MI

WARNING --- ROUTED OUTFLOW (760.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (834.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (890.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (929.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (951.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (959.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (954.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (938.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (914.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (882.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (845.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (804.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (761.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (716.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .99

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	588.	197.9	3014.8	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	1		0825	102	584.	193.8	3014.5	1		1645	202	1.	4.0	2992.8
1		0010	3	0.	.0	2990.0	1		0830	103	580.	189.8	3014.2	1		1650	203	1.	4.0	2992.8
1		0015	4	0.	.0	2990.1	1		0835	104	575.	185.9	3013.9	1		1655	204	1.	4.0	2992.8
1		0020	5	0.	.0	2990.2	1		0840	105	571.	181.9	3013.6	1		1700	205	1.	4.0	2992.8
1		0025	6	0.	.0	2990.5	1		0845	106	567.	178.0	3013.3	1		1705	206	1.	4.0	2992.8
1		0030	7	0.	.1	2991.0	1		0850	107	562.	174.1	3013.0	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.2	2991.2	1		0855	108	558.	170.3	3012.7	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.3	2991.3	1		0900	109	554.	166.4	3012.4	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.5	2991.6	1		0905	110	550.	162.6	3012.1	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.7	2991.9	1		0910	111	546.	158.8	3011.8	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.9	2992.0	1		0915	112	542.	155.1	3011.5	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	1.0	2992.1	1		0920	113	538.	151.4	3011.2	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	1.2	2992.1	1		0925	114	534.	147.7	3011.0	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	1.4	2992.1	1		0930	115	530.	144.0	3010.7	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	1.5	2992.2	1		0935	116	526.	140.4	3010.4	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	1.8	2992.2	1		0940	117	522.	136.8	3010.1	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	2.0	2992.3	1		0945	118	517.	133.2	3009.8	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	2.4	2992.4	1		0950	119	512.	129.7	3009.5	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	2.8	2992.5	1		0955	120	508.	126.1	3009.2	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	3.5	2992.7	1		1000	121	502.	122.7	3008.8	1		1820	221	0.	4.0	2992.8
1		0145	22	7.	4.3	2992.9	1		1005	122	496.	119.2	3008.5	1		1825	222	0.	4.0	2992.8
1		0150	23	26.	5.2	2993.1	1		1010	123	491.	115.8	3008.1	1		1830	223	0.	4.0	2992.8
1		0155	24	44.	6.0	2993.3	1		1015	124	485.	112.5	3007.8	1		1835	224	0.	4.0	2992.8
1		0200	25	60.	6.8	2993.5	1		1020	125	479.	109.2	3007.5	1		1840	225	0.	4.0	2992.8
1		0205	26	74.	7.4	2993.7	1		1025	126	474.	105.9	3007.1	1		1845	226	0.	4.0	2992.8
1		0210	27	85.	8.0	2993.8	1		1030	127	468.	102.6	3006.8	1		1850	227	0.	4.0	2992.8
1		0215	28	95.	8.4	2993.9	1		1035	128	463.	99.4	3006.5	1		1855	228	0.	4.0	2992.8
1		0220	29	107.	9.0	2994.1	1		1040	129	458.	96.2	3006.1	1		1900	229	0.	4.0	2992.8
1		0225	30	122.	9.7	2994.2	1		1045	130	452.	93.1	3005.8	1		1905	230	0.	4.0	2992.8
1		0230	31	140.	10.6	2994.5	1		1050	131	446.	90.0	3005.4	1		1910	231	0.	4.0	2992.8
1		0235	32	159.	11.4	2994.7	1		1055	132	440.	87.0	3005.1	1		1915	232	0.	4.0	2992.8
1		0240	33	177.	12.3	2994.9	1		1100	133	433.	84.0	3004.7	1		1920	233	0.	4.0	2992.8
1		0245	34	188.	13.0	2995.1	1		1105	134	426.	81.0	3004.4	1		1925	234	0.	4.0	2992.8
1		0250	35	194.	13.9	2995.2	1		1110	135	419.	78.1	3004.0	1		1930	235	0.	4.0	2992.8
1		0255	36	200.	14.8	2995.3	1		1115	136	412.	75.2	3003.6	1		1935	236	0.	4.0	2992.8
1		0300	37	206.	15.8	2995.5	1		1120	137	404.	72.4	3003.2	1		1940	237	0.	4.0	2992.8
1		0305	38	212.	16.8	2995.7	1		1125	138	397.	69.7	3002.9	1		1945	238	0.	4.0	2992.8
1		0310	39	220.	18.0	2995.9	1		1130	139	389.	67.0	3002.5	1		1950	239	0.	4.0	2992.8
1		0315	40	230.	19.9	2996.2	1		1135	140	382.	64.3	3002.2	1		1955	240	0.	4.0	2992.8
1		0320	41	247.	23.1	2996.7	1		1140	141	375.	61.7	3001.8	1		2000	241	0.	4.0	2992.8
1		0325	42	272.	28.9	2997.5	1		1145	142	368.	59.1	3001.5	1		2005	242	0.	4.0	2992.8
1		0330	43	307.	38.8	2998.8	1		1150	143	361.	56.6	3001.1	1		2010	243	0.	4.0	2992.8
1		0335	44	353.	53.8	3000.8	1		1155	144	354.	54.2	3000.8	1		2015	244	0.	4.0	2992.8
1		0340	45	408.	73.6	3003.4	1		1200	145	348.	51.7	3000.5	1		2020	245	0.	4.0	2992.8
1		0345	46	458.	96.5	3006.1	1		1205	146	341.	49.4	3000.2	1		2025	246	0.	4.0	2992.8
1		0350	47	498.	120.3	3008.6	1		1210	147	333.	47.0	2999.9	1		2030	247	0.	4.0	2992.8
1		0355	48	529.	143.6	3010.7	1		1215	148	326.	44.8	2999.6	1		2035	248	0.	4.0	2992.8
1		0400	49	554.	165.9	3012.4	1		1220	149	319.	42.6	2999.3	1		2040	249	0.	4.0	2992.8
1		0405	50	576.	186.8	3014.0	1		1225	150	312.	40.4	2999.0	1		2045	250	0.	4.0	2992.8
1		0410	51	596.	206.2	3015.4	1		1230	151	305.	38.3	2998.7	1		2050	251	0.	4.0	2992.8
1		0415	52	612.	223.8	3016.6	1		1235	152	298.	36.2	2998.5	1		2055	252	0.	4.0	2992.8
1		0420	53	626.	239.1	3017.7	1		1240	153	291.	34.2	2998.2	1		2100	253	0.	4.0	2992.8
1		0425	54	637.	252.3	3018.6	1		1245	154	284.	32.2	2997.9	1		2105	254	0.	4.0	2992.8
1		0430	55	646.	263.5	3019.4	1		1250	155	277.	30.2	2997.7	1		2110	255	0.	4.0	2992.8
1		0435	56	654.	273.1	3020.0	1		1255	156	270.	28.4	2997.4	1		2115	256	0.	4.0	2992.8
1		0440	57	661.	281.8	3020.5	1		1300	157	263.	26.5	2997.2	1		2120	257	0.	4.0	2992.8
1		0445	58	666.	289.6	3021.0	1		1305	158	255.	24.7	2997.0	1		2125	258	0.	4.0	2992.8
1		0450	59	672.	296.8	3021.5	1		1310	159	247.	23.0	2996.7	1		2130	259	0.	4.0	2992.8
1		0455	60	677.	303.4	3021.9	1		1315	160	238.	21.4	2996.4	1		2135	260	0.	4.0	2992.8
1		0500	61	760.	309.2	3022.3	1		1320	161	230.	19.7	2996.2	1		2140	261	0.	4.0	2992.8
1		0505	62	834.	314.0	3022.6	1		1325	162	221.	18.2	2995.9	1		2145	262	0.	4.0	2992.8
1		0510	63	890.	317.7	3022.8	1		1330	163	212.	16.7	2995.7	1		2150	263	0.	4.0	2992.8
1		0515	64	929.	320.2	3023.0	1		1335	164	203.	15.3	2995.4	1		2155	264	0.	4.0	2992.8
1		0520	65	951.	321.6	3023.0	1		1340	165	194.	13.9	2995.2	1		2200	265	0.	4.0	2992.8
1		0525	66	959.	322.1	3023.1	1		1345	166	184.	12.6	2995.0	1		2205	266	0.	4.0	2992.8
1		0530	67	954.	321.8	3023.1	1		1350	167	159.	11.4	2994.7	1		2210	267	0.	4.0	2992.8
1		0535	68	938.	320.8	3023.0	1		1355	168	137.	10.4	2994.4	1		2215	268	0.	4.0	2992.8
1		0540	69	914.	319.2	3022.9	1		1400	169	118.	9.5	2994.2	1		2220	269	0.	4.0	2992.8
1		0545	70	882.	317.2	3022.8	1		1405	170	102.	8.8	2994.0	1		2225	270	0.	4.0	2992.8
1		0550	71	845.	314.8	3022.6	1		1410	171	88.	8.1	2993.8	1		2230	271	0.	4.0	2992.8
1		0555	72	804.	312.1	3022.4	1		1415	172	76.	7.5	2993.7	1		2235	272	0.	4.0	2992.8
1		0600	73	761.	309.3	3022.3	1		1420	173	66.	7.1	2993.6	1		2240	273	0.	4.0	2992.8
1		0605	74	716.	306.4	3022.1	1		1425	174	57.	6.6	2993.5	1		2245	274	0.	4.0	2992.8

1	0610	75	677.	303.5	3021.9	*	1	1430	175	49.	6.3	2993.4	*	1	2250	275	0.	4.0	2992.8
1	0615	76	674.	300.4	3021.7	*	1	1435	176	42.	6.0	2993.3	*	1	2255	276	0.	4.0	2992.8
1	0620	77	672.	297.0	3021.5	*	1	1440	177	36.	5.7	2993.2	*	1	2300	277	0.	4.0	2992.8
1	0625	78	669.	293.5	3021.3	*	1	1445	178	32.	5.5	2993.2	*	1	2305	278	0.	4.0	2992.8
1	0630	79	667.	289.8	3021.0	*	1	1450	179	27.	5.3	2993.1	*	1	2310	279	0.	4.0	2992.8
1	0635	80	664.	285.9	3020.8	*	1	1455	180	23.	5.1	2993.1	*	1	2315	280	0.	4.0	2992.8
1	0640	81	661.	281.9	3020.5	*	1	1500	181	20.	4.9	2993.0	*	1	2320	281	0.	4.0	2992.8
1	0645	82	658.	277.9	3020.3	*	1	1505	182	17.	4.8	2993.0	*	1	2325	282	0.	4.0	2992.8
1	0650	83	654.	273.7	3020.0	*	1	1510	183	15.	4.7	2993.0	*	1	2330	283	0.	4.0	2992.8
1	0655	84	651.	269.5	3019.8	*	1	1515	184	13.	4.6	2993.0	*	1	2335	284	0.	4.0	2992.8
1	0700	85	648.	265.3	3019.5	*	1	1520	185	11.	4.5	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	644.	261.0	3019.2	*	1	1525	186	10.	4.4	2992.9	*	1	2345	286	0.	4.0	2992.8
1	0710	87	641.	256.7	3018.9	*	1	1530	187	8.	4.4	2992.9	*	1	2350	287	0.	4.0	2992.8
1	0715	88	637.	252.5	3018.6	*	1	1535	188	7.	4.3	2992.9	*	1	2355	288	0.	4.0	2992.8
1	0720	89	634.	248.2	3018.3	*	1	1540	189	6.	4.3	2992.9	*	2	0000	289	0.	4.0	2992.8
1	0725	90	630.	243.9	3018.1	*	1	1545	190	5.	4.2	2992.9	*	2	0005	290	0.	4.0	2992.8
1	0730	91	626.	239.6	3017.8	*	1	1550	191	5.	4.2	2992.9	*	2	0010	291	0.	4.0	2992.8
1	0735	92	623.	235.3	3017.5	*	1	1555	192	4.	4.2	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	619.	231.1	3017.2	*	1	1600	193	3.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	615.	226.8	3016.9	*	1	1605	194	3.	4.1	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	611.	222.6	3016.6	*	1	1610	195	3.	4.1	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	607.	218.4	3016.3	*	1	1615	196	2.	4.1	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	604.	214.3	3016.0	*	1	1620	197	2.	4.1	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	600.	210.1	3015.7	*	1	1625	198	2.	4.1	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	596.	206.0	3015.4	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	592.	201.9	3015.1	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
						*							*						

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
	(CFS)				
+ 959.	5.42	656.	244.	235.	235.
	(INCHES)	1.390	2.069	2.069	2.069
	(AC-FT)	326.	485.	485.	485.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
322.	5.42	240.	74.	72.	72.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3023.07	5.42	3017.55	3000.78	3000.41	3000.41

CUMULATIVE AREA = 4.39 SQ MI

WARNING --- ROUTED OUTFLOW (761.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (823.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (867.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (894.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (906.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (905.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (894.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (873.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (845.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (811.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (773.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (732.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .98

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
							*								*							
1		0000	1	0.	.0	2990.0	*	1		0820	101	587.	196.4	3014.7	*	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	*	1		0825	102	582.	192.4	3014.4	*	1		1645	202	1.	4.0	2992.8
1		0010	3	0.	.0	2990.0	*	1		0830	103	578.	188.4	3014.1	*	1		1650	203	1.	4.0	2992.8
1		0015	4	0.	.0	2990.0	*	1		0835	104	574.	184.4	3013.8	*	1		1655	204	1.	4.0	2992.8
1		0020	5	0.	.0	2990.2	*	1		0840	105	569.	180.5	3013.5	*	1		1700	205	1.	4.0	2992.8
1		0025	6	0.	.0	2990.5	*	1		0845	106	565.	176.6	3013.2	*	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2991.0	*	1		0850	107	561.	172.7	3012.9	*	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.2	2991.1	*	1		0855	108	557.	168.8	3012.6	*	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.3	2991.3	*	1		0900	109	553.	165.0	3012.3	*	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.5	2991.6	*	1		0905	110	549.	161.2	3012.0	*	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.7	2991.8	*	1		0910	111	544.	157.5	3011.7	*	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.8	2992.0	*	1		0915	112	540.	153.7	3011.4	*	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	1.0	2992.0	*	1		0920	113	536.	150.0	3011.1	*	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	1.1	2992.1	*	1		0925	114	532.	146.4	3010.9	*	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	1.3	2992.1	*	1		0930	115	528.	142.7	3010.6	*	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	1.4	2992.2	*	1		0935	116	524.	139.1	3010.3	*	1		1755	216	0.	4.0	2992.8

1	0120	17	0.	1.6	2992.2	*	1	0940	117	521.	135.5	3010.0	*	1	1800	217	0.	4.0	2992.8
1	0125	18	0.	1.9	2992.3	*	1	0945	118	516.	131.9	3009.7	*	1	1805	218	0.	4.0	2992.8
1	0130	19	0.	2.2	2992.4	*	1	0950	119	511.	128.4	3009.4	*	1	1810	219	0.	4.0	2992.8
1	0135	20	0.	2.7	2992.5	*	1	0955	120	506.	124.9	3009.1	*	1	1815	220	0.	4.0	2992.8
1	0140	21	0.	3.3	2992.6	*	1	1000	121	500.	121.4	3008.7	*	1	1820	221	0.	4.0	2992.8
1	0145	22	3.	4.1	2992.8	*	1	1005	122	494.	118.0	3008.4	*	1	1825	222	0.	4.0	2992.8
1	0150	23	21.	5.0	2993.1	*	1	1010	123	489.	114.6	3008.0	*	1	1830	223	0.	4.0	2992.8
1	0155	24	39.	5.8	2993.3	*	1	1015	124	483.	111.3	3007.7	*	1	1835	224	0.	4.0	2992.8
1	0200	25	56.	6.6	2993.5	*	1	1020	125	477.	107.9	3007.3	*	1	1840	225	0.	4.0	2992.8
1	0205	26	69.	7.2	2993.6	*	1	1025	126	472.	104.7	3007.0	*	1	1845	226	0.	4.0	2992.8
1	0210	27	80.	7.8	2993.8	*	1	1030	127	466.	101.4	3006.7	*	1	1850	227	0.	4.0	2992.8
1	0215	28	91.	8.2	2993.9	*	1	1035	128	461.	98.3	3006.3	*	1	1855	228	0.	4.0	2992.8
1	0220	29	102.	8.8	2994.0	*	1	1040	129	456.	95.1	3006.0	*	1	1900	229	0.	4.0	2992.8
1	0225	30	117.	9.5	2994.2	*	1	1045	130	450.	92.0	3005.7	*	1	1905	230	0.	4.0	2992.8
1	0230	31	135.	10.3	2994.4	*	1	1050	131	444.	88.9	3005.3	*	1	1910	231	0.	4.0	2992.8
1	0235	32	154.	11.2	2994.6	*	1	1055	132	438.	85.9	3005.0	*	1	1915	232	0.	4.0	2992.8
1	0240	33	171.	12.0	2994.8	*	1	1100	133	431.	82.9	3004.6	*	1	1920	233	0.	4.0	2992.8
1	0245	34	186.	12.8	2995.0	*	1	1105	134	423.	79.9	3004.2	*	1	1925	234	0.	4.0	2992.8
1	0250	35	192.	13.6	2995.1	*	1	1110	135	416.	77.0	3003.8	*	1	1930	235	0.	4.0	2992.8
1	0255	36	198.	14.5	2995.3	*	1	1115	136	409.	74.2	3003.5	*	1	1935	236	0.	4.0	2992.8
1	0300	37	204.	15.4	2995.4	*	1	1120	137	402.	71.4	3003.1	*	1	1940	237	0.	4.0	2992.8
1	0305	38	210.	16.4	2995.6	*	1	1125	138	394.	68.7	3002.7	*	1	1945	238	0.	4.0	2992.8
1	0310	39	217.	17.5	2995.8	*	1	1130	139	387.	66.0	3002.4	*	1	1950	239	0.	4.0	2992.8
1	0315	40	228.	19.4	2996.1	*	1	1135	140	380.	63.3	3002.0	*	1	1955	240	0.	4.0	2992.8
1	0320	41	244.	22.5	2996.6	*	1	1140	141	372.	60.7	3001.7	*	1	2000	241	0.	4.0	2992.8
1	0325	42	269.	28.2	2997.4	*	1	1145	142	365.	58.2	3001.4	*	1	2005	242	0.	4.0	2992.8
1	0330	43	304.	37.9	2998.7	*	1	1150	143	359.	55.7	3001.0	*	1	2010	243	0.	4.0	2992.8
1	0335	44	350.	52.7	3000.6	*	1	1155	144	352.	53.3	3000.7	*	1	2015	244	0.	4.0	2992.8
1	0340	45	404.	72.2	3003.2	*	1	1200	145	345.	50.9	3000.4	*	1	2020	245	0.	4.0	2992.8
1	0345	46	455.	94.6	3005.9	*	1	1205	146	338.	48.5	3000.1	*	1	2025	246	0.	4.0	2992.8
1	0350	47	494.	118.0	3008.4	*	1	1210	147	331.	46.2	2999.8	*	1	2030	247	0.	4.0	2992.8
1	0355	48	526.	141.0	3010.4	*	1	1215	148	323.	44.0	2999.5	*	1	2035	248	0.	4.0	2992.8
1	0400	49	550.	162.9	3012.1	*	1	1220	149	316.	41.8	2999.2	*	1	2040	249	0.	4.0	2992.8
1	0405	50	573.	183.5	3013.7	*	1	1225	150	309.	39.6	2998.9	*	1	2045	250	0.	4.0	2992.8
1	0410	51	593.	202.6	3015.2	*	1	1230	151	302.	37.5	2998.6	*	1	2050	251	0.	4.0	2992.8
1	0415	52	609.	219.8	3016.4	*	1	1235	152	296.	35.4	2998.4	*	1	2055	252	0.	4.0	2992.8
1	0420	53	622.	235.0	3017.4	*	1	1240	153	288.	33.4	2998.1	*	1	2100	253	0.	4.0	2992.8
1	0425	54	634.	247.9	3018.3	*	1	1245	154	281.	31.5	2997.8	*	1	2105	254	0.	4.0	2992.8
1	0430	55	643.	258.9	3019.1	*	1	1250	155	274.	29.6	2997.6	*	1	2110	255	0.	4.0	2992.8
1	0435	56	650.	268.4	3019.7	*	1	1255	156	267.	27.7	2997.3	*	1	2115	256	0.	4.0	2992.8
1	0440	57	657.	276.9	3020.2	*	1	1300	157	260.	25.9	2997.1	*	1	2120	257	0.	4.0	2992.8
1	0445	58	663.	284.6	3020.7	*	1	1305	158	252.	24.1	2996.9	*	1	2125	258	0.	4.0	2992.8
1	0450	59	668.	291.7	3021.2	*	1	1310	159	243.	22.4	2996.6	*	1	2130	259	0.	4.0	2992.8
1	0455	60	673.	298.2	3021.6	*	1	1315	160	235.	20.8	2996.3	*	1	2135	260	0.	4.0	2992.8
1	0500	61	682.	304.1	3021.9	*	1	1320	161	227.	19.2	2996.1	*	1	2140	261	0.	4.0	2992.8
1	0505	62	761.	309.3	3022.3	*	1	1325	162	218.	17.6	2995.8	*	1	2145	262	0.	4.0	2992.8
1	0510	63	823.	313.4	3022.5	*	1	1330	163	209.	16.2	2995.6	*	1	2150	263	0.	4.0	2992.8
1	0515	64	867.	316.2	3022.7	*	1	1335	164	200.	14.8	2995.3	*	1	2155	264	0.	4.0	2992.8
1	0520	65	894.	317.9	3022.8	*	1	1340	165	191.	13.4	2995.1	*	1	2200	265	0.	4.0	2992.8
1	0525	66	906.	318.7	3022.9	*	1	1345	166	174.	12.2	2994.9	*	1	2205	266	0.	4.0	2992.8
1	0530	67	905.	318.7	3022.9	*	1	1350	167	150.	11.0	2994.6	*	1	2210	267	0.	4.0	2992.8
1	0535	68	894.	317.9	3022.8	*	1	1355	168	130.	10.1	2994.3	*	1	2215	268	0.	4.0	2992.8
1	0540	69	873.	316.6	3022.7	*	1	1400	169	112.	9.2	2994.1	*	1	2220	269	0.	4.0	2992.8
1	0545	70	845.	314.8	3022.6	*	1	1405	170	97.	8.5	2993.9	*	1	2225	270	0.	4.0	2992.8
1	0550	71	811.	312.5	3022.5	*	1	1410	171	84.	7.9	2993.8	*	1	2230	271	0.	4.0	2992.8
1	0555	72	773.	310.1	3022.3	*	1	1415	172	72.	7.4	2993.7	*	1	2235	272	0.	4.0	2992.8
1	0600	73	732.	307.4	3022.2	*	1	1420	173	62.	6.9	2993.5	*	1	2240	273	0.	4.0	2992.8
1	0605	74	690.	304.7	3022.0	*	1	1425	174	54.	6.5	2993.4	*	1	2245	274	0.	4.0	2992.8
1	0610	75	675.	301.9	3021.8	*	1	1430	175	46.	6.2	2993.3	*	1	2250	275	0.	4.0	2992.8
1	0615	76	673.	298.8	3021.6	*	1	1435	176	40.	5.9	2993.3	*	1	2255	276	0.	4.0	2992.8
1	0620	77	671.	295.4	3021.4	*	1	1440	177	35.	5.6	2993.2	*	1	2300	277	0.	4.0	2992.8
1	0625	78	668.	291.9	3021.2	*	1	1445	178	30.	5.4	2993.2	*	1	2305	278	0.	4.0	2992.8
1	0630	79	665.	288.1	3020.9	*	1	1450	179	26.	5.2	2993.1	*	1	2310	279	0.	4.0	2992.8
1	0635	80	662.	284.3	3020.7	*	1	1455	180	22.	5.0	2993.1	*	1	2315	280	0.	4.0	2992.8
1	0640	81	659.	280.3	3020.4	*	1	1500	181	19.	4.9	2993.0	*	1	2320	281	0.	4.0	2992.8
1	0645	82	656.	276.2	3020.2	*	1	1505	182	17.	4.8	2993.0	*	1	2325	282	0.	4.0	2992.8
1	0650	83	653.	272.1	3019.9	*	1	1510	183	14.	4.6	2993.0	*	1	2330	283	0.	4.0	2992.8
1	0655	84	650.	267.9	3019.6	*	1	1515	184	12.	4.6	2992.9	*	1	2335	284	0.	4.0	2992.8
1	0700	85	646.	263.7	3019.4	*	1	1520	185	11.	4.5	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	643.	259.4	3019.1	*	1	1525	186	9.	4.4	2992.9	*	1	2345	286	0.	4.0	2992.8
1	0710	87	640.	255.1	3018.8	*	1	1530	187	8.	4.4	2992.9	*	1	2350	287	0.	4.0	2992.8
1	0715	88	636.	250.9	3018.5	*	1	1535	188	7.	4.3	2992.9	*	1	2355	288	0.	4.0	2992.8
1	0720	89	632.	246.6	3018.2	*	1	1540	189	6.	4.3	2992.9	*	2	0000	289	0.	4.0	2992.8
1	0725	90	629.	242.3	3017.9	*	1	1545	190	5.	4.2	2992.9	*	2	0005	290	0.	4.0	2992.8
1	0730	91	625.	238.0	3017.6	*	1	1550	191	4.	4.2	2992.9	*	2	0010	291	0.	4.0	2992.8
1	0735	92	621.	233.8	3017.3	*	1	1555	192	4.	4.2	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	617.	229.5	3017.0	*	1	1600	193	3.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	614.	225.3	3016.8	*	1	1605	194	3.	4.1	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	610.	221.1	3016.5	*	1	1610	195	2.	4.1	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	606.	216.9	3016.2	*	1	1615	196	2.	4.1	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	602.	212.8	3015.9	*	1	1620	197	2.	4.1	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	598.	208.6	3015.6	*	1	1625	198	2.	4.1	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	595.	204.5	3015.3	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	591.	200.5	3015.0	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 906.	5.42		645.	241.	232.	232.
		(INCHES)	1.366	2.037	2.037	2.037
		(AC-FT)	320.	477.	477.	477.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
319.	5.42	237.	73.	71.	71.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
3022.86	5.42	3017.39	3000.71	3000.34	3000.34

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .94

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	576.	186.8	3014.0	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	1		0825	102	572.	182.9	3013.7	1		1645	202	1.	4.0	2992.8
1		0010	3	0.	.0	2990.0	1		0830	103	568.	178.9	3013.4	1		1650	203	1.	4.0	2992.8
1		0015	4	0.	.0	2990.0	1		0835	104	564.	175.0	3013.1	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.1	1		0840	105	559.	171.2	3012.8	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.4	1		0845	106	555.	167.3	3012.5	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2991.0	1		0850	107	551.	163.5	3012.2	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.1	1		0855	108	547.	159.7	3011.9	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.2	2991.2	1		0900	109	543.	156.0	3011.6	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.4	2991.4	1		0905	110	539.	152.3	3011.3	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.5	2991.6	1		0910	111	535.	148.6	3011.0	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.6	2991.8	1		0915	112	531.	144.9	3010.7	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.7	2991.9	1		0920	113	527.	141.3	3010.5	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.8	2992.0	1		0925	114	523.	137.6	3010.2	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	1.0	2992.0	1		0930	115	519.	134.1	3009.9	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	1.1	2992.1	1		0935	116	514.	130.5	3009.6	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	1.3	2992.1	1		0940	117	509.	127.0	3009.3	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	1.5	2992.2	1		0945	118	504.	123.5	3008.9	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	1.7	2992.2	1		0950	119	498.	120.1	3008.6	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	2.1	2992.3	1		0955	120	492.	116.6	3008.2	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	2.6	2992.5	1		1000	121	486.	113.3	3007.9	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	3.3	2992.6	1		1005	122	481.	109.9	3007.5	1		1825	222	0.	4.0	2992.8
1		0150	23	4.	4.2	2992.8	1		1010	123	475.	106.7	3007.2	1		1830	223	0.	4.0	2992.8
1		0155	24	22.	5.0	2993.1	1		1015	124	470.	103.4	3006.9	1		1835	224	0.	4.0	2992.8
1		0200	25	38.	5.7	2993.2	1		1020	125	464.	100.2	3006.5	1		1840	225	0.	4.0	2992.8
1		0205	26	51.	6.4	2993.4	1		1025	126	459.	97.0	3006.2	1		1845	226	0.	4.0	2992.8
1		0210	27	62.	6.9	2993.5	1		1030	127	453.	93.9	3005.9	1		1850	227	0.	4.0	2992.8
1		0215	28	73.	7.4	2993.7	1		1035	128	447.	90.8	3005.5	1		1855	228	0.	4.0	2992.8
1		0220	29	84.	7.9	2993.8	1		1040	129	441.	87.7	3005.2	1		1900	229	0.	4.0	2992.8
1		0225	30	99.	8.6	2994.0	1		1045	130	435.	84.7	3004.8	1		1905	230	0.	4.0	2992.8
1		0230	31	116.	9.4	2994.2	1		1050	131	428.	81.7	3004.4	1		1910	231	0.	4.0	2992.8
1		0235	32	133.	10.2	2994.4	1		1055	132	421.	78.8	3004.1	1		1915	232	0.	4.0	2992.8
1		0240	33	150.	11.0	2994.6	1		1100	133	414.	75.9	3003.7	1		1920	233	0.	4.0	2992.8
1		0245	34	165.	11.7	2994.8	1		1105	134	406.	73.1	3003.3	1		1925	234	0.	4.0	2992.8
1		0250	35	180.	12.4	2994.9	1		1110	135	399.	70.3	3002.9	1		1930	235	0.	4.0	2992.8
1		0255	36	189.	13.2	2995.1	1		1115	136	391.	67.6	3002.6	1		1935	236	0.	4.0	2992.8
1		0300	37	195.	14.0	2995.2	1		1120	137	384.	64.9	3002.2	1		1940	237	0.	4.0	2992.8
1		0305	38	200.	14.8	2995.3	1		1125	138	377.	62.3	3001.9	1		1945	238	0.	4.0	2992.8
1		0310	39	207.	15.9	2995.5	1		1130	139	370.	59.7	3001.6	1		1950	239	0.	4.0	2992.8
1		0315	40	217.	17.5	2995.8	1		1135	140	363.	57.2	3001.2	1		1955	240	0.	4.0	2992.8
1		0320	41	233.	20.3	2996.3	1		1140	141	356.	54.7	3000.9	1		2000	241	0.	4.0	2992.8
1		0325	42	259.	25.5	2997.1	1		1145	142	349.	52.3	3000.6	1		2005	242	0.	4.0	2992.8
1		0330	43	292.	34.5	2998.2	1		1150	143	343.	49.9	3000.3	1		2010	243	0.	4.0	2992.8
1		0335	44	337.	48.2	3000.0	1		1155	144	335.	47.6	3000.0	1		2015	244	0.	4.0	2992.8
1		0340	45	388.	66.3	3002.4	1		1200	145	328.	45.3	2999.7	1		2020	245	0.	4.0	2992.8
1		0345	46	441.	87.3	3005.1	1		1205	146	321.	43.1	2999.4	1		2025	246	0.	4.0	2992.8
1		0350	47	479.	109.2	3007.5	1		1210	147	313.	40.9	2999.1	1		2030	247	0.	4.0	2992.8
1		0355	48	514.	130.7	3009.6	1		1215	148	307.	38.8	2998.8	1		2035	248	0.	4.0	2992.8
1		0400	49	538.	151.2	3011.2	1		1220	149	300.	36.7	2998.5	1		2040	249	0.	4.0	2992.8
1		0405	50	559.	170.5	3012.7	1		1225	150	293.	34.6	2998.3	1		2045	250	0.	4.0	2992.8
1		0410	51	578.	188.4	3014.1	1		1230	151	285.	32.6	2998.0	1		2050	251	0.	4.0	2992.8
1		0415	52	595.	204.5	3015.3	1		1235	152	278.	30.7	2997.7	1		2055	252	0.	4.0	2992.8
1		0420	53	608.	218.7	3016.3	1		1240	153	271.	28.8	2997.5	1		2100	253	0.	4.0	2992.8
1		0425	54	618.	230.8	3017.1	1		1245	154	264.	27.0	2997.3	1		2105	254	0.	4.0	2992.8
1		0430	55	628.	241.1	3017.9	1		1250	155	258.	25.2	2997.0	1		2110	255	0.	4.0	2992.8
1		0435	56	635.	249.9	3018.5	1		1255	156	249.	23.4	2996.7	1		2115	256	0.	4.0	2992.8
1		0440	57	642.	257.8	3019.0	1		1300	157	240.	21.7	2996.5	1		2120	257	0.	4.0	2992.8
1		0445	58	647.	265.0	3019.5	1		1305	158	232.	20.1	2996.2	1		2125	258	0.	4.0	2992.8
1		0450	59	653.	271.5	3019.9	1		1310	159	223.	18.6	2996.0	1		2130	259	0.	4.0	2992.8
1		0455	60	657.	277.5	3020.3	1		1315	160	214.	17.0	2995.7	1		2135	260	0.	4.0	2992.8
1		0500	61	662.	283.1	3020.6	1		1320	161	205.	15.6	2995.5	1		2140	261	0.	4.0	2992.8
1		0505	62	665.	288.1	3020.9	1		1325	162	196.	14.2	2995.3	1		2145	262	0.	4.0	2992.8
1		0510	63	669.	292.6	3021.2	1		1330	163	187.	12.9	2995.0	1		2150	263	0.	4.0	2992.8
1		0515	64	671.	296.2	3021.4	1		1335	164	164.	11.7	2994.7	1		2155	264	0.	4.0	2992.8
1		0520	65	673.	299.0	3021.6	1		1340	165	142.	10.6	2994.5	1		2200	265	0.	4.0	2992.8
1		0525	66	675.	301.0	3021.7	1		1345	166	122.	9.7	2994.2	1		2205	266	0.	4.0	2992.8
1		0530	67	676.	302.2	3021.8	1		1350	167	106.	8.9	2994.1	1		2210	267	0.	4.0	2992.8
1		0535	68	676.	302.7	3021.9	1		1355	168	91.	8.3	2993.9	1		2215	268	0.	4.0	2992.8
1		0540	69	676.	302.6	3021.8	1		1400	169	79.	7.7	2993.7	1		2220	269	0.	4.0	2992.8
1		0545	70	675.	301.8	3021.8	1		1405	170	68.	7.2	2993.6	1		2225	270	0.	4.0	2992.8
1		0550	71	674.	300.5	3021.7	1		1410	171	59.	6.7	2993.5	1		2230	271	0.	4.0	2992.8
1		0555	72	673.	298.7	3021.6	1		1415	172	51.	6.4	2993.4	1		2235	272	0.	4.0	2992.8
1		0600	73	671.	296.5	3021.5	1		1420	173	44.	6.0	2993.3	1		2240	273	0.	4.0	2992.8
1		0605	74	670.	293.9	3021.3	1		1425	174	38.	5.8	2993.2	1		2245	274	0.	4.0	2992.8
1		0610	75	668.	291.1	3021.1	1		1430	175	33.	5.5	2993.2	1		2250	275	0.	4.0	2992.8
1		0615	76	665.	287.9	3020.9	1		1435	176	28.	5.3	2993.1	1		2255	276	0.	4.0	2992.8
1		0620	77	663.	284.6	3020.7	1		1440	177	24.	5.1	2993.1	1		2300	277	0.	4.0	2992.8
1		0625	78	660.	281.0	3020.5	1		1445	178	21.	5.0	2993.0	1		2305	278	0.	4.0	2992.8
1		0630	79	657.	277.3	3020.3	1		1450	179	18.	4.8	2993.0	1		2310	279	0.	4.0	2992.8
1		0635	80	654.	273.5	3020.0	1		1455	180	16.	4.7	2993.0	1		2315	280	0.	4.0	2992.8
1		0640	81	651.	269.6	3019.8	1		1500	181	14.	4.6	2993.0	1		2320	281	0.	4.0	2992.8

1	0645	82	648.	265.5	3019.5	*	1	1505	182	12.	4.5	2992.9	*	1	2325	282	0.	4.0	2992.8
1	0650	83	645.	261.4	3019.2	*	1	1510	183	10.	4.4	2992.9	*	1	2330	283	0.	4.0	2992.8
1	0655	84	641.	257.3	3018.9	*	1	1515	184	9.	4.4	2992.9	*	1	2335	284	0.	4.0	2992.8
1	0700	85	638.	253.1	3018.7	*	1	1520	185	8.	4.3	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	634.	248.9	3018.4	*	1	1525	186	6.	4.3	2992.9	*	1	2345	286	0.	4.0	2992.8
1	0710	87	631.	244.7	3018.1	*	1	1530	187	6.	4.2	2992.9	*	1	2350	287	0.	4.0	2992.8
1	0715	88	627.	240.4	3017.8	*	1	1535	188	5.	4.2	2992.9	*	1	2355	288	0.	4.0	2992.8
1	0720	89	623.	236.2	3017.5	*	1	1540	189	4.	4.2	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	620.	232.0	3017.2	*	1	1545	190	4.	4.1	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	616.	227.8	3016.9	*	1	1550	191	3.	4.1	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	612.	223.6	3016.6	*	1	1555	192	3.	4.1	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	608.	219.4	3016.3	*	1	1600	193	2.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	604.	215.3	3016.0	*	1	1605	194	2.	4.1	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	601.	211.1	3015.8	*	1	1610	195	2.	4.1	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	597.	207.0	3015.5	*	1	1615	196	1.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	593.	202.9	3015.2	*	1	1620	197	1.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	589.	198.8	3014.9	*	1	1625	198	1.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	585.	194.8	3014.6	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	581.	190.8	3014.3	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR	
+ (CFS)	(HR)					
		(CFS)				
+ 676.	5.58	608.	226.	218.	218.	
		(INCHES)	1.288	1.912	1.912	1.912
		(AC-FT)	302.	448.	448.	448.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
303.	5.58	225.	69.	67.	67.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3021.86	5.58	3016.55	3000.33	2999.98	2999.98

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .93

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	571.	181.8	3013.6	*	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	*	1		0825	102	567.	177.8	3013.3	*	1		1645	202	1.	4.0	2992.8
1		0010	3	0.	.0	2990.0	*	1		0830	103	562.	174.0	3013.0	*	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.0	*	1		0835	104	558.	170.1	3012.7	*	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.1	*	1		0840	105	554.	166.3	3012.4	*	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.4	*	1		0845	106	550.	162.5	3012.1	*	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2990.9	*	1		0850	107	546.	158.7	3011.8	*	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.1	*	1		0855	108	542.	155.0	3011.5	*	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.2	2991.2	*	1		0900	109	538.	151.2	3011.2	*	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.3	2991.4	*	1		0905	110	534.	147.5	3011.0	*	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.5	2991.5	*	1		0910	111	530.	143.9	3010.7	*	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.6	2991.7	*	1		0915	112	526.	140.2	3010.4	*	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.7	2991.9	*	1		0920	113	522.	136.6	3010.1	*	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.8	2992.0	*	1		0925	114	517.	133.1	3009.8	*	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	.9	2992.0	*	1		0930	115	512.	129.5	3009.5	*	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	1.0	2992.1	*	1		0935	116	507.	126.0	3009.2	*	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	1.2	2992.1	*	1		0940	117	502.	122.5	3008.8	*	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	1.4	2992.1	*	1		0945	118	496.	119.1	3008.5	*	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	1.6	2992.2	*	1		0950	119	490.	115.7	3008.1	*	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	2.0	2992.3	*	1		0955	120	485.	112.3	3007.8	*	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	2.5	2992.4	*	1		1000	121	479.	109.0	3007.4	*	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	3.2	2992.6	*	1		1005	122	474.	105.7	3007.1	*	1		1825	222	0.	4.0	2992.8
1		0150	23	0.	4.0	2992.8	*	1		1010	123	468.	102.5	3006.8	*	1		1830	223	0.	4.0	2992.8
1		0155	24	17.	4.8	2993.0	*	1		1015	124	463.	99.3	3006.4	*	1		1835	224	0.	4.0	2992.8
1		0200	25	33.	5.5	2993.2	*	1		1020	125	457.	96.1	3006.1	*	1		1840	225	0.	4.0	2992.8
1		0205	26	47.	6.2	2993.4	*	1		1025	126	452.	93.0	3005.8	*	1		1845	226	0.	4.0	2992.8
1		0210	27	58.	6.7	2993.5	*	1		1030	127	446.	89.9	3005.4	*	1		1850	227	0.	4.0	2992.8
1		0215	28	68.	7.2	2993.6	*	1		1035	128	440.	86.9	3005.1	*	1		1855	228	0.	4.0	2992.8
1		0220	29	80.	7.7	2993.7	*	1		1040	129	433.	83.8	3004.7	*	1		1900	229	0.	4.0	2992.8
1		0225	30	94.	8.4	2993.9	*	1		1045	130	426.	80.9	3004.3	*	1		1905	230	0.	4.0	2992.8
1		0230	31	111.	9.2	2994.1	*	1		1050	131	419.	78.0	3004.0	*	1		1910	231	0.	4.0	2992.8
1		0235	32	128.	10.0	2994.3	*	1		1055	132	412.	75.1	3003.6	*	1		1915	232	0.	4.0	2992.8
1		0240	33	145.	10.8	2994.5	*	1		1100	133	404.	72.3	3003.2	*	1		1920	233	0.	4.0	2992.8
1		0245	34	160.	11.5	2994.7	*	1		1105	134	397.	69.6	3002.8	*	1		1925	234	0.	4.0	2992.8
1		0250	35	175.	12.2	2994.9	*	1		1110	135	389.	66.8	3002.5	*	1		1930	235	0.	4.0	2992.8
1		0255	36	187.	12.9	2995.0	*	1		1115	136	382.	64.2	3002.1	*	1		1935	236	0.	4.0	2992.8
1		0300	37	192.	13.7	2995.2	*	1		1120	137	375.	61.6	3001.8	*	1		1940	237	0.	4.0	2992.8
1		0305	38	198.	14.5	2995.3	*	1		1125	138	368.	59.0	3001.5	*	1		1945	238	0.	4.0	2992.8
1		0310	39	204.	15.5	2995.5	*	1		1130	139	361.	56.5	3001.1	*	1		1950	239	0.	4.0	2992.8
1		0315	40	214.	17.0	2995.7	*	1		1135	140	354.	54.1	3000.8	*	1		1955	240	0.	4.0	2992.8
1		0320	41	230.	19.8	2996.2	*	1		1140	141	347.	51.6	3000.5	*	1		2000	241	0.	4.0	2992.8
1		0325	42	256.	24.9	2997.0	*	1		1145	142	341.	49.3	3000.2	*	1		2005	242	0.	4.0	2992.8
1		0330	43	289.	33.6	2998.1	*	1		1150	143	333.	47.0	2999.9	*	1		2010	243	0.	4.0	2992.8
1		0335	44	333.	47.0	2999.9	*	1		1155	144	326.	44.7	2999.6	*	1		2015	244	0.	4.0	2992.8
1		0340	45	384.	64.8	3002.2	*	1		1200	145	319.	42.5	2999.3	*	1		2020	245	0.	4.0	2992.8
1		0345	46	437.	85.5	3004.9	*	1		1205	146	312.	40.3	2999.0	*	1		2025	246	0.	4.0	2992.8
1		0350	47	476.	107.0	3007.2	*	1		1210	147	305.	38.2	2998.7	*	1		2030	247	0.	4.0	2992.8

1	0355	48	510.	128.1	3009.4	*	1	1215	148	298.	36.1	2998.5	*	1	2035	248	0.	4.0	2992.8
1	0400	49	534.	148.3	3011.0	*	1	1220	149	291.	34.1	2998.2	*	1	2040	249	0.	4.0	2992.8
1	0405	50	555.	167.2	3012.5	*	1	1225	150	283.	32.1	2997.9	*	1	2045	250	0.	4.0	2992.8
1	0410	51	574.	184.8	3013.8	*	1	1230	151	276.	30.2	2997.7	*	1	2050	251	0.	4.0	2992.8
1	0415	52	591.	200.7	3015.0	*	1	1235	152	269.	28.3	2997.4	*	1	2055	252	0.	4.0	2992.8
1	0420	53	604.	214.6	3016.0	*	1	1240	153	262.	26.5	2997.2	*	1	2100	253	0.	4.0	2992.8
1	0425	54	615.	226.5	3016.8	*	1	1245	154	255.	24.7	2996.9	*	1	2105	254	0.	4.0	2992.8
1	0430	55	624.	236.6	3017.5	*	1	1250	155	246.	23.0	2996.7	*	1	2110	255	0.	4.0	2992.8
1	0435	56	631.	245.3	3018.1	*	1	1255	156	238.	21.3	2996.4	*	1	2115	256	0.	4.0	2992.8
1	0440	57	638.	253.0	3018.7	*	1	1300	157	229.	19.7	2996.1	*	1	2120	257	0.	4.0	2992.8
1	0445	58	644.	260.1	3019.1	*	1	1305	158	221.	18.1	2995.9	*	1	2125	258	0.	4.0	2992.8
1	0450	59	649.	266.5	3019.6	*	1	1310	159	212.	16.6	2995.7	*	1	2130	259	0.	4.0	2992.8
1	0455	60	653.	272.4	3019.9	*	1	1315	160	203.	15.2	2995.4	*	1	2135	260	0.	4.0	2992.8
1	0500	61	657.	277.8	3020.3	*	1	1320	161	194.	13.8	2995.2	*	1	2140	261	0.	4.0	2992.8
1	0505	62	661.	282.8	3020.6	*	1	1325	162	183.	12.6	2995.0	*	1	2145	262	0.	4.0	2992.8
1	0510	63	665.	287.1	3020.9	*	1	1330	163	158.	11.4	2994.7	*	1	2150	263	0.	4.0	2992.8
1	0515	64	667.	290.6	3021.1	*	1	1335	164	136.	10.4	2994.4	*	1	2155	264	0.	4.0	2992.8
1	0520	65	669.	293.4	3021.3	*	1	1340	165	118.	9.5	2994.2	*	1	2200	265	0.	4.0	2992.8
1	0525	66	671.	295.3	3021.4	*	1	1345	166	101.	8.7	2994.0	*	1	2205	266	0.	4.0	2992.8
1	0530	67	671.	296.5	3021.5	*	1	1350	167	88.	8.1	2993.8	*	1	2210	267	0.	4.0	2992.8
1	0535	68	672.	296.9	3021.5	*	1	1355	168	76.	7.5	2993.7	*	1	2215	268	0.	4.0	2992.8
1	0540	69	672.	296.8	3021.5	*	1	1400	169	65.	7.0	2993.6	*	1	2220	269	0.	4.0	2992.8
1	0545	70	671.	296.0	3021.4	*	1	1405	170	56.	6.6	2993.5	*	1	2225	270	0.	4.0	2992.8
1	0550	71	670.	294.7	3021.4	*	1	1410	171	49.	6.3	2993.4	*	1	2230	271	0.	4.0	2992.8
1	0555	72	669.	292.9	3021.2	*	1	1415	172	42.	5.9	2993.3	*	1	2235	272	0.	4.0	2992.8
1	0600	73	667.	290.7	3021.1	*	1	1420	173	36.	5.7	2993.2	*	1	2240	273	0.	4.0	2992.8
1	0605	74	665.	288.1	3020.9	*	1	1425	174	31.	5.4	2993.2	*	1	2245	274	0.	4.0	2992.8
1	0610	75	663.	285.3	3020.8	*	1	1430	175	27.	5.2	2993.1	*	1	2250	275	0.	4.0	2992.8
1	0615	76	661.	282.1	3020.6	*	1	1435	176	23.	5.1	2993.1	*	1	2255	276	0.	4.0	2992.8
1	0620	77	658.	278.8	3020.3	*	1	1440	177	20.	4.9	2993.0	*	1	2300	277	0.	4.0	2992.8
1	0625	78	656.	275.3	3020.1	*	1	1445	178	17.	4.8	2993.0	*	1	2305	278	0.	4.0	2992.8
1	0630	79	653.	271.6	3019.9	*	1	1450	179	15.	4.7	2993.0	*	1	2310	279	0.	4.0	2992.8
1	0635	80	650.	267.8	3019.6	*	1	1455	180	13.	4.6	2993.0	*	1	2315	280	0.	4.0	2992.8
1	0640	81	647.	263.9	3019.4	*	1	1500	181	11.	4.5	2992.9	*	1	2320	281	0.	4.0	2992.8
1	0645	82	643.	259.9	3019.1	*	1	1505	182	10.	4.4	2992.9	*	1	2325	282	0.	4.0	2992.8
1	0650	83	640.	255.8	3018.8	*	1	1510	183	8.	4.4	2992.9	*	1	2330	283	0.	4.0	2992.8
1	0655	84	637.	251.7	3018.6	*	1	1515	184	7.	4.3	2992.9	*	1	2335	284	0.	4.0	2992.8
1	0700	85	633.	247.5	3018.3	*	1	1520	185	6.	4.3	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	630.	243.3	3018.0	*	1	1525	186	5.	4.2	2992.9	*	1	2345	286	0.	4.0	2992.8
1	0710	87	626.	239.1	3017.7	*	1	1530	187	5.	4.2	2992.9	*	1	2350	287	0.	4.0	2992.8
1	0715	88	622.	234.9	3017.4	*	1	1535	188	4.	4.2	2992.8	*	1	2355	288	0.	4.0	2992.8
1	0720	89	618.	230.7	3017.1	*	1	1540	189	3.	4.1	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	615.	226.6	3016.8	*	1	1545	190	3.	4.1	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	611.	222.4	3016.5	*	1	1550	191	3.	4.1	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	607.	218.2	3016.3	*	1	1555	192	2.	4.1	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	603.	214.1	3016.0	*	1	1600	193	2.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	600.	209.9	3015.7	*	1	1605	194	2.	4.1	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	596.	205.8	3015.4	*	1	1610	195	1.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	592.	201.8	3015.1	*	1	1615	196	1.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	588.	197.7	3014.8	*	1	1620	197	1.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	584.	193.7	3014.5	*	1	1625	198	1.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	579.	189.7	3014.2	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	575.	185.7	3013.9	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 672.	5.58	604.	222.	214.	214.
		(INCHES) 1.278	1.881	1.881	1.881
		(AC-FT) 299.	441.	441.	441.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
297.	5.58	220.	67.	65.	65.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3021.50	5.58	3016.19	3000.17	2999.82	2999.82

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .92

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	565.	176.8	3013.2	*	1		1640	201	0.	4.0	2992.8
1		0005	2	0.	.0	2990.0	*	1		0825	102	561.	172.9	3012.9	*	1		1645	202	0.	4.0	2992.8
1		0010	3	0.	.0	2990.0	*	1		0830	103	557.	169.1	3012.6	*	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.0	*	1		0835	104	553.	165.3	3012.3	*	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.1	*	1		0840	105	549.	161.5	3012.0	*	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.4	*	1		0845	106	545.	157.7	3011.7	*	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2990.9	*	1		0850	107	541.	154.0	3011.4	*	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.1	*	1		0855	108	537.	150.3	3011.2	*	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.2	2991.2	*	1		0900	109	533.	146.6	3010.9	*	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.3	2991.4	*	1		0905	110	529.	142.9	3010.6	*	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.4	2991.5	*	1		0910	111	525.	139.3	3010.3	*	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.5	2991.7	*	1		0915	112	521.	135.7	3010.0	*	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.6	2991.8	*	1		0920	113	516.	132.1	3009.7	*	1		1740	213	0.	4.0	2992.8

1	0105	14	0.	.7	2991.9	*	1	0925	114	511.	128.6	3009.4	*	1	1745	214	0.	4.0	2992.8
1	0110	15	0.	.8	2992.0	*	1	0930	115	506.	125.1	3009.1	*	1	1750	215	0.	4.0	2992.8
1	0115	16	0.	.9	2992.0	*	1	0935	116	500.	121.6	3008.7	*	1	1755	216	0.	4.0	2992.8
1	0120	17	0.	1.1	2992.1	*	1	0940	117	495.	118.2	3008.4	*	1	1800	217	0.	4.0	2992.8
1	0125	18	0.	1.3	2992.1	*	1	0945	118	489.	114.8	3008.0	*	1	1805	218	0.	4.0	2992.8
1	0130	19	0.	1.5	2992.2	*	1	0950	119	483.	111.5	3007.7	*	1	1810	219	0.	4.0	2992.8
1	0135	20	0.	1.9	2992.3	*	1	0955	120	478.	108.2	3007.3	*	1	1815	220	0.	4.0	2992.8
1	0140	21	0.	2.3	2992.4	*	1	1000	121	472.	104.9	3007.0	*	1	1820	221	0.	4.0	2992.8
1	0145	22	0.	3.0	2992.5	*	1	1005	122	467.	101.6	3006.7	*	1	1825	222	0.	4.0	2992.8
1	0150	23	0.	3.8	2992.7	*	1	1010	123	461.	98.4	3006.4	*	1	1830	223	0.	4.0	2992.8
1	0155	24	13.	4.6	2992.9	*	1	1015	124	456.	95.3	3006.0	*	1	1835	224	0.	4.0	2992.8
1	0200	25	29.	5.3	2993.1	*	1	1020	125	450.	92.2	3005.7	*	1	1840	225	0.	4.0	2992.8
1	0205	26	42.	6.0	2993.3	*	1	1025	126	444.	89.1	3005.3	*	1	1845	226	0.	4.0	2992.8
1	0210	27	53.	6.5	2993.4	*	1	1030	127	438.	86.1	3005.0	*	1	1850	227	0.	4.0	2992.8
1	0215	28	64.	7.0	2993.6	*	1	1035	128	431.	83.1	3004.6	*	1	1855	228	0.	4.0	2992.8
1	0220	29	75.	7.5	2993.7	*	1	1040	129	424.	80.1	3004.2	*	1	1900	229	0.	4.0	2992.8
1	0225	30	89.	8.2	2993.9	*	1	1045	130	417.	77.2	3003.9	*	1	1905	230	0.	4.0	2992.8
1	0230	31	106.	9.0	2994.1	*	1	1050	131	410.	74.4	3003.5	*	1	1910	231	0.	4.0	2992.8
1	0235	32	123.	9.8	2994.3	*	1	1055	132	402.	71.6	3003.1	*	1	1915	232	0.	4.0	2992.8
1	0240	33	139.	10.5	2994.4	*	1	1100	133	395.	68.8	3002.8	*	1	1920	233	0.	4.0	2992.8
1	0245	34	154.	11.2	2994.6	*	1	1105	134	387.	66.1	3002.4	*	1	1925	234	0.	4.0	2992.8
1	0250	35	169.	11.9	2994.8	*	1	1110	135	380.	63.5	3002.1	*	1	1930	235	0.	4.0	2992.8
1	0255	36	184.	12.6	2995.0	*	1	1115	136	373.	60.9	3001.7	*	1	1935	236	0.	4.0	2992.8
1	0300	37	190.	13.3	2995.1	*	1	1120	137	366.	58.4	3001.4	*	1	1940	237	0.	4.0	2992.8
1	0305	38	195.	14.1	2995.2	*	1	1125	138	359.	55.9	3001.0	*	1	1945	238	0.	4.0	2992.8
1	0310	39	202.	15.1	2995.4	*	1	1130	139	352.	53.4	3000.7	*	1	1950	239	0.	4.0	2992.8
1	0315	40	211.	16.6	2995.6	*	1	1135	140	346.	51.0	3000.4	*	1	1955	240	0.	4.0	2992.8
1	0320	41	227.	19.3	2996.1	*	1	1140	141	339.	48.7	3000.1	*	1	2000	241	0.	4.0	2992.8
1	0325	42	253.	24.3	2996.9	*	1	1145	142	331.	46.4	2999.8	*	1	2005	242	0.	4.0	2992.8
1	0330	43	286.	32.8	2998.0	*	1	1150	143	324.	44.1	2999.5	*	1	2010	243	0.	4.0	2992.8
1	0335	44	330.	46.0	2999.7	*	1	1155	144	317.	41.9	2999.2	*	1	2015	244	0.	4.0	2992.8
1	0340	45	380.	63.5	3002.0	*	1	1200	145	310.	39.7	2998.9	*	1	2020	245	0.	4.0	2992.8
1	0345	46	433.	83.7	3004.7	*	1	1205	146	303.	37.6	2998.7	*	1	2025	246	0.	4.0	2992.8
1	0350	47	472.	104.9	3007.0	*	1	1210	147	296.	35.6	2998.4	*	1	2030	247	0.	4.0	2992.8
1	0355	48	507.	125.7	3009.1	*	1	1215	148	289.	33.5	2998.1	*	1	2035	248	0.	4.0	2992.8
1	0400	49	531.	145.5	3010.8	*	1	1220	149	282.	31.6	2997.9	*	1	2040	249	0.	4.0	2992.8
1	0405	50	552.	164.1	3012.2	*	1	1225	150	274.	29.7	2997.6	*	1	2045	250	0.	4.0	2992.8
1	0410	51	570.	181.4	3013.5	*	1	1230	151	267.	27.8	2997.4	*	1	2050	251	0.	4.0	2992.8
1	0415	52	587.	197.0	3014.7	*	1	1235	152	261.	26.0	2997.1	*	1	2055	252	0.	4.0	2992.8
1	0420	53	600.	210.6	3015.7	*	1	1240	153	253.	24.2	2996.9	*	1	2100	253	0.	4.0	2992.8
1	0425	54	611.	222.3	3016.5	*	1	1245	154	244.	22.5	2996.6	*	1	2105	254	0.	4.0	2992.8
1	0430	55	620.	232.2	3017.2	*	1	1250	155	236.	20.9	2996.3	*	1	2110	255	0.	4.0	2992.8
1	0435	56	627.	240.8	3017.8	*	1	1255	156	227.	19.3	2996.1	*	1	2115	256	0.	4.0	2992.8
1	0440	57	634.	248.4	3018.4	*	1	1300	157	218.	17.7	2995.8	*	1	2120	257	0.	4.0	2992.8
1	0445	58	640.	255.3	3018.8	*	1	1305	158	209.	16.3	2995.6	*	1	2125	258	0.	4.0	2992.8
1	0450	59	645.	261.6	3019.2	*	1	1310	159	200.	14.8	2995.4	*	1	2130	259	0.	4.0	2992.8
1	0455	60	649.	267.3	3019.6	*	1	1315	160	191.	13.5	2995.1	*	1	2135	260	0.	4.0	2992.8
1	0500	61	654.	272.7	3020.0	*	1	1320	161	176.	12.2	2994.9	*	1	2140	261	0.	4.0	2992.8
1	0505	62	657.	277.5	3020.3	*	1	1325	162	152.	11.1	2994.6	*	1	2145	262	0.	4.0	2992.8
1	0510	63	660.	281.7	3020.5	*	1	1330	163	131.	10.1	2994.4	*	1	2150	263	0.	4.0	2992.8
1	0515	64	663.	285.2	3020.8	*	1	1335	164	113.	9.3	2994.1	*	1	2155	264	0.	4.0	2992.8
1	0520	65	665.	287.9	3020.9	*	1	1340	165	98.	8.6	2994.0	*	1	2200	265	0.	4.0	2992.8
1	0525	66	667.	289.7	3021.0	*	1	1345	166	84.	7.9	2993.8	*	1	2205	266	0.	4.0	2992.8
1	0530	67	667.	290.9	3021.1	*	1	1350	167	73.	7.4	2993.7	*	1	2210	267	0.	4.0	2992.8
1	0535	68	668.	291.3	3021.1	*	1	1355	168	63.	6.9	2993.5	*	1	2215	268	0.	4.0	2992.8
1	0540	69	668.	291.1	3021.1	*	1	1400	169	54.	6.5	2993.4	*	1	2220	269	0.	4.0	2992.8
1	0545	70	667.	290.3	3021.1	*	1	1405	170	47.	6.2	2993.4	*	1	2225	270	0.	4.0	2992.8
1	0550	71	666.	289.0	3021.0	*	1	1410	171	40.	5.9	2993.3	*	1	2230	271	0.	4.0	2992.8
1	0555	72	665.	287.1	3020.9	*	1	1415	172	35.	5.6	2993.2	*	1	2235	272	0.	4.0	2992.8
1	0600	73	663.	284.9	3020.7	*	1	1420	173	30.	5.4	2993.2	*	1	2240	273	0.	4.0	2992.8
1	0605	74	661.	282.4	3020.6	*	1	1425	174	26.	5.2	2993.1	*	1	2245	274	0.	4.0	2992.8
1	0610	75	659.	279.5	3020.4	*	1	1430	175	22.	5.0	2993.1	*	1	2250	275	0.	4.0	2992.8
1	0615	76	656.	276.4	3020.2	*	1	1435	176	19.	4.9	2993.0	*	1	2255	276	0.	4.0	2992.8
1	0620	77	654.	273.1	3020.0	*	1	1440	177	17.	4.8	2993.0	*	1	2300	277	0.	4.0	2992.8
1	0625	78	651.	269.6	3019.8	*	1	1445	178	14.	4.7	2993.0	*	1	2305	278	0.	4.0	2992.8
1	0630	79	648.	265.9	3019.5	*	1	1450	179	12.	4.6	2992.9	*	1	2310	279	0.	4.0	2992.8
1	0635	80	645.	262.1	3019.3	*	1	1455	180	11.	4.5	2992.9	*	1	2315	280	0.	4.0	2992.8
1	0640	81	642.	258.3	3019.0	*	1	1500	181	9.	4.4	2992.9	*	1	2320	281	0.	4.0	2992.8
1	0645	82	639.	254.3	3018.7	*	1	1505	182	8.	4.4	2992.9	*	1	2325	282	0.	4.0	2992.8
1	0650	83	635.	250.2	3018.5	*	1	1510	183	7.	4.3	2992.9	*	1	2330	283	0.	4.0	2992.8
1	0655	84	632.	246.2	3018.2	*	1	1515	184	6.	4.3	2992.9	*	1	2335	284	0.	4.0	2992.8
1	0700	85	629.	242.0	3017.9	*	1	1520	185	5.	4.2	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	625.	237.9	3017.6	*	1	1525	186	4.	4.2	2992.9	*	1	2345	286	0.	4.0	2992.8
1	0710	87	621.	233.7	3017.3	*	1	1530	187	4.	4.2	2992.8	*	1	2350	287	0.	4.0	2992.8
1	0715	88	617.	229.5	3017.1	*	1	1535	188	3.	4.1	2992.8	*	1	2355	288	0.	4.0	2992.8
1	0720	89	614.	225.4	3016.8	*	1	1540	189	3.	4.1	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	610.	221.2	3016.5	*	1	1545	190	2.	4.1	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	606.	217.1	3016.2	*	1	1550	191	2.	4.1	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	602.	213.0	3015.9	*	1	1555	192	2.	4.1	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	599.	208.8	3015.6	*	1	1600	193	2.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	595.	204.7	3015.3	*	1	1605	194	1.	4.0	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	591.	200.7	3015.0	*	1	1610	195	1.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	587.	196.6	3014.7	*	1	1615	196	1.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	583.	192.6	3014.4	*	1	1620	197	1.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	578.	188.6	3014.1	*	1	1625	198	1.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	574.	184.7	3013.8	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	570.	180.7	3013.5	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 668.	5.58		599.	218.	210.	210.
		(INCHES)	1.268	1.850	1.850	1.850
		(AC-FT)	297.	433.	433.	433.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE

+ (AC-FT)	(HR)	6-HR	24-HR	72-HR	24.92-HR
291.	5.58	215.	66.	63.	63.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3021.14	5.58	3015.84	3000.00	2999.66	2999.66

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	560.	171.9	3012.8	1		1640	201	0.	4.0	2992.8
1		0005	2	0.	.0	2990.0	1		0825	102	556.	168.0	3012.5	1		1645	202	0.	4.0	2992.8
1		0010	3	0.	.0	2990.0	1		0830	103	552.	164.2	3012.2	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.0	1		0835	104	548.	160.4	3011.9	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.1	1		0840	105	544.	156.7	3011.7	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.3	1		0845	106	539.	152.9	3011.4	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2990.9	1		0850	107	535.	149.2	3011.1	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.1	1		0855	108	531.	145.6	3010.8	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.2	2991.2	1		0900	109	528.	141.9	3010.5	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.3	2991.3	1		0905	110	524.	138.3	3010.2	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.4	2991.5	1		0910	111	520.	134.7	3010.0	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.5	2991.6	1		0915	112	515.	131.1	3009.6	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.6	2991.7	1		0920	113	510.	127.6	3009.3	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.7	2991.8	1		0925	114	505.	124.1	3009.0	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	.8	2991.9	1		0930	115	499.	120.7	3008.6	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	.9	2992.0	1		0935	116	493.	117.3	3008.3	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	1.0	2992.0	1		0940	117	487.	113.9	3007.9	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	1.2	2992.1	1		0945	118	482.	110.5	3007.6	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	1.4	2992.2	1		0950	119	476.	107.2	3007.3	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	1.7	2992.2	1		0955	120	471.	104.0	3006.9	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	2.2	2992.4	1		1000	121	465.	100.8	3006.6	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	2.8	2992.5	1		1005	122	460.	97.6	3006.3	1		1825	222	0.	4.0	2992.8
1		0150	23	0.	3.6	2992.7	1		1010	123	454.	94.4	3005.9	1		1830	223	0.	4.0	2992.8
1		0155	24	8.	4.4	2992.9	1		1015	124	448.	91.3	3005.6	1		1835	224	0.	4.0	2992.8
1		0200	25	24.	5.1	2993.1	1		1020	125	443.	88.2	3005.3	1		1840	225	0.	4.0	2992.8
1		0205	26	38.	5.7	2993.2	1		1025	126	436.	85.2	3004.9	1		1845	226	0.	4.0	2992.8
1		0210	27	49.	6.3	2993.4	1		1030	127	429.	82.2	3004.5	1		1850	227	0.	4.0	2992.8
1		0215	28	59.	6.8	2993.5	1		1035	128	422.	79.3	3004.1	1		1855	228	0.	4.0	2992.8
1		0220	29	71.	7.3	2993.6	1		1040	129	415.	76.4	3003.7	1		1900	229	0.	4.0	2992.8
1		0225	30	85.	8.0	2993.8	1		1045	130	408.	73.6	3003.4	1		1905	230	0.	4.0	2992.8
1		0230	31	101.	8.7	2994.0	1		1050	131	400.	70.8	3003.0	1		1910	231	0.	4.0	2992.8
1		0235	32	118.	9.5	2994.2	1		1055	132	393.	68.1	3002.7	1		1915	232	0.	4.0	2992.8
1		0240	33	134.	10.3	2994.4	1		1100	133	385.	65.4	3002.3	1		1920	233	0.	4.0	2992.8
1		0245	34	149.	11.0	2994.6	1		1105	134	378.	62.8	3002.0	1		1925	234	0.	4.0	2992.8
1		0250	35	163.	11.6	2994.7	1		1110	135	371.	60.2	3001.6	1		1930	235	0.	4.0	2992.8
1		0255	36	178.	12.4	2994.9	1		1115	136	364.	57.7	3001.3	1		1935	236	0.	4.0	2992.8
1		0300	37	188.	13.1	2995.1	1		1120	137	357.	55.2	3001.0	1		1940	237	0.	4.0	2992.8
1		0305	38	193.	13.8	2995.2	1		1125	138	350.	52.7	3000.6	1		1945	238	0.	4.0	2992.8
1		0310	39	199.	14.7	2995.3	1		1130	139	344.	50.4	3000.3	1		1950	239	0.	4.0	2992.8
1		0315	40	209.	16.2	2995.6	1		1135	140	337.	48.0	3000.0	1		1955	240	0.	4.0	2992.8
1		0320	41	225.	18.8	2996.0	1		1140	141	329.	45.7	2999.7	1		2000	241	0.	4.0	2992.8
1		0325	42	250.	23.7	2996.8	1		1145	142	322.	43.5	2999.4	1		2005	242	0.	4.0	2992.8
1		0330	43	283.	32.0	2997.9	1		1150	143	315.	41.3	2999.1	1		2010	243	0.	4.0	2992.8
1		0335	44	326.	44.9	2999.6	1		1155	144	308.	39.1	2998.9	1		2015	244	0.	4.0	2992.8
1		0340	45	376.	62.1	3001.9	1		1200	145	301.	37.0	2998.6	1		2020	245	0.	4.0	2992.8
1		0345	46	428.	81.9	3004.5	1		1205	146	294.	35.0	2998.3	1		2025	246	0.	4.0	2992.8
1		0350	47	469.	102.7	3006.8	1		1210	147	287.	33.0	2998.0	1		2030	247	0.	4.0	2992.8
1		0355	48	503.	123.2	3008.9	1		1215	148	280.	31.0	2997.8	1		2035	248	0.	4.0	2992.8
1		0400	49	528.	142.6	3010.6	1		1220	149	272.	29.1	2997.5	1		2040	249	0.	4.0	2992.8
1		0405	50	548.	160.9	3012.0	1		1225	150	265.	27.3	2997.3	1		2045	250	0.	4.0	2992.8
1		0410	51	567.	177.9	3013.3	1		1230	151	259.	25.5	2997.1	1		2050	251	0.	4.0	2992.8
1		0415	52	583.	193.2	3014.5	1		1235	152	250.	23.7	2996.8	1		2055	252	0.	4.0	2992.8
1		0420	53	597.	206.6	3015.4	1		1240	153	242.	22.0	2996.5	1		2100	253	0.	4.0	2992.8
1		0425	54	607.	218.1	3016.2	1		1245	154	233.	20.4	2996.3	1		2105	254	0.	4.0	2992.8
1		0430	55	616.	227.8	3016.9	1		1250	155	225.	18.8	2996.0	1		2110	255	0.	4.0	2992.8
1		0435	56	623.	236.2	3017.5	1		1255	156	216.	17.3	2995.8	1		2115	256	0.	4.0	2992.8
1		0440	57	630.	243.7	3018.0	1		1300	157	207.	15.9	2995.5	1		2120	257	0.	4.0	2992.8
1		0445	58	636.	250.4	3018.5	1		1305	158	198.	14.5	2995.3	1		2125	258	0.	4.0	2992.8
1		0450	59	641.	256.6	3018.9	1		1310	159	189.	13.1	2995.1	1		2130	259	0.	4.0	2992.8
1		0455	60	645.	262.3	3019.3	1		1315	160	169.	11.9	2994.8	1		2135	260	0.	4.0	2992.8
1		0500	61	649.	267.5	3019.6	1		1320	161	146.	10.8	2994.5	1		2140	261	0.	4.0	2992.8
1		0505	62	653.	272.2	3019.9	1		1325	162	126.	9.9	2994.3	1		2145	262	0.	4.0	2992.8
1		0510	63	656.	276.4	3020.2	1		1330	163	109.	9.1	2994.1	1		2150	263	0.	4.0	2992.8
1		0515	64	659.	279.7	3020.4	1		1335	164	94.	8.4	2993.9	1		2155	264	0.	4.0	2992.8
1		0520	65	661.	282.3	3020.6	1		1340	165	81.	7.8	2993.8	1		2200	265	0.	4.0	2992.8
1		0525	66	662.	284.1	3020.7	1		1345	166	70.	7.3	2993.6	1		2205	266	0.	4.0	2992.8
1		0530	67	663.	285.2	3020.8	1		1350	167	60.	6.8	2993.5	1		2210	267	0.	4.0	2992.8
1		0535	68	663.	285.6	3020.8	1		1355	168	52.	6.4	2993.4	1		2215	268	0.	4.0	2992.8
1		0540	69	663.	285.4	3020.8	1		1400	169	45.	6.1	2993.3	1		2220	269	0.	4.0	2992.8
1		0545	70	663.	284.6	3020.7	1		1405	170	39.	5.8	2993.3	1		2225	270	0.	4.0	2992.8
1		0550	71	662.	283.2	3020.6	1		1410	171	34.	5.6	2993.2	1		2230	271	0.	4.0	2992.8
1		0555	72	660.	281.4	3020.5	1		1415	172	29.	5.3	2993.1	1		2235	272	0.	4.0	2992.8
1		0600	73	659.	279.2	3020.4	1		1420	173	25.	5.1	2993.1	1		2240	273	0.	4.0	2992.8
1		0605	74	657.	276.6	3020.2	1		1425	174	22.	5.0	2993.1	1		2245	274	0.	4.0	2992.8
1		0610	75	654.	273.8	3020.0	1		1430	175	19.	4.9	2993.0	1		2250	275	0.	4.0	2992.8
1		0615	76	652.	270.7	3019.8	1		1435	176	16.	4.7	2993.0	1		2255	276	0.	4.0	2992.8
1		0620	77	649.	267.4	3019.6	1		1440	177	14.	4.6	2993.0	1		2300	277	0.	4.0	2992.8
1		0625	78	647.	263.9	3019.4	1		1445	178	12.	4.5	2992.9	1		2305	278	0.	4.0	2992.8

1	0630	79	644.	260.3	3019.1	*	1	1450	179	10.	4.5	2992.9	*	1	2310	279	0.	4.0	2992.8
1	0635	80	641.	256.5	3018.9	*	1	1455	180	9.	4.4	2992.9	*	1	2315	280	0.	4.0	2992.8
1	0640	81	637.	252.6	3018.6	*	1	1500	181	8.	4.3	2992.9	*	1	2320	281	0.	4.0	2992.8
1	0645	82	634.	248.7	3018.4	*	1	1505	182	7.	4.3	2992.9	*	1	2325	282	0.	4.0	2992.8
1	0650	83	631.	244.7	3018.1	*	1	1510	183	6.	4.2	2992.9	*	1	2330	283	0.	4.0	2992.8
1	0655	84	627.	240.6	3017.8	*	1	1515	184	5.	4.2	2992.9	*	1	2335	284	0.	4.0	2992.8
1	0700	85	624.	236.5	3017.5	*	1	1520	185	4.	4.2	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	620.	232.4	3017.3	*	1	1525	186	4.	4.1	2992.8	*	1	2345	286	0.	4.0	2992.8
1	0710	87	616.	228.3	3017.0	*	1	1530	187	3.	4.1	2992.8	*	1	2350	287	0.	4.0	2992.8
1	0715	88	612.	224.1	3016.7	*	1	1535	188	3.	4.1	2992.8	*	1	2355	288	0.	4.0	2992.8
1	0720	89	609.	220.0	3016.4	*	1	1540	189	2.	4.1	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	605.	215.9	3016.1	*	1	1545	190	2.	4.1	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	601.	211.8	3015.8	*	1	1550	191	2.	4.1	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	598.	207.7	3015.5	*	1	1555	192	2.	4.0	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	594.	203.6	3015.2	*	1	1600	193	1.	4.0	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	590.	199.5	3014.9	*	1	1605	194	1.	4.0	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	586.	195.5	3014.6	*	1	1610	195	1.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	581.	191.5	3014.3	*	1	1615	196	1.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	577.	187.5	3014.0	*	1	1620	197	1.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	573.	183.6	3013.7	*	1	1625	198	1.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	568.	179.6	3013.4	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	564.	175.7	3013.1	*	1	1635	200	0.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 663.	5.58		594.	215.	207.	207.
		(INCHES)	1.258	1.819	1.819	1.819
		(AC-FT)	295.	426.	426.	426.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
286.	5.58	210.	64.	62.	62.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3020.78	5.58	3015.48	2999.84	2999.50	2999.50

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .70

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	418.	77.9	3003.9	*	1		1640	201	0.	4.0	2992.8
1		0005	2	0.	.0	2990.0	*	1		0825	102	411.	75.0	3003.6	*	1		1645	202	0.	4.0	2992.8
1		0010	3	0.	.0	2990.0	*	1		0830	103	404.	72.2	3003.2	*	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.0	*	1		0835	104	396.	69.4	3002.8	*	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.0	*	1		0840	105	389.	66.7	3002.5	*	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.1	*	1		0845	106	382.	64.1	3002.1	*	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.0	2990.2	*	1		0850	107	374.	61.5	3001.8	*	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.0	2990.5	*	1		0855	108	367.	58.9	3001.5	*	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.1	2990.8	*	1		0900	109	361.	56.4	3001.1	*	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.1	2991.0	*	1		0905	110	354.	54.0	3000.8	*	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.1	2991.0	*	1		0910	111	347.	51.5	3000.5	*	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.1	2991.0	*	1		0915	112	340.	49.2	3000.2	*	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.1	2991.0	*	1		0920	113	333.	46.9	2999.9	*	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.1	2991.1	*	1		0925	114	325.	44.6	2999.6	*	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	.1	2991.1	*	1		0930	115	318.	42.4	2999.3	*	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	.1	2991.1	*	1		0935	116	311.	40.2	2999.0	*	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	.1	2991.1	*	1		0940	117	304.	38.1	2998.7	*	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	.2	2991.1	*	1		0945	118	298.	36.0	2998.4	*	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	.2	2991.2	*	1		0950	119	291.	34.0	2998.2	*	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	.3	2991.3	*	1		0955	120	283.	32.0	2997.9	*	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	.4	2991.4	*	1		1000	121	276.	30.1	2997.7	*	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	.5	2991.6	*	1		1005	122	269.	28.2	2997.4	*	1		1825	222	0.	4.0	2992.8
1		0150	23	0.	.8	2991.9	*	1		1010	123	262.	26.4	2997.2	*	1		1830	223	0.	4.0	2992.8
1		0155	24	0.	1.0	2992.1	*	1		1015	124	255.	24.6	2996.9	*	1		1835	224	0.	4.0	2992.8
1		0200	25	0.	1.3	2992.1	*	1		1020	125	246.	22.9	2996.7	*	1		1840	225	0.	4.0	2992.8
1		0205	26	0.	1.6	2992.2	*	1		1025	126	237.	21.2	2996.4	*	1		1845	226	0.	4.0	2992.8
1		0210	27	0.	1.9	2992.3	*	1		1030	127	229.	19.6	2996.1	*	1		1850	227	0.	4.0	2992.8
1		0215	28	0.	2.2	2992.3	*	1		1035	128	220.	18.1	2995.9	*	1		1855	228	0.	4.0	2992.8
1		0220	29	0.	2.6	2992.4	*	1		1040	129	211.	16.6	2995.6	*	1		1900	229	0.	4.0	2992.8
1		0225	30	0.	3.1	2992.6	*	1		1045	130	202.	15.2	2995.4	*	1		1905	230	0.	4.0	2992.8
1		0230	31	0.	3.7	2992.7	*	1		1050	131	193.	13.8	2995.2	*	1		1910	231	0.	4.0	2992.8
1		0235	32	8.	4.4	2992.9	*	1		1055	132	182.	12.5	2994.9	*	1		1915	232	0.	4.0	2992.8
1		0240	33	22.	5.0	2993.1	*	1		1100	133	157.	11.3	2994.7	*	1		1920	233	0.	4.0	2992.8
1		0245	34	35.	5.6	2993.2	*	1		1105	134	135.	10.3	2994.4	*	1		1925	234	0.	4.0	2992.8
1		0250	35	47.	6.2	2993.4	*	1		1110	135	117.	9.5	2994.2	*	1		1930	235	0.	4.0	2992.8
1		0255	36	59.	6.8	2993.5	*	1		1115	136	101.	8.7	2994.0	*	1		1935	236	0.	4.0	2992.8
1		0300	37	71.	7.3	2993.6	*	1		1120	137	87.	8.1	2993.8	*	1		1940	237	0.	4.0	2992.8
1		0305	38	82.	7.8	2993.8	*	1		1125	138	75.	7.5	2993.7	*	1		1945	238	0.	4.0	2992.8
1		0310	39	95.	8.4	2993.9	*	1		1130	139	65.	7.0	2993.6	*	1		1950	239	0.	4.0	2992.8
1		0315	40	113.	9.3	2994.1	*	1		1135	140	56.	6.6	2993.5	*	1		1955	240	0.	4.0	2992.8
1		0320	41	143.	10.7	2994.5	*	1		1140	141	48.	6.2	2993.4	*	1		2000	241	0.	4.0	2992.8
1		0325	42	190.	13.3	2995.1	*	1		1145	142	42.	5.9	2993.3	*	1		2005	242	0.	4.0	2992.8
1		0330	43	220.	18.0	2995.9	*	1		1150	143	36.	5.7	2993.2	*	1		2010	243	0.	4.0	2992.8
1		0335	44	259.	25.5	2997.1	*	1		1155	144	31.	5.4	2993.2	*	1		2015	244	0.	4.0	2992.8

1	0340	45	298.	36.0	2998.4	*	1	1200	145	27.	5.2	2993.1	*	1	2020	245	0.	4.0	2992.8
1	0345	46	338.	48.5	3000.1	*	1	1205	146	23.	5.1	2993.1	*	1	2025	246	0.	4.0	2992.8
1	0350	47	375.	61.7	3001.8	*	1	1210	147	20.	4.9	2993.0	*	1	2030	247	0.	4.0	2992.8
1	0355	48	411.	74.7	3003.5	*	1	1215	148	17.	4.8	2993.0	*	1	2035	248	0.	4.0	2992.8
1	0400	49	440.	87.1	3005.1	*	1	1220	149	15.	4.7	2993.0	*	1	2040	249	0.	4.0	2992.8
1	0405	50	462.	98.7	3006.4	*	1	1225	150	13.	4.6	2993.0	*	1	2045	250	0.	4.0	2992.8
1	0410	51	480.	109.5	3007.5	*	1	1230	151	11.	4.5	2992.9	*	1	2050	251	0.	4.0	2992.8
1	0415	52	496.	119.2	3008.5	*	1	1235	152	10.	4.4	2992.9	*	1	2055	252	0.	4.0	2992.8
1	0420	53	510.	127.7	3009.3	*	1	1240	153	8.	4.4	2992.9	*	1	2100	253	0.	4.0	2992.8
1	0425	54	520.	134.8	3010.0	*	1	1245	154	7.	4.3	2992.9	*	1	2105	254	0.	4.0	2992.8
1	0430	55	526.	140.8	3010.4	*	1	1250	155	6.	4.3	2992.9	*	1	2110	255	0.	4.0	2992.8
1	0435	56	532.	145.9	3010.8	*	1	1255	156	5.	4.2	2992.9	*	1	2115	256	0.	4.0	2992.8
1	0440	57	537.	150.4	3011.2	*	1	1300	157	5.	4.2	2992.9	*	1	2120	257	0.	4.0	2992.8
1	0445	58	541.	154.4	3011.5	*	1	1305	158	4.	4.2	2992.8	*	1	2125	258	0.	4.0	2992.8
1	0450	59	545.	158.0	3011.8	*	1	1310	159	3.	4.1	2992.8	*	1	2130	259	0.	4.0	2992.8
1	0455	60	549.	161.3	3012.0	*	1	1315	160	3.	4.1	2992.8	*	1	2135	260	0.	4.0	2992.8
1	0500	61	552.	164.3	3012.2	*	1	1320	161	3.	4.1	2992.8	*	1	2140	261	0.	4.0	2992.8
1	0505	62	555.	167.0	3012.4	*	1	1325	162	2.	4.1	2992.8	*	1	2145	262	0.	4.0	2992.8
1	0510	63	557.	169.3	3012.6	*	1	1330	163	2.	4.1	2992.8	*	1	2150	263	0.	4.0	2992.8
1	0515	64	559.	171.1	3012.8	*	1	1335	164	2.	4.1	2992.8	*	1	2155	264	0.	4.0	2992.8
1	0520	65	561.	172.3	3012.9	*	1	1340	165	1.	4.0	2992.8	*	1	2200	265	0.	4.0	2992.8
1	0525	66	561.	173.0	3012.9	*	1	1345	166	1.	4.0	2992.8	*	1	2205	266	0.	4.0	2992.8
1	0530	67	561.	173.2	3012.9	*	1	1350	167	1.	4.0	2992.8	*	1	2210	267	0.	4.0	2992.8
1	0535	68	561.	172.9	3012.9	*	1	1355	168	1.	4.0	2992.8	*	1	2215	268	0.	4.0	2992.8
1	0540	69	560.	172.2	3012.8	*	1	1400	169	1.	4.0	2992.8	*	1	2220	269	0.	4.0	2992.8
1	0545	70	559.	171.0	3012.8	*	1	1405	170	1.	4.0	2992.8	*	1	2225	270	0.	4.0	2992.8
1	0550	71	557.	169.4	3012.6	*	1	1410	171	1.	4.0	2992.8	*	1	2230	271	0.	4.0	2992.8
1	0555	72	555.	167.6	3012.5	*	1	1415	172	1.	4.0	2992.8	*	1	2235	272	0.	4.0	2992.8
1	0600	73	553.	165.4	3012.3	*	1	1420	173	0.	4.0	2992.8	*	1	2240	273	0.	4.0	2992.8
1	0605	74	550.	163.1	3012.1	*	1	1425	174	0.	4.0	2992.8	*	1	2245	274	0.	4.0	2992.8
1	0610	75	548.	160.5	3011.9	*	1	1430	175	0.	4.0	2992.8	*	1	2250	275	0.	4.0	2992.8
1	0615	76	545.	157.7	3011.7	*	1	1435	176	0.	4.0	2992.8	*	1	2255	276	0.	4.0	2992.8
1	0620	77	542.	154.9	3011.5	*	1	1440	177	0.	4.0	2992.8	*	1	2300	277	0.	4.0	2992.8
1	0625	78	538.	151.8	3011.3	*	1	1445	178	0.	4.0	2992.8	*	1	2305	278	0.	4.0	2992.8
1	0630	79	535.	148.7	3011.0	*	1	1450	179	0.	4.0	2992.8	*	1	2310	279	0.	4.0	2992.8
1	0635	80	531.	145.5	3010.8	*	1	1455	180	0.	4.0	2992.8	*	1	2315	280	0.	4.0	2992.8
1	0640	81	528.	142.3	3010.5	*	1	1500	181	0.	4.0	2992.8	*	1	2320	281	0.	4.0	2992.8
1	0645	82	524.	139.0	3010.3	*	1	1505	182	0.	4.0	2992.8	*	1	2325	282	0.	4.0	2992.8
1	0650	83	521.	135.6	3010.0	*	1	1510	183	0.	4.0	2992.8	*	1	2330	283	0.	4.0	2992.8
1	0655	84	516.	132.2	3009.7	*	1	1515	184	0.	4.0	2992.8	*	1	2335	284	0.	4.0	2992.8
1	0700	85	511.	128.9	3009.4	*	1	1520	185	0.	4.0	2992.8	*	1	2340	285	0.	4.0	2992.8
1	0705	86	507.	125.5	3009.1	*	1	1525	186	0.	4.0	2992.8	*	1	2345	286	0.	4.0	2992.8
1	0710	87	501.	122.1	3008.8	*	1	1530	187	0.	4.0	2992.8	*	1	2350	287	0.	4.0	2992.8
1	0715	88	496.	118.7	3008.4	*	1	1535	188	0.	4.0	2992.8	*	1	2355	288	0.	4.0	2992.8
1	0720	89	490.	115.4	3008.1	*	1	1540	189	0.	4.0	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	484.	112.1	3007.8	*	1	1545	190	0.	4.0	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	479.	108.8	3007.4	*	1	1550	191	0.	4.0	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	473.	105.5	3007.1	*	1	1555	192	0.	4.0	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	468.	102.3	3006.7	*	1	1600	193	0.	4.0	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	463.	99.1	3006.4	*	1	1605	194	0.	4.0	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	457.	96.0	3006.1	*	1	1610	195	0.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	451.	92.8	3005.8	*	1	1615	196	0.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	445.	89.8	3005.4	*	1	1620	197	0.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	440.	86.7	3005.1	*	1	1625	198	0.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	433.	83.7	3004.7	*	1	1630	199	0.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	425.	80.8	3004.3	*	1	1635	200	0.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 561.	5.50		473.	141.	135.	135.
		(INCHES)	1.001	1.191	1.191	1.191
		(AC-FT)	234.	279.	279.	279.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
173.	5.50	115.	33.	32.	32.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3012.92	5.50	3007.45	2996.72	2996.49	2996.49

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .54

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	263.	26.7	2997.2	1		1640	201	0.	4.0	2992.8
1		0005	2	0.	.0	2990.0	1		0825	102	256.	24.9	2997.0	1		1645	202	0.	4.0	2992.8
1		0010	3	0.	.0	2990.0	1		0830	103	247.	23.1	2996.7	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.0	1		0835	104	239.	21.5	2996.4	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.0	1		0840	105	230.	19.9	2996.2	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.0	1		0845	106	222.	18.3	2995.9	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.0	2990.0	1		0850	107	213.	16.8	2995.7	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.0	2990.1	1		0855	108	204.	15.4	2995.4	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.0	2990.2	1		0900	109	195.	14.0	2995.2	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.0	2990.2	1		0905	110	186.	12.7	2995.0	1		1725	210	0.	4.0	2992.8

1	0050	11	0.	.0	2990.3	*	1	0910	111	160.	11.5	2994.7	*	1	1730	211	0.	4.0	2992.8
1	0055	12	0.	.0	2990.3	*	1	0915	112	138.	10.5	2994.4	*	1	1735	212	0.	4.0	2992.8
1	0100	13	0.	.0	2990.3	*	1	0920	113	119.	9.6	2994.2	*	1	1740	213	0.	4.0	2992.8
1	0105	14	0.	.0	2990.3	*	1	0925	114	103.	8.8	2994.0	*	1	1745	214	0.	4.0	2992.8
1	0110	15	0.	.0	2990.3	*	1	0930	115	89.	8.2	2993.9	*	1	1750	215	0.	4.0	2992.8
1	0115	16	0.	.0	2990.4	*	1	0935	116	77.	7.6	2993.7	*	1	1755	216	0.	4.0	2992.8
1	0120	17	0.	.0	2990.4	*	1	0940	117	66.	7.1	2993.6	*	1	1800	217	0.	4.0	2992.8
1	0125	18	0.	.0	2990.5	*	1	0945	118	57.	6.7	2993.5	*	1	1805	218	0.	4.0	2992.8
1	0130	19	0.	.0	2990.7	*	1	0950	119	49.	6.3	2993.4	*	1	1810	219	0.	4.0	2992.8
1	0135	20	0.	.1	2990.9	*	1	0955	120	43.	6.0	2993.3	*	1	1815	220	0.	4.0	2992.8
1	0140	21	0.	.1	2991.0	*	1	1000	121	37.	5.7	2993.2	*	1	1820	221	0.	4.0	2992.8
1	0145	22	0.	.1	2991.1	*	1	1005	122	32.	5.5	2993.2	*	1	1825	222	0.	4.0	2992.8
1	0150	23	0.	.2	2991.1	*	1	1010	123	27.	5.3	2993.1	*	1	1830	223	0.	4.0	2992.8
1	0155	24	0.	.2	2991.2	*	1	1015	124	24.	5.1	2993.1	*	1	1835	224	0.	4.0	2992.8
1	0200	25	0.	.2	2991.2	*	1	1020	125	20.	4.9	2993.0	*	1	1840	225	0.	4.0	2992.8
1	0205	26	0.	.3	2991.2	*	1	1025	126	18.	4.8	2993.0	*	1	1845	226	0.	4.0	2992.8
1	0210	27	0.	.3	2991.3	*	1	1030	127	15.	4.7	2993.0	*	1	1850	227	0.	4.0	2992.8
1	0215	28	0.	.3	2991.4	*	1	1035	128	13.	4.6	2993.0	*	1	1855	228	0.	4.0	2992.8
1	0220	29	0.	.4	2991.4	*	1	1040	129	11.	4.5	2992.9	*	1	1900	229	0.	4.0	2992.8
1	0225	30	0.	.5	2991.6	*	1	1045	130	10.	4.4	2992.9	*	1	1905	230	0.	4.0	2992.8
1	0230	31	0.	.6	2991.8	*	1	1050	131	8.	4.4	2992.9	*	1	1910	231	0.	4.0	2992.8
1	0235	32	0.	.8	2992.0	*	1	1055	132	7.	4.3	2992.9	*	1	1915	232	0.	4.0	2992.8
1	0240	33	0.	1.0	2992.1	*	1	1100	133	6.	4.3	2992.9	*	1	1920	233	0.	4.0	2992.8
1	0245	34	0.	1.3	2992.1	*	1	1105	134	5.	4.2	2992.9	*	1	1925	234	0.	4.0	2992.8
1	0250	35	0.	1.6	2992.2	*	1	1110	135	5.	4.2	2992.9	*	1	1930	235	0.	4.0	2992.8
1	0255	36	0.	1.9	2992.3	*	1	1115	136	4.	4.2	2992.8	*	1	1935	236	0.	4.0	2992.8
1	0300	37	0.	2.3	2992.4	*	1	1120	137	4.	4.1	2992.8	*	1	1940	237	0.	4.0	2992.8
1	0305	38	0.	2.7	2992.5	*	1	1125	138	3.	4.1	2992.8	*	1	1945	238	0.	4.0	2992.8
1	0310	39	0.	3.2	2992.6	*	1	1130	139	3.	4.1	2992.8	*	1	1950	239	0.	4.0	2992.8
1	0315	40	0.	3.9	2992.8	*	1	1135	140	2.	4.1	2992.8	*	1	1955	240	0.	4.0	2992.8
1	0320	41	19.	4.8	2993.0	*	1	1140	141	2.	4.1	2992.8	*	1	2000	241	0.	4.0	2992.8
1	0325	42	53.	6.5	2993.4	*	1	1145	142	2.	4.1	2992.8	*	1	2005	242	0.	4.0	2992.8
1	0330	43	111.	9.2	2994.1	*	1	1150	143	1.	4.0	2992.8	*	1	2010	243	0.	4.0	2992.8
1	0335	44	191.	13.4	2995.1	*	1	1155	144	1.	4.0	2992.8	*	1	2015	244	0.	4.0	2992.8
1	0340	45	228.	19.4	2996.1	*	1	1200	145	1.	4.0	2992.8	*	1	2020	245	0.	4.0	2992.8
1	0345	46	263.	26.7	2997.2	*	1	1205	146	1.	4.0	2992.8	*	1	2025	246	0.	4.0	2992.8
1	0350	47	292.	34.5	2998.2	*	1	1210	147	1.	4.0	2992.8	*	1	2030	247	0.	4.0	2992.8
1	0355	48	318.	42.3	2999.3	*	1	1215	148	1.	4.0	2992.8	*	1	2035	248	0.	4.0	2992.8
1	0400	49	342.	49.8	3000.3	*	1	1220	149	1.	4.0	2992.8	*	1	2040	249	0.	4.0	2992.8
1	0405	50	362.	56.9	3001.2	*	1	1225	150	1.	4.0	2992.8	*	1	2045	250	0.	4.0	2992.8
1	0410	51	380.	63.4	3002.0	*	1	1230	151	0.	4.0	2992.8	*	1	2050	251	0.	4.0	2992.8
1	0415	52	396.	69.2	3002.8	*	1	1235	152	0.	4.0	2992.8	*	1	2055	252	0.	4.0	2992.8
1	0420	53	410.	74.3	3003.5	*	1	1240	153	0.	4.0	2992.8	*	1	2100	253	0.	4.0	2992.8
1	0425	54	420.	78.5	3004.0	*	1	1245	154	0.	4.0	2992.8	*	1	2105	254	0.	4.0	2992.8
1	0430	55	428.	82.0	3004.5	*	1	1250	155	0.	4.0	2992.8	*	1	2110	255	0.	4.0	2992.8
1	0435	56	435.	84.8	3004.9	*	1	1255	156	0.	4.0	2992.8	*	1	2115	256	0.	4.0	2992.8
1	0440	57	441.	87.3	3005.1	*	1	1300	157	0.	4.0	2992.8	*	1	2120	257	0.	4.0	2992.8
1	0445	58	445.	89.4	3005.4	*	1	1305	158	0.	4.0	2992.8	*	1	2125	258	0.	4.0	2992.8
1	0450	59	449.	91.3	3005.6	*	1	1310	159	0.	4.0	2992.8	*	1	2130	259	0.	4.0	2992.8
1	0455	60	452.	93.1	3005.8	*	1	1315	160	0.	4.0	2992.8	*	1	2135	260	0.	4.0	2992.8
1	0500	61	455.	94.6	3005.9	*	1	1320	161	0.	4.0	2992.8	*	1	2140	261	0.	4.0	2992.8
1	0505	62	457.	95.9	3006.1	*	1	1325	162	0.	4.0	2992.8	*	1	2145	262	0.	4.0	2992.8
1	0510	63	459.	97.0	3006.2	*	1	1330	163	0.	4.0	2992.8	*	1	2150	263	0.	4.0	2992.8
1	0515	64	460.	97.7	3006.3	*	1	1335	164	0.	4.0	2992.8	*	1	2155	264	0.	4.0	2992.8
1	0520	65	461.	98.0	3006.3	*	1	1340	165	0.	4.0	2992.8	*	1	2200	265	0.	4.0	2992.8
1	0525	66	461.	98.0	3006.3	*	1	1345	166	0.	4.0	2992.8	*	1	2205	266	0.	4.0	2992.8
1	0530	67	460.	97.7	3006.3	*	1	1350	167	0.	4.0	2992.8	*	1	2210	267	0.	4.0	2992.8
1	0535	68	459.	97.0	3006.2	*	1	1355	168	0.	4.0	2992.8	*	1	2215	268	0.	4.0	2992.8
1	0540	69	457.	96.0	3006.1	*	1	1400	169	0.	4.0	2992.8	*	1	2220	269	0.	4.0	2992.8
1	0545	70	455.	94.8	3006.0	*	1	1405	170	0.	4.0	2992.8	*	1	2225	270	0.	4.0	2992.8
1	0550	71	452.	93.3	3005.8	*	1	1410	171	0.	4.0	2992.8	*	1	2230	271	0.	4.0	2992.8
1	0555	72	449.	91.6	3005.6	*	1	1415	172	0.	4.0	2992.8	*	1	2235	272	0.	4.0	2992.8
1	0600	73	445.	89.7	3005.4	*	1	1420	173	0.	4.0	2992.8	*	1	2240	273	0.	4.0	2992.8
1	0605	74	442.	87.7	3005.2	*	1	1425	174	0.	4.0	2992.8	*	1	2245	274	0.	4.0	2992.8
1	0610	75	437.	85.6	3005.0	*	1	1430	175	0.	4.0	2992.8	*	1	2250	275	0.	4.0	2992.8
1	0615	76	432.	83.4	3004.7	*	1	1435	176	0.	4.0	2992.8	*	1	2255	276	0.	4.0	2992.8
1	0620	77	426.	81.0	3004.4	*	1	1440	177	0.	4.0	2992.8	*	1	2300	277	0.	4.0	2992.8
1	0625	78	420.	78.7	3004.0	*	1	1445	178	0.	4.0	2992.8	*	1	2305	278	0.	4.0	2992.8
1	0630	79	414.	76.2	3003.7	*	1	1450	179	0.	4.0	2992.8	*	1	2310	279	0.	4.0	2992.8
1	0635	80	408.	73.8	3003.4	*	1	1455	180	0.	4.0	2992.8	*	1	2315	280	0.	4.0	2992.8
1	0640	81	401.	71.3	3003.1	*	1	1500	181	0.	4.0	2992.8	*	1	2320	281	0.	4.0	2992.8
1	0645	82	395.	68.8	3002.8	*	1	1505	182	0.	4.0	2992.8	*	1	2325	282	0.	4.0	2992.8
1	0650	83	388.	66.3	3002.4	*	1	1510	183	0.	4.0	2992.8	*	1	2330	283	0.	4.0	2992.8
1	0655	84	381.	63.9	3002.1	*	1	1515	184	0.	4.0	2992.8	*	1	2335	284	0.	4.0	2992.8
1	0700	85	374.	61.4	3001.8	*	1	1520	185	0.	4.0	2992.8	*	1	2340	285	0.	4.0	2992.8
1	0705	86	367.	58.9	3001.5	*	1	1525	186	0.	4.0	2992.8	*	1	2345	286	0.	4.0	2992.8
1	0710	87	361.	56.5	3001.1	*	1	1530	187	0.	4.0	2992.8	*	1	2350	287	0.	4.0	2992.8
1	0715	88	354.	54.1	3000.8	*	1	1535	188	0.	4.0	2992.8	*	1	2355	288	0.	4.0	2992.8
1	0720	89	348.	51.7	3000.5	*	1	1540	189	0.	4.0	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	341.	49.4	3000.2	*	1	1545	190	0.	4.0	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	334.	47.1	2999.9	*	1	1550	191	0.	4.0	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	326.	44.9	2999.6	*	1	1555	192	0.	4.0	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	319.	42.7	2999.3	*	1	1600	193	0.	4.0	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	312.	40.5	2999.0	*	1	1605	194	0.	4.0	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	305.	38.4	2998.8	*	1	1610	195	0.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	299.	36.3	2998.5	*	1	1615	196	0.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	292.	34.3	2998.2	*	1	1620	197	0.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	284.	32.3	2998.0	*	1	1625	198	0.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	277.	30.4	2997.7	*	1	1630	199	0.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	270.	28.5	2997.5	*	1	1635	200	0.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8

***

	(AC-FT)	171.	176.	176.	176.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
98.	5.33	57.	17.	16.	16.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3006.31	5.33	3001.03	2994.75	2994.58	2994.58

CUMULATIVE AREA = 4.39 SQ MI

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PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .99	RATIO 3 .98	RATIO 4 .94	RATIO 5 .93	RATIO 6 .92	RATIO 7 .91	RATIO 8 .70	RATIO 9 .54
HYDROGRAPH AT													
+	1-1A	2.34	1	FLOW	2541.	2505.	2469.	2325.	2289.	2253.	2217.	1477.	942.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	1-1B	.17	1	FLOW	226.	223.	219.	203.	199.	195.	192.	115.	63.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.67
ROUTED TO													
+	R2	.17	1	FLOW	220.	218.	215.	200.	194.	193.	189.	112.	62.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CP1	2.51	1	FLOW	2670.	2632.	2594.	2442.	2404.	2366.	2329.	1549.	986.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	R3	2.51	1	FLOW	2610.	2572.	2535.	2386.	2349.	2312.	2275.	1512.	960.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	1-2A	.86	1	FLOW	1584.	1562.	1541.	1453.	1432.	1410.	1388.	938.	608.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO													
+	R4	.86	1	FLOW	1516.	1494.	1473.	1388.	1366.	1345.	1324.	884.	565.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	1-2B	.22	1	FLOW	315.	310.	305.	286.	281.	276.	271.	173.	103.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT													
+	CP2	3.59	1	FLOW	3324.	3275.	3228.	3037.	2989.	2941.	2894.	1914.	1209.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	R5	3.59	1	FLOW	3291.	3243.	3196.	3007.	2959.	2912.	2865.	1894.	1197.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	4.00
HYDROGRAPH AT													
+	1-2CR	.57	1	FLOW	885.	872.	859.	807.	794.	781.	768.	503.	313.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT													
+	CP3	4.17	1	FLOW	3812.	3756.	3700.	3476.	3419.	3365.	3309.	2171.	1365.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.83	3.83
ROUTED TO													
+	R6	4.17	1	FLOW	3790.	3734.	3681.	3460.	3404.	3351.	3296.	2168.	1360.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	1-3P	.03	1	FLOW	61.	60.	60.	57.	56.	55.	55.	40.	29.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	CP4	4.19	1	FLOW	3806.	3750.	3697.	3475.	3419.	3366.	3311.	2179.	1368.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	R7	4.19	1	FLOW	3795.	3740.	3685.	3462.	3408.	3353.	3298.	2163.	1362.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.92
HYDROGRAPH AT													
+	1-12P	.18	1	FLOW	291.	287.	284.	269.	265.	262.	258.	181.	124.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CP5	4.37	1	FLOW	4003.	3945.	3888.	3654.	3598.	3540.	3483.	2295.	1443.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	1-14	.00	1	FLOW	3.	3.	3.	3.	3.	2.	2.	2.	1.

				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-15	.01	1	FLOW	10.	10.	10.	9.	9.	9.	9.	6.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-16	.00	1	FLOW	5.	5.	5.	5.	5.	5.	5.	3.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-17	.00	1	FLOW	7.	7.	7.	6.	6.	6.	6.	4.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-18	.00	1	FLOW	7.	7.	6.	6.	6.	6.	6.	4.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
6 COMBINED AT													
+	CP5B	4.39	1	FLOW	4014.	3956.	3898.	3664.	3608.	3550.	3493.	2302.	1448.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	EXDB	4.39	1	FLOW	1007.	959.	906.	676.	672.	668.	663.	561.	461.
				TIME	5.42	5.42	5.42	5.58	5.58	5.58	5.58	5.50	5.33
			** PEAK STAGES IN FEET **										
			1	STAGE	3023.27	3023.07	3022.86	3021.86	3021.50	3021.14	3020.78	3012.92	3006.31
				TIME	5.42	5.42	5.42	5.58	5.58	5.58	5.58	5.50	5.33
HYDROGRAPH AT													
+	1-4R	.05	1	FLOW	100.	98.	97.	91.	90.	89.	87.	58.	37.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-5R	.03	1	FLOW	63.	62.	61.	58.	57.	56.	55.	37.	24.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	CP6	.09	1	FLOW	163.	161.	158.	149.	147.	145.	142.	95.	61.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO													
+	R8	.09	1	FLOW	156.	154.	152.	143.	141.	138.	136.	92.	60.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.58	3.58
HYDROGRAPH AT													
+	1-6R	.02	1	FLOW	28.	28.	27.	26.	25.	25.	25.	16.	11.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-7R	.03	1	FLOW	50.	50.	49.	46.	45.	45.	44.	30.	19.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	CP7	.04	1	FLOW	79.	77.	76.	72.	71.	70.	69.	46.	29.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO													
+	R9	.04	1	FLOW	76.	75.	74.	70.	69.	68.	67.	45.	30.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	1-8R	.00	1	FLOW	5.	5.	4.	4.	4.	4.	4.	3.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-10R	.06	1	FLOW	101.	100.	99.	93.	91.	90.	89.	59.	38.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	CP8	.06	1	FLOW	106.	105.	103.	97.	96.	94.	93.	62.	39.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO													
+	R10	.06	1	FLOW	102.	101.	99.	94.	92.	90.	89.	61.	39.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	1-11P	.18	1	FLOW	311.	307.	303.	287.	283.	279.	275.	193.	132.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
4 COMBINED AT													
+	CP9	.37	1	FLOW	644.	636.	627.	593.	584.	576.	568.	391.	261.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	1-13	.00	1	FLOW	1.	1.	1.	1.	1.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	LMT1R	1.96	1	FLOW	2144.	2114.	2085.	1966.	1937.	1907.	1878.	1267.	821.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
3 COMBINED AT													
+	CP10	2.33	1	FLOW	2462.	2428.	2394.	2258.	2224.	2190.	2156.	1456.	945.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83

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ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION INTERVAL PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .00									
R2	MANE	3.62	221.26	220.72	1.60	5.00	220.26	220.00	1.60

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1495E+02 EXCESS= .0000E+00 OUTFLOW= .1496E+02 BASIN STORAGE= .1444E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.64	219.12	218.16	1.57	5.00	217.69	220.00	1.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1469E+02 EXCESS= .0000E+00 OUTFLOW= .1470E+02 BASIN STORAGE= .1118E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.65	216.76	219.24	1.55	5.00	215.22	220.00	1.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1444E+02 EXCESS= .0000E+00 OUTFLOW= .1444E+02 BASIN STORAGE= .1367E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.73	200.37	220.08	1.44	5.00	200.09	220.00	1.44

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1341E+02 EXCESS= .0000E+00 OUTFLOW= .1341E+02 BASIN STORAGE= .1137E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.75	194.48	221.26	1.41	5.00	193.59	220.00	1.41

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1315E+02 EXCESS= .0000E+00 OUTFLOW= .1315E+02 BASIN STORAGE= .1366E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.77	194.78	218.70	1.38	5.00	193.14	220.00	1.38

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1291E+02 EXCESS= .0000E+00 OUTFLOW= .1292E+02 BASIN STORAGE= .1037E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.79	189.65	219.91	1.36	5.00	189.47	220.00	1.36

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1265E+02 EXCESS= .0000E+00 OUTFLOW= .1265E+02 BASIN STORAGE= .1202E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.75	114.28	221.25	.82	5.00	112.11	220.00	.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7650E+01 EXCESS= .0000E+00 OUTFLOW= .7654E+01 BASIN STORAGE= .1004E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00									
R2	MANE	2.25	64.30	222.75	.47	5.00	61.71	220.00	.47

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4359E+01 EXCESS= .0000E+00 OUTFLOW= .4361E+01 BASIN STORAGE= .1019E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00									
R6	MANE	1.32	3798.53	227.06	2.11	5.00	3790.18	230.00	2.11

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4682E+03 EXCESS= .0000E+00 OUTFLOW= .4681E+03 BASIN STORAGE= .5398E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R6	MANE	1.33	3743.79	227.90	2.07	5.00	3734.37	230.00	2.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4612E+03 EXCESS= .0000E+00 OUTFLOW= .4611E+03 BASIN STORAGE= .5897E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R6	MANE	1.33	3688.44	227.43	2.04	5.00	3681.22	230.00	2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4542E+03 EXCESS= .0000E+00 OUTFLOW= .4541E+03 BASIN STORAGE= .5356E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R6	MANE	1.35	3465.50	228.32	1.92	5.00	3459.93	230.00	1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4264E+03 EXCESS= .0000E+00 OUTFLOW= .4263E+03 BASIN STORAGE= .6080E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.36	3410.14	227.90	1.89	5.00	3403.62	230.00	1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4195E+03 EXCESS= .0000E+00 OUTFLOW= .4194E+03 BASIN STORAGE= .5400E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.36	3355.30	227.45	1.86	5.00	3350.78	230.00	1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4126E+03 EXCESS= .0000E+00 OUTFLOW= .4125E+03 BASIN STORAGE= .5832E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.37	3299.90	228.42	1.83	5.00	3295.94	230.00	1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4057E+03 EXCESS= .0000E+00 OUTFLOW= .4056E+03 BASIN STORAGE= .5145E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.52	2168.16	229.48	1.20	5.00	2167.85	230.00	1.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2660E+03 EXCESS= .0000E+00 OUTFLOW= .2660E+03 BASIN STORAGE= .5661E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.71	1362.06	232.09	.76	5.00	1359.64	230.00	.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1682E+03 EXCESS= .0000E+00 OUTFLOW= .1682E+03 BASIN STORAGE= .5203E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.79	3795.47	229.59	2.11	5.00	3794.94	230.00	2.11

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4719E+03 EXCESS= .0000E+00 OUTFLOW= .4717E+03 BASIN STORAGE= .7225E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.80	3741.66	230.44	2.08	5.00	3740.03	230.00	2.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4648E+03 EXCESS= .0000E+00 OUTFLOW= .4646E+03 BASIN STORAGE= .6929E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.81	3685.33	229.46	2.05	5.00	3685.12	230.00	2.05

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4578E+03 EXCESS= .0000E+00 OUTFLOW= .4576E+03 BASIN STORAGE= .8800E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.83	3463.33	231.20	1.92	5.00	3461.87	230.00	1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4298E+03 EXCESS= .0000E+00 OUTFLOW= .4297E+03 BASIN STORAGE= .7381E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.84	3409.52	230.31	1.89	5.00	3407.77	230.00	1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4228E+03 EXCESS= .0000E+00 OUTFLOW= .4227E+03 BASIN STORAGE= .7227E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.85	3354.19	231.21	1.86	5.00	3352.63	230.00	1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4159E+03 EXCESS= .0000E+00 OUTFLOW= .4158E+03 BASIN STORAGE= .8686E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.86	3300.09	230.31	1.83	5.00	3298.02	230.00	1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4090E+03 EXCESS= .0000E+00 OUTFLOW= .4088E+03 BASIN STORAGE= .8491E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	2.06	2169.04	230.96	1.20	5.00	2163.34	230.00	1.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2684E+03 EXCESS= .0000E+00 OUTFLOW= .2683E+03 BASIN STORAGE= .8289E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	2.32	1363.96	233.98	.76	5.00	1361.82	235.00	.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1699E+03 EXCESS= .0000E+00 OUTFLOW= .1699E+03 BASIN STORAGE= .7707E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	.93	162.44	211.19	2.06	5.00	156.28	210.00	2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9673E+01 EXCESS= .0000E+00 OUTFLOW= .9673E+01 BASIN STORAGE= .1111E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	.94	160.11	211.79	2.03	5.00	154.20	210.00	2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9530E+01 EXCESS= .0000E+00 OUTFLOW= .9530E+01 BASIN STORAGE= .1067E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	.94	157.86	211.45	2.00	5.00	151.74	210.00	2.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9386E+01 EXCESS= .0000E+00 OUTFLOW= .9386E+01 BASIN STORAGE= .1011E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	.95	148.79	211.13	1.88	5.00	142.96	210.00	1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8822E+01 EXCESS= .0000E+00 OUTFLOW= .8822E+01 BASIN STORAGE= .9884E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	.95	146.53	211.78	1.85	5.00	140.79	210.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8682E+01 EXCESS= .0000E+00 OUTFLOW= .8682E+01 BASIN STORAGE= .1118E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	.96	144.27	211.49	1.82	5.00	138.40	210.00	1.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8540E+01 EXCESS= .0000E+00 OUTFLOW= .8540E+01 BASIN STORAGE= .1059E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	.96	141.99	211.20	1.79	5.00	136.26	210.00	1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8401E+01 EXCESS= .0000E+00 OUTFLOW= .8401E+01 BASIN STORAGE= .9888E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	1.04	95.18	212.20	1.18	5.00	92.29	215.00	1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5549E+01 EXCESS= .0000E+00 OUTFLOW= .5549E+01 BASIN STORAGE= .1036E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	1.14	61.18	212.58	.76	5.00	60.41	215.00	.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3541E+01 EXCESS= .0000E+00 OUTFLOW= .3541E+01 BASIN STORAGE= .1150E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.21	77.94	213.91	2.07	5.00	75.83	215.00	2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4663E+01 EXCESS= .0000E+00 OUTFLOW= .4663E+01 BASIN STORAGE= .2195E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.21	76.93	212.31	2.04	5.00	75.47	215.00	2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4596E+01 EXCESS= .0000E+00 OUTFLOW= .4596E+01 BASIN STORAGE= .2595E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.22	75.81	212.92	2.01	5.00	74.35	215.00	2.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4526E+01 EXCESS= .0000E+00 OUTFLOW= .4526E+01 BASIN STORAGE= .2157E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.24	71.46	213.22	1.88	5.00	69.79	215.00	1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4250E+01 EXCESS= .0000E+00 OUTFLOW= .4250E+01 BASIN STORAGE= .2037E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.25	70.38	213.87	1.86	5.00	68.57	215.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4185E+01 EXCESS= .0000E+00 OUTFLOW= .4185E+01 BASIN STORAGE= .2368E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.26	69.30	212.28	1.83	5.00	68.25	215.00	1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4120E+01 EXCESS= .0000E+00 OUTFLOW= .4121E+01 BASIN STORAGE= .2804E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.27	68.22	212.96	1.80	5.00	67.01	215.00	1.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4050E+01 EXCESS= .0000E+00 OUTFLOW= .4050E+01 BASIN STORAGE= .2266E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.45	45.90	213.56	1.19	5.00	45.08	215.00	1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2676E+01 EXCESS= .0000E+00 OUTFLOW= .2676E+01 BASIN STORAGE= .2443E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.68	29.81	214.60	.76	5.00	29.57	215.00	.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1707E+01 EXCESS= .0000E+00 OUTFLOW= .1708E+01 BASIN STORAGE= .2506E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.91	105.41	212.23	2.03	5.00	102.04	215.00	2.03

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6281E+01 EXCESS= .0000E+00 OUTFLOW= .6282E+01 BASIN STORAGE= .1837E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.92	103.90	212.84	2.00	5.00	100.78	215.00	2.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6191E+01 EXCESS= .0000E+00 OUTFLOW= .6192E+01 BASIN STORAGE= .2091E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.92	102.41	213.46	1.97	5.00	98.79	215.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6100E+01 EXCESS= .0000E+00 OUTFLOW= .6100E+01 BASIN STORAGE= .2350E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.95	96.48	212.14	1.85	5.00	93.59	215.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5728E+01 EXCESS= .0000E+00 OUTFLOW= .5728E+01 BASIN STORAGE= .1973E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.95	95.02	212.79	1.82	5.00	92.45	215.00	1.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5636E+01 EXCESS= .0000E+00 OUTFLOW= .5637E+01 BASIN STORAGE= .2226E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.96	93.59	213.47	1.79	5.00	90.47	215.00	1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5545E+01 EXCESS= .0000E+00 OUTFLOW= .5545E+01 BASIN STORAGE= .2464E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.96	92.04	212.18	1.76	5.00	89.47	215.00	1.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5453E+01 EXCESS= .0000E+00 OUTFLOW= .5453E+01 BASIN STORAGE= .1980E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	2.13	61.63	213.03	1.16	5.00	60.64	215.00	1.16

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3593E+01 EXCESS= .0000E+00 OUTFLOW= .3593E+01 BASIN STORAGE= .1886E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	2.33	39.86	214.40	.74	5.00	39.34	215.00	.74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2284E+01 EXCESS= .0000E+00 OUTFLOW= .2284E+01 BASIN STORAGE= .2420E-03 PERCENT ERROR= .0

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

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   29OCT15  TIME  13:47:13   *
*                                       *
*****************************************
```

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

```
X     X  XXXXXXX   XXXX          X
X     X  X        X    X        XX
X     X  X        X             X
XXXXXXX  XXXX     X        XXXX X
X     X  X        X             X
X     X  X        X    X        X
X     X  XXXXXXX   XXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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

              *DIAGRAM
    1         ID   ********************************************************************
    2         ID   * ..................................................................  *
    3         ID   * :                SUMMERLIN VILLAGE 26                            :  *
    4         ID   * :                 INTERIM  CONDITION                             :  *
    5         ID   * :       THIS MODEL DETERMINES THE RUNOFF DURING                   :  *
    6         ID   * :           INTERIM DEVELOPMENT CONDITIONS                        :  *
    7         ID   * :.................................................................:  *
    8         ID   * :              RETURN PERIOD_ _ _ _100-YEAR                       :  *
    9         ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3                    :  *
   10         ID   * :              PROJECT NO_ _ _ _ _ 764.204.013                    :  *
   11         ID   * :              FILENAME_ _ _ _ _ _ V26INT.H1                      :  *
   12         ID   * :              DATE_ _ _ _ _ _ _ _ 10/19/15                       :  *
   13         ID   * :              MODELED BY_ _ _ _ _ REH/BJK/DBC                    :  *
   14         ID   * :                                                                 :  *
   15         ID   * :             DEPTH AREA REDUCTION FACTORS:                       :  *
   16         ID   * :               AREA                DARF                          :  *
   17         ID   * :             0.00 TO 0.24 SQ MI     1.00                       :  *
   18         ID   * :             0.25 TO 0.49 SQ MI     0.99                       :  *
   19         ID   * :             0.50 TO 0.99 SQ MI     0.98                       :  *
   20         ID   * :             1.00 TO 1.24 SQ MI     0.97                       :  *
   21         ID   * :             1.25 TO 1.50 SQ MI     0.96                       :  *
   22         ID   * :             1.51 TO 1.74 SQ MI     0.95                       :  *
   23         ID   * :             1.75 TO 1.99 SQ MI     0.94                       :  *
   24         ID   * :             2.00 TO 2.99 SQ MI     0.93                       :  *
   25         ID   * :             3.00 TO 3.99 SQ MI     0.92                       :  *
   26         ID   * :             4.00 TO 4.99 SQ MI     0.91                       :  *
   27         ID   * :             6.00 TO 7.99 SQ MI     0.90                       :  *
   28         ID   * :.................................................................:  *
   29         ID   ********************************************************************
   30         ID
   31         ID
   32         IT      5       0       0     300
   33         IO      5
   34         IN      5       0       0
   35         JR    PREC     1.0    0.99    0.98    0.94    0.93    0.92    0.91    0.90
              *
   36         KK     EX2
   37         KM    1605.5 ACRES
   38         BA   2.509
   39         PB    3.66
   40         PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
   41         PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
   42         PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
   43         PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
   44         PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
   45         PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
   46         PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
   47         PC   .9980   .9990  1.000
   48         LS      0    85.9
   49         UD  0.530
              *
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1 HEC-1 INPUT PAGE 2

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

   50         KK      R1
   51         KM    ROUTE EX2 THROUGH EX1R TO CP1
   52         KM    ASSUME EXISTING WASH
   53         KM    NSTEPS       K       X
   54         RM        2    .158     .15
              *

   55         KK     EX1
   56         KM    1101.5 ACRES
   57         PB    3.52
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```
 58          BA   1.721
 59          LS       0      86.3
 60          UD   0.316
             *

 61          KK     CP1
 62          KM    COMBINE EX1R AND EX2
 63          HC       2
             *

 64          KK      R2
 65          KM    ROUTE CP1 TO CP2
 66          KM      LEN    SLOPE      n            SHAPE      BW      SS
 67          RD     3233   0.0575   0.025       0    TRAP      50       3
             *

 68          KK     INT6
 69          PB     3.33
 70          BA    .1638
 71          LS       0      90.2
 72          UD     .126
             *

 73          KK   DEBR1N
 74          PB     3.51
 75          BA   .57538
 76          LS       0        85
 77          UD    0.418
             *

 78          KK     R-1
 79          KM    ROUTE DEBR1N TO C-1
 80          KM      LEN    SLOPE      n            SHAPE      BW      SS
 81          RD     1340    0.005   0.020       0    TRAP      80       2
             *

 82          KK     AREV
 83          PB     3.38
 84          BA   .14851
 85          LS       0        82
 86          UD    0.184
             *
```



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

 87          KK     C-1
 88          KM    COMBINE DEBR1N & AREV
 89          HC       2
             *

 90          KK     R-2
 91          KM    ROUTE C-1 TO C-2
 92          KM      LEN    SLOPE      n            SHAPE      BW      SS
 93          RD     1300    0.005   0.020       0    TRAP      80       2
             *

 94          KK     BREV
 95          PB     3.42
 96          BA   .20824
 97          LS       0        83
 98          UD    0.273
             *

 99          KK     C-2
100          KM    COMBINE C-1 & BREV
101          HC       2
             *

102          KK     CREV
103          PB     3.41
104          BA   .07413
105          LS       0        86
106          UD    0.171
             *

107          KK     C-3
108          KM    COMBINE C-2 & CREV
109          HC       2
             *

110          KK     R-3
111          KM    ROUTE C-3 TO C-4
112          KM      LEN    SLOPE      n            SHAPE      BW      SS
113          RD      820    0.005   0.020       0    TRAP      80       2
             *

114          KK     DREV
115          PB     3.41
116          BA   .13140
117          LS       0        86
118          UD    0.202
             *

119          KK     C-4
120          KM    COMBINE C-3 & DREV
121          HC       2
             *
```



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

122          KK     EREV
123          PB     3.41
```

```
124          BA  .16304
125          LS        0       86
126          UD   0.242
             *

127          KK     C-5
128          KM    COMBINE C-4 & EREV
129          HC        2
             *

130          KK     R-4
131          KM   ROUTE C-5 TO C-6
132          KM      LEN    SLOPE      n            SHAPE      BW       SS
133          RD     1415    0.005    0.020       0    TRAP      80        2
             *

134          KK     FREV
135          PB     3.46
136          BA  .36194
137          LS        0       86
138          UD   0.305
             *

139          KK     C-6
140          KM    COMBINE C-5 & FREV
141          HC        2
             *

142          KK     GREV
143          PB     3.37
144          BA  .02394
145          LS        0       86
146          UD   0.127
             *

147          KK     C-7
148          KM    COMBINE C-6 & GREV
149          HC        2
             *

150          KK     R-5
151          KM   ROUTE C-7 TO C-8
152          KM      LEN     SLOPE      n            SHAPE      BW       SS
153          RD     3500   0.0575    0.025       0    TRAP      50        3
             *

154          KK     C-8
155          KM    COMBINE CP1, INT6, & C-7
156          HC        3
             *
```

1 HEC-1 INPUT PAGE 5

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

157          KK    INT3
158          PB    3.34
159          BA   .0184
160          LS        0    89.9
161          UD    .170
             *

162          KK    INT4
163          PB    3.33
164          BA   .0110
165          LS        0    89.7
166          UD    .072
             *

167          KK    1-14
168          PB    3.31
169          BA   .0019
170          LS        0    86.9
171          UD    .100
             *

172          KK    1-15
173          PB    3.32
174          BA   .0044
175          LS        0      87
176          UD    .100
             *

177          KK    1-16
178          PB    3.31
179          BA   .0024
180          LS        0      87
181          UD    .100
             *

182          KK     CP2
183          KM    COMBINE C-8, INT3, INT4, 1-14, 1-15, AND 1-16
184          HC        6
             *

185          KK    INT5
186          PB    3.28
187          BA   .0024
188          LS        0    90.0
189          UD    .067
             *

190          KK    1-17
191          PB    3.28
192          BA   .0033
193          LS        0      87
```

```
 194          UD    .100
              *
```



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

 195          KK    1-18
 196          PB    3.28
 197          BA   .0046
 198          LS       0    86.7
 199          UD    .100
              *

 200          KK     CP3
 201          KM    COMBINE CP2, INT5, 1-17 AND 1-18
 202          HC       4
              *

 203          KK   INTDB
 204          KO       1
 205          KM   DETENTION BASIN CHEYENNE AND BELTWAY
 206          KM   LOW-FLOW OUTLET IS 96" PIPE
 207          RS       1    STOR       0
 208          SV       0    0.07    0.80   12.71   18.75   25.05   85.95   95.04  124.21
 209          SV  135.14  200.27  243.11  258.06  273.36  289.00  304.99
 210          SE    2990    2991    2992    2995    2996    2997    3005    3006    3009
 211          SE    3010    3015    3018    3019    3020    3021    3022
 212          SL  2994.1   50.27     0.7     0.5
 213          SS  3021.9     200     2.6     1.5
              *

 214          KK    1-4R
 215          PB    3.44
 216          BA   .0535
 217          LS       0      87
 218          UD    .100
              *

 219          KK    1-5R
 220          PB    3.42
 221          BA   .0336
 222          LS       0      87
 223          UD    .100
              *

 224          KK     CP4
 225          KM    COMBINE 1-4R AND 1-5R
 226          HC       2
              *

 227          KK      R3
 228          KM    ROUTE CP4 TO CP7
 229          KM     LEN   SLOPE     n             SHAPE      BW      SS
 230          RD    1790  0.0575   0.025       0    TRAP      20       3
              *
```



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

 231          KK    1-6R
 232          PB    3.43
 233          BA   .0151
 234          LS       0      87
 235          UD    .100
              *

 236          KK    1-7R
 237          PB    3.44
 238          BA   .0270
 239          LS       0      87
 240          UD    .100
              *

 241          KK     CP5
 242          KM    COMBINE 1-6R AND 1-7R
 243          HC       2
              *

 244          KK      R4
 245          KM    ROUTE CP5 TO CP7
 246          KM     LEN   SLOPE     n             SHAPE      BW      SS
 247          RD    2470  0.0433   0.025       0    TRAP      20       3
              *

 248          KK    1-8R
 249          PB    3.42
 250          BA   .0026
 251          LS       0      87
 252          UD    .100
              *

 253          KK   1-10R
 254          PB    3.41
 255          BA   .0524
 256          LS       0      87
 257          UD    .100
              *

 258          KK     CP6
 259          KM    COMBINE 1-8R AND 1-10R
 260          HC       2
              *

 261          KK      R5
```

```
 262          KM   ROUTE CP6 TO CP7
 263          KM     LEN   SLOPE     n            SHAPE      BW      SS
 264          RD    2470  0.0433   0.025       0    TRAP      20       3
              *
```



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

 265          KK    INT1
 266          PB    3.38
 267          BA   .1980
 268          LS       0    90.9
 269          UD    .125
              *

 270          KK    INT2
 271          PB    3.37
 272          BA   .0051
 273          LS       0    89.3
 274          UD    .079
              *

 275          KK      R6
 276          KM   ROUTE INT2 TO CP7
 277          KM   SHEET FLOW
 278          KM     LEN   SLOPE     n            SHAPE      BW      SS
 279          RD    1350  0.0630   0.025       0    TRAP       5      50
              *

 280          KK     CP7
 281          KM    COMBINE CP4, CP5, CP6, INT1, AND INT2
 282          HC       5
              *

 283          KK    1-13
 284          PB    3.34
 285          BA   .0009
 286          LS       0      87
 287          UD    .100
              *

 288          KK   LMT1R
 289          PB    3.44
 290          BA  1.959
 291          LS       0    87.4
 292          UD    .435
              *

 293          KK     CP8
 294          KM    COMBINE CP7, 1-13, AND LMT1R
 295          HC       3
              *
 296          ZZ
```

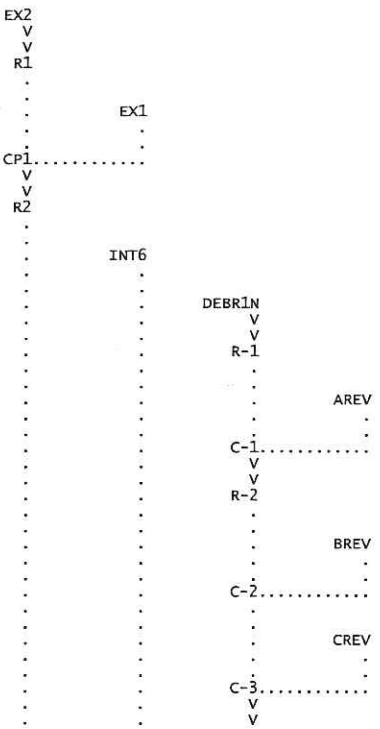
1

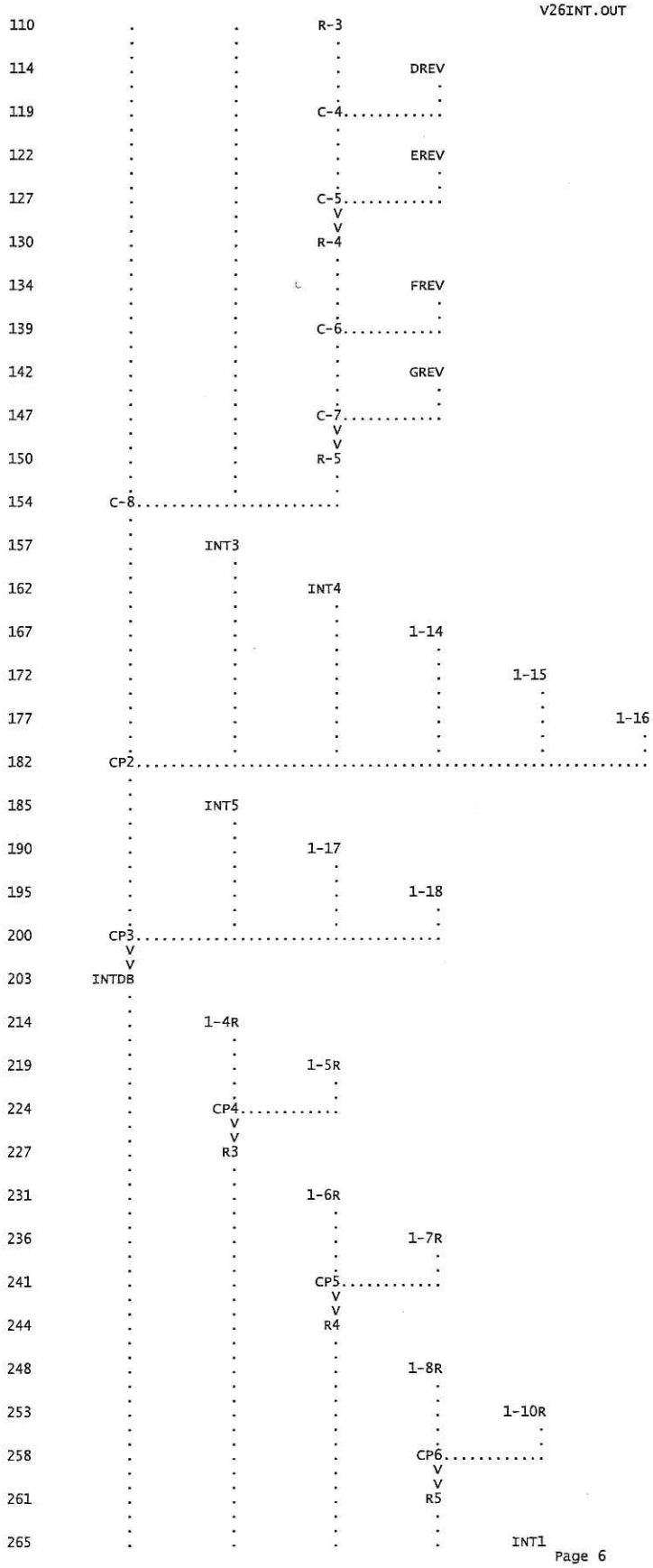
SCHEMATIC DIAGRAM OF STREAM NETWORK

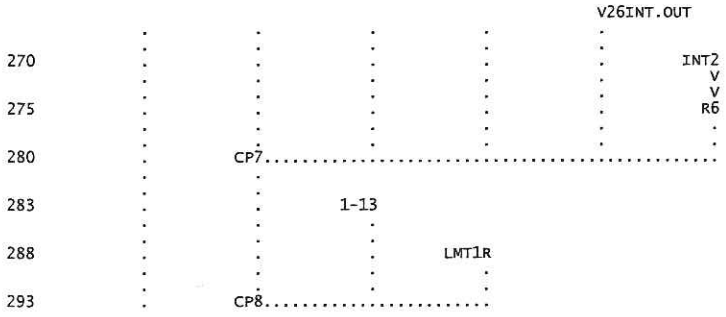
INPUT LINE NO.

(V) ROUTING (---->) DIVERSION OR PUMP FLOW

(.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW




110
R-3
114
DREV
119
C-4
122
EREV
127
C-5
130
R-4
134
FREV
139
C-6
142
GREV
147
C-7
150
R-5
154
C-8
157
INT3
162
INT4
167
1-14
172
1-15
177
1-16
182
CP2
185
INT5
190
1-17
195
1-18
200
CP3
203
INTDB
214
1-4R
219
1-5R
224
CP4
227
R3
231
1-6R
236
1-7R
241
CP5
244
R4
248
1-8R
253
1-10R
258
CP6
261
R5
265
INT1



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   29OCT15  TIME  13:47:13   *
*                                       *
*****************************************
```

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

```
*****************************************************************
* .............................................................. *
* :                SUMMERLIN VILLAGE 26                        : *
* :                 INTERIM  CONDITION                         : *
* :       THIS MODEL DETERMINES THE RUNOFF DURING              : *
* :           INTERIM DEVELOPMENT CONDITIONS                   : *
* :............................................................: *
* :              RETURN PERIOD_ _ _ _100-YEAR                  : *
* :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3               : *
* :              PROJECT NO_ _ _ _ _ 764.204.013               : *
* :              FILENAME_ _ _ _ _ _ V26INT.H1                 : *
* :              DATE_ _ _ _ _ _ _ _ 10/19/15                  : *
* :              MODELED BY_ _ _ _ _ REH/BJK/DBC               : *
* :                                                            : *
* :             DEPTH AREA REDUCTION FACTORS:                  : *
* :               AREA                DARF                     : *
* :             0.00 TO 0.24 SQ MI     1.00                    : *
* :             0.25 TO 0.49 SQ MI     0.99                    : *
* :             0.50 TO 0.99 SQ MI     0.98                    : *
* :             1.00 TO 1.24 SQ MI     0.97                    : *
* :             1.25 TO 1.50 SQ MI     0.96                    : *
* :             1.51 TO 1.74 SQ MI     0.95                    : *
* :             1.75 TO 1.99 SQ MI     0.94                    : *
* :             2.00 TO 2.99 SQ MI     0.93                    : *
* :             3.00 TO 3.99 SQ MI     0.92                    : *
* :             4.00 TO 4.99 SQ MI     0.91                    : *
* :             6.00 TO 7.99 SQ MI     0.90                    : *
* :............................................................: *
*****************************************************************
```

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

   IT          HYDROGRAPH TIME DATA
                     NMIN           5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME         0000  STARTING TIME
                       NQ          300  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      2   0  ENDING DATE
                   NDTIME         0055  ENDING TIME
                   ICENT            19  CENTURY MARK

                 COMPUTATION INTERVAL      .08 HOURS
                     TOTAL TIME BASE    24.92 HOURS

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

   JP          MULTI-PLAN OPTION
                    NPLAN          1  NUMBER OF PLANS

   JR          MULTI-RATIO OPTION
                  RATIOS OF PRECIPITATION
                 1.00       .99       .98       .94       .93       .92       .91       .90
```

*** ***

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

```
203 KK      *     INTDB  *
            *            *
            ***************

204 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                        DETENTION BASIN CHEYENNE AND BELTWAY
                        LOW-FLOW OUTLET IS 96" PIPE

                HYDROGRAPH ROUTING DATA

207 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC        .00  INITIAL CONDITION
                         X        .00 WORKING R AND D COEFFICIENT

208 SV            STORAGE         .0       .1       .8      12.7      18.8      25.0      85.9      95.0     124.2        .0
                                135.1     200.3     243.1     258.1     273.4     289.0     305.0

210 SE          ELEVATION     2990.00   2991.00   2992.00   2995.00   2996.00   2997.00   3005.00   3006.00   3009.00      .00
                              3010.00   3015.00   3018.00   3019.00   3020.00   3021.00   3022.00

212 SL          LOW-LEVEL OUTLET
                     ELEVL     2994.10  ELEVATION AT CENTER OF OUTLET
                     CAREA       50.27  CROSS-SECTIONAL AREA
                      COQL         .70  COEFFICIENT
                      EXPL         .50  EXPONENT OF HEAD

213 SS          SPILLWAY
                      CREL     3021.90  SPILLWAY CREST ELEVATION
                     SPWID      200.00  SPILLWAY WIDTH
                      COQW        2.60  WEIR COEFFICIENT
                      EXPW        1.50  EXPONENT OF HEAD
```

***

COMPUTED OUTFLOW-ELEVATION DATA

OUTFLOW	.00	.00	565.00	619.92	686.70	769.58	875.22	1014.48	1206.44	1488.00
ELEVATION	2990.00	2994.10	2998.11	2998.93	3000.02	3001.54	3003.72	3007.02	3012.37	3021.90
OUTFLOW	1488.23	1488.61	1489.25	1490.24	1491.63	1493.50	1495.91	1498.95	1502.65	1507.14
ELEVATION	3021.90	3021.91	3021.91	3021.92	3021.93	3021.94	3021.95	3021.97	3021.98	3022.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.07	.80	9.14	12.71	18.75	25.05	33.49	39.71	48.05
OUTFLOW	.00	.00	.00	.00	267.72	389.00	480.59	565.00	619.92	686.70
ELEVATION	2990.00	2991.00	2992.00	2994.10	2995.00	2996.00	2997.00	2998.11	2998.93	3000.02
STORAGE	59.58	76.19	85.95	95.04	104.98	124.21	135.14	166.07	200.27	243.11
OUTFLOW	769.58	875.22	931.74	973.54	1014.48	1089.36	1125.33	1206.44	1290.19	1379.68
ELEVATION	3001.54	3003.72	3005.00	3006.00	3007.02	3009.00	3010.00	3012.37	3015.00	3018.00
STORAGE	258.06	273.36	289.00	303.39	303.62	303.88	304.05	304.25	304.47	304.72
OUTFLOW	1408.25	1436.25	1463.72	1488.00	1489.25	1491.63	1493.50	1495.91	1498.95	1502.65
ELEVATION	3019.00	3020.00	3021.00	3021.90	3021.91	3021.93	3021.94	3021.95	3021.97	3021.98
STORAGE	304.99									
OUTFLOW	1507.14									
ELEVATION	3022.00									

```
WARNING --- ROUTED OUTFLOW (   1667.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   1834.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   1947.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   2022.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   2071.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   2102.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   2121.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   2129.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   2127.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   2114.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   2086.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   2044.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   1988.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   1919.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   1839.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   1751.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   1658.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (   1561.) IS GREATER THAN MAXIMUM OUTFLOW (   1507.) IN STORAGE-OUTFLOW TABLE
```

****

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	888.	78.5	3004.0	1		1640	201	0.	9.1	2994.1
1		0005	2	0.	.0	2990.0	1		0825	102	852.	72.5	3003.2	1		1645	202	0.	9.1	2994.1
1		0010	3	0.	.0	2990.0	1		0830	103	815.	66.8	3002.5	1		1650	203	0.	9.1	2994.1
1		0015	4	0.	.0	2990.0	1		0835	104	780.	61.3	3001.8	1		1655	204	0.	9.1	2994.1
1		0020	5	0.	.0	2990.1	1		0840	105	744.	56.0	3001.1	1		1700	205	0.	9.1	2994.1
1		0025	6	0.	.0	2990.4	1		0845	106	708.	51.0	3000.4	1		1705	206	0.	9.1	2994.1
1		0030	7	0.	.1	2991.0	1		0850	107	672.	46.3	2999.8	1		1710	207	0.	9.1	2994.1
1		0035	8	0.	.2	2991.2	1		0855	108	636.	41.8	2999.2	1		1715	208	0.	9.1	2994.1
1		0040	9	0.	.4	2991.4	1		0900	109	600.	37.5	2998.6	1		1720	209	0.	9.1	2994.1
1		0045	10	0.	.6	2991.7	1		0905	110	565.	33.5	2998.1	1		1725	210	0.	9.1	2994.1
1		0050	11	0.	.8	2992.0	1		0910	111	527.	29.7	2997.6	1		1730	211	0.	9.1	2994.1
1		0055	12	0.	1.1	2992.1	1		0915	112	492.	26.2	2997.2	1		1735	212	0.	9.1	2994.1
1		0100	13	0.	1.4	2992.2	1		0920	113	450.	23.0	2996.7	1		1740	213	0.	9.1	2994.1
1		0105	14	0.	1.7	2992.2	1		0925	114	407.	20.0	2996.2	1		1745	214	0.	9.1	2994.1
1		0110	15	0.	2.0	2992.3	1		0930	115	361.	17.4	2995.8	1		1750	215	0.	9.1	2994.1
1		0115	16	0.	2.3	2992.4	1		0935	116	315.	15.0	2995.4	1		1755	216	0.	9.1	2994.1
1		0120	17	0.	2.7	2992.5	1		0940	117	274.	13.0	2995.1	1		1800	217	0.	9.1	2994.1
1		0125	18	0.	3.1	2992.6	1		0945	118	175.	11.5	2994.7	1		1805	218	0.	9.1	2994.1
1		0130	19	0.	3.5	2992.7	1		0950	119	103.	10.5	2994.4	1		1810	219	0.	9.1	2994.1
1		0135	20	0.	4.2	2992.8	1		0955	120	61.	9.9	2994.3	1		1815	220	0.	9.1	2994.1
1		0140	21	0.	5.0	2993.1	1		1000	121	36.	9.6	2994.2	1		1820	221	0.	9.1	2994.1
1		0145	22	0.	6.0	2993.3	1		1005	122	21.	9.4	2994.2	1		1825	222	0.	9.1	2994.1
1		0150	23	0.	7.3	2993.6	1		1010	123	12.	9.3	2994.1	1		1830	223	0.	9.1	2994.1
1		0155	24	0.	8.8	2994.0	1		1015	124	7.	9.2	2994.1	1		1835	224	0.	9.1	2994.1
1		0200	25	81.	10.2	2994.4	1		1020	125	4.	9.2	2994.1	1		1840	225	0.	9.1	2994.1
1		0205	26	150.	11.1	2994.6	1		1025	126	3.	9.2	2994.1	1		1845	226	0.	9.1	2994.1
1		0210	27	192.	11.7	2994.7	1		1030	127	2.	9.2	2994.1	1		1850	227	0.	9.1	2994.1
1		0215	28	218.	12.0	2994.8	1		1035	128	1.	9.1	2994.1	1		1855	228	0.	9.1	2994.1
1		0220	29	239.	12.3	2994.9	1		1040	129	1.	9.1	2994.1	1		1900	229	0.	9.1	2994.1
1		0225	30	263.	12.6	2995.0	1		1045	130	0.	9.1	2994.1	1		1905	230	0.	9.1	2994.1
1		0230	31	276.	13.1	2995.1	1		1050	131	0.	9.1	2994.1	1		1910	231	0.	9.1	2994.1
1		0235	32	288.	13.7	2995.2	1		1055	132	0.	9.1	2994.1	1		1915	232	0.	9.1	2994.1
1		0240	33	304.	14.5	2995.3	1		1100	133	0.	9.1	2994.1	1		1920	233	0.	9.1	2994.1
1		0245	34	321.	15.4	2995.4	1		1105	134	0.	9.1	2994.1	1		1925	234	0.	9.1	2994.1
1		0250	35	338.	16.2	2995.6	1		1110	135	0.	9.1	2994.1	1		1930	235	0.	9.1	2994.1
1		0255	36	356.	17.1	2995.7	1		1115	136	0.	9.1	2994.1	1		1935	236	0.	9.1	2994.1
1		0300	37	374.	18.0	2995.9	1		1120	137	0.	9.1	2994.1	1		1940	237	0.	9.1	2994.1
1		0305	38	392.	19.0	2996.0	1		1125	138	0.	9.1	2994.1	1		1945	238	0.	9.1	2994.1
1		0310	39	409.	20.1	2996.2	1		1130	139	0.	9.1	2994.1	1		1950	239	0.	9.1	2994.1
1		0315	40	435.	21.9	2996.5	1		1135	140	0.	9.1	2994.1	1		1955	240	0.	9.1	2994.1
1		0320	41	482.	25.2	2997.0	1		1140	141	0.	9.1	2994.1	1		2000	241	0.	9.1	2994.1
1		0325	42	544.	31.4	2997.8	1		1145	142	0.	9.1	2994.1	1		2005	242	0.	9.1	2994.1
1		0330	43	642.	42.4	2999.3	1		1150	143	0.	9.1	2994.1	1		2010	243	0.	9.1	2994.1
1		0335	44	772.	60.0	3001.6	1		1155	144	0.	9.1	2994.1	1		2015	244	0.	9.1	2994.1
1		0340	45	920.	84.0	3004.7	1		1200	145	0.	9.1	2994.1	1		2020	245	0.	9.1	2994.1
1		0345	46	1045.	112.8	3007.8	1		1205	146	0.	9.1	2994.1	1		2025	246	0.	9.1	2994.1
1		0350	47	1149.	144.3	3010.7	1		1210	147	0.	9.1	2994.1	1		2030	247	0.	9.1	2994.1
1		0355	48	1231.	176.1	3013.1	1		1215	148	0.	9.1	2994.1	1		2035	248	0.	9.1	2994.1
1		0400	49	1303.	206.6	3015.4	1		1220	149	0.	9.1	2994.1	1		2040	249	0.	9.1	2994.1
1		0405	50	1362.	234.7	3017.4	1		1225	150	0.	9.1	2994.1	1		2045	250	0.	9.1	2994.1
1		0410	51	1412.	260.0	3019.1	1		1230	151	0.	9.1	2994.1	1		2050	251	0.	9.1	2994.1
1		0415	52	1451.	281.9	3020.5	1		1235	152	0.	9.1	2994.1	1		2055	252	0.	9.1	2994.1
1		0420	53	1483.	300.3	3021.7	1		1240	153	0.	9.1	2994.1	1		2100	253	0.	9.1	2994.1
1		0425	54	1667.	314.7	3022.6	1		1245	154	0.	9.1	2994.1	1		2105	254	0.	9.1	2994.1
1		0430	55	1834.	324.9	3023.2	1		1250	155	0.	9.1	2994.1	1		2110	255	0.	9.1	2994.1
1		0435	56	1947.	331.8	3023.7	1		1255	156	0.	9.1	2994.1	1		2115	256	0.	9.1	2994.1
1		0440	57	2022.	336.3	3024.0	1		1300	157	0.	9.1	2994.1	1		2120	257	0.	9.1	2994.1
1		0445	58	2071.	339.3	3024.1	1		1305	158	0.	9.1	2994.1	1		2125	258	0.	9.1	2994.1
1		0450	59	2102.	341.2	3024.3	1		1310	159	0.	9.1	2994.1	1		2130	259	0.	9.1	2994.1
1		0455	60	2121.	342.3	3024.3	1		1315	160	0.	9.1	2994.1	1		2135	260	0.	9.1	2994.1
1		0500	61	2129.	342.8	3024.4	1		1320	161	0.	9.1	2994.1	1		2140	261	0.	9.1	2994.1
1		0505	62	2127.	342.7	3024.4	1		1325	162	0.	9.1	2994.1	1		2145	262	0.	9.1	2994.1
1		0510	63	2114.	341.9	3024.3	1		1330	163	0.	9.1	2994.1	1		2150	263	0.	9.1	2994.1
1		0515	64	2086.	340.3	3024.2	1		1335	164	0.	9.1	2994.1	1		2155	264	0.	9.1	2994.1
1		0520	65	2044.	337.7	3024.0	1		1340	165	0.	9.1	2994.1	1		2200	265	0.	9.1	2994.1
1		0525	66	1988.	334.3	3023.8	1		1345	166	0.	9.1	2994.1	1		2205	266	0.	9.1	2994.1
1		0530	67	1919.	330.0	3023.6	1		1350	167	0.	9.1	2994.1	1		2210	267	0.	9.1	2994.1
1		0535	68	1839.	325.2	3023.3	1		1355	168	0.	9.1	2994.1	1		2215	268	0.	9.1	2994.1
1		0540	69	1751.	319.9	3022.9	1		1400	169	0.	9.1	2994.1	1		2220	269	0.	9.1	2994.1
1		0545	70	1658.	314.2	3022.6	1		1405	170	0.	9.1	2994.1	1		2225	270	0.	9.1	2994.1
1		0550	71	1561.	308.3	3022.2	1		1410	171	0.	9.1	2994.1	1		2230	271	0.	9.1	2994.1
1		0555	72	1486.	302.2	3021.8	1		1415	172	0.	9.1	2994.1	1		2235	272	0.	9.1	2994.1
1		0600	73	1475.	295.8	3021.4	1		1420	173	0.	9.1	2994.1	1		2240	273	0.	9.1	2994.1
1		0605	74	1464.	289.0	3021.0	1		1425	174	0.	9.1	2994.1	1		2245	274	0.	9.1	2994.1
1		0610	75	1451.	281.8	3020.5	1		1430	175	0.	9.1	2994.1	1		2250	275	0.	9.1	2994.1
1		0615	76	1438.	274.3	3020.1	1		1435	176	0.	9.1	2994.1	1		2255	276	0.	9.1	2994.1
1		0620	77	1424.	266.4	3019.5	1		1440	177	0.	9.1	2994.1	1		2300	277	0.	9.1	2994.1
1		0625	78	1409.	258.4	3019.0	1		1445	178	0.	9.1	2994.1	1		2305	278	0.	9.1	2994.1
1		0630	79	1393.	250.2	3018.5	1		1450	179	0.	9.1	2994.1	1		2310	279	0.	9.1	2994.1
1		0635	80	1377.	241.8	3017.9	1		1455	180	0.	9.1	2994.1	1		2315	280	0.	9.1	2994.1
1		0640	81	1359.	233.4	3017.3	1		1500	181	0.	9.1	2994.1	1		2320	281	0.	9.1	2994.1
1		0645	82	1342.	224.8	3016.7	1		1505	182	0.	9.1	2994.1	1		2325	282	0.	9.1	2994.1
1		0650	83	1324.	216.3	3016.1	1		1510	183	0.	9.1	2994.1	1		2330	283	0.	9.1	2994.1
1		0655	84	1306.	207.7	3015.5	1		1515	184	0.	9.1	2994.1	1		2335	284	0.	9.1	2994.1
1		0700	85	1288.	199.2	3014.9	1		1520	185	0.	9.1	2994.1	1		2340	285	0.	9.1	2994.1
1		0705	86	1267.	190.7	3014.3	1		1525	186	0.	9.1	2994.1	1		2345	286	0.	9.1	2994.1
1		0710	87	1246.	182.3	3013.6	1		1530	187	0.	9.1	2994.1	1		2350	287	0.	9.1	2994.1
1		0715	88	1226.	174.0	3013.0	1		1535	188	0.	9.1	2994.1	1		2355	288	0.	9.1	2994.1
1		0720	89	1206.	165.8	3012.4	1		1540	189	0.	9.1	2994.1	2		0000	289	0.	9.1	2994.1
1		0725	90	1184.	157.7	3011.7	1		1545	190	0.	9.1	2994.1	2		0005	290	0.	9.1	2994.1
1		0730	91	1163.	149.7	3011.1	1		1550	191	0.	9.1	2994.1	2		0010	291	0.	9.1	2994.1
1		0735	92	1143.	141.8	3010.5	1		1555	192	0.	9.1	2994.1	2		0015	292	0.	9.1	2994.1
1		0740	93	1122.	134.1	3009.9	1		1600	193	0.	9.1	2994.1	2		0020	293	0.	9.1	2994.1
1		0745	94	1097.	126.5	3009.2	1		1605	194	0.	9.1	2994.1	2		0025	294	0.	9.1	2994.1
1		0750	95	1069.	119.0	3008.5	1		1610	195	0.	9.1	2994.1	2		0030	295	0.	9.1	2994.1
1		0755	96	1041.	111.8	3007.7	1		1615	196	0.	9.1	2994.1	2		0035	296	0.	9.1	2994.1
1		0800	97	1013.	104.7	3007.0	1		1620	197	0.	9.1	2994.1	2		0040	297	0.	9.1	2994.1
1		0805	98	985.	97.9	3006.3	1		1625	198	0.	9.1	2994.1	2		0045	298	0.	9.1	2994.1
1		0810	99	956.	91.2	3005.6	1		1630	199	0.	9.1	2994.1	2		0050	299	0.	9.1	2994.1
1		0815	100	925.	84.7	3004.8	1		1635	200	0.	9.1	2994.1	2		0055	300	0.	9.1	2994.1

PEAK FLOW (CFS)	TIME (HR)		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	24.92-HR
2129.	5.00	(CFS)	1295.	348.	335.	335.
		(INCHES)	1.964	2.109	2.109	2.109
		(AC-FT)	642.	689.	689.	689.

PEAK STORAGE (AC-FT)	TIME (HR)	6-HR	MAXIMUM AVERAGE STORAGE 24-HR	72-HR	24.92-HR
343.	5.00	196.	56.	54.	54.

PEAK STAGE (FEET)	TIME (HR)	6-HR	MAXIMUM AVERAGE STAGE 24-HR	72-HR	24.92-HR
3024.37	5.00	3013.35	2998.97	2998.67	2998.67

CUMULATIVE AREA = 6.13 SQ MI

WARNING --- ROUTED OUTFLOW (1577.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1749.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1867.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1947.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (2000.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (2035.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (2058.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (2070.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (2072.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (2062.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (2037.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1999.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1945.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1879.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1802.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1717.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1626.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (1532.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION INTDB
PLAN 1, RATIO = .99

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	882.	77.3	3003.9	1		1640	201	0.	9.1	2994.1
1		0005	2	0.	.0	2990.0	1		0825	102	845.	71.4	3003.1	1		1645	202	0.	9.1	2994.1
1		0010	3	0.	.0	2990.0	1		0830	103	808.	65.7	3002.3	1		1650	203	0.	9.1	2994.1
1		0015	4	0.	.0	2990.0	1		0835	104	774.	60.2	3001.6	1		1655	204	0.	9.1	2994.1
1		0020	5	0.	.0	2990.1	1		0840	105	737.	55.0	3000.9	1		1700	205	0.	9.1	2994.1
1		0025	6	0.	.0	2990.4	1		0845	106	701.	50.1	3000.3	1		1705	206	0.	9.1	2994.1
1		0030	7	0.	.1	2991.0	1		0850	107	665.	45.4	2999.7	1		1710	207	0.	9.1	2994.1
1		0035	8	0.	.2	2991.2	1		0855	108	630.	40.9	2999.1	1		1715	208	0.	9.1	2994.1
1		0040	9	0.	.3	2991.4	1		0900	109	594.	36.7	2998.5	1		1720	209	0.	9.1	2994.1
1		0045	10	0.	.5	2991.6	1		0905	110	558.	32.8	2998.0	1		1725	210	0.	9.1	2994.1
1		0050	11	0.	.8	2992.0	1		0910	111	521.	29.0	2997.5	1		1730	211	0.	9.1	2994.1
1		0055	12	0.	1.1	2992.1	1		0915	112	486.	25.6	2997.1	1		1735	212	0.	9.1	2994.1
1		0100	13	0.	1.3	2992.1	1		0920	113	442.	22.4	2996.6	1		1740	213	0.	9.1	2994.1
1		0105	14	0.	1.6	2992.2	1		0925	114	400.	19.5	2996.1	1		1745	214	0.	9.1	2994.1
1		0110	15	0.	1.9	2992.3	1		0930	115	352.	16.9	2995.7	1		1750	215	0.	9.1	2994.1
1		0115	16	0.	2.2	2992.4	1		0935	116	306.	14.6	2995.3	1		1755	216	0.	9.1	2994.1
1		0120	17	0.	2.5	2992.4	1		0940	117	264.	12.7	2995.0	1		1800	217	0.	9.1	2994.1
1		0125	18	0.	2.9	2992.5	1		0945	118	156.	11.2	2994.6	1		1805	218	0.	9.1	2994.1
1		0130	19	0.	3.3	2992.6	1		0950	119	92.	10.4	2994.4	1		1810	219	0.	9.1	2994.1
1		0135	20	0.	3.9	2992.8	1		0955	120	54.	9.9	2994.3	1		1815	220	0.	9.1	2994.1
1		0140	21	0.	4.7	2993.0	1		1000	121	32.	9.6	2994.2	1		1820	221	0.	9.1	2994.1
1		0145	22	0.	5.7	2993.2	1		1005	122	19.	9.4	2994.2	1		1825	222	0.	9.1	2994.1
1		0150	23	0.	7.0	2993.6	1		1010	123	11.	9.3	2994.1	1		1830	223	0.	9.1	2994.1
1		0155	24	0.	8.5	2993.9	1		1015	124	7.	9.2	2994.1	1		1835	224	0.	9.1	2994.1
1		0200	25	56.	9.9	2994.3	1		1020	125	4.	9.2	2994.1	1		1840	225	0.	9.1	2994.1
1		0205	26	132.	10.9	2994.5	1		1025	126	2.	9.2	2994.1	1		1845	226	0.	9.1	2994.1
1		0210	27	178.	11.5	2994.7	1		1030	127	1.	9.2	2994.1	1		1850	227	0.	9.1	2994.1
1		0215	28	207.	11.9	2994.8	1		1035	128	1.	9.1	2994.1	1		1855	228	0.	9.1	2994.1
1		0220	29	229.	12.2	2994.9	1		1040	129	0.	9.1	2994.1	1		1900	229	0.	9.1	2994.1
1		0225	30	254.	12.5	2995.0	1		1045	130	0.	9.1	2994.1	1		1905	230	0.	9.1	2994.1
1		0230	31	273.	13.0	2995.0	1		1050	131	0.	9.1	2994.1	1		1910	231	0.	9.1	2994.1
1		0235	32	285.	13.6	2995.1	1		1055	132	0.	9.1	2994.1	1		1915	232	0.	9.1	2994.1
1		0240	33	299.	14.3	2995.3	1		1100	133	0.	9.1	2994.1	1		1920	233	0.	9.1	2994.1
1		0245	34	316.	15.1	2995.4	1		1105	134	0.	9.1	2994.1	1		1925	234	0.	9.1	2994.1
1		0250	35	332.	15.9	2995.5	1		1110	135	0.	9.1	2994.1	1		1930	235	0.	9.1	2994.1
1		0255	36	349.	16.8	2995.7	1		1115	136	0.	9.1	2994.1	1		1935	236	0.	9.1	2994.1
1		0300	37	367.	17.6	2995.8	1		1120	137	0.	9.1	2994.1	1		1940	237	0.	9.1	2994.1
1		0305	38	386.	18.6	2996.0	1		1125	138	0.	9.1	2994.1	1		1945	238	0.	9.1	2994.1

1	0310	39	403.	19.7	2996.2	*	1	1130	139	0.	9.1	2994.1	*	1	1950	239	0.	9.1	2994.1
1	0315	40	428.	21.5	2996.4	*	1	1135	140	0.	9.1	2994.1	*	1	1955	240	0.	9.1	2994.1
1	0320	41	474.	24.6	2996.9	*	1	1140	141	0.	9.1	2994.1	*	1	2000	241	0.	9.1	2994.1
1	0325	42	536.	30.6	2997.7	*	1	1145	142	0.	9.1	2994.1	*	1	2005	242	0.	9.1	2994.1
1	0330	43	634.	41.5	2999.2	*	1	1150	143	0.	9.1	2994.1	*	1	2010	243	0.	9.1	2994.1
1	0335	44	763.	58.7	3001.4	*	1	1155	144	0.	9.1	2994.1	*	1	2015	244	0.	9.1	2994.1
1	0340	45	910.	82.2	3004.5	*	1	1200	145	0.	9.1	2994.1	*	1	2020	245	0.	9.1	2994.1
1	0345	46	1036.	110.6	3007.6	*	1	1205	146	0.	9.1	2994.1	*	1	2025	246	0.	9.1	2994.1
1	0350	47	1142.	141.5	3010.5	*	1	1210	147	0.	9.1	2994.1	*	1	2030	247	0.	9.1	2994.1
1	0355	48	1223.	172.7	3012.9	*	1	1215	148	0.	9.1	2994.1	*	1	2035	248	0.	9.1	2994.1
1	0400	49	1295.	202.6	3015.2	*	1	1220	149	0.	9.1	2994.1	*	1	2040	249	0.	9.1	2994.1
1	0405	50	1353.	230.3	3017.1	*	1	1225	150	0.	9.1	2994.1	*	1	2045	250	0.	9.1	2994.1
1	0410	51	1403.	255.1	3018.8	*	1	1230	151	0.	9.1	2994.1	*	1	2050	251	0.	9.1	2994.1
1	0415	52	1442.	276.7	3020.2	*	1	1235	152	0.	9.1	2994.1	*	1	2055	252	0.	9.1	2994.1
1	0420	53	1474.	294.8	3021.4	*	1	1240	153	0.	9.1	2994.1	*	1	2100	253	0.	9.1	2994.1
1	0425	54	1577.	309.2	3022.3	*	1	1245	154	0.	9.1	2994.1	*	1	2105	254	0.	9.1	2994.1
1	0430	55	1749.	319.7	3022.9	*	1	1250	155	0.	9.1	2994.1	*	1	2110	255	0.	9.1	2994.1
1	0435	56	1867.	326.9	3023.4	*	1	1255	156	0.	9.1	2994.1	*	1	2115	256	0.	9.1	2994.1
1	0440	57	1947.	331.7	3023.7	*	1	1300	157	0.	9.1	2994.1	*	1	2120	257	0.	9.1	2994.1
1	0445	58	2000.	335.0	3023.9	*	1	1305	158	0.	9.1	2994.1	*	1	2125	258	0.	9.1	2994.1
1	0450	59	2035.	337.1	3024.0	*	1	1310	159	0.	9.1	2994.1	*	1	2130	259	0.	9.1	2994.1
1	0455	60	2058.	338.5	3024.1	*	1	1315	160	0.	9.1	2994.1	*	1	2135	260	0.	9.1	2994.1
1	0500	61	2070.	339.3	3024.1	*	1	1320	161	0.	9.1	2994.1	*	1	2140	261	0.	9.1	2994.1
1	0505	62	2072.	339.4	3024.1	*	1	1325	162	0.	9.1	2994.1	*	1	2145	262	0.	9.1	2994.1
1	0510	63	2062.	338.7	3024.1	*	1	1330	163	0.	9.1	2994.1	*	1	2150	263	0.	9.1	2994.1
1	0515	64	2037.	337.3	3024.0	*	1	1335	164	0.	9.1	2994.1	*	1	2155	264	0.	9.1	2994.1
1	0520	65	1999.	334.9	3023.9	*	1	1340	165	0.	9.1	2994.1	*	1	2200	265	0.	9.1	2994.1
1	0525	66	1945.	331.6	3023.7	*	1	1345	166	0.	9.1	2994.1	*	1	2205	266	0.	9.1	2994.1
1	0530	67	1879.	327.6	3023.4	*	1	1350	167	0.	9.1	2994.1	*	1	2210	267	0.	9.1	2994.1
1	0535	68	1802.	322.9	3023.1	*	1	1355	168	0.	9.1	2994.1	*	1	2215	268	0.	9.1	2994.1
1	0540	69	1717.	317.8	3022.8	*	1	1400	169	0.	9.1	2994.1	*	1	2220	269	0.	9.1	2994.1
1	0545	70	1626.	312.2	3022.5	*	1	1405	170	0.	9.1	2994.1	*	1	2225	270	0.	9.1	2994.1
1	0550	71	1532.	306.5	3022.1	*	1	1410	171	0.	9.1	2994.1	*	1	2230	271	0.	9.1	2994.1
1	0555	72	1483.	300.5	3021.7	*	1	1415	172	0.	9.1	2994.1	*	1	2235	272	0.	9.1	2994.1
1	0600	73	1472.	294.1	3021.3	*	1	1420	173	0.	9.1	2994.1	*	1	2240	273	0.	9.1	2994.1
1	0605	74	1461.	287.2	3020.9	*	1	1425	174	0.	9.1	2994.1	*	1	2245	274	0.	9.1	2994.1
1	0610	75	1448.	280.0	3020.4	*	1	1430	175	0.	9.1	2994.1	*	1	2250	275	0.	9.1	2994.1
1	0615	76	1435.	272.5	3019.9	*	1	1435	176	0.	9.1	2994.1	*	1	2255	276	0.	9.1	2994.1
1	0620	77	1420.	264.7	3019.4	*	1	1440	177	0.	9.1	2994.1	*	1	2300	277	0.	9.1	2994.1
1	0625	78	1406.	256.6	3018.9	*	1	1445	178	0.	9.1	2994.1	*	1	2305	278	0.	9.1	2994.1
1	0630	79	1390.	248.4	3018.4	*	1	1450	179	0.	9.1	2994.1	*	1	2310	279	0.	9.1	2994.1
1	0635	80	1373.	240.1	3017.8	*	1	1455	180	0.	9.1	2994.1	*	1	2315	280	0.	9.1	2994.1
1	0640	81	1356.	231.6	3017.2	*	1	1500	181	0.	9.1	2994.1	*	1	2320	281	0.	9.1	2994.1
1	0645	82	1338.	223.1	3016.6	*	1	1505	182	0.	9.1	2994.1	*	1	2325	282	0.	9.1	2994.1
1	0650	83	1320.	214.6	3016.0	*	1	1510	183	0.	9.1	2994.1	*	1	2330	283	0.	9.1	2994.1
1	0655	84	1302.	206.0	3015.4	*	1	1515	184	0.	9.1	2994.1	*	1	2335	284	0.	9.1	2994.1
1	0700	85	1284.	197.5	3014.8	*	1	1520	185	0.	9.1	2994.1	*	1	2340	285	0.	9.1	2994.1
1	0705	86	1263.	189.1	3014.1	*	1	1525	186	0.	9.1	2994.1	*	1	2345	286	0.	9.1	2994.1
1	0710	87	1242.	180.7	3013.5	*	1	1530	187	0.	9.1	2994.1	*	1	2350	287	0.	9.1	2994.1
1	0715	88	1222.	172.4	3012.9	*	1	1535	188	0.	9.1	2994.1	*	1	2355	288	0.	9.1	2994.1
1	0720	89	1202.	164.2	3012.2	*	1	1540	189	0.	9.1	2994.1	*	2	0000	289	0.	9.1	2994.1
1	0725	90	1180.	156.1	3011.6	*	1	1545	190	0.	9.1	2994.1	*	2	0005	290	0.	9.1	2994.1
1	0730	91	1159.	148.2	3011.0	*	1	1550	191	0.	9.1	2994.1	*	2	0010	291	0.	9.1	2994.1
1	0735	92	1139.	140.3	3010.4	*	1	1555	192	0.	9.1	2994.1	*	2	0015	292	0.	9.1	2994.1
1	0740	93	1117.	132.6	3009.8	*	1	1600	193	0.	9.1	2994.1	*	2	0020	293	0.	9.1	2994.1
1	0745	94	1092.	125.0	3009.1	*	1	1605	194	0.	9.1	2994.1	*	2	0025	294	0.	9.1	2994.1
1	0750	95	1064.	117.6	3008.3	*	1	1610	195	0.	9.1	2994.1	*	2	0030	295	0.	9.1	2994.1
1	0755	96	1036.	110.4	3007.6	*	1	1615	196	0.	9.1	2994.1	*	2	0035	296	0.	9.1	2994.1
1	0800	97	1008.	103.4	3006.9	*	1	1620	197	0.	9.1	2994.1	*	2	0040	297	0.	9.1	2994.1
1	0805	98	980.	96.6	3006.2	*	1	1625	198	0.	9.1	2994.1	*	2	0045	298	0.	9.1	2994.1
1	0810	99	950.	89.9	3005.4	*	1	1630	199	0.	9.1	2994.1	*	2	0050	299	0.	9.1	2994.1
1	0815	100	918.	83.5	3004.7	*	1	1635	200	0.	9.1	2994.1	*	2	0055	300	0.	9.1	2994.1
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 2072.	5.08		1276.	342.	330.	330.
		(INCHES)	1.936	2.077	2.077	2.077
		(AC-FT)	633.	679.	679.	679.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
339.	5.08	194.	56.	53.	53.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3024.15	5.08	3013.19	2998.92	2998.62	2998.62

CUMULATIVE AREA = 6.13 SQ MI

WARNING --- ROUTED OUTFLOW (1672.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1795.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1879.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1936.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1975.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (2001.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (2016.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (2021.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (2014.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1992.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1956.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1905.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1841.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1767.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1685.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1596.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION INTDB
PLAN 1, RATIO = .98

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	876.	76.2	3003.7	1		1640	201	0.	9.1	2994.1
1		0005	2	0.	.0	2990.0	1		0825	102	838.	70.3	3002.9	1		1645	202	0.	9.1	2994.1
1		0010	3	0.	.0	2990.0	1		0830	103	802.	64.7	3002.2	1		1650	203	0.	9.1	2994.1
1		0015	4	0.	.0	2990.0	1		0835	104	768.	59.3	3001.5	1		1655	204	0.	9.1	2994.1
1		0020	5	0.	.0	2990.1	1		0840	105	730.	54.1	3000.8	1		1700	205	0.	9.1	2994.1
1		0025	6	0.	.0	2990.4	1		0845	106	695.	49.2	3000.2	1		1705	206	0.	9.1	2994.1
1		0030	7	0.	.1	2991.0	1		0850	107	659.	44.6	2999.6	1		1710	207	0.	9.1	2994.1
1		0035	8	0.	.2	2991.2	1		0855	108	623.	40.2	2999.0	1		1715	208	0.	9.1	2994.1
1		0040	9	0.	.3	2991.4	1		0900	109	587.	36.0	2998.4	1		1720	209	0.	9.1	2994.1
1		0045	10	0.	.5	2991.6	1		0905	110	551.	32.1	2997.9	1		1725	210	0.	9.1	2994.1
1		0050	11	0.	.7	2991.9	1		0910	111	514.	28.4	2997.4	1		1730	211	0.	9.1	2994.1
1		0055	12	0.	1.0	2992.0	1		0915	112	480.	25.0	2997.0	1		1735	212	0.	9.1	2994.1
1		0100	13	0.	1.3	2992.1	1		0920	113	434.	21.8	2996.5	1		1740	213	0.	9.1	2994.1
1		0105	14	0.	1.5	2992.2	1		0925	114	392.	19.0	2996.0	1		1745	214	0.	9.1	2994.1
1		0110	15	0.	1.8	2992.2	1		0930	115	343.	16.5	2995.6	1		1750	215	0.	9.1	2994.1
1		0115	16	0.	2.1	2992.3	1		0935	116	299.	14.2	2995.3	1		1755	216	0.	9.1	2994.1
1		0120	17	0.	2.4	2992.4	1		0940	117	243.	12.4	2994.9	1		1800	217	0.	9.1	2994.1
1		0125	18	0.	2.7	2992.5	1		0945	118	143.	11.1	2994.6	1		1805	218	0.	9.1	2994.1
1		0130	19	0.	3.1	2992.6	1		0950	119	85.	10.3	2994.4	1		1810	219	0.	9.1	2994.1
1		0135	20	0.	3.7	2992.7	1		0955	120	50.	9.8	2994.3	1		1815	220	0.	9.1	2994.1
1		0140	21	0.	4.5	2992.9	1		1000	121	29.	9.5	2994.2	1		1820	221	0.	9.1	2994.1
1		0145	22	0.	5.5	2993.2	1		1005	122	17.	9.4	2994.2	1		1825	222	0.	9.1	2994.1
1		0150	23	0.	6.7	2993.5	1		1010	123	10.	9.3	2994.1	1		1830	223	0.	9.1	2994.1
1		0155	24	0.	8.1	2993.8	1		1015	124	6.	9.2	2994.1	1		1835	224	0.	9.1	2994.1
1		0200	25	31.	9.5	2994.2	1		1020	125	4.	9.2	2994.1	1		1840	225	0.	9.1	2994.1
1		0205	26	114.	10.7	2994.5	1		1025	126	2.	9.2	2994.1	1		1845	226	0.	9.1	2994.1
1		0210	27	165.	11.3	2994.7	1		1030	127	1.	9.2	2994.1	1		1850	227	0.	9.1	2994.1
1		0215	28	196.	11.8	2994.8	1		1035	128	1.	9.1	2994.1	1		1855	228	0.	9.1	2994.1
1		0220	29	220.	12.1	2994.8	1		1040	129	0.	9.1	2994.1	1		1900	229	0.	9.1	2994.1
1		0225	30	246.	12.4	2994.9	1		1045	130	0.	9.1	2994.1	1		1905	230	0.	9.1	2994.1
1		0230	31	270.	12.8	2995.0	1		1050	131	0.	9.1	2994.1	1		1910	231	0.	9.1	2994.1
1		0235	32	281.	13.4	2995.1	1		1055	132	0.	9.1	2994.1	1		1915	232	0.	9.1	2994.1
1		0240	33	295.	14.1	2995.2	1		1100	133	0.	9.1	2994.1	1		1920	233	0.	9.1	2994.1
1		0245	34	311.	14.8	2995.4	1		1105	134	0.	9.1	2994.1	1		1925	234	0.	9.1	2994.1
1		0250	35	327.	15.7	2995.5	1		1110	135	0.	9.1	2994.1	1		1930	235	0.	9.1	2994.1
1		0255	36	343.	16.5	2995.6	1		1115	136	0.	9.1	2994.1	1		1935	236	0.	9.1	2994.1
1		0300	37	360.	17.3	2995.8	1		1120	137	0.	9.1	2994.1	1		1940	237	0.	9.1	2994.1
1		0305	38	378.	18.2	2995.9	1		1125	138	0.	9.1	2994.1	1		1945	238	0.	9.1	2994.1
1		0310	39	397.	19.3	2996.1	1		1130	139	0.	9.1	2994.1	1		1950	239	0.	9.1	2994.1
1		0315	40	422.	21.0	2996.4	1		1135	140	0.	9.1	2994.1	1		1955	240	0.	9.1	2994.1
1		0320	41	467.	24.1	2996.8	1		1140	141	0.	9.1	2994.1	1		2000	241	0.	9.1	2994.1
1		0325	42	530.	30.0	2997.7	1		1145	142	0.	9.1	2994.1	1		2005	242	0.	9.1	2994.1
1		0330	43	628.	40.7	2999.1	1		1150	143	0.	9.1	2994.1	1		2010	243	0.	9.1	2994.1
1		0335	44	755.	57.6	3001.3	1		1155	144	0.	9.1	2994.1	1		2015	244	0.	9.1	2994.1
1		0340	45	901.	80.7	3004.3	1		1200	145	0.	9.1	2994.1	1		2020	245	0.	9.1	2994.1
1		0345	46	1029.	108.6	3007.4	1		1205	146	0.	9.1	2994.1	1		2025	246	0.	9.1	2994.1
1		0350	47	1135.	139.0	3010.3	1		1210	147	0.	9.1	2994.1	1		2030	247	0.	9.1	2994.1
1		0355	48	1215.	169.7	3012.7	1		1215	148	0.	9.1	2994.1	1		2035	248	0.	9.1	2994.1
1		0400	49	1288.	199.2	3014.9	1		1220	149	0.	9.1	2994.1	1		2040	249	0.	9.1	2994.1
1		0405	50	1345.	226.4	3016.8	1		1225	150	0.	9.1	2994.1	1		2045	250	0.	9.1	2994.1
1		0410	51	1395.	250.9	3018.5	1		1230	151	0.	9.1	2994.1	1		2050	251	0.	9.1	2994.1
1		0415	52	1434.	272.1	3019.9	1		1235	152	0.	9.1	2994.1	1		2055	252	0.	9.1	2994.1
1		0420	53	1465.	289.9	3021.1	1		1240	153	0.	9.1	2994.1	1		2100	253	0.	9.1	2994.1
1		0425	54	1496.	304.3	3022.0	1		1245	154	0.	9.1	2994.1	1		2105	254	0.	9.1	2994.1
1		0430	55	1672.	315.0	3022.6	1		1250	155	0.	9.1	2994.1	1		2110	255	0.	9.1	2994.1
1		0435	56	1795.	322.5	3023.1	1		1255	156	0.	9.1	2994.1	1		2115	256	0.	9.1	2994.1
1		0440	57	1879.	327.6	3023.4	1		1300	157	0.	9.1	2994.1	1		2120	257	0.	9.1	2994.1
1		0445	58	1936.	331.1	3023.6	1		1305	158	0.	9.1	2994.1	1		2125	258	0.	9.1	2994.1
1		0450	59	1975.	333.5	3023.8	1		1310	159	0.	9.1	2994.1	1		2130	259	0.	9.1	2994.1
1		0455	60	2001.	335.1	3023.9	1		1315	160	0.	9.1	2994.1	1		2135	260	0.	9.1	2994.1
1		0500	61	2016.	336.0	3023.9	1		1320	161	0.	9.1	2994.1	1		2140	261	0.	9.1	2994.1
1		0505	62	2021.	336.3	3024.0	1		1325	162	0.	9.1	2994.1	1		2145	262	0.	9.1	2994.1
1		0510	63	2014.	335.8	3023.9	1		1330	163	0.	9.1	2994.1	1		2150	263	0.	9.1	2994.1
1		0515	64	1992.	334.5	3023.8	1		1335	164	0.	9.1	2994.1	1		2155	264	0.	9.1	2994.1
1		0520	65	1956.	332.3	3023.7	1		1340	165	0.	9.1	2994.1	1		2200	265	0.	9.1	2994.1
1		0525	66	1905.	329.2	3023.5	1		1345	166	0.	9.1	2994.1	1		2205	266	0.	9.1	2994.1
1		0530	67	1841.	325.3	3023.3	1		1350	167	0.	9.1	2994.1	1		2210	267	0.	9.1	2994.1
1		0535	68	1767.	320.8	3023.0	1		1355	168	0.	9.1	2994.1	1		2215	268	0.	9.1	2994.1
1		0540	69	1685.	315.8	3022.7	1		1400	169	0.	9.1	2994.1	1		2220	269	0.	9.1	2994.1
1		0545	70	1596.	310.4	3022.3	1		1405	170	0.	9.1	2994.1	1		2225	270	0.	9.1	2994.1
1		0550	71	1504.	304.8	3022.0	1		1410	171	0.	9.1	2994.1	1		2230	271	0.	9.1	2994.1
1		0555	72	1480.	298.9	3021.6	1		1415	172	0.	9.1	2994.1	1		2235	272	0.	9.1	2994.1
1		0600	73	1470.	292.4	3021.2	1		1420	173	0.	9.1	2994.1	1		2240	273	0.	9.1	2994.1
1		0605	74	1458.	285.6	3020.8	1		1425	174	0.	9.1	2994.1	1		2245	274	0.	9.1	2994.1
1		0610	75	1445.	278.3	3020.3	1		1430	175	0.	9.1	2994.1	1		2250	275	0.	9.1	2994.1
1		0615	76	1432.	270.8	3019.8	1		1435	176	0.	9.1	2994.1	1		2255	276	0.	9.1	2994.1
1		0620	77	1417.	263.0	3019.3	1		1440	177	0.	9.1	2994.1	1		2300	277	0.	9.1	2994.1
1		0625	78	1402.	254.9	3018.8	1		1445	178	0.	9.1	2994.1	1		2305	278	0.	9.1	2994.1
1		0630	79	1387.	246.7	3018.2	1		1450	179	0.	9.1	2994.1	1		2310	279	0.	9.1	2994.1
1		0635	80	1370.	238.4	3017.7	1		1455	180	0.	9.1	2994.1	1		2315	280	0.	9.1	2994.1
1		0640	81	1352.	230.0	3017.1	1		1500	181	0.	9.1	2994.1	1		2320	281	0.	9.1	2994.1
1		0645	82	1334.	221.5	3016.5	1		1505	182	0.	9.1	2994.1	1		2325	282	0.	9.1	2994.1
1		0650	83	1317.	213.0	3015.9	1		1510	183	0.	9.1	2994.1	1		2330	283	0.	9.1	2994.1
1		0655	84	1299.	204.5	3015.3	1		1515	184	0.	9.1	2994.1	1		2335	284	0.	9.1	2994.1
1		0700	85	1280.	196.0	3014.7	1		1520	185	0.	9.1	2994.1	1		2340	285	0.	9.1	2994.1

1	0705	86	1259.	187.5	3014.0	*	1	1525	186	0.	9.1	2994.1	*	1	2345	286	0.	9.1	2994.1
1	0710	87	1239.	179.2	3013.4	*	1	1530	187	0.	9.1	2994.1	*	1	2350	287	0.	9.1	2994.1
1	0715	88	1218.	170.9	3012.7	*	1	1535	188	0.	9.1	2994.1	*	1	2355	288	0.	9.1	2994.1
1	0720	89	1198.	162.7	3012.1	*	1	1540	189	0.	9.1	2994.1	*	2	0000	289	0.	9.1	2994.1
1	0725	90	1177.	154.7	3011.5	*	1	1545	190	0.	9.1	2994.1	*	2	0005	290	0.	9.1	2994.1
1	0730	91	1156.	146.7	3010.9	*	1	1550	191	0.	9.1	2994.1	*	2	0010	291	0.	9.1	2994.1
1	0735	92	1135.	138.9	3010.3	*	1	1555	192	0.	9.1	2994.1	*	2	0015	292	0.	9.1	2994.1
1	0740	93	1112.	131.2	3009.6	*	1	1600	193	0.	9.1	2994.1	*	2	0020	293	0.	9.1	2994.1
1	0745	94	1087.	123.7	3008.9	*	1	1605	194	0.	9.1	2994.1	*	2	0025	294	0.	9.1	2994.1
1	0750	95	1059.	116.3	3008.2	*	1	1610	195	0.	9.1	2994.1	*	2	0030	295	0.	9.1	2994.1
1	0755	96	1031.	109.2	3007.5	*	1	1615	196	0.	9.1	2994.1	*	2	0035	296	0.	9.1	2994.1
1	0800	97	1003.	102.2	3006.7	*	1	1620	197	0.	9.1	2994.1	*	2	0040	297	0.	9.1	2994.1
1	0805	98	975.	95.4	3006.0	*	1	1625	198	0.	9.1	2994.1	*	2	0045	298	0.	9.1	2994.1
1	0810	99	945.	88.8	3005.3	*	1	1630	199	0.	9.1	2994.1	*	2	0050	299	0.	9.1	2994.1
1	0815	100	911.	82.4	3004.5	*	1	1635	200	0.	9.1	2994.1	*	2	0055	300	0.	9.1	2994.1
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 2021.	5.08		1260.	337.	325.	325.
		(INCHES)	1.911	2.046	2.046	2.046
		(AC-FT)	625.	669.	669.	669.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
+ 336.	5.08	192.	55.	53.	53.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
+ 3023.96	5.08	3013.04	2998.88	2998.58	2998.58

CUMULATIVE AREA = 6.13 SQ MI

WARNING --- ROUTED OUTFLOW (1549.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1628.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1687.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1732.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1764.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1784.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1792.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1785.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1762.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1724.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1673.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1611.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1540.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

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HYDROGRAPH AT STATION INTDB
PLAN 1, RATIO = .94

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
							*								*							
1		0000	1	0.	.0	2990.0	*	1		0820	101	843.	71.1	3003.0	*	1		1640	201	0.	9.1	2994.1
1		0005	2	0.	.0	2990.0	*	1		0825	102	807.	65.4	3002.3	*	1		1645	202	0.	9.1	2994.1
1		0010	3	0.	.0	2990.0	*	1		0830	103	772.	60.0	3001.6	*	1		1650	203	0.	9.1	2994.1
1		0015	4	0.	.0	2990.0	*	1		0835	104	735.	54.8	3000.9	*	1		1655	204	0.	9.1	2994.1
1		0020	5	0.	.0	2990.0	*	1		0840	105	700.	49.9	3000.3	*	1		1700	205	0.	9.1	2994.1
1		0025	6	0.	.0	2990.3	*	1		0845	106	664.	45.2	2999.6	*	1		1705	206	0.	9.1	2994.1
1		0030	7	0.	.1	2990.9	*	1		0850	107	628.	40.7	2999.1	*	1		1710	207	0.	9.1	2994.1
1		0035	8	0.	.1	2991.1	*	1		0855	108	592.	36.5	2998.5	*	1		1715	208	0.	9.1	2994.1
1		0040	9	0.	.3	2991.3	*	1		0900	109	556.	32.6	2998.0	*	1		1720	209	0.	9.1	2994.1
1		0045	10	0.	.4	2991.4	*	1		0905	110	519.	28.9	2997.5	*	1		1725	210	0.	9.1	2994.1
1		0050	11	0.	.5	2991.7	*	1		0910	111	484.	25.4	2997.0	*	1		1730	211	0.	9.1	2994.1
1		0055	12	0.	.7	2991.9	*	1		0915	112	440.	22.2	2996.6	*	1		1735	212	0.	9.1	2994.1
1		0100	13	0.	.9	2992.0	*	1		0920	113	398.	19.3	2996.1	*	1		1740	213	0.	9.1	2994.1
1		0105	14	0.	1.1	2992.1	*	1		0925	114	349.	16.8	2995.7	*	1		1745	214	0.	9.1	2994.1
1		0110	15	0.	1.3	2992.1	*	1		0930	115	304.	14.5	2995.3	*	1		1750	215	0.	9.1	2994.1
1		0115	16	0.	1.5	2992.2	*	1		0935	116	259.	12.6	2995.0	*	1		1755	216	0.	9.1	2994.1
1		0120	17	0.	1.8	2992.2	*	1		0940	117	153.	11.2	2994.6	*	1		1800	217	0.	9.1	2994.1
1		0125	18	0.	2.1	2992.3	*	1		0945	118	90.	10.3	2994.4	*	1		1805	218	0.	9.1	2994.1
1		0130	19	0.	2.4	2992.4	*	1		0950	119	53.	9.8	2994.3	*	1		1810	219	0.	9.1	2994.1
1		0135	20	0.	2.9	2992.5	*	1		0955	120	31.	9.6	2994.2	*	1		1815	220	0.	9.1	2994.1
1		0140	21	0.	3.5	2992.7	*	1		1000	121	18.	9.4	2994.2	*	1		1820	221	0.	9.1	2994.1
1		0145	22	0.	4.4	2992.9	*	1		1005	122	11.	9.3	2994.1	*	1		1825	222	0.	9.1	2994.1
1		0150	23	0.	5.4	2993.2	*	1		1010	123	6.	9.2	2994.1	*	1		1830	223	0.	9.1	2994.1
1		0155	24	0.	6.7	2993.5	*	1		1015	124	4.	9.2	2994.1	*	1		1835	224	0.	9.1	2994.1
1		0200	25	0.	8.0	2993.8	*	1		1020	125	2.	9.2	2994.1	*	1		1840	225	0.	9.1	2994.1
1		0205	26	19.	9.4	2994.2	*	1		1025	126	1.	9.2	2994.1	*	1		1845	226	0.	9.1	2994.1
1		0210	27	97.	10.4	2994.4	*	1		1030	127	1.	9.1	2994.1	*	1		1850	227	0.	9.1	2994.1
1		0215	28	145.	11.1	2994.6	*	1		1035	128	0.	9.1	2994.1	*	1		1855	228	0.	9.1	2994.1
1		0220	29	179.	11.5	2994.7	*	1		1040	129	0.	9.1	2994.1	*	1		1900	229	0.	9.1	2994.1
1		0225	30	209.	11.9	2994.8	*	1		1045	130	0.	9.1	2994.1	*	1		1905	230	0.	9.1	2994.1
1		0230	31	241.	12.3	2994.9	*	1		1050	131	0.	9.1	2994.1	*	1		1910	231	0.	9.1	2994.1
1		0235	32	269.	12.8	2995.0	*	1		1055	132	0.	9.1	2994.1	*	1		1915	232	0.	9.1	2994.1

1	0240	33	280.	13.3	2995.1	*	1	1100	133	0.	9.1	2994.1	*	1	1920	233	0.	9.1	2994.1
1	0245	34	293.	13.9	2995.2	*	1	1105	134	0.	9.1	2994.1	*	1	1925	234	0.	9.1	2994.1
1	0250	35	306.	14.6	2995.3	*	1	1110	135	0.	9.1	2994.1	*	1	1930	235	0.	9.1	2994.1
1	0255	36	320.	15.3	2995.4	*	1	1115	136	0.	9.1	2994.1	*	1	1935	236	0.	9.1	2994.1
1	0300	37	334.	16.0	2995.5	*	1	1120	137	0.	9.1	2994.1	*	1	1940	237	0.	9.1	2994.1
1	0305	38	350.	16.8	2995.7	*	1	1125	138	0.	9.1	2994.1	*	1	1945	238	0.	9.1	2994.1
1	0310	39	370.	17.8	2995.8	*	1	1130	139	0.	9.1	2994.1	*	1	1950	239	0.	9.1	2994.1
1	0315	40	397.	19.3	2996.1	*	1	1135	140	0.	9.1	2994.1	*	1	1955	240	0.	9.1	2994.1
1	0320	41	437.	22.0	2996.5	*	1	1140	141	0.	9.1	2994.1	*	1	2000	241	0.	9.1	2994.1
1	0325	42	504.	27.4	2997.3	*	1	1145	142	0.	9.1	2994.1	*	1	2005	242	0.	9.1	2994.1
1	0330	43	597.	37.1	2998.6	*	1	1150	143	0.	9.1	2994.1	*	1	2010	243	0.	9.1	2994.1
1	0335	44	720.	52.7	3000.6	*	1	1155	144	0.	9.1	2994.1	*	1	2015	244	0.	9.1	2994.1
1	0340	45	862.	74.1	3003.4	*	1	1200	145	0.	9.1	2994.1	*	1	2020	245	0.	9.1	2994.1
1	0345	46	994.	100.1	3006.5	*	1	1205	146	0.	9.1	2994.1	*	1	2025	246	0.	9.1	2994.1
1	0350	47	1103.	128.4	3009.4	*	1	1210	147	0.	9.1	2994.1	*	1	2030	247	0.	9.1	2994.1
1	0355	48	1183.	157.1	3011.7	*	1	1215	148	0.	9.1	2994.1	*	1	2035	248	0.	9.1	2994.1
1	0400	49	1252.	184.7	3013.8	*	1	1220	149	0.	9.1	2994.1	*	1	2040	249	0.	9.1	2994.1
1	0405	50	1311.	210.1	3015.7	*	1	1225	150	0.	9.1	2994.1	*	1	2045	250	0.	9.1	2994.1
1	0410	51	1358.	232.9	3017.3	*	1	1230	151	0.	9.1	2994.1	*	1	2050	251	0.	9.1	2994.1
1	0415	52	1398.	252.6	3018.6	*	1	1235	152	0.	9.1	2994.1	*	1	2055	252	0.	9.1	2994.1
1	0420	53	1429.	269.2	3019.7	*	1	1240	153	0.	9.1	2994.1	*	1	2100	253	0.	9.1	2994.1
1	0425	54	1452.	282.5	3020.6	*	1	1245	154	0.	9.1	2994.1	*	1	2105	254	0.	9.1	2994.1
1	0430	55	1470.	293.0	3021.2	*	1	1250	155	0.	9.1	2994.1	*	1	2110	255	0.	9.1	2994.1
1	0435	56	1484.	301.2	3021.8	*	1	1255	156	0.	9.1	2994.1	*	1	2115	256	0.	9.1	2994.1
1	0440	57	1549.	307.5	3022.2	*	1	1300	157	0.	9.1	2994.1	*	1	2120	257	0.	9.1	2994.1
1	0445	58	1628.	312.3	3022.5	*	1	1305	158	0.	9.1	2994.1	*	1	2125	258	0.	9.1	2994.1
1	0450	59	1687.	315.9	3022.7	*	1	1310	159	0.	9.1	2994.1	*	1	2130	259	0.	9.1	2994.1
1	0455	60	1732.	318.7	3022.9	*	1	1315	160	0.	9.1	2994.1	*	1	2135	260	0.	9.1	2994.1
1	0500	61	1764.	320.6	3023.0	*	1	1320	161	0.	9.1	2994.1	*	1	2140	261	0.	9.1	2994.1
1	0505	62	1784.	321.9	3023.1	*	1	1325	162	0.	9.1	2994.1	*	1	2145	262	0.	9.1	2994.1
1	0510	63	1792.	322.3	3023.1	*	1	1330	163	0.	9.1	2994.1	*	1	2150	263	0.	9.1	2994.1
1	0515	64	1785.	321.9	3023.1	*	1	1335	164	0.	9.1	2994.1	*	1	2155	264	0.	9.1	2994.1
1	0520	65	1762.	320.5	3023.0	*	1	1340	165	0.	9.1	2994.1	*	1	2200	265	0.	9.1	2994.1
1	0525	66	1724.	318.2	3022.8	*	1	1345	166	0.	9.1	2994.1	*	1	2205	266	0.	9.1	2994.1
1	0530	67	1673.	315.1	3022.6	*	1	1350	167	0.	9.1	2994.1	*	1	2210	267	0.	9.1	2994.1
1	0535	68	1611.	311.3	3022.4	*	1	1355	168	0.	9.1	2994.1	*	1	2215	268	0.	9.1	2994.1
1	0540	69	1540.	307.0	3022.1	*	1	1400	169	0.	9.1	2994.1	*	1	2220	269	0.	9.1	2994.1
1	0545	70	1486.	302.2	3021.8	*	1	1405	170	0.	9.1	2994.1	*	1	2225	270	0.	9.1	2994.1
1	0550	71	1477.	296.9	3021.5	*	1	1410	171	0.	9.1	2994.1	*	1	2230	271	0.	9.1	2994.1
1	0555	72	1467.	290.9	3021.1	*	1	1415	172	0.	9.1	2994.1	*	1	2235	272	0.	9.1	2994.1
1	0600	73	1456.	284.3	3020.7	*	1	1420	173	0.	9.1	2994.1	*	1	2240	273	0.	9.1	2994.1
1	0605	74	1443.	277.4	3020.3	*	1	1425	174	0.	9.1	2994.1	*	1	2245	274	0.	9.1	2994.1
1	0610	75	1430.	270.2	3019.8	*	1	1430	175	0.	9.1	2994.1	*	1	2250	275	0.	9.1	2994.1
1	0615	76	1417.	262.6	3019.3	*	1	1435	176	0.	9.1	2994.1	*	1	2255	276	0.	9.1	2994.1
1	0620	77	1402.	254.8	3018.8	*	1	1440	177	0.	9.1	2994.1	*	1	2300	277	0.	9.1	2994.1
1	0625	78	1387.	246.8	3018.2	*	1	1445	178	0.	9.1	2994.1	*	1	2305	278	0.	9.1	2994.1
1	0630	79	1370.	238.7	3017.7	*	1	1450	179	0.	9.1	2994.1	*	1	2310	279	0.	9.1	2994.1
1	0635	80	1353.	230.4	3017.1	*	1	1455	180	0.	9.1	2994.1	*	1	2315	280	0.	9.1	2994.1
1	0640	81	1336.	222.0	3016.5	*	1	1500	181	0.	9.1	2994.1	*	1	2320	281	0.	9.1	2994.1
1	0645	82	1318.	213.6	3015.9	*	1	1505	182	0.	9.1	2994.1	*	1	2325	282	0.	9.1	2994.1
1	0650	83	1300.	205.2	3015.3	*	1	1510	183	0.	9.1	2994.1	*	1	2330	283	0.	9.1	2994.1
1	0655	84	1282.	196.8	3014.7	*	1	1515	184	0.	9.1	2994.1	*	1	2335	284	0.	9.1	2994.1
1	0700	85	1261.	188.4	3014.1	*	1	1520	185	0.	9.1	2994.1	*	1	2340	285	0.	9.1	2994.1
1	0705	86	1241.	180.1	3013.5	*	1	1525	186	0.	9.1	2994.1	*	1	2345	286	0.	9.1	2994.1
1	0710	87	1221.	171.8	3012.8	*	1	1530	187	0.	9.1	2994.1	*	1	2350	287	0.	9.1	2994.1
1	0715	88	1200.	163.7	3012.2	*	1	1535	188	0.	9.1	2994.1	*	1	2355	288	0.	9.1	2994.1
1	0720	89	1179.	155.6	3011.6	*	1	1540	189	0.	9.1	2994.1	*	2	0000	289	0.	9.1	2994.1
1	0725	90	1158.	147.7	3011.0	*	1	1545	190	0.	9.1	2994.1	*	2	0005	290	0.	9.1	2994.1
1	0730	91	1138.	139.9	3010.4	*	1	1550	191	0.	9.1	2994.1	*	2	0010	291	0.	9.1	2994.1
1	0735	92	1116.	132.2	3009.7	*	1	1555	192	0.	9.1	2994.1	*	2	0015	292	0.	9.1	2994.1
1	0740	93	1091.	124.6	3009.0	*	1	1600	193	0.	9.1	2994.1	*	2	0020	293	0.	9.1	2994.1
1	0745	94	1062.	117.3	3008.3	*	1	1605	194	0.	9.1	2994.1	*	2	0025	294	0.	9.1	2994.1
1	0750	95	1034.	110.1	3007.5	*	1	1610	195	0.	9.1	2994.1	*	2	0030	295	0.	9.1	2994.1
1	0755	96	1007.	103.1	3006.8	*	1	1615	196	0.	9.1	2994.1	*	2	0035	296	0.	9.1	2994.1
1	0800	97	978.	96.2	3006.1	*	1	1620	197	0.	9.1	2994.1	*	2	0040	297	0.	9.1	2994.1
1	0805	98	949.	89.6	3005.4	*	1	1625	198	0.	9.1	2994.1	*	2	0045	298	0.	9.1	2994.1
1	0810	99	916.	83.2	3004.6	*	1	1630	199	0.	9.1	2994.1	*	2	0050	299	0.	9.1	2994.1
1	0815	100	880.	77.0	3003.8	*	1	1635	200	0.	9.1	2994.1	*	2	0055	300	0.	9.1	2994.1
						*							*							

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1792.	5.17		1190.	317.	305.	305.
		(INCHES)	1.805	1.921	1.921	1.921
		(AC-FT)	590.	628.	628.	628.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)					
322.	5.17		183.	53.	51.	51.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)					
3023.08	5.17		3012.33	2998.67	2998.38	2998.38

CUMULATIVE AREA = 6.13 SQ MI

WARNING --- ROUTED OUTFLOW (1536.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1602.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1653.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1691.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1716.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1728.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1725.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1707.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1673.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1626.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1567.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION INTDB
PLAN 1, RATIO = .93

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	833.	69.6	3002.9	1		1640	201	0.	9.1	2994.1
1		0005	2	0.	.0	2990.0	1		0825	102	798.	64.0	3002.1	1		1645	202	0.	9.1	2994.1
1		0010	3	0.	.0	2990.0	1		0830	103	763.	58.6	3001.4	1		1650	203	0.	9.1	2994.1
1		0015	4	0.	.0	2990.0	1		0835	104	726.	53.5	3000.7	1		1655	204	0.	9.1	2994.1
1		0020	5	0.	.0	2990.0	1		0840	105	691.	48.6	3000.1	1		1700	205	0.	9.1	2994.1
1		0025	6	0.	.0	2990.2	1		0845	106	654.	44.0	2999.5	1		1705	206	0.	9.1	2994.1
1		0030	7	0.	.1	2990.9	1		0850	107	619.	39.6	2998.9	1		1710	207	0.	9.1	2994.1
1		0035	8	0.	.1	2991.1	1		0855	108	583.	35.5	2998.4	1		1715	208	0.	9.1	2994.1
1		0040	9	0.	.2	2991.2	1		0900	109	546.	31.6	2997.9	1		1720	209	0.	9.1	2994.1
1		0045	10	0.	.4	2991.4	1		0905	110	510.	27.9	2997.4	1		1725	210	0.	9.1	2994.1
1		0050	11	0.	.5	2991.6	1		0910	111	474.	24.6	2996.9	1		1730	211	0.	9.1	2994.1
1		0055	12	0.	.7	2991.8	1		0915	112	428.	21.5	2996.4	1		1735	212	0.	9.1	2994.1
1		0100	13	0.	.9	2992.0	1		0920	113	387.	18.7	2996.0	1		1740	213	0.	9.1	2994.1
1		0105	14	0.	1.1	2992.1	1		0925	114	337.	16.2	2995.6	1		1745	214	0.	9.1	2994.1
1		0110	15	0.	1.2	2992.1	1		0930	115	293.	14.0	2995.2	1		1750	215	0.	9.1	2994.1
1		0115	16	0.	1.4	2992.2	1		0935	116	229.	12.2	2994.9	1		1755	216	0.	9.1	2994.1
1		0120	17	0.	1.7	2992.2	1		0940	117	135.	10.9	2994.6	1		1800	217	0.	9.1	2994.1
1		0125	18	0.	1.9	2992.3	1		0945	118	80.	10.2	2994.4	1		1805	218	0.	9.1	2994.1
1		0130	19	0.	2.3	2992.4	1		0950	119	47.	9.8	2994.3	1		1810	219	0.	9.1	2994.1
1		0135	20	0.	2.7	2992.5	1		0955	120	28.	9.5	2994.2	1		1815	220	0.	9.1	2994.1
1		0140	21	0.	3.3	2992.6	1		1000	121	16.	9.4	2994.2	1		1820	221	0.	9.1	2994.1
1		0145	22	0.	4.1	2992.8	1		1005	122	10.	9.3	2994.1	1		1825	222	0.	9.1	2994.1
1		0150	23	0.	5.2	2993.1	1		1010	123	6.	9.2	2994.1	1		1830	223	0.	9.1	2994.1
1		0155	24	0.	6.3	2993.4	1		1015	124	3.	9.2	2994.1	1		1835	224	0.	9.1	2994.1
1		0200	25	0.	7.7	2993.7	1		1020	125	2.	9.2	2994.1	1		1840	225	0.	9.1	2994.1
1		0205	26	0.	9.0	2994.1	1		1025	126	1.	9.2	2994.1	1		1845	226	0.	9.1	2994.1
1		0210	27	77.	10.2	2994.4	1		1030	127	1.	9.1	2994.1	1		1850	227	0.	9.1	2994.1
1		0215	28	130.	10.9	2994.5	1		1035	128	0.	9.1	2994.1	1		1855	228	0.	9.1	2994.1
1		0220	29	167.	11.4	2994.7	1		1040	129	0.	9.1	2994.1	1		1900	229	0.	9.1	2994.1
1		0225	30	199.	11.8	2994.8	1		1045	130	0.	9.1	2994.1	1		1905	230	0.	9.1	2994.1
1		0230	31	231.	12.2	2994.9	1		1050	131	0.	9.1	2994.1	1		1910	231	0.	9.1	2994.1
1		0235	32	264.	12.7	2995.0	1		1055	132	0.	9.1	2994.1	1		1915	232	0.	9.1	2994.1
1		0240	33	277.	13.2	2995.1	1		1100	133	0.	9.1	2994.1	1		1920	233	0.	9.1	2994.1
1		0245	34	288.	13.7	2995.2	1		1105	134	0.	9.1	2994.1	1		1925	234	0.	9.1	2994.1
1		0250	35	301.	14.4	2995.3	1		1110	135	0.	9.1	2994.1	1		1930	235	0.	9.1	2994.1
1		0255	36	314.	15.0	2995.4	1		1115	136	0.	9.1	2994.1	1		1935	236	0.	9.1	2994.1
1		0300	37	328.	15.7	2995.5	1		1120	137	0.	9.1	2994.1	1		1940	237	0.	9.1	2994.1
1		0305	38	343.	16.5	2995.6	1		1125	138	0.	9.1	2994.1	1		1945	238	0.	9.1	2994.1
1		0310	39	363.	17.4	2995.8	1		1130	139	0.	9.1	2994.1	1		1950	239	0.	9.1	2994.1
1		0315	40	391.	18.9	2996.0	1		1135	140	0.	9.1	2994.1	1		1955	240	0.	9.1	2994.1
1		0320	41	430.	21.6	2996.5	1		1140	141	0.	9.1	2994.1	1		2000	241	0.	9.1	2994.1
1		0325	42	498.	26.8	2997.2	1		1145	142	0.	9.1	2994.1	1		2005	242	0.	9.1	2994.1
1		0330	43	590.	36.4	2998.5	1		1150	143	0.	9.1	2994.1	1		2010	243	0.	9.1	2994.1
1		0335	44	712.	51.6	3000.5	1		1155	144	0.	9.1	2994.1	1		2015	244	0.	9.1	2994.1
1		0340	45	853.	72.7	3003.3	1		1200	145	0.	9.1	2994.1	1		2020	245	0.	9.1	2994.1
1		0345	46	986.	98.1	3006.3	1		1205	146	0.	9.1	2994.1	1		2025	246	0.	9.1	2994.1
1		0350	47	1095.	125.8	3009.1	1		1210	147	0.	9.1	2994.1	1		2030	247	0.	9.1	2994.1
1		0355	48	1175.	153.9	3011.4	1		1215	148	0.	9.1	2994.1	1		2035	248	0.	9.1	2994.1
1		0400	49	1243.	180.9	3013.5	1		1220	149	0.	9.1	2994.1	1		2040	249	0.	9.1	2994.1
1		0405	50	1302.	205.8	3015.4	1		1225	150	0.	9.1	2994.1	1		2045	250	0.	9.1	2994.1
1		0410	51	1349.	228.2	3017.0	1		1230	151	0.	9.1	2994.1	1		2050	251	0.	9.1	2994.1
1		0415	52	1388.	247.6	3018.3	1		1235	152	0.	9.1	2994.1	1		2055	252	0.	9.1	2994.1
1		0420	53	1419.	263.9	3019.4	1		1240	153	0.	9.1	2994.1	1		2100	253	0.	9.1	2994.1
1		0425	54	1443.	276.9	3020.2	1		1245	154	0.	9.1	2994.1	1		2105	254	0.	9.1	2994.1
1		0430	55	1461.	287.2	3020.9	1		1250	155	0.	9.1	2994.1	1		2110	255	0.	9.1	2994.1
1		0435	56	1474.	295.2	3021.4	1		1255	156	0.	9.1	2994.1	1		2115	256	0.	9.1	2994.1
1		0440	57	1485.	301.6	3021.8	1		1300	157	0.	9.1	2994.1	1		2120	257	0.	9.1	2994.1
1		0445	58	1536.	306.8	3022.1	1		1305	158	0.	9.1	2994.1	1		2125	258	0.	9.1	2994.1
1		0450	59	1602.	310.8	3022.4	1		1310	159	0.	9.1	2994.1	1		2130	259	0.	9.1	2994.1
1		0455	60	1653.	313.9	3022.6	1		1315	160	0.	9.1	2994.1	1		2135	260	0.	9.1	2994.1
1		0500	61	1691.	316.2	3022.7	1		1320	161	0.	9.1	2994.1	1		2140	261	0.	9.1	2994.1
1		0505	62	1716.	317.7	3022.8	1		1325	162	0.	9.1	2994.1	1		2145	262	0.	9.1	2994.1
1		0510	63	1728.	318.4	3022.8	1		1330	163	0.	9.1	2994.1	1		2150	263	0.	9.1	2994.1
1		0515	64	1725.	318.3	3022.8	1		1335	164	0.	9.1	2994.1	1		2155	264	0.	9.1	2994.1
1		0520	65	1707.	317.1	3022.8	1		1340	165	0.	9.1	2994.1	1		2200	265	0.	9.1	2994.1
1		0525	66	1673.	315.1	3022.6	1		1345	166	0.	9.1	2994.1	1		2205	266	0.	9.1	2994.1
1		0530	67	1626.	312.2	3022.5	1		1350	167	0.	9.1	2994.1	1		2210	267	0.	9.1	2994.1
1		0535	68	1567.	308.7	3022.2	1		1355	168	0.	9.1	2994.1	1		2215	268	0.	9.1	2994.1
1		0540	69	1500.	304.5	3022.0	1		1400	169	0.	9.1	2994.1	1		2220	269	0.	9.1	2994.1
1		0545	70	1482.	299.8	3021.7	1		1405	170	0.	9.1	2994.1	1		2225	270	0.	9.1	2994.1
1		0550	71	1473.	294.5	3021.3	1		1410	171	0.	9.1	2994.1	1		2230	271	0.	9.1	2994.1
1		0555	72	1463.	288.4	3021.0	1		1415	172	0.	9.1	2994.1	1		2235	272	0.	9.1	2994.1
1		0600	73	1451.	281.9	3020.5	1		1420	173	0.	9.1	2994.1	1		2240	273	0.	9.1	2994.1
1		0605	74	1439.	275.0	3020.1	1		1425	174	0.	9.1	2994.1	1		2245	274	0.	9.1	2994.1
1		0610	75	1426.	267.7	3019.6	1		1430	175	0.	9.1	2994.1	1		2250	275	0.	9.1	2994.1
1		0615	76	1412.	260.2	3019.1	1		1435	176	0.	9.1	2994.1	1		2255	276	0.	9.1	2994.1
1		0620	77	1397.	252.4	3018.6	1		1440	177	0.	9.1	2994.1	1		2300	277	0.	9.1	2994.1
1		0625	78	1382.	244.4	3018.1	1		1445	178	0.	9.1	2994.1	1		2305	278	0.	9.1	2994.1
1		0630	79	1365.	236.3	3017.5	1		1450	179	0.	9.1	2994.1	1		2310	279	0.	9.1	2994.1
1		0635	80	1348.	228.0	3016.9	1		1455	180	0.	9.1	2994.1	1		2315	280	0.	9.1	2994.1
1		0640	81	1331.	219.7	3016.4	1		1500	181	0.	9.1	2994.1	1		2320	281	0.	9.1	2994.1
1		0645	82	1313.	211.3	3015.8	1		1505	182	0.	9.1	2994.1	1		2325	282	0.	9.1	2994.1
1		0650	83	1296.	202.9	3015.2	1		1510	183	0.	9.1	2994.1	1		2330	283	0.	9.1	2994.1
1		0655	84	1276.	194.5	3014.6	1		1515	184	0.	9.1	2994.1	1		2335	284	0.	9.1	2994.1
1		0700	85	1256.	186.2	3013.9	1		1520	185	0.	9.1	2994.1	1		2340	285	0.	9.1	2994.1
1		0705	86	1235.	177.9	3013.3	1		1525	186	0.	9.1	2994.1	1		2345	286	0.	9.1	2994.1
1		0710	87	1215.	169.7	3012.7	1		1530	187	0.	9.1	2994.1	1		2350	287	0.	9.1	2994.1
1		0715	88	1195.	161.6	3012.0	1		1535	188	0.	9.1	2994.1	1		2355	288	0.	9.1	2994.1
1		0720	89	1174.	153.5	3011.4	1		1540	189	0.	9.1	2994.1	2		0000	289	0.	9.1	2994.1

1	0725	90	1153.	145.6	3010.8	*	1	1545	190	0.	9.1	2994.1	*	2	0005	290	0.	9.1	2994.1
1	0730	91	1132.	137.9	3010.2	*	1	1550	191	0.	9.1	2994.1	*	2	0010	291	0.	9.1	2994.1
1	0735	92	1109.	130.2	3009.5	*	1	1555	192	0.	9.1	2994.1	*	2	0015	292	0.	9.1	2994.1
1	0740	93	1083.	122.7	3008.8	*	1	1600	193	0.	9.1	2994.1	*	2	0020	293	0.	9.1	2994.1
1	0745	94	1055.	115.4	3008.1	*	1	1605	194	0.	9.1	2994.1	*	2	0025	294	0.	9.1	2994.1
1	0750	95	1027.	108.2	3007.4	*	1	1610	195	0.	9.1	2994.1	*	2	0030	295	0.	9.1	2994.1
1	0755	96	999.	101.3	3006.6	*	1	1615	196	0.	9.1	2994.1	*	2	0035	296	0.	9.1	2994.1
1	0800	97	971.	94.5	3005.9	*	1	1620	197	0.	9.1	2994.1	*	2	0040	297	0.	9.1	2994.1
1	0805	98	941.	87.9	3005.2	*	1	1625	198	0.	9.1	2994.1	*	2	0045	298	0.	9.1	2994.1
1	0810	99	906.	81.6	3004.4	*	1	1630	199	0.	9.1	2994.1	*	2	0050	299	0.	9.1	2994.1
1	0815	100	871.	75.5	3003.6	*	1	1635	200	0.	9.1	2994.1	*	2	0055	300	0.	9.1	2994.1
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1728.	5.17		1172.	311.	300.	300.
		(INCHES)	1.779	1.889	1.889	1.889
		(AC-FT)	581.	618.	618.	618.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
318.	5.17	180.	52.	50.	50.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3022.84	5.17	3012.14	2998.62	2998.33	2998.33

CUMULATIVE AREA = 6.13 SQ MI

WARNING --- ROUTED OUTFLOW (1511.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1569.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1613.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1644.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1661.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1663.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1649.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1619.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1576.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1521.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

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HYDROGRAPH AT STATION INTDB
PLAN 1, RATIO = .92

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	823.	68.0	3002.6	*	1		1640	201	0.	9.1	2994.1
1		0005	2	0.	.0	2990.0	*	1		0825	102	788.	62.4	3001.9	*	1		1645	202	0.	9.1	2994.1
1		0010	3	0.	.0	2990.0	*	1		0830	103	752.	57.1	3001.2	*	1		1650	203	0.	9.1	2994.1
1		0015	4	0.	.0	2990.0	*	1		0835	104	716.	52.1	3000.5	*	1		1655	204	0.	9.1	2994.1
1		0020	5	0.	.0	2990.0	*	1		0840	105	680.	47.3	2999.9	*	1		1700	205	0.	9.1	2994.1
1		0025	6	0.	.0	2990.2	*	1		0845	106	644.	42.7	2999.3	*	1		1705	206	0.	9.1	2994.1
1		0030	7	0.	.1	2990.8	*	1		0850	107	608.	38.4	2998.8	*	1		1710	207	0.	9.1	2994.1
1		0035	8	0.	.1	2991.1	*	1		0855	108	572.	34.3	2998.2	*	1		1715	208	0.	9.1	2994.1
1		0040	9	0.	.2	2991.2	*	1		0900	109	535.	30.5	2997.7	*	1		1720	209	0.	9.1	2994.1
1		0045	10	0.	.3	2991.4	*	1		0905	110	500.	26.9	2997.2	*	1		1725	210	0.	9.1	2994.1
1		0050	11	0.	.5	2991.6	*	1		0910	111	460.	23.6	2996.8	*	1		1730	211	0.	9.1	2994.1
1		0055	12	0.	.6	2991.8	*	1		0915	112	416.	20.6	2996.3	*	1		1735	212	0.	9.1	2994.1
1		0100	13	0.	.8	2992.0	*	1		0920	113	372.	17.9	2995.9	*	1		1740	213	0.	9.1	2994.1
1		0105	14	0.	1.0	2992.0	*	1		0925	114	324.	15.5	2995.5	*	1		1745	214	0.	9.1	2994.1
1		0110	15	0.	1.1	2992.1	*	1		0930	115	282.	13.4	2995.1	*	1		1750	215	0.	9.1	2994.1
1		0115	16	0.	1.3	2992.1	*	1		0935	116	198.	11.8	2994.8	*	1		1755	216	0.	9.1	2994.1
1		0120	17	0.	1.5	2992.2	*	1		0940	117	117.	10.7	2994.5	*	1		1800	217	0.	9.1	2994.1
1		0125	18	0.	1.8	2992.2	*	1		0945	118	69.	10.1	2994.3	*	1		1805	218	0.	9.1	2994.1
1		0130	19	0.	2.1	2992.3	*	1		0950	119	41.	9.7	2994.2	*	1		1810	219	0.	9.1	2994.1
1		0135	20	0.	2.5	2992.4	*	1		0955	120	24.	9.5	2994.2	*	1		1815	220	0.	9.1	2994.1
1		0140	21	0.	3.1	2992.6	*	1		1000	121	14.	9.3	2994.1	*	1		1820	221	0.	9.1	2994.1
1		0145	22	0.	3.9	2992.8	*	1		1005	122	8.	9.2	2994.1	*	1		1825	222	0.	9.1	2994.1
1		0150	23	0.	4.9	2993.0	*	1		1010	123	5.	9.2	2994.1	*	1		1830	223	0.	9.1	2994.1
1		0155	24	0.	6.0	2993.3	*	1		1015	124	3.	9.2	2994.1	*	1		1835	224	0.	9.1	2994.1
1		0200	25	0.	7.3	2993.6	*	1		1020	125	2.	9.2	2994.1	*	1		1840	225	0.	9.1	2994.1
1		0205	26	0.	8.6	2994.0	*	1		1025	126	1.	9.2	2994.1	*	1		1845	226	0.	9.1	2994.1
1		0210	27	49.	9.8	2994.3	*	1		1030	127	1.	9.1	2994.1	*	1		1850	227	0.	9.1	2994.1
1		0215	28	111.	10.6	2994.5	*	1		1035	128	0.	9.1	2994.1	*	1		1855	228	0.	9.1	2994.1
1		0220	29	153.	11.2	2994.6	*	1		1040	129	0.	9.1	2994.1	*	1		1900	229	0.	9.1	2994.1
1		0225	30	188.	11.6	2994.7	*	1		1045	130	0.	9.1	2994.1	*	1		1905	230	0.	9.1	2994.1
1		0230	31	221.	12.1	2994.8	*	1		1050	131	0.	9.1	2994.1	*	1		1910	231	0.	9.1	2994.1
1		0235	32	255.	12.5	2995.0	*	1		1055	132	0.	9.1	2994.1	*	1		1915	232	0.	9.1	2994.1
1		0240	33	274.	13.0	2995.0	*	1		1100	133	0.	9.1	2994.1	*	1		1920	233	0.	9.1	2994.1
1		0245	34	284.	13.5	2995.1	*	1		1105	134	0.	9.1	2994.1	*	1		1925	234	0.	9.1	2994.1
1		0250	35	296.	14.1	2995.2	*	1		1110	135	0.	9.1	2994.1	*	1		1930	235	0.	9.1	2994.1
1		0255	36	309.	14.8	2995.3	*	1		1115	136	0.	9.1	2994.1	*	1		1935	236	0.	9.1	2994.1
1		0300	37	322.	15.4	2995.4	*	1		1120	137	0.	9.1	2994.1	*	1		1940	237	0.	9.1	2994.1
1		0305	38	337.	16.1	2995.6	*	1		1125	138	0.	9.1	2994.1	*	1		1945	238	0.	9.1	2994.1
1		0310	39	355.	17.1	2995.7	*	1		1130	139	0.	9.1	2994.1	*	1		1950	239	0.	9.1	2994.1
1		0315	40	384.	18.5	2996.0	*	1		1135	140	0.	9.1	2994.1	*	1		1955	240	0.	9.1	2994.1
1		0320	41	423.	21.1	2996.4	*	1		1140	141	0.	9.1	2994.1	*	1		2000	241	0.	9.1	2994.1
1		0325	42	491.	26.1	2997.1	*	1		1145	142	0.	9.1	2994.1	*	1		2005	242	0.	9.1	2994.1

1	0330	43	582.	35.4	2998.4	*	1	1150	143	0.	9.1	2994.1	*	1	2010	243	0.	9.1	2994.1
1	0335	44	703.	50.3	3000.3	*	1	1155	144	0.	9.1	2994.1	*	1	2015	244	0.	9.1	2994.1
1	0340	45	842.	70.9	3003.0	*	1	1200	145	0.	9.1	2994.1	*	1	2020	245	0.	9.1	2994.1
1	0345	46	977.	96.0	3006.1	*	1	1205	146	0.	9.1	2994.1	*	1	2025	246	0.	9.1	2994.1
1	0350	47	1086.	123.3	3008.9	*	1	1210	147	0.	9.1	2994.1	*	1	2030	247	0.	9.1	2994.1
1	0355	48	1167.	150.9	3011.2	*	1	1215	148	0.	9.1	2994.1	*	1	2035	248	0.	9.1	2994.1
1	0400	49	1234.	177.5	3013.3	*	1	1220	149	0.	9.1	2994.1	*	1	2040	249	0.	9.1	2994.1
1	0405	50	1294.	202.0	3015.1	*	1	1225	150	0.	9.1	2994.1	*	1	2045	250	0.	9.1	2994.1
1	0410	51	1340.	223.9	3016.7	*	1	1230	151	0.	9.1	2994.1	*	1	2050	251	0.	9.1	2994.1
1	0415	52	1379.	243.0	3018.0	*	1	1235	152	0.	9.1	2994.1	*	1	2055	252	0.	9.1	2994.1
1	0420	53	1410.	258.9	3019.1	*	1	1240	153	0.	9.1	2994.1	*	1	2100	253	0.	9.1	2994.1
1	0425	54	1433.	271.7	3019.9	*	1	1245	154	0.	9.1	2994.1	*	1	2105	254	0.	9.1	2994.1
1	0430	55	1451.	281.7	3020.5	*	1	1250	155	0.	9.1	2994.1	*	1	2110	255	0.	9.1	2994.1
1	0435	56	1465.	289.6	3021.0	*	1	1255	156	0.	9.1	2994.1	*	1	2115	256	0.	9.1	2994.1
1	0440	57	1475.	295.8	3021.4	*	1	1300	157	0.	9.1	2994.1	*	1	2120	257	0.	9.1	2994.1
1	0445	58	1484.	300.9	3021.7	*	1	1305	158	0.	9.1	2994.1	*	1	2125	258	0.	9.1	2994.1
1	0450	59	1511.	305.2	3022.0	*	1	1310	159	0.	9.1	2994.1	*	1	2130	259	0.	9.1	2994.1
1	0455	60	1569.	308.7	3022.2	*	1	1315	160	0.	9.1	2994.1	*	1	2135	260	0.	9.1	2994.1
1	0500	61	1613.	311.4	3022.4	*	1	1320	161	0.	9.1	2994.1	*	1	2140	261	0.	9.1	2994.1
1	0505	62	1644.	313.3	3022.5	*	1	1325	162	0.	9.1	2994.1	*	1	2145	262	0.	9.1	2994.1
1	0510	63	1661.	314.3	3022.6	*	1	1330	163	0.	9.1	2994.1	*	1	2150	263	0.	9.1	2994.1
1	0515	64	1663.	314.5	3022.6	*	1	1335	164	0.	9.1	2994.1	*	1	2155	264	0.	9.1	2994.1
1	0520	65	1649.	313.6	3022.5	*	1	1340	165	0.	9.1	2994.1	*	1	2200	265	0.	9.1	2994.1
1	0525	66	1619.	311.8	3022.4	*	1	1345	166	0.	9.1	2994.1	*	1	2205	266	0.	9.1	2994.1
1	0530	67	1576.	309.2	3022.3	*	1	1350	167	0.	9.1	2994.1	*	1	2210	267	0.	9.1	2994.1
1	0535	68	1521.	305.9	3022.1	*	1	1355	168	0.	9.1	2994.1	*	1	2215	268	0.	9.1	2994.1
1	0540	69	1485.	301.9	3021.8	*	1	1400	169	0.	9.1	2994.1	*	1	2220	269	0.	9.1	2994.1
1	0545	70	1478.	297.2	3021.5	*	1	1405	170	0.	9.1	2994.1	*	1	2225	270	0.	9.1	2994.1
1	0550	71	1468.	291.8	3021.2	*	1	1410	171	0.	9.1	2994.1	*	1	2230	271	0.	9.1	2994.1
1	0555	72	1458.	285.7	3020.8	*	1	1415	172	0.	9.1	2994.1	*	1	2235	272	0.	9.1	2994.1
1	0600	73	1446.	279.2	3020.4	*	1	1420	173	0.	9.1	2994.1	*	1	2240	273	0.	9.1	2994.1
1	0605	74	1434.	272.3	3019.9	*	1	1425	174	0.	9.1	2994.1	*	1	2245	274	0.	9.1	2994.1
1	0610	75	1421.	265.0	3019.5	*	1	1430	175	0.	9.1	2994.1	*	1	2250	275	0.	9.1	2994.1
1	0615	76	1407.	257.5	3019.0	*	1	1435	176	0.	9.1	2994.1	*	1	2255	276	0.	9.1	2994.1
1	0620	77	1392.	249.7	3018.4	*	1	1440	177	0.	9.1	2994.1	*	1	2300	277	0.	9.1	2994.1
1	0625	78	1377.	241.7	3017.9	*	1	1445	178	0.	9.1	2994.1	*	1	2305	278	0.	9.1	2994.1
1	0630	79	1360.	233.6	3017.3	*	1	1450	179	0.	9.1	2994.1	*	1	2310	279	0.	9.1	2994.1
1	0635	80	1343.	225.4	3016.8	*	1	1455	180	0.	9.1	2994.1	*	1	2315	280	0.	9.1	2994.1
1	0640	81	1325.	217.1	3016.2	*	1	1500	181	0.	9.1	2994.1	*	1	2320	281	0.	9.1	2994.1
1	0645	82	1308.	208.7	3015.6	*	1	1505	182	0.	9.1	2994.1	*	1	2325	282	0.	9.1	2994.1
1	0650	83	1290.	200.3	3015.0	*	1	1510	183	0.	9.1	2994.1	*	1	2330	283	0.	9.1	2994.1
1	0655	84	1270.	192.0	3014.4	*	1	1515	184	0.	9.1	2994.1	*	1	2335	284	0.	9.1	2994.1
1	0700	85	1250.	183.7	3013.7	*	1	1520	185	0.	9.1	2994.1	*	1	2340	285	0.	9.1	2994.1
1	0705	86	1229.	175.4	3013.1	*	1	1525	186	0.	9.1	2994.1	*	1	2345	286	0.	9.1	2994.1
1	0710	87	1209.	167.3	3012.5	*	1	1530	187	0.	9.1	2994.1	*	1	2350	287	0.	9.1	2994.1
1	0715	88	1188.	159.2	3011.8	*	1	1535	188	0.	9.1	2994.1	*	1	2355	288	0.	9.1	2994.1
1	0720	89	1168.	151.2	3011.2	*	1	1540	189	0.	9.1	2994.1	*	2	0000	289	0.	9.1	2994.1
1	0725	90	1147.	143.4	3010.6	*	1	1545	190	0.	9.1	2994.1	*	2	0005	290	0.	9.1	2994.1
1	0730	91	1127.	135.6	3010.0	*	1	1550	191	0.	9.1	2994.1	*	2	0010	291	0.	9.1	2994.1
1	0735	92	1102.	128.0	3009.3	*	1	1555	192	0.	9.1	2994.1	*	2	0015	292	0.	9.1	2994.1
1	0740	93	1075.	120.6	3008.6	*	1	1600	193	0.	9.1	2994.1	*	2	0020	293	0.	9.1	2994.1
1	0745	94	1047.	113.3	3007.9	*	1	1605	194	0.	9.1	2994.1	*	2	0025	294	0.	9.1	2994.1
1	0750	95	1019.	106.2	3007.1	*	1	1610	195	0.	9.1	2994.1	*	2	0030	295	0.	9.1	2994.1
1	0755	96	991.	99.3	3006.4	*	1	1615	196	0.	9.1	2994.1	*	2	0035	296	0.	9.1	2994.1
1	0800	97	962.	92.6	3005.7	*	1	1620	197	0.	9.1	2994.1	*	2	0040	297	0.	9.1	2994.1
1	0805	98	932.	86.1	3005.0	*	1	1625	198	0.	9.1	2994.1	*	2	0045	298	0.	9.1	2994.1
1	0810	99	896.	79.8	3004.2	*	1	1630	199	0.	9.1	2994.1	*	2	0050	299	0.	9.1	2994.1
1	0815	100	860.	73.8	3003.4	*	1	1635	200	0.	9.1	2994.1	*	2	0055	300	0.	9.1	2994.1

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 1663.	5.25		1156.	306.	295.	295.
		(INCHES)	1.753	1.859	1.859	1.859
		(AC-FT)	573.	608.	608.	608.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
+ 314.	5.25	177.	51.	49.	49.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
+ 3022.59	5.25	3011.92	2998.56	2998.27	2998.27

CUMULATIVE AREA = 6.13 SQ MI

WARNING --- ROUTED OUTFLOW (1521.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1559.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1582.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1590.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1582.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1558.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1519.) IS GREATER THAN MAXIMUM OUTFLOW (1507.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION INTDB
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1	0000		1	0.	.0	2990.0	1	0820		101	811.	66.1	3002.4	1	1640		201	0.	9.1	2994.1

1	0005	2	0.	.0	2990.0	*	1	0825	102	776.	60.6	3001.7	*	1	1645	202	0.	9.1	2994.1
1	0010	3	0.	.0	2990.0	*	1	0830	103	739.	55.4	3001.0	*	1	1650	203	0.	9.1	2994.1
1	0015	4	0.	.0	2990.0	*	1	0835	104	704.	50.4	3000.3	*	1	1655	204	0.	9.1	2994.1
1	0020	5	0.	.0	2990.0	*	1	0840	105	668.	45.7	2999.7	*	1	1700	205	0.	9.1	2994.1
1	0025	6	0.	.0	2990.2	*	1	0845	106	632.	41.2	2999.1	*	1	1705	206	0.	9.1	2994.1
1	0030	7	0.	.1	2990.8	*	1	0850	107	596.	37.0	2998.6	*	1	1710	207	0.	9.1	2994.1
1	0035	8	0.	.1	2991.1	*	1	0855	108	560.	33.0	2998.0	*	1	1715	208	0.	9.1	2994.1
1	0040	9	0.	.2	2991.2	*	1	0900	109	523.	29.3	2997.6	*	1	1720	209	0.	9.1	2994.1
1	0045	10	0.	.3	2991.3	*	1	0905	110	488.	25.8	2997.1	*	1	1725	210	0.	9.1	2994.1
1	0050	11	0.	.4	2991.5	*	1	0910	111	445.	22.6	2996.6	*	1	1730	211	0.	9.1	2994.1
1	0055	12	0.	.6	2991.7	*	1	0915	112	402.	19.7	2996.1	*	1	1735	212	0.	9.1	2994.1
1	0100	13	0.	.7	2991.9	*	1	0920	113	355.	17.1	2995.7	*	1	1740	213	0.	9.1	2994.1
1	0105	14	0.	.9	2992.0	*	1	0925	114	309.	14.8	2995.3	*	1	1745	214	0.	9.1	2994.1
1	0110	15	0.	1.1	2992.1	*	1	0930	115	269.	12.8	2995.0	*	1	1750	215	0.	9.1	2994.1
1	0115	16	0.	1.2	2992.1	*	1	0935	116	162.	11.3	2994.6	*	1	1755	216	0.	9.1	2994.1
1	0120	17	0.	1.4	2992.2	*	1	0940	117	95.	10.4	2994.4	*	1	1800	217	0.	9.1	2994.1
1	0125	18	0.	1.6	2992.2	*	1	0945	118	56.	9.9	2994.3	*	1	1805	218	0.	9.1	2994.1
1	0130	19	0.	1.9	2992.3	*	1	0950	119	33.	9.6	2994.2	*	1	1810	219	0.	9.1	2994.1
1	0135	20	0.	2.4	2992.4	*	1	0955	120	20.	9.4	2994.2	*	1	1815	220	0.	9.1	2994.1
1	0140	21	0.	2.9	2992.5	*	1	1000	121	12.	9.3	2994.1	*	1	1820	221	0.	9.1	2994.1
1	0145	22	0.	3.7	2992.7	*	1	1005	122	7.	9.2	2994.1	*	1	1825	222	0.	9.1	2994.1
1	0150	23	0.	4.6	2993.0	*	1	1010	123	4.	9.2	2994.1	*	1	1830	223	0.	9.1	2994.1
1	0155	24	0.	5.7	2993.2	*	1	1015	124	2.	9.2	2994.1	*	1	1835	224	0.	9.1	2994.1
1	0200	25	0.	6.9	2993.5	*	1	1020	125	1.	9.2	2994.1	*	1	1840	225	0.	9.1	2994.1
1	0205	26	0.	8.2	2993.9	*	1	1025	126	1.	9.1	2994.1	*	1	1845	226	0.	9.1	2994.1
1	0210	27	22.	9.4	2994.2	*	1	1030	127	0.	9.1	2994.1	*	1	1850	227	0.	9.1	2994.1
1	0215	28	93.	10.4	2994.4	*	1	1035	128	0.	9.1	2994.1	*	1	1855	228	0.	9.1	2994.1
1	0220	29	139.	11.0	2994.6	*	1	1040	129	0.	9.1	2994.1	*	1	1900	229	0.	9.1	2994.1
1	0225	30	177.	11.5	2994.7	*	1	1045	130	0.	9.1	2994.1	*	1	1905	230	0.	9.1	2994.1
1	0230	31	212.	12.0	2994.8	*	1	1050	131	0.	9.1	2994.1	*	1	1910	231	0.	9.1	2994.1
1	0235	32	246.	12.4	2994.9	*	1	1055	132	0.	9.1	2994.1	*	1	1915	232	0.	9.1	2994.1
1	0240	33	271.	12.9	2995.0	*	1	1100	133	0.	9.1	2994.1	*	1	1920	233	0.	9.1	2994.1
1	0245	34	281.	13.4	2995.1	*	1	1105	134	0.	9.1	2994.1	*	1	1925	234	0.	9.1	2994.1
1	0250	35	292.	13.9	2995.2	*	1	1110	135	0.	9.1	2994.1	*	1	1930	235	0.	9.1	2994.1
1	0255	36	304.	14.5	2995.3	*	1	1115	136	0.	9.1	2994.1	*	1	1935	236	0.	9.1	2994.1
1	0300	37	316.	15.1	2995.4	*	1	1120	137	0.	9.1	2994.1	*	1	1940	237	0.	9.1	2994.1
1	0305	38	330.	15.8	2995.5	*	1	1125	138	0.	9.1	2994.1	*	1	1945	238	0.	9.1	2994.1
1	0310	39	348.	16.7	2995.7	*	1	1130	139	0.	9.1	2994.1	*	1	1950	239	0.	9.1	2994.1
1	0315	40	376.	18.1	2995.9	*	1	1135	140	0.	9.1	2994.1	*	1	1955	240	0.	9.1	2994.1
1	0320	41	417.	20.7	2996.3	*	1	1140	141	0.	9.1	2994.1	*	1	2000	241	0.	9.1	2994.1
1	0325	42	486.	25.6	2997.1	*	1	1145	142	0.	9.1	2994.1	*	1	2005	242	0.	9.1	2994.1
1	0330	43	576.	34.7	2998.3	*	1	1150	143	0.	9.1	2994.1	*	1	2010	243	0.	9.1	2994.1
1	0335	44	696.	49.3	3000.2	*	1	1155	144	0.	9.1	2994.1	*	1	2015	244	0.	9.1	2994.1
1	0340	45	833.	69.6	3002.8	*	1	1200	145	0.	9.1	2994.1	*	1	2020	245	0.	9.1	2994.1
1	0345	46	969.	94.1	3005.9	*	1	1205	146	0.	9.1	2994.1	*	1	2025	246	0.	9.1	2994.1
1	0350	47	1076.	120.8	3008.6	*	1	1210	147	0.	9.1	2994.1	*	1	2030	247	0.	9.1	2994.1
1	0355	48	1159.	147.9	3011.0	*	1	1215	148	0.	9.1	2994.1	*	1	2035	248	0.	9.1	2994.1
1	0400	49	1226.	173.9	3013.0	*	1	1220	149	0.	9.1	2994.1	*	1	2040	249	0.	9.1	2994.1
1	0405	50	1284.	197.9	3014.8	*	1	1225	150	0.	9.1	2994.1	*	1	2045	250	0.	9.1	2994.1
1	0410	51	1330.	219.5	3016.3	*	1	1230	151	0.	9.1	2994.1	*	1	2050	251	0.	9.1	2994.1
1	0415	52	1369.	238.2	3017.7	*	1	1235	152	0.	9.1	2994.1	*	1	2055	252	0.	9.1	2994.1
1	0420	53	1400.	253.8	3018.7	*	1	1240	153	0.	9.1	2994.1	*	1	2100	253	0.	9.1	2994.1
1	0425	54	1423.	266.3	3019.5	*	1	1245	154	0.	9.1	2994.1	*	1	2105	254	0.	9.1	2994.1
1	0430	55	1441.	276.1	3020.2	*	1	1250	155	0.	9.1	2994.1	*	1	2110	255	0.	9.1	2994.1
1	0435	56	1455.	283.8	3020.7	*	1	1255	156	0.	9.1	2994.1	*	1	2115	256	0.	9.1	2994.1
1	0440	57	1465.	289.8	3021.1	*	1	1300	157	0.	9.1	2994.1	*	1	2120	257	0.	9.1	2994.1
1	0445	58	1473.	294.8	3021.4	*	1	1305	158	0.	9.1	2994.1	*	1	2125	258	0.	9.1	2994.1
1	0450	59	1481.	299.0	3021.6	*	1	1310	159	0.	9.1	2994.1	*	1	2130	259	0.	9.1	2994.1
1	0455	60	1487.	302.7	3021.9	*	1	1315	160	0.	9.1	2994.1	*	1	2135	260	0.	9.1	2994.1
1	0500	61	1521.	305.8	3022.1	*	1	1320	161	0.	9.1	2994.1	*	1	2140	261	0.	9.1	2994.1
1	0505	62	1559.	308.1	3022.2	*	1	1325	162	0.	9.1	2994.1	*	1	2145	262	0.	9.1	2994.1
1	0510	63	1582.	309.6	3022.3	*	1	1330	163	0.	9.1	2994.1	*	1	2150	263	0.	9.1	2994.1
1	0515	64	1590.	310.1	3022.3	*	1	1335	164	0.	9.1	2994.1	*	1	2155	264	0.	9.1	2994.1
1	0520	65	1582.	309.5	3022.3	*	1	1340	165	0.	9.1	2994.1	*	1	2200	265	0.	9.1	2994.1
1	0525	66	1558.	308.1	3022.2	*	1	1345	166	0.	9.1	2994.1	*	1	2205	266	0.	9.1	2994.1
1	0530	67	1519.	305.7	3022.0	*	1	1350	167	0.	9.1	2994.1	*	1	2210	267	0.	9.1	2994.1
1	0535	68	1487.	302.6	3021.9	*	1	1355	168	0.	9.1	2994.1	*	1	2215	268	0.	9.1	2994.1
1	0540	69	1480.	298.7	3021.6	*	1	1400	169	0.	9.1	2994.1	*	1	2220	269	0.	9.1	2994.1
1	0545	70	1472.	294.0	3021.3	*	1	1405	170	0.	9.1	2994.1	*	1	2225	270	0.	9.1	2994.1
1	0550	71	1463.	288.5	3021.0	*	1	1410	171	0.	9.1	2994.1	*	1	2230	271	0.	9.1	2994.1
1	0555	72	1452.	282.5	3020.6	*	1	1415	172	0.	9.1	2994.1	*	1	2235	272	0.	9.1	2994.1
1	0600	73	1441.	275.9	3020.2	*	1	1420	173	0.	9.1	2994.1	*	1	2240	273	0.	9.1	2994.1
1	0605	74	1428.	269.0	3019.7	*	1	1425	174	0.	9.1	2994.1	*	1	2245	274	0.	9.1	2994.1
1	0610	75	1415.	261.8	3019.2	*	1	1430	175	0.	9.1	2994.1	*	1	2250	275	0.	9.1	2994.1
1	0615	76	1401.	254.2	3018.7	*	1	1435	176	0.	9.1	2994.1	*	1	2255	276	0.	9.1	2994.1
1	0620	77	1386.	246.5	3018.2	*	1	1440	177	0.	9.1	2994.1	*	1	2300	277	0.	9.1	2994.1
1	0625	78	1370.	238.5	3017.7	*	1	1445	178	0.	9.1	2994.1	*	1	2305	278	0.	9.1	2994.1
1	0630	79	1353.	230.5	3017.1	*	1	1450	179	0.	9.1	2994.1	*	1	2310	279	0.	9.1	2994.1
1	0635	80	1336.	222.3	3016.5	*	1	1455	180	0.	9.1	2994.1	*	1	2315	280	0.	9.1	2994.1
1	0640	81	1319.	214.0	3016.0	*	1	1500	181	0.	9.1	2994.1	*	1	2320	281	0.	9.1	2994.1
1	0645	82	1301.	205.7	3015.4	*	1	1505	182	0.	9.1	2994.1	*	1	2325	282	0.	9.1	2994.1
1	0650	83	1283.	197.3	3014.8	*	1	1510	183	0.	9.1	2994.1	*	1	2330	283	0.	9.1	2994.1
1	0655	84	1263.	189.0	3014.1	*	1	1515	184	0.	9.1	2994.1	*	1	2335	284	0.	9.1	2994.1
1	0700	85	1242.	180.8	3013.5	*	1	1520	185	0.	9.1	2994.1	*	1	2340	285	0.	9.1	2994.1
1	0705	86	1222.	172.6	3012.9	*	1	1525	186	0.	9.1	2994.1	*	1	2345	286	0.	9.1	2994.1
1	0710	87	1202.	164.5	3012.3	*	1	1530	187	0.	9.1	2994.1	*	1	2350	287	0.	9.1	2994.1
1	0715	88	1181.	156.4	3011.6	*	1	1535	188	0.	9.1	2994.1	*	1	2355	288	0.	9.1	2994.1
1	0720	89	1160.	148.5	3011.0	*	1	1540	189	0.	9.1	2994.1	*	2	0000	289	0.	9.1	2994.1
1	0725	90	1140.	140.7	3010.4	*	1	1545	190	0.	9.1	2994.1	*	2	0005	290	0.	9.1	2994.1
1	0730	91	1118.	133.0	3009.8	*	1	1550	191	0.	9.1	2994.1	*	2	0010	291	0.	9.1	2994.1
1	0735	92	1093.	125.4	3009.1	*	1	1555	192	0.	9.1	2994.1	*	2	0015	292	0.	9.1	2994.1
1	0740	93	1065.	118.1	3008.4	*	1	1600	193	0.	9.1	2994.1	*	2	0020	293	0.	9.1	2994.1
1	0745	94	1037.	110.9	3007.6	*	1	1605	194	0.	9.1	2994.1	*	2	0025	294	0.	9.1	2994.1
1	0750	95	1010.	103.8	3006.9	*	1	1610	195	0.	9.1	2994.1	*	2	0030	295	0.	9.1	2994.1
1	0755	96	982.	97.0	3006.2	*	1	1615	196	0.	9.1	2994.1	*	2	0035	296	0.	9.1	2994.1
1	0800	97	952.	90.4	3005.5	*	1	1620	197	0.	9.1	2994.1	*	2	0040	297	0.	9.1	2994.1
1	0805	98	920.	83.9	3004.7	*	1	1625	198	0.	9.1	2994.1	*	2	0045	298	0.	9.1	2994.1
1	0810	99	884.	77.7	3003.9	*	1	1630	199	0.	9.1	2994.1	*	2	0050	299	0.	9.1	2994.1
1	0815	100	847.	71.8	3003.1	*	1	1635	200	0.	9.1	2994.1	*	2	0055	300	0.	9.1	2994.1
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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW				
		6-HR	24-HR	72-HR	24.92-HR	
+ (CFS)	(HR)	(CFS)				

+	1590.	5.25		1139.	301.	290.	290.
			(INCHES)	1.728	1.828	1.828	1.828
			(AC-FT)	565.	597.	597.	597.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
310.	5.25	174.	50.	49.	49.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3022.32	5.25	3011.69	2998.49	2998.20	2998.20

CUMULATIVE AREA = 6.13 SQ MI

HYDROGRAPH AT STATION INTDB
PLAN 1, RATIO = .90

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	796.	63.7	3002.1	1		1640	201	0.	9.1	2994.1
1		0005	2	0.	.0	2990.0	1		0825	102	761.	58.3	3001.4	1		1645	202	0.	9.1	2994.1
1		0010	3	0.	.0	2990.0	1		0830	103	724.	53.2	3000.7	1		1650	203	0.	9.1	2994.1
1		0015	4	0.	.0	2990.0	1		0835	104	689.	48.4	3000.1	1		1655	204	0.	9.1	2994.1
1		0020	5	0.	.0	2990.0	1		0840	105	652.	43.7	2999.5	1		1700	205	0.	9.1	2994.1
1		0025	6	0.	.0	2990.2	1		0845	106	617.	39.4	2998.9	1		1705	206	0.	9.1	2994.1
1		0030	7	0.	.1	2990.7	1		0850	107	581.	35.3	2998.3	1		1710	207	0.	9.1	2994.1
1		0035	8	0.	.1	2991.1	1		0855	108	544.	31.4	2997.8	1		1715	208	0.	9.1	2994.1
1		0040	9	0.	.2	2991.2	1		0900	109	508.	27.8	2997.4	1		1720	209	0.	9.1	2994.1
1		0045	10	0.	.3	2991.3	1		0905	110	471.	24.4	2996.9	1		1725	210	0.	9.1	2994.1
1		0050	11	0.	.4	2991.5	1		0910	111	426.	21.3	2996.4	1		1730	211	0.	9.1	2994.1
1		0055	12	0.	.5	2991.6	1		0915	112	384.	18.5	2996.0	1		1735	212	0.	9.1	2994.1
1		0100	13	0.	.7	2991.8	1		0920	113	334.	16.0	2995.6	1		1740	213	0.	9.1	2994.1
1		0105	14	0.	.8	2992.0	1		0925	114	291.	13.9	2995.2	1		1745	214	0.	9.1	2994.1
1		0110	15	0.	1.0	2992.0	1		0930	115	223.	12.1	2994.8	1		1750	215	0.	9.1	2994.1
1		0115	16	0.	1.1	2992.1	1		0935	116	131.	10.9	2994.5	1		1755	216	0.	9.1	2994.1
1		0120	17	0.	1.3	2992.1	1		0940	117	77.	10.2	2994.4	1		1800	217	0.	9.1	2994.1
1		0125	18	0.	1.5	2992.2	1		0945	118	46.	9.7	2994.3	1		1805	218	0.	9.1	2994.1
1		0130	19	0.	1.8	2992.3	1		0950	119	27.	9.5	2994.2	1		1810	219	0.	9.1	2994.1
1		0135	20	0.	2.2	2992.4	1		0955	120	16.	9.3	2994.2	1		1815	220	0.	9.1	2994.1
1		0140	21	0.	2.7	2992.5	1		1000	121	9.	9.3	2994.1	1		1820	221	0.	9.1	2994.1
1		0145	22	0.	3.4	2992.7	1		1005	122	6.	9.2	2994.1	1		1825	222	0.	9.1	2994.1
1		0150	23	0.	4.3	2992.9	1		1010	123	3.	9.2	2994.1	1		1830	223	0.	9.1	2994.1
1		0155	24	0.	5.4	2993.2	1		1015	124	2.	9.2	2994.1	1		1835	224	0.	9.1	2994.1
1		0200	25	0.	6.6	2993.5	1		1020	125	1.	9.2	2994.1	1		1840	225	0.	9.1	2994.1
1		0205	26	0.	7.8	2993.8	1		1025	126	1.	9.1	2994.1	1		1845	226	0.	9.1	2994.1
1		0210	27	0.	9.1	2994.1	1		1030	127	0.	9.1	2994.1	1		1850	227	0.	9.1	2994.1
1		0215	28	72.	10.1	2994.3	1		1035	128	0.	9.1	2994.1	1		1855	228	0.	9.1	2994.1
1		0220	29	125.	10.8	2994.5	1		1040	129	0.	9.1	2994.1	1		1900	229	0.	9.1	2994.1
1		0225	30	165.	11.3	2994.7	1		1045	130	0.	9.1	2994.1	1		1905	230	0.	9.1	2994.1
1		0230	31	202.	11.8	2994.8	1		1050	131	0.	9.1	2994.1	1		1910	231	0.	9.1	2994.1
1		0235	32	236.	12.3	2994.9	1		1055	132	0.	9.1	2994.1	1		1915	232	0.	9.1	2994.1
1		0240	33	268.	12.7	2995.0	1		1100	133	0.	9.1	2994.1	1		1920	233	0.	9.1	2994.1
1		0245	34	277.	13.2	2995.1	1		1105	134	0.	9.1	2994.1	1		1925	234	0.	9.1	2994.1
1		0250	35	287.	13.7	2995.2	1		1110	135	0.	9.1	2994.1	1		1930	235	0.	9.1	2994.1
1		0255	36	298.	14.2	2995.3	1		1115	136	0.	9.1	2994.1	1		1935	236	0.	9.1	2994.1
1		0300	37	310.	14.8	2995.4	1		1120	137	0.	9.1	2994.1	1		1940	237	0.	9.1	2994.1
1		0305	38	324.	15.5	2995.5	1		1125	138	0.	9.1	2994.1	1		1945	238	0.	9.1	2994.1
1		0310	39	341.	16.4	2995.6	1		1130	139	0.	9.1	2994.1	1		1950	239	0.	9.1	2994.1
1		0315	40	368.	17.7	2995.8	1		1135	140	0.	9.1	2994.1	1		1955	240	0.	9.1	2994.1
1		0320	41	409.	20.2	2996.2	1		1140	141	0.	9.1	2994.1	1		2000	241	0.	9.1	2994.1
1		0325	42	479.	24.9	2997.0	1		1145	142	0.	9.1	2994.1	1		2005	242	0.	9.1	2994.1
1		0330	43	567.	33.7	2998.1	1		1150	143	0.	9.1	2994.1	1		2010	243	0.	9.1	2994.1
1		0335	44	686.	48.0	3000.0	1		1155	144	0.	9.1	2994.1	1		2015	244	0.	9.1	2994.1
1		0340	45	822.	67.8	3002.6	1		1200	145	0.	9.1	2994.1	1		2020	245	0.	9.1	2994.1
1		0345	46	959.	91.9	3005.7	1		1205	146	0.	9.1	2994.1	1		2025	246	0.	9.1	2994.1
1		0350	47	1066.	118.2	3008.4	1		1210	147	0.	9.1	2994.1	1		2030	247	0.	9.1	2994.1
1		0355	48	1151.	144.8	3010.7	1		1215	148	0.	9.1	2994.1	1		2035	248	0.	9.1	2994.1
1		0400	49	1217.	170.4	3012.7	1		1220	149	0.	9.1	2994.1	1		2040	249	0.	9.1	2994.1
1		0405	50	1275.	194.0	3014.5	1		1225	150	0.	9.1	2994.1	1		2045	250	0.	9.1	2994.1
1		0410	51	1321.	215.1	3016.0	1		1230	151	0.	9.1	2994.1	1		2050	251	0.	9.1	2994.1
1		0415	52	1360.	233.5	3017.3	1		1235	152	0.	9.1	2994.1	1		2055	252	0.	9.1	2994.1
1		0420	53	1390.	248.8	3018.4	1		1240	153	0.	9.1	2994.1	1		2100	253	0.	9.1	2994.1
1		0425	54	1414.	261.0	3019.2	1		1245	154	0.	9.1	2994.1	1		2105	254	0.	9.1	2994.1
1		0430	55	1431.	270.6	3019.8	1		1250	155	0.	9.1	2994.1	1		2110	255	0.	9.1	2994.1
1		0435	56	1445.	278.1	3020.3	1		1255	156	0.	9.1	2994.1	1		2115	256	0.	9.1	2994.1
1		0440	57	1455.	284.0	3020.7	1		1300	157	0.	9.1	2994.1	1		2120	257	0.	9.1	2994.1
1		0445	58	1463.	288.9	3021.0	1		1305	158	0.	9.1	2994.1	1		2125	258	0.	9.1	2994.1
1		0450	59	1470.	293.0	3021.2	1		1310	159	0.	9.1	2994.1	1		2130	259	0.	9.1	2994.1
1		0455	60	1476.	296.5	3021.5	1		1315	160	0.	9.1	2994.1	1		2135	260	0.	9.1	2994.1
1		0500	61	1482.	299.6	3021.7	1		1320	161	0.	9.1	2994.1	1		2140	261	0.	9.1	2994.1
1		0505	62	1486.	302.1	3021.8	1		1325	162	0.	9.1	2994.1	1		2145	262	0.	9.1	2994.1
1		0510	63	1493.	304.0	3021.9	1		1330	163	0.	9.1	2994.1	1		2150	263	0.	9.1	2994.1
1		0515	64	1506.	304.9	3022.0	1		1335	164	0.	9.1	2994.1	1		2155	264	0.	9.1	2994.1
1		0520	65	1504.	304.8	3022.0	1		1340	165	0.	9.1	2994.1	1		2200	265	0.	9.1	2994.1
1		0525	66	1490.	303.7	3021.9	1		1345	166	0.	9.1	2994.1	1		2205	266	0.	9.1	2994.1
1		0530	67	1485.	301.6	3021.8	1		1350	167	0.	9.1	2994.1	1		2210	267	0.	9.1	2994.1
1		0535	68	1480.	298.6	3021.6	1		1355	168	0.	9.1	2994.1	1		2215	268	0.	9.1	2994.1
1		0540	69	1473.	294.6	3021.4	1		1400	169	0.	9.1	2994.1	1		2220	269	0.	9.1	2994.1
1		0545	70	1465.	289.9	3021.1	1		1405	170	0.	9.1	2994.1	1		2225	270	0.	9.1	2994.1
1		0550	71	1456.	284.4	3020.7	1		1410	171	0.	9.1	2994.1	1		2230	271	0.	9.1	2994.1
1		0555	72	1445.	278.3	3020.3	1		1415	172	0.	9.1	2994.1	1		2235	272	0.	9.1	2994.1
1		0600	73	1433.	271.8	3019.9	1		1420	173	0.	9.1	2994.1	1		2240	273	0.	9.1	2994.1
1		0605	74	1421.	264.9	3019.4	1		1425	174	0.	9.1	2994.1	1		2245	274	0.	9.1	2994.1
1		0610	75	1408.	257.7	3019.0	1		1430	175	0.	9.1	2994.1	1		2250	275	0.	9.1	2994.1
1		0615	76	1393.	250.2	3018.5	1		1435	176	0.	9.1	2994.1	1		2255	276	0.	9.1	2994.1
1		0620	77	1378.	242.5	3018.0	1		1440	177	0.	9.1	2994.1	1		2300	277	0.	9.1	2994.1
1		0625	78	1362.	234.6	3017.4	1		1445	178	0.	9.1	2994.1	1		2305	278	0.	9.1	2994.1
1		0630	79	1345.	226.5	3016.8	1		1450	179	0.	9.1	2994.1	1		2310	279	0.	9.1	2994.1
1		0635	80	1328.	218.3	3016.3	1		1455	180	0.	9.1	2994.1	1		2315	280	0.	9.1	2994.1

1	0640	81	1311.	210.1	3015.7	*	1	1500	181	0.	9.1	2994.1	*	1	2320	281	0.	9.1	2994.1
1	0645	82	1294.	201.9	3015.1	*	1	1505	182	0.	9.1	2994.1	*	1	2325	282	0.	9.1	2994.1
1	0650	83	1274.	193.6	3014.5	*	1	1510	183	0.	9.1	2994.1	*	1	2330	283	0.	9.1	2994.1
1	0655	84	1254.	185.3	3013.9	*	1	1515	184	0.	9.1	2994.1	*	1	2335	284	0.	9.1	2994.1
1	0700	85	1234.	177.1	3013.2	*	1	1520	185	0.	9.1	2994.1	*	1	2340	285	0.	9.1	2994.1
1	0705	86	1214.	169.0	3012.6	*	1	1525	186	0.	9.1	2994.1	*	1	2345	286	0.	9.1	2994.1
1	0710	87	1193.	160.9	3012.0	*	1	1530	187	0.	9.1	2994.1	*	1	2350	287	0.	9.1	2994.1
1	0715	88	1172.	153.0	3011.4	*	1	1535	188	0.	9.1	2994.1	*	1	2355	288	0.	9.1	2994.1
1	0720	89	1151.	145.1	3010.8	*	1	1540	189	0.	9.1	2994.1	*	2	0000	289	0.	9.1	2994.1
1	0725	90	1131.	137.3	3010.2	*	1	1545	190	0.	9.1	2994.1	*	2	0005	290	0.	9.1	2994.1
1	0730	91	1107.	129.7	3009.5	*	1	1550	191	0.	9.1	2994.1	*	2	0010	291	0.	9.1	2994.1
1	0735	92	1082.	122.2	3008.8	*	1	1555	192	0.	9.1	2994.1	*	2	0015	292	0.	9.1	2994.1
1	0740	93	1053.	114.9	3008.0	*	1	1600	193	0.	9.1	2994.1	*	2	0020	293	0.	9.1	2994.1
1	0745	94	1026.	107.8	3007.3	*	1	1605	194	0.	9.1	2994.1	*	2	0025	294	0.	9.1	2994.1
1	0750	95	998.	100.9	3006.6	*	1	1610	195	0.	9.1	2994.1	*	2	0030	295	0.	9.1	2994.1
1	0755	96	969.	94.1	3005.9	*	1	1615	196	0.	9.1	2994.1	*	2	0035	296	0.	9.1	2994.1
1	0800	97	939.	87.6	3005.2	*	1	1620	197	0.	9.1	2994.1	*	2	0040	297	0.	9.1	2994.1
1	0805	98	904.	81.2	3004.4	*	1	1625	198	0.	9.1	2994.1	*	2	0045	298	0.	9.1	2994.1
1	0810	99	869.	75.1	3003.6	*	1	1630	199	0.	9.1	2994.1	*	2	0050	299	0.	9.1	2994.1
1	0815	100	831.	69.3	3002.8	*	1	1635	200	0.	9.1	2994.1	*	2	0055	300	0.	9.1	2994.1
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 1506.	5.25		1123.	296.	285.	285.
		(INCHES)	1.703	1.797	1.797	1.797
		(AC-FT)	557.	587.	587.	587.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
305.	5.25	171.	49.	48.	48.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3021.99	5.25	3011.41	2998.42	2998.13	2998.13

CUMULATIVE AREA = 6.13 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .99	RATIO 3 .98	RATIO 4 .94	RATIO 5 .93	RATIO 6 .92	RATIO 7 .91	RATIO 8 .90
HYDROGRAPH AT												
+	EX2	2.51	1	FLOW	2624.	2587.	2550.	2404.	2368.	2331.	2295.	2258.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO												
+	R1	2.51	1	FLOW	2539.	2503.	2468.	2326.	2291.	2256.	2221.	2185.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17	4.17	4.17
HYDROGRAPH AT												
+	EX1	1.72	1	FLOW	2282.	2250.	2218.	2091.	2059.	2028.	1996.	1964.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT												
+	CP1	4.23	1	FLOW	3999.	3943.	3887.	3661.	3605.	3549.	3493.	3437.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO												
+	R2	4.23	1	FLOW	3966.	3912.	3856.	3629.	3575.	3519.	3462.	3407.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT												
+	INT6	.16	1	FLOW	314.	310.	306.	291.	287.	283.	279.	275.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	DEBR1N	.58	1	FLOW	630.	621.	611.	575.	566.	556.	547.	538.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO												
+	R-1	.58	1	FLOW	624.	615.	606.	569.	561.	552.	543.	534.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT												
+	AREV	.15	1	FLOW	197.	193.	190.	178.	175.	171.	168.	165.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT												
+	C-1	.72	1	FLOW	736.	725.	714.	670.	659.	648.	638.	627.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO												
+	R-2	.72	1	FLOW	727.	714.	705.	661.	651.	640.	630.	620.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT												
+	BREV	.21	1	FLOW	248.	245.	241.	225.	221.	217.	214.	210.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT												
+	C-2	.93	1	FLOW	944.	931.	915.	858.	844.	829.	816.	800.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83

HYDROGRAPH AT												
+	CREV	.07	1	FLOW	120.	118.	117.	110.	108.	106.	105.	103.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT												
+	C-3	1.01	1	FLOW	1011.	998.	980.	920.	906.	889.	876.	859.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO												
+	R-3	1.01	1	FLOW	1009.	996.	978.	917.	903.	887.	872.	856.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT												
+	DREV	.13	1	FLOW	196.	193.	190.	179.	176.	173.	170.	168.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT												
+	C-4	1.14	1	FLOW	1154.	1138.	1118.	1047.	1029.	1011.	992.	976.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT												
+	EREV	.16	1	FLOW	230.	227.	224.	211.	208.	204.	201.	198.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT												
+	C-5	1.30	1	FLOW	1369.	1350.	1327.	1244.	1223.	1202.	1180.	1161.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO												
+	R-4	1.30	1	FLOW	1347.	1332.	1306.	1227.	1200.	1186.	1161.	1141.
				TIME	3.75	3.75	3.75	3.75	3.83	3.75	3.83	3.83
HYDROGRAPH AT												
+	FREV	.36	1	FLOW	470.	464.	457.	431.	424.	417.	411.	404.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT												
+	C-6	1.66	1	FLOW	1818.	1796.	1764.	1658.	1623.	1603.	1569.	1544.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT												
+	GREV	.02	1	FLOW	41.	40.	40.	38.	37.	36.	36.	35.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT												
+	C-7	1.69	1	FLOW	1842.	1819.	1787.	1680.	1645.	1625.	1590.	1565.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO												
+	R-5	1.69	1	FLOW	1831.	1795.	1775.	1665.	1626.	1612.	1572.	1557.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
3 COMBINED AT												
+	C-8	6.08	1	FLOW	5780.	5689.	5611.	5285.	5192.	5122.	5029.	4956.
				TIME	3.83	3.83	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT												
+	INT3	.02	1	FLOW	33.	33.	32.	31.	30.	30.	29.	29.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	INT4	.01	1	FLOW	24.	24.	24.	22.	22.	22.	21.	21.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	1-14	.00	1	FLOW	3.	3.	3.	3.	3.	3.	3.	3.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	1-15	.00	1	FLOW	8.	8.	8.	7.	7.	7.	7.	7.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	1-16	.00	1	FLOW	4.	4.	4.	4.	4.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
6 COMBINED AT												
+	CP2	6.12	1	FLOW	5809.	5718.	5639.	5304.	5211.	5141.	5048.	4974.
				TIME	3.83	3.83	3.83	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT												
+	INT5	.00	1	FLOW	5.	5.	5.	5.	5.	5.	5.	5.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	1-17	.00	1	FLOW	6.	6.	6.	5.	5.	5.	5.	5.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	1-18	.00	1	FLOW	8.	8.	8.	7.	7.	7.	7.	7.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
4 COMBINED AT												
+	CP3	6.13	1	FLOW	5815.	5724.	5645.	5308.	5215.	5144.	5051.	4977.
				TIME	3.83	3.83	3.83	3.83	3.92	3.92	3.92	3.92
ROUTED TO												
+	INTDB	6.13	1	FLOW	2129.	2072.	2021.	1792.	1728.	1663.	1590.	1506.
				TIME	5.00	5.08	5.08	5.17	5.17	5.25	5.25	5.25
			** PEAK STAGES IN FEET **									
			1	STAGE	3024.37	3024.15	3023.96	3023.08	3022.84	3022.59	3022.32	3021.99
				TIME	5.00	5.08	5.08	5.17	5.17	5.25	5.25	5.25
HYDROGRAPH AT												
+	1-4R	.05	1	FLOW	102.	100.	99.	93.	92.	91.	89.	88.

				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	1-5R	.03	1	FLOW	63.	63.	62.	58.	57.	56.	56.	55.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT												
+	CP4	.09	1	FLOW	165.	163.	161.	152.	149.	147.	145.	143.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO												
+	R3	.09	1	FLOW	162.	157.	157.	147.	146.	143.	141.	140.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	1-6R	.02	1	FLOW	29.	28.	28.	26.	26.	25.	25.	25.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	1-7R	.03	1	FLOW	51.	51.	50.	47.	46.	46.	45.	44.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT												
+	CP5	.04	1	FLOW	80.	79.	78.	73.	72.	71.	70.	69.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO												
+	R4	.04	1	FLOW	78.	77.	76.	72.	71.	69.	68.	67.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	1-8R	.00	1	FLOW	5.	5.	5.	5.	4.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	1-10R	.05	1	FLOW	99.	97.	96.	90.	89.	88.	86.	85.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT												
+	CP6	.05	1	FLOW	103.	102.	101.	95.	94.	92.	91.	89.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO												
+	R5	.05	1	FLOW	102.	100.	99.	93.	92.	90.	89.	88.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	INT1	.20	1	FLOW	394.	390.	385.	366.	361.	356.	351.	346.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	INT2	.01	1	FLOW	11.	11.	11.	10.	10.	10.	10.	10.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO												
+	R6	.01	1	FLOW	10.	10.	10.	10.	9.	9.	9.	9.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
5 COMBINED AT												
+	CP7	.39	1	FLOW	747.	734.	726.	686.	678.	668.	658.	650.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	1-13	.00	1	FLOW	2.	2.	2.	2.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	LMT1R	1.96	1	FLOW	2207.	2176.	2146.	2024.	1994.	1963.	1933.	1903.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
3 COMBINED AT												
+	CP8	2.35	1	FLOW	2532.	2497.	2463.	2325.	2291.	2257.	2223.	2189.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO=		.00							
R2	MANE	1.81	3995.48	237.27	2.20	5.00	3966.32	235.00	2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4952E+03 EXCESS= .0000E+00 OUTFLOW= .4952E+03 BASIN STORAGE= .3205E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO=		.00							
R2	MANE	1.82	3938.19	236.65	2.16	5.00	3911.80	235.00	2.16

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4880E+03 EXCESS= .0000E+00 OUTFLOW= .4880E+03 BASIN STORAGE= .3516E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO=		.00							
R2	MANE	1.83	3875.10	237.87	2.13	5.00	3855.54	235.00	2.13

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4808E+03 EXCESS= .0000E+00 OUTFLOW= .4808E+03 BASIN STORAGE= .3166E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO=		.00							
R2	MANE	1.87	3657.97	237.38	2.00	5.00	3629.42	235.00	2.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4520E+03 EXCESS= .0000E+00 OUTFLOW= .4520E+03 BASIN STORAGE= .3807E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R2	MANE	1.88	3602.27	236.81	1.97	5.00	3574.99	235.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4449E+03 EXCESS= .0000E+00 OUTFLOW= .4449E+03 BASIN STORAGE= .3239E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R2	MANE	1.89	3538.28	238.13	1.94	5.00	3519.24	235.00	1.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4377E+03 EXCESS= .0000E+00 OUTFLOW= .4377E+03 BASIN STORAGE= .3495E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R2	MANE	1.90	3489.42	237.59	1.91	5.00	3461.98	235.00	1.91

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4306E+03 EXCESS= .0000E+00 OUTFLOW= .4306E+03 BASIN STORAGE= .3080E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R2	MANE	1.91	3435.09	237.05	1.88	5.00	3406.72	235.00	1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4235E+03 EXCESS= .0000E+00 OUTFLOW= .4235E+03 BASIN STORAGE= .3308E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-1	MANE	3.06	626.60	232.40	2.03	5.00	624.00	235.00	2.02

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6214E+02 EXCESS= .0000E+00 OUTFLOW= .6214E+02 BASIN STORAGE= .3616E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-1	MANE	3.07	617.43	233.69	1.99	5.00	614.64	235.00	1.99

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6121E+02 EXCESS= .0000E+00 OUTFLOW= .6121E+02 BASIN STORAGE= .3712E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-1	MANE	3.09	606.47	231.92	1.96	5.00	606.27	235.00	1.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6027E+02 EXCESS= .0000E+00 OUTFLOW= .6028E+02 BASIN STORAGE= .3801E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-1	MANE	3.17	570.95	234.24	1.84	5.00	569.32	235.00	1.84

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5655E+02 EXCESS= .0000E+00 OUTFLOW= .5655E+02 BASIN STORAGE= .4077E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-1	MANE	3.18	562.76	232.48	1.81	5.00	560.53	235.00	1.81

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5562E+02 EXCESS= .0000E+00 OUTFLOW= .5563E+02 BASIN STORAGE= .4327E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-1	MANE	3.20	554.05	233.91	1.78	5.00	551.84	235.00	1.78

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5469E+02 EXCESS= .0000E+00 OUTFLOW= .5470E+02 BASIN STORAGE= .4370E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-1	MANE	3.22	543.23	232.15	1.75	5.00	542.56	235.00	1.75

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5378E+02 EXCESS= .0000E+00 OUTFLOW= .5378E+02 BASIN STORAGE= .4405E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-1	MANE	3.24	536.99	233.63	1.72	5.00	534.34	235.00	1.72

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5287E+02 EXCESS= .0000E+00 OUTFLOW= .5287E+02 BASIN STORAGE= .4431E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-2	MANE	2.80	731.76	232.21	1.96	5.00	726.51	235.00	1.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7548E+02 EXCESS= .0000E+00 OUTFLOW= .7548E+02 BASIN STORAGE= .4351E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-2	MANE	2.81	719.18	233.44	1.93	5.00	714.33	235.00	1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7432E+02 EXCESS= .0000E+00 OUTFLOW= .7432E+02 BASIN STORAGE= .4374E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-2	MANE	2.83	709.80	232.05	1.90	5.00	704.79	235.00	1.90

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7318E+02 EXCESS= .0000E+00 OUTFLOW= .7318E+02 BASIN STORAGE= .4286E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-2 MANE	2.90	666.25	231.79	1.78	5.00	661.40	235.00	1.78	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6859E+02 EXCESS= .0000E+00 OUTFLOW= .6859E+02 BASIN STORAGE= .3946E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-2 MANE	2.92	655.49	233.29	1.75	5.00	651.00	235.00	1.75	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6744E+02 EXCESS= .0000E+00 OUTFLOW= .6745E+02 BASIN STORAGE= .3935E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-2 MANE	2.93	644.18	231.81	1.72	5.00	640.45	235.00	1.72	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6631E+02 EXCESS= .0000E+00 OUTFLOW= .6631E+02 BASIN STORAGE= .3873E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-2 MANE	2.95	634.29	233.29	1.69	5.00	630.00	235.00	1.69	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6517E+02 EXCESS= .0000E+00 OUTFLOW= .6518E+02 BASIN STORAGE= .3798E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-2 MANE	2.97	622.57	231.81	1.66	5.00	619.74	235.00	1.66	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6406E+02 EXCESS= .0000E+00 OUTFLOW= .6406E+02 BASIN STORAGE= .3726E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-3 MANE	1.57	1009.61	228.51	1.93	5.00	1009.41	230.00	1.93	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1033E+03 EXCESS= .0000E+00 OUTFLOW= .1033E+03 BASIN STORAGE= .2170E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-3 MANE	1.57	996.32	228.07	1.90	5.00	995.52	230.00	1.90	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1018E+03 EXCESS= .0000E+00 OUTFLOW= .1018E+03 BASIN STORAGE= .2313E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-3 MANE	1.58	978.25	228.02	1.87	5.00	977.91	230.00	1.87	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1002E+03 EXCESS= .0000E+00 OUTFLOW= .1002E+03 BASIN STORAGE= .2273E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-3 MANE	1.62	917.51	230.29	1.75	5.00	917.46	230.00	1.75	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9386E+02 EXCESS= .0000E+00 OUTFLOW= .9386E+02 BASIN STORAGE= .2527E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-3 MANE	1.63	903.00	230.03	1.72	5.00	902.99	230.00	1.72	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9230E+02 EXCESS= .0000E+00 OUTFLOW= .9230E+02 BASIN STORAGE= .2144E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-3 MANE	1.64	886.59	230.00	1.69	5.00	886.59	230.00	1.69	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9075E+02 EXCESS= .0000E+00 OUTFLOW= .9074E+02 BASIN STORAGE= .2101E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-3 MANE	1.65	872.28	231.34	1.66	5.00	872.06	230.00	1.66	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8916E+02 EXCESS= .0000E+00 OUTFLOW= .8916E+02 BASIN STORAGE= .2201E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-3 MANE	1.66	855.96	231.35	1.63	5.00	855.96	230.00	1.63	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8763E+02 EXCESS= .0000E+00 OUTFLOW= .8763E+02 BASIN STORAGE= .2157E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-4 MANE	2.41	1356.42	226.45	1.95	5.00	1347.25	225.00	1.94	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1350E+03 EXCESS= .0000E+00 OUTFLOW= .1350E+03 BASIN STORAGE= .4723E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R-4 MANE	2.42	1339.15	227.67	1.92	5.00	1331.74	225.00	1.92	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1331E+03 EXCESS= .0000E+00 OUTFLOW= .1331E+03 BASIN STORAGE= .4304E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-4	MANE	2.44	1315.10	226.70	1.89	5.00	1306.38	225.00	1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1309E+03 EXCESS= .0000E+00 OUTFLOW= .1309E+03 BASIN STORAGE= .3976E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-4	MANE	2.50	1234.03	227.31	1.77	5.00	1227.09	225.00	1.77

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1228E+03 EXCESS= .0000E+00 OUTFLOW= .1228E+03 BASIN STORAGE= .3943E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-4	MANE	2.51	1210.84	226.26	1.74	5.00	1200.41	230.00	1.74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1207E+03 EXCESS= .0000E+00 OUTFLOW= .1207E+03 BASIN STORAGE= .3801E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-4	MANE	2.53	1192.46	227.71	1.71	5.00	1185.97	225.00	1.71

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1187E+03 EXCESS= .0000E+00 OUTFLOW= .1187E+03 BASIN STORAGE= .3610E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-4	MANE	2.55	1170.08	226.75	1.68	5.00	1161.04	230.00	1.68

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1167E+03 EXCESS= .0000E+00 OUTFLOW= .1167E+03 BASIN STORAGE= .4156E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-4	MANE	2.56	1150.10	228.19	1.65	5.00	1141.46	230.00	1.65

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1147E+03 EXCESS= .0000E+00 OUTFLOW= .1147E+03 BASIN STORAGE= .3972E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-5	MANE	2.59	1830.71	230.08	1.97	5.00	1830.55	230.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1773E+03 EXCESS= .0000E+00 OUTFLOW= .1773E+03 BASIN STORAGE= .3271E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-5	MANE	2.60	1803.81	228.50	1.94	5.00	1795.10	230.00	1.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1748E+03 EXCESS= .0000E+00 OUTFLOW= .1748E+03 BASIN STORAGE= .3347E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-5	MANE	2.61	1776.02	229.96	1.91	5.00	1775.15	230.00	1.91

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1720E+03 EXCESS= .0000E+00 OUTFLOW= .1720E+03 BASIN STORAGE= .4372E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-5	MANE	2.67	1669.64	229.74	1.79	5.00	1665.46	230.00	1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1613E+03 EXCESS= .0000E+00 OUTFLOW= .1613E+03 BASIN STORAGE= .3928E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-5	MANE	2.69	1631.54	228.77	1.76	5.00	1625.65	230.00	1.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1587E+03 EXCESS= .0000E+00 OUTFLOW= .1587E+03 BASIN STORAGE= .3638E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-5	MANE	2.70	1614.93	229.78	1.73	5.00	1611.60	230.00	1.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1560E+03 EXCESS= .0000E+00 OUTFLOW= .1560E+03 BASIN STORAGE= .3953E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-5	MANE	2.72	1576.87	228.85	1.71	5.00	1572.03	230.00	1.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1534E+03 EXCESS= .0000E+00 OUTFLOW= .1534E+03 BASIN STORAGE= .3329E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R-5	MANE	2.74	1557.14	230.13	1.68	5.00	1556.93	230.00	1.68

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1507E+03 EXCESS= .0000E+00 OUTFLOW= .1507E+03 BASIN STORAGE= .3405E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R3	MANE	2.44	164.66	212.65	2.12	5.00	161.87	215.00	2.13

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9860E+01 EXCESS= .0000E+00 OUTFLOW= .9864E+01 BASIN STORAGE= .1004E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R3 MANE 2.46 161.66 213.60 2.09 5.00 157.42 215.00 2.09

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9713E+01 EXCESS= .0000E+00 OUTFLOW= .9717E+01 BASIN STORAGE= .1085E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R3 MANE 2.47 158.65 214.57 2.06 5.00 156.59 215.00 2.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9570E+01 EXCESS= .0000E+00 OUTFLOW= .9574E+01 BASIN STORAGE= .1235E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R3 MANE 2.51 150.57 213.61 1.94 5.00 146.81 215.00 1.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9003E+01 EXCESS= .0000E+00 OUTFLOW= .9007E+01 BASIN STORAGE= .1234E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R3 MANE 2.53 147.63 214.64 1.91 5.00 146.06 215.00 1.91

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8862E+01 EXCESS= .0000E+00 OUTFLOW= .8866E+01 BASIN STORAGE= .9183E-03 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R3 MANE 2.54 146.42 213.17 1.88 5.00 143.11 215.00 1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8720E+01 EXCESS= .0000E+00 OUTFLOW= .8724E+01 BASIN STORAGE= .9844E-03 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R3 MANE 2.55 143.52 214.24 1.85 5.00 140.81 215.00 1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8579E+01 EXCESS= .0000E+00 OUTFLOW= .8583E+01 BASIN STORAGE= .1045E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R3 MANE 2.56 142.18 212.76 1.82 5.00 139.92 215.00 1.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8445E+01 EXCESS= .0000E+00 OUTFLOW= .8449E+01 BASIN STORAGE= .1129E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R4 MANE 3.75 78.82 217.50 2.13 5.00 78.34 215.00 2.13

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4777E+01 EXCESS= .0000E+00 OUTFLOW= .4785E+01 BASIN STORAGE= .1497E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R4 MANE 3.50 78.76 217.00 2.10 5.00 77.03 215.00 2.10

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4708E+01 EXCESS= .0000E+00 OUTFLOW= .4713E+01 BASIN STORAGE= .2001E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R4 MANE 3.50 77.71 217.00 2.07 5.00 75.94 215.00 2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4639E+01 EXCESS= .0000E+00 OUTFLOW= .4644E+01 BASIN STORAGE= .1989E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R4 MANE 3.50 73.51 217.00 1.95 5.00 71.61 215.00 1.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4364E+01 EXCESS= .0000E+00 OUTFLOW= .4369E+01 BASIN STORAGE= .1940E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R4 MANE 3.50 72.46 217.00 1.92 5.00 70.52 215.00 1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4296E+01 EXCESS= .0000E+00 OUTFLOW= .4300E+01 BASIN STORAGE= .1928E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R4 MANE 3.50 71.41 217.00 1.88 5.00 69.44 215.00 1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4228E+01 EXCESS= .0000E+00 OUTFLOW= .4232E+01 BASIN STORAGE= .1915E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R4 MANE 3.75 70.11 217.50 1.85 5.00 68.06 215.00 1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4159E+01 EXCESS= .0000E+00 OUTFLOW= .4164E+01 BASIN STORAGE= .1577E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R4 MANE 3.75 69.08 217.50 1.82 5.00 66.98 215.00 1.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4091E+01 EXCESS= .0000E+00 OUTFLOW= .4096E+01 BASIN STORAGE= .1566E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R5 MANE 3.50 102.03 217.00 2.11 5.00 101.59 215.00 2.11

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6173E+01 EXCESS= .0000E+00 OUTFLOW= .6181E+01 BASIN STORAGE= .1985E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R5 MANE 3.50 100.71 217.00 2.08 5.00 100.19 215.00 2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6083E+01 EXCESS= .0000E+00 OUTFLOW= .6091E+01 BASIN STORAGE= .1972E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R5 MANE 3.50 99.38 217.00 2.05 5.00 98.80 215.00 2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5994E+01 EXCESS= .0000E+00 OUTFLOW= .6001E+01 BASIN STORAGE= .1959E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R5 MANE 3.50 94.40 217.00 1.92 5.00 92.90 215.00 1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5638E+01 EXCESS= .0000E+00 OUTFLOW= .5643E+01 BASIN STORAGE= .1443E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R5 MANE 3.50 93.06 217.00 1.89 5.00 91.50 215.00 1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5550E+01 EXCESS= .0000E+00 OUTFLOW= .5554E+01 BASIN STORAGE= .1434E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R5 MANE 3.50 91.72 217.00 1.86 5.00 90.11 215.00 1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5461E+01 EXCESS= .0000E+00 OUTFLOW= .5466E+01 BASIN STORAGE= .1425E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00
R5 MANE 3.75 89.14 217.50 1.83 5.00 88.96 215.00 1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5373E+01 EXCESS= .0000E+00 OUTFLOW= .5380E+01 BASIN STORAGE= .1621E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R5 MANE 3.75 87.84 217.50 1.80 5.00 87.56 215.00 1.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5285E+01 EXCESS= .0000E+00 OUTFLOW= .5292E+01 BASIN STORAGE= .1610E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R6 MANE 3.25 10.39 214.50 2.26 5.00 10.33 215.00 2.26

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6153E+00 EXCESS= .0000E+00 OUTFLOW= .6159E+00 BASIN STORAGE= .5620E-03 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R6 MANE 3.25 10.25 214.50 2.23 5.00 10.20 215.00 2.23

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6068E+00 EXCESS= .0000E+00 OUTFLOW= .6074E+00 BASIN STORAGE= .5579E-03 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R6 MANE 3.25 10.11 214.50 2.20 5.00 10.07 215.00 2.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5984E+00 EXCESS= .0000E+00 OUTFLOW= .5990E+00 BASIN STORAGE= .5539E-03 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R6 MANE 3.25 9.56 214.50 2.08 5.00 9.53 215.00 2.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5647E+00 EXCESS= .0000E+00 OUTFLOW= .5654E+00 BASIN STORAGE= .5375E-03 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R6 MANE 3.50 9.70 217.00 2.05 5.00 9.40 215.00 2.05

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5580E+00 EXCESS= .0000E+00 OUTFLOW= .5586E+00 BASIN STORAGE= .7549E-03 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R6 MANE 3.50 9.57 217.00 2.02 5.00 9.26 215.00 2.02

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5496E+00 EXCESS= .0000E+00 OUTFLOW= .5502E+00 BASIN STORAGE= .7491E-03 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
R6 MANE 3.50 9.44 217.00 1.99 5.00 9.13 215.00 1.99

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5412E+00 EXCESS= .0000E+00 OUTFLOW= .5418E+00 BASIN STORAGE= .7433E-03 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00

R6 MANE	3.50	9.31	217.00	1.96	5.00	9.00	215.00	1.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5329E+00 EXCESS= .0000E+00 OUTFLOW= .5335E+00 BASIN STORAGE= .7374E-03 PERCENT ERROR= -.2

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

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*          VERSION 4.1                  *
*                                       *
*  RUN DATE   15DEC15  TIME  18:07:07   *
*                                       *
*****************************************
```

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

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

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

```
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
                    *DIAGRAM
 *** FREE ***
               1    ID   ************************************************************
               2    ID   * .......................................................... *
               3    ID   * :              SUMMERLIN VILLAGE 26 REVERENCE            : *
               4    ID   * :                   ULTIMATE CONDITION                   : *
               5    ID   * :       THIS MODEL DETERMINES THE RUNOFF DURING          : *
               6    ID   * :          ULTIMATE DEVELOPMENT CONDITIONS               : *
               7    ID   * :........................................................: *
               8    ID   * :               RETURN PERIOD_ _ _ _100-YEAR             : *
               9    ID   * :               DISTRIBUTION_ _ _ _ 6-HOUR SDN3          : *
              10    ID   * :               PROJECT NO_ _ _ _ _ 764.204.011          : *
              11    ID   * :               FILENAME_ _ _ _ _ _ V26ULT.H1            : *
              12    ID   * :               DATE_ _ _ _ _ _ _ _ 11/23/2015           : *
              13    ID   * :               MODELED BY_ _ _ _ _ JAM                  : *
              14    ID   * :                                                        : *
              15    ID   * :              DEPTH AREA REDUCTION FACTORS:             : *
              16    ID   * :                AREA                DARF                : *
              17    ID   * :              0.00 TO 0.24 SQ MI     1.00               : *
              18    ID   * :              0.25 TO 0.49 SQ MI     0.99               : *
              19    ID   * :              0.50 TO 0.99 SQ MI     0.98               : *
              20    ID   * :              1.00 TO 1.24 SQ MI     0.97               : *
              21    ID   * :              1.25 TO 1.50 SQ MI     0.96               : *
              22    ID   * :              1.51 TO 1.74 SQ MI     0.95               : *
              23    ID   * :              1.75 TO 1.99 SQ MI     0.94               : *
              24    ID   * :              2.00 TO 2.99 SQ MI     0.93               : *
              25    ID   * :              3.00 TO 3.99 SQ MI     0.92               : *
              26    ID   * :              4.00 TO 4.99 SQ MI     0.91               : *
              27    ID   * :........................................................: *
              28    ID   ************************************************************
              29    ID
              30    ID
              31    IT       5       0       0     300
              32    IO       5
              33    IN       5       0       0
              34    JR    PREC     1.0    0.99    0.98    0.94    0.93    0.92    0.91    0.70    0.54
                    *
              35    KK    1-1A
              36    BA   2.339
              37    PB    3.67
              38    PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
              39    PC   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
              40    PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
              41    PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
              42    PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
              43    PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
              44    PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
              45    PC   .9980   .9990  1.000
              46    LS       0    85.4
              47    UD   0.488
                    *
```

1 HEC-1 INPUT PAGE 2

```
          LINE      ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
              48    KK    1-1B
              49    PB    3.61
              50    BA   0.175
              51    LS       0    78.3
              52    UD    .176
                    *
              53    KK      R2
              54    KM   ROUTE 1-1B THROUGH PORTION OF 1-1A
              55    KM   ASSUME EXISTING WASH
              56    KM     LEN   SLOPE      n             SHAPE      BW      SS
```

```
 57          RD    1885  0.0680    0.04       0    TRAP      20       10
             *

 58          KK     CP1
 59          KM    COMBINE 1-1A AND R2
 60          HC       2
             *

 61          KK      R3
 62          KM   ROUTE CP1 THROUGH 1-2B TO CP2
 63          KM   ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 64          KM   NSTEPS      K      X
 65          RM       1    .092     .15
             *

 66          KK    1-2A
 67          PB    3.55
 68          BA   0.864
 69          LS       0    85.8
 70          UD    .125
             *

 71          KK      R4
 72          KM   ROUTE 1-2A THROUGH 1-2B TO CP2
 73          KM   ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 74          KM   NSTEPS      K      X
 75          RM       1    .054     .15
             *

 76          KK    1-2B
 77          PB    3.51
 78          BA   0.215
 79          LS       0    82.6
 80          UD    .178
             *

 81          KK     CP2
 82          KM    COMBINE 1-2B, R4 AND R3
 83          HC       3
             *
```

1 HEC-1 INPUT PAGE 3

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

 84          KK      R5
 85          KM   ROUTE CP2 THROUGH 1-2C TO CP3
 86          KM   ASSUME EXISTING WASH
 87          KM   NSTEPS      K      X
 88          RM       1    .087     .15
             *

 89          KK   1-2CR
 90          PB    3.46
 91          BA   0.574
 92          LS       0    84.7
 93          UD    .180
             *

 94          KK     CP3
 95          KM    COMBINE 1-2C AND R5
 96          KO       1
 97          HC       2
             *

 98          KK      R6
 99          KM   ROUTE CP3 TO CP4
100          KM   ASSUME BOX CULVERT
101          KM     LEN   SLOPE     n              SHAPE      BW
102          RD    1745  0.0050   0.015       0    DEEP      14
             *

103          KK    1-3P
104          PB    3.36
105          BA   .0258
106          LS       0    94.9
107          UD    .084
             *

108          KK     CP4
109          KM    COMBINE CP3 and 1-3P
110          HC       2
             *

111          KK      R7
112          KM   ROUTE CP4 THROUGH 1-12P TO CP5 (DETENTION BASIN)
113          KM   ASSUME RCP
114          KM     LEN   SLOPE     n              SHAPE      BW
115          RD    2258  0.0050   0.016       0    DEEP      12
             *

116          KK   1-12P
117          PB    3.32
118          BA   .1814
119          LS       0    83.8
120          UD    .234
             *
```

1 HEC-1 INPUT PAGE 4

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

121          KK     CP5
122          KM    COMBINE CP4 AND 1-12P
123          HC       2
             *
```

```
 124          KK    1-14
 125          PB    3.31
 126          BA   .0016
 127          LS       0     86.3
 128          UD    .100
              *

 129          KK    1-15
 130          PB    3.32
 131          BA   .0057
 132          LS       0     86.1
 133          UD    .100
              *

 134          KK    1-16
 135          PB    3.31
 136          BA   .0030
 137          LS       0     86.3
 138          UD    .100
              *

 139          KK    1-17
 140          PB    3.28
 141          BA   .0039
 142          LS       0     86.3
 143          UD    .100
              *

 144          KK    1-18
 145          PB    3.28
 146          BA   .0038
 147          LS       0     86.3
 148          UD    .100
              *

 149          KK    CP5B
 150          KM    COMBINE CP5, 1-14, 1-15, 1-16, 1-17, AND 1-18 AT DETENTION BASIN
 151          KO       1
 152          HC       6
              *

 153          KK    EXDB
 154          KO       1
 155          KM   DETENTION BASIN CHEYENNE AND BELTWAY
 156          KM   LOW-FLOW OUTLET IS 66" PIPE
 157          RS       1    STOR       0
 158          SV       0    0.07    0.80   12.71   18.75   25.05   85.95   95.04  124.21  135.14
 159          SV  200.27  243.11  258.06  273.36  289.00  304.99
 160          SE    2990    2991    2992    2995    2996    2997    3005    3006    3009    3010
1                                          HEC-1 INPUT                                          PAGE  5

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

 161          SE    3015    3018    3019    3020    3021    3022
 162          SL  2992.8   22.34     0.7     0.5
 163          SS  3021.9     200     2.6     1.5
              *

 164          KK    1-4R
 165          PB    3.44
 166          BA  0.0536
 167          LS       0     86.3
 168          UD   0.100
              *

 169          KK    1-5R
 170          PB    3.42
 171          BA   .0343
 172          LS       0     86.3
 173          UD   0.100
              *

 174          KK     CP6
 175          KM    COMBINE 1-4R AND 1-5R
 176          HC       2
              *

 177          KK      R8
 178          KM   ROUTE CP6 THROUGH 1-11P TO CP9
 179          KM   ASSUME RCP
 180          KM     LEN   SLOPE     n              SHAPE   DIAMETER
 181          RD    1800  0.0610   0.013       0    CIRC       4
              *

 182          KK    1-6R
 183          PB    3.43
 184          BA   .0152
 185          LS       0     86.3
 186          UD    .100
              *

 187          KK    1-7R
 188          PB    3.44
 189          BA   .0271
 190          LS       0     86.3
 191          UD    .100
              *

 192          KK     CP7
 193          KM    COMBINE 1-6R AND 1-7R
 194          HC       2
              *
1                                          HEC-1 INPUT                                          PAGE  6

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

```
195           KK      R9
196           KM    ROUTE CP7 THROUGH 1-11P TO CP9
197           KM    ASSUME RCP
198           KM      LEN   SLOPE      n             SHAPE    DIAMETER
199           RD     3150  0.0400    0.013       0    CIRC      4.5
              *

200           KK    1-8R
201           PB     3.42
202           BA    .0025
203           LS       0     86.3
204           UD     .100
              *

205           KK    1-10R
206           PB     3.41
207           BA    .0556
208           LS       0     86.1
209           UD     .100
              *

210           KK     CP8
211           KM     COMBINE 1-8R AND 1-10R
212           HC        2
              *

213           KK     R10
214           KM    ASSUME RCP
215           KM      LEN   SLOPE      n             SHAPE    DIAMETER
216           RD     2900  0.0400    0.013       0    CIRC      4.5
              *

217           KK    1-11P
218           PB     3.38
219           BA    .1775
220           LS       0     81.7
221           UD     .214
              *

222           KK     CP9
223           KM     COMBINE CP6, CP7, CP8 AND 1-11P
224           HC        4
              *

225           KK    1-13
226           PB     3.34
227           BA    .0008
228           LS       0     86.3
229           UD     .100
              *
```



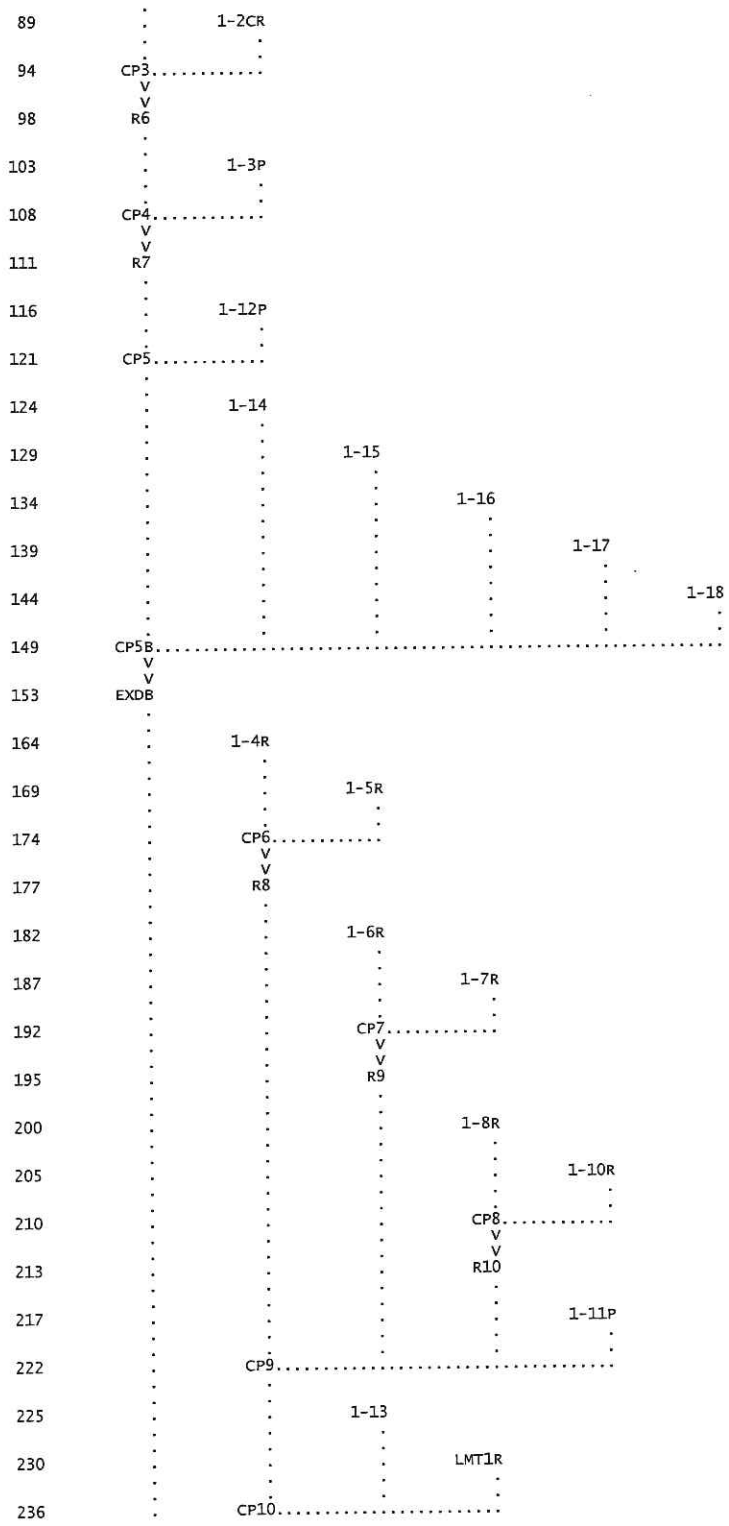
```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

230           KK    LMT1R
231           KM    REFERENCED FROM LAS VEGAS VALLEY MPU
232           PB     3.45
233           BA    1.964
234           LS       0     86.8
235           UD     .447
              *

236           KK     CP10
237           KM     COMBINE CP9, 1-13, AND LMT1R
238           HC        3
              *
239           ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   15DEC15  TIME  18:07:07   *
*                                       *
*****************************************
```

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

```
*****************************************************************
* ............................................................ *
* :            SUMMERLIN VILLAGE 26 REVERENCE                  : *
* :                  ULTIMATE CONDITION                        : *
* :      THIS MODEL DETERMINES THE RUNOFF DURING               : *
* :          ULTIMATE DEVELOPMENT CONDITIONS                   : *
* ............................................................ *
* :             RETURN PERIOD_ _ _ _100-YEAR                   : *
* :             DISTRIBUTION_ _ _ _ 6-HOUR SDN3                : *
* :             PROJECT NO_ _ _ _ _ 764.204.011                : *
* :             FILENAME_ _ _ _ _ _ V26ULT.H1                  : *
* :             DATE_ _ _ _ _ _ _ _ 11/23/2015                 : *
* :             MODELED BY_ _ _ _ _ JAM                        : *
* :                                                            : *
* :            DEPTH AREA REDUCTION FACTORS:                   : *
* :              AREA                DARF                      : *
* :            0.00 TO 0.24 SQ MI     1.00                     : *
* :            0.25 TO 0.49 SQ MI     0.99                     : *
* :            0.50 TO 0.99 SQ MI     0.98                     : *
* :            1.00 TO 1.24 SQ MI     0.97                     : *
* :            1.25 TO 1.50 SQ MI     0.96                     : *
* :            1.51 TO 1.74 SQ MI     0.95                     : *
* :            1.75 TO 1.99 SQ MI     0.94                     : *
* :            2.00 TO 2.99 SQ MI     0.93                     : *
* :            3.00 TO 3.99 SQ MI     0.92                     : *
* :            4.00 TO 4.99 SQ MI     0.91                     : *
* ............................................................ *
*****************************************************************


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

    IT        HYDROGRAPH TIME DATA
                    NMIN          5  MINUTES IN COMPUTATION INTERVAL
                   IDATE      1   0  STARTING DATE
                   ITIME       0000  STARTING TIME
                      NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                  NDDATE      2   0  ENDING DATE
                  NDTIME       0055  ENDING TIME
                   ICENT         19  CENTURY MARK

              COMPUTATION INTERVAL     .08 HOURS
                   TOTAL TIME BASE   24.92 HOURS

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

    JP        MULTI-PLAN OPTION
                   NPLAN          1  NUMBER OF PLANS

    JR        MULTI-RATIO OPTION
                  RATIOS OF PRECIPITATION
                 1.00      .99      .98      .94      .93      .92      .91      .70      .54


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


            **************
            *            *
 94 KK      *      CP3   *
            *            *
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 96 KO        OUTPUT CONTROL VARIABLES
                   IPRNT          1  PRINT CONTROL
                   IPLOT          0  PLOT CONTROL
                   QSCAL         0.  HYDROGRAPH PLOT SCALE

 97 HC        HYDROGRAPH COMBINATION
                   ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE
                                                          ***

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                                        HYDROGRAPH AT STATION      CP3
                                           SUM OF  2 HYDROGRAPHS
                                          PLAN 1,   RATIO =  1.00

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	176.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	144.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	119.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	98.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	80.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	64.	1		1255	156	0.	1		1910	231	0.

1	0030	7	3.	*	1	0645	82	51.	*	1	1300	157	0.	*	1	1915	232	0.
1	0035	8	10.	*	1	0650	83	40.	*	1	1305	158	0.	*	1	1920	233	0.
1	0040	9	20.	*	1	0655	84	31.	*	1	1310	159	0.	*	1	1925	234	0.
1	0045	10	25.	*	1	0700	85	24.	*	1	1315	160	0.	*	1	1930	235	0.
1	0050	11	24.	*	1	0705	86	18.	*	1	1320	161	0.	*	1	1935	236	0.
1	0055	12	22.	*	1	0710	87	14.	*	1	1325	162	0.	*	1	1940	237	0.
1	0100	13	22.	*	1	0715	88	10.	*	1	1330	163	0.	*	1	1945	238	0.
1	0105	14	22.	*	1	0720	89	8.	*	1	1335	164	0.	*	1	1950	239	0.
1	0110	15	24.	*	1	0725	90	6.	*	1	1340	165	0.	*	1	1955	240	0.
1	0115	16	29.	*	1	0730	91	4.	*	1	1345	166	0.	*	1	2000	241	0.
1	0120	17	35.	*	1	0735	92	3.	*	1	1350	167	0.	*	1	2005	242	0.
1	0125	18	42.	*	1	0740	93	2.	*	1	1355	168	0.	*	1	2010	243	0.
1	0130	19	57.	*	1	0745	94	2.	*	1	1400	169	0.	*	1	2015	244	0.
1	0135	20	83.	*	1	0750	95	1.	*	1	1405	170	0.	*	1	2020	245	0.
1	0140	21	111.	*	1	0755	96	1.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	136.	*	1	0800	97	1.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	152.	*	1	0805	98	1.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	158.	*	1	0810	99	0.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	154.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	147.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	148.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	167.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	205.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	247.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	272.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	272.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	272.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	294.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	325.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	337.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	330.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	353.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	445.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	628.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	962.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1509.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	2268.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	3079.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3618.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3812.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3787.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3685.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3538.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3363.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3134.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2826.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2493.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2193.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1966.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1828.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1737.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1643.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1555.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1503.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1449.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1358.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1234.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1109.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	988.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	874.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	768.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	665.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	566.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	478.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	410.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	351.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	298.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	251.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	212.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3812.	3.75		941.	236.	227.	227.
		(INCHES)	2.100	2.107	2.107	2.107
		(AC-FT)	467.	468.	468.	468.

CUMULATIVE AREA = 4.17 SQ MI

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HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .99

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	0000	1	0.	*	1	0615	76	174.	*	1	1230	151	0.	*	1	1845	226	0.
1	0005	2	0.	*	1	0620	77	143.	*	1	1235	152	0.	*	1	1850	227	0.
1	0010	3	0.	*	1	0625	78	117.	*	1	1240	153	0.	*	1	1855	228	0.
1	0015	4	0.	*	1	0630	79	96.	*	1	1245	154	0.	*	1	1900	229	0.
1	0020	5	0.	*	1	0635	80	79.	*	1	1250	155	0.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	63.	*	1	1255	156	0.	*	1	1910	231	0.
1	0030	7	2.	*	1	0645	82	50.	*	1	1300	157	0.	*	1	1915	232	0.
1	0035	8	9.	*	1	0650	83	39.	*	1	1305	158	0.	*	1	1920	233	0.
1	0040	9	18.	*	1	0655	84	30.	*	1	1310	159	0.	*	1	1925	234	0.
1	0045	10	23.	*	1	0700	85	23.	*	1	1315	160	0.	*	1	1930	235	0.
1	0050	11	22.	*	1	0705	86	18.	*	1	1320	161	0.	*	1	1935	236	0.
1	0055	12	21.	*	1	0710	87	14.	*	1	1325	162	0.	*	1	1940	237	0.
1	0100	13	20.	*	1	0715	88	10.	*	1	1330	163	0.	*	1	1945	238	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	0105	14	20.	*	1	0720	89	8.	*	1	1335	164	0.	*	1	1950	239	0.	
1	0110	15	23.	*	1	0725	90	6.	*	1	1340	165	0.	*	1	1955	240	0.	
1	0115	16	28.	*	1	0730	91	4.	*	1	1345	166	0.	*	1	2000	241	0.	
1	0120	17	33.	*	1	0735	92	3.	*	1	1350	167	0.	*	1	2005	242	0.	
1	0125	18	40.	*	1	0740	93	2.	*	1	1355	168	0.	*	1	2010	243	0.	
1	0130	19	55.	*	1	0745	94	2.	*	1	1400	169	0.	*	1	2015	244	0.	
1	0135	20	80.	*	1	0750	95	1.	*	1	1405	170	0.	*	1	2020	245	0.	
1	0140	21	108.	*	1	0755	96	1.	*	1	1410	171	0.	*	1	2025	246	0.	
1	0145	22	132.	*	1	0800	97	1.	*	1	1415	172	0.	*	1	2030	247	0.	
1	0150	23	148.	*	1	0805	98	1.	*	1	1420	173	0.	*	1	2035	248	0.	
1	0155	24	153.	*	1	0810	99	0.	*	1	1425	174	0.	*	1	2040	249	0.	
1	0200	25	150.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.	
1	0205	26	143.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.	
1	0210	27	144.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.	
1	0215	28	162.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.	
1	0220	29	200.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.	
1	0225	30	241.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.	
1	0230	31	265.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.	
1	0235	32	266.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.	
1	0240	33	266.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.	
1	0245	34	287.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.	
1	0250	35	318.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.	
1	0255	36	330.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.	
1	0300	37	323.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.	
1	0305	38	345.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.	
1	0310	39	436.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.	
1	0315	40	616.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.	
1	0320	41	944.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.	
1	0325	42	1483.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.	
1	0330	43	2230.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.	
1	0335	44	3031.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.	
1	0340	45	3564.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.	
1	0345	46	3756.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.	
1	0350	47	3731.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.	
1	0355	48	3631.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.	
1	0400	49	3488.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.	
1	0405	50	3316.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.	
1	0410	51	3090.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.	
1	0415	52	2787.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.	
1	0420	53	2459.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.	
1	0425	54	2163.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.	
1	0430	55	1940.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.	
1	0435	56	1804.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.	
1	0440	57	1715.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.	
1	0445	58	1622.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.	
1	0450	59	1536.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.	
1	0455	60	1484.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.	
1	0500	61	1431.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.	
1	0505	62	1341.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.	
1	0510	63	1219.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.	
1	0515	64	1096.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.	
1	0520	65	976.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.	
1	0525	66	863.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.	
1	0530	67	759.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.	
1	0535	68	657.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.	
1	0540	69	559.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.	
1	0545	70	472.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.	
1	0550	71	405.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.	
1	0555	72	347.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.	
1	0600	73	294.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.	
1	0605	74	248.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.	
1	0610	75	209.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.	

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3756.	3.75		927.	233.	224.	224.
		(INCHES)	2.069	2.075	2.075	2.075
		(AC-FT)	460.	461.	461.	461.

CUMULATIVE AREA = 4.17 SQ MI

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HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .98

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	0000	1	0.	*	1	0615	76	172.	*	1	1230	151	0.	*	1	1845	226	0.	
1	0005	2	0.	*	1	0620	77	141.	*	1	1235	152	0.	*	1	1850	227	0.	
1	0010	3	0.	*	1	0625	78	116.	*	1	1240	153	0.	*	1	1855	228	0.	
1	0015	4	0.	*	1	0630	79	95.	*	1	1245	154	0.	*	1	1900	229	0.	
1	0020	5	0.	*	1	0635	80	78.	*	1	1250	155	0.	*	1	1905	230	0.	
1	0025	6	0.	*	1	0640	81	62.	*	1	1255	156	0.	*	1	1910	231	0.	
1	0030	7	2.	*	1	0645	82	49.	*	1	1300	157	0.	*	1	1915	232	0.	
1	0035	8	8.	*	1	0650	83	39.	*	1	1305	158	0.	*	1	1920	233	0.	
1	0040	9	16.	*	1	0655	84	30.	*	1	1310	159	0.	*	1	1925	234	0.	
1	0045	10	21.	*	1	0700	85	23.	*	1	1315	160	0.	*	1	1930	235	0.	
1	0050	11	21.	*	1	0705	86	18.	*	1	1320	161	0.	*	1	1935	236	0.	
1	0055	12	19.	*	1	0710	87	14.	*	1	1325	162	0.	*	1	1940	237	0.	
1	0100	13	19.	*	1	0715	88	10.	*	1	1330	163	0.	*	1	1945	238	0.	
1	0105	14	19.	*	1	0720	89	8.	*	1	1335	164	0.	*	1	1950	239	0.	
1	0110	15	21.	*	1	0725	90	6.	*	1	1340	165	0.	*	1	1955	240	0.	
1	0115	16	26.	*	1	0730	91	4.	*	1	1345	166	0.	*	1	2000	241	0.	
1	0120	17	32.	*	1	0735	92	3.	*	1	1350	167	0.	*	1	2005	242	0.	
1	0125	18	38.	*	1	0740	93	2.	*	1	1355	168	0.	*	1	2010	243	0.	
1	0130	19	52.	*	1	0745	94	2.	*	1	1400	169	0.	*	1	2015	244	0.	
1	0135	20	77.	*	1	0750	95	1.	*	1	1405	170	0.	*	1	2020	245	0.	

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0140	21	104.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	127.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	143.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	149.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	145.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	139.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	139.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	158.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	195.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	235.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	259.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	259.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	259.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	281.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	311.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	322.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	316.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	338.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	427.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	604.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	927.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1457.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2194.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2983.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3509.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3700.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3677.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3579.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3438.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3269.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3047.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2749.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2425.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2134.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1913.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1780.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1692.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1601.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1515.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1465.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1413.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1324.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1204.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1082.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	964.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	852.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	749.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	649.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	552.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	466.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	400.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	343.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	291.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	245.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	207.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3700.	3.75		913.	229.	221.	221.
		(INCHES)	2.038	2.044	2.044	2.044
		(AC-FT)	453.	454.	454.	454.

CUMULATIVE AREA = 4.17 SQ MI

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HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .94

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	163.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	134.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	110.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	91.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	74.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	59.	1		1255	156	0.	1		1910	231	0.
1		0030	7	1.	1		0645	82	47.	1		1300	157	0.	1		1915	232	0.
1		0035	8	5.	1		0650	83	37.	1		1305	158	0.	1		1920	233	0.
1		0040	9	11.	1		0655	84	29.	1		1310	159	0.	1		1925	234	0.
1		0045	10	15.	1		0700	85	22.	1		1315	160	0.	1		1930	235	0.
1		0050	11	15.	1		0705	86	17.	1		1320	161	0.	1		1935	236	0.
1		0055	12	14.	1		0710	87	13.	1		1325	162	0.	1		1940	237	0.
1		0100	13	13.	1		0715	88	10.	1		1330	163	0.	1		1945	238	0.
1		0105	14	14.	1		0720	89	7.	1		1335	164	0.	1		1950	239	0.
1		0110	15	16.	1		0725	90	5.	1		1340	165	0.	1		1955	240	0.
1		0115	16	20.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	25.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	31.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	43.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	65.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	89.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	110.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	125.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	130.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	127.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	122.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	123.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.

1	0215	28	140.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	174.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	211.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	233.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	234.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	235.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	255.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	283.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	294.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	289.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	309.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	392.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	556.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	857.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1354.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	2047.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2792.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3291.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3476.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3458.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3369.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3238.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3081.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2873.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2594.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2289.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2016.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1809.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1683.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1601.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1516.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1436.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1389.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1340.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1256.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1142.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1027.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	915.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	809.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	712.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	616.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	524.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	443.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	380.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	326.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	276.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	233.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	196.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3476.	3.75		858.	215.	207.	207.
		(INCHES)	1.914	1.919	1.919	1.919
		(AC-FT)	425.	426.	426.	426.

CUMULATIVE AREA = 4.17 SQ MI

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HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .93

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	161.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	132.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	109.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	89.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	73.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	59.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	1.	*	1		0645	82	46.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	4.	*	1		0650	83	36.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	10.	*	1		0655	84	28.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	13.	*	1		0700	85	22.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	14.	*	1		0705	86	17.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	13.	*	1		0710	87	13.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	12.	*	1		0715	88	10.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	13.	*	1		0720	89	7.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	14.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	18.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	23.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	29.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	41.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	62.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	85.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	106.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	120.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	126.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	123.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	118.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	119.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	136.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	169.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	205.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	227.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	228.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	228.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	248.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0250	35	276.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	287.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	282.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	302.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	384.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	545.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	840.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1329.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2011.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2745.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3238.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3419.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3402.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3315.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3188.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3034.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	2830.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2555.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2255.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1986.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1782.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1659.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1579.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1494.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1416.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1370.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1321.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1239.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1127.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1013.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	903.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	798.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	702.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	608.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	517.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	437.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	375.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	321.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	273.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	230.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	194.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
3419.	3.75		844.	211.	204.	204.
		(INCHES)	1.883	1.887	1.887	1.887
		(AC-FT)	419.	419.	419.	419.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .92

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	159.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	131.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	107.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	88.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	72.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	58.	1		1255	156	0.	1		1910	231	0.
1		0030	7	1.	1		0645	82	46.	1		1300	157	0.	1		1915	232	0.
1		0035	8	4.	1		0650	83	36.	1		1305	158	0.	1		1920	233	0.
1		0040	9	9.	1		0655	84	28.	1		1310	159	0.	1		1925	234	0.
1		0045	10	12.	1		0700	85	21.	1		1315	160	0.	1		1930	235	0.
1		0050	11	12.	1		0705	86	16.	1		1320	161	0.	1		1935	236	0.
1		0055	12	11.	1		0710	87	13.	1		1325	162	0.	1		1940	237	0.
1		0100	13	11.	1		0715	88	9.	1		1330	163	0.	1		1945	238	0.
1		0105	14	11.	1		0720	89	7.	1		1335	164	0.	1		1950	239	0.
1		0110	15	13.	1		0725	90	5.	1		1340	165	0.	1		1955	240	0.
1		0115	16	17.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	21.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	27.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	39.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	59.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	82.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	102.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	116.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	121.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	119.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	114.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	115.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	131.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	164.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	199.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	220.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	222.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	222.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	242.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	269.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	280.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	275.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	295.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	375.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	533.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	823.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	0325	42	1303.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.				
1	0330	43	1974.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.				
1	0335	44	2698.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.				
1	0340	45	3184.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.				
1	0345	46	3365.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.				
1	0350	47	3348.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.				
1	0355	48	3263.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.				
1	0400	49	3138.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.				
1	0405	50	2987.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.				
1	0410	51	2787.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.				
1	0415	52	2516.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.				
1	0420	53	2222.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.				
1	0425	54	1957.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.				
1	0430	55	1756.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.				
1	0435	56	1635.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.				
1	0440	57	1556.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.				
1	0445	58	1473.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.				
1	0450	59	1396.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.				
1	0455	60	1350.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.				
1	0500	61	1303.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.				
1	0505	62	1221.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.				
1	0510	63	1111.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.				
1	0515	64	999.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.				
1	0520	65	890.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.				
1	0525	66	788.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.				
1	0530	67	693.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.				
1	0535	68	600.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.				
1	0540	69	510.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.				
1	0545	70	431.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.				
1	0550	71	370.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.				
1	0555	72	317.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.				
1	0600	73	269.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.				
1	0605	74	227.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.				
1	0610	75	191.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3365.	3.75		830.	208.	200.	200.
		(INCHES)	1.853	1.857	1.857	1.857
		(AC-FT)	412.	413.	413.	413.

CUMULATIVE AREA = 4.17 SQ MI

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HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .91

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1	0000	1	0.	*	1	0615	76	157.	*	1	1230	151	0.	*	1	1845	226	0.				
1	0005	2	0.	*	1	0620	77	129.	*	1	1235	152	0.	*	1	1850	227	0.				
1	0010	3	0.	*	1	0625	78	106.	*	1	1240	153	0.	*	1	1855	228	0.				
1	0015	4	0.	*	1	0630	79	87.	*	1	1245	154	0.	*	1	1900	229	0.				
1	0020	5	0.	*	1	0635	80	71.	*	1	1250	155	0.	*	1	1905	230	0.				
1	0025	6	0.	*	1	0640	81	57.	*	1	1255	156	0.	*	1	1910	231	0.				
1	0030	7	1.	*	1	0645	82	45.	*	1	1300	157	0.	*	1	1915	232	0.				
1	0035	8	3.	*	1	0650	83	35.	*	1	1305	158	0.	*	1	1920	233	0.				
1	0040	9	8.	*	1	0655	84	28.	*	1	1310	159	0.	*	1	1925	234	0.				
1	0045	10	11.	*	1	0700	85	21.	*	1	1315	160	0.	*	1	1930	235	0.				
1	0050	11	11.	*	1	0705	86	16.	*	1	1320	161	0.	*	1	1935	236	0.				
1	0055	12	10.	*	1	0710	87	12.	*	1	1325	162	0.	*	1	1940	237	0.				
1	0100	13	10.	*	1	0715	88	9.	*	1	1330	163	0.	*	1	1945	238	0.				
1	0105	14	10.	*	1	0720	89	7.	*	1	1335	164	0.	*	1	1950	239	0.				
1	0110	15	12.	*	1	0725	90	5.	*	1	1340	165	0.	*	1	1955	240	0.				
1	0115	16	16.	*	1	0730	91	4.	*	1	1345	166	0.	*	1	2000	241	0.				
1	0120	17	20.	*	1	0735	92	3.	*	1	1350	167	0.	*	1	2005	242	0.				
1	0125	18	25.	*	1	0740	93	2.	*	1	1355	168	0.	*	1	2010	243	0.				
1	0130	19	37.	*	1	0745	94	2.	*	1	1400	169	0.	*	1	2015	244	0.				
1	0135	20	56.	*	1	0750	95	1.	*	1	1405	170	0.	*	1	2020	245	0.				
1	0140	21	78.	*	1	0755	96	1.	*	1	1410	171	0.	*	1	2025	246	0.				
1	0145	22	98.	*	1	0800	97	1.	*	1	1415	172	0.	*	1	2030	247	0.				
1	0150	23	111.	*	1	0805	98	0.	*	1	1420	173	0.	*	1	2035	248	0.				
1	0155	24	117.	*	1	0810	99	0.	*	1	1425	174	0.	*	1	2040	249	0.				
1	0200	25	114.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.				
1	0205	26	110.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.				
1	0210	27	111.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.				
1	0215	28	127.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.				
1	0220	29	158.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.				
1	0225	30	193.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.				
1	0230	31	214.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.				
1	0235	32	216.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.				
1	0240	33	216.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.				
1	0245	34	235.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.				
1	0250	35	262.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.				
1	0255	36	273.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.				
1	0300	37	268.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.				
1	0305	38	288.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.				
1	0310	39	366.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.				
1	0315	40	521.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.				
1	0320	41	806.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.				
1	0325	42	1278.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.				
1	0330	43	1938.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.				
1	0335	44	2650.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.				
1	0340	45	3129.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.				
1	0345	46	3309.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.				
1	0350	47	3294.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.				
1	0355	48	3211.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.				

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0400	49	3088.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	2940.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	2744.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2478.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2188.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1927.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1730.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1611.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1533.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1452.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1376.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1332.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1285.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1205.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1096.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	986.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	878.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	777.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	683.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	592.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	503.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	425.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	365.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	313.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	265.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	224.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	189.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
3309.	3.75	817.	205.	197.	197.
		(INCHES) 1.822	1.826	1.826	1.826
		(AC-FT) 405.	406.	406.	406.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .70

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	112.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	92.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	76.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	62.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	51.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	41.	1		1255	156	0.	1		1910	231	0.
1		0030	7	0.	1		0645	82	32.	1		1300	157	0.	1		1915	232	0.
1		0035	8	0.	1		0650	83	25.	1		1305	158	0.	1		1920	233	0.
1		0040	9	0.	1		0655	84	20.	1		1310	159	0.	1		1925	234	0.
1		0045	10	0.	1		0700	85	15.	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	12.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	9.	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	7.	1		1330	163	0.	1		1945	238	0.
1		0105	14	0.	1		0720	89	5.	1		1335	164	0.	1		1950	239	0.
1		0110	15	0.	1		0725	90	4.	1		1340	165	0.	1		1955	240	0.
1		0115	16	0.	1		0730	91	3.	1		1345	166	0.	1		2000	241	0.
1		0120	17	0.	1		0735	92	2.	1		1350	167	0.	1		2005	242	0.
1		0125	18	1.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	4.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	9.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	17.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	25.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	32.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	36.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	37.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	37.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	39.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	47.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	64.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	83.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	96.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	99.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	101.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	113.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	130.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	137.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	137.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	150.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	197.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	290.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	467.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	769.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1204.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1689.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	2026.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	2164.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	2171.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	2130.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	2060.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1972.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1850.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1678.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1488.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1316.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1187.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.

1	0435	56	1110.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1062.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1009.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	960.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	932.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	903.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	848.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	774.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	697.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	622.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	551.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	486.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	421.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	358.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	303.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	260.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	223.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	189.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	160.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	135.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
2171.	3.83	536.	134.	129.	129.
		(INCHES) 1.197	1.197	1.197	1.197
		(AC-FT) 266.	266.	266.	266.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .54

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	78.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	65.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	53.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	44.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	36.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	29.	1		1255	156	0.	1		1910	231	0.
1		0030	7	0.	1		0645	82	23.	1		1300	157	0.	1		1915	232	0.
1		0035	8	0.	1		0650	83	18.	1		1305	158	0.	1		1920	233	0.
1		0040	9	0.	1		0655	84	14.	1		1310	159	0.	1		1925	234	0.
1		0045	10	0.	1		0700	85	11.	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	8.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	6.	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	5.	1		1330	163	0.	1		1945	238	0.
1		0105	14	0.	1		0720	89	4.	1		1335	164	0.	1		1950	239	0.
1		0110	15	0.	1		0725	90	3.	1		1340	165	0.	1		1955	240	0.
1		0115	16	0.	1		0730	91	2.	1		1345	166	0.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1.	1		1350	167	0.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	0.	1		0755	96	0.	1		1410	171	0.	1		2025	246	0.
1		0145	22	1.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	2.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	3.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	3.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	4.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	5.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	7.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	13.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	21.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	27.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	31.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	34.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	40.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	49.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	54.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	56.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	63.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	89.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	140.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	242.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	423.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	697.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1013.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	1243.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	1348.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	1365.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	1350.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	1316.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1268.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1198.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1093.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	974.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	867.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	786.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	740.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	712.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	680.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	650.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	634.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	616.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	581.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.

1	0510	63	531.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	480.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	430.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	381.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	336.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	292.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	249.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	211.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	181.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	155.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	132.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	111.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	94.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1365.	3.83		339.	85.	82.	82.
		(INCHES)	.757	.757	.757	.757
		(AC-FT)	168.	168.	168.	168.

CUMULATIVE AREA = 4.17 SQ MI

149 KK

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*            *
*     CP5B   *
*            *
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151 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

152 HC HYDROGRAPH COMBINATION

ICOMP	6	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = 1.00

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	209.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	173.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	142.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	116.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	95.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	4.	*	1		0640	81	77.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	7.	*	1		0645	82	62.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	10.	*	1		0650	83	49.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	16.	*	1		0655	84	39.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	21.	*	1		0700	85	30.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	24.	*	1		0705	86	23.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	24.	*	1		0710	87	18.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	23.	*	1		0715	88	14.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	22.	*	1		0720	89	10.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	24.	*	1		0725	90	8.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	28.	*	1		0730	91	6.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	33.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	41.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	53.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	74.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	100.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	127.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	149.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	160.	*	1		0810	99	1.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	162.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	157.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	155.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	165.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	193.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	233.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	267.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	283.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	288.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	298.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	320.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	340.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	348.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	362.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	419.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	555.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	838.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1332.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	2064.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2907.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3573.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3921.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3985.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3891.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.

1	0400	49	3738.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3552.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3327.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	3049.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2730.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2420.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	2165.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1987.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1868.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1771.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1683.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1611.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1546.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1466.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1354.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1226.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1097.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	976.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	863.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	757.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	655.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	562.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	478.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	409.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	349.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	296.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	249.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 3985.	3.83	987.	247.	238.	238.
		(INCHES) 2.089	2.095	2.095	2.095
		(AC-FT) 489.	491.	491.	491.

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .99

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	206.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	171.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	140.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	115.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	94.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	4.	*	1		0640	81	77.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	6.	*	1		0645	82	61.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	10.	*	1		0650	83	49.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	15.	*	1		0655	84	38.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	20.	*	1		0700	85	30.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	23.	*	1		0705	86	23.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	22.	*	1		0710	87	18.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	21.	*	1		0715	88	13.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	21.	*	1		0720	89	10.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	23.	*	1		0725	90	8.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	26.	*	1		0730	91	6.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	32.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	39.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	51.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	71.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	96.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	123.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	144.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	155.	*	1		0810	99	1.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	157.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	153.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	150.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	160.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	188.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	227.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	260.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	276.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	281.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	291.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	313.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	333.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	341.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	354.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	410.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	544.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	819.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1305.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	2029.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2855.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3524.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3875.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3927.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3832.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	3684.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	3504.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	3282.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	3006.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	2693.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	2386.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	2134.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.

1	0435	56	1961.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1844.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1749.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1662.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1591.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1527.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1447.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1337.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1210.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1084.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	964.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	853.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	748.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	648.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	555.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	473.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	404.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	345.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	293.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	246.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

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PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3927.	3.83	(CFS)	972.	244.	235.	235.
		(INCHES)	2.058	2.064	2.064	2.064
		(AC-FT)	482.	484.	484.	484.

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .98

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DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	204.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	169.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	138.	1		1240	153	0.	1		1855	228	0.
1		0015	4	1.	1		0630	79	114.	1		1245	154	0.	1		1900	229	0.
1		0020	5	2.	1		0635	80	93.	1		1250	155	0.	1		1905	230	0.
1		0025	6	4.	1		0640	81	76.	1		1255	156	0.	1		1910	231	0.
1		0030	7	6.	1		0645	82	61.	1		1300	157	0.	1		1915	232	0.
1		0035	8	9.	1		0650	83	48.	1		1305	158	0.	1		1920	233	0.
1		0040	9	13.	1		0655	84	38.	1		1310	159	0.	1		1925	234	0.
1		0045	10	18.	1		0700	85	29.	1		1315	160	0.	1		1930	235	0.
1		0050	11	21.	1		0705	86	23.	1		1320	161	0.	1		1935	236	0.
1		0055	12	21.	1		0710	87	17.	1		1325	162	0.	1		1940	237	0.
1		0100	13	19.	1		0715	88	13.	1		1330	163	0.	1		1945	238	0.
1		0105	14	19.	1		0720	89	10.	1		1335	164	0.	1		1950	239	0.
1		0110	15	21.	1		0725	90	8.	1		1340	165	0.	1		1955	240	0.
1		0115	16	25.	1		0730	91	6.	1		1345	166	0.	1		2000	241	0.
1		0120	17	30.	1		0735	92	4.	1		1350	167	0.	1		2005	242	0.
1		0125	18	37.	1		0740	93	3.	1		1355	168	0.	1		2010	243	0.
1		0130	19	49.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	68.	1		0750	95	2.	1		1405	170	0.	1		2020	245	0.
1		0140	21	93.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	119.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	139.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	150.	1		0810	99	1.	1		1425	174	0.	1		2040	249	0.
1		0200	25	152.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	148.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	146.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	156.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	183.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	221.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	254.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	270.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	274.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	285.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	306.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	325.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	333.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	347.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	402.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	533.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	804.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1282.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1992.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2812.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3462.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3805.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3870.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3779.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3632.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3453.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3237.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2966.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2657.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2356.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	2107.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1934.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1819.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1726.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1640.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1570.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1508.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1429.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.

1	0510	63	1321.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1196.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1071.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	952.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	842.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	739.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	640.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	548.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	467.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	399.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	341.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	289.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	243.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3870.	3.83		958.	240.	231.	231.
		(INCHES)	2.027	2.033	2.033	2.033
		(AC-FT)	475.	476.	476.	476.

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .94

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
					*						*						*					
1		0000	1	0.	*	1		0615	76	194.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	160.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	132.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	108.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	89.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	3.	*	1		0640	81	72.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	5.	*	1		0645	82	58.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	7.	*	1		0650	83	46.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	9.	*	1		0655	84	36.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	12.	*	1		0700	85	28.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	15.	*	1		0705	86	22.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	15.	*	1		0710	87	17.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	14.	*	1		0715	88	13.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	14.	*	1		0720	89	10.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	16.	*	1		0725	90	7.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	19.	*	1		0730	91	5.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	23.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	29.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	40.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	56.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	79.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	102.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	121.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	131.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	133.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	130.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	128.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	138.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	163.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	197.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	228.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	243.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	248.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	258.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	277.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	296.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	304.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	317.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	368.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	490.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	737.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1183.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1850.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2621.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3247.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3571.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3636.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3556.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	3421.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	3255.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	3053.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	2801.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	2510.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	2227.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1993.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1830.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	1722.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	1634.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	1554.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	1488.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	1430.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.
1		0505	62	1356.	*	1		1120	137	0.	*	1		1735	212	0.	*	1		2350	287	0.
1		0510	63	1254.	*	1		1125	138	0.	*	1		1740	213	0.	*	1		2355	288	0.
1		0515	64	1136.	*	1		1130	139	0.	*	1		1745	214	0.	*	2		0000	289	0.
1		0520	65	1017.	*	1		1135	140	0.	*	1		1750	215	0.	*	2		0005	290	0.
1		0525	66	905.	*	1		1140	141	0.	*	1		1755	216	0.	*	2		0010	291	0.
1		0530	67	801.	*	1		1145	142	0.	*	1		1800	217	0.	*	2		0015	292	0.
1		0535	68	703.	*	1		1150	143	0.	*	1		1805	218	0.	*	2		0020	293	0.
1		0540	69	609.	*	1		1155	144	0.	*	1		1810	219	0.	*	2		0025	294	0.

1	0545	70	521.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	444.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	379.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	324.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	275.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	232.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

****

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 3636.	3.83	899.	225.	217.	217.
		(INCHES) 1.904	1.909	1.909	1.909
		(AC-FT) 446.	447.	447.	447.

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .93

****

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	191.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	158.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	130.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	107.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	88.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	3.	*	1		0640	81	71.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	5.	*	1		0645	82	57.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	7.	*	1		0650	83	45.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	9.	*	1		0655	84	36.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	11.	*	1		0700	85	28.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	13.	*	1		0705	86	21.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	13.	*	1		0710	87	16.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	13.	*	1		0715	88	13.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	13.	*	1		0720	89	10.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	14.	*	1		0725	90	7.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	17.	*	1		0730	91	5.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	21.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	27.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	38.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	54.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	75.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	98.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	116.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	126.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	129.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	126.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	124.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	134.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	158.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	192.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	222.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	236.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	241.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	251.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	271.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	289.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	296.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	309.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	360.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	479.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	723.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1159.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1813.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2571.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3185.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3518.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3579.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3498.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	3367.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	3206.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	3006.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	2758.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	2473.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	2194.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1965.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1804.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	1698.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	1611.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	1533.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	1468.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	1410.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.
1		0505	62	1337.	*	1		1120	137	0.	*	1		1735	212	0.	*	1		2350	287	0.
1		0510	63	1237.	*	1		1125	138	0.	*	1		1740	213	0.	*	1		2355	288	0.
1		0515	64	1121.	*	1		1130	139	0.	*	1		1745	214	0.	*	2		0000	289	0.
1		0520	65	1004.	*	1		1135	140	0.	*	1		1750	215	0.	*	2		0005	290	0.
1		0525	66	893.	*	1		1140	141	0.	*	1		1755	216	0.	*	2		0010	291	0.
1		0530	67	791.	*	1		1145	142	0.	*	1		1800	217	0.	*	2		0015	292	0.
1		0535	68	694.	*	1		1150	143	0.	*	1		1805	218	0.	*	2		0020	293	0.
1		0540	69	601.	*	1		1155	144	0.	*	1		1810	219	0.	*	2		0025	294	0.
1		0545	70	515.	*	1		1200	145	0.	*	1		1815	220	0.	*	2		0030	295	0.
1		0550	71	438.	*	1		1205	146	0.	*	1		1820	221	0.	*	2		0035	296	0.
1		0555	72	375.	*	1		1210	147	0.	*	1		1825	222	0.	*	2		0040	297	0.
1		0600	73	320.	*	1		1215	148	0.	*	1		1830	223	0.	*	2		0045	298	0.
1		0605	74	272.	*	1		1220	149	0.	*	1		1835	224	0.	*	2		0050	299	0.
1		0610	75	229.	*	1		1225	150	0.	*	1		1840	225	0.	*	2		0055	300	0.
					*						*						*					

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3579.	3.83	(CFS)	885.	222.	214.	214.
		(INCHES)	1.873	1.877	1.877	1.877
		(AC-FT)	439.	440.	440.	440.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .92

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	189.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	156.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	129.	1		1240	153	0.	1		1855	228	0.
1		0015	4	1.	1		0630	79	106.	1		1245	154	0.	1		1900	229	0.
1		0020	5	2.	1		0635	80	86.	1		1250	155	0.	1		1905	230	0.
1		0025	6	3.	1		0640	81	70.	1		1255	156	0.	1		1910	231	0.
1		0030	7	5.	1		0645	82	57.	1		1300	157	0.	1		1915	232	0.
1		0035	8	6.	1		0650	83	45.	1		1305	158	0.	1		1920	233	0.
1		0040	9	8.	1		0655	84	35.	1		1310	159	0.	1		1925	234	0.
1		0045	10	10.	1		0700	85	27.	1		1315	160	0.	1		1930	235	0.
1		0050	11	12.	1		0705	86	21.	1		1320	161	0.	1		1935	236	0.
1		0055	12	12.	1		0710	87	16.	1		1325	162	0.	1		1940	237	0.
1		0100	13	12.	1		0715	88	12.	1		1330	163	0.	1		1945	238	0.
1		0105	14	12.	1		0720	89	9.	1		1335	164	0.	1		1950	239	0.
1		0110	15	13.	1		0725	90	7.	1		1340	165	0.	1		1955	240	0.
1		0115	16	16.	1		0730	91	5.	1		1345	166	0.	1		2000	241	0.
1		0120	17	20.	1		0735	92	4.	1		1350	167	0.	1		2005	242	0.
1		0125	18	26.	1		0740	93	3.	1		1355	168	0.	1		2010	243	0.
1		0130	19	35.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	51.	1		0750	95	2.	1		1405	170	0.	1		2020	245	0.
1		0140	21	72.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	94.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	112.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	122.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	124.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	121.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	120.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	129.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	153.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	186.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	215.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	230.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	235.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	245.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	264.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	282.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	289.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	302.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	351.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	468.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	706.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1135.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1780.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2527.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3136.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3455.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3521.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3444.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3315.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3156.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	2961.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2717.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2437.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2163.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1935.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1779.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1674.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1589.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1511.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1447.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1391.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1319.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1220.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1105.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	990.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	881.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	780.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	684.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	593.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	508.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	433.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	370.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	316.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	268.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	226.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
3521.	3.83	(CFS)	870.	218.	210.	210.

(INCHES)	1.842	1.847	1.847	1.847
(AC-FT)	432.	433.	433.	433.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	186.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	154.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	127.	1		1240	153	0.	1		1855	228	0.
1		0015	4	1.	1		0630	79	104.	1		1245	154	0.	1		1900	229	0.
1		0020	5	2.	1		0635	80	85.	1		1250	155	0.	1		1905	230	0.
1		0025	6	3.	1		0640	81	69.	1		1255	156	0.	1		1910	231	0.
1		0030	7	5.	1		0645	82	56.	1		1300	157	0.	1		1915	232	0.
1		0035	8	6.	1		0650	83	44.	1		1305	158	0.	1		1920	233	0.
1		0040	9	7.	1		0655	84	35.	1		1310	159	0.	1		1925	234	0.
1		0045	10	9.	1		0700	85	27.	1		1315	160	0.	1		1930	235	0.
1		0050	11	11.	1		0705	86	21.	1		1320	161	0.	1		1935	236	0.
1		0055	12	11.	1		0710	87	16.	1		1325	162	0.	1		1940	237	0.
1		0100	13	11.	1		0715	88	12.	1		1330	163	0.	1		1945	238	0.
1		0105	14	10.	1		0720	89	9.	1		1335	164	0.	1		1950	239	0.
1		0110	15	12.	1		0725	90	7.	1		1340	165	0.	1		1955	240	0.
1		0115	16	15.	1		0730	91	5.	1		1345	166	0.	1		2000	241	0.
1		0120	17	18.	1		0735	92	4.	1		1350	167	0.	1		2005	242	0.
1		0125	18	24.	1		0740	93	3.	1		1355	168	0.	1		2010	243	0.
1		0130	19	33.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	48.	1		0750	95	2.	1		1405	170	0.	1		2020	245	0.
1		0140	21	69.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	90.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	107.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	117.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	120.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	117.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	116.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	125.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	148.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	180.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	209.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	223.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	228.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	238.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	257.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	274.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	282.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	295.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	343.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	457.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	691.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1111.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1743.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2479.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3075.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3399.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3464.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3388.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3262.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3107.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	2915.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2675.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2400.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2130.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1908.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1752.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1649.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1566.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1490.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1427.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1371.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1301.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1204.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1091.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	977.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	870.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	770.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	675.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	585.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	501.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	427.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	365.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	312.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	264.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	223.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	3464.	3.83		856.	214.	207.	207.
			(INCHES)	1.812	1.816	1.816	1.816
			(AC-FT)	424.	425.	425.	425.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .70

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	135.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	112.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	92.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	76.	1		1245	154	0.	1		1900	229	0.
1		0020	5	1.	1		0635	80	62.	1		1250	155	0.	1		1905	230	0.
1		0025	6	2.	1		0640	81	51.	1		1255	156	0.	1		1910	231	0.
1		0030	7	2.	1		0645	82	41.	1		1300	157	0.	1		1915	232	0.
1		0035	8	3.	1		0650	83	32.	1		1305	158	0.	1		1920	233	0.
1		0040	9	2.	1		0655	84	25.	1		1310	159	0.	1		1925	234	0.
1		0045	10	1.	1		0700	85	20.	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	15.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	12.	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	9.	1		1330	163	0.	1		1945	238	0.
1		0105	14	0.	1		0720	89	7.	1		1335	164	0.	1		1950	239	0.
1		0110	15	0.	1		0725	90	5.	1		1340	165	0.	1		1955	240	0.
1		0115	16	1.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	1.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	2.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	4.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	8.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	13.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	21.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	29.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	34.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	37.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	38.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	39.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	45.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	57.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	74.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	90.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	100.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	105.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	112.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	124.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	136.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	142.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	152.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	181.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	249.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	383.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	634.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1039.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1532.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	1955.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	2205.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	2273.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	2243.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	2174.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	2083.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1966.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1816.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1639.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1462.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1314.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1211.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1143.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1089.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1040.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	999.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	963.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	918.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	852.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	775.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	696.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	621.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	551.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	485.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	421.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	360.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	306.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	262.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	224.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	191.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	161.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)	(CFS)				
+	2273.	3.83		562.	141.	135.	135.
			(INCHES)	1.190	1.191	1.191	1.191
			(AC-FT)	279.	279.	279.	279.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .54

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	101.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	85.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	71.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	59.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	49.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	41.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	1.	*	1		0645	82	34.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	1.	*	1		0650	83	27.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	1.	*	1		0655	84	22.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	1.	*	1		0700	85	17.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	13.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	10.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	8.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	6.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	0.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	1.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	1.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	1.	*	1		0745	94	1.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	2.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	2.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	2.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	2.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	2.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	2.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	3.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	4.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	5.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	8.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	12.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	18.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	24.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	30.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	35.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	40.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	47.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	54.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	60.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	70.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	99.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	172.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	318.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	563.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	879.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	1171.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	1355.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	1421.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	1417.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	1385.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	1338.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	1274.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	1187.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	1079.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	968.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	874.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	808.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	766.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	734.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	705.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	679.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	657.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.
1		0505	62	629.	*	1		1120	137	0.	*	1		1735	212	0.	*	1		2350	287	0.
1		0510	63	588.	*	1		1125	138	0.	*	1		1740	213	0.	*	1		2355	288	0.
1		0515	64	537.	*	1		1130	139	0.	*	1		1745	214	0.	*	2		0000	289	0.
1		0520	65	484.	*	1		1135	140	0.	*	1		1750	215	0.	*	2		0005	290	0.
1		0525	66	433.	*	1		1140	141	0.	*	1		1755	216	0.	*	2		0010	291	0.
1		0530	67	385.	*	1		1145	142	0.	*	1		1800	217	0.	*	2		0015	292	0.
1		0535	68	339.	*	1		1150	143	0.	*	1		1805	218	0.	*	2		0020	293	0.
1		0540	69	296.	*	1		1155	144	0.	*	1		1810	219	0.	*	2		0025	294	0.
1		0545	70	255.	*	1		1200	145	0.	*	1		1815	220	0.	*	2		0030	295	0.
1		0550	71	218.	*	1		1205	146	0.	*	1		1820	221	0.	*	2		0035	296	0.
1		0555	72	188.	*	1		1210	147	0.	*	1		1825	222	0.	*	2		0040	297	0.
1		0600	73	162.	*	1		1215	148	0.	*	1		1830	223	0.	*	2		0045	298	0.
1		0605	74	139.	*	1		1220	149	0.	*	1		1835	224	0.	*	2		0050	299	0.
1		0610	75	119.	*	1		1225	150	0.	*	1		1840	225	0.	*	2		0055	300	0.

****

+	PEAK FLOW (CFS)	TIME (HR)		6-HR	MAXIMUM AVERAGE FLOW 24-HR	72-HR	24.92-HR
+	1421.	3.83	(CFS)	355.	89.	86.	86.
			(INCHES)	.753	.753	.753	.753
			(AC-FT)	176.	176.	176.	176.

CUMULATIVE AREA = 4.39 SQ MI

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153 KK          **************
                *            *
                *    EXDB    *
                *            *
                **************

154 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
```

DETENTION BASIN CHEYENNE AND BELTWAY
LOW-FLOW OUTLET IS 66" PIPE

HYDROGRAPH ROUTING DATA

```
157 RS          STORAGE ROUTING
                     NSTPS          1  NUMBER OF SUBREACHES
                      ITYP       STOR  TYPE OF INITIAL CONDITION
                    RSVRIC        .00  INITIAL CONDITION
                         X        .00 WORKING R AND D COEFFICIENT

158 SV            STORAGE          .0        .1        .8      12.7      18.8      25.0      85.9      95.0     124.2     135.1
                                 200.3     243.1     258.1     273.4     289.0     305.0

160 SE            ELEVATION   2990.00   2991.00   2992.00   2995.00   2996.00   2997.00   3005.00   3006.00   3009.00   3010.00
                              3015.00   3018.00   3019.00   3020.00   3021.00   3022.00

162 SL          LOW-LEVEL OUTLET
                     ELEVL   2992.80  ELEVATION AT CENTER OF OUTLET
                     CAREA     22.34  CROSS-SECTIONAL AREA
                      COQL       .70  COEFFICIENT
                      EXPL       .50  EXPONENT OF HEAD

163 SS          SPILLWAY
                      CREL   3021.90  SPILLWAY CREST ELEVATION
                     SPWID    200.00  SPILLWAY WIDTH
                      COQW      2.60  WEIR COEFFICIENT
                      EXPW      1.50  EXPONENT OF HEAD
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COMPUTED OUTFLOW-ELEVATION DATA

OUTFLOW	.00	.00	206.99	229.77	258.19	294.62	343.04	410.49	510.96	676.55
ELEVATION	2990.00	2992.80	2995.52	2996.16	2997.04	2998.32	3000.28	3003.51	3009.40	3021.90
OUTFLOW	676.62	676.84	677.28	678.05	679.22	680.90	683.14	686.07	689.72	694.18
ELEVATION	3021.90	3021.91	3021.91	3021.92	3021.93	3021.94	3021.95	3021.97	3021.98	3022.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.07	.80	3.98	12.71	15.87	18.75	19.74	25.05	25.34
OUTFLOW	.00	.00	.00	.00	186.02	206.99	224.35	229.77	257.03	258.19
ELEVATION	2990.00	2991.00	2992.00	2992.80	2995.00	2995.52	2996.00	2996.16	2997.00	2997.04
STORAGE	35.09	50.03	74.63	85.95	95.04	124.21	128.56	135.14	200.27	243.11
OUTFLOW	294.62	343.04	410.49	438.06	455.66	504.79	510.96	520.14	590.92	629.59
ELEVATION	2998.32	3000.28	3003.51	3005.00	3006.00	3009.00	3009.40	3010.00	3015.00	3018.00
STORAGE	258.06	273.36	289.00	303.39	303.57	303.83	304.00	304.21	304.44	304.70
OUTFLOW	641.96	654.09	666.01	676.55	677.28	679.22	680.90	683.14	686.07	689.72
ELEVATION	3019.00	3020.00	3021.00	3021.90	3021.91	3021.93	3021.94	3021.95	3021.97	3021.98
STORAGE	304.99									
OUTFLOW	694.18									
ELEVATION	3022.00									

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WARNING --- ROUTED OUTFLOW (    696.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    785.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    858.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    914.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    952.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    973.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    979.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    973.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    957.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    932.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    899.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    861.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    819.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    774.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
WARNING --- ROUTED OUTFLOW (    729.) IS GREATER THAN MAXIMUM OUTFLOW (    694.) IN STORAGE-OUTFLOW TABLE
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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = 1.00

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	589.	198.6	3014.9	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	1		0825	102	585.	194.6	3014.6	1		1645	202	1.	4.0	2992.8
1		0010	3	0.	.0	2990.0	1		0830	103	580.	190.6	3014.3	1		1650	203	1.	4.0	2992.8
1		0015	4	0.	.0	2990.1	1		0835	104	576.	186.6	3013.9	1		1655	204	1.	4.0	2992.8
1		0020	5	0.	.0	2990.3	1		0840	105	572.	182.6	3013.6	1		1700	205	1.	4.0	2992.8
1		0025	6	0.	.0	2990.6	1		0845	106	567.	178.7	3013.3	1		1705	206	1.	4.0	2992.8
1		0030	7	0.	.1	2991.0	1		0850	107	563.	174.8	3013.0	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.1	1		0855	108	559.	170.9	3012.7	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.2	2991.2	1		0900	109	555.	167.1	3012.5	1		1720	209	0.	4.0	2992.8

1	0045	10	0.	.4	2991.4	*	1	0905	110	551.	163.3	3012.2	*	1	1725	210	0.	4.0	2992.8
1	0050	11	0.	.5	2991.6	*	1	0910	111	547.	159.5	3011.9	*	1	1730	211	0.	4.0	2992.8
1	0055	12	0.	.7	2991.8	*	1	0915	112	543.	155.8	3011.6	*	1	1735	212	0.	4.0	2992.8
1	0100	13	0.	.8	2992.0	*	1	0920	113	539.	152.0	3011.3	*	1	1740	213	0.	4.0	2992.8
1	0105	14	0.	1.0	2992.0	*	1	0925	114	534.	148.3	3011.0	*	1	1745	214	0.	4.0	2992.8
1	0110	15	0.	1.2	2992.1	*	1	0930	115	531.	144.7	3010.7	*	1	1750	215	0.	4.0	2992.8
1	0115	16	0.	1.3	2992.1	*	1	0935	116	527.	141.0	3010.5	*	1	1755	216	0.	4.0	2992.8
1	0120	17	0.	1.5	2992.2	*	1	0940	117	523.	137.4	3010.2	*	1	1800	217	0.	4.0	2992.8
1	0125	18	0.	1.8	2992.3	*	1	0945	118	518.	133.8	3009.9	*	1	1805	218	0.	4.0	2992.8
1	0130	19	0.	2.1	2992.3	*	1	0950	119	513.	130.3	3009.6	*	1	1810	219	0.	4.0	2992.8
1	0135	20	0.	2.6	2992.4	*	1	0955	120	508.	126.8	3009.2	*	1	1815	220	0.	4.0	2992.8
1	0140	21	0.	3.2	2992.6	*	1	1000	121	503.	123.3	3008.9	*	1	1820	221	0.	4.0	2992.8
1	0145	22	0.	3.9	2992.8	*	1	1005	122	497.	119.8	3008.6	*	1	1825	222	0.	4.0	2992.8
1	0150	23	18.	4.8	2993.0	*	1	1010	123	492.	116.4	3008.2	*	1	1830	223	0.	4.0	2992.8
1	0155	24	37.	5.7	2993.2	*	1	1015	124	486.	113.1	3007.9	*	1	1835	224	0.	4.0	2992.8
1	0200	25	54.	6.5	2993.4	*	1	1020	125	480.	109.7	3007.5	*	1	1840	225	0.	4.0	2992.8
1	0205	26	68.	7.2	2993.6	*	1	1025	126	475.	106.5	3007.2	*	1	1845	226	0.	4.0	2992.8
1	0210	27	80.	7.7	2993.7	*	1	1030	127	469.	103.2	3006.8	*	1	1850	227	0.	4.0	2992.8
1	0215	28	91.	8.3	2993.9	*	1	1035	128	464.	100.0	3006.5	*	1	1855	228	0.	4.0	2992.8
1	0220	29	103.	8.8	2994.0	*	1	1040	129	459.	96.8	3006.2	*	1	1900	229	0.	4.0	2992.8
1	0225	30	118.	9.5	2994.2	*	1	1045	130	453.	93.7	3005.8	*	1	1905	230	0.	4.0	2992.8
1	0230	31	136.	10.4	2994.4	*	1	1050	131	447.	90.6	3005.5	*	1	1910	231	0.	4.0	2992.8
1	0235	32	155.	11.3	2994.6	*	1	1055	132	441.	87.5	3005.2	*	1	1915	232	0.	4.0	2992.8
1	0240	33	173.	12.1	2994.8	*	1	1100	133	435.	84.5	3004.8	*	1	1920	233	0.	4.0	2992.8
1	0245	34	187.	12.9	2995.0	*	1	1105	134	427.	81.5	3004.4	*	1	1925	234	0.	4.0	2992.8
1	0250	35	193.	13.7	2995.2	*	1	1110	135	420.	78.6	3004.0	*	1	1930	235	0.	4.0	2992.8
1	0255	36	199.	14.6	2995.3	*	1	1115	136	413.	75.7	3003.7	*	1	1935	236	0.	4.0	2992.8
1	0300	37	205.	15.6	2995.5	*	1	1120	137	406.	72.9	3003.3	*	1	1940	237	0.	4.0	2992.8
1	0305	38	211.	16.6	2995.6	*	1	1125	138	398.	70.2	3002.9	*	1	1945	238	0.	4.0	2992.8
1	0310	39	219.	17.8	2995.8	*	1	1130	139	391.	67.4	3002.6	*	1	1950	239	0.	4.0	2992.8
1	0315	40	229.	19.6	2996.1	*	1	1135	140	383.	64.8	3002.2	*	1	1955	240	0.	4.0	2992.8
1	0320	41	245.	22.8	2996.6	*	1	1140	141	376.	62.2	3001.9	*	1	2000	241	0.	4.0	2992.8
1	0325	42	270.	28.5	2997.5	*	1	1145	142	369.	59.6	3001.5	*	1	2005	242	0.	4.0	2992.8
1	0330	43	305.	38.2	2998.7	*	1	1150	143	362.	57.1	3001.2	*	1	2010	243	0.	4.0	2992.8
1	0335	44	351.	53.1	3000.7	*	1	1155	144	356.	54.6	3000.9	*	1	2015	244	0.	4.0	2992.8
1	0340	45	405.	72.8	3003.3	*	1	1200	145	349.	52.2	3000.6	*	1	2020	245	0.	4.0	2992.8
1	0345	46	457.	95.6	3006.1	*	1	1205	146	342.	49.8	3000.2	*	1	2025	246	0.	4.0	2992.8
1	0350	47	497.	119.5	3008.5	*	1	1210	147	335.	47.5	2999.9	*	1	2030	247	0.	4.0	2992.8
1	0355	48	529.	143.1	3010.6	*	1	1215	148	327.	45.2	2999.6	*	1	2035	248	0.	4.0	2992.8
1	0400	49	553.	165.7	3012.3	*	1	1220	149	320.	42.9	2999.4	*	1	2040	249	0.	4.0	2992.8
1	0405	50	576.	186.9	3014.0	*	1	1225	150	313.	40.8	2999.1	*	1	2045	250	0.	4.0	2992.8
1	0410	51	597.	206.6	3015.4	*	1	1230	151	306.	38.6	2998.8	*	1	2050	251	0.	4.0	2992.8
1	0415	52	613.	224.3	3016.7	*	1	1235	152	299.	36.6	2998.5	*	1	2055	252	0.	4.0	2992.8
1	0420	53	627.	240.0	3017.8	*	1	1240	153	292.	34.5	2998.2	*	1	2100	253	0.	4.0	2992.8
1	0425	54	638.	253.3	3018.7	*	1	1245	154	285.	32.5	2998.0	*	1	2105	254	0.	4.0	2992.8
1	0430	55	647.	264.7	3019.4	*	1	1250	155	278.	30.6	2997.7	*	1	2110	255	0.	4.0	2992.8
1	0435	56	655.	274.5	3020.1	*	1	1255	156	271.	28.7	2997.5	*	1	2115	256	0.	4.0	2992.8
1	0440	57	662.	283.3	3020.6	*	1	1300	157	264.	26.9	2997.2	*	1	2120	257	0.	4.0	2992.8
1	0445	58	668.	291.2	3021.1	*	1	1305	158	257.	25.1	2997.0	*	1	2125	258	0.	4.0	2992.8
1	0450	59	673.	298.5	3021.6	*	1	1310	159	248.	23.3	2996.7	*	1	2130	259	0.	4.0	2992.8
1	0455	60	696.	305.1	3022.0	*	1	1315	160	240.	21.6	2996.5	*	1	2135	260	0.	4.0	2992.8
1	0500	61	785.	310.9	3022.4	*	1	1320	161	231.	20.0	2996.2	*	1	2140	261	0.	4.0	2992.8
1	0505	62	858.	315.6	3022.7	*	1	1325	162	223.	18.5	2996.0	*	1	2145	262	0.	4.0	2992.8
1	0510	63	914.	319.2	3022.9	*	1	1330	163	214.	17.0	2995.7	*	1	2150	263	0.	4.0	2992.8
1	0515	64	952.	321.7	3023.0	*	1	1335	164	205.	15.5	2995.5	*	1	2155	264	0.	4.0	2992.8
1	0520	65	973.	323.1	3023.1	*	1	1340	165	195.	14.1	2995.2	*	1	2200	265	0.	4.0	2992.8
1	0525	66	979.	323.5	3023.2	*	1	1345	166	187.	12.8	2995.0	*	1	2205	266	0.	4.0	2992.8
1	0530	67	973.	323.1	3023.1	*	1	1350	167	163.	11.6	2994.7	*	1	2210	267	0.	4.0	2992.8
1	0535	68	957.	322.0	3023.1	*	1	1355	168	141.	10.6	2994.5	*	1	2215	268	0.	4.0	2992.8
1	0540	69	932.	320.4	3023.0	*	1	1400	169	121.	9.7	2994.2	*	1	2220	269	0.	4.0	2992.8
1	0545	70	899.	318.3	3022.8	*	1	1405	170	105.	8.9	2994.0	*	1	2225	270	0.	4.0	2992.8
1	0550	71	861.	315.8	3022.7	*	1	1410	171	90.	8.2	2993.9	*	1	2230	271	0.	4.0	2992.8
1	0555	72	819.	313.0	3022.5	*	1	1415	172	78.	7.6	2993.7	*	1	2235	272	0.	4.0	2992.8
1	0600	73	774.	310.2	3022.3	*	1	1420	173	67.	7.1	2993.6	*	1	2240	273	0.	4.0	2992.8
1	0605	74	729.	307.2	3022.1	*	1	1425	174	58.	6.7	2993.5	*	1	2245	274	0.	4.0	2992.8
1	0610	75	683.	304.2	3022.0	*	1	1430	175	50.	6.3	2993.4	*	1	2250	275	0.	4.0	2992.8
1	0615	76	675.	301.1	3021.8	*	1	1435	176	43.	6.0	2993.3	*	1	2255	276	0.	4.0	2992.8
1	0620	77	672.	297.8	3021.6	*	1	1440	177	37.	5.7	2993.2	*	1	2300	277	0.	4.0	2992.8
1	0625	78	670.	294.3	3021.3	*	1	1445	178	32.	5.5	2993.2	*	1	2305	278	0.	4.0	2992.8
1	0630	79	667.	290.5	3021.1	*	1	1450	179	28.	5.3	2993.1	*	1	2310	279	0.	4.0	2992.8
1	0635	80	664.	286.7	3020.9	*	1	1455	180	24.	5.1	2993.1	*	1	2315	280	0.	4.0	2992.8
1	0640	81	661.	282.7	3020.6	*	1	1500	181	21.	5.0	2993.0	*	1	2320	281	0.	4.0	2992.8
1	0645	82	658.	278.7	3020.3	*	1	1505	182	18.	4.8	2993.0	*	1	2325	282	0.	4.0	2992.8
1	0650	83	655.	274.5	3020.1	*	1	1510	183	16.	4.7	2993.0	*	1	2330	283	0.	4.0	2992.8
1	0655	84	652.	270.3	3019.8	*	1	1515	184	13.	4.6	2993.0	*	1	2335	284	0.	4.0	2992.8
1	0700	85	648.	266.1	3019.5	*	1	1520	185	12.	4.5	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	645.	261.8	3019.2	*	1	1525	186	10.	4.4	2992.9	*	1	2345	286	0.	4.0	2992.8
1	0710	87	642.	257.5	3019.0	*	1	1530	187	9.	4.4	2992.9	*	1	2350	287	0.	4.0	2992.8
1	0715	88	638.	253.2	3018.7	*	1	1535	188	7.	4.3	2992.9	*	1	2355	288	0.	4.0	2992.8
1	0720	89	634.	248.9	3018.4	*	1	1540	189	6.	4.3	2992.9	*	2	0000	289	0.	4.0	2992.8
1	0725	90	631.	244.6	3018.1	*	1	1545	190	6.	4.2	2992.9	*	2	0005	290	0.	4.0	2992.8
1	0730	91	627.	240.4	3017.8	*	1	1550	191	5.	4.2	2992.9	*	2	0010	291	0.	4.0	2992.8
1	0735	92	623.	236.1	3017.5	*	1	1555	192	4.	4.2	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	619.	231.8	3017.2	*	1	1600	193	4.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	616.	227.6	3016.9	*	1	1605	194	3.	4.1	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	612.	223.4	3016.6	*	1	1610	195	3.	4.1	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	608.	219.2	3016.3	*	1	1615	196	2.	4.1	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	604.	215.0	3016.0	*	1	1620	197	2.	4.1	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	601.	210.9	3015.7	*	1	1625	198	2.	4.1	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	597.	206.8	3015.5	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	593.	202.7	3015.2	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
						*							*							

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 979.	5.42		661.	245.	236.	236.
		(INCHES)	1.399	2.079	2.079	2.079
		(AC-FT)	328.	487.	487.	487.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
323.	5.42	240.	74.	72.	72.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
3023.16	5.42	3017.60	3000.80	3000.43	3000.43

CUMULATIVE AREA = 4.39 SQ MI

WARNING --- ROUTED OUTFLOW (710.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (788.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (849.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (892.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (918.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (929.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (927.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (914.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (892.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (863.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (827.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (788.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (746.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (703.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .99

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	588.	197.2	3014.8	*	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	*	1		0825	102	583.	193.2	3014.5	*	1		1645	202	1.	4.0	2992.8
1		0010	3	0.	.0	2990.0	*	1		0830	103	579.	189.2	3014.1	*	1		1650	203	1.	4.0	2992.8
1		0015	4	0.	.0	2990.1	*	1		0835	104	575.	185.2	3013.8	*	1		1655	204	1.	4.0	2992.8
1		0020	5	0.	.0	2990.3	*	1		0840	105	570.	181.3	3013.5	*	1		1700	205	1.	4.0	2992.8
1		0025	6	0.	.0	2990.6	*	1		0845	106	566.	177.3	3013.2	*	1		1705	206	1.	4.0	2992.8
1		0030	7	0.	.1	2991.0	*	1		0850	107	562.	173.5	3012.9	*	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.1	*	1		0855	108	558.	169.6	3012.6	*	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.2	2991.2	*	1		0900	109	553.	165.8	3012.4	*	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.3	2991.4	*	1		0905	110	549.	162.0	3012.1	*	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.5	2991.6	*	1		0910	111	545.	158.2	3011.8	*	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.6	2991.8	*	1		0915	112	541.	154.5	3011.5	*	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.8	2992.0	*	1		0920	113	537.	150.8	3011.2	*	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.9	2992.0	*	1		0925	114	533.	147.1	3010.9	*	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	1.1	2992.1	*	1		0930	115	529.	143.4	3010.6	*	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	1.2	2992.1	*	1		0935	116	525.	139.8	3010.4	*	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	1.4	2992.2	*	1		0940	117	521.	136.2	3010.1	*	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	1.7	2992.2	*	1		0945	118	517.	132.6	3009.8	*	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	2.0	2992.3	*	1		0950	119	512.	129.1	3009.4	*	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	2.4	2992.4	*	1		0955	120	507.	125.6	3009.1	*	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	3.0	2992.6	*	1		1000	121	501.	122.1	3008.8	*	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	3.7	2992.7	*	1		1005	122	495.	118.7	3008.4	*	1		1825	222	0.	4.0	2992.8
1		0150	23	14.	4.6	2993.0	*	1		1010	123	490.	115.3	3008.1	*	1		1830	223	0.	4.0	2992.8
1		0155	24	32.	5.5	2993.2	*	1		1015	124	484.	111.9	3007.7	*	1		1835	224	0.	4.0	2992.8
1		0200	25	49.	6.3	2993.4	*	1		1020	125	478.	108.6	3007.4	*	1		1840	225	0.	4.0	2992.8
1		0205	26	64.	7.0	2993.6	*	1		1025	126	473.	105.3	3007.1	*	1		1845	226	0.	4.0	2992.8
1		0210	27	76.	7.5	2993.7	*	1		1030	127	468.	102.1	3006.7	*	1		1850	227	0.	4.0	2992.8
1		0215	28	86.	8.0	2993.8	*	1		1035	128	462.	98.9	3006.4	*	1		1855	228	0.	4.0	2992.8
1		0220	29	98.	8.6	2994.0	*	1		1040	129	457.	95.7	3006.1	*	1		1900	229	0.	4.0	2992.8
1		0225	30	113.	9.3	2994.1	*	1		1045	130	451.	92.6	3005.7	*	1		1905	230	0.	4.0	2992.8
1		0230	31	131.	10.1	2994.4	*	1		1050	131	445.	89.5	3005.4	*	1		1910	231	0.	4.0	2992.8
1		0235	32	150.	11.0	2994.6	*	1		1055	132	439.	86.5	3005.1	*	1		1915	232	0.	4.0	2992.8
1		0240	33	168.	11.8	2994.8	*	1		1100	133	432.	83.5	3004.7	*	1		1920	233	0.	4.0	2992.8
1		0245	34	184.	12.6	2995.0	*	1		1105	134	425.	80.5	3004.3	*	1		1925	234	0.	4.0	2992.8
1		0250	35	191.	13.4	2995.1	*	1		1110	135	418.	77.6	3003.9	*	1		1930	235	0.	4.0	2992.8
1		0255	36	196.	14.3	2995.3	*	1		1115	136	411.	74.8	3003.5	*	1		1935	236	0.	4.0	2992.8
1		0300	37	203.	15.2	2995.4	*	1		1120	137	403.	72.0	3003.2	*	1		1940	237	0.	4.0	2992.8
1		0305	38	209.	16.2	2995.6	*	1		1125	138	396.	69.2	3002.8	*	1		1945	238	0.	4.0	2992.8
1		0310	39	216.	17.4	2995.8	*	1		1130	139	388.	66.5	3002.4	*	1		1950	239	0.	4.0	2992.8
1		0315	40	226.	19.1	2996.1	*	1		1135	140	381.	63.9	3002.1	*	1		1955	240	0.	4.0	2992.8
1		0320	41	242.	22.2	2996.6	*	1		1140	141	374.	61.3	3001.8	*	1		2000	241	0.	4.0	2992.8
1		0325	42	267.	27.8	2997.4	*	1		1145	142	367.	58.7	3001.4	*	1		2005	242	0.	4.0	2992.8
1		0330	43	302.	37.3	2998.6	*	1		1150	143	360.	56.2	3001.1	*	1		2010	243	0.	4.0	2992.8
1		0335	44	348.	51.9	3000.5	*	1		1155	144	353.	53.7	3000.8	*	1		2015	244	0.	4.0	2992.8
1		0340	45	401.	71.3	3003.1	*	1		1200	145	347.	51.3	3000.5	*	1		2020	245	0.	4.0	2992.8
1		0345	46	453.	93.8	3005.9	*	1		1205	146	340.	49.0	3000.1	*	1		2025	246	0.	4.0	2992.8
1		0350	47	493.	117.4	3008.3	*	1		1210	147	332.	46.7	2999.8	*	1		2030	247	0.	4.0	2992.8
1		0355	48	526.	140.6	3010.4	*	1		1215	148	325.	44.4	2999.5	*	1		2035	248	0.	4.0	2992.8
1		0400	49	550.	162.8	3012.1	*	1		1220	149	318.	42.2	2999.3	*	1		2040	249	0.	4.0	2992.8
1		0405	50	573.	183.7	3013.7	*	1		1225	150	311.	40.0	2999.0	*	1		2045	250	0.	4.0	2992.8
1		0410	51	593.	203.0	3015.2	*	1		1230	151	304.	37.9	2998.7	*	1		2050	251	0.	4.0	2992.8
1		0415	52	609.	220.5	3016.4	*	1		1235	152	297.	35.8	2998.4	*	1		2055	252	0.	4.0	2992.8
1		0420	53	623.	235.9	3017.5	*	1		1240	153	290.	33.8	2998.2	*	1		2100	253	0.	4.0	2992.8
1		0425	54	635.	249.1	3018.4	*	1		1245	154	283.	31.8	2997.9	*	1		2105	254	0.	4.0	2992.8
1		0430	55	644.	260.3	3019.1	*	1		1250	155	275.	29.9	2997.6	*	1		2110	255	0.	4.0	2992.8
1		0435	56	651.	269.9	3019.8	*	1		1255	156	268.	28.1	2997.4	*	1		2115	256	0.	4.0	2992.8
1		0440	57	658.	278.5	3020.3	*	1		1300	157	262.	26.2	2997.2	*	1		2120	257	0.	4.0	2992.8
1		0445	58	664.	286.3	3020.8	*	1		1305	158	254.	24.5	2996.9	*	1		2125	258	0.	4.0	2992.8
1		0450	59	669.	293.5	3021.3	*	1		1310	159	245.	22.7	2996.6	*	1		2130	259	0.	4.0	2992.8
1		0455	60	674.	300.0	3021.7	*	1		1315	160	237.	21.1	2996.4	*	1		2135	260	0.	4.0	2992.8

1	0500	61	710.	306.0	3022.1	*	1	1320	161	228.	19.5	2996.1	*	1	2140	261	0.	4.0	2992.8
1	0505	62	788.	311.1	3022.4	*	1	1325	162	219.	17.9	2995.9	*	1	2145	262	0.	4.0	2992.8
1	0510	63	849.	315.0	3022.6	*	1	1330	163	210.	16.5	2995.6	*	1	2150	263	0.	4.0	2992.8
1	0515	64	892.	317.8	3022.8	*	1	1335	164	201.	15.0	2995.4	*	1	2155	264	0.	4.0	2992.8
1	0520	65	918.	319.5	3022.9	*	1	1340	165	192.	13.7	2995.2	*	1	2200	265	0.	4.0	2992.8
1	0525	66	929.	320.2	3022.9	*	1	1345	166	179.	12.4	2994.9	*	1	2205	266	0.	4.0	2992.8
1	0530	67	927.	320.0	3022.9	*	1	1350	167	155.	11.2	2994.6	*	1	2210	267	0.	4.0	2992.8
1	0535	68	914.	319.2	3022.9	*	1	1355	168	134.	10.3	2994.4	*	1	2215	268	0.	4.0	2992.8
1	0540	69	892.	317.8	3022.8	*	1	1400	169	115.	9.4	2994.2	*	1	2220	269	0.	4.0	2992.8
1	0545	70	863.	315.9	3022.7	*	1	1405	170	100.	8.7	2994.0	*	1	2225	270	0.	4.0	2992.8
1	0550	71	827.	313.6	3022.5	*	1	1410	171	86.	8.0	2993.8	*	1	2230	271	0.	4.0	2992.8
1	0555	72	788.	311.1	3022.4	*	1	1415	172	74.	7.5	2993.7	*	1	2235	272	0.	4.0	2992.8
1	0600	73	746.	308.4	3022.2	*	1	1420	173	64.	7.0	2993.6	*	1	2240	273	0.	4.0	2992.8
1	0605	74	703.	305.6	3022.0	*	1	1425	174	55.	6.6	2993.5	*	1	2245	274	0.	4.0	2992.8
1	0610	75	676.	302.7	3021.9	*	1	1430	175	48.	6.2	2993.4	*	1	2250	275	0.	4.0	2992.8
1	0615	76	674.	299.6	3021.7	*	1	1435	176	41.	5.9	2993.3	*	1	2255	276	0.	4.0	2992.8
1	0620	77	671.	296.3	3021.5	*	1	1440	177	36.	5.6	2993.2	*	1	2300	277	0.	4.0	2992.8
1	0625	78	669.	292.7	3021.2	*	1	1445	178	31.	5.4	2993.2	*	1	2305	278	0.	4.0	2992.8
1	0630	79	666.	289.0	3021.0	*	1	1450	179	27.	5.2	2993.1	*	1	2310	279	0.	4.0	2992.8
1	0635	80	663.	285.1	3020.8	*	1	1455	180	23.	5.1	2993.1	*	1	2315	280	0.	4.0	2992.8
1	0640	81	660.	281.2	3020.5	*	1	1500	181	20.	4.9	2993.0	*	1	2320	281	0.	4.0	2992.8
1	0645	82	657.	277.1	3020.2	*	1	1505	182	17.	4.8	2993.0	*	1	2325	282	0.	4.0	2992.8
1	0650	83	654.	273.0	3020.0	*	1	1510	183	15.	4.7	2993.0	*	1	2330	283	0.	4.0	2992.8
1	0655	84	650.	268.8	3019.7	*	1	1515	184	13.	4.6	2993.0	*	1	2335	284	0.	4.0	2992.8
1	0700	85	647.	264.5	3019.4	*	1	1520	185	11.	4.5	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	644.	260.3	3019.1	*	1	1525	186	9.	4.4	2992.9	*	1	2345	286	0.	4.0	2992.8
1	0710	87	640.	256.0	3018.9	*	1	1530	187	8.	4.4	2992.9	*	1	2350	287	0.	4.0	2992.8
1	0715	88	637.	251.7	3018.6	*	1	1535	188	7.	4.3	2992.9	*	1	2355	288	0.	4.0	2992.8
1	0720	89	633.	247.4	3018.3	*	1	1540	189	6.	4.3	2992.9	*	2	0000	289	0.	4.0	2992.8
1	0725	90	630.	243.1	3018.0	*	1	1545	190	5.	4.2	2992.9	*	2	0005	290	0.	4.0	2992.8
1	0730	91	626.	238.9	3017.7	*	1	1550	191	5.	4.2	2992.9	*	2	0010	291	0.	4.0	2992.8
1	0735	92	622.	234.6	3017.4	*	1	1555	192	4.	4.2	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	618.	230.4	3017.1	*	1	1600	193	3.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	614.	226.1	3016.8	*	1	1605	194	3.	4.1	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	610.	221.9	3016.5	*	1	1610	195	3.	4.1	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	607.	217.7	3016.2	*	1	1615	196	2.	4.1	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	603.	213.6	3015.9	*	1	1620	197	2.	4.1	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	599.	209.4	3015.6	*	1	1625	198	2.	4.1	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	595.	205.3	3015.4	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	592.	201.3	3015.1	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 929.	5.42		650.	242.	233.	233.
		(INCHES)	1.376	2.047	2.047	2.047
		(AC-FT)	322.	480.	480.	480.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
320.	5.42	238.	74.	71.	71.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3022.95	5.42	3017.45	3000.73	3000.36	3000.36

CUMULATIVE AREA = 4.39 SQ MI

WARNING --- ROUTED OUTFLOW (712.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (779.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (827.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (858.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (874.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (876.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (867.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (849.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (824.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (792.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (755.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (716.) IS GREATER THAN MAXIMUM OUTFLOW (694.) IN STORAGE-OUTFLOW TABLE

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .98

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
							*								*							
1		0000	1	0.	.0	2990.0	*	1		0820	101	586.	195.6	3014.6	*	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	*	1		0825	102	582.	191.6	3014.3	*	1		1645	202	1.	4.0	2992.8
1		0010	3	0.	.0	2990.0	*	1		0830	103	577.	187.6	3014.0	*	1		1650	203	1.	4.0	2992.8
1		0015	4	0.	.0	2990.1	*	1		0835	104	573.	183.7	3013.7	*	1		1655	204	1.	4.0	2992.8
1		0020	5	0.	.0	2990.3	*	1		0840	105	569.	179.7	3013.4	*	1		1700	205	1.	4.0	2992.8
1		0025	6	0.	.0	2990.6	*	1		0845	106	564.	175.8	3013.1	*	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2991.0	*	1		0850	107	560.	172.0	3012.8	*	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.1	*	1		0855	108	556.	168.1	3012.5	*	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.2	2991.2	*	1		0900	109	552.	164.3	3012.2	*	1		1720	209	0.	4.0	2992.8

1	0045	10	0.	.3	2991.3	*	1	0905	110	548.	160.5	3011.9	*	1	1725	210	0.	4.0	2992.8
1	0050	11	0.	.4	2991.5	*	1	0910	111	544.	156.8	3011.7	*	1	1730	211	0.	4.0	2992.8
1	0055	12	0.	.6	2991.7	*	1	0915	112	540.	153.0	3011.4	*	1	1735	212	0.	4.0	2992.8
1	0100	13	0.	.7	2991.9	*	1	0920	113	536.	149.3	3011.1	*	1	1740	213	0.	4.0	2992.8
1	0105	14	0.	.9	2992.0	*	1	0925	114	532.	145.7	3010.8	*	1	1745	214	0.	4.0	2992.8
1	0110	15	0.	1.0	2992.1	*	1	0930	115	528.	142.0	3010.5	*	1	1750	215	0.	4.0	2992.8
1	0115	16	0.	1.2	2992.1	*	1	0935	116	524.	138.4	3010.2	*	1	1755	216	0.	4.0	2992.8
1	0120	17	0.	1.3	2992.1	*	1	0940	117	520.	134.8	3010.0	*	1	1800	217	0.	4.0	2992.8
1	0125	18	0.	1.6	2992.2	*	1	0945	118	515.	131.2	3009.6	*	1	1805	218	0.	4.0	2992.8
1	0130	19	0.	1.9	2992.3	*	1	0950	119	510.	127.7	3009.3	*	1	1810	219	0.	4.0	2992.8
1	0135	20	0.	2.3	2992.4	*	1	0955	120	505.	124.2	3009.0	*	1	1815	220	0.	4.0	2992.8
1	0140	21	0.	2.8	2992.5	*	1	1000	121	499.	120.8	3008.6	*	1	1820	221	0.	4.0	2992.8
1	0145	22	0.	3.5	2992.7	*	1	1005	122	493.	117.3	3008.3	*	1	1825	222	0.	4.0	2992.8
1	0150	23	9.	4.4	2992.9	*	1	1010	123	488.	114.0	3007.9	*	1	1830	223	0.	4.0	2992.8
1	0155	24	28.	5.3	2993.1	*	1	1015	124	482.	110.6	3007.6	*	1	1835	224	0.	4.0	2992.8
1	0200	25	45.	6.1	2993.3	*	1	1020	125	476.	107.3	3007.3	*	1	1840	225	0.	4.0	2992.8
1	0205	26	59.	6.7	2993.5	*	1	1025	126	471.	104.1	3006.9	*	1	1845	226	0.	4.0	2992.8
1	0210	27	71.	7.3	2993.6	*	1	1030	127	465.	100.8	3006.6	*	1	1850	227	0.	4.0	2992.8
1	0215	28	82.	7.8	2993.8	*	1	1035	128	460.	97.7	3006.3	*	1	1855	228	0.	4.0	2992.8
1	0220	29	94.	8.4	2993.9	*	1	1040	129	455.	94.5	3005.9	*	1	1900	229	0.	4.0	2992.8
1	0225	30	109.	9.1	2994.1	*	1	1045	130	449.	91.4	3005.6	*	1	1905	230	0.	4.0	2992.8
1	0230	31	126.	9.9	2994.3	*	1	1050	131	443.	88.3	3005.3	*	1	1910	231	0.	4.0	2992.8
1	0235	32	145.	10.8	2994.5	*	1	1055	132	436.	85.3	3004.9	*	1	1915	232	0.	4.0	2992.8
1	0240	33	162.	11.6	2994.7	*	1	1100	133	429.	82.3	3004.5	*	1	1920	233	0.	4.0	2992.8
1	0245	34	178.	12.3	2994.9	*	1	1105	134	422.	79.4	3004.1	*	1	1925	234	0.	4.0	2992.8
1	0250	35	189.	13.1	2995.1	*	1	1110	135	415.	76.5	3003.8	*	1	1930	235	0.	4.0	2992.8
1	0255	36	194.	14.0	2995.2	*	1	1115	136	408.	73.7	3003.4	*	1	1935	236	0.	4.0	2992.8
1	0300	37	200.	14.9	2995.4	*	1	1120	137	400.	70.9	3003.0	*	1	1940	237	0.	4.0	2992.8
1	0305	38	207.	15.8	2995.5	*	1	1125	138	393.	68.2	3002.7	*	1	1945	238	0.	4.0	2992.8
1	0310	39	213.	16.9	2995.7	*	1	1130	139	385.	65.5	3002.3	*	1	1950	239	0.	4.0	2992.8
1	0315	40	224.	18.7	2996.0	*	1	1135	140	378.	62.8	3002.0	*	1	1955	240	0.	4.0	2992.8
1	0320	41	240.	21.7	2996.5	*	1	1140	141	371.	60.3	3001.6	*	1	2000	241	0.	4.0	2992.8
1	0325	42	265.	27.1	2997.3	*	1	1145	142	364.	57.7	3001.3	*	1	2005	242	0.	4.0	2992.8
1	0330	43	299.	36.4	2998.5	*	1	1150	143	357.	55.3	3001.0	*	1	2010	243	0.	4.0	2992.8
1	0335	44	345.	50.8	3000.4	*	1	1155	144	351.	52.8	3000.6	*	1	2015	244	0.	4.0	2992.8
1	0340	45	397.	69.8	3002.9	*	1	1200	145	344.	50.4	3000.3	*	1	2020	245	0.	4.0	2992.8
1	0345	46	450.	91.9	3005.7	*	1	1205	146	337.	48.1	3000.0	*	1	2025	246	0.	4.0	2992.8
1	0350	47	489.	115.1	3008.1	*	1	1210	147	329.	45.8	2999.7	*	1	2030	247	0.	4.0	2992.8
1	0355	48	523.	138.0	3010.2	*	1	1215	148	322.	43.5	2999.4	*	1	2035	248	0.	4.0	2992.8
1	0400	49	547.	159.8	3011.9	*	1	1220	149	315.	41.3	2999.1	*	1	2040	249	0.	4.0	2992.8
1	0405	50	569.	180.4	3013.5	*	1	1225	150	308.	39.2	2998.9	*	1	2045	250	0.	4.0	2992.8
1	0410	51	590.	199.4	3014.9	*	1	1230	151	301.	37.1	2998.6	*	1	2050	251	0.	4.0	2992.8
1	0415	52	606.	216.7	3016.1	*	1	1235	152	294.	35.1	2998.3	*	1	2055	252	0.	4.0	2992.8
1	0420	53	619.	231.8	3017.2	*	1	1240	153	287.	33.1	2998.1	*	1	2100	253	0.	4.0	2992.8
1	0425	54	631.	244.7	3018.1	*	1	1245	154	280.	31.1	2997.8	*	1	2105	254	0.	4.0	2992.8
1	0430	55	640.	255.7	3018.8	*	1	1250	155	273.	29.2	2997.5	*	1	2110	255	0.	4.0	2992.8
1	0435	56	648.	265.2	3019.5	*	1	1255	156	266.	27.3	2997.3	*	1	2115	256	0.	4.0	2992.8
1	0440	57	654.	273.7	3020.0	*	1	1300	157	259.	25.5	2997.1	*	1	2120	257	0.	4.0	2992.8
1	0445	58	660.	281.3	3020.5	*	1	1305	158	251.	23.8	2996.8	*	1	2125	258	0.	4.0	2992.8
1	0450	59	666.	288.4	3021.0	*	1	1310	159	242.	22.1	2996.5	*	1	2130	259	0.	4.0	2992.8
1	0455	60	670.	294.8	3021.4	*	1	1315	160	233.	20.5	2996.3	*	1	2135	260	0.	4.0	2992.8
1	0500	61	675.	300.8	3021.7	*	1	1320	161	225.	18.9	2996.0	*	1	2140	261	0.	4.0	2992.8
1	0505	62	712.	306.1	3022.1	*	1	1325	162	216.	17.4	2995.8	*	1	2145	262	0.	4.0	2992.8
1	0510	63	779.	310.5	3022.3	*	1	1330	163	207.	15.9	2995.5	*	1	2150	263	0.	4.0	2992.8
1	0515	64	827.	313.6	3022.5	*	1	1335	164	198.	14.5	2995.3	*	1	2155	264	0.	4.0	2992.8
1	0520	65	858.	315.6	3022.7	*	1	1340	165	189.	13.2	2995.1	*	1	2200	265	0.	4.0	2992.8
1	0525	66	874.	316.6	3022.7	*	1	1345	166	170.	11.9	2994.8	*	1	2205	266	0.	4.0	2992.8
1	0530	67	876.	316.8	3022.7	*	1	1350	167	146.	10.8	2994.5	*	1	2210	267	0.	4.0	2992.8
1	0535	68	867.	316.2	3022.7	*	1	1355	168	126.	9.9	2994.3	*	1	2215	268	0.	4.0	2992.8
1	0540	69	849.	315.0	3022.6	*	1	1400	169	109.	9.1	2994.1	*	1	2220	269	0.	4.0	2992.8
1	0545	70	824.	313.4	3022.5	*	1	1405	170	94.	8.4	2993.9	*	1	2225	270	0.	4.0	2992.8
1	0550	71	792.	311.3	3022.4	*	1	1410	171	81.	7.8	2993.8	*	1	2230	271	0.	4.0	2992.8
1	0555	72	755.	309.0	3022.2	*	1	1415	172	70.	7.3	2993.6	*	1	2235	272	0.	4.0	2992.8
1	0600	73	716.	306.4	3022.1	*	1	1420	173	61.	6.8	2993.5	*	1	2240	273	0.	4.0	2992.8
1	0605	74	679.	303.8	3021.9	*	1	1425	174	52.	6.4	2993.4	*	1	2245	274	0.	4.0	2992.8
1	0610	75	675.	301.0	3021.7	*	1	1430	175	45.	6.1	2993.3	*	1	2250	275	0.	4.0	2992.8
1	0615	76	673.	297.9	3021.6	*	1	1435	176	39.	5.8	2993.3	*	1	2255	276	0.	4.0	2992.8
1	0620	77	670.	294.5	3021.3	*	1	1440	177	34.	5.6	2993.2	*	1	2300	277	0.	4.0	2992.8
1	0625	78	667.	291.0	3021.1	*	1	1445	178	29.	5.3	2993.1	*	1	2305	278	0.	4.0	2992.8
1	0630	79	665.	287.3	3020.9	*	1	1450	179	25.	5.2	2993.1	*	1	2310	279	0.	4.0	2992.8
1	0635	80	662.	283.4	3020.6	*	1	1455	180	22.	5.0	2993.1	*	1	2315	280	0.	4.0	2992.8
1	0640	81	659.	279.4	3020.4	*	1	1500	181	19.	4.9	2993.0	*	1	2320	281	0.	4.0	2992.8
1	0645	82	656.	275.4	3020.1	*	1	1505	182	16.	4.7	2993.0	*	1	2325	282	0.	4.0	2992.8
1	0650	83	652.	271.3	3019.9	*	1	1510	183	14.	4.6	2993.0	*	1	2330	283	0.	4.0	2992.8
1	0655	84	649.	267.1	3019.6	*	1	1515	184	12.	4.5	2992.9	*	1	2335	284	0.	4.0	2992.8
1	0700	85	646.	262.8	3019.3	*	1	1520	185	10.	4.5	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	642.	258.6	3019.0	*	1	1525	186	9.	4.4	2992.9	*	1	2345	286	0.	4.0	2992.8
1	0710	87	639.	254.3	3018.7	*	1	1530	187	8.	4.3	2992.9	*	1	2350	287	0.	4.0	2992.8
1	0715	88	635.	250.0	3018.5	*	1	1535	188	7.	4.3	2992.9	*	1	2355	288	0.	4.0	2992.8
1	0720	89	632.	245.7	3018.2	*	1	1540	189	6.	4.2	2992.9	*	2	0000	289	0.	4.0	2992.8
1	0725	90	628.	241.5	3017.9	*	1	1545	190	5.	4.2	2992.9	*	2	0005	290	0.	4.0	2992.8
1	0730	91	624.	237.2	3017.6	*	1	1550	191	4.	4.2	2992.9	*	2	0010	291	0.	4.0	2992.8
1	0735	92	620.	233.0	3017.3	*	1	1555	192	4.	4.2	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	617.	228.7	3017.0	*	1	1600	193	3.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	613.	224.5	3016.7	*	1	1605	194	3.	4.1	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	609.	220.3	3016.4	*	1	1610	195	2.	4.1	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	605.	216.1	3016.1	*	1	1615	196	2.	4.1	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	602.	212.0	3015.8	*	1	1620	197	2.	4.1	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	598.	207.9	3015.5	*	1	1625	198	2.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	594.	203.8	3015.2	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	590.	199.7	3015.0	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 876.	5.50		639.	238.	229.	229.
		(INCHES)	1.353	2.016	2.016	2.016
		(AC-FT)	317.	472.	472.	472.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
+ 317.	5.50	236.	73.	70.	70.

PEAK STAGE (FEET)	TIME (HR)	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	24.92-HR
3022.74	5.50	3017.29	3000.66	3000.29	3000.29

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .94

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	573.	184.1	3013.8	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	1		0825	102	569.	180.2	3013.5	1		1645	202	1.	4.0	2992.8
1		0010	3	0.	.0	2990.0	1		0830	103	565.	176.3	3013.2	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.1	1		0835	104	561.	172.4	3012.9	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.2	1		0840	105	556.	168.6	3012.6	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.5	1		0845	106	552.	164.8	3012.3	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2990.9	1		0850	107	548.	161.0	3012.0	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.1	1		0855	108	544.	157.2	3011.7	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.2	2991.1	1		0900	109	540.	153.5	3011.4	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.2	2991.2	1		0905	110	536.	149.8	3011.1	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.3	2991.4	1		0910	111	532.	146.1	3010.8	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.4	2991.5	1		0915	112	528.	142.4	3010.6	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.5	2991.6	1		0920	113	524.	138.8	3010.3	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.6	2991.8	1		0925	114	520.	135.2	3010.0	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	.7	2991.9	1		0930	115	515.	131.7	3009.7	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	.8	2992.0	1		0935	116	510.	128.1	3009.4	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	1.0	2992.0	1		0940	117	505.	124.6	3009.0	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	1.2	2992.1	1		0945	118	500.	121.2	3008.7	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	1.4	2992.2	1		0950	119	494.	117.7	3008.3	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	1.7	2992.2	1		0955	120	488.	114.4	3008.0	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	2.2	2992.4	1		1000	121	483.	111.0	3007.6	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	2.8	2992.5	1		1005	122	477.	107.7	3007.3	1		1825	222	0.	4.0	2992.8
1		0150	23	0.	3.6	2992.7	1		1010	123	472.	104.4	3007.0	1		1830	223	0.	4.0	2992.8
1		0155	24	10.	4.4	2992.9	1		1015	124	466.	101.2	3006.6	1		1835	224	0.	4.0	2992.8
1		0200	25	26.	5.2	2993.1	1		1020	125	461.	98.0	3006.3	1		1840	225	0.	4.0	2992.8
1		0205	26	41.	5.9	2993.3	1		1025	126	455.	94.9	3006.0	1		1845	226	0.	4.0	2992.8
1		0210	27	53.	6.5	2993.4	1		1030	127	449.	91.8	3005.6	1		1850	227	0.	4.0	2992.8
1		0215	28	64.	7.0	2993.6	1		1035	128	443.	88.7	3005.3	1		1855	228	0.	4.0	2992.8
1		0220	29	76.	7.5	2993.7	1		1040	129	437.	85.7	3005.0	1		1900	229	0.	4.0	2992.8
1		0225	30	90.	8.2	2993.9	1		1045	130	430.	82.7	3004.6	1		1905	230	0.	4.0	2992.8
1		0230	31	107.	9.0	2994.1	1		1050	131	423.	79.7	3004.2	1		1910	231	0.	4.0	2992.8
1		0235	32	124.	9.8	2994.3	1		1055	132	416.	76.8	3003.8	1		1915	232	0.	4.0	2992.8
1		0240	33	141.	10.6	2994.5	1		1100	133	409.	74.0	3003.4	1		1920	233	0.	4.0	2992.8
1		0245	34	156.	11.3	2994.6	1		1105	134	401.	71.2	3003.1	1		1925	234	0.	4.0	2992.8
1		0250	35	171.	12.0	2994.8	1		1110	135	394.	68.5	3002.7	1		1930	235	0.	4.0	2992.8
1		0255	36	186.	12.8	2995.0	1		1115	136	386.	65.8	3002.4	1		1935	236	0.	4.0	2992.8
1		0300	37	191.	13.5	2995.1	1		1120	137	379.	63.2	3002.0	1		1940	237	0.	4.0	2992.8
1		0305	38	197.	14.3	2995.3	1		1125	138	372.	60.6	3001.7	1		1945	238	0.	4.0	2992.8
1		0310	39	203.	15.3	2995.4	1		1130	139	365.	58.0	3001.3	1		1950	239	0.	4.0	2992.8
1		0315	40	213.	16.8	2995.7	1		1135	140	358.	55.5	3001.0	1		1955	240	0.	4.0	2992.8
1		0320	41	229.	19.5	2996.1	1		1140	141	351.	53.1	3000.7	1		2000	241	0.	4.0	2992.8
1		0325	42	254.	24.5	2996.9	1		1145	142	345.	50.7	3000.4	1		2005	242	0.	4.0	2992.8
1		0330	43	287.	33.1	2998.1	1		1150	143	338.	48.3	3000.1	1		2010	243	0.	4.0	2992.8
1		0335	44	331.	46.3	2999.8	1		1155	144	330.	46.0	2999.8	1		2015	244	0.	4.0	2992.8
1		0340	45	382.	64.1	3002.1	1		1200	145	323.	43.8	2999.5	1		2020	245	0.	4.0	2992.8
1		0345	46	435.	84.8	3004.8	1		1205	146	316.	41.6	2999.2	1		2025	246	0.	4.0	2992.8
1		0350	47	475.	106.4	3007.2	1		1210	147	309.	39.5	2998.9	1		2030	247	0.	4.0	2992.8
1		0355	48	510.	127.8	3009.3	1		1215	148	302.	37.3	2998.6	1		2035	248	0.	4.0	2992.8
1		0400	49	534.	148.2	3011.0	1		1220	149	295.	35.3	2998.3	1		2040	249	0.	4.0	2992.8
1		0405	50	555.	167.5	3012.5	1		1225	150	288.	33.3	2998.1	1		2045	250	0.	4.0	2992.8
1		0410	51	575.	185.3	3013.9	1		1230	151	281.	31.3	2997.8	1		2050	251	0.	4.0	2992.8
1		0415	52	592.	201.4	3015.1	1		1235	152	273.	29.4	2997.6	1		2055	252	0.	4.0	2992.8
1		0420	53	605.	215.6	3016.1	1		1240	153	266.	27.6	2997.3	1		2100	253	0.	4.0	2992.8
1		0425	54	616.	227.7	3016.9	1		1245	154	260.	25.7	2997.1	1		2105	254	0.	4.0	2992.8
1		0430	55	625.	238.0	3017.6	1		1250	155	252.	24.0	2996.8	1		2110	255	0.	4.0	2992.8
1		0435	56	633.	246.8	3018.2	1		1255	156	243.	22.3	2996.6	1		2115	256	0.	4.0	2992.8
1		0440	57	639.	254.7	3018.8	1		1300	157	234.	20.6	2996.3	1		2120	257	0.	4.0	2992.8
1		0445	58	645.	261.8	3019.2	1		1305	158	226.	19.1	2996.0	1		2125	258	0.	4.0	2992.8
1		0450	59	650.	268.3	3019.7	1		1310	159	217.	17.5	2995.8	1		2130	259	0.	4.0	2992.8
1		0455	60	655.	274.3	3020.1	1		1315	160	208.	16.1	2995.6	1		2135	260	0.	4.0	2992.8
1		0500	61	659.	279.8	3020.4	1		1320	161	199.	14.7	2995.3	1		2140	261	0.	4.0	2992.8
1		0505	62	663.	284.9	3020.7	1		1325	162	190.	13.3	2995.1	1		2145	262	0.	4.0	2992.8
1		0510	63	666.	289.3	3021.0	1		1330	163	173.	12.1	2994.8	1		2150	263	0.	4.0	2992.8
1		0515	64	669.	292.9	3021.2	1		1335	164	149.	11.0	2994.6	1		2155	264	0.	4.0	2992.8
1		0520	65	671.	295.7	3021.4	1		1340	165	129.	10.0	2994.3	1		2200	265	0.	4.0	2992.8
1		0525	66	672.	297.7	3021.5	1		1345	166	111.	9.2	2994.1	1		2205	266	0.	4.0	2992.8
1		0530	67	673.	298.9	3021.6	1		1350	167	96.	8.5	2993.9	1		2210	267	0.	4.0	2992.8
1		0535	68	674.	299.5	3021.7	1		1355	168	83.	7.9	2993.8	1		2215	268	0.	4.0	2992.8
1		0540	69	674.	299.4	3021.6	1		1400	169	71.	7.3	2993.6	1		2220	269	0.	4.0	2992.8
1		0545	70	673.	298.6	3021.6	1		1405	170	62.	6.9	2993.5	1		2225	270	0.	4.0	2992.8
1		0550	71	672.	297.3	3021.5	1		1410	171	53.	6.5	2993.4	1		2230	271	0.	4.0	2992.8
1		0555	72	671.	295.5	3021.4	1		1415	172	46.	6.1	2993.3	1		2235	272	0.	4.0	2992.8
1		0600	73	669.	293.3	3021.3	1		1420	173	40.	5.8	2993.3	1		2240	273	0.	4.0	2992.8
1		0605	74	667.	290.8	3021.1	1		1425	174	34.	5.6	2993.2	1		2245	274	0.	4.0	2992.8
1		0610	75	665.	287.9	3020.9	1		1430	175	30.	5.4	2993.1	1		2250	275	0.	4.0	2992.8
1		0615	76	663.	284.8	3020.7	1		1435	176	26.	5.2	2993.1	1		2255	276	0.	4.0	2992.8
1		0620	77	660.	281.5	3020.5	1		1440	177	22.	5.0	2993.1	1		2300	277	0.	4.0	2992.8
1		0625	78	658.	278.0	3020.3	1		1445	178	19.	4.9	2993.0	1		2305	278	0.	4.0	2992.8
1		0630	79	655.	274.3	3020.1	1		1450	179	16.	4.7	2993.0	1		2310	279	0.	4.0	2992.8
1		0635	80	652.	270.5	3019.8	1		1455	180	14.	4.6	2993.0	1		2315	280	0.	4.0	2992.8
1		0640	81	649.	266.5	3019.6	1		1500	181	12.	4.6	2992.9	1		2320	281	0.	4.0	2992.8
1		0645	82	645.	262.5	3019.3	1		1505	182	11.	4.5	2992.9	1		2325	282	0.	4.0	2992.8
1		0650	83	642.	258.4	3019.0	1		1510	183	9.	4.4	2992.9	1		2330	283	0.	4.0	2992.8
1		0655	84	639.	254.3	3018.7	1		1515	184	8.	4.3	2992.9	1		2335	284	0.	4.0	2992.8
1		0700	85	635.	250.1	3018.5	1		1520	185	7.	4.3	2992.9	1		2340	285	0.	4.0	2992.8
1		0705	86	632.	246.0	3018.2	1		1525	186	6.	4.3	2992.9	1		2345	286	0.	4.0	2992.8
1		0710	87	628.	241.7	3017.9	1		1530	187	5.	4.2	2992.9	1		2350	287	0.	4.0	2992.8
1		0715	88	625.	237.5	3017.6	1		1535	188	4.	4.2	2992.9	1		2355	288	0.	4.0	2992.8

1	0720	89	621.	233.3	3017.3	*	1	1540	189	4.	4.2	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	617.	229.1	3017.0	*	1	1545	190	3.	4.1	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	613.	224.9	3016.7	*	1	1550	191	3.	4.1	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	609.	220.7	3016.4	*	1	1555	192	2.	4.1	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	606.	216.6	3016.1	*	1	1600	193	2.	4.1	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	602.	212.4	3015.9	*	1	1605	194	2.	4.1	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	598.	208.3	3015.6	*	1	1610	195	2.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	594.	204.2	3015.3	*	1	1615	196	1.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	591.	200.2	3015.0	*	1	1620	197	1.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	586.	196.1	3014.7	*	1	1625	198	1.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	582.	192.1	3014.4	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	578.	188.1	3014.1	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 674.	5.58		606.	223.	215.	215.
		(INCHES)	1.282	1.892	1.892	1.892
		(AC-FT)	300.	443.	443.	443.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
299.	5.58	222.	68.	66.	66.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3021.66	5.58	3016.34	3000.23	2999.88	2999.88

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .93

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	568.	179.1	3013.4	*	1		1640	201	1.	4.0	2992.8
1		0005	2	0.	.0	2990.0	*	1		0825	102	564.	175.2	3013.1	*	1		1645	202	0.	4.0	2992.8
1		0010	3	0.	.0	2990.0	*	1		0830	103	560.	171.4	3012.8	*	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.1	*	1		0835	104	555.	167.5	3012.5	*	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.2	*	1		0840	105	551.	163.7	3012.2	*	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.5	*	1		0845	106	547.	159.9	3011.9	*	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2990.9	*	1		0850	107	543.	156.2	3011.6	*	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.0	*	1		0855	108	539.	152.4	3011.3	*	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.2	2991.1	*	1		0900	109	535.	148.8	3011.0	*	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.2	2991.2	*	1		0905	110	531.	145.1	3010.8	*	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.3	2991.3	*	1		0910	111	527.	141.4	3010.5	*	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.4	2991.5	*	1		0915	112	523.	137.8	3010.2	*	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.5	2991.6	*	1		0920	113	519.	134.2	3009.9	*	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.6	2991.7	*	1		0925	114	514.	130.7	3009.6	*	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	.7	2991.8	*	1		0930	115	509.	127.2	3009.3	*	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	.8	2992.0	*	1		0935	116	504.	123.7	3008.9	*	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	.9	2992.0	*	1		0940	117	498.	120.2	3008.6	*	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	1.1	2992.1	*	1		0945	118	492.	116.8	3008.2	*	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	1.3	2992.1	*	1		0950	119	487.	113.4	3007.9	*	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	1.6	2992.2	*	1		0955	120	481.	110.1	3007.5	*	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	2.1	2992.3	*	1		1000	121	475.	106.8	3007.2	*	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	2.7	2992.5	*	1		1005	122	470.	103.6	3006.9	*	1		1825	222	0.	4.0	2992.8
1		0150	23	0.	3.4	2992.7	*	1		1010	123	465.	100.3	3006.5	*	1		1830	223	0.	4.0	2992.8
1		0155	24	5.	4.2	2992.9	*	1		1015	124	459.	97.2	3006.2	*	1		1835	224	0.	4.0	2992.8
1		0200	25	22.	5.0	2993.1	*	1		1020	125	454.	94.0	3005.9	*	1		1840	225	0.	4.0	2992.8
1		0205	26	36.	5.7	2993.2	*	1		1025	126	448.	90.9	3005.5	*	1		1845	226	0.	4.0	2992.8
1		0210	27	48.	6.2	2993.4	*	1		1030	127	442.	87.8	3005.2	*	1		1850	227	0.	4.0	2992.8
1		0215	28	59.	6.8	2993.5	*	1		1035	128	435.	84.8	3004.9	*	1		1855	228	0.	4.0	2992.8
1		0220	29	71.	7.3	2993.6	*	1		1040	129	428.	81.9	3004.5	*	1		1900	229	0.	4.0	2992.8
1		0225	30	85.	8.0	2993.8	*	1		1045	130	421.	78.9	3004.1	*	1		1905	230	0.	4.0	2992.8
1		0230	31	102.	8.8	2994.0	*	1		1050	131	414.	76.1	3003.7	*	1		1910	231	0.	4.0	2992.8
1		0235	32	119.	9.6	2994.2	*	1		1055	132	407.	73.2	3003.3	*	1		1915	232	0.	4.0	2992.8
1		0240	33	136.	10.3	2994.4	*	1		1100	133	399.	70.5	3003.0	*	1		1920	233	0.	4.0	2992.8
1		0245	34	151.	11.1	2994.6	*	1		1105	134	392.	67.7	3002.6	*	1		1925	234	0.	4.0	2992.8
1		0250	35	166.	11.8	2994.8	*	1		1110	135	384.	65.1	3002.3	*	1		1930	235	0.	4.0	2992.8
1		0255	36	181.	12.5	2994.9	*	1		1115	136	377.	62.4	3001.9	*	1		1935	236	0.	4.0	2992.8
1		0300	37	189.	13.2	2995.1	*	1		1120	137	370.	59.9	3001.6	*	1		1940	237	0.	4.0	2992.8
1		0305	38	195.	14.0	2995.2	*	1		1125	138	363.	57.3	3001.2	*	1		1945	238	0.	4.0	2992.8
1		0310	39	201.	14.9	2995.4	*	1		1130	139	356.	54.9	3000.9	*	1		1950	239	0.	4.0	2992.8
1		0315	40	210.	16.4	2995.6	*	1		1135	140	350.	52.4	3000.6	*	1		1955	240	0.	4.0	2992.8
1		0320	41	226.	19.0	2996.0	*	1		1140	141	343.	50.0	3000.3	*	1		2000	241	0.	4.0	2992.8
1		0325	42	251.	23.9	2996.8	*	1		1145	142	336.	47.7	3000.0	*	1		2005	242	0.	4.0	2992.8
1		0330	43	284.	32.3	2997.9	*	1		1150	143	328.	45.4	2999.7	*	1		2010	243	0.	4.0	2992.8
1		0335	44	328.	45.3	2999.7	*	1		1155	144	321.	43.2	2999.4	*	1		2015	244	0.	4.0	2992.8
1		0340	45	378.	62.7	3001.9	*	1		1200	145	314.	41.0	2999.1	*	1		2020	245	0.	4.0	2992.8
1		0345	46	431.	83.0	3004.6	*	1		1205	146	307.	38.9	2998.8	*	1		2025	246	0.	4.0	2992.8
1		0350	47	471.	104.3	3007.0	*	1		1210	147	300.	36.8	2998.5	*	1		2030	247	0.	4.0	2992.8
1		0355	48	506.	125.3	3009.1	*	1		1215	148	293.	34.7	2998.3	*	1		2035	248	0.	4.0	2992.8
1		0400	49	531.	145.4	3010.8	*	1		1220	149	286.	32.7	2998.0	*	1		2040	249	0.	4.0	2992.8
1		0405	50	552.	164.3	3012.2	*	1		1225	150	279.	30.8	2997.8	*	1		2045	250	0.	4.0	2992.8
1		0410	51	571.	181.8	3013.6	*	1		1230	151	271.	28.9	2997.5	*	1		2050	251	0.	4.0	2992.8
1		0415	52	588.	197.6	3014.8	*	1		1235	152	265.	27.1	2997.3	*	1		2055	252	0.	4.0	2992.8
1		0420	53	601.	211.6	3015.8	*	1		1240	153	258.	25.3	2997.0	*	1		2100	253	0.	4.0	2992.8
1		0425	54	612.	223.5	3016.6	*	1		1245	154	249.	23.5	2996.8	*	1		2105	254	0.	4.0	2992.8
1		0430	55	621.	233.5	3017.3	*	1		1250	155	240.	21.8	2996.5	*	1		2110	255	0.	4.0	2992.8
1		0435	56	629.	242.2	3017.9	*	1		1255	156	232.	20.2	2996.2	*	1		2115	256	0.	4.0	2992.8
1		0440	57	635.	249.9	3018.5	*	1		1300	157	224.	18.6	2996.0	*	1		2120	257	0.	4.0	2992.8
1		0445	58	641.	256.9	3018.9	*	1		1305	158	215.	17.1	2995.7	*	1		2125	258	0.	4.0	2992.8
1		0450	59	646.	263.3	3019.3	*	1		1310	159	206.	15.7	2995.5	*	1		2130	259	0.	4.0	2992.8
1		0455	60	651.	269.2	3019.7	*	1		1315	160	196.	14.3	2995.3	*	1		2135	260	0.	4.0	2992.8
1		0500	61	655.	274.6	3020.1	*	1		1320	161	188.	13.0	2995.0	*	1		2140	261	0.	4.0	2992.8

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0505	62	659.	279.5	3020.4	1		1325	162	166.	11.7	2994.8	1		2145	262	0.	4.0	2992.8
1		0510	63	662.	283.8	3020.7	1		1330	163	143.	10.7	2994.5	1		2150	263	0.	4.0	2992.8
1		0515	64	665.	287.4	3020.9	1		1335	164	123.	9.8	2994.3	1		2155	264	0.	4.0	2992.8
1		0520	65	667.	290.1	3021.1	1		1340	165	107.	9.0	2994.1	1		2200	265	0.	4.0	2992.8
1		0525	66	668.	292.1	3021.2	1		1345	166	92.	8.3	2993.9	1		2205	266	0.	4.0	2992.8
1		0530	67	669.	293.3	3021.3	1		1350	167	79.	7.7	2993.7	1		2210	267	0.	4.0	2992.8
1		0535	68	669.	293.8	3021.3	1		1355	168	69.	7.2	2993.6	1		2215	268	0.	4.0	2992.8
1		0540	69	669.	293.6	3021.3	1		1400	169	59.	6.8	2993.5	1		2220	269	0.	4.0	2992.8
1		0545	70	669.	292.8	3021.2	1		1405	170	51.	6.4	2993.4	1		2225	270	0.	4.0	2992.8
1		0550	71	668.	291.5	3021.2	1		1410	171	44.	6.0	2993.3	1		2230	271	0.	4.0	2992.8
1		0555	72	667.	289.7	3021.0	1		1415	172	38.	5.8	2993.3	1		2235	272	0.	4.0	2992.8
1		0600	73	665.	287.5	3020.9	1		1420	173	33.	5.5	2993.2	1		2240	273	0.	4.0	2992.8
1		0605	74	663.	285.0	3020.7	1		1425	174	28.	5.3	2993.1	1		2245	274	0.	4.0	2992.8
1		0610	75	661.	282.2	3020.6	1		1430	175	25.	5.1	2993.1	1		2250	275	0.	4.0	2992.8
1		0615	76	658.	279.1	3020.4	1		1435	176	21.	5.0	2993.1	1		2255	276	0.	4.0	2992.8
1		0620	77	656.	275.7	3020.2	1		1440	177	18.	4.8	2993.0	1		2300	277	0.	4.0	2992.8
1		0625	78	653.	272.2	3019.9	1		1445	178	16.	4.7	2993.0	1		2305	278	0.	4.0	2992.8
1		0630	79	650.	268.6	3019.7	1		1450	179	14.	4.6	2993.0	1		2310	279	0.	4.0	2992.8
1		0635	80	647.	264.8	3019.4	1		1455	180	12.	4.5	2992.9	1		2315	280	0.	4.0	2992.8
1		0640	81	644.	260.9	3019.2	1		1500	181	10.	4.5	2992.9	1		2320	281	0.	4.0	2992.8
1		0645	82	641.	256.9	3018.9	1		1505	182	9.	4.4	2992.9	1		2325	282	0.	4.0	2992.8
1		0650	83	638.	252.8	3018.6	1		1510	183	8.	4.3	2992.9	1		2330	283	0.	4.0	2992.8
1		0655	84	634.	248.7	3018.4	1		1515	184	7.	4.3	2992.9	1		2335	284	0.	4.0	2992.8
1		0700	85	631.	244.6	3018.1	1		1520	185	6.	4.2	2992.9	1		2340	285	0.	4.0	2992.8
1		0705	86	627.	240.4	3017.8	1		1525	186	5.	4.2	2992.9	1		2345	286	0.	4.0	2992.8
1		0710	87	623.	236.2	3017.5	1		1530	187	4.	4.2	2992.8	1		2350	287	0.	4.0	2992.8
1		0715	88	620.	232.1	3017.2	1		1535	188	4.	4.1	2992.8	1		2355	288	0.	4.0	2992.8
1		0720	89	616.	227.9	3016.9	1		1540	189	3.	4.1	2992.8	2		0000	289	0.	4.0	2992.8
1		0725	90	612.	223.7	3016.6	1		1545	190	3.	4.1	2992.8	2		0005	290	0.	4.0	2992.8
1		0730	91	608.	219.6	3016.4	1		1550	191	2.	4.1	2992.8	2		0010	291	0.	4.0	2992.8
1		0735	92	605.	215.4	3016.1	1		1555	192	2.	4.1	2992.8	2		0015	292	0.	4.0	2992.8
1		0740	93	601.	211.3	3015.8	1		1600	193	2.	4.1	2992.8	2		0020	293	0.	4.0	2992.8
1		0745	94	597.	207.2	3015.5	1		1605	194	2.	4.0	2992.8	2		0025	294	0.	4.0	2992.8
1		0750	95	593.	203.1	3015.2	1		1610	195	1.	4.0	2992.8	2		0030	295	0.	4.0	2992.8
1		0755	96	590.	199.0	3014.9	1		1615	196	1.	4.0	2992.8	2		0035	296	0.	4.0	2992.8
1		0800	97	585.	195.0	3014.6	1		1620	197	1.	4.0	2992.8	2		0040	297	0.	4.0	2992.8
1		0805	98	581.	191.0	3014.3	1		1625	198	1.	4.0	2992.8	2		0045	298	0.	4.0	2992.8
1		0810	99	576.	187.0	3014.0	1		1630	199	1.	4.0	2992.8	2		0050	299	0.	4.0	2992.8
1		0815	100	572.	183.0	3013.7	1		1635	200	1.	4.0	2992.8	2		0055	300	0.	4.0	2992.8

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 669.	5.58		601.	220.	212.	212.
		(INCHES)	1.272	1.860	1.860	1.860
		(AC-FT)	298.	436.	436.	436.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
294.	5.58	217.	66.	64.	64.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3021.30	5.58	3015.99	3000.06	2999.72	2999.72

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .92

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	563.	174.2	3013.0	1		1640	201	0.	4.0	2992.8
1		0005	2	0.	.0	2990.0	1		0825	102	558.	170.4	3012.7	1		1645	202	0.	4.0	2992.8
1		0010	3	0.	.0	2990.0	1		0830	103	554.	166.5	3012.4	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.1	1		0835	104	550.	162.7	3012.1	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.2	1		0840	105	546.	158.9	3011.8	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.5	1		0845	106	542.	155.2	3011.5	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2990.9	1		0850	107	538.	151.5	3011.3	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.1	2991.0	1		0855	108	534.	147.8	3011.0	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.1	2991.1	1		0900	109	530.	144.1	3010.7	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.2	2991.2	1		0905	110	526.	140.5	3010.4	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.3	2991.3	1		0910	111	522.	136.9	3010.1	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.4	2991.4	1		0915	112	518.	133.3	3009.8	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.4	2991.5	1		0920	113	513.	129.8	3009.5	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.5	2991.6	1		0925	114	508.	126.2	3009.2	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	.6	2991.7	1		0930	115	502.	122.8	3008.9	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	.7	2991.9	1		0935	116	497.	119.3	3008.5	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	.8	2992.0	1		0940	117	491.	115.9	3008.1	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	1.0	2992.0	1		0945	118	485.	112.6	3007.8	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	1.2	2992.1	1		0950	119	480.	109.2	3007.5	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	1.5	2992.2	1		0955	120	474.	106.0	3007.1	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	1.9	2992.3	1		1000	121	469.	102.7	3006.8	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	2.5	2992.4	1		1005	122	463.	99.5	3006.5	1		1825	222	0.	4.0	2992.8
1		0150	23	0.	3.2	2992.6	1		1010	123	458.	96.3	3006.1	1		1830	223	0.	4.0	2992.8
1		0155	24	1.	4.0	2992.8	1		1015	124	452.	93.2	3005.8	1		1835	224	0.	4.0	2992.8
1		0200	25	17.	4.8	2993.0	1		1020	125	446.	90.1	3005.5	1		1840	225	0.	4.0	2992.8
1		0205	26	32.	5.5	2993.2	1		1025	126	440.	87.1	3005.1	1		1845	226	0.	4.0	2992.8
1		0210	27	44.	6.0	2993.3	1		1030	127	433.	84.0	3004.7	1		1850	227	0.	4.0	2992.8
1		0215	28	55.	6.6	2993.4	1		1035	128	426.	81.1	3004.4	1		1855	228	0.	4.0	2992.8
1		0220	29	67.	7.1	2993.6	1		1040	129	419.	78.2	3004.0	1		1900	229	0.	4.0	2992.8
1		0225	30	81.	7.8	2993.8	1		1045	130	412.	75.3	3003.6	1		1905	230	0.	4.0	2992.8
1		0230	31	97.	8.5	2993.9	1		1050	131	405.	72.5	3003.2	1		1910	231	0.	4.0	2992.8
1		0235	32	114.	9.3	2994.2	1		1055	132	397.	69.7	3002.9	1		1915	232	0.	4.0	2992.8
1		0240	33	130.	10.1	2994.3	1		1100	133	390.	67.0	3002.5	1		1920	233	0.	4.0	2992.8
1		0245	34	145.	10.8	2994.5	1		1105	134	382.	64.4	3002.2	1		1925	234	0.	4.0	2992.8

1	0250	35	160.	11.5	2994.7	*	1	1110	135	375.	61.8	3001.8	*	1	1930	235	0.	4.0	2992.8
1	0255	36	176.	12.2	2994.9	*	1	1115	136	368.	59.2	3001.5	*	1	1935	236	0.	4.0	2992.8
1	0300	37	187.	12.9	2995.0	*	1	1120	137	361.	56.7	3001.2	*	1	1940	237	0.	4.0	2992.8
1	0305	38	192.	13.7	2995.2	*	1	1125	138	355.	54.2	3000.8	*	1	1945	238	0.	4.0	2992.8
1	0310	39	198.	14.6	2995.3	*	1	1130	139	348.	51.8	3000.5	*	1	1950	239	0.	4.0	2992.8
1	0315	40	208.	16.0	2995.5	*	1	1135	140	341.	49.4	3000.2	*	1	1955	240	0.	4.0	2992.8
1	0320	41	223.	18.5	2996.0	*	1	1140	141	334.	47.1	2999.9	*	1	2000	241	0.	4.0	2992.8
1	0325	42	248.	23.3	2996.7	*	1	1145	142	326.	44.8	2999.6	*	1	2005	242	0.	4.0	2992.8
1	0330	43	281.	31.5	2997.8	*	1	1150	143	319.	42.6	2999.3	*	1	2010	243	0.	4.0	2992.8
1	0335	44	324.	44.2	2999.5	*	1	1155	144	312.	40.4	2999.0	*	1	2015	244	0.	4.0	2992.8
1	0340	45	374.	61.3	3001.8	*	1	1200	145	305.	38.3	2998.7	*	1	2020	245	0.	4.0	2992.8
1	0345	46	427.	81.3	3004.4	*	1	1205	146	298.	36.2	2998.5	*	1	2025	246	0.	4.0	2992.8
1	0350	47	468.	102.2	3006.7	*	1	1210	147	291.	34.2	2998.2	*	1	2030	247	0.	4.0	2992.8
1	0355	48	502.	122.8	3008.9	*	1	1215	148	284.	32.2	2997.9	*	1	2035	248	0.	4.0	2992.8
1	0400	49	528.	142.6	3010.6	*	1	1220	149	277.	30.3	2997.7	*	1	2040	249	0.	4.0	2992.8
1	0405	50	548.	161.1	3012.0	*	1	1225	150	270.	28.4	2997.4	*	1	2045	250	0.	4.0	2992.8
1	0410	51	567.	178.4	3013.3	*	1	1230	151	263.	26.6	2997.2	*	1	2050	251	0.	4.0	2992.8
1	0415	52	584.	194.0	3014.5	*	1	1235	152	256.	24.8	2997.0	*	1	2055	252	0.	4.0	2992.8
1	0420	53	598.	207.6	3015.5	*	1	1240	153	247.	23.1	2996.7	*	1	2100	253	0.	4.0	2992.8
1	0425	54	608.	219.3	3016.3	*	1	1245	154	238.	21.4	2996.4	*	1	2105	254	0.	4.0	2992.8
1	0430	55	617.	229.2	3017.0	*	1	1250	155	230.	19.8	2996.2	*	1	2110	255	0.	4.0	2992.8
1	0435	56	625.	237.7	3017.6	*	1	1255	156	221.	18.2	2995.9	*	1	2115	256	0.	4.0	2992.8
1	0440	57	631.	245.3	3018.1	*	1	1300	157	212.	16.7	2995.7	*	1	2120	257	0.	4.0	2992.8
1	0445	58	637.	252.2	3018.6	*	1	1305	158	203.	15.3	2995.4	*	1	2125	258	0.	4.0	2992.8
1	0450	59	642.	258.4	3019.0	*	1	1310	159	194.	13.9	2995.2	*	1	2130	259	0.	4.0	2992.8
1	0455	60	647.	264.2	3019.4	*	1	1315	160	184.	12.6	2995.0	*	1	2135	260	0.	4.0	2992.8
1	0500	61	651.	269.5	3019.7	*	1	1320	161	159.	11.5	2994.7	*	1	2140	261	0.	4.0	2992.8
1	0505	62	655.	274.3	3020.1	*	1	1325	162	137.	10.4	2994.4	*	1	2145	262	0.	4.0	2992.8
1	0510	63	658.	278.5	3020.3	*	1	1330	163	119.	9.5	2994.2	*	1	2150	263	0.	4.0	2992.8
1	0515	64	661.	282.0	3020.6	*	1	1335	164	102.	8.8	2994.0	*	1	2155	264	0.	4.0	2992.8
1	0520	65	663.	284.7	3020.7	*	1	1340	165	88.	8.1	2993.8	*	1	2200	265	0.	4.0	2992.8
1	0525	66	664.	286.5	3020.8	*	1	1345	166	76.	7.6	2993.7	*	1	2205	266	0.	4.0	2992.8
1	0530	67	665.	287.7	3020.9	*	1	1350	167	66.	7.1	2993.6	*	1	2210	267	0.	4.0	2992.8
1	0535	68	665.	288.1	3020.9	*	1	1355	168	57.	6.6	2993.5	*	1	2215	268	0.	4.0	2992.8
1	0540	69	665.	288.0	3020.9	*	1	1400	169	49.	6.3	2993.4	*	1	2220	269	0.	4.0	2992.8
1	0545	70	665.	287.2	3020.9	*	1	1405	170	42.	6.0	2993.3	*	1	2225	270	0.	4.0	2992.8
1	0550	71	664.	285.8	3020.8	*	1	1410	171	37.	5.7	2993.2	*	1	2230	271	0.	4.0	2992.8
1	0555	72	662.	284.0	3020.7	*	1	1415	172	32.	5.5	2993.2	*	1	2235	272	0.	4.0	2992.8
1	0600	73	661.	281.8	3020.5	*	1	1420	173	27.	5.3	2993.1	*	1	2240	273	0.	4.0	2992.8
1	0605	74	659.	279.3	3020.4	*	1	1425	174	24.	5.1	2993.1	*	1	2245	274	0.	4.0	2992.8
1	0610	75	656.	276.5	3020.2	*	1	1430	175	20.	4.9	2993.0	*	1	2250	275	0.	4.0	2992.8
1	0615	76	654.	273.4	3020.0	*	1	1435	176	18.	4.8	2993.0	*	1	2255	276	0.	4.0	2992.8
1	0620	77	651.	270.1	3019.8	*	1	1440	177	15.	4.7	2993.0	*	1	2300	277	0.	4.0	2992.8
1	0625	78	649.	266.6	3019.6	*	1	1445	178	13.	4.6	2993.0	*	1	2305	278	0.	4.0	2992.8
1	0630	79	646.	262.9	3019.3	*	1	1450	179	11.	4.5	2992.9	*	1	2310	279	0.	4.0	2992.8
1	0635	80	643.	259.2	3019.1	*	1	1455	180	10.	4.4	2992.9	*	1	2315	280	0.	4.0	2992.8
1	0640	81	640.	255.3	3018.8	*	1	1500	181	8.	4.4	2992.9	*	1	2320	281	0.	4.0	2992.8
1	0645	82	636.	251.3	3018.5	*	1	1505	182	7.	4.3	2992.9	*	1	2325	282	0.	4.0	2992.8
1	0650	83	633.	247.3	3018.3	*	1	1510	183	6.	4.3	2992.9	*	1	2330	283	0.	4.0	2992.8
1	0655	84	630.	243.2	3018.0	*	1	1515	184	5.	4.2	2992.9	*	1	2335	284	0.	4.0	2992.8
1	0700	85	626.	239.1	3017.7	*	1	1520	185	5.	4.2	2992.9	*	1	2340	285	0.	4.0	2992.8
1	0705	86	622.	235.0	3017.4	*	1	1525	186	4.	4.2	2992.8	*	1	2345	286	0.	4.0	2992.8
1	0710	87	619.	230.9	3017.1	*	1	1530	187	3.	4.1	2992.8	*	1	2350	287	0.	4.0	2992.8
1	0715	88	615.	226.7	3016.9	*	1	1535	188	3.	4.1	2992.8	*	1	2355	288	0.	4.0	2992.8
1	0720	89	611.	222.6	3016.6	*	1	1540	189	3.	4.1	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	607.	218.4	3016.3	*	1	1545	190	2.	4.1	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	604.	214.3	3016.0	*	1	1550	191	2.	4.1	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	600.	210.2	3015.7	*	1	1555	192	2.	4.1	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	596.	206.1	3015.4	*	1	1600	193	1.	4.0	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	592.	202.0	3015.1	*	1	1605	194	1.	4.0	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	588.	198.0	3014.8	*	1	1610	195	1.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	584.	193.9	3014.5	*	1	1615	196	1.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	580.	189.9	3014.2	*	1	1620	197	1.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	575.	186.0	3013.9	*	1	1625	198	1.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	571.	182.0	3013.6	*	1	1630	199	1.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	567.	178.1	3013.3	*	1	1635	200	1.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 665.	5.58		596.	216.	208.	208.
		(INCHES)	1.262	1.830	1.830	1.830
		(AC-FT)	296.	429.	429.	429.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)					
288.	5.58		212.	65.	62.	62.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
			6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)					
3020.95	5.58		3015.63	2999.90	2999.56	2999.56

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0 *	1		0820	101	557.	169.3	3012.6 *	1		1640	201	0.	4.0	2992.8
1		0005	2	0.	.0	2990.0 *	1		0825	102	553.	165.5	3012.3 *	1		1645	202	0.	4.0	2992.8
1		0010	3	0.	.0	2990.0 *	1		0830	103	549.	161.7	3012.0 *	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.1 *	1		0835	104	545.	157.9	3011.7 *	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.2 *	1		0840	105	541.	154.2	3011.5 *	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.5 *	1		0845	106	537.	150.5	3011.2 *	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.1	2990.8 *	1		0850	107	533.	146.8	3010.9 *	1		1710	207	0.	4.0	2992.8

1	0035	8	0.	.1	2991.0	*	1	0855	108	529.	143.1	3010.6	*	1	1715	208	0.	4.0	2992.8
1	0040	9	0.	.1	2991.1	*	1	0900	109	525.	139.5	3010.3	*	1	1720	209	0.	4.0	2992.8
1	0045	10	0.	.2	2991.2	*	1	0905	110	521.	135.9	3010.1	*	1	1725	210	0.	4.0	2992.8
1	0050	11	0.	.3	2991.3	*	1	0910	111	516.	132.3	3009.7	*	1	1730	211	0.	4.0	2992.8
1	0055	12	0.	.3	2991.4	*	1	0915	112	511.	128.8	3009.4	*	1	1735	212	0.	4.0	2992.8
1	0100	13	0.	.4	2991.5	*	1	0920	113	506.	125.3	3009.1	*	1	1740	213	0.	4.0	2992.8
1	0105	14	0.	.5	2991.6	*	1	0925	114	501.	121.8	3008.8	*	1	1745	214	0.	4.0	2992.8
1	0110	15	0.	.6	2991.7	*	1	0930	115	495.	118.4	3008.4	*	1	1750	215	0.	4.0	2992.8
1	0115	16	0.	.7	2991.8	*	1	0935	116	489.	115.0	3008.1	*	1	1755	216	0.	4.0	2992.8
1	0120	17	0.	.8	2992.0	*	1	0940	117	484.	111.6	3007.7	*	1	1800	217	0.	4.0	2992.8
1	0125	18	0.	.9	2992.0	*	1	0945	118	478.	108.3	3007.4	*	1	1805	218	0.	4.0	2992.8
1	0130	19	0.	1.1	2992.1	*	1	0950	119	473.	105.1	3007.0	*	1	1810	219	0.	4.0	2992.8
1	0135	20	0.	1.4	2992.1	*	1	0955	120	467.	101.8	3006.7	*	1	1815	220	0.	4.0	2992.8
1	0140	21	0.	1.8	2992.3	*	1	1000	121	462.	98.6	3006.4	*	1	1820	221	0.	4.0	2992.8
1	0145	22	0.	2.3	2992.4	*	1	1005	122	456.	95.5	3006.0	*	1	1825	222	0.	4.0	2992.8
1	0150	23	0.	3.0	2992.6	*	1	1010	123	450.	92.3	3005.7	*	1	1830	223	0.	4.0	2992.8
1	0155	24	0.	3.8	2992.8	*	1	1015	124	444.	89.3	3005.4	*	1	1835	224	0.	4.0	2992.8
1	0200	25	12.	4.6	2992.9	*	1	1020	125	439.	86.2	3005.0	*	1	1840	225	0.	4.0	2992.8
1	0205	26	27.	5.2	2993.1	*	1	1025	126	431.	83.2	3004.6	*	1	1845	226	0.	4.0	2992.8
1	0210	27	39.	5.8	2993.3	*	1	1030	127	424.	80.3	3004.3	*	1	1850	227	0.	4.0	2992.8
1	0215	28	50.	6.3	2993.4	*	1	1035	128	417.	77.4	3003.9	*	1	1855	228	0.	4.0	2992.8
1	0220	29	62.	6.9	2993.5	*	1	1040	129	410.	74.5	3003.5	*	1	1900	229	0.	4.0	2992.8
1	0225	30	76.	7.5	2993.7	*	1	1045	130	403.	71.7	3003.1	*	1	1905	230	0.	4.0	2992.8
1	0230	31	92.	8.3	2993.9	*	1	1050	131	395.	69.0	3002.8	*	1	1910	231	0.	4.0	2992.8
1	0235	32	109.	9.1	2994.1	*	1	1055	132	388.	66.3	3002.4	*	1	1915	232	0.	4.0	2992.8
1	0240	33	125.	9.8	2994.3	*	1	1100	133	380.	63.6	3002.1	*	1	1920	233	0.	4.0	2992.8
1	0245	34	140.	10.5	2994.5	*	1	1105	134	373.	61.0	3001.7	*	1	1925	234	0.	4.0	2992.8
1	0250	35	155.	11.2	2994.6	*	1	1110	135	366.	58.5	3001.4	*	1	1930	235	0.	4.0	2992.8
1	0255	36	170.	11.9	2994.8	*	1	1115	136	359.	56.0	3001.1	*	1	1935	236	0.	4.0	2992.8
1	0300	37	185.	12.6	2995.0	*	1	1120	137	353.	53.5	3000.7	*	1	1940	237	0.	4.0	2992.8
1	0305	38	190.	13.3	2995.1	*	1	1125	138	346.	51.1	3000.4	*	1	1945	238	0.	4.0	2992.8
1	0310	39	196.	14.2	2995.2	*	1	1130	139	339.	48.8	3000.1	*	1	1950	239	0.	4.0	2992.8
1	0315	40	205.	15.6	2995.5	*	1	1135	140	332.	46.5	2999.8	*	1	1955	240	0.	4.0	2992.8
1	0320	41	220.	18.1	2995.9	*	1	1140	141	324.	44.2	2999.5	*	1	2000	241	0.	4.0	2992.8
1	0325	42	245.	22.7	2996.6	*	1	1145	142	317.	42.0	2999.2	*	1	2005	242	0.	4.0	2992.8
1	0330	43	278.	30.7	2997.7	*	1	1150	143	310.	39.8	2998.9	*	1	2010	243	0.	4.0	2992.8
1	0335	44	321.	43.2	2999.4	*	1	1155	144	303.	37.7	2998.7	*	1	2015	244	0.	4.0	2992.8
1	0340	45	370.	59.9	3001.6	*	1	1200	145	297.	35.7	2998.4	*	1	2020	245	0.	4.0	2992.8
1	0345	46	422.	79.5	3004.2	*	1	1205	146	289.	33.7	2998.1	*	1	2025	246	0.	4.0	2992.8
1	0350	47	464.	100.1	3006.5	*	1	1210	147	282.	31.7	2997.9	*	1	2030	247	0.	4.0	2992.8
1	0355	48	498.	120.4	3008.6	*	1	1215	148	275.	29.8	2997.6	*	1	2035	248	0.	4.0	2992.8
1	0400	49	525.	139.7	3010.4	*	1	1220	149	268.	27.9	2997.4	*	1	2040	249	0.	4.0	2992.8
1	0405	50	545.	158.0	3011.8	*	1	1225	150	261.	26.1	2997.1	*	1	2045	250	0.	4.0	2992.8
1	0410	51	563.	174.9	3013.1	*	1	1230	151	253.	24.3	2996.9	*	1	2050	251	0.	4.0	2992.8
1	0415	52	580.	190.2	3014.2	*	1	1235	152	244.	22.6	2996.6	*	1	2055	252	0.	4.0	2992.8
1	0420	53	594.	203.6	3015.2	*	1	1240	153	236.	20.9	2996.3	*	1	2100	253	0.	4.0	2992.8
1	0425	54	604.	215.1	3016.0	*	1	1245	154	228.	19.3	2996.1	*	1	2105	254	0.	4.0	2992.8
1	0430	55	613.	224.8	3016.7	*	1	1250	155	219.	17.8	2995.8	*	1	2110	255	0.	4.0	2992.8
1	0435	56	621.	233.2	3017.3	*	1	1255	156	210.	16.3	2995.6	*	1	2115	256	0.	4.0	2992.8
1	0440	57	627.	240.6	3017.8	*	1	1300	157	201.	14.9	2995.4	*	1	2120	257	0.	4.0	2992.8
1	0445	58	633.	247.3	3018.3	*	1	1305	158	192.	13.6	2995.1	*	1	2125	258	0.	4.0	2992.8
1	0450	59	638.	253.5	3018.7	*	1	1310	159	177.	12.3	2994.9	*	1	2130	259	0.	4.0	2992.8
1	0455	60	643.	259.1	3019.1	*	1	1315	160	153.	11.2	2994.6	*	1	2135	260	0.	4.0	2992.8
1	0500	61	647.	264.3	3019.4	*	1	1320	161	132.	10.2	2994.4	*	1	2140	261	0.	4.0	2992.8
1	0505	62	651.	269.0	3019.7	*	1	1325	162	114.	9.3	2994.1	*	1	2145	262	0.	4.0	2992.8
1	0510	63	654.	273.2	3020.0	*	1	1330	163	98.	8.6	2994.0	*	1	2150	263	0.	4.0	2992.8
1	0515	64	657.	276.6	3020.2	*	1	1335	164	85.	8.0	2993.8	*	1	2155	264	0.	4.0	2992.8
1	0520	65	659.	279.1	3020.4	*	1	1340	165	73.	7.4	2993.7	*	1	2200	265	0.	4.0	2992.8
1	0525	66	660.	281.0	3020.5	*	1	1345	166	63.	7.0	2993.5	*	1	2205	266	0.	4.0	2992.8
1	0530	67	661.	282.1	3020.6	*	1	1350	167	55.	6.5	2993.4	*	1	2210	267	0.	4.0	2992.8
1	0535	68	661.	282.5	3020.6	*	1	1355	168	47.	6.2	2993.4	*	1	2215	268	0.	4.0	2992.8
1	0540	69	661.	282.3	3020.6	*	1	1400	169	41.	5.9	2993.3	*	1	2220	269	0.	4.0	2992.8
1	0545	70	660.	281.5	3020.5	*	1	1405	170	35.	5.6	2993.2	*	1	2225	270	0.	4.0	2992.8
1	0550	71	659.	280.1	3020.4	*	1	1410	171	30.	5.4	2993.2	*	1	2230	271	0.	4.0	2992.8
1	0555	72	658.	278.3	3020.3	*	1	1415	172	26.	5.2	2993.1	*	1	2235	272	0.	4.0	2992.8
1	0600	73	656.	276.1	3020.2	*	1	1420	173	23.	5.0	2993.1	*	1	2240	273	0.	4.0	2992.8
1	0605	74	654.	273.6	3020.0	*	1	1425	174	20.	4.9	2993.0	*	1	2245	274	0.	4.0	2992.8
1	0610	75	652.	270.8	3019.8	*	1	1430	175	17.	4.8	2993.0	*	1	2250	275	0.	4.0	2992.8
1	0615	76	650.	267.7	3019.6	*	1	1435	176	15.	4.7	2993.0	*	1	2255	276	0.	4.0	2992.8
1	0620	77	647.	264.4	3019.4	*	1	1440	177	13.	4.6	2992.9	*	1	2300	277	0.	4.0	2992.8
1	0625	78	644.	260.9	3019.2	*	1	1445	178	11.	4.5	2992.9	*	1	2305	278	0.	4.0	2992.8
1	0630	79	641.	257.3	3018.9	*	1	1450	179	9.	4.4	2992.9	*	1	2310	279	0.	4.0	2992.8
1	0635	80	638.	253.5	3018.7	*	1	1455	180	8.	4.4	2992.9	*	1	2315	280	0.	4.0	2992.8
1	0640	81	635.	249.7	3018.4	*	1	1500	181	7.	4.3	2992.9	*	1	2320	281	0.	4.0	2992.8
1	0645	82	632.	245.8	3018.2	*	1	1505	182	6.	4.3	2992.9	*	1	2325	282	0.	4.0	2992.8
1	0650	83	628.	241.8	3017.9	*	1	1510	183	5.	4.2	2992.9	*	1	2330	283	0.	4.0	2992.8
1	0655	84	625.	237.7	3017.6	*	1	1515	184	4.	4.2	2992.9	*	1	2335	284	0.	4.0	2992.8
1	0700	85	621.	233.6	3017.3	*	1	1520	185	4.	4.2	2992.8	*	1	2340	285	0.	4.0	2992.8
1	0705	86	617.	229.6	3017.1	*	1	1525	186	3.	4.1	2992.8	*	1	2345	286	0.	4.0	2992.8
1	0710	87	614.	225.4	3016.8	*	1	1530	187	3.	4.1	2992.8	*	1	2350	287	0.	4.0	2992.8
1	0715	88	610.	221.3	3016.5	*	1	1535	188	2.	4.1	2992.8	*	1	2355	288	0.	4.0	2992.8
1	0720	89	606.	217.2	3016.2	*	1	1540	189	2.	4.1	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	603.	213.1	3015.9	*	1	1545	190	2.	4.1	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	599.	209.0	3015.6	*	1	1550	191	2.	4.1	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	595.	204.9	3015.3	*	1	1555	192	1.	4.0	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	591.	200.9	3015.0	*	1	1600	193	1.	4.0	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	587.	196.8	3014.7	*	1	1605	194	1.	4.0	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	583.	192.8	3014.4	*	1	1610	195	1.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	578.	188.8	3014.1	*	1	1615	196	1.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	574.	184.9	3013.8	*	1	1620	197	1.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	570.	180.9	3013.5	*	1	1625	198	1.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	566.	177.0	3013.2	*	1	1630	199	0.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	561.	173.1	3012.9	*	1	1635	200	0.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 661.	5.58		592.	212.	205.	205.
		(INCHES)	1.252	1.799	1.799	1.799
		(AC-FT)	293.	421.	421.	421.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR

+ (AC-FT)	(HR)				
282.	5.58	207.	63.	61.	61.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3020.58	5.58	3015.27	2999.74	2999.40	2999.40

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .70

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	414.	76.0	3003.7	1		1640	201	0.	4.0	2992.8
1		0005	2	0.	.0	2990.0	1		0825	102	407.	73.2	3003.3	1		1645	202	0.	4.0	2992.8
1		0010	3	0.	.0	2990.0	1		0830	103	399.	70.4	3003.0	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.0	1		0835	104	391.	67.7	3002.6	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.1	1		0840	105	384.	65.0	3002.3	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.2	1		0845	106	377.	62.4	3001.9	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.0	2990.4	1		0850	107	370.	59.8	3001.6	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.0	2990.6	1		0855	108	363.	57.3	3001.2	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.1	2990.8	1		0900	109	356.	54.8	3000.9	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.1	2991.0	1		0905	110	350.	52.4	3000.6	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.1	2991.0	1		0910	111	343.	50.0	3000.3	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.1	2991.0	1		0915	112	335.	47.7	3000.0	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.1	2991.0	1		0920	113	328.	45.4	2999.7	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.1	2991.0	1		0925	114	321.	43.2	2999.4	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	.1	2991.0	1		0930	115	314.	41.0	2999.1	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	.1	2991.0	1		0935	116	307.	38.8	2998.8	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	.1	2991.0	1		0940	117	300.	36.8	2998.5	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	.1	2991.0	1		0945	118	293.	34.7	2998.3	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	.1	2991.1	1		0950	119	286.	32.7	2998.0	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	.2	2991.1	1		0955	120	278.	30.8	2997.8	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	.2	2991.2	1		1000	121	271.	28.9	2997.5	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	.3	2991.4	1		1005	122	265.	27.0	2997.3	1		1825	222	0.	4.0	2992.8
1		0150	23	0.	.5	2991.6	1		1010	123	258.	25.2	2997.0	1		1830	223	0.	4.0	2992.8
1		0155	24	0.	.7	2991.9	1		1015	124	249.	23.5	2996.8	1		1835	224	0.	4.0	2992.8
1		0200	25	0.	1.0	2992.0	1		1020	125	240.	21.8	2996.5	1		1840	225	0.	4.0	2992.8
1		0205	26	0.	1.2	2992.1	1		1025	126	232.	20.2	2996.2	1		1845	226	0.	4.0	2992.8
1		0210	27	0.	1.5	2992.2	1		1030	127	223.	18.6	2996.0	1		1850	227	0.	4.0	2992.8
1		0215	28	0.	1.8	2992.3	1		1035	128	214.	17.1	2995.7	1		1855	228	0.	4.0	2992.8
1		0220	29	0.	2.1	2992.3	1		1040	129	206.	15.7	2995.5	1		1900	229	0.	4.0	2992.8
1		0225	30	0.	2.6	2992.5	1		1045	130	196.	14.3	2995.3	1		1905	230	0.	4.0	2992.8
1		0230	31	0.	3.2	2992.6	1		1050	131	188.	12.9	2995.0	1		1910	231	0.	4.0	2992.8
1		0235	32	0.	3.8	2992.8	1		1055	132	165.	11.7	2994.8	1		1915	232	0.	4.0	2992.8
1		0240	33	11.	4.5	2992.9	1		1100	133	143.	10.7	2994.5	1		1920	233	0.	4.0	2992.8
1		0245	34	24.	5.1	2993.1	1		1105	134	123.	9.8	2994.3	1		1925	234	0.	4.0	2992.8
1		0250	35	37.	5.7	2993.2	1		1110	135	106.	9.0	2994.1	1		1930	235	0.	4.0	2992.8
1		0255	36	50.	6.3	2993.4	1		1115	136	92.	8.3	2993.9	1		1935	236	0.	4.0	2992.8
1		0300	37	62.	6.9	2993.5	1		1120	137	79.	7.7	2993.7	1		1940	237	0.	4.0	2992.8
1		0305	38	74.	7.4	2993.7	1		1125	138	68.	7.2	2993.6	1		1945	238	0.	4.0	2992.8
1		0310	39	86.	8.0	2993.8	1		1130	139	59.	6.7	2993.5	1		1950	239	0.	4.0	2992.8
1		0315	40	104.	8.8	2994.0	1		1135	140	51.	6.4	2993.4	1		1955	240	0.	4.0	2992.8
1		0320	41	133.	10.2	2994.4	1		1140	141	44.	6.0	2993.3	1		2000	241	0.	4.0	2992.8
1		0325	42	184.	12.6	2995.0	1		1145	142	38.	5.8	2993.2	1		2005	242	0.	4.0	2992.8
1		0330	43	214.	17.0	2995.7	1		1150	143	33.	5.5	2993.2	1		2010	243	0.	4.0	2992.8
1		0335	44	253.	24.3	2996.9	1		1155	144	28.	5.3	2993.1	1		2015	244	0.	4.0	2992.8
1		0340	45	292.	34.4	2998.2	1		1200	145	24.	5.1	2993.1	1		2020	245	0.	4.0	2992.8
1		0345	46	332.	46.6	2999.8	1		1205	146	21.	5.0	2993.0	1		2025	246	0.	4.0	2992.8
1		0350	47	369.	59.6	3001.5	1		1210	147	18.	4.8	2993.0	1		2030	247	0.	4.0	2992.8
1		0355	48	405.	72.5	3003.2	1		1215	148	16.	4.7	2993.0	1		2035	248	0.	4.0	2992.8
1		0400	49	435.	84.8	3004.8	1		1220	149	14.	4.6	2993.0	1		2040	249	0.	4.0	2992.8
1		0405	50	458.	96.4	3006.1	1		1225	150	12.	4.5	2992.9	1		2045	250	0.	4.0	2992.8
1		0410	51	476.	107.1	3007.2	1		1230	151	10.	4.5	2992.9	1		2050	251	0.	4.0	2992.8
1		0415	52	492.	116.8	3008.2	1		1235	152	9.	4.4	2992.9	1		2055	252	0.	4.0	2992.8
1		0420	53	506.	125.2	3009.1	1		1240	153	8.	4.3	2992.9	1		2100	253	0.	4.0	2992.8
1		0425	54	516.	132.4	3009.7	1		1245	154	7.	4.3	2992.9	1		2105	254	0.	4.0	2992.8
1		0430	55	524.	138.4	3010.2	1		1250	155	6.	4.2	2992.9	1		2110	255	0.	4.0	2992.8
1		0435	56	529.	143.4	3010.6	1		1255	156	5.	4.2	2992.9	1		2115	256	0.	4.0	2992.8
1		0440	57	534.	147.9	3011.0	1		1300	157	4.	4.2	2992.8	1		2120	257	0.	4.0	2992.8
1		0445	58	538.	151.9	3011.3	1		1305	158	4.	4.1	2992.8	1		2125	258	0.	4.0	2992.8
1		0450	59	542.	155.5	3011.6	1		1310	159	3.	4.1	2992.8	1		2130	259	0.	4.0	2992.8
1		0455	60	546.	158.8	3011.8	1		1315	160	3.	4.1	2992.8	1		2135	260	0.	4.0	2992.8
1		0500	61	549.	161.7	3012.0	1		1320	161	2.	4.1	2992.8	1		2140	261	0.	4.0	2992.8
1		0505	62	552.	164.4	3012.2	1		1325	162	2.	4.1	2992.8	1		2145	262	0.	4.0	2992.8
1		0510	63	554.	166.7	3012.4	1		1330	163	2.	4.1	2992.8	1		2150	263	0.	4.0	2992.8
1		0515	64	556.	168.5	3012.6	1		1335	164	1.	4.0	2992.8	1		2155	264	0.	4.0	2992.8
1		0520	65	558.	169.7	3012.7	1		1340	165	1.	4.0	2992.8	1		2200	265	0.	4.0	2992.8
1		0525	66	558.	170.4	3012.7	1		1345	166	1.	4.0	2992.8	1		2205	266	0.	4.0	2992.8
1		0530	67	559.	170.6	3012.7	1		1350	167	1.	4.0	2992.8	1		2210	267	0.	4.0	2992.8
1		0535	68	558.	170.3	3012.7	1		1355	168	1.	4.0	2992.8	1		2215	268	0.	4.0	2992.8
1		0540	69	558.	169.6	3012.6	1		1400	169	1.	4.0	2992.8	1		2220	269	0.	4.0	2992.8
1		0545	70	556.	168.5	3012.6	1		1405	170	1.	4.0	2992.8	1		2225	270	0.	4.0	2992.8
1		0550	71	555.	166.9	3012.4	1		1410	171	1.	4.0	2992.8	1		2230	271	0.	4.0	2992.8
1		0555	72	553.	165.1	3012.3	1		1415	172	0.	4.0	2992.8	1		2235	272	0.	4.0	2992.8
1		0600	73	550.	162.9	3012.1	1		1420	173	0.	4.0	2992.8	1		2240	273	0.	4.0	2992.8
1		0605	74	548.	160.6	3012.0	1		1425	174	0.	4.0	2992.8	1		2245	274	0.	4.0	2992.8
1		0610	75	545.	158.0	3011.8	1		1430	175	0.	4.0	2992.8	1		2250	275	0.	4.0	2992.8
1		0615	76	542.	155.3	3011.5	1		1435	176	0.	4.0	2992.8	1		2255	276	0.	4.0	2992.8
1		0620	77	539.	152.4	3011.3	1		1440	177	0.	4.0	2992.8	1		2300	277	0.	4.0	2992.8
1		0625	78	536.	149.4	3011.1	1		1445	178	0.	4.0	2992.8	1		2305	278	0.	4.0	2992.8
1		0630	79	532.	146.3	3010.9	1		1450	179	0.	4.0	2992.8	1		2310	279	0.	4.0	2992.8
1		0635	80	529.	143.2	3010.6	1		1455	180	0.	4.0	2992.8	1		2315	280	0.	4.0	2992.8
1		0640	81	525.	139.9	3010.4	1		1500	181	0.	4.0	2992.8	1		2320	281	0.	4.0	2992.8
1		0645	82	522.	136.6	3010.1	1		1505	182	0.	4.0	2992.8	1		2325	282	0.	4.0	2992.8
1		0650	83	518.	133.3	3009.8	1		1510	183	0.	4.0	2992.8	1		2330	283	0.	4.0	2992.8
1		0655	84	513.	129.9	3009.5	1		1515	184	0.	4.0	2992.8	1		2335	284	0.	4.0	2992.8
1		0700	85	508.	126.6	3009.2	1		1520	185	0.	4.0	2992.8	1		2340	285	0.	4.0	2992.8
1		0705	86	503.	123.2	3008.9	1		1525	186	0.	4.0	2992.8	1		2345	286	0.	4.0	2992.8

1	0710	87	497.	119.9	3008.6	*	1	1530	187	0.	4.0	2992.8	*	1	2350	287	0.	4.0	2992.8
1	0715	88	492.	116.5	3008.2	*	1	1535	188	0.	4.0	2992.8	*	1	2355	288	0.	4.0	2992.8
1	0720	89	486.	113.2	3007.9	*	1	1540	189	0.	4.0	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	481.	109.9	3007.5	*	1	1545	190	0.	4.0	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	475.	106.7	3007.2	*	1	1550	191	0.	4.0	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	470.	103.4	3006.9	*	1	1555	192	0.	4.0	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	464.	100.2	3006.5	*	1	1600	193	0.	4.0	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	459.	97.1	3006.2	*	1	1605	194	0.	4.0	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	454.	93.9	3005.9	*	1	1610	195	0.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	448.	90.9	3005.5	*	1	1615	196	0.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	442.	87.8	3005.2	*	1	1620	197	0.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	435.	84.8	3004.8	*	1	1625	198	0.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	428.	81.8	3004.5	*	1	1630	199	0.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	421.	78.9	3004.1	*	1	1635	200	0.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
						*							*							

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 559.	5.50		469.	139.	134.	134.
		(INCHES)	.993	1.174	1.174	1.174
		(AC-FT)	233.	275.	275.	275.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
171.	5.50	112.	32.	31.	31.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3012.72	5.50	3007.24	2996.64	2996.41	2996.41

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .54

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	259.	25.6	2997.1	*	1		1640	201	0.	4.0	2992.8
1		0005	2	0.	.0	2990.0	*	1		0825	102	251.	23.8	2996.8	*	1		1645	202	0.	4.0	2992.8
1		0010	3	0.	.0	2990.0	*	1		0830	103	242.	22.1	2996.5	*	1		1650	203	0.	4.0	2992.8
1		0015	4	0.	.0	2990.0	*	1		0835	104	234.	20.5	2996.3	*	1		1655	204	0.	4.0	2992.8
1		0020	5	0.	.0	2990.0	*	1		0840	105	225.	18.9	2996.0	*	1		1700	205	0.	4.0	2992.8
1		0025	6	0.	.0	2990.0	*	1		0845	106	216.	17.4	2995.8	*	1		1705	206	0.	4.0	2992.8
1		0030	7	0.	.0	2990.1	*	1		0850	107	207.	15.9	2995.5	*	1		1710	207	0.	4.0	2992.8
1		0035	8	0.	.0	2990.2	*	1		0855	108	198.	14.5	2995.3	*	1		1715	208	0.	4.0	2992.8
1		0040	9	0.	.0	2990.3	*	1		0900	109	189.	13.2	2995.1	*	1		1720	209	0.	4.0	2992.8
1		0045	10	0.	.0	2990.4	*	1		0905	110	170.	12.0	2994.8	*	1		1725	210	0.	4.0	2992.8
1		0050	11	0.	.0	2990.5	*	1		0910	111	147.	10.9	2994.5	*	1		1730	211	0.	4.0	2992.8
1		0055	12	0.	.0	2990.5	*	1		0915	112	127.	9.9	2994.3	*	1		1735	212	0.	4.0	2992.8
1		0100	13	0.	.0	2990.5	*	1		0920	113	110.	9.1	2994.1	*	1		1740	213	0.	4.0	2992.8
1		0105	14	0.	.0	2990.5	*	1		0925	114	95.	8.4	2993.9	*	1		1745	214	0.	4.0	2992.8
1		0110	15	0.	.0	2990.5	*	1		0930	115	82.	7.8	2993.8	*	1		1750	215	0.	4.0	2992.8
1		0115	16	0.	.0	2990.5	*	1		0935	116	70.	7.3	2993.6	*	1		1755	216	0.	4.0	2992.8
1		0120	17	0.	.0	2990.6	*	1		0940	117	61.	6.8	2993.5	*	1		1800	217	0.	4.0	2992.8
1		0125	18	0.	.0	2990.6	*	1		0945	118	53.	6.4	2993.4	*	1		1805	218	0.	4.0	2992.8
1		0130	19	0.	.0	2990.7	*	1		0950	119	45.	6.1	2993.3	*	1		1810	219	0.	4.0	2992.8
1		0135	20	0.	.1	2990.8	*	1		0955	120	39.	5.8	2993.3	*	1		1815	220	0.	4.0	2992.8
1		0140	21	0.	.1	2991.0	*	1		1000	121	34.	5.6	2993.2	*	1		1820	221	0.	4.0	2992.8
1		0145	22	0.	.1	2991.0	*	1		1005	122	29.	5.3	2993.1	*	1		1825	222	0.	4.0	2992.8
1		0150	23	0.	.1	2991.0	*	1		1010	123	25.	5.2	2993.1	*	1		1830	223	0.	4.0	2992.8
1		0155	24	0.	.1	2991.1	*	1		1015	124	22.	5.0	2993.1	*	1		1835	224	0.	4.0	2992.8
1		0200	25	0.	.1	2991.1	*	1		1020	125	19.	4.9	2993.0	*	1		1840	225	0.	4.0	2992.8
1		0205	26	0.	.1	2991.1	*	1		1025	126	16.	4.7	2993.0	*	1		1845	226	0.	4.0	2992.8
1		0210	27	0.	.2	2991.1	*	1		1030	127	14.	4.6	2993.0	*	1		1850	227	0.	4.0	2992.8
1		0215	28	0.	.2	2991.2	*	1		1035	128	12.	4.5	2992.9	*	1		1855	228	0.	4.0	2992.8
1		0220	29	0.	.2	2991.2	*	1		1040	129	10.	4.5	2992.9	*	1		1900	229	0.	4.0	2992.8
1		0225	30	0.	.3	2991.3	*	1		1045	130	9.	4.4	2992.9	*	1		1905	230	0.	4.0	2992.8
1		0230	31	0.	.4	2991.5	*	1		1050	131	8.	4.3	2992.9	*	1		1910	231	0.	4.0	2992.8
1		0235	32	0.	.6	2991.7	*	1		1055	132	7.	4.3	2992.9	*	1		1915	232	0.	4.0	2992.8
1		0240	33	0.	.7	2991.9	*	1		1100	133	6.	4.2	2992.9	*	1		1920	233	0.	4.0	2992.8
1		0245	34	0.	1.0	2992.0	*	1		1105	134	5.	4.2	2992.9	*	1		1925	234	0.	4.0	2992.8
1		0250	35	0.	1.2	2992.1	*	1		1110	135	4.	4.2	2992.9	*	1		1930	235	0.	4.0	2992.8
1		0255	36	0.	1.5	2992.2	*	1		1115	136	4.	4.2	2992.8	*	1		1935	236	0.	4.0	2992.8
1		0300	37	0.	1.9	2992.3	*	1		1120	137	3.	4.1	2992.8	*	1		1940	237	0.	4.0	2992.8
1		0305	38	0.	2.3	2992.4	*	1		1125	138	3.	4.1	2992.8	*	1		1945	238	0.	4.0	2992.8
1		0310	39	0.	2.7	2992.5	*	1		1130	139	2.	4.1	2992.8	*	1		1950	239	0.	4.0	2992.8
1		0315	40	0.	3.3	2992.6	*	1		1135	140	2.	4.1	2992.8	*	1		1955	240	0.	4.0	2992.8
1		0320	41	5.	4.2	2992.9	*	1		1140	141	2.	4.1	2992.8	*	1		2000	241	0.	4.0	2992.8
1		0325	42	38.	5.8	2993.2	*	1		1145	142	2.	4.0	2992.8	*	1		2005	242	0.	4.0	2992.8
1		0330	43	93.	8.3	2993.9	*	1		1150	143	1.	4.0	2992.8	*	1		2010	243	0.	4.0	2992.8
1		0335	44	179.	12.4	2994.9	*	1		1155	144	1.	4.0	2992.8	*	1		2015	244	0.	4.0	2992.8
1		0340	45	220.	18.1	2995.9	*	1		1200	145	1.	4.0	2992.8	*	1		2020	245	0.	4.0	2992.8
1		0345	46	257.	25.1	2997.0	*	1		1205	146	1.	4.0	2992.8	*	1		2025	246	0.	4.0	2992.8
1		0350	47	286.	32.8	2998.0	*	1		1210	147	1.	4.0	2992.8	*	1		2030	247	0.	4.0	2992.8
1		0355	48	312.	40.5	2999.0	*	1		1215	148	1.	4.0	2992.8	*	1		2035	248	0.	4.0	2992.8
1		0400	49	336.	47.9	3000.0	*	1		1220	149	1.	4.0	2992.8	*	1		2040	249	0.	4.0	2992.8
1		0405	50	356.	54.9	3000.9	*	1		1225	150	0.	4.0	2992.8	*	1		2045	250	0.	4.0	2992.8
1		0410	51	374.	61.4	3001.8	*	1		1230	151	0.	4.0	2992.8	*	1		2050	251	0.	4.0	2992.8
1		0415	52	390.	67.2	3002.5	*	1		1235	152	0.	4.0	2992.8	*	1		2055	252	0.	4.0	2992.8
1		0420	53	404.	72.3	3003.2	*	1		1240	153	0.	4.0	2992.8	*	1		2100	253	0.	4.0	2992.8
1		0425	54	415.	76.5	3003.8	*	1		1245	154	0.	4.0	2992.8	*	1		2105	254	0.	4.0	2992.8
1		0430	55	424.	80.0	3004.2	*	1		1250	155	0.	4.0	2992.8	*	1		2110	255	0.	4.0	2992.8
1		0435	56	430.	82.8	3004.6	*	1		1255	156	0.	4.0	2992.8	*	1		2115	256	0.	4.0	2992.8
1		0440	57	436.	85.3	3004.9	*	1		1300	157	0.	4.0	2992.8	*	1		2120	257	0.	4.0	2992.8
1		0445	58	441.	87.4	3005.2	*	1		1305	158	0.	4.0	2992.8	*	1		2125	258	0.	4.0	2992.8
1		0450	59	445.	89.3	3005.4	*	1		1310	159	0.	4.0	2992.8	*	1		2130	259	0.	4.0	2992.8

1	0455	60	448.	91.0	3005.6	*	1	1315	160	0.	4.0	2992.8	*	1	2135	260	0.	4.0	2992.8
1	0500	61	451.	92.5	3005.7	*	1	1320	161	0.	4.0	2992.8	*	1	2140	261	0.	4.0	2992.8
1	0505	62	453.	93.8	3005.9	*	1	1325	162	0.	4.0	2992.8	*	1	2145	262	0.	4.0	2992.8
1	0510	63	455.	94.9	3006.0	*	1	1330	163	0.	4.0	2992.8	*	1	2150	263	0.	4.0	2992.8
1	0515	64	457.	95.6	3006.1	*	1	1335	164	0.	4.0	2992.8	*	1	2155	264	0.	4.0	2992.8
1	0520	65	457.	96.0	3006.1	*	1	1340	165	0.	4.0	2992.8	*	1	2200	265	0.	4.0	2992.8
1	0525	66	457.	96.0	3006.1	*	1	1345	166	0.	4.0	2992.8	*	1	2205	266	0.	4.0	2992.8
1	0530	67	457.	95.7	3006.1	*	1	1350	167	0.	4.0	2992.8	*	1	2210	267	0.	4.0	2992.8
1	0535	68	456.	95.0	3006.0	*	1	1355	168	0.	4.0	2992.8	*	1	2215	268	0.	4.0	2992.8
1	0540	69	454.	94.1	3005.9	*	1	1400	169	0.	4.0	2992.8	*	1	2220	269	0.	4.0	2992.8
1	0545	70	451.	92.9	3005.8	*	1	1405	170	0.	4.0	2992.8	*	1	2225	270	0.	4.0	2992.8
1	0550	71	449.	91.4	3005.6	*	1	1410	171	0.	4.0	2992.8	*	1	2230	271	0.	4.0	2992.8
1	0555	72	445.	89.7	3005.4	*	1	1415	172	0.	4.0	2992.8	*	1	2235	272	0.	4.0	2992.8
1	0600	73	442.	87.9	3005.2	*	1	1420	173	0.	4.0	2992.8	*	1	2240	273	0.	4.0	2992.8
1	0605	74	438.	85.9	3005.0	*	1	1425	174	0.	4.0	2992.8	*	1	2245	274	0.	4.0	2992.8
1	0610	75	433.	83.8	3004.7	*	1	1430	175	0.	4.0	2992.8	*	1	2250	275	0.	4.0	2992.8
1	0615	76	427.	81.6	3004.4	*	1	1435	176	0.	4.0	2992.8	*	1	2255	276	0.	4.0	2992.8
1	0620	77	422.	79.3	3004.1	*	1	1440	177	0.	4.0	2992.8	*	1	2300	277	0.	4.0	2992.8
1	0625	78	416.	76.9	3003.8	*	1	1445	178	0.	4.0	2992.8	*	1	2305	278	0.	4.0	2992.8
1	0630	79	410.	74.5	3003.5	*	1	1450	179	0.	4.0	2992.8	*	1	2310	279	0.	4.0	2992.8
1	0635	80	404.	72.1	3003.2	*	1	1455	180	0.	4.0	2992.8	*	1	2315	280	0.	4.0	2992.8
1	0640	81	397.	69.6	3002.9	*	1	1500	181	0.	4.0	2992.8	*	1	2320	281	0.	4.0	2992.8
1	0645	82	390.	67.2	3002.5	*	1	1505	182	0.	4.0	2992.8	*	1	2325	282	0.	4.0	2992.8
1	0650	83	383.	64.7	3002.2	*	1	1510	183	0.	4.0	2992.8	*	1	2330	283	0.	4.0	2992.8
1	0655	84	377.	62.3	3001.9	*	1	1515	184	0.	4.0	2992.8	*	1	2335	284	0.	4.0	2992.8
1	0700	85	370.	59.9	3001.6	*	1	1520	185	0.	4.0	2992.8	*	1	2340	285	0.	4.0	2992.8
1	0705	86	363.	57.4	3001.3	*	1	1525	186	0.	4.0	2992.8	*	1	2345	286	0.	4.0	2992.8
1	0710	87	357.	55.0	3000.9	*	1	1530	187	0.	4.0	2992.8	*	1	2350	287	0.	4.0	2992.8
1	0715	88	350.	52.7	3000.6	*	1	1535	188	0.	4.0	2992.8	*	1	2355	288	0.	4.0	2992.8
1	0720	89	344.	50.3	3000.3	*	1	1540	189	0.	4.0	2992.8	*	2	0000	289	0.	4.0	2992.8
1	0725	90	337.	48.0	3000.0	*	1	1545	190	0.	4.0	2992.8	*	2	0005	290	0.	4.0	2992.8
1	0730	91	329.	45.8	2999.7	*	1	1550	191	0.	4.0	2992.8	*	2	0010	291	0.	4.0	2992.8
1	0735	92	322.	43.5	2999.4	*	1	1555	192	0.	4.0	2992.8	*	2	0015	292	0.	4.0	2992.8
1	0740	93	315.	41.4	2999.1	*	1	1600	193	0.	4.0	2992.8	*	2	0020	293	0.	4.0	2992.8
1	0745	94	308.	39.2	2998.9	*	1	1605	194	0.	4.0	2992.8	*	2	0025	294	0.	4.0	2992.8
1	0750	95	301.	37.1	2998.6	*	1	1610	195	0.	4.0	2992.8	*	2	0030	295	0.	4.0	2992.8
1	0755	96	295.	35.1	2998.3	*	1	1615	196	0.	4.0	2992.8	*	2	0035	296	0.	4.0	2992.8
1	0800	97	287.	33.1	2998.1	*	1	1620	197	0.	4.0	2992.8	*	2	0040	297	0.	4.0	2992.8
1	0805	98	280.	31.1	2997.8	*	1	1625	198	0.	4.0	2992.8	*	2	0045	298	0.	4.0	2992.8
1	0810	99	273.	29.2	2997.6	*	1	1630	199	0.	4.0	2992.8	*	2	0050	299	0.	4.0	2992.8
1	0815	100	266.	27.4	2997.3	*	1	1635	200	0.	4.0	2992.8	*	2	0055	300	0.	4.0	2992.8
						*							*						

****

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 457.	5.42		339.	87.	84.	84.
		(INCHES)	.717	.736	.736	.736
		(AC-FT)	168.	172.	172.	172.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
96.	5.42	55.	17.	16.	16.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3006.10	5.42	3000.84	2994.69	2994.53	2994.53

CUMULATIVE AREA = 4.39 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .99	RATIO 3 .98	RATIO 4 .94	RATIO 5 .93	RATIO 6 .92	RATIO 7 .91	RATIO 8 .70	RATIO 9 .54
HYDROGRAPH AT													
+	1-1A	2.34	1	FLOW	2541.	2505.	2469.	2325.	2289.	2253.	2217.	1477.	942.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	1-1B	.17	1	FLOW	226.	223.	219.	203.	199.	195.	192.	115.	63.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.67
ROUTED TO													
+	R2	.17	1	FLOW	220.	218.	215.	200.	194.	193.	189.	112.	62.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CP1	2.51	1	FLOW	2670.	2632.	2594.	2442.	2404.	2366.	2329.	1549.	986.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	R3	2.51	1	FLOW	2610.	2572.	2535.	2386.	2349.	2312.	2275.	1512.	960.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	1-2A	.86	1	FLOW	1584.	1562.	1541.	1453.	1432.	1410.	1388.	938.	608.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO													
+	R4	.86	1	FLOW	1516.	1494.	1473.	1388.	1366.	1345.	1324.	884.	565.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	1-2B	.22	1	FLOW	315.	310.	305.	286.	281.	276.	271.	173.	103.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58

3 COMBINED AT													
+	CP2	3.59	1	FLOW	3324.	3275.	3228.	3037.	2989.	2941.	2894.	1914.	1209.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	R5	3.59	1	FLOW	3291.	3243.	3196.	3007.	2959.	2912.	2865.	1894.	1197.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	4.00
HYDROGRAPH AT													
+	1-2CR	.57	1	FLOW	885.	872.	859.	807.	794.	781.	768.	503.	313.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT													
+	CP3	4.17	1	FLOW	3812.	3756.	3700.	3476.	3419.	3365.	3309.	2171.	1365.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.83	3.83
ROUTED TO													
+	R6	4.17	1	FLOW	3790.	3734.	3681.	3460.	3404.	3351.	3296.	2168.	1360.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	1-3P	.03	1	FLOW	63.	62.	61.	58.	58.	57.	56.	42.	31.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	CP4	4.19	1	FLOW	3806.	3750.	3697.	3475.	3419.	3366.	3311.	2179.	1368.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	R7	4.19	1	FLOW	3795.	3740.	3685.	3462.	3408.	3353.	3298.	2163.	1362.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.92
HYDROGRAPH AT													
+	1-12P	.18	1	FLOW	230.	227.	223.	209.	206.	202.	199.	128.	78.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CP5	4.37	1	FLOW	3974.	3917.	3859.	3626.	3569.	3511.	3454.	2266.	1416.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	1-14	.00	1	FLOW	3.	3.	3.	3.	3.	2.	2.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-15	.01	1	FLOW	10.	10.	10.	9.	9.	9.	9.	6.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-16	.00	1	FLOW	5.	5.	5.	5.	5.	5.	5.	3.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-17	.00	1	FLOW	7.	7.	7.	6.	6.	6.	6.	4.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-18	.00	1	FLOW	7.	7.	6.	6.	6.	6.	6.	4.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
6 COMBINED AT													
+	CP5B	4.39	1	FLOW	3985.	3927.	3870.	3636.	3579.	3521.	3464.	2273.	1421.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	EXDB	4.39	1	FLOW	979.	929.	876.	674.	669.	665.	661.	559.	457.
				TIME	5.42	5.42	5.50	5.58	5.58	5.58	5.58	5.50	5.42
			** PEAK STAGES IN FEET **										
			1	STAGE	3023.16	3022.95	3022.74	3021.66	3021.30	3020.95	3020.58	3012.72	3006.10
				TIME	5.42	5.42	5.50	5.58	5.58	5.58	5.58	5.50	5.42
HYDROGRAPH AT													
+	1-4R	.05	1	FLOW	100.	98.	97.	91.	90.	89.	87.	58.	37.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-5R	.03	1	FLOW	63.	62.	61.	58.	57.	56.	55.	37.	24.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	CP6	.09	1	FLOW	163.	161.	158.	149.	147.	145.	142.	95.	61.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO													
+	R8	.09	1	FLOW	156.	154.	152.	143.	141.	138.	136.	92.	60.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.58	3.58
HYDROGRAPH AT													
+	1-6R	.02	1	FLOW	28.	28.	27.	26.	25.	25.	25.	16.	11.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-7R	.03	1	FLOW	50.	50.	49.	46.	45.	45.	44.	30.	19.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	CP7	.04	1	FLOW	79.	77.	76.	72.	71.	70.	69.	46.	29.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO													
+	R9	.04	1	FLOW	76.	75.	74.	70.	69.	68.	67.	45.	30.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													

+	1-8R	.00	1	FLOW	5.	5.	4.	4.	4.	4.	4.	3.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	1-10R	.06	1	FLOW	101.	100.	99.	93.	91.	90.	89.	59.	38.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	CP8	.06	1	FLOW	106.	105.	103.	97.	96.	94.	93.	62.	39.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO													
+	R10	.06	1	FLOW	102.	101.	99.	94.	92.	90.	89.	61.	39.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	1-11P	.18	1	FLOW	219.	215.	212.	198.	194.	191.	188.	118.	69.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
4 COMBINED AT													
+	CP9	.37	1	FLOW	543.	536.	528.	495.	487.	480.	472.	308.	192.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	1-13	.00	1	FLOW	1.	1.	1.	1.	1.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	LMT1R	1.96	1	FLOW	2144.	2114.	2085.	1966.	1937.	1907.	1878.	1267.	821.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
3 COMBINED AT													
+	CP10	2.33	1	FLOW	2429.	2395.	2361.	2224.	2190.	2156.	2123.	1422.	913.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .00									
R2	MANE	3.62	221.26	220.72	1.60	5.00	220.26	220.00	1.60

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1495E+02 EXCESS= .0000E+00 OUTFLOW= .1496E+02 BASIN STORAGE= .1444E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.64	219.12	218.16	1.57	5.00	217.69	220.00	1.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1469E+02 EXCESS= .0000E+00 OUTFLOW= .1470E+02 BASIN STORAGE= .1118E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.65	216.76	219.24	1.55	5.00	215.22	220.00	1.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1444E+02 EXCESS= .0000E+00 OUTFLOW= .1444E+02 BASIN STORAGE= .1367E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.73	200.37	220.08	1.44	5.00	200.09	220.00	1.44

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1341E+02 EXCESS= .0000E+00 OUTFLOW= .1341E+02 BASIN STORAGE= .1137E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.75	194.48	221.26	1.41	5.00	193.59	220.00	1.41

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1315E+02 EXCESS= .0000E+00 OUTFLOW= .1315E+02 BASIN STORAGE= .1366E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.77	194.78	218.70	1.38	5.00	193.14	220.00	1.38

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1291E+02 EXCESS= .0000E+00 OUTFLOW= .1292E+02 BASIN STORAGE= .1037E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.79	189.65	219.91	1.36	5.00	189.47	220.00	1.36

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1265E+02 EXCESS= .0000E+00 OUTFLOW= .1265E+02 BASIN STORAGE= .1202E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.75	114.28	221.25	.82	5.00	112.11	220.00	.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7650E+01 EXCESS= .0000E+00 OUTFLOW= .7654E+01 BASIN STORAGE= .1004E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00									
R2	MANE	2.25	64.30	222.75	.47	5.00	61.71	220.00	.47

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4359E+01 EXCESS= .0000E+00 OUTFLOW= .4361E+01 BASIN STORAGE= .1019E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00

R6	MANE	1.32	3798.53	227.06	2.11	5.00	3790.18	230.00	2.11

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4682E+03 EXCESS= .0000E+00 OUTFLOW= .4681E+03 BASIN STORAGE= .5398E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.33	3743.79	227.90	2.07	5.00	3734.37	230.00	2.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4612E+03 EXCESS= .0000E+00 OUTFLOW= .4611E+03 BASIN STORAGE= .5897E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.33	3688.44	227.43	2.04	5.00	3681.22	230.00	2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4542E+03 EXCESS= .0000E+00 OUTFLOW= .4541E+03 BASIN STORAGE= .5356E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.35	3465.50	228.32	1.92	5.00	3459.93	230.00	1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4264E+03 EXCESS= .0000E+00 OUTFLOW= .4263E+03 BASIN STORAGE= .6080E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.36	3410.14	227.90	1.89	5.00	3403.62	230.00	1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4195E+03 EXCESS= .0000E+00 OUTFLOW= .4194E+03 BASIN STORAGE= .5400E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.36	3355.30	227.45	1.86	5.00	3350.78	230.00	1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4126E+03 EXCESS= .0000E+00 OUTFLOW= .4125E+03 BASIN STORAGE= .5832E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.37	3299.90	228.42	1.83	5.00	3295.94	230.00	1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4057E+03 EXCESS= .0000E+00 OUTFLOW= .4056E+03 BASIN STORAGE= .5145E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.52	2168.16	229.48	1.20	5.00	2167.85	230.00	1.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2660E+03 EXCESS= .0000E+00 OUTFLOW= .2660E+03 BASIN STORAGE= .5661E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R6	MANE	1.71	1362.06	232.09	.76	5.00	1359.64	230.00	.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1682E+03 EXCESS= .0000E+00 OUTFLOW= .1682E+03 BASIN STORAGE= .5203E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.79	3795.45	229.59	2.11	5.00	3794.91	230.00	2.11

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4720E+03 EXCESS= .0000E+00 OUTFLOW= .4718E+03 BASIN STORAGE= .7223E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.80	3741.61	230.44	2.08	5.00	3739.99	230.00	2.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4650E+03 EXCESS= .0000E+00 OUTFLOW= .4648E+03 BASIN STORAGE= .6922E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.81	3685.33	229.46	2.05	5.00	3685.10	230.00	2.05

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4579E+03 EXCESS= .0000E+00 OUTFLOW= .4577E+03 BASIN STORAGE= .8797E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.83	3463.28	231.21	1.92	5.00	3461.86	230.00	1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4300E+03 EXCESS= .0000E+00 OUTFLOW= .4298E+03 BASIN STORAGE= .7379E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.84	3409.50	230.31	1.89	5.00	3407.75	230.00	1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4230E+03 EXCESS= .0000E+00 OUTFLOW= .4228E+03 BASIN STORAGE= .7225E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R7	MANE	1.85	3354.16	231.21	1.86	5.00	3352.63	230.00	1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4161E+03 EXCESS= .0000E+00 OUTFLOW= .4159E+03 BASIN STORAGE= .8684E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R7 MANE 1.86 3300.08 230.31 1.83 5.00 3298.02 230.00 1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4091E+03 EXCESS= .0000E+00 OUTFLOW= .4090E+03 BASIN STORAGE= .8486E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R7 MANE 2.06 2169.12 230.96 1.20 5.00 2163.45 230.00 1.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2685E+03 EXCESS= .0000E+00 OUTFLOW= .2684E+03 BASIN STORAGE= .8290E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R7 MANE 2.32 1364.06 233.98 .76 5.00 1361.92 235.00 .76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1700E+03 EXCESS= .0000E+00 OUTFLOW= .1700E+03 BASIN STORAGE= .7714E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R8 MANE .93 162.44 211.19 2.06 5.00 156.28 210.00 2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9673E+01 EXCESS= .0000E+00 OUTFLOW= .9673E+01 BASIN STORAGE= .1111E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R8 MANE .94 160.11 211.79 2.03 5.00 154.20 210.00 2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9530E+01 EXCESS= .0000E+00 OUTFLOW= .9530E+01 BASIN STORAGE= .1067E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R8 MANE .94 157.86 211.45 2.00 5.00 151.74 210.00 2.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9386E+01 EXCESS= .0000E+00 OUTFLOW= .9386E+01 BASIN STORAGE= .1011E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R8 MANE .95 148.79 211.13 1.88 5.00 142.96 210.00 1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8822E+01 EXCESS= .0000E+00 OUTFLOW= .8822E+01 BASIN STORAGE= .9884E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R8 MANE .95 146.53 211.78 1.85 5.00 140.79 210.00 1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8682E+01 EXCESS= .0000E+00 OUTFLOW= .8682E+01 BASIN STORAGE= .1118E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R8 MANE .96 144.27 211.49 1.82 5.00 138.40 210.00 1.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8540E+01 EXCESS= .0000E+00 OUTFLOW= .8540E+01 BASIN STORAGE= .1059E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R8 MANE .96 141.99 211.20 1.79 5.00 136.26 210.00 1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8401E+01 EXCESS= .0000E+00 OUTFLOW= .8401E+01 BASIN STORAGE= .9888E-04 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R8 MANE 1.04 95.18 212.20 1.18 5.00 92.29 215.00 1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5549E+01 EXCESS= .0000E+00 OUTFLOW= .5549E+01 BASIN STORAGE= .1036E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R8 MANE 1.14 61.18 212.58 .76 5.00 60.41 215.00 .76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3541E+01 EXCESS= .0000E+00 OUTFLOW= .3541E+01 BASIN STORAGE= .1150E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R9 MANE 2.21 77.94 213.91 2.07 5.00 75.83 215.00 2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4663E+01 EXCESS= .0000E+00 OUTFLOW= .4663E+01 BASIN STORAGE= .2195E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R9 MANE 2.21 76.93 212.31 2.04 5.00 75.47 215.00 2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4596E+01 EXCESS= .0000E+00 OUTFLOW= .4596E+01 BASIN STORAGE= .2595E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00
R9 MANE 2.22 75.81 212.92 2.01 5.00 74.35 215.00 2.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4526E+01 EXCESS= .0000E+00 OUTFLOW= .4526E+01 BASIN STORAGE= .2157E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.24	71.46	213.22	1.88	5.00	69.79	215.00	1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4250E+01 EXCESS= .0000E+00 OUTFLOW= .4250E+01 BASIN STORAGE= .2037E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.25	70.38	213.87	1.86	5.00	68.57	215.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4185E+01 EXCESS= .0000E+00 OUTFLOW= .4185E+01 BASIN STORAGE= .2368E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.26	69.30	212.28	1.83	5.00	68.25	215.00	1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4120E+01 EXCESS= .0000E+00 OUTFLOW= .4121E+01 BASIN STORAGE= .2804E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.27	68.22	212.96	1.80	5.00	67.01	215.00	1.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4050E+01 EXCESS= .0000E+00 OUTFLOW= .4050E+01 BASIN STORAGE= .2266E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.45	45.90	213.56	1.19	5.00	45.08	215.00	1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2676E+01 EXCESS= .0000E+00 OUTFLOW= .2676E+01 BASIN STORAGE= .2443E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.68	29.81	214.60	.76	5.00	29.57	215.00	.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1707E+01 EXCESS= .0000E+00 OUTFLOW= .1708E+01 BASIN STORAGE= .2506E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.91	105.41	212.23	2.03	5.00	102.04	215.00	2.03

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6281E+01 EXCESS= .0000E+00 OUTFLOW= .6282E+01 BASIN STORAGE= .1837E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.92	103.90	212.84	2.00	5.00	100.78	215.00	2.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6191E+01 EXCESS= .0000E+00 OUTFLOW= .6192E+01 BASIN STORAGE= .2091E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.92	102.41	213.46	1.97	5.00	98.79	215.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6100E+01 EXCESS= .0000E+00 OUTFLOW= .6100E+01 BASIN STORAGE= .2350E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.95	96.48	212.14	1.85	5.00	93.59	215.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5728E+01 EXCESS= .0000E+00 OUTFLOW= .5728E+01 BASIN STORAGE= .1973E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.95	95.02	212.79	1.82	5.00	92.45	215.00	1.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5636E+01 EXCESS= .0000E+00 OUTFLOW= .5637E+01 BASIN STORAGE= .2226E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.96	93.59	213.47	1.79	5.00	90.47	215.00	1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5545E+01 EXCESS= .0000E+00 OUTFLOW= .5545E+01 BASIN STORAGE= .2464E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.96	92.04	212.18	1.76	5.00	89.47	215.00	1.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5453E+01 EXCESS= .0000E+00 OUTFLOW= .5453E+01 BASIN STORAGE= .1980E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	2.13	61.63	213.03	1.16	5.00	60.64	215.00	1.16

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3593E+01 EXCESS= .0000E+00 OUTFLOW= .3593E+01 BASIN STORAGE= .1886E-03 PERCENT ERROR= .0

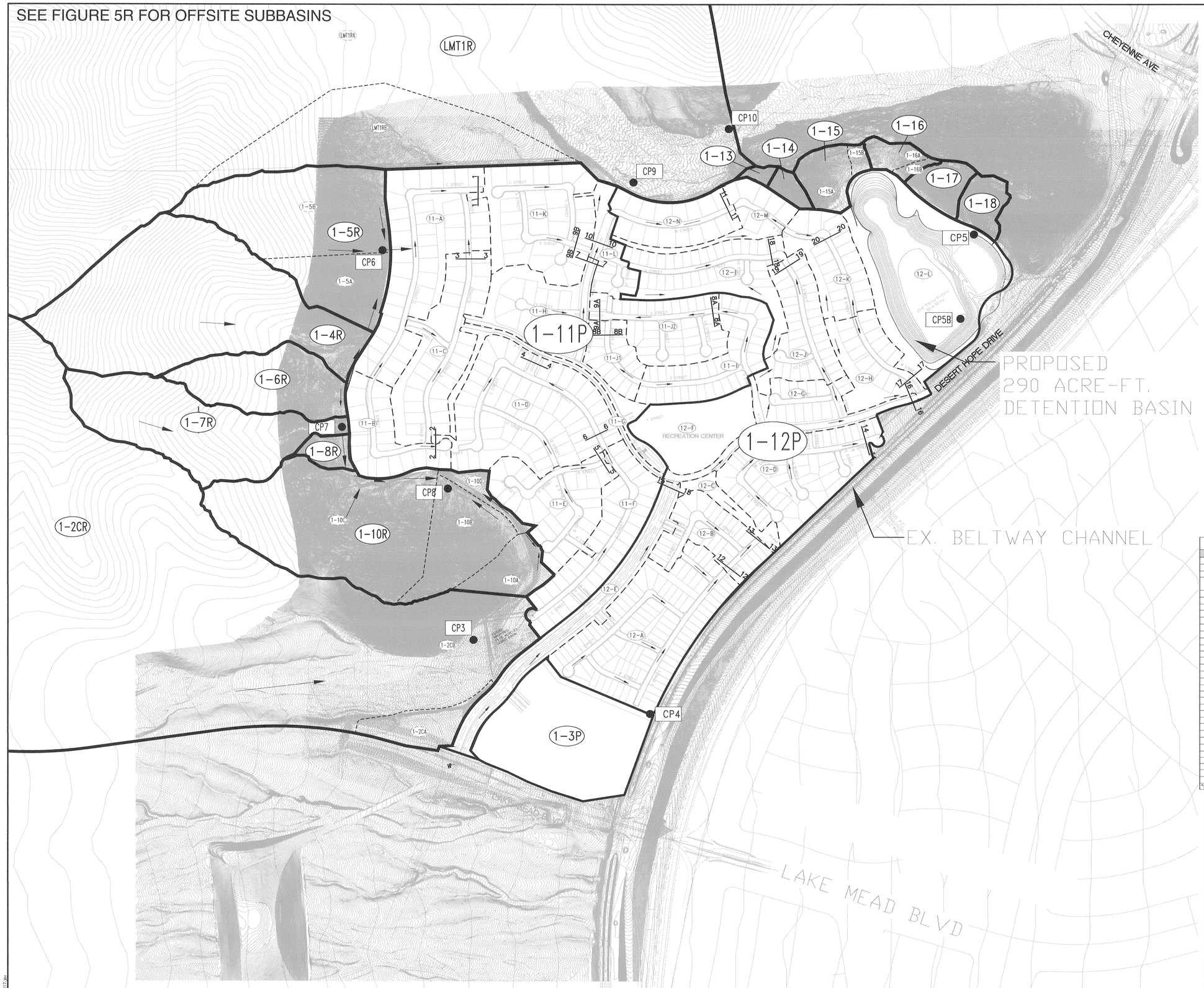
FOR PLAN = 1 RATIO= .00

R10	MANE	2.33	39.86	214.40	.74	5.00	39.34	215.00	.74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2284E+01 EXCESS= .0000E+00 OUTFLOW= .2284E+01 BASIN STORAGE= .2420E-03 PERCENT ERROR= .0

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

SEE FIGURE 5R FOR OFFSITE SUBBASINS



NORTH

SCALE 1" = 300'

GRAPHIC SCALE

300 0 150 300

(IN FEET)

1 inch = 300 ft.

LEGEND

- 1-3P — DRAINAGE BASIN
- 3-E — PRORATED DRAINAGE BASIN
- CP3 — CONCENTRATION POINT
- BASIN BOUNDARY
- PRORATE BASIN BOUNDARY
- FLOW DIRECTION
- 1 1 — STREET CROSS SECTION

SUMMARY OF ULTIMATE CONDITIONS HEC-1 MODEL

SB OR CP	AREA (AC)	100 YR (CFS)	25 YR (CFS)	10 YR (CFS)
1-1A	1497.2	2289	1477	942
1-1B	111.8	226	115	63
CP1	-	2404	1549	986
1-2A	552.7	1541	938	608
1-2B	137.7	315	173	103
CP2	-	2941	1914	1209
1-2CR	367.6	859	503	313
CP3	-	3309	2171	1365
1-3P	16.5	63	42	31
CP4	-	3311	2179	1368
1-12P	116.1*	230*	128	78
CP5	-	3454*	2266*	1416*
1-14	1.0	3	2	1
1-15	3.6	10	6	4
1-16	1.9	5	3	2
1-17	2.5	7	4	2
1-18	2.4	7	4	2
CP5B	-	3464	2273	1421
EXDB	-	653	550	446
1-4R	34.3	100	58	37
1-5R	22	63	37	24
CP6	-	163	95	61
1-6R	9.7	28	16	11
1-7R	17.3	50	30	19
CP7	-	79	46	29
1-8R	1.6	5	3	2
1-10R	35.6	101	59	38
CP8	-	106	62	39
1-11P	113.6*	219*	118	69
CP9	-	536*	308	192
1-13	0.5	1	1	1
LMT1R	1256.6	1966	1267	821
CP10	-	2190	1422	913

ONSITE PRORATED FLOW SUMMARY

Subbasin	Q_{100} (cfs)	New Area	cfs/acre
1-11P	219*	113.6*	1.93
1-12P	230*	116.1*	1.98
Onsite Prorated Basins			
Subbasin	Q_{100} (cfs)	New Area (acres)	cfs/acre
11-A	30*	15.6*	1.93
11-B	12	6.3*	1.93
11-C	21	10.7*	1.93
11-D	33*	17.1*	1.93
11-E	17*	9.0*	1.93
11-F	18	9.2*	1.93
11-G	5*	2.3*	1.93
11-H	19	9.7*	1.93
11-I	14	7.4*	1.93
11-J1	6	3.3	1.93
11-J2	15*	7.5*	1.93
11-K	23	12.1*	1.93
11-L	6	3.4*	1.93
Total	**219***	**113.6***	**N/A**
12-A	33	16.5	1.98
12-B	11	5.8	1.98
12-C	3	1.7*	1.98
12-D	24	12.0	1.98
12-E	15	7.4*	1.98
12-F	14	7.0	1.98
12-G	13*	6.6*	1.98
12-H	12*	5.9*	1.98
12-I	17*	8.8*	1.98
12-J	13	6.7*	1.98
12-K	13	6.4	1.98
12-L	43	21.5	1.98
12-M	7	3.8	1.98
12-N	12	6*	1.98
TOTAL	**230***	**116.1***	**N/A**

*Revised from Previous Submittal

OFFSITE PRORATED FLOW SUMMARY

Subbasin	Q_{100} (cfs)	Area (acres)	cfs/acre
1-2CR	859	367.6	2.34
1-5R	63	22.0	2.86
1-10R	101	35.6	2.84
1-15	10	3.6	2.78
1-16	5	1.9	2.63
LM1TR	1966	1256.6	1.56
Offsite Prorated Basins			
Subbasin	Q_{100} (cfs)	Area (acres)	cfs/acre
1-2CA	9	3.7	2.34
1-2CB	850	363.9	2.34
TOTAL	**859**	**367.6**	**N/A**
1-5A	18	6.2	2.86
1-5B	45	15.8	2.86
TOTAL	**63**	**22.0**	**N/A**
1-10A	10	3.5	2.84
1-10B	21	7.4	2.84
1-10C	66	23.2	2.84
1-10D	4	1.5	2.84
TOTAL	**101**	**35.6**	**N/A**
1-15A	9	3.1	2.78
1-15B	1	0.5	2.78
TOTAL	**10**	**3.6**	**N/A**
1-16A	4	1.4	2.63
1-16B	1	0.5	2.63
TOTAL	**5**	**1.9**	**N/A**
LM1TRA	1935	1236.8	1.56
LM1TRB	31	19.8	1.56
TOTAL	**1966**	**1256.6**	**N/A**

100-YEAR STREET FLOW CHARACTERISTICS ULTIMATE CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V	Tributary Subbasins
Section 1	6.00	32	0.44	6.59	2.9	11-A + $Q_{Byp\text{-}Sect3}$
Section 2	2.80	12	0.38	3.89	1.5	11-B
Section 3	3.20	21	0.43	4.68	2.0	11-C
Section 4	3.80	35	0.48	5.63	2.7	11-D + $Q_{Byp\text{-}Sect6}$
Section 5	2.66	17	0.42	4.14	1.7	11-E
Section 6	2.30	20	0.44	4.09	1.8	11-F + $Q_{Byp\text{-}Sect5}$
Section 7	2.54	21	0.44	4.29	1.9	11-H + $Q_{Byp\text{-}Sect9A}$
Section 8A	0.50	14	0.50	2.08	1.0	11-I
Section 8B	2.34	6	0.32	3.10	1.0	11-J1
Section 9A	2.54	19	0.43	4.19	1.8	11-J2 + $Q_{Byp\text{-}Sect8A}$ + $Q_{Byp\text{-}Sect8B}$
Section 9B	3.07	23	0.44	4.70	2.1	11-K
Section 10	5.67	10	0.33	4.90	1.6	11-L + $Q_{Byp\text{-}Sect7}$ + $Q_{Byp\text{-}Sect9B}$
Section 11	0.50	12	0.48	2.02	1.0	12-N
Section 12	5.55	33	0.45	6.44	2.9	12-A
Section 13	5.20	13	0.36	5.02	1.8	12-B + $Q_{Byp\text{-}Sect12}$
Section 14	5.00	24	0.42	5.72	2.4	12-D
Section 15	2.96	15	0.40	4.19	1.7	12-E
Section 16	6.00	29	0.43	6.42	2.8	12-G + 12-F + $Q_{Byp\text{-}Sect15}$
Section 17	0.50	12	0.48	2.02	1.0	12-H
Section 18	1.80	17	0.44	3.56	1.6	12-I
Section 19	5.00	13	0.36	4.95	1.8	12-J
Section 20	0.49	13	0.49	2.05	1.0	12-K

*$Q_{Byp\text{-}Sect8}$: Assumes 2 cfs bypasses the upstream street cross section

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 11-24-15
PLOT TIME: 13:23:28

NO.	DESCRIPTION	REV. DATE	DATE ASSN. APP.	DATE CON. APP.	DATE

1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com
GCW
ENGINEERS \ SURVEYORS
F:\Projects\700\784-204-01\Division Ext\Figures\RTC\ Fig. 5-3.dgn

PULTE HOMES

REVERENCE

MASTER DRAINAGE STUDY

ULTIMATE CONDITIONS DRAINAGE MAP

DRAWING

FIG 5AR

OF SHTS

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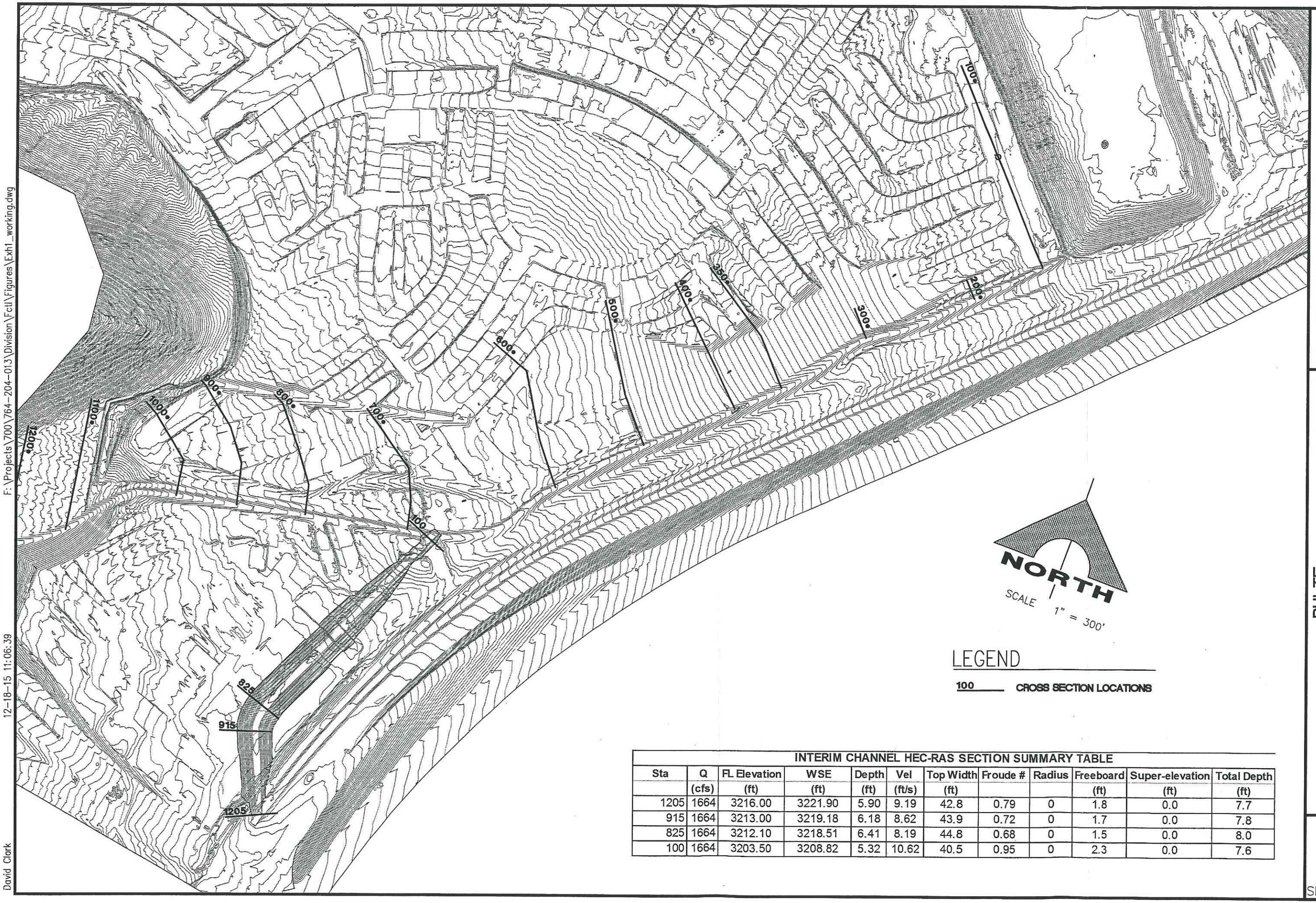

LEGEND

100 CROSS SECTION LOCATIONS

INTERIM CHANNEL HEC-RAS SECTION SUMMARY TABLE

Sta	Q	FL Elevation	WSE	Depth	Vel	Top Width	Froude #	Radius	Freeboard	Super-elevation	Total Depth
	(cfs)	(ft)	(ft)	(ft)	(ft/s)	(ft)			(ft)	(ft)	(ft)
1205	1664	3216.00	3221.90	5.90	9.19	42.8	0.79	0	1.8	0.0	7.7
915	1664	3213.00	3219.18	6.18	8.62	43.9	0.72	0	1.7	0.0	7.8
825	1664	3212.10	3218.51	6.41	8.19	44.8	0.68	0	1.5	0.0	8.0
100	1664	3203.50	3208.82	5.32	10.62	40.5	0.95	0	2.3	0.0	7.6

GCW
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PULTE
REVERENCE
INTERIM CHANNEL DURING
BELTWAY CHANNEL CONSTRUCTION

SHEET
EXH1
SHT OF 0 SHTS

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12-18-15 11:06:39
David Clark

APPENDIX B

Hydraulic Calculations and Information

Worksheet for Cross Section 1

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.64	%
Discharge	108.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.48	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	25.11	ft²
Wetted Perimeter	53.16	ft
Hydraulic Radius	0.47	ft
Top Width	52.93	ft
Normal Depth	0.48	ft
Critical Depth	0.52	ft
Critical Slope	0.02945	ft/ft

Worksheet for Cross Section 1

Results

Velocity		4.30	ft/s
Velocity Head		0.29	ft
Specific Energy		0.77	ft
Froude Number		1.10	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.48	ft
Critical Depth	0.52	ft
Channel Slope	3.64	%
Critical Slope	0.02945	ft/ft

Messages

Notes

(1-4R + 11-A1)

Cross Section for Cross Section 1

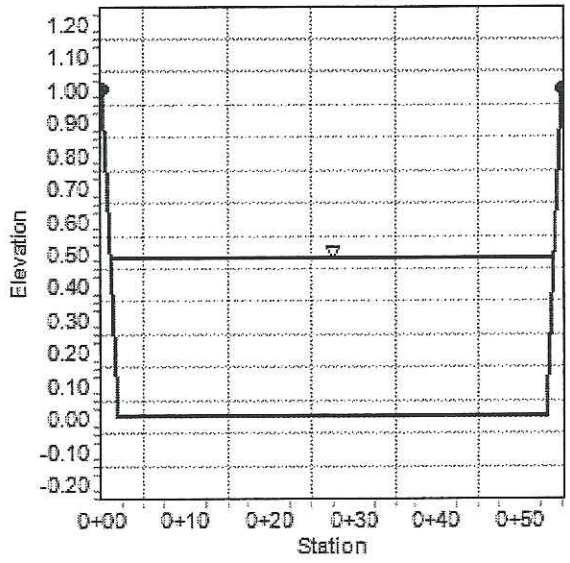
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.64	%
Normal Depth	0.48	ft
Discharge	108.00	ft^3/s

Cross Section Image



RIPRAP
Cross Section 1

Channel Protection Sizing Using Equation 718		
Known:		
V=	Velocity (fps)	5.7
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.036
	$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$	
Solve For:		
	d_{50}=	6 inches
	thickness=	13 inches

Worksheet for Cross Section 2

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.53	%
Discharge	189.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	1.20	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	63.89	ft²
Wetted Perimeter	55.87	ft
Hydraulic Radius	1.14	ft
Top Width	55.00	ft
Normal Depth	1.20	ft
Critical Depth	0.75	ft
Critical Slope	0.02618	ft/ft

Worksheet for Cross Section 2

Results

Velocity		2.96	ft/s
Velocity Head		0.14	ft
Specific Energy		1.33	ft
Froude Number		0.48	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.20	ft
Critical Depth	0.75	ft
Channel Slope	0.53	%
Critical Slope	0.02618	ft/ft

Messages

Notes

(CP6 + 11-A1 + 11-A2)

Cross Section for Cross Section 2

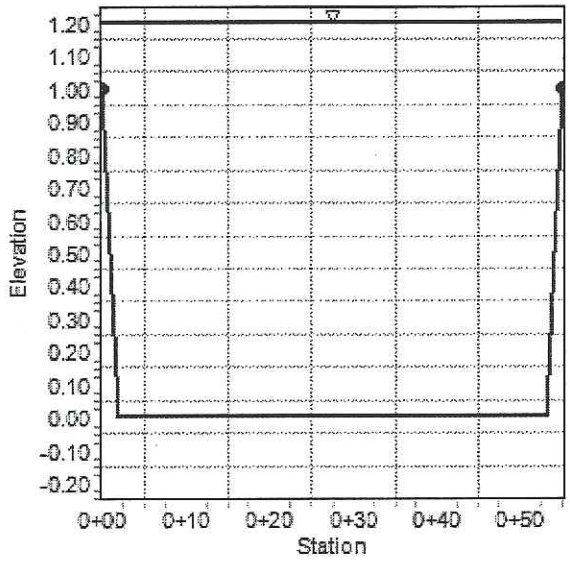
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.53	%
Normal Depth	1.20	ft
Discharge	189.00	ft^3/s

Cross Section Image



RIPRAP
Cross Section 2

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	3.9
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.005

$$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$$

Solve For:

d_{50}=		2 inches
thickness=		3 inches

Worksheet for Cross Section 2A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.00	%
Discharge	199.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.042

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.62	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	32.27	ft²
Wetted Perimeter	53.76	ft
Hydraulic Radius	0.60	ft
Top Width	53.47	ft
Normal Depth	0.62	ft
Critical Depth	0.77	ft
Critical Slope	0.02855	ft/ft

Worksheet for Cross Section 2A

Results

Velocity		6.17	ft/s
Velocity Head		0.59	ft
Specific Energy		1.21	ft
Froude Number		1.40	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.62	ft
Critical Depth	0.77	ft
Channel Slope	6.00	%
Critical Slope	0.02855	ft/ft

Cross Section for Cross Section 2A

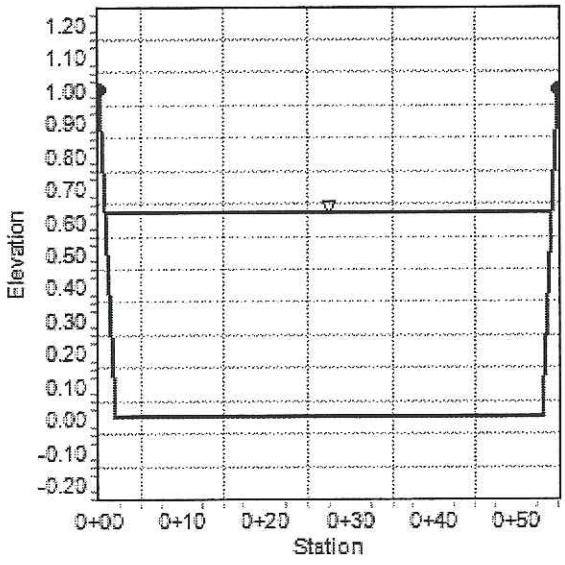
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.00	%
Normal Depth	0.62	ft
Discharge	199.00	ft^3/s

Cross Section Image



RIPRAP
Cross Section 2A

Channel Protection Sizing Using Equation 718		
Known:		
V=	Velocity (fps)	8.5
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.0600
	$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$	
Solve For:		
	d_{50}=	16 inches
	thickness=	33 inches

Worksheet for Cross Section 3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.00	%
Discharge	235.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.042

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.68	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	35.72	ft²
Wetted Perimeter	54.05	ft
Hydraulic Radius	0.66	ft
Top Width	53.73	ft
Normal Depth	0.68	ft
Critical Depth	0.86	ft
Critical Slope	0.02758	ft/ft

Worksheet for Cross Section 3

Results

Velocity		6.58	ft/s
Velocity Head		0.67	ft
Specific Energy		1.35	ft
Froude Number		1.42	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.68	ft
Critical Depth	0.86	ft
Channel Slope	6.00	%
Critical Slope	0.02758	ft/ft

Messages

Notes

(CP6 + 11-A1 + 11-A2 + 11-A3 + 11-A4 + 11-C)

Cross Section for Cross Section 3

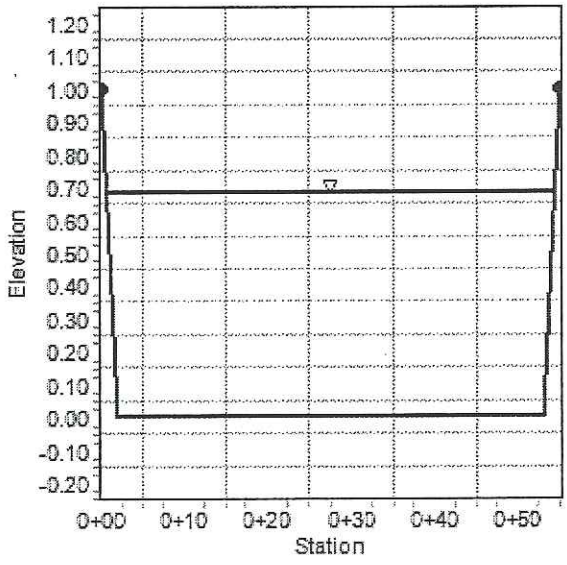
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.00	%
Normal Depth	0.68	ft
Discharge	235.00	ft³/s

Cross Section Image



RIPRAP
Cross Section 3

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	9.0
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.0600

$$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$$

Solve For:

d_{50}=	18 inches
thickness=	37 inches

Worksheet for Cross Section 4

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50	%
Discharge	36.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.34	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	17.69	ft²
Wetted Perimeter	52.53	ft
Hydraulic Radius	0.34	ft
Top Width	52.37	ft
Normal Depth	0.34	ft
Critical Depth	0.25	ft
Critical Slope	0.01458	ft/ft

Worksheet for Cross Section 4

Results

Velocity		2.04	ft/s
Velocity Head		0.06	ft
Specific Energy		0.41	ft
Froude Number		0.62	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.34	ft
Critical Depth	0.25	ft
Channel Slope	0.50	%
Critical Slope	0.01458	ft/ft

Cross Section for Cross Section 4

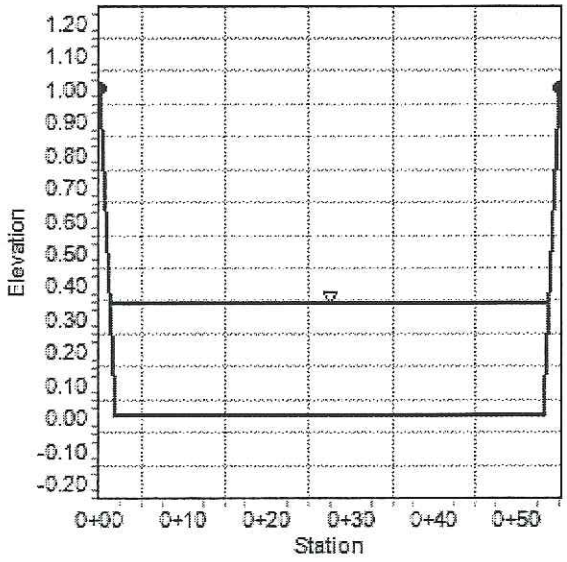
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50	%
Normal Depth	0.34	ft
Discharge	36.00	ft³/s

Cross Section Image



Worksheet for Cross Section 5

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.00	%
Discharge	96.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.41	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	21.22	ft²
Wetted Perimeter	52.83	ft
Hydraulic Radius	0.40	ft
Top Width	52.64	ft
Normal Depth	0.41	ft
Critical Depth	0.48	ft
Critical Slope	0.03021	ft/ft

Worksheet for Cross Section 5

Results

Velocity		4.52	ft/s
Velocity Head		0.32	ft
Specific Energy		0.73	ft
Froude Number		1.26	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.41	ft
Critical Depth	0.48	ft
Channel Slope	5.00	%
Critical Slope	0.03021	ft/ft

Messages

Notes

(CP7 + 11-B)

Cross Section for Cross Section 5

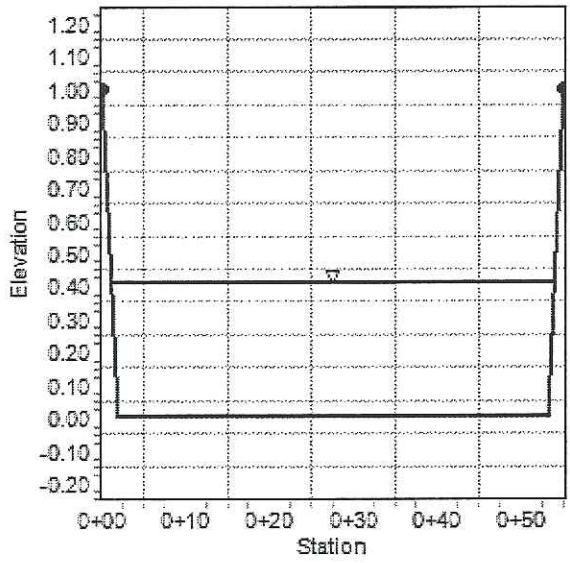
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.00	%
Normal Depth	0.41	ft
Discharge	96.00	ft³/s

Cross Section Image



RIPRAP
Cross Section 5

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	6.0
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.0500

$$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$$

Solve For:

d_{50}=	8	inches
thickness=	16	inches

Worksheet for Cross Section 5A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.87	%
Discharge	299.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+01	0.00
0+62	0.00
0+63	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+63, 1.00)	0.042

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.76	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	46.77	ft²
Wetted Perimeter	63.14	ft
Hydraulic Radius	0.74	ft
Top Width	62.51	ft
Normal Depth	0.76	ft
Critical Depth	0.90	ft
Critical Slope	0.02715	ft/ft

Worksheet for Cross Section 5A

Results

Velocity		6.39	ft/s
Velocity Head		0.64	ft
Specific Energy		1.39	ft
Froude Number		1.30	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.76	ft
Critical Depth	0.90	ft
Channel Slope	4.87	%
Critical Slope	0.02715	ft/ft

Cross Section for Cross Section 5A

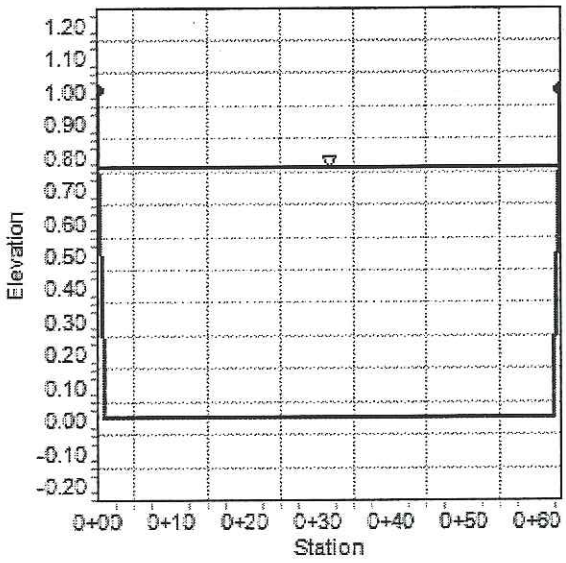
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.87	%
Normal Depth	0.76	ft
Discharge	299.00	ft³/s

Cross Section Image



RIPRAP
Cross Section 5A

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	8.8
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.0487

$$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$$

Solve For:

d_{50}=	16 inches
thickness=	33 inches

Worksheet for Cross Section 6

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.49	%
Discharge	247.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.042

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.77	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	40.27	ft²
Wetted Perimeter	54.43	ft
Hydraulic Radius	0.74	ft
Top Width	54.07	ft
Normal Depth	0.77	ft
Critical Depth	0.89	ft
Critical Slope	0.02730	ft/ft

Worksheet for Cross Section 6

Results

Velocity		6.13	ft/s
Velocity Head		0.58	ft
Specific Energy		1.35	ft
Froude Number		1.25	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.77	ft
Critical Depth	0.89	ft
Channel Slope	4.49	%
Critical Slope	0.02730	ft/ft

Messages

Notes

(CP6 + 11-A1 + 11-A2 + 11-A3 + 11-A4 + 11-C + 11-K1)

Cross Section for Cross Section 6

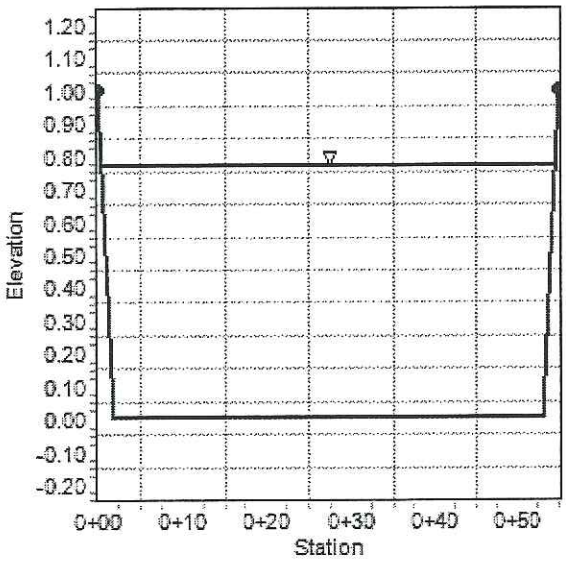
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.49	%
Normal Depth	0.77	ft
Discharge	247.00	ft³/s

Cross Section Image



RIPRAP
Cross Section 6

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	8.4
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.045

$$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$$

Solve For:

d_{50}=		15 inches
thickness=		29 inches

TRAPEZOIDAL CHANNEL

Section 6A - Rough Grade Channel

Flow "Q"	247	cfs
Manning's "n"	0.047	
Slope (%)	13.02	
Bottom Width	30.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Radius	0.0	ft

OUTPUT:

Velocity	9.56	ft/sec
Depth	0.82	ft
Freeboard	1.22	ft
Total Depth	2.04	ft
Froude No.	1.91	ft
Superelevation	0.00	ft

Normal depth calculations using Manning's equation

Fb = 1+0.025Vd^(1/3) Supercritical; 0.5+V^2/2g Subcritical

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RIPRAP CHANNEL

Section 6A - Rough Grade Channel

Flow "Q"	247	cfs
Manning's "n"	0.046	
Slope (%)	13.02	
Bottom Width	30.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Specific Gravity	2.50	

OUTPUT:

Velocity	9.69	ft/s
Depth	0.81	ft
Freeboard	1.23	ft
Total Depth	2.04	ft
Froude No.	1.95	
Riprap Size D50	28.2	in

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TRAPEZOIDAL CHANNEL

Section 6A - Rough Grade Channel

Flow "Q"	636	cfs
Manning's "n"	0.047	
Slope (%)	13.02	
Bottom Width	75.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Radius	0.0	ft

OUTPUT:

Velocity	9.93	ft/sec
Depth	0.84	ft
Freeboard	1.23	ft
Total Depth	2.07	ft
Froude No.	1.93	ft
Superelevation	0.00	ft

Normal depth calculations using Manning's equation

Fb = 1+0.025Vd^(1/3) Supercritical; 0.5+V^2/2g Subcritical

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RIPRAP CHANNEL

Section 6A - Rough Grade Channel

Flow "Q"	636	cfs
Manning's "n"	0.046	
Slope (%)	13.02	
Bottom Width	75.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Specific Gravity	2.50	

OUTPUT:

Velocity	10.07	ft/s
Depth	0.82	ft
Freeboard	1.24	ft
Total Depth	2.06	ft
Froude No.	1.98	
Riprap Size D50	30.0	in

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Worksheet for Cross Section 7

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.45	%
Discharge	21.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+62	0.00
0+63	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+63, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.13	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	7.58	ft²
Wetted Perimeter	60.46	ft
Hydraulic Radius	0.13	ft
Top Width	60.38	ft
Normal Depth	0.13	ft
Critical Depth	0.16	ft
Critical Slope	0.01698	ft/ft

Worksheet for Cross Section 7

Results

Velocity		2.77	ft/s
Velocity Head		0.12	ft
Specific Energy		0.25	ft
Froude Number		1.38	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.13	ft
Critical Depth	0.16	ft
Channel Slope	3.45	%
Critical Slope	0.01698	ft/ft

Cross Section for Cross Section 7

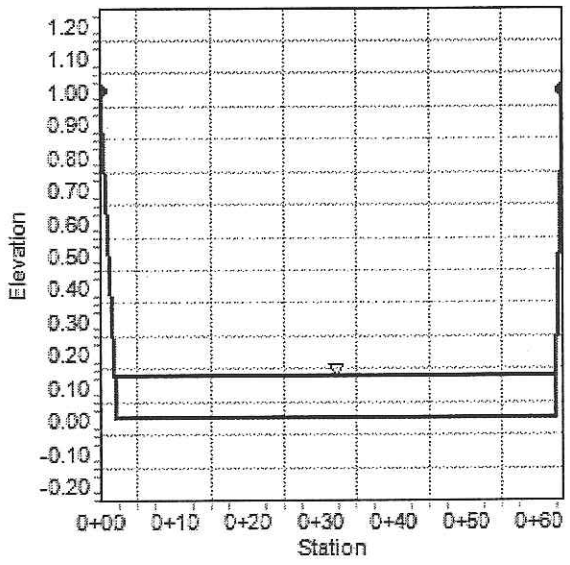
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.45	%
Normal Depth	0.13	ft
Discharge	21.00	ft³/s

Cross Section Image



Worksheet for Cross Section 8

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.75	%
Discharge	27.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.15	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	7.52	ft²
Wetted Perimeter	51.66	ft
Hydraulic Radius	0.15	ft
Top Width	51.59	ft
Normal Depth	0.15	ft
Critical Depth	0.21	ft
Critical Slope	0.01552	ft/ft

Worksheet for Cross Section 8

Results

Velocity		3.59	ft/s
Velocity Head		0.20	ft
Specific Energy		0.35	ft
Froude Number		1.66	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.15	ft
Critical Depth	0.21	ft
Channel Slope	4.75	%
Critical Slope	0.01552	ft/ft

Cross Section for Cross Section 8

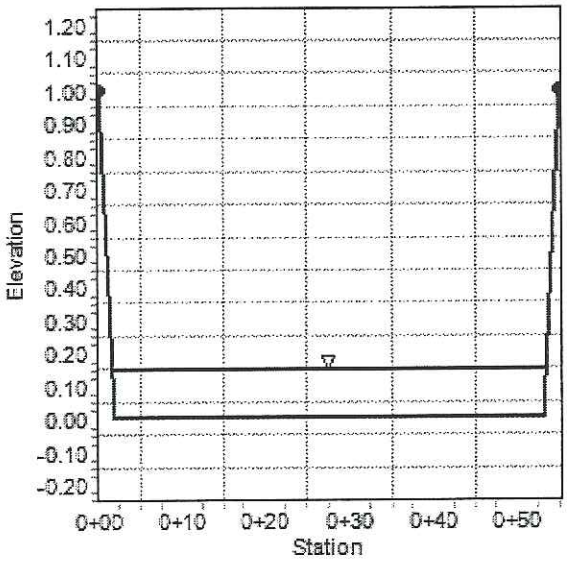
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.75	%
Normal Depth	0.15	ft
Discharge	27.00	ft³/s

Cross Section Image



Worksheet for Cross Section 9

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.98	%
Discharge	233.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	1.13	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	60.19	ft²
Wetted Perimeter	55.73	ft
Hydraulic Radius	1.08	ft
Top Width	55.00	ft
Normal Depth	1.13	ft
Critical Depth	0.86	ft
Critical Slope	0.02507	ft/ft

Worksheet for Cross Section 9

Results

Velocity		3.87	ft/s
Velocity Head		0.23	ft
Specific Energy		1.36	ft
Froude Number		0.65	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.13	ft
Critical Depth	0.86	ft
Channel Slope	0.98	%
Critical Slope	0.02507	ft/ft

Messages

Notes

CP7 + CP8 + 11-B + 11-D

Cross Section for Cross Section 9

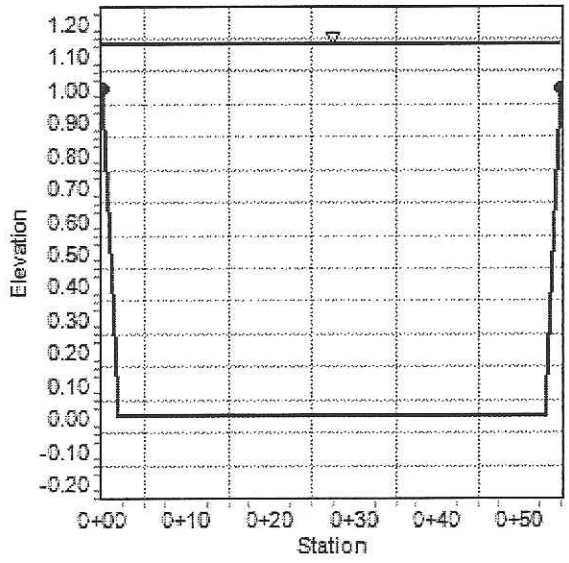
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.98	%
Normal Depth	1.13	ft
Discharge	233.00	ft^3/s

Cross Section Image



RIPRAP
Cross Section 9

Channel Protection Sizing Using Equation 718		
Known:		
V=	Velocity (fps)	5.2
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.010
	$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$	
Solve For:		
	d_{50}=	3 inches
	thickness=	7 inches

Worksheet for Cross Section 9A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.98	%
Discharge	12.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.10	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	5.30	ft²
Wetted Perimeter	51.46	ft
Hydraulic Radius	0.10	ft
Top Width	51.41	ft
Normal Depth	0.10	ft
Critical Depth	0.12	ft
Critical Slope	0.01855	ft/ft

Worksheet for Cross Section 9A

Results

Velocity		2.26	ft/s
Velocity Head		0.08	ft
Specific Energy		0.18	ft
Froude Number		1.24	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.10	ft
Critical Depth	0.12	ft
Channel Slope	2.98	%
Critical Slope	0.01855	ft/ft

Messages

Notes

CP7 + 11-B

Cross Section for Cross Section 9A

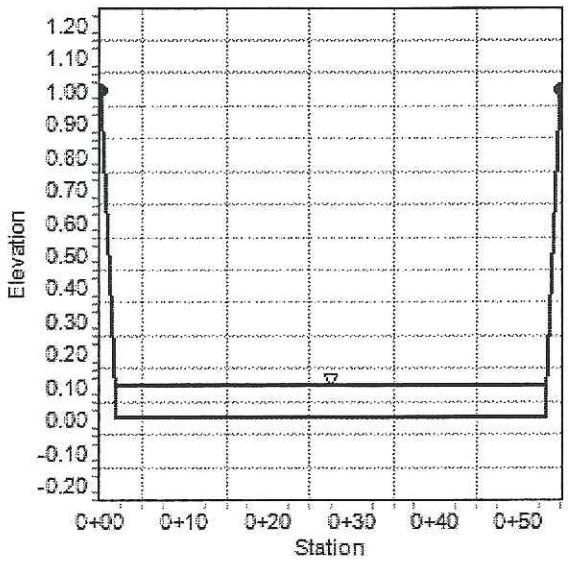
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.98	%
Normal Depth	0.10	ft
Discharge	12.00	ft³/s

Cross Section Image



Worksheet for Cross Section 10

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.65	%
Discharge	25.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.15	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	7.78	ft²
Wetted Perimeter	51.68	ft
Hydraulic Radius	0.15	ft
Top Width	51.61	ft
Normal Depth	0.15	ft
Critical Depth	0.19	ft
Critical Slope	0.01578	ft/ft

Worksheet for Cross Section 10

Results

Velocity	3.22	ft/s
Velocity Head	0.16	ft
Specific Energy	0.31	ft
Froude Number	1.46	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.15	ft
Critical Depth	0.19	ft
Channel Slope	3.65	%
Critical Slope	0.01578	ft/ft

Cross Section for Cross Section 10

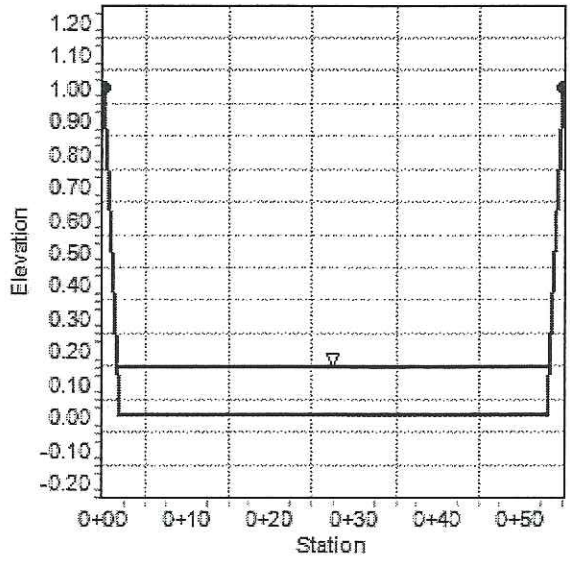
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.65	%
Normal Depth	0.15	ft
Discharge	25.00	ft³/s

Cross Section Image



Worksheet for Cross Section 10A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.99	%
Discharge	25.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.14	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	7.09	ft²
Wetted Perimeter	51.62	ft
Hydraulic Radius	0.14	ft
Top Width	51.55	ft
Normal Depth	0.14	ft
Critical Depth	0.19	ft
Critical Slope	0.01578	ft/ft

Worksheet for Cross Section 10A

Results

Velocity		3.53	ft/s
Velocity Head		0.19	ft
Specific Energy		0.33	ft
Froude Number		1.68	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	

GVF Output Data

Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		0.14	ft
Critical Depth		0.19	ft
Channel Slope		4.99	%
Critical Slope		0.01578	ft/ft

Cross Section for Cross Section 10A

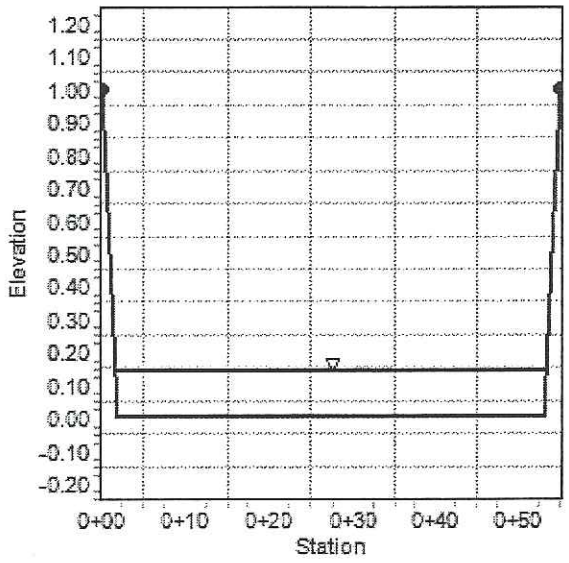
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.99	%
Normal Depth	0.14	ft
Discharge	25.00	ft³/s

Cross Section Image



Worksheet for Cross Section 11

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.90	%
Discharge	50.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.21	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	10.80	ft²
Wetted Perimeter	51.94	ft
Hydraulic Radius	0.21	ft
Top Width	51.84	ft
Normal Depth	0.21	ft
Critical Depth	0.31	ft
Critical Slope	0.01357	ft/ft

Worksheet for Cross Section 11

Results

Velocity		4.63	ft/s
Velocity Head		0.33	ft
Specific Energy		0.54	ft
Froude Number		1.79	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	

GVF Output Data

Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		0.21	ft
Critical Depth		0.31	ft
Channel Slope		4.90	%
Critical Slope		0.01357	ft/ft

Cross Section for Cross Section 11

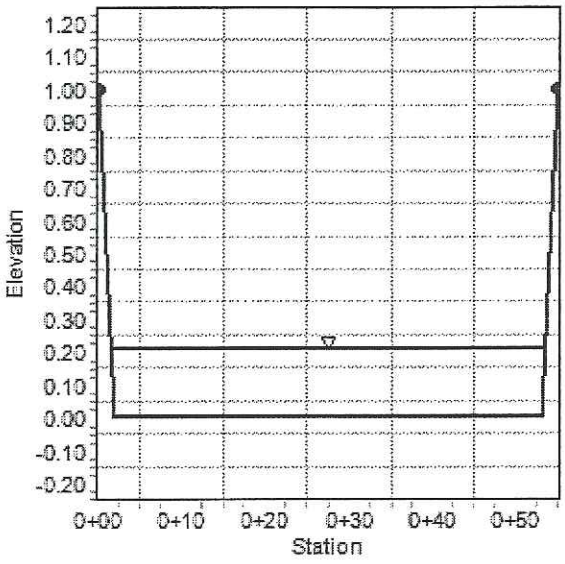
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.90	%
Normal Depth	0.21	ft
Discharge	50.00	ft³/s

Cross Section Image



Worksheet for Cross Section 12

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.35	%
Discharge	66.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.31	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	15.97	ft²
Wetted Perimeter	52.38	ft
Hydraulic Radius	0.30	ft
Top Width	52.24	ft
Normal Depth	0.31	ft
Critical Depth	0.37	ft
Critical Slope	0.01279	ft/ft

Worksheet for Cross Section 12

Results

Velocity		4.13	ft/s
Velocity Head		0.27	ft
Specific Energy		0.57	ft
Froude Number		1.32	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.31	ft
Critical Depth	0.37	ft
Channel Slope	2.35	%
Critical Slope	0.01279	ft/ft

Cross Section for Cross Section 12

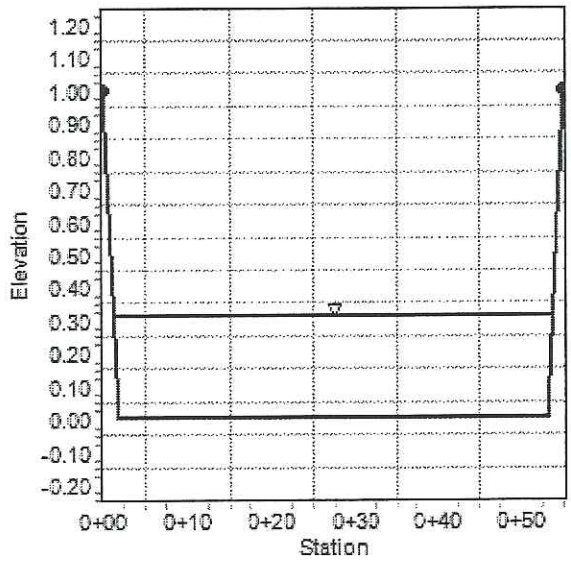
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.35	%
Normal Depth	0.31	ft
Discharge	66.00	ft³/s

Cross Section Image



Worksheet for Cross Section 13

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50	%
Discharge	41.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.37	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	19.14	ft²
Wetted Perimeter	52.65	ft
Hydraulic Radius	0.36	ft
Top Width	52.48	ft
Normal Depth	0.37	ft
Critical Depth	0.27	ft
Critical Slope	0.01417	ft/ft

Worksheet for Cross Section 13

Results

Velocity		2.14	ft/s
Velocity Head		0.07	ft
Specific Energy		0.44	ft
Froude Number		0.63	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.37	ft
Critical Depth	0.27	ft
Channel Slope	0.50	%
Critical Slope	0.01417	ft/ft

Cross Section for Cross Section 13

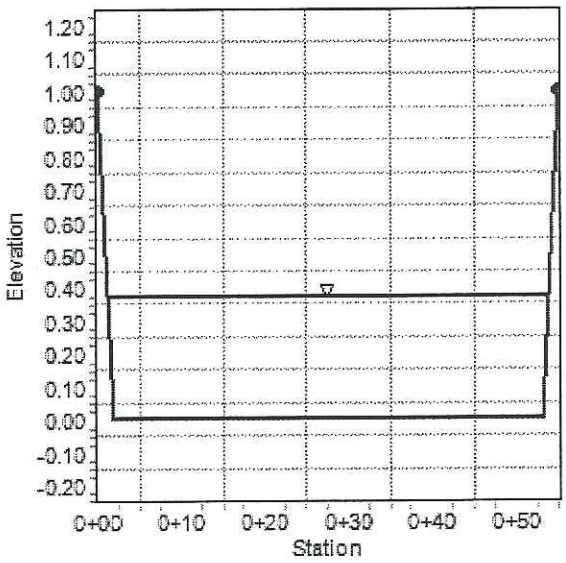
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50	%
Normal Depth	0.37	ft
Discharge	41.00	ft³/s

Cross Section Image



Worksheet for Cross Section 13A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.35	%
Discharge	9.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.09	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	4.80	ft²
Wetted Perimeter	51.42	ft
Hydraulic Radius	0.09	ft
Top Width	51.38	ft
Normal Depth	0.09	ft
Critical Depth	0.10	ft
Critical Slope	0.01977	ft/ft

Worksheet for Cross Section 13A

Results

Velocity		1.87	ft/s
Velocity Head		0.05	ft
Specific Energy		0.15	ft
Froude Number		1.08	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.09	ft
Critical Depth	0.10	ft
Channel Slope	2.35	%
Critical Slope	0.01977	ft/ft

Cross Section for Cross Section 13A

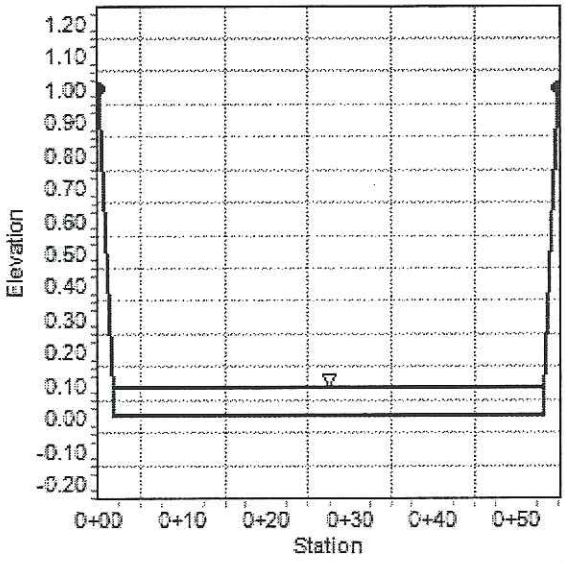
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.35	%
Normal Depth	0.09	ft
Discharge	9.00	ft³/s

Cross Section Image



Worksheet for Cross Section 14

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.29	%
Discharge	15.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.11	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	5.45	ft²
Wetted Perimeter	51.48	ft
Hydraulic Radius	0.11	ft
Top Width	51.43	ft
Normal Depth	0.11	ft
Critical Depth	0.14	ft
Critical Slope	0.01765	ft/ft

Worksheet for Cross Section 14

Results

Velocity		2.75	ft/s
Velocity Head		0.12	ft
Specific Energy		0.22	ft
Froude Number		1.49	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.11	ft
Critical Depth	0.14	ft
Channel Slope	4.29	%
Critical Slope	0.01765	ft/ft

Cross Section for Cross Section 14

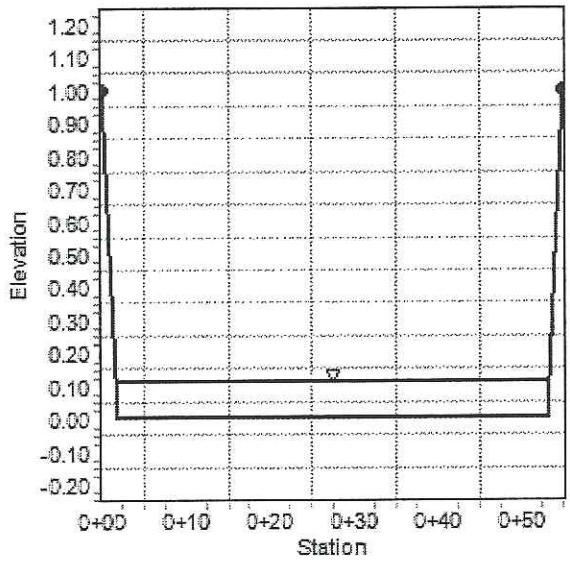
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.29	%
Normal Depth	0.11	ft
Discharge	15.00	ft³/s

Cross Section Image



RIPRAP CHANNEL

Section 15 - Rough Grade Channel

Flow "Q"	412	cfs
Manning's "n"	0.038	
Slope (%)	1.48	
Bottom Width	10.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Specific Gravity	2.5	

OUTPUT:

Velocity	7.92	ft/s
Depth	3.18	ft
Freeboard	1.47	ft
Total Depth	4.65	ft
Froude No.	0.92	
Riprap Size D50	9.0	in

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TRAPEZOIDAL CHANNEL

Section 15 - Rough Grade Channel

Flow "Q"	412	cfs
Manning's "n"	0.040	
Slope (%)	1.48	
Bottom Width	10.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Radius	0.0	ft

OUTPUT:

Velocity	7.63	ft/sec
Depth	3.27	ft
Freeboard	1.40	ft
Total Depth	4.67	ft
Froude No.	0.88	ft
Superelevation	0.00	ft

Normal depth calculations using Manning's equation

Fb = 1+0.025Vd^(1/3) Supercritical; 0.5+V^2/2g Subcritical

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Worksheet for Cross Section 15A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.50	%
Discharge	412.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.047

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	1.00	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	52.82	ft²
Wetted Perimeter	55.46	ft
Hydraulic Radius	0.95	ft
Top Width	54.99	ft
Normal Depth	1.00	ft
Critical Depth	1.24	ft
Critical Slope	0.03096	ft/ft

Worksheet for Cross Section 15A

Results

Velocity		7.80	ft/s
Velocity Head		0.95	ft
Specific Energy		1.94	ft
Froude Number		1.40	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	

GVF Output Data

Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		1.00	ft
Critical Depth		1.24	ft
Channel Slope		6.50	%
Critical Slope		0.03096	ft/ft

Cross Section for Cross Section 15A

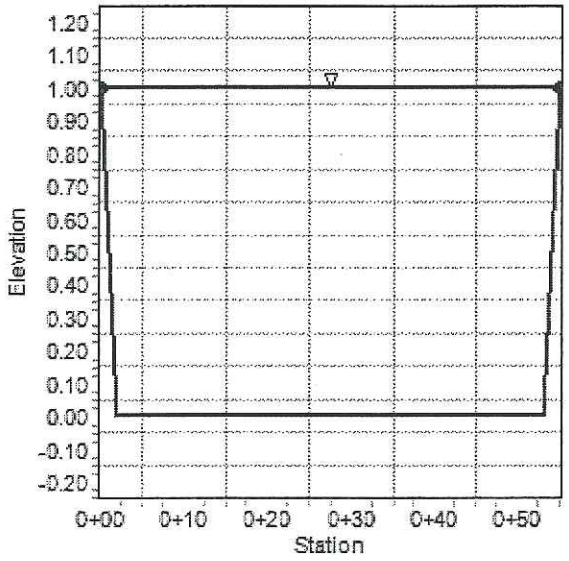
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.50	%
Normal Depth	1.00	ft
Discharge	412.00	ft³/s

Cross Section Image



RIPRAP
Cross Section 15A

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	11.5
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.065

$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$

Solve For:

d_{50}=	31
thickness=	62 inches

Worksheet for Cross Section 15B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.67	%
Discharge	382.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+01	0.00
0+47	0.00
0+48	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+48, 1.00)	0.046

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	1.05	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	49.36	ft²
Wetted Perimeter	48.93	ft
Hydraulic Radius	1.01	ft
Top Width	48.00	ft
Normal Depth	1.05	ft
Critical Depth	1.27	ft
Critical Slope	0.02970	ft/ft

Worksheet for Cross Section 15B

Results

Velocity		7.74	ft/s
Velocity Head		0.93	ft
Specific Energy		1.98	ft
Froude Number		1.35	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.05	ft
Critical Depth	1.27	ft
Channel Slope	5.67	%
Critical Slope	0.02970	ft/ft

Cross Section for Cross Section 15B

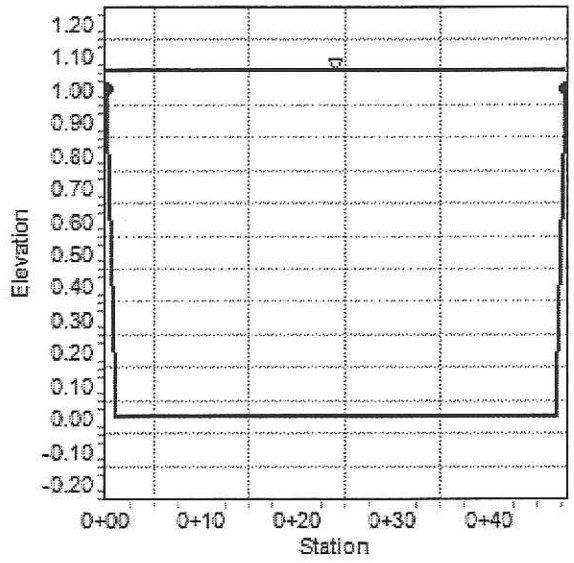
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.67	%
Normal Depth	1.05	ft
Discharge	382.00	ft³/s

Cross Section Image



RIPRAP
Cross Section 15B

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	11.2
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.057

$$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$$

Solve For:

d_{50}=	28
thickness=	56 inches

Worksheet for Cross Section 15C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.39	%
Discharge	382.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+01	0.00
0+47	0.00
0+48	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+48, 1.00)	0.042

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth		1.16	ft
Elevation Range	0.00 to 1.00 ft		
Flow Area		54.64	ft²
Wetted Perimeter		49.15	ft
Hydraulic Radius		1.11	ft
Top Width		48.00	ft
Normal Depth		1.16	ft
Critical Depth		1.27	ft
Critical Slope		0.02476	ft/ft

Worksheet for Cross Section 15C

Results

Velocity		6.99	ft/s
Velocity Head		0.76	ft
Specific Energy		1.92	ft
Froude Number		1.16	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.16	ft
Critical Depth	1.27	ft
Channel Slope	3.39	%
Critical Slope	0.02476	ft/ft

Messages

Notes

(CP7 + CP8 + 11-B + 11-D1 + 11-D2 + 11-D3 + 11-E + 11-F + 11-G + 11-H)

Cross Section for Cross Section 15C

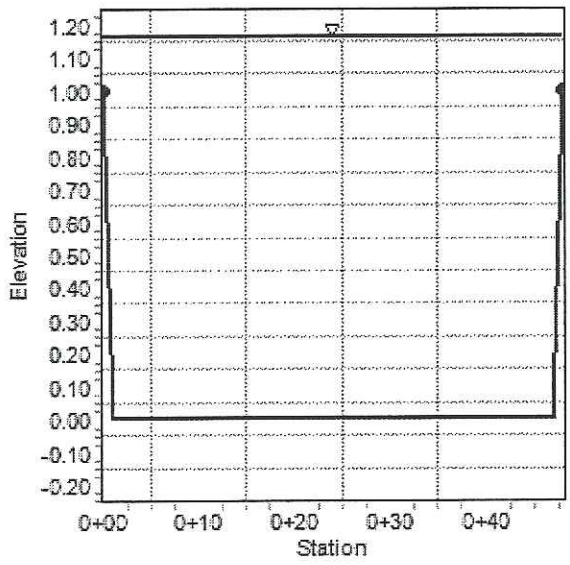
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.39	%
Normal Depth	1.16	ft
Discharge	382.00	ft³/s

Cross Section Image



RIPRAP
Cross Section 15C

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	9.6
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.034

$$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$$

Solve For:

d_{50}=	17
thickness=	35 inches

Worksheet for Cross Section 15D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.27	%
Discharge	305.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+01	0.00
0+47	0.00
0+48	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+48, 1.00)	0.042

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	1.02	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	48.15	ft²
Wetted Perimeter	48.88	ft
Hydraulic Radius	0.99	ft
Top Width	48.00	ft
Normal Depth	1.02	ft
Critical Depth	1.10	ft
Critical Slope	0.02578	ft/ft

Worksheet for Cross Section 15D

Results

Velocity		6.33	ft/s
Velocity Head		0.62	ft
Specific Energy		1.65	ft
Froude Number		1.12	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.02	ft
Critical Depth	1.10	ft
Channel Slope	3.27	%
Critical Slope	0.02578	ft/ft

Messages

Notes

(CP7 + CP8 + 11-B + 11-D + 11-E + 11-F + 11-G + 11-H)

Cross Section for Cross Section 15D

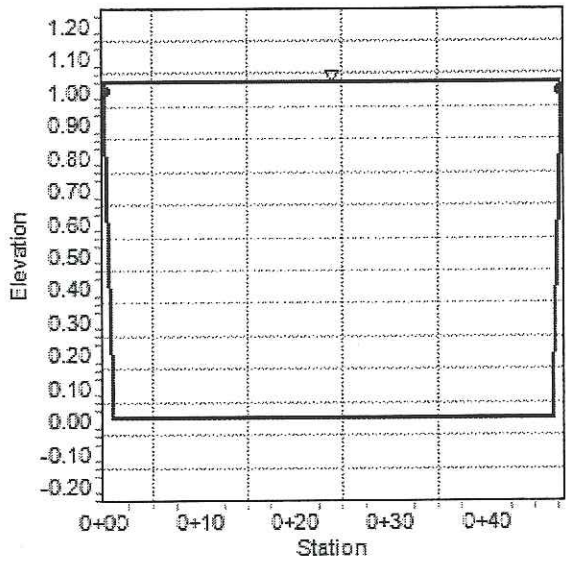
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.27	%
Normal Depth	1.02	ft
Discharge	305.00	ft^3/s

Cross Section Image



RIPRAP
Cross Section 15D

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	8.7
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.033

$$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$$

Solve For:

d_{50}=	14 inches
thickness=	28 inches

Worksheet for Cross Section 16

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50	%
Discharge	25.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.28	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	14.18	ft²
Wetted Perimeter	52.23	ft
Hydraulic Radius	0.27	ft
Top Width	52.10	ft
Normal Depth	0.28	ft
Critical Depth	0.20	ft
Critical Slope	0.01578	ft/ft

Worksheet for Cross Section 16

Results

Velocity		1.76	ft/s
Velocity Head		0.05	ft
Specific Energy		0.32	ft
Froude Number		0.60	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.28	ft
Critical Depth	0.20	ft
Channel Slope	0.50	%
Critical Slope	0.01578	ft/ft

Cross Section for Cross Section 16

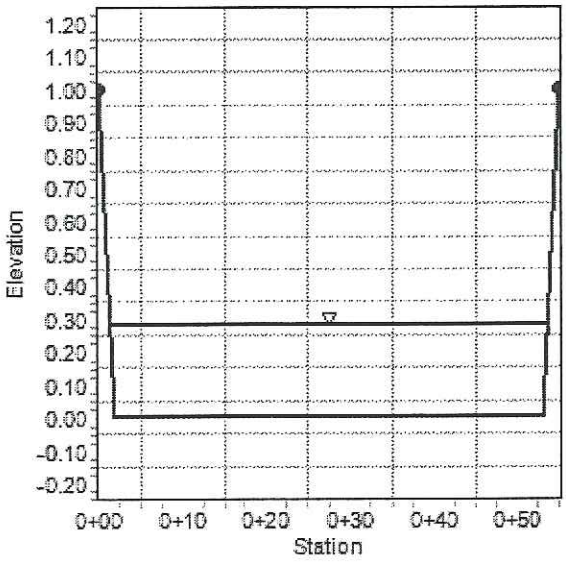
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.50	%
Normal Depth	0.28	ft
Discharge	25.00	ft³/s

Cross Section Image



Worksheet for Cross Section 17

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.22	%
Discharge	16.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.16	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	8.28	ft²
Wetted Perimeter	51.72	ft
Hydraulic Radius	0.16	ft
Top Width	51.65	ft
Normal Depth	0.16	ft
Critical Depth	0.14	ft
Critical Slope	0.01740	ft/ft

Worksheet for Cross Section 17

Results

Velocity		1.93	ft/s
Velocity Head		0.06	ft
Specific Energy		0.22	ft
Froude Number		0.85	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.16	ft
Critical Depth	0.14	ft
Channel Slope	1.22	%
Critical Slope	0.01740	ft/ft

Cross Section for Cross Section 17

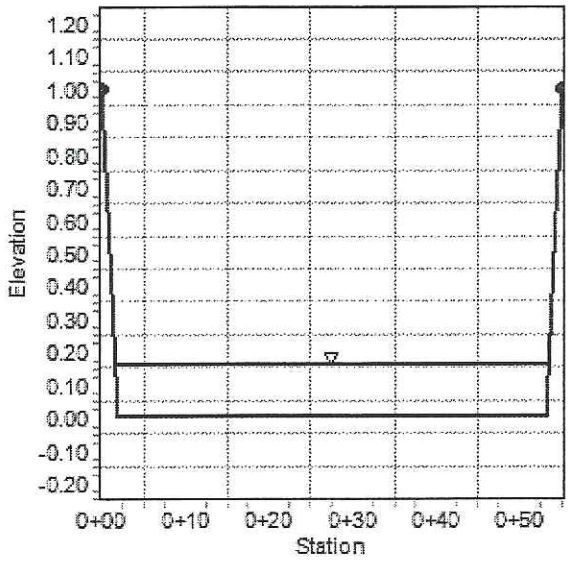
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.22	%
Normal Depth	0.16	ft
Discharge	16.00	ft^3/s

Cross Section Image



Worksheet for Cross Section 18

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.03	%
Discharge	39.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.18	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	9.23	ft²
Wetted Perimeter	51.80	ft
Hydraulic Radius	0.18	ft
Top Width	51.72	ft
Normal Depth	0.18	ft
Critical Depth	0.26	ft
Critical Slope	0.01432	ft/ft

Worksheet for Cross Section 18

Results

Velocity		4.23	ft/s
Velocity Head		0.28	ft
Specific Energy		0.46	ft
Froude Number		1.76	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.18	ft
Critical Depth	0.26	ft
Channel Slope	5.03	%
Critical Slope	0.01432	ft/ft

Cross Section for Cross Section 18

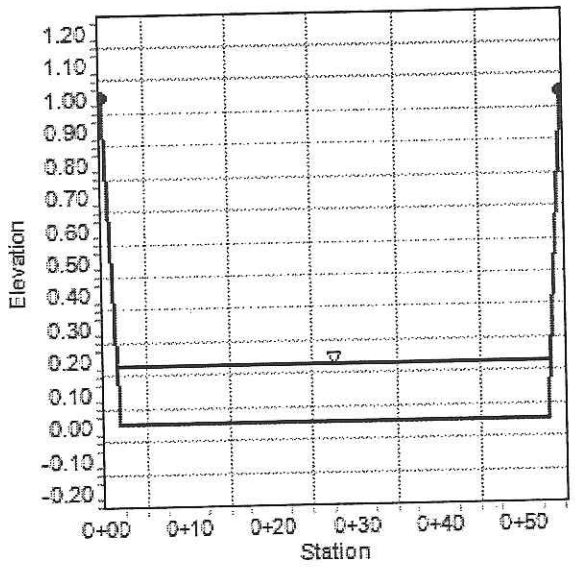
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.03	%
Normal Depth	0.18	ft
Discharge	39.00	ft³/s

Cross Section Image



TRAPEZOIDAL CHANNEL

Section 18A - Rough Grade Channel

Flow "Q"	39	cfs
Manning's "n"	0.040	
Slope (%)	5.58	
Bottom Width	5.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Radius	0.0	ft

OUTPUT:

Velocity	6.65	ft/sec
Depth	0.87	ft
Freeboard	1.16	ft
Total Depth	2.03	ft
Froude No.	1.41	ft
Superelevation	0.00	ft

Normal depth calculations using Manning's equation

Fb = 1+0.025Vd^(1/3) Supercritical; 0.5+V^2/2g Subcritical

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RIPRAP CHANNEL

Section 18A - Rough Grade Channel

Flow "Q"	39	cfs
Manning's "n"	0.039	
Slope (%)	5.58	
Bottom Width	5.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Specific Gravity	2.5	

OUTPUT:

Velocity	6.77	ft/s
Depth	0.86	ft
Freeboard	1.16	ft
Total Depth	2.02	ft
Froude No.	1.44	
Riprap Size D50	10.3	in

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Worksheet for Cross Section 19

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.55	%
Discharge	15.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.20	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	10.11	ft²
Wetted Perimeter	51.88	ft
Hydraulic Radius	0.19	ft
Top Width	51.79	ft
Normal Depth	0.20	ft
Critical Depth	0.14	ft
Critical Slope	0.01764	ft/ft

Worksheet for Cross Section 19

Results

Velocity		1.48	ft/s
Velocity Head		0.03	ft
Specific Energy		0.23	ft
Froude Number		0.59	
Flow Type	Subcritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.20	ft
Critical Depth	0.14	ft
Channel Slope	0.55	%
Critical Slope	0.01764	ft/ft

Cross Section for Cross Section 19

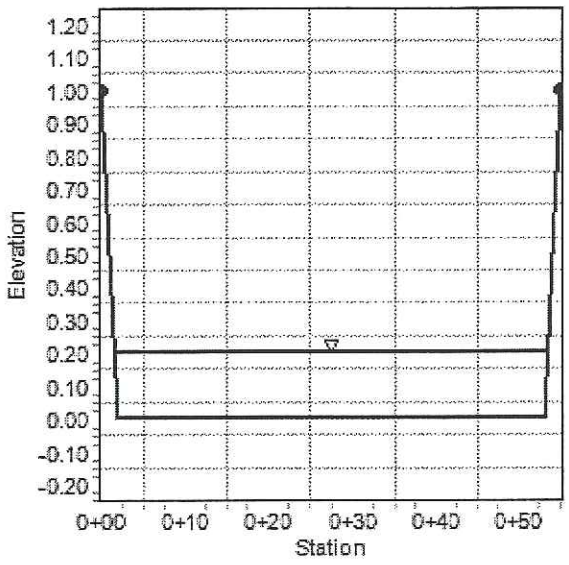
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.55	%
Normal Depth	0.20	ft
Discharge	15.00	ft³/s

Cross Section Image



Worksheet for Cross Section 20

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.22	%
Discharge	41.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.18	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	9.40	ft²
Wetted Perimeter	51.82	ft
Hydraulic Radius	0.18	ft
Top Width	51.73	ft
Normal Depth	0.18	ft
Critical Depth	0.27	ft
Critical Slope	0.01417	ft/ft

Worksheet for Cross Section 20

Results

Velocity		4.36	ft/s
Velocity Head		0.30	ft
Specific Energy		0.48	ft
Froude Number		1.80	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.18	ft
Critical Depth	0.27	ft
Channel Slope	5.22	%
Critical Slope	0.01417	ft/ft

Cross Section for Cross Section 20

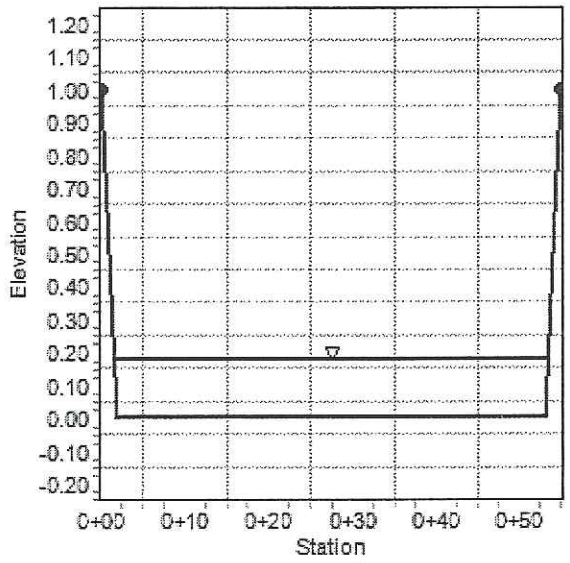
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.22	%
Normal Depth	0.18	ft
Discharge	41.00	ft³/s

Cross Section Image



Worksheet for Cross Section 20A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.21	%
Discharge	56.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.22	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	11.36	ft²
Wetted Perimeter	51.99	ft
Hydraulic Radius	0.22	ft
Top Width	51.88	ft
Normal Depth	0.22	ft
Critical Depth	0.33	ft
Critical Slope	0.01325	ft/ft

Worksheet for Cross Section 20A

Results

Velocity		4.93	ft/s
Velocity Head		0.38	ft
Specific Energy		0.60	ft
Froude Number		1.86	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.22	ft
Critical Depth	0.33	ft
Channel Slope	5.21	%
Critical Slope	0.01325	ft/ft

Cross Section for Cross Section 20A

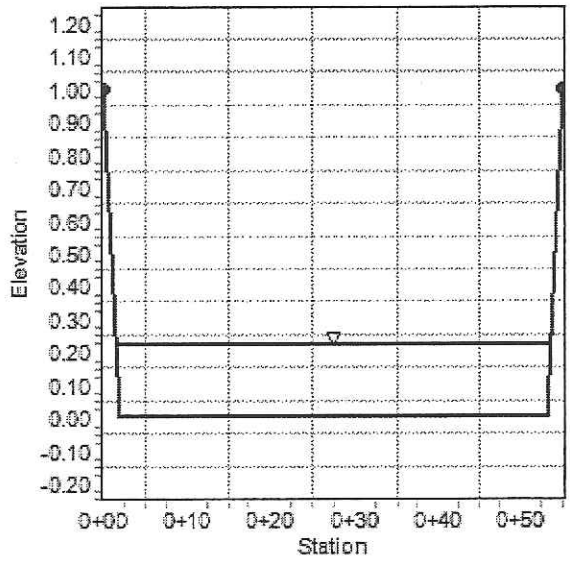
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.21	%
Normal Depth	0.22	ft
Discharge	56.00	ft³/s

Cross Section Image



Worksheet for Cross Section 21

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.08	%
Discharge	30.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.14	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	7.43	ft²
Wetted Perimeter	51.65	ft
Hydraulic Radius	0.14	ft
Top Width	51.58	ft
Normal Depth	0.14	ft
Critical Depth	0.22	ft
Critical Slope	0.01517	ft/ft

Worksheet for Cross Section 21

Results

Velocity		4.04	ft/s
Velocity Head		0.25	ft
Specific Energy		0.40	ft
Froude Number		1.87	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.14	ft
Critical Depth	0.22	ft
Channel Slope	6.08	%
Critical Slope	0.01517	ft/ft

Cross Section for Cross Section 21

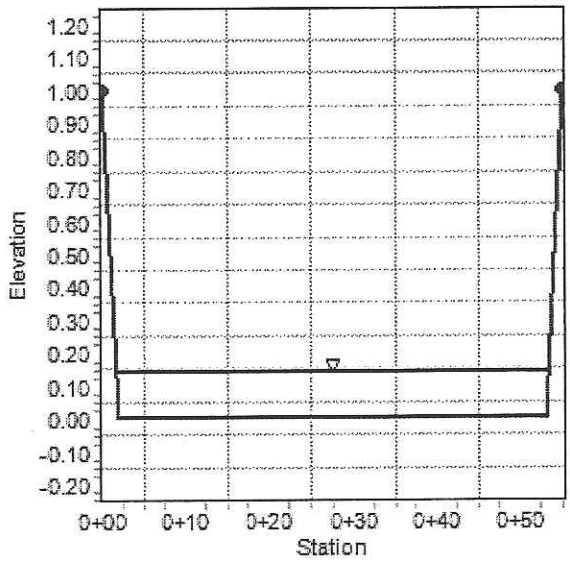
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.08	%
Normal Depth	0.14	ft
Discharge	30.00	ft³/s

Cross Section Image



Worksheet for Cross Section 22

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.99	%
Discharge	30.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+02	0.00
0+53	0.00
0+55	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+55, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.15	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	7.89	ft²
Wetted Perimeter	51.69	ft
Hydraulic Radius	0.15	ft
Top Width	51.62	ft
Normal Depth	0.15	ft
Critical Depth	0.22	ft
Critical Slope	0.01517	ft/ft

Worksheet for Cross Section 22

Results

Velocity	3.80	ft/s
Velocity Head	0.22	ft
Specific Energy	0.38	ft
Froude Number	1.71	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.15	ft
Critical Depth	0.22	ft
Channel Slope	4.99	%
Critical Slope	0.01517	ft/ft

Cross Section for Cross Section 22

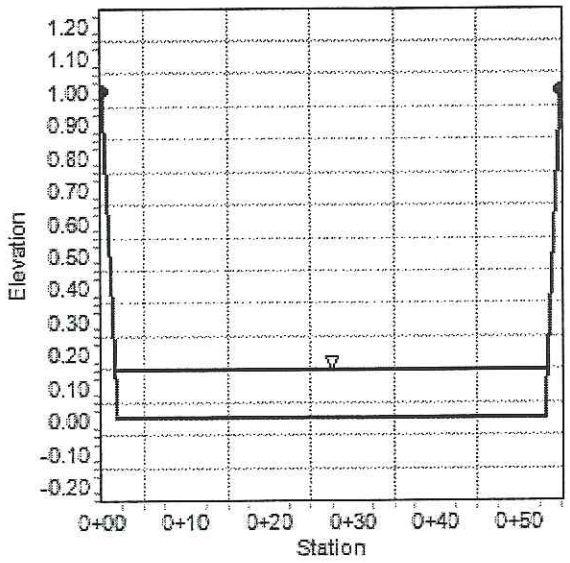
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.99	%
Normal Depth	0.15	ft
Discharge	30.00	ft³/s

Cross Section Image



Worksheet for Cross Section 23

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.63	%
Discharge	19.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+01	0.00
0+84	0.00
0+85	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+85, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.09	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	7.43	ft²
Wetted Perimeter	83.25	ft
Hydraulic Radius	0.09	ft
Top Width	83.18	ft
Normal Depth	0.09	ft
Critical Depth	0.12	ft
Critical Slope	0.01863	ft/ft

Worksheet for Cross Section 23

Results

Velocity		2.56	ft/s
Velocity Head		0.10	ft
Specific Energy		0.19	ft
Froude Number		1.51	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.09	ft
Critical Depth	0.12	ft
Channel Slope	4.63	%
Critical Slope	0.01863	ft/ft

Cross Section for Cross Section 23

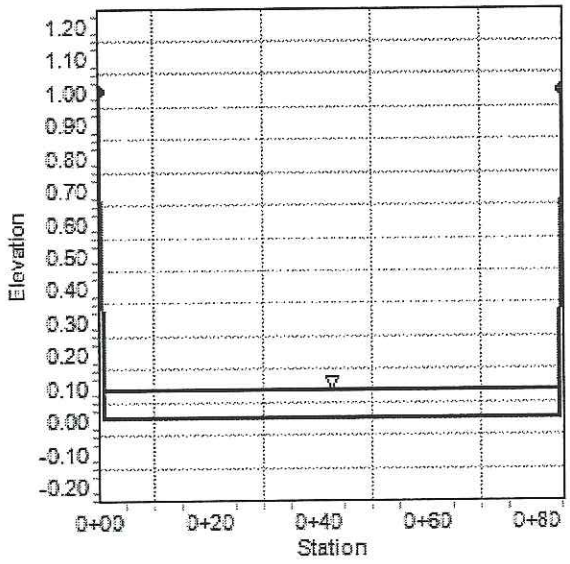
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.63	%
Normal Depth	0.09	ft
Discharge	19.00	ft³/s

Cross Section Image



Worksheet for Cross Section 24

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.97	%
Discharge	67.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+01	0.00
0+47	0.00
0+48	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+48, 1.00)	0.025

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.25	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	11.64	ft²
Wetted Perimeter	46.71	ft
Hydraulic Radius	0.25	ft
Top Width	46.50	ft
Normal Depth	0.25	ft
Critical Depth	0.40	ft
Critical Slope	0.01248	ft/ft

Worksheet for Cross Section 24

Results

Velocity	5.75	ft/s
Velocity Head	0.51	ft
Specific Energy	0.77	ft
Froude Number	2.03	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.25	ft
Critical Depth	0.40	ft
Channel Slope	5.97	%
Critical Slope	0.01248	ft/ft

Cross Section for Cross Section 24

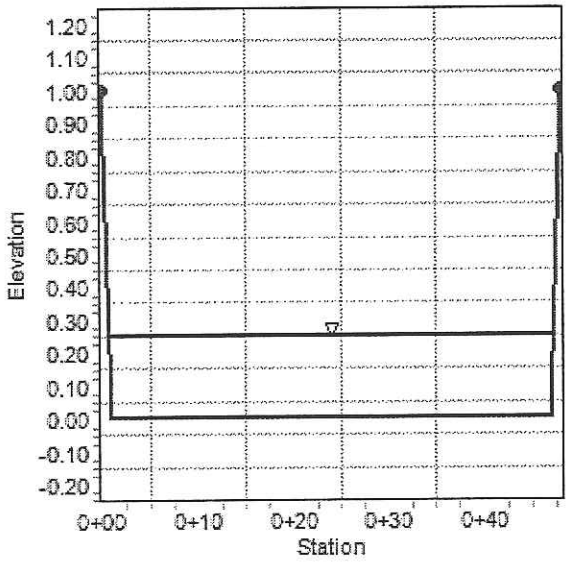
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.97	%
Normal Depth	0.25	ft
Discharge	67.00	ft³/s

Cross Section Image



RIPRAP CHANNEL

Section 25 - Rough Grade Channel

Flow "Q"	31	cfs
Manning's "n"	0.040	
Slope (%)	22.20	
Bottom Width	26.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Specific Gravity	2.50	

OUTPUT:

Velocity	5.90	ft/s
Depth	0.20	ft
Freeboard	1.09	ft
Total Depth	1.29	ft
Froude No.	2.34	
Riprap Size D50	12.5	in

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TRAPEZOIDAL CHANNEL

Section 25 - Rough Grade Channel

Flow "Q"	31	cfs
Manning's "n"	0.040	
Slope (%)	22.20	
Bottom Width	26.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Radius	0.0	ft

OUTPUT:

Velocity	5.90	ft/sec
Depth	0.20	ft
Freeboard	1.09	ft
Total Depth	1.29	ft
Froude No.	2.34	ft
Superelevation	0.00	ft

Normal depth calculations using Manning's equation

Fb = 1+0.025Vd^(1/3) Supercritical; 0.5+V^2/2g Subcritical

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Worksheet for Cross Section 26

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	7.95	%
Discharge	75.00	ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+01	0.00
0+40	0.00
0+41	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+41, 1.00)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.36	ft
Elevation Range	0.00 to 1.00 ft	
Flow Area	14.25	ft²
Wetted Perimeter	40.02	ft
Hydraulic Radius	0.36	ft
Top Width	39.72	ft
Normal Depth	0.36	ft
Critical Depth	0.48	ft
Critical Slope	0.03021	ft/ft

Worksheet for Cross Section 26

Results

Velocity		5.26	ft/s
Velocity Head		0.43	ft
Specific Energy		0.79	ft
Froude Number		1.55	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.36	ft
Critical Depth	0.48	ft
Channel Slope	7.95	%
Critical Slope	0.03021	ft/ft

Cross Section for Cross Section 26

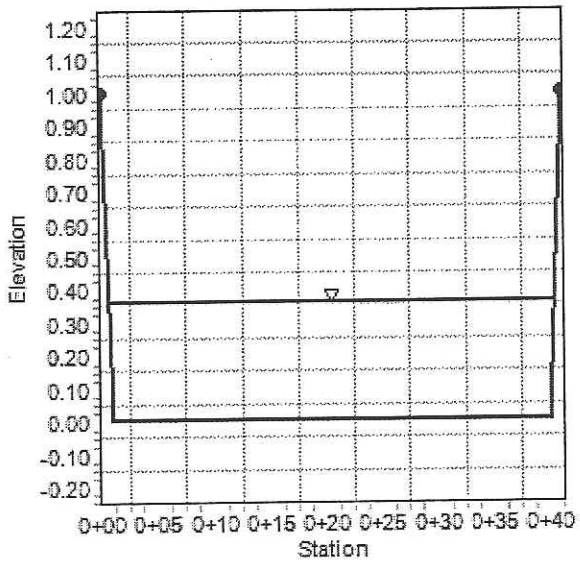
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	7.95	%
Normal Depth	0.36	ft
Discharge	75.00	ft³/s

Cross Section Image



RIPRAP
Sect 26

Channel Protection Sizing Using Equation 718

Known:

V=	Velocity (fps)	7.0
Sg=	Specific Gravity of Rock (typ=2.5)	2.5
s=	Longitudinal Channel Slope (ft/ft)	0.080

$$d_{50}=((vel*S^{0.17})/(3*(Sg-1)))^2$$

Solve For:

d_{50}=	12 inches
thickness=	25 inches

TRAPEZOIDAL CHANNEL

Section 27 - Rough Grade Channel

Flow "Q"	106	cfs
Manning's "n"	0.025	
Slope (%)	0.40	
Bottom Width	15.0	ft
Side Slope (Lt)	2.0	H:1V
Side Slope (Rt)	2.0	H:1V
Radius	0.0	ft

OUTPUT:

Velocity	4.20	ft/sec
Depth	1.42	ft
Freeboard	0.77	ft
Total Depth	2.19	ft
Froude No.	0.67	ft
Superelevation	0.00	ft

Normal depth calculations using Manning's equation

Fb = 1+0.025Vd^(1/3) Supercritical; 0.5+V^2/2g Subcritical

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TRAPEZOIDAL CHANNEL

Rough Grade Channel at 1-3P North Berm

Flow "Q"	31	cfs
Manning's "n"	0.025	
Slope (%)	0.60	
Bottom Width	0.0	ft
Side Slope (Lt)	3.0	H:1V
Side Slope (Rt)	3.0	H:1V
Radius	0.0	ft

OUTPUT:

Velocity	3.88	ft/sec
Depth	1.63	ft
Freeboard	0.73	ft
Total Depth	2.36	ft
Froude No.	0.76	ft
Superelevation	0.00	ft

Normal depth calculations using Manning's equation

Fb = 1+0.025Vd^(1/3) Supercritical; 0.5+V^2/2g Subcritical

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TRAPEZOIDAL CHANNEL

Rough Grade Channel at 1-3P East Berm

Flow "Q"	31	cfs
Manning's "n"	0.025	
Slope (%)	0.80	
Bottom Width	0.0	ft
Side Slope (Lt)	3.0	H:1V
Side Slope (Rt)	3.0	H:1V
Radius	0.0	ft

OUTPUT:

Velocity	4.32	ft/sec
Depth	1.55	ft
Freeboard	0.79	ft
Total Depth	2.34	ft
Froude No.	0.86	ft
Superelevation	0.00	ft

Normal depth calculations using Manning's equation

Fb = 1+0.025Vd^(1/3) Supercritical; 0.5+V^2/2g Subcritical

G. C. WALLACE COMPANIES
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PIPE CULVERT

Sump at Facility 20

INPUT		
Pipe Diameter	42	in
Number of Pipes	1	
Length	100.0	ft
Slope	1.00	%
Manning's 'n'	0.013	
Flow "Q"	80	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	5.70	ft
Sq. Edge	5.08	ft
Beveled	4.65	ft
Tapered	4.49	ft.

OUTLET		
Head Water	4.23	ft
Critical	2.79	ft
Velocity	8.32	ft/s

G. C. WALLACE COMPANIES
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PIPE CULVERT

Sump at Facility 24

INPUT		
Pipe Diameter	48	in
Number of Pipes	1	
Length	100.0	ft
Slope	1.00	%
Manning's 'n'	0.013	
Flow "Q"	61	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	3.82	ft
Sq. Edge	3.54	ft
Beveled	3.38	ft
Tapered	3.49	ft.

OUTLET		
Head Water	N/A	ft
Critical	2.35	ft
Velocity	4.85	ft/s

G. C. WALLACE COMPANIES
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PIPE CULVERT

Sump at Facility 26B

INPUT		
Pipe Diameter	42	in
Number of Pipes	1	
Length	100.0	ft
Slope	1.00	%
Manning's 'n'	0.013	
Flow "Q"	60	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	4.24	ft
Sq. Edge	3.89	ft
Beveled	3.64	ft
Tapered	3.65	ft.

OUTLET		
Head Water	3.13	ft
Critical	2.43	ft
Velocity	6.24	ft/s

G. C. WALLACE COMPANIES
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PIPE CULVERT

Sump at Facility 28

INPUT		
Pipe Diameter	36	in
Number of Pipes	1	
Length	100.0	ft
Slope	1.00	%
Manning's 'n'	0.013	
Flow "Q"	30	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	2.89	ft
Sq. Edge	2.67	ft
Beveled	2.55	ft
Tapered	2.63	ft.

OUTLET		
Head Water	N/A	ft
Critical	1.77	ft
Velocity	4.24	ft/s

G. C. WALLACE COMPANIES
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PIPE CULVERT

Sump at Facility 31

INPUT		
Pipe Diameter	36	in
Number of Pipes	1	
Length	100.0	ft
Slope	1.00	%
Manning's 'n'	0.013	
Flow "Q"	67	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	6.57	ft
Sq. Edge	5.57	ft
Beveled	4.90	ft
Tapered	4.45	ft.

OUTLET		
Head Water	4.70	ft
Critical	2.62	ft
Velocity	9.48	ft/s

G. C. WALLACE COMPANIES
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PIPE CULVERT

Sump at Facility 36

INPUT		
Pipe Diameter	42	in
Number of Pipes	1	
Length	100.0	ft
Slope	1.00	%
Manning's 'n'	0.013	
Flow "Q"	32	cfs
Entrance Coef.	0.35	
Tail Water	0	ft

INLET		
Thin Edge	2.70	ft
Sq. Edge	2.53	ft
Beveled	2.45	ft
Tapered	2.57	ft.

OUTLET		
Head Water	N/A	ft
Critical	1.75	ft
Velocity	3.33	ft/s

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Storm Drain Hydraulics Calculations

G.C. Wallace, Inc. | Facility 20 | DATE: 12/18/15 | FILE: SF6.xls

Storm Drain Manning's n (typ=0.013)= 0.013 | Inlet Structure Type or K_i= D | Headwall:Square Edge (cut concrete and CMP)

	CONDUIT DATA										FLOW DATA									ENERGY LOSS DATA																								EGL & HGL				COMMENTS	
																				PIPE	TRANSITION																														
	STATION			PIPE	BOX		IRREG		#	INVERT ELEV	L	S	A	Φ	Q	V	V2/2g	Sf	Ave.	Frict	Frict	Manhole			Junction			Contraction/ Inlet			Expansion/Outlet			Bend					Misc			CONDUIT		TRANSITION		FULL/	
	FROM (ft)	TO (ft)	T/R	D (in)	SPAN (ft)	RISE (ft)	AREA (ft^2)	HYD RAD (ft)		D/S (ft)	U/S (ft)	(ft)	(%)	(ft^2)		(cfs)	(ft/s)	(ft)	(ft/ft)	S_f (ft/ft)	H_f (ft)	H_f (ft)	Θ (deg)	K_{mh}	H_{mh} (ft)	Θ (deg)	K_j	H_j (ft)	Inlet/ Cont	K_i	H_c (ft)	Θ (deg)	K_o	H_o (ft)	R_{bend} (ft)	Θ (deg)	K_b	H_b (ft)	H_m (ft)	Total (ft)	U/S EGL	U/S HGL	U/S EGL	U/S HGL	PART FLOW	CRTL
1		1000.00		48							2995.00																																				
																															Outlet K_o=	1.0																
2	1000.00	1122.14	R	48					1	2995.00	3009.04	122.1	11.50%	12.57	0.0049	93	7.40	0.85	0.0042	0.0042	0.51																					0.00	3013.89	3013.04			PART	D/S
3	1122.14	1127.14	T	48					1	3009.04	3009.43	5.0	7.67%	12.57	0.0049	93	7.40	0.85	0.0042	0.0042		0.02	78	1.06	0.90																	0.92			3014.82	3013.96	FULL	U/S
4	1127.14	1245.53	R	48					1	3009.43	3013.98	118.4	3.85%	12.57	0.0049	93	7.40	0.85	0.0042	0.0042	0.50																					0.00	3018.83	3017.98			PART	D/S
5	1245.53	1250.53	T	48					1	3013.98	3014.09	5.0	2.17%	12.57	0.0049	93	7.40	0.85	0.0042	0.0042		0.02	14	0.05	0.04																	0.06			3018.94	3018.09	FULL	D/S
6	1250.53	1464.00	R	48					1	3014.09	3015.16	213.5	0.50%	12.57	0.0049	93	7.40	0.85	0.0042	0.0042	0.89																					0.00	3020.01	3019.16			FULL	D/S
7	1464.00	1469.00	T	42					1	3015.16	3016.17	5.0	20.16%	9.62	0.0049	80	8.32	1.07	0.0063	0.0053		0.03	90	1.33	1.13	58	0.40	0.42													1.58			3021.59	3020.51	FULL	U/S
8	1469.00	1627.03	R	42					1	3016.17	3047.50	158.0	19.83%	9.62	0.0049	80	8.32	1.07	0.0063	0.0063	1.00																					0.00	3052.08	3051.00			PART	D/S
9	1627.03	1632.03	T	42					1	3047.50	3048.04	5.0	10.61%	9.62	0.0049	80	8.32	1.07	0.0063	0.0063		0.03	57	0.63	0.68																	0.71			3052.79	3051.71	FULL	U/S
10	1632.03	1772.15	R	42					1	3048.04	3050.00	140.1	1.40%	9.62	0.0049	80	8.32	1.07	0.0063	0.0063	0.88																				0.63	0.63	3054.57	3053.50	3054.57	3053.50	FULL	D/S
11	1772.15	1772.15	R	42					1	3050.00	3050.00	0.0		9.62	0.0049	80	8.32	1.07	0.0063	0.0063	0.00							Ki=	0.4	0.43											0.43			3055.00	3055.00	FULL	U/S
12																																														
13																																														

Summary of Results

						(Optional)		HGL with respect	Pressure Gasket
	STATION	INVERT	SOFFIT	EGL	HGL	GRADE	LOCATION	DESCRIPTION	to FG	Required?
1	1000.00	2995	2999.00	2999.85	2999.00	3022.00			OK	NO
2	1122.14	3009.043	3013.04	3013.89	3013.04	3022.00	SDMH #7		OK	NO
3	1127.14	3009.426	3013.43	3014.82	3013.96	3022.00	SDMH #7		OK	NO
4	1245.53	3013.984	3017.98	3018.83	3017.98	3022.20	SDMH #6		OK	NO
5	1250.53	3014.093	3018.09	3018.94	3018.09	3022.20	SDMH #6		OK	NO
6	1464.00	3015.158	3019.16	3020.01	3019.16	3023.10	SDMH #5		OK	NO
7	1469.00	3016.166	3019.67	3021.59	3020.51	3023.10	SDMH #5		OK	NO
8	1627.03	3047.504	3051.00	3052.08	3051.00	3055.00	SDMH #4		OK	NO
9	1632.03	3048.035	3051.54	3052.79	3051.71	3055.00	SDMH #4		OK	NO
10	1772.15	3050	3053.50	3054.57	3053.50	3057.00			OK	NO
11	1772.15	3050	3053.50	3055.00	3055.00	3057.00			OK	NO
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Storm Drain Hydraulics Calculations

G.C. Wallace, Inc. | Facility 20A | DATE: 12/18/15 | FILE: SF6.xls

Storm Drain Manning's n (typ=0.013)= 0.013 | Inlet Structure Type or K_i= D | Headwall:Square Edge (cut concrete and CMP)

	CONDUIT DATA										FLOW DATA									ENERGY LOSS DATA																								EGL & HGL				COMMENTS	
																				PIPE	TRANSITION																														
	STATION			PIPE	BOX		IRREG		#	INVERT ELEV	L	S	A	Φ	Q	V	V2/2g	Sf	Ave.	Frict	Frict	Manhole			Junction			Contraction/ Inlet			Expansion/Outlet			Bend				Misc			CONDUIT		TRANSITION		FULL/	
	FROM	TO	T/R	D	SPAN	RISE	AREA	HYD RAD		D/S	U/S									S_f	H_f	H_f	Θ	K_{mh}	H_{mh}	Θ	K_j	H_j	Inlet/	K_j	H_c	Θ	K_o	H_o	R_{bend}	Θ	K_b	H_b	H_m	Total	U/S	U/S	U/S	U/S	PART	CRTL
	(ft)	(ft)		(in)	(ft)	(ft)	(ft^2)	(ft)		(ft)	(ft)	(ft)	(%)	(ft^2)		(cfs)	(ft/s)	(ft)	(ft/ft)	(ft/ft)	(ft)	(ft)	(deg)			(deg)		(ft)	Cont			(deg)		(ft)	(ft)	(deg)			(ft)	(ft)	EGL	HGL	EGL	HGL	FLOW	
1		1000.00		24							3017.17																																			
																														Outlet K_o=			1.0														
2	1000.00	1182.67	R	24					1	3017.17	3018.09	182.7	0.50%	3.14	0.0049	13	4.14	0.27	0.0033	0.0033	0.60																		0.00	3021.69	3021.42			FULL	U/S
3	1182.67	1187.67	T	24					1	3018.09	3018.11	5.0	0.50%	3.14	0.0049	13	4.14	0.27	0.0033	0.0033		0.02																0.02			3021.70	3021.44	FULL	U/S
4	1187.67	1366.08	R	24					1	3018.11	3019.00	178.4	0.50%	3.14	0.0049	13	4.14	0.27	0.0033	0.0033	0.59																		0.00	3022.29	3022.03			FULL	U/S
5	1366.08	1366.08	R	24					1	3019.00	3019.00	0.0		3.14	0.0049	13	4.14	0.27	0.0033	0.0033	0.00								Ki=	0.4	0.11								0.11			3022.40	3022.40	FULL	U/S
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Summary of Results

	STATION	INVERT	SOFFIT	EGL	HGL	(Optional) GRADE	(Optional) LOCATION	(Optional) DESCRIPTION	HGL with respect to FG	Pressure Gasket Required?
1	1000.00	3017.17	3019.17	3021.09	3020.82	3023.10	SDMH#5		OK	NO
2	1182.67	3018.088	3020.09	3021.69	3021.42	3022.60			OK	NO
3	1187.67	3018.113	3020.11	3021.70	3021.44	3022.60			OK	NO
4	1366.08	3019	3021.00	3022.29	3022.03	3023.00			HGL<1ft below FG	NO
5	1366.08	3019	3021.00	3022.40	3022.40	3023.00			HGL<1ft below FG	NO
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Storm Drain Hydraulics Calculations

G.C. Wallace, Inc. | Facility 24 | DATE: 12/18/15 | FILE: SF6.xls

Storm Drain Manning's n (typ=0.013)= 0.013 | Inlet Structure Type or K_i= D | Headwall:Square Edge (cut concrete and CMP)

CONDUIT DATA											FLOW DATA									ENERGY LOSS DATA																						EGL & HGL				COMMENTS	
																						TRANSITION																										
STATION			PIPE	BOX		IRREG		#	INVERT ELEV		L	S	A	Φ	Q	V	V2/2g	Sf	Ave.	PIPE		Manhole			Junction			Contraction/ Inlet			Expansion/Outlet			Bend				Misc				CONDUIT		TRANSITION		FULL/	
FROM	TO	T/R	D	SPAN	RISE	AREA	HYD RAD		D/S	U/S									S_f	Frict	Frict	Θ	K_{mh}	H_{mh}	Θ	K_i	H_i	Inlet/	K_i	H_c	Θ	K_o	H_o	R_{bend}	Θ	K_b	H_b	H_m	Total	U/S	U/S	U/S	U/S	PART	CRTL
(ft)	(ft)		(in)	(ft)	(ft)	(ft^2)	(ft)		(ft)	(ft)	(ft)	(%)	(ft^2)		(cfs)	(ft/s)	(ft)	(ft/ft)	(ft/ft)	H_f (ft)	H_f (ft)	(deg)		(ft)	(deg)		(ft)	Cont		(ft)	(deg)		(ft)	(ft)	(deg)		(ft)	(ft)	(ft)	(ft)	(ft)	EGL	HGL	EGL	HGL	FLOW	
	1000.00		36							3219.00																			Outlet K_c=	1.0													3224.16	3223.00		
1000.00	1043.03	R	36					1	3219.00	3219.43	43.0	1.00%	7.07	0.0049	61	8.63	1.16	0.0083	0.0083	0.36																				0.00	3224.52	3223.36			FULL	U/S
1043.03	1073.03	R	36					1	3219.43	3230.00	30.0	35.23%	7.07	0.0049	61	8.63	1.16	0.0083	0.0083	0.25																				0.00	3234.16	3233.00			PART	D/S
1073.03	1073.03	R	36					1	3230.00	3230.00	0.0		7.07	0.0049	61	8.63	1.16	0.0083	0.0083	0.00										Ki=	0.4	0.46								0.46			3234.62	3234.62	FULL	U/S

Summary of Results

	STATION	INVERT	SOFFIT	EGL	HGL	(Optional) GRADE	(Optional) LOCATION	(Optional) DESCRIPTION	HGL with respect to FG	Pressure Gasket Required?
1	1000.00	3219	3222.00	3224.16	3223.00	3227.00	14X14RCB		OK	NO
2	1043.03	3219.43	3222.43	3224.52	3223.36	3227.00			OK	NO
3	1073.03	3230	3233.00	3234.16	3233.00	3237.00			OK	NO
4	1073.03	3230	3233.00	3234.62	3234.62	3237.00			OK	NO
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Storm Drain Hydraulics Calculations

G.C. Wallace, Inc. | Facility 26B | DATE: 12/18/15 | FILE: SF6.xls

Storm Drain Manning's n (typ=0.013)= 0.013 | Inlet Structure Type or K_i= D | Headwall:Square Edge (cut concrete and CMP)

	CONDUIT DATA										FLOW DATA									ENERGY LOSS DATA																					EGL & HGL				COMMENTS	
																				PIPE	TRANSITION																									
	STATION			PIPE	BOX		IRREG		#	INVERT ELEV	L	S	A	Φ	Q	V	V2/2g	Sf	Ave.	Frict	Frict	Manhole			Junction			Contraction/ Inlet			Expansion/Outlet			Bend				Misc			CONDUIT		TRANSITION		FULL/	
	FROM	TO	T/R	D	SPAN	RISE	AREA	HYD RAD		D/S	U/S								S_f	H_f	H_f	Θ	K_{mh}	H_{mh}	Θ	K_j	H_j	Inlet/	K_i	H_c	Θ	K_o	H_o	R_{bend}	Θ	K_b	H_b	H_m	Total	U/S	U/S	U/S	U/S	PART	CRTL
	(ft)	(ft)		(in)	(ft)	(ft)	(ft^2)	(ft)		(ft)	(ft)	(ft)	(%)	(ft^2)		(cfs)	(ft/s)	(ft)	(ft/ft)	(ft/ft)	(ft)	(ft)	(deg)		(ft)	(deg)		(ft)	Cont		(ft)	(deg)		(ft)	(ft)	(deg)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	EGL	HGL	EGL	HGL	FLOW	
1		1000.00		42						3145.78																			Outlet K_o=	1.0													3149.88	3149.28		
2	1000.00	1053.00	R	42					1	3145.78	3146.50	53.0	1.36%	9.62	0.0049	60	6.24	0.60	0.0036	0.0036	0.19																				0.00	3150.60	3150.00			FULL	D/S
3	1053.00	1053.00	R	42					1	3146.50	3146.50	0.0		9.62	0.0049	60	6.24	0.60	0.0036	0.0036	0.00							Ki=	0.4	0.24										0.24			3150.85	3150.85	FULL	U/S
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Summary of Results

	STATION	INVERT	SOFFIT	EGL	HGL	(Optional) GRADE	(Optional) LOCATION	(Optional) DESCRIPTION	HGL with respect to FG	Pressure Gasket Required?
1	1000.00	3145.78	3149.28	3149.88	3149.28	3151.00			OK	NO
2	1053.00	3146.5	3150.00	3150.60	3150.00	3152.00			OK	NO
3	1053.00	3146.5	3150.00	3150.85	3150.85	3152.00			OK	NO
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Storm Drain Hydraulics Calculations

G.C. Wallace, Inc. | Facility 28 | DATE: 12/18/15 | FILE: SF6.xls

Storm Drain Manning's n (typ=0.013)= 0.013 | Inlet Structure Type or K_i= D | Headwall:Square Edge (cut concrete and CMP)

	CONDUIT DATA										FLOW DATA									ENERGY LOSS DATA																						EGL & HGL				COMMENTS	
																				PIPE	TRANSITION																											
	STATION			PIPE	BOX		IRREG		#	INVERT ELEV	L	S	A	Φ	Q	V	V2/2g	Sf	Ave.	Frict	Frict	Manhole			Junction			Contraction/ Inlet			Expansion/Outlet			Bend				Misc			CONDUIT		TRANSITION		FULL/	
	FROM	TO	T/R	D	SPAN	RISE	AREA	HYD RAD		D/S	U/S								S_f	H_f	H_f	Θ	K_{mh}	H_{mh}	Θ	K_j	H_j	Inlet/	K_i	H_c	Θ	K_o	H_o	R_{bend}	Θ	K_b	H_b	H_m	Total	U/S	U/S	U/S	U/S	PART	CRTL
	(ft)	(ft)		(in)	(ft)	(ft)	(ft^2)	(ft)		(ft)	(ft)	(ft)	(%)	(ft^2)		(cfs)	(ft/s)	(ft)	(ft/ft)	(ft/ft)	(ft)	(ft)	(deg)		(ft)	(deg)		(ft)	Cont		(ft)	(deg)		(ft)	(ft)	(deg)		(ft)	(ft)	(ft)	(ft)	(ft)	(deg)		(ft)	(ft)	(ft)	(ft)	EGL	HGL	EGL	HGL	FLOW	
1		1000.00		36							3076.11																			Outlet K_o=		1.0											3079.39	3079.11		
2	1000.00	1056.67	R	36					1	3076.11	3080.00	56.7	6.86%	7.07	0.0049	30	4.24	0.28	0.0020	0.0020	0.11																				0.00	3083.28	3083.00			PART	D/S
3	1056.67	1056.67	R	36					1	3080.00	3080.00	0.0		7.07	0.0049	30	4.24	0.28	0.0020	0.0020	0.00							Ki=	0.4	0.11										0.11			3083.39	3083.39	FULL	U/S
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Summary of Results

	STATION	INVERT	SOFFIT	EGL	HGL	(Optional) GRADE	(Optional) LOCATION	(Optional) DESCRIPTION	HGL with respect to FG	Pressure Gasket Required?
1	1000.00	3076.11	3079.11	3079.39	3079.11	3082.11			OK	NO
2	1056.67	3080	3083.00	3083.28	3083.00	3087.50			OK	NO
3	1056.67	3080	3083.00	3083.39	3083.39	3087.50			OK	NO
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Storm Drain Hydraulics Calculations

G.C. Wallace, Inc. | Facility 31 | DATE: 12/18/15 | FILE: SF6.xls

Storm Drain Manning's n (typ=0.013)= 0.013 | Inlet Structure Type or K_i= D | Headwall:Square Edge (cut concrete and CMP)

	CONDUIT DATA										FLOW DATA									ENERGY LOSS DATA																						EGL & HGL				COMMENTS	
																				PIPE	TRANSITION																											
	STATION			PIPE	BOX		IRREG		#	INVERT ELEV	L	S	A	Φ	Q	V	V2/2g	Sf	Ave.	Frict	Frict	Manhole			Junction			Contraction/ Inlet			Expansion/Outlet			Bend				Misc			CONDUIT		TRANSITION		FULL/	
	FROM (ft)	TO (ft)	T/R	D (in)	SPAN (ft)	RISE (ft)	AREA (ft^2)	HYD RAD (ft)		D/S (ft)	U/S (ft)	(ft)	(%)	(ft^2)		(cfs)	(ft/s)	(ft)	(ft/ft)	S_f (ft/ft)	H_f (ft)	H_f (ft)	Θ (deg)	K_{mh}	H_{mh} (ft)	Θ (deg)	K_j	H_j (ft)	Inlet/ Cont	K_j	H_c (ft)	Θ (deg)	K_o	H_o (ft)	R_{bend} (ft)	Θ (deg)	K_b	H_b (ft)	H_m (ft)	Total (ft)	U/S EGL	U/S HGL	U/S EGL	U/S HGL	PART FLOW	CRTL
1		1000.00		36							3032.84																															3037.24	3035.84		
																													Outlet K_o=		1.0														
2	1000.00	1055.82	R	36					1	3032.84	3036.19	55.8	6.00%	7.07	0.0049	67	9.48	1.40	0.0101	0.0101	0.56																				0.00	3040.59	3039.19			PART	D/S
3	1055.82	1075.82	R	36					1	3036.19	3043.00	20.0	34.05%	7.07	0.0049	67	9.48	1.40	0.0101	0.0101	0.20																				0.00	3047.40	3046.00			PART	D/S
4	1075.82	1075.82	R	36					1	3043.00	3043.00	0.0		7.07	0.0049	67	9.48	1.40	0.0101	0.0101	0.00							Ki=	0.4	0.56											0.56			3047.95	3047.95	FULL	U/S
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Summary of Results

	STATION	INVERT	SOFFIT	EGL	HGL	(Optional) GRADE	(Optional) LOCATION	(Optional) DESCRIPTION	HGL with respect to FG	Pressure Gasket Required?
1	1000.00	3032.84	3035.84	3037.24	3035.84	3047.00			OK	NO
2	1055.82	3036.19	3039.19	3040.59	3039.19	3050.50			OK	NO
3	1075.82	3043	3046.00	3047.40	3046.00	3055.50			OK	NO
4	1075.82	3043	3046.00	3047.95	3047.95	3055.50			OK	NO
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Storm Drain Hydraulics Calculations

G.C. Wallace, Inc. | Facility 36 | DATE: 12/18/15 | FILE: SF6.xls

Storm Drain Manning's n (typ=0.013)= 0.013 | Inlet Structure Type or K_i= D | Headwall:Square Edge (cut concrete and CMP)

	CONDUIT DATA										FLOW DATA									ENERGY LOSS DATA																				EGL & HGL				COMMENTS	
																				PIPE	TRANSITION																									
	STATION			PIPE	BOX		IRREG		#	INVERT ELEV	L	S	A	Φ	Q	V	V2/2g	Sf	Ave.	Frict	Frict	Manhole			Junction			Contraction/ Inlet			Expansion/Outlet			Bend				Misc		CONDUIT		TRANSITION		FULL/	
	FROM	TO	T/R	D	SPAN	RISE	AREA	HYD RAD		D/S	U/S									S_f	H_f	H_f	Θ	K_{mh}	H_{mh}	Θ	K_j	H_j	Inlet/	K_i	H_c	Θ	K_o	H_o	R_{bend}	Θ	K_b	H_b	H_m	Total	U/S	U/S	U/S	U/S	PART	CRTL
	(ft)	(ft)		(in)	(ft)	(ft)	(ft^2)	(ft)		(ft)	(ft)	(ft)	(%)	(ft^2)		(cfs)	(ft/s)	(ft)	(ft/ft)	(ft/ft)	(ft)	(ft)	(deg)		(ft)	(deg)		(ft)	Cont		(ft)	(deg)		(ft)	(ft)	(deg)		(ft)	(ft)	(ft)	EGL	HGL	EGL	HGL	FLOW	
1		1000.00		30							2993.34																			Outlet K_o=		1.0											2996.07	2995.84		
2	1000.00	1114.42	R	30					1	2993.34	2995.94	114.4	2.28%	4.91	0.0049	19	3.87	0.23	0.0021	0.0021	0.24																		0.00	2998.68	2998.44			PART	D/S
3	1114.42	1119.42	T	30					1	2995.94	2996.24	5.0	5.98%	4.91	0.0049	19	3.87	0.23	0.0021	0.0021		0.01	11	0.05	0.01														0.02			2998.97	2998.74	FULL	D/S
4	1119.42	1333.63	R	30					1	2996.24	3017.00	214.2	9.69%	4.91	0.0049	19	3.87	0.23	0.0021	0.0021	0.46																		0.00	3019.73	3019.50			PART	D/S
5	1333.63	1333.63	R	30					1	3017.00	3017.00	0.0		4.91	0.0049	19	3.87	0.23	0.0021	0.0021	0.00								Ki=	0.4	0.09									0.09			3019.83	3019.83	FULL	U/S
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Summary of Results

	STATION	INVERT	SOFFIT	EGL	HGL	(Optional) GRADE	(Optional) LOCATION	(Optional) DESCRIPTION	HGL with respect to FG	Pressure Gasket Required?
1	1000.00	2993.34	2995.84	2996.07	2995.84	3023.10			OK	NO
2	1114.42	2995.943	2998.44	2998.68	2998.44	3022.60	SDMH#9		OK	NO
3	1119.42	2996.242	2998.74	2998.97	2998.74	3022.60	SDMH#9		OK	NO
4	1333.63	3017	3019.50	3019.73	3019.50	3023.00			OK	NO
5	1333.63	3017	3019.50	3019.83	3019.83	3023.00				
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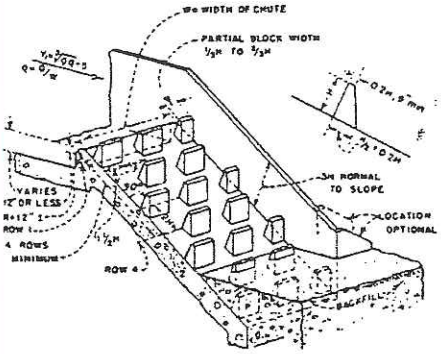
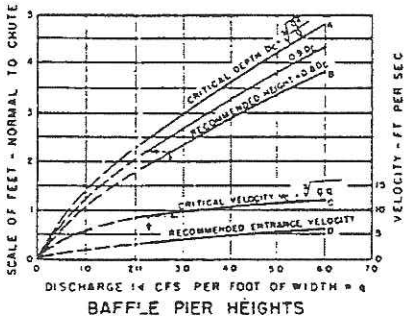
DESIGN DATA-USBR TYPE STILLING BASINS

BAFFLED APRON FOR CANAL OR SPILLWAY DROPS (BASIN IX)

For use in flow ways where water is to be lowered from one level to another. The baffle piers prevent undue acceleration of the flow as it passes down the chute. Since the flow velocities entering the downstream channel are relatively low, no stilling basin is required. The chute may be designed to discharge up to 60 cubic feet per second per foot of width, and the drop may be as high as structurally feasible.





BAFFLE PIER HEIGHTS AND ALLOWABLE VELOCITIES

DESIGN PROCEDURE

The baffled apron should be designed for the maximum expected discharge, Q, up to 60 c.f.s. per foot of width.

Entrance velocity V_1, should be as low as practical or $V = \sqrt[3]{gq^2}$

See Figures 103, 105, 107 and 109 for sample approach pools.

Baffle pier height, H, should be about $0.8D_c$ to $0.9D_c$, Curve B above.

Baffle pier widths and spaces should be equal, up to ⅔ H, but not less than H.

The slope distance between rows of baffle piers should be 2H, twice the baffle height H. See text for increase in row spacing on flat chutes.

Four rows of baffle piers are required to establish full control of the flow, although fewer rows have operated successfully. At least one row of baffles should be buried in the backfill.

The chute training walls should be three times as high as the baffle piers.

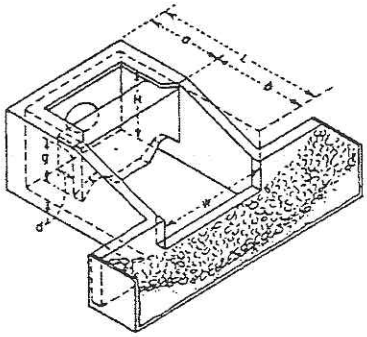
Riprap consisting of 6- to 12-inch stones should be placed at the downstream ends of training walls to prevent eddies from undermining the walls.

STILLING BASIN FOR PIPE ON OPEN CHANNEL OUTLET (BASIN VI)

For use on pipe or open channel outlets. Sizes and discharges from table V_1 should not exceed 30 feet per second. No tailwater required. Froude number usually 1.5 to 7 but not important

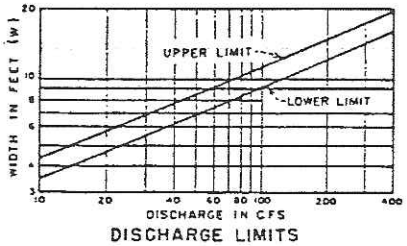
May substitute for Basin IV.

Energy loss greater than in comparable jump

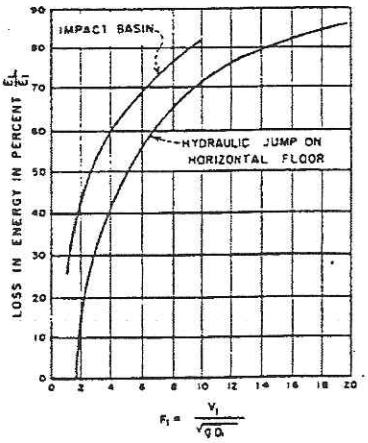


PIPE DIA	PIPE AREA IN SQ FT	Q	FEET AND INCHES W	H	L	a	b	c	d	g
18	1.77	21	5-6	4-3	7-4	3-3	4-1	2-4	10-11	2-1
24	3.14	38	6-9	5-3	9-0	3-11	5-1	2-10	1-2	2-6
30	4.91	59	8-0	6-3	10-8	4-7	6-1	3-4	1-6	3-0
36	7.07	85	9-3	7-3	12-4	5-3	7-1	3-10	1-7	3-6
42	9.62	115	10-6	8-0	14-0	6-0	8-0	4-5	1-9	3-11
48	12.57	151	11-9	9-0	15-8	6-9	8-11	4-11	2-0	4-5
54	15.90	191	13-0	9-9	17-4	7-4	10-0	5-5	2-2	4-11
60	19.63	236	14-3	10-9	19-0	8-0	11-0	5-11	2-5	5-6
72	28.27	339	16-6	12-3	22-0	9-3	12-9	6-11	2-9	6-2

BASIC DIMENSIONS



DISCHARGE LIMITS



COMPARISON OF ENERGY LOSSES

Revision	Date

WRC ENGINEERING

REFERENCE: "Hydraulic Design of Stilling Basins and Energy Dissipators", EM25 BR, January 1978

Type VI Stilling Basin
Facility #20

Pipe Diameter=	48	in	
Q=	93	cfs	
V^1=	29.87	fps	(Must be < 30 fps)

From Figure 1109:
Basic Dimensions Based on Diameter and Flowrate:

W=	11	ft	9	in
H=	9	ft	0	in
L=	15	ft	15	in
a=	6		9	in
b=	8		11	in
c=	4		11	in
d=	2		0	in
g=	4		5	in

f=1.5(c-d)=	4	ft
W_{MAX}	11.75	ft
W_{MIN}	9	ft

From Section 1102.2.7
For a Riprap Pad for a W<12 ft

Pad Length = W =	11.75	ft
D50	12	in
Thickness	24	in

1 Based on normal depth

Worksheet for Facility #20

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	11.50	%
Diameter	48.00	in
Discharge	93.00	ft³/s

Results

Normal Depth	1.18	ft
Flow Area	3.11	ft²
Wetted Perimeter	4.60	ft
Hydraulic Radius	0.68	ft
Top Width	3.65	ft
Critical Depth	2.92	ft
Percent Full	29.6	%
Critical Slope	0.00536	ft/ft
Velocity	29.87	ft/s
Velocity Head	13.86	ft
Specific Energy	15.05	ft
Froude Number	5.70	
Maximum Discharge	523.97	ft³/s
Discharge Full	487.09	ft³/s
Slope Full	0.00419	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	29.61	%
Downstream Velocity	Infinity	ft/s

Worksheet for Facility #20

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.18	ft
Critical Depth	2.92	ft
Channel Slope	11.50	%
Critical Slope	0.00536	ft/ft

Cross Section for Facility #20

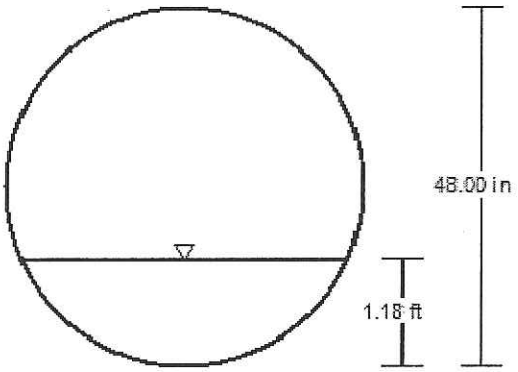
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	11.50	%
Normal Depth	1.18	ft
Diameter	48.00	in
Discharge	93.00	ft³/s

Cross Section Image



V: 1
H: 1

Pipe Culvert Outlet Protection

30" RCP Storm Drain (Facility 36)

Known:

Q=	Flow (cfs)	19
D=	Diameter of Pipe (ft)	2.5
Ø=	Expansion angle of the culvert flow (typ=20o)	20.0
V=	Allowable downstream velocity (typ=8 ft/s)	5
Fr=	Froude Number (0 if full)	2.32
Yn=	Depth of flow in Pipe Culvert (ft)*	0.95
	* Not necessary if Fr<1	

Solve For:

D_{50}=	Required Rip-rap size (ft)	0.58
D_{50}=	Required Rip-rap size (in)	7.0
D_{50}=	Required Rip-rap size (in)	7
A_t=	Req'd Area of flow at allowable velocity (ft^2)	3.8
Y_t=	Tailwater depth (ft)	0.69
L=	Length of Protection (ft)	4.1

Equations are valid for given hydraulic parameters

Error in Eq. 764, see page 783 of CCRFCD Manual

Equations from CCRFCD Manual

$(d_{50}/D)*(Y_t/D)1.2/(Q/D^{2.5})=0.023$	Eq. 760
Da=1/2(D+Yn) (used in place of D if Fr>1)	Eq. 762
$L=(1/(2 \tan Ø))(A_t/Y_t-W)$	Eq. 764
$A_t=Q/V$	Eq. 765

Worksheet for Facility #36

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	2.27	%
Diameter	30.00	in
Discharge	19.00	ft^3/s

Results

Normal Depth	0.95	ft
Flow Area	1.72	ft^2
Wetted Perimeter	3.32	ft
Hydraulic Radius	0.52	ft
Top Width	2.43	ft
Critical Depth	1.48	ft
Percent Full	38.1	%
Critical Slope	0.00497	ft/ft
Velocity	11.08	ft/s
Velocity Head	1.91	ft
Specific Energy	2.86	ft
Froude Number	2.32	
Maximum Discharge	66.47	ft^3/s
Discharge Full	61.80	ft^3/s
Slope Full	0.00215	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	38.06	%
Downstream Velocity	Infinity	ft/s

Worksheet for Facility #36

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.95	ft
Critical Depth	1.48	ft
Channel Slope	2.27	%
Critical Slope	0.00497	ft/ft

Cross Section for Facility #36

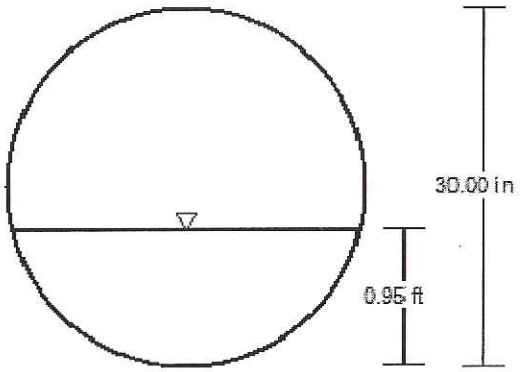
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	2.27	%
Normal Depth	0.95	ft
Diameter	30.00	in
Discharge	19.00	ft³/s

Cross Section Image



V: 1
H: 1

rcb.WSW

0

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JX  -1847.7003209.986  1  7   .015     2.000          3218.960       -90.0          .000
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R   -1261.1003215.600  1      .015                                  29.220    .000 0
R   -1165.7103216.145  1      .015                                    .000    .000 0
TS  -1115.7103216.430  5      .015                                    .000    .000 0
R   -1042.5403216.837  5      .015                                    .000    .000 0
R   -1038.4103216.861  5      .015                                    .000    .000 0
JX  -1035.4103216.878  5  4   .015     0.100          3227.870       -90.0          .000
R   -1005.1203217.051  5      .015                                   7.147    .000 0
R    -991.3503217.130  5      .015                                    .000    .000 0
WE                     5      .500
SH   -991.3503217.130  5      .015                        .000
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CD   2  4   0    .000   3.000
CD   3  4   0    .000   1.500
CD   4  4   0    .000   2.000
CD   5  3   1   1.000  14.000   21.000  .000  .000   .00
CD   6  3   0    .000  14.000   20.000  .000  .000   .00
CD   7  4   0    .000   4.000
Q          3309.000   .0
```

PULTE HOMES, INC.
VILLAGE 26 AT SUMMERLIN WEST
14' x 14' RCB

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT) / SF Ave	Water Elev / HF	Q (CFS) / SE Dpth	Vel (FPS) / Froude N	Vel Head / Norm Dp	Energy Grd.El. / "N"	Super Elev / X-Fall	Critical Depth / ZR	Flow Top Width / ZL	Height/Dia.-FT or I.D.	Base Wt or I.D.	ZL	No Wth Prs/Pip / Type Ch
-2058.060	3208.240	6.327	3214.567	3311.10	26.17	10.63	3225.20	4.25	9.48	20.00	14.000	20.000	.00	0 .0
WALL EXIT														
-2058.060	3208.240	9.911	3218.151	3311.10	23.86	8.84	3226.99	2.48	12.02	14.00	14.000	14.000	.00	0 .0
152.860	.0077					.0092	1.40	12.39	1.34	10.49	.015	.00	.00	BOX
-1905.200	3209.410	9.644	3219.053	3311.10	24.52	9.34	3228.39	.00	12.02	14.00	14.000	14.000	.00	0 .0
52.500	.0100					.0094	.50	9.64	1.39	9.44	.015	.00	.00	BOX
-1852.700	3209.935	9.676	3219.611	3311.10	24.44	9.28	3228.89	.00	12.02	14.00	14.000	14.000	.00	0 .0
JUNCT STR	.0102					.0094	.05	9.68	1.38		.015	.00	.00	BOX
-1847.700	3209.986	9.656	3219.641	3309.10	24.48	9.31	3228.95	.00	12.02	14.00	14.000	14.000	.00	0 .0
132.147	.0102					.0093	1.23	9.66	1.39	9.38	.015	.00	.00	BOX
-1715.553	3211.329	9.788	3221.117	3309.10	24.15	9.06	3230.17	.00	12.02	14.00	14.000	14.000	.00	0 .0
219.625	.0102					.0086	1.89	9.79	1.36	9.38	.015	.00	.00	BOX
-1495.928	3213.561	10.266	3223.826	3309.10	23.02	8.23	3232.06	.00	12.02	14.00	14.000	14.000	.00	0 .0
96.884	.0102					.0076	.74	10.27	1.27	9.38	.015	.00	.00	BOX
-1399.044	3214.545	10.767	3225.312	3309.10	21.95	7.48	3232.80	.00	12.02	14.00	14.000	14.000	.00	0 .0
45.326	.0102					.0067	.31	10.77	1.18	9.38	.015	.00	.00	BOX
-1353.718	3215.006	11.292	3226.298	3309.10	20.93	6.80	3233.10	.00	12.02	14.00	14.000	14.000	.00	0 .0
16.118	.0102					.0060	.10	11.29	1.10	9.38	.015	.00	.00	BOX

PULTE HOMES, INC.
VILLAGE 26 AT SUMMERLIN WEST
14' x 14' RCB

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT) / SF Ave	Water Elev / HF	Q (CFS) / SE Dpth	Vel (FPS) / Froude N	Vel Head / Norm Dp	Energy Grd.El. / "N"	Super Elev / X-Fall	Critical Depth / ZR	Flow Top Width / ZL	Height/Dia.-FT or I.D.	Base Wt or I.D.	ZL	No Wth Prs/Pip / Type Ch
-1337.600	3215.170	11.843	3227.013	3309.10	19.96	6.18	3233.20	1.15	12.02	14.00	14.000	14.000	.00	0 .0
76.500	.0056					.0057	.43	13.00	1.02	11.85	.015	.00	.00	BOX
-1261.100	3215.600	11.774	3227.374	3309.10	20.08	6.26	3233.63	.00	12.02	14.00	14.000	14.000	.00	0 .0
42.578	.0057					.0057	.24	11.77	1.03	11.77	.015	.00	.00	BOX
-1218.522	3215.843	11.774	3227.617	3309.10	20.08	6.26	3233.88	.00	12.02	14.00	14.000	14.000	.00	0 .0
52.812	.0057					.0056	.29	11.77	1.03	11.77	.015	.00	.00	BOX
-1165.710	3216.145	12.019	3228.164	3309.10	19.67	6.01	3234.17	.00	12.02	14.00	14.000	14.000	.00	0 .0
TRANS STR	.0057					.0034	.17	12.02	1.00		.015	.00	.00	BOX
-1115.710	3216.430	16.175	3232.605	3309.10	11.82	2.17	3234.77	.00	9.47	21.00	14.000	21.000	.00	1 1.0
73.170	.0056					.0034	.25	16.18	.57	10.03	.015	.00	.00	BOX
-1042.540	3216.837	16.018	3232.855	3309.10	11.82	2.17	3235.02	.00	9.47	21.00	14.000	21.000	.00	1 1.0
4.130	.0059					.0034	.01	16.02	.57	9.82	.015	.00	.00	BOX
-1038.410	3216.861	16.008	3232.869	3309.10	11.82	2.17	3235.04	.00	9.47	21.00	14.000	21.000	.00	1 1.0
JUNCT STR	.0056					.0034	.01	.00	.57		.015	.00	.00	BOX
-1035.410	3216.878	16.002	3232.880	3309.00	11.82	2.17	3235.05	.00	9.47	21.00	14.000	21.000	.00	1 1.0
30.290	.0057					.0034	.10	.00	.57	9.92	.015	.00	.00	BOX
-1005.120	3217.051	16.055	3233.105	3309.00	11.82	2.17	3235.27	.00	9.47	21.00	14.000	21.000	.00	1 1.0
13.770	.0057					.0034	.05	16.05	.57	9.91	.015	.00	.00	BOX

PULTE HOMES, INC.
VILLAGE 26 AT SUMMERLIN WEST
14' x 14' RCB

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT or I.D.	Base Wt or I.D.	ZL	No Wth Prs/Pip

L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-991.350	3217.130	16.023	3233.153	3309.00	11.82	2.17	3235.32	.00	9.47	21.00	14.000	21.000	.00	1 1.0
WALL	ENTRANCE													
-991.350	3217.130	16.325	3233.455	3309.00	11.26	1.97	3235.42	.00	9.17	21.00	14.000	21.000	.00	0 .0

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R   -5050.0003026.640  1      .015                                      .000    .000 0
JX  -4992.0403029.885  1  2   .015   67.000          3032.890          53.0          .000
R   -4981.5903030.470  1      .015                                      .000    .000 0
R   -4825.8603048.520  1      .015                                    44.600    .000 0
SH  -4825.8603048.520  1      .015                  3051.890
CD   1  3   0    .000   7.000   20.000  .000  .000   .00
CD   2  4   0    .000   4.000
Q          3401.000   .0
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♀ FILE: rcb.WSW W S P G W - CIVILDESIGN Version 14.08

Program Package Serial Number: 7044

WATER SURFACE PROFILE LISTING Date:12-15-2015 Time: 3:57:31

PULTE HOMES, INC.
VILLAGE 26 AT SUMMERLIN WEST
20' X 7' RCB

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
-5155.040	3023.200	3.580	3026.780	3468.00	48.44	36.44	3063.22	.00	7.00	20.00	7.000	20.000	.00	0 .0
55.040	.0116					.0703	3.87	3.58	4.51	6.50	.015	.00	.00	BOX
-5100.000	3023.840	3.424	3027.264	3468.00	50.64	39.82	3067.09	.00	7.00	20.00	7.000	20.000	.00	0 .0
50.000	.0560					.0765	3.83	3.42	4.82	3.78	.015	.00	.00	BOX
-5050.000	3026.640	3.379	3030.019	3468.00	51.32	40.90	3070.92	.00	7.00	20.00	7.000	20.000	.00	0 .0
JUNCT STR	.0560					.0840	4.87	3.38	4.92		.015	.00	.00	BOX
-4992.040	3029.885	3.181	3033.066	3401.00	53.46	44.38	3077.44	.00	7.00	20.00	7.000	20.000	.00	0 .0
10.450	.0560					.0905	.95	3.18	5.28	3.73	.015	.00	.00	BOX
-4981.590	3030.470	3.168	3033.637	3401.00	53.69	44.75	3078.39	7.00	7.00	20.00	7.000	20.000	.00	0 .0
45.493	.1159					.0892	4.06	7.00	5.32	2.93	.015	.00	.00	BOX
-4936.097	3035.743	3.213	3038.956	3401.00	52.92	43.49	3082.45	7.00	7.00	20.00	7.000	20.000	.00	0 .0
110.237	.1159					.0815	8.98	7.00	5.20	2.93	.015	.00	.00	BOX
-4825.860	3048.520	3.370	3051.890	3401.00	50.46	39.54	3091.43	7.00	7.00	20.00	7.000	20.000	.00	0 .0

♀

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

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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
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PROJECT DATA
Project Title: Village 26 Open Channel
Project File : Village26.prj
Run Date and Time: 12/12/2015 10:01:05 AM

Project in English units

PLAN DATA

Plan Title: Plan 03
Plan File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\V26 Channel\Village26.p03

Geometry Title: Village 26 Geometric Data Update R1
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\V26 Channel\Village26.g03

Flow Title : CP4 + 12-A + 12-B + 12-C
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\V26 Channel\Village26.f02

Plan Summary Information:
Number of: Cross Sections = 24 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 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: CP4 + 12-A + 12-B + 12-C
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\V26 Channel\Village26.f02

Flow Data (cfs)

River	Reach	RS	PF 1
Village 26 Open	V26	-2038.06	3311
Village 26 Open	V26	-3385	3371
Village 26 Open	V26	-4449.18	3401

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Village 26 Open	V26	PF 1	Normal S = 0.0076	Normal S = 0.1101

GEOMETRY DATA

Geometry Title: Village 26 Geometric Data Update R1
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\V26 Channel\Village26.g03

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2038.06

INPUT
Description: In V26 RCB
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3222.39	0	3208.39	14	3208.39	14	3222.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	14	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	14	19.99	19.99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3226.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.85	Wt. n-Val.		0.015	
W.S. Elev (ft)	3218.91	Reach Len. (ft)	19.99	19.99	19.99
Crit W.S. (ft)	3220.40	Flow Area (sq ft)		147.22	
E.G. Slope (ft/ft)	0.007600	Area (sq ft)		147.22	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	14.00	Top Width (ft)		14.00	
Vel Total (ft/s)	22.49	Avg. Vel. (ft/s)		22.49	
Max Chl Dpth (ft)	10.52	Hydr. Depth (ft)		10.52	
Conv. Total (cfs)	37979.7	Conv. (cfs)		37979.7	
Length Wtd. (ft)	19.99	Wetted Per. (ft)		35.03	
Min Ch El (ft)	3208.39	Shear (lb/sq ft)		1.99	
Alpha	1.00	Stream Power (lb/ft s)	14.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		5.31	
C & E Loss (ft)		Cum SA (acres)		1.28	

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2058.05

INPUT
Description: End of RCB
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3222.25	0	3208.25	14	3208.25	14	3222.25

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	14	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	14	.01	.01	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3226.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.79	Wt. n-Val.		0.015	
W.S. Elev (ft)	3218.81	Reach Len. (ft)	0.01	0.01	0.01
Crit W.S. (ft)	3220.26	Flow Area (sq ft)		147.79	
E.G. Slope (ft/ft)	0.007526	Area (sq ft)		147.79	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	14.00	Top Width (ft)		14.00	
Vel Total (ft/s)	22.40	Avg. Vel. (ft/s)		22.40	
Max Chl Dpth (ft)	10.56	Hydr. Depth (ft)		10.56	
Conv. Total (cfs)	38165.1	Conv. (cfs)		38165.1	
Length Wtd. (ft)	0.01	Wetted Per. (ft)		35.11	
Min Ch El (ft)	3208.25	Shear (lb/sq ft)		1.98	
Alpha	1.00	Stream Power (lb/ft s)	14.00	0.00	0.00
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)		5.24	
C & E Loss (ft)	0.02	Cum SA (acres)		1.27	

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2058.06

INPUT
Description: Beginning of Channel
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3225.25	0	3208.24	20	3208.24	20	3225.24

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	12	12	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	3		F
17	20		F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3226.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.83	Wt. n-Val.		0.015	
W.S. Elev (ft)	3218.77	Reach Len. (ft)	12.00	12.00	12.00
Crit W.S. (ft)	3220.28	Flow Area (sq ft)		147.41	
E.G. Slope (ft/ft)	0.002228	Area (sq ft)		210.58	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	22.46	Avg. Vel. (ft/s)		22.46	
Max Chl Dpth (ft)	10.53	Hydr. Depth (ft)		10.53	
Conv. Total (cfs)	70147.8	Conv. (cfs)		70147.8	
Length Wtd. (ft)	12.00	Wetted Per. (ft)		14.00	
Min Ch El (ft)	3208.24	Shear (lb/sq ft)		1.46	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		5.24	
C & E Loss (ft)	0.00	Cum SA (acres)		1.27	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: During the supercritical standard step calculations, the final energy answer that was computed is greater than the upstream energy. This is not physically possible. Please check your data.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2070.06

INPUT
Description: End of Ineffective Flow
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3225.15	0	3208.15	20	3208.15	20	3225.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	13	13	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3226.13	Element			
Vel Head (ft)	12.03	Wt. n-Val.		0.015	
W.S. Elev (ft)	3214.10	Reach Len. (ft)	13.00	13.00	13.00
Crit W.S. (ft)	3217.63	Flow Area (sq ft)		118.95	
E.G. Slope (ft/ft)	0.013652	Area (sq ft)		118.95	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	27.84	Avg. Vel. (ft/s)		27.84	
Max Chl Dpth (ft)	5.95	Hydr. Depth (ft)		5.95	
Conv. Total (cfs)	28337.7	Conv. (cfs)		28337.7	
Length Wtd. (ft)	13.00	Wetted Per. (ft)		31.90	
Min Ch El (ft)	3208.15	Shear (lb/sq ft)		3.18	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		5.20	
C & E Loss (ft)	0.42	Cum SA (acres)		1.27	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2083.06

INPUT
Description: Drop Channel Height to 9 feet
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3217.05	0	3208.05	20	3208.05	20	3217.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	142.14	142.14	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3225.91	Element			
Vel Head (ft)	11.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	3214.04	Reach Len. (ft)	142.14	142.14	142.14
Crit W.S. (ft)	3217.52	Flow Area (sq ft)		119.77	
E.G. Slope (ft/ft)	0.013388	Area (sq ft)		119.77	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	27.64	Avg. Vel. (ft/s)		27.64	
Max Chl Dpth (ft)	5.99	Hydr. Depth (ft)		5.99	
Conv. Total (cfs)	28615.1	Conv. (cfs)		28615.1	
Length Wtd. (ft)	142.14	Wetted Per. (ft)		31.98	
Min Ch El (ft)	3208.05	Shear (lb/sq ft)		3.13	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)		5.16	
C & E Loss (ft)	0.05	Cum SA (acres)		1.26	

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2225.20

INPUT
Description: Grade Break Location
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3215.98	0	3206.98	20	3206.98	20	3215.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	136.1	136.1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3223.73	Element			
Vel Head (ft)	10.33	Wt. n-Val.		0.015	
W.S. Elev (ft)	3213.40	Reach Len. (ft)	136.10	136.10	136.10
Crit W.S. (ft)	3216.45	Flow Area (sq ft)		128.37	
E.G. Slope (ft/ft)	0.011007	Area (sq ft)		128.37	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	

Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	25.79	Avg. Vel. (ft/s)		25.79	
Max Chl Dpth (ft)	6.42	Hydr. Depth (ft)		6.42	
Conv. Total (cfs)	31558.8	Conv. (cfs)		31558.8	
Length Wtd. (ft)	136.10	Wetted Per. (ft)		32.84	
Min Ch El (ft)	3206.98	Shear (lb/sq ft)		2.69	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	1.72	Cum Volume (acre-ft)		4.76	
C & E Loss (ft)	0.46	Cum SA (acres)		1.20	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2361.30

INPUT
Description: Drop Channel Height to 8 feet
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3209.65	0	3201.65	20	3201.65	20	3209.65

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	208.5	208.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3221.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	14.36	Wt. n-Val.		0.015	
W.S. Elev (ft)	3207.09	Reach Len. (ft)	208.50	208.50	208.50
Crit W.S. (ft)	3211.12	Flow Area (sq ft)		108.86	
E.G. Slope (ft/ft)	0.017574	Area (sq ft)		108.86	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	30.41	Avg. Vel. (ft/s)		30.41	
Max Chl Dpth (ft)	5.44	Hydr. Depth (ft)		5.44	
Conv. Total (cfs)	24976.0	Conv. (cfs)		24976.0	
Length Wtd. (ft)	208.50	Wetted Per. (ft)		30.89	
Min Ch El (ft)	3201.65	Shear (lb/sq ft)		3.87	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	1.87	Cum Volume (acre-ft)		4.39	
C & E Loss (ft)	0.40	Cum SA (acres)		1.13	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2569.80

INPUT
Description: Corresponds to WB Channel Sta. 2565.64
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3201.5	0	3193.5	20	3193.5	20	3201.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	53.17	53.17	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3216.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	18.40	Wt. n-Val.		0.015	
W.S. Elev (ft)	3198.31	Reach Len. (ft)	53.17	53.17	53.17
Crit W.S. (ft)	3202.97	Flow Area (sq ft)		96.19	
E.G. Slope (ft/ft)	0.025108	Area (sq ft)		96.19	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	34.42	Avg. Vel. (ft/s)		34.42	
Max Chl Dpth (ft)	4.81	Hydr. Depth (ft)		4.81	
Conv. Total (cfs)	20895.4	Conv. (cfs)		20895.4	
Length Wtd. (ft)	53.17	Wetted Per. (ft)		29.62	
Min Ch El (ft)	3193.50	Shear (lb/sq ft)		5.09	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	4.35	Cum Volume (acre-ft)		3.90	
C & E Loss (ft)	0.40	Cum SA (acres)		1.04	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2622.97

INPUT

Description: Angle Point
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3199.41	0	3191.41	21.8	3191.41	21.8	3199.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	21.8	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	21.8	10.25	10.25	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3215.17	Element			
Vel Head (ft)	19.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	3195.70	Reach Len. (ft)	10.25	10.25	10.25
Crit W.S. (ft)	3200.36	Flow Area (sq ft)		93.50	
E.G. Slope (ft/ft)	0.028545	Area (sq ft)		93.50	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	21.80	Top Width (ft)		21.80	
Vel Total (ft/s)	35.41	Avg. Vel. (ft/s)		35.41	
Max Chl Dpth (ft)	4.29	Hydr. Depth (ft)		4.29	
Conv. Total (cfs)	19597.1	Conv. (cfs)		19597.1	
Length Wtd. (ft)	10.25	Wetted Per. (ft)		30.38	
Min Ch El (ft)	3191.41	Shear (lb/sq ft)		5.48	
Alpha	1.00	Stream Power (lb/ft s)	21.80	0.00	0.00
Frctn Loss (ft)	1.42	Cum Volume (acre-ft)		3.78	
C & E Loss (ft)	0.11	Cum SA (acres)		1.01	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2633.22

INPUT
Description: Angle Point
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3199.03	0	3191.03	20	3191.03	20	3199.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	90.5	90.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3214.75	Element			
Vel Head (ft)	18.98	Wt. n-Val.		0.015	
W.S. Elev (ft)	3195.77	Reach Len. (ft)	90.50	90.50	90.50
Crit W.S. (ft)	3200.50	Flow Area (sq ft)		94.70	
E.G. Slope (ft/ft)	0.026268	Area (sq ft)		94.70	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	34.96	Avg. Vel. (ft/s)		34.96	
Max Chl Dpth (ft)	4.74	Hydr. Depth (ft)		4.74	
Conv. Total (cfs)	20429.1	Conv. (cfs)		20429.1	
Length Wtd. (ft)	90.50	Wetted Per. (ft)		29.47	
Min Ch El (ft)	3191.03	Shear (lb/sq ft)		5.27	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)		3.76	
C & E Loss (ft)	0.15	Cum SA (acres)		1.01	

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2723.72

INPUT
Description: Drop Channel Height to 6.8 feet and Grade Break Location
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3194.28	0	3187.48	20	3187.48	20	3194.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	276.28	276.28	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3212.16	Element			
Vel Head (ft)	20.08	Wt. n-Val.		0.015	
W.S. Elev (ft)	3192.08	Reach Len. (ft)	276.28	276.28	276.28
Crit W.S. (ft)	3196.95	Flow Area (sq ft)		92.08	
E.G. Slope (ft/ft)	0.028503	Area (sq ft)		92.08	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	35.96	Avg. Vel. (ft/s)		35.96	
Max Chl Dpth (ft)	4.60	Hydr. Depth (ft)		4.60	
Conv. Total (cfs)	19611.6	Conv. (cfs)		19611.6	
Length Wtd. (ft)	276.28	Wetted Per. (ft)		29.21	
Min Ch El (ft)	3187.48	Shear (lb/sq ft)		5.61	

Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	2.48	Cum Volume (acre-ft)		3.56	
C & E Loss (ft)	0.11	Cum SA (acres)		0.97	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3000.00

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3176.32	0	3169.52	20	3169.52	20	3176.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	200	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3201.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	28.04	Wt. n-Val.		0.015	
W.S. Elev (ft)	3173.42	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	3178.99	Flow Area (sq ft)		77.92	
E.G. Slope (ft/ft)	0.046542	Area (sq ft)		77.92	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	42.49	Avg. Vel. (ft/s)		42.49	
Max Chl Dpth (ft)	3.90	Hydr. Depth (ft)		3.90	
Conv. Total (cfs)	15347.5	Conv. (cfs)		15347.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		27.79	
Min Ch El (ft)	3169.52	Shear (lb/sq ft)		8.15	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	9.91	Cum Volume (acre-ft)		3.02	
C & E Loss (ft)	0.80	Cum SA (acres)		0.84	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3200

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3163.32	0	3156.52	20	3156.52	20	3163.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	185	185	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3191.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	30.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	3160.23	Reach Len. (ft)	185.00	185.00	185.00
Crit W.S. (ft)	3165.99	Flow Area (sq ft)		74.18	
E.G. Slope (ft/ft)	0.053853	Area (sq ft)		74.18	
Q Total (cfs)	3311.00	Flow (cfs)		3311.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	44.63	Avg. Vel. (ft/s)		44.63	
Max Chl Dpth (ft)	3.71	Hydr. Depth (ft)		3.71	
Conv. Total (cfs)	14267.8	Conv. (cfs)		14267.8	
Length Wtd. (ft)	185.00	Wetted Per. (ft)		27.42	
Min Ch El (ft)	3156.52	Shear (lb/sq ft)		9.10	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	10.00	Cum Volume (acre-ft)		2.68	
C & E Loss (ft)	0.29	Cum SA (acres)		0.75	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3385

INPUT
Description: 42" RCP CONNECTION
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3151.3	0	3144.5	20	3144.5	20	3151.3

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	15	15	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3180.74	Element			
Vel Head (ft)	32.56	Wt. n-Val.		0.015	
W.S. Elev (ft)	3148.18	Reach Len. (ft)	15.00	15.00	15.00
Crit W.S. (ft)	3154.06	Flow Area (sq ft)		73.61	
E.G. Slope (ft/ft)	0.057109	Area (sq ft)		73.61	
Q Total (cfs)	3371.00	Flow (cfs)		3371.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	45.79	Avg. Vel. (ft/s)		45.79	
Max Chl Dpth (ft)	3.68	Hydr. Depth (ft)		3.68	
Conv. Total (cfs)	14106.1	Conv. (cfs)		14106.1	
Length Wtd. (ft)	15.00	Wetted Per. (ft)		27.36	
Min Ch El (ft)	3144.50	Shear (lb/sq ft)		9.59	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	10.26	Cum Volume (acre-ft)		2.36	
C & E Loss (ft)	0.16	Cum SA (acres)		0.66	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3400

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3150.32	0	3143.52	20	3143.52	20	3150.32

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	200	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3179.87	Element			
Vel Head (ft)	32.68	Wt. n-Val.		0.015	
W.S. Elev (ft)	3147.19	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	3153.08	Flow Area (sq ft)		73.48	
E.G. Slope (ft/ft)	0.057414	Area (sq ft)		73.48	
Q Total (cfs)	3371.00	Flow (cfs)		3371.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	45.88	Avg. Vel. (ft/s)		45.88	
Max Chl Dpth (ft)	3.67	Hydr. Depth (ft)		3.67	
Conv. Total (cfs)	14068.5	Conv. (cfs)		14068.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		27.35	
Min Ch El (ft)	3143.52	Shear (lb/sq ft)		9.63	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	0.86	Cum Volume (acre-ft)		2.34	
C & E Loss (ft)	0.01	Cum SA (acres)		0.65	

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3600

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3137.31	0	3130.51	20	3130.51	20	3137.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	200	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3167.97	Element			
Vel Head (ft)	33.85	Wt. n-Val.		0.015	
W.S. Elev (ft)	3134.12	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	3140.07	Flow Area (sq ft)		72.20	
E.G. Slope (ft/ft)	0.060497	Area (sq ft)		72.20	
Q Total (cfs)	3371.00	Flow (cfs)		3371.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	46.69	Avg. Vel. (ft/s)		46.69	
Max Chl Dpth (ft)	3.61	Hydr. Depth (ft)		3.61	
Conv. Total (cfs)	13705.4	Conv. (cfs)		13705.4	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		27.22	
Min Ch El (ft)	3130.51	Shear (lb/sq ft)		10.02	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	11.79	Cum Volume (acre-ft)		2.00	
C & E Loss (ft)	0.12	Cum SA (acres)		0.56	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3800

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3124.31	0	3117.51	20	3117.51	20	3124.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	200	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3155.62	Element			
Vel Head (ft)	34.54	Wt. n-Val.		0.015	
W.S. Elev (ft)	3121.08	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	3127.07	Flow Area (sq ft)		71.48	
E.G. Slope (ft/ft)	0.062338	Area (sq ft)		71.48	
Q Total (cfs)	3371.00	Flow (cfs)		3371.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	47.16	Avg. Vel. (ft/s)		47.16	
Max Chl Dpth (ft)	3.57	Hydr. Depth (ft)		3.57	
Conv. Total (cfs)	13501.5	Conv. (cfs)		13501.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		27.15	
Min Ch El (ft)	3117.51	Shear (lb/sq ft)		10.25	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	12.28	Cum Volume (acre-ft)		1.67	
C & E Loss (ft)	0.07	Cum SA (acres)		0.47	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4000.00

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3111.31	0	3104.51	20	3104.51	20	3111.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	200	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3143.00	Element			
Vel Head (ft)	34.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	3108.06	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	3114.07	Flow Area (sq ft)		71.06	
E.G. Slope (ft/ft)	0.063431	Area (sq ft)		71.06	
Q Total (cfs)	3371.00	Flow (cfs)		3371.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	47.44	Avg. Vel. (ft/s)		47.44	
Max Chl Dpth (ft)	3.55	Hydr. Depth (ft)		3.55	
Conv. Total (cfs)	13384.7	Conv. (cfs)		13384.7	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		27.11	
Min Ch El (ft)	3104.51	Shear (lb/sq ft)		10.38	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	12.58	Cum Volume (acre-ft)		1.34	
C & E Loss (ft)	0.04	Cum SA (acres)		0.38	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4200

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3098.31	0	3091.51	20	3091.51	20	3098.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	200	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3130.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	35.18	Wt. n-Val.		0.015	
W.S. Elev (ft)	3095.05	Reach Len. (ft)	200.00	200.00	200.00
Crit W.S. (ft)	3101.07	Flow Area (sq ft)		70.83	
E.G. Slope (ft/ft)	0.064072	Area (sq ft)		70.83	
Q Total (cfs)	3371.00	Flow (cfs)		3371.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	47.60	Avg. Vel. (ft/s)		47.60	
Max Chl Dpth (ft)	3.54	Hydr. Depth (ft)		3.54	
Conv. Total (cfs)	13317.5	Conv. (cfs)		13317.5	
Length Wtd. (ft)	200.00	Wetted Per. (ft)		27.08	
Min Ch El (ft)	3091.51	Shear (lb/sq ft)		10.46	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	12.75	Cum Volume (acre-ft)		1.02	
C & E Loss (ft)	0.02	Cum SA (acres)		0.29	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4400

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3085.31	0	3078.51	20	3078.51	20	3085.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	49.18 49.18	49.18	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3117.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	35.32	Wt. n-Val.		0.015	
W.S. Elev (ft)	3082.04	Reach Len. (ft)	49.18	49.18	49.18
Crit W.S. (ft)	3088.07	Flow Area (sq ft)		70.68	
E.G. Slope (ft/ft)	0.064456	Area (sq ft)		70.68	
Q Total (cfs)	3371.00	Flow (cfs)		3371.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	47.69	Avg. Vel. (ft/s)		47.69	
Max Chl Dpth (ft)	3.53	Hydr. Depth (ft)		3.53	
Conv. Total (cfs)	13277.8	Conv. (cfs)		13277.8	
Length Wtd. (ft)	49.18	Wetted Per. (ft)		27.07	
Min Ch El (ft)	3078.51	Shear (lb/sq ft)		10.51	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	12.85	Cum Volume (acre-ft)		0.69	
C & E Loss (ft)	0.01	Cum SA (acres)		0.20	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4449.18

INPUT
Description: 36" RCP CONNECTION
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3082.11	0	3075.31	20	3075.31	20	3082.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	150.82 150.82	150.82	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3114.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	35.33	Wt. n-Val.		0.015	
W.S. Elev (ft)	3078.88	Reach Len. (ft)	150.82	150.82	150.82
Crit W.S. (ft)	3084.93	Flow Area (sq ft)		71.30	
E.G. Slope (ft/ft)	0.063920	Area (sq ft)		71.30	
Q Total (cfs)	3401.00	Flow (cfs)		3401.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	47.70	Avg. Vel. (ft/s)		47.70	
Max Chl Dpth (ft)	3.57	Hydr. Depth (ft)		3.57	
Conv. Total (cfs)	13452.0	Conv. (cfs)		13452.0	
Length Wtd. (ft)	150.82	Wetted Per. (ft)		27.13	
Min Ch El (ft)	3075.31	Shear (lb/sq ft)		10.49	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	3.16	Cum Volume (acre-ft)		0.61	
C & E Loss (ft)	0.00	Cum SA (acres)		0.17	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4600.00

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3072.31	0	3065.51	20	3065.51	20	3072.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	180.33	180.33	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3104.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	35.45	Wt. n-Val.		0.015	
W.S. Elev (ft)	3069.07	Reach Len. (ft)	180.33	180.33	180.33
Crit W.S. (ft)	3075.13	Flow Area (sq ft)		71.18	
E.G. Slope (ft/ft)	0.064261	Area (sq ft)		71.18	
Q Total (cfs)	3401.00	Flow (cfs)		3401.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	47.78	Avg. Vel. (ft/s)		47.78	
Max Chl Dpth (ft)	3.56	Hydr. Depth (ft)		3.56	
Conv. Total (cfs)	13416.3	Conv. (cfs)		13416.3	
Length Wtd. (ft)	180.33	Wetted Per. (ft)		27.12	
Min Ch El (ft)	3065.51	Shear (lb/sq ft)		10.53	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	9.67	Cum Volume (acre-ft)		0.37	
C & E Loss (ft)	0.01	Cum SA (acres)		0.10	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4780.33

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3060.59	0	3053.79	20	3053.79	20	3060.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	45.53	45.53	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3092.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	35.56	Wt. n-Val.		0.015	
W.S. Elev (ft)	3057.34	Reach Len. (ft)	45.53	45.53	45.53
Crit W.S. (ft)	3063.41	Flow Area (sq ft)		71.07	
E.G. Slope (ft/ft)	0.064538	Area (sq ft)		71.07	
Q Total (cfs)	3401.00	Flow (cfs)		3401.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	47.85	Avg. Vel. (ft/s)		47.85	
Max Chl Dpth (ft)	3.55	Hydr. Depth (ft)		3.55	
Conv. Total (cfs)	13387.5	Conv. (cfs)		13387.5	
Length Wtd. (ft)	45.53	Wetted Per. (ft)		27.11	
Min Ch El (ft)	3053.79	Shear (lb/sq ft)		10.56	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	11.61	Cum Volume (acre-ft)		0.07	
C & E Loss (ft)	0.01	Cum SA (acres)		0.02	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4825.86

INPUT
Description: End of Open Channel
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3055.2	0	3048.2	20	3048.2	20	3055.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	20	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	20	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3089.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	37.94	Wt. n-Val.		0.015	
W.S. Elev (ft)	3051.64	Reach Len. (ft)			
Crit W.S. (ft)	3057.82	Flow Area (sq ft)		68.80	
E.G. Slope (ft/ft)	0.071113	Area (sq ft)		68.80	
Q Total (cfs)	3401.00	Flow (cfs)		3401.00	

Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	49.43	Avg. Vel. (ft/s)		49.43	
Max Chl Dpth (ft)	3.44	Hydr. Depth (ft)		3.44	
Conv. Total (cfs)	12753.6	Conv. (cfs)		12753.6	
Length Wtd. (ft)		Wetted Per. (ft)		26.88	
Min Ch El (ft)	3048.20	Shear (lb/sq ft)		11.36	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)	3.08	Cum Volume (acre-ft)			
C & E Loss (ft)	0.24	Cum SA (acres)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:Village 26 Open

Reach	River Sta.	n1	n2	n3
V26	-2038.06	.015	.015	.015
V26	-2058.05	.015	.015	.015
V26	-2058.06	.015	.015	.015
V26	-2070.06	.015	.015	.015
V26	-2083.06	.015	.015	.015
V26	-2225.20	.015	.015	.015
V26	-2361.30	.015	.015	.015
V26	-2569.80	.015	.015	.015
V26	-2622.97	.015	.015	.015
V26	-2633.22	.015	.015	.015
V26	-2723.72	.015	.015	.015
V26	-3000.00	.015	.015	.015
V26	-3200	.015	.015	.015
V26	-3385	.015	.015	.015
V26	-3400	.015	.015	.015
V26	-3600	.015	.015	.015
V26	-3800	.015	.015	.015
V26	-4000.00	.015	.015	.015
V26	-4200	.015	.015	.015
V26	-4400	.015	.015	.015
V26	-4449.18	.015	.015	.015
V26	-4600.00	.015	.015	.015
V26	-4780.33	.015	.015	.015
V26	-4825.86	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Village 26 Open

Reach	River Sta.	Left	Channel	Right
V26	-2038.06	19.99	19.99	19.99
V26	-2058.05	.01	.01	.01
V26	-2058.06	12	12	12
V26	-2070.06	13	13	13
V26	-2083.06	142.14	142.14	142.14
V26	-2225.20	136.1	136.1	136.1
V26	-2361.30	208.5	208.5	208.5
V26	-2569.80	53.17	53.17	53.17
V26	-2622.97	10.25	10.25	10.25
V26	-2633.22	90.5	90.5	90.5
V26	-2723.72	276.28	276.28	276.28
V26	-3000.00	200	200	200
V26	-3200	185	185	185
V26	-3385	15	15	15
V26	-3400	200	200	200
V26	-3600	200	200	200
V26	-3800	200	200	200
V26	-4000.00	200	200	200
V26	-4200	200	200	200
V26	-4400	49.18	49.18	49.18
V26	-4449.18	150.82	150.82	150.82
V26	-4600.00	180.33	180.33	180.33
V26	-4780.33	45.53	45.53	45.53
V26	-4825.86			

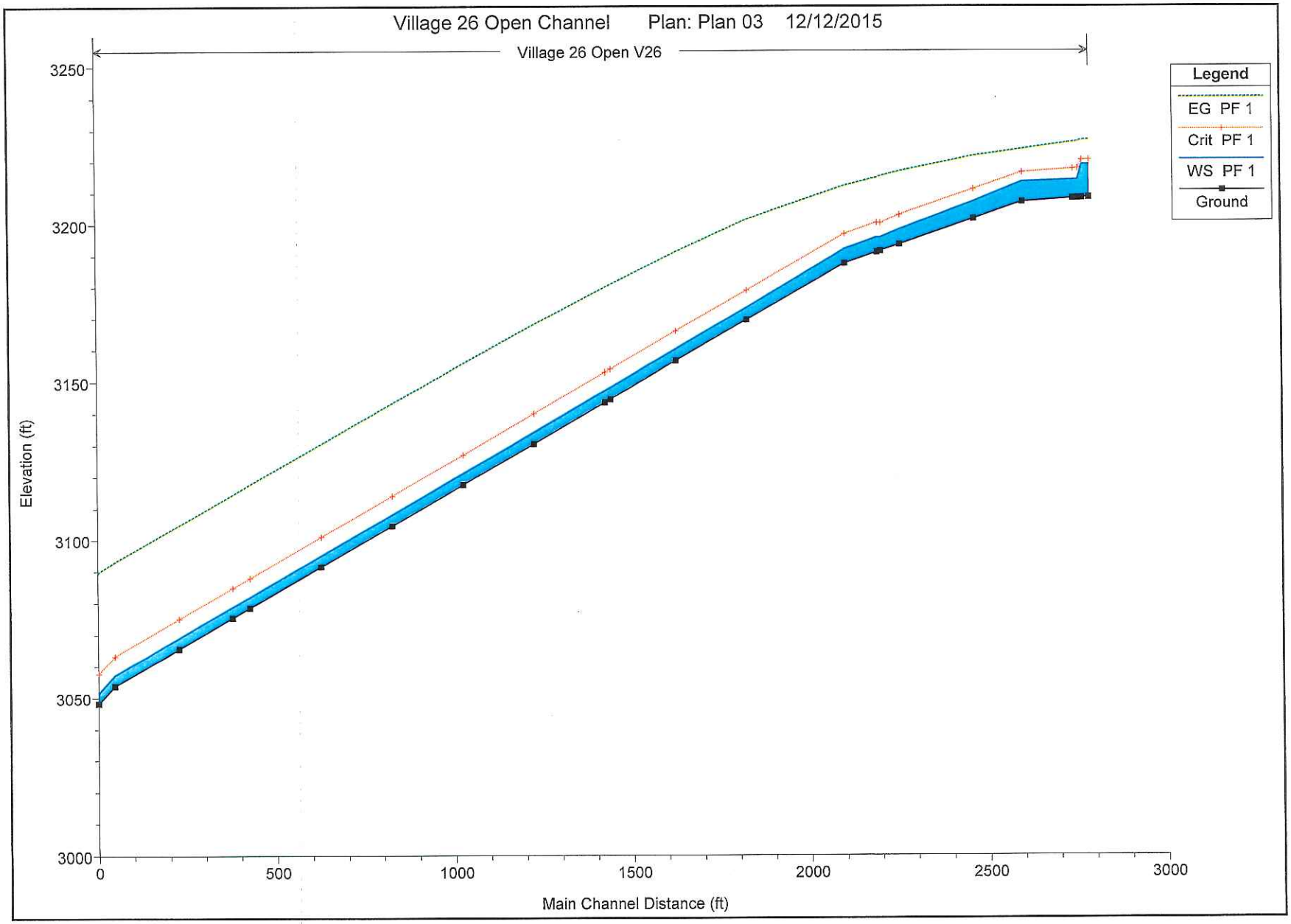
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Village 26 Open

Reach	River Sta.	Contr.	Expan.
V26	-2038.06	.1	.3
V26	-2058.05	.1	.3
V26	-2058.06	.1	.3
V26	-2070.06	.1	.3
V26	-2083.06	.1	.3
V26	-2225.20	.1	.3
V26	-2361.30	.1	.3
V26	-2569.80	.1	.3
V26	-2622.97	.1	.3
V26	-2633.22	.1	.3
V26	-2723.72	.1	.3
V26	-3000.00	.1	.3
V26	-3200	.1	.3
V26	-3385	.1	.3
V26	-3400	.1	.3

V26	-3600	.1	.3
V26	-3800	.1	.3
V26	-4000.00	.1	.3
V26	-4200	.1	.3
V26	-4400	.1	.3
V26	-4449.18	.1	.3
V26	-4600.00	.1	.3
V26	-4780.33	.1	.3
V26	-4825.86	.1	.3

HEC-RAS Plan: Plan 03 River: Village 26 Open Reach: V26 Profile: PF 1

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)	
V26	-2038.06	3311.00	3208.39	3218.91	3220.40	3226.76	0.007600	22.49	147.22	14.00	1.22
V26	-2058.05	3311.00	3208.25	3218.81	3220.26	3226.60	0.007526	22.40	147.79	14.00	1.22
V26	-2058.06	3311.00	3208.24	3218.77	3220.28	3226.60	0.002228	22.46	147.41	20.00	1.22
V26	-2070.06	3311.00	3208.15	3214.10	3217.63	3226.13	0.013652	27.84	118.95	20.00	2.01
V26	-2083.06	3311.00	3208.05	3214.04	3217.52	3225.91	0.013388	27.64	119.77	20.00	1.99
V26	-2225.20	3311.00	3206.98	3213.40	3216.45	3223.73	0.011007	25.79	128.37	20.00	1.79
V26	-2361.30	3311.00	3201.65	3207.09	3211.12	3221.46	0.017574	30.41	108.86	20.00	2.30
V26	-2569.80	3311.00	3193.50	3198.31	3202.97	3216.71	0.025108	34.42	96.19	20.00	2.77
V26	-2622.97	3311.00	3191.41	3195.70	3200.36	3215.17	0.028545	35.41	93.50	21.80	3.01
V26	-2633.22	3311.00	3191.03	3195.77	3200.50	3214.75	0.026268	34.96	94.70	20.00	2.83
V26	-2723.72	3311.00	3187.48	3192.08	3196.95	3212.16	0.028503	35.96	92.08	20.00	2.95
V26	-3000.00	3311.00	3169.52	3173.42	3178.99	3201.45	0.046542	42.49	77.92	20.00	3.79
V26	-3200	3311.00	3156.52	3160.23	3165.99	3191.17	0.053853	44.63	74.18	20.00	4.08
V26	-3385	3371.00	3144.50	3148.18	3154.06	3180.74	0.057109	45.79	73.61	20.00	4.21
V26	-3400	3371.00	3143.52	3147.19	3153.08	3179.87	0.057414	45.88	73.48	20.00	4.22
V26	-3600	3371.00	3130.51	3134.12	3140.07	3167.97	0.060497	46.69	72.20	20.00	4.33
V26	-3800	3371.00	3117.51	3121.08	3127.07	3155.62	0.062338	47.16	71.48	20.00	4.40
V26	-4000.00	3371.00	3104.51	3108.06	3114.07	3143.00	0.063431	47.44	71.06	20.00	4.43
V26	-4200	3371.00	3091.51	3095.05	3101.07	3130.23	0.064072	47.60	70.83	20.00	4.46
V26	-4400	3371.00	3078.51	3082.04	3088.07	3117.36	0.064456	47.69	70.68	20.00	4.47
V26	-4449.18	3401.00	3075.31	3078.88	3084.93	3114.20	0.063920	47.70	71.30	20.00	4.45
V26	-4600.00	3401.00	3065.51	3069.07	3075.13	3104.52	0.064261	47.78	71.18	20.00	4.46
V26	-4780.33	3401.00	3053.79	3057.34	3063.41	3092.90	0.064538	47.85	71.07	20.00	4.47
V26	-4825.86	3401.00	3048.20	3051.64	3057.82	3089.58	0.071113	49.43	68.80	20.00	4.70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Village 26 Open V26
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Crit PF 1
WS PF 1
Ground
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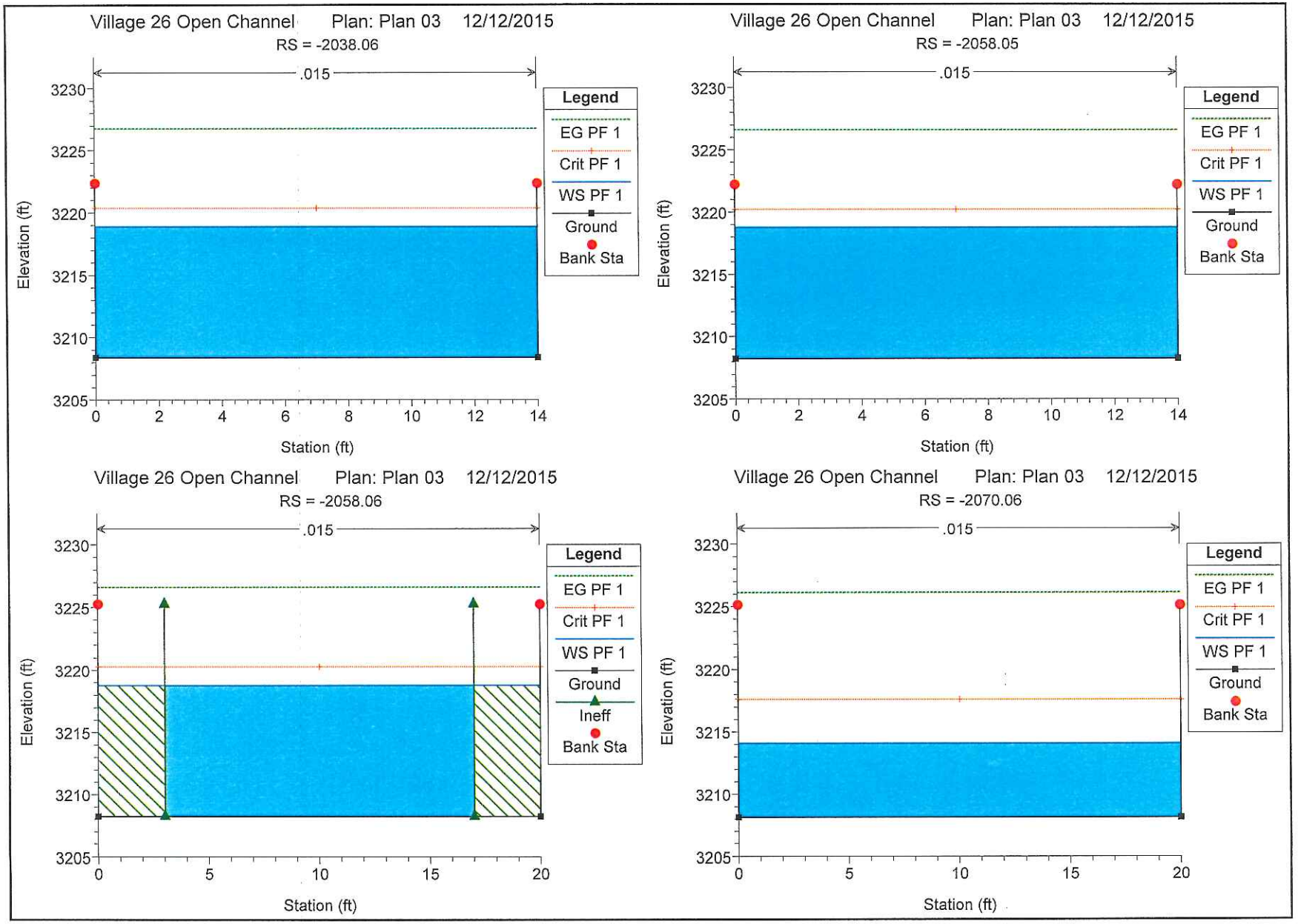
3200
3150
3100
3050
3000
0
500
1000
1500
2000
2500
3000
Main Channel Distance (ft)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Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -2058.05
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Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
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EG PF 1
Crit PF 1
WS PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
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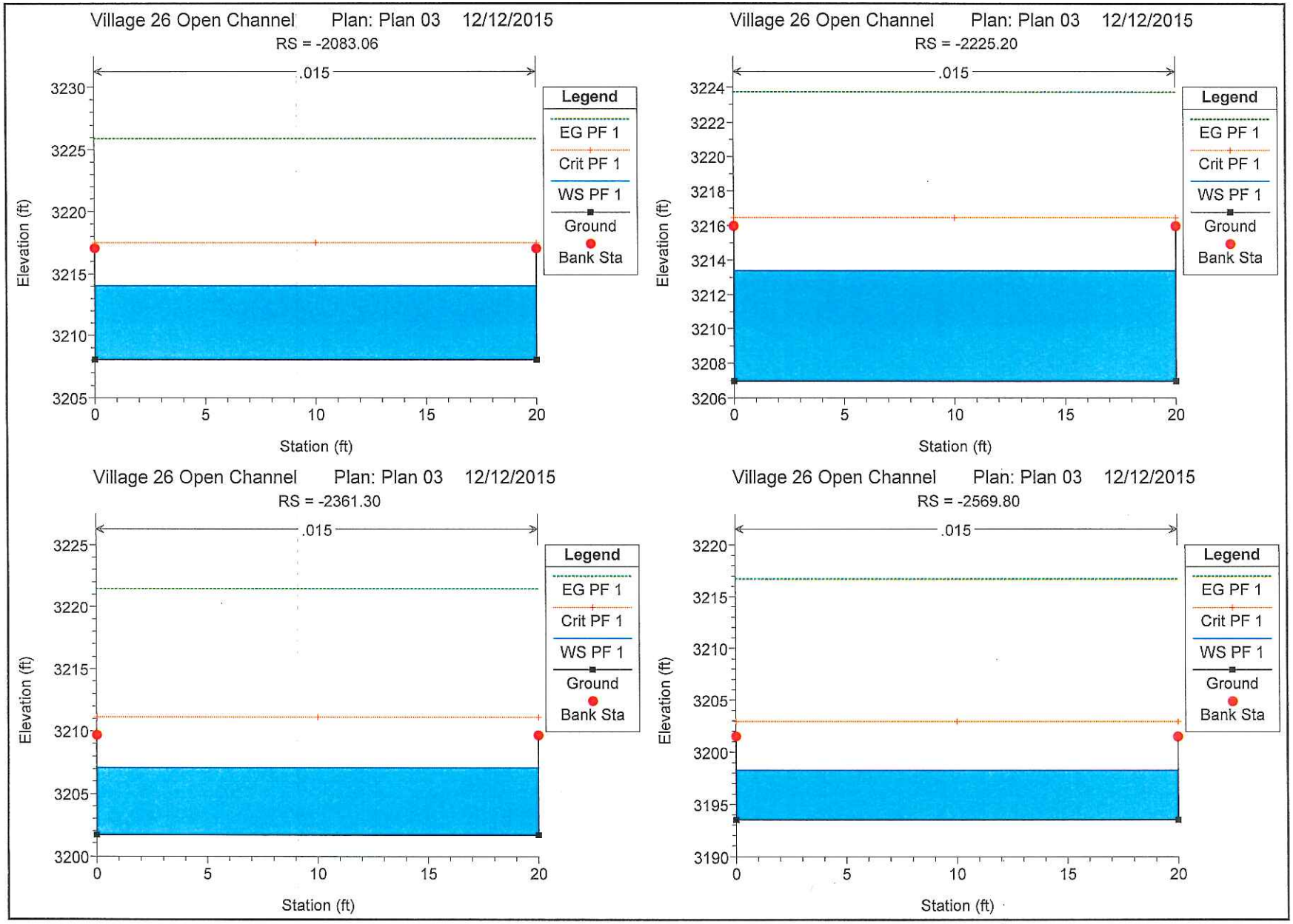
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)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Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -2225.20
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -2361.30
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
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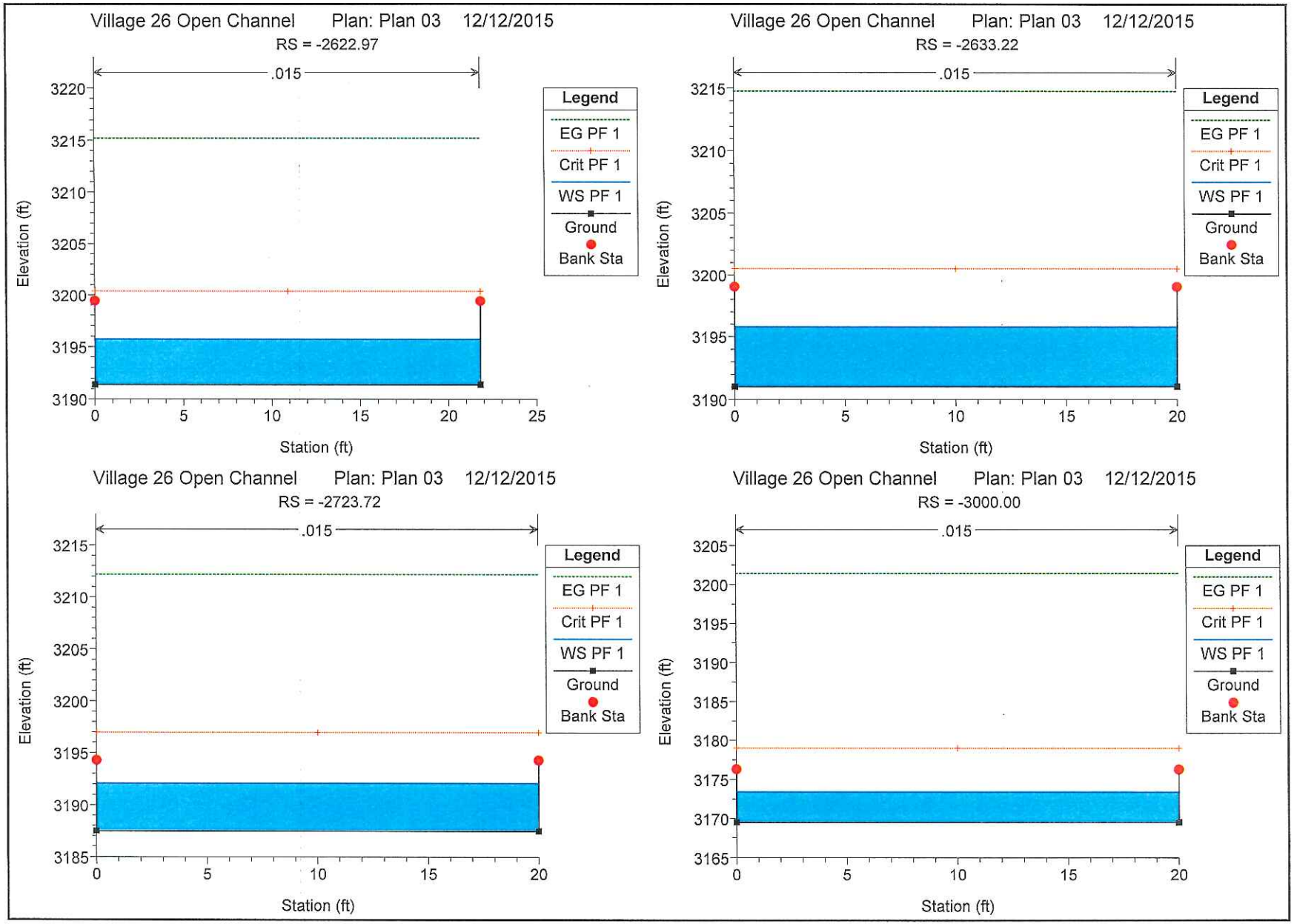
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)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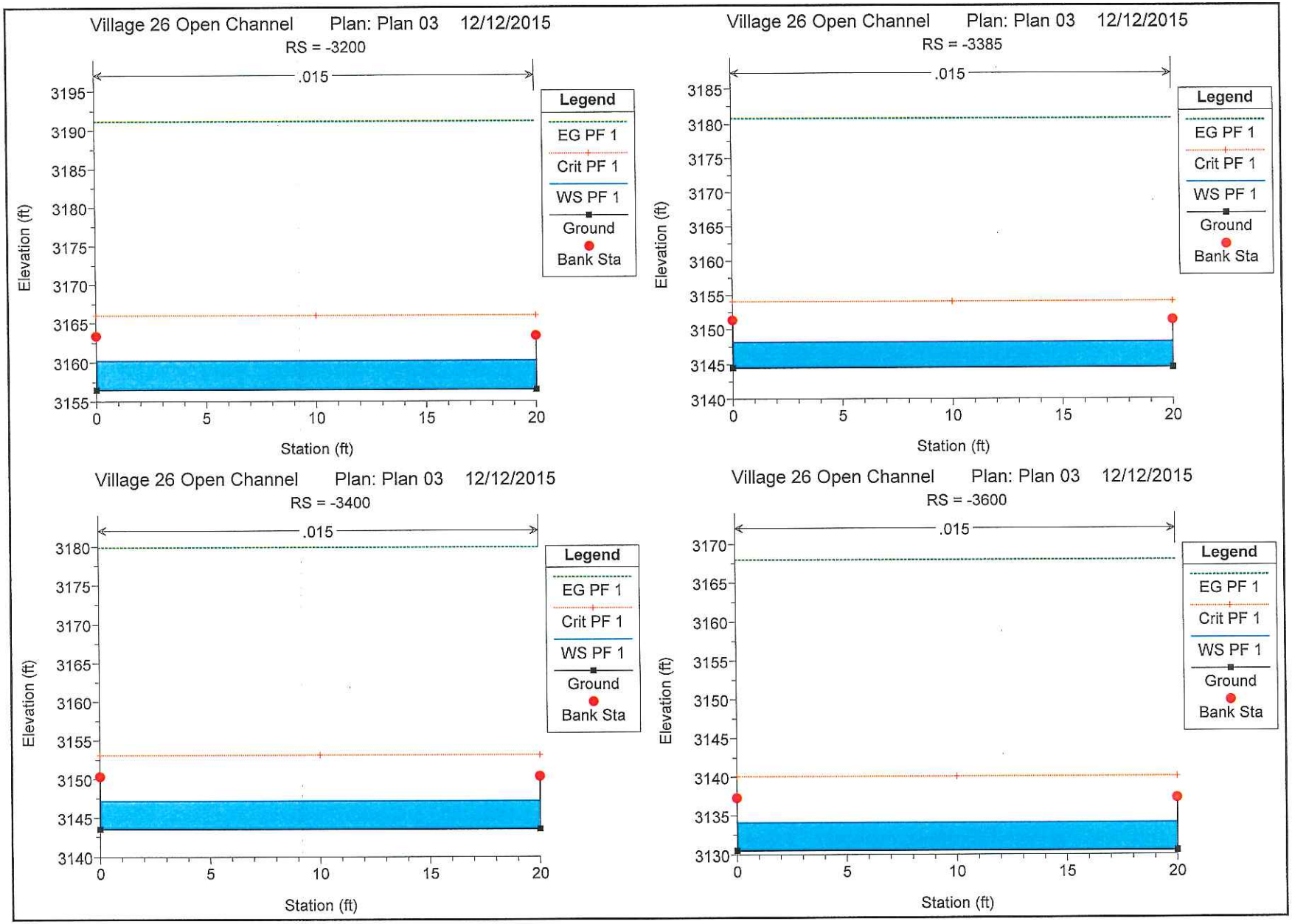
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -2633.22
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -2723.72
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -3000.00
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta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Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -3385
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -3400
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
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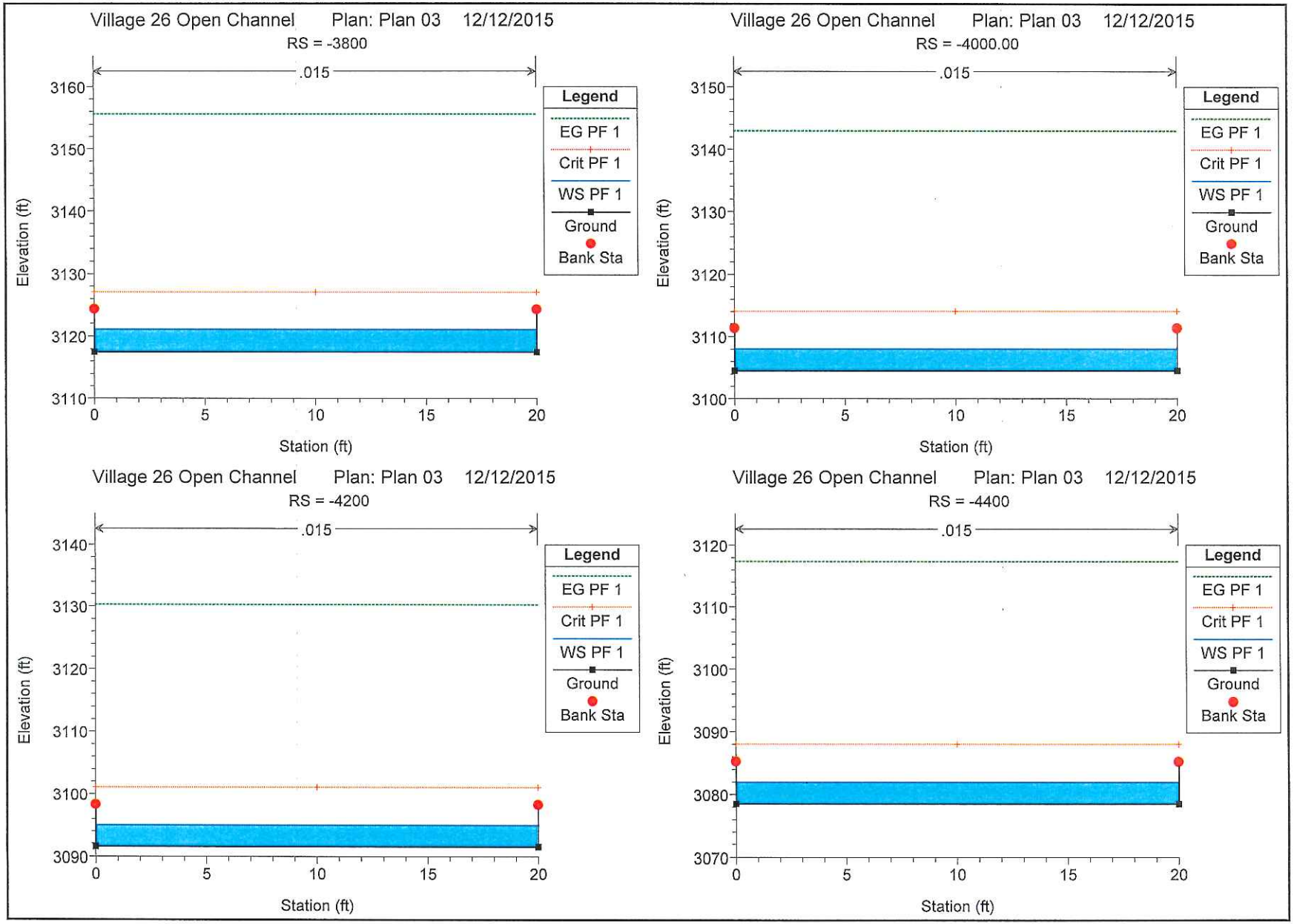
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -4000.00
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -4200
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Village 26 Open Channel Plan: Plan 03 12/12/2015
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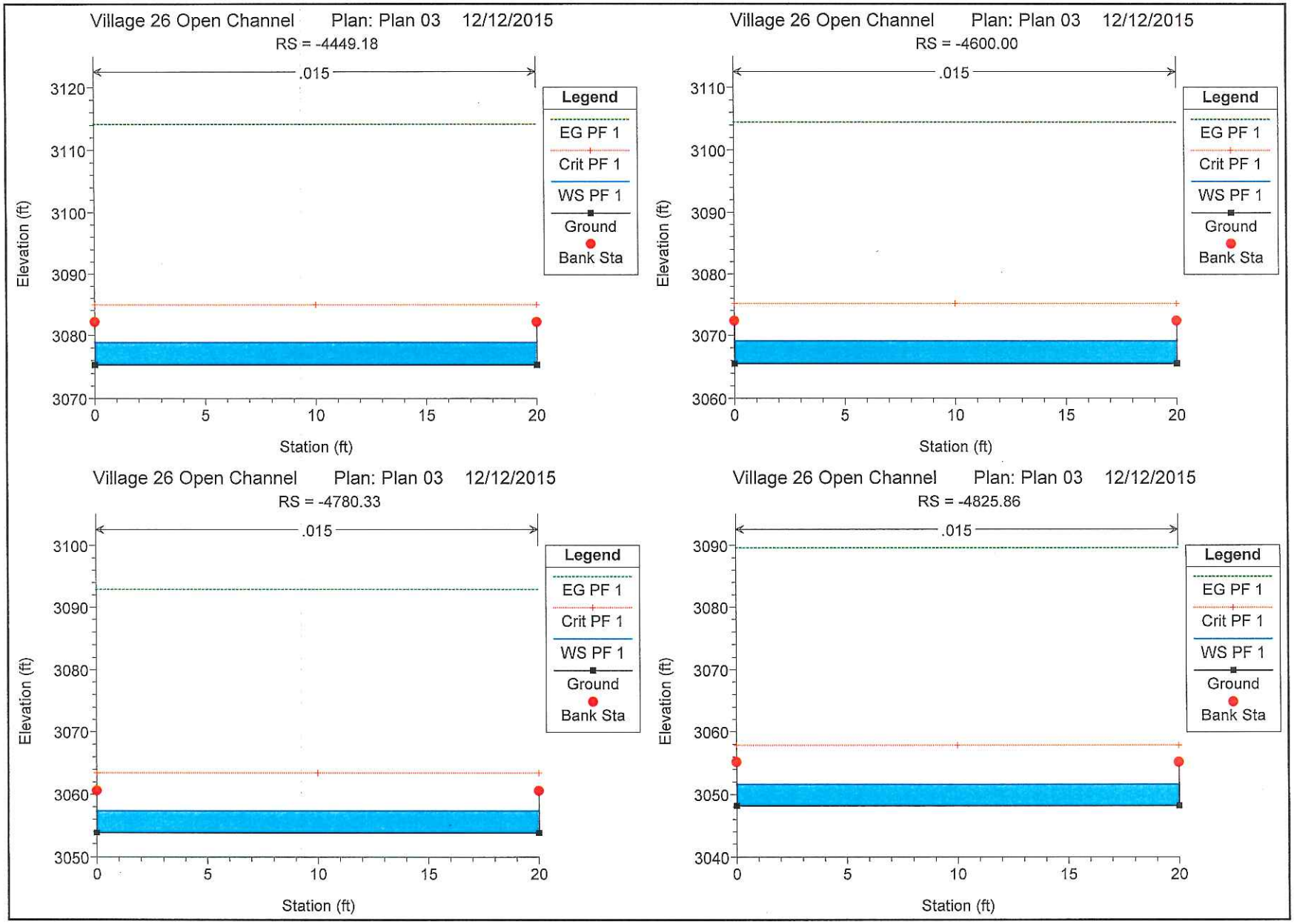
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta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Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -4600.00
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -4780.33
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)
Village 26 Open Channel Plan: Plan 03 12/12/2015
RS = -4825.86
.015
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

PROJECT DATA
Project Title: Revised Western Beltway Channel
Project File : WB.prj
Run Date and Time: 12/14/2015 6:51:54 PM

Project in English units

PLAN DATA

Plan Title: Plan 02
Plan File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Interim\WB.p02

Geometry Title: Western Beltway Geometric Data R1
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Interim\WB.g02

Flow Title : Referenced from Beltway Plans
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Interim\WB.f01

Plan Summary Information:

Number of:	Cross Sections	= 26	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 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: Referenced from Beltway Plans
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Interim\WB.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Village 26 Open	V26	-384.04	1664
Village 26 Open	V26	-1531.61	1692
Village 26 Open	V26	-2127.53	1716
Village 26 Open	V26	-4771.98	1769

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Village 26 Open	V26	PF 1	Normal S = 0.005	Normal S = 0.0653

GEOMETRY DATA

Geometry Title: Western Beltway Geometric Data R1
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Interim\WB.g02

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -384.04

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3230.97	17.4	3222.27	27.4	3221.97	37.4	3222.27	54.8	3230.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	54.8	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	54.8	572.08	572.08	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3229.56	Element		0.015	
Vel Head (ft)	3.32	Wt. n-Val.			
W.S. Elev (ft)	3226.24	Reach Len. (ft)	572.08	572.08	572.08
Crit W.S. (ft)	3227.21	Flow Area (sq ft)		113.81	
E.G. Slope (ft/ft)	0.005002	Area (sq ft)		113.81	
Q Total (cfs)	1664.00	Flow (cfs)		1664.00	
Top Width (ft)	35.87	Top Width (ft)		35.87	
Vel Total (ft/s)	14.62	Avg. Vel. (ft/s)		14.62	
Max Chl Dpth (ft)	4.27	Hydr. Depth (ft)		3.17	
Conv. Total (cfs)	23528.0	Conv. (cfs)		23528.0	
Length Wtd. (ft)	572.08	Wetted Per. (ft)		37.75	
Min Ch El (ft)	3221.97	Shear (lb/sq ft)		0.94	
Alpha	1.00	Stream Power (lb/ft s)	54.80	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		9.01	
C & E Loss (ft)		Cum SA (acres)		1.89	

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -956.12

INPUT
Description: Beginning of Transition

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3228.11	17.4	3219.41	27.4	3219.11	37.4	3219.41	54.8	3228.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	54.8	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	54.8	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3227.69	Element		0.015	
Vel Head (ft)	0.56	Wt. n-Val.			
W.S. Elev (ft)	3227.13	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	3224.33	Flow Area (sq ft)		276.38	
E.G. Slope (ft/ft)	0.000424	Area (sq ft)		276.38	
Q Total (cfs)	1664.00	Flow (cfs)		1664.00	
Top Width (ft)	50.86	Top Width (ft)		50.86	
Vel Total (ft/s)	6.02	Avg. Vel. (ft/s)		6.02	
Max Chl Dpth (ft)	8.02	Hydr. Depth (ft)		5.43	
Conv. Total (cfs)	80798.9	Conv. (cfs)		80798.9	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		54.51	
Min Ch El (ft)	3219.11	Shear (lb/sq ft)		0.13	
Alpha	1.00	Stream Power (lb/ft s)	54.80	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)		6.45	
C & E Loss (ft)	0.18	Cum SA (acres)		1.32	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1006.12

INPUT
Description: Beginning of Dual 10x9 Box

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3229.36	0	3218.36	10	3218.36	10	3229.36	11	3229.36
11	3218.36	21	3218.36	21	3229.36				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	21	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	21	400	400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3227.46	Element		0.015	
Vel Head (ft)	2.38	Wt. n-Val.			
W.S. Elev (ft)	3225.08	Reach Len. (ft)	400.00	400.00	400.00
Crit W.S. (ft)		Flow Area (sq ft)		134.36	
E.G. Slope (ft/ft)	0.003838	Area (sq ft)		134.36	
Q Total (cfs)	1664.00	Flow (cfs)		1664.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	12.38	Avg. Vel. (ft/s)		12.38	
Max Chl Dpth (ft)	6.72	Hydr. Depth (ft)		6.72	
Conv. Total (cfs)	26858.4	Conv. (cfs)		26858.4	
Length Wtd. (ft)	400.00	Wetted Per. (ft)		46.87	
Min Ch El (ft)	3218.36	Shear (lb/sq ft)		0.69	
Alpha	1.00	Stream Power (lb/ft s)	21.00	0.00	0.00
Frctn Loss (ft)	1.22	Cum Volume (acre-ft)		6.21	
C & E Loss (ft)	0.21	Cum SA (acres)		1.28	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1406.12

INPUT
Description: End of Box
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3227.36	0	3216.36	10	3216.36	10	3227.36	11	3227.36
11	3216.36	21	3216.36	21	3227.36				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	21	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	21	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3226.03	Element			
Vel Head (ft)	1.68	Wt. n-Val.		0.015	
W.S. Elev (ft)	3224.35	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)		Flow Area (sq ft)		159.77	
E.G. Slope (ft/ft)	0.002472	Area (sq ft)		159.77	
Q Total (cfs)	1664.00	Flow (cfs)		1664.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	10.42	Avg. Vel. (ft/s)		10.42	
Max Chl Dpth (ft)	7.99	Hydr. Depth (ft)		7.99	
Conv. Total (cfs)	33468.4	Conv. (cfs)		33468.4	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		51.95	
Min Ch El (ft)	3216.36	Shear (lb/sq ft)		0.47	
Alpha	1.00	Stream Power (lb/ft s)	21.00	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		4.86	
C & E Loss (ft)	0.06	Cum SA (acres)		1.10	

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1407.12

INPUT
Description: Beginning of Transition
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3227.35	0	3216.35	10	3216.35	11	3216.35	21	3216.35
21	3227.35								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	21	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	21	99	99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3225.97	Element			
Vel Head (ft)	1.47	Wt. n-Val.		0.015	
W.S. Elev (ft)	3224.50	Reach Len. (ft)	99.00	99.00	99.00
Crit W.S. (ft)		Flow Area (sq ft)		171.10	
E.G. Slope (ft/ft)	0.001264	Area (sq ft)		171.10	
Q Total (cfs)	1664.00	Flow (cfs)		1664.00	
Top Width (ft)	21.00	Top Width (ft)		21.00	
Vel Total (ft/s)	9.73	Avg. Vel. (ft/s)		9.73	
Max Chl Dpth (ft)	8.15	Hydr. Depth (ft)		8.15	
Conv. Total (cfs)	46797.7	Conv. (cfs)		46797.7	
Length Wtd. (ft)	99.00	Wetted Per. (ft)		37.30	
Min Ch El (ft)	3216.35	Shear (lb/sq ft)		0.36	
Alpha	1.00	Stream Power (lb/ft s)	21.00	0.00	0.00
Frctn Loss (ft)	0.19	Cum Volume (acre-ft)		4.86	
C & E Loss (ft)	0.15	Cum SA (acres)		1.10	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1506.12

INPUT
Description: End of Transition
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3224.58	0	3215.58	17	3215.58	17	3224.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	17	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	17	25.49 25.49	25.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3225.63	Element		0.015	
Vel Head (ft)	2.95	Wt. n-Val.			
W.S. Elev (ft)	3222.69	Reach Len. (ft)	25.49	25.49	25.49
Crit W.S. (ft)	3222.24	Flow Area (sq ft)		120.83	
E.G. Slope (ft/ft)	0.003180	Area (sq ft)		120.83	
Q Total (cfs)	1664.00	Flow (cfs)		1664.00	
Top Width (ft)	17.00	Top Width (ft)		17.00	
Vel Total (ft/s)	13.77	Avg. Vel. (ft/s)		13.77	
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)		7.11	
Conv. Total (cfs)	29507.4	Conv. (cfs)		29507.4	
Length Wtd. (ft)	25.49	Wetted Per. (ft)		31.21	
Min Ch El (ft)	3215.58	Shear (lb/sq ft)		0.77	
Alpha	1.00	Stream Power (lb/ft s)	17.00	0.00	0.00
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)		4.53	
C & E Loss (ft)	0.04	Cum SA (acres)		1.06	

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1531.61

INPUT
Description: Junction
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3224.38	0	3215.38	17	3215.38	17	3224.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	17	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	17	595.92	595.92	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3225.51	Element		0.015	
Vel Head (ft)	3.39	Wt. n-Val.			
W.S. Elev (ft)	3222.11	Reach Len. (ft)	595.92	595.92	595.92
Crit W.S. (ft)	3222.11	Flow Area (sq ft)		114.45	
E.G. Slope (ft/ft)	0.003814	Area (sq ft)		114.45	
Q Total (cfs)	1692.00	Flow (cfs)		1692.00	
Top Width (ft)	17.00	Top Width (ft)		17.00	
Vel Total (ft/s)	14.78	Avg. Vel. (ft/s)		14.78	
Max Chl Dpth (ft)	6.73	Hydr. Depth (ft)		6.73	
Conv. Total (cfs)	27399.2	Conv. (cfs)		27399.2	
Length Wtd. (ft)	595.92	Wetted Per. (ft)		30.46	
Min Ch El (ft)	3215.38	Shear (lb/sq ft)		0.89	
Alpha	1.00	Stream Power (lb/ft s)	17.00	0.00	0.00
Frctn Loss (ft)	2.28	Cum Volume (acre-ft)		4.46	
C & E Loss (ft)	0.00	Cum SA (acres)		1.05	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2127.53

INPUT
Description: Begin Transition
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3218.2	0	3210.7	17	3210.7	17	3218.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	17	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	17	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3221.94	Element		0.015	
Vel Head (ft)	6.18	Wt. n-Val.			
W.S. Elev (ft)	3215.76	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	3217.50	Flow Area (sq ft)		86.04	
E.G. Slope (ft/ft)	0.008696	Area (sq ft)		86.04	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	17.00	Top Width (ft)		17.00	
Vel Total (ft/s)	19.94	Avg. Vel. (ft/s)		19.94	
Max Chl Dpth (ft)	5.06	Hydr. Depth (ft)		5.06	
Conv. Total (cfs)	18402.0	Conv. (cfs)		18402.0	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		27.12	
Min Ch El (ft)	3210.70	Shear (lb/sq ft)		1.72	
Alpha	1.00	Stream Power (lb/ft s)	17.00	0.00	0.00
Frctn Loss (ft)	3.29	Cum Volume (acre-ft)		3.09	
C & E Loss (ft)	0.28	Cum SA (acres)		0.81	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2177.53

INPUT
Description: End Transition

Station Elevation Data	num=	4					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3216.23	0	3208.73	15	3208.73	15	3216.23

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	15	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	15	150	150	150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3221.34	Element		0.015	
Vel Head (ft)	7.35	Wt. n-Val.			
W.S. Elev (ft)	3213.99	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)	3216.12	Flow Area (sq ft)		78.89	
E.G. Slope (ft/ft)	0.010706	Area (sq ft)		78.89	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	15.00	Top Width (ft)		15.00	
Vel Total (ft/s)	21.75	Avg. Vel. (ft/s)		21.75	
Max Chl Dpth (ft)	5.26	Hydr. Depth (ft)		5.26	
Conv. Total (cfs)	16584.2	Conv. (cfs)		16584.2	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		25.52	
Min Ch El (ft)	3208.73	Shear (lb/sq ft)		2.07	
Alpha	1.00	Stream Power (lb/ft s)	15.00	0.00	0.00
Frctn Loss (ft)	0.48	Cum Volume (acre-ft)		2.99	
C & E Loss (ft)	0.12	Cum SA (acres)		0.80	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2327.53

INPUT
Description:

Station Elevation Data	num=	4					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3210.34	0	3202.84	15	3202.84	15	3210.34

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	15	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	15	150	150	150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3218.73	Element		0.015	
Vel Head (ft)	11.72	Wt. n-Val.			
W.S. Elev (ft)	3207.00	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)	3210.23	Flow Area (sq ft)		62.45	
E.G. Slope (ft/ft)	0.020698	Area (sq ft)		62.45	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	15.00	Top Width (ft)		15.00	
Vel Total (ft/s)	27.48	Avg. Vel. (ft/s)		27.48	
Max Chl Dpth (ft)	4.16	Hydr. Depth (ft)		4.16	
Conv. Total (cfs)	11927.7	Conv. (cfs)		11927.7	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		23.33	
Min Ch El (ft)	3202.84	Shear (lb/sq ft)		3.46	
Alpha	1.00	Stream Power (lb/ft s)	15.00	0.00	0.00
Frctn Loss (ft)	2.17	Cum Volume (acre-ft)		2.75	
C & E Loss (ft)	0.44	Cum SA (acres)		0.74	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2477.53

INPUT
Description:

Station Elevation Data	num=	4					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3204.44	0	3196.94	15	3196.94	15	3204.44

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	15	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	15	87.93	87.93	87.93	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3214.93	Element			

Vel Head (ft)	14.21	Wt. n-Val.		0.015	
W.S. Elev (ft)	3200.72	Reach Len. (ft)	87.93	87.93	87.93
Crit W.S. (ft)	3204.33	Flow Area (sq ft)		56.73	
E.G. Slope (ft/ft)	0.027279	Area (sq ft)		56.73	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	15.00	Top Width (ft)		15.00	
Vel Total (ft/s)	30.25	Avg. Vel. (ft/s)		30.25	
Max Chl Dpth (ft)	3.78	Hydr. Depth (ft)		3.78	
Conv. Total (cfs)	10389.7	Conv. (cfs)		10389.7	
Length Wtd. (ft)	87.93	Wetted Per. (ft)		22.56	
Min Ch El (ft)	3196.94	Shear (lb/sq ft)		4.28	
Alpha	1.00	Stream Power (lb/ft s)	15.00	0.00	0.00
Frctn Loss (ft)	3.55	Cum Volume (acre-ft)		2.54	
C & E Loss (ft)	0.25	Cum SA (acres)		0.69	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2565.46

INPUT
Description: Beginning of Transition
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3200.98	0	3193.48	15	3193.48	15	3200.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	15	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	15	61.22	61.22	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3212.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	15.19	Wt. n-Val.		0.015	
W.S. Elev (ft)	3197.14	Reach Len. (ft)	61.22	61.22	61.22
Crit W.S. (ft)	3200.87	Flow Area (sq ft)		54.87	
E.G. Slope (ft/ft)	0.030028	Area (sq ft)		54.87	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	15.00	Top Width (ft)		15.00	
Vel Total (ft/s)	31.27	Avg. Vel. (ft/s)		31.27	
Max Chl Dpth (ft)	3.66	Hydr. Depth (ft)		3.66	
Conv. Total (cfs)	9902.7	Conv. (cfs)		9902.7	
Length Wtd. (ft)	61.22	Wetted Per. (ft)		22.32	
Min Ch El (ft)	3193.48	Shear (lb/sq ft)		4.61	
Alpha	1.00	Stream Power (lb/ft s)	15.00	0.00	0.00
Frctn Loss (ft)	2.52	Cum Volume (acre-ft)		2.43	
C & E Loss (ft)	0.10	Cum SA (acres)		0.66	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2626.68

INPUT
Description: End of Transition
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3198.57	0	3191.07	11	3191.07	11	3198.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	91.08	91.08	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3210.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	14.06	Wt. n-Val.		0.015	
W.S. Elev (ft)	3196.25	Reach Len. (ft)	91.08	91.08	91.08
Crit W.S. (ft)	3200.15	Flow Area (sq ft)		57.02	
E.G. Slope (ft/ft)	0.024932	Area (sq ft)		57.02	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	30.09	Avg. Vel. (ft/s)		30.09	
Max Chl Dpth (ft)	5.18	Hydr. Depth (ft)		5.18	
Conv. Total (cfs)	10867.7	Conv. (cfs)		10867.7	
Length Wtd. (ft)	91.08	Wetted Per. (ft)		21.37	
Min Ch El (ft)	3191.07	Shear (lb/sq ft)		4.15	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	1.67	Cum Volume (acre-ft)		2.35	
C & E Loss (ft)	0.34	Cum SA (acres)		0.64	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2717.76

INPUT
Description: Grade Break
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3194.28	0	3187.48	11	3187.48	11	3194.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	82.24	82.24	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3207.78	Element			
Vel Head (ft)	15.33	Wt. n-Val.		0.015	
W.S. Elev (ft)	3192.44	Reach Len. (ft)	82.24	82.24	82.24
Crit W.S. (ft)	3196.58	Flow Area (sq ft)		54.61	
E.G. Slope (ft/ft)	0.028013	Area (sq ft)		54.61	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	31.42	Avg. Vel. (ft/s)		31.42	
Max Chl Dpth (ft)	4.96	Hydr. Depth (ft)		4.96	
Conv. Total (cfs)	10252.6	Conv. (cfs)		10252.6	
Length Wtd. (ft)	82.24	Wetted Per. (ft)		20.93	
Min Ch El (ft)	3187.48	Shear (lb/sq ft)		4.56	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	2.40	Cum Volume (acre-ft)		2.24	
C & E Loss (ft)	0.13	Cum SA (acres)		0.62	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2800.00

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3188.9	0	3182.1	11	3182.1	11	3188.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3204.91	Element			
Vel Head (ft)	18.26	Wt. n-Val.		0.015	
W.S. Elev (ft)	3186.65	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	3191.18	Flow Area (sq ft)		50.04	
E.G. Slope (ft/ft)	0.035507	Area (sq ft)		50.04	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	34.29	Avg. Vel. (ft/s)		34.29	
Max Chl Dpth (ft)	4.55	Hydr. Depth (ft)		4.55	
Conv. Total (cfs)	9106.6	Conv. (cfs)		9106.6	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		20.10	
Min Ch El (ft)	3182.10	Shear (lb/sq ft)		5.52	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	2.58	Cum Volume (acre-ft)		2.14	
C & E Loss (ft)	0.29	Cum SA (acres)		0.60	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2900.00

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3182.36	0	3175.56	11	3175.56	11	3182.36

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3200.74	Element			
Vel Head (ft)	20.93	Wt. n-Val.		0.015	
W.S. Elev (ft)	3179.81	Reach Len. (ft)	100.00	100.00	100.00

Crit W.S. (ft)	3184.66	Flow Area (sq ft)		46.74	
E.G. Slope (ft/ft)	0.042823	Area (sq ft)		46.74	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	36.72	Avg. Vel. (ft/s)		36.72	
Max Chl Dpth (ft)	4.25	Hydr. Depth (ft)		4.25	
Conv. Total (cfs)	8292.4	Conv. (cfs)		8292.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		19.50	
Min Ch El (ft)	3175.56	Shear (lb/sq ft)		6.41	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	3.89	Cum Volume (acre-ft)		2.03	
C & E Loss (ft)	0.27	Cum SA (acres)		0.58	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3000.00

INPUT
Description:

Station Elevation Data	num=	4					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3175.83	0	3169.03	11	3169.03	11	3175.83

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	150	150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3195.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	22.90	Wt. n-Val.		0.015	
W.S. Elev (ft)	3173.09	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)	3178.13	Flow Area (sq ft)		44.68	
E.G. Slope (ft/ft)	0.048479	Area (sq ft)		44.68	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	38.40	Avg. Vel. (ft/s)		38.40	
Max Chl Dpth (ft)	4.06	Hydr. Depth (ft)		4.06	
Conv. Total (cfs)	7793.6	Conv. (cfs)		7793.6	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		19.12	
Min Ch El (ft)	3169.03	Shear (lb/sq ft)		7.07	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	4.55	Cum Volume (acre-ft)		1.92	
C & E Loss (ft)	0.20	Cum SA (acres)		0.55	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3150.00

INPUT
Description: End of Horizontal Curve

Station Elevation Data	num=	4					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3166.02	0	3159.22	11	3159.22	11	3166.02

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	450	450	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3188.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	24.97	Wt. n-Val.		0.015	
W.S. Elev (ft)	3163.11	Reach Len. (ft)	450.00	450.00	450.00
Crit W.S. (ft)	3168.32	Flow Area (sq ft)		42.79	
E.G. Slope (ft/ft)	0.054656	Area (sq ft)		42.79	
Q Total (cfs)	1716.00	Flow (cfs)		1716.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	40.10	Avg. Vel. (ft/s)		40.10	
Max Chl Dpth (ft)	3.89	Hydr. Depth (ft)		3.89	
Conv. Total (cfs)	7340.0	Conv. (cfs)		7340.0	
Length Wtd. (ft)	450.00	Wetted Per. (ft)		18.78	
Min Ch El (ft)	3159.22	Shear (lb/sq ft)		7.77	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	7.71	Cum Volume (acre-ft)		1.77	
C & E Loss (ft)	0.21	Cum SA (acres)		0.51	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open

REACH: V26 RS: -3600

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3136.76	0	3129.96	11	3129.96	11	3136.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	400	400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3161.38	Wt. n-Val.		0.015	
Vel Head (ft)	27.73	Reach Len. (ft)	400.00	400.00	400.00
W.S. Elev (ft)	3133.65	Flow Area (sq ft)		40.61	
Crit W.S. (ft)	3139.06	Area (sq ft)		40.61	
E.G. Slope (ft/ft)	0.063253	Flow (cfs)		1716.00	
Q Total (cfs)	1716.00	Top Width (ft)		11.00	
Top Width (ft)	11.00	Avg. Vel. (ft/s)		42.26	
Vel Total (ft/s)	42.26	Hydr. Depth (ft)		3.69	
Max Chl Dpth (ft)	3.69	Conv. (cfs)		6823.0	
Conv. Total (cfs)	6823.0	Wetted Per. (ft)		18.38	
Length Wtd. (ft)	400.00	Shear (lb/sq ft)		8.72	
Min Ch El (ft)	3129.96	Stream Power (lb/ft s)	11.00	0.00	0.00
Alpha	1.00	Cum Volume (acre-ft)		1.34	
Frctn Loss (ft)	26.42	Cum SA (acres)		0.40	
C & E Loss (ft)	0.28				

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4000

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3110.76	0	3103.96	11	3103.96	11	3110.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	400	400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3135.77	Wt. n-Val.		0.015	
Vel Head (ft)	28.15	Reach Len. (ft)	400.00	400.00	400.00
W.S. Elev (ft)	3107.62	Flow Area (sq ft)		40.30	
Crit W.S. (ft)	3113.06	Area (sq ft)		40.30	
E.G. Slope (ft/ft)	0.064595	Flow (cfs)		1716.00	
Q Total (cfs)	1716.00	Top Width (ft)		11.00	
Top Width (ft)	11.00	Avg. Vel. (ft/s)		42.58	
Vel Total (ft/s)	42.58	Hydr. Depth (ft)		3.66	
Max Chl Dpth (ft)	3.66	Conv. (cfs)		6751.8	
Conv. Total (cfs)	6751.8	Wetted Per. (ft)		18.33	
Length Wtd. (ft)	400.00	Shear (lb/sq ft)		8.87	
Min Ch El (ft)	3103.96	Stream Power (lb/ft s)	11.00	0.00	0.00
Alpha	1.00	Cum Volume (acre-ft)		0.97	
Frctn Loss (ft)	25.57	Cum SA (acres)		0.30	
C & E Loss (ft)	0.04				

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4400

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3084.76	0	3077.96	11	3077.96	11	3084.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	371.98	371.98 371.98	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3109.86	Wt. n-Val.		0.015	
Vel Head (ft)	28.25	Reach Len. (ft)	371.98	371.98	371.98
W.S. Elev (ft)	3081.62	Flow Area (sq ft)		40.23	
Crit W.S. (ft)	3087.06	Area (sq ft)		40.23	
E.G. Slope (ft/ft)	0.064909	Flow (cfs)		1716.00	
Q Total (cfs)	1716.00				

Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	42.65	Avg. Vel. (ft/s)		42.65	
Max Chl Dpth (ft)	3.66	Hydr. Depth (ft)		3.66	
Conv. Total (cfs)	6735.4	Conv. (cfs)		6735.4	
Length Wtd. (ft)	371.98	Wetted Per. (ft)		18.32	
Min Ch El (ft)	3077.96	Shear (lb/sq ft)		8.90	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	25.90	Cum Volume (acre-ft)		0.60	
C & E Loss (ft)	0.01	Cum SA (acres)		0.20	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4771.98

INPUT
Description: Grade Break
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3060.56	0	3053.76	11	3053.76	11	3060.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	109.02	109.02	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3085.92	Element		0.015	
Vel Head (ft)	28.39	Wt. n-Val.	109.02	109.02	109.02
W.S. Elev (ft)	3057.52	Reach Len. (ft)		41.37	
Crit W.S. (ft)	3063.05	Flow Area (sq ft)		41.37	
E.G. Slope (ft/ft)	0.063826	Area (sq ft)		1769.00	
Q Total (cfs)	1769.00	Flow (cfs)		11.00	
Top Width (ft)	11.00	Top Width (ft)		42.76	
Vel Total (ft/s)	42.76	Avg. Vel. (ft/s)		3.76	
Max Chl Dpth (ft)	3.76	Hydr. Depth (ft)		7002.1	
Conv. Total (cfs)	7002.1	Conv. (cfs)		18.52	
Length Wtd. (ft)	109.02	Wetted Per. (ft)		8.90	
Min Ch El (ft)	3053.76	Shear (lb/sq ft)	11.00	0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)		0.25	
Frctn Loss (ft)	23.94	Cum Volume (acre-ft)		0.10	
C & E Loss (ft)	0.01	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4880.88

INPUT
Description: Beginning of Transition
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3054.37	0	3047.57	11	3047.57	11	3054.37

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	50.11	50.11	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3078.83	Element		0.015	
Vel Head (ft)	27.43	Wt. n-Val.	50.11	50.11	50.11
W.S. Elev (ft)	3051.40	Reach Len. (ft)		42.09	
Crit W.S. (ft)	3056.86	Flow Area (sq ft)		42.09	
E.G. Slope (ft/ft)	0.060817	Area (sq ft)		1769.00	
Q Total (cfs)	1769.00	Flow (cfs)		11.00	
Top Width (ft)	11.00	Top Width (ft)		42.03	
Vel Total (ft/s)	42.03	Avg. Vel. (ft/s)		3.83	
Max Chl Dpth (ft)	3.83	Hydr. Depth (ft)		7173.2	
Conv. Total (cfs)	7173.2	Conv. (cfs)		18.65	
Length Wtd. (ft)	50.11	Wetted Per. (ft)		8.57	
Min Ch El (ft)	3047.57	Shear (lb/sq ft)	11.00	0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)		0.15	
Frctn Loss (ft)	6.79	Cum Volume (acre-ft)		0.07	
C & E Loss (ft)	0.29	Cum SA (acres)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4931.11

INPUT
Description: End of Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3051.57	5.7	3044.97	13.45	3044.82	21.2	3044.97	26.9	3051.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	26.9	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	26.9	50.1	50.1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3075.35	Wt. n-Val.		0.015	
Vel Head (ft)	28.07	Reach Len. (ft)	50.10	50.10	50.10
W.S. Elev (ft)	3047.28	Flow Area (sq ft)		41.60	
Crit W.S. (ft)	3051.42	Area (sq ft)		41.60	
E.G. Slope (ft/ft)	0.076927	Flow (cfs)		1769.00	
Q Total (cfs)	1769.00	Top Width (ft)		19.49	
Top Width (ft)	19.49	Avg. Vel. (ft/s)		42.52	
Vel Total (ft/s)	42.52	Hydr. Depth (ft)		2.13	
Max Chl Dpth (ft)	2.46	Conv. (cfs)		6378.1	
Conv. Total (cfs)	6378.1	Wetted Per. (ft)		21.61	
Length Wtd. (ft)	50.10	Shear (lb/sq ft)		9.25	
Min Ch El (ft)	3044.82	Stream Power (lb/ft s)	26.90	0.00	0.00
Alpha	1.00	Cum Volume (acre-ft)		0.10	
Frctn Loss (ft)	3.42	Cum SA (acres)		0.06	
C & E Loss (ft)	0.06				

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4981.21

INPUT
Description: End of Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3047.85	11.4	3042.15	21.4	3041.85	31.4	3042.15	42.8	3047.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	42.8	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	42.8	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3070.62	Wt. n-Val.		0.015	
Vel Head (ft)	26.78	Reach Len. (ft)	50.00	50.00	50.00
W.S. Elev (ft)	3043.84	Flow Area (sq ft)		42.60	
Crit W.S. (ft)	3047.25	Area (sq ft)		42.60	
E.G. Slope (ft/ft)	0.098426	Flow (cfs)		1769.00	
Q Total (cfs)	1769.00	Top Width (ft)		26.77	
Top Width (ft)	26.77	Avg. Vel. (ft/s)		41.53	
Vel Total (ft/s)	41.53	Hydr. Depth (ft)		1.59	
Max Chl Dpth (ft)	1.99	Conv. (cfs)		5638.6	
Conv. Total (cfs)	5638.6	Wetted Per. (ft)		27.58	
Length Wtd. (ft)	50.00	Shear (lb/sq ft)		9.49	
Min Ch El (ft)	3041.85	Stream Power (lb/ft s)	42.80	0.00	0.00
Alpha	1.00	Cum Volume (acre-ft)		0.05	
Frctn Loss (ft)	4.34	Cum SA (acres)		0.03	
C & E Loss (ft)	0.39				

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -5031.21

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3044.31	11.4	3038.61	21.4	3038.31	31.4	3038.61	42.8	3044.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	42.8	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	42.8	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3065.42	Wt. n-Val.		0.015	
Vel Head (ft)	25.06	Reach Len. (ft)			
W.S. Elev (ft)	3040.36	Flow Area (sq ft)		44.03	
Crit W.S. (ft)	3043.72	Area (sq ft)		44.03	
E.G. Slope (ft/ft)	0.089164	Flow (cfs)		1769.00	
Q Total (cfs)	1769.00	Top Width (ft)		26.99	
Top Width (ft)	26.99	Avg. Vel. (ft/s)		40.17	
Vel Total (ft/s)	40.17	Hydr. Depth (ft)		1.63	
Max Chl Dpth (ft)	2.05	Conv. (cfs)		5924.3	
Conv. Total (cfs)	5924.3				

Length Wtd. (ft)		Wetted Per. (ft)		27.82	
Min Ch El (ft)	3038.31	Shear (lb/sq ft)		8.81	
Alpha	1.00	Stream Power (lb/ft s)	42.80	0.00	0.00
Frctn Loss (ft)	4.68	Cum Volume (acre-ft)			
C & E Loss (ft)	0.51	Cum SA (acres)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:Village 26 Open

Reach	River Sta.	n1	n2	n3
V26	-384.04	.015	.015	.015
V26	-956.12	.015	.015	.015
V26	-1006.12	.015	.015	.015
V26	-1406.12	.015	.015	.015
V26	-1407.12	.015	.015	.015
V26	-1506.12	.015	.015	.015
V26	-1531.61	.015	.015	.015
V26	-2127.53	.015	.015	.015
V26	-2177.53	.015	.015	.015
V26	-2327.53	.015	.015	.015
V26	-2477.53	.015	.015	.015
V26	-2565.46	.015	.015	.015
V26	-2626.68	.015	.015	.015
V26	-2717.76	.015	.015	.015
V26	-2800.00	.015	.015	.015
V26	-2900.00	.015	.015	.015
V26	-3000.00	.015	.015	.015
V26	-3150.00	.015	.015	.015
V26	-3600	.015	.015	.015
V26	-4000	.015	.015	.015
V26	-4400	.015	.015	.015
V26	-4771.98	.015	.015	.015
V26	-4880.88	.015	.015	.015
V26	-4931.11	.015	.015	.015
V26	-4981.21	.015	.015	.015
V26	-5031.21	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Village 26 Open

Reach	River Sta.	Left	Channel	Right
V26	-384.04	572.08	572.08	572.08
V26	-956.12	50	50	50
V26	-1006.12	400	400	400
V26	-1406.12	1	1	1
V26	-1407.12	99	99	99
V26	-1506.12	25.49	25.49	25.49
V26	-1531.61	595.92	595.92	595.92
V26	-2127.53	50	50	50
V26	-2177.53	150	150	150
V26	-2327.53	150	150	150
V26	-2477.53	87.93	87.93	87.93
V26	-2565.46	61.22	61.22	61.22
V26	-2626.68	91.08	91.08	91.08
V26	-2717.76	82.24	82.24	82.24
V26	-2800.00	100	100	100
V26	-2900.00	100	100	100
V26	-3000.00	150	150	150
V26	-3150.00	450	450	450
V26	-3600	400	400	400
V26	-4000	400	400	400
V26	-4400	371.98	371.98	371.98
V26	-4771.98	109.02	109.02	109.02
V26	-4880.88	50.11	50.11	50.11
V26	-4931.11	50.1	50.1	50.1
V26	-4981.21	50	50	50
V26	-5031.21			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Village 26 Open

Reach	River Sta.	Contr.	Expan.
V26	-384.04	.1	.3
V26	-956.12	.1	.3
V26	-1006.12	.1	.3
V26	-1406.12	.1	.3
V26	-1407.12	.1	.3
V26	-1506.12	.1	.3
V26	-1531.61	.1	.3
V26	-2127.53	.1	.3
V26	-2177.53	.1	.3
V26	-2327.53	.1	.3
V26	-2477.53	.1	.3
V26	-2565.46	.1	.3
V26	-2626.68	.1	.3
V26	-2717.76	.1	.3
V26	-2800.00	.1	.3

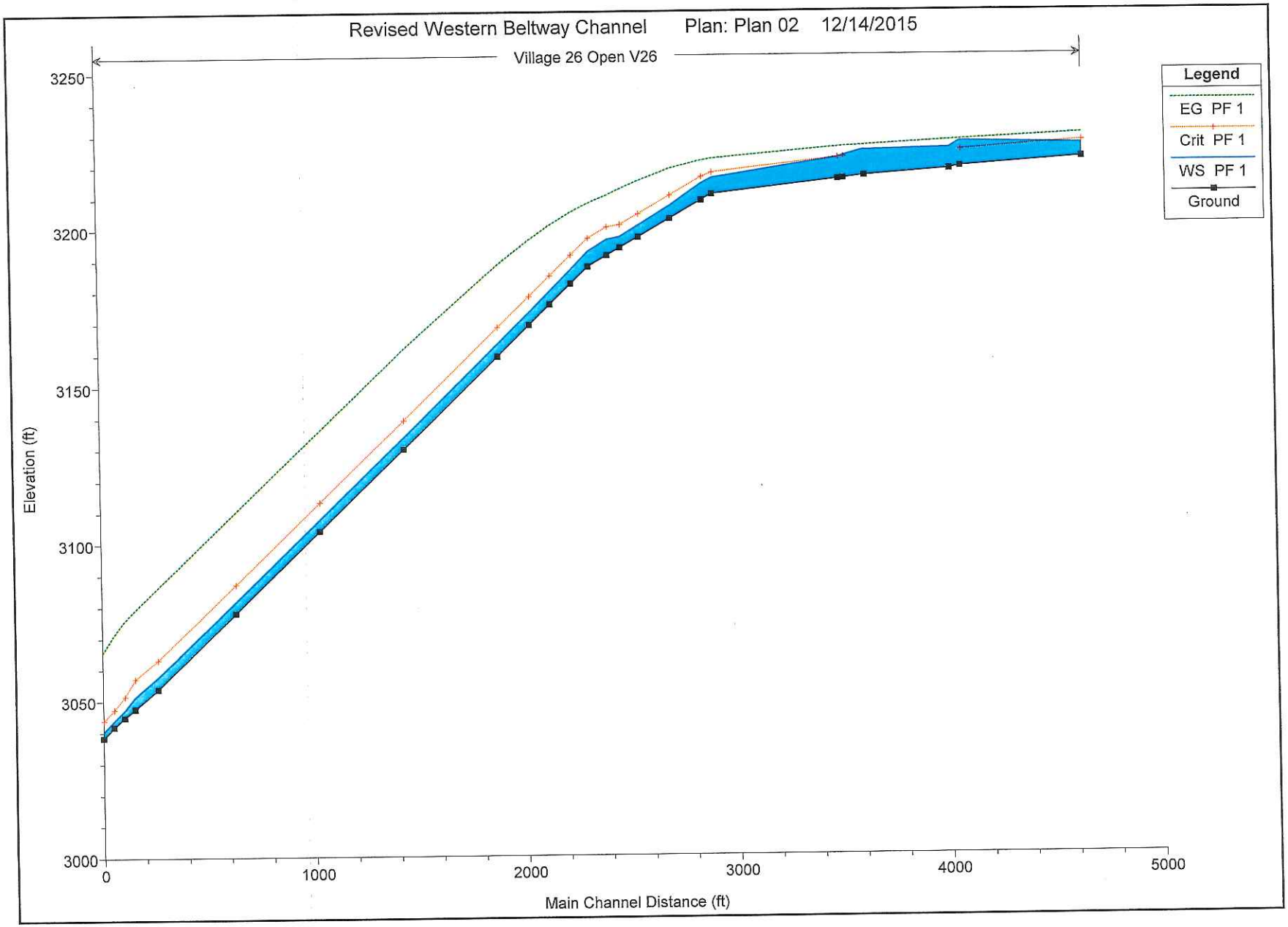
V26	-2900.00	.1	.3
V26	-3000.00	.1	.3
V26	-3150.00	.1	.3
V26	-3600	.1	.3
V26	-4000	.1	.3
V26	-4400	.1	.3
V26	-4771.98	.1	.3
V26	-4880.88	.1	.3
V26	-4931.11	.1	.3
V26	-4981.21	.1	.3
V26	-5031.21	.1	.3

HEC-RAS Plan: Plan 03 River: Village 26 Open Reach: V26 Profile: PF 1

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)	
V26	-2038.06	3311.00	3208.39	3218.91	3220.40	3226.76	0.007600	22.49	147.22	14.00	1.22
V26	-2058.05	3311.00	3208.25	3218.81	3220.26	3226.60	0.007526	22.40	147.79	14.00	1.22
V26	-2058.06	3311.00	3208.24	3218.77	3220.28	3226.60	0.002228	22.46	147.41	20.00	1.22
V26	-2070.06	3311.00	3208.15	3214.10	3217.63	3226.13	0.013652	27.84	118.95	20.00	2.01
V26	-2083.06	3311.00	3208.05	3214.04	3217.52	3225.91	0.013388	27.64	119.77	20.00	1.99
V26	-2225.20	3311.00	3206.98	3213.40	3216.45	3223.73	0.011007	25.79	128.37	20.00	1.79
V26	-2361.30	3311.00	3201.65	3207.09	3211.12	3221.46	0.017574	30.41	108.86	20.00	2.30
V26	-2569.80	3311.00	3193.50	3198.31	3202.97	3216.71	0.025108	34.42	96.19	20.00	2.77
V26	-2622.97	3311.00	3191.41	3195.70	3200.36	3215.17	0.028545	35.41	93.50	21.80	3.01
V26	-2633.22	3311.00	3191.03	3195.77	3200.50	3214.75	0.026268	34.96	94.70	20.00	2.83
V26	-2723.72	3311.00	3187.48	3192.08	3196.95	3212.16	0.028503	35.96	92.08	20.00	2.95
V26	-3000.00	3311.00	3169.52	3173.42	3178.99	3201.45	0.046542	42.49	77.92	20.00	3.79
V26	-3200	3311.00	3156.52	3160.23	3165.99	3191.17	0.053853	44.63	74.18	20.00	4.08
V26	-3385	3371.00	3144.50	3148.18	3154.06	3180.74	0.057109	45.79	73.61	20.00	4.21
V26	-3400	3371.00	3143.52	3147.19	3153.08	3179.87	0.057414	45.88	73.48	20.00	4.22
V26	-3600	3371.00	3130.51	3134.12	3140.07	3167.97	0.060497	46.69	72.20	20.00	4.33
V26	-3800	3371.00	3117.51	3121.08	3127.07	3155.62	0.062338	47.16	71.48	20.00	4.40
V26	-4000.00	3371.00	3104.51	3108.06	3114.07	3143.00	0.063431	47.44	71.06	20.00	4.43
V26	-4200	3371.00	3091.51	3095.05	3101.07	3130.23	0.064072	47.60	70.83	20.00	4.46
V26	-4400	3371.00	3078.51	3082.04	3088.07	3117.36	0.064456	47.69	70.68	20.00	4.47
V26	-4449.18	3401.00	3075.31	3078.88	3084.93	3114.20	0.063920	47.70	71.30	20.00	4.45
V26	-4600.00	3401.00	3065.51	3069.07	3075.13	3104.52	0.064261	47.78	71.18	20.00	4.46
V26	-4780.33	3401.00	3053.79	3057.34	3063.41	3092.90	0.064538	47.85	71.07	20.00	4.47
V26	-4825.86	3401.00	3048.20	3051.64	3057.82	3089.58	0.071113	49.43	68.80	20.00	4.70

HEC-RAS Plan: Plan 02 River: Village 26 Open Reach: V26 Profile: PF 1

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)	
V26	-384.04	1664.00	3221.97	3226.24	3227.21	3229.56	0.005002	14.62	113.81	35.87	1.45
V26	-956.12	1664.00	3219.11	3227.13	3224.33	3227.69	0.000424	6.02	276.38	50.86	0.46
V26	-1006.12	1664.00	3218.36	3225.08		3227.46	0.003838	12.38	134.36	20.00	0.84
V26	-1406.12	1664.00	3216.36	3224.35		3226.03	0.002472	10.42	159.77	20.00	0.65
V26	-1407.12	1664.00	3216.35	3224.50		3225.97	0.001264	9.73	171.10	21.00	0.60
V26	-1506.12	1664.00	3215.58	3222.69	3222.24	3225.63	0.003180	13.77	120.83	17.00	0.91
V26	-1531.61	1692.00	3215.38	3222.11	3222.11	3225.51	0.003814	14.78	114.45	17.00	1.00
V26	-2127.53	1716.00	3210.70	3215.76	3217.50	3221.94	0.008696	19.94	86.04	17.00	1.56
V26	-2177.53	1716.00	3208.73	3213.99	3216.12	3221.34	0.010706	21.75	78.89	15.00	1.67
V26	-2327.53	1716.00	3202.84	3207.00	3210.23	3218.73	0.020698	27.48	62.45	15.00	2.37
V26	-2477.53	1716.00	3196.94	3200.72	3204.33	3214.93	0.027279	30.25	56.73	15.00	2.74
V26	-2565.46	1716.00	3193.48	3197.14	3200.87	3212.32	0.030028	31.27	54.87	15.00	2.88
V26	-2626.68	1716.00	3191.07	3196.25	3200.15	3210.32	0.024932	30.09	57.02	11.00	2.33
V26	-2717.76	1716.00	3187.48	3192.44	3196.58	3207.78	0.028013	31.42	54.61	11.00	2.49
V26	-2800.00	1716.00	3182.10	3186.65	3191.18	3204.91	0.035507	34.29	50.04	11.00	2.83
V26	-2900.00	1716.00	3175.56	3179.81	3184.66	3200.74	0.042823	36.72	46.74	11.00	3.14
V26	-3000.00	1716.00	3169.03	3173.09	3178.13	3195.99	0.048479	38.40	44.68	11.00	3.36
V26	-3150.00	1716.00	3159.22	3163.11	3168.32	3188.08	0.054656	40.10	42.79	11.00	3.58
V26	-3600	1716.00	3129.96	3133.65	3139.06	3161.38	0.063253	42.26	40.61	11.00	3.88
V26	-4000	1716.00	3103.96	3107.62	3113.06	3135.77	0.064595	42.58	40.30	11.00	3.92
V26	-4400	1716.00	3077.96	3081.62	3087.06	3109.86	0.064909	42.65	40.23	11.00	3.93
V26	-4771.98	1769.00	3053.76	3057.52	3063.05	3085.92	0.063826	42.76	41.37	11.00	3.89
V26	-4880.88	1769.00	3047.57	3051.40	3056.86	3078.83	0.060817	42.03	42.09	11.00	3.79
V26	-4931.11	1769.00	3044.82	3047.28	3051.42	3075.35	0.076927	42.52	41.60	19.49	5.13
V26	-4981.21	1769.00	3041.85	3043.84	3047.25	3070.62	0.098426	41.53	42.60	26.77	5.80
V26	-5031.21	1769.00	3038.31	3040.36	3043.72	3065.42	0.089164	40.17	44.03	26.99	5.54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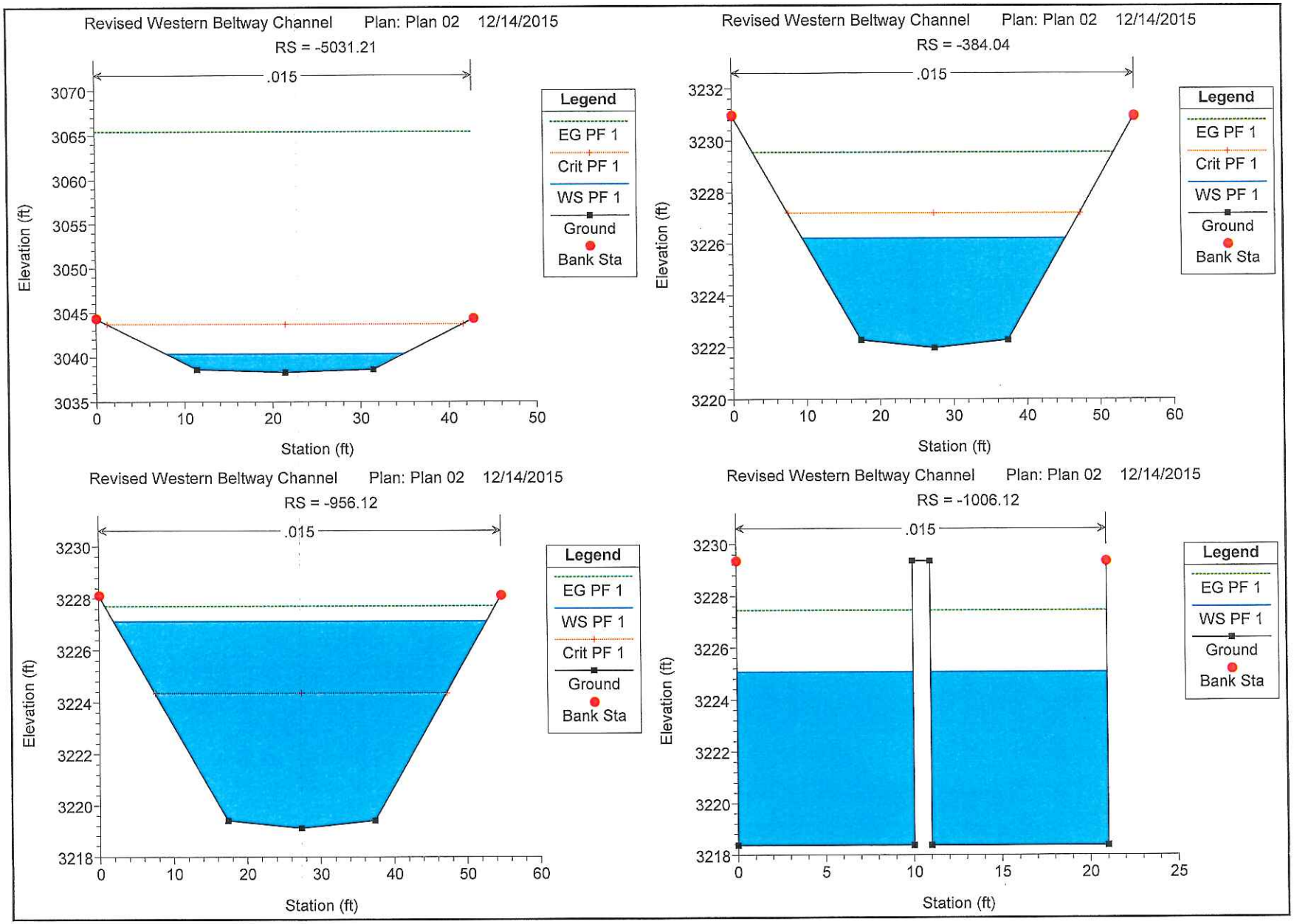
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Legend
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Crit PF 1
WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
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Crit PF 1
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Bank Sta
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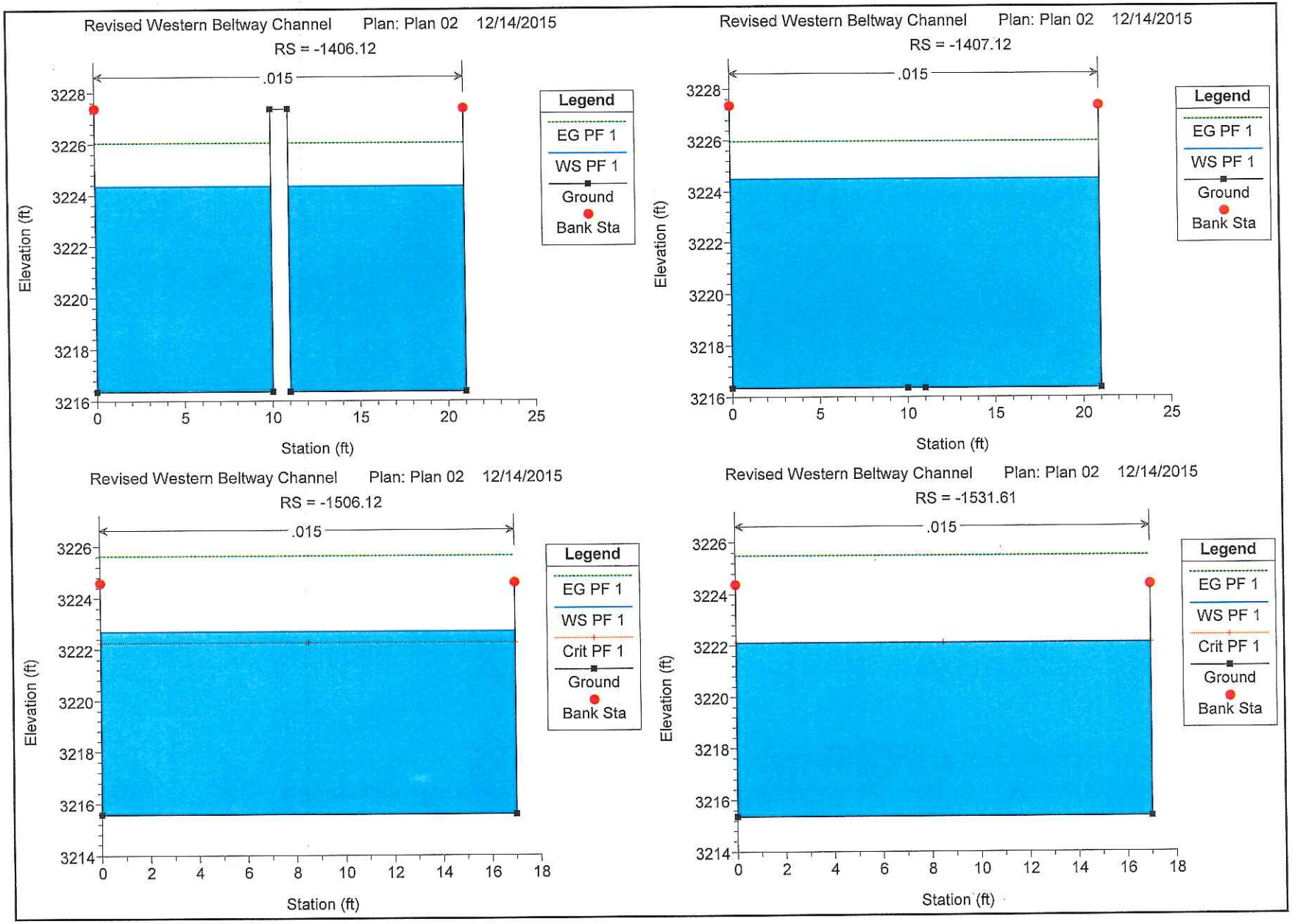
Bank Sta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Station (ft)
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WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
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Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
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Bank Sta
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Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
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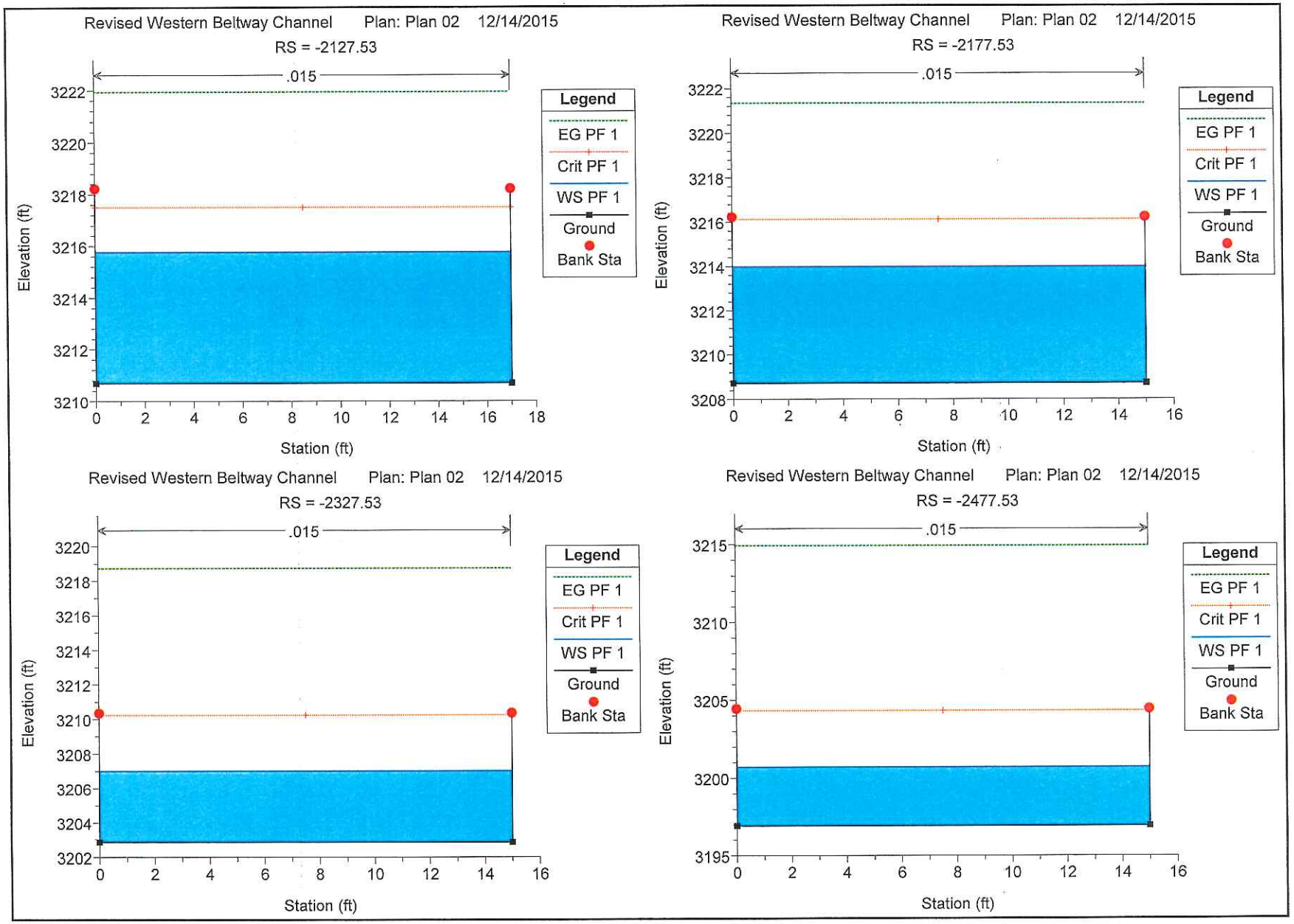
Bank Sta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Crit PF 1
WS PF 1
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Bank Sta
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Elevation (ft)
Station (ft)
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Crit PF 1
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Bank Sta
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Elevation (ft)
Station (ft)
Legend
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Crit PF 1
WS PF 1
Ground
Bank Sta
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Legend
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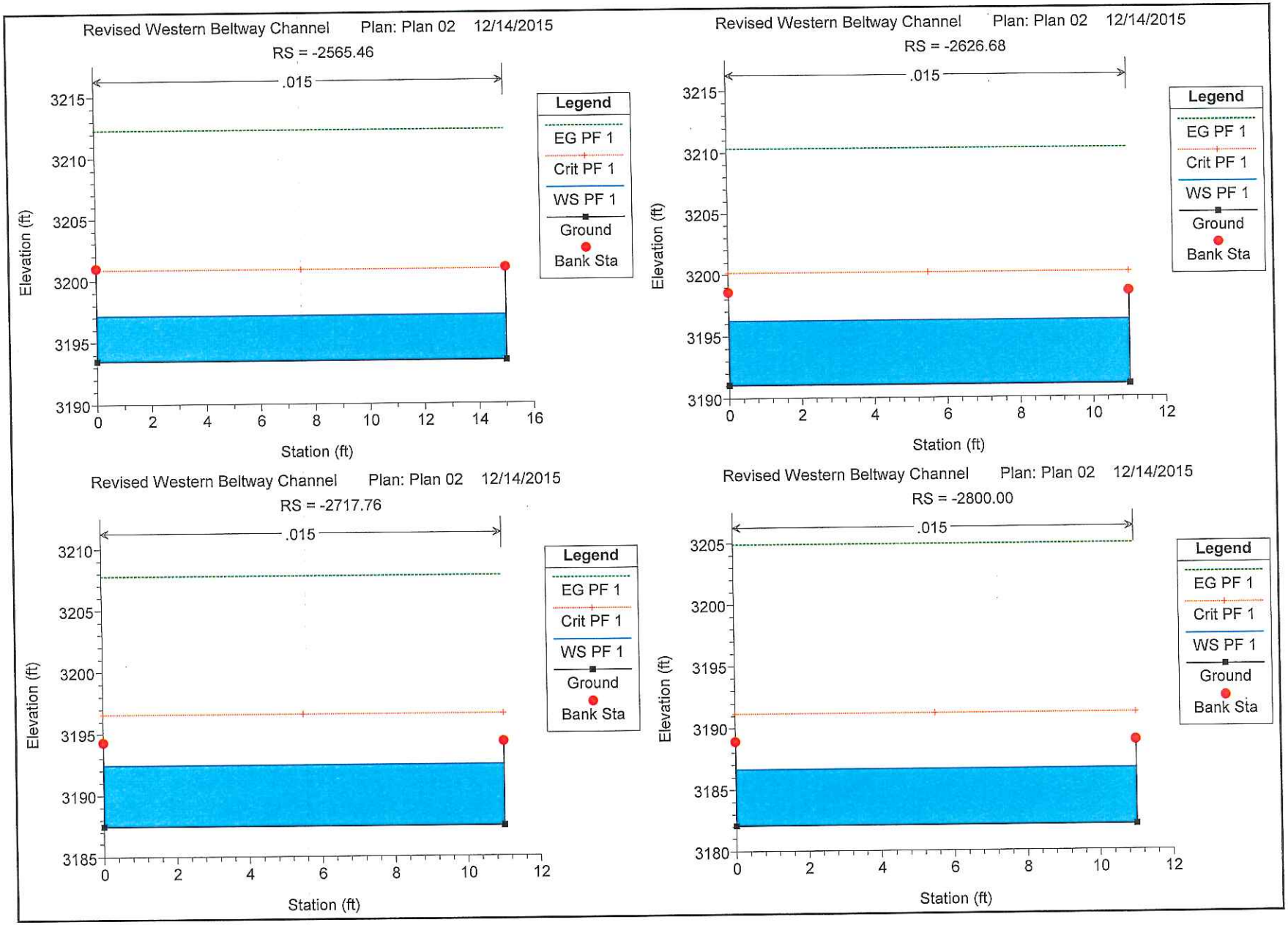
Crit PF 1
WS PF 1
Ground
Bank Sta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Crit PF 1
WS PF 1
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Bank Sta
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
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Bank Sta
Revised Western Beltway Channel Plan: Plan 02 12/14/2015
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Station (ft)
Legend
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Crit PF 1
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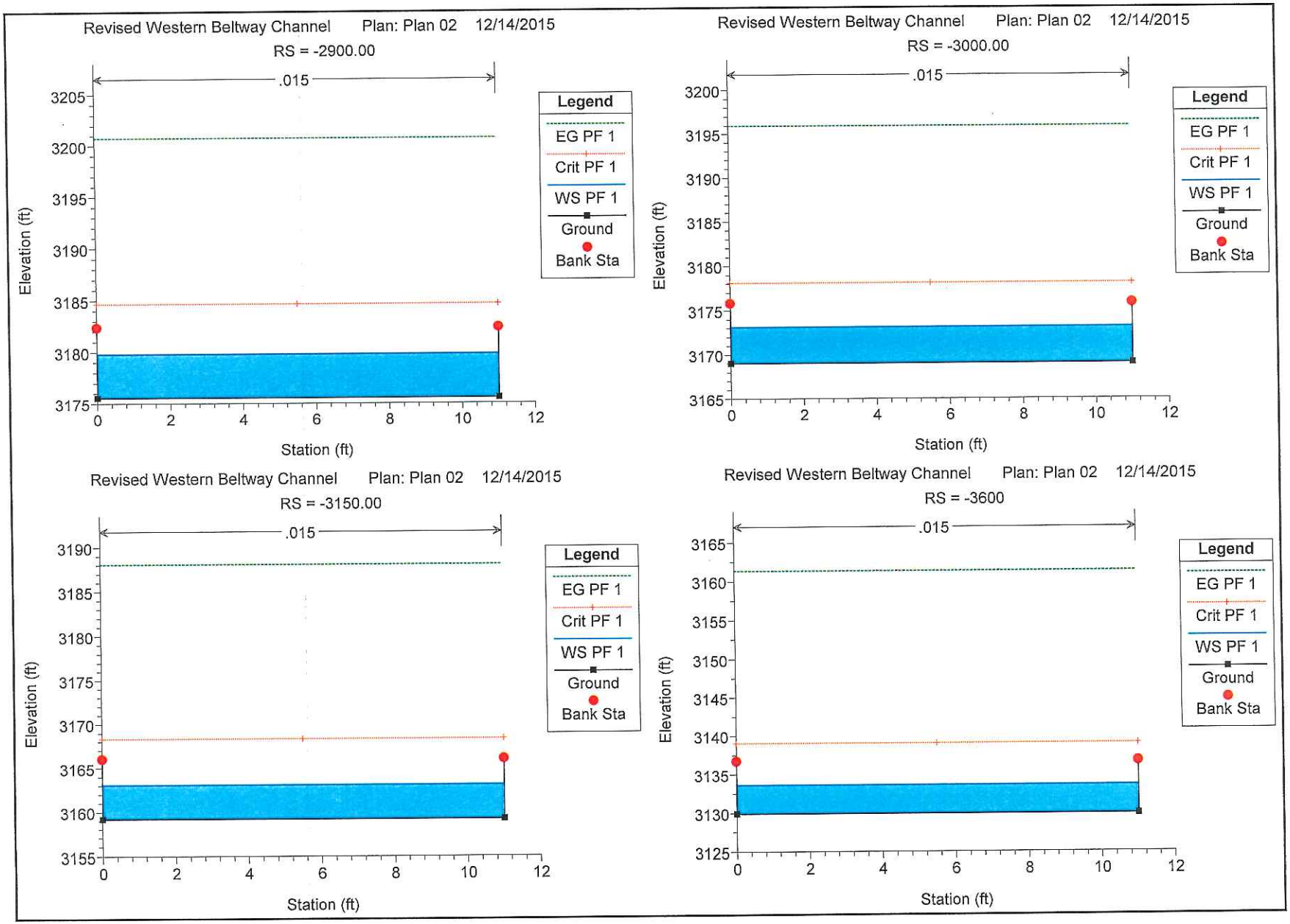
Ground
Bank Sta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Legend
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Crit PF 1
WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
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Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
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Station (ft)
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WS PF 1
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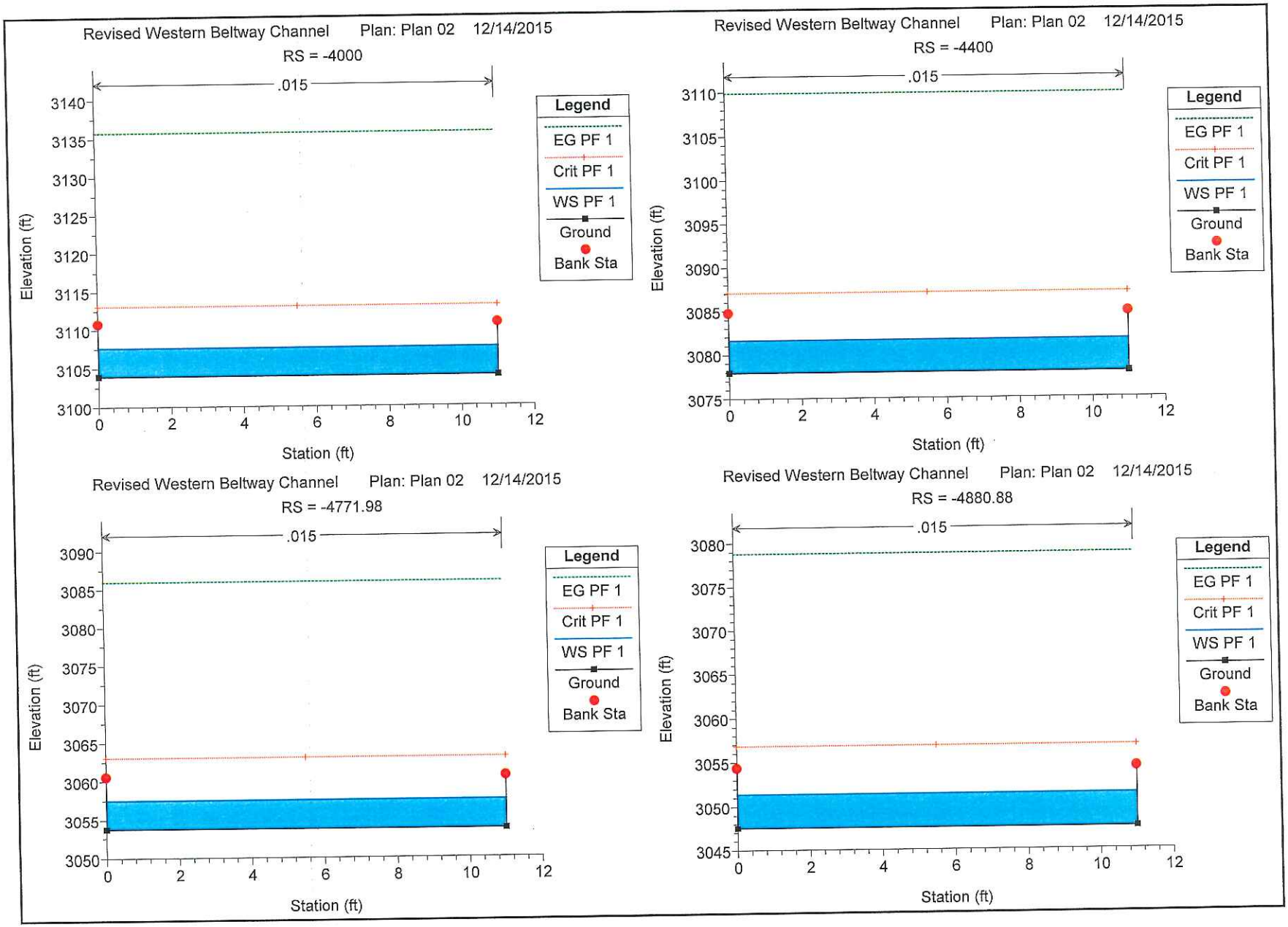
Bank Sta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Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
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Bank Sta
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 02 12/14/2015
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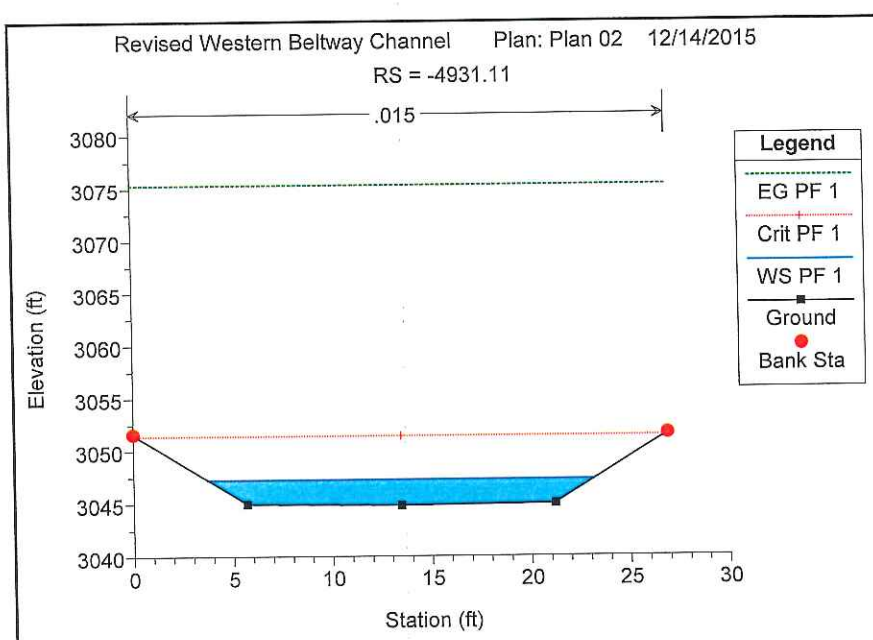
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta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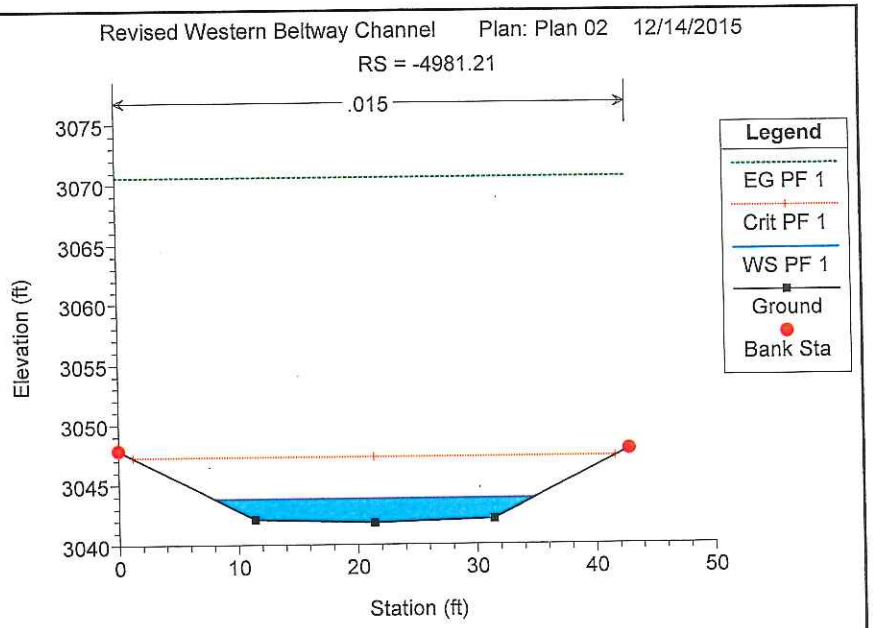
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

PROJECT DATA
Project Title: Revised Western Beltway Channel
Project File : WB.prj
Run Date and Time: 12/14/2015 6:51:56 PM

Project in English units

PLAN DATA

Plan Title: Plan 01
Plan File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Ultimate\WB.p01

Geometry Title: Western Beltway Geometric Data
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Ultimate\WB.g01

Flow Title : Summerlin West Flows
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Ultimate\WB.f01

Plan Summary Information:

Number of:	Cross Sections	= 26	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 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: Summerlin West Flows
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Ultimate\WB.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Village 26 Open	V26	-384.04	880

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Village 26 Open	V26	PF 1	Normal S = 0.005	Normal S = 0.0653

GEOMETRY DATA

Geometry Title: Western Beltway Geometric Data
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\WB\Ultimate\WB.g01

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -384.04

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3230.97	17.4	3222.27	27.4	3221.97	37.4	3222.27	54.8	3230.97

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	54.8	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	54.8	572.08	572.08	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3227.27	Element		0.015	
Vel Head (ft)	2.26	Wt. n-Val.			
W.S. Elev (ft)	3225.01	Reach Len. (ft)	572.08	572.08	572.08
Crit W.S. (ft)	3225.64	Flow Area (sq ft)		72.94	
E.G. Slope (ft/ft)	0.005002	Area (sq ft)		72.94	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	30.98	Top Width (ft)		30.98	
Vel Total (ft/s)	12.06	Avg. Vel. (ft/s)		12.06	
Max Chl Dpth (ft)	3.04	Hydr. Depth (ft)		2.35	
Conv. Total (cfs)	12442.9	Conv. (cfs)		12442.9	
Length Wtd. (ft)	572.08	Wetted Per. (ft)		32.28	
Min Ch El (ft)	3221.97	Shear (lb/sq ft)		0.71	
Alpha	1.00	Stream Power (lb/ft s)	54.80	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		5.18	
C & E Loss (ft)		Cum SA (acres)		1.76	

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -956.12

INPUT
Description: Beginning of Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3228.11	17.4	3219.41	27.4	3219.11	37.4	3219.41	54.8	3228.11

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	54.8	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	54.8	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3224.45	Element		0.015	
Vel Head (ft)	0.77	Wt. n-Val.			
W.S. Elev (ft)	3223.68	Reach Len. (ft)	50.00	50.00	50.00
Crit W.S. (ft)	3222.77	Flow Area (sq ft)		124.95	
E.G. Slope (ft/ft)	0.001074	Area (sq ft)		124.95	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	37.09	Top Width (ft)		37.09	
Vel Total (ft/s)	7.04	Avg. Vel. (ft/s)		7.04	
Max Chl Dpth (ft)	4.57	Hydr. Depth (ft)		3.37	
Conv. Total (cfs)	26848.6	Conv. (cfs)		26848.6	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		39.12	
Min Ch El (ft)	3219.11	Shear (lb/sq ft)		0.21	
Alpha	1.00	Stream Power (lb/ft s)	54.80	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)		3.88	
C & E Loss (ft)	0.12	Cum SA (acres)		1.31	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Note: Hydraulic jump has occurred between this cross section and the previous upstream section.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1006.12

INPUT
Description: Beginning of Dual 10x9 Box
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3229.36	0	3218.36	10	3218.36	10	3229.36	11	3229.36
11	3218.36	21	3218.36	21	3229.36				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	21	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	21	400	400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3224.24	Element		0.015	
Vel Head (ft)	1.97	Wt. n-Val.			
W.S. Elev (ft)	3222.27	Reach Len. (ft)	400.00	400.00	400.00
Crit W.S. (ft)	3222.27	Flow Area (sq ft)		78.11	
E.G. Slope (ft/ft)	0.004541	Area (sq ft)		78.11	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	11.27	Avg. Vel. (ft/s)		11.27	
Max Chl Dpth (ft)	3.91	Hydr. Depth (ft)		3.91	
Conv. Total (cfs)	13058.8	Conv. (cfs)		13058.8	
Length Wtd. (ft)	400.00	Wetted Per. (ft)		35.62	
Min Ch El (ft)	3218.36	Shear (lb/sq ft)		0.62	
Alpha	1.00	Stream Power (lb/ft s)	21.00	0.00	0.00
Frctn Loss (ft)	1.31	Cum Volume (acre-ft)		3.76	
C & E Loss (ft)	0.21	Cum SA (acres)		1.28	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated

water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1406.12

INPUT
Description: End of Box
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3227.36	0	3216.36	10	3216.36	10	3227.36
11	3216.36	21	3216.36	21	3227.36		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	21	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	21	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3222.50	Element			
Vel Head (ft)	1.26	Wt. n-Val.		0.015	
W.S. Elev (ft)	3221.24	Reach Len. (ft)	1.00	1.00	1.00
Crit W.S. (ft)	3220.27	Flow Area (sq ft)		97.53	
E.G. Slope (ft/ft)	0.002486	Area (sq ft)		97.53	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	9.02	Avg. Vel. (ft/s)		9.02	
Max Chl Dpth (ft)	4.88	Hydr. Depth (ft)		4.88	
Conv. Total (cfs)	17648.9	Conv. (cfs)		17648.9	
Length Wtd. (ft)	1.00	Wetted Per. (ft)		39.51	
Min Ch El (ft)	3216.36	Shear (lb/sq ft)		0.38	
Alpha	1.00	Stream Power (lb/ft s)	21.00	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)		2.95	
C & E Loss (ft)	0.05	Cum SA (acres)		1.09	

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1407.12

INPUT
Description: Beginning of Transition
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3227.35	0	3216.35	10	3216.35	11	3216.35	21	3216.35
21	3227.35								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	21	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	21	99	99	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3222.45	Element			
Vel Head (ft)	1.09	Wt. n-Val.		0.015	
W.S. Elev (ft)	3221.36	Reach Len. (ft)	99.00	99.00	99.00
Crit W.S. (ft)		Flow Area (sq ft)		105.17	
E.G. Slope (ft/ft)	0.001400	Area (sq ft)		105.17	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	21.00	Top Width (ft)		21.00	
Vel Total (ft/s)	8.37	Avg. Vel. (ft/s)		8.37	
Max Chl Dpth (ft)	5.01	Hydr. Depth (ft)		5.01	
Conv. Total (cfs)	23515.7	Conv. (cfs)		23515.7	
Length Wtd. (ft)	99.00	Wetted Per. (ft)		31.02	
Min Ch El (ft)	3216.35	Shear (lb/sq ft)		0.30	
Alpha	1.00	Stream Power (lb/ft s)	21.00	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)		2.95	
C & E Loss (ft)	0.11	Cum SA (acres)		1.09	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1506.12

INPUT
Description: End of Transition
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3224.58	0	3215.58	17	3215.58	17	3224.58

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	17	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	17	25.49 25.49	25.49	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3222.13	Wt. n-Val.		0.015	
Vel Head (ft)	2.20	Reach Len. (ft)	25.49	25.49	25.49
W.S. Elev (ft)	3219.93	Flow Area (sq ft)		73.97	
Crit W.S. (ft)	3219.93	Area (sq ft)		73.97	
E.G. Slope (ft/ft)	0.003523	Flow (cfs)		880.00	
Q Total (cfs)	880.00	Top Width (ft)		17.00	
Top Width (ft)	17.00	Avg. Vel. (ft/s)		11.90	
Vel Total (ft/s)	11.90	Hydr. Depth (ft)		4.35	
Max Chl Dpth (ft)	4.35	Conv. (cfs)		14825.2	
Conv. Total (cfs)	14825.2	Wetted Per. (ft)		25.70	
Length Wtd. (ft)	25.49	Shear (lb/sq ft)		0.63	
Min Ch El (ft)	3215.58	Stream Power (lb/ft s)	17.00	0.00	0.00
Alpha	1.00	Cum Volume (acre-ft)		2.75	
Frctn Loss (ft)	0.09	Cum SA (acres)		1.05	
C & E Loss (ft)	0.00				

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -1531.61

INPUT
Description: Junction

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3224.38	0	3215.38	17	3215.38	17	3224.38

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	17	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	17	595.92	595.92	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3221.99	Wt. n-Val.		0.015	
Vel Head (ft)	2.63	Reach Len. (ft)	595.92	595.92	595.92
W.S. Elev (ft)	3219.36	Flow Area (sq ft)		67.65	
Crit W.S. (ft)	3219.73	Area (sq ft)		67.65	
E.G. Slope (ft/ft)	0.004563	Flow (cfs)		880.00	
Q Total (cfs)	880.00	Top Width (ft)		17.00	
Top Width (ft)	17.00	Avg. Vel. (ft/s)		13.01	
Vel Total (ft/s)	13.01	Hydr. Depth (ft)		3.98	
Max Chl Dpth (ft)	3.98	Conv. (cfs)		13028.1	
Conv. Total (cfs)	13028.1	Wetted Per. (ft)		24.96	
Length Wtd. (ft)	595.92	Shear (lb/sq ft)		0.77	
Min Ch El (ft)	3215.38	Stream Power (lb/ft s)	17.00	0.00	0.00
Alpha	1.00	Cum Volume (acre-ft)		2.71	
Frctn Loss (ft)	0.10	Cum SA (acres)		1.04	
C & E Loss (ft)	0.04				

Note: Program found supercritical flow starting at this cross section.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2127.53

INPUT
Description: Begin Transition

Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3218.2	0	3210.7	17	3210.7	17	3218.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	17	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	17	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	3218.08	Wt. n-Val.		0.015	
Vel Head (ft)	4.24	Reach Len. (ft)	50.00	50.00	50.00
W.S. Elev (ft)	3213.83	Flow Area (sq ft)		53.23	
Crit W.S. (ft)	3215.05	Area (sq ft)		53.23	
E.G. Slope (ft/ft)	0.009237	Flow (cfs)		880.00	
Q Total (cfs)	880.00	Top Width (ft)		17.00	
Top Width (ft)	17.00	Avg. Vel. (ft/s)		16.53	
Vel Total (ft/s)	16.53	Hydr. Depth (ft)		3.13	
Max Chl Dpth (ft)	3.13	Conv. (cfs)		9156.2	
Conv. Total (cfs)	9156.2	Wetted Per. (ft)		23.26	
Length Wtd. (ft)	50.00	Shear (lb/sq ft)		1.32	
Min Ch El (ft)	3210.70	Stream Power (lb/ft s)	17.00	0.00	0.00
Alpha	1.00	Cum Volume (acre-ft)		1.88	
Frctn Loss (ft)	3.75	Cum SA (acres)		0.81	
C & E Loss (ft)	0.16				

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2177.53

INPUT
Description: End Transition
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3216.23	0	3208.73	15	3208.73	15	3216.23

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	15	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	15	150	150	150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3217.40	Element			
Vel Head (ft)	5.57	Wt. n-Val.		0.015	
W.S. Elev (ft)	3211.83	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)	3213.46	Flow Area (sq ft)		46.45	
E.G. Slope (ft/ft)	0.012847	Area (sq ft)		46.45	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	15.00	Top Width (ft)		15.00	
Vel Total (ft/s)	18.95	Avg. Vel. (ft/s)		18.95	
Max Chl Dpth (ft)	3.10	Hydr. Depth (ft)		3.10	
Conv. Total (cfs)	7764.0	Conv. (cfs)		7764.0	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		21.19	
Min Ch El (ft)	3208.73	Shear (lb/sq ft)		1.76	
Alpha	1.00	Stream Power (lb/ft s)	15.00	0.00	0.00
Frctn Loss (ft)	0.54	Cum Volume (acre-ft)		1.82	
C & E Loss (ft)	0.13	Cum SA (acres)		0.79	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2327.53

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3210.34	0	3202.84	15	3202.84	15	3210.34

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	15	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	15	150	150	150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3214.36	Element			
Vel Head (ft)	9.10	Wt. n-Val.		0.015	
W.S. Elev (ft)	3205.26	Reach Len. (ft)	150.00	150.00	150.00
Crit W.S. (ft)	3207.57	Flow Area (sq ft)		36.35	
E.G. Slope (ft/ft)	0.026643	Area (sq ft)		36.35	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	15.00	Top Width (ft)		15.00	
Vel Total (ft/s)	24.21	Avg. Vel. (ft/s)		24.21	
Max Chl Dpth (ft)	2.42	Hydr. Depth (ft)		2.42	
Conv. Total (cfs)	5391.2	Conv. (cfs)		5391.2	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		19.85	
Min Ch El (ft)	3202.84	Shear (lb/sq ft)		3.05	
Alpha	1.00	Stream Power (lb/ft s)	15.00	0.00	0.00
Frctn Loss (ft)	2.68	Cum Volume (acre-ft)		1.68	
C & E Loss (ft)	0.35	Cum SA (acres)		0.74	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2477.53

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3204.44	0	3196.94	15	3196.94	15	3204.44

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	15	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	15	87.93	87.93	87.93	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3209.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.56	Wt. n-Val.		0.015	
W.S. Elev (ft)	3199.19	Reach Len. (ft)	87.93	87.93	87.93
Crit W.S. (ft)	3201.67	Flow Area (sq ft)		33.74	
E.G. Slope (ft/ft)	0.033372	Area (sq ft)		33.74	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	15.00	Top Width (ft)		15.00	
Vel Total (ft/s)	26.08	Avg. Vel. (ft/s)		26.08	
Max Chl Dpth (ft)	2.25	Hydr. Depth (ft)		2.25	
Conv. Total (cfs)	4817.1	Conv. (cfs)		4817.1	
Length Wtd. (ft)	87.93	Wetted Per. (ft)		19.50	
Min Ch El (ft)	3196.94	Shear (lb/sq ft)		3.61	
Alpha	1.00	Stream Power (lb/ft s)	15.00	0.00	0.00
Frctn Loss (ft)	4.46	Cum Volume (acre-ft)		1.56	
C & E Loss (ft)	0.15	Cum SA (acres)		0.69	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2565.46

INPUT
Description: Beginning of Transition
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3200.98	0	3193.48	15	3193.48	15	3200.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	15	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	15	61.22	61.22	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3206.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	11.00	Wt. n-Val.		0.015	
W.S. Elev (ft)	3195.68	Reach Len. (ft)	61.22	61.22	61.22
Crit W.S. (ft)	3198.21	Flow Area (sq ft)		33.06	
E.G. Slope (ft/ft)	0.035486	Area (sq ft)		33.06	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	15.00	Top Width (ft)		15.00	
Vel Total (ft/s)	26.62	Avg. Vel. (ft/s)		26.62	
Max Chl Dpth (ft)	2.20	Hydr. Depth (ft)		2.20	
Conv. Total (cfs)	4671.5	Conv. (cfs)		4671.5	
Length Wtd. (ft)	61.22	Wetted Per. (ft)		19.41	
Min Ch El (ft)	3193.48	Shear (lb/sq ft)		3.77	
Alpha	1.00	Stream Power (lb/ft s)	15.00	0.00	0.00
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)		1.49	
C & E Loss (ft)	0.04	Cum SA (acres)		0.66	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2626.68

INPUT
Description: End of Transition
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3198.57	0	3191.07	11	3191.07	11	3198.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	91.08	91.08	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3204.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.46	Wt. n-Val.		0.015	
W.S. Elev (ft)	3194.15	Reach Len. (ft)	91.08	91.08	91.08
Crit W.S. (ft)	3196.89	Flow Area (sq ft)		33.91	
E.G. Slope (ft/ft)	0.027692	Area (sq ft)		33.91	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	25.95	Avg. Vel. (ft/s)		25.95	
Max Chl Dpth (ft)	3.08	Hydr. Depth (ft)		3.08	
Conv. Total (cfs)	5288.2	Conv. (cfs)		5288.2	
Length Wtd. (ft)	91.08	Wetted Per. (ft)		17.17	
Min Ch El (ft)	3191.07	Shear (lb/sq ft)		3.42	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	1.91	Cum Volume (acre-ft)		1.45	
C & E Loss (ft)	0.16	Cum SA (acres)		0.64	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2717.76

INPUT
Description: Grade Break

Station Elevation Data	num=	4					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3194.28	0	3187.48	11	3187.48	11	3194.28

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	82.24	82.24	82.24	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3201.84	Element			
Vel Head (ft)	11.40	Wt. n-Val.		0.015	
W.S. Elev (ft)	3190.43	Reach Len. (ft)	82.24	82.24	82.24
Crit W.S. (ft)	3193.30	Flow Area (sq ft)		32.47	
E.G. Slope (ft/ft)	0.031337	Area (sq ft)		32.47	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	27.10	Avg. Vel. (ft/s)		27.10	
Max Chl Dpth (ft)	2.95	Hydr. Depth (ft)		2.95	
Conv. Total (cfs)	4971.2	Conv. (cfs)		4971.2	
Length Wtd. (ft)	82.24	Wetted Per. (ft)		16.90	
Min Ch El (ft)	3187.48	Shear (lb/sq ft)		3.76	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	2.68	Cum Volume (acre-ft)		1.38	
C & E Loss (ft)	0.09	Cum SA (acres)		0.62	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2800.00

INPUT
Description:

Station Elevation Data	num=	4					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3188.9	0	3182.1	11	3182.1	11	3188.9

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	100	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3198.65	Element			
Vel Head (ft)	13.87	Wt. n-Val.		0.015	
W.S. Elev (ft)	3184.78	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	3187.92	Flow Area (sq ft)		29.45	
E.G. Slope (ft/ft)	0.041545	Area (sq ft)		29.45	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	29.88	Avg. Vel. (ft/s)		29.88	
Max Chl Dpth (ft)	2.68	Hydr. Depth (ft)		2.68	
Conv. Total (cfs)	4317.4	Conv. (cfs)		4317.4	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		16.35	
Min Ch El (ft)	3182.10	Shear (lb/sq ft)		4.67	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	2.95	Cum Volume (acre-ft)		1.32	
C & E Loss (ft)	0.25	Cum SA (acres)		0.59	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -2900.00

INPUT
Description:

Station Elevation Data	num=	4					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3182.36	0	3175.56	11	3175.56	11	3182.36

Manning's n Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	100	100	100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3193.89	Element			

				0.015	
Vel Head (ft)	15.83	Wt. n-Val.		0.015	
W.S. Elev (ft)	3178.07	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	3181.38	Flow Area (sq ft)		27.56	
E.G. Slope (ft/ft)	0.050340	Area (sq ft)		27.56	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	31.93	Avg. Vel. (ft/s)		31.93	
Max Chl Dpth (ft)	2.51	Hydr. Depth (ft)		2.51	
Conv. Total (cfs)	3922.2	Conv. (cfs)		3922.2	
Length Wtd. (ft)	100.00	Wetted Per. (ft)		16.01	
Min Ch El (ft)	3175.56	Shear (lb/sq ft)		5.41	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	4.56	Cum Volume (acre-ft)		1.25	
C & E Loss (ft)	0.20	Cum SA (acres)		0.57	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3000.00

INPUT
Description:

Station Elevation Data	num=	4		
Sta Elev	Sta Elev	Sta Elev	Sta Elev	
0 3175.83	0 3169.03	11 3169.03	11 3175.83	

Manning's n Values	num=	3	
Sta n Val	Sta n Val	Sta n Val	
0 .015	0 .015	11 .015	

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	150 150	150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
				0.015	
E.G. Elev (ft)	3188.47	Element		0.015	
Vel Head (ft)	17.02	Wt. n-Val.	150.00	150.00	150.00
W.S. Elev (ft)	3171.45	Reach Len. (ft)		26.58	
Crit W.S. (ft)	3174.85	Flow Area (sq ft)		26.58	
E.G. Slope (ft/ft)	0.055989	Area (sq ft)		880.00	
Q Total (cfs)	880.00	Flow (cfs)		11.00	
Top Width (ft)	11.00	Top Width (ft)		33.11	
Vel Total (ft/s)	33.11	Avg. Vel. (ft/s)		2.42	
Max Chl Dpth (ft)	2.42	Hydr. Depth (ft)		3719.0	
Conv. Total (cfs)	3719.0	Conv. (cfs)		15.83	
Length Wtd. (ft)	150.00	Wetted Per. (ft)		5.87	
Min Ch El (ft)	3169.03	Shear (lb/sq ft)	11.00	0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)		1.19	
Frctn Loss (ft)	5.31	Cum Volume (acre-ft)		0.54	
C & E Loss (ft)	0.12	Cum SA (acres)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3150.00

INPUT
Description: End of Horizontal Curve

Station Elevation Data	num=	4		
Sta Elev	Sta Elev	Sta Elev	Sta Elev	
0 3166.02	0 3159.22	11 3159.22	11 3166.02	

Manning's n Values	num=	3	
Sta n Val	Sta n Val	Sta n Val	
0 .015	0 .015	11 .015	

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	450 450	450	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
				0.015	
E.G. Elev (ft)	3179.61	Element		0.015	
Vel Head (ft)	18.04	Wt. n-Val.	450.00	450.00	450.00
W.S. Elev (ft)	3161.57	Reach Len. (ft)		25.82	
Crit W.S. (ft)	3165.04	Flow Area (sq ft)		25.82	
E.G. Slope (ft/ft)	0.060976	Area (sq ft)		880.00	
Q Total (cfs)	880.00	Flow (cfs)		11.00	
Top Width (ft)	11.00	Top Width (ft)		34.09	
Vel Total (ft/s)	34.09	Avg. Vel. (ft/s)		2.35	
Max Chl Dpth (ft)	2.35	Hydr. Depth (ft)		3563.7	
Conv. Total (cfs)	3563.7	Conv. (cfs)		15.69	
Length Wtd. (ft)	450.00	Wetted Per. (ft)		6.26	
Min Ch El (ft)	3159.22	Shear (lb/sq ft)	11.00	0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)		1.10	
Frctn Loss (ft)	8.76	Cum Volume (acre-ft)		0.51	
C & E Loss (ft)	0.10	Cum SA (acres)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -3600

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3136.76	0	3129.96	11	3129.96	11	3136.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	400	400	400 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3151.15	Element		0.015	
Vel Head (ft)	18.89	Wt. n-Val.	400.00	400.00	400.00
W.S. Elev (ft)	3132.25	Reach Len. (ft)		25.23	
Crit W.S. (ft)	3135.78	Flow Area (sq ft)		25.23	
E.G. Slope (ft/ft)	0.065247	Area (sq ft)		880.00	
Q Total (cfs)	880.00	Flow (cfs)		11.00	
Top Width (ft)	11.00	Top Width (ft)		34.88	
Vel Total (ft/s)	34.88	Avg. Vel. (ft/s)		2.29	
Max Chl Dpth (ft)	2.29	Hydr. Depth (ft)		3445.1	
Conv. Total (cfs)	3445.1	Conv. (cfs)		15.59	
Length Wtd. (ft)	400.00	Wetted Per. (ft)		6.59	
Min Ch El (ft)	3129.96	Shear (lb/sq ft)		0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.84	
Frctn Loss (ft)	28.38	Cum Volume (acre-ft)		0.39	
C & E Loss (ft)	0.09	Cum SA (acres)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4000

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3110.76	0	3103.96	11	3103.96	11	3110.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	400	400	400 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3125.09	Element		0.015	
Vel Head (ft)	18.83	Wt. n-Val.	400.00	400.00	400.00
W.S. Elev (ft)	3106.26	Reach Len. (ft)		25.27	
Crit W.S. (ft)	3109.78	Flow Area (sq ft)		25.27	
E.G. Slope (ft/ft)	0.064942	Area (sq ft)		880.00	
Q Total (cfs)	880.00	Flow (cfs)		11.00	
Top Width (ft)	11.00	Top Width (ft)		34.83	
Vel Total (ft/s)	34.83	Avg. Vel. (ft/s)		2.30	
Max Chl Dpth (ft)	2.30	Hydr. Depth (ft)		3453.2	
Conv. Total (cfs)	3453.2	Conv. (cfs)		15.59	
Length Wtd. (ft)	400.00	Wetted Per. (ft)		6.57	
Min Ch El (ft)	3103.96	Shear (lb/sq ft)		0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.60	
Frctn Loss (ft)	26.04	Cum Volume (acre-ft)		0.29	
C & E Loss (ft)	0.02	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4400

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3084.76	0	3077.96	11	3077.96	11	3084.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	11	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	371.98	371.98	371.98 .1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3099.10	Element		0.015	
Vel Head (ft)	18.85	Wt. n-Val.	371.98	371.98	371.98
W.S. Elev (ft)	3080.26	Reach Len. (ft)		25.26	
Crit W.S. (ft)	3083.78	Flow Area (sq ft)			

E.G. Slope (ft/ft)	0.065002	Area (sq ft)		25.26	
Q Total (cfs)	880.00	Flow (cfs)		880.00	
Top Width (ft)	11.00	Top Width (ft)		11.00	
Vel Total (ft/s)	34.84	Avg. Vel. (ft/s)		34.84	
Max Chl Dpth (ft)	2.30	Hydr. Depth (ft)		2.30	
Conv. Total (cfs)	3451.6	Conv. (cfs)		3451.6	
Length Wtd. (ft)	371.98	Wetted Per. (ft)		15.59	
Min Ch El (ft)	3077.96	Shear (lb/sq ft)		6.57	
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.00	0.00
Frctn Loss (ft)	25.99	Cum Volume (acre-ft)		0.37	
C & E Loss (ft)	0.00	Cum SA (acres)		0.19	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4771.98

INPUT
Description: Grade Break

Station Elevation Data	num=	4			
Sta	Elev	Sta	Elev	Sta	Elev
0	3060.56	0	3053.76	11	3053.76
11	3060.56				

Manning's n Values	num=	3	
Sta	n Val	Sta	n Val
0	.015	0	.015
11	.015		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	109.02	109.02	109.02	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3074.91	Element		0.015	
Vel Head (ft)	18.86	Wt. n-Val.	109.02	109.02	109.02
W.S. Elev (ft)	3056.06	Reach Len. (ft)		25.25	
Crit W.S. (ft)	3059.58	Flow Area (sq ft)		25.25	
E.G. Slope (ft/ft)	0.065063	Area (sq ft)		880.00	
Q Total (cfs)	880.00	Flow (cfs)		11.00	
Top Width (ft)	11.00	Top Width (ft)		34.85	
Vel Total (ft/s)	34.85	Avg. Vel. (ft/s)		2.30	
Max Chl Dpth (ft)	2.30	Hydr. Depth (ft)		3450.0	
Conv. Total (cfs)	3450.0	Conv. (cfs)		15.59	
Length Wtd. (ft)	109.02	Wetted Per. (ft)		6.58	
Min Ch El (ft)	3053.76	Shear (lb/sq ft)		0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.16	
Frctn Loss (ft)	24.19	Cum Volume (acre-ft)		0.10	
C & E Loss (ft)	0.00	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4880.88

INPUT
Description: Beginning of Transition

Station Elevation Data	num=	4			
Sta	Elev	Sta	Elev	Sta	Elev
0	3054.37	0	3047.57	11	3047.57
11	3054.37				

Manning's n Values	num=	3	
Sta	n Val	Sta	n Val
0	.015	0	.015
11	.015		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	11	50.11	50.11	50.11	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3067.80	Element		0.015	
Vel Head (ft)	17.87	Wt. n-Val.	50.11	50.11	50.11
W.S. Elev (ft)	3049.93	Reach Len. (ft)		25.94	
Crit W.S. (ft)	3053.39	Flow Area (sq ft)		25.94	
E.G. Slope (ft/ft)	0.060128	Area (sq ft)		880.00	
Q Total (cfs)	880.00	Flow (cfs)		11.00	
Top Width (ft)	11.00	Top Width (ft)		33.92	
Vel Total (ft/s)	33.92	Avg. Vel. (ft/s)		2.36	
Max Chl Dpth (ft)	2.36	Hydr. Depth (ft)		3588.8	
Conv. Total (cfs)	3588.8	Conv. (cfs)		15.72	
Length Wtd. (ft)	50.11	Wetted Per. (ft)		6.20	
Min Ch El (ft)	3047.57	Shear (lb/sq ft)		0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)	11.00	0.09	
Frctn Loss (ft)	6.82	Cum Volume (acre-ft)		0.07	
C & E Loss (ft)	0.30	Cum SA (acres)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4931.11

INPUT

Description: End of Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3051.57	5.7	3044.97	13.45	3044.82	21.2	3044.97	26.9	3051.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	26.9	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	26.9	50.1	50.1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3064.35	Element		0.015	
Vel Head (ft)	17.90	Wt. n-Val.	50.10	50.10	50.10
W.S. Elev (ft)	3046.45	Reach Len. (ft)		25.92	
Crit W.S. (ft)	3049.17	Flow Area (sq ft)		25.92	
E.G. Slope (ft/ft)	0.079855	Area (sq ft)		880.00	
Q Total (cfs)	880.00	Flow (cfs)		18.05	
Top Width (ft)	18.05	Top Width (ft)		33.95	
Vel Total (ft/s)	33.95	Avg. Vel. (ft/s)		1.44	
Max Chl Dpth (ft)	1.63	Hydr. Depth (ft)		3114.1	
Conv. Total (cfs)	3114.1	Conv. (cfs)		19.40	
Length Wtd. (ft)	50.10	Wetted Per. (ft)		6.66	
Min Ch El (ft)	3044.82	Shear (lb/sq ft)		0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)	26.90	0.06	
Frctn Loss (ft)	3.45	Cum Volume (acre-ft)		0.05	
C & E Loss (ft)	0.00	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -4981.21

INPUT
Description: End of Transition
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3047.85	11.4	3042.15	21.4	3041.85	31.4	3042.15	42.8	3047.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	42.8	.015

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	42.8	50	50	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3059.51	Element		0.015	
Vel Head (ft)	16.27	Wt. n-Val.	50.00	50.00	50.00
W.S. Elev (ft)	3043.24	Reach Len. (ft)		27.19	
Crit W.S. (ft)	3045.51	Flow Area (sq ft)		27.19	
E.G. Slope (ft/ft)	0.094878	Area (sq ft)		880.00	
Q Total (cfs)	880.00	Flow (cfs)		24.36	
Top Width (ft)	24.36	Top Width (ft)		32.37	
Vel Total (ft/s)	32.37	Avg. Vel. (ft/s)		1.12	
Max Chl Dpth (ft)	1.39	Hydr. Depth (ft)		2856.9	
Conv. Total (cfs)	2856.9	Conv. (cfs)		24.89	
Length Wtd. (ft)	50.00	Wetted Per. (ft)		6.47	
Min Ch El (ft)	3041.85	Shear (lb/sq ft)		0.00	0.00
Alpha	1.00	Stream Power (lb/ft s)	42.80	0.03	
Frctn Loss (ft)	4.35	Cum Volume (acre-ft)		0.03	
C & E Loss (ft)	0.49	Cum SA (acres)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26 Open
REACH: V26 RS: -5031.21

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3044.31	11.4	3038.61	21.4	3038.31	31.4	3038.61	42.8	3044.31

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.015	0	.015	42.8	.015

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	42.8	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3054.67	Element		0.015	
Vel Head (ft)	14.92	Wt. n-Val.		28.39	
W.S. Elev (ft)	3039.75	Reach Len. (ft)		28.39	
Crit W.S. (ft)	3041.96	Flow Area (sq ft)		880.00	
E.G. Slope (ft/ft)	0.083096	Area (sq ft)		24.56	
Q Total (cfs)	880.00	Flow (cfs)		31.00	
Top Width (ft)	24.56	Top Width (ft)		1.16	
Vel Total (ft/s)	31.00	Avg. Vel. (ft/s)			
Max Chl Dpth (ft)	1.44	Hydr. Depth (ft)			

Conv. Total (cfs)	3052.8	Conv. (cfs)		3052.8	
Length Wtd. (ft)		Wetted Per. (ft)		25.11	
Min Ch El (ft)	3038.31	Shear (lb/sq ft)		5.87	
Alpha	1.00	Stream Power (lb/ft s)	42.80	0.00	0.00
Frctn Loss (ft)	4.43	Cum Volume (acre-ft)			
C & E Loss (ft)	0.40	Cum SA (acres)			

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:Village 26 Open

Reach	River Sta.	n1	n2	n3
V26	-384.04	.015	.015	.015
V26	-956.12	.015	.015	.015
V26	-1006.12	.015	.015	.015
V26	-1406.12	.015	.015	.015
V26	-1407.12	.015	.015	.015
V26	-1506.12	.015	.015	.015
V26	-1531.61	.015	.015	.015
V26	-2127.53	.015	.015	.015
V26	-2177.53	.015	.015	.015
V26	-2327.53	.015	.015	.015
V26	-2477.53	.015	.015	.015
V26	-2565.46	.015	.015	.015
V26	-2626.68	.015	.015	.015
V26	-2717.76	.015	.015	.015
V26	-2800.00	.015	.015	.015
V26	-2900.00	.015	.015	.015
V26	-3000.00	.015	.015	.015
V26	-3150.00	.015	.015	.015
V26	-3600	.015	.015	.015
V26	-4000	.015	.015	.015
V26	-4400	.015	.015	.015
V26	-4771.98	.015	.015	.015
V26	-4880.88	.015	.015	.015
V26	-4931.11	.015	.015	.015
V26	-4981.21	.015	.015	.015
V26	-5031.21	.015	.015	.015

SUMMARY OF REACH LENGTHS

River: Village 26 Open

Reach	River Sta.	Left	Channel	Right
V26	-384.04	572.08	572.08	572.08
V26	-956.12	50	50	50
V26	-1006.12	400	400	400
V26	-1406.12	1	1	1
V26	-1407.12	99	99	99
V26	-1506.12	25.49	25.49	25.49
V26	-1531.61	595.92	595.92	595.92
V26	-2127.53	50	50	50
V26	-2177.53	150	150	150
V26	-2327.53	150	150	150
V26	-2477.53	87.93	87.93	87.93
V26	-2565.46	61.22	61.22	61.22
V26	-2626.68	91.08	91.08	91.08
V26	-2717.76	82.24	82.24	82.24
V26	-2800.00	100	100	100
V26	-2900.00	100	100	100
V26	-3000.00	150	150	150
V26	-3150.00	450	450	450
V26	-3600	400	400	400
V26	-4000	400	400	400
V26	-4400	371.98	371.98	371.98
V26	-4771.98	109.02	109.02	109.02
V26	-4880.88	50.11	50.11	50.11
V26	-4931.11	50.1	50.1	50.1
V26	-4981.21	50	50	50
V26	-5031.21			

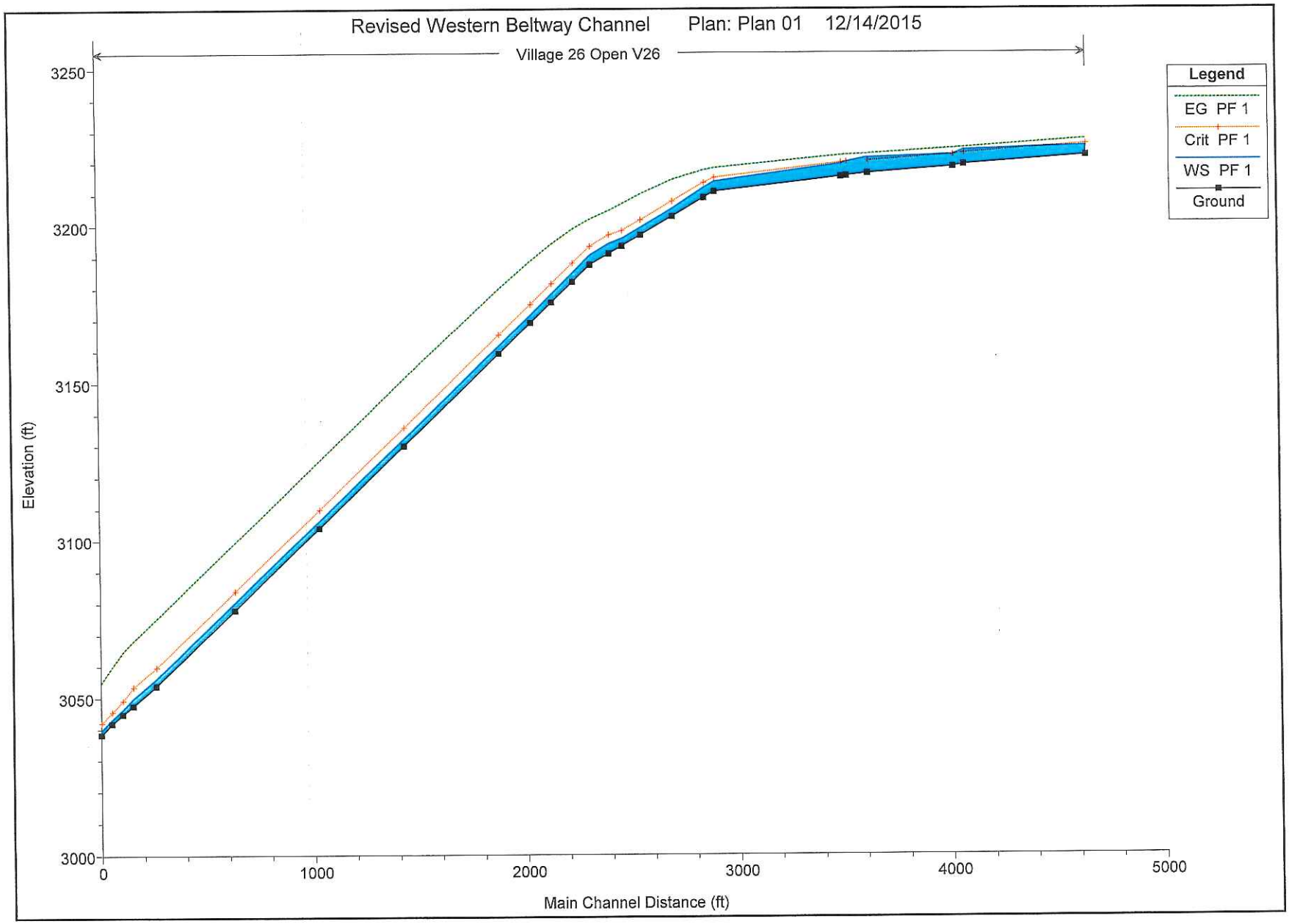
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Village 26 Open

Reach	River Sta.	Contr.	Expan.
V26	-384.04	.1	.3
V26	-956.12	.1	.3
V26	-1006.12	.1	.3
V26	-1406.12	.1	.3
V26	-1407.12	.1	.3
V26	-1506.12	.1	.3
V26	-1531.61	.1	.3
V26	-2127.53	.1	.3
V26	-2177.53	.1	.3
V26	-2327.53	.1	.3
V26	-2477.53	.1	.3
V26	-2565.46	.1	.3
V26	-2626.68	.1	.3
V26	-2717.76	.1	.3

V26	-2800.00	.1	.3
V26	-2900.00	.1	.3
V26	-3000.00	.1	.3
V26	-3150.00	.1	.3
V26	-3600	.1	.3
V26	-4000	.1	.3
V26	-4400	.1	.3
V26	-4771.98	.1	.3
V26	-4880.88	.1	.3
V26	-4931.11	.1	.3
V26	-4981.21	.1	.3
V26	-5031.21	.1	.3

HEC-RAS Plan: Plan 01 River: Village 26 Open Reach: V26 Profile: PF 1

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)	
V26	-384.04	880.00	3221.97	3225.01	3225.64	3227.27	0.005002	12.06	72.94	30.98	1.39
V26	-956.12	880.00	3219.11	3223.68	3222.77	3224.45	0.001074	7.04	124.95	37.09	0.68
V26	-1006.12	880.00	3218.36	3222.27	3222.27	3224.24	0.004541	11.27	78.11	20.00	1.00
V26	-1406.12	880.00	3216.36	3221.24	3220.27	3222.50	0.002486	9.02	97.53	20.00	0.72
V26	-1407.12	880.00	3216.35	3221.36		3222.45	0.001400	8.37	105.17	21.00	0.66
V26	-1506.12	880.00	3215.58	3219.93	3219.93	3222.13	0.003523	11.90	73.97	17.00	1.01
V26	-1531.61	880.00	3215.38	3219.36	3219.73	3221.99	0.004563	13.01	67.65	17.00	1.15
V26	-2127.53	880.00	3210.70	3213.83	3215.05	3218.08	0.009237	16.53	53.23	17.00	1.65
V26	-2177.53	880.00	3208.73	3211.83	3213.46	3217.40	0.012847	18.95	46.45	15.00	1.90
V26	-2327.53	880.00	3202.84	3205.26	3207.57	3214.36	0.026643	24.21	36.35	15.00	2.74
V26	-2477.53	880.00	3196.94	3199.19	3201.67	3209.75	0.033372	26.08	33.74	15.00	3.06
V26	-2565.46	880.00	3193.48	3195.68	3198.21	3206.69	0.035486	26.62	33.06	15.00	3.16
V26	-2626.68	880.00	3191.07	3194.15	3196.89	3204.61	0.027692	25.95	33.91	11.00	2.60
V26	-2717.76	880.00	3187.48	3190.43	3193.30	3201.84	0.031337	27.10	32.47	11.00	2.78
V26	-2800.00	880.00	3182.10	3184.78	3187.92	3198.65	0.041545	29.88	29.45	11.00	3.22
V26	-2900.00	880.00	3175.56	3178.07	3181.38	3193.89	0.050340	31.93	27.56	11.00	3.55
V26	-3000.00	880.00	3169.03	3171.45	3174.85	3188.47	0.055989	33.11	26.58	11.00	3.75
V26	-3150.00	880.00	3159.22	3161.57	3165.04	3179.61	0.060976	34.09	25.82	11.00	3.92
V26	-3600	880.00	3129.96	3132.25	3135.78	3151.15	0.065247	34.88	25.23	11.00	4.06
V26	-4000	880.00	3103.96	3106.26	3109.78	3125.09	0.064942	34.83	25.27	11.00	4.05
V26	-4400	880.00	3077.96	3080.26	3083.78	3099.10	0.065002	34.84	25.26	11.00	4.05
V26	-4771.98	880.00	3053.76	3056.06	3059.58	3074.91	0.065063	34.85	25.25	11.00	4.05
V26	-4880.88	880.00	3047.57	3049.93	3053.39	3067.80	0.060128	33.92	25.94	11.00	3.89
V26	-4931.11	880.00	3044.82	3046.45	3049.17	3064.35	0.079855	33.95	25.92	18.05	4.99
V26	-4981.21	880.00	3041.85	3043.24	3045.51	3059.51	0.094878	32.37	27.19	24.36	5.40
V26	-5031.21	880.00	3038.31	3039.75	3041.96	3054.67	0.083096	31.00	28.39	24.56	5.08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Village 26 Open V26
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Crit PF 1
WS PF 1
Ground
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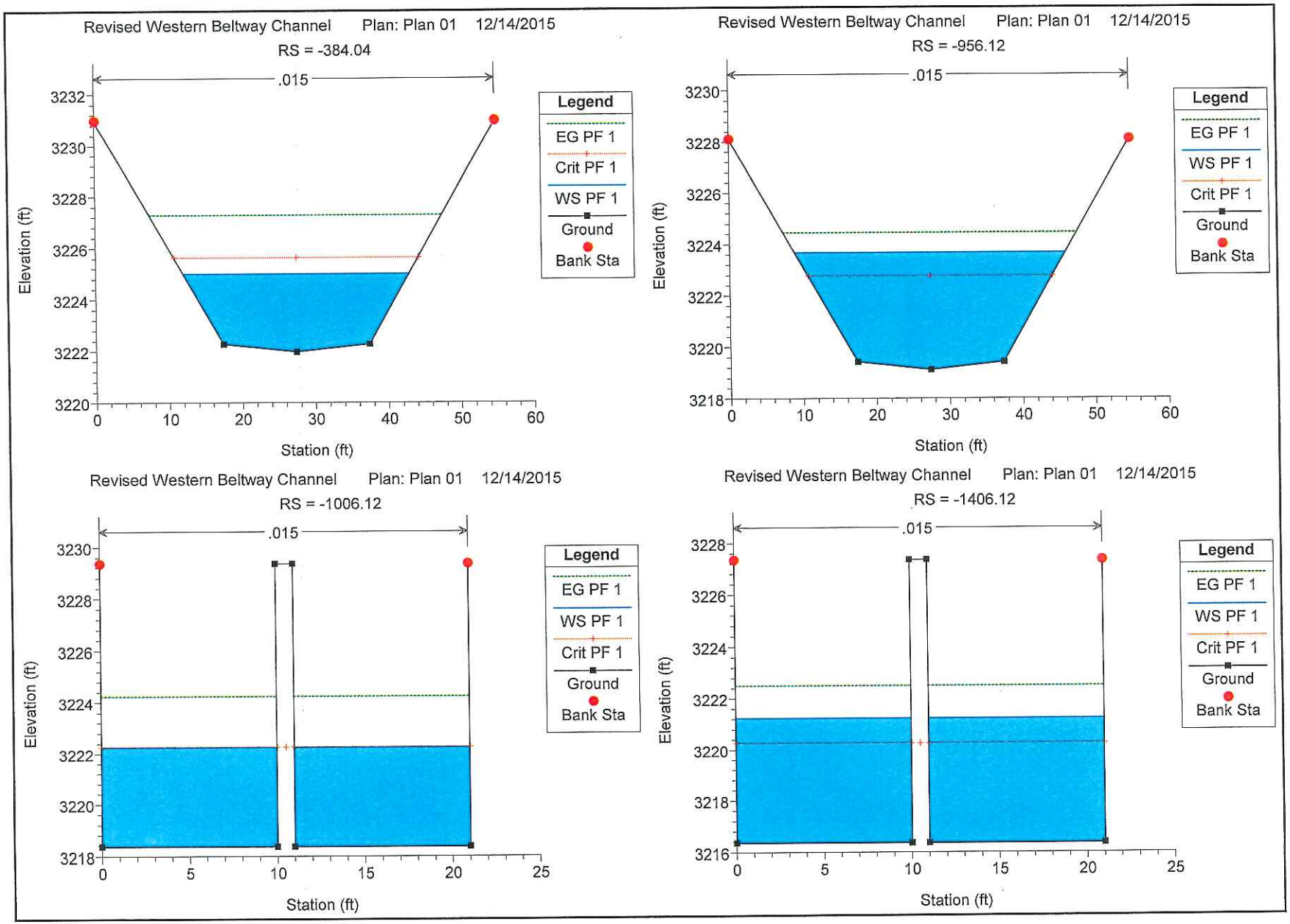
3200
3150
3100
3050
3000
0
1000
2000
3000
4000
5000
Main Channel Distance (ft)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Legend
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Crit PF 1
WS PF 1
Ground
Bank Sta
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RS = -956.12
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Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
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RS = -1006.12
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Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
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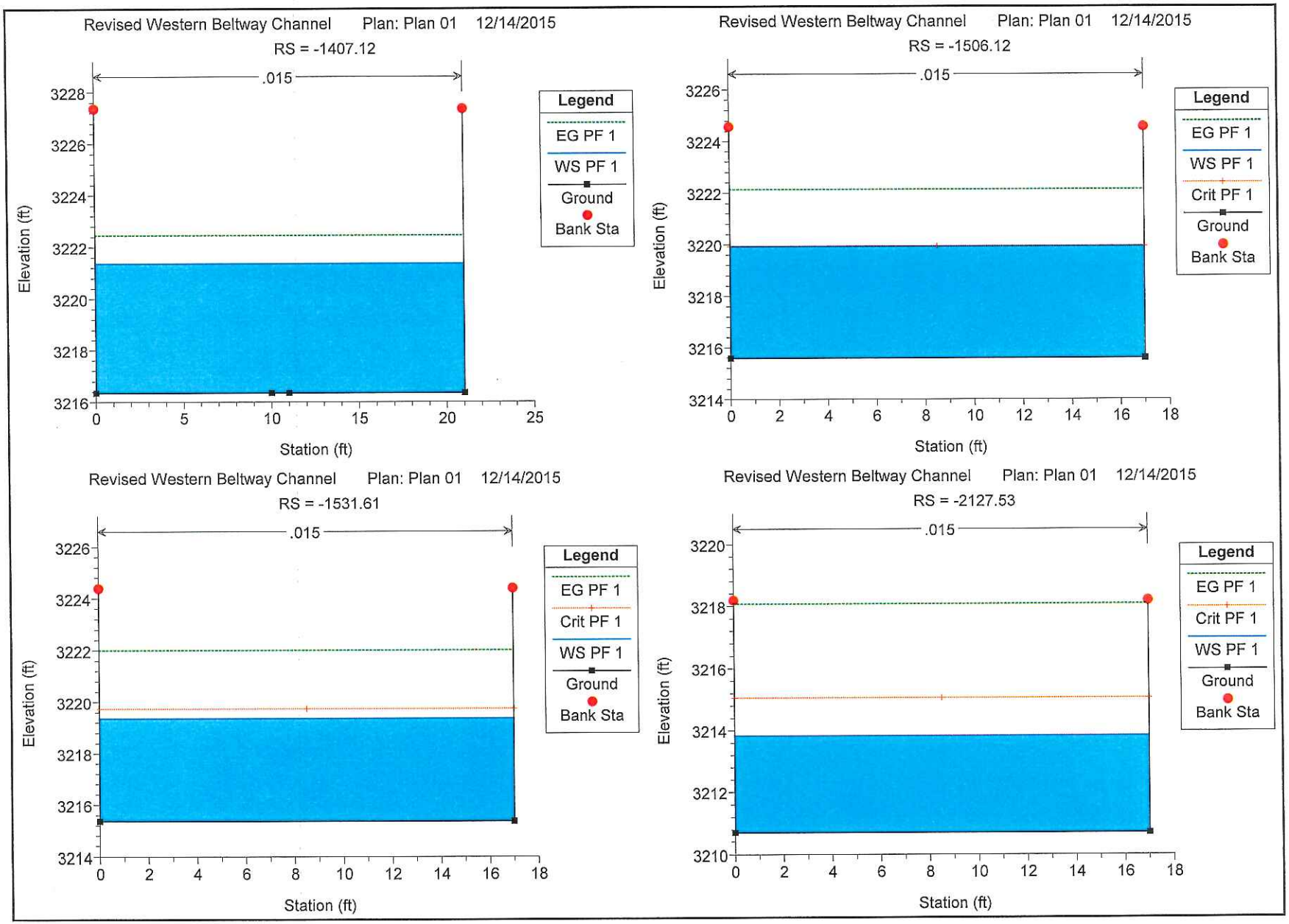
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta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Legend
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WS PF 1
Ground
Bank Sta
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.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
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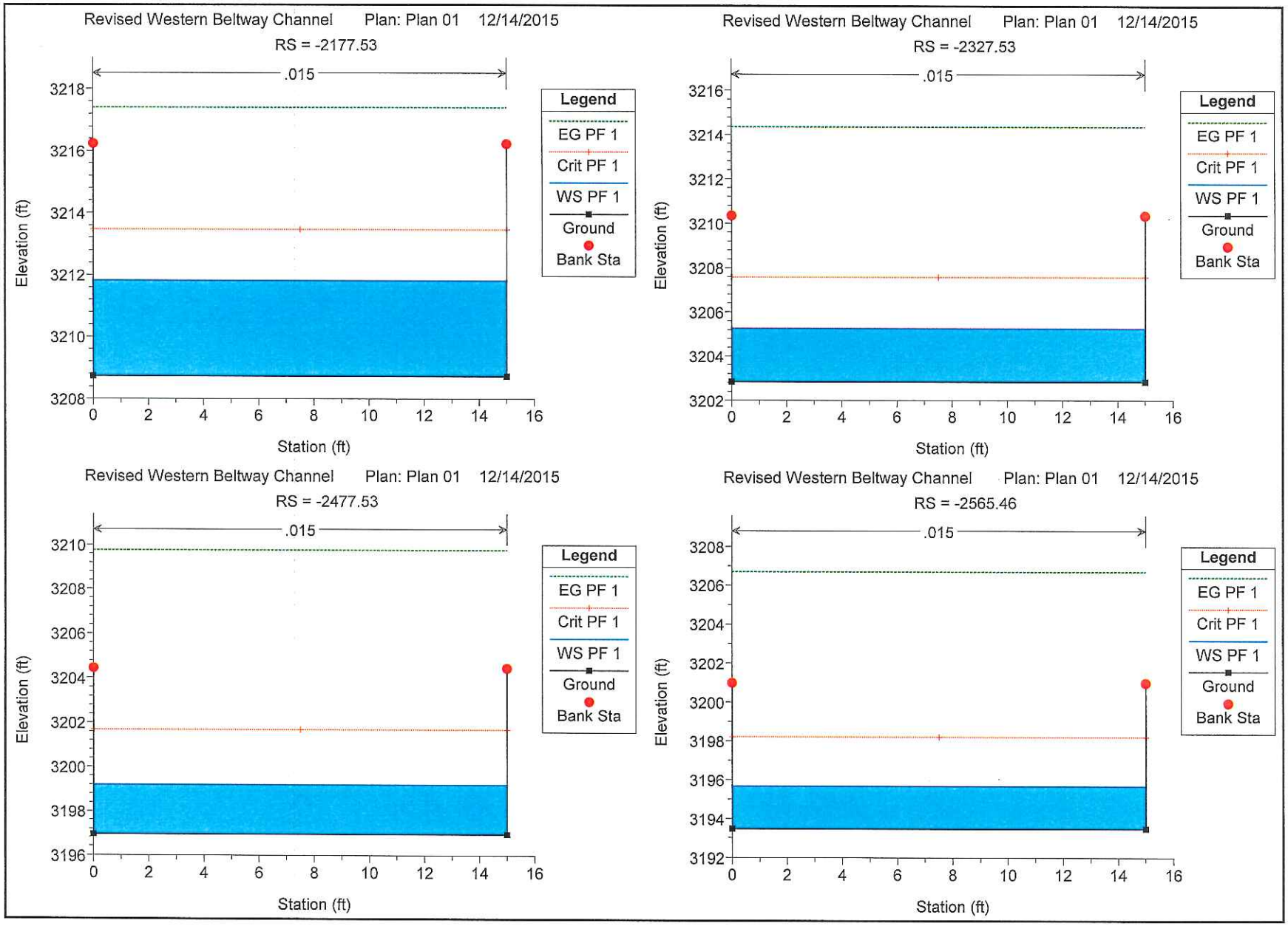
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta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Station (ft)
Legend
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Crit PF 1
WS PF 1
Ground
Bank Sta
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RS = -2327.53
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
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Legend
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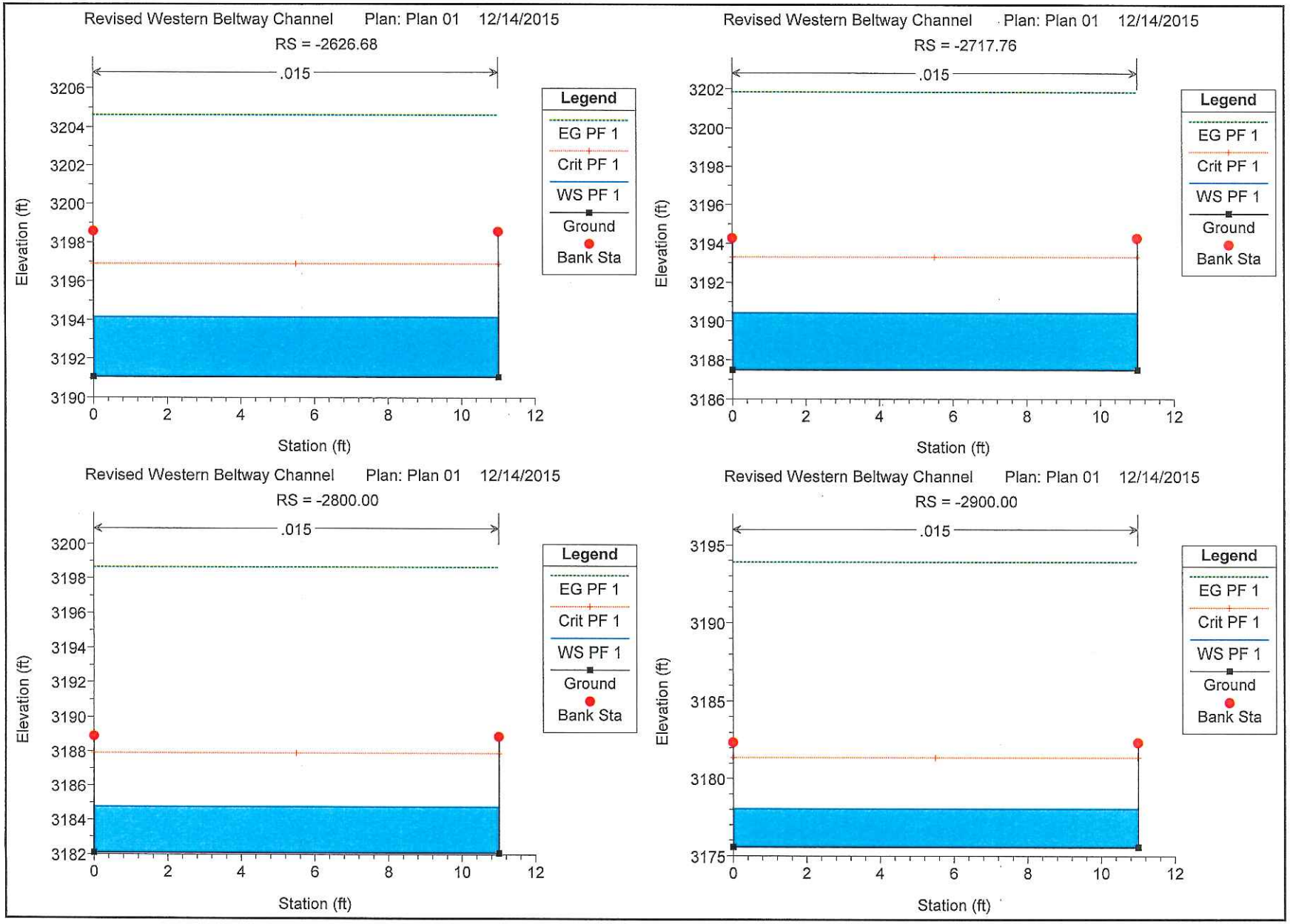
Crit PF 1
WS PF 1
Ground
Bank Sta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Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
RS = -2717.76
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
RS = -2800.00
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
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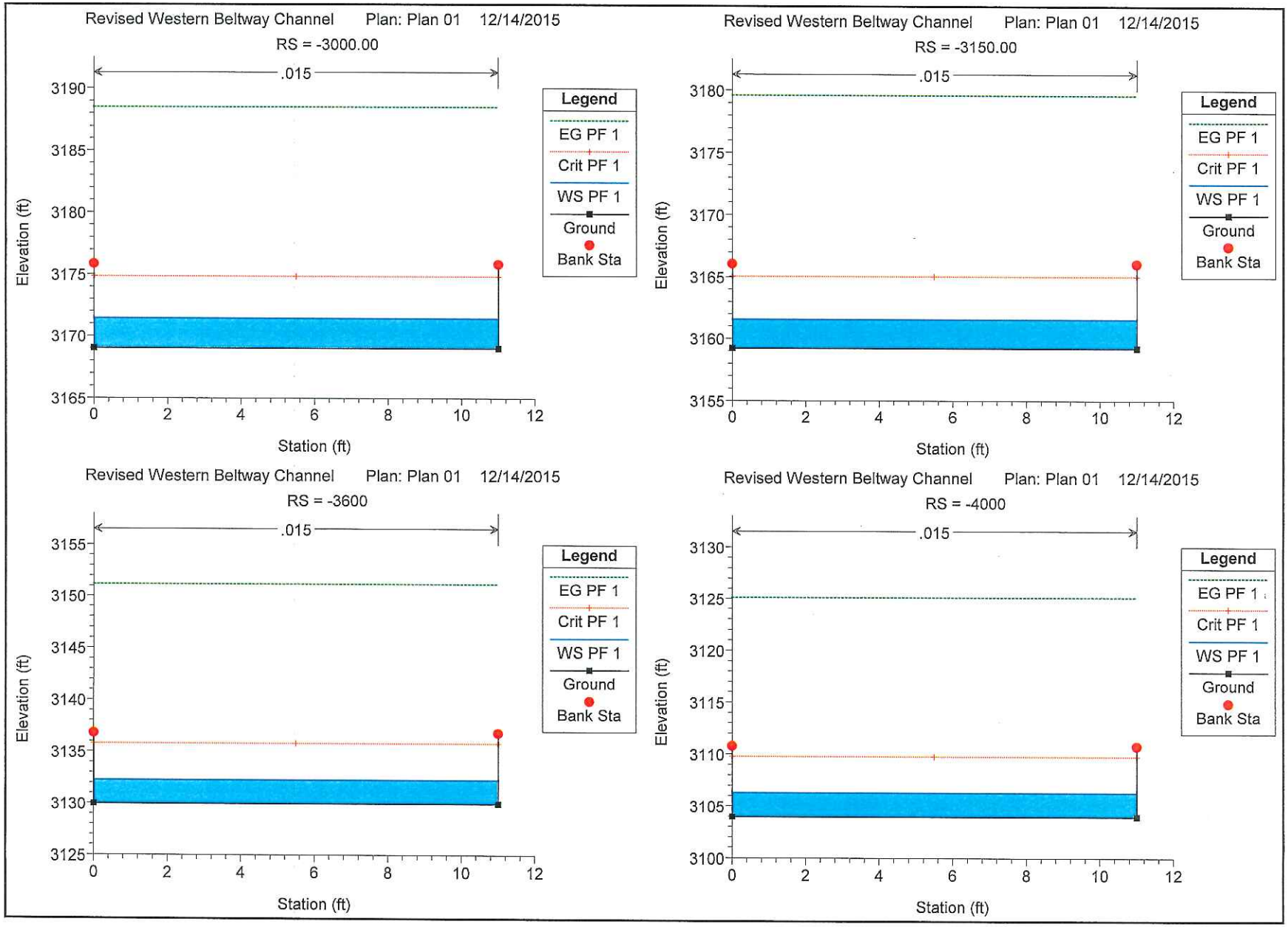
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
RS = -3150.00
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
RS = -3600
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
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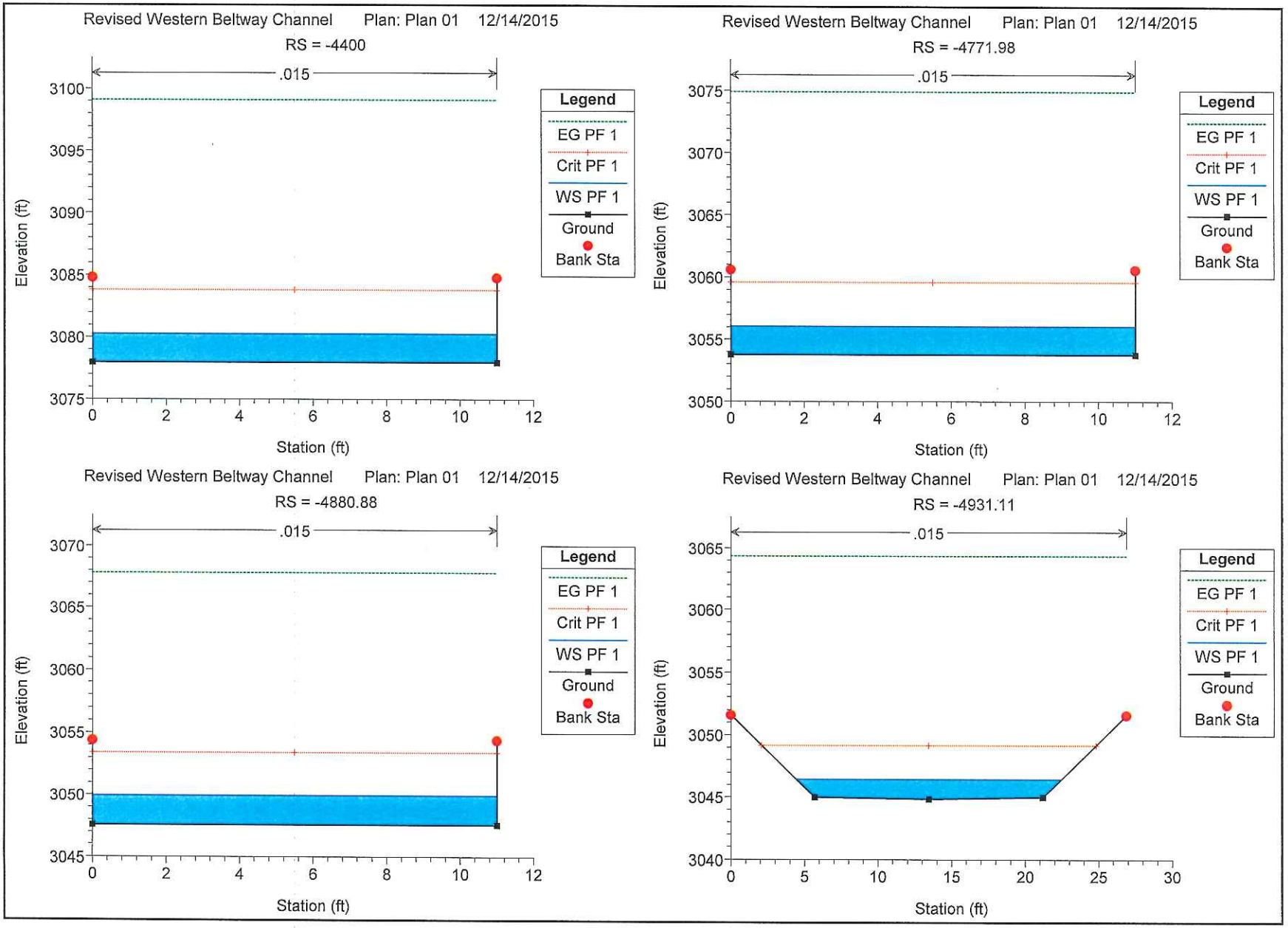
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
RS = -4771.98
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
RS = -4880.88
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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
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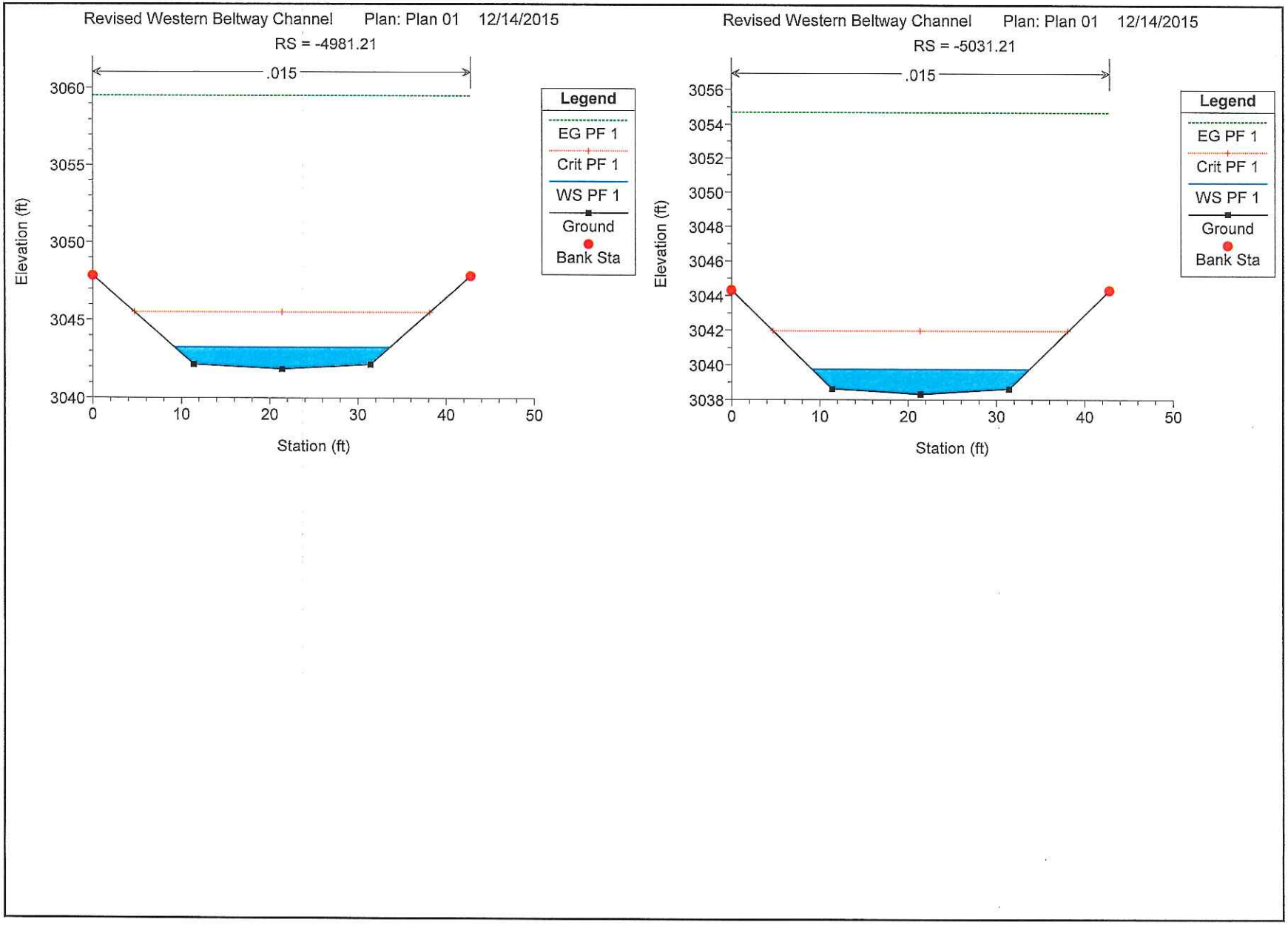
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta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Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta
Revised Western Beltway Channel Plan: Plan 01 12/14/2015
RS = -5031.21
.015
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Bank Sta

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
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: Village 26 Debris Basin Stepped Inflow
Project File : Debris.prj
Run Date and Time: 8/5/2008 1:59:25 PM

Project in English units

PLAN DATA

Plan Title: Plan 01
Plan File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Referenced Models\CCRFCD\DebBasInflow\Debris.p01

Geometry Title: Debris Basin Stepped Inflow
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Referenced Models\CCRFCD\DebBasInflow\Debris.g01

Flow Title : Debris Basin Inflow
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Referenced Models\CCRFCD\DebBasInflow\Debris.f01

Plan Summary Information:
Number of: Cross Sections = 11 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 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: Debris Basin Inflow
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Referenced Models\CCRFCD\DebBasInflow\Debris.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Village 26	Stepped Inflow	1255.33	3503

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Village 26	Stepped Inflow	PF 1	Normal S = 0.07	Normal S = 0.75

GEOMETRY DATA

Geometry Title: Debris Basin Stepped Inflow
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Referenced Models\CCRFCD\DebBasInflow\Debris.g01

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1255.33

INPUT
Description: Top of Stepped Structure
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3301	0	3296	54	3295	72	3294	137	3294
150	3295	155	3296	278	3296	325	3295	348	3294
355	3293	363	3293	370	3294	402	3294	405	3295
408	3296	411	3297						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	411	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	411	99.9	99.9	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3298.00	Element			
Vel Head (ft)	2.43	Wt. n-Val.		0.035	
W.S. Elev (ft)	3295.57	Reach Len. (ft)	99.90	99.90	99.90
Crit W.S. (ft)	3296.35	Flow Area (sq ft)		280.08	
E.G. Slope (ft/ft)	0.070041	Area (sq ft)		280.08	
Q Total (cfs)	3503.00	Flow (cfs)		3503.00	
Top Width (ft)	237.92	Top Width (ft)		237.92	
Vel Total (ft/s)	12.51	Avg. Vel. (ft/s)		12.51	
Max Chl Dpth (ft)	2.57	Hydr. Depth (ft)		1.18	
Conv. Total (cfs)	13236.2	Conv. (cfs)		13236.2	
Length Wtd. (ft)	99.90	Wetted Per. (ft)		238.48	
Min Ch El (ft)	3293.00	Shear (lb/sq ft)		5.14	
Alpha	1.00	Stream Power (lb/ft s)		64.23	
Frctn Loss (ft)		Cum Volume (acre-ft)		1.09	
C & E Loss (ft)		Cum SA (acres)		1.00	

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1155.43

INPUT
Description: Top of Stepped Structure
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3292	0	3287	29	3288	39	3289	210	3289
236	3288	244	3287	260	3286	273	3285	299	3285
361	3286	373	3287	375	3288				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	375	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	375	.1	.1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3290.96	Element			
Vel Head (ft)	3.58	Wt. n-Val.		0.035	
W.S. Elev (ft)	3287.38	Reach Len. (ft)	0.10	0.10	0.10
Crit W.S. (ft)	3288.48	Flow Area (sq ft)		230.74	
E.G. Slope (ft/ft)	0.068546	Area (sq ft)		230.74	
Q Total (cfs)	3503.00	Flow (cfs)		3503.00	
Top Width (ft)	143.93	Top Width (ft)		143.93	
Vel Total (ft/s)	15.18	Avg. Vel. (ft/s)		15.18	
Max Chl Dpth (ft)	2.38	Hydr. Depth (ft)		1.60	
Conv. Total (cfs)	13379.8	Conv. (cfs)		13379.8	
Length Wtd. (ft)	0.10	Wetted Per. (ft)		144.55	
Min Ch El (ft)	3285.00	Shear (lb/sq ft)		6.83	
Alpha	1.00	Stream Power (lb/ft s)		103.70	
Frctn Loss (ft)	6.92	Cum Volume (acre-ft)		0.50	
C & E Loss (ft)	0.11	Cum SA (acres)		0.56	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1155.33

INPUT
Description: Top of Stepped Structure
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3294	0	3289	210	3289	236	3288	256	3287
315	3286	345	3285	375	3285	375	3294		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.017	0	.017	375	.017

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	375	12	12	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3290.69	Element			
Vel Head (ft)	2.66	Wt. n-Val.		0.017	
W.S. Elev (ft)	3288.03	Reach Len. (ft)	12.00	12.00	12.00

Crit W.S. (ft)	3289.27	Flow Area (sq ft)	267.65
E.G. Slope (ft/ft)	0.009707	Area (sq ft)	267.65
Q Total (cfs)	3503.00	Flow (cfs)	3503.00
Top Width (ft)	139.77	Top Width (ft)	139.77
Vel Total (ft/s)	13.09	Avg. Vel. (ft/s)	13.09
Max Chl Dpth (ft)	3.03	Hydr. Depth (ft)	1.91
Conv. Total (cfs)	35554.9	Conv. (cfs)	35554.9
Length Wtd. (ft)	12.00	Wetted Per. (ft)	142.85
Min Ch El (ft)	3285.00	Shear (lb/sq ft)	1.14
Alpha	1.00	Stream Power (lb/ft s)	14.86
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	0.50
C & E Loss (ft)	0.28	Cum SA (acres)	0.56

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1143.33

INPUT
Description: Top of Stepped Structure
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3294	0	3288.9	210	3288.9	236	3287.9	256	3286.9
315	3285.9	345	3284.9	375	3284.9	375	3294		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	375	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	375	13.333	13.333	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3290.26	Element			
Vel Head (ft)	2.09	Wt. n-Val.		0.060	
W.S. Elev (ft)	3288.17	Reach Len. (ft)	13.33	13.33	13.33
Crit W.S. (ft)	3289.18	Flow Area (sq ft)		301.87	
E.G. Slope (ft/ft)	0.085893	Area (sq ft)		301.87	
Q Total (cfs)	3503.00	Flow (cfs)		3503.00	
Top Width (ft)	146.00	Top Width (ft)		146.00	
Vel Total (ft/s)	11.60	Avg. Vel. (ft/s)		11.60	
Max Chl Dpth (ft)	3.27	Hydr. Depth (ft)		2.07	
Conv. Total (cfs)	11952.6	Conv. (cfs)		11952.6	
Length Wtd. (ft)	13.33	Wetted Per. (ft)		149.33	
Min Ch El (ft)	3284.90	Shear (lb/sq ft)		10.84	
Alpha	1.00	Stream Power (lb/ft s)		125.79	
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)		0.42	
C & E Loss (ft)	0.17	Cum SA (acres)		0.52	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1130

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3284	0	3279	274	3279	274	3284

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	274	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	274	13.334	13.334	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3286.76	Element			
Vel Head (ft)	7.16	Wt. n-Val.		0.060	
W.S. Elev (ft)	3279.60	Reach Len. (ft)	13.33	13.33	13.33
Crit W.S. (ft)	3280.71	Flow Area (sq ft)		163.09	
E.G. Slope (ft/ft)	1.511086	Area (sq ft)		163.09	
Q Total (cfs)	3503.00	Flow (cfs)		3503.00	
Top Width (ft)	274.00	Top Width (ft)		274.00	
Vel Total (ft/s)	21.48	Avg. Vel. (ft/s)		21.48	
Max Chl Dpth (ft)	0.60	Hydr. Depth (ft)		0.60	
Conv. Total (cfs)	2849.7	Conv. (cfs)		2849.7	
Length Wtd. (ft)	13.33	Wetted Per. (ft)		275.19	
Min Ch El (ft)	3279.00	Shear (lb/sq ft)		55.91	
Alpha	1.00	Stream Power (lb/ft s)		1200.85	
Frctn Loss (ft)	2.99	Cum Volume (acre-ft)		0.35	
C & E Loss (ft)	0.51	Cum SA (acres)		0.46	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1116.67

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3274	0	3269	253	3269	253	3274

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	253	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	253	13.333 13.333	13.333	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3274.12	Element			
Vel Head (ft)	4.28	Wt. n-Val.		0.060	
W.S. Elev (ft)	3269.83	Reach Len. (ft)	13.33	13.33	13.33
Crit W.S. (ft)	3270.81	Flow Area (sq ft)		210.94	
E.G. Slope (ft/ft)	0.578078	Area (sq ft)		210.94	
Q Total (cfs)	3503.00	Flow (cfs)		3503.00	
Top Width (ft)	253.00	Top Width (ft)		253.00	
Vel Total (ft/s)	16.61	Avg. Vel. (ft/s)		16.61	
Max Chl Dpth (ft)	0.83	Hydr. Depth (ft)		0.83	
Conv. Total (cfs)	4607.3	Conv. (cfs)		4607.3	
Length Wtd. (ft)	13.33	Wetted Per. (ft)		254.67	
Min Ch El (ft)	3269.00	Shear (lb/sq ft)		29.89	
Alpha	1.00	Stream Power (lb/ft s)		496.42	
Frctn Loss (ft)	11.77	Cum Volume (acre-ft)		0.30	
C & E Loss (ft)	0.86	Cum SA (acres)		0.37	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1103.33

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3264	0	3259	246	3259	246	3264

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	246	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	246	13.333 13.333	13.333	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3265.06	Element			
Vel Head (ft)	5.29	Wt. n-Val.		0.060	
W.S. Elev (ft)	3259.77	Reach Len. (ft)	13.33	13.33	13.33
Crit W.S. (ft)	3260.84	Flow Area (sq ft)		189.85	
E.G. Slope (ft/ft)	0.790792	Area (sq ft)		189.85	
Q Total (cfs)	3503.00	Flow (cfs)		3503.00	
Top Width (ft)	246.00	Top Width (ft)		246.00	
Vel Total (ft/s)	18.45	Avg. Vel. (ft/s)		18.45	
Max Chl Dpth (ft)	0.77	Hydr. Depth (ft)		0.77	
Conv. Total (cfs)	3939.2	Conv. (cfs)		3939.2	
Length Wtd. (ft)	13.33	Wetted Per. (ft)		247.54	
Min Ch El (ft)	3259.00	Shear (lb/sq ft)		37.86	
Alpha	1.00	Stream Power (lb/ft s)		698.63	
Frctn Loss (ft)	8.96	Cum Volume (acre-ft)		0.24	
C & E Loss (ft)	0.10	Cum SA (acres)		0.30	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1090

INPUT

Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3254	0	3249	237.5	3249	237.5	3254

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	237.5	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	237.5	13.334	13.334	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3254.95	Element			
Vel Head (ft)	5.14	Wt. n-Val.		0.060	
W.S. Elev (ft)	3249.81	Reach Len. (ft)	13.33	13.33	13.33
Crit W.S. (ft)	3250.89	Flow Area (sq ft)		192.50	
E.G. Slope (ft/ft)	0.720904	Area (sq ft)		192.50	
Q Total (cfs)	3503.00	Flow (cfs)		3503.00	
Top Width (ft)	237.50	Top Width (ft)		237.50	
Vel Total (ft/s)	18.20	Avg. Vel. (ft/s)		18.20	
Max Chl Dpth (ft)	0.81	Hydr. Depth (ft)		0.81	
Conv. Total (cfs)	4125.7	Conv. (cfs)		4125.7	
Length Wtd. (ft)	13.33	Wetted Per. (ft)		239.12	
Min Ch El (ft)	3249.00	Shear (lb/sq ft)		36.23	
Alpha	1.00	Stream Power (lb/ft s)		659.31	
Frctn Loss (ft)	10.06	Cum Volume (acre-ft)		0.18	
C & E Loss (ft)	0.04	Cum SA (acres)		0.22	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1076.67

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3244	0	3239	240	3239	240	3244

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	240	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	240	13.333	13.333	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3245.06	Element			
Vel Head (ft)	5.27	Wt. n-Val.		0.060	
W.S. Elev (ft)	3239.79	Reach Len. (ft)	13.33	13.33	13.33
Crit W.S. (ft)	3240.88	Flow Area (sq ft)		190.14	
E.G. Slope (ft/ft)	0.761607	Area (sq ft)		190.14	
Q Total (cfs)	3503.00	Flow (cfs)		3503.00	
Top Width (ft)	240.00	Top Width (ft)		240.00	
Vel Total (ft/s)	18.42	Avg. Vel. (ft/s)		18.42	
Max Chl Dpth (ft)	0.79	Hydr. Depth (ft)		0.79	
Conv. Total (cfs)	4014.0	Conv. (cfs)		4014.0	
Length Wtd. (ft)	13.33	Wetted Per. (ft)		241.58	
Min Ch El (ft)	3239.00	Shear (lb/sq ft)		37.42	
Alpha	1.00	Stream Power (lb/ft s)		689.44	
Frctn Loss (ft)	9.88	Cum Volume (acre-ft)		0.12	
C & E Loss (ft)	0.01	Cum SA (acres)		0.15	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1063.33

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3234	0	3229	245	3229	245	3234

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	245	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	245	13.333	13.333	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3234.93	Element			
Vel Head (ft)	5.15	Wt. n-Val.		0.060	
W.S. Elev (ft)	3229.79	Reach Len. (ft)	13.33	13.33	13.33

Crit W.S. (ft)	3230.85	Flow Area (sq ft)	192.42
E.G. Slope (ft/ft)	0.752069	Area (sq ft)	192.42
Q Total (cfs)	3503.00	Flow (cfs)	3503.00
Top Width (ft)	245.00	Top Width (ft)	245.00
Vel Total (ft/s)	18.20	Avg. Vel. (ft/s)	18.20
Max Chl Dpth (ft)	0.79	Hydr. Depth (ft)	0.79
Conv. Total (cfs)	4039.4	Conv. (cfs)	4039.4
Length Wtd. (ft)	13.33	Wetted Per. (ft)	246.57
Min Ch El (ft)	3229.00	Shear (lb/sq ft)	36.64
Alpha	1.00	Stream Power (lb/ft s)	667.04
Frctn Loss (ft)	10.09	Cum Volume (acre-ft)	0.06
C & E Loss (ft)	0.04	Cum SA (acres)	0.08

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1050

INPUT
Description: Begin Concrete Pad
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3224	0	3219	260	3219	260	3224

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	260	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	260	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3224.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.98	Wt. n-Val.		0.060	
W.S. Elev (ft)	3219.75	Reach Len. (ft)			
Crit W.S. (ft)	3220.77	Flow Area (sq ft)		195.57	
E.G. Slope (ft/ft)	0.770574	Area (sq ft)		195.57	
Q Total (cfs)	3503.00	Flow (cfs)		3503.00	
Top Width (ft)	260.00	Top Width (ft)		260.00	
Vel Total (ft/s)	17.91	Avg. Vel. (ft/s)		17.91	
Max Chl Dpth (ft)	0.75	Hydr. Depth (ft)		0.75	
Conv. Total (cfs)	3990.6	Conv. (cfs)		3990.6	
Length Wtd. (ft)		Wetted Per. (ft)		261.50	
Min Ch El (ft)	3219.00	Shear (lb/sq ft)		35.98	
Alpha	1.00	Stream Power (lb/ft s)		644.42	
Frctn Loss (ft)	10.15	Cum Volume (acre-ft)			
C & E Loss (ft)	0.05	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:Village 26

Reach	River Sta.	n1	n2	n3
Stepped Inflow	1255.33	.035	.035	.035
Stepped Inflow	1155.43	.035	.035	.035
Stepped Inflow	1155.33	.017	.017	.017
Stepped Inflow	1143.33	.06	.06	.06
Stepped Inflow	1130	.06	.06	.06
Stepped Inflow	1116.67	.06	.06	.06
Stepped Inflow	1103.33	.06	.06	.06
Stepped Inflow	1090	.06	.06	.06
Stepped Inflow	1076.67	.06	.06	.06
Stepped Inflow	1063.33	.06	.06	.06
Stepped Inflow	1050	.06	.06	.06

SUMMARY OF REACH LENGTHS

River: Village 26

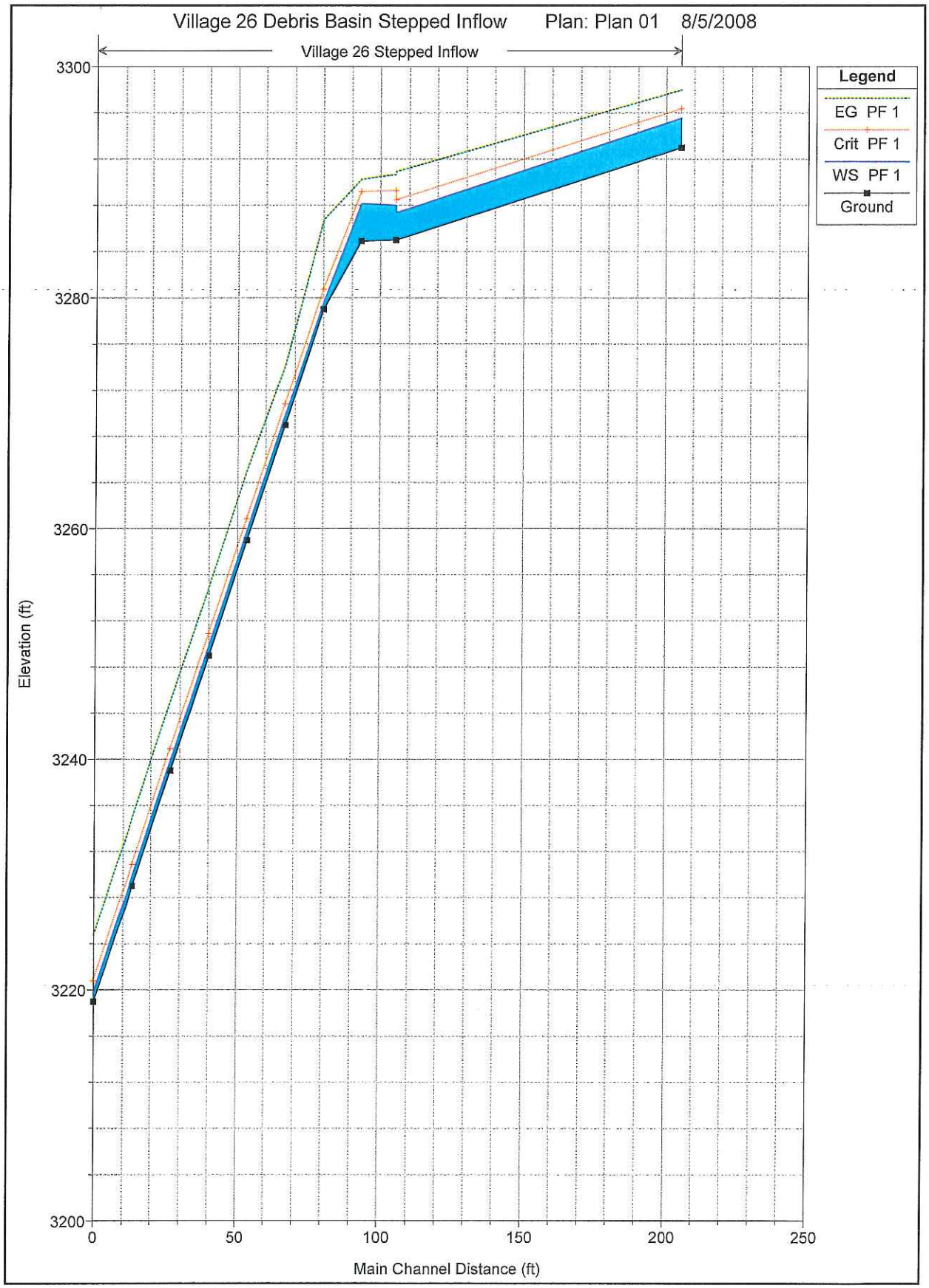
Reach	River Sta.	Left	Channel	Right
Stepped Inflow	1255.33	99.9	99.9	99.9
Stepped Inflow	1155.43	.1	.1	.1
Stepped Inflow	1155.33	12	12	12
Stepped Inflow	1143.33	13.333	13.333	13.333
Stepped Inflow	1130	13.334	13.334	13.334
Stepped Inflow	1116.67	13.333	13.333	13.333
Stepped Inflow	1103.33	13.333	13.333	13.333
Stepped Inflow	1090	13.334	13.334	13.334
Stepped Inflow	1076.67	13.333	13.333	13.333
Stepped Inflow	1063.33	13.333	13.333	13.333
Stepped Inflow	1050			

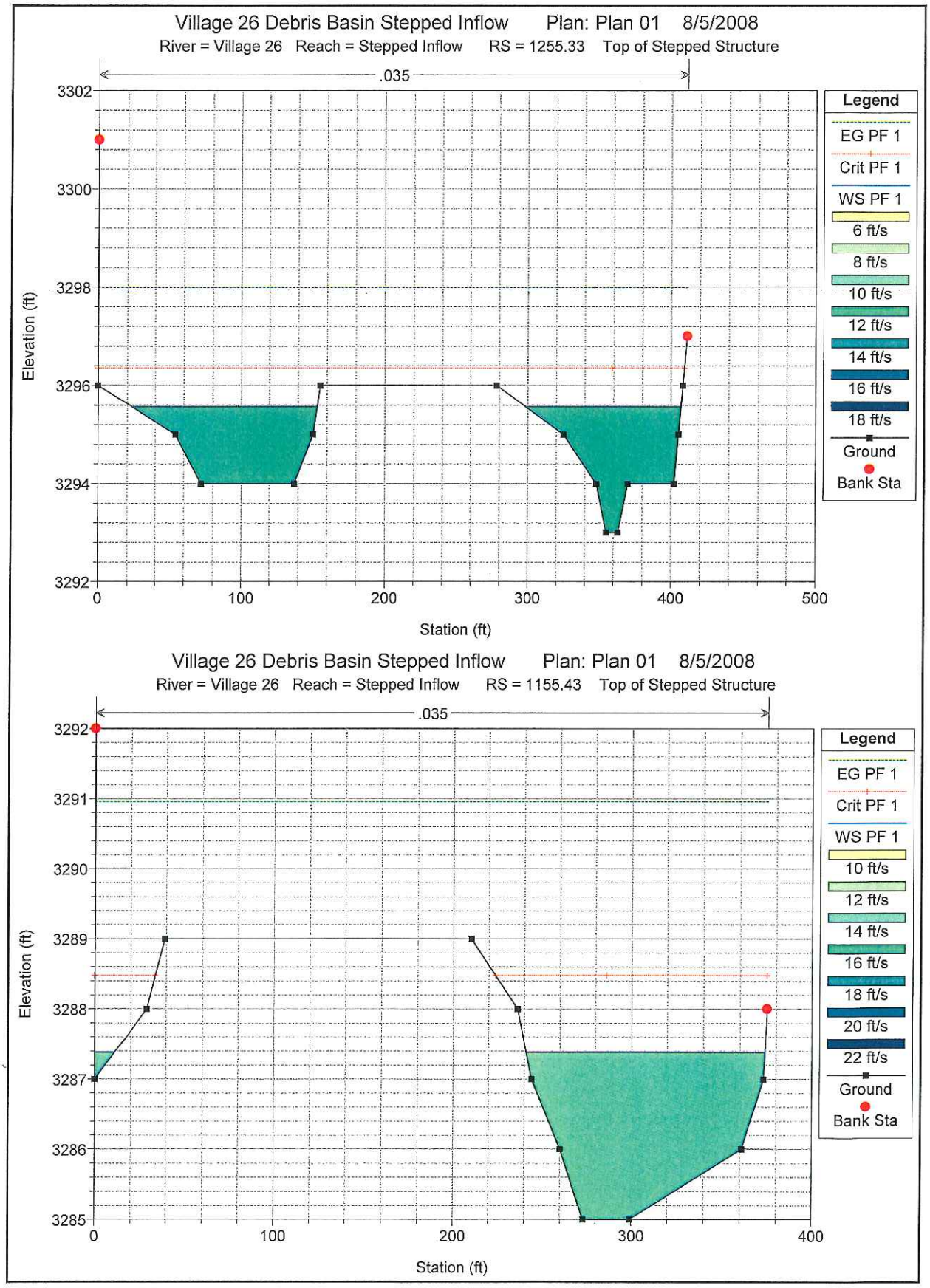
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Village 26

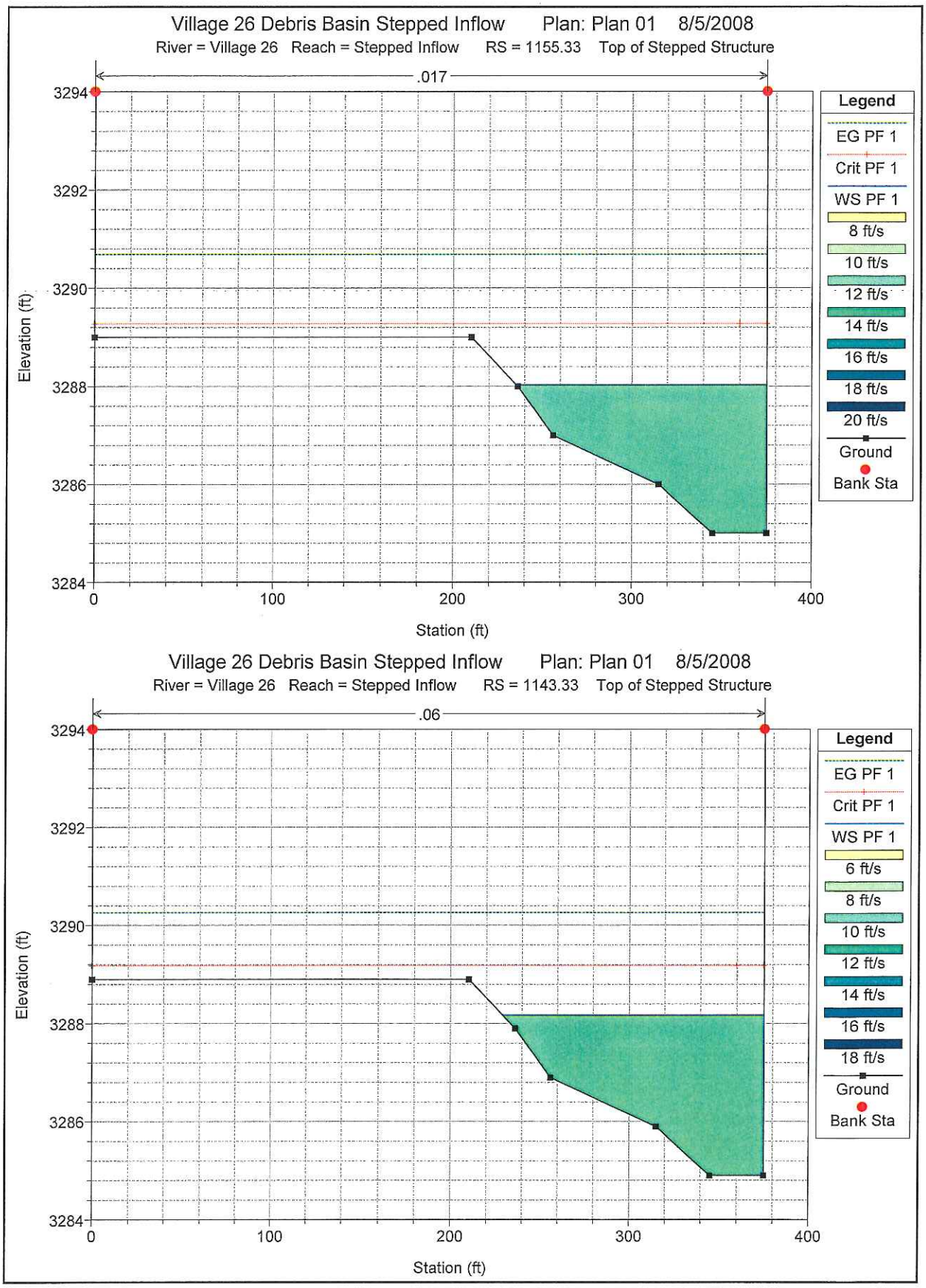
Reach	River Sta.	Contr.	Expan.
Stepped Inflow	1255.33	.1	.3
Stepped Inflow	1155.43	.1	.3
Stepped Inflow	1155.33	.1	.3
Stepped Inflow	1143.33	.1	.3
Stepped Inflow	1130	.1	.3
Stepped Inflow	1116.67	.1	.3
Stepped Inflow	1103.33	.1	.3
Stepped Inflow	1090	.1	.3
Stepped Inflow	1076.67	.1	.3
Stepped Inflow	1063.33	.1	.3
Stepped Inflow	1050	.1	.3

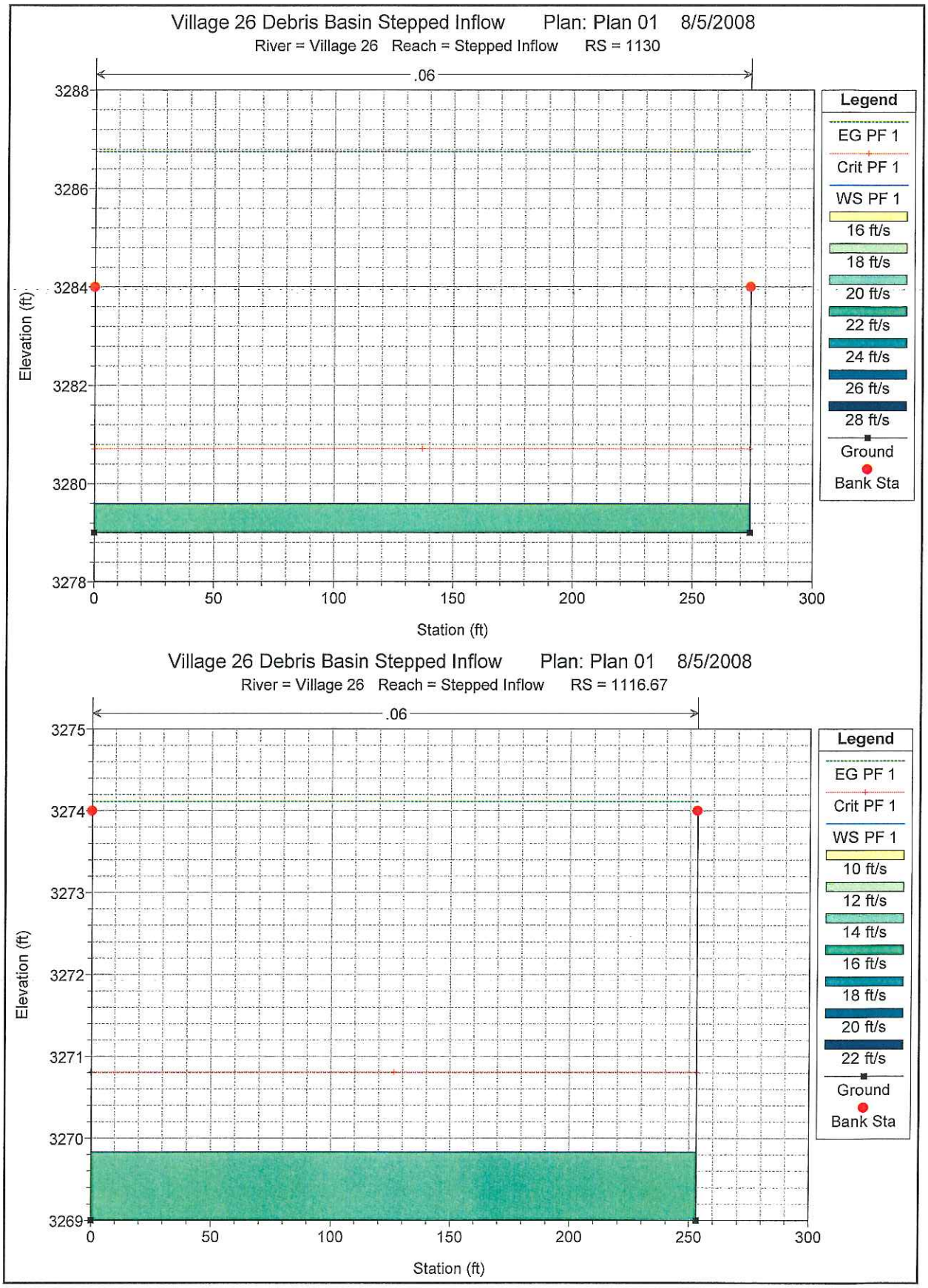
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Plan 01

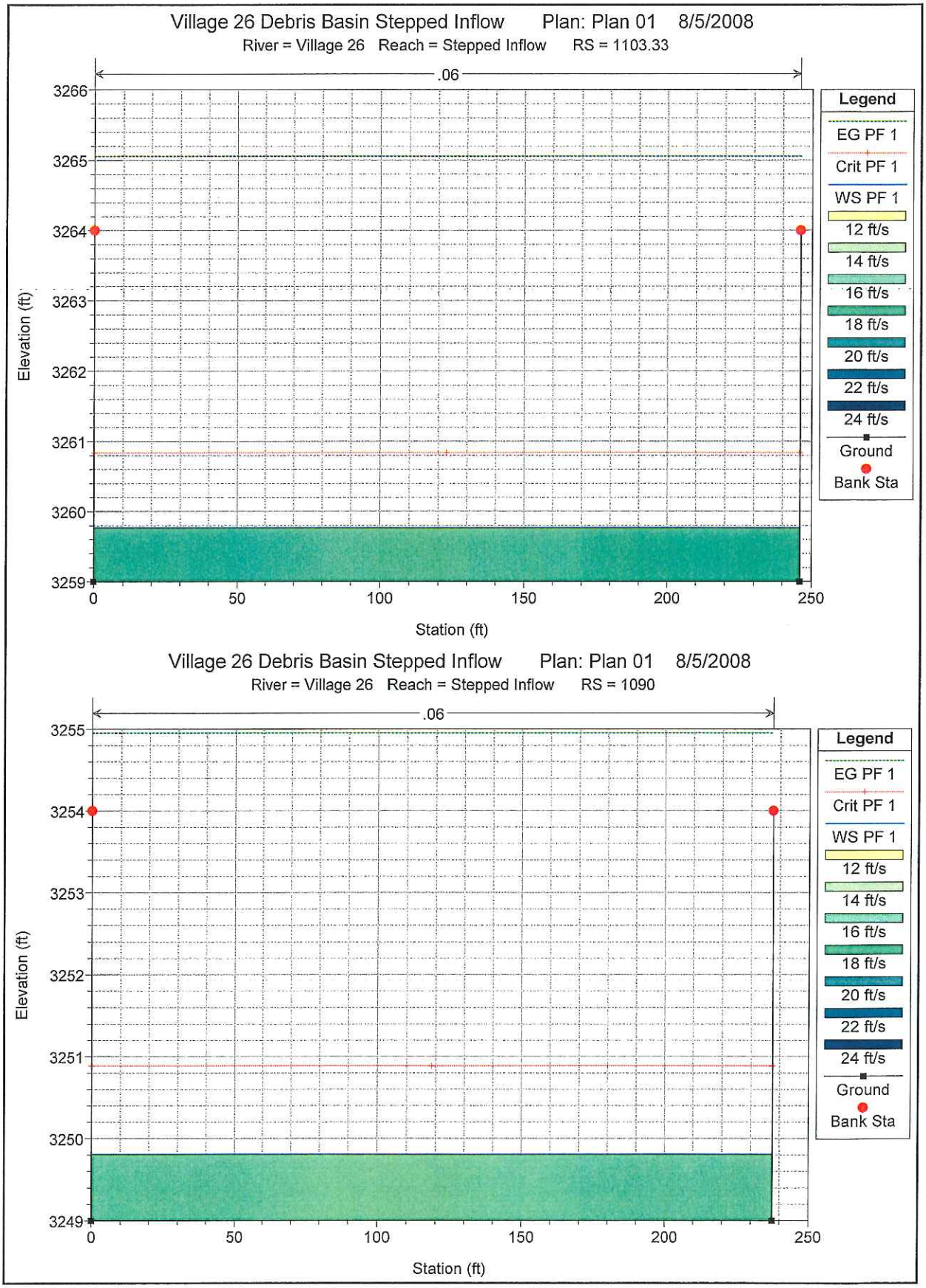
River: Village 26 Reach: Stepped Inflow RS: 1255.33 Profile: PF 1
Warning:Divided flow computed for this cross-section.
River: Village 26 Reach: Stepped Inflow RS: 1155.43 Profile: PF 1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1155.33 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1143.33 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1130 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1116.67 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1103.33 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1090 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1076.67 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1063.33 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1050 Profile: PF 1
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

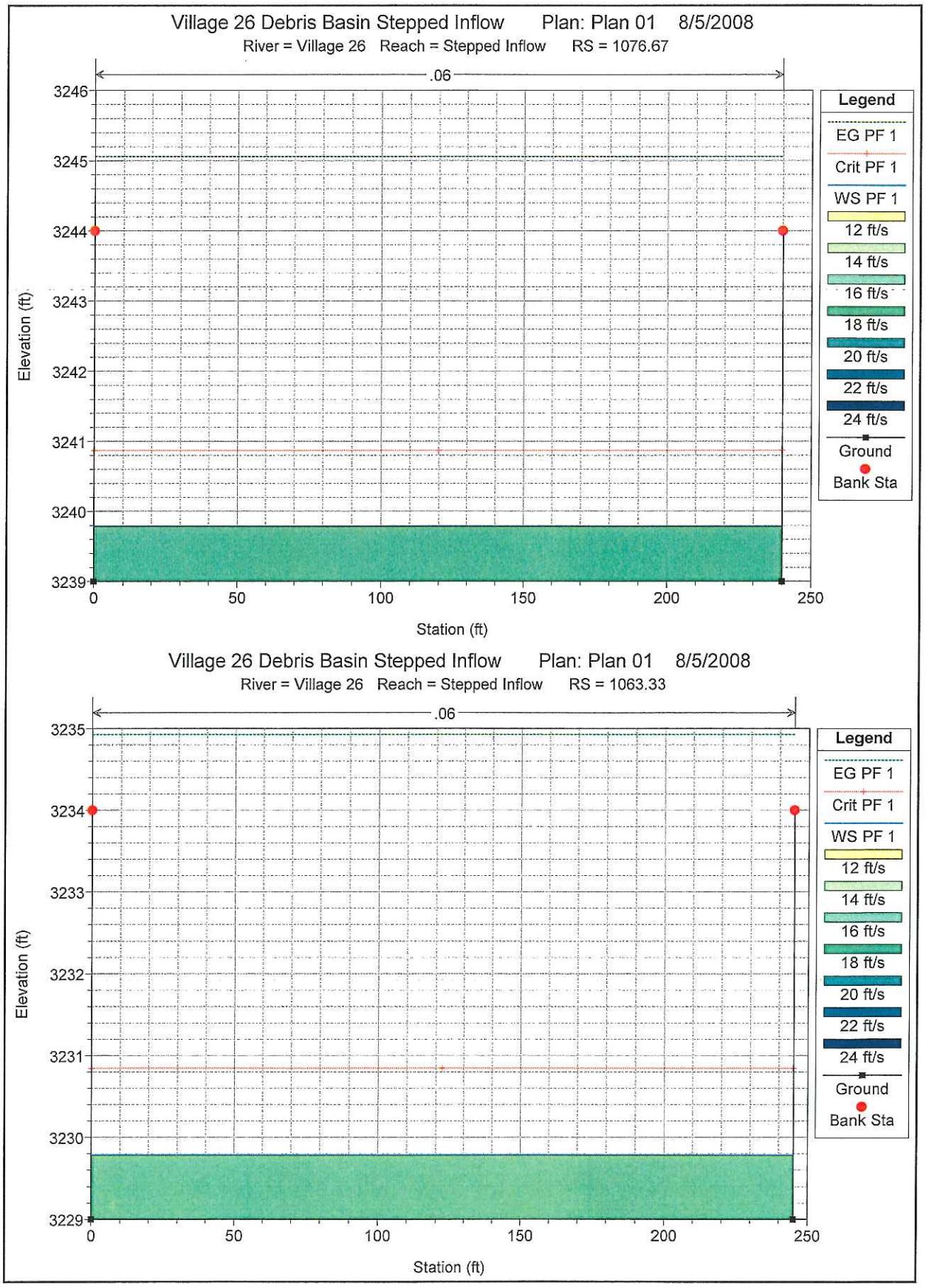

Village 26 Debris Basin Stepped Inflow
Plan: Plan 01
8/5/2008
Village 26 Stepped Inflow
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
3300
3280
3260
3240
3220
3200
0
50
100
150
200
250
Main Channel Distance (ft)

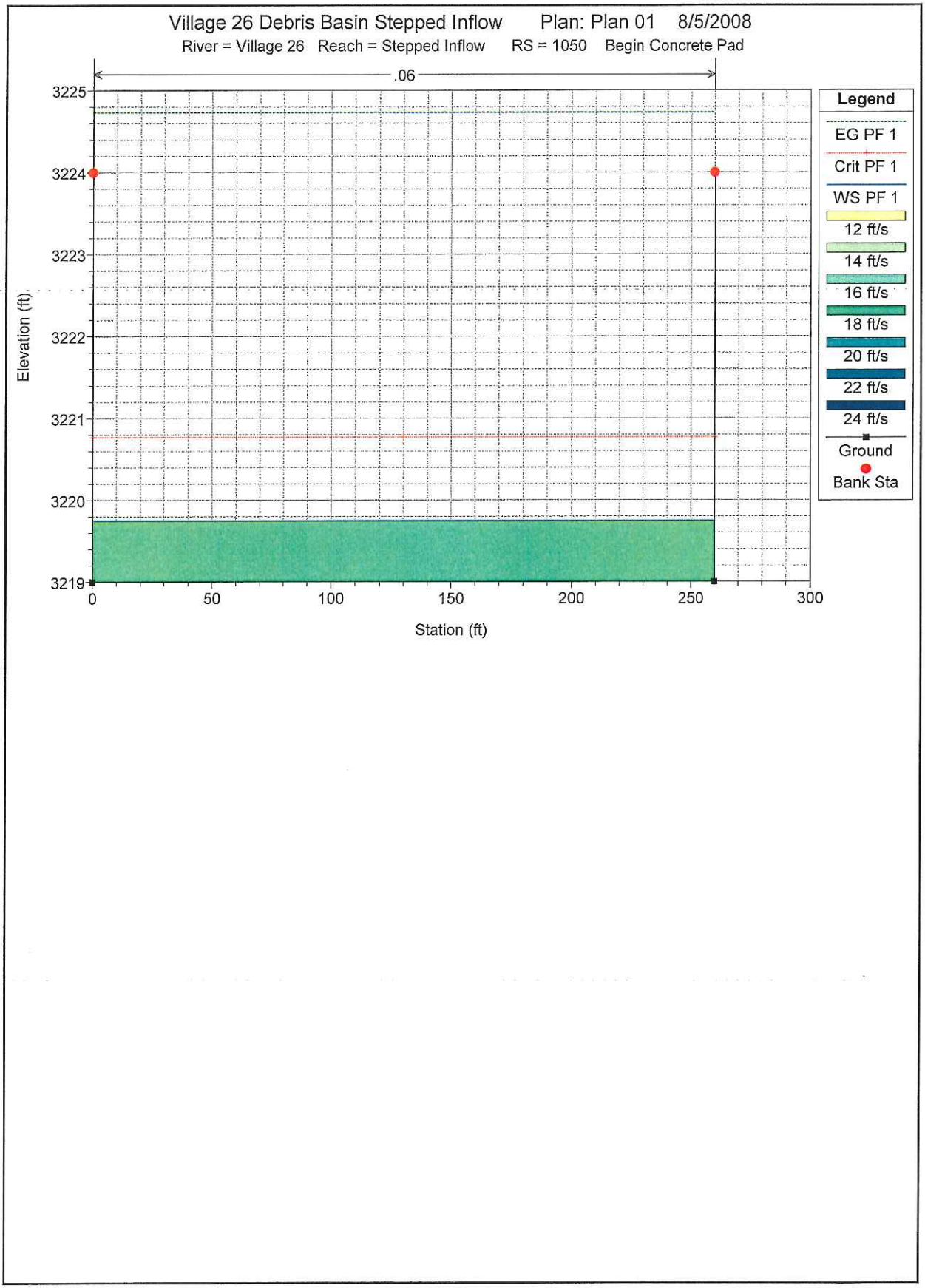

Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1255.33 Top of Stepped Structure
.035
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta
Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1155.43 Top of Stepped Structure
.035
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
Ground
Bank Sta


Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1155.33 Top of Stepped Structure
.017
3294
3292
3290
3288
3286
3284
Elevation (ft)
0
100
200
300
400
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta
Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1143.33 Top of Stepped Structure
.06
3294
3292
3290
3288
3286
3284
Elevation (ft)
0
100
200
300
400
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta


Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1130
.06
3288
3286
3284
3282
3280
3278
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
26 ft/s
28 ft/s
Ground
Bank Sta
Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1116.67
.06
3275
3274
3273
3272
3271
3270
3269
Elevation (ft)
0
50
100
150
200
250
300
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
Ground
Bank Sta


Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1103.33
.06
3266
3265
3264
3263
3262
3261
3260
3259
Elevation (ft)
0
50
100
150
200
250
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
Ground
Bank Sta
Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1090
.06
3255
3254
3253
3252
3251
3250
3249
Elevation (ft)
0
50
100
150
200
250
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
Ground
Bank Sta


Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1076.67
.06
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
Ground
Bank Sta
Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1063.33
.06
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
Ground
Bank Sta


Village 26 Debris Basin Stepped Inflow Plan: Plan 01 8/5/2008
River = Village 26 Reach = Stepped Inflow RS = 1050 Begin Concrete Pad
.06
Elevation (ft)
3225
3224
3223
3222
3221
3220
3219
0
50
100
150
200
250
300
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
Ground
Bank Sta

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
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: V26 Detention Basin Stepped Inflow
Project File : Detention.prj
Run Date and Time: 12/9/2015 11:22:33 AM

Project in English units

Project Description:
.

PLAN DATA

Plan Title: Plan 05
Plan File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\DetBasinInflow\Detention.p05

Geometry Title: Detention Basin Stepped Inflow Update R1
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\DetBasinInflow\Detention.g03

Flow Title : Detention Basin Inflow Interim
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\DetBasinInflow\Detention.f03

Plan Summary Information:
Number of: Cross Sections = 7 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 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: Detention Basin Inflow Interim
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\DetBasinInflow\Detention.f03

Flow Data (cfs)

River	Reach	RS	PF 1
Village 26	Stepped Inflow	1162.5	3492

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Village 26	Stepped Inflow	PF 1	Known WS = 3027.09	Normal S = 0.333

GEOMETRY DATA

Geometry Title: Detention Basin Stepped Inflow Update R1
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\DetBasinInflow\Detention.g03

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1162.5

INPUT
Description: Station 51+55.04 from SD Profile
Station Elevation Data num= 4
Sta Elev Sta Elev Sta Elev Sta Elev

0 3033.2 0 3023.2 20 3023.2 20 3033.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.035	0	.035	20	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	20	21.97	21.97	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3058.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	31.28	Wt. n-Val.		0.035	
W.S. Elev (ft)	3027.09	Reach Len. (ft)	21.97	21.97	21.97
Crit W.S. (ft)	3032.99	Flow Area (sq ft)		77.80	
E.G. Slope (ft/ft)	0.283113	Area (sq ft)		77.80	
Q Total (cfs)	3492.00	Flow (cfs)		3492.00	
Top Width (ft)	20.00	Top Width (ft)		20.00	
Vel Total (ft/s)	44.88	Avg. Vel. (ft/s)		44.88	
Max Chl Dpth (ft)	3.89	Hydr. Depth (ft)		3.89	
Conv. Total (cfs)	6562.9	Conv. (cfs)		6562.9	
Length Wtd. (ft)	21.97	Wetted Per. (ft)		27.78	
Min Ch El (ft)	3023.20	Shear (lb/sq ft)		49.50	
Alpha	1.00	Stream Power (lb/ft s)	20.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		0.43	
C & E Loss (ft)		Cum SA (acres)		0.24	

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1117.5

INPUT
Description: End of first step
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3032.7	0	3022.7	41.97	3022.7	41.97	3032.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	41.97	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	41.97	22.5	22.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3045.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	20.27	Wt. n-Val.		0.060	
W.S. Elev (ft)	3025.00	Reach Len. (ft)	22.50	22.50	22.50
Crit W.S. (ft)	3028.68	Flow Area (sq ft)		96.65	
E.G. Slope (ft/ft)	0.804256	Area (sq ft)		96.65	
Q Total (cfs)	3492.00	Flow (cfs)		3492.00	
Top Width (ft)	41.97	Top Width (ft)		41.97	
Vel Total (ft/s)	36.13	Avg. Vel. (ft/s)		36.13	
Max Chl Dpth (ft)	2.30	Hydr. Depth (ft)		2.30	
Conv. Total (cfs)	3893.8	Conv. (cfs)		3893.8	
Length Wtd. (ft)	22.50	Wetted Per. (ft)		46.58	
Min Ch El (ft)	3022.70	Shear (lb/sq ft)		104.19	
Alpha	1.00	Stream Power (lb/ft s)	41.97	0.00	0.00
Frctn Loss (ft)	9.80	Cum Volume (acre-ft)		0.38	
C & E Loss (ft)	3.30	Cum SA (acres)		0.22	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1095

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3026.2	0	3016.2	64.47	3016.2	64.47	3026.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	64.47	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	64.47	22.5	22.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3028.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	10.67	Wt. n-Val.		0.060	
W.S. Elev (ft)	3018.27	Reach Len. (ft)	22.50	22.50	22.50
Crit W.S. (ft)	3020.68	Flow Area (sq ft)		133.22	
E.G. Slope (ft/ft)	0.462387	Area (sq ft)		133.22	
Q Total (cfs)	3492.00	Flow (cfs)		3492.00	

Top Width (ft)	64.47	Top Width (ft)	64.47		
Vel Total (ft/s)	26.21	Avg. Vel. (ft/s)	26.21		
Max Chl Dpth (ft)	2.07	Hydr. Depth (ft)	2.07		
Conv. Total (cfs)	5135.4	Conv. (cfs)	5135.4		
Length Wtd. (ft)	22.50	Wetted Per. (ft)	68.60		
Min Ch El (ft)	3016.20	Shear (lb/sq ft)	56.06		
Alpha	1.00	Stream Power (lb/ft s)	64.47	0.00	0.00
Frctn Loss (ft)	13.46	Cum Volume (acre-ft)		0.32	
C & E Loss (ft)	2.88	Cum SA (acres)		0.20	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1080

INPUT
Description:

Station Elevation Data	num=	4			
Sta	Elev	Sta	Elev	Sta	Elev
0	3019.7	0	3009.7	86.97	3009.7
86.97	3019.7				

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	86.97	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	86.97	22.5	22.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3018.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	7.29	Wt. n-Val.		0.060	
W.S. Elev (ft)	3011.55	Reach Len. (ft)	22.50	22.50	22.50
Crit W.S. (ft)	3013.37	Flow Area (sq ft)		161.20	
E.G. Slope (ft/ft)	0.355281	Area (sq ft)		161.20	
Q Total (cfs)	3492.00	Flow (cfs)		3492.00	
Top Width (ft)	86.97	Top Width (ft)		86.97	
Vel Total (ft/s)	21.66	Avg. Vel. (ft/s)		21.66	
Max Chl Dpth (ft)	1.85	Hydr. Depth (ft)		1.85	
Conv. Total (cfs)	5858.5	Conv. (cfs)		5858.5	
Length Wtd. (ft)	22.50	Wetted Per. (ft)		90.68	
Min Ch El (ft)	3009.70	Shear (lb/sq ft)		39.43	
Alpha	1.00	Stream Power (lb/ft s)	86.97	0.00	0.00
Frctn Loss (ft)	9.08	Cum Volume (acre-ft)		0.25	
C & E Loss (ft)	1.01	Cum SA (acres)		0.16	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1072.5

INPUT
Description:

Station Elevation Data	num=	4			
Sta	Elev	Sta	Elev	Sta	Elev
0	3013.2	0	3003.2	109.47	3003.2
109.47	3013.2				

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	109.47	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	109.47	22.5	22.5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3010.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	5.86	Wt. n-Val.		0.060	
W.S. Elev (ft)	3004.84	Reach Len. (ft)	22.50	22.50	22.50
Crit W.S. (ft)	3006.35	Flow Area (sq ft)		179.71	
E.G. Slope (ft/ft)	0.330691	Area (sq ft)		179.71	
Q Total (cfs)	3492.00	Flow (cfs)		3492.00	
Top Width (ft)	109.47	Top Width (ft)		109.47	
Vel Total (ft/s)	19.43	Avg. Vel. (ft/s)		19.43	
Max Chl Dpth (ft)	1.64	Hydr. Depth (ft)		1.64	
Conv. Total (cfs)	6072.4	Conv. (cfs)		6072.4	
Length Wtd. (ft)	22.50	Wetted Per. (ft)		112.75	
Min Ch El (ft)	3003.20	Shear (lb/sq ft)		32.90	
Alpha	1.00	Stream Power (lb/ft s)	109.47	0.00	0.00
Frctn Loss (ft)	7.71	Cum Volume (acre-ft)		0.16	
C & E Loss (ft)	0.43	Cum SA (acres)		0.11	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1060

INPUT
Description:
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3006.7	0	2996.7	131.97	2996.7	131.97	3006.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	131.97	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	131.97	13.86	13.86	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3003.14	Element			
Vel Head (ft)	4.96	Wt. n-Val.		0.060	
W.S. Elev (ft)	2998.18	Reach Len. (ft)	13.86	13.86	13.86
Crit W.S. (ft)	2999.48	Flow Area (sq ft)		195.41	
E.G. Slope (ft/ft)	0.317779	Area (sq ft)		195.41	
Q Total (cfs)	3492.00	Flow (cfs)		3492.00	
Top Width (ft)	131.97	Top Width (ft)		131.97	
Vel Total (ft/s)	17.87	Avg. Vel. (ft/s)		17.87	
Max Chl Dpth (ft)	1.48	Hydr. Depth (ft)		1.48	
Conv. Total (cfs)	6194.6	Conv. (cfs)		6194.6	
Length Wtd. (ft)	13.86	Wetted Per. (ft)		134.93	
Min Ch El (ft)	2996.70	Shear (lb/sq ft)		28.73	
Alpha	1.00	Stream Power (lb/ft s)	131.97	0.00	0.00
Frctn Loss (ft)	7.29	Cum Volume (acre-ft)		0.06	
C & E Loss (ft)	0.27	Cum SA (acres)		0.04	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Village 26
REACH: Stepped Inflow RS: 1050

INPUT
Description: Bottom of stepped structure
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3002.7	0	2992.7	145.83	2992.7	145.83	3002.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	0	.06	145.83	.06

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	145.83	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	2998.65	Element			
Vel Head (ft)	4.54	Wt. n-Val.		0.060	
W.S. Elev (ft)	2994.10	Reach Len. (ft)			
Crit W.S. (ft)	2995.30	Flow Area (sq ft)		204.11	
E.G. Slope (ft/ft)	0.312635	Area (sq ft)		204.11	
Q Total (cfs)	3492.00	Flow (cfs)		3492.00	
Top Width (ft)	145.83	Top Width (ft)		145.83	
Vel Total (ft/s)	17.11	Avg. Vel. (ft/s)		17.11	
Max Chl Dpth (ft)	1.40	Hydr. Depth (ft)		1.40	
Conv. Total (cfs)	6245.3	Conv. (cfs)		6245.3	
Length Wtd. (ft)		Wetted Per. (ft)		148.63	
Min Ch El (ft)	2992.70	Shear (lb/sq ft)		26.80	
Alpha	1.00	Stream Power (lb/ft s)	145.83	0.00	0.00
Frctn Loss (ft)	4.37	Cum Volume (acre-ft)			
C & E Loss (ft)	0.12	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:Village 26

Reach	River Sta.	n1	n2	n3
Stepped Inflow	1162.5	.035	.035	.035
Stepped Inflow	1117.5	.06	.06	.06
Stepped Inflow	1095	.06	.06	.06
Stepped Inflow	1080	.06	.06	.06
Stepped Inflow	1072.5	.06	.06	.06
Stepped Inflow	1060	.06	.06	.06
Stepped Inflow	1050	.06	.06	.06

SUMMARY OF REACH LENGTHS

River: Village 26

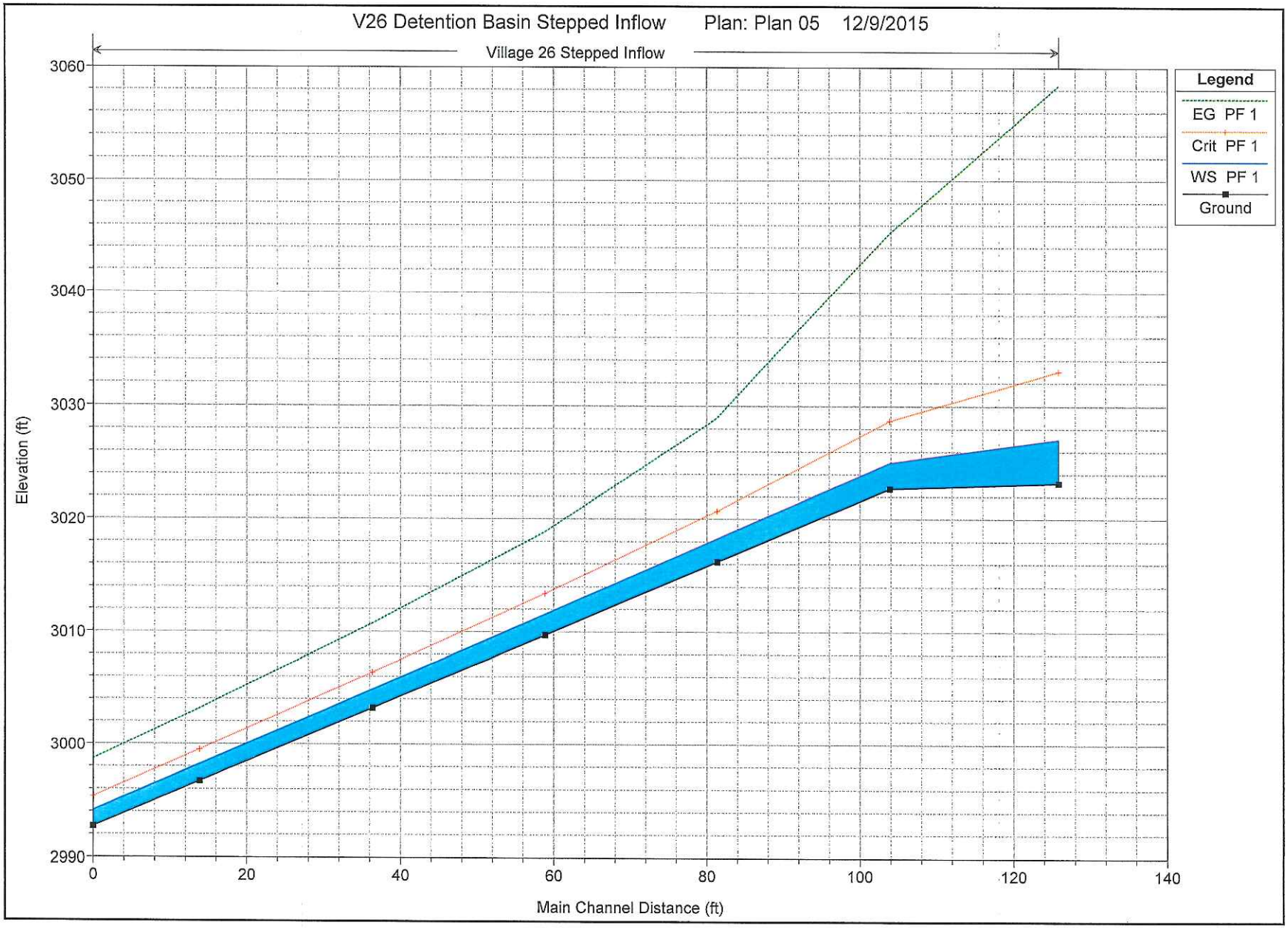
Reach	River Sta.	Left	Channel	Right
Stepped Inflow	1162.5	21.97	21.97	21.97
Stepped Inflow	1117.5	22.5	22.5	22.5
Stepped Inflow	1095	22.5	22.5	22.5
Stepped Inflow	1080	22.5	22.5	22.5
Stepped Inflow	1072.5	22.5	22.5	22.5
Stepped Inflow	1060	13.86	13.86	13.86
Stepped Inflow	1050			

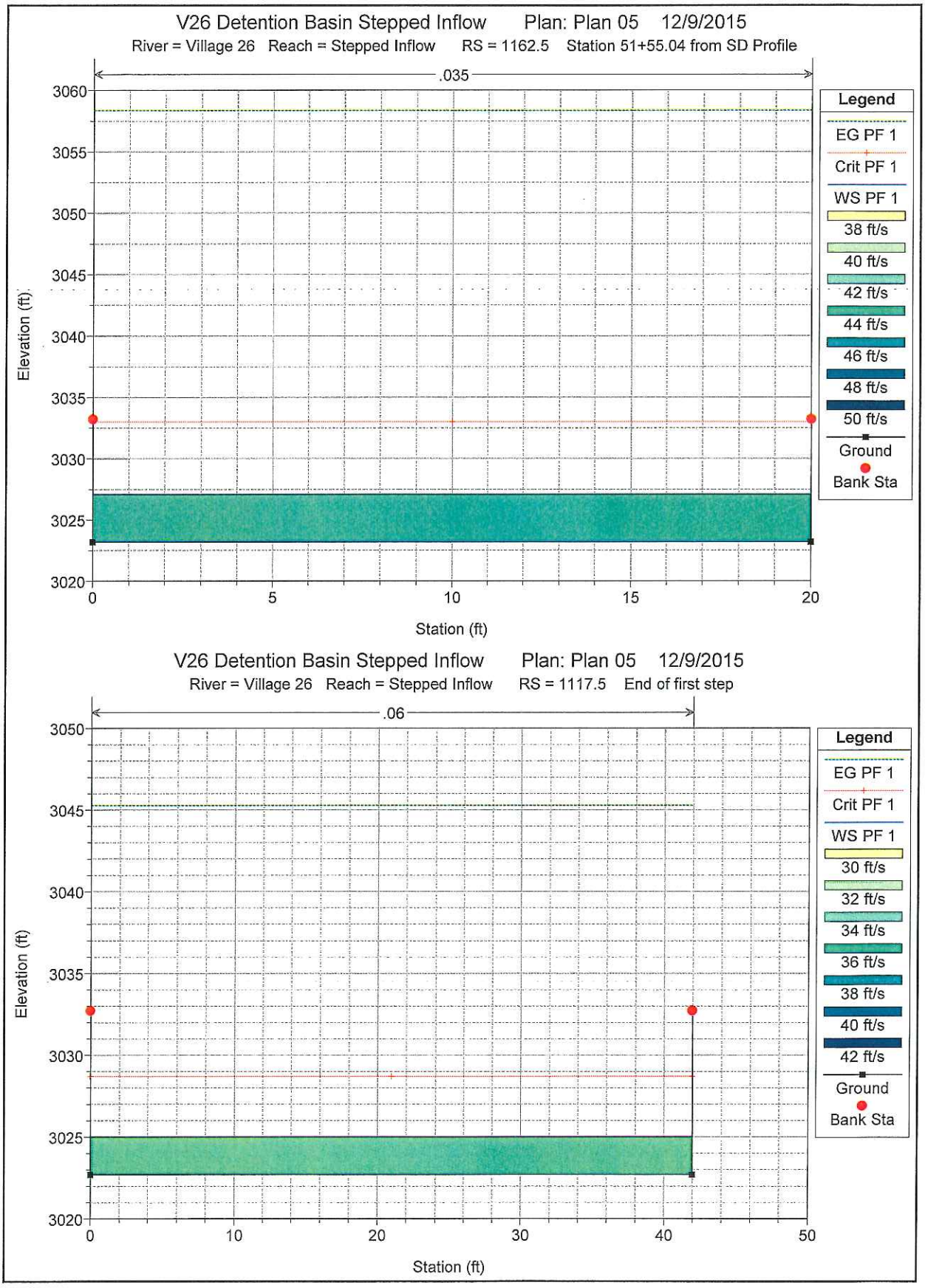
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Village 26

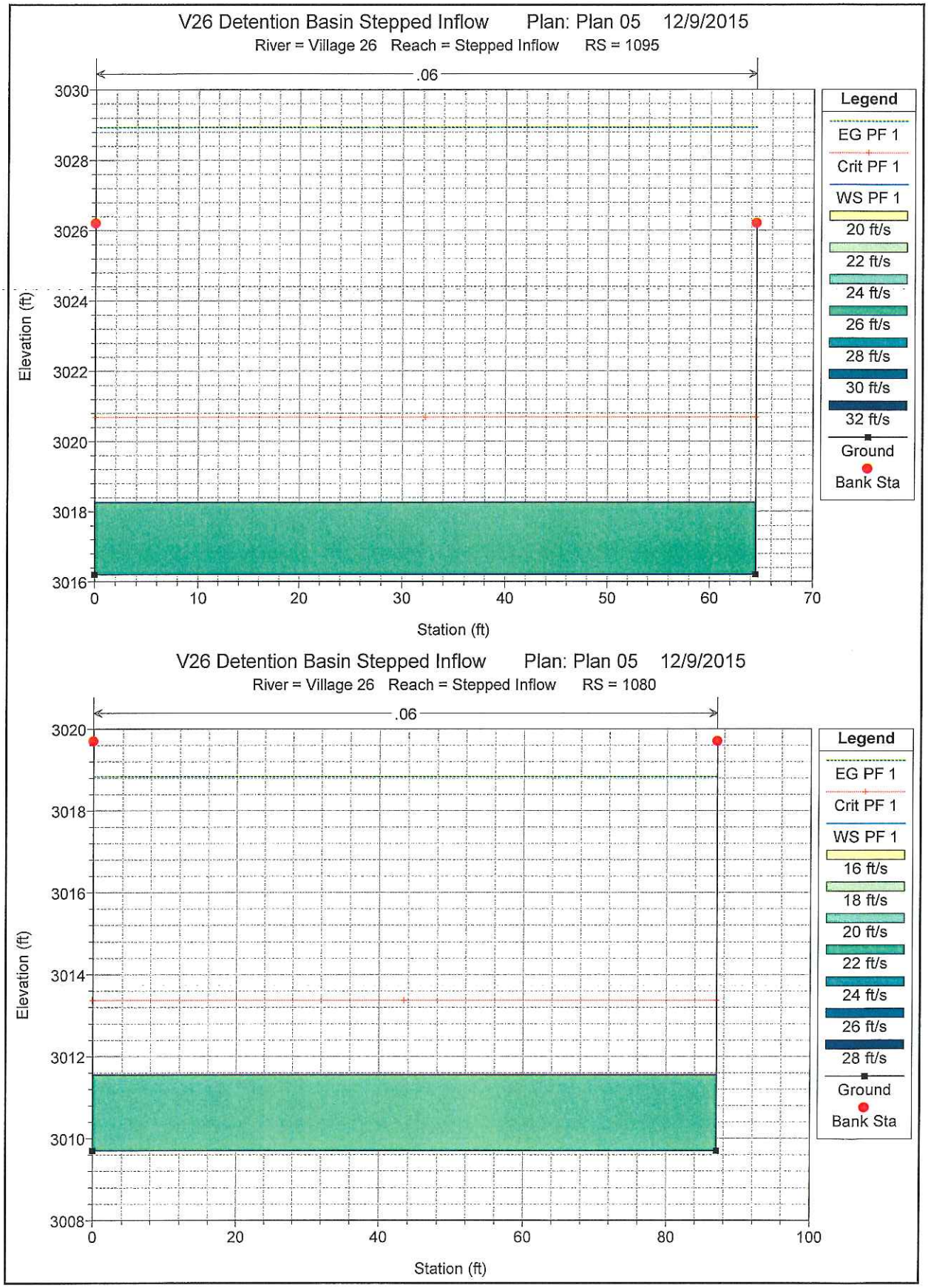
Reach	River Sta.	Contr.	Expan.
Stepped Inflow	1162.5	.1	.3
Stepped Inflow	1117.5	.1	.3
Stepped Inflow	1095	.1	.3
Stepped Inflow	1080	.1	.3
Stepped Inflow	1072.5	.1	.3
Stepped Inflow	1060	.1	.3
Stepped Inflow	1050	.1	.3

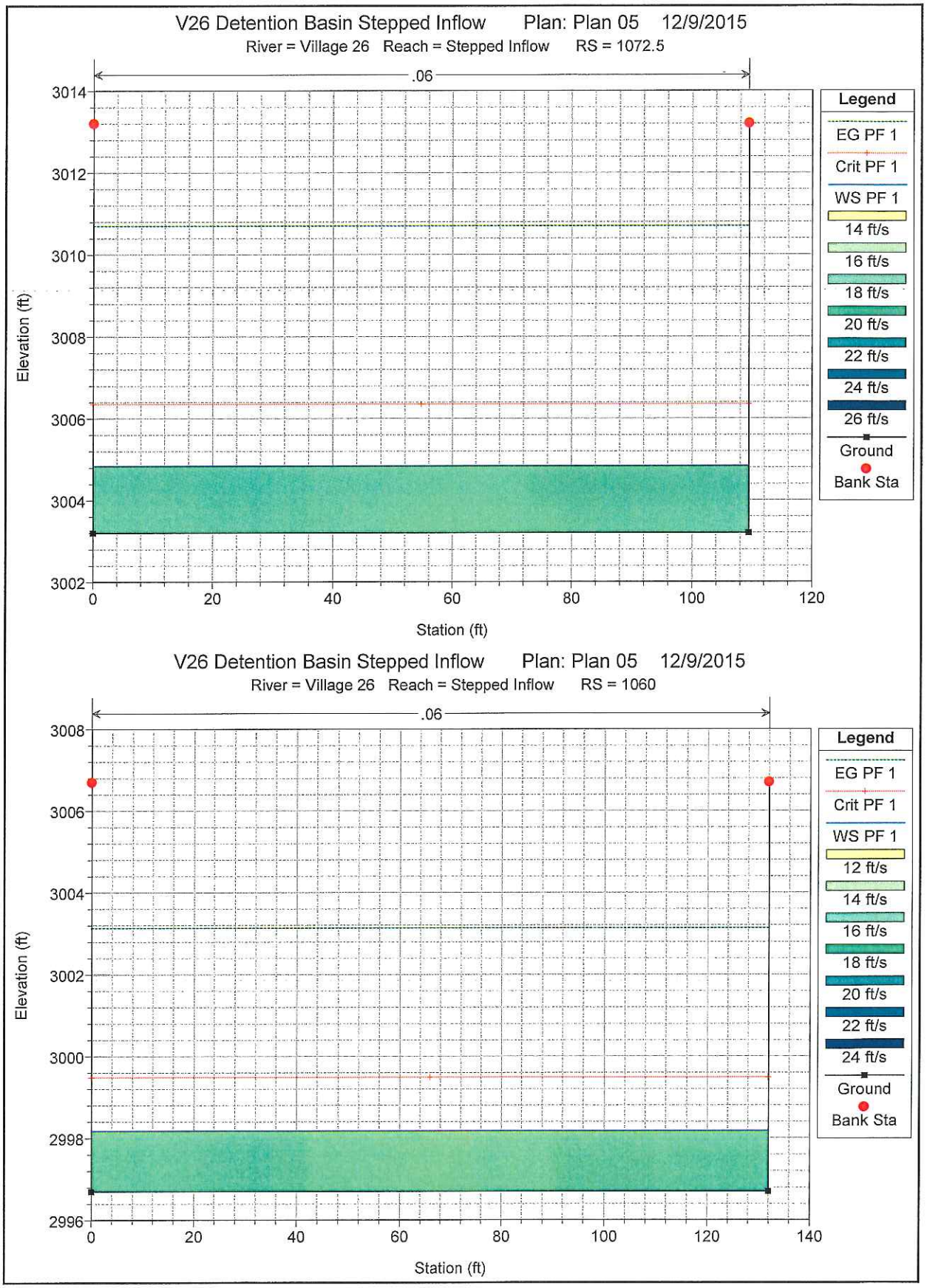
ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Plan 05

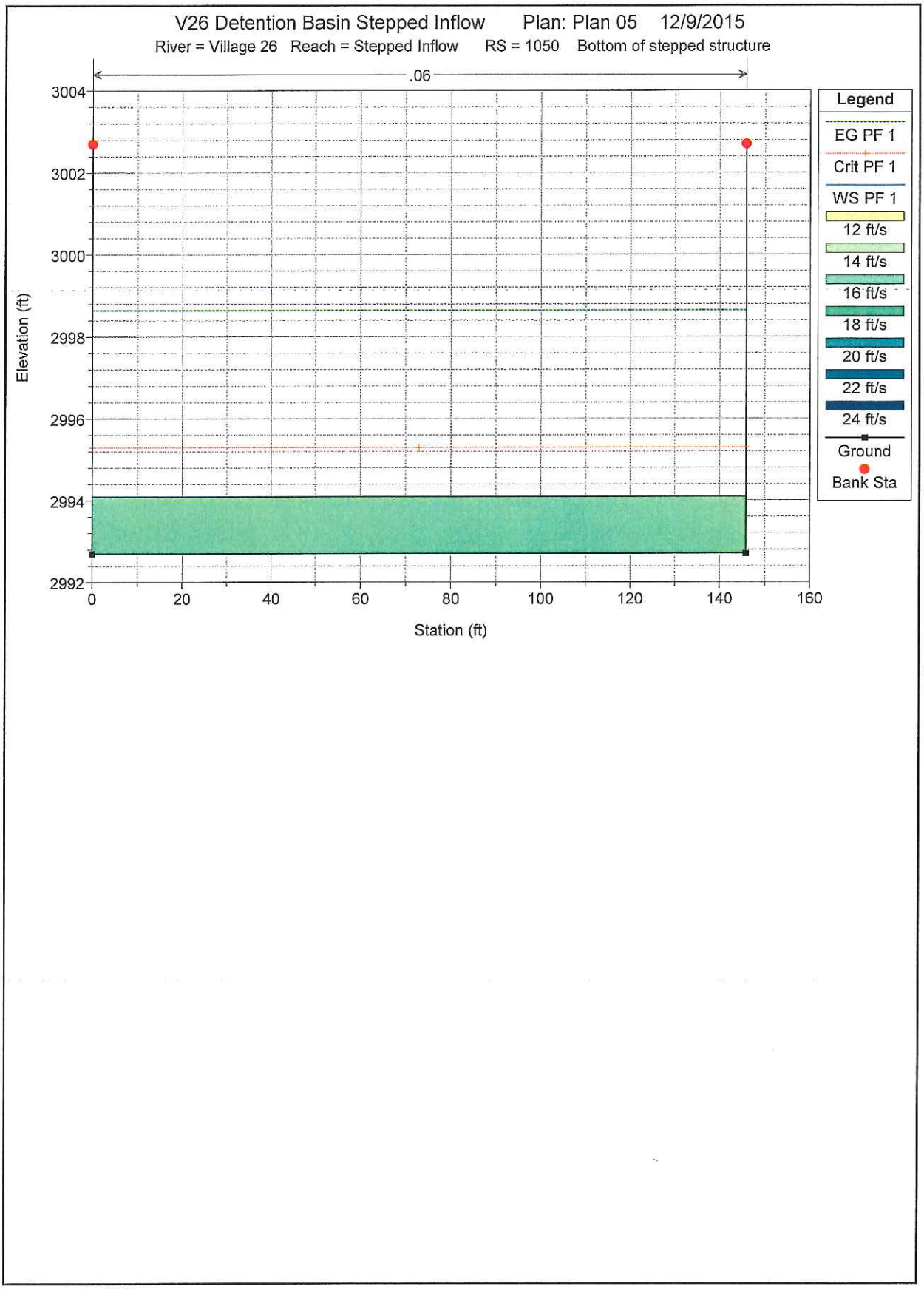
River: Village 26 Reach: Stepped Inflow RS: 1117.5 Profile: PF 1
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1095 Profile: PF 1
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1080 Profile: PF 1
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1072.5 Profile: PF 1
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1060 Profile: PF 1
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: Village 26 Reach: Stepped Inflow RS: 1050 Profile: PF 1
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.


V26 Detention Basin Stepped Inflow Plan: Plan 05 12/9/2015
Village 26 Stepped Inflow
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
3060
3050
3040
3030
3020
3010
3000
2990
0
20
40
60
80
100
120
140
Main Channel Distance (ft)


V26 Detention Basin Stepped Inflow Plan: Plan 05 12/9/2015
River = Village 26 Reach = Stepped Inflow RS = 1162.5 Station 51+55.04 from SD Profile
.035
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
38 ft/s
40 ft/s
42 ft/s
44 ft/s
46 ft/s
48 ft/s
50 ft/s
Ground
Bank Sta
V26 Detention Basin Stepped Inflow Plan: Plan 05 12/9/2015
River = Village 26 Reach = Stepped Inflow RS = 1117.5 End of first step
.06
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
30 ft/s
32 ft/s
34 ft/s
36 ft/s
38 ft/s
40 ft/s
42 ft/s
Ground
Bank Sta


V26 Detention Basin Stepped Inflow Plan: Plan 05 12/9/2015
River = Village 26 Reach = Stepped Inflow RS = 1095
.06
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
20 ft/s
22 ft/s
24 ft/s
26 ft/s
28 ft/s
30 ft/s
32 ft/s
Ground
Bank Sta
V26 Detention Basin Stepped Inflow Plan: Plan 05 12/9/2015
River = Village 26 Reach = Stepped Inflow RS = 1080
.06
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
26 ft/s
28 ft/s
Ground
Bank Sta

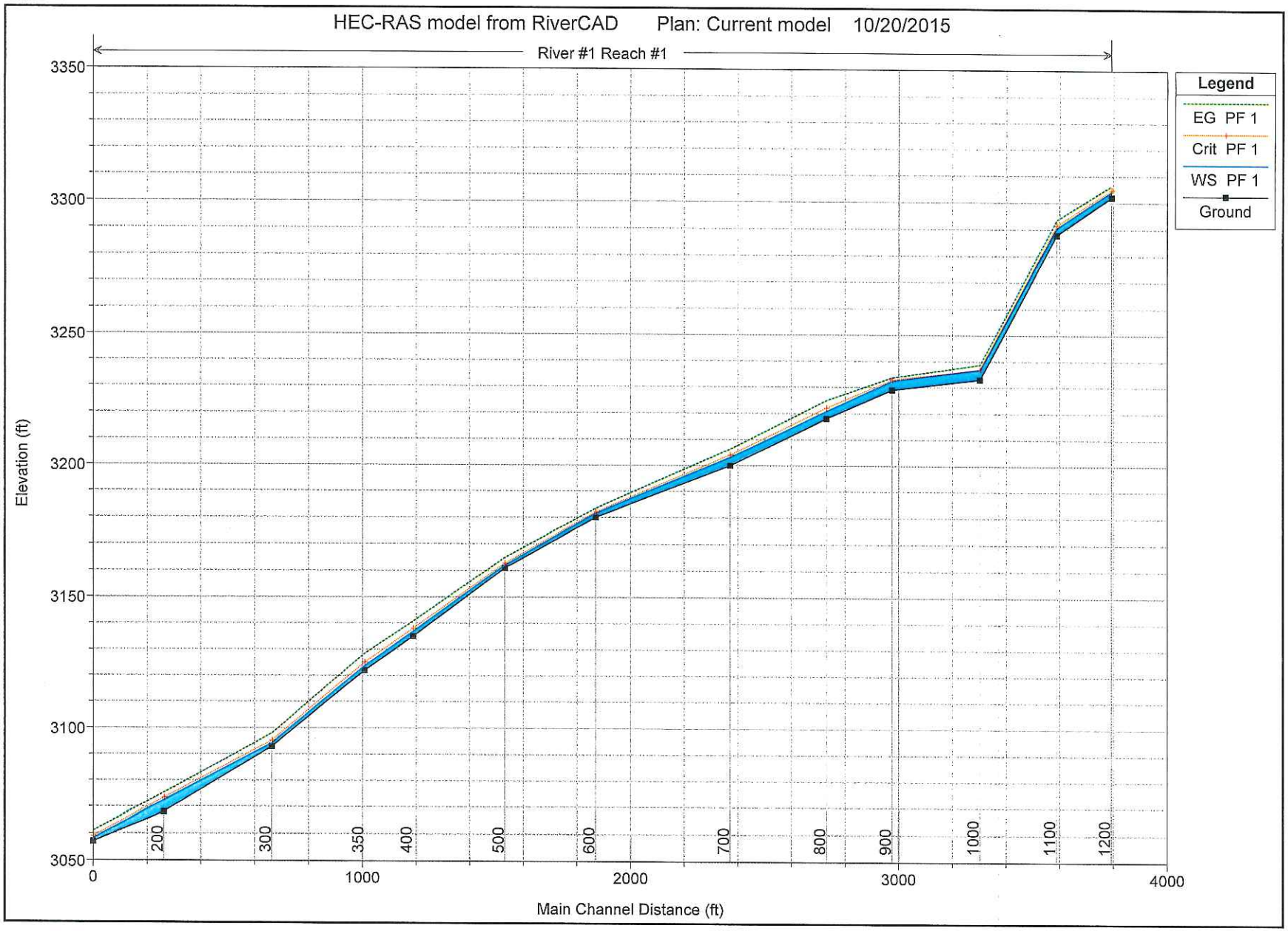

V26 Detention Basin Stepped Inflow Plan: Plan 05 12/9/2015
River = Village 26 Reach = Stepped Inflow RS = 1072.5
.06
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
26 ft/s
Ground
Bank Sta
V26 Detention Basin Stepped Inflow Plan: Plan 05 12/9/2015
River = Village 26 Reach = Stepped Inflow RS = 1060
.06
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
Ground
Bank Sta

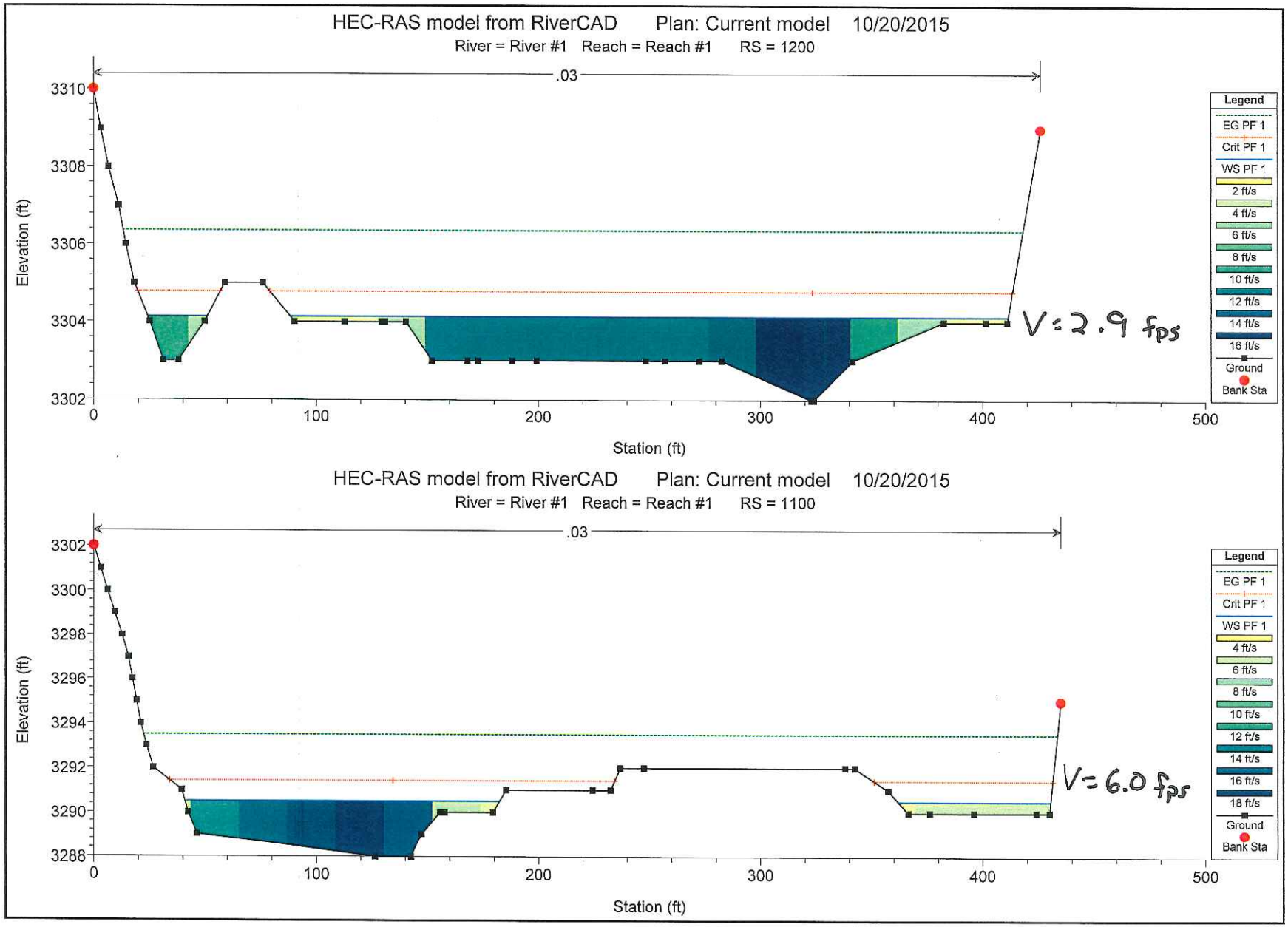

V26 Detention Basin Stepped Inflow Plan: Plan 05 12/9/2015
River = Village 26 Reach = Stepped Inflow RS = 1050 Bottom of stepped structure
.06
Elevation (ft)
3004
3002
3000
2998
2996
2994
2992
0
20
40
60
80
100
120
140
160
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
22 ft/s
24 ft/s
Ground
Bank Sta

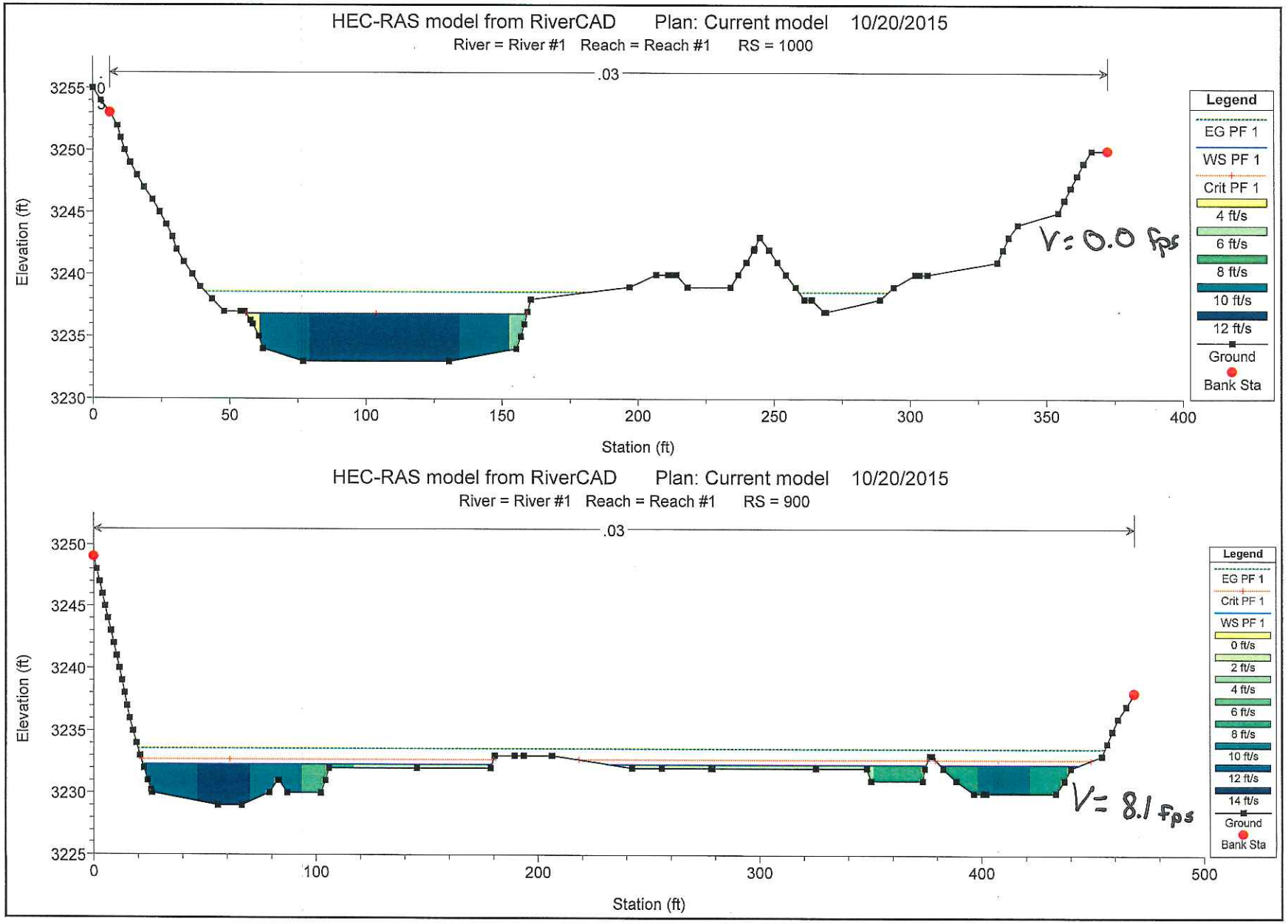
REVERENCE INTERIM BERM HEC-RAS SECTION SUMMARY TABLE												
Sta	Q (cfs)	FL Elevation (ft)	Depth (ft)	Vel (ft/s)	Top Width (ft)	Froude #	Freeboard (ft)	Total Depth (ft)	Min Top of Berm Elev (ft)	Top of Berm Elev (ft)	Vel at Berm (ft/s)	Notes
1200	3721	3302	2.14	11.96	355.91	2.24	1.4	3.5	3305.5	3309.0	2.9	
1100	3721	3288	2.50	13.9	214.90	2.17	1.5	4.0	3292.0	3295.0	6.0	
1000	3721	3233	3.83	10.64	94.76	1.02	1.4	5.2	3238.2	3250.0	N/A	Flows not against berm
900	3721	3229	3.30	9.00	386.90	1.49	1.3	4.6	3233.6	3238.0	8.1	
800	3721	3218	2.70	16.23	234.53	2.04	1.6	4.3	3222.3	3229.0	N/A	Flows not against berm
700	3721	3200	3.05	14.3	224.05	2.22	1.5	4.6	3204.6	3214.0	N/A	Flows not against berm
600	4956	3180	1.48	11.03	348.47	1.74	1.3	2.8	3182.8	3185.0	10.9	
500	4956	3161	1.02	13.57	417.92	2.54	1.3	2.4	3163.4	3165.0	2.8	
400	4956	3135	1.80	15.67	207.77	2.24	1.5	3.3	3138.3	3140.0	9.7	
350	4956	3122	1.65	17.36	208.46	2.61	1.5	3.2	3125.2	3128.0	9.5	
300	4956	3093	1.21	15.43	315.87	2.70	1.4	2.6	3095.6	3103.0	6.4	
200	4956	3068	4.31	13.45	217.54	1.82	1.5	5.9	3073.9	3078.0	N/A	Flows not against berm
100	4956	3057	1.10	13.36	426.46	2.53	1.3	2.4	3059.4	3061.0	13.7	

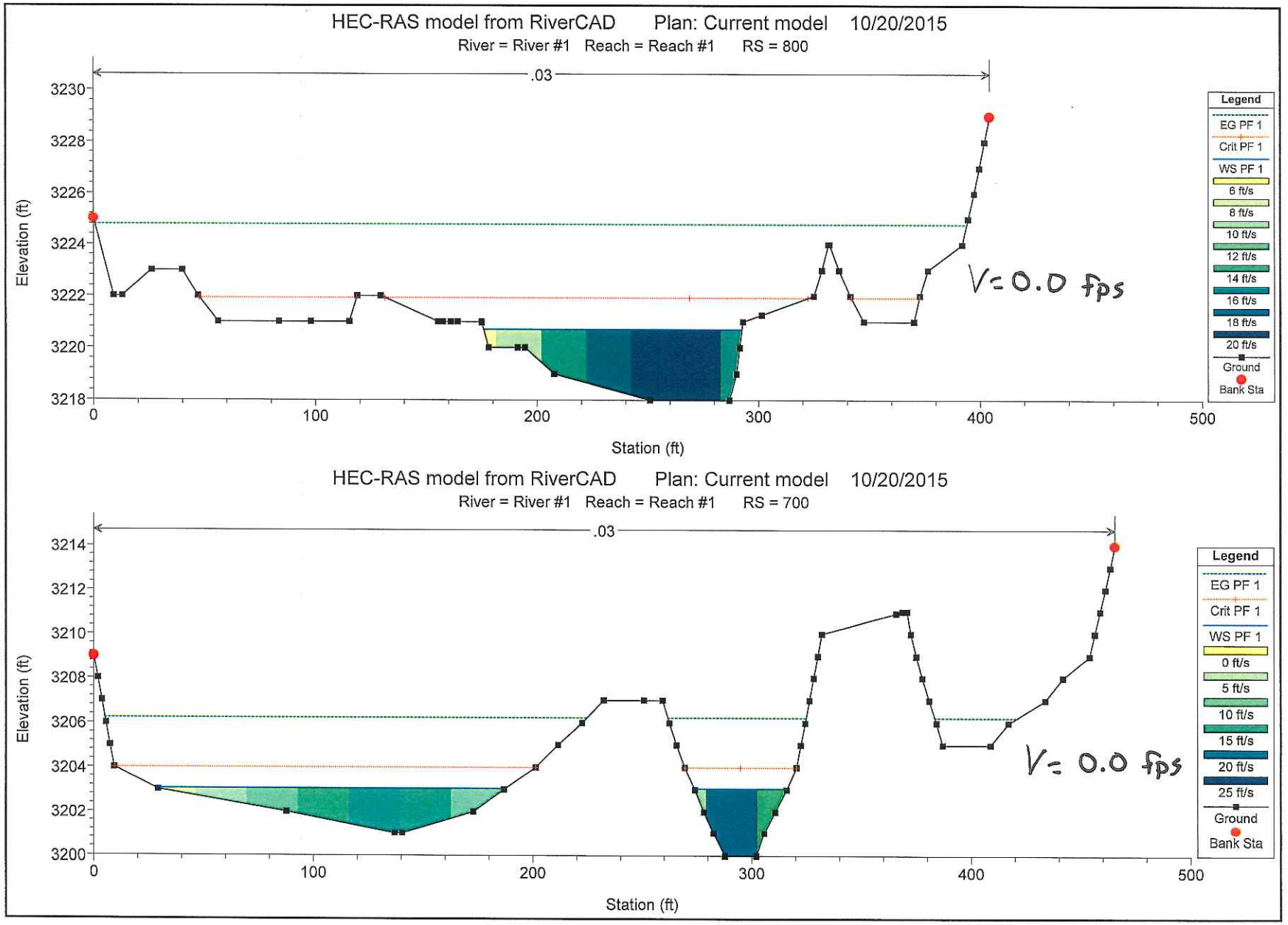
HEC-RAS Plan: Current mode River: River #1 Reach: Reach #1 Profile: PF 1

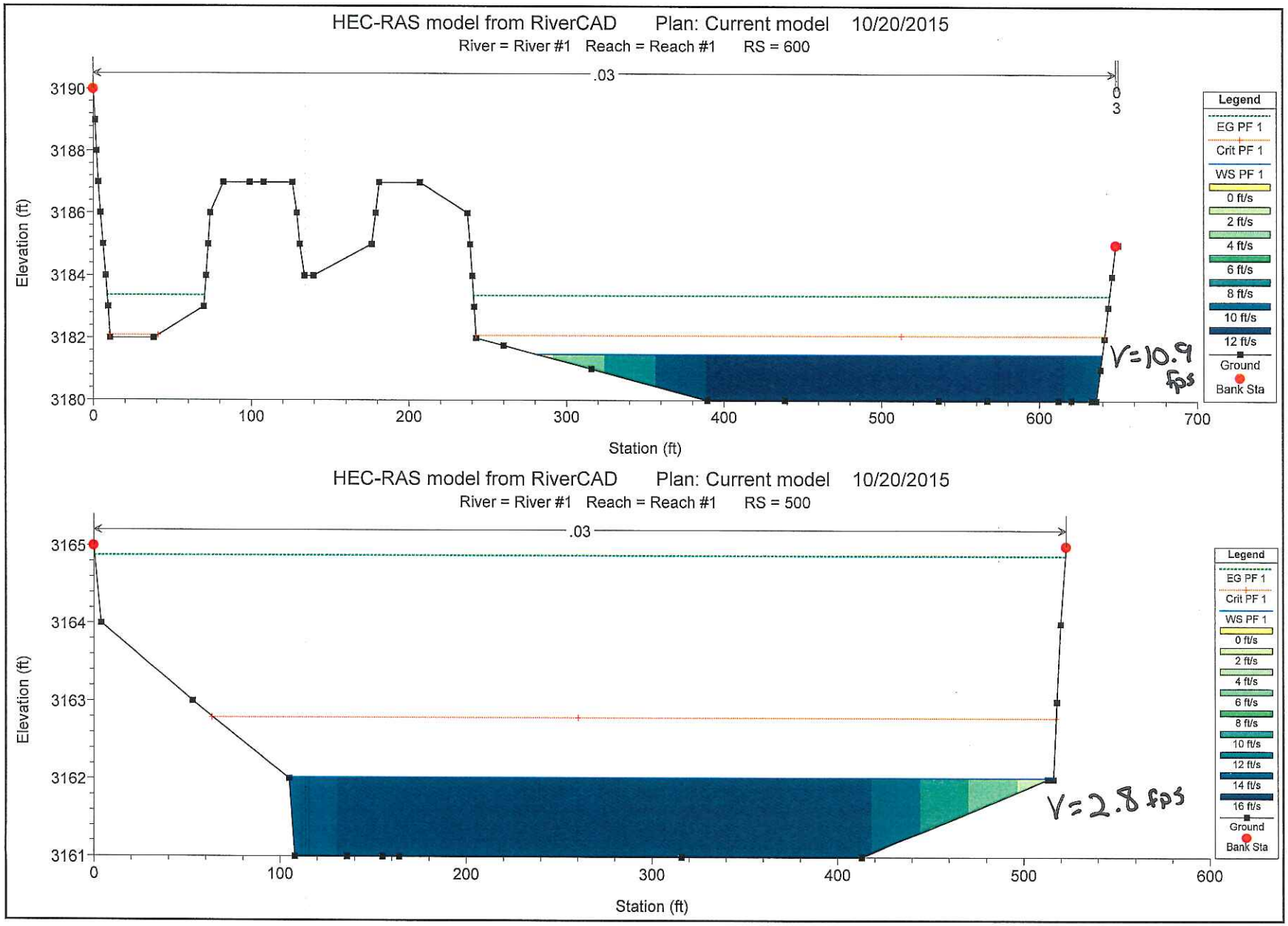
Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach #1	1200	PF 1	3721.00	3302.00	3304.14	3304.78	3306.36	0.068433	11.96	310.99	350.20	2.24
Reach #1	1100	PF 1	3721.00	3288.00	3290.50	3291.42	3293.50	0.057196	13.90	267.68	209.91	2.17
Reach #1	1000	PF 1	3721.00	3233.00	3236.83	3236.83	3238.59	0.009253	10.64	349.64	103.11	1.02
Reach #1	900	PF 1	3721.00	3229.00	3232.30	3232.66	3233.56	0.028054	9.00	413.58	363.43	1.49
Reach #1	800	PF 1	3721.00	3218.00	3220.70	3221.92	3224.79	0.044090	16.23	229.20	116.70	2.04
Reach #1	700	PF 1	3721.00	3200.00	3203.05	3203.99	3206.23	0.059749	14.30	260.19	201.93	2.22
Reach #1	600	PF 1	4956.00	3180.00	3181.48	3182.09	3183.37	0.036850	11.03	449.49	359.67	1.74
Reach #1	500	PF 1	4956.00	3161.00	3162.02	3162.80	3164.88	0.088218	13.57	365.24	412.15	2.54
Reach #1	400	PF 1	4956.00	3135.00	3136.80	3137.88	3140.61	0.057556	15.67	316.33	208.55	2.24
Reach #1	350	PF 1	4956.00	3122.00	3123.65	3124.89	3128.33	0.080794	17.36	285.42	208.04	2.61
Reach #1	300	PF 1	4956.00	3093.00	3094.21	3095.17	3097.91	0.095283	15.43	321.28	316.95	2.70
Reach #1	200	PF 1	4956.00	3068.00	3072.31	3073.16	3075.12	0.036831	13.45	368.50	216.29	1.82
Reach #1	100	PF 1	4956.00	3057.00	3058.10	3058.86	3060.87	0.088188	13.36	371.01	428.52	2.53

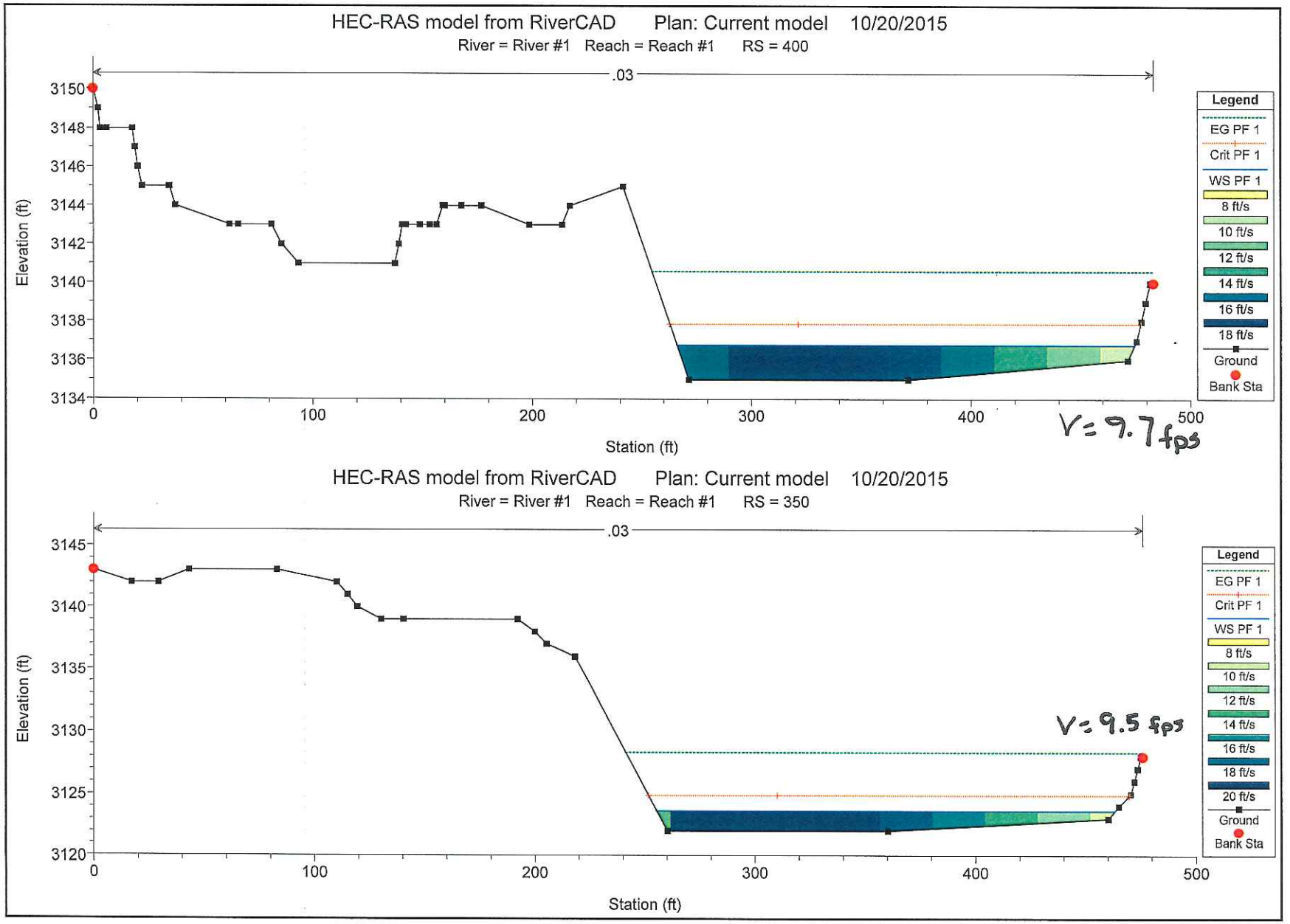

HEC-RAS model from RiverCAD
Plan: Current model
10/20/2015
River #1 Reach #1
Legend
EG PF 1
Crit PF 1
WS PF 1
Ground
Elevation (ft)
3350
3300
3250
3200
3150
3100
3050
0
1000
2000
3000
4000
Main Channel Distance (ft)
200
300
350
400
500
600
700
800
900
1000
1100
1200

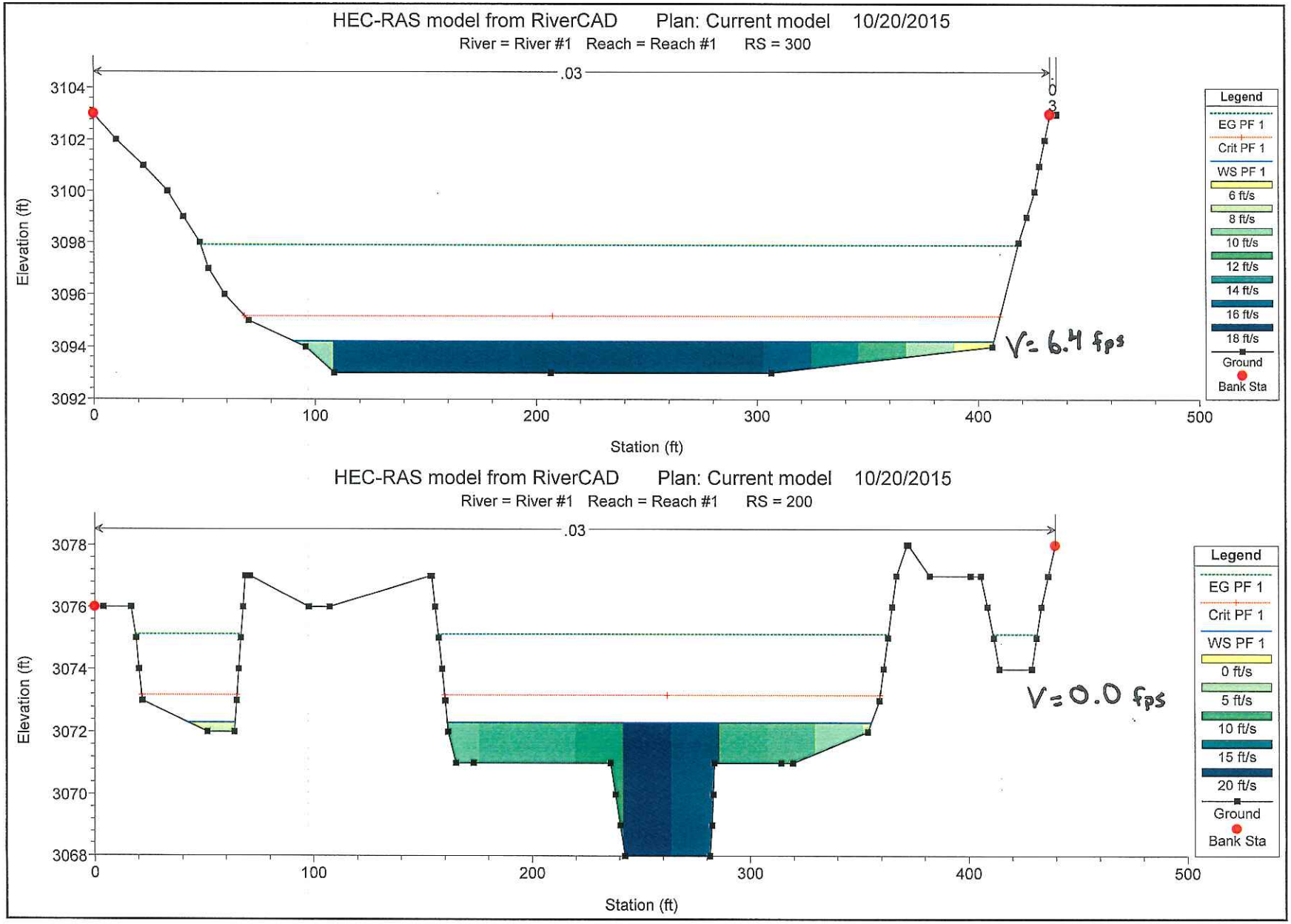

HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 1200
.03
Elevation (ft)
Station (ft)
V = 2.9 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta
HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 1100
.03
Elevation (ft)
Station (ft)
V = 6.0 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta

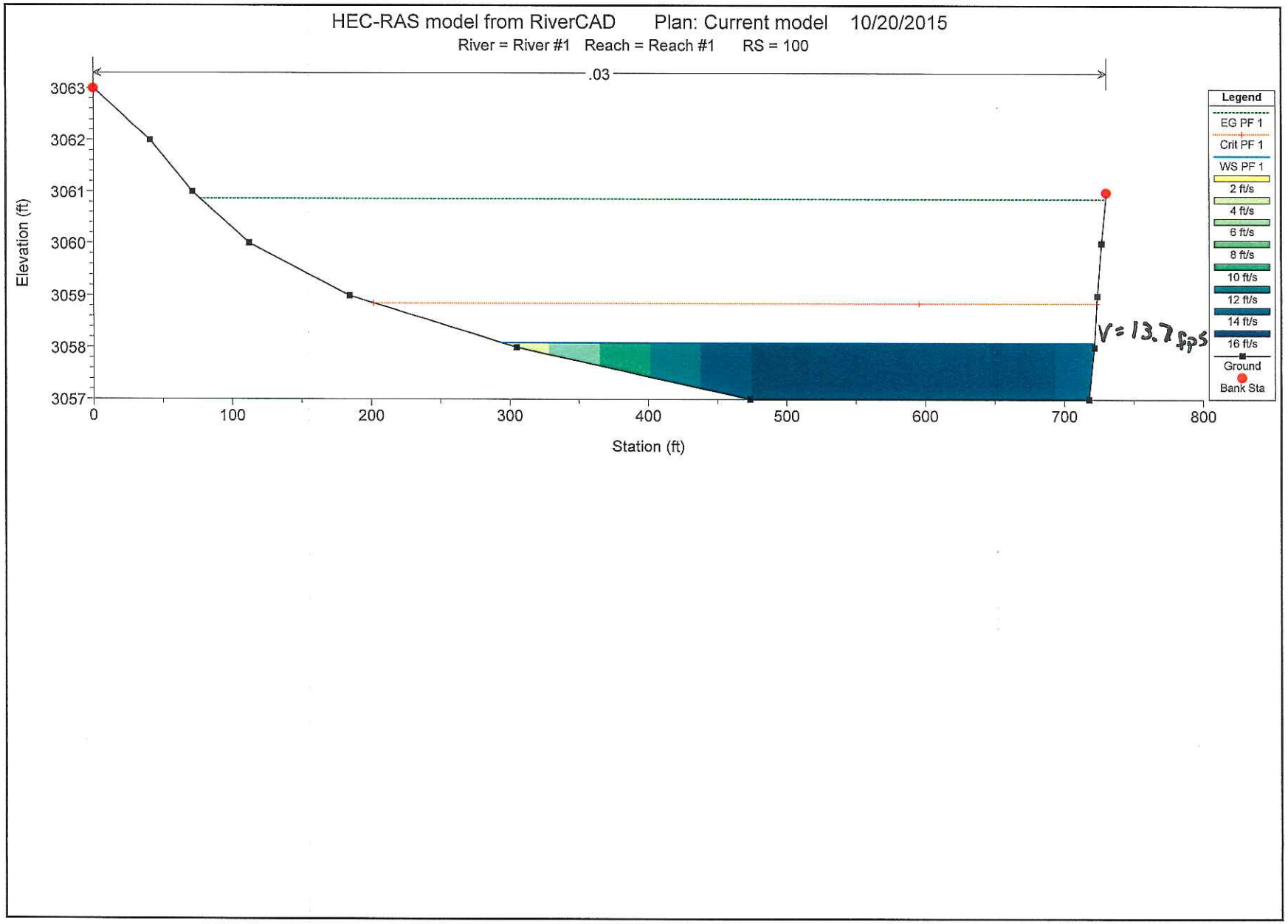

HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 1000
.03
.03
Elevation (ft)
Station (ft)
3255
3250
3245
3240
3235
3230
0
50
100
150
200
250
300
350
400
V= 0.0 fps
Legend
EG PF 1
WS PF 1
Crit PF 1
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta
HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 900
3250
3245
3240
3235
3230
3225
0
100
200
300
400
500
V= 8.1 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
Ground
Bank Sta


HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 800
.03
Elevation (ft)
3230
3228
3226
3224
3222
3220
3218
0
100
200
300
400
500
Station (ft)
V= 0.0 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta
HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 700
.03
Elevation (ft)
3214
3212
3210
3208
3206
3204
3202
3200
0
100
200
300
400
500
Station (ft)
V= 0.0 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
5 ft/s
10 ft/s
15 ft/s
20 ft/s
25 ft/s
Ground
Bank Sta


HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 600
.03
0
3
Elevation (ft)
3190
3188
3186
3184
3182
3180
0
100
200
300
400
500
600
700
Station (ft)
V=10.9 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta
HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 500
.03
Elevation (ft)
3165
3164
3163
3162
3161
0
100
200
300
400
500
600
Station (ft)
V=2.8 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta


HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 400
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta
V = 9.7 fps
HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 350
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta
V = 9.5 fps


HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 300
.03
.03
Elevation (ft)
Station (ft)
V= 6.4 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta
HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 200
.03
Elevation (ft)
Station (ft)
V=0.0 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
5 ft/s
10 ft/s
15 ft/s
20 ft/s
Ground
Bank Sta


HEC-RAS model from RiverCAD Plan: Current model 10/20/2015
River = River #1 Reach = Reach #1 RS = 100
.03
Elevation (ft)
3063
3062
3061
3060
3059
3058
3057
0
100
200
300
400
500
600
700
800
Station (ft)
V = 13.7 fps
Legend
EG PF 1
Crit PF 1
WS PF 1
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
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: HEC-RAS model from RiverCAD
Project File : RIVERCAD.prj
Run Date and Time: 10/20/2015 8:28:42 AM

Project in English units

PLAN DATA

Plan Title: Current model
Plan File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Beltway Interim Channel Diversion\HEC-RAS\HEC-RAS-Update 3 - Interim Berm_UPDbydbc_151020\RIVERCAD.P01

Geometry Title: Base Conditions Geometry
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Beltway Interim Channel Diversion\HEC-RAS\HEC-RAS-Update 3 - Interim Berm_UPDbydbc_151020\RIVERCAD.G01

Flow Title : 1 Flow Profiles
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Beltway Interim Channel Diversion\HEC-RAS\HEC-RAS-Update 3 - Interim Berm_UPDbydbc_151020\RIVERCAD.F01

Plan Summary Information:
Number of: Cross Sections = 13 Multiple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 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: 1 Flow Profiles
Flow File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Beltway Interim Channel Diversion\HEC-RAS\HEC-RAS-Update 3 - Interim Berm_UPDbydbc_151020\RIVERCAD.F01

Flow Data (cfs)

River	Reach	RS	PF 1
River #1	Reach #1	1200	3721
River #1	Reach #1	600	4956

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
River #1	Reach #1	PF 1	Normal S = 0.068326	Normal S = 0.036881

GEOMETRY DATA

Geometry Title: Base Conditions Geometry
Geometry File : f:\Projects\700\764-204-013\Division\Fctl\Calcs\HEC-RAS\Beltway Interim Channel Diversion\HEC-RAS\HEC-RAS-Update 3 - Interim Berm_UPDbydbc_151020\RIVERCAD.G01

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1200

INPUT
Description:

Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3310	3.09	3309	6.64	3308	11.17	3307	14.36	3306
18.23	3305	25.12	3304	31.18	3303	38	3303	49.85	3304
58.93	3305	76.04	3305	90.22	3304	112.69	3304	129.37	3304
130.91	3304	140.23	3304	151.97	3303	167.93	3303	172.8	3303
188.14	3303	199.14	3303	248.41	3303	256.99	3303	272.5	3303
282.52	3303	322.89	3302	324.09	3302	341.53	3303	382.55	3304
401.42	3304	411	3304	426	3309				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	426	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	426	241.36	204.9 234.97	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3306.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.22	Wt. n-Val.		0.030	
W.S. Elev (ft)	3304.14	Reach Len. (ft)	241.36	204.90	234.97
Crit W.S. (ft)	3304.78	Flow Area (sq ft)		310.99	
E.G. Slope (ft/ft)	0.068433	Area (sq ft)		310.99	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	350.20	Top Width (ft)		350.20	
Vel Total (ft/s)	11.96	Avg. Vel. (ft/s)		11.96	
Max Chl Dpth (ft)	2.14	Hydr. Depth (ft)		0.89	
Conv. Total (cfs)	14224.2	Conv. (cfs)		14224.2	
Length Wtd. (ft)	204.90	Wetted Per. (ft)		350.46	
Min Ch El (ft)	3302.00	Shear (lb/sq ft)		3.79	
Alpha	1.00	Stream Power (lb/ft s)	426.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		29.05	
C & E Loss (ft)		Cum SA (acres)		22.77	

Warning: Divided flow computed for this cross-section.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	21.30	42.60	157.52	16.10	18.56	4.23	0.87	9.79	3.70	36.25
2	Chan	42.60	63.90	19.12	3.33	8.57	0.51	0.39	5.74	1.66	9.53
3	Chan	63.90	85.20							0.00	0.00
4	Chan	85.20	106.50	6.87	2.44	18.29	0.18	0.13	2.81	0.57	1.60
5	Chan	106.50	127.80	8.79	3.01	21.30	0.24	0.14	2.92	0.60	1.76
6	Chan	127.80	149.10	30.56	6.36	21.33	0.82	0.30	4.80	1.27	6.12
7	Chan	149.10	170.40	278.78	23.96	21.31	7.49	1.12	11.64	4.80	55.89
8	Chan	170.40	191.70	285.71	24.31	21.30	7.68	1.14	11.75	4.88	57.31
9	Chan	191.70	213.00	285.71	24.31	21.30	7.68	1.14	11.75	4.88	57.31
10	Chan	213.00	234.30	285.71	24.31	21.30	7.68	1.14	11.75	4.88	57.31
11	Chan	234.30	255.60	285.71	24.31	21.30	7.68	1.14	11.75	4.88	57.31
12	Chan	255.60	276.90	285.71	24.31	21.30	7.68	1.14	11.75	4.88	57.31
13	Chan	276.90	298.20	347.76	27.36	21.30	9.35	1.28	12.71	5.49	69.74
14	Chan	298.20	319.50	606.74	38.20	21.31	16.31	1.79	15.88	7.66	121.66
15	Chan	319.50	340.80	586.85	37.46	21.33	15.77	1.76	15.67	7.50	117.55
16	Chan	340.80	362.10	192.22	19.17	21.31	5.17	0.90	10.03	3.84	38.54
17	Chan	362.10	383.40	45.82	8.11	21.31	1.23	0.38	5.65	1.63	9.19
18	Chan	383.40	404.70	8.79	3.01	21.30	0.24	0.14	2.92	0.60	1.76
19	Chan	404.70	426.00	2.63	0.92	6.75	0.07	0.14	2.85	0.58	1.66

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1100

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3302	3.11	3301	6.22	3300	9.38	3299	12.68	3298
15.56	3297	17.33	3296	19.16	3295	21.02	3294	23.66	3293
26.66	3292	39.42	3291	42.36	3290	46.33	3289	126.38	3288
142.46	3288	147.28	3289	155.61	3290	157.67	3290	179.45	3290
185.29	3291	224.3	3291	232.4	3291	236.81	3292	247.44	3292
338.11	3292	342.53	3292	357.49	3291	366.54	3290	376.21	3290
396.04	3290	423.99	3290	430	3290	435	3295		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	435	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	435	190.38	285.14 405.9	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3293.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.00	Wt. n-Val.		0.030	
W.S. Elev (ft)	3290.50	Reach Len. (ft)	190.38	285.14	405.90
Crit W.S. (ft)	3291.42	Flow Area (sq ft)		267.68	
E.G. Slope (ft/ft)	0.057196	Area (sq ft)		267.68	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	209.91	Top Width (ft)		209.91	

Vel Total (ft/s)	13.90	Avg. Vel. (ft/s)		13.90	
Max Chl Dpth (ft)	2.50	Hydr. Depth (ft)		1.28	
Conv. Total (cfs)	15558.8	Conv. (cfs)		15558.8	
Length Wtd. (ft)		Wetted Per. (ft)		210.57	
Min Ch El (ft)	3288.00	Shear (lb/sq ft)		4.54	
Alpha	1.00	Stream Power (lb/ft s)	435.00	0.00	0.00
Frctn Loss (ft)	12.79	Cum Volume (acre-ft)		27.69	
C & E Loss (ft)	0.08	Cum SA (acres)		21.45	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	21.75	43.50	5.80	1.09	2.72	0.16	0.42	5.30	1.44	7.61
2	Chan	43.50	65.25	439.80	33.79	21.84	11.82	1.55	13.01	5.53	71.91
3	Chan	65.25	87.00	600.28	40.66	21.75	16.13	1.87	14.76	6.68	98.54
4	Chan	87.00	108.75	752.63	46.57	21.75	20.23	2.14	16.16	7.65	123.55
5	Chan	108.75	130.50	915.36	52.38	21.75	24.60	2.41	17.48	8.60	150.27
6	Chan	130.50	152.25	719.74	45.45	21.89	19.34	2.09	15.83	7.42	117.42
7	Chan	152.25	174.00	73.04	11.49	21.77	1.96	0.53	6.35	1.88	11.98
8	Chan	174.00	195.75	18.39	3.43	8.40	0.49	0.41	5.36	1.46	7.82
9	Chan	195.75	217.50							0.00	0.00
10	Chan	217.50	239.25							0.00	0.00
11	Chan	239.25	261.00							0.00	0.00
12	Chan	261.00	282.75							0.00	0.00
13	Chan	282.75	304.50							0.00	0.00
14	Chan	304.50	326.25							0.00	0.00
15	Chan	326.25	348.00							0.00	0.00
16	Chan	348.00	369.75	13.14	2.72	7.74	0.35	0.35	4.84	1.25	6.06
17	Chan	369.75	391.50	66.05	10.82	21.75	1.78	0.50	6.11	1.78	10.84
18	Chan	391.50	413.25	66.05	10.82	21.75	1.78	0.50	6.11	1.78	10.84
19	Chan	413.25	435.00	50.72	8.45	17.45	1.36	0.49	6.00	1.73	10.38

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1000

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3255	2.84	3254	6.23	3253	8.97	3252	10.11	3251
11.59	3250	13.61	3249	16.15	3248	18.67	3247	21.79	3246
24.39	3245	26.84	3244	29.04	3243	30.56	3242	33.21	3241
36.32	3240	39.2	3239	43.56	3238	48	3237	54.06	3237
55.48	3237	57.64	3236.27	58.44	3236	60.67	3235	62.22	3234
76.96	3233	130.48	3233	155.14	3234	156.81	3235	158.1	3236
159.31	3237	160.52	3238	196.84	3239	206.68	3240	211.01	3240
211.68	3240	214.04	3240	218.19	3239	234.04	3239	236.88	3240
239.87	3241	242.61	3242	242.88	3242.13	244.76	3243	244.81	3243
248.22	3242	251.3	3241	254.39	3240	257.95	3239	261.25	3238
263.63	3238	263.91	3238	268.46	3237	269	3237	288.93	3238
293.97	3239	301.92	3240	303.34	3240	306.29	3240	331.94	3241
333.99	3242	336.11	3243	339.46	3244	354.31	3245	356.58	3246
358.91	3247	361.26	3248	363.59	3249	366.62	3250	372.47	3250

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	6.23	.03	372.47	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
6.23	372.47	208.44	326.91 214.82	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3238.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.76	Wt. n-Val.		0.030	
W.S. Elev (ft)	3236.83	Reach Len. (ft)	208.44	326.91	214.82
Crit W.S. (ft)	3236.83	Flow Area (sq ft)		349.64	
E.G. Slope (ft/ft)	0.009253	Area (sq ft)		349.64	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	103.11	Top Width (ft)		103.11	
Vel Total (ft/s)	10.64	Avg. Vel. (ft/s)		10.64	
Max Chl Dpth (ft)	3.83	Hydr. Depth (ft)		3.39	
Conv. Total (cfs)	38683.1	Conv. (cfs)		38683.1	
Length Wtd. (ft)	326.91	Wetted Per. (ft)		104.73	
Min Ch El (ft)	3233.00	Shear (lb/sq ft)		1.93	
Alpha	1.00	Stream Power (lb/ft s)	372.47	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		25.67	
C & E Loss (ft)		Cum SA (acres)		20.42	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	42.85	61.17	21.07	4.96	5.62	0.57	0.96	4.24	0.51	2.17
2	Chan	61.17	79.48	627.72	61.32	18.55	16.87	3.35	10.24	1.91	19.55
3	Chan	79.48	97.79	791.27	70.11	18.31	21.26	3.83	11.29	2.21	24.96
4	Chan	97.79	116.10	791.27	70.11	18.31	21.26	3.83	11.29	2.21	24.96
5	Chan	116.10	134.41	785.28	69.79	18.32	21.10	3.81	11.25	2.20	24.77
6	Chan	134.41	152.73	616.68	60.39	18.33	16.57	3.30	10.21	1.90	19.44
7	Chan	152.73	171.04	87.71	12.96	7.30	2.36	2.03	6.77	1.03	6.95

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 900

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3249	1.31	3248	2.62	3247	3.89	3246	5.13	3245
6.36	3244	7.77	3243	9.05	3242	10.32	3241	11.62	3240
12.81	3239	13.95	3238	14.98	3237	16.13	3236	17.69	3235
19.3	3234	20.9	3233	22.57	3232	24.25	3231	25.76	3230.23
26.2	3230	55.92	3229	66.65	3229	78.92	3230	82.8	3231
83.31	3231	87.04	3230	102.19	3230	104.17	3231	105.83	3232
145.35	3232	178.58	3232	180.46	3233	189.44	3233	193.64	3233
206.11	3233	206.47	3233	242.43	3232	255.82	3232	278.05	3232
278.58	3232	325.34	3232	348.39	3232	350.26	3231	373.43	3231
374.26	3232	376.6	3233	377.63	3233	382.75	3232	388.52	3231
396.47	3230	400.72	3230	401.94	3230	433.28	3230	437.12	3231
440.02	3232	454.01	3233	456.33	3234	458.66	3235	461.22	3236
464.94	3237	468.66	3238						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	468.66	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	468.66	148.02	244.37	242.24	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3233.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.26	Wt. n-Val.		0.030	
W.S. Elev (ft)	3232.30	Reach Len. (ft)	148.02	244.37	242.24
Crit W.S. (ft)	3232.66	Flow Area (sq ft)		413.58	
E.G. Slope (ft/ft)	0.028054	Area (sq ft)		413.58	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	363.43	Top Width (ft)		363.43	
Vel Total (ft/s)	9.00	Avg. Vel. (ft/s)		9.00	
Max Chl Dpth (ft)	3.30	Hydr. Depth (ft)		1.14	
Conv. Total (cfs)	22215.6	Conv. (cfs)		22215.6	
Length Wtd. (ft)	244.37	Wetted Per. (ft)		366.21	
Min Ch El (ft)	3229.00	Shear (lb/sq ft)		1.98	
Alpha	1.00	Stream Power (lb/ft s)	468.66	0.00	0.00
Frctn Loss (ft)	4.88	Cum Volume (acre-ft)		22.81	
C & E Loss (ft)	0.15	Cum SA (acres)		18.67	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	0.00	23.43	1.65	0.56	1.59	0.04	0.41	2.96	0.61	1.82
2	Chan	23.43	46.87	645.82	59.10	23.82	17.36	2.52	10.93	4.35	47.49
3	Chan	46.87	70.30	979.84	75.42	23.45	26.33	3.22	12.99	5.63	73.18
4	Chan	70.30	93.73	533.73	52.62	23.72	14.34	2.25	10.14	3.89	39.41
5	Chan	93.73	117.17	182.63	27.76	23.95	4.91	1.18	6.58	2.03	13.36
6	Chan	117.17	140.60	18.84	7.04	23.43	0.51	0.30	2.68	0.53	1.41
7	Chan	140.60	164.03	18.84	7.04	23.43	0.51	0.30	2.68	0.53	1.41
8	Chan	164.03	187.46	11.74	4.46	15.19	0.32	0.29	2.63	0.51	1.35
9	Chan	187.46	210.90							0.00	0.00
10	Chan	210.90	234.33	0.07	0.10	2.71	0.00	0.04	0.67	0.07	0.04
11	Chan	234.33	257.76	14.95	6.13	23.44	0.40	0.26	2.44	0.46	1.12
12	Chan	257.76	281.20	18.84	7.04	23.43	0.51	0.30	2.68	0.53	1.41

13	Chan	281.20	304.63	18.84	7.04	23.43	0.51	0.30	2.68	0.53	1.41
14	Chan	304.63	328.06	18.84	7.04	23.43	0.51	0.30	2.68	0.53	1.41
15	Chan	328.06	351.50	29.27	9.21	23.68	0.79	0.39	3.18	0.68	2.16
16	Chan	351.50	374.93	199.75	29.30	23.96	5.37	1.25	6.82	2.14	14.60
17	Chan	374.93	398.36	171.62	23.52	17.37	4.61	1.37	7.30	2.37	17.31
18	Chan	398.36	421.79	560.18	53.91	23.43	15.05	2.30	10.39	4.03	41.87
19	Chan	421.79	445.23	295.55	36.29	22.74	7.94	1.62	8.14	2.80	22.77

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 800

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3225	9	3222	12.95	3222	26.22	3223	39.88	3223
47.09	3222	56.09	3221	83.53	3221	97.92	3221	115.21	3221
118.84	3222	129.39	3222	155.28	3221	157.37	3221	161.06	3221
164.14	3221	174.86	3221	174.99	3220.96	178.08	3220	191.13	3220
194.41	3220	207.59	3219	250.97	3218	286.84	3218	290	3219
291.47	3220	292.99	3221	301.51	3221.27	324.99	3222	328.64	3223
331.64	3224	332.16	3224	336.42	3223	341.49	3222	347.63	3221
370.12	3221	372.85	3222	376.44	3223	391.85	3224	394.52	3225
397.18	3226	399.52	3227	401.82	3228	404.2	3229		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	404.2	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	404.2	326.86	358.35 361.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3224.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.09	Wt. n-Val.		0.030	
W.S. Elev (ft)	3220.70	Reach Len. (ft)	326.86	358.35	361.96
Crit W.S. (ft)	3221.92	Flow Area (sq ft)		229.20	
E.G. Slope (ft/ft)	0.044090	Area (sq ft)		229.20	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	116.70	Top Width (ft)		116.70	
Vel Total (ft/s)	16.23	Avg. Vel. (ft/s)		16.23	
Max Chl Dpth (ft)	2.70	Hydr. Depth (ft)		1.96	
Conv. Total (cfs)	17721.0	Conv. (cfs)		17721.0	
Length Wtd. (ft)	358.35	Wetted Per. (ft)		117.53	
Min Ch El (ft)	3218.00	Shear (lb/sq ft)		5.37	
Alpha	1.00	Stream Power (lb/ft s)	404.20	0.00	0.00
Frctn Loss (ft)	8.49	Cum Volume (acre-ft)		21.00	
C & E Loss (ft)	0.28	Cum SA (acres)		17.33	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	161.68	181.89	22.49	3.44	6.16	0.60	0.57	6.53	1.54	10.04
2	Chan	181.89	202.10	136.54	16.36	20.23	3.67	0.81	8.35	2.23	18.58
3	Chan	202.10	222.31	501.01	35.68	20.23	13.46	1.77	14.04	4.85	68.17
4	Chan	222.31	242.52	762.51	45.89	20.22	20.49	2.27	16.62	6.25	103.82
5	Chan	242.52	262.73	991.31	53.71	20.21	26.64	2.66	18.46	7.31	135.00
6	Chan	262.73	282.94	1016.83	54.53	20.21	27.33	2.70	18.65	7.43	138.49
7	Chan	282.94	303.15	290.31	19.60	10.26	7.80	2.04	14.81	5.26	77.86

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 700

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3209	1.82	3208	3.68	3207	5.5	3206	7.3	3205
9.26	3204	29.11	3203	87.66	3202	136.96	3201	140.42	3201
172.8	3202	186.79	3203	201.31	3204	211.52	3205	222.48	3206
232.39	3207	250.83	3207	259.35	3207	262.47	3206	265.63	3205
269.42	3204	274.05	3203	278.19	3202	282.55	3201	287.71	3200
302.07	3200	305.54	3201	310.63	3202	315.93	3203	320.38	3204

322.37	3205	324.36	3206	326.3	3207	328.24	3208	330.16	3209
332.08	3210	365.94	3210.92	368.71	3211	370.85	3211	372.6	3210
375.13	3209	377.76	3208	380.94	3207	384.21	3206	387.06	3205
408.79	3205	416.94	3206	433.68	3207	441.81	3208	453.92	3209
456.36	3210	458.78	3211	461.11	3212	463.44	3213	465.58	3214

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	465.58	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	465.58	426.05	502.88	540.06	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3206.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.18	Wt. n-Val.		0.030	
W.S. Elev (ft)	3203.05	Reach Len. (ft)	426.05	502.88	540.06
Crit W.S. (ft)	3203.99	Flow Area (sq ft)		260.19	
E.G. Slope (ft/ft)	0.059749	Area (sq ft)		260.19	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	201.93	Top Width (ft)		201.93	
Vel Total (ft/s)	14.30	Avg. Vel. (ft/s)		14.30	
Max Chl Dpth (ft)	3.05	Hydr. Depth (ft)		1.29	
Conv. Total (cfs)	15222.8	Conv. (cfs)		15222.8	
Length Wtd. (ft)	502.88	Wetted Per. (ft)		202.67	
Min Ch El (ft)	3200.00	Shear (lb/sq ft)		4.79	
Alpha	1.00	Stream Power (lb/ft s)	465.58	0.00	0.00
Frctn Loss (ft)	18.29	Cum Volume (acre-ft)		18.99	
C & E Loss (ft)	0.28	Cum SA (acres)		16.02	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	23.28	46.56	12.28	3.58	18.53	0.33	0.19	3.43	0.72	2.47
2	Chan	46.56	69.84	88.57	12.83	23.28	2.38	0.55	6.90	2.06	14.19
3	Chan	69.84	93.12	219.72	22.14	23.28	5.90	0.95	9.93	3.55	35.20
4	Chan	93.12	116.40	419.24	32.62	23.28	11.27	1.40	12.85	5.23	67.16
5	Chan	116.40	139.67	678.37	43.54	23.28	18.23	1.87	15.58	6.97	108.68
6	Chan	139.67	162.95	588.62	39.99	23.29	15.82	1.72	14.72	6.40	94.27
7	Chan	162.95	186.23	179.15	19.60	23.32	4.81	0.84	9.14	3.13	28.66
8	Chan	186.23	209.51	0.08	0.06	1.35	0.00	0.05	1.33	0.17	0.23
9	Chan	209.51	232.79							0.00	0.00
10	Chan	232.79	256.07							0.00	0.00
11	Chan	256.07	279.35	28.17	3.68	5.71	0.76	0.66	7.66	2.40	18.42
12	Chan	279.35	302.63	1285.50	64.10	23.48	34.55	2.75	20.05	10.18	204.21
13	Chan	302.63	325.91	221.29	18.06	13.86	5.95	1.33	12.25	4.86	59.55

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 600

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3190	1.13	3189	2.11	3188	3.11	3187	4.53	3186
6.18	3185	7.8	3184	9.28	3183	10.53	3182	38.06	3182
69.86	3183	71.42	3184	72.79	3185	74.13	3186	82.47	3187
99.11	3187	108.06	3187	126.08	3187	128.95	3186	130.84	3185
133.84	3184	139.44	3184	176.41	3185	178.89	3186	181.16	3187
207.05	3187	237.19	3186	238.72	3185	240.14	3184	241.31	3183
242.56	3182	259.87	3181.76	315.74	3181	389.3	3180	438.67	3180
536.17	3180	566.8	3180	612	3180	620.17	3180	633.14	3180
635.99	3180	638.71	3181	641.27	3182	643.63	3183	646	3184
648.41	3185	649.88	3185						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	648.41	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	648.41	472.7	338.14	340.16	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3183.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.89	Wt. n-Val.		0.030	
W.S. Elev (ft)	3181.48	Reach Len. (ft)	472.70	338.14	340.16
Crit W.S. (ft)	3182.09	Flow Area (sq ft)		449.49	
E.G. Slope (ft/ft)	0.036850	Area (sq ft)		449.49	
Q Total (cfs)	4956.00	Flow (cfs)		4956.00	
Top Width (ft)	359.67	Top Width (ft)		359.67	
Vel Total (ft/s)	11.03	Avg. Vel. (ft/s)		11.03	

Max Chl Dpth (ft)	1.48	Hydr. Depth (ft)		1.25	
Conv. Total (cfs)	25817.5	Conv. (cfs)		25817.5	
Length Wtd. (ft)	338.14	Wetted Per. (ft)		359.95	
Min Ch El (ft)	3180.00	Shear (lb/sq ft)		2.87	
Alpha	1.00	Stream Power (lb/ft s)	649.88	0.00	0.00
Frctn Loss (ft)	22.48	Cum Volume (acre-ft)		14.89	
C & E Loss (ft)	0.39	Cum SA (acres)		12.77	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	259.36	291.78	1.47	0.90	11.51	0.03	0.08	1.64	0.18	0.29
2	Chan	291.78	324.21	57.02	12.22	32.42	1.15	0.38	4.66	0.87	4.05
3	Chan	324.21	356.63	207.26	26.52	32.42	4.18	0.82	7.82	1.88	14.71
4	Chan	356.63	389.05	425.17	40.81	32.42	8.58	1.26	10.42	2.90	30.17
5	Chan	389.05	421.47	558.50	48.06	32.42	11.27	1.48	11.62	3.41	39.63
6	Chan	421.47	453.89	558.51	48.06	32.42	11.27	1.48	11.62	3.41	39.63
7	Chan	453.89	486.31	558.51	48.06	32.42	11.27	1.48	11.62	3.41	39.63
8	Chan	486.31	518.73	558.51	48.06	32.42	11.27	1.48	11.62	3.41	39.63
9	Chan	518.73	551.15	558.51	48.06	32.42	11.27	1.48	11.62	3.41	39.63
10	Chan	551.15	583.57	558.51	48.06	32.42	11.27	1.48	11.62	3.41	39.63
11	Chan	583.57	615.99	558.51	48.06	32.42	11.27	1.48	11.62	3.41	39.63
12	Chan	615.99	648.41	355.53	32.62	24.22	7.17	1.36	10.90	3.10	33.76

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 500

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3165	4	3164	53	3163	105	3162	108	3161
136	3161	155	3161	164	3161	316	3161	413	3161
513	3162	516	3162	518	3163	520	3164	523	3165

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	523	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	523	299.7 343.12	345.13	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3164.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.86	Wt. n-Val.		0.030	
W.S. Elev (ft)	3162.02	Reach Len. (ft)	299.70	343.12	345.13
Crit W.S. (ft)	3162.80	Flow Area (sq ft)		365.24	
E.G. Slope (ft/ft)	0.088218	Area (sq ft)		365.24	
Q Total (cfs)	4956.00	Flow (cfs)		4956.00	
Top Width (ft)	412.15	Top Width (ft)		412.15	
Vel Total (ft/s)	13.57	Avg. Vel. (ft/s)		13.57	
Max Chl Dpth (ft)	1.02	Hydr. Depth (ft)		0.89	
Conv. Total (cfs)	16686.0	Conv. (cfs)		16686.0	
Length Wtd. (ft)	343.12	Wetted Per. (ft)		412.32	
Min Ch El (ft)	3161.00	Shear (lb/sq ft)		4.88	
Alpha	1.00	Stream Power (lb/ft s)	523.00	0.00	0.00
Frctn Loss (ft)	18.39	Cum Volume (acre-ft)		11.73	
C & E Loss (ft)	0.10	Cum SA (acres)		9.78	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	78.45	104.60	0.00	0.00	0.70	0.00	0.01	0.50	0.04	0.02
2	Chan	104.60	130.75	332.49	24.80	26.31	6.71	0.95	13.40	5.19	69.59
3	Chan	130.75	156.90	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53
4	Chan	156.90	183.05	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53
5	Chan	183.05	209.20	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53
6	Chan	209.20	235.35	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53
7	Chan	235.35	261.50	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53
8	Chan	261.50	287.65	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53
9	Chan	287.65	313.80	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53
10	Chan	313.80	339.95	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53

11	Chan	339.95	366.10	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53
12	Chan	366.10	392.25	377.60	26.71	26.15	7.62	1.02	14.14	5.62	79.53
13	Chan	392.25	418.40	374.17	26.56	26.15	7.55	1.02	14.09	5.59	78.80
14	Chan	418.40	444.55	270.78	21.88	26.15	5.46	0.84	12.38	4.61	57.03
15	Chan	444.55	470.70	144.99	15.04	26.15	2.93	0.58	9.64	3.17	30.54
16	Chan	470.70	496.85	52.78	8.20	26.15	1.06	0.31	6.44	1.73	11.11
17	Chan	496.85	523.00	4.77	1.71	19.20	0.10	0.09	2.78	0.49	1.37

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 400

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3150	2.11	3149	3.12	3148	6	3148	17.7	3148
18.95	3147	20.24	3146	22.2	3145	34.28	3145	34.68	3145
37.2	3144	61.99	3143	66	3143	81.14	3143	85.69	3142
93.37	3141	137.32	3141	139.07	3142	140.58	3143	142.32	3143
148.75	3143	153.27	3143	156.31	3143	159.11	3144	160.11	3144
167.6	3144	176.77	3144	198.59	3143	213.54	3143	217.14	3144
241.41	3145	271.41	3135	371.41	3135	471.41	3136	475.34	3137
477.53	3138	479.49	3139	481.46	3140	483.11	3140		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	483.11	.03

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
0 483.11 134.85 180.11 179.45 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3140.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.81	Wt. n-Val.		0.030	
W.S. Elev (ft)	3136.80	Reach Len. (ft)	134.85	180.11	179.45
Crit W.S. (ft)	3137.88	Flow Area (sq ft)		316.33	
E.G. Slope (ft/ft)	0.057556	Area (sq ft)		316.33	
Q Total (cfs)	4956.00	Flow (cfs)		4956.00	
Top Width (ft)	208.55	Top Width (ft)		208.55	
Vel Total (ft/s)	15.67	Avg. Vel. (ft/s)		15.67	
Max Chl Dpth (ft)	1.80	Hydr. Depth (ft)		1.52	
Conv. Total (cfs)	20657.8	Conv. (cfs)		20657.8	
Length Wtd. (ft)	180.11	Wetted Per. (ft)		208.95	
Min Ch El (ft)	3135.00	Shear (lb/sq ft)		5.44	
Alpha	1.00	Stream Power (lb/ft s)	483.11	0.00	0.00
Frctn Loss (ft)	24.17	Cum Volume (acre-ft)		9.05	
C & E Loss (ft)	0.10	Cum SA (acres)		7.33	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	265.71	289.87	597.41	38.11	24.15	12.05	1.60	15.68	5.67	88.88
2	Chan	289.87	314.02	744.97	43.50	24.16	15.03	1.80	17.12	6.47	110.82
3	Chan	314.02	338.18	744.97	43.50	24.16	15.03	1.80	17.12	6.47	110.82
4	Chan	338.18	362.33	744.97	43.50	24.16	15.03	1.80	17.12	6.47	110.82
5	Chan	362.33	386.49	712.78	42.37	24.16	14.38	1.75	16.82	6.30	106.03
6	Chan	386.49	410.64	567.29	36.94	24.16	11.45	1.53	15.36	5.50	84.38
7	Chan	410.64	434.80	426.02	31.11	24.16	8.60	1.29	13.69	4.63	63.37
8	Chan	434.80	458.95	301.36	25.28	24.16	6.08	1.05	11.92	3.76	44.83
9	Chan	458.95	483.11	116.24	12.01	15.70	2.35	0.77	9.68	2.75	26.60

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 350

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3143	17.19	3142	29.22	3142	43.2	3143	83.07	3143
110.18	3142	115.02	3141	119.41	3140	130.3	3139	140.33	3139
192.19	3139	200.05	3138	205.42	3137	218.27	3136	260.27	3122
360.27	3122	460.27	3123	465	3124	470.45	3125	472.07	3126
473.53	3127	475.08	3128	475.99	3128				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	475.99	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	475.99	416.03	344 346.84	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3128.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.68	Wt. n-Val.		0.030	
W.S. Elev (ft)	3123.65	Reach Len. (ft)	416.03	344.00	346.84
Crit W.S. (ft)	3124.89	Flow Area (sq ft)		285.42	
E.G. Slope (ft/ft)	0.080794	Area (sq ft)		285.42	
Q Total (cfs)	4956.00	Flow (cfs)		4956.00	
Top Width (ft)	208.04	Top Width (ft)		208.04	
Vel Total (ft/s)	17.36	Avg. Vel. (ft/s)		17.36	
Max Chl Dpth (ft)	1.65	Hydr. Depth (ft)		1.37	
Conv. Total (cfs)	17435.8	Conv. (cfs)		17435.8	
Length Wtd. (ft)	344.00	Wetted Per. (ft)		208.38	
Min Ch El (ft)	3122.00	Shear (lb/sq ft)		6.91	
Alpha	1.00	Stream Power (lb/ft s)	475.99	0.00	0.00
Frctn Loss (ft)	12.19	Cum Volume (acre-ft)		7.80	
C & E Loss (ft)	0.09	Cum SA (acres)		6.47	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	238.00	261.79	88.58	6.61	6.75	1.79	1.02	13.40	4.94	66.22
2	Chan	261.79	285.59	746.26	39.31	23.80	15.06	1.65	18.99	8.33	158.16
3	Chan	285.59	309.39	746.26	39.31	23.80	15.06	1.65	18.99	8.33	158.16
4	Chan	309.39	333.19	746.26	39.31	23.80	15.06	1.65	18.99	8.33	158.16
5	Chan	333.19	356.99	746.26	39.31	23.80	15.06	1.65	18.99	8.33	158.16
6	Chan	356.99	380.79	680.77	37.20	23.80	13.74	1.56	18.30	7.88	144.27
7	Chan	380.79	404.59	518.43	31.59	23.80	10.46	1.33	16.41	6.69	109.87
8	Chan	404.59	428.39	373.01	25.93	23.80	7.53	1.09	14.39	5.50	79.05
9	Chan	428.39	452.19	247.33	20.26	23.80	4.99	0.85	12.21	4.29	52.42
10	Chan	452.19	475.99	62.85	6.60	11.23	1.27	0.59	9.53	2.96	28.23

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 300

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3103	10.23	3102	22.49	3101	33.36	3100	40.38	3099
47.85	3098	51.79	3097	59.05	3096	69.83	3095	95.58	3094
108.45	3093	206.4	3093	306.4	3093	406.4	3094	418.4	3098
421.96	3099	425.63	3100	427.84	3101	430.23	3102	432.62	3103
435.47	3103								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	432.62	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	432.62	400.32	402.05 400.72	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3097.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.69	Wt. n-Val.		0.030	
W.S. Elev (ft)	3094.21	Reach Len. (ft)	400.32	402.05	400.72
Crit W.S. (ft)	3095.17	Flow Area (sq ft)		321.28	
E.G. Slope (ft/ft)	0.095283	Area (sq ft)		321.28	
Q Total (cfs)	4956.00	Flow (cfs)		4956.00	
Top Width (ft)	316.95	Top Width (ft)		316.95	
Vel Total (ft/s)	15.43	Avg. Vel. (ft/s)		15.43	
Max Chl Dpth (ft)	1.21	Hydr. Depth (ft)		1.01	
Conv. Total (cfs)	16055.5	Conv. (cfs)		16055.5	
Length Wtd. (ft)	402.05	Wetted Per. (ft)		317.03	
Min Ch El (ft)	3093.00	Shear (lb/sq ft)		6.03	
Alpha	1.00	Stream Power (lb/ft s)	435.47	0.00	0.00
Frctn Loss (ft)	30.13	Cum Volume (acre-ft)		5.41	
C & E Loss (ft)	0.30	Cum SA (acres)		4.40	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

Pos	Left Sta	Right Sta	Flow	Area	W.P.	Percent	Hydr	Velocity	Shear	Power

		(ft)	(ft)	(cfs)	(sq ft)	(ft)	Conv	Depth(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
1	Chan	86.52	108.16	88.24	9.41	18.11	1.78	0.52	9.38	3.09	28.99
2	Chan	108.16	129.79	433.00	26.24	21.63	8.74	1.21	16.50	7.22	119.07
3	Chan	129.79	151.42	433.11	26.24	21.63	8.74	1.21	16.50	7.22	119.10
4	Chan	151.42	173.05	433.11	26.24	21.63	8.74	1.21	16.50	7.22	119.10
5	Chan	173.05	194.68	433.11	26.24	21.63	8.74	1.21	16.50	7.22	119.10
6	Chan	194.68	216.31	433.11	26.24	21.63	8.74	1.21	16.50	7.22	119.10
7	Chan	216.31	237.94	433.11	26.24	21.63	8.74	1.21	16.50	7.22	119.10
8	Chan	237.94	259.57	433.11	26.24	21.63	8.74	1.21	16.50	7.22	119.10
9	Chan	259.57	281.20	433.11	26.24	21.63	8.74	1.21	16.50	7.22	119.10
10	Chan	281.20	302.83	433.11	26.24	21.63	8.74	1.21	16.50	7.22	119.10
11	Chan	302.83	324.47	389.14	24.61	21.63	7.85	1.14	15.81	6.77	107.01
12	Chan	324.47	346.10	275.28	19.99	21.63	5.55	0.92	13.77	5.50	75.70
13	Chan	346.10	367.73	176.52	15.31	21.63	3.56	0.71	11.53	4.21	48.54
14	Chan	367.73	389.36	96.14	10.64	21.63	1.94	0.49	9.04	2.92	26.44
15	Chan	389.36	410.99	32.82	5.15	17.72	0.66	0.29	6.37	1.73	11.02

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 200

INPUT
Description:
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3076	3.85	3076	16.55	3076	18.84	3075	20.21	3074
21.69	3073	51.37	3072	63.74	3072	64.87	3073	65.78	3074
66.82	3075	67.86	3076	68.86	3077	71	3077	97.94	3076
107.47	3076	153.64	3077	154.13	3077	155.72	3076	157.3	3075
158.81	3074	160.19	3073	161.52	3072	165.14	3071	173.1	3071
235.87	3071	238.14	3070	240.38	3069	242.52	3068	281.45	3068
282.44	3069	282.97	3070	283.5	3071	314.17	3071	319.48	3071
353.91	3072	359.14	3073	361.17	3074	363.19	3075	365.13	3076
367.07	3077	371.98	3078	372.63	3078	382.4	3077	400.98	3077
405.66	3077	408.73	3076	411.53	3075	413.99	3074	428.93	3074
431.09	3075	433.35	3076	436.49	3077	439.77	3078		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	439.77	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	439.77	394.44	262 263.09	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3075.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.81	Wt. n-Val.		0.030	
W.S. Elev (ft)	3072.31	Reach Len. (ft)	394.44	262.00	263.09
Crit W.S. (ft)	3073.16	Flow Area (sq ft)		368.50	
E.G. Slope (ft/ft)	0.036831	Area (sq ft)		368.50	
Q Total (cfs)	4956.00	Flow (cfs)		4956.00	
Top Width (ft)	216.29	Top Width (ft)		216.29	
Vel Total (ft/s)	13.45	Avg. Vel. (ft/s)		13.45	
Max Chl Dpth (ft)	4.31	Hydr. Depth (ft)		1.70	
Conv. Total (cfs)	25824.2	Conv. (cfs)		25824.2	
Length Wtd. (ft)	262.00	Wetted Per. (ft)		218.96	
Min Ch El (ft)	3068.00	Shear (lb/sq ft)		3.87	
Alpha	1.00	Stream Power (lb/ft s)	439.77	0.00	0.00
Frctn Loss (ft)	22.52	Cum Volume (acre-ft)		2.22	
C & E Loss (ft)	0.27	Cum SA (acres)		1.94	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	21.99	43.98	0.04	0.05	1.77	0.00	0.03	0.71	0.07	0.05
2	Chan	43.98	65.97	15.75	5.23	20.23	0.32	0.26	3.01	0.59	1.79
3	Chan	65.97	87.95							0.00	0.00
4	Chan	87.95	109.94							0.00	0.00
5	Chan	109.94	131.93							0.00	0.00
6	Chan	131.93	153.92							0.00	0.00
7	Chan	153.92	175.91	137.89	17.08	15.04	2.78	1.15	8.07	2.61	21.09
8	Chan	175.91	197.90	255.26	28.77	21.99	5.15	1.31	8.87	3.01	26.69
9	Chan	197.90	219.89	255.26	28.77	21.99	5.15	1.31	8.87	3.01	26.69
10	Chan	219.89	241.87	377.65	36.78	22.57	7.62	1.67	10.27	3.75	38.48
11	Chan	241.87	263.86	1853.14	94.64	22.06	37.39	4.30	19.58	9.87	193.19
12	Chan	263.86	285.85	1482.67	85.07	23.61	29.92	3.87	17.43	8.29	144.40
13	Chan	285.85	307.84	255.26	28.77	21.99	5.15	1.31	8.87	3.01	26.69
14	Chan	307.84	329.83	232.66	27.22	21.99	4.69	1.24	8.55	2.85	24.32
15	Chan	329.83	351.82	87.55	15.14	22.00	1.77	0.69	5.78	1.58	9.15
16	Chan	351.82	373.80	2.87	0.96	3.74	0.06	0.26	2.99	0.59	1.77

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 100

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3063	40.77	3062	71.11	3061	112.08	3060	184.48	3059
304.84	3058	473.56	3057	717.7	3057	721.61	3058	723.75	3059
726.8	3060	730.31	3061						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	730.31	.03

Bank Sta: Left Right Coeff Contr. Expan.
0 730.31 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3060.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.77	Wt. n-Val.		0.030	
W.S. Elev (ft)	3058.10	Reach Len. (ft)			
Crit W.S. (ft)	3058.86	Flow Area (sq ft)		371.01	
E.G. Slope (ft/ft)	0.088188	Area (sq ft)		371.01	
Q Total (cfs)	4956.00	Flow (cfs)		4956.00	
Top Width (ft)	428.52	Top Width (ft)		428.52	
Vel Total (ft/s)	13.36	Avg. Vel. (ft/s)		13.36	
Max Chl Dpth (ft)	1.10	Hydr. Depth (ft)		0.87	
Conv. Total (cfs)	16688.8	Conv. (cfs)		16688.8	
Length Wtd. (ft)		Wetted Per. (ft)		428.67	
Min Ch El (ft)	3057.00	Shear (lb/sq ft)		4.76	
Alpha	1.00	Stream Power (lb/ft s)	730.31	0.00	0.00
Frctn Loss (ft)	14.24	Cum Volume (acre-ft)			
C & E Loss (ft)	0.01	Cum SA (acres)			

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Profile #PF 1

	Pos	Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	Percent Conv	Hydr Depth(ft)	Velocity (ft/s)	Shear (lb/sq ft)	Power (lb/ft s)
1	Chan	292.12	328.64	15.54	4.52	35.35	0.31	0.13	3.44	0.70	2.42
2	Chan	328.64	365.16	84.10	12.61	36.52	1.70	0.35	6.67	1.90	12.68
3	Chan	365.16	401.67	189.28	20.51	36.52	3.82	0.56	9.23	3.09	28.54
4	Chan	401.67	438.19	325.86	28.41	36.52	6.58	0.78	11.47	4.28	49.13
5	Chan	438.19	474.70	490.43	36.31	36.52	9.90	0.99	13.51	5.47	73.94
6	Chan	474.70	511.22	576.75	40.02	36.52	11.64	1.10	14.41	6.03	86.96
7	Chan	511.22	547.73	576.75	40.02	36.52	11.64	1.10	14.41	6.03	86.96
8	Chan	547.73	584.25	576.75	40.02	36.52	11.64	1.10	14.41	6.03	86.96
9	Chan	584.25	620.76	576.75	40.02	36.52	11.64	1.10	14.41	6.03	86.96
10	Chan	620.76	657.28	576.75	40.02	36.52	11.64	1.10	14.41	6.03	86.96
11	Chan	657.28	693.79	576.75	40.02	36.52	11.64	1.10	14.41	6.03	86.96
12	Chan	693.79	730.31	390.32	28.54	28.17	7.88	1.02	13.68	5.58	76.29

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:River #1

Reach	River Sta.	n1	n2	n3
Reach #1	1200	.03	.03	.03
Reach #1	1100	.03	.03	.03
Reach #1	1000	.03	.03	.03
Reach #1	900	.03	.03	.03
Reach #1	800	.03	.03	.03
Reach #1	700	.03	.03	.03
Reach #1	600	.03	.03	.03
Reach #1	500	.03	.03	.03
Reach #1	400	.03	.03	.03
Reach #1	350	.03	.03	.03
Reach #1	300	.03	.03	.03
Reach #1	200	.03	.03	.03
Reach #1	100	.03	.03	.03

SUMMARY OF REACH LENGTHS

River: River #1

Reach	River Sta.	Left	Channel	Right
Reach #1	1200	241.36	204.9	234.97
Reach #1	1100	190.38	285.14	405.9
Reach #1	1000	208.44	326.91	214.82
Reach #1	900	148.02	244.37	242.24
Reach #1	800	326.86	358.35	361.96
Reach #1	700	426.05	502.88	540.06
Reach #1	600	472.7	338.14	340.16
Reach #1	500	299.7	343.12	345.13
Reach #1	400	134.85	180.11	179.45
Reach #1	350	416.03	344	346.84
Reach #1	300	400.32	402.05	400.72
Reach #1	200	394.44	262	263.09
Reach #1	100			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: River #1

Reach	River Sta.	Contr.	Expan.
Reach #1	1200	.1	.3
Reach #1	1100	.1	.3
Reach #1	1000	.1	.3
Reach #1	900	.1	.3
Reach #1	800	.1	.3
Reach #1	700	.1	.3
Reach #1	600	.1	.3
Reach #1	500	.1	.3
Reach #1	400	.1	.3
Reach #1	350	.1	.3
Reach #1	300	.1	.3
Reach #1	200	.1	.3
Reach #1	100	.1	.3

ERRORS WARNINGS AND NOTES
Errors Warnings and Notes for Plan : Current mode

River: River #1 Reach: Reach #1 RS: 1200 Profile: PF 1
Warning:Divided flow computed for this cross-section.
River: River #1 Reach: Reach #1 RS: 1100 Profile: PF 1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 1000 Profile: PF 1
Warning:The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 900 Profile: PF 1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 800 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 700 Profile: PF 1
Warning:Divided flow computed for this cross-section.
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 600 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 500 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 400 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
River: River #1 Reach: Reach #1 RS: 350 Profile: PF 1
Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: River #1 Reach: Reach #1 RS: 300 Profile: PF 1

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: River #1 Reach: Reach #1 RS: 200 Profile: PF 1

Warning:Divided flow computed for this cross-section.

Warning:The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

River: River #1 Reach: Reach #1 RS: 100 Profile: PF 1

Warning:The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning:The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

VILLAGE 26 CHANNEL HEC-RAS SECTION SUMMARY TABLE											
Sta	Q	FL Elevation	Depth	Vel	Top Width	Froude #	Radius	Freeboard	Super-elevation	Total Depth	
	(cfs)	(ft)	(ft)	(ft/s)	(ft)			(ft)	(ft)	(ft)	Notes
20+38.06	3311	3208.39	10.52	22.49	14.0	1.22	3000	2.2	0.0	12.8	
20+58.05	3311	3208.25	10.56	22.40	14.0	1.22	3000	2.2	0.0	12.8	Beginning of 20' Wide Rect. Channel
20+58.06	3311	3208.24	10.53	22.46	20.0	1.22	3000	2.2	0.1	12.8	
20+70.06	3311	3208.15	5.95	27.84	20.0	2.01	3000	2.3	0.1	8.3	End of Ineffective Flow
20+83.06	3311	3208.05	5.99	27.64	20.0	1.99	3000	2.3	0.1	8.3	Drop Channel Height to 9 feet
22+25.20	3311	3206.98	6.42	25.79	20.0	1.79	3000	2.2	0.1	8.7	Grade Break
23+61.30	3311	3201.65	5.44	30.41	20.0	2.30	3000	2.3	0.1	7.9	Drop Channel Height to 8 feet
25+69.80	3311	3193.50	4.81	34.42	20.0	2.77	3000	2.5	0.1	7.4	
26+22.97	3311	3191.41	4.29	35.41	21.8	3.01	3000	2.4	0.1	6.9	
26+33.22	3311	3191.03	4.74	34.96	20.0	2.83	0	2.5	0.0	7.2	
27+23.72	3311	3187.48	4.60	35.96	20.0	2.95	0	2.5	0.0	7.1	Drop Channel Height to 6.8 feet, GB
30+00.00	3311	3169.52	3.90	42.49	20.0	3.79	0	2.7	0.0	6.6	
32+00.00	3311	3156.52	3.71	44.63	20.0	4.08	0	2.7	0.0	6.4	
33+85.00	3371	3144.50	3.68	45.79	20.0	4.21	0	2.8	0.0	6.4	
34+00.00	3371	3143.52	3.67	45.88	20.0	4.22	0	2.8	0.0	6.4	
36+00.00	3371	3130.51	3.61	46.69	20.0	4.33	0	2.8	0.0	6.4	
38+00.00	3371	3117.51	3.57	47.16	20.0	4.4	0	2.8	0.0	6.4	
40+00.00	3371	3104.51	3.55	47.44	20.0	4.43	0	2.8	0.0	6.4	
42+00.00	3371	3091.51	3.54	47.6	20.0	4.46	0	2.8	0.0	6.4	
44+00.00	3371	3078.51	3.53	47.69	20.0	4.47	0	2.8	0.0	6.3	
44+49.18	3401	3075.31	3.57	47.7	20.0	4.45	0	2.8	0.0	6.4	
46+00.00	3401	3065.51	3.56	47.78	20.0	4.46	0	2.8	0.0	6.4	
47+80.33	3401	3053.79	3.55	47.85	20	4.47	0	2.8	0.00	6.4	Grade Break
48+25.86	3401	3048.2	3.44	49.43	20	4.7	0	2.9	0.00	6.3	Beginning of 20'x7' RCB

WESTERN BELTWAY CHANNEL HEC-RAS SECTION SUMMARY TABLE												
Sta	ULT Q	FL Elevation	Depth	Vel	Top Width	Froude #	Radius	Freeboard	Super-elevation	Total Depth	Interim Depth	
	(cfs)	(ft)	(ft)	(ft/s)	(ft)			(ft)	(ft)	(ft)	(ft)	Notes
03+84.04	1664	3221.97	3.04	12.06	30.98	1.39	0	1.4	0.0	4.5	4.27	
09+56.12	1664	3219.11	4.57	7.04	37.09	0.68	0	1.3	0.0	5.8	8.02	
10+06.12	1664	3218.36	3.91	11.27	20.00	1.00	0	1.4	0.0	5.4	6.72	
14+06.12	1664	3216.36	4.88	9.02	20.00	0.72	4279	1.8	0.0	6.6	7.99	Exit from RCB Structure
14+07.12	1664	3216.35	5.01	8.37	21.00	0.66	4279	1.6	0.0	6.6	8.15	
15+06.12	1664	3215.58	4.35	11.90	17.00	1.01	4279	1.5	0.0	5.8	7.11	Transition to 17' BW Channel
15+31.61	1692	3215.38	3.98	13.01	17.00	1.15	4279	1.5	0.0	5.5	6.73	Junction
21+27.53	1716	3210.70	3.13	16.53	17.00	1.65	2992	1.6	0.0	4.8	5.06	Transition to 15' BW, Grade Break
21+77.53	1716	3208.73	3.10	18.95	15.00	1.90	2993	1.7	0.0	4.8	5.26	End Transition
23+27.53	1716	3202.84	2.42	24.21	15.00	2.74	2993	1.8	0.0	4.3	4.16	
24+77.53	1716	3196.94	2.25	26.08	15.00	3.06	2993	1.9	0.1	4.2	3.78	
25+65.46	1716	3193.48	2.20	26.62	15.00	3.16	2993	1.9	0.1	4.1	3.66	Transition to 11' BW Channel
26+26.68	1716	3191.07	3.08	25.95	11.00	2.60	2993	1.9	0.0	5.1	5.18	End Transition
27+17.76	1716	3187.48	2.95	27.10	11.00	2.78	2993	2.0	0.0	5.0	4.96	Grade Break
28+00.00	1716	3182.1	2.68	29.88	11.00	3.22	2993	2.0	0.1	4.8	4.55	
29+00.00	1716	3175.56	2.51	31.93	11.00	3.55	2993	2.1	0.1	4.7	4.25	
30+00.00	1716	3169.03	2.42	33.11	11.00	3.75	2993	2.1	0.1	4.6	4.06	
31+50.00	1716	3159.22	2.35	34.09	11.00	3.92	2993	2.1	0.1	4.5	3.89	
36+00.00	1716	3129.96	2.29	34.88	11.00	4.06	0	2.1	0.0	4.4	3.69	
40+00.00	1716	3103.96	2.30	34.83	11.00	4.05	0	2.1	0.0	4.4	3.66	
44+00.00	1716	3077.96	2.30	34.84	11.00	4.05	0	2.1	0.0	4.4	3.66	
47+71.98	1769	3053.76	2.30	34.85	11.00	4.05	0	2.1	0.0	4.4	3.76	Grade Break
48+80.88	1769	3047.57	2.36	33.92	11.00	3.89	0	2.1	0.0	4.5	3.83	Beginning of Transition
49+31.11	1769	3044.82	1.63	33.95	18.05	4.99	0	2.0	0.0	3.6	2.46	
49+81.21	1769	3041.85	1.39	32.37	24.36	5.40	0	1.9	0.0	3.3	1.99	
50+31.21	1769	3038.31	1.44	31.00	24.56	5.08	0	1.9	0.0	3.3	2.05	End of Transition/Channel

Tatewar and Ingle Method																				
Location	Flow **Q** (cfs)	Flow **Q** (m^3/s)	Channel Width **w** (ft)	Channel Width **w** (m)	Unit Flow **q** ($m^3/s/m$)	Step Height **h** (ft)	Step Height **h** (m)	Step Length **b** (ft)	Step Length **b** (m)	Lamda **λ** (m)	**K** (m)	Slope **S**	Gravity **g** (m/s^2)	Section Factor **Z**	**Manning's "n"**	Equation 1	Equation 2	Equation 3	Final* (Adjust "n" until 0)	**Manning's "n" used**
Debris Basin	3309	93.7	140	42.7	2.2	2.5	0.76	3.33	1.01	1.27	0.61	0.600	9.81	0.41	**0.146**	1.844	-0.088	2.006	0.000	**0.060**
Detention Basin	3493	98.9	55	16.8	5.9	12.5	3.81	7.5	2.29	4.44	1.96	0.857	9.81	0.59	**0.093**	5.484	-2.469	3.265	0.000	**0.060**

* Based on the equation 0.25 + Equation 1 + Equation 2 - Equation 3 = 0

Equation 1 = 19.0 log(λ/b)

Equation 2 = 5.75 log($Z^{0.6}$/k) $Z=(qn/(S^{0.5}))$

Equation 3 = $Z^{0.1}/ng^{1/2}$

VILLAGE 26 DETENTION BASIN
USBR TYPE IV STILLING BASIN

Flow Characteristics				Chute Blocks				Sill	Basin		
US Depth (d_1,ft)	US Froude # (F_1,ft)	DS Depth[1] (d_2,ft)	T.W.[2] (ft)	Height[3] (ft)	Width[4] (ft)	Min. Length[5] (ft)	Spacing[6] (ft)	Height[7] (ft)	L_j/d_2[8] (ft/ft)	Length[9] (ft)	Width[10] (ft)
1.40	2.55	4.4	4.8	2.8	1.4	2.8	3.5	1.8	4.9	21	122.3

[1] From equation $d_2/d_1=0.5*((1+8F^2)^{0.5}-1)$

[2] Tailwater Depth, from equation $T.W./d_2=1.1$

[3] Chute Block Height, from Type IV Dimensions, $Height=2*d_1$

[4] Chute Block Width, from Type IV Dimensions, Width=d1

[5] Chute Min. Length, from Type IV Basins Dimensions,$Spacing=2*d_1$

[6] Chute Block Spacing, from Type IV Basins Dimensions,Spacing=2.5*ChuteWidth

[7] Sill Height, from Type IV Basin Dimensions, $Height=1.25*d_1$

[8] Basin length to downstream depth ratio, from Figure 9-39

[9] Basin length. From Type IV Dimensions, $Length=d_2*L_j/d_2$

[10] Basin width

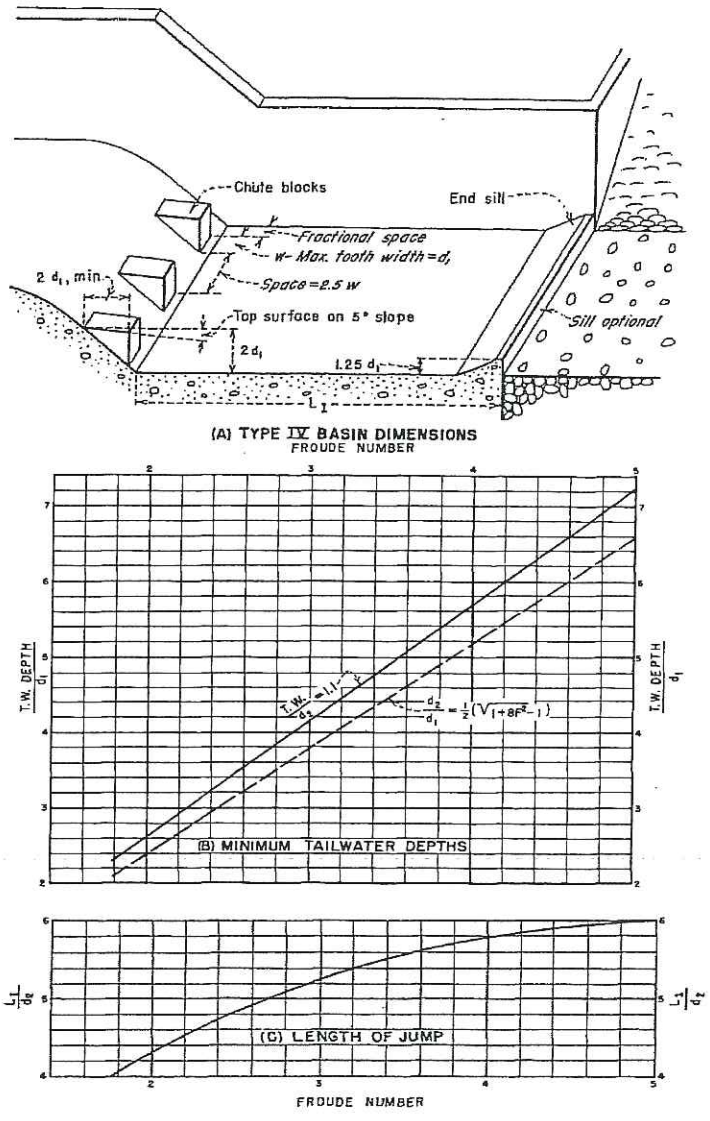


Figure 9-39.—Stilling basin characteristics for Froude numbers between 2.5 and 4.5. 288-D-2425.

Design information taken from Design of Small Dams by the US Bureau of Reclamation, pg. 390.

VILLAGE 26 DEBRIS BASIN
USBR TYPE IV STILLING BASIN

Flow Characteristics				Chute Blocks				Sill	Basin		
US Depth (d_1,ft)	US Froude # (F_1,ft)	DS Depth[1] (d_2,ft)	T.W.[2] (ft)	Height[3] (ft)	Width[4] (ft)	Min. Length[5] (ft)	Spacing[6] (ft)	Height[7] (ft)	L_j/d_2[8] (ft/ft)	Length[9] (ft)	Width[10] (ft)
0.75	3.64	3.5	3.9	1.50	0.75	1.5	1.9	0.94	5.6	20	260

[1] From equation $d_2/d_1=0.5*((1+8F^2)^{0.5}-1)$

[2] Tailwater Depth, from equation $T.W./d_2=1.1$

[3] Chute Block Height, from Type IV Dimensions, $Height=2*d_1$

[4] Chute Block Width, from Type IV Dimensions, Width=d1

[5] Chute Min. Length, from Type IV Basins Dimensions,$Spacing=2*d_1$

[6] Chute Block Spacing, from Type IV Basins Dimensions,Spacing=2.5*ChuteWidth

[7] Sill Height, from Type IV Basin Dimensions, $Height=1.25*d_1$

[8] Basin length to downstream depth ratio, from Figure 9-39

[9] Basin length. From Type IV Dimensions, $Length=d_2*L_j/d_2$

[10] Basin width

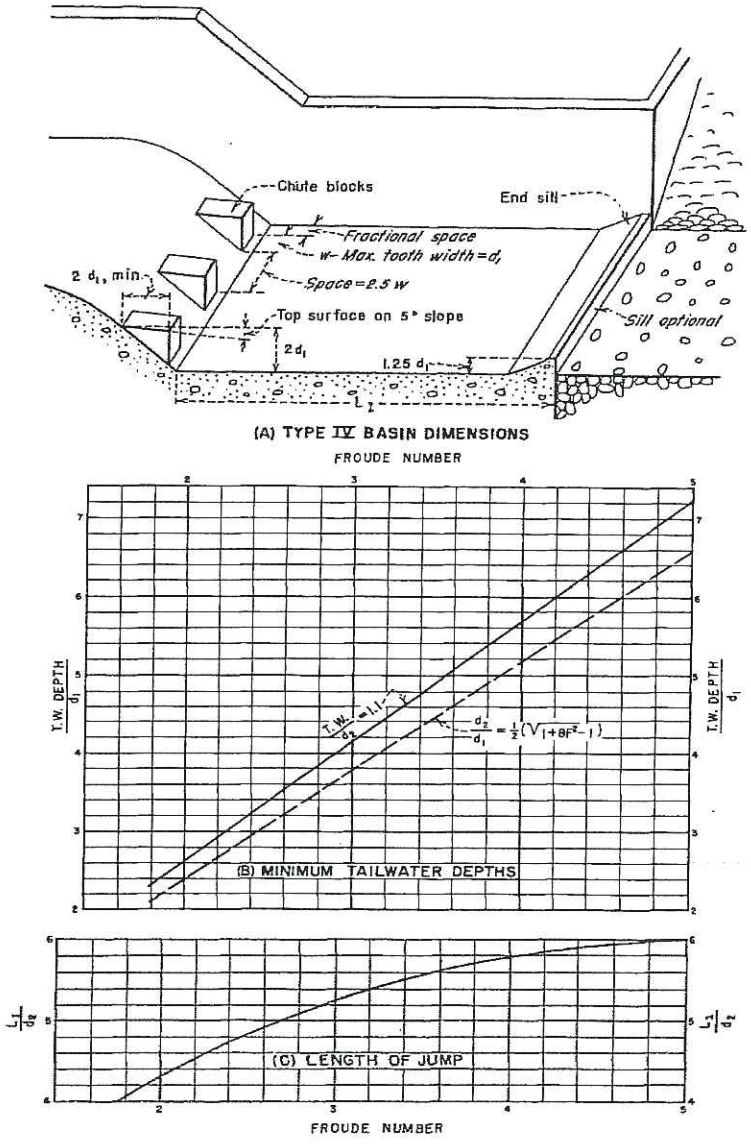


Figure 9-39.—Stilling basin characteristics for Froude numbers between 2.5 and 4.5. 288-D-2425.

Worksheet for Neenah R-4999-AX Grate Capacity

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.015	
Channel Slope	1.00	%
Normal Depth	0.67	ft
Bottom Width	0.50	ft

Results

Discharge	1.06	ft^3/s
Flow Area	0.33	ft^2
Wetted Perimeter	1.83	ft
Hydraulic Radius	0.18	ft
Top Width	0.50	ft
Critical Depth	0.52	ft
Critical Slope	0.01825	ft/ft
Velocity	3.18	ft/s
Velocity Head	0.16	ft
Specific Energy	0.82	ft
Froude Number	0.69	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.67	ft
Critical Depth	0.52	ft
Channel Slope	1.00	%
Critical Slope	0.01825	ft/ft

Cross Section for Neenah R-4999-AX Grate Capacity

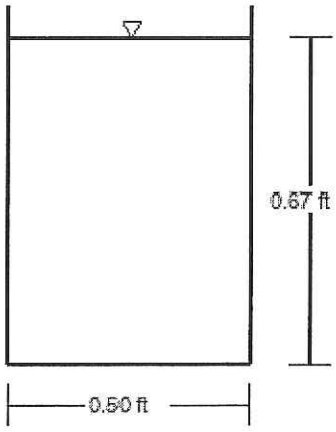
Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.015	
Channel Slope	1.00	%
Normal Depth	0.67	ft
Bottom Width	0.50	ft
Discharge	1.06	ft^3/s

Cross Section Image



V: 1
H: 1

Worksheet for 36" RCP Nuisance Storm Drain

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	16.31	%
Diameter	36.00	in
Discharge	1.00	ft³/s

Results

Normal Depth	0.13	ft
Flow Area	0.11	ft²
Wetted Perimeter	1.27	ft
Hydraulic Radius	0.09	ft
Top Width	1.24	ft
Critical Depth	0.31	ft
Percent Full	4.4	%
Critical Slope	0.00455	ft/ft
Velocity	9.03	ft/s
Velocity Head	1.27	ft
Specific Energy	1.40	ft
Froude Number	5.32	
Maximum Discharge	289.74	ft³/s
Discharge Full	269.35	ft³/s
Slope Full	0.00000	ft/ft
Flow Type	SuperCritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	4.44	%
Downstream Velocity	Infinity	ft/s

Worksheet for 36" RCP Nuisance Storm Drain

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.13	ft
Critical Depth	0.31	ft
Channel Slope	16.31	%
Critical Slope	0.00455	ft/ft

Cross Section for 36" RCP Nuisance Storm Drain

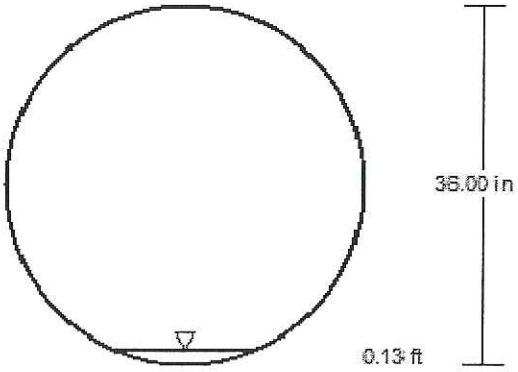
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.013	
Channel Slope	16.31	%
Normal Depth	0.13	ft
Diameter	36.00	in
Discharge	1.00	ft³/s

Cross Section Image



V: 1
H: 1

NORTH
SCALE 1" = 20'

| | | |

ELEVATION BEGIN	ELEVATION END	VOLUME (cy)
3022	3021	492043.74
3021	3020	468251.50
3020	3019	441020.06
3019	3018	415342.20
3018	3017	392220.77
3017	3016	368850.40
3016	3015	345616.70
3015	3014	323109.84
3014	3013	301111.40
3013	3012	279800.50
3012	3011	258577.29
3011	3010	238042.57
3010	3009	218042.57
3009	3008	200397.87
3008	3007	184224.92
3007	3006	168537.59
3006	3005	153330.88
3005	3004	138670.28
3004	3003	124582.94
3003	3002	111046.81
3002	3001	93043.92
3001	3000	85556.50
3000	2999	73586.93
2999	2998	62057.58
2998	2997	51010.85
2997	2996	40410.15
2996	2995	30245.06
2995	2994	20507.32
2994	2993	12102.08
2993	2992	5548.52
2992	2991	1291.66
2991	2990	106.19
2990	2990	0

DRAWING
EXH
1 OF 1 SHTS

PULTE HOMES

REVERENCE

DETENTION BASIN EXHIBIT

GCW
ENGINEERS & SURVEYORS

1555 S. RAINBOW BLVD.
LAS VEGAS, NV 89146
T: 702.804.2000
F: 702.804.2299
gcwengineering.com

F:\PROJECTS\700\764-204-013\DWG\PRODUCTION\OS DRAINAGE\EXHIBIT\DE
LUKY ROXANA LOPEZ

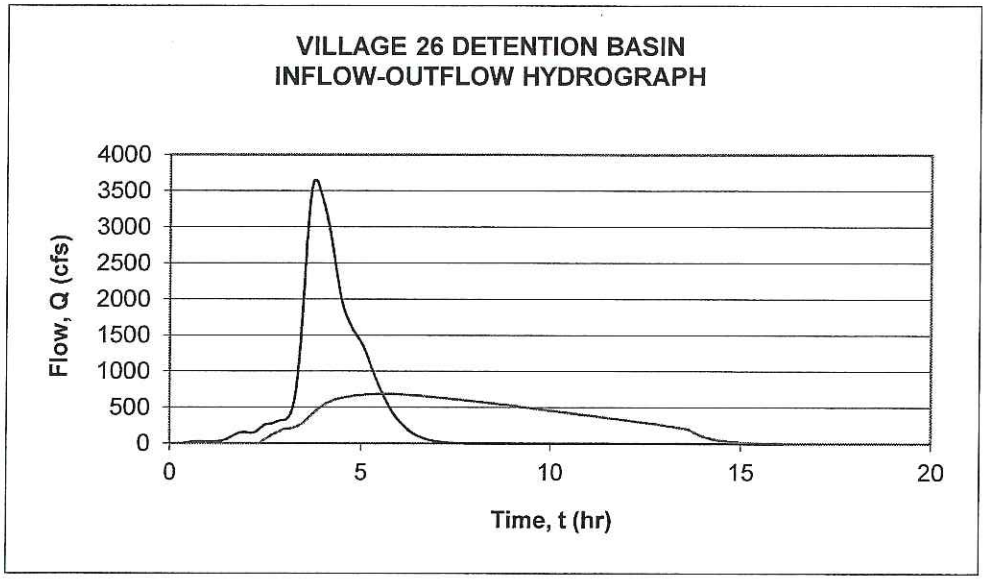
PROJECT NO.
764-204-013

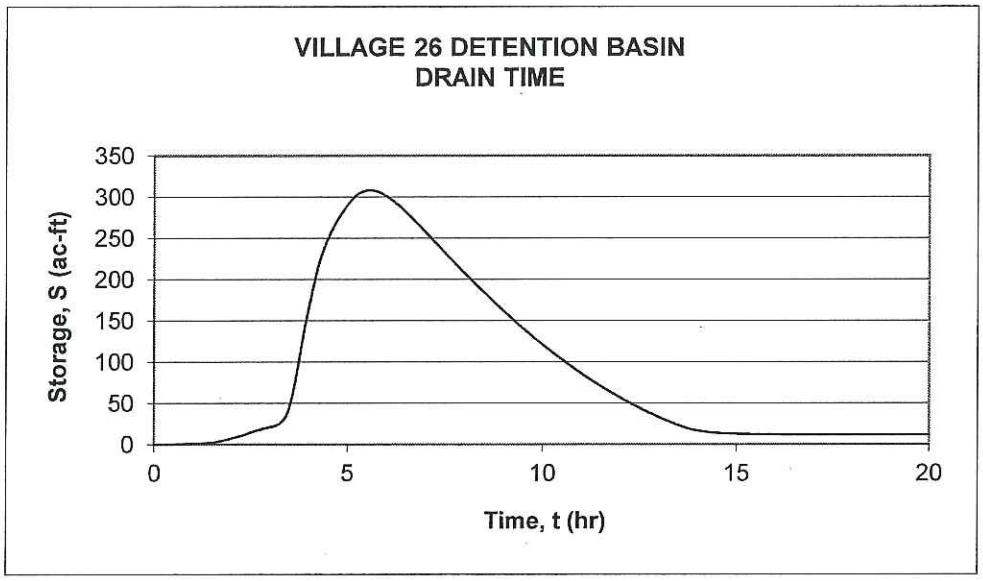
DESIGN:
DRAWN:
CHECK:
PLOT DATE: 12-17-15
BASIN EXH.DWG
PLOT TIME: 14:20:24

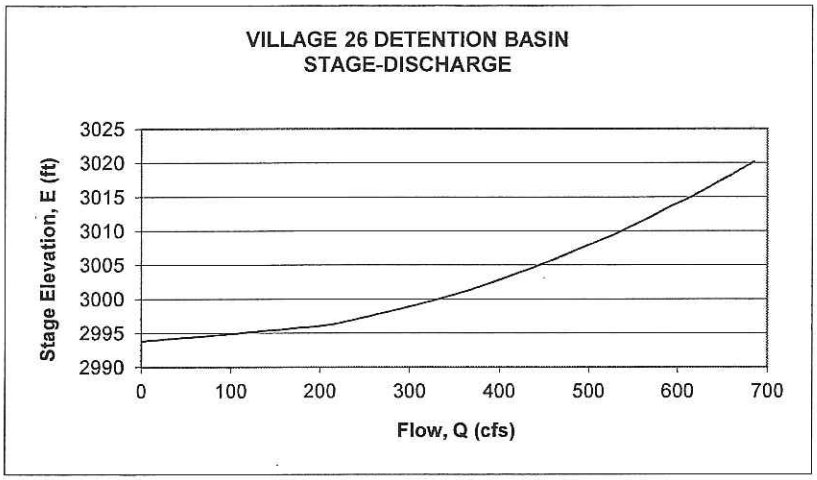
REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP

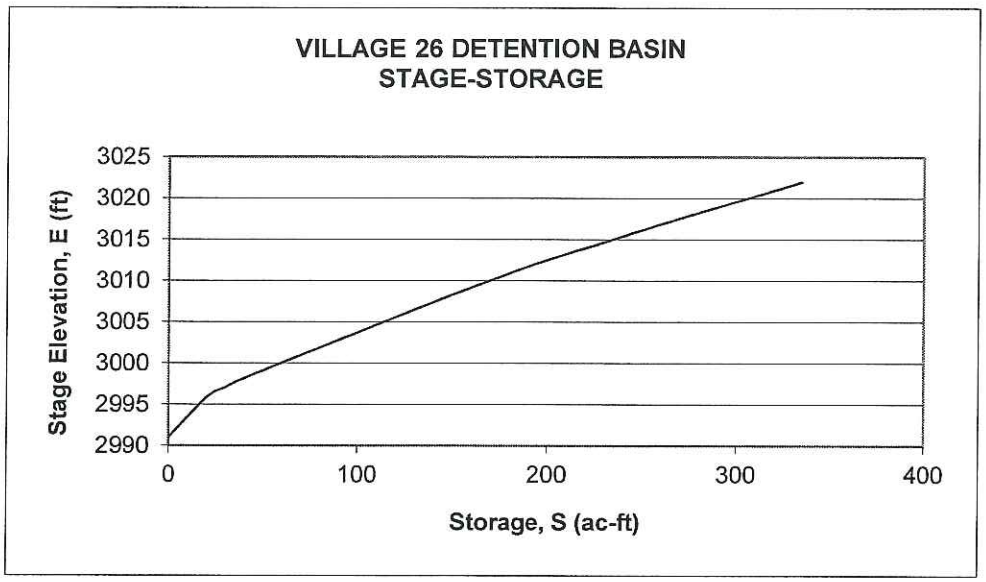
DATE:

Village 26 Detention Basin Summaries (Revised12/8/15)							
	Master Study Q_{100}	Offsites Study Q_{100}	Current MDS Revised Q_{100}	Combined Q_{100}	Current Offsites Revised Interim Q_{100}	Current Revised Q_{25}	Current Revised Q_{10}
Peak Storage Volume (acre-feet)	308	308	287	305	286	173	98
Peak Stage Elevation (feet)	3020.18	3020.18	3020.88	3021.99	3020.78	3012.92	3006.61
Peak Inflow (cfs)	3643	3643	3464	4977	3493	2302	1448
Peak Outflow (cfs)	685	685	653	1506	663	561	461
Drain Time (hours)	17.05	17.05	16.1	10.3	16.35	14.2	12.3
Tributary Area (square miles)	4.39	4.39	4.39	6.13	4.39	4.39	4.39
Spillway Elevation (feet)	3022	3022	3022	3022	3022	3022	3022
Storage at Spillway Elevation (acre-feet)	335.08	335.08	304.99	310	304.99	304.99	304.99
Spillway Length (feet)							
Emergency WSE (feet)							


VILLAGE 26 DETENTION BASIN
INFLOW-OUTFLOW HYDROGRAPH
Flow, Q (cfs)
4000
3500
3000
2500
2000
1500
1000
500
0
0
5
10
15
20
Time, t (hr)


VILLAGE 26 DETENTION BASIN
DRAIN TIME
Storage, S (ac-ft)
350
300
250
200
150
100
50
0
0
5
10
15
20
Time, t (hr)


VILLAGE 26 DETENTION BASIN
STAGE-DISCHARGE
Stage Elevation, E (ft)
3025
3020
3015
3010
3005
3000
2995
2990
0
100
200
300
400
500
600
700
Flow, Q (cfs)


VILLAGE 26 DETENTION BASIN
STAGE-STORAGE
Stage Elevation, E (ft)
3025
3020
3015
3010
3005
3000
2995
2990
0
100
200
300
400
Storage, S (ac-ft)

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design data 7

american concrete pipe association

CONCRETE PIPE SELECTION: Trench Installations

Trench conduits are usually installed in relatively narrow trenches excavated in undisturbed soil and backfilled to the original ground surface.

When a rigid conduit is installed in a narrow trench and backfilled, the backfill material will tend to settle. This downward movement generates frictional forces along the trench walls, which act upward to help support the weight of the backfill material. The magnitude of the frictional forces depends on the unit weight of the backfill material w, the value of Rankine's lateral pressure ratio K, and the coefficient of sliding friction μ' between the backfill material and the trench walls.

The backfill load on a conduit installed in a trench condition is equal to the weight of the mass of fill material within the trench less the summation of the frictional load transfers, and is expressed by the equation:

$$W_d = C_d \, w \, B_d^2$$

where

W_d=backfill load, pounds per linear foot
C_d=load coefficient for trench condition
w=unit weight of backfill material, pounds per cubic foot
B_d=width of trench at the top of the conduit, feet

Figures 2 through 5, based on the above equation, enable a direct determination of backfill load for a given trench width and depth of cover. As the trench width increases for a given depth of cover and pipe diameter, a point is reached at which an embankment condition develops. The curves showing pipe size indicate the limiting trench width for each pipe diameter beyond which greater trench widths will not affect the load. When this condition occurs, the load on the conduit remains constant. This load should be determined by the intersection of the vertical line representing the depth of cover and the dashed line representing the particular pipe diameter under consideration. For intermediate pipe sizes not shown in *Figures 2 through 5*, interpolation should be used.

The field supporting strength of a concrete pipe line is dependent on the inherent strength of the pipe, the type of foundation on which the pipe is installed and the compaction of the sidefill material adjacent to the pipe. A common method used to determine the inherent strength of a pipe is the three-edge bearing test, in which the pipe is subjected to concentrated loads at the crown and invert. The load that a pipe will support under this condition of loading is called the *three-edge bearing strength* and is expressed in pounds per linear foot.

ASTM Specification C14 covers three strength classes for non-reinforced concrete pipe — Class 1, 2 and 3. These three classes are specified to meet ultimate loads, expressed in terms of minimum strength in three-edge-bearing as listed in *Table I*.

TABLE I: Strength Requirements Non-reinforced Concrete Pipe ASTM C14

Pipe Diameter, Inches	Minimum Three-Edge Bearing Strengths, Pounds per Linear Foot		
	Class 1	Class 2	Class 3
4	1500	2000	2400
6	1500	2000	2400
8	1500	2000	2400
10	1600	2000	2400
12	1800	2250	2600
15	2000	2600	2900
18	2200	3000	3300
21	2400	3300	3850
24	2600	3600	4400
27	2800	3950	4600
30	3000	4300	4750
33	3150	4400	4875
36	3300	4500	5000

Another means of expressing pipe strength is in terms of D-load. The D-load of a pipe is the supporting strength of a pipe loaded under three-edge-bearing test conditions expressed in pounds per linear foot per foot of inside diameter. Thus the bearing strength may be converted to D-load by dividing by the inside diameter in feet.

ASTM Specification C76 specifies five strength classes reinforced concrete pipe. These strength classes are expressed in terms of D-load at 0.01-inch crack and for ultimate load. The D-load to produce the 0.01-inch crack $D_{0.01}$ is the maximum load applied to the concrete pipe before a crack occurs having a width of 0.01-inch measured at close intervals, throughout a length of at least 1-foot. The D-load to produce ultimate load D_u is the maximum three-edge-bearing test load carried by a pipe, expressed as D-load. *Table II* lists 0.01-inch crack and ultimate D-loads for the strength classes covered by ASTM Specification C76.

TABLE II: Strength Requirements Reinforced Concrete Pipe ASTM C76

Strength Class	Minimum D-Load in Three-Edge Bearing Pounds per Linear Foot per Foot of Internal Diameter	
	0.01 Inch Crack-$D_{0.01}$	Ultimate-D_u
I	800	1200
II	1000	1500
→ III	1350	2000
IV	2000	3000
V	3000	3750

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 18 IN. DIAMETER CIRCULAR PIPE

****

P I P E D A T A

DIAMETER (in.)	18.00
WALL B, THICKNESS (in.)	2.500

I N S T A L L A T I O N C O N D I T I O N S

MINIMUM DEPTH OF FILL (ft.)	1.00
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	5.90
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

A D D I T I O N A L L O A D S

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

F A C T O R S O F S A F E T Y

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

R E S U L T S O F A N A L Y S I S

```
SSSSSSSSS   AAAAAAAAA   MMM   MMM   MMM   MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
```

P R O G R A M S A M M

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	REQUIRED D-LOAD ULT. (lb/ft/ft)
1.0	1.11	Y	297.	2603.	0.	2900.	1.90	1018.	1527.
1.5	1.17	Y	470.	1971.	0.	2440.	1.90	856.	1284.
2.0	1.23	Y	660.	1455.	0.	2115.	1.90	742.	1113.
2.5	1.30	Y	871.	1032.	0.	1903.	1.90	668.	1002.
3.0	1.37	Y	1104.	751.	0.	1855.	1.90	651.	976.
3.5	1.45	Y	1362.	616.	0.	1978.	1.90	694.	1041.
4.0	1.47	Y	1573.	516.	0.	2089.	1.90	733.	1100.
4.5	1.47	Y	1776.	439.	0.	2215.	1.90	777.	1166.
5.0	1.48	Y	1979.	378.	0.	2357.	1.90	827.	1241.
5.5	1.48	Y	2185.	329.	0.	2514.	1.90	882.	1323.
6.0	1.48	Y	2387.	290.	0.	2677.	1.90	939.	1409.
6.5	1.48	Y	2590.	257.	0.	2847.	1.90	999.	1498.
7.0	1.49	Y	2792.	229.	0.	3022.	1.90	1060.	1590.
7.5	1.49	Y	2995.	206.	0.	3201.	1.90	1123.	1685.
8.0	1.49	Y	3197.	186.	0.	3384.	1.90	1187.	1781.
8.5	1.49	Y	3400.	169.	0.	3569.	1.90	1252.	1879.
9.0	1.49	Y	3602.	155.	0.	3757.	1.90	1318.	1977.
9.5	1.49	Y	3805.	142.	0.	3947.	1.90	1385.	2077.
10.0	1.49	Y	4008.	130.	0.	4138.	1.90	1452.	2178.
10.5	1.49	Y	4210.	120.	0.	4330.	1.90	1519.	2279.
11.0	1.50	Y	4413.	111.	0.	4524.	1.90	1587.	2381.
11.5	1.50	Y	4616.	103.	0.	4719.	1.90	1656.	2484.
12.0	1.50	Y	4818.	96.	0.	4915.	1.90	1724.	2587.
12.5	1.49	Y	5014.	90.	0.	5103.	1.90	1791.	2686.
13.0	1.50	Y	5216.	84.	0.	5300.	1.90	1860.	2789.
13.5	1.50	Y	5418.	79.	0.	5497.	1.90	1929.	2893.

14.0	1.50	Y	5620.	74.	0.	5694.	1.90	1998.	2997.
14.5	1.50	Y	5823.	70.	0.	5892.	1.90	2067.	3066.
15.0	1.50	Y	6025.	66.	0.	6091.	1.90	2137.	3132.
15.5	1.50	Y	6227.	62.	0.	6289.	1.90	2207.	3196.
16.0	1.50	Y	6429.	59.	0.	6488.	1.90	2277.	3257.
16.5	1.50	Y	6632.	56.	0.	6687.	1.90	2346.	3316.
17.0	1.50	Y	6834.	53.	0.	6887.	1.90	2416.	3373.
17.5	1.50	Y	7036.	50.	0.	7087.	1.90	2487.	3427.
18.0	1.50	Y	7239.	48.	0.	7287.	1.90	2557.	3479.
18.5	1.50	Y	7441.	46.	0.	7487.	1.90	2627.	3529.
19.0	1.50	Y	7644.	43.	0.	7687.	1.90	2697.	3576.
19.5	1.50	Y	7846.	41.	0.	7887.	1.90	2768.	3620.
20.0	1.50	Y	8048.	40.	0.	8088.	1.90	2838.	3662.

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 24 IN. DIAMETER CIRCULAR PIPE

****

P I P E D A T A

DIAMETER (in.)	24.00
WALL B, THICKNESS (in.)	3.000

I N S T A L L A T I O N C O N D I T I O N S

MINIMUM DEPTH OF FILL (ft.)	1.00
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	6.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.0165
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

A D D I T I O N A L L O A D S

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

F A C T O R S O F S A F E T Y

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

E S U L T S O F A N A L Y S I S

```
SSSSSSSSS   AAAAAAAAA   MMM   MMM   MMM   MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
```

P R O G R A M S A M M

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
1.0	1.08	Y	378.	3008.	0.	3386.	1.90	891.	1337.
1.5	1.12	Y	591.	2400.	0.	2991.	1.90	787.	1181.
2.0	1.17	Y	820.	1781.	0.	2600.	1.90	684.	1026.
2.5	1.22	Y	1067.	1269.	0.	2336.	1.90	615.	922.
3.0	1.27	Y	1334.	927.	0.	2261.	1.90	595.	893.
3.5	1.33	Y	1623.	763.	0.	2386.	1.90	628.	942.
4.0	1.38	Y	1935.	641.	0.	2575.	1.90	678.	1017.
4.5	1.44	Y	2272.	546.	0.	2818.	1.90	742.	1112.
5.0	1.46	Y	2562.	472.	0.	3034.	1.90	798.	1197.
5.5	1.47	Y	2827.	412.	0.	3239.	1.90	852.	1278.
6.0	1.47	Y	3091.	363.	0.	3454.	1.90	909.	1363.
6.5	1.47	Y	3356.	322.	0.	3678.	1.90	968.	1452.
7.0	1.48	Y	3625.	288.	0.	3913.	1.90	1030.	1545.
7.5	1.48	Y	3889.	260.	0.	4149.	1.90	1092.	1638.
8.0	1.48	Y	4153.	235.	0.	4388.	1.90	1155.	1732.
8.5	1.48	Y	4417.	214.	0.	4631.	1.90	1219.	1828.
9.0	1.49	Y	4682.	195.	0.	4877.	1.90	1283.	1925.
9.5	1.49	Y	4946.	179.	0.	5125.	1.90	1349.	2023.
10.0	1.49	Y	5210.	165.	0.	5375.	1.90	1414.	2122.
10.5	1.49	Y	5474.	152.	0.	5627.	1.90	1481.	2221.
11.0	1.49	Y	5738.	141.	0.	5880.	1.90	1547.	2321.
11.5	1.49	Y	6003.	131.	0.	6134.	1.90	1614.	2421.
12.0	1.49	Y	6267.	122.	0.	6389.	1.90	1681.	2522.
12.5	1.49	Y	6531.	114.	0.	6645.	1.90	1749.	2623.
13.0	1.49	Y	6795.	107.	0.	6902.	1.90	1816.	2725.
13.5	1.49	Y	7060.	100.	0.	7160.	1.90	1884.	2826.

14.0	1.49	Y	7324.	94.	0.	7418.	1.90	1952.	2928.
14.5	1.50	Y	7588.	89.	0.	7677.	1.90	2020.	3020.
15.0	1.50	Y	7853.	84.	0.	7937.	1.90	2089.	3087.
15.5	1.50	Y	8117.	79.	0.	8196.	1.90	2157.	3151.
16.0	1.49	Y	8369.	75.	0.	8444.	1.90	2222.	3210.
16.5	1.49	Y	8633.	71.	0.	8704.	1.90	2291.	3269.
17.0	1.50	Y	8897.	68.	0.	8964.	1.90	2359.	3327.
17.5	1.50	Y	9160.	64.	0.	9225.	1.90	2428.	3382.
18.0	1.50	Y	9424.	61.	0.	9485.	1.90	2496.	3435.
18.5	1.50	Y	9688.	58.	0.	9746.	1.90	2565.	3485.
19.0	1.50	Y	9952.	56.	0.	10008.	1.90	2634.	3533.
19.5	1.50	Y	10216.	53.	0.	10269.	1.90	2702.	3579.
20.0	1.50	Y	10480.	51.	0.	10530.	1.90	2771.	3622.

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 30 IN. DIAMETER CIRCULAR PIPE

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'IPE DATA

DIAMETER (in.)	30.00
WALL B, THICKNESS (in.)	3.500

:NSTALLAT ION CONDITIONS

MINIMUM DEPTH OF FILL (ft.)	1.00
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	7.10
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

ADDITIONAL LOADS

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

FACTORS OF SAFETY

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

RESULTS OF ANALYSIS

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SSSSSSSSS   AAAAAAAAA   MMM    MMM   MMM    MMM
SS          AA     AA   MM M  M MM   MM M  M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
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P R O G R A M S A M M

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
1.0	1.07	Y	460.	2830.	0.	3290.	1.90	693.	1039.
1.5	1.10	Y	712.	2777.	0.	3489.	1.90	734.	1102.
2.0	1.14	Y	981.	2069.	0.	3050.	1.90	642.	963.
2.5	1.17	Y	1266.	1480.	0.	2746.	1.90	578.	867.
3.0	1.21	Y	1571.	1084.	0.	2655.	1.90	559.	838.
3.5	1.25	Y	1895.	896.	0.	2790.	1.90	587.	881.
4.0	1.30	Y	2239.	754.	0.	2993.	1.90	630.	945.
4.5	1.34	Y	2606.	644.	0.	3250.	1.90	684.	1026.
5.0	1.39	Y	2997.	558.	0.	3554.	1.90	748.	1122.
5.5	1.44	Y	3412.	488.	0.	3900.	1.90	821.	1232.
6.0	1.46	Y	3783.	431.	0.	4214.	1.90	887.	1331.
6.5	1.47	Y	4115.	383.	0.	4498.	1.90	947.	1420.
7.0	1.47	Y	4441.	343.	0.	4784.	1.90	1007.	1511.
7.5	1.47	Y	4767.	310.	0.	5077.	1.90	1069.	1603.
8.0	1.47	Y	5093.	281.	0.	5374.	1.90	1131.	1697.
8.5	1.48	Y	5427.	255.	0.	5682.	1.90	1196.	1794.
9.0	1.48	Y	5753.	234.	0.	5986.	1.90	1260.	1890.
9.5	1.48	Y	6079.	215.	0.	6293.	1.90	1325.	1987.
10.0	1.48	Y	6404.	198.	0.	6602.	1.90	1390.	2085.
10.5	1.48	Y	6730.	183.	0.	6913.	1.90	1455.	2183.
11.0	1.49	Y	7056.	170.	0.	7226.	1.90	1521.	2282.
11.5	1.49	Y	7382.	158.	0.	7540.	1.90	1587.	2381.
12.0	1.49	Y	7708.	147.	0.	7855.	1.90	1654.	2480.
12.5	1.49	Y	8034.	138.	0.	8171.	1.90	1720.	2580.
13.0	1.49	Y	8359.	129.	0.	8488.	1.90	1787.	2681.
13.5	1.49	Y	8685.	121.	0.	8806.	1.90	1854.	2781.

14.0	1.49	Y	9011.	114.	0.	9125.	1.90	1921.	2882.
14.5	1.49	Y	9337.	107.	0.	9444.	1.90	1988.	2982.
15.0	1.49	Y	9663.	101.	0.	9764.	1.90	2056.	3055.
15.5	1.49	Y	9989.	96.	0.	10085.	1.90	2123.	3119.
16.0	1.49	Y	10315.	91.	0.	10405.	1.90	2191.	3182.
16.5	1.49	Y	10641.	86.	0.	10727.	1.90	2258.	3242.
17.0	1.49	Y	10967.	82.	0.	11048.	1.90	2326.	3299.
17.5	1.49	Y	11293.	78.	0.	11370.	1.90	2394.	3355.
18.0	1.50	Y	11619.	74.	0.	11693.	1.90	2462.	3408.
18.5	1.50	Y	11945.	71.	0.	12015.	1.90	2530.	3459.
19.0	1.50	Y	12271.	67.	0.	12338.	1.90	2598.	3508.
19.5	1.50	Y	12597.	64.	0.	12661.	1.90	2666.	3555.
20.0	1.49	Y	12904.	62.	0.	12965.	1.90	2730.	3596.

PROGRAM SAMM-

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 36 IN. DIAMETER CIRCULAR PIPE

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PIPE DATA

DIAMETER (in.)	36.00
WALL B, THICKNESS (in.)	4.000

INSTALLATION CONDITIONS

MINIMUM DEPTH OF FILL (ft.)	1.00
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	7.67
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1650
SOIL LATERAL PRESSURE COEFICIENT	0.33

ADDITIONAL LOADS

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

FACTORS OF SAFETY

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

R E S U L T S O F A N A L Y S I S

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SSSSSSSSS   AAAAAAAAA   MMM   MMM   MMM   MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
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P R O G R A M S A M M

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

Program SAMM computes earth loads on concrete pipe in accordance with the methods presented in the Concrete Pipe Design Manual (March 1990) and the Concrete Pipe Handbook (January 1988), published by the American Concrete Pipe Association. The user must select input values suitable to his specific installation. The information presented in the computer output is for review, interpetation, application and approval by a qualified engineer who must assume full responsibility for verifying that said output is appropriate and correct. There are no express or implied warranties. The use of this product does not constitute endorsement by ACPA or any other agents.

PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
1.0	1.05	Y	537.	2814.	0.	3351.	1.90	588.	882.
2.0	1.10	Y	1125.	2326.	0.	3450.	1.90	605.	908.
3.0	1.15	Y	1768.	1227.	0.	2995.	1.90	525.	788.
4.0	1.20	Y	2472.	857.	0.	3329.	1.90	584.	876.
5.0	1.26	Y	3241.	637.	0.	3878.	1.90	680.	1021.
6.0	1.33	Y	4084.	494.	0.	4577.	1.90	803.	1205.
7.0	1.39	Y	5006.	395.	0.	5400.	1.90	947.	1421.
8.0	1.43	Y	5871.	323.	0.	6194.	1.90	1087.	1630.
9.0	1.43	Y	6630.	270.	0.	6899.	1.90	1210.	1816.
10.0	1.44	Y	7387.	229.	0.	7616.	1.90	1336.	2004.
11.0	1.44	Y	8154.	197.	0.	8351.	1.90	1465.	2198.
12.0	1.45	Y	8911.	171.	0.	9082.	1.90	1593.	2390.
13.0	1.45	Y	9668.	150.	0.	9817.	1.90	1722.	2584.
14.0	1.45	Y	10424.	132.	0.	10557.	1.90	1852.	2778.
15.0	1.45	Y	11181.	118.	0.	11298.	1.90	1982.	2973.
16.0	1.45	Y	11937.	106.	0.	12043.	1.90	2113.	3110.
17.0	1.45	Y	12693.	95.	0.	12789.	1.90	2244.	3229.
18.0	1.46	N	13446.	86.	0.	13533.	1.90	2374.	3339.
19.0	1.43	N	13930.	79.	0.	14009.	1.90	2458.	3405.
20.0	1.40	N	14394.	72.	0.	14466.	1.90	2538.	3466.

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 42 IN. DIAMETER CIRCULAR PIPE

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? I P E D A T A

DIAMETER (in.)	42.00
WALL B, THICKNESS (in.)	4.500

I N S T A L L A T I O N C O N D I T I O N S

MINIMUM DEPTH OF FILL (ft.)	0.50
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	8.83
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

A D D I T I O N A L L O A D S

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

F A C T O R S O F S A F E T Y

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

R E S U L T S O F A N A L Y S I S

PIPE DEPTH (ft.)	ARCHING FACTOR	>TRANS	EARTH LOAD LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	ULT. (lb/ft/ft)
0.5	1.02	Y	304.	2856.	0.	3160.	1.90	475.	713.
1.0	1.05	Y	623.	2550.	0.	3172.	1.90	477.	716.
1.5	1.07	Y	956.	2768.	0.	3724.	1.90	560.	840.
2.0	1.10	Y	1305.	2556.	0.	3860.	1.90	580.	871.
2.5	1.12	Y	1669.	1840.	0.	3509.	1.90	528.	792.
3.0	1.15	Y	2051.	1356.	0.	3407.	1.90	512.	768.
3.5	1.18	Y	2450.	1126.	0.	3576.	1.90	538.	807.
4.0	1.21	Y	2868.	952.	0.	3820.	1.90	574.	862.
4.5	1.23	Y	3305.	817.	0.	4122.	1.90	620.	930.
5.0	1.26	Y	3763.	710.	0.	4473.	1.90	673.	1009.
5.5	1.30	Y	4241.	623.	0.	4864.	1.90	731.	1097.
6.0	1.33	Y	4742.	552.	0.	5294.	1.90	796.	1194.
6.5	1.36	Y	5266.	493.	0.	5758.	1.90	866.	1299.
7.0	1.40	Y	5814.	442.	0.	6257.	1.90	941.	1411.
7.5	1.43	Y	6388.	400.	0.	6788.	1.90	1021.	1531.
8.0	1.46	Y	6946.	363.	0.	7309.	1.90	1099.	1649.
8.5	1.46	Y	7404.	331.	0.	7735.	1.90	1163.	1745.
9.0	1.47	Y	7854.	304.	0.	8158.	1.90	1227.	1840.
9.5	1.47	Y	8304.	280.	0.	8583.	1.90	1291.	1936.
10.0	1.47	Y	8754.	258.	0.	9012.	1.90	1355.	2033.
10.5	1.47	Y	9203.	239.	0.	9442.	1.90	1420.	2130.
11.0	1.47	Y	9653.	222.	0.	9875.	1.90	1485.	2227.
11.5	1.48	Y	10116.	207.	0.	10323.	1.90	1552.	2328.
12.0	1.48	Y	10565.	193.	0.	10758.	1.90	1618.	2427.
12.5	1.48	Y	11015.	181.	0.	11195.	1.90	1684.	2525.
13.0	1.48	Y	11464.	170.	0.	11633.	1.90	1749.	2624.
13.5	1.48	Y	11913.	159.	0.	12072.	1.90	1815.	2723.
14.0	1.48	Y	12362.	150.	0.	12512.	1.90	1882.	2822.
14.5	1.48	Y	12811.	142.	0.	12953.	1.90	1948.	2922.
15.0	1.49	Y	13260.	134.	0.	13394.	1.90	2014.	3014.
15.5	1.49	Y	13710.	127.	0.	13836.	1.90	2081.	3079.
16.0	1.49	Y	14159.	120.	0.	14279.	1.90	2147.	3142.
16.5	1.49	Y	14608.	114.	0.	14722.	1.90	2214.	3202.
17.0	1.49	Y	15057.	108.	0.	15165.	1.90	2281.	3261.
17.5	1.49	Y	15506.	103.	0.	15609.	1.90	2347.	3317.
18.0	1.49	Y	15955.	98.	0.	16054.	1.90	2414.	3371.
18.5	1.49	Y	16404.	94.	0.	16498.	1.90	2481.	3423.
19.0	1.49	N	16817.	90.	0.	16906.	1.90	2542.	3469.
19.5	1.48	N	17118.	86.	0.	17203.	1.90	2587.	3501.
20.0	1.46	N	17413.	82.	0.	17495.	1.90	2631.	3531.

PROGRAM SAMM
D-LOAD REQUIREMENTS FOR A 48 IN. DIAMETER CIRCULAR PIPE

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P I P E D A T A

DIAMETER (in.)	48.00
WALL B, THICKNESS (in.)	5.000

I N S T A L L A T I O N C O N D I T I O N S

MINIMUM DEPTH OF FILL (ft.)	0.50
MAXIMUM DEPTH OF FILL (ft.)	20.00
SOIL DENSITY (lb/cu. ft.)	140.0
SPECIFIED BEDDING FACTOR	1.90
INSTALLATION TYPE	TRENCH
TRENCH WIDTH (ft.)	8.83
SOIL LATERAL PRESSURE/FRICTION TERM (KMU')	0.1650
PARAMETERS TO COMPUTE TRANSITION WIDTH	
POSITIVE PROJECTION RATIO	1.00
POSITIVE SETTLEMENT RATIO	0.50
SOIL LATERAL PRESSURE/FRICTION TERM (KMU)	0.1924
SOIL LATERAL PRESSURE COEFICIENT	0.33

A D D I T I O N A L L O A D S

LIVE LOAD	AASHTO HS-20
NO SURCHARGE LOAD	

F A C T O R S O F S A F E T Y

FACTOR OF SAFETY ON 0.01 INCH CRACK D-LOAD (EARTH,LIVE)	1.00; 1.00
FACTOR OF SAFETY ON ULTIMATE LOAD (EARTH,LIVE) IN ACCORDANCE WITH ASTM C 76	
DL.01 LESS THAN 2000 LBS/FT/FT	1.5
DL.01 GREATER THAN 3000 LBS/FT/FT	1.25
DL.01 BETWEEN 2000 AND 3000 LBS/FT/FT	INTERPOLATED

: E S U L T S O F A N A L Y S I S

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SSSSSSSSS   AAAAAAAAA   MMM   MMM   MMM   MMM
SS          AA     AA   MM M M MM   MM M M MM
SSSSSSSSS   AAAAAAAAA   MM  M  MM   MM  M  MM
      SS    AA     AA   MM     MM   MM     MM
SSSSSSSSS   AA     AA   MM     MM   MM     MM
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P R O G R A M S A M M

AMERICAN CONCRETE PIPE ASSOCIATION
VERSION 2.0 - 1 SEPTEMBER 1990

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PIPE DEPTH (ft.)	EARTH LOAD ARCHING FACTOR	>TRANS	EARTH LOAD (lb/ft)	LIVE LOAD (lb/ft)	SURCH LOAD (lb/ft)	TOTAL LOAD (lb/ft)	BED FACT	REQUIRED D-LOAD 0.01 in. (lb/ft/ft)	REQUIRED D-LOAD ULT. (lb/ft/ft)
0.5	1.02	Y	345.	2584.	0.	2929.	1.90	385.	578.
1.0	1.04	Y	704.	2331.	0.	3035.	1.90	399.	599.
1.5	1.06	Y	1078.	2623.	0.	3701.	1.90	487.	731.
2.0	1.08	Y	1467.	2475.	0.	3942.	1.90	519.	778.
2.5	1.11	Y	1872.	1994.	0.	3866.	1.90	509.	763.
3.0	1.13	Y	2293.	1474.	0.	3766.	1.90	496.	743.
3.5	1.15	Y	2731.	1226.	0.	3957.	1.90	521.	781.
4.0	1.18	Y	3187.	1039.	0.	4226.	1.90	556.	834.
4.5	1.20	Y	3662.	893.	0.	4555.	1.90	599.	899.
5.0	1.23	Y	4156.	778.	0.	4933.	1.90	649.	974.
5.5	1.25	Y	4670.	684.	0.	5353.	1.90	704.	1057.
6.0	1.28	Y	5204.	606.	0.	5811.	1.90	765.	1147.
6.5	1.31	Y	5761.	542.	0.	6303.	1.90	829.	1244.
7.0	1.34	Y	6340.	487.	0.	6827.	1.90	898.	1348.
7.5	1.37	Y	6943.	441.	0.	7384.	1.90	972.	1457.
8.0	1.40	Y	7570.	401.	0.	7971.	1.90	1049.	1573.
8.5	1.43	Y	8222.	366.	0.	8589.	1.90	1130.	1695.
9.0	1.46	Y	8884.	336.	0.	9220.	1.90	1213.	1820.
9.5	1.46	Y	9394.	309.	0.	9703.	1.90	1277.	1915.
10.0	1.47	Y	9917.	286.	0.	10203.	1.90	1343.	2014.
10.5	1.47	Y	10429.	265.	0.	10694.	1.90	1407.	2111.
11.0	1.47	Y	10940.	246.	0.	11187.	1.90	1472.	2208.
11.5	1.47	Y	11452.	230.	0.	11681.	1.90	1537.	2306.
12.0	1.47	N	11954.	215.	0.	12169.	1.90	1601.	2402.
12.5	1.46	N	12345.	201.	0.	12546.	1.90	1651.	2476.
13.0	1.45	N	12729.	189.	0.	12918.	1.90	1700.	2550.

13.5	1.43	N	13106.	177.	0.	13283.	1.90	1748.	2622.
14.0	1.42	N	13475.	167.	0.	13643.	1.90	1795.	2693.
14.5	1.41	N	13838.	158.	0.	13996.	1.90	1842.	2762.
15.0	1.40	N	14195.	149.	0.	14344.	1.90	1887.	2831.
15.5	1.39	N	14544.	141.	0.	14685.	1.90	1932.	2898.
16.0	1.38	N	14887.	134.	0.	15021.	1.90	1976.	2965.
16.5	1.36	N	15224.	127.	0.	15351.	1.90	2020.	3020.
17.0	1.35	N	15555.	121.	0.	15676.	1.90	2063.	3062.
17.5	1.34	N	15879.	115.	0.	15994.	1.90	2105.	3102.
18.0	1.33	N	16197.	110.	0.	16307.	1.90	2146.	3140.
18.5	1.32	N	16510.	105.	0.	16615.	1.90	2186.	3177.
19.0	1.31	N	16817.	100.	0.	16917.	1.90	2226.	3213.
19.5	1.30	N	17118.	96.	0.	17213.	1.90	2265.	3247.
20.0	1.29	N	17413.	92.	0.	17505.	1.90	2303.	3280.

APPENDIX C

Referenced Material and Supporting Documents

MASTER DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 26 – REVERENCE

764-204-011

September 2015

Prepared for:

Pulte Homes
8345 West Sunset Road
Las Vegas, Nevada 89113
Phone: (702) 437-7999
Fax: (702) 256-7900

GCW
ENGINEERS \ SURVEYORS

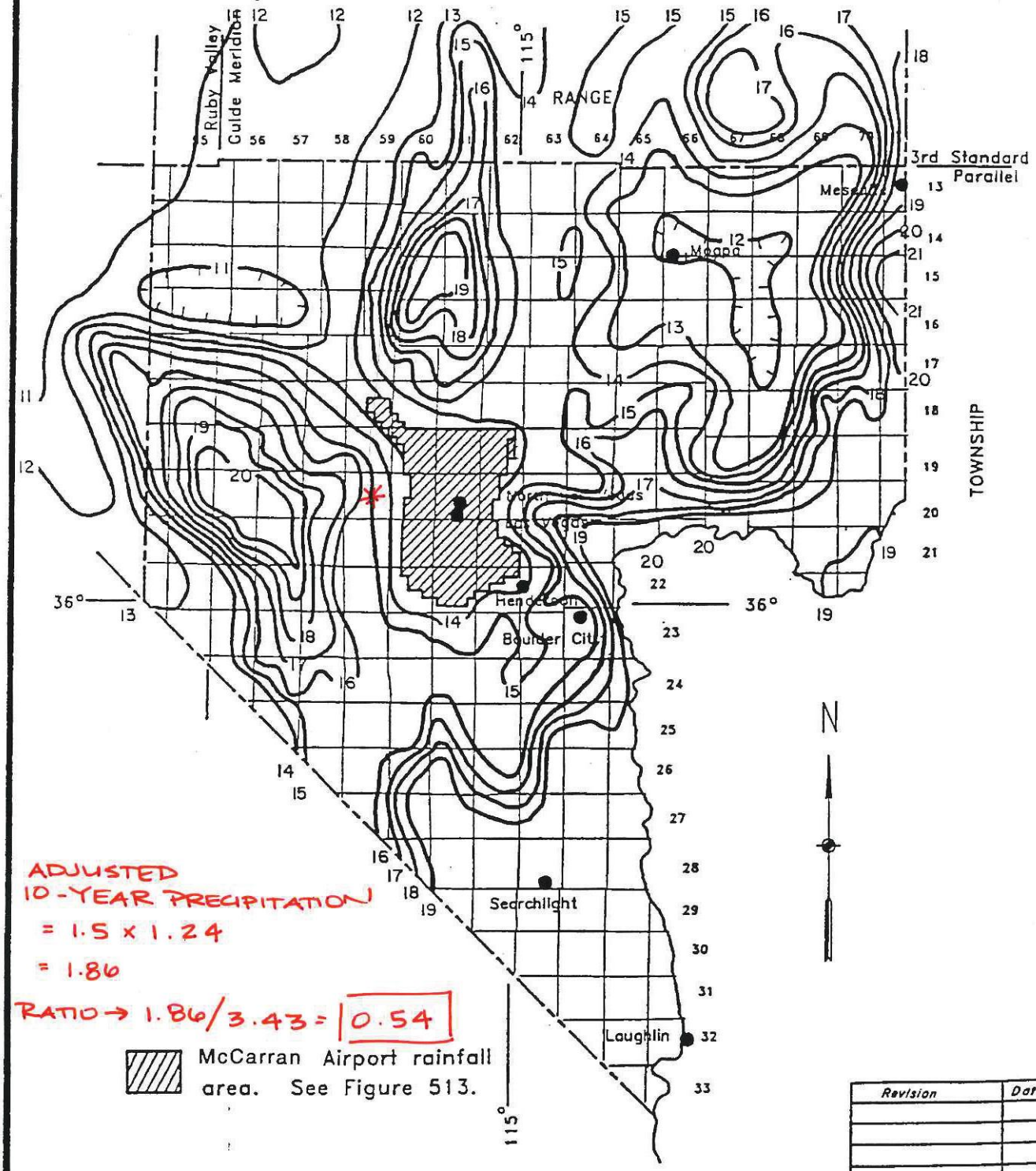
PRECIPITATION ADJUSTMENT RATIOS

Recurrence Interval	Ratio to NOAA Atlas 2
2-year	1.00
5-year	1.16
10-year	1.24
25-year	1.33
50-year	1.39
100-year	1.43

NOTE:
1. Multiply the values obtained from the NOAA Atlas 2 by the above ratios to obtain the adjusted precipitation values.
2. NOAA Atlas 2 values for use with TR-55 shall not be adjusted by the above ratios.
3. Tables 505 and 506 require no adjustments.

Revision	Date

RAINFALL DEPTH-DURATION-FREQUENCY
10-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



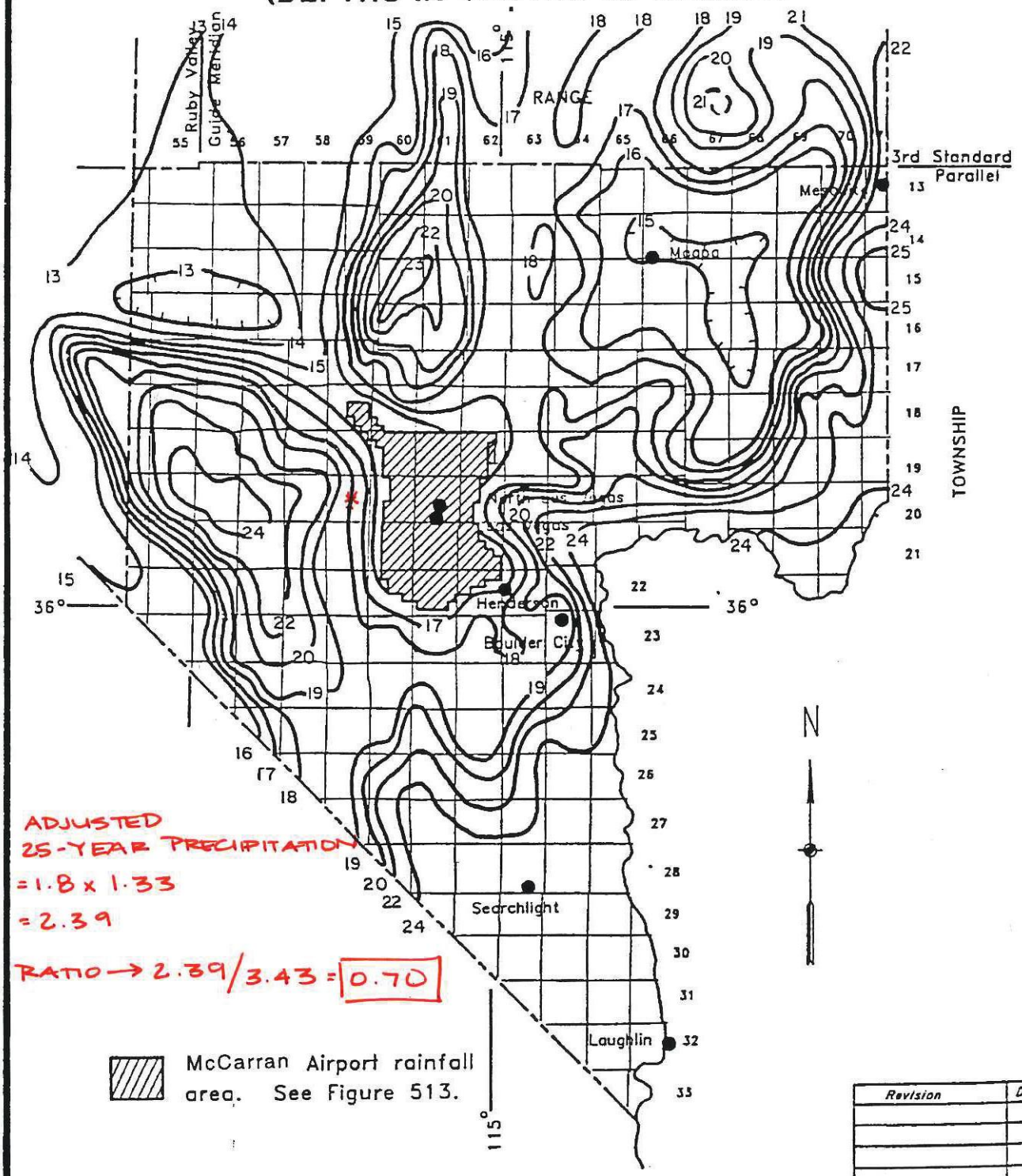
Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 503

RAINFALL DEPTH-DURATION-FREQUENCY
25-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



ADJUSTED
25-YEAR PRECIPITATION
= 1.8 x 1.33
= 2.39

RATIO → 2.39/3.43 = 0.70

McCarran Airport rainfall area. See Figure 513.

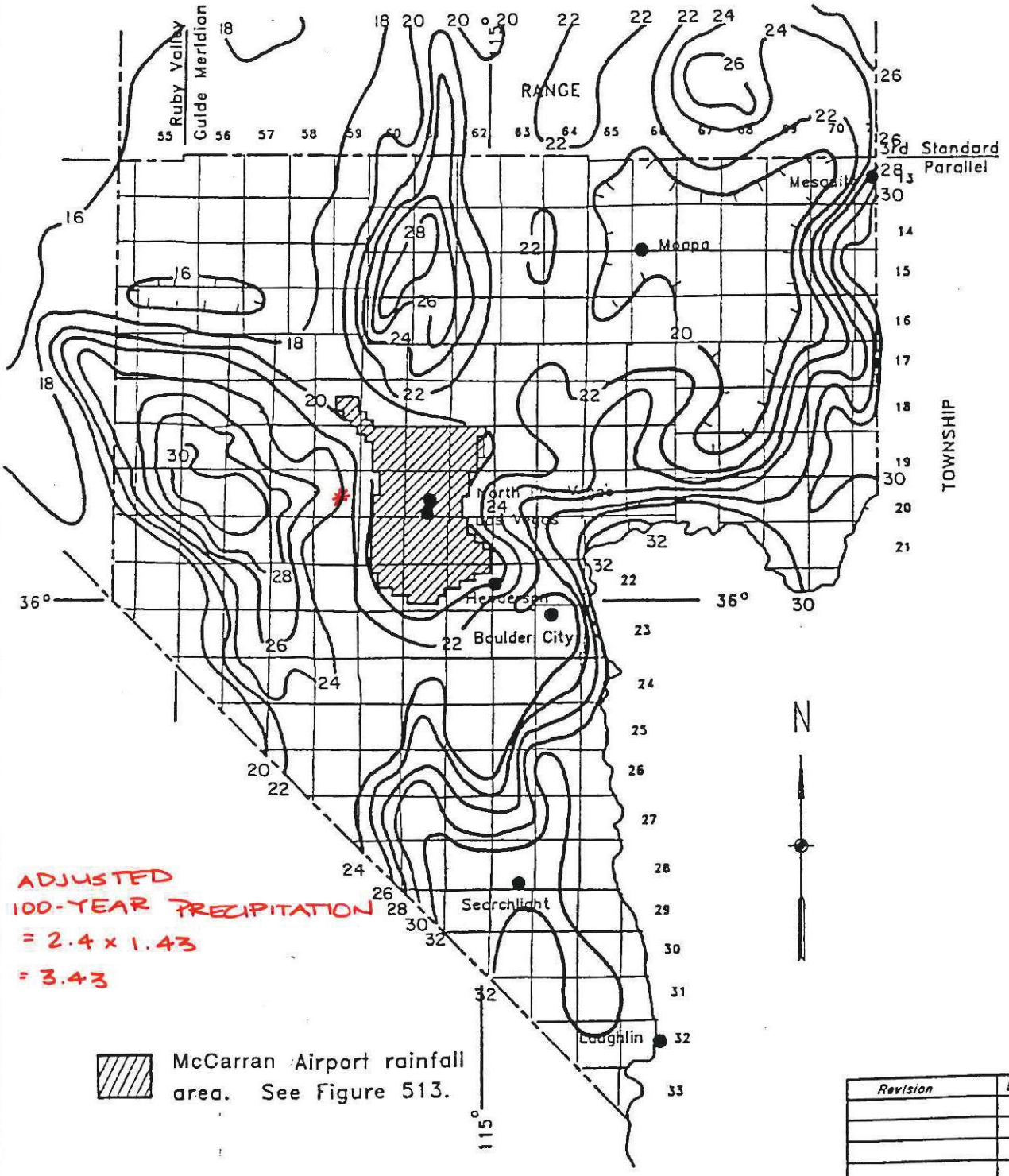
Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 504

RAINFALL DEPTH-DURATION-FREQUENCY
100-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



Revision	Date

WRC ENGINEERING

REFERENCE:
NOAA ATLAS 2, VOLUME VII NEVADA, 1973

FIGURE 506

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

Average Lot Size or Usage[1]	Percent Impervious[2]	Curve Number for Hydrologic Soil Groups			
		A	B	C	D
Apartments/Condos	72	81	88	91	93
Townhouses/6,000 sq ft lots or less[3]	69	80	87	90	92
7,000 sq ft lots	63	76	84	89	91
8,000 sq ft lots	58	73	82	88	90
10,000 sq ft lots	38	61	75	83	87
14,000 sq ft lots	30	57	72	81	86
20,000 sq ft lots	25	54	70	80	85
40,000 sq ft lots	20	51	68	79	84
80,000 sq ft lots	12	46	65	77	82

1 Lot size should represent the size of the average lot and not the gross acreage divided by the number of lots.

2 Actual percent impervious value should be compared to selected land use type.

3 In cases where average residential lots are smaller than 6,000 sq ft, commercial/business/industrial land use should be used.

Revision	Date

REFERENCE:

TABLE 602A

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
See Table 602A					
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system. Impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using Figure 603.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using Figure 603 based on the impervious area percentage (CN #98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using Figure 603 based on the degree of development impervious area percentage) and the CN's for the newly graded pervious areas.

Revision	Date

RUNOFF CURVE NUMBERS
(SEMIARID RANGELANDS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

[1]Average runoff condition, and $I_a = 0.2S$.

[2]*Poor:* <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: >70% ground cover.

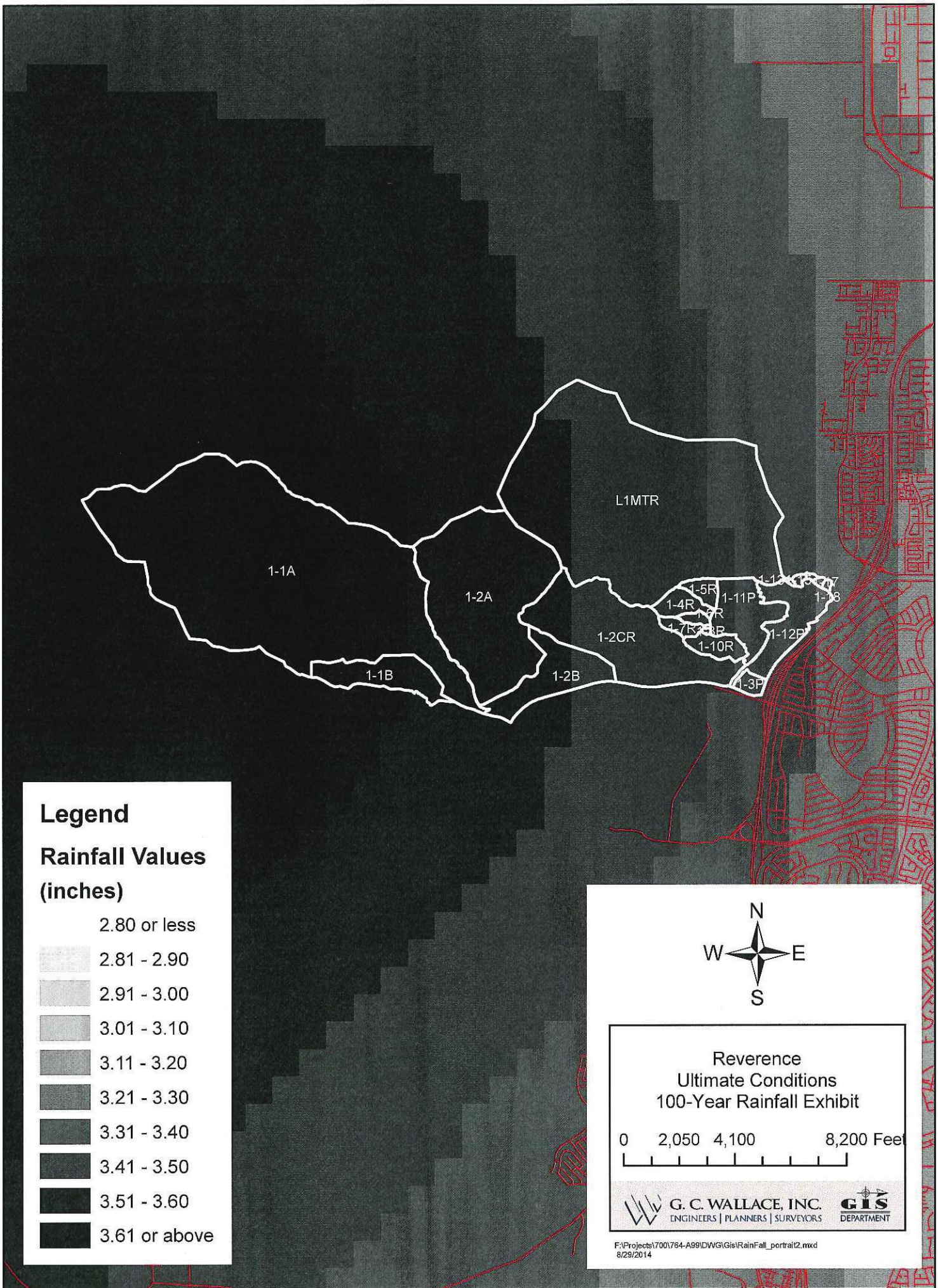
[3]Curve numbers for group A have been developed only for desert shrub.

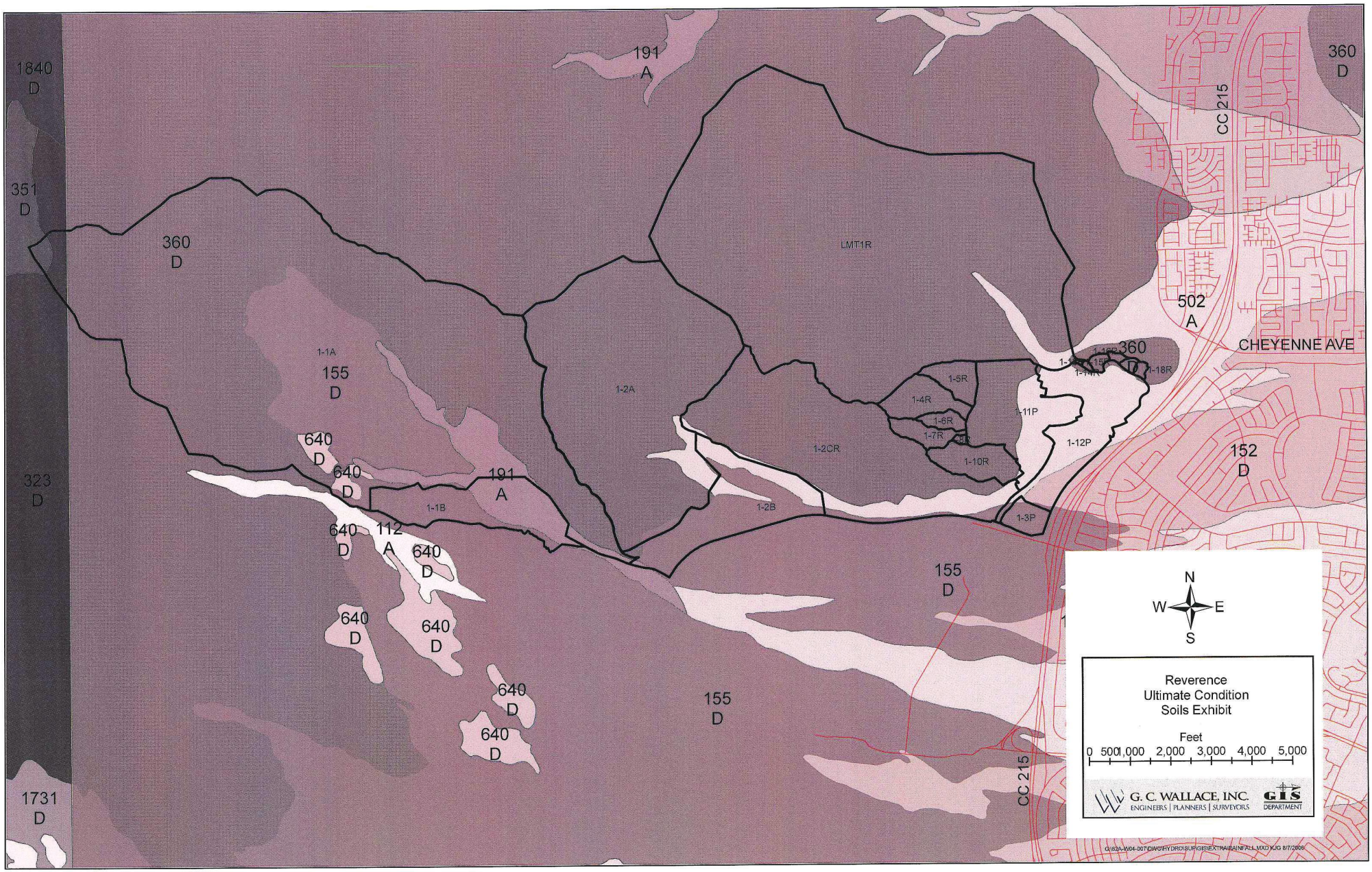
Revision	Date

WRC ENGINEERING

REFERENCE: SCS TR-55, USDA, June 1986.

TABLE 602
4 of 4


L1MTR
1-1A
1-2A
1-2CR
1-1B
1-2B
1-5R
1-11P
1-4R
1-10R
1-12P
1-3P
Legend
Rainfall Values
(inches)
2.80 or less
2.81 - 2.90
2.91 - 3.00
3.01 - 3.10
3.11 - 3.20
3.21 - 3.30
3.31 - 3.40
3.41 - 3.50
3.51 - 3.60
3.61 or above
N
W
E
S
Reverence
Ultimate Conditions
100-Year Rainfall Exhibit
0 2,050 4,100 8,200 Feet
G. C. WALLACE, INC.
ENGINEERS | PLANNERS | SURVEYORS
GIS
DEPARTMENT
F:\Projects\700\764-A99\DWG\Gis\RainFall_portrait2.mxd
8/29/2014


1840
D
351
D
323
D
1731
D
191
A
360
D
360
D
155
D
640
D
640
D
640
D
640
D
640
D
640
D
640
D
191
A
112
A
155
D
155
D
CC 215
CC 215
502
A
CHEYENNE AVE
360
D
152
D
LMT1R
1-1A
1-1B
1-2A
1-2B
1-2CR
1-3P
1-4R
1-5R
1-6R
1-7R
1-10R
1-11P
1-12P
1-18R
N
W
E
S
Reverence
Ultimate Condition
Soils Exhibit
Feet
0 500 1,000 2,000 3,000 4,000 5,000
G. C. WALLACE, INC.
ENGINEERS | PLANNERS | SURVEYORS
GIS
DEPARTMENT
G:\62A-W04-007\DWG\HYDRO\SUP\GIS\EXTRA\RAINFALL.MXD KJG 8/7/2008

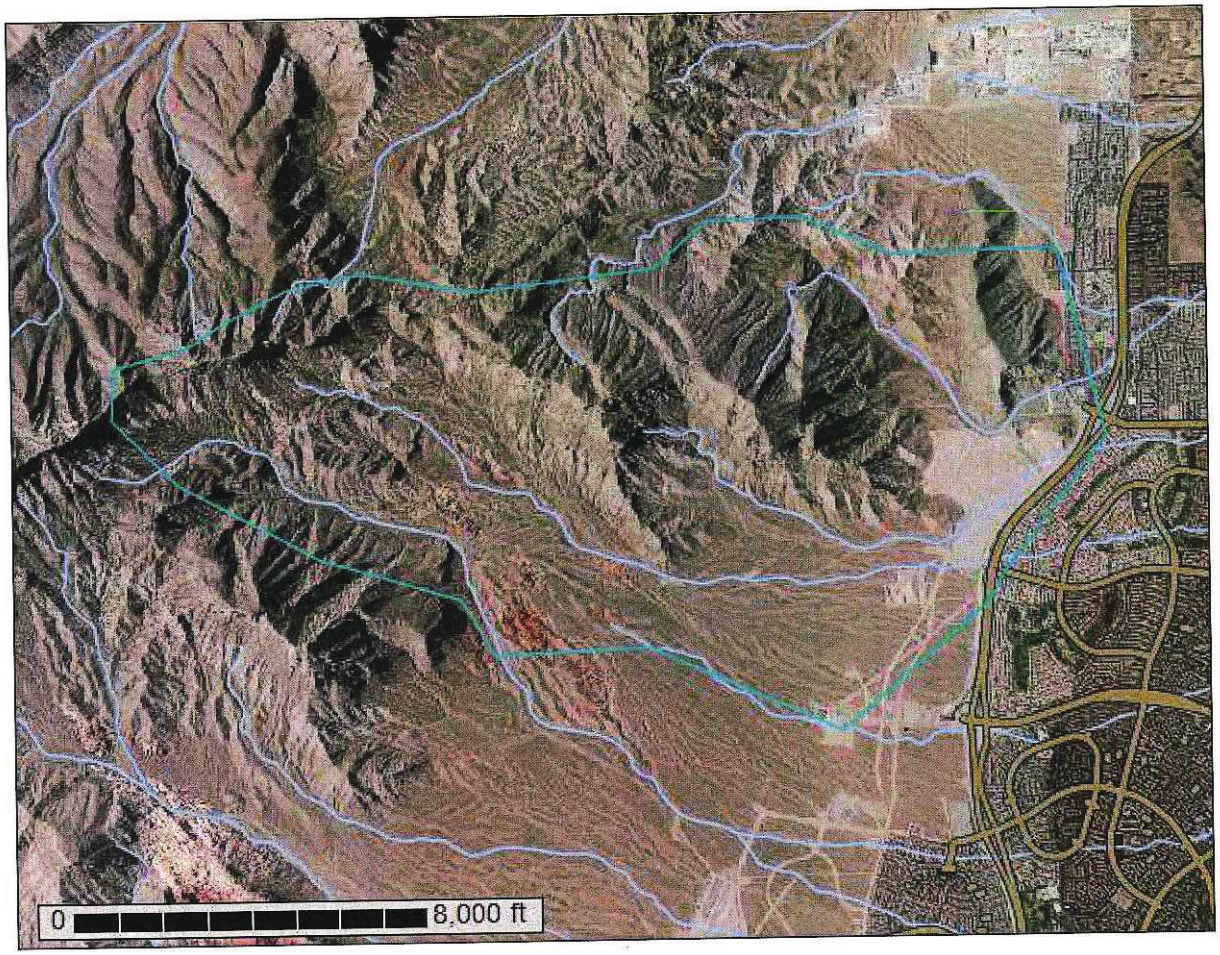
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

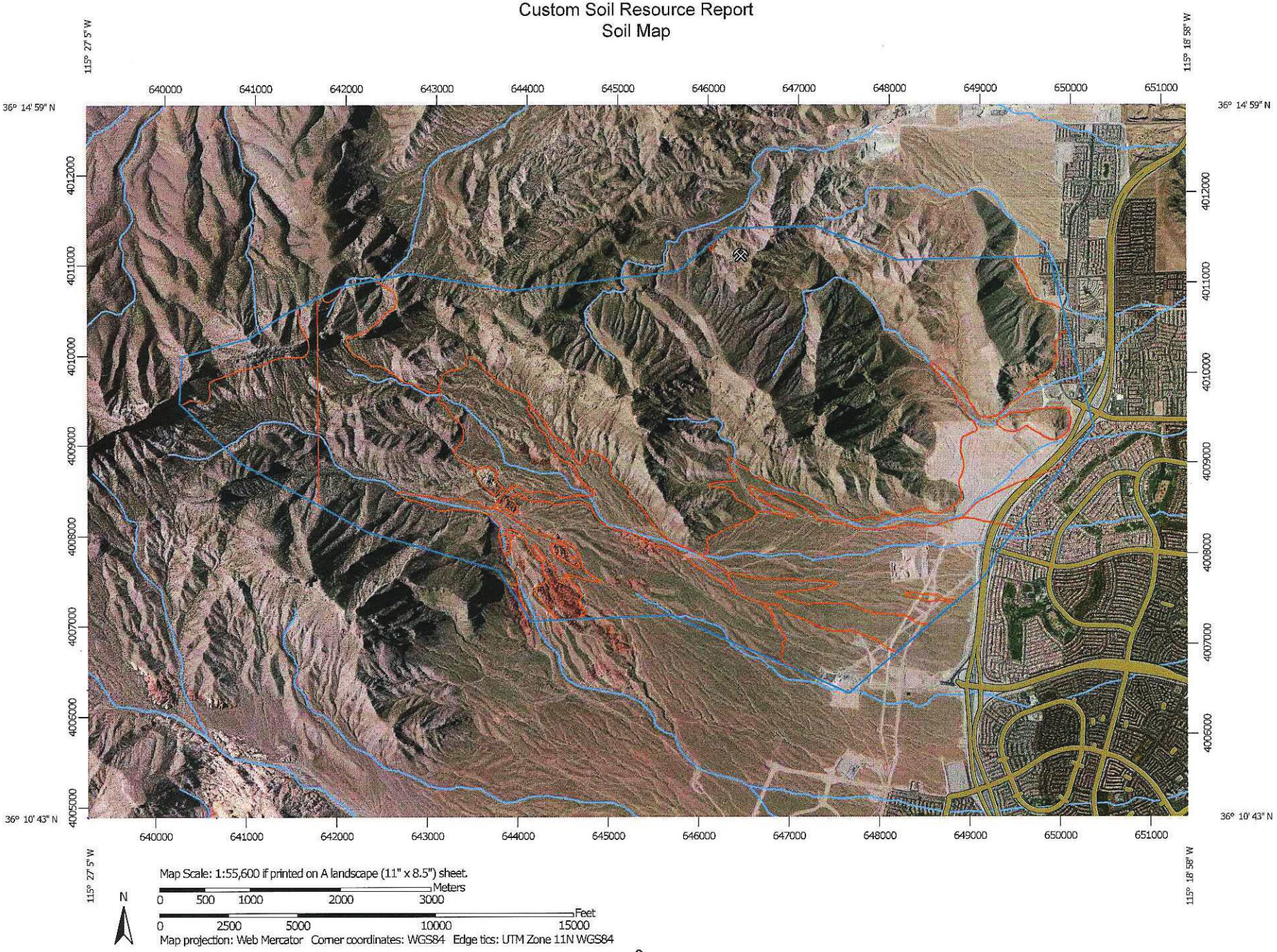
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Clark County Area, Nevada; and Las Vegas Valley Area, Nevada, Part of Clark County



August 12, 2015

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County Area, Nevada
Survey Area Data: Version 10, Aug 22, 2014

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 10, Aug 22, 2014

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2011—Feb 25, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Clark County Area, Nevada (NV755)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
323	Boxspring-Scrapy-Rock outcrop association	396.5	4.8%
351	Seralin extremely gravelly loam, 30 to 75 percent slopes	145.5	1.8%
Subtotals for Soil Survey Area		**542.0**	**6.6%**
Totals for Area of Interest		**8,212.9**	**100.0%**

Las Vegas Valley Area, Nevada, Part of Clark County (NV788)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
112	Arizo very gravelly loamy sand, flooded, 0 to 4 percent slopes	79.0	1.0%
152	Cave gravelly fine sandy loam, 0 to 4 percent slopes	79.2	1.0%
155	Cave gravelly fine sandy loam, 4 to 15 percent slopes	969.6	11.8%
156	Vace-Wechech association	165.8	2.0%
190	Dalian very gravelly fine sandy loam, 2 to 4 percent slopes	0.0	0.0%
191	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	165.3	2.0%
320	Boxspring-Zeheme-Rock outcrop association	4,001.6	48.7%
323	Boxspring-Scrapy-Rock outcrop association	892.7	10.9%
360	Rock outcrop-St. Thomas complex, 15 to 30 percent slopes	47.2	0.6%
400	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	41.7	0.5%
502	Canutio-Cave gravelly fine sandy loams, 2 to 8 percent slopes	579.1	7.1%
640	Rock outcrop, sandstone	96.1	1.2%
731	Purob-Irongold association	553.7	6.7%
Subtotals for Soil Survey Area		**7,670.9**	**93.4%**
Totals for Area of Interest		**8,212.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly

indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Clark County Area, Nevada

323—Boxspring-Scrapy-Rock outcrop association

Map Unit Setting

National map unit symbol: 1qpg8
Elevation: 4,430 to 7,690 feet
Mean annual precipitation: 7 to 14 inches
Mean annual air temperature: 51 to 57 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Boxspring and similar soils: 40 percent
Scrapy and similar soils: 30 percent
Rock outcrop: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boxspring

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium and/or residuum weathered from limestone and dolomite

Typical profile

H1 - 0 to 2 inches: extremely gravelly loam
H2 - 2 to 15 inches: extremely gravelly loam
H3 - 15 to 25 inches: bedrock

Properties and qualities

Slope: 30 to 75 percent
Depth to restrictive feature: 14 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: SHALLOW GRAVELLY LOAM 7-9 P.Z. (R030XC007NV)
Other vegetative classification: Shallow Gravelly Loam 8-10 p.z. (029XY077NV_1)

Description of Scrapy

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Concave
Across-slope shape: Linear

Typical profile

A - 0 to 1 inches: very gravelly sandy loam
Bk - 1 to 12 inches: very gravelly sandy loam
R - 12 to 22 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Percent of area covered with surface fragments: 2.0 percent
Depth to restrictive feature: 10 to 14 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Ecological site: SHALLOW LIMESTONE SLOPE 11-13 P.Z. (R030XC025NV)

Description of Rock Outcrop

Setting

Landform: Cliffs
Down-slope shape: Convex
Across-slope shape: Convex

Minor Components

Lithic calciustolls

Percent of map unit: 9 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Pinus monophylla-Juniperus osteosperma/Artemisia nova-Amelanchier utahensis/Poa fendleriana (F030XC235NV)

Typic haplustolls

Percent of map unit: 6 percent
Landform: Mountains

Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Pinus monophylla-Juniperus osteosperma/Purshia stansburiana-Artemisia nova/Bouteloua gracilis (F030XC243NV)
Other vegetative classification: PIMO-JUOS WSG: OR0507 (029XY126NV)

351—Seralin extremely gravelly loam, 30 to 75 percent slopes

Map Unit Setting

National map unit symbol: hqwv
Elevation: 5,120 to 8,100 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 45 to 49 degrees F
Frost-free period: 90 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Seralin and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Seralin

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium and/or residuum weathered from limestone and dolomite

Typical profile

H1 - 0 to 2 inches: extremely gravelly loam
H2 - 2 to 14 inches: very gravelly loam
H3 - 14 to 24 inches: bedrock

Properties and qualities

Slope: 30 to 75 percent
Percent of area covered with surface fragments: 5.0 percent
Depth to restrictive feature: 8 to 14 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent

Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Pinus monophylla-Juniperus osteosperma/Purshia stansburiana-Artemisia nova/Bouteloua gracilis (F030XC243NV)

Minor Components

Potosi

Percent of map unit: 7 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SHALLOW LIMESTONE SLOPE 7-9 P.Z. (R030XC008NV)

Lithic torriorthents

Percent of map unit: 4 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: SHALLOW GRAVELLY FAN 11-15 P.Z. (R030XC023NV)

Rock outcrop

Percent of map unit: 4 percent
Landform: Cliffs
Down-slope shape: Convex
Across-slope shape: Convex

Las Vegas Valley Area, Nevada, Part of Clark County

112—Arizo very gravelly loamy sand, flooded, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: hr9d
Elevation: 1,700 to 2,800 feet
Mean annual precipitation: 5 to 7 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Arizo and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arizo

Setting

Landform: Channels
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 2 inches: very gravelly loamy sand
H2 - 2 to 60 inches: stratified extremely gravelly loamy sand to cobbly coarse sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A
Ecological site: VALLEY WASH (R030XB028NV)

152—Cave gravelly fine sandy loam, 0 to 4 percent slopes

Map Unit Setting

National map unit symbol: hr9v
Elevation: 2,000 to 4,800 feet
Mean annual precipitation: 4 to 12 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Cave and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cave

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 12 inches: gravelly fine sandy loam
H2 - 12 to 36 inches: indurated
H3 - 36 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: 4 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)

155—Cave gravelly fine sandy loam, 4 to 15 percent slopes

Map Unit Setting

National map unit symbol: hr9w
Elevation: 2,000 to 4,800 feet
Mean annual precipitation: 4 to 12 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Cave and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cave

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 15 inches: gravelly fine sandy loam
H2 - 15 to 60 inches: indurated

Properties and qualities

Slope: 4 to 15 percent
Depth to restrictive feature: 4 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)

Landform: Fan remnants
Landform position (two-dimensional): Summit
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: SHALLOW GRAVELLY LOAM 5-7 P.Z. (R030XB029NV)
Other vegetative classification: Shallow Gravelly Loam 7-9 p.z. (030XB029NV_4)

323—Boxspring-Scrapy-Rock outcrop association

Map Unit Setting

National map unit symbol: 1tf6r
Elevation: 4,430 to 7,690 feet
Mean annual precipitation: 7 to 14 inches
Mean annual air temperature: 51 to 57 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Boxspring and similar soils: 40 percent
Scrapy and similar soils: 30 percent
Rock outcrop: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Boxspring

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium and/or residuum weathered from limestone and dolomite

Typical profile

H1 - 0 to 2 inches: extremely gravelly loam
H2 - 2 to 15 inches: extremely gravelly loam
H3 - 15 to 25 inches: bedrock

Properties and qualities

Slope: 30 to 75 percent
Depth to restrictive feature: 14 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 0.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: SHALLOW GRAVELLY LOAM 7-9 P.Z. (R030XC007NV)
Other vegetative classification: Shallow Gravelly Loam 8-10 p.z. (029XY077NV_1)

Description of Scrapy

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Concave
Across-slope shape: Linear

Typical profile

A - 0 to 1 inches: very gravelly sandy loam
Bk - 1 to 12 inches: very gravelly sandy loam
R - 12 to 22 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Percent of area covered with surface fragments: 2.0 percent
Depth to restrictive feature: 10 to 14 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Ecological site: SHALLOW LIMESTONE SLOPE 11-13 P.Z. (R030XC025NV)

Description of Rock Outcrop

Setting

Landform: Cliffs
Down-slope shape: Convex
Across-slope shape: Convex

Minor Components

Lithic calciustolls

Percent of map unit: 9 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Pinus monophylla-Juniperus osteosperma/Artemisia nova-Amelanchier utahensis/Poa fendleriana (F030XC235NV)

Typic haplustolls

Percent of map unit: 6 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Pinus monophylla-Juniperus osteosperma/Purshia stansburiana-Artemisia nova/Bouteloua gracilis (F030XC243NV)
Other vegetative classification: PIMO-JUOS WSG: OR0507 (029XY126NV)

360—Rock outcrop-St. Thomas complex, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: hrby
Elevation: 1,600 to 3,000 feet
Mean annual precipitation: 4 to 9 inches
Mean annual air temperature: 61 to 70 degrees F
Frost-free period: 170 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Rock outcrop: 50 percent
St. thomas and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Convex

Description of St. Thomas

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Colluvium derived from limestone and dolomite over residuum weathered from limestone and dolomite

Typical profile

H1 - 0 to 7 inches: extremely cobbly fine sandy loam
H2 - 7 to 17 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 30 percent
Percent of area covered with surface fragments: 2.0 percent
Depth to restrictive feature: 4 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Very low (about 0.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Other vegetative classification: LIMY HILL 3-5" P.Z. (030XB017NV_3)

Minor Components

Weiser

Percent of map unit: 10 percent
Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Convex
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)

Bracken

Percent of map unit: 5 percent
Landform: Pediments
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: GYSIC LOAM 3-8 P.Z. (030XB026NV_2)

502—Canutio-Cave gravelly fine sandy loams, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: hrcf
Elevation: 1,700 to 4,800 feet
Mean annual precipitation: 4 to 12 inches
Mean annual air temperature: 57 to 70 degrees F
Frost-free period: 180 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition

Canutio and similar soils: 55 percent
Cave and similar soils: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canutio

Setting

Landform: Inset fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 9 inches: gravelly fine sandy loam
H2 - 9 to 60 inches: stratified extremely gravelly loamy coarse sand to gravelly loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: A
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)

Description of Cave

Setting

Landform: Fan remnants
Down-slope shape: Linear

Across-slope shape: Convex
Parent material: Mixed alluvium

Typical profile
H1 - 0 to 16 inches: gravelly fine sandy loam
H2 - 16 to 30 inches: indurated
H3 - 30 to 60 inches: very gravelly sandy loam

Properties and qualities
Slope: 2 to 8 percent
Depth to restrictive feature: 4 to 20 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Gypsum, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Very low (about 1.6 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Other vegetative classification: LIMY 3-5" P.Z. (030XB019NV_3)

Minor Components

Arizo
Percent of map unit: 5 percent
Landform: Channels
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: VALLEY WASH (R030XB028NV)

640—Rock outcrop, sandstone

Map Unit Setting
National map unit symbol: hrct
Elevation: 3,970 to 6,660 feet
Mean annual precipitation: 7 to 9 inches
Mean annual air temperature: 51 to 56 degrees F
Frost-free period: 130 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition
Rock outcrop: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rock Outcrop

Setting
Landform: Cliffs
Down-slope shape: Convex
Across-slope shape: Convex

Minor Components

Moentria
Percent of map unit: 5 percent
Landform: Mountains
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SHALLOW GRAVELLY LOAM 7-9 P.Z. (R030XC007NV)
Other vegetative classification: Shallow Gravelly Loam 8-10 p.z. (029XY077NV_1)

Nupper
Percent of map unit: 5 percent
Landform: Cliffs
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: SHALLOW SANDSTONE HILL 11-13 P.Z. (R030XC020NV)

731—Purob-Irongold association

Map Unit Setting
National map unit symbol: 1tf74
Elevation: 3,410 to 6,660 feet
Mean annual precipitation: 5 to 10 inches
Mean annual air temperature: 51 to 63 degrees F
Frost-free period: 130 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Purob and similar soils: 60 percent
Irongold and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba).

Engineering Properties–Clark County Area, Nevada														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
323—Boxspring-Scrapy-Rock outcrop association														
Boxspring	40	D	0-2	Extremely gravelly loam	GP-GC	A-2	0- 0- 0	5-25- 30	25-30-35	15-20-25	13-15-24	9-10- 19	20-25-30	6-9 -12
			2-15	Extremely gravelly loam, very gravelly loam	GC	A-1, A-2	0- 0- 0	0-10- 25	30-35-55	20-25-45	15-22-40	10-16-35	20-25-30	6-9 -12
			15-25	Bedrock	—	—	—	—	—	—	—	—	—	—
Scrapy	30	D	0-1	Very gravelly sandy loam	GP-GM, GM, GC-GM, GP-GC	A-1	0- 0- 5	0- 0- 5	35-40-50	30-35-45	10-20-30	5-15- 20	17-21-28	2-4 -10
			1-12	Very gravelly loam, extremely gravelly sandy loam, very gravelly sandy loam, extremely gravelly loam	GP-GC, GC-GM, GM, GP-GM	A-1, A-2	0- 0- 5	0- 0- 5	25-40-50	20-35-45	10-30-45	5-20- 35	16-20-27	2-4 -10
			12-22	Bedrock	—	—	—	—	—	—	—	—	—	—
Lithic calciustolls	9	D	0-2	Extremely stony sandy loam	GM, GP-GM	A-1	25-30-40	15-20-25	35-48-60	15-23-30	10-18-25	5-13- 20	20-23-25	NP-3 -5
			2-7	Very gravelly loam	GM	A-1, A-2	0- 0- 0	10-13-15	40-53-65	35-43-50	30-35-40	20-25-30	20-23-25	NP
			7-16	Very gravelly loam, very gravelly very fine sandy loam	SM	A-1, A-2	0- 0- 0	15-23-30	55-65-75	45-55-65	25-35-45	15-23-30	20-23-25	NP-3 -5

Engineering Properties–Clark County Area, Nevada														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
			16-26	Bedrock	—	—	—	—	—	—	—	—	—	—
Typic haplustolls	6	D	0-2	Very stony loam	GM, GP-GM	A-1	0- 3- 5	15-20-25	35-48-60	15-23-30	10-18-25	5-13- 20	20-23 -25	NP-3 -5
			2-7	Very gravelly loam	GM	A-1, A-2	0- 0- 0	10-13-15	40-53-65	35-43-50	30-35-40	20-25-30	20-23 -25	NP
			7-16	Very gravelly loam, very gravelly very fine sandy loam	GM	A-1, A-2	0- 0- 0	15-20-30	50-60-70	45-55-65	25-35-45	15-23-30	20-23 -25	NP-3 -5
			16-26	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Clark County Area, Nevada														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
351—Seralin extremely gravelly loam, 30 to 75 percent slopes														
Seralin	85	D	0-2	Extremely gravelly loam	GP-GC	A-2	0- 0- 0	5-25- 30	25-30-35	15-20-25	13-15-24	9-10- 19	20-25-30	6-9 -12
			2-14	Extremely gravelly loam, extremely gravelly very fine sandy loam, very gravelly loam, very gravelly very fine sandy loam	GC-GM, GC, GP-GC	A-2	0- 0- 5	5-15- 25	15-40-45	10-35-40	8-27- 30	5-17- 25	21-26-31	6-9 -12
			14-24	Bedrock	—	—	—	—	—	—	—	—	—	—
Potosi	7	D	0-2	Very gravelly loam	GM	A-1	0- 5- 10	0- 8- 15	40-50-55	30-40-45	10-15-20	10-15-20	15-20-25	NP-3 -5
			2-11	Extremely gravelly loam, very gravelly sandy loam	GM, GP-GM	A-1	0- 0- 0	0- 8- 15	20-33-45	10-23-35	10-15-20	5-13- 20	15-20-25	NP-3 -5
			11-21	Bedrock	—	—	—	—	—	—	—	—	—	—
Lithic torriorthents	4	D	0-2	Extremely gravelly sandy loam	GP	A-1	5-10- 15	10-18-25	15-18-20	10-13-15	5- 8- 10	0- 3- 5	17-21-25	3-5 -7
			2-11	Very gravelly sandy loam	GM, GP-GM	A-1, A-2	0- 0- 0	0- 0- 0	35-48-60	25-38-50	20-33-45	5-20- 35	15-20-25	NP-3 -5
			11-21	Bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Las Vegas Valley Area, Nevada, Part of Clark County														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
112—Arizo very gravelly loamy sand, flooded, 0 to 4 percent slopes									60	40	23	10		
Arizo	100	A	0-2	Very gravelly loamy sand	GM, GP-GM, SM, SP-SM	A-1	0- 0- 5	0- 7- 15	40-50-60	30-40-50	15-23-30	5-10- 15	0-17 -21	NP-2 -4
			2-60	Stratified extremely gravelly loamy sand to cobbly coarse sand	GP, GP-GM	A-1	0- 3- 5	5-22- 30	35-45-55	20-35-50	10-20-30	0- 5- 10	0-16 -19	NP-1 -3
152—Cave gravelly fine sandy loam, 0 to 4 percent slopes														
Cave	100	D	0-12	Gravelly fine sandy loam	SC-SM, SM	A-2, A-4	0- 0- 0	0- 3- 5	70-80-90	60-68-75	40-53-65	25-33-40	15-20 -25	NP-3 -5
			12-36	Indurated	—	—	—	—	—	—	—	—	—	—
			36-60	Gravelly loamy sand, very gravelly sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0- 0- 0	0- 3- 5	35-55-75	30-45-60	20-28-35	10-20-30	0-8 -15	NP
155—Cave gravelly fine sandy loam, 4 to 15 percent slopes														
Cave	100	D	0-15	Gravelly fine sandy loam	SC-SM, SM	A-2, A-4	0- 0- 0	0- 3- 5	70-80-90	60-68-75	40-53-65	25-33-40	15-20 -25	NP-3 -5
			15-60	Indurated	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Las Vegas Valley Area, Nevada, Part of Clark County														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes									60	55	48	25		
Dalian	100	A	0-5	Very cobbly fine sandy loam	GM	A-1, A-2	0- 0- 0	35-43-50	55-60-65	50-55-60	40-48-55	20-25-30	0-7 -14	NP
			5-60	Very gravelly sandy loam, very gravelly fine sandy loam	GM	A-1	0- 0- 0	5- 8- 10	35-45-55	30-40-50	20-30-40	10-18-25	0-7 -14	NP

Engineering Properties–Las Vegas Valley Area, Nevada, Part of Clark County														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
323—Boxspring-Scrapy-Rock outcrop association														
Boxspring	40	D	0-2	Extremely gravelly loam	GP-GC	A-2	0- 0- 0	5-25- 30	25-30-35	15-20-25	13-15-24	9-10- 19	20-25-30	6-9 -12
			2-15	Extremely gravelly loam, very gravelly loam	GC	A-1, A-2	0- 0- 0	0-10- 25	30-35-55	20-25-45	15-22-40	10-16-35	20-25-30	6-9 -12
			15-25	Bedrock	—	—	—	—	—	—	—	—	—	—
Scrapy	30	D	0-1	Very gravelly sandy loam	GP-GM, GM, GC-GM, GP-GC	A-1	0- 0- 5	0- 0- 5	35-40-50	30-35-45	10-20-30	5-15- 20	17-21-28	2-4 -10
			1-12	Very gravelly loam, extremely gravelly sandy loam, very gravelly sandy loam, extremely gravelly loam	GP-GC, GC-GM, GM, GP-GM	A-1, A-2	0- 0- 5	0- 0- 5	25-40-50	20-35-45	10-30-45	5-20- 35	16-20-27	2-4 -10
			12-22	Bedrock	—	—	—	—	—	—	—	—	—	—
Lithic calciustolls	9	D	0-2	Extremely stony sandy loam	GM, GP-GM	A-1	25-30-40	15-20-25	35-48-60	15-23-30	10-18-25	5-13- 20	20-23-25	NP-3 -5
			2-7	Very gravelly loam	GM	A-1, A-2	0- 0- 0	10-13-15	40-53-65	35-43-50	30-35-40	20-25-30	20-23-25	NP
			7-16	Very gravelly loam, very gravelly very fine sandy loam	SM	A-1, A-2	0- 0- 0	15-23-30	55-65-75	45-55-65	25-35-45	15-23-30	20-23-25	NP-3 -5

Engineering Properties–Las Vegas Valley Area, Nevada, Part of Clark County

Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
			16-26	Bedrock	—	—	—	—	—	—	—	—	—	—
Typic haplustolls	6	D	0-2	Very stony loam	GM, GP-GM	A-1	0- 3- 5	15-20-25	35-48-60	15-23-30	10-18-25	5-13- 20	20-23-25	NP-3 -5
			2-7	Very gravelly loam	GM	A-1, A-2	0- 0- 0	10-13-15	40-53-65	35-43-50	30-35-40	20-25-30	20-23-25	NP
			7-16	Very gravelly loam, very gravelly very fine sandy loam	GM	A-1, A-2	0- 0- 0	15-20-30	50-60-70	45-55-65	25-35-45	15-23-30	20-23-25	NP-3 -5
			16-26	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
360—Rock outcrop-St. Thomas complex, 15 to 30 percent slopes									58	48	33	18		
St. thomas	35	D	0-7	Extremely cobbly fine sandy loam	GM, SM	A-1	0- 3- 5	55-65-75	45-58-70	35-48-60	25-33-40	10-18-25	15-18-20	NP-3 -5
			7-17	Unweathered bedrock	—	—	—	—	—	—	—	—	—	—
Weiser	10	A	0-1	Extremely gravelly fine sandy loam	GC-GM, GM, GP-GC, GP-GM	A-1, A-2	0- 3- 5	0- 8- 15	15-25-35	10-20-30	10-18-25	5-10- 15	15-20-25	NP-5 -10
			1-63	Stratified extremely gravelly sandy loam to very gravelly fine sandy loam	GM, GP, GP-GM, GP-GC, GW-GC	A-1, A-2	0- 3- 5	0-20- 40	20-28-35	10-23-35	5-18- 30	0-10- 20	15-20-25	NP-5 -10
Bracken	5	A	0-1	Very cobbly fine sandy loam	GM, SM	A-1	0- 1- 1	25-40-55	45-53-60	40-48-55	25-35-45	10-18-25	0-7 -14	NP
			1-50	Gypsiferous material	GP	A-1	—	—	—	—	—	—	—	—
			50-60	Weathered bedrock	—	—	—	—	—	—	—	—	—	—

Engineering Properties–Las Vegas Valley Area, Nevada, Part of Clark County														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
502—Canutio-Cave gravelly fine sandy loams, 2 to 8 percent slopes														
Canutio	55	A	0-9	Gravelly fine sandy loam	GC, GC-GM, SC-SM, SM	A-1, A-2	0- 0- 0	0- 8- 15	60-70-80	55-65-75	40-50-60	20-28-35	15-20 -25	NP-5 -10
			9-60	Stratified extremely gravelly loamy coarse sand to gravelly loam	GC, GC-GM, GM, GP-GM	A-1, A-2	0- 0- 0	5-18- 30	30-43-55	25-38-50	15-25-35	10-20-30	15-20 -25	NP-5 -10
Cave	40	D	0-16	Gravelly fine sandy loam	SC-SM, SM	A-2, A-4	0- 0- 0	0- 3- 5	70-80-90	60-68-75	40-53-65	25-33-40	15-20 -25	NP-3 -5
			16-30	Indurated	—	—	—	—	—	—	—	—	—	—
			30-60	Gravelly loamy sand, very gravelly sandy loam	GM, GP-GM, SM, SP-SM	A-1, A-2	0- 0- 0	0- 3- 5	35-55-75	30-45-60	20-28-35	10-20-30	0-8 -15	NP
Arizo	5	A	0-2	Very gravelly loamy sand	GM, GP-GM, SM, SP-SM	A-1	0- 0- 5	0- 7- 15	40-50-60	30-40-50	15-23-30	5-10- 15	0-17 -21	NP-2 -4
			2-60	Stratified extremely gravelly loamy sand to cobbly coarse sand	GP, GP-GM	A-1	0- 3- 5	5-22- 30	35-45-55	20-35-50	10-20-30	0- 5- 10	0-16 -19	NP-1 -3

Engineering Properties–Las Vegas Valley Area, Nevada, Part of Clark County														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*Pct*	*Pct*					*Pct*	
640—Rock outcrop, sandstone														
Moentria	5	D	0-3	Extremely gravelly loam	GC, GC-GM	A-2	0- 2- 5	0- 3- 8	25-30-35	15-20-25	10-15-20	10-15-20	19-25-30	4-8 -12
			3-9	Extremely gravelly loam, very gravelly loam, extremely gravelly fine sandy loam, very gravelly fine sandy loam, extremely gravelly very fine sandy loam, very gravelly very fine sandy loam	GC, GC-GM	A-2	0- 0- 0	0- 0- 5	25-40-45	15-30-35	15-25-30	10-20-25	18-24-30	4-8 -12
			9-19	Bedrock	—	—	—	—	—	—	—	—	—	—
			19-29	Bedrock	—	—	—	—	—	—	—	—	—	—
Nupper	5	D	0-3	Extremely flaggy loamy fine sand	SM, SC-SM, GC-GM, GM	A-1, A-2	0- 0- 0	60-80-85	40-70-75	35-65-70	35-50-60	10-18-20	16-19-23	2-4 -6
			3-13	Extremely gravelly fine sandy loam, extremely cobbly fine sandy loam, extremely gravelly sandy loam	GC-GM, GP-GC, GC	A-2	0- 0- 5	15-30-45	20-30-40	15-25-35	10-20-25	5-10- 15	18-24-27	4-8 -10
			13-23	Bedrock	—	—	—	—	—	—	—	—	—	—

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Erosion Factors

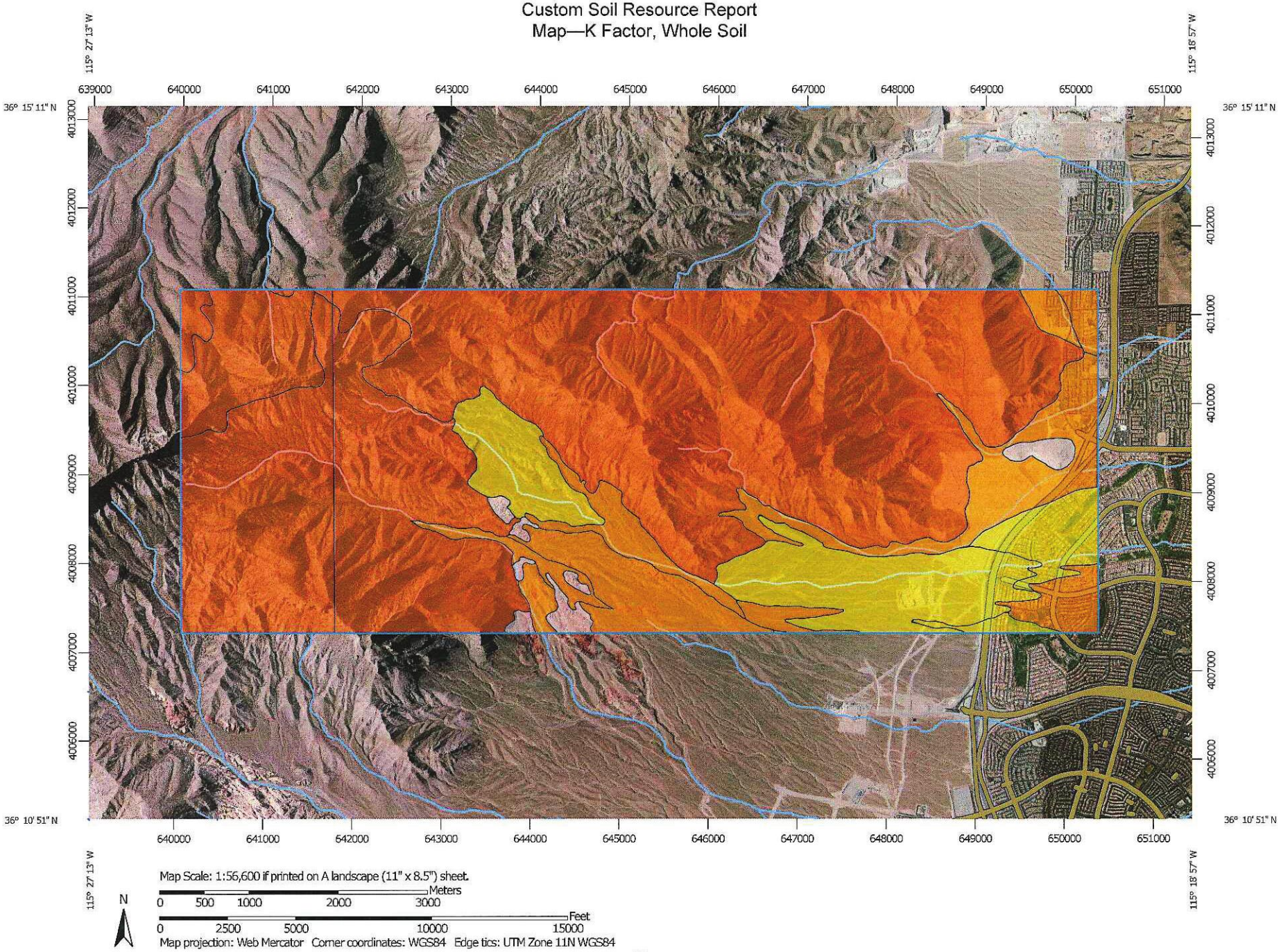
Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

K Factor, Whole Soil

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Custom Soil Resource Report
Map—K Factor, Whole Soil



Map Scale: 1:56,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2500 5000 10000 15000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Soil Rating Lines

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Soil Rating Points

.02
.05
.10
.15
.17
.20
.24
.28
.32
.37
.43
.49
.55
.64
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County Area, Nevada
Survey Area Data: Version 10, Aug 22, 2014

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 10, Aug 22, 2014

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2011—Feb 25, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—K Factor, Whole Soil

K Factor, Whole Soil— Summary by Map Unit — Clark County Area, Nevada (NV755)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
320	Boxspring-Zeheme-Rock outcrop association	.05	64.5	0.7%
323	Boxspring-Scrapy-Rock outcrop association	.05	1,135.4	11.5%
351	Seralin extremely gravelly loam, 30 to 75 percent slopes	.05	446.0	4.5%
Subtotals for Soil Survey Area			**1,646.0**	**16.7%**
Totals for Area of Interest			**9,866.8**	**100.0%**

K Factor, Whole Soil— Summary by Map Unit — Las Vegas Valley Area, Nevada, Part of Clark County (NV788)				
Map unit symbol	Map unit name	Rating [K-Factor]	Acres in AOI	Percent of AOI
112	Arizo very gravelly loamy sand, flooded, 0 to 4 percent slopes	.10	79.0	0.8%
152	Cave gravelly fine sandy loam, 0 to 4 percent slopes	.20	262.3	2.7%
155	Cave gravelly fine sandy loam, 4 to 15 percent slopes	.20	990.3	10.0%
156	Vace-Wechech association	.17	0.8	0.0%
190	Dalian very gravelly fine sandy loam, 2 to 4 percent slopes	.10	52.8	0.5%
191	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	.10	164.3	1.7%
320	Boxspring-Zeheme-Rock outcrop association	.05	4,140.9	42.0%
323	Boxspring-Scrapy-Rock outcrop association	.05	1,255.4	12.7%
360	Rock outcrop-St. Thomas complex, 15 to 30 percent slopes		47.2	0.5%
400	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	.10	55.8	0.6%
502	Canutio-Cave gravelly fine sandy loams, 2 to 8 percent slopes	.10	670.0	6.8%
640	Rock outcrop, sandstone		95.3	1.0%
731	Purob-Irongold association	.10	406.8	4.1%

K Factor, Whole Soil— Summary by Map Unit — Las Vegas Valley Area, Nevada, Part of Clark County (NV788)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Subtotals for Soil Survey Area			8,220.8	83.3%
Totals for Area of Interest			9,866.8	100.0%

Rating Options—K Factor, Whole Soil

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or

inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

REVERENCE
SOILS DESCRIPTION TABLES

Hydrologic Soil Group	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial
A	63	80	61	89
B	77	87	75	92
C	85	90	83	94
D	88	92	87	95
ROCK	92	92	92	95

SOIL 112 Arizo (very gravelly loamy sand, flooded)

Description	Type	%	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial
Arizo	A	100%	63	80	61	89
Composite CN		100%	63.0	80.0	61.0	89.0

SOIL 152 Cave (gravelly fine sandy loam)

Description	Type	%	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial
Cave	D	100%	88	92	87	95
Composite CN		100%	88.0	92.0	87.0	95.0

SOIL 155 Cave (gravelly fine sandy loam)

Description	Type	%	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial/ Industrial
Cave	D	100%	88	92	87	95
Composite CN		100%	88.0	92.0	87.0	95.0

SOIL 191 Dalian (very cobbly fine sandy loam)

Description	Type	%	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial
Dalian	A	100%	63	80	61	89
Composite CN		100%	63.0	80.0	61.0	89.0

SOIL 323 Boxspring-Scrapy-Rock Outcrop (extremely gravelly loan

Description	Type	%	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial
Boxspring/Scrapy	D	85%	88	92	87	95
Rock Outcrop	ROCK	15%	92	92	92	95
Composite CN		100%	88.6	92.0	87.8	95.0

SOIL 351 Seralin (extremely gravelly loam)

Description	Type	%	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial
Seralin	D	96%	88	92	87	95
Rock Outcrop	ROCK	4%	92	92	92	95
Composite CN		100%	88.2	92.0	87.2	95.0

SOIL 360 Rock outcrop-St. Thomas complex

Description	Type	%	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial
Bracken/Weiser	A	15%	63	80	61	89
St. Thomas	D	35%	88	92	87	95
Rock Outcrop	ROCK	50%	92	92	92	95
Composite CN		100%	86.3	90.2	85.6	94.1

SOIL 502 Canutio-Cave (gravelly fine sandy loam)

Description	Type	%	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial
Canutio/Arizo	A	60%	63	80	61	89
Cave	D	40%	88	92	87	95
Composite CN		100%	73.0	84.8	71.4	91.4

SOIL 640 Rock outcrop, sandstone

Description	Type	%	Desert Shrub (Poor Condition)	Townhouses/ 6,000 sq ft lots or less	Residential (10,000 sq ft lot)	Commercial
Moentria/Nupper	D	10%	88	92	87	95
Rock outcrop	ROCK	90%	92	92	92	95
Composite CN		100%	91.6	92.0	91.5	95.0

REVERENCE

ONSITE WEIGHTED CURVE NUMBER CALCULATIONS

GCW, INC.
DATE: 9/11/2015
FILE: CNTABLE.xls
BY: DBC

Basin	Soil	Percent	CN	Landuse	WCN
1-3P	152	1.76%	95.0	Commercial	94.9
	155	96.82%	95.0	Commercial	
	502	1.42%	91.4	Commercial	
1-11P	360	53.20%	87.0	9,000 sq ft lots	81.7
	502	46.80%	75.6	9,000 sq ft lots	
1-12P	152	15.00%	91.0	7,000 sq ft lots	83.8
	155	2.44%	91.0	7,000 sq ft lots	
	360	3.12%	89.3	7,000 sq ft lots	
	502	79.44%	82.0	7,000 sq ft lots	

REVERENCE

OFFSITE WEIGHTED CURVE NUMBER CALCULATIONS

GCW, INC.
DATE: 8/28/2015
FILE: CNTABLE.xls
BY: DBC

Basin	Soil	Percent	CN	Landuse	WCN
1-1A	112	0.01%	63.0	Desert Shrub (Poor Condition)	**85.4**
	155	21.77%	88.0	Desert Shrub (Poor Condition)	
	191	5.96%	63.0	Desert Shrub (Poor Condition)	
	360	69.24%	86.3	Desert Shrub (Poor Condition)	
	640	1.56%	91.6	Desert Shrub (Poor Condition)	
	323	1.03%	88.6	Desert Shrub (Poor Condition)	
	351	0.42%	88.2	Desert Shrub (Poor Condition)	
1-2A	155	1.02%	88.0	Desert Shrub (Poor Condition)	**85.8**
	360	95.08%	86.3	Desert Shrub (Poor Condition)	
	502	3.90%	73.0	Desert Shrub (Poor Condition)	
1-2CR	155	3.02%	88.0	Desert Shrub (Poor Condition)	**84.7**
	360	84.20%	86.3	Desert Shrub (Poor Condition)	
	502	12.78%	73.0	Desert Shrub (Poor Condition)	
1-4R	360	100.0%	86.3	Desert Shrub (Poor Condition)	**86.3**
1-5R	360	100.0%	86.3	Desert Shrub (Poor Condition)	**86.3**
1-6R	360	100.0%	86.3	Desert Shrub (Poor Condition)	**86.3**
1-7R	360	100.0%	86.3	Desert Shrub (Poor Condition)	**86.3**
1-8R	360	100.0%	86.3	Desert Shrub (Poor Condition)	**86.3**
1-10R	360	98.52%	86.3	Desert Shrub (Poor Condition)	**86.1**
	502	1.48%	73.0	Desert Shrub (Poor Condition)	
1-13R	360	99.81%	86.3	Desert Shrub (Poor Condition)	**86.3**
	502	0.19%	73.0	Desert Shrub (Poor Condition)	
1-14R	360	100.0%	86.3	Desert Shrub (Poor Condition)	**86.3**
1-15R	360	98.74%	86.3	Desert Shrub (Poor Condition)	**86.1**
	502	1.26%	73.0	Desert Shrub (Poor Condition)	
1-16R	360	100.0%	86.3	Desert Shrub (Poor Condition)	**86.3**
1-17R	360	100.0%	86.3	Desert Shrub (Poor Condition)	**86.3**
1-18R	360	100.0%	86.3	Desert Shrub (Poor Condition)	**86.3**
LMT1R*	360	88.26%	86.3	Desert Shrub (Poor Condition)	**86.8**
	502	2.06%	73.0	Desert Shrub (Poor Condition)	
	360	9.68%	94.1	Commercial	

*Land use referenced from 2008 Las Vegas Valley MPU

Curve Number Calculations

Developed Conditions For the Northern Regional Watershed

Project site consists of soils 112 (HSG "A"), 152 (HSG "D"), 155 (HSG "D"), 191 (HSG "B"), 360 (HSG "D"), 502 (HSG "C") 640 (HSG "D"), 1321 (HSG "D"), 1351 (HSG "D")
Composite curve numbers were calculated.

Area within Loop Road

	DENSITY	LOT	LOT	CN TYPE				
USAGE	(units/acres)	SIZE	VALUE	A	B	C	D	
SF2	6	7260	7000	76	84	89	91	7,000 sq. ft. lots
SF3	10	4356	4000	89	92	94	95	COMMERCIAL
SFA	18	2420	2000	89	92	94	95	COMMERCIAL
MF2	21	2074	2000	89	92	94	95	COMMERCIAL
MF3	21	2074	2000	89	92	94	95	COMMERCIAL
NF	N/A	N/A	N/A	89	92	94	95	COMMERCIAL
COS	N/A	N/A	N/A	68	79	86	89	PARK, POOR CONDITION
COS*	N/A	N/A	N/A	63	77	85	88	UNDISTURBED LAND, POOR CONDITION
COM	N/A	N/A	N/A	89	92	94	95	COMMERCIAL
H-1	N/A	N/A	N/A	89	92	94	95	COMMERCIAL
BLM	N/A	N/A	N/A	63	77	85	88	UNDISTURBED LAND, POOR CONDITION
Property	N/A	N/A	N/A	81	88	91	93	INDUSTRIAL
Golf Course	N/A	N/A	N/A	68	79	86	89	PARK, POOR CONDITION

Notes:
1. Densities of SF2 and SF3 were reduced beyond the Loop Road - see calculations below.
2. NF (Neighborhood Focus) - consists of schools
3. COS (Community Open Space) - consists of manmade parks w/desert and grass landscaping
4. COS* (Community Open Space) - consists of natural terrain, i.e. Red Rock outcrops, preserved waterways
   2002 MPU HEC-1 used Fair Conditions for tributary basins north of Summerlin Pkwy and Poor Conditions for tributary basins south of Summerlin Pkwy
5. H-1 (Limited Resort and Apartment District) - considered high density/commercial
6. BLM (Bureau of Land Management Land) - undisturbed land
7. Undevelopable Property - shown as white on the Land Use Plan and will be reserved for water reservoirs, power substations, undevelopable terrain and U.S. Waters
8. Golf Course - shown as teal on the Land Use Plan and will consist of turf

Area beyond Loop Road

	DENSITY	LOT	LOT	CN TYPE				
USAGE	RANGE	SIZE	VALUE	A	B	C	D	
SF2	4	10890	10000	61	75	83	87	10,000 SF LOTS
SF3	8	5445	5000	89	92	94	95	COMMERCIAL

Land Use Distribution (Acres)/Curve Number Calculation												
Basin	Total Acres	SF2	SF3	COS (Park and Golf Course)	COS* (undisturbed/ BLM)	SFA, MF2, MF3, NF, COM, H-1	Undevelopable Property	Percent in Soil Group A	Percent in Soil Group B	Percent in Soil Group C	Percent in Soil Group D	Composite CN
Village 26 Offsite/Onsite												
1-1B	111.8	68.0			12.5	2.2	29.1	48.21%			51.79%	78.3
1-2B	137.7	109.5			28.2			17.70%			82.30%	82.6

SUMMERLIN VILLAGE 26 Debris Basin calculations DATE: 21-Aug-15
Drainage Basin DEBRIS BY: DBC

Bedload Calculations

CCRFCD Manual Eqn 704								
HG	Q	W	q	S	qs	TIME	Wsoil	Vol. Sed.
Ordinate	(cfs)	(ft)	(cfs/ft)	(ft/ft)	(cfs/ft)	(min)	(lbs/c.f.)	(acre-ft)
6	0	50.00	0.00	0.068	0.00	25.00	126.00	0.00
11	11	50.00	0.22	0.068	0.00	25.00	126.00	0.00
16	16	50.00	0.32	0.068	0.00	25.00	126.00	0.00
21	78	50.00	1.56	0.068	0.00	25.00	126.00	0.00
26	110	50.00	2.20	0.068	0.00	25.00	126.00	0.01
31	214	50.00	4.28	0.068	0.01	25.00	126.00	0.02
36	273	50.00	5.46	0.068	0.02	25.00	126.00	0.03
41	806	50.00	16.12	0.068	0.09	25.00	126.00	0.15
46	3309	50.00	66.18	0.068	0.80	25.00	126.00	1.37
51	2744	50.00	54.88	0.068	0.59	25.00	126.00	1.02
56	1611	50.00	32.22	0.068	0.26	25.00	126.00	0.44
61	1285	50.00	25.70	0.068	0.18	25.00	126.00	0.31
66	777	50.00	15.54	0.068	0.08	25.00	126.00	0.14
71	365	50.00	7.30	0.068	0.03	25.00	126.00	0.04
76	157	50.00	3.14	0.068	0.01	25.00	126.00	0.01
81	57	50.00	1.14	0.068	0.00	25.00	126.00	0.00
86	16	50.00	0.32	0.068	0.00	25.00	126.00	0.00
91	4	50.00	0.08	0.068	0.00	25.00	126.00	0.00
96	1	50.00	0.02	0.068	0.00	25.00	126.00	0.00
101	0	50.00	0.00	0.068	0.00	25.00	126.00	0.00
							TOTAL	3.55

Segment =
Q = flow in channel
W = width of channel
q = flow per foot of channel width
S = equilibrium channel slope (see Eqn 707)
qs = C1 * Y C2 * V C3
Eqn 704, sediment transport rate in a channel; cfs/ft of channel width.

$q = Q/W$ Flow per foot of channel width.
$q_s=C_1*Y^{C3}*[(q*n)/(1.486*Se^{1/2})]^{3/5*(C2-C3)}$ Eqn 706 [Eqn 704 combined with Eqn 705 (Manning equation)], sediment transport rate in cfs/ft of channel width.

Parameters Used in Equation 704			
C1	C2	C3	n
5.47E-06	0.004534	3.909	0.04

Paramteters C_1, C_2, and C_3 were calculated for each soil using d_{50} and Table 703A (assuming Gr=1.0). Then the Paramters were weighted using the basin and soils areas.

Washload Calculations

MODIFIED UNIVERSAL SOIL LOSS EQUATION (EQUATION 1307 OF THE MANUAL)

$Y_S=\alpha(VQ_P)^{\beta}KLSCP$

SOIL WT.	126	
α	95	See Section 1301.7.4 of the Manual
β	0.56	See Section 1301.7.4 of the Manual
V	245	See HEC-1 model calculations; drainage areas reduced to eliminate areas of bare rock from calculation.
Q_p	1914	See HEC-1 model calculations; drainage areas reduced to eliminate areas of bare rock from calculation.
K	0.12	Calculated from Table 14 in the Soil Survey of Las Vegas Valley Area Nevada.
LS	16.40	Calculated from Equation 1303 of the Manual
C	0.26	Calculated from Equation 1304 of the Manual with C1, C2, & C3 from Figure 1303 of the Manual; assume 30% ground cover, 10% mulch cover and 20% root network.
P	1.00	See Section 1301.7.3 of the Manual
Ys	**73014 TONS**	
DELIVERY RATIO	0.48	Obtained from Figure 6-2 in the National Engineering Handbook
TRAP EFFICIENCY	0.90	Obtained from Section 3 Chapter 8 in the National Engineering Handbook
AREA	1.723 SQ.MI.	Actual area/Reduced area
Vtotal	**11.5 ACRE-FEET**	

Ys is the sediment yield in tons for a storm event.
α is a coefficient calibrated as 95 for Texas and Nebraska but considered "reasonable" for Nevada
b is a coefficient calibrated as 0.56 for Texas and Nebraska but considered "reasonable" for Nevada
Qp is the storm-event peak flow in cfs.
V is the storm-event runoff volume in ac-ft.
K is the soil-erodibility factor; its value depends on percent of silt, coarse sand, organic matter, soil structure and permeability.
LS is the topographic factor:

For Topological Factor (LS) Calculation:

Xr	So	LS (Eqn 1303)
24900	0.083	16.40247

Xr is the field runoff length; see Section 1301.7.3 of the Manual.
(The runoff length is the distance from the start of overland flow to the start of a well-defined channel or to a slope decrease such that sediment deposition begins.)
So is the surface slope.

C is the crop factor; its value represents the site's vegetative cover protection from rainfall impact.
P is the conservation practice factor which accounts for the effects of contouring and terracing on farmland. This factor is of no significance for undeveloped desert land and the factor may be set equal to 1.0.
Delivery ratio concerns the amount of the predicted sediment loss that actually makes it to the outfall (because of areas of deposition upsream of outlet.)

Total Sediment Load: 15.05 ACRE-FEET

POWER EQUATIONS FOR TOTAL BED MATERIAL DISCHARGE IN SAND- AND FINE-GRAVEL-BED STREAMS

$$q_s = C_1 (Y)^{C_2} (V)^{C_3}$$

d_{50}								
(mm)	0.1	0.25	0.5	1.0	2.0	3.0	4.0	5.0
(inches)	0.00394	0.00984	0.0197	0.0394	0.0787	0.118	0.157	0.197
G_f=1.0								
C_1	3.30×10^{-5}	1.42×10^{-6}	7.6×10^{-6}	5.62×10^{-6}	5.64×10^{-6}	6.32×10^{-6}	7.10×10^{-6}	7.78×10^{-6}
C_2	0.715	0.495	0.28	0.06	-0.14	-0.24	-0.30	-0.34
C_3	3.30	3.61	3.82	3.93	3.95	3.92	3.89	3.87
G_f=2.0								
C_1		1.59×10^{-5}	9.8×10^{-6}	6.94×10^{-6}	6.32×10^{-6}	6.62×10^{-6}	6.94×10^{-6}	
C_2		0.51	0.33	0.12	-0.09	-0.196	-0.27	
C_3		3.55	3.73	3.86	3.91	3.91	3.90	
G_f=3.0								
C_1			1.21×10^{-5}	9.14×10^{-6}	7.44×10^{-6}			
C_2			0.36	0.18	-0.02			
C_3			3.66	3.76	3.86			
G_f=4.0								
C_1				1.0510^{-5}				
C_2				0.21				
C_3				3.71				

Definitions: q_s=Unit sediment transport rate in ft^2/s (unbulked); V=Velocity in ft/s; Y=Depth in ft; G_f=Gradation coefficient = $(d_{84}/d_{50} + d_{50}/d_{16})/2$.

Revision	Date

REFERENCE:

TABLE 703A

Soil Characteristics for Sediment Loss Calculations										
For bedload calculations								For washload calculations		
Drainage Area	Soil Number [1]	Land Use	Area (ac.)	d_{50} mm	C_1	C_2	C_3	Drainage Area	Area	Weighted K Factor
					Use G_r = 1.0					
1-1A [6]	112	Desert shrub (poor condition)	0.20	4.750	7.61E-06	-0.33	3.875	1-1A [6]	0.20	0.1
	155	Desert shrub (poor condition)	324.93	0.350	0.00000389	0.41	3.69		324.93	0.2
	191	Desert shrub (poor condition)	88.99	0.875	0.00000612	0.115	3.903		88.99	0.1
	360	Desert shrub (poor condition)	1033.49	2.000	0.00000564	-0.14	3.95		1033.49	0.1
	640	Rock Outcrop	23.26	NA	NA	NA	NA		-	-
	351	Desert shrub (poor condition)	6.30	NA	NA	NA	NA		6.30	0.05
	323	Desert shrub (poor condition)	15.37	NA	NA	NA	NA		15.37	0.05
Total			1492.54		5.27698E-06	-0.001	3.89	Total	1447.61	0.12
1-1B [6]	SOILS DATA REFERENCED FROM SUMMERLIN WEST		111.81	NA	0.00000612	0.41	3.95	1-1B [6]	41.60	**0.2
	C1, C2, AND C3 VALUES ARE MOST CONSERVATIVE VALUES FOR THE BASIN							UNDEVELOPED AREA REFERENCED FROM SUMMERLIN WEST		
1-2A [6]	155	Desert shrub (poor condition)	5.62	0.350	0.00000389	0.41	3.69	1-2A [6]	5.62	0.2
	360	Desert shrub (poor condition)	525.50	2.000	0.00000564	-0.14	3.95		525.50	0.1
	502	Desert shrub (poor condition)	21.56	0.425	0.000005746	0.3445	3.757		21.56	0.1
Total			552.68		5.62633E-06	-0.116	3.94	Total	552.68	0.10
1-2B [6]	SOILS DATA REFERENCED FROM SUMMERLIN WEST		137.70	NA	0.00000612	0.41	3.95	1-2B [6]	28.20	**0.2
	C1, C2, AND C3 VALUES ARE MOST CONSERVATIVE VALUES FOR THE BASIN							UNDEVELOPED AREA REFERENCED FROM SUMMERLIN WEST		
1-2CR [6]	155	Desert shrub (poor condition)	12.21	0.350	0.00000389	0.41	3.69	1-2CR [6]	12.21	0.2
	360	Desert shrub (poor condition)	340.80	2.000	0.00000564	-0.14	3.95		340.80	0.1
	502	Desert shrub (poor condition)	51.74	0.425	0.000005746	0.3445	3.757		51.74	0.1
Total			404.75		5.60074E-06	-0.061	3.92	Total	404.75	0.10
Total					**5.47E-06**	**0.004534**	**3.909**	**Weighted total for all subbasins:**		**0.116**
NOTES:										

1. From the Custom Soils Resource Report

2. From Table 602 in the *Manual; revised for the washload flow calculations.*

6. The drainage area to the Village 26 proposed debris basin.

7. Actual area of soil 360 has been reduced by one-half because this soil is 50% bare rock and will not contribute sediment to the washload.

** ASSUMES MOST CONSERVATIVE CN AND K FACTOR FOR UNDEVELOPED PORTION; DEVELOPED PORTIONS OF THE SITE HAVE BEEN REMOVED IN THE HEC-1 MODEL FOR W/

Village 26 Area Reduction Curve Number Calculations

Drainage Area	Soil Number	Land Use	CN	Area [ac]
1-1A [6]	112	Desert shrub (poor condition)	63.0	0.20
	155	Desert shrub (poor condition)	88.0	324.93
	191	Desert shrub (poor condition)	63.0	88.99
	360	Desert shrub (poor condition)	86.3	1033.49
	640	Rock Outcrop	91.6	23.26
	351	Desert shrub (poor condition)	88.2	6.30
	323	Desert shrub (poor condition)	88.6	15.37
Total			85.4	1492.54
AREA IS REFERENCED UNDEVELOPED FROM SUMMERLIN WEST				
1-1B [6]	155	Desert shrub (poor condition)	88.0	41.60
	191	Desert shrub (poor condition)	63.0	0.00
ASSUME FOR HIGHEST CURVE #	360	Desert shrub (poor condition)	86.3	0.00
Total			88.0	41.60
1-2A [6]	155	Desert shrub (poor condition)	88.0	5.62
	360	Desert shrub (poor condition)	86.3	525.50
	502	Desert shrub (poor condition)	73.0	21.56
Total			85.8	552.68
AREA IS REFERENCED UNDEVELOPED FROM SUMMERLIN WEST				
1-2B [6]	155	Desert shrub (poor condition)	88.0	28.20
	191	Desert shrub (poor condition)	63.0	0.00
ASSUME FOR HIGHEST CURVE #	360	Desert shrub (poor condition)	86.3	0.00
	502	Desert shrub (poor condition)	73.0	0.00
Total			88.0	28.20
1-2CR [6]	155	Desert shrub (poor condition)	88.0	12.213
	360	Desert shrub (poor condition)	86.3	340.797
	502	Desert shrub (poor condition)	73.0	51.737
Total			84.7	404.75

THE ABOVE CN VALUES ARE USED IN THE REDUCED AREA HEC-1

Area reduction from rock outcrop (50% of soil 360, 90% of soil 640, and 15% of soil 323, and 4% of soil 351)

Soil	Soil Area [ac]	Total Basin Area [ac]	Formula for Area of Rock Outcrop [% Rock Outcrop X Soil Area / Total Basin Area]	Total Rock Outcrop [%]	Total Erosive Area [%]	Total Reduced Area [ac]
1-1A		1492.5	(90% X 23.26 + 50% X 1033.49 + 4% X 6.3 + 15% X 15.37) / 1492.54	36.20%	63.80%	952.30
112	0.20					
155	324.93					
191	88.99					
360	1033.49					
640	23.26					
351	6.30					
323	15.37					
1-1B		41.6	(0) / (41.6)	0.00	100.00	41.60
155	41.60	(SOIL 155 ASSUMED FOR HIGHEST K VALUE)				
191	0.00					
360	0.00					
1-2A		552.68	(50% X 525.50) / 552.7)	47.54%	52.46%	289.93
155	5.62					
360	525.50					
502	21.56					
1-2B		28.20	0 / 28.2	0	100	28.2
155	28.20	(SOIL 155 ASSUMED FOR HIGHEST K VALUE)				
191	0.00					
360	0.00					
502	0.00					
1-2CR		404.7	(50% X 340.797) / (367.2)	42.10%	57.90%	234.349
155	12.213					
360	340.797					
502	51.737					

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

GCW ENGINEERS \ SURVEYORS

Summerlin Village 26
Reverence
Ultimate Conditions -REVISED AREAS

Project No: 764-204-011
Date: 08/24/15
Calculated by: JYA

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG: (1)	DEV./EX. (D or E)	CN (16)	K (2)	AREA Ac (3)	AREA Sq Mi (4)	INITIAL LENGTH Feet (5)	SLOPE % (6)	Ti Min (7)	TRAVEL LENGTH Feet (8)	SLOPE % (9a)	V1 VELOCITY fps (9b)	V2 VELOCITY fps (10)	Tt Min (11)	TOTAL LENGTH Feet (12)	Tc = (L/180)+10 Min (13)	Min (14)	Tlag = 0.6Tc/60 Hours (15)	Rainfall (in)
1-1A*	E	85.4	0.7373	952.3	1.4880	500	34.0	4.5	14575	8.4	4.3	8.5	29.5	15075	N/A	34.0	**0.488**	3.67
1-1B*	D	78.3	0.6436	41.6	0.0650	100	1.0	8.2	4775	8.5	5.9	8.9	9.4	4875	37.1	17.6	**0.176**	3.61
1-2A*	E	85.8	0.7426	289.9	0.4530	500	56.0	3.8	5905	17.4	6.2	12.3	8.7	6405	N/A	12.5	**0.125**	3.55
1-2B*	D	82.6	0.7003	28.2	0.0441	100	1.0	7.2	5100	7.5	5.5	8.4	10.7	5200	38.9	17.8	**0.178**	3.51
1-2CR*	E	84.7	0.7280	234.4	0.3662	500	52.0	4.0	9505	16.3	6.0	11.9	14.0	10005	N/A	18.0	**0.180**	3.46

Tc = Ti + Tt Tlag = 0.6 Tc

$Ti = 1.8\ (1.1 - K)\ L^{1/2} / S^{1/3}$

K = 0.0132 (CN) - 0.39

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing: $V1 = 14.8*(S/100)^{1/2}$ $V2 = 29.4*(S/100)^{1/2}$

Developed: $V1 = 20.2*(S/100)^{1/2}$ $V2 = 30.6*(S/100)^{1/2}$

* Basin paramaters referenced from the Summerlin West MPU

REFERENCE:

STANDARD FORM 4

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1*****************************************                 ****************************************
 *                                       *                 *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                 *    U.S. ARMY CORPS OF ENGINEERS      *
 *              JUN   1998               *                 *    HYDROLOGIC ENGINEERING CENTER     *
 *           VERSION 4.1                 *                 *          609 SECOND STREET           *
 *                                       *                 *       DAVIS, CALIFORNIA 95616        *
 *  RUN DATE   24AUG15  TIME  14:25:42   *                 *           (916) 756-1104             *
 *                                       *                 *                                      *
 *****************************************                 ****************************************


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


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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                                  HEC-1 INPUT                                                  PAGE  1

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

                      *DIAGRAM
 *** FREE ***
           1          ID   ******************************************************************
           2          ID   * ................................................................ *
           3          ID   * :              SUMMERLIN VILLAGE 26 REVERENCE                 : *
           4          ID   * :                  ULTIMATE CONDITION                         : *
           5          ID   * :       THIS MODEL DETERMINES THE REVISED RUNOFF DURING       : *
           6          ID   * :                 FOR THE DEBRIS BASIN                        : *
           7          ID   * :................................................................: *
           8          ID   * :               RETURN PERIOD_ _ _ _100-YEAR                   : *
           9          ID   * :               DISTRIBUTION_ _ _ _ 6-HOUR SDN3                : *
          10          ID   * :               PROJECT NO_ _ _ _ _ 764.204.011                : *
          11          ID   * :               FILENAME_ _ _ _ _ _ REV_V26ULT.H1              : *
          12          ID   * :               DATE_ _ _ _ _ _ _ _ 8/21/2015                  : *
          13          ID   * :               MODELED BY_ _ _ _ _ DBC                        : *
          14          ID   * :                                                              : *
          15          ID   * :              DEPTH AREA REDUCTION FACTORS:                   : *
          16          ID   * :                AREA                DARF                      : *
          17          ID   * :              0.00 TO 0.24 SQ MI     1.00                     : *
          18          ID   * :              0.25 TO 0.49 SQ MI     0.99                     : *
          19          ID   * :              0.50 TO 0.99 SQ MI     0.98                     : *
          20          ID   * :              1.00 TO 1.24 SQ MI     0.97                     : *
          21          ID   * :              1.25 TO 1.50 SQ MI     0.96                     : *
          22          ID   * :              1.51 TO 1.74 SQ MI     0.95                     : *
          23          ID   * :              1.75 TO 1.99 SQ MI     0.94                     : *
          24          ID   * :              2.00 TO 2.99 SQ MI     0.93                     : *
          25          ID   * :              3.00 TO 3.99 SQ MI     0.92                     : *
          26          ID   * :              4.00 TO 4.99 SQ MI     0.91                     : *
          27          ID   * :................................................................: *
          28          ID   ******************************************************************
          29          ID
          30          ID
          31          IT       5       0       0     300
          32          IO       5
          33          IN       5       0       0
          34          JR    PREC     1.0    0.99    0.98    0.94    0.93    0.92    0.91
                      *

          35          KK    1-1A
          36          BA   1.488
          37          PB    3.67
          38          PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
          39          PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
          40          PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
          41          PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
          42          PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
          43          PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
          44          PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
          45          PC   .9980   .9990   1.000
          46          LS       0    85.4
          47          UD   0.488
                      *
1                                                  HEC-1 INPUT                                                  PAGE  2

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


          48          KK    1-1B
          49          PB    3.61
          50          BA   0.065
          51          LS       0    78.3
```

```
 52          UD    .176
             *

 53          KK      R2
 54          KM   ROUTE 1-1B THROUGH PORTION OF 1-1A
 55          KM   ASSUME EXISTING WASH
 56          KM     LEN   SLOPE     n              SHAPE      BW      SS
 57          RD    1885  0.0680    0.04       0    TRAP      20      10
             *

 58          KK     CP1
 59          KM    COMBINE 1-1A AND R2
 60          HC       2
             *

 61          KK      R3
 62          KM   ROUTE CP1 THROUGH 1-2B TO CP2
 63          KM   ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 64          KM   NSTEPS      K      X
 65          RM       1    .092     .15
             *

 66          KK    1-2A
 67          PB    3.55
 68          BA   0.453
 69          LS       0    85.8
 70          UD    .125
             *

 71          KK      R4
 72          KM   ROUTE 1-2A THROUGH 1-2B TO CP2
 73          KM   ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 74          KM   NSTEPS      K      X
 75          RM       1    .054     .15
             *

 76          KK    1-2B
 77          PB    3.51
 78          BA  0.0441
 79          LS       0    82.6
 80          UD    .178
             *

 81          KK     CP2
 82          KM    COMBINE 1-2B, R4 AND R3
 83          HC       3
             *
1                                          HEC-1 INPUT                                                    PAGE  3

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

 84          KK      R5
 85          KM   ROUTE CP2 THROUGH 1-2C TO CP3
 86          KM   ASSUME EXISTING WASH
 87          KM   NSTEPS      K      X
 88          RM       1    .087     .15
             *

 89          KK   1-2CR
 90          PB    3.46
 91          BA  0.3662
 92          LS       0    84.7
 93          UD    .180
             *

 94          KK     CP3
 95          KM    COMBINE 1-2C AND R5
 96          KO       1
 97          HC       2
             *
 98          ZZ
1
             SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE     (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   35        1-1A
               .
               .
   48          .        1-1B
               .           V
               .           V
   53          .          R2
               .           .
               .           .
   58        CP1............
               V
               V
   61         R3
               .
               .
   66          .        1-2A
               .           V
               .           V
   71          .          R4
               .           .
```

```
                .           .
   76           .           .        1-2B
                .           .           .
                .           .           .
   81         CP2.....................
                V
                V
   84           R5
                .
                .
   89           .       1-2CR
                .           .
                .           .
   94         CP3............
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN   1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   24AUG15  TIME  14:25:42   *
*                                       *
*****************************************
```

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

```
*************************************************************
* ......................................................... *
* :            SUMMERLIN VILLAGE 26 REVERENCE             : *
* :                 ULTIMATE CONDITION                    : *
* :       THIS MODEL DETERMINES THE REVISED RUNOFF DURING  : *
* :                 FOR THE DEBRIS BASIN                  : *
* :.....................................................: *
* :            RETURN PERIOD_ _ _ _100-YEAR               : *
* :            DISTRIBUTION_ _ _ _ _6-HOUR SDN3           : *
* :            PROJECT NO_ _ _ _ _ 764.204.011            : *
* :            FILENAME_ _ _ _ _ _ REV_V26ULT.H1          : *
* :            DATE_ _ _ _ _ _ _ _ 8/21/2015              : *
* :            MODELED BY_ _ _ _ _ DBC                    : *
* :                                                       : *
* :            DEPTH AREA REDUCTION FACTORS:              : *
* :              AREA                DARF                 : *
* :            0.00 TO 0.24 SQ MI     1.00                : *
* :            0.25 TO 0.49 SQ MI     0.99                : *
* :            0.50 TO 0.99 SQ MI     0.98                : *
* :            1.00 TO 1.24 SQ MI     0.97                : *
* :            1.25 TO 1.50 SQ MI     0.96                : *
* :            1.51 TO 1.74 SQ MI     0.95                : *
* :            1.75 TO 1.99 SQ MI     0.94                : *
* :            2.00 TO 2.99 SQ MI     0.93                : *
* :            3.00 TO 3.99 SQ MI     0.92                : *
* :            4.00 TO 4.99 SQ MI     0.91                : *
* :.....................................................: *
*************************************************************
```

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

    IT           HYDROGRAPH TIME DATA
                      NMIN           5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1    0  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ         300  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2    0  ENDING DATE
                    NDTIME        0055  ENDING TIME
                     ICENT          19  CENTURY MARK

                   COMPUTATION INTERVAL      .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

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

    JP           MULTI-PLAN OPTION
                      NPLAN           1  NUMBER OF PLANS

    JR           MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                   1.00       .99       .98       .94       .93       .92       .91
```

*** ***

```
          **************
          *            *
94 KK     *      CP3   *
          *            *
          **************

96 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

97 HC          HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                  ***
```

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = 1.00

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	108.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	89.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	74.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	61.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	50.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	40.	1		1255	156	0.	1		1910	231	0.
1		0030	7	2.	1		0645	82	32.	1		1300	157	0.	1		1915	232	0.
1		0035	8	6.	1		0650	83	25.	1		1305	158	0.	1		1920	233	0.
1		0040	9	11.	1		0655	84	20.	1		1310	159	0.	1		1925	234	0.
1		0045	10	14.	1		0700	85	15.	1		1315	160	0.	1		1930	235	0.
1		0050	11	14.	1		0705	86	12.	1		1320	161	0.	1		1935	236	0.
1		0055	12	13.	1		0710	87	9.	1		1325	162	0.	1		1940	237	0.
1		0100	13	13.	1		0715	88	7.	1		1330	163	0.	1		1945	238	0.
1		0105	14	14.	1		0720	89	5.	1		1335	164	0.	1		1950	239	0.
1		0110	15	15.	1		0725	90	4.	1		1340	165	0.	1		1955	240	0.
1		0115	16	18.	1		0730	91	3.	1		1345	166	0.	1		2000	241	0.
1		0120	17	21.	1		0735	92	2.	1		1350	167	0.	1		2005	242	0.
1		0125	18	25.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	33.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	47.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	63.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	77.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	87.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	91.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	90.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	88.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	89.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	101.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	121.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	143.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	155.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	155.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	157.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	171.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	190.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	196.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	193.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	208.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	260.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	361.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	544.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	843.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1254.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1691.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	1980.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	2105.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	2130.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	2119.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	2078.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	2007.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1891.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1719.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1526.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1346.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1204.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1109.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1040.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	972.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	914.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	881.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	847.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	796.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	729.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	663.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	597.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	533.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	472.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	410.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	349.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	296.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	253.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	216.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	182.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0605	74	154.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	129.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW	6-HR	24-HR	72-HR	24.92-HR
		(CFS)				
2130.	3.83		551.	138.	133.	133.
		(INCHES)	2.120	2.126	2.126	2.126
		(AC-FT)	273.	274.	274.	274.

CUMULATIVE AREA = 2.42 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .99

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	107.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	88.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	73.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	60.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	49.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	40.	1		1255	156	0.	1		1910	231	0.
1		0030	7	1.	1		0645	82	32.	1		1300	157	0.	1		1915	232	0.
1		0035	8	5.	1		0650	83	25.	1		1305	158	0.	1		1920	233	0.
1		0040	9	10.	1		0655	84	19.	1		1310	159	0.	1		1925	234	0.
1		0045	10	13.	1		0700	85	15.	1		1315	160	0.	1		1930	235	0.
1		0050	11	13.	1		0705	86	11.	1		1320	161	0.	1		1935	236	0.
1		0055	12	12.	1		0710	87	9.	1		1325	162	0.	1		1940	237	0.
1		0100	13	12.	1		0715	88	7.	1		1330	163	0.	1		1945	238	0.
1		0105	14	13.	1		0720	89	5.	1		1335	164	0.	1		1950	239	0.
1		0110	15	14.	1		0725	90	4.	1		1340	165	0.	1		1955	240	0.
1		0115	16	17.	1		0730	91	3.	1		1345	166	0.	1		2000	241	0.
1		0120	17	20.	1		0735	92	2.	1		1350	167	0.	1		2005	242	0.
1		0125	18	24.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	32.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	46.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	61.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	75.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	84.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	88.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	87.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	85.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	87.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	98.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	118.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	140.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	152.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	152.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	153.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	167.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	185.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	192.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	189.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	204.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	255.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	354.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	534.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	828.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1233.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1664.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	1950.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	2073.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	2098.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	2088.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	2048.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1979.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1864.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1695.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1505.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1328.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1188.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1095.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1027.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	960.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	903.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	870.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	837.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	786.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	720.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	655.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	590.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	527.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	466.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	405.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	345.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	292.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	250.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	213.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	180.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.

1	0605	74	152.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	128.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
2098.	3.83	543.	136.	131.	131.
		(INCHES) 2.088	2.094	2.094	2.094
		(AC-FT) 269.	270.	270.	270.

CUMULATIVE AREA = 2.42 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .98

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	105.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	87.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	72.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	60.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	49.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	39.	1		1255	156	0.	1		1910	231	0.
1		0030	7	1.	1		0645	82	31.	1		1300	157	0.	1		1915	232	0.
1		0035	8	5.	1		0650	83	25.	1		1305	158	0.	1		1920	233	0.
1		0040	9	9.	1		0655	84	19.	1		1310	159	0.	1		1925	234	0.
1		0045	10	12.	1		0700	85	15.	1		1315	160	0.	1		1930	235	0.
1		0050	11	12.	1		0705	86	11.	1		1320	161	0.	1		1935	236	0.
1		0055	12	11.	1		0710	87	9.	1		1325	162	0.	1		1940	237	0.
1		0100	13	11.	1		0715	88	7.	1		1330	163	0.	1		1945	238	0.
1		0105	14	12.	1		0720	89	5.	1		1335	164	0.	1		1950	239	0.
1		0110	15	13.	1		0725	90	4.	1		1340	165	0.	1		1955	240	0.
1		0115	16	16.	1		0730	91	3.	1		1345	166	0.	1		2000	241	0.
1		0120	17	19.	1		0735	92	2.	1		1350	167	0.	1		2005	242	0.
1		0125	18	22.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	30.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	44.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	59.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	72.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	81.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	85.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	85.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	83.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	84.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	95.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	115.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	136.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	148.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	148.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	150.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	164.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	181.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	188.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	185.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	199.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	250.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	347.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	524.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	814.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1213.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1638.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	1920.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	2042.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	2067.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	2058.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	2018.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1951.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1838.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1671.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1484.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1309.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1172.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1080.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1013.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	947.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	891.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	859.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	826.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	776.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	711.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	647.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	583.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	520.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	460.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	400.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	341.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	288.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	247.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	210.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	178.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.

1	0605	74	150.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	126.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*					

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
2067.	3.83	535.	134.	129.	129.
		(INCHES) 2.057	2.062	2.062	2.062
		(AC-FT) 265.	266.	266.	266.

CUMULATIVE AREA = 2.42 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .94

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	100.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	83.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	69.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	57.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	46.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	37.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	1.	*	1		0645	82	30.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	3.	*	1		0650	83	23.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	6.	*	1		0655	84	18.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	8.	*	1		0700	85	14.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	9.	*	1		0705	86	11.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	8.	*	1		0710	87	8.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	8.	*	1		0715	88	6.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	9.	*	1		0720	89	5.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	10.	*	1		0725	90	3.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	12.	*	1		0730	91	3.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	15.	*	1		0735	92	2.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	18.	*	1		0740	93	1.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	25.	*	1		0745	94	1.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	37.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	51.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	63.	*	1		0800	97	0.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	71.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	75.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	74.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	73.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	74.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	84.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	103.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	122.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	133.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	134.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	135.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	149.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	165.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	171.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	169.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	182.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	229.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	320.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	485.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	757.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1133.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	1534.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	1802.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	1919.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	1945.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	1937.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	1901.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	1839.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	1733.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	1577.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	1401.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	1237.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	1107.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	1022.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	959.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	897.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.
1		0450	59	844.	*	1		1105	134	0.	*	1		1720	209	0.	*	1		2335	284	0.
1		0455	60	814.	*	1		1110	135	0.	*	1		1725	210	0.	*	1		2340	285	0.
1		0500	61	783.	*	1		1115	136	0.	*	1		1730	211	0.	*	1		2345	286	0.
1		0505	62	736.	*	1		1120	137	0.	*	1		1735	212	0.	*	1		2350	287	0.
1		0510	63	675.	*	1		1125	138	0.	*	1		1740	213	0.	*	1		2355	288	0.
1		0515	64	614.	*	1		1130	139	0.	*	1		1745	214	0.	*	2		0000	289	0.
1		0520	65	553.	*	1		1135	140	0.	*	1		1750	215	0.	*	2		0005	290	0.
1		0525	66	494.	*	1		1140	141	0.	*	1		1755	216	0.	*	2		0010	291	0.
1		0530	67	437.	*	1		1145	142	0.	*	1		1800	217	0.	*	2		0015	292	0.
1		0535	68	380.	*	1		1150	143	0.	*	1		1805	218	0.	*	2		0020	293	0.
1		0540	69	324.	*	1		1155	144	0.	*	1		1810	219	0.	*	2		0025	294	0.
1		0545	70	274.	*	1		1200	145	0.	*	1		1815	220	0.	*	2		0030	295	0.
1		0550	71	234.	*	1		1205	146	0.	*	1		1820	221	0.	*	2		0035	296	0.
1		0555	72	200.	*	1		1210	147	0.	*	1		1825	222	0.	*	2		0040	297	0.
1		0600	73	169.	*	1		1215	148	0.	*	1		1830	223	0.	*	2		0045	298	0.

1	0605	74	142.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	120.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
1945.	3.83	502.	126.	121.	121.
		(INCHES) 1.932	1.937	1.937	1.937
		(AC-FT) 249.	250.	250.	250.

CUMULATIVE AREA = 2.42 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1 RATIO = .93

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	99.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	82.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	68.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	56.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	46.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	37.	1		1255	156	0.	1		1910	231	0.
1		0030	7	1.	1		0645	82	29.	1		1300	157	0.	1		1915	232	0.
1		0035	8	2.	1		0650	83	23.	1		1305	158	0.	1		1920	233	0.
1		0040	9	5.	1		0655	84	18.	1		1310	159	0.	1		1925	234	0.
1		0045	10	8.	1		0700	85	14.	1		1315	160	0.	1		1930	235	0.
1		0050	11	8.	1		0705	86	11.	1		1320	161	0.	1		1935	236	0.
1		0055	12	7.	1		0710	87	8.	1		1325	162	0.	1		1940	237	0.
1		0100	13	8.	1		0715	88	6.	1		1330	163	0.	1		1945	238	0.
1		0105	14	8.	1		0720	89	5.	1		1335	164	0.	1		1950	239	0.
1		0110	15	9.	1		0725	90	3.	1		1340	165	0.	1		1955	240	0.
1		0115	16	11.	1		0730	91	2.	1		1345	166	0.	1		2000	241	0.
1		0120	17	14.	1		0735	92	2.	1		1350	167	0.	1		2005	242	0.
1		0125	18	17.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	24.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	35.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	49.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	60.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	69.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	72.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	72.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	70.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	72.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	82.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	100.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	119.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	130.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	130.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	132.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	145.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	161.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	167.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	165.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	178.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	224.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	313.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	475.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	743.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1113.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1509.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	1772.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	1888.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	1914.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	1907.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	1872.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1811.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1707.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1554.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1380.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1219.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1091.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1007.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	945.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	884.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	832.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	803.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	772.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	726.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	666.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	606.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	546.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	487.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	431.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	375.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	319.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	270.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	231.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	197.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	167.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.

1	0605	74	141.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	118.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
1914.	3.83		494.	124.	119.	119.
		(INCHES)	1.901	1.906	1.906	1.906
		(AC-FT)	245.	246.	246.	246.

CUMULATIVE AREA = 2.42 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .92

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	97.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	81.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	67.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	55.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	45.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	37.	1		1255	156	0.	1		1910	231	0.
1		0030	7	0.	1		0645	82	29.	1		1300	157	0.	1		1915	232	0.
1		0035	8	2.	1		0650	83	23.	1		1305	158	0.	1		1920	233	0.
1		0040	9	5.	1		0655	84	18.	1		1310	159	0.	1		1925	234	0.
1		0045	10	7.	1		0700	85	14.	1		1315	160	0.	1		1930	235	0.
1		0050	11	7.	1		0705	86	10.	1		1320	161	0.	1		1935	236	0.
1		0055	12	7.	1		0710	87	8.	1		1325	162	0.	1		1940	237	0.
1		0100	13	7.	1		0715	88	6.	1		1330	163	0.	1		1945	238	0.
1		0105	14	7.	1		0720	89	5.	1		1335	164	0.	1		1950	239	0.
1		0110	15	8.	1		0725	90	3.	1		1340	165	0.	1		1955	240	0.
1		0115	16	10.	1		0730	91	2.	1		1345	166	0.	1		2000	241	0.
1		0120	17	13.	1		0735	92	2.	1		1350	167	0.	1		2005	242	0.
1		0125	18	16.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	23.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	34.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	47.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	58.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	66.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	70.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	69.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	68.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	70.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	79.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	97.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	115.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	126.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	127.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	129.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	141.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	157.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	163.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	161.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	174.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	219.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	306.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	466.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	729.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1093.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1483.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	1743.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	1858.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	1884.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	1877.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	1843.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1783.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1681.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1530.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1360.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1201.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1075.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	992.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	932.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	871.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	820.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	791.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	762.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	716.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	657.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	597.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	538.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	481.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	425.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	370.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	315.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	267.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	228.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	195.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	165.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0605	74	139.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	117.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW (CFS)	TIME (HR)	MAXIMUM AVERAGE FLOW	6-HR	24-HR	72-HR	24.92-HR
		(CFS)				
1884.	3.83		486.	122.	117.	117.
		(INCHES)	1.871	1.874	1.874	1.874
		(AC-FT)	241.	242.	242.	242.

CUMULATIVE AREA = 2.42 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	96.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	80.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	66.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	55.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	45.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	36.	1		1255	156	0.	1		1910	231	0.
1		0030	7	0.	1		0645	82	29.	1		1300	157	0.	1		1915	232	0.
1		0035	8	2.	1		0650	83	23.	1		1305	158	0.	1		1920	233	0.
1		0040	9	4.	1		0655	84	17.	1		1310	159	0.	1		1925	234	0.
1		0045	10	6.	1		0700	85	13.	1		1315	160	0.	1		1930	235	0.
1		0050	11	6.	1		0705	86	10.	1		1320	161	0.	1		1935	236	0.
1		0055	12	6.	1		0710	87	8.	1		1325	162	0.	1		1940	237	0.
1		0100	13	6.	1		0715	88	6.	1		1330	163	0.	1		1945	238	0.
1		0105	14	6.	1		0720	89	4.	1		1335	164	0.	1		1950	239	0.
1		0110	15	7.	1		0725	90	3.	1		1340	165	0.	1		1955	240	0.
1		0115	16	10.	1		0730	91	2.	1		1345	166	0.	1		2000	241	0.
1		0120	17	12.	1		0735	92	2.	1		1350	167	0.	1		2005	242	0.
1		0125	18	15.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	21.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	32.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	45.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	56.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	64.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	67.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	67.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	66.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	67.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	77.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	94.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	112.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	122.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	123.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	125.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	137.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	153.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	159.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	157.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	170.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	214.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	299.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	456.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	714.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1073.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1457.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	1714.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	1827.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	1853.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	1847.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	1813.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1755.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1655.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1507.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1339.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1183.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1059.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	978.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	918.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	859.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	809.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	780.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	751.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	706.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	648.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	589.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	531.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	474.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	420.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	365.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	311.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	263.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	225.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	192.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	162.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.

```
    1     0605   74      137.   *    1     1220  149        0.   *    1     1835  224        0.   *    2     0050  299        0.
    1     0610   75      115.   *    1     1225  150        0.   *    1     1840  225        0.   *    2     0055  300        0.
                                *                                   *                                   *
**********************************************************************************************************************************
```

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
1853.	3.83	478.	120.	115.	115.
		(INCHES) 1.840	1.843	1.843	1.843
		(AC-FT) 237.	238.	238.	238.

CUMULATIVE AREA = 2.42 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .99	RATIO 3 .98	RATIO 4 .94	RATIO 5 .93	RATIO 6 .92	RATIO 7 .91
HYDROGRAPH AT											
+	1-1A	1.49	1	FLOW	1617.	1594.	1571.	1479.	1456.	1433.	1410.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT											
+	1-1B	.06	1	FLOW	84.	83.	81.	75.	74.	73.	71.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO											
+	R2	.06	1	FLOW	82.	80.	78.	74.	72.	71.	69.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT											
+	CP1	1.55	1	FLOW	1667.	1644.	1620.	1525.	1502.	1478.	1454.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO											
+	R3	1.55	1	FLOW	1628.	1605.	1581.	1489.	1465.	1442.	1419.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT											
+	1-2A	.45	1	FLOW	831.	819.	808.	762.	751.	739.	728.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO											
+	R4	.45	1	FLOW	795.	784.	772.	727.	716.	705.	694.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	1-2B	.04	1	FLOW	65.	64.	63.	59.	58.	57.	56.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT											
+	CP2	2.05	1	FLOW	1911.	1883.	1856.	1747.	1720.	1693.	1666.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO											
+	R5	2.05	1	FLOW	1889.	1861.	1834.	1727.	1700.	1674.	1647.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT											
+	1-2CR	.37	1	FLOW	565.	556.	548.	515.	507.	498.	490.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT											
+	CP3	2.42	1	FLOW	2130.	2098.	2067.	1945.	1914.	1884.	1853.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83

1

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .00									
R2	MANE	4.50	83.32	220.50	1.60	5.00	82.20	220.00	1.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5557E+01 EXCESS= .0000E+00 OUTFLOW= .5559E+01 BASIN STORAGE= .1081E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00									
R2	MANE	4.75	79.71	223.25	1.57	5.00	79.51	220.00	1.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5454E+01 EXCESS= .0000E+00 OUTFLOW= .5457E+01 BASIN STORAGE= .1221E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00									
R2	MANE	4.75	78.39	223.25	1.55	5.00	78.11	220.00	1.54

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5357E+01 EXCESS= .0000E+00 OUTFLOW= .5361E+01 BASIN STORAGE= .1210E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00

R2	MANE	4.50	74.75	220.50	1.44	5.00	73.67	220.00	1.44

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4982E+01 EXCESS= .0000E+00 OUTFLOW= .4985E+01 BASIN STORAGE= .1025E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00

R2	MANE	4.50	73.33	220.50	1.41	5.00	72.26	220.00	1.41

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4888E+01 EXCESS= .0000E+00 OUTFLOW= .4891E+01 BASIN STORAGE= .1016E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00

R2	MANE	4.50	71.92	220.50	1.38	5.00	70.85	220.00	1.39

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4794E+01 EXCESS= .0000E+00 OUTFLOW= .4797E+01 BASIN STORAGE= .1006E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00

R2	MANE	4.50	70.51	220.50	1.36	5.00	69.45	220.00	1.36

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4700E+01 EXCESS= .0000E+00 OUTFLOW= .4703E+01 BASIN STORAGE= .9965E-03 PERCENT ERROR= -.1

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

DATE _____

CLIENT _____ JOB NO _____ CALC BY _____

DESCRIPTION Sieve Analysis (Percent passing) CHECKED BY _____

Soil	Sieve size #4 (4.75mm)	#10 (2.02mm)	#40 (0.425mm)	#200 (0.075)
155	80 %	65 %	55 %	33 %
191	63 %	55 %	45 %	25 %
360	58 %	48 %	38 %	15 %
502	70 %	65 %	50 %	28 %
112	50 %	40 %	22.5 %	10 %
132	N/A			
135	N/A			

G. C. WALLACE, INC.

DATE _____

CLIENT _____ JOB NO _____ CALC BY _____

DESCRIPTION Topographic Factor CHECKED BY _____

From Equation 1303 from the Manual

$x = 24900$

$S_o = 0.083$

$$LS = \sqrt{x}\,(0.0076 + 0.533 S_o + 7.6 S_o^2)$$

$$= \sqrt{24900}\,(0.0076 + 0.533(0.083) + 7.6(0.083)^2)$$

$$LS = 157.80\,(0.0076 + 0.044239 + 0.05236)$$

$$LS = 16.40$$

EN-3-N
3/66

G. C. WALLACE, INC.
Engineers/Planners/Surveyors

SHEET ____ OF ____

DATE _____

CLIENT _____ JOB NO _____ CALC BY _____

DESCRIPTION Summerlin Village 26 CHECKED BY _____

Debris Basin

$C = C_I \, C_{II} \, C_{III}$

$C_I = 0.77$

$C_{II} = 0.77$

$C_{III} = 0.44$

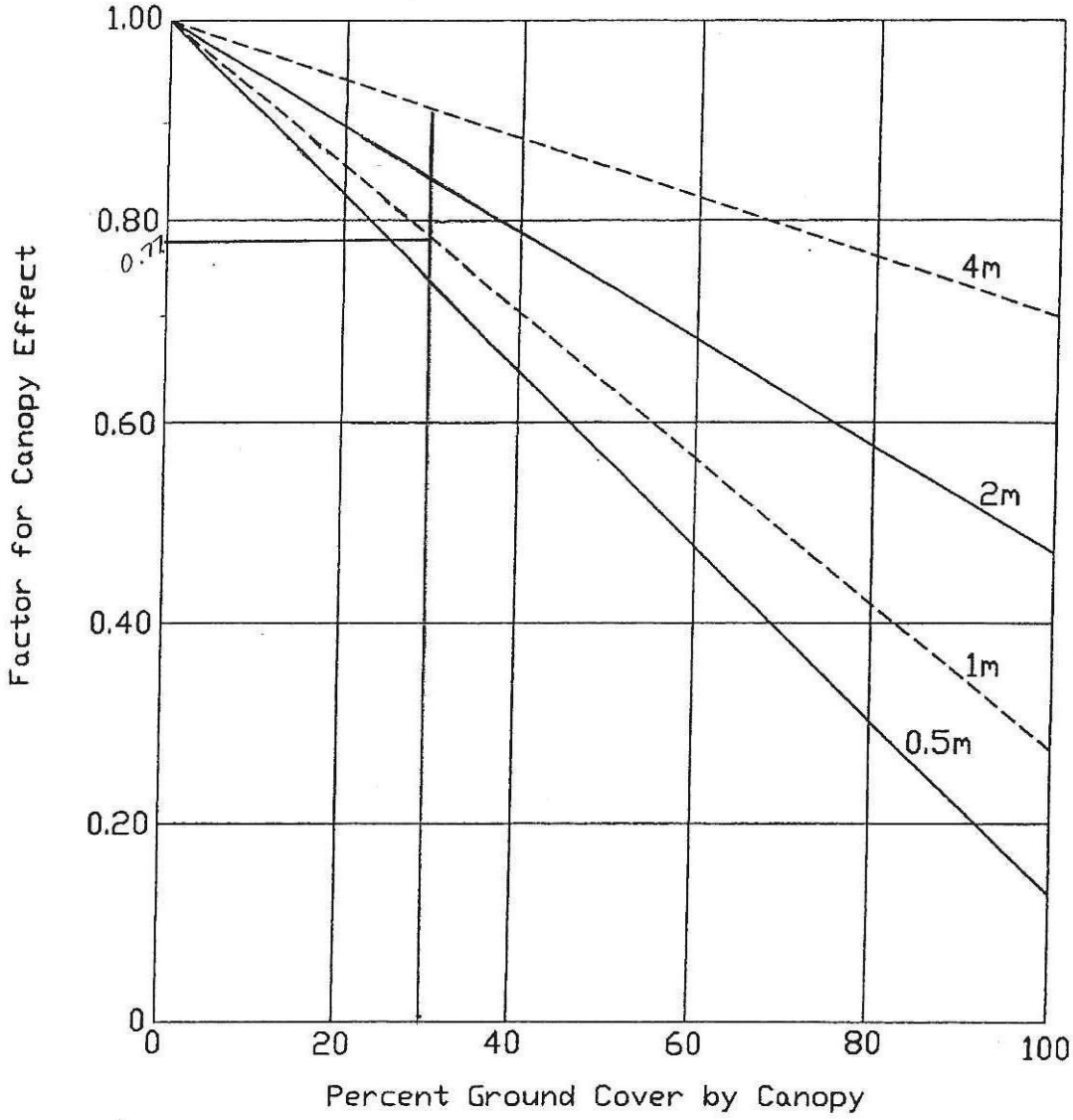
$C = (0.77)(0.77)(0.44)$

$C = 0.26$

G. C. WALLACE, INC.
Engineers/Planners/Surveyors

SHEET____ OF_____

INFLUENCE OF VEGETAL CANOPY



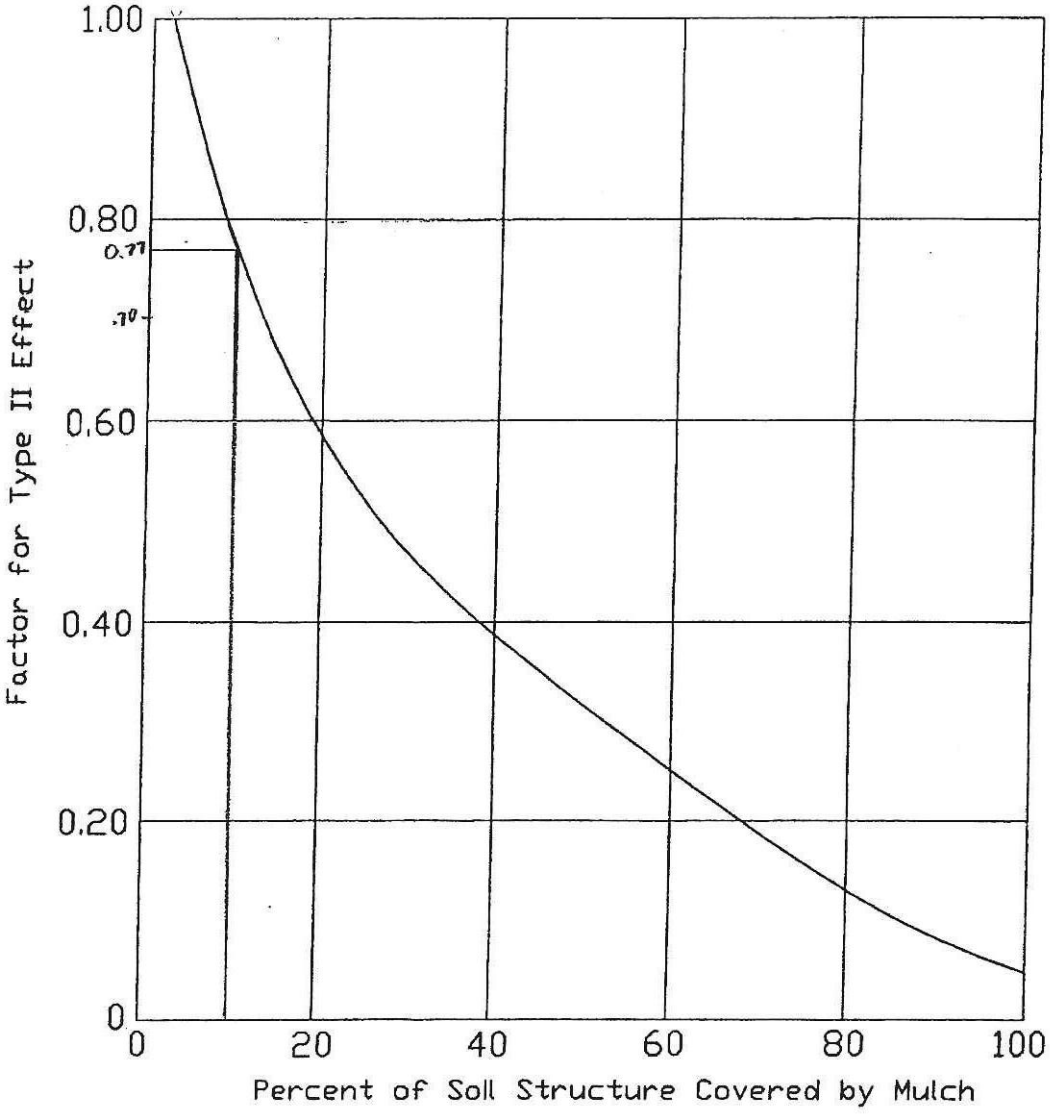
$C_1 \simeq 0.77$

Revision	Date

REFERENCE: A Soil-Erodibility Nomograph for Farmland and Construction Sites, 1971

FIGURE 1303b

EFFECT OF PLANT RESIDUES OR CLOSE-GROWING STEMS AT THE SOIL SURFACE



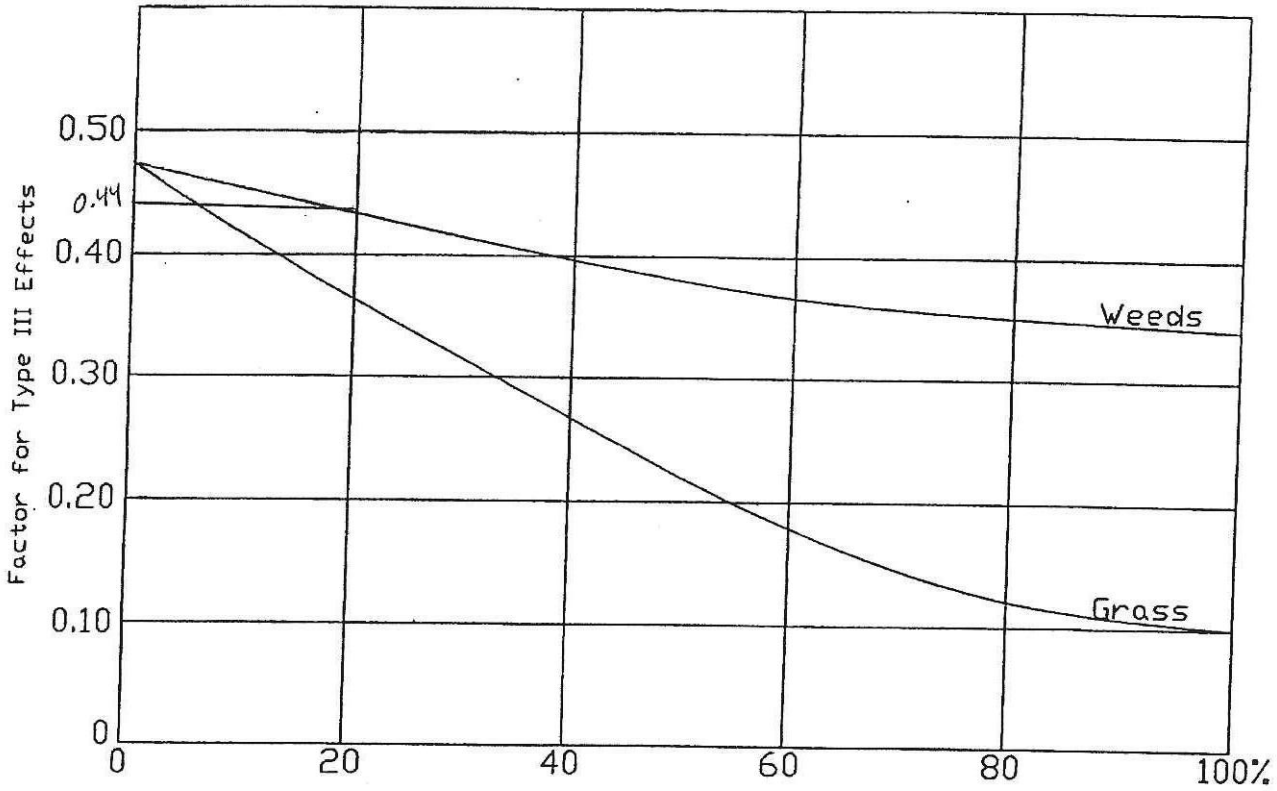
$C_{II} \simeq 0.77$

Revision	Date

REFERENCE: Estimating the Cover and Management Factor for Undisturbed Areas, 1972

FIGURE 1303c

TYPE III EFFECTS ON UNDISTURBED LAND AREAS



$C_{III} \simeq 0.44$

Revision	Date

REFERENCE: Estimating the Cover and Management Factor for Undisturbed Areas, 1972

FIGURE 1303d

United States
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Service

National Engineering Handbook

Section 3

Sedimentation

Chapter 6

Sediment Sources, Yields, and Delivery Ratios

[redacted]

type, and the results will be only as good as the assumptions.

Source Deposition

Another method of determining the sediment delivery ratio is to make a field study of a watershed and estimate the amount of deposition that can be traced to any one source. The difference in the volume of such deposition and the volume of sediment produced by the source gives an estimate of the delivery ratio from that source.

Table 6–2.—Sediment source and the delivery ratio

Sediment source	Erosion[1]		Sediment yield[2]		Delivery ratio
	Sand	Fines	Sand	Fines	
	tons/yr	*tons/yr*	*tons/yr*	*tons/yr*	*Pct.*
Sheet erosion	—	900,000	—	[3]300,000	33
Channel erosion					
Gullies	350,000	—	280,000	—	[4]80
Roadbanks	150,000	—	120,000	—	[4]80
Streambanks	—	900,000	—	900,000	100
Total	500,000	1,800,000	[5]400,000	[6]1,200,000	70

[1]Determine by standard SCS procedures.
[2]Assume that all fines are from sheet erosion and streambanks and all sand is from gullies and roadbanks.
[3]Difference between total yield of fines and yield of fines from streambanks.
[4]Compute as ratio of total sand yield to total sand available; assume equal delivery ratio for gullies and roadbanks.
[5]Estimate bedload as a percentage of the suspended load.
[6]Determine from suspended-load measurements.

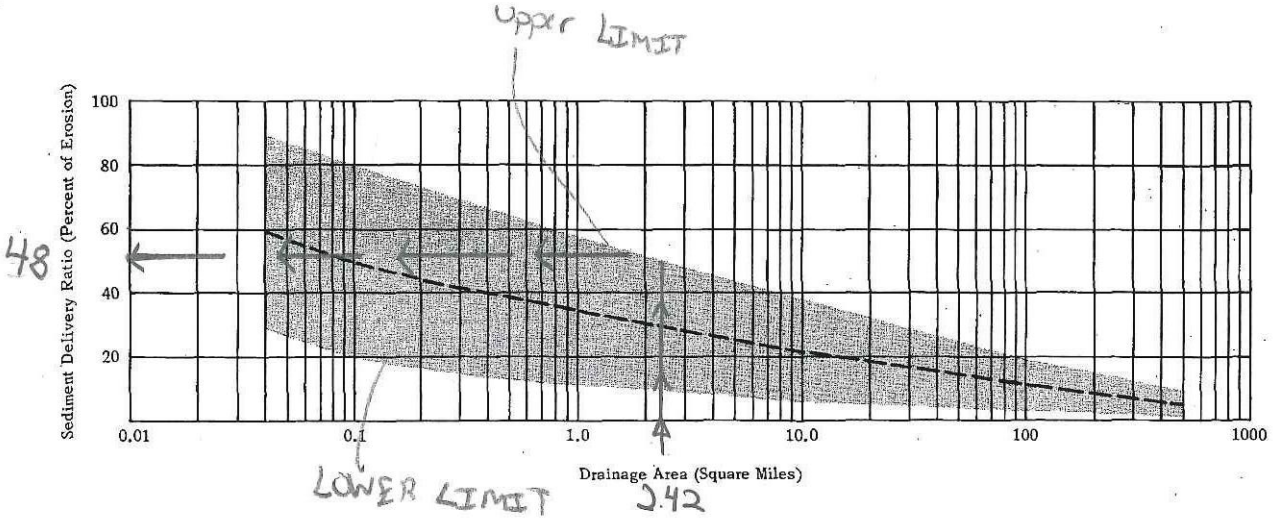

Figure 6–2.—Relationship between drainage area and sediment delivery ratio.

Total Area = |1-1A| + |1-1B| + |1-2A| + |1-2B| + |1-2CR|
= |492.5| + |111.8| + |552.6| + |137.7| + |404.8|
= 2666.6 Acres = 4.21 SQ MI

Reduced Area = |952.3| + |41.6*| + |289.9| + |28.2*| + |234.4|
= 1546.4 ACRES = 2.42 SQ MI

* AS SHOWN IN SUMMERLIN WEST STUDY

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Section 3

Sedimentation

Chapter 8

Sediment-Storage Design Criteria

The amount of sediment accumulation in a reservoir depends on the sediment yield to the reservoir and the trap efficiency. How the accumulated sediment is distributed within the reservoir depends on the character of the inflowing sediment, the operation of the reservoir, and other factors.

Trap Efficiency

Trap efficiency is the amount (percentage) of the sediment delivered to a reservoir that remains in it. It is a function of detention storage time, character of the sediment, nature of the inflow, and other factors. Trap efficiency can be readily estimated on the basis of the ratio of the capacity of the reservoir to the average annual inflow (Brune 1953, Gottschalk 1965) by using the following procedure:

1. Estimate the total capacity required of the reservoir in watershed inches (see page 8–13), including the total capacity allocated to floodwater detention, sediment storage, and other uses. Since an actual value cannot be obtained until final design is completed, estimate the total capacity as follows:
   a. Assume, for the particular physiographic area, a reasonable sediment-storage volume that might be required for the design life of the structure; e.g., 1.5 in.
   b. Obtain from the hydrologist an estimate of the required floodwater-detention storage; e.g., 4.5 in.
   c. Add the values for 1a and 1b to get an estimate of the total capacity of the reservoir; i.e., 1.5 + 4.5 = 6.0 in. Include any additional storage for water supply, recreation, and other uses in the total. If an estimate of the total required storage in acre-feet is available, convert this value to watershed inches to simplify the calculation.
2. Determine the average annual runoff in inches. This value can be determined from the hydrologic analysis of the watershed, from Hydrologic Investigation Atlas HA–212 (Busby 1966) or from other available information. In this example, the average annual runoff is 17.5 in.
3. Divide the aproximate total capacity in inches (item 1c) by the average annual runoff in inches (item 2) to obtain the capacity-inflow ratio (C/I); i.e., C/I = 6.0 ÷ 17.5 = 0.343.
4. Obtain the trap efficiency for a given C/I fro the vertical scale of figure 8–2. To do so, estimate the texture of the incoming sediment on the basis of the character of watershed soils and the principal sediment sources. If the incoming sediment is predominantly bedload or coarse material or is highly flocculated, use the upper curve of figure 8–2 to determine trap efficiency. If the incoming sediment is primarily colloids, dispersed clays, and fine silts, use the lower curve. If the incoming sediment consists of various grain sizes widely distributed, use the median curve. The texure also affects the distribution and allocation of the sediment in various pools.

The curves in figure 8–2 cannot be applied directly to dry reservoirs. If water flows through ungated outlets below the crest of the principal spillway, trap efficiency is likely to be lowered. If the inflowing sediment is predominantly sand, reduce the trap efficiency by about 5 percent; if the sediment is chiefly fine textured, reduce the trap efficiency by about 10 percent.

If the incoming sediment is composed essentially of equal parts of clay, silt, and fine sand and the proposed structure is to have a submerged sediment pool, use the median curve of figure 8–2 without adjustment. In the example (C/I = 0.343) trap efficiency would be 95 percent. In a situation similar except that the structure is designed as a dry reservoir, trap efficiency would be 85 percent.

Design Life

The design life of a reservoir is the period required for the reservoir to fulfill its intended purpose. Structures designed by SCS in the watershed protection and flood prevention programs usually are designed for a life of 50 or 100 years. Provision must be made to ensure the full design storage capacity for the planned design life. This may mean cleaning out deposited sediment at predetermined intervals during the design life or, as is generally the situation, providing enough capacity to store all the accumulated sediment for the reservoir's design life without dimininshing the design water storage.

Land treatment (conservation) measures seldom are fully effective in reducing erosion and sediment yield in less than 5 years. Often a longer time is required. This delay in effectiveness during the

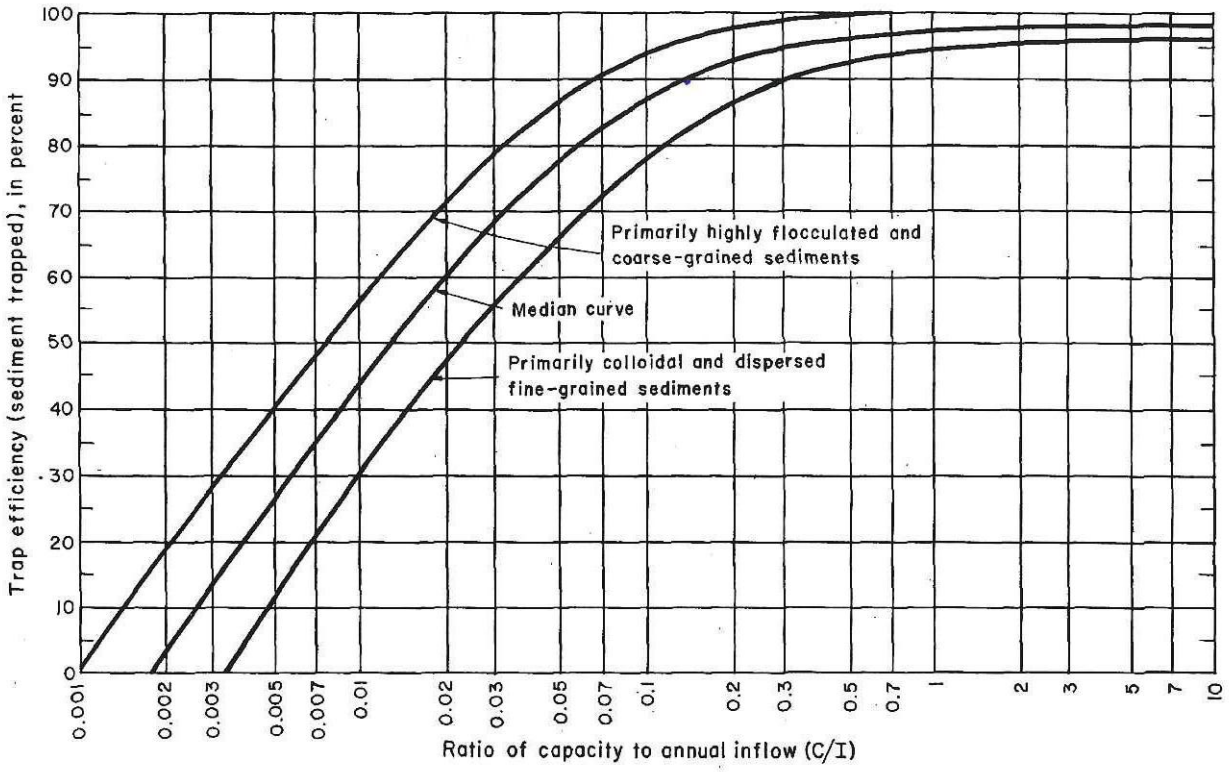

Figure 8-2.—Trap efficiency of reservoirs.

early part of a reservoir's life (Present Conditions on SCS-ENG-309) must be recognized in design. Determine, in consultation with the state program staff and the area and district conservationists, how many years will be required for the proposed land-treatment measures to be installed and become effective.

Distribution of Sediment

The total storage capacity of a reservoir must include capacity for all water storage plus capacity for the sediment expected to accumulate during the reservoir's design life. Consequently, the amount of sediment that will be deposited above the elevation designated for the sediment pool must be estimated. Such deposits may materially affect the proper functioning of the structure.

The amount of sediment that will be deposited above the principal spillway varies with the nature of the sediment, shape of the reservoir, topography of the reservoir floor, nature of the approach channel, detention time, and purpose of the reserovir. The coarse sediment settles quickly as the velocity of the water decreases. Generally, sediment inflow is greatest when detention capacity is being used and some sediment is deposited at elevations above the principal spillway. Usually, more coarse material than fine material is deposited above this elevation. The texture of the incoming sediment is the basis for estimating the percentage of incoming sediment that will be deposited above the elevation of the principal spillway. Use the following guidelines for estimating this percentage.

1. For watersheds of low to moderate relief in which the predominant sources of sediment are silty and clayey soils, sheet flow is the principal eroding agent, and the sediment is transported primarily in suspension: 10 percent.
2. For watersheds of low to moderate relief in which the incoming sediment consists of nearly equal amounts of medium to fine sands, silts, and clays; sheet flow and channel erosion are the principal agents; and the coarser material is

RESPONSE TO COMMENTS
ON THE
MASTER DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 26
REVERENCE

764-204-011

November 2015

GCW
ENGINEERS \ SURVEYORS

Prepared For:

Pulte Homes
7255 S. Tenaya Way, #200
Las Vegas, NV 89113
(702) 914-4800

GCW
ENGINEERS \ SURVEYORS

764-204-011

November 24, 2015

Albert Sung, PE
Flood Control Project Engineer
City of Las Vegas Department of Public Works
333 N. Rancho Drive
Las Vegas, NV 89106

Re: Response to Comments on the Master Drainage Study for Summerlin Village 26 – Reverence
DS 4752A

Dear Mr. Sung:

The purpose of this letter is to address your comments dated October 22, 2015, regarding the above-referenced project. The comments are individually addressed as follows:

Comment: "1. Provide a copy of the zoning/planning conditions associated with this site (**TMP-60968**) with the next submittal to verify compliance with conditions. *Flood* Control will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted."

Response: A copy of the zoning/planning conditions associated with this site (**TMP-60968**) is included in Appendix A.

Comment: "2. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study."

Response: The study will be submitted to CCRFCD for concurrence following conditional approval from the City of Las Vegas.

Comment: "3. The site is also adjacent to the *Clark County Western Beltway-215* project to the east. The engineer must coordinate with *Clark County Public Works Department* (CCPW) and incorporate any concerns for boundary conditions. CCPW concurrence is required prior to final acceptance of the study."

Response: Noted. Upon CLV conditional approval, the study will be submitted to CCPW for their review and concurrence.

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Comment: "4. The final approval of this *Master Drainage Study* is only as a precursor to allow the submittal of technical drainage studies such as but not limited to the Modified Detention Basin, Infrastructures and Phases of housing subdivisions etc."

Response: Noted.

Comment: "5. Since the previous studies from the master drainage, offsite berms/channels, street and storm drains improvements to individual Unit developments were approved seven to eight years ago, subsequent technical drainage studies must be submitted as a new project after the approval of this master study."

Response: Noted.

Comment: "6. Technical drainage studies are required for each of the development phases (PODs). The studies for the PODs may not be submitted prior to the conditional approval of the pertinent infrastructure drainage studies. No building permits will be issued prior to the final approval of the pertinent technical drainage studies and improvement plans"

Response: In a meeting with CLV on November 12, 2015, it was determined the comment should be revised to state "The studies for the PODS may not be submitted prior to conditional approval of this Master Study Update. Conditional approval of the studies for the (PODS) will not be granted prior to conditional approval of the pertinent infrastructure drainage studies. However, the infrastructure studies can be submitted prior to conditional approval of the Master Study Update, provided the site plan and proposed drainage patterns are consistent with the Master Study Update."

Comment: "7. Provide a chapter in the Master Drainage Study Update to detail the sequence of forthcoming submittal of the technical drainage studies and the pertinent improvement plans. Include a description of the existing infrastructures such as interim flood control facilities and proposed and ultimate conditions in the next submittal."

Response: The offsite improvements will include rough grading for the site and the proposed pertinent infrastructure improvements required to protect the site. As discussed in the meeting with CLV on November 12, 2015, the offsite improvements will be constructed prior to onsite POD development. The pertinent offsite improvements will include a debris basin and RCB storm drain / concrete-lined channel outfall system and modification of the Village 26 detention basin. Additionally, the offsite improvements will include reconstruction of the existing Western Beltway Channel adjacent to the site. GCW is currently preparing, a technical drainage study update that addresses the proposed offsite improvements and proposed interim conditions. The proposed offsite improvements will be addressed in the future technical drainage study update to the "*Technical Drainage Study for Village 26 at Summerlin West Offsite Improvements* (hereinafter, referred to as the Offsites Study) which is currently scheduled to be submitted to CLV for review shortly hereafter.

Comment: "8. Page 4 of the *Master Study* stated that, quote "CCRFCD Facilities GOBE 0001-0065 will be removed and replaced with this project". Advise what the regional facilities will be replaced with inthe next submittal."

Response: CCRFCD Facilities GOBE 0001-0065 will be replaced with an 11-foot wide to 17-foot wide concrete channel. The proposed CCRFCD Facilities are labeled on Figure 6R included in Appendix A.

Comment: "9. Page 20 of the *Master Drainage Study* stated that concrete-lined rectangular channels will be constructed along the perimeter of **Village** 26 for flood protection. Address in the addendum whether the channels will be built altogether before any phases of development or will be built in phases. Provide a perimeter channels phasing map (if any) in the next submittal. A technical drainage study for the proposed concrete channels as infrastructure must be submitted prior to any onsite developments."

Response: As discussed in the meeting with CLV on November 12, 2015, the perimeter channels will not be constructed prior to the phases of development. The concrete-lined rectangular perimeter channel will be constructed as required to provide offsite flow protection for each phase of development. The phasing for the concrete-lined perimeter channels have been labeled on the phasing exhibits included in Appendix A. Future technical drainage studies for the PODS will address interim grading required to fully protect each phase of development from offsite flows.

Comment: "10. Obtain Bureau of Land Management (BLM) approval if the perimeter channels encroach into their property prior to the final approval of the infrastructure drainage study."

Response: The proposed perimeter channels will be constructed onsite and will not encroach onto BLM property; therefore BLM approval is not anticipated.

Comment: "11. The master drainage study proposes a mixed-use detention basin that may include a park, amphitheatre, basketball court etc. Design multi-use facilities per *Section 304.8* of the *CCRFCD Hydrologic Criteria and Drainage Design Manual.* The modification of the existing detention basin will require a technical drainage study with *State* and *CCRFCD* approval. Any technical drainage studies for future onsite developments will not be accepted for review prior to the final approval of the modified detention basin study."

Response: Noted. GCW intends to obtain *State* and *CCRFCD* approval for the modification of the existing detention basin. The modifications will be addressed in the future update to the Offsites Study. In the meeting with CLV on November 12, 2015, CLV agreed that the technical drainage studies for the future onsite developments can be submitted after conditional approval of the Master Study Update and the initial review of the future update to the Offsites Study, provided the site plan and proposed drainage patterns are consistent with the Master Study Update.

Comment: "12. To accommodate the additional features such as a park and the various ball game courts in the detention basin as well as the anticipated sediment load generated by the 100-year storm event, address in the next submittal how and where the additional storage volume in the basin will come from."

Response: The proposed detention basin modification does not include sediment load since the upstream sediment load will be captured by the proposed debris basin. The proposed soccer fields will be elevated above the 10-year storm event water surface elevation and the proposed park, basketball courts, tennis courts, volleyball and amphitheatre will be elevated above the 25-year storm event water surface elevation to meet CCRFCD Criteria. Additionally, a minimum 1-foot of freeboard will be provided in the detention basin during the 100-year storm event. As discussed in the November 12, 2015 Meeting, maintenance access to the bottom of the proposed detention basin will be provided and the proposed park improvements will be required to be maintained by the Homeowner's Association.

Comment: "13. Provide a technical drainage study for a proposed debris basin at the southwest corner of *Summerlin Village 26* as part of the infrastructure studies."

Response: The proposed debris basin will be addressed in the future update to the Offsites Study.

Comment: "14. The *Master Study* discussed about the volume of the proposed debris basin at CP3, the southwest corner of *Village 26* for onsite protection. However, even though the sediment transported from *Subbasin LMT1R* does not impact the proposed developments, it will impact the downstream regional facility (GOL4 0025 and 0026). Address in the addendum whether another debris basin will be necessitated for downstream facilities protection."

Response: This project will not adversely impact sediment to or from Subbasin LMT1R. The flow velocity discharged from the site into LMT1R will be non-erosive. Therefore, development of the site will not increase sediment to LMT1R and a debris basin will not be required at this location due to development of the site.

Facility 18, which is proposed to discharge flow to the wash north of the site will include outlet protection. The need for an energy dissipater at this location will be evaluated in the future technical drainage study for the PODS.

Comment: "15. Provide a *Master Storm Drain Plan* identifying all the existing and proposed *Clark County Regional Flood Control Facilities* with the "ID / River Mile" clearly labeled."

Response: The CCRFCD Facilities have been clearly labeled with the "ID / River Mile" on the tables shown on revised *Figure 6R Flood Control Facilities Map*. Figure 6R has been included in Appendix A.

Comment: "16. FIG 6 (Flood Control Facilities Map): It appears that Concentration Point 4 (CP4) is mis-located on the map. Move the identifier to the northeast corner of Subbasin 1-3P to match that of in FIG 5 and FIG 5A.

CP5B was missing in FIG 6. Provide as such in the next submittal.

Provide a north arrow and scale bar in Figure 6."

Response: The label for Concentration Point CP4 has been moved to the correct location on Figure 6R and now matches Figures 5 and 5A. The label for CP5B, a north arrow, and a scale bar has been added to Figure 6R. Figure 6R has been included in Appendix A.

Additional Comments

Minor changes to the land plan for the site have occurred since the previous submittal. Although general drainage patterns and the proposed flowrate and volumes for the conceptually proposed detention basin were not affected by the revisions, slight revisions to the onsite basin boundaries Subbasins 1-11P and 1-12P have occurred. Please refer to the revised drainage maps (Figures 5R and 5AR) and facility map (Figure 6R) included in Appendix A. The Standard Form 4, HEC-1, and subbasin prorate calculations have also been revised to reflect the site plan revisions. The revised hydrology calculations have been included in Appendix A.

The results of the revised HEC-1 model have been summarized in Table 1. A copy of the HEC-1 model has been included in Appendix A.

TABLE 1
SUMMARY OF ULTIMATE CONDITIONS HEC-1 MODEL

SB OR CP	AREA (AC)	100 YR (CFS)	25 YR (CFS)	10 YR (CFS)
1-1A	1497.2	2289	1477	942
1-1B	111.8	226	115	63
CP1	-	2404	1549	986
1-2A	552.7	1541	938	608
1-2B	137.7	315	173	103
CP2	-	2941	1914	1209
1-2CR	367.6	859	503	313
CP3	-	3309	2171	1365
1-3P	16.5	63	42	31
CP4	-	3311	2179	1368
1-12P	116.1*	230*	128	78
CP5	-	3454*	2266*	1416*
1-14	1.0	3	2	1
1-15	3.6	10	6	4
1-16	1.9	5	3	2
1-17	2.5	7	4	2

TABLE 1 SUMMARY OF ULTIMATE CONDITIONS HEC-1 MODEL				
SB OR CP	AREA (AC)	100 YR (CFS)	25 YR (CFS)	10 YR (CFS)
1-18	2.4	7	4	2
CP5B	-	3464	2273	1421
EXDB	-	653	550	446
1-4R	34.3	100	58	37
1-5R	22	63	37	24
CP6	-	163	95	61
1-6R	9.7	28	16	11
1-7R	17.3	50	30	19
CP7	-	79	46	29
1-8R	1.6	5	3	2
1-10R	35.6	101	59	38
CP8	-	106	62	39
1-11P	113.6*	219*	118	69
CP9	-	536*	308	192
1-13	0.5	1	1	1
LMT1R	1256.6	1966	1267	821
CP10	-	2190	1422	913
*Revised from Previous Submittal				

The results of the revised onsite prorate calculations have been summarized below.

ONSITE PRORATED FLOW SUMMARY			
Subbasin	Q_{100} (cfs)	New Area	cfs/acre
1-11P	219*	113.6*	1.93
1-12P	230*	116.1*	1.98
Onsite Prorated Basins			
Subbasin	Q_{100} (cfs)	New Area (acres)	cfs/acre
11-A	30*	15.6*	1.93
11-B	12	6.3*	1.93
11-C	21	10.7	1.93
11-D	33*	17.1*	1.93
11-E	17*	9.0*	1.93
11-F	18	9.2*	1.93
11-G	5*	2.3*	1.93
11-H	19	9.7*	1.93
11-I	14	7.4	1.93
11-J1	6	3.3	1.93

ONSITE PRORATED FLOW SUMMARY			
Subbasin	Q_{100} (cfs)	New Area	cfs/acre
11-J2	15*	7.5	1.93
11-K	23	12.1*	1.93
11-L	6	3.4*	1.93
Total	**219***	**113.6***	**N/A**
12-A	33	16.5	1.98
12-B	11	5.8	1.98
12-C	3	1.7*	1.98
12-D	24	12.0	1.98
12-E	15	7.4*	1.98
12-F	14	7.0	1.98
12-G	13*	6.6*	1.98
12-H	12*	5.9*	1.98
12-I	17*	8.8*	1.98
12-J	13	6.7*	1.98
12-K	13	6.4	1.98
12-L	43	21.5	1.98
12-M	7	3.8	1.98
12-N	12	6*	1.98
TOTAL	**230***	**116.1***	**N/A**
*Revised from Previous Submittal			

The results of the revised street flow calculations are summarized in Table 2. The street flow and facility normal depth calculations have been included in Appendix B.

TABLE 2
100-YEAR STREET FLOW CHARACTERISTICS
ULTIMATE CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V	Tributary Subbasins
Section 1	6.00	32	0.44	6.59	2.9	11-A + $Q_{Byp\text{-}Sect3}$
Section 2	2.80	12	0.38	3.89	1.5	11-B
Section 3	3.20	21	0.43	4.68	2.0	11-C
Section 4	3.80	35	0.48	5.63	2.7	11-D + $Q_{Byp\text{-}Sect6}$
Section 5	2.66	17	0.42	4.14	1.7	11-E
Section 6	2.30	20	0.44	4.09	1.8	11-F + $Q_{Byp\text{-}Sect5}$
Section 7	2.54	21	0.44	4.29	1.9	11-H + $Q_{Byp\text{-}Sect9A}$
Section 8A	0.50	14	0.50	2.08	1.0	11-I
Section 8B	2.34	6	0.32	3.10	1.0	11-J1
Section 9A	2.54	19	0.43	4.19	1.8	11-J2 + $Q_{Byp\text{-}Sect8A}$ + $Q_{Byp\text{-}Sect8B}$

TABLE 2
100-YEAR STREET FLOW CHARACTERISTICS
ULTIMATE CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V	Tributary Subbasins
Section 9B	3.07	23	0.44	4.70	2.1	11-K
Section 10	5.67	10	0.33	4.90	1.6	11-L + $Q_{Byp\text{-}Sect7}$ + $Q_{Byp\text{-}Sect9B}$
Section 11	0.50	12	0.48	2.02	1.0	12-N
Section 12	5.60	33	0.45	6.44	2.9	12-A
Section 13	5.20	13	0.36	5.02	1.8	12-B + $Q_{Byp\text{-}Sect12}$
Section 14	5.00	24	0.42	5.72	2.4	12-D
Section 15	2.96	15	0.40	4.19	1.7	12-E
Section 16	6.00	29	0.43	6.42	2.8	12-G + 12-F + $Q_{Byp\text{-}Sect15}$
Section 17	0.50	12	0.48	2.02	1.0	12-H
Section 18	1.80	17	0.44	3.56	1.6	12-I
Section 19	5.00	13	0.36	4.95	1.8	12-J
Section 20	0.49	13	0.49	2.05	1.0	12-K

*$Q_{byp\text{-}Sect\#}$: Assumes 2 cfs bypasses the upstream street cross section

In general, the proposed drainage patterns are consistent with the previously approved referenced drainage studies. The proposed facilities do not significantly alter existing peak flows or the character of flows downstream of the development and do not pose any negative impacts on downstream facilities and development.

If you have any questions or require additional information, please contact our office at 702-804-2133.

Cordially,
GCW, INC.

James A. Monroe, PE LEED AP
Project Manager
Flood Control Division

JAM/vlr
Enclosures

c: Brian Schmidt, GCW
Ryan Belsick, GCW
Wes Petty, GCW

764-704

October 14, 2015

Ms. Julie Cleaver
The Howard Hughes Company
10801 West Charleston Blvd., 3rd Floor
Las Vegas, Nevada 89135

RE: TMP-60968 [PRJ-60662] - TENTATIVE MAP RELATED TO MOD-61039 PLANNING COMMISSION MEETING OF OCTOBER 13, 2015

Dear Applicant:

Your request for a Tentative Map FOR A MASTER PLANNED VILLAGE CONTAINING 323 SINGLE-FAMILY RESIDENTIAL LOTS, ONE MULTI-FAMILY RESIDENTIAL LOT AND 14 LARGE POD LOTS on 300.16 acres at the northwest corner of Lake Mead Boulevard and Clark County 215 (APNs 137-13-101-007 and 008; 137-14-501-004; and 137-14-601-002), P-C (Planned Community) Zone, Ward 4 (Anthony) [PRJ-60662], was considered by the Planning Commission on October 13, 2015.

The Planning Commission voted to recommend ***APPROVAL*** of your request, subject to the following:

Planning

1. Approval of the Tentative Map shall be for no more than four (4) years. If a Final Map is not recorded on all or a portion of the area embraced by the Tentative Map within four (4) years of the approval of the Tentative Map, this action is void.

2. Approval of a Major Modification (MOD-61039) of the Village 26 Development Plan shall be required, if approved.

3. Prior to recordation of a final map over this site, a Parcel Map (PMP-61340) shall be recorded.

4. All development shall conform to the Summerlin Village 10, 11, 12 and 26 Development Agreement and the Summerlin Development Standards, 2004 Revision, as applicable.

5. Street names must be provided in accordance with the City's Street Naming Regulations.

6. A fully operational fire protection system, including fire apparatus roads, fire hydrants and water supply, shall be installed and shall be functioning prior to construction of any combustible structures.

LAS VEGAS CITY COUNCIL

CAROLYN G. GOODMAN
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CITY OF LAS VEGAS
DEPARTMENT OF PLANNING

DEVELOPMENT SERVICES CENTER
333 NORTH RANCHO DRIVE
3RD FLOOR
LAS VEGAS, NEVADA 89106

VOICE 702.229.6301
FAX 702.474.0352
TTY 7-1-1
www.lasvegasnevada.gov

/city of las vegas

7. All development is subject to the conditions of City Departments and State Subdivision Statutes.

Public Works

8. If an area outside the proposed public right-of-way is planned for public infrastructure, separate public easements (sewer, drainage, traffic, pedestrian, etc.) must be granted for these facilities on the Final Map for this site unless otherwise allowed by the City Engineer. We note that the areas shown as "Future Utility Easement" on the Tentative Map across Parcels Q & R & COS-5 may need to be granted as Public Sewer and Public Drainage Easements to be privately maintained on the Final Map. Construction of these public improvements may happen at a later date to coincide with parcel development. All Public Sewer Easements must be a minimum 20' wide and have paved drivable access for maintenance purposes. The size of Public Drainage Easements will be determined through a required Drainage Study.

9. Unless otherwise allowed by the City Engineer, provide a terminus and grant an associated Temporary Access Easement acceptable to the Department of Public Works for all public streets that continue to a future phase.

10. All parcels created by the Parent Final Map for this site shall provide a minimum of two lanes of paved legal access from an existing paved public street to each developable parcel prior to occupancy of any buildings within each developable parcel. All public roads shown on the Final Map shall be labeled as "Hereby Dedicated."

11. Meet with the Sanitary Sewer Planning Section of the Department of Public Works regarding the previously approved Summerlin Village 26 Wastewater Collection System Master Plan. All public sewer lines and manholes shall have paved, drivable access at all times. Comply with the recommendations of the Sanitary Sewer Planning Section.

12. Prior to the recordation of the Final Map for this site, meet with the Fire Protection Engineering Section of the Department of Fire Services to discuss fire requirements for this site.

13. All landscaping within public rights of way or common areas shall be maintained by the Master Developer or his designee. Encroachment Agreement approval shall be obtained from the City Council prior to installation of any private improvements within public rights of way. All installed landscaping, whether in public rights-of-way or within common area properties, shall be situated and maintained so as to not create sight visibility obstructions for vehicular traffic at all development access drives and all adjacent, abutting street intersections.

14. If a Special Improvement District (SID) is proposed, the SID section of the Department of Public Works must be contacted and appropriate written agreements (if necessary) must be executed by the property owner(s) of record prior to the recordation of a Final Map or the issuance of any building permits, whichever may occur first. The written agreements (if applicable) will allow the recalculation and/or the redistribution of all assessments of record on this site.

15. Coordinate with the Clark County Department of Public Works to establish appropriate wall heights along the eastern perimeter of this site in order to comply with noise mitigation requirements as set forth in the Beltway Noise Mitigation Study. Provide documentation from Clark County to the City of Las Vegas Land Development Section that this condition has been satisfied prior to the submittal of any construction drawings.

16. A Traffic Impact Analysis must be submitted to and approved by the Department of Public Works prior to the issuance of any building or grading permits, submittal of any construction drawings or the recordation of a Map subdividing this site. Comply with the recommendations of the approved Traffic Impact Analysis prior to occupancy of the site. The Traffic Impact Analysis shall also include a section addressing Standard Drawings #234.1 #234.2 and #234.3 to determine additional right-of-way requirements for bus turnouts adjacent to this site, if any; dedicate all areas recommended by the approved Traffic Impact Analysis. All additional rights of way required by Standard Drawing #201.1 for exclusive right turn lanes and dual left turn lanes shall be dedicated prior to or concurrent with the commencement of on site development activities unless specifically noted as not required in the approved Traffic Impact Analysis. If additional rights of way are not required and Traffic Control devices are or may be proposed at this site outside of the public right of way, all necessary easements for the location and/or access of such devices shall be granted prior to the issuance of permits for this site. Phased compliance will be allowed if recommended by the approved Traffic Impact Analysis. No recommendation of the approved Traffic Impact Analysis, nor compliance therewith, shall be deemed to modify or eliminate any condition of approval imposed by the Planning Commission or the City Council on the development of this site.

17. A Drainage Plan and Technical Drainage Study must be submitted to and approved by the Department of Public Works prior to the issuance of any building or grading permits or submittal of any construction drawings, whichever may occur first. Provide and improve all drainageways recommended in the approved drainage plan/study. The developer of this site shall be responsible to construct such neighborhood or local drainage facility improvements as are recommended by the City of Las Vegas Neighborhood Drainage Studies and approved Drainage Plan/Study concurrent with development of this site.

18. The approval of all Public Works related improvements shown on this rezoning map is in concept only. Specific design and construction details relating to size, type and/or alignment of public improvements, including but not limited to street, sewer and drainage improvements, shall be resolved prior to approval of the construction plans by the City. All deviations from adopted Summerlin and/or City Standards must receive approval from the City Planning Commission or the City Engineer prior to the recordation of a Final Map or the approval of subdivision related construction plans, whichever may occur first. We reserve the right to impose additional conditions of approval for each individual development site when such plans are known. We anticipate the need for additional conditions concurrent with approval of the Master Tentative Map(s) and/or Village Map(s) for this site.

This item will be considered by the City Council on ***November 18, 2015***, at 1:00 P.M. in the Council Chambers of City Hall, 495 South Main Street, Las Vegas, Nevada. ***The Council requires that you or your representative be present at this meeting.*** If you or your representative chooses not to attend, the City Council may act in your absence without your input.

Sincerely,

Peter Lowenstein, AICP
Planning Manager
Case Planning Division

PL:nl

cc:

Bernin Anderson
PN II, Inc.
8345 West Sunset Road
Las Vegas, Nevada 89113

Ms. Cindie Gee
G.C. Wallace, Inc.
1555 South Rainbow Blvd.
Las Vegas, Nevada 89146

764-264-01

LAS VEGAS
CITY COUNCIL

CAROLYN G. GOODMAN
MAYOR

STEVEN D. ROSS
MAYOR PRO TEM

LOIS TARKANIAN
RICKI Y. BARLOW
STAVROS S. ANTHONY
BOB COFFIN
BOB BEERS

ELIZABETH N. FRETWELL
CITY MANAGER

November 19, 2015

Ms. Julie Cleaver
The Howard Hughes Company
10801 West Charleston Boulevard, 3rd Floor
Las Vegas, Nevada 89135

RE: MOD-61039 [PRJ-60662] - MAJOR MODIFICATION RELATED TO TMP-60968
CITY COUNCIL MEETING OF NOVEMBER 18, 2015

Dear Ms. Cleaver:

The City Council at a regular meeting held on November 18, 2015 ***APPROVED*** a request for a Summerlin Major Modification of an approved Development Plan for Village 26 on 300.16 acres at the northwest corner of Lake Mead Boulevard and Clark County 215 (APNs 137-13-101-007 and 008; 137-14-501-004; and 137-14-601-002), P-C (Planned Community) Zone, Ward 4 (Anthony) [PRJ-60662].

The Notice of Final Action was filed with the Las Vegas City Clerk on November 19, 2015.

Sincerely,

Thomas A. Perrigo
Director
Department of Planning

TAP:clb

cc: Mr. Bernin Anderson
PN II, Inc.
8345 West Sunset Road
Las Vegas, Nevada 89113

Ms. Cindie Gee
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2014 WINNER OF THE U.S. CONFERENCE OF MAYORS CLIMATE PROTECTION AWARD

LAS VEGAS
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/city of las vegas

November 19, 2015

Ms. Julie Cleaver
The Howard Hughes Company
10801 West Charleston Boulevard, 3rd Floor
Las Vegas, Nevada 89135

RE: TMP-60968 [PRJ-60662] - TENTATIVE MAP RELATED TO MOD-61039 CITY COUNCIL MEETING OF NOVEMBER 19, 2015

Dear Ms. Cleaver:

The City Council at a regular meeting held on November 18, 2015 ***APPROVED*** a request for a Tentative Map FOR A MASTER PLANNED VILLAGE CONTAINING 323 SINGLE-FAMILY RESIDENTIAL LOTS, ONE MULTI-FAMILY RESIDENTIAL LOT AND 14 LARGE POD LOTS on 300.16 acres at the northwest corner of Lake Mead Boulevard and Clark County 215 (APNs 137-13-101-007 and 008; 137-14-501-004; and 137-14-601-002), P-C (Planned Community) Zone, Ward 4 (Anthony) [PRJ-60662].

This approval is subject to the following conditions:

Planning

1. Approval of the Tentative Map shall be for no more than four (4) years. If a Final Map is not recorded on all or a portion of the area embraced by the Tentative Map within four (4) years of the approval of the Tentative Map, this action is void.

2. Approval of a Major Modification (MOD-61039) of the Village 26 Development Plan shall be required, if approved.

3. Prior to recordation of a final map over this site, a Parcel Map (PMP-61340) shall be recorded.

4. All development shall conform to the Summerlin Village 10, 11, 12 and 26 Development Agreement and the Summerlin Development Standards, 2004 Revision, as applicable.

5. Street names must be provided in accordance with the City's Street Naming Regulations.

6. A fully operational fire protection system, including fire apparatus roads, fire hydrants and water supply, shall be installed and shall be functioning prior to construction of any combustible structures.

7. All development is subject to the conditions of City Departments and State Subdivision Statutes.

Public Works

8. If an area outside the proposed public right-of-way is planned for public infrastructure, separate public easements (sewer, drainage, traffic, pedestrian, etc.) must be granted for these facilities on the Final Map for this site unless otherwise allowed by the City Engineer. We note that the areas shown as "Future Utility Easement" on the Tentative Map across Parcels Q & R & COS-5 may need to be granted as Public Sewer and Public Drainage Easements to be privately maintained on the Final Map. Construction of these public improvements may happen at a later date to coincide with parcel development. All Public Sewer Easements must be a minimum 20' wide and have paved drivable access for maintenance purposes. The size of Public Drainage Easements will be determined through a required Drainage Study.

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Sincerely,

Thomas A. Perrigo
Director
Department of Planning

TAP:clb

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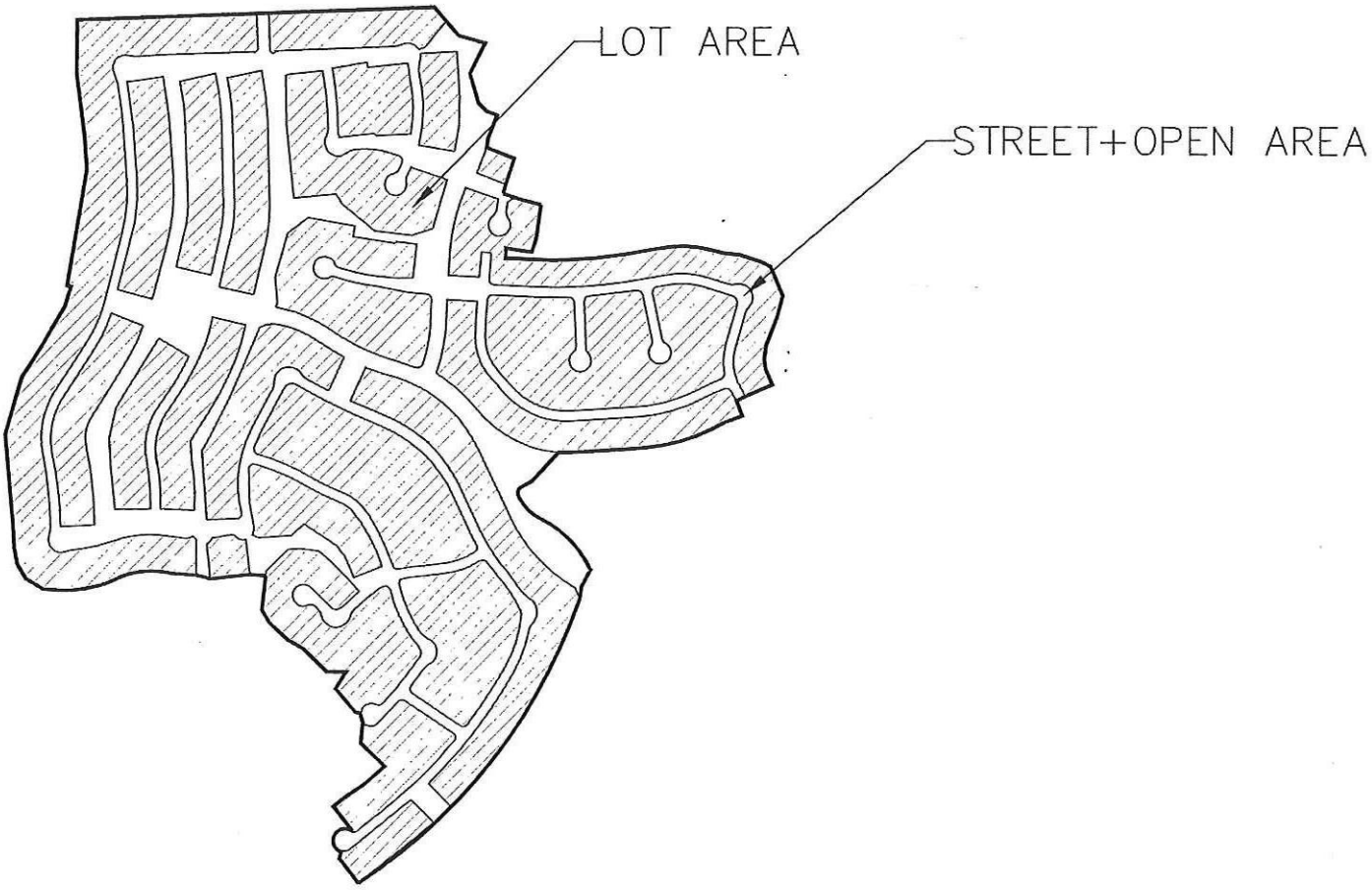
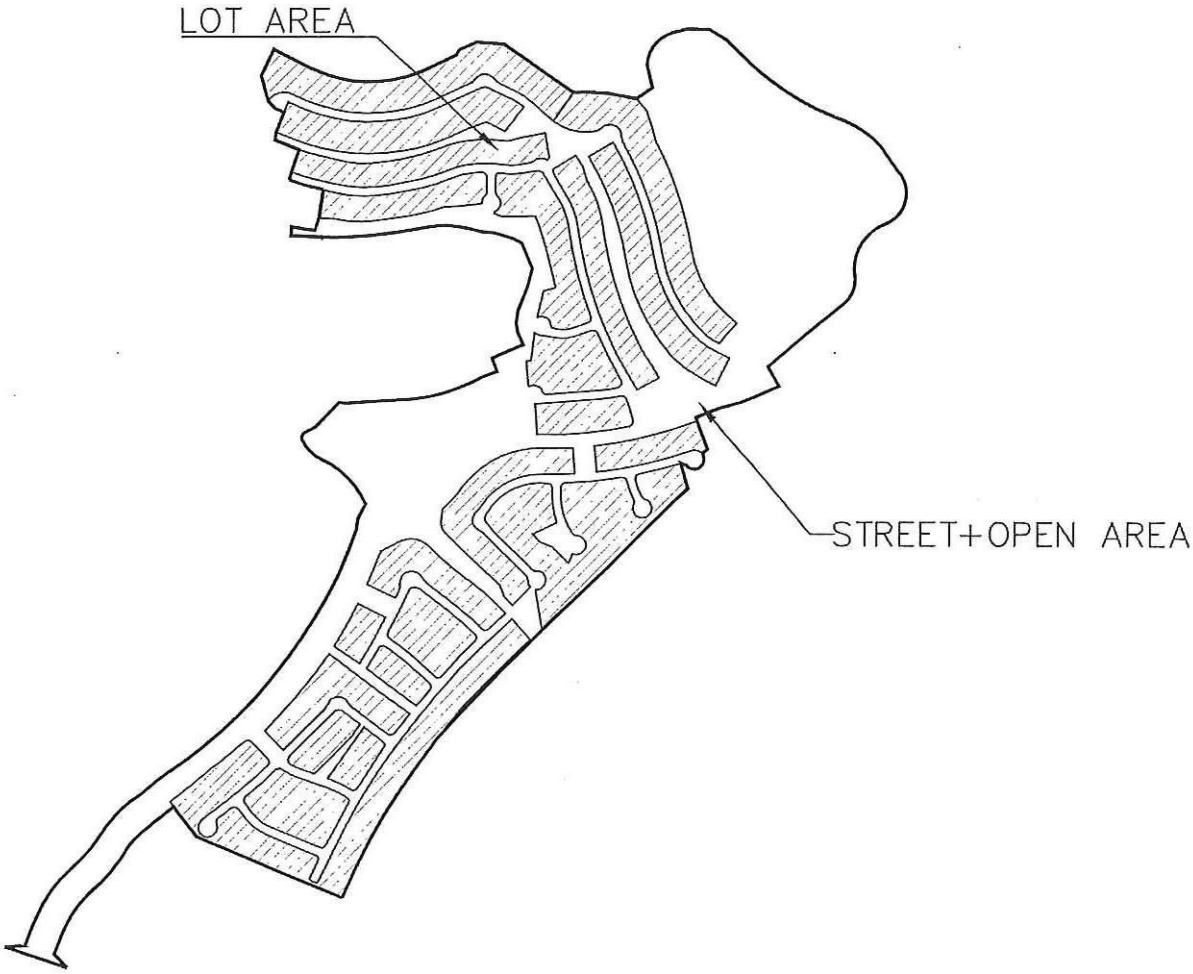
PN II, Inc.
8345 West Sunset Road
Las Vegas, Nevada 89113

Ms. Cindie Gee
G.C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89146



LOT AREA = 81.57 AC
LOTS = 342
AVG LOT SIZE = LOT AREA / # LOTS = 81.57 AC / 342 = 0.239 AC = 10,389.44 SQFT



LOT AREA = 55.14 AC
LOTS = 317
AVG LOT SIZE = LOT AREA / # LOTS = 55.14 AC / 317 = 0.17 AC = 7,576.97 SQFT

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

GCW
ENGINEERS \ SURVEYORS

Summerlin Village 26
Reverence
Ultimate Conditions

Project No: 764-204-011
Date: 11/23/15
Calculated by: JYA

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG: (1)	DEV./EX. (D or E)	CN (16)	K (2)	AREA Ac (3)	AREA Sq Mi (4)	INITIAL LENGTH Feet (5)	SLOPE % (6)	Ti Min (7)	TRAVEL LENGTH Feet (8)	SLOPE % (9a)	V1 VELOCITY fps (9b)	V2 VELOCITY fps (10)	Tt Min (11)	TOTAL LENGTH Feet (12)	Tc = (L/180)+10 Min (13)	Min (14)	Tlag = 0.6Tc/60 Hours (15)	Rainfall (in)
1-1A*	E	85.4	0.7373	1497.2	2.3394	500	34.0	4.5	14575	8.4	4.3	8.5	29.5	15075	N/A	34.0	**0.488**	3.67
1-1B*	D	78.3	0.6436	111.8	0.1747	100	1.0	8.2	4775	8.5	5.9	8.9	9.4	4875	37.1	17.6	**0.176**	3.61
1-2A*	E	85.8	0.7426	552.7	0.8636	500	56.0	3.8	5905	17.4	6.2	12.3	8.7	6405	N/A	12.5	**0.125**	3.55
1-2B*	D	82.6	0.7003	137.7	0.2152	100	1.0	7.2	5100	7.5	5.5	8.4	10.7	5200	38.9	17.8	**0.178**	3.51
1-2CR*	E	84.7	0.7280	367.6	0.5743	500	52.0	4.0	9505	16.3	6.0	11.9	14.0	10005	N/A	18.0	**0.180**	3.46
1-4R	E	86.3	0.7492	34.3	0.0536	500	60.0	3.6	1890	36.2	8.9	17.7	2.2	2390	N/A	5.9	**0.100**	3.44
1-5R	E	86.3	0.7492	22.0	0.0343	330	65.0	2.9	1160	39.0	9.2	18.4	1.5	1490	N/A	4.4	**0.100**	3.42
1-6R	E	86.3	0.7492	9.7	0.0152	360	56.9	3.1	840	34.4	8.7	17.2	1.3	1200	N/A	4.4	**0.100**	3.43
1-7R	E	86.3	0.7492	17.3	0.0271	500	72.0	3.4	1490	26.8	7.7	15.2	2.2	1990	N/A	5.6	**0.100**	3.44
1-8R	E	86.3	0.7492	1.6	0.0025	210	38.3	2.7	205	20.0	6.6	13.1	0.5	415	N/A	3.2	**0.100**	3.42
1-10R	E	86.1	0.7465	35.6	0.0556	500	24.0	4.9	1030	21.9	6.9	13.8	1.8	1530	N/A	6.8	**0.100**	3.41
1-3P	D	94.9	0.8627	16.5	0.0258	100	1.0	4.3	1190	3.7	3.9	5.9	4.1	1290	17.2	8.4	**0.084**	3.36
1-11P	D	81.7	0.6884	113.6	0.1775	100	1.0	7.4	4160	3.0	3.5	5.3	14.0	4260	33.7	21.4	**0.214**	3.38
1-12P	D	83.8	0.7162	116.1	0.1814	100	1.0	6.9	5810	4.0	4.1	6.1	16.5	5910	42.8	23.4	**0.234**	3.32
1-13	E	86.3	0.7492	0.5	0.0008	50	40.0	1.3	333	25.0	7.4	14.7	0.8	383	N/A	2.1	**0.100**	3.34
1-14	E	86.3	0.7492	1.0	0.0016	50	40.0	1.3	406	18.0	6.3	12.5	1.1	456	N/A	2.4	**0.100**	3.31
1-15	E	86.1	0.7465	3.6	0.0057	50	26.0	1.5	575	19.7	6.6	13.0	1.4	625	N/A	2.9	**0.100**	3.32
1-16	E	86.3	0.7492	1.9	0.0030	50	32.0	1.4	334	6.9	3.9	7.7	1.4	384	N/A	2.8	**0.100**	3.31
1-17	E	86.3	0.7492	2.5	0.0039	50	62.0	1.1	452	38.1	9.1	18.1	0.8	502	N/A	2.0	**0.100**	3.28
1-18	E	86.3	0.7492	2.4	0.0038	50	58.0	1.2	657	24.8	7.4	14.6	1.3	707	N/A	2.5	**0.100**	3.28

$Tc = Ti + Tt$ $Tlag = 0.6\ Tc$

$Ti = 1.8\ (1.1 - K)\ L^{1/2} / S^{1/3}$

$K = 0.0132\ (CN) - 0.39$

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing: $V1 = 14.8*(S/100)^{1/2}$ $V2 = 29.4*(S/100)^{1/2}$

Developed: $V1 = 20.2*(S/100)^{1/2}$ $V2 = 30.6*(S/100)^{1/2}$

* Basin parameters referenced from the Summerlin West MPU

REFERENCE:

STANDARD FORM 4

ONSITE PRORATED FLOW SUMMARY			
Subbasin	Q_{100} (cfs)	New Area	cfs/acre
1-11P	219*	113.6*	1.93
1-12P	230*	116.1*	1.98
Onsite Prorated Basins			
Subbasin	Q_{100} (cfs)	New Area (acres)	cfs/acre
11-A	30*	15.6*	1.93
11-B	12	6.3*	1.93
11-C	21	10.7	1.93
11-D	33*	17.1*	1.93
11-E	17*	9.0*	1.93
11-F	18	9.2*	1.93
11-G	5*	2.3*	1.93
11-H	19	9.7*	1.93
11-I	14	7.4	1.93
11-J1	6	3.3	1.93
11-J2	15*	7.5	1.93
11-K	23	12.1*	1.93
11-L	6	3.4*	1.93
Total	**219***	**113.6***	**N/A**
12-A	33	16.5	1.98
12-B	11	5.8	1.98
12-C	3	1.7*	1.98
12-D	24	12.0	1.98
12-E	15	7.4*	1.98
12-F	14	7.0	1.98
12-G	13*	6.6*	1.98
12-H	12*	5.9*	1.98
12-I	17*	8.8*	1.98
12-J	13	6.7*	1.98
12-K	13	6.4	1.98
12-L	43	21.5	1.98
12-M	7	3.8	1.98
12-N	12	6*	1.98
TOTAL	**230***	**116.1***	**N/A**
*Revised from Previous Submittal			

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   23NOV15  TIME  13:13:11   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X               X
XXXXXXX  XXXX     X       XXXXX   X
X     X  X        X               X
X     X  X        X     X         X
X     X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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

                    *DIAGRAM
*** FREE ***
               1    ID   ************************************************************
               2    ID   * ........................................................ *
               3    ID   * :            SUMMERLIN VILLAGE 26 REVERENCE            : *
               4    ID   * :                 ULTIMATE CONDITION                   : *
               5    ID   * :       THIS MODEL DETERMINES THE RUNOFF DURING       : *
               6    ID   * :           ULTIMATE DEVELOPMENT CONDITIONS           : *
               7    ID   * :.....................................................: *
               8    ID   * :             RETURN PERIOD_ _ _ _100-YEAR            : *
               9    ID   * :             DISTRIBUTION_ _ _ _ 6-HOUR SDN3         : *
              10    ID   * :             PROJECT NO_ _ _ _ _ 764.204.011         : *
              11    ID   * :             FILENAME_ _ _ _ _ _ V26ULT.H1           : *
              12    ID   * :             DATE_ _ _ _ _ _ _ 11/23/2015            : *
              13    ID   * :             MODELED BY_ _ _ _ JAM                   : *
              14    ID   * :                                                     : *
              15    ID   * :             DEPTH AREA REDUCTION FACTORS:           : *
              16    ID   * :               AREA              DARF                : *
              17    ID   * :             0.00 TO 0.24 SQ MI     1.00             : *
              18    ID   * :             0.25 TO 0.49 SQ MI     0.99             : *
              19    ID   * :             0.50 TO 0.99 SQ MI     0.98             : *
              20    ID   * :             1.00 TO 1.24 SQ MI     0.97             : *
              21    ID   * :             1.25 TO 1.50 SQ MI     0.96             : *
              22    ID   * :             1.51 TO 1.74 SQ MI     0.95             : *
              23    ID   * :             1.75 TO 1.99 SQ MI     0.94             : *
              24    ID   * :             2.00 TO 2.99 SQ MI     0.93             : *
              25    ID   * :             3.00 TO 3.99 SQ MI     0.92             : *
              26    ID   * :             4.00 TO 4.99 SQ MI     0.91             : *
              27    ID   * :.....................................................: *
              28    ID   ************************************************************
              29    ID
              30    ID
              31    IT       5       0       0     300
              32    IO       5
              33    IN       5       0       0
              34    JR    PREC     1.0    0.99    0.98    0.94    0.93    0.92    0.91    0.70    0.54
                    *
              35    KK    1-1A
              36    BA   2.339
              37    PB    3.67
              38    PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
              39    PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
              40    PC   .1900   .1970   .1990   .2000   .2010   .2040   .2140   .2290   .2410   .2490
              41    PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
              42    PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
              43    PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
              44    PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
              45    PC   .9980   .9990  1.000
              46    LS       0    85.4
              47    UD   0.488
                    *
```



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

              48    KK    1-1B
              49    PB    3.61
              50    BA   0.175
              51    LS       0    78.3
              52    UD    .176
                    *
              53    KK      R2
              54    KM   ROUTE 1-1B THROUGH PORTION OF 1-1A
```

```
 55          KM   ASSUME EXISTING WASH
 56          KM     LEN   SLOPE     n              SHAPE      BW      SS
 57          RD    1885  0.0680    0.04        0    TRAP      20      10
             *

 58          KK     CP1
 59          KM    COMBINE 1-1A AND R2
 60          HC       2
             *

 61          KK      R3
 62          KM   ROUTE CP1 THROUGH 1-2B TO CP2
 63          KM   ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 64          KM   NSTEPS      K       X
 65          RM       1    .092     .15
             *

 66          KK    1-2A
 67          PB    3.55
 68          BA   0.864
 69          LS       0    85.8
 70          UD    .125
             *

 71          KK      R4
 72          KM   ROUTE 1-2A THROUGH 1-2B TO CP2
 73          KM   ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 74          KM   NSTEPS      K       X
 75          RM       1    .054     .15
             *

 76          KK    1-2B
 77          PB    3.51
 78          BA   0.215
 79          LS       0    82.6
 80          UD    .178
             *

 81          KK     CP2
 82          KM    COMBINE 1-2B, R4 AND R3
 83          HC       3
             *
```



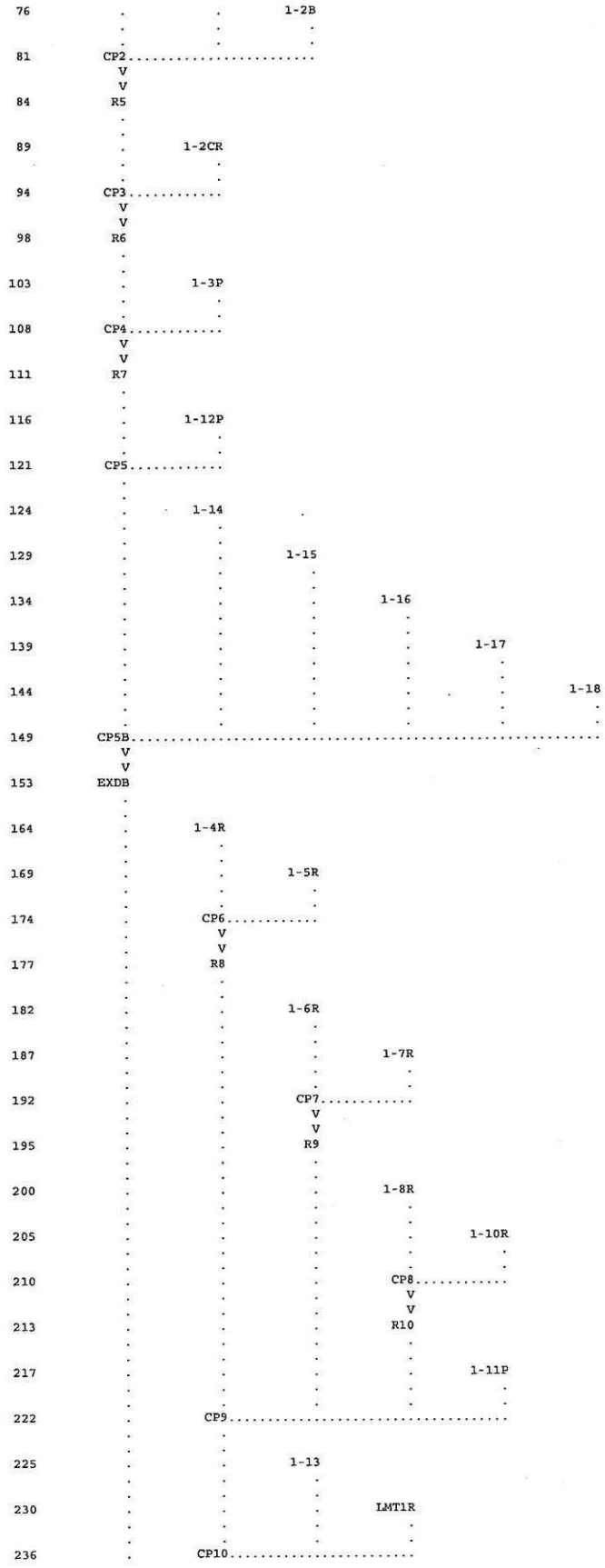
```
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 84          KK      R5
 85          KM   ROUTE CP2 THROUGH 1-2C TO CP3
 86          KM   ASSUME EXISTING WASH
 87          KM   NSTEPS      K       X
 88          RM       1    .087     .15
             *

 89          KK   1-2CR
 90          PB    3.46
 91          BA   0.574
 92          LS       0    84.7
 93          UD    .180
             *

 94          KK     CP3
 95          KM    COMBINE 1-2C AND R5
 96          KO       1
 97          HC       2
             *

 98          KK      R6
 99          KM   ROUTE CP3 TO CP4
100          KM   ASSUME BOX CULVERT
101          KM     LEN   SLOPE     n              SHAPE      BW
102          RD    1745  0.0050   0.015        0    DEEP      14
             *

103          KK    1-3P
104          PB    3.36
105          BA   .0258
106          LS       0    94.9
107          UD    .084
             *

108          KK     CP4
109          KM    COMBINE CP3 and 1-3P
110          HC       2
             *

111          KK      R7
112          KM   ROUTE CP4 THROUGH 1-12P TO CP5 (DETENTION BASIN)
113          KM   ASSUME RCP
114          KM     LEN   SLOPE     n              SHAPE      BW
115          RD    2258  0.0050   0.016        0    DEEP      12
             *

116          KK   1-12P
117          PB    3.32
118          BA   .1814
119          LS       0    83.8
120          UD    .234
             *
```



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

```
121          KK     CP5
122          KM    COMBINE CP4 AND 1-12P
123          HC       2
             *

124          KK    1-14
125          PB    3.31
126          BA   .0016
127          LS       0    86.3
128          UD    .100
             *

129          KK    1-15
130          PB    3.32
131          BA   .0057
132          LS       0    86.1
133          UD    .100
             *

134          KK    1-16
135          PB    3.31
136          BA   .0030
137          LS       0    86.3
138          UD    .100
             *

139          KK    1-17
140          PB    3.28
141          BA   .0039
142          LS       0    86.3
143          UD    .100
             *

144          KK    1-18
145          PB    3.28
146          BA   .0038
147          LS       0    86.3
148          UD    .100
             *

149          KK    CP5B
150          KM    COMBINE CP5, 1-14, 1-15, 1-16, 1-17, AND 1-18 AT DETENTION BASIN
151          KO       1
152          HC       6
             *

153          KK    EXDB
154          KO       1
155          KM   DETENTION BASIN CHEYENNE AND BELTWAY
156          KM   LOW-FLOW OUTLET IS 66" PIPE
157          RS       1    STOR       0
158          SV       0    0.07    0.80   12.71   18.75   25.05   85.95   95.04  124.21  135.14
159          SV  200.27  243.11  258.06  273.36  289.00  304.99
160          SE    2990    2991    2992    2995    2996    2997    3005    3006    3009    3010
1                                          HEC-1 INPUT                                          PAGE  5

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

161          SE    3015    3018    3019    3020    3021    3022
162          SL  2993.7   22.31     0.7     0.5
163          SS  3021.9     200     2.6     1.5
             *

164          KK    1-4R
165          PB    3.44
166          BA  0.0536
167          LS       0    86.3
168          UD   0.100
             *

169          KK    1-5R
170          PB    3.42
171          BA   .0343
172          LS       0    86.3
173          UD   0.100
             *

174          KK     CP6
175          KM    COMBINE 1-4R AND 1-5R
176          HC       2
             *

177          KK      R8
178          KM   ROUTE CP6 THROUGH 1-11P TO CP9
179          KM   ASSUME RCP
180          KM     LEN   SLOPE     n              SHAPE   DIAMETER
181          RD    1800  0.0610   0.013       0    CIRC       4
             *

182          KK    1-6R
183          PB    3.43
184          BA   .0152
185          LS       0    86.3
186          UD    .100
             *

187          KK    1-7R
188          PB    3.44
189          BA   .0271
190          LS       0    86.3
191          UD    .100
             *

192          KK     CP7
```

```
 193          KM    COMBINE 1-6R AND 1-7R
 194          HC       2
              *
1                                        HEC-1 INPUT                                        PAGE  6

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

 195          KK      R9
 196          KM   ROUTE CP7 THROUGH 1-11P TO CP9
 197          KM   ASSUME RCP
 198          KM     LEN   SLOPE     n              SHAPE   DIAMETER
 199          RD    3150  0.0400   0.013       0    CIRC     4.5
              *

 200          KK    1-8R
 201          PB    3.42
 202          BA   .0025
 203          LS       0     86.3
 204          UD    .100
              *

 205          KK   1-10R
 206          PB    3.41
 207          BA   .0556
 208          LS       0     86.1
 209          UD    .100
              *

 210          KK     CP8
 211          KM    COMBINE 1-8R AND 1-10R
 212          HC       2
              *

 213          KK     R10
 214          KM   ASSUME RCP
 215          KM     LEN   SLOPE     n              SHAPE   DIAMETER
 216          RD    2900  0.0400   0.013       0    CIRC     4.5
              *

 217          KK   1-11P
 218          PB    3.38
 219          BA   .1775
 220          LS       0     81.7
 221          UD    .214
              *

 222          KK     CP9
 223          KM    COMBINE CP6, CP7, CP8 AND 1-11P
 224          HC       4
              *

 225          KK    1-13
 226          PB    3.34
 227          BA   .0008
 228          LS       0     86.3
 229          UD    .100
              *
1                                        HEC-1 INPUT                                        PAGE  7

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

 230          KK   LMT1R
 231          KM   REFERENCED FROM LAS VEGAS VALLEY MPU
 232          PB    3.45
 233          BA   1.964
 234          LS       0     86.8
 235          UD    .447
              *

 236          KK    CP10
 237          KM    COMBINE CP9, 1-13, AND LMT1R
 238          HC       3
              *
 239          ZZ
1
              SCHEMATIC DIAGRAM OF STREAM NETWORK
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    35        1-1A
                .
                .
    48          .        1-1B
                .           V
                .           V
    53          .          R2
                .           .
                .           .
    58        CP1............
                V
                V
    61         R3
                .
                .
    66          .        1-2A
                .           V
                .           V
    71          .          R4
                .           .
                .           .
```


76
1-2B
81
CP2
84
R5
89
1-2CR
94
CP3
98
R6
103
1-3P
108
CP4
111
R7
116
1-12P
121
CP5
124
1-14
129
1-15
134
1-16
139
1-17
144
1-18
149
CP5B
153
EXDB
164
1-4R
169
1-5R
174
CP6
177
R8
182
1-6R
187
1-7R
192
CP7
195
R9
200
1-8R
205
1-10R
210
CP8
213
R10
217
1-11P
222
CP9
225
1-13
230
LMT1R
236
CP10

```
(***) RUNOFF ALSO COMPUTED AT THIS LOCATION
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN   1998               *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   23NOV15  TIME  13:13:11   *
*                                       *
*****************************************
```

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

```
*****************************************************************
* ............................................................ *
* :            SUMMERLIN VILLAGE 26 REVERENCE                  : *
* :                 ULTIMATE CONDITION                         : *
* :      THIS MODEL DETERMINES THE RUNOFF DURING               : *
* :          ULTIMATE DEVELOPMENT CONDITIONS                   : *
* :............................................................: *
* :             RETURN PERIOD_ _ _ _100-YEAR                   : *
* :             DISTRIBUTION_ _ _ _ 6-HOUR SDN3                : *
* :             PROJECT NO_ _ _ _ _ 764.204.011                : *
* :             FILENAME_ _ _ _ _ _ V26ULT.H1                  : *
* :             DATE_ _ _ _ _ _ _ _ 11/23/2015                 : *
* :             MODELED BY_ _ _ _ _ JAM                        : *
* :                                                            : *
* :            DEPTH AREA REDUCTION FACTORS:                   : *
* :              AREA                DARF                      : *
* :            0.00 TO 0.24 SQ MI     1.00                     : *
* :            0.25 TO 0.49 SQ MI     0.99                     : *
* :            0.50 TO 0.99 SQ MI     0.98                     : *
* :            1.00 TO 1.24 SQ MI     0.97                     : *
* :            1.25 TO 1.50 SQ MI     0.96                     : *
* :            1.51 TO 1.74 SQ MI     0.95                     : *
* :            1.75 TO 1.99 SQ MI     0.94                     : *
* :            2.00 TO 2.99 SQ MI     0.93                     : *
* :            3.00 TO 3.99 SQ MI     0.92                     : *
* :            4.00 TO 4.99 SQ MI     0.91                     : *
* :............................................................: *
*****************************************************************
```

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

    IT          HYDROGRAPH TIME DATA
                      NMIN          5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                        NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2   0  ENDING DATE
                    NDTIME       0055  ENDING TIME
                     ICENT         19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                       TOTAL TIME BASE   24.92 HOURS

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

    JP          MULTI-PLAN OPTION
                     NPLAN          1  NUMBER OF PLANS

    JR          MULTI-RATIO OPTION
                    RATIOS OF PRECIPITATION
                  1.00      .99      .98      .94      .93      .92      .91      .70      .54

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

            **************
            *            *
 94 KK      *      CP3   *
            *            *
            **************

 96 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          1  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

 97 HC          HYDROGRAPH COMBINATION
                     ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

                                                    ***

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

                                    HYDROGRAPH AT STATION      CP3
                                         SUM OF  2 HYDROGRAPHS
```

PLAN 1, RATIO = 1.00

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	176.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	144.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	119.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	98.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	80.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	64.	1		1255	156	0.	1		1910	231	0.
1		0030	7	3.	1		0645	82	51.	1		1300	157	0.	1		1915	232	0.
1		0035	8	10.	1		0650	83	40.	1		1305	158	0.	1		1920	233	0.
1		0040	9	20.	1		0655	84	31.	1		1310	159	0.	1		1925	234	0.
1		0045	10	25.	1		0700	85	24.	1		1315	160	0.	1		1930	235	0.
1		0050	11	24.	1		0705	86	18.	1		1320	161	0.	1		1935	236	0.
1		0055	12	22.	1		0710	87	14.	1		1325	162	0.	1		1940	237	0.
1		0100	13	22.	1		0715	88	10.	1		1330	163	0.	1		1945	238	0.
1		0105	14	22.	1		0720	89	8.	1		1335	164	0.	1		1950	239	0.
1		0110	15	24.	1		0725	90	6.	1		1340	165	0.	1		1955	240	0.
1		0115	16	29.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	35.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	42.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	57.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	83.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	111.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	136.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	152.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	158.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	154.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	147.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	148.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	167.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	205.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	247.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	272.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	272.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	272.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	294.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	325.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	337.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	330.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	353.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	445.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	628.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	962.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1509.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2268.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	3079.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3618.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3812.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3787.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3685.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3538.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3363.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3134.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2826.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2493.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2193.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1966.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1828.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1737.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1643.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1555.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1503.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1449.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1358.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1234.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1109.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	988.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	874.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	768.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	665.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	566.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	478.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	410.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	351.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	298.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	251.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	212.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)	(CFS)				
3812.	3.75		941.	236.	227.	227.
		(INCHES)	2.100	2.107	2.107	2.107
		(AC-FT)	467.	468.	468.	468.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .99

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	174.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	143.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	117.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	96.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	79.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	63.	1		1255	156	0.	1		1910	231	0.
1		0030	7	2.	1		0645	82	50.	1		1300	157	0.	1		1915	232	0.
1		0035	8	9.	1		0650	83	39.	1		1305	158	0.	1		1920	233	0.
1		0040	9	18.	1		0655	84	30.	1		1310	159	0.	1		1925	234	0.
1		0045	10	23.	1		0700	85	23.	1		1315	160	0.	1		1930	235	0.
1		0050	11	22.	1		0705	86	18.	1		1320	161	0.	1		1935	236	0.
1		0055	12	21.	1		0710	87	14.	1		1325	162	0.	1		1940	237	0.
1		0100	13	20.	1		0715	88	10.	1		1330	163	0.	1		1945	238	0.
1		0105	14	20.	1		0720	89	8.	1		1335	164	0.	1		1950	239	0.
1		0110	15	23.	1		0725	90	6.	1		1340	165	0.	1		1955	240	0.
1		0115	16	28.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	33.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	40.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	55.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	80.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	108.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	132.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	148.	1		0805	98	1.	1		1420	173	0.	1		2035	248	0.
1		0155	24	153.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	150.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	143.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	144.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	162.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	200.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	241.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	265.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	266.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	266.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	287.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	318.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	330.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	323.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	345.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	436.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	616.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	944.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1483.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2230.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	3031.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3564.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3756.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3731.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3631.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3488.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3316.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	3090.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2787.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2459.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2163.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1940.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1804.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1715.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1622.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1536.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1484.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1431.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1341.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1219.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1096.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	976.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	863.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	759.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	657.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	559.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	472.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	405.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	347.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	294.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	248.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	209.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)	(CFS)				
3756.	3.75		927.	233.	224.	224.
		(INCHES)	2.069	2.075	2.075	2.075
		(AC-FT)	460.	461.	461.	461.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .98

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	172.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	141.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	116.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	95.	1		1245	154	0.	1		1900	229	0.

1	0020	5	0.	*	1	0635	80	78.	*	1	1250	155	0.	*	1	1905	230	0.
1	0025	6	0.	*	1	0640	81	62.	*	1	1255	156	0.	*	1	1910	231	0.
1	0030	7	2.	*	1	0645	82	49.	*	1	1300	157	0.	*	1	1915	232	0.
1	0035	8	8.	*	1	0650	83	39.	*	1	1305	158	0.	*	1	1920	233	0.
1	0040	9	16.	*	1	0655	84	30.	*	1	1310	159	0.	*	1	1925	234	0.
1	0045	10	21.	*	1	0700	85	23.	*	1	1315	160	0.	*	1	1930	235	0.
1	0050	11	21.	*	1	0705	86	18.	*	1	1320	161	0.	*	1	1935	236	0.
1	0055	12	19.	*	1	0710	87	14.	*	1	1325	162	0.	*	1	1940	237	0.
1	0100	13	19.	*	1	0715	88	10.	*	1	1330	163	0.	*	1	1945	238	0.
1	0105	14	19.	*	1	0720	89	8.	*	1	1335	164	0.	*	1	1950	239	0.
1	0110	15	21.	*	1	0725	90	6.	*	1	1340	165	0.	*	1	1955	240	0.
1	0115	16	26.	*	1	0730	91	4.	*	1	1345	166	0.	*	1	2000	241	0.
1	0120	17	32.	*	1	0735	92	3.	*	1	1350	167	0.	*	1	2005	242	0.
1	0125	18	38.	*	1	0740	93	2.	*	1	1355	168	0.	*	1	2010	243	0.
1	0130	19	52.	*	1	0745	94	2.	*	1	1400	169	0.	*	1	2015	244	0.
1	0135	20	77.	*	1	0750	95	1.	*	1	1405	170	0.	*	1	2020	245	0.
1	0140	21	104.	*	1	0755	96	1.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	127.	*	1	0800	97	1.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	143.	*	1	0805	98	1.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	149.	*	1	0810	99	0.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	145.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	139.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	139.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	158.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	195.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	235.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	259.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	259.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	259.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	281.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	311.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	322.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	316.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	338.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	427.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	604.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	927.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1457.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	2194.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2983.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3509.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3700.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3677.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3579.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3438.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3269.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3047.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2749.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2425.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2134.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1913.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1780.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1692.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1601.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1515.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1465.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1413.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1324.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1204.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1082.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	964.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	852.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	749.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	649.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	552.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	466.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	400.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	343.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	291.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	245.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	207.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)			
+ 3700.	3.75	913.	229.	221.	221.
		(INCHES) 2.038	2.044	2.044	2.044
		(AC-FT) 453.	454.	454.	454.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .94

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	163.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	134.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	110.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	91.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	74.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	59.	1		1255	156	0.	1		1910	231	0.
1		0030	7	1.	1		0645	82	47.	1		1300	157	0.	1		1915	232	0.
1		0035	8	5.	1		0650	83	37.	1		1305	158	0.	1		1920	233	0.
1		0040	9	11.	1		0655	84	29.	1		1310	159	0.	1		1925	234	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0045	10	15.	1		0700	85	22.	1		1315	160	0.	1		1930	235	0.
1		0050	11	15.	1		0705	86	17.	1		1320	161	0.	1		1935	236	0.
1		0055	12	14.	1		0710	87	13.	1		1325	162	0.	1		1940	237	0.
1		0100	13	13.	1		0715	88	10.	1		1330	163	0.	1		1945	238	0.
1		0105	14	14.	1		0720	89	7.	1		1335	164	0.	1		1950	239	0.
1		0110	15	16.	1		0725	90	5.	1		1340	165	0.	1		1955	240	0.
1		0115	16	20.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	25.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	31.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	43.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	65.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	89.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	110.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	125.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	130.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	127.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	122.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	123.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	140.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	174.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	211.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	233.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	234.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	235.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	255.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	283.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	294.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	289.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	309.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	392.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	556.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	857.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	1354.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	2047.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	2792.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	3291.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	3476.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	3458.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	3369.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	3238.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	3081.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	2873.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	2594.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	2289.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	2016.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1809.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1683.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1601.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1516.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	1436.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	1389.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	1340.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	1256.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	1142.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	1027.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	915.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	809.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	712.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	616.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	524.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	443.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	380.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	326.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	276.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	233.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	196.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
3476.	3.75	858.	215.	207.	207.
		(INCHES) 1.914	1.919	1.919	1.919
		(AC-FT) 425.	426.	426.	426.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .93

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	161.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	132.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	109.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	89.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	73.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	59.	1		1255	156	0.	1		1910	231	0.
1		0030	7	1.	1		0645	82	46.	1		1300	157	0.	1		1915	232	0.
1		0035	8	4.	1		0650	83	36.	1		1305	158	0.	1		1920	233	0.
1		0040	9	10.	1		0655	84	28.	1		1310	159	0.	1		1925	234	0.
1		0045	10	13.	1		0700	85	22.	1		1315	160	0.	1		1930	235	0.
1		0050	11	14.	1		0705	86	17.	1		1320	161	0.	1		1935	236	0.
1		0055	12	13.	1		0710	87	13.	1		1325	162	0.	1		1940	237	0.
1		0100	13	12.	1		0715	88	10.	1		1330	163	0.	1		1945	238	0.
1		0105	14	13.	1		0720	89	7.	1		1335	164	0.	1		1950	239	0.

1	0110	15	14.	*	1	0725	90	5.	*	1	1340	165	0.	*	1	1955	240	0.
1	0115	16	18.	*	1	0730	91	4.	*	1	1345	166	0.	*	1	2000	241	0.
1	0120	17	23.	*	1	0735	92	3.	*	1	1350	167	0.	*	1	2005	242	0.
1	0125	18	29.	*	1	0740	93	2.	*	1	1355	168	0.	*	1	2010	243	0.
1	0130	19	41.	*	1	0745	94	2.	*	1	1400	169	0.	*	1	2015	244	0.
1	0135	20	62.	*	1	0750	95	1.	*	1	1405	170	0.	*	1	2020	245	0.
1	0140	21	85.	*	1	0755	96	1.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	106.	*	1	0800	97	1.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	120.	*	1	0805	98	0.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	126.	*	1	0810	99	0.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	123.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	118.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	119.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	136.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	169.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	205.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	227.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	228.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	228.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	248.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	276.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	287.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	282.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	302.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	384.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	545.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	840.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1329.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	2011.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2745.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3238.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3419.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3402.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3315.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3188.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3034.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2830.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2555.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2255.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	1986.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1782.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1659.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1579.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1494.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1416.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1370.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1321.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1239.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1127.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1013.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	903.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	798.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	702.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	608.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	517.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	437.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	375.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	321.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	273.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	230.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	194.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 3419.	3.75		844.	211.	204.	204.
		(INCHES)	1.883	1.887	1.887	1.887
		(AC-FT)	419.	419.	419.	419.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .92

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	159.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	131.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	107.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	88.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	72.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	58.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	1.	*	1		0645	82	46.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	4.	*	1		0650	83	36.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	9.	*	1		0655	84	28.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	12.	*	1		0700	85	21.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	12.	*	1		0705	86	16.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	11.	*	1		0710	87	13.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	11.	*	1		0715	88	9.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	11.	*	1		0720	89	7.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	13.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	17.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	21.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	27.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	39.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.

1	0135	20	59.	*	1	0750	95	1.	*	1	1405	170	0.	*	1	2020	245	0.	
1	0140	21	82.	*	1	0755	96	1.	*	1	1410	171	0.	*	1	2025	246	0.	
1	0145	22	102.	*	1	0800	97	1.	*	1	1415	172	0.	*	1	2030	247	0.	
1	0150	23	116.	*	1	0805	98	0.	*	1	1420	173	0.	*	1	2035	248	0.	
1	0155	24	121.	*	1	0810	99	0.	*	1	1425	174	0.	*	1	2040	249	0.	
1	0200	25	119.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.	
1	0205	26	114.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.	
1	0210	27	115.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.	
1	0215	28	131.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.	
1	0220	29	164.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.	
1	0225	30	199.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.	
1	0230	31	220.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.	
1	0235	32	222.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.	
1	0240	33	222.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.	
1	0245	34	242.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.	
1	0250	35	269.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.	
1	0255	36	280.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.	
1	0300	37	275.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.	
1	0305	38	295.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.	
1	0310	39	375.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.	
1	0315	40	533.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.	
1	0320	41	823.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.	
1	0325	42	1303.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.	
1	0330	43	1974.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.	
1	0335	44	2698.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.	
1	0340	45	3184.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.	
1	0345	46	3365.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.	
1	0350	47	3348.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.	
1	0355	48	3263.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.	
1	0400	49	3138.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.	
1	0405	50	2987.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.	
1	0410	51	2787.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.	
1	0415	52	2516.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.	
1	0420	53	2222.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.	
1	0425	54	1957.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.	
1	0430	55	1756.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.	
1	0435	56	1635.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.	
1	0440	57	1556.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.	
1	0445	58	1473.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.	
1	0450	59	1396.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.	
1	0455	60	1350.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.	
1	0500	61	1303.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.	
1	0505	62	1221.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.	
1	0510	63	1111.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.	
1	0515	64	999.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.	
1	0520	65	890.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.	
1	0525	66	788.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.	
1	0530	67	693.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.	
1	0535	68	600.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.	
1	0540	69	510.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.	
1	0545	70	431.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.	
1	0550	71	370.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.	
1	0555	72	317.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.	
1	0600	73	269.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.	
1	0605	74	227.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.	
1	0610	75	191.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.	

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 3365.	3.75		830.	208.	200.	200.
		(INCHES)	1.853	1.857	1.857	1.857
		(AC-FT)	412.	413.	413.	413.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	157.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	129.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	106.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	87.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	71.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	57.	1		1255	156	0.	1		1910	231	0.
1		0030	7	1.	1		0645	82	45.	1		1300	157	0.	1		1915	232	0.
1		0035	8	3.	1		0650	83	35.	1		1305	158	0.	1		1920	233	0.
1		0040	9	8.	1		0655	84	28.	1		1310	159	0.	1		1925	234	0.
1		0045	10	11.	1		0700	85	21.	1		1315	160	0.	1		1930	235	0.
1		0050	11	11.	1		0705	86	16.	1		1320	161	0.	1		1935	236	0.
1		0055	12	10.	1		0710	87	12.	1		1325	162	0.	1		1940	237	0.
1		0100	13	10.	1		0715	88	9.	1		1330	163	0.	1		1945	238	0.
1		0105	14	10.	1		0720	89	7.	1		1335	164	0.	1		1950	239	0.
1		0110	15	12.	1		0725	90	5.	1		1340	165	0.	1		1955	240	0.
1		0115	16	16.	1		0730	91	4.	1		1345	166	0.	1		2000	241	0.
1		0120	17	20.	1		0735	92	3.	1		1350	167	0.	1		2005	242	0.
1		0125	18	25.	1		0740	93	2.	1		1355	168	0.	1		2010	243	0.
1		0130	19	37.	1		0745	94	2.	1		1400	169	0.	1		2015	244	0.
1		0135	20	56.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	78.	1		0755	96	1.	1		1410	171	0.	1		2025	246	0.
1		0145	22	98.	1		0800	97	1.	1		1415	172	0.	1		2030	247	0.
1		0150	23	111.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	117.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.

1	0200	25	114.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	110.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	111.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	127.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	158.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	193.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	214.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	216.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	216.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	235.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	262.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	273.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	268.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	288.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	366.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	521.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	806.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1278.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1938.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2650.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3129.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3309.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3294.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3211.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3088.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	2940.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2744.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2478.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2188.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	1927.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1730.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1611.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1533.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1452.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1376.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1332.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1285.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1205.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1096.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	986.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	878.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	777.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	683.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	592.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	503.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	425.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	365.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	313.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	265.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	224.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	189.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 3309.	3.75		817.	205.	197.	197.
		(INCHES)	1.822	1.826	1.826	1.826
		(AC-FT)	405.	406.	406.	406.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .70

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	112.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	92.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	76.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	62.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	51.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	41.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	0.	*	1		0645	82	32.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	0.	*	1		0650	83	25.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	0.	*	1		0655	84	20.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	0.	*	1		0700	85	15.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	12.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	9.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	7.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	5.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	4.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	0.	*	1		0730	91	3.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	0.	*	1		0735	92	2.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	1.	*	1		0740	93	1.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	4.	*	1		0745	94	1.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	9.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	17.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	25.	*	1		0800	97	0.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	32.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	36.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	37.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	37.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	39.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	47.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	64.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0225	30	83.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	96.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	99.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	101.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	113.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.
1		0250	35	130.	1		0905	110	0.	1		1520	185	0.	1		2135	260	0.
1		0255	36	137.	1		0910	111	0.	1		1525	186	0.	1		2140	261	0.
1		0300	37	137.	1		0915	112	0.	1		1530	187	0.	1		2145	262	0.
1		0305	38	150.	1		0920	113	0.	1		1535	188	0.	1		2150	263	0.
1		0310	39	197.	1		0925	114	0.	1		1540	189	0.	1		2155	264	0.
1		0315	40	290.	1		0930	115	0.	1		1545	190	0.	1		2200	265	0.
1		0320	41	467.	1		0935	116	0.	1		1550	191	0.	1		2205	266	0.
1		0325	42	769.	1		0940	117	0.	1		1555	192	0.	1		2210	267	0.
1		0330	43	1204.	1		0945	118	0.	1		1600	193	0.	1		2215	268	0.
1		0335	44	1689.	1		0950	119	0.	1		1605	194	0.	1		2220	269	0.
1		0340	45	2026.	1		0955	120	0.	1		1610	195	0.	1		2225	270	0.
1		0345	46	2164.	1		1000	121	0.	1		1615	196	0.	1		2230	271	0.
1		0350	47	2171.	1		1005	122	0.	1		1620	197	0.	1		2235	272	0.
1		0355	48	2130.	1		1010	123	0.	1		1625	198	0.	1		2240	273	0.
1		0400	49	2060.	1		1015	124	0.	1		1630	199	0.	1		2245	274	0.
1		0405	50	1972.	1		1020	125	0.	1		1635	200	0.	1		2250	275	0.
1		0410	51	1850.	1		1025	126	0.	1		1640	201	0.	1		2255	276	0.
1		0415	52	1678.	1		1030	127	0.	1		1645	202	0.	1		2300	277	0.
1		0420	53	1488.	1		1035	128	0.	1		1650	203	0.	1		2305	278	0.
1		0425	54	1316.	1		1040	129	0.	1		1655	204	0.	1		2310	279	0.
1		0430	55	1187.	1		1045	130	0.	1		1700	205	0.	1		2315	280	0.
1		0435	56	1110.	1		1050	131	0.	1		1705	206	0.	1		2320	281	0.
1		0440	57	1062.	1		1055	132	0.	1		1710	207	0.	1		2325	282	0.
1		0445	58	1009.	1		1100	133	0.	1		1715	208	0.	1		2330	283	0.
1		0450	59	960.	1		1105	134	0.	1		1720	209	0.	1		2335	284	0.
1		0455	60	932.	1		1110	135	0.	1		1725	210	0.	1		2340	285	0.
1		0500	61	903.	1		1115	136	0.	1		1730	211	0.	1		2345	286	0.
1		0505	62	848.	1		1120	137	0.	1		1735	212	0.	1		2350	287	0.
1		0510	63	774.	1		1125	138	0.	1		1740	213	0.	1		2355	288	0.
1		0515	64	697.	1		1130	139	0.	1		1745	214	0.	2		0000	289	0.
1		0520	65	622.	1		1135	140	0.	1		1750	215	0.	2		0005	290	0.
1		0525	66	551.	1		1140	141	0.	1		1755	216	0.	2		0010	291	0.
1		0530	67	486.	1		1145	142	0.	1		1800	217	0.	2		0015	292	0.
1		0535	68	421.	1		1150	143	0.	1		1805	218	0.	2		0020	293	0.
1		0540	69	358.	1		1155	144	0.	1		1810	219	0.	2		0025	294	0.
1		0545	70	303.	1		1200	145	0.	1		1815	220	0.	2		0030	295	0.
1		0550	71	260.	1		1205	146	0.	1		1820	221	0.	2		0035	296	0.
1		0555	72	223.	1		1210	147	0.	1		1825	222	0.	2		0040	297	0.
1		0600	73	189.	1		1215	148	0.	1		1830	223	0.	2		0045	298	0.
1		0605	74	160.	1		1220	149	0.	1		1835	224	0.	2		0050	299	0.
1		0610	75	135.	1		1225	150	0.	1		1840	225	0.	2		0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 2171.	3.83	536.	134.	129.	129.
		(INCHES) 1.197	1.197	1.197	1.197
		(AC-FT) 266.	266.	266.	266.

CUMULATIVE AREA = 4.17 SQ MI

HYDROGRAPH AT STATION CP3
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .54

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	1		0615	76	78.	1		1230	151	0.	1		1845	226	0.
1		0005	2	0.	1		0620	77	65.	1		1235	152	0.	1		1850	227	0.
1		0010	3	0.	1		0625	78	53.	1		1240	153	0.	1		1855	228	0.
1		0015	4	0.	1		0630	79	44.	1		1245	154	0.	1		1900	229	0.
1		0020	5	0.	1		0635	80	36.	1		1250	155	0.	1		1905	230	0.
1		0025	6	0.	1		0640	81	29.	1		1255	156	0.	1		1910	231	0.
1		0030	7	0.	1		0645	82	23.	1		1300	157	0.	1		1915	232	0.
1		0035	8	0.	1		0650	83	18.	1		1305	158	0.	1		1920	233	0.
1		0040	9	0.	1		0655	84	14.	1		1310	159	0.	1		1925	234	0.
1		0045	10	0.	1		0700	85	11.	1		1315	160	0.	1		1930	235	0.
1		0050	11	0.	1		0705	86	8.	1		1320	161	0.	1		1935	236	0.
1		0055	12	0.	1		0710	87	6.	1		1325	162	0.	1		1940	237	0.
1		0100	13	0.	1		0715	88	5.	1		1330	163	0.	1		1945	238	0.
1		0105	14	0.	1		0720	89	4.	1		1335	164	0.	1		1950	239	0.
1		0110	15	0.	1		0725	90	3.	1		1340	165	0.	1		1955	240	0.
1		0115	16	0.	1		0730	91	2.	1		1345	166	0.	1		2000	241	0.
1		0120	17	0.	1		0735	92	1.	1		1350	167	0.	1		2005	242	0.
1		0125	18	0.	1		0740	93	1.	1		1355	168	0.	1		2010	243	0.
1		0130	19	0.	1		0745	94	1.	1		1400	169	0.	1		2015	244	0.
1		0135	20	0.	1		0750	95	1.	1		1405	170	0.	1		2020	245	0.
1		0140	21	0.	1		0755	96	0.	1		1410	171	0.	1		2025	246	0.
1		0145	22	1.	1		0800	97	0.	1		1415	172	0.	1		2030	247	0.
1		0150	23	2.	1		0805	98	0.	1		1420	173	0.	1		2035	248	0.
1		0155	24	3.	1		0810	99	0.	1		1425	174	0.	1		2040	249	0.
1		0200	25	3.	1		0815	100	0.	1		1430	175	0.	1		2045	250	0.
1		0205	26	4.	1		0820	101	0.	1		1435	176	0.	1		2050	251	0.
1		0210	27	5.	1		0825	102	0.	1		1440	177	0.	1		2055	252	0.
1		0215	28	7.	1		0830	103	0.	1		1445	178	0.	1		2100	253	0.
1		0220	29	13.	1		0835	104	0.	1		1450	179	0.	1		2105	254	0.
1		0225	30	21.	1		0840	105	0.	1		1455	180	0.	1		2110	255	0.
1		0230	31	27.	1		0845	106	0.	1		1500	181	0.	1		2115	256	0.
1		0235	32	31.	1		0850	107	0.	1		1505	182	0.	1		2120	257	0.
1		0240	33	34.	1		0855	108	0.	1		1510	183	0.	1		2125	258	0.
1		0245	34	40.	1		0900	109	0.	1		1515	184	0.	1		2130	259	0.

1	0250	35	49.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	54.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	56.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	63.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	89.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	140.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	242.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	423.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	697.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	1013.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	1243.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	1348.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	1365.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	1350.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	1316.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	1268.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	1198.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	1093.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	974.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	867.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	786.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	740.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	712.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	680.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	650.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	634.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	616.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	581.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	531.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	480.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	430.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	381.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	336.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	292.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	249.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	211.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	181.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	155.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	132.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	111.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	94.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1365.	3.83		339.	85.	82.	82.
		(INCHES)	.757	.757	.757	.757
		(AC-FT)	168.	168.	168.	168.

CUMULATIVE AREA = 4.17 SQ MI

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          *            *
149 KK    *     CP5B   *
          *            *
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151 KO OUTPUT CONTROL VARIABLES

IPRNT	1	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

152 HC HYDROGRAPH COMBINATION

ICOMP	6	NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = 1.00

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	209.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	173.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	142.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	116.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	95.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	4.	*	1		0640	81	77.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	7.	*	1		0645	82	62.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	10.	*	1		0650	83	49.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	16.	*	1		0655	84	39.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	21.	*	1		0700	85	30.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	24.	*	1		0705	86	23.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	24.	*	1		0710	87	18.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	23.	*	1		0715	88	14.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	22.	*	1		0720	89	10.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	24.	*	1		0725	90	8.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	28.	*	1		0730	91	6.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	33.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	41.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.

1	0130	19	53.	*	1	0745	94	2.	*	1	1400	169	0.	*	1	2015	244	0.
1	0135	20	74.	*	1	0750	95	2.	*	1	1405	170	0.	*	1	2020	245	0.
1	0140	21	100.	*	1	0755	96	1.	*	1	1410	171	0.	*	1	2025	246	0.
1	0145	22	127.	*	1	0800	97	1.	*	1	1415	172	0.	*	1	2030	247	0.
1	0150	23	149.	*	1	0805	98	1.	*	1	1420	173	0.	*	1	2035	248	0.
1	0155	24	160.	*	1	0810	99	1.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	162.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	157.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	155.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	165.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	193.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	233.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	267.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	283.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	288.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	298.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	320.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	340.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	348.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	362.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	419.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	555.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	838.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1332.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	2064.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2907.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3573.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3921.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3985.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3891.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3738.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3552.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3327.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	3049.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2730.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2420.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	2165.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1987.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1868.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1771.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1683.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1611.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1546.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1466.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1354.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1226.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1097.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	976.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	863.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	757.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	655.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	562.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	478.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	409.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	349.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	296.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	249.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3985.	3.83		987.	247.	238.	238.
		(INCHES)	2.089	2.095	2.095	2.095
		(AC-FT)	489.	491.	491.	491.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .99

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	206.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	171.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	140.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	115.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	94.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	4.	*	1		0640	81	77.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	6.	*	1		0645	82	61.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	10.	*	1		0650	83	49.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	15.	*	1		0655	84	38.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	20.	*	1		0700	85	30.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	23.	*	1		0705	86	23.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	22.	*	1		0710	87	18.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	21.	*	1		0715	88	13.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	21.	*	1		0720	89	10.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	23.	*	1		0725	90	8.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	26.	*	1		0730	91	6.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	32.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	39.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	51.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	71.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	96.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	123.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	144.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.

1	0155	24	155.	*	1	0810	99	1.	*	1	1425	174	0.	*	1	2040	249	0.
1	0200	25	157.	*	1	0815	100	0.	*	1	1430	175	0.	*	1	2045	250	0.
1	0205	26	153.	*	1	0820	101	0.	*	1	1435	176	0.	*	1	2050	251	0.
1	0210	27	150.	*	1	0825	102	0.	*	1	1440	177	0.	*	1	2055	252	0.
1	0215	28	160.	*	1	0830	103	0.	*	1	1445	178	0.	*	1	2100	253	0.
1	0220	29	188.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	227.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	260.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	276.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	281.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	291.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	313.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	333.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	341.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	354.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	410.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	544.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	819.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1305.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	2029.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2855.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3524.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3875.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3927.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3832.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3684.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3504.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3282.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	3006.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2693.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2386.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	2134.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1961.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1844.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1749.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1662.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1591.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1527.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1447.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1337.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1210.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1084.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	964.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	853.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	748.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	648.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	555.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	473.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	404.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	345.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	293.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	246.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	24.92-HR
+	(CFS)	(HR)					
			(CFS)				
+	3927.	3.83		972.	244.	235.	235.
			(INCHES)	2.058	2.064	2.064	2.064
			(AC-FT)	482.	484.	484.	484.

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .98

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DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
					*						*						*					
1		0000	1	0.	*	1		0615	76	204.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	169.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	138.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	114.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	93.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	4.	*	1		0640	81	76.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	6.	*	1		0645	82	61.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	9.	*	1		0650	83	48.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	13.	*	1		0655	84	38.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	18.	*	1		0700	85	29.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	21.	*	1		0705	86	23.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	21.	*	1		0710	87	17.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	19.	*	1		0715	88	13.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	19.	*	1		0720	89	10.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	21.	*	1		0725	90	8.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	25.	*	1		0730	91	6.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	30.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	37.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	49.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	68.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	93.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	119.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	139.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	150.	*	1		0810	99	1.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	152.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	148.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	146.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	156.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.

1	0220	29	183.	*	1	0835	104	0.	*	1	1450	179	0.	*	1	2105	254	0.
1	0225	30	221.	*	1	0840	105	0.	*	1	1455	180	0.	*	1	2110	255	0.
1	0230	31	254.	*	1	0845	106	0.	*	1	1500	181	0.	*	1	2115	256	0.
1	0235	32	270.	*	1	0850	107	0.	*	1	1505	182	0.	*	1	2120	257	0.
1	0240	33	274.	*	1	0855	108	0.	*	1	1510	183	0.	*	1	2125	258	0.
1	0245	34	285.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	306.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	325.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	333.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	347.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	402.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	533.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	804.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1282.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1992.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2812.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3462.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3805.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3870.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3779.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3632.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3453.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3237.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2966.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2657.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2356.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	2107.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1934.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1819.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1726.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1640.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1570.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1508.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1429.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1321.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1196.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1071.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	952.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	842.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	739.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	640.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	548.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	467.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	399.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	341.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	289.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	243.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3870.	3.83		958.	240.	231.	231.
		(INCHES)	2.027	2.033	2.033	2.033
		(AC-FT)	475.	476.	476.	476.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .94

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	0000	1	0.	1	0615	76	194.	1	1230	151	0.	1	1845	226	0.
1	0005	2	0.	1	0620	77	160.	1	1235	152	0.	1	1850	227	0.
1	0010	3	0.	1	0625	78	132.	1	1240	153	0.	1	1855	228	0.
1	0015	4	1.	1	0630	79	108.	1	1245	154	0.	1	1900	229	0.
1	0020	5	2.	1	0635	80	89.	1	1250	155	0.	1	1905	230	0.
1	0025	6	3.	1	0640	81	72.	1	1255	156	0.	1	1910	231	0.
1	0030	7	5.	1	0645	82	58.	1	1300	157	0.	1	1915	232	0.
1	0035	8	7.	1	0650	83	46.	1	1305	158	0.	1	1920	233	0.
1	0040	9	9.	1	0655	84	36.	1	1310	159	0.	1	1925	234	0.
1	0045	10	12.	1	0700	85	28.	1	1315	160	0.	1	1930	235	0.
1	0050	11	15.	1	0705	86	22.	1	1320	161	0.	1	1935	236	0.
1	0055	12	15.	1	0710	87	17.	1	1325	162	0.	1	1940	237	0.
1	0100	13	14.	1	0715	88	13.	1	1330	163	0.	1	1945	238	0.
1	0105	14	14.	1	0720	89	10.	1	1335	164	0.	1	1950	239	0.
1	0110	15	16.	1	0725	90	7.	1	1340	165	0.	1	1955	240	0.
1	0115	16	19.	1	0730	91	5.	1	1345	166	0.	1	2000	241	0.
1	0120	17	23.	1	0735	92	4.	1	1350	167	0.	1	2005	242	0.
1	0125	18	29.	1	0740	93	3.	1	1355	168	0.	1	2010	243	0.
1	0130	19	40.	1	0745	94	2.	1	1400	169	0.	1	2015	244	0.
1	0135	20	56.	1	0750	95	2.	1	1405	170	0.	1	2020	245	0.
1	0140	21	79.	1	0755	96	1.	1	1410	171	0.	1	2025	246	0.
1	0145	22	102.	1	0800	97	1.	1	1415	172	0.	1	2030	247	0.
1	0150	23	121.	1	0805	98	1.	1	1420	173	0.	1	2035	248	0.
1	0155	24	131.	1	0810	99	0.	1	1425	174	0.	1	2040	249	0.
1	0200	25	133.	1	0815	100	0.	1	1430	175	0.	1	2045	250	0.
1	0205	26	130.	1	0820	101	0.	1	1435	176	0.	1	2050	251	0.
1	0210	27	128.	1	0825	102	0.	1	1440	177	0.	1	2055	252	0.
1	0215	28	138.	1	0830	103	0.	1	1445	178	0.	1	2100	253	0.
1	0220	29	163.	1	0835	104	0.	1	1450	179	0.	1	2105	254	0.
1	0225	30	197.	1	0840	105	0.	1	1455	180	0.	1	2110	255	0.
1	0230	31	228.	1	0845	106	0.	1	1500	181	0.	1	2115	256	0.
1	0235	32	243.	1	0850	107	0.	1	1505	182	0.	1	2120	257	0.
1	0240	33	248.	1	0855	108	0.	1	1510	183	0.	1	2125	258	0.

1	0245	34	258.	*	1	0900	109	0.	*	1	1515	184	0.	*	1	2130	259	0.
1	0250	35	277.	*	1	0905	110	0.	*	1	1520	185	0.	*	1	2135	260	0.
1	0255	36	296.	*	1	0910	111	0.	*	1	1525	186	0.	*	1	2140	261	0.
1	0300	37	304.	*	1	0915	112	0.	*	1	1530	187	0.	*	1	2145	262	0.
1	0305	38	317.	*	1	0920	113	0.	*	1	1535	188	0.	*	1	2150	263	0.
1	0310	39	368.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	490.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	737.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1183.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1850.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2621.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3247.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3571.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3636.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3556.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3421.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3255.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3053.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2801.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2510.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2227.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1993.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1830.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1722.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1634.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1554.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1488.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1430.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1356.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1254.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1136.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1017.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	905.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	801.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	703.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	609.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	521.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	444.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	379.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	324.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	275.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	232.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3636.	3.83		899.	225.	217.	217.
		(INCHES)	1.904	1.909	1.909	1.909
		(AC-FT)	446.	447.	447.	447.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .93

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	191.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	158.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	130.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	107.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	88.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	3.	*	1		0640	81	71.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	5.	*	1		0645	82	57.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	7.	*	1		0650	83	45.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	9.	*	1		0655	84	36.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	11.	*	1		0700	85	28.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	13.	*	1		0705	86	21.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	13.	*	1		0710	87	16.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	13.	*	1		0715	88	13.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	13.	*	1		0720	89	10.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	14.	*	1		0725	90	7.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	17.	*	1		0730	91	5.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	21.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	27.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	38.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	54.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	75.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	98.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	116.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	126.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	129.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	126.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	124.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	134.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	158.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	192.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	222.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	236.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	241.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	251.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	271.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	289.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	296.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	309.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.

1	0310	39	360.	*	1	0925	114	0.	*	1	1540	189	0.	*	1	2155	264	0.
1	0315	40	479.	*	1	0930	115	0.	*	1	1545	190	0.	*	1	2200	265	0.
1	0320	41	723.	*	1	0935	116	0.	*	1	1550	191	0.	*	1	2205	266	0.
1	0325	42	1159.	*	1	0940	117	0.	*	1	1555	192	0.	*	1	2210	267	0.
1	0330	43	1813.	*	1	0945	118	0.	*	1	1600	193	0.	*	1	2215	268	0.
1	0335	44	2571.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3185.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3518.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3579.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3498.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3367.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3206.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	3006.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2758.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2473.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2194.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1965.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1804.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1698.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1611.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1533.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1468.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1410.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1337.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1237.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1121.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	1004.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	893.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	791.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	694.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	601.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	515.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	438.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	375.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	320.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	272.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	229.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 3579.	3.83	885.	222.	214.	214.
		(INCHES) 1.873	1.877	1.877	1.877
		(AC-FT) 439.	440.	440.	440.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .92

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	189.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	156.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	129.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	106.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	86.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	3.	*	1		0640	81	70.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	5.	*	1		0645	82	57.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	6.	*	1		0650	83	45.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	8.	*	1		0655	84	35.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	10.	*	1		0700	85	27.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	12.	*	1		0705	86	21.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	12.	*	1		0710	87	16.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	12.	*	1		0715	88	12.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	12.	*	1		0720	89	9.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	13.	*	1		0725	90	7.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	16.	*	1		0730	91	5.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	20.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	26.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	35.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	51.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	72.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	94.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	112.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	122.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	124.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	121.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	120.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	129.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	153.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	186.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	215.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	230.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	235.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	245.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	264.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	282.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	289.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	302.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	351.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	468.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	706.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1135.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1780.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.

1	0335	44	2527.	*	1	0950	119	0.	*	1	1605	194	0.	*	1	2220	269	0.
1	0340	45	3136.	*	1	0955	120	0.	*	1	1610	195	0.	*	1	2225	270	0.
1	0345	46	3455.	*	1	1000	121	0.	*	1	1615	196	0.	*	1	2230	271	0.
1	0350	47	3521.	*	1	1005	122	0.	*	1	1620	197	0.	*	1	2235	272	0.
1	0355	48	3444.	*	1	1010	123	0.	*	1	1625	198	0.	*	1	2240	273	0.
1	0400	49	3315.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3156.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2961.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2717.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2437.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2163.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1935.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1779.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1674.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1589.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1511.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1447.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1391.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1319.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1220.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1105.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	990.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	881.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	780.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	684.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	593.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	508.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	433.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	370.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	316.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	268.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	226.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 3521.	3.83		870.	218.	210.	210.
		(INCHES)	1.842	1.847	1.847	1.847
		(AC-FT)	432.	433.	433.	433.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	186.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	154.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	127.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	1.	*	1		0630	79	104.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	2.	*	1		0635	80	85.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	3.	*	1		0640	81	69.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	5.	*	1		0645	82	56.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	6.	*	1		0650	83	44.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	7.	*	1		0655	84	35.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	9.	*	1		0700	85	27.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	11.	*	1		0705	86	21.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	11.	*	1		0710	87	16.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	11.	*	1		0715	88	12.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	10.	*	1		0720	89	9.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	12.	*	1		0725	90	7.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	15.	*	1		0730	91	5.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	18.	*	1		0735	92	4.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	24.	*	1		0740	93	3.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	33.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	48.	*	1		0750	95	2.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	69.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	90.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	107.	*	1		0805	98	1.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	117.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	120.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	117.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	116.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	125.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	148.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	180.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	209.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	223.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	228.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	238.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	257.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	274.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	282.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	295.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	343.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	457.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	691.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	1111.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1743.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	2479.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	3075.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	3399.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	3464.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	3388.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.

1	0400	49	3262.	*	1	1015	124	0.	*	1	1630	199	0.	*	1	2245	274	0.
1	0405	50	3107.	*	1	1020	125	0.	*	1	1635	200	0.	*	1	2250	275	0.
1	0410	51	2915.	*	1	1025	126	0.	*	1	1640	201	0.	*	1	2255	276	0.
1	0415	52	2675.	*	1	1030	127	0.	*	1	1645	202	0.	*	1	2300	277	0.
1	0420	53	2400.	*	1	1035	128	0.	*	1	1650	203	0.	*	1	2305	278	0.
1	0425	54	2130.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1908.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1752.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1649.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1566.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1490.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	1427.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	1371.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	1301.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	1204.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	1091.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	977.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	870.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	770.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	675.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	585.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	501.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	427.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	365.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	312.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	264.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	223.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
3464.	3.83	856.	214.	207.	207.
		(INCHES) 1.812	1.816	1.816	1.816
		(AC-FT) 424.	425.	425.	425.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .70

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	135.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	112.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	92.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	76.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	1.	*	1		0635	80	62.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	2.	*	1		0640	81	51.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	2.	*	1		0645	82	41.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	3.	*	1		0650	83	32.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	2.	*	1		0655	84	25.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	1.	*	1		0700	85	20.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	15.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	12.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	9.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	7.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	1.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	1.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	2.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	4.	*	1		0745	94	2.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	8.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	13.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	21.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	29.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	34.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	37.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	38.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	39.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	45.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	57.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	74.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	90.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	100.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	105.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	112.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	124.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	136.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	142.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	152.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	181.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	249.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	383.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	634.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	1039.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	1532.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	1955.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	2205.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	2273.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	2243.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	2174.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	2083.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	1966.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	1816.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	1639.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.

1	0425	54	1462.	*	1	1040	129	0.	*	1	1655	204	0.	*	1	2310	279	0.
1	0430	55	1314.	*	1	1045	130	0.	*	1	1700	205	0.	*	1	2315	280	0.
1	0435	56	1211.	*	1	1050	131	0.	*	1	1705	206	0.	*	1	2320	281	0.
1	0440	57	1143.	*	1	1055	132	0.	*	1	1710	207	0.	*	1	2325	282	0.
1	0445	58	1089.	*	1	1100	133	0.	*	1	1715	208	0.	*	1	2330	283	0.
1	0450	59	1040.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	999.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	963.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	918.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	852.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	775.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	696.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	621.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	551.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	485.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	421.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	360.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	306.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	262.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	224.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	191.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	161.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)			
+ 2273.	3.83	562.	141.	135.	135.
		(INCHES) 1.190	1.191	1.191	1.191
		(AC-FT) 279.	279.	279.	279.

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION CP5B
SUM OF 6 HYDROGRAPHS
PLAN 1, RATIO = .54

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW
1		0000	1	0.	*	1		0615	76	101.	*	1		1230	151	0.	*	1		1845	226	0.
1		0005	2	0.	*	1		0620	77	85.	*	1		1235	152	0.	*	1		1850	227	0.
1		0010	3	0.	*	1		0625	78	71.	*	1		1240	153	0.	*	1		1855	228	0.
1		0015	4	0.	*	1		0630	79	59.	*	1		1245	154	0.	*	1		1900	229	0.
1		0020	5	0.	*	1		0635	80	49.	*	1		1250	155	0.	*	1		1905	230	0.
1		0025	6	0.	*	1		0640	81	41.	*	1		1255	156	0.	*	1		1910	231	0.
1		0030	7	1.	*	1		0645	82	34.	*	1		1300	157	0.	*	1		1915	232	0.
1		0035	8	1.	*	1		0650	83	27.	*	1		1305	158	0.	*	1		1920	233	0.
1		0040	9	1.	*	1		0655	84	22.	*	1		1310	159	0.	*	1		1925	234	0.
1		0045	10	1.	*	1		0700	85	17.	*	1		1315	160	0.	*	1		1930	235	0.
1		0050	11	0.	*	1		0705	86	13.	*	1		1320	161	0.	*	1		1935	236	0.
1		0055	12	0.	*	1		0710	87	10.	*	1		1325	162	0.	*	1		1940	237	0.
1		0100	13	0.	*	1		0715	88	8.	*	1		1330	163	0.	*	1		1945	238	0.
1		0105	14	0.	*	1		0720	89	6.	*	1		1335	164	0.	*	1		1950	239	0.
1		0110	15	0.	*	1		0725	90	5.	*	1		1340	165	0.	*	1		1955	240	0.
1		0115	16	0.	*	1		0730	91	4.	*	1		1345	166	0.	*	1		2000	241	0.
1		0120	17	1.	*	1		0735	92	3.	*	1		1350	167	0.	*	1		2005	242	0.
1		0125	18	1.	*	1		0740	93	2.	*	1		1355	168	0.	*	1		2010	243	0.
1		0130	19	1.	*	1		0745	94	1.	*	1		1400	169	0.	*	1		2015	244	0.
1		0135	20	2.	*	1		0750	95	1.	*	1		1405	170	0.	*	1		2020	245	0.
1		0140	21	2.	*	1		0755	96	1.	*	1		1410	171	0.	*	1		2025	246	0.
1		0145	22	2.	*	1		0800	97	1.	*	1		1415	172	0.	*	1		2030	247	0.
1		0150	23	2.	*	1		0805	98	0.	*	1		1420	173	0.	*	1		2035	248	0.
1		0155	24	2.	*	1		0810	99	0.	*	1		1425	174	0.	*	1		2040	249	0.
1		0200	25	2.	*	1		0815	100	0.	*	1		1430	175	0.	*	1		2045	250	0.
1		0205	26	3.	*	1		0820	101	0.	*	1		1435	176	0.	*	1		2050	251	0.
1		0210	27	4.	*	1		0825	102	0.	*	1		1440	177	0.	*	1		2055	252	0.
1		0215	28	5.	*	1		0830	103	0.	*	1		1445	178	0.	*	1		2100	253	0.
1		0220	29	8.	*	1		0835	104	0.	*	1		1450	179	0.	*	1		2105	254	0.
1		0225	30	12.	*	1		0840	105	0.	*	1		1455	180	0.	*	1		2110	255	0.
1		0230	31	18.	*	1		0845	106	0.	*	1		1500	181	0.	*	1		2115	256	0.
1		0235	32	24.	*	1		0850	107	0.	*	1		1505	182	0.	*	1		2120	257	0.
1		0240	33	30.	*	1		0855	108	0.	*	1		1510	183	0.	*	1		2125	258	0.
1		0245	34	35.	*	1		0900	109	0.	*	1		1515	184	0.	*	1		2130	259	0.
1		0250	35	40.	*	1		0905	110	0.	*	1		1520	185	0.	*	1		2135	260	0.
1		0255	36	47.	*	1		0910	111	0.	*	1		1525	186	0.	*	1		2140	261	0.
1		0300	37	54.	*	1		0915	112	0.	*	1		1530	187	0.	*	1		2145	262	0.
1		0305	38	60.	*	1		0920	113	0.	*	1		1535	188	0.	*	1		2150	263	0.
1		0310	39	70.	*	1		0925	114	0.	*	1		1540	189	0.	*	1		2155	264	0.
1		0315	40	99.	*	1		0930	115	0.	*	1		1545	190	0.	*	1		2200	265	0.
1		0320	41	172.	*	1		0935	116	0.	*	1		1550	191	0.	*	1		2205	266	0.
1		0325	42	318.	*	1		0940	117	0.	*	1		1555	192	0.	*	1		2210	267	0.
1		0330	43	563.	*	1		0945	118	0.	*	1		1600	193	0.	*	1		2215	268	0.
1		0335	44	879.	*	1		0950	119	0.	*	1		1605	194	0.	*	1		2220	269	0.
1		0340	45	1171.	*	1		0955	120	0.	*	1		1610	195	0.	*	1		2225	270	0.
1		0345	46	1355.	*	1		1000	121	0.	*	1		1615	196	0.	*	1		2230	271	0.
1		0350	47	1421.	*	1		1005	122	0.	*	1		1620	197	0.	*	1		2235	272	0.
1		0355	48	1417.	*	1		1010	123	0.	*	1		1625	198	0.	*	1		2240	273	0.
1		0400	49	1385.	*	1		1015	124	0.	*	1		1630	199	0.	*	1		2245	274	0.
1		0405	50	1338.	*	1		1020	125	0.	*	1		1635	200	0.	*	1		2250	275	0.
1		0410	51	1274.	*	1		1025	126	0.	*	1		1640	201	0.	*	1		2255	276	0.
1		0415	52	1187.	*	1		1030	127	0.	*	1		1645	202	0.	*	1		2300	277	0.
1		0420	53	1079.	*	1		1035	128	0.	*	1		1650	203	0.	*	1		2305	278	0.
1		0425	54	968.	*	1		1040	129	0.	*	1		1655	204	0.	*	1		2310	279	0.
1		0430	55	874.	*	1		1045	130	0.	*	1		1700	205	0.	*	1		2315	280	0.
1		0435	56	808.	*	1		1050	131	0.	*	1		1705	206	0.	*	1		2320	281	0.
1		0440	57	766.	*	1		1055	132	0.	*	1		1710	207	0.	*	1		2325	282	0.
1		0445	58	734.	*	1		1100	133	0.	*	1		1715	208	0.	*	1		2330	283	0.

1	0450	59	705.	*	1	1105	134	0.	*	1	1720	209	0.	*	1	2335	284	0.
1	0455	60	679.	*	1	1110	135	0.	*	1	1725	210	0.	*	1	2340	285	0.
1	0500	61	657.	*	1	1115	136	0.	*	1	1730	211	0.	*	1	2345	286	0.
1	0505	62	629.	*	1	1120	137	0.	*	1	1735	212	0.	*	1	2350	287	0.
1	0510	63	588.	*	1	1125	138	0.	*	1	1740	213	0.	*	1	2355	288	0.
1	0515	64	537.	*	1	1130	139	0.	*	1	1745	214	0.	*	2	0000	289	0.
1	0520	65	484.	*	1	1135	140	0.	*	1	1750	215	0.	*	2	0005	290	0.
1	0525	66	433.	*	1	1140	141	0.	*	1	1755	216	0.	*	2	0010	291	0.
1	0530	67	385.	*	1	1145	142	0.	*	1	1800	217	0.	*	2	0015	292	0.
1	0535	68	339.	*	1	1150	143	0.	*	1	1805	218	0.	*	2	0020	293	0.
1	0540	69	296.	*	1	1155	144	0.	*	1	1810	219	0.	*	2	0025	294	0.
1	0545	70	255.	*	1	1200	145	0.	*	1	1815	220	0.	*	2	0030	295	0.
1	0550	71	218.	*	1	1205	146	0.	*	1	1820	221	0.	*	2	0035	296	0.
1	0555	72	188.	*	1	1210	147	0.	*	1	1825	222	0.	*	2	0040	297	0.
1	0600	73	162.	*	1	1215	148	0.	*	1	1830	223	0.	*	2	0045	298	0.
1	0605	74	139.	*	1	1220	149	0.	*	1	1835	224	0.	*	2	0050	299	0.
1	0610	75	119.	*	1	1225	150	0.	*	1	1840	225	0.	*	2	0055	300	0.
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1421.	3.83		355.	89.	86.	86.
		(INCHES)	.753	.753	.753	.753
		(AC-FT)	176.	176.	176.	176.

CUMULATIVE AREA = 4.39 SQ MI

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          *            *
153 KK    *     EXDB   *
          *            *
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154 KO OUTPUT CONTROL VARIABLES
IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE
DETENTION BASIN CHEYENNE AND BELTWAY
LOW-FLOW OUTLET IS 66" PIPE

HYDROGRAPH ROUTING DATA

157 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP STOR TYPE OF INITIAL CONDITION
RSVRIC .00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

158 SV	STORAGE	.0	.1	.8	12.7	18.8	25.0	85.9	95.0	124.2	135.1
		200.3	243.1	258.1	273.4	289.0	305.0				
160 SE	ELEVATION	2990.00	2991.00	2992.00	2995.00	2996.00	2997.00	3005.00	3006.00	3009.00	3010.00
		3015.00	3018.00	3019.00	3020.00	3021.00	3022.00				

162 SL LOW-LEVEL OUTLET
ELEVL 2993.70 ELEVATION AT CENTER OF OUTLET
CAREA 22.31 CROSS-SECTIONAL AREA
COQL .70 COEFFICIENT
EXPL .50 EXPONENT OF HEAD

163 SS SPILLWAY
CREL 3021.90 SPILLWAY CREST ELEVATION
SPWID 200.00 SPILLWAY WIDTH
COQW 2.60 WEIR COEFFICIENT
EXPW 1.50 EXPONENT OF HEAD

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COMPUTED OUTFLOW-ELEVATION DATA

OUTFLOW	.00	.00	206.52	229.08	257.18	293.14	340.79	406.93	504.93	665.11
ELEVATION	2990.00	2993.70	2996.42	2997.05	2997.92	2999.18	3001.10	3004.26	3009.95	3021.90
OUTFLOW	665.18	665.40	665.87	666.62	667.82	669.47	671.71	674.64	678.30	682.76
ELEVATION	3021.90	3021.91	3021.91	3021.92	3021.93	3021.94	3021.95	3021.97	3021.98	3022.00

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.07	.80	7.55	12.71	18.75	21.39	25.05	25.39	32.03
OUTFLOW	.00	.00	.00	.00	142.81	189.95	206.52	227.53	229.08	257.18
ELEVATION	2990.00	2991.00	2992.00	2993.70	2995.00	2996.00	2996.42	2997.00	2997.05	2997.92
STORAGE	41.63	56.29	80.29	85.95	95.04	124.21	134.62	135.14	200.27	243.11
OUTFLOW	293.14	340.79	406.93	421.03	439.26	489.91	504.93	505.67	578.05	617.41
ELEVATION	2999.18	3001.10	3004.26	3005.00	3006.00	3009.00	3009.95	3010.00	3015.00	3018.00
STORAGE	258.06	273.36	289.00	303.39	303.57	303.83	304.00	304.21	304.44	304.70
OUTFLOW	629.99	642.32	654.42	665.11	665.87	667.82	669.47	671.71	674.64	678.30
ELEVATION	3019.00	3020.00	3021.00	3021.90	3021.91	3021.93	3021.94	3021.95	3021.97	3021.98
STORAGE	304.99									
OUTFLOW	682.76									
ELEVATION	3022.00									

WARNING --- ROUTED OUTFLOW (749.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (833.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (901.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (952.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (986.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1004.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (1007.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (999.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (979.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (952.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (917.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (877.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (833.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (787.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (740.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (693.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = 1.00

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	579.	201.8	3015.1	1		1640	201	0.	7.6	2993.7
1		0005	2	0.	.0	2990.0	1		0825	102	575.	197.8	3014.8	1		1645	202	0.	7.6	2993.7
1		0010	3	0.	.0	2990.0	1		0830	103	571.	193.9	3014.5	1		1650	203	0.	7.6	2993.7
1		0015	4	0.	.0	2990.1	1		0835	104	567.	189.9	3014.2	1		1655	204	0.	7.6	2993.7
1		0020	5	0.	.0	2990.3	1		0840	105	562.	186.1	3013.9	1		1700	205	0.	7.6	2993.7
1		0025	6	0.	.0	2990.6	1		0845	106	558.	182.2	3013.6	1		1705	206	0.	7.6	2993.7
1		0030	7	0.	.1	2991.0	1		0850	107	554.	178.4	3013.3	1		1710	207	0.	7.6	2993.7
1		0035	8	0.	.1	2991.1	1		0855	108	549.	174.6	3013.0	1		1715	208	0.	7.6	2993.7
1		0040	9	0.	.2	2991.2	1		0900	109	545.	170.8	3012.7	1		1720	209	0.	7.6	2993.7
1		0045	10	0.	.4	2991.4	1		0905	110	541.	167.1	3012.5	1		1725	210	0.	7.6	2993.7
1		0050	11	0.	.5	2991.6	1		0910	111	537.	163.3	3012.2	1		1730	211	0.	7.6	2993.7
1		0055	12	0.	.7	2991.8	1		0915	112	533.	159.7	3011.9	1		1735	212	0.	7.6	2993.7
1		0100	13	0.	.8	2992.0	1		0920	113	529.	156.0	3011.6	1		1740	213	0.	7.6	2993.7
1		0105	14	0.	1.0	2992.0	1		0925	114	525.	152.4	3011.3	1		1745	214	0.	7.6	2993.7
1		0110	15	0.	1.2	2992.1	1		0930	115	521.	148.8	3011.0	1		1750	215	0.	7.6	2993.7
1		0115	16	0.	1.3	2992.1	1		0935	116	517.	145.2	3010.8	1		1755	216	0.	7.5	2993.7
1		0120	17	0.	1.5	2992.2	1		0940	117	513.	141.7	3010.5	1		1800	217	0.	7.5	2993.7
1		0125	18	0.	1.8	2992.3	1		0945	118	509.	138.1	3010.2	1		1805	218	0.	7.5	2993.7
1		0130	19	0.	2.1	2992.3	1		0950	119	505.	134.6	3010.0	1		1810	219	0.	7.5	2993.7
1		0135	20	0.	2.6	2992.4	1		0955	120	500.	131.2	3009.6	1		1815	220	0.	7.5	2993.7
1		0140	21	0.	3.2	2992.6	1		1000	121	495.	127.8	3009.3	1		1820	221	0.	7.5	2993.7
1		0145	22	0.	3.9	2992.8	1		1005	122	490.	124.4	3009.0	1		1825	222	0.	7.5	2993.7
1		0150	23	0.	4.9	2993.0	1		1010	123	484.	121.0	3008.7	1		1830	223	0.	7.5	2993.7
1		0155	24	0.	6.0	2993.3	1		1015	124	479.	117.7	3008.3	1		1835	224	0.	7.5	2993.7
1		0200	25	0.	7.1	2993.6	1		1020	125	473.	114.4	3008.0	1		1840	225	0.	7.5	2993.7
1		0205	26	16.	8.1	2993.8	1		1025	126	467.	111.2	3007.7	1		1845	226	0.	7.5	2993.7
1		0210	27	40.	9.0	2994.1	1		1030	127	462.	108.0	3007.3	1		1850	227	0.	7.5	2993.7
1		0215	28	61.	9.7	2994.3	1		1035	128	456.	104.8	3007.0	1		1855	228	0.	7.5	2993.7
1		0220	29	81.	10.5	2994.4	1		1040	129	451.	101.7	3006.7	1		1900	229	0.	7.5	2993.7
1		0225	30	104.	11.3	2994.6	1		1045	130	445.	98.6	3006.4	1		1905	230	0.	7.5	2993.7
1		0230	31	130.	12.2	2994.9	1		1050	131	440.	95.6	3006.1	1		1910	231	0.	7.5	2993.7
1		0235	32	146.	13.2	2995.1	1		1055	132	434.	92.5	3005.7	1		1915	232	0.	7.5	2993.7
1		0240	33	154.	14.1	2995.2	1		1100	133	428.	89.6	3005.4	1		1920	233	0.	7.5	2993.7
1		0245	34	161.	15.0	2995.4	1		1105	134	422.	86.6	3005.1	1		1925	234	0.	7.5	2993.7
1		0250	35	169.	16.0	2995.6	1		1110	135	416.	83.8	3004.7	1		1930	235	0.	7.5	2993.7
1		0255	36	177.	17.1	2995.7	1		1115	136	409.	80.9	3004.3	1		1935	236	0.	7.5	2993.7
1		0300	37	186.	18.2	2995.9	1		1120	137	401.	78.1	3004.0	1		1940	237	0.	7.5	2993.7
1		0305	38	194.	19.4	2996.1	1		1125	138	393.	75.4	3003.6	1		1945	238	0.	7.5	2993.7
1		0310	39	202.	20.7	2996.3	1		1130	139	386.	72.7	3003.3	1		1950	239	0.	7.5	2993.7
1		0315	40	214.	22.6	2996.6	1		1135	140	379.	70.1	3002.9	1		1955	240	0.	7.5	2993.7
1		0320	41	231.	25.9	2997.1	1		1140	141	372.	67.5	3002.6	1		2000	241	0.	7.5	2993.7
1		0325	42	256.	31.7	2997.9	1		1145	142	365.	65.0	3002.2	1		2005	242	0.	7.5	2993.7
1		0330	43	293.	41.5	2999.2	1		1150	143	358.	62.5	3001.9	1		2010	243	0.	7.5	2993.7
1		0335	44	341.	56.4	3001.1	1		1155	144	351.	60.0	3001.6	1		2015	244	0.	7.5	2993.7
1		0340	45	396.	76.2	3003.7	1		1200	145	345.	57.6	3001.3	1		2020	245	0.	7.5	2993.7
1		0345	46	446.	99.1	3006.4	1		1205	146	338.	55.3	3001.0	1		2025	246	0.	7.5	2993.7
1		0350	47	488.	123.1	3008.9	1		1210	147	330.	53.0	3000.7	1		2030	247	0.	7.5	2993.7
1		0355	48	519.	146.8	3010.9	1		1215	148	323.	50.7	3000.4	1		2035	248	0.	7.5	2993.7
1		0400	49	544.	169.4	3012.6	1		1220	149	316.	48.5	3000.1	1		2040	249	0.	7.5	2993.7
1		0405	50	567.	190.7	3014.3	1		1225	150	309.	46.4	2999.8	1		2045	250	0.	7.5	2993.7
1		0410	51	587.	210.4	3015.7	1		1230	151	302.	44.3	2999.5	1		2050	251	0.	7.5	2993.7
1		0415	52	604.	228.2	3017.0	1		1235	152	295.	42.2	2999.3	1		2055	252	0.	7.5	2993.7
1		0420	53	618.	243.9	3018.1	1		1240	153	288.	40.2	2999.0	1		2100	253	0.	7.5	2993.7
1		0425	54	629.	257.4	3019.0	1		1245	154	281.	38.3	2998.7	1		2105	254	0.	7.5	2993.7
1		0430	55	639.	268.8	3019.7	1		1250	155	273.	36.4	2998.5	1		2110	255	0.	7.5	2993.7
1		0435	56	646.	278.7	3020.3	1		1255	156	266.	34.5	2998.2	1		2115	256	0.	7.5	2993.7
1		0440	57	653.	287.5	3020.9	1		1300	157	260.	32.7	2998.0	1		2120	257	0.	7.5	2993.7
1		0445	58	659.	295.5	3021.4	1		1305	158	253.	30.9	2997.8	1		2125	258	0.	7.5	2993.7
1		0450	59	665.	302.8	3021.9	1		1310	159	245.	29.2	2997.5	1		2130	259	0.	7.5	2993.7
1		0455	60	749.	309.3	3022.3	1		1315	160	238.	27.6	2997.3	1		2135	260	0.	7.5	2993.7
1		0500	61	833.	314.7	3022.6	1		1320	161	231.	25.9	2997.1	1		2140	261	0.	7.5	2993.7
1		0505	62	901.	319.1	3022.9	1		1325	162	224.	24.4	2996.9	1		2145	262	0.	7.5	2993.7
1		0510	63	952.	322.4	3023.1	1		1330	163	215.	22.9	2996.7	1		2150	263	0.	7.5	2993.7

1	0515	64	986.	324.6	3023.2	*	1	1335	164	207.	21.4	2996.4	*	1	2155	264	0.	7.5	2993.7
1	0520	65	1004.	325.8	3023.3	*	1	1340	165	198.	20.0	2996.2	*	1	2200	265	0.	7.5	2993.7
1	0525	66	1007.	326.0	3023.3	*	1	1345	166	189.	18.7	2996.0	*	1	2205	266	0.	7.5	2993.7
1	0530	67	999.	325.4	3023.3	*	1	1350	167	179.	17.4	2995.8	*	1	2210	267	0.	7.5	2993.7
1	0535	68	979.	324.2	3023.2	*	1	1355	168	170.	16.2	2995.6	*	1	2215	268	0.	7.5	2993.7
1	0540	69	952.	322.4	3023.1	*	1	1400	169	161.	15.1	2995.4	*	1	2220	269	0.	7.5	2993.7
1	0545	70	917.	320.2	3022.9	*	1	1405	170	153.	14.0	2995.2	*	1	2225	270	0.	7.5	2993.7
1	0550	71	877.	317.6	3022.8	*	1	1410	171	145.	13.0	2995.0	*	1	2230	271	0.	7.5	2993.7
1	0555	72	833.	314.7	3022.6	*	1	1415	172	124.	12.0	2994.8	*	1	2235	272	0.	7.5	2993.7
1	0600	73	787.	311.8	3022.4	*	1	1420	173	102.	11.3	2994.6	*	1	2240	273	0.	7.5	2993.7
1	0605	74	740.	308.7	3022.2	*	1	1425	174	85.	10.6	2994.5	*	1	2245	274	0.	7.5	2993.7
1	0610	75	693.	305.7	3022.0	*	1	1430	175	70.	10.1	2994.3	*	1	2250	275	0.	7.5	2993.7
1	0615	76	664.	302.6	3021.8	*	1	1435	176	58.	9.6	2994.2	*	1	2255	276	0.	7.5	2993.7
1	0620	77	662.	299.3	3021.6	*	1	1440	177	48.	9.3	2994.1	*	1	2300	277	0.	7.5	2993.7
1	0625	78	659.	295.8	3021.4	*	1	1445	178	39.	9.0	2994.1	*	1	2305	278	0.	7.5	2993.7
1	0630	79	657.	292.2	3021.2	*	1	1450	179	33.	8.7	2994.0	*	1	2310	279	0.	7.5	2993.7
1	0635	80	654.	288.4	3021.0	*	1	1455	180	27.	8.5	2993.9	*	1	2315	280	0.	7.5	2993.7
1	0640	81	651.	284.5	3020.7	*	1	1500	181	22.	8.4	2993.9	*	1	2320	281	0.	7.5	2993.7
1	0645	82	648.	280.5	3020.5	*	1	1505	182	18.	8.2	2993.9	*	1	2325	282	0.	7.5	2993.7
1	0650	83	645.	276.4	3020.2	*	1	1510	183	15.	8.1	2993.8	*	1	2330	283	0.	7.5	2993.7
1	0655	84	641.	272.3	3019.9	*	1	1515	184	13.	8.0	2993.8	*	1	2335	284	0.	7.5	2993.7
1	0700	85	638.	268.2	3019.7	*	1	1520	185	10.	7.9	2993.8	*	1	2340	285	0.	7.5	2993.7
1	0705	86	635.	264.0	3019.4	*	1	1525	186	9.	7.9	2993.8	*	1	2345	286	0.	7.5	2993.7
1	0710	87	631.	259.7	3019.1	*	1	1530	187	7.	7.8	2993.8	*	1	2350	287	0.	7.5	2993.7
1	0715	88	628.	255.5	3018.8	*	1	1535	188	6.	7.8	2993.8	*	1	2355	288	0.	7.5	2993.7
1	0720	89	624.	251.3	3018.5	*	1	1540	189	5.	7.7	2993.7	*	2	0000	289	0.	7.5	2993.7
1	0725	90	621.	247.1	3018.3	*	1	1545	190	4.	7.7	2993.7	*	2	0005	290	0.	7.5	2993.7
1	0730	91	617.	242.8	3018.0	*	1	1550	191	3.	7.7	2993.7	*	2	0010	291	0.	7.5	2993.7
1	0735	92	613.	238.6	3017.7	*	1	1555	192	3.	7.6	2993.7	*	2	0015	292	0.	7.5	2993.7
1	0740	93	609.	234.5	3017.4	*	1	1600	193	2.	7.6	2993.7	*	2	0020	293	0.	7.5	2993.7
1	0745	94	606.	230.3	3017.1	*	1	1605	194	2.	7.6	2993.7	*	2	0025	294	0.	7.5	2993.7
1	0750	95	602.	226.1	3016.8	*	1	1610	195	2.	7.6	2993.7	*	2	0030	295	0.	7.5	2993.7
1	0755	96	598.	222.0	3016.5	*	1	1615	196	1.	7.6	2993.7	*	2	0035	296	0.	7.5	2993.7
1	0800	97	594.	217.9	3016.2	*	1	1620	197	1.	7.6	2993.7	*	2	0040	297	0.	7.5	2993.7
1	0805	98	591.	213.9	3016.0	*	1	1625	198	1.	7.6	2993.7	*	2	0045	298	0.	7.5	2993.7
1	0810	99	587.	209.8	3015.7	*	1	1630	199	1.	7.6	2993.7	*	2	0050	299	0.	7.5	2993.7
1	0815	100	583.	205.8	3015.4	*	1	1635	200	1.	7.6	2993.7	*	2	0055	300	0.	7.5	2993.7

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1007.	5.42		659.	244.	235.	235.
		(INCHES)	1.396	2.063	2.063	2.063
		(AC-FT)	327.	483.	483.	483.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
326.	5.42	243.	78.	75.	75.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3023.31	5.42	3017.81	3001.40	3001.01	3001.01

CUMULATIVE AREA = 4.39 SQ MI

WARNING --- ROUTED OUTFLOW (762.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (836.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (892.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (930.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (952.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (960.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (954.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (939.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (914.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (883.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (845.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (804.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (761.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (716.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .99

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	578.	200.5	3015.0	1		1640	201	0.	7.6	2993.7
1		0005	2	0.	.0	2990.0	1		0825	102	574.	196.6	3014.7	1		1645	202	0.	7.6	2993.7
1		0010	3	0.	.0	2990.0	1		0830	103	570.	192.6	3014.4	1		1650	203	0.	7.6	2993.7
1		0015	4	0.	.0	2990.1	1		0835	104	565.	188.7	3014.1	1		1655	204	0.	7.6	2993.7
1		0020	5	0.	.0	2990.3	1		0840	105	561.	184.8	3013.8	1		1700	205	0.	7.6	2993.7
1		0025	6	0.	.0	2990.6	1		0845	106	557.	181.0	3013.5	1		1705	206	0.	7.6	2993.7

1	0030	7	0.	.1	2991.0	*	1	0850	107	552.	177.2	3013.2	*	1	1710	207	0.	7.6	2993.7
1	0035	8	0.	.1	2991.1	*	1	0855	108	548.	173.4	3012.9	*	1	1715	208	0.	7.6	2993.7
1	0040	9	0.	.2	2991.2	*	1	0900	109	544.	169.6	3012.6	*	1	1720	209	0.	7.6	2993.7
1	0045	10	0.	.3	2991.4	*	1	0905	110	540.	165.9	3012.4	*	1	1725	210	0.	7.6	2993.7
1	0050	11	0.	.5	2991.6	*	1	0910	111	536.	162.2	3012.1	*	1	1730	211	0.	7.6	2993.7
1	0055	12	0.	.6	2991.8	*	1	0915	112	532.	158.5	3011.8	*	1	1735	212	0.	7.6	2993.7
1	0100	13	0.	.8	2992.0	*	1	0920	113	528.	154.9	3011.5	*	1	1740	213	0.	7.6	2993.7
1	0105	14	0.	.9	2992.0	*	1	0925	114	524.	151.2	3011.2	*	1	1745	214	0.	7.6	2993.7
1	0110	15	0.	1.1	2992.1	*	1	0930	115	520.	147.6	3011.0	*	1	1750	215	0.	7.5	2993.7
1	0115	16	0.	1.2	2992.1	*	1	0935	116	516.	144.1	3010.7	*	1	1755	216	0.	7.5	2993.7
1	0120	17	0.	1.4	2992.2	*	1	0940	117	512.	140.5	3010.4	*	1	1800	217	0.	7.5	2993.7
1	0125	18	0.	1.7	2992.2	*	1	0945	118	508.	137.0	3010.1	*	1	1805	218	0.	7.5	2993.7
1	0130	19	0.	2.0	2992.3	*	1	0950	119	503.	133.6	3009.9	*	1	1810	219	0.	7.5	2993.7
1	0135	20	0.	2.4	2992.4	*	1	0955	120	498.	130.1	3009.5	*	1	1815	220	0.	7.5	2993.7
1	0140	21	0.	3.0	2992.6	*	1	1000	121	493.	126.7	3009.2	*	1	1820	221	0.	7.5	2993.7
1	0145	22	0.	3.7	2992.7	*	1	1005	122	488.	123.3	3008.9	*	1	1825	222	0.	7.5	2993.7
1	0150	23	0.	4.7	2993.0	*	1	1010	123	483.	120.0	3008.6	*	1	1830	223	0.	7.5	2993.7
1	0155	24	0.	5.7	2993.2	*	1	1015	124	477.	116.7	3008.2	*	1	1835	224	0.	7.5	2993.7
1	0200	25	0.	6.8	2993.5	*	1	1020	125	471.	113.4	3007.9	*	1	1840	225	0.	7.5	2993.7
1	0205	26	7.	7.8	2993.8	*	1	1025	126	466.	110.2	3007.6	*	1	1845	226	0.	7.5	2993.7
1	0210	27	32.	8.7	2994.0	*	1	1030	127	460.	107.0	3007.2	*	1	1850	227	0.	7.5	2993.7
1	0215	28	54.	9.5	2994.2	*	1	1035	128	455.	103.8	3006.9	*	1	1855	228	0.	7.5	2993.7
1	0220	29	75.	10.2	2994.4	*	1	1040	129	449.	100.7	3006.6	*	1	1900	229	0.	7.5	2993.7
1	0225	30	98.	11.1	2994.6	*	1	1045	130	444.	97.6	3006.3	*	1	1905	230	0.	7.5	2993.7
1	0230	31	123.	12.0	2994.8	*	1	1050	131	438.	94.6	3006.0	*	1	1910	231	0.	7.5	2993.7
1	0235	32	144.	12.9	2995.0	*	1	1055	132	432.	91.6	3005.6	*	1	1915	232	0.	7.5	2993.7
1	0240	33	152.	13.8	2995.2	*	1	1100	133	426.	88.7	3005.3	*	1	1920	233	0.	7.5	2993.7
1	0245	34	159.	14.7	2995.3	*	1	1105	134	420.	85.7	3005.0	*	1	1925	234	0.	7.5	2993.7
1	0250	35	166.	15.7	2995.5	*	1	1110	135	413.	82.9	3004.6	*	1	1930	235	0.	7.5	2993.7
1	0255	36	174.	16.7	2995.7	*	1	1115	136	406.	80.0	3004.2	*	1	1935	236	0.	7.5	2993.7
1	0300	37	183.	17.8	2995.8	*	1	1120	137	399.	77.3	3003.9	*	1	1940	237	0.	7.5	2993.7
1	0305	38	191.	18.9	2996.0	*	1	1125	138	391.	74.6	3003.5	*	1	1945	238	0.	7.5	2993.7
1	0310	39	199.	20.2	2996.2	*	1	1130	139	384.	71.9	3003.2	*	1	1950	239	0.	7.5	2993.7
1	0315	40	211.	22.1	2996.5	*	1	1135	140	377.	69.3	3002.8	*	1	1955	240	0.	7.5	2993.7
1	0320	41	229.	25.3	2997.0	*	1	1140	141	369.	66.7	3002.5	*	1	2000	241	0.	7.5	2993.7
1	0325	42	253.	30.9	2997.8	*	1	1145	142	363.	64.2	3002.1	*	1	2005	242	0.	7.5	2993.7
1	0330	43	289.	40.6	2999.0	*	1	1150	143	356.	61.7	3001.8	*	1	2010	243	0.	7.5	2993.7
1	0335	44	337.	55.2	3001.0	*	1	1155	144	349.	59.3	3001.5	*	1	2015	244	0.	7.5	2993.7
1	0340	45	391.	74.7	3003.5	*	1	1200	145	342.	56.9	3001.2	*	1	2020	245	0.	7.5	2993.7
1	0345	46	443.	97.3	3006.2	*	1	1205	146	335.	54.6	3000.9	*	1	2025	246	0.	7.5	2993.7
1	0350	47	484.	120.9	3008.7	*	1	1210	147	328.	52.3	3000.6	*	1	2030	247	0.	7.5	2993.7
1	0355	48	516.	144.2	3010.7	*	1	1215	148	321.	50.0	3000.3	*	1	2035	248	0.	7.5	2993.7
1	0400	49	540.	166.5	3012.4	*	1	1220	149	313.	47.9	3000.0	*	1	2040	249	0.	7.5	2993.7
1	0405	50	564.	187.4	3014.0	*	1	1225	150	306.	45.7	2999.7	*	1	2045	250	0.	7.5	2993.7
1	0410	51	584.	206.8	3015.5	*	1	1230	151	300.	43.6	2999.4	*	1	2050	251	0.	7.5	2993.7
1	0415	52	600.	224.4	3016.7	*	1	1235	152	293.	41.6	2999.2	*	1	2055	252	0.	7.5	2993.7
1	0420	53	614.	239.9	3017.8	*	1	1240	153	286.	39.6	2998.9	*	1	2100	253	0.	7.5	2993.7
1	0425	54	626.	253.1	3018.7	*	1	1245	154	278.	37.7	2998.7	*	1	2105	254	0.	7.5	2993.7
1	0430	55	635.	264.3	3019.4	*	1	1250	155	271.	35.8	2998.4	*	1	2110	255	0.	7.5	2993.7
1	0435	56	643.	274.0	3020.0	*	1	1255	156	264.	33.9	2998.2	*	1	2115	256	0.	7.5	2993.7
1	0440	57	650.	282.7	3020.6	*	1	1300	157	258.	32.1	2997.9	*	1	2120	257	0.	7.5	2993.7
1	0445	58	656.	290.5	3021.1	*	1	1305	158	250.	30.4	2997.7	*	1	2125	258	0.	7.5	2993.7
1	0450	59	661.	297.7	3021.5	*	1	1310	159	243.	28.7	2997.5	*	1	2130	259	0.	7.5	2993.7
1	0455	60	674.	304.4	3022.0	*	1	1315	160	236.	27.0	2997.3	*	1	2135	260	0.	7.5	2993.7
1	0500	61	762.	310.1	3022.3	*	1	1320	161	229.	25.4	2997.1	*	1	2140	261	0.	7.5	2993.7
1	0505	62	836.	314.9	3022.6	*	1	1325	162	221.	23.9	2996.8	*	1	2145	262	0.	7.5	2993.7
1	0510	63	892.	318.5	3022.8	*	1	1330	163	212.	22.4	2996.6	*	1	2150	263	0.	7.5	2993.7
1	0515	64	930.	321.0	3023.0	*	1	1335	164	204.	21.0	2996.4	*	1	2155	264	0.	7.5	2993.7
1	0520	65	952.	322.4	3023.1	*	1	1340	165	195.	19.6	2996.1	*	1	2200	265	0.	7.5	2993.7
1	0525	66	960.	322.9	3023.1	*	1	1345	166	186.	18.3	2995.9	*	1	2205	266	0.	7.5	2993.7
1	0530	67	954.	322.6	3023.1	*	1	1350	167	176.	17.0	2995.7	*	1	2210	267	0.	7.5	2993.7
1	0535	68	939.	321.6	3023.0	*	1	1355	168	167.	15.8	2995.5	*	1	2215	268	0.	7.5	2993.7
1	0540	69	914.	320.0	3022.9	*	1	1400	169	158.	14.7	2995.3	*	1	2220	269	0.	7.5	2993.7
1	0545	70	883.	317.9	3022.8	*	1	1405	170	150.	13.7	2995.2	*	1	2225	270	0.	7.5	2993.7
1	0550	71	845.	315.5	3022.7	*	1	1410	171	141.	12.7	2995.0	*	1	2230	271	0.	7.5	2993.7
1	0555	72	804.	312.9	3022.5	*	1	1415	172	117.	11.8	2994.8	*	1	2235	272	0.	7.5	2993.7
1	0600	73	761.	310.0	3022.3	*	1	1420	173	96.	11.0	2994.6	*	1	2240	273	0.	7.5	2993.7
1	0605	74	716.	307.2	3022.1	*	1	1425	174	80.	10.4	2994.4	*	1	2245	274	0.	7.5	2993.7
1	0610	75	672.	304.2	3022.0	*	1	1430	175	66.	9.9	2994.3	*	1	2250	275	0.	7.5	2993.7
1	0615	76	663.	301.2	3021.8	*	1	1435	176	54.	9.5	2994.2	*	1	2255	276	0.	7.5	2993.7
1	0620	77	661.	297.9	3021.6	*	1	1440	177	45.	9.2	2994.1	*	1	2300	277	0.	7.5	2993.7
1	0625	78	658.	294.5	3021.3	*	1	1445	178	37.	8.9	2994.0	*	1	2305	278	0.	7.5	2993.7
1	0630	79	656.	290.8	3021.1	*	1	1450	179	31.	8.7	2994.0	*	1	2310	279	0.	7.5	2993.7
1	0635	80	653.	287.0	3020.9	*	1	1455	180	25.	8.5	2993.9	*	1	2315	280	0.	7.5	2993.7
1	0640	81	650.	283.1	3020.6	*	1	1500	181	21.	8.3	2993.9	*	1	2320	281	0.	7.5	2993.7
1	0645	82	647.	279.1	3020.4	*	1	1505	182	17.	8.2	2993.9	*	1	2325	282	0.	7.5	2993.7
1	0650	83	644.	275.1	3020.1	*	1	1510	183	14.	8.1	2993.8	*	1	2330	283	0.	7.5	2993.7
1	0655	84	640.	270.9	3019.8	*	1	1515	184	12.	8.0	2993.8	*	1	2335	284	0.	7.5	2993.7
1	0700	85	637.	266.8	3019.6	*	1	1520	185	10.	7.9	2993.8	*	1	2340	285	0.	7.5	2993.7
1	0705	86	634.	262.6	3019.3	*	1	1525	186	8.	7.8	2993.8	*	1	2345	286	0.	7.5	2993.7
1	0710	87	630.	258.4	3019.0	*	1	1530	187	7.	7.8	2993.8	*	1	2350	287	0.	7.5	2993.7
1	0715	88	627.	254.2	3018.7	*	1	1535	188	5.	7.7	2993.7	*	1	2355	288	0.	7.5	2993.7
1	0720	89	623.	249.9	3018.5	*	1	1540	189	5.	7.7	2993.7	*	2	0000	289	0.	7.5	2993.7
1	0725	90	620.	245.7	3018.2	*	1	1545	190	4.	7.7	2993.7	*	2	0005	290	0.	7.5	2993.7
1	0730	91	616.	241.5	3017.9	*	1	1550	191	3.	7.7	2993.7	*	2	0010	291	0.	7.5	2993.7
1	0735	92	612.	237.3	3017.6	*	1	1555	192	3.	7.6	2993.7	*	2	0015	292	0.	7.5	2993.7
1	0740	93	608.	233.1	3017.3	*	1	1600	193	2.	7.6	2993.7	*	2	0020	293	0.	7.5	2993.7
1	0745	94	604.	229.0	3017.0	*	1	1605	194	2.	7.6	2993.7	*	2	0025	294	0.	7.5	2993.7
1	0750	95	601.	224.8	3016.7	*	1	1610	195	1.	7.6	2993.7	*	2	0030	295	0.	7.5	2993.7
1	0755	96	597.	220.7	3016.4	*	1	1615	196	1.	7.6	2993.7	*	2	0035	296	0.	7.5	2993.7
1	0800	97	593.	216.6	3016.1	*	1	1620	197	1.	7.6	2993.7	*	2	0040	297	0.	7.5	2993.7
1	0805	98	589.	212.6	3015.9	*	1	1625	198	1.	7.6	2993.7	*	2	0045	298	0.	7.5	2993.7
1	0810	99	586.	208.5	3015.6	*	1	1630	199	1.	7.6	2993.7	*	2	0050	299	0.	7.5	2993.7
1	0815	100	582.	204.5	3015.3	*	1	1635	200	1.	7.6	2993.7	*	2	0055	300	0.	7.5	2993.7
						*							*							

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+	PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	24.92-HR
+	960.	5.42	(CFS)	648.	240.	231.	231.
			(INCHES)	1.372	2.032	2.032	2.032
			(AC-FT)	321.	476.	476.	476.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
323.	5.42	241.	77.	74.	74.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3023.12	5.42	3017.67	3001.34	3000.95	3000.95

CUMULATIVE AREA = 4.39 SQ MI

WARNING --- ROUTED OUTFLOW (685.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (764.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (826.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (869.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (896.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (908.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (907.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (895.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (874.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (846.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (812.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (773.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (733.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (690.) IS GREATER THAN MAXIMUM OUTFLOW (683.) IN STORAGE-OUTFLOW TABLE

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .98

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	577.	199.1	3014.9	1		1640	201	0.	7.6	2993.7
1		0005	2	0.	.0	2990.0	1		0825	102	572.	195.1	3014.6	1		1645	202	0.	7.6	2993.7
1		0010	3	0.	.0	2990.0	1		0830	103	568.	191.2	3014.3	1		1650	203	0.	7.6	2993.7
1		0015	4	0.	.0	2990.1	1		0835	104	564.	187.3	3014.0	1		1655	204	0.	7.6	2993.7
1		0020	5	0.	.0	2990.3	1		0840	105	559.	183.5	3013.7	1		1700	205	0.	7.6	2993.7
1		0025	6	0.	.0	2990.6	1		0845	106	555.	179.6	3013.4	1		1705	206	0.	7.6	2993.7
1		0030	7	0.	.1	2991.0	1		0850	107	551.	175.8	3013.1	1		1710	207	0.	7.6	2993.7
1		0035	8	0.	.1	2991.1	1		0855	108	547.	172.0	3012.8	1		1715	208	0.	7.6	2993.7
1		0040	9	0.	.2	2991.2	1		0900	109	542.	168.3	3012.5	1		1720	209	0.	7.6	2993.7
1		0045	10	0.	.3	2991.3	1		0905	110	538.	164.6	3012.3	1		1725	210	0.	7.6	2993.7
1		0050	11	0.	.4	2991.5	1		0910	111	534.	160.9	3012.0	1		1730	211	0.	7.6	2993.7
1		0055	12	0.	.6	2991.7	1		0915	112	530.	157.2	3011.7	1		1735	212	0.	7.6	2993.7
1		0100	13	0.	.7	2991.9	1		0920	113	526.	153.6	3011.4	1		1740	213	0.	7.6	2993.7
1		0105	14	0.	.9	2992.0	1		0925	114	522.	149.9	3011.1	1		1745	214	0.	7.6	2993.7
1		0110	15	0.	1.0	2992.1	1		0930	115	518.	146.4	3010.9	1		1750	215	0.	7.5	2993.7
1		0115	16	0.	1.2	2992.1	1		0935	116	514.	142.8	3010.6	1		1755	216	0.	7.5	2993.7
1		0120	17	0.	1.3	2992.1	1		0940	117	510.	139.3	3010.3	1		1800	217	0.	7.5	2993.7
1		0125	18	0.	1.6	2992.2	1		0945	118	506.	135.8	3010.0	1		1805	218	0.	7.5	2993.7
1		0130	19	0.	1.9	2992.3	1		0950	119	502.	132.3	3009.7	1		1810	219	0.	7.5	2993.7
1		0135	20	0.	2.3	2992.4	1		0955	120	497.	128.9	3009.4	1		1815	220	0.	7.5	2993.7
1		0140	21	0.	2.8	2992.5	1		1000	121	492.	125.5	3009.1	1		1820	221	0.	7.5	2993.7
1		0145	22	0.	3.5	2992.7	1		1005	122	486.	122.1	3008.8	1		1825	222	0.	7.5	2993.7
1		0150	23	0.	4.4	2992.9	1		1010	123	480.	118.8	3008.4	1		1830	223	0.	7.5	2993.7
1		0155	24	0.	5.4	2993.2	1		1015	124	475.	115.5	3008.1	1		1835	224	0.	7.5	2993.7
1		0200	25	0.	6.5	2993.4	1		1020	125	469.	112.2	3007.8	1		1840	225	0.	7.5	2993.7
1		0205	26	0.	7.5	2993.7	1		1025	126	464.	109.0	3007.4	1		1845	226	0.	7.5	2993.7
1		0210	27	25.	8.4	2993.9	1		1030	127	458.	105.8	3007.1	1		1850	227	0.	7.5	2993.7
1		0215	28	47.	9.2	2994.1	1		1035	128	453.	102.7	3006.8	1		1855	228	0.	7.5	2993.7
1		0220	29	68.	10.0	2994.3	1		1040	129	447.	99.6	3006.5	1		1900	229	0.	7.5	2993.7
1		0225	30	91.	10.8	2994.5	1		1045	130	442.	96.6	3006.2	1		1905	230	0.	7.5	2993.7
1		0230	31	117.	11.8	2994.8	1		1050	131	436.	93.5	3005.8	1		1910	231	0.	7.5	2993.7
1		0235	32	142.	12.7	2995.0	1		1055	132	430.	90.5	3005.5	1		1915	232	0.	7.5	2993.7
1		0240	33	149.	13.5	2995.1	1		1100	133	424.	87.6	3005.2	1		1920	233	0.	7.5	2993.7
1		0245	34	156.	14.4	2995.3	1		1105	134	418.	84.7	3004.8	1		1925	234	0.	7.5	2993.7
1		0250	35	163.	15.4	2995.4	1		1110	135	411.	81.8	3004.5	1		1930	235	0.	7.5	2993.7
1		0255	36	171.	16.4	2995.6	1		1115	136	404.	79.0	3004.1	1		1935	236	0.	7.5	2993.7
1		0300	37	180.	17.4	2995.8	1		1120	137	396.	76.3	3003.7	1		1940	237	0.	7.5	2993.7
1		0305	38	188.	18.5	2996.0	1		1125	138	388.	73.6	3003.4	1		1945	238	0.	7.5	2993.7
1		0310	39	196.	19.8	2996.2	1		1130	139	381.	70.9	3003.0	1		1950	239	0.	7.5	2993.7
1		0315	40	208.	21.6	2996.5	1		1135	140	374.	68.3	3002.7	1		1955	240	0.	7.5	2993.7
1		0320	41	226.	24.7	2996.9	1		1140	141	367.	65.8	3002.4	1		2000	241	0.	7.5	2993.7
1		0325	42	250.	30.2	2997.7	1		1145	142	360.	63.3	3002.0	1		2005	242	0.	7.5	2993.7
1		0330	43	286.	39.7	2998.9	1		1150	143	353.	60.8	3001.7	1		2010	243	0.	7.5	2993.7
1		0335	44	334.	54.1	3000.8	1		1155	144	347.	58.4	3001.4	1		2015	244	0.	7.5	2993.7
1		0340	45	387.	73.2	3003.3	1		1200	145	340.	56.1	3001.1	1		2020	245	0.	7.5	2993.7
1		0345	46	440.	95.4	3006.0	1		1205	146	333.	53.7	3000.8	1		2025	246	0.	7.5	2993.7
1		0350	47	480.	118.7	3008.4	1		1210	147	325.	51.5	3000.5	1		2030	247	0.	7.5	2993.7
1		0355	48	513.	141.6	3010.5	1		1215	148	318.	49.3	3000.2	1		2035	248	0.	7.5	2993.7
1		0400	49	537.	163.5	3012.2	1		1220	149	311.	47.1	2999.9	1		2040	249	0.	7.5	2993.7
1		0405	50	560.	184.1	3013.8	1		1225	150	304.	45.0	2999.6	1		2045	250	0.	7.5	2993.7
1		0410	51	581.	203.2	3015.2	1		1230	151	297.	42.9	2999.3	1		2050	251	0.	7.5	2993.7
1		0415	52	597.	220.5	3016.4	1		1235	152	290.	40.9	2999.1	1		2055	252	0.	7.5	2993.7
1		0420	53	611.	235.7	3017.5	1		1240	153	283.	38.9	2998.8	1		2100	253	0.	7.5	2993.7

1	0425	54	622.	248.7	3018.4	*	1	1245	154	276.	37.0	2998.6	*	1	2105	254	0.	7.5	2993.7
1	0430	55	631.	259.8	3019.1	*	1	1250	155	269.	35.1	2998.3	*	1	2110	255	0.	7.5	2993.7
1	0435	56	639.	269.3	3019.7	*	1	1255	156	262.	33.3	2998.1	*	1	2115	256	0.	7.5	2993.7
1	0440	57	646.	277.8	3020.3	*	1	1300	157	255.	31.5	2997.8	*	1	2120	257	0.	7.5	2993.7
1	0445	58	652.	285.6	3020.8	*	1	1305	158	248.	29.8	2997.6	*	1	2125	258	0.	7.5	2993.7
1	0450	59	657.	292.6	3021.2	*	1	1310	159	241.	28.1	2997.4	*	1	2130	259	0.	7.5	2993.7
1	0455	60	662.	299.2	3021.6	*	1	1315	160	234.	26.5	2997.2	*	1	2135	260	0.	7.5	2993.7
1	0500	61	685.	305.1	3022.0	*	1	1320	161	227.	24.9	2997.0	*	1	2140	261	0.	7.5	2993.7
1	0505	62	764.	310.2	3022.3	*	1	1325	162	218.	23.3	2996.7	*	1	2145	262	0.	7.5	2993.7
1	0510	63	826.	314.2	3022.6	*	1	1330	163	209.	21.9	2996.5	*	1	2150	263	0.	7.5	2993.7
1	0515	64	869.	317.1	3022.8	*	1	1335	164	201.	20.5	2996.3	*	1	2155	264	0.	7.5	2993.7
1	0520	65	896.	318.8	3022.9	*	1	1340	165	192.	19.1	2996.1	*	1	2200	265	0.	7.5	2993.7
1	0525	66	908.	319.5	3022.9	*	1	1345	166	183.	17.8	2995.8	*	1	2205	266	0.	7.5	2993.7
1	0530	67	907.	319.5	3022.9	*	1	1350	167	173.	16.6	2995.6	*	1	2210	267	0.	7.5	2993.7
1	0535	68	895.	318.7	3022.9	*	1	1355	168	164.	15.4	2995.5	*	1	2215	268	0.	7.5	2993.7
1	0540	69	874.	317.4	3022.8	*	1	1400	169	155.	14.3	2995.3	*	1	2220	269	0.	7.5	2993.7
1	0545	70	846.	315.5	3022.7	*	1	1405	170	147.	13.3	2995.1	*	1	2225	270	0.	7.5	2993.7
1	0550	71	812.	313.3	3022.5	*	1	1410	171	132.	12.3	2994.9	*	1	2230	271	0.	7.5	2993.7
1	0555	72	773.	310.9	3022.4	*	1	1415	172	109.	11.5	2994.7	*	1	2235	272	0.	7.5	2993.7
1	0600	73	733.	308.2	3022.2	*	1	1420	173	90.	10.8	2994.5	*	1	2240	273	0.	7.5	2993.7
1	0605	74	690.	305.5	3022.0	*	1	1425	174	74.	10.2	2994.4	*	1	2245	274	0.	7.5	2993.7
1	0610	75	665.	302.7	3021.9	*	1	1430	175	62.	9.8	2994.3	*	1	2250	275	0.	7.5	2993.7
1	0615	76	662.	299.6	3021.7	*	1	1435	176	51.	9.4	2994.2	*	1	2255	276	0.	7.5	2993.7
1	0620	77	660.	296.3	3021.5	*	1	1440	177	42.	9.1	2994.1	*	1	2300	277	0.	7.5	2993.7
1	0625	78	657.	292.9	3021.2	*	1	1445	178	35.	8.8	2994.0	*	1	2305	278	0.	7.5	2993.7
1	0630	79	655.	289.2	3021.0	*	1	1450	179	29.	8.6	2994.0	*	1	2310	279	0.	7.5	2993.7
1	0635	80	652.	285.4	3020.8	*	1	1455	180	24.	8.4	2993.9	*	1	2315	280	0.	7.5	2993.7
1	0640	81	649.	281.5	3020.5	*	1	1500	181	20.	8.3	2993.9	*	1	2320	281	0.	7.5	2993.7
1	0645	82	646.	277.6	3020.3	*	1	1505	182	16.	8.1	2993.8	*	1	2325	282	0.	7.5	2993.7
1	0650	83	642.	273.5	3020.0	*	1	1510	183	13.	8.0	2993.8	*	1	2330	283	0.	7.5	2993.7
1	0655	84	639.	269.4	3019.7	*	1	1515	184	11.	7.9	2993.8	*	1	2335	284	0.	7.5	2993.7
1	0700	85	636.	265.2	3019.5	*	1	1520	185	9.	7.9	2993.8	*	1	2340	285	0.	7.5	2993.7
1	0705	86	632.	261.0	3019.2	*	1	1525	186	8.	7.8	2993.8	*	1	2345	286	0.	7.5	2993.7
1	0710	87	629.	256.8	3018.9	*	1	1530	187	6.	7.8	2993.8	*	1	2350	287	0.	7.5	2993.7
1	0715	88	625.	252.6	3018.6	*	1	1535	188	5.	7.7	2993.7	*	1	2355	288	0.	7.5	2993.7
1	0720	89	622.	248.4	3018.4	*	1	1540	189	4.	7.7	2993.7	*	2	0000	289	0.	7.5	2993.7
1	0725	90	618.	244.2	3018.1	*	1	1545	190	3.	7.7	2993.7	*	2	0005	290	0.	7.5	2993.7
1	0730	91	615.	240.0	3017.8	*	1	1550	191	3.	7.7	2993.7	*	2	0010	291	0.	7.5	2993.7
1	0735	92	611.	235.8	3017.5	*	1	1555	192	2.	7.6	2993.7	*	2	0015	292	0.	7.5	2993.7
1	0740	93	607.	231.6	3017.2	*	1	1600	193	2.	7.6	2993.7	*	2	0020	293	0.	7.5	2993.7
1	0745	94	603.	227.5	3016.9	*	1	1605	194	2.	7.6	2993.7	*	2	0025	294	0.	7.5	2993.7
1	0750	95	599.	223.4	3016.6	*	1	1610	195	1.	7.6	2993.7	*	2	0030	295	0.	7.5	2993.7
1	0755	96	595.	219.3	3016.3	*	1	1615	196	1.	7.6	2993.7	*	2	0035	296	0.	7.5	2993.7
1	0800	97	592.	215.2	3016.0	*	1	1620	197	1.	7.6	2993.7	*	2	0040	297	0.	7.5	2993.7
1	0805	98	588.	211.1	3015.8	*	1	1625	198	1.	7.6	2993.7	*	2	0045	298	0.	7.5	2993.7
1	0810	99	584.	207.1	3015.5	*	1	1630	199	1.	7.6	2993.7	*	2	0050	299	0.	7.5	2993.7
1	0815	100	581.	203.1	3015.2	*	1	1635	200	1.	7.6	2993.7	*	2	0055	300	0.	7.5	2993.7

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR	
(CFS)	(HR)					
		(CFS)				
908.	5.42	637.	236.	228.	228.	
		(INCHES)	1.349	2.001	2.001	2.001
		(AC-FT)	316.	469.	469.	469.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
(AC-FT)	(HR)				
320.	5.42	239.	76.	74.	74.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
(FEET)	(HR)				
3022.91	5.42	3017.52	3001.28	3000.89	3000.89

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .94

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	567.	190.4	3014.2	1		1640	201	0.	7.6	2993.7
1		0005	2	0.	.0	2990.0	1		0825	102	563.	186.5	3013.9	1		1645	202	0.	7.6	2993.7
1		0010	3	0.	.0	2990.0	1		0830	103	559.	182.7	3013.7	1		1650	203	0.	7.6	2993.7
1		0015	4	0.	.0	2990.1	1		0835	104	554.	178.9	3013.4	1		1655	204	0.	7.6	2993.7
1		0020	5	0.	.0	2990.2	1		0840	105	550.	175.1	3013.1	1		1700	205	0.	7.6	2993.7
1		0025	6	0.	.0	2990.5	1		0845	106	546.	171.3	3012.8	1		1705	206	0.	7.6	2993.7
1		0030	7	0.	.1	2990.9	1		0850	107	542.	167.5	3012.5	1		1710	207	0.	7.6	2993.7
1		0035	8	0.	.1	2991.1	1		0855	108	538.	163.8	3012.2	1		1715	208	0.	7.6	2993.7
1		0040	9	0.	.2	2991.1	1		0900	109	533.	160.1	3011.9	1		1720	209	0.	7.6	2993.7
1		0045	10	0.	.2	2991.2	1		0905	110	529.	156.5	3011.6	1		1725	210	0.	7.6	2993.7
1		0050	11	0.	.3	2991.4	1		0910	111	525.	152.8	3011.4	1		1730	211	0.	7.6	2993.7
1		0055	12	0.	.4	2991.5	1		0915	112	521.	149.2	3011.1	1		1735	212	0.	7.6	2993.7
1		0100	13	0.	.5	2991.6	1		0920	113	517.	145.7	3010.8	1		1740	213	0.	7.5	2993.7
1		0105	14	0.	.6	2991.8	1		0925	114	513.	142.1	3010.5	1		1745	214	0.	7.5	2993.7
1		0110	15	0.	.7	2991.9	1		0930	115	510.	138.6	3010.3	1		1750	215	0.	7.5	2993.7
1		0115	16	0.	.8	2992.0	1		0935	116	506.	135.1	3010.0	1		1755	216	0.	7.5	2993.7
1		0120	17	0.	1.0	2992.0	1		0940	117	501.	131.6	3009.7	1		1800	217	0.	7.5	2993.7
1		0125	18	0.	1.2	2992.1	1		0945	118	496.	128.2	3009.4	1		1805	218	0.	7.5	2993.7
1		0130	19	0.	1.4	2992.2	1		0950	119	491.	124.8	3009.1	1		1810	219	0.	7.5	2993.7
1		0135	20	0.	1.7	2992.2	1		0955	120	485.	121.4	3008.7	1		1815	220	0.	7.5	2993.7
1		0140	21	0.	2.2	2992.4	1		1000	121	479.	118.1	3008.4	1		1820	221	0.	7.5	2993.7
1		0145	22	0.	2.8	2992.5	1		1005	122	474.	114.8	3008.0	1		1825	222	0.	7.5	2993.7
1		0150	23	0.	3.6	2992.7	1		1010	123	468.	111.6	3007.7	1		1830	223	0.	7.5	2993.7
1		0155	24	0.	4.5	2992.9	1		1015	124	462.	108.4	3007.4	1		1835	224	0.	7.5	2993.7

1	0200	25	0.	5.4	2993.2	*	1	1020	125	457.	105.2	3007.0	*	1	1840	225	0.	7.5	2993.7
1	0205	26	0.	6.3	2993.4	*	1	1025	126	452.	102.1	3006.7	*	1	1845	226	0.	7.5	2993.7
1	0210	27	0.	7.2	2993.6	*	1	1030	127	446.	99.0	3006.4	*	1	1850	227	0.	7.5	2993.7
1	0215	28	13.	8.0	2993.8	*	1	1035	128	441.	96.0	3006.1	*	1	1855	228	0.	7.5	2993.7
1	0220	29	37.	8.9	2994.0	*	1	1040	129	435.	92.9	3005.8	*	1	1900	229	0.	7.5	2993.7
1	0225	30	62.	9.8	2994.3	*	1	1045	130	429.	90.0	3005.4	*	1	1905	230	0.	7.5	2993.7
1	0230	31	88.	10.7	2994.5	*	1	1050	131	423.	87.0	3005.1	*	1	1910	231	0.	7.5	2993.7
1	0235	32	114.	11.7	2994.7	*	1	1055	132	417.	84.1	3004.8	*	1	1915	232	0.	7.5	2993.7
1	0240	33	137.	12.5	2994.9	*	1	1100	133	409.	81.3	3004.4	*	1	1920	233	0.	7.5	2993.7
1	0245	34	147.	13.3	2995.1	*	1	1105	134	402.	78.5	3004.0	*	1	1925	234	0.	7.5	2993.7
1	0250	35	153.	14.1	2995.2	*	1	1110	135	394.	75.8	3003.7	*	1	1930	235	0.	7.5	2993.7
1	0255	36	160.	15.0	2995.4	*	1	1115	136	387.	73.1	3003.3	*	1	1935	236	0.	7.5	2993.7
1	0300	37	168.	15.9	2995.5	*	1	1120	137	380.	70.4	3003.0	*	1	1940	237	0.	7.5	2993.7
1	0305	38	175.	16.8	2995.7	*	1	1125	138	373.	67.8	3002.6	*	1	1945	238	0.	7.5	2993.7
1	0310	39	184.	18.0	2995.9	*	1	1130	139	366.	65.3	3002.3	*	1	1950	239	0.	7.5	2993.7
1	0315	40	195.	19.6	2996.1	*	1	1135	140	359.	62.8	3002.0	*	1	1955	240	0.	7.5	2993.7
1	0320	41	213.	22.4	2996.6	*	1	1140	141	352.	60.3	3001.6	*	1	2000	241	0.	7.5	2993.7
1	0325	42	238.	27.5	2997.3	*	1	1145	142	345.	57.9	3001.3	*	1	2005	242	0.	7.5	2993.7
1	0330	43	273.	36.2	2998.5	*	1	1150	143	339.	55.6	3001.0	*	1	2010	243	0.	7.5	2993.7
1	0335	44	319.	49.5	3000.2	*	1	1155	144	331.	53.3	3000.7	*	1	2015	244	0.	7.5	2993.7
1	0340	45	371.	67.4	3002.6	*	1	1200	145	324.	51.0	3000.4	*	1	2020	245	0.	7.5	2993.7
1	0345	46	425.	88.1	3005.2	*	1	1205	146	317.	48.8	3000.1	*	1	2025	246	0.	7.5	2993.7
1	0350	47	465.	109.9	3007.5	*	1	1210	147	310.	46.7	2999.8	*	1	2030	247	0.	7.5	2993.7
1	0355	48	500.	131.3	3009.6	*	1	1215	148	303.	44.6	2999.6	*	1	2035	248	0.	7.5	2993.7
1	0400	49	524.	151.8	3011.3	*	1	1220	149	296.	42.5	2999.3	*	1	2040	249	0.	7.5	2993.7
1	0405	50	546.	171.1	3012.8	*	1	1225	150	289.	40.5	2999.0	*	1	2045	250	0.	7.5	2993.7
1	0410	51	566.	189.0	3014.1	*	1	1230	151	282.	38.5	2998.8	*	1	2050	251	0.	7.5	2993.7
1	0415	52	583.	205.2	3015.3	*	1	1235	152	274.	36.6	2998.5	*	1	2055	252	0.	7.5	2993.7
1	0420	53	596.	219.4	3016.3	*	1	1240	153	267.	34.7	2998.3	*	1	2100	253	0.	7.5	2993.7
1	0425	54	607.	231.6	3017.2	*	1	1245	154	261.	32.9	2998.0	*	1	2105	254	0.	7.5	2993.7
1	0430	55	616.	241.9	3017.9	*	1	1250	155	253.	31.2	2997.8	*	1	2110	255	0.	7.5	2993.7
1	0435	56	624.	250.8	3018.5	*	1	1255	156	246.	29.4	2997.6	*	1	2115	256	0.	7.5	2993.7
1	0440	57	631.	258.7	3019.0	*	1	1300	157	239.	27.8	2997.4	*	1	2120	257	0.	7.5	2993.7
1	0445	58	636.	265.9	3019.5	*	1	1305	158	232.	26.1	2997.1	*	1	2125	258	0.	7.5	2993.7
1	0450	59	642.	272.5	3019.9	*	1	1310	159	225.	24.6	2996.9	*	1	2130	259	0.	7.5	2993.7
1	0455	60	646.	278.5	3020.3	*	1	1315	160	216.	23.0	2996.7	*	1	2135	260	0.	7.5	2993.7
1	0500	61	651.	284.1	3020.7	*	1	1320	161	208.	21.6	2996.5	*	1	2140	261	0.	7.5	2993.7
1	0505	62	655.	289.2	3021.0	*	1	1325	162	199.	20.2	2996.2	*	1	2145	262	0.	7.5	2993.7
1	0510	63	658.	293.7	3021.3	*	1	1330	163	191.	18.8	2996.0	*	1	2150	263	0.	7.5	2993.7
1	0515	64	661.	297.4	3021.5	*	1	1335	164	181.	17.6	2995.8	*	1	2155	264	0.	7.5	2993.7
1	0520	65	663.	300.2	3021.7	*	1	1340	165	171.	16.4	2995.6	*	1	2200	265	0.	7.5	2993.7
1	0525	66	664.	302.3	3021.8	*	1	1345	166	162.	15.2	2995.4	*	1	2205	266	0.	7.5	2993.7
1	0530	67	666.	303.6	3021.9	*	1	1350	167	154.	14.1	2995.2	*	1	2210	267	0.	7.5	2993.7
1	0535	68	671.	304.1	3021.9	*	1	1355	168	146.	13.1	2995.1	*	1	2215	268	0.	7.5	2993.7
1	0540	69	670.	304.0	3021.9	*	1	1400	169	127.	12.1	2994.9	*	1	2220	269	0.	7.5	2993.7
1	0545	70	665.	303.3	3021.9	*	1	1405	170	105.	11.3	2994.7	*	1	2225	270	0.	7.5	2993.7
1	0550	71	664.	302.1	3021.8	*	1	1410	171	87.	10.7	2994.5	*	1	2230	271	0.	7.5	2993.7
1	0555	72	663.	300.4	3021.7	*	1	1415	172	72.	10.1	2994.4	*	1	2235	272	0.	7.5	2993.7
1	0600	73	661.	298.2	3021.6	*	1	1420	173	59.	9.7	2994.2	*	1	2240	273	0.	7.5	2993.7
1	0605	74	659.	295.7	3021.4	*	1	1425	174	49.	9.3	2994.1	*	1	2245	274	0.	7.5	2993.7
1	0610	75	657.	292.9	3021.2	*	1	1430	175	40.	9.0	2994.1	*	1	2250	275	0.	7.5	2993.7
1	0615	76	655.	289.9	3021.1	*	1	1435	176	33.	8.8	2994.0	*	1	2255	276	0.	7.5	2993.7
1	0620	77	653.	286.6	3020.8	*	1	1440	177	28.	8.5	2994.0	*	1	2300	277	0.	7.5	2993.7
1	0625	78	650.	283.1	3020.6	*	1	1445	178	23.	8.4	2993.9	*	1	2305	278	0.	7.5	2993.7
1	0630	79	647.	279.5	3020.4	*	1	1450	179	19.	8.2	2993.9	*	1	2310	279	0.	7.5	2993.7
1	0635	80	644.	275.7	3020.2	*	1	1455	180	16.	8.1	2993.8	*	1	2315	280	0.	7.5	2993.7
1	0640	81	641.	271.8	3019.9	*	1	1500	181	13.	8.0	2993.8	*	1	2320	281	0.	7.5	2993.7
1	0645	82	638.	267.9	3019.6	*	1	1505	182	11.	7.9	2993.8	*	1	2325	282	0.	7.5	2993.7
1	0650	83	635.	263.9	3019.4	*	1	1510	183	9.	7.9	2993.8	*	1	2330	283	0.	7.5	2993.7
1	0655	84	631.	259.8	3019.1	*	1	1515	184	7.	7.8	2993.8	*	1	2335	284	0.	7.5	2993.7
1	0700	85	628.	255.7	3018.8	*	1	1520	185	6.	7.8	2993.8	*	1	2340	285	0.	7.5	2993.7
1	0705	86	624.	251.5	3018.6	*	1	1525	186	5.	7.7	2993.7	*	1	2345	286	0.	7.5	2993.7
1	0710	87	621.	247.4	3018.3	*	1	1530	187	4.	7.7	2993.7	*	1	2350	287	0.	7.5	2993.7
1	0715	88	618.	243.2	3018.0	*	1	1535	188	3.	7.7	2993.7	*	1	2355	288	0.	7.5	2993.7
1	0720	89	614.	239.1	3017.7	*	1	1540	189	3.	7.6	2993.7	*	2	0000	289	0.	7.5	2993.7
1	0725	90	610.	234.9	3017.4	*	1	1545	190	2.	7.6	2993.7	*	2	0005	290	0.	7.5	2993.7
1	0730	91	606.	230.8	3017.1	*	1	1550	191	2.	7.6	2993.7	*	2	0010	291	0.	7.5	2993.7
1	0735	92	602.	226.6	3016.8	*	1	1555	192	2.	7.6	2993.7	*	2	0015	292	0.	7.5	2993.7
1	0740	93	598.	222.5	3016.6	*	1	1600	193	1.	7.6	2993.7	*	2	0020	293	0.	7.5	2993.7
1	0745	94	595.	218.4	3016.3	*	1	1605	194	1.	7.6	2993.7	*	2	0025	294	0.	7.5	2993.7
1	0750	95	591.	214.4	3016.0	*	1	1610	195	1.	7.6	2993.7	*	2	0030	295	0.	7.5	2993.7
1	0755	96	587.	210.3	3015.7	*	1	1615	196	1.	7.6	2993.7	*	2	0035	296	0.	7.5	2993.7
1	0800	97	584.	206.3	3015.4	*	1	1620	197	1.	7.6	2993.7	*	2	0040	297	0.	7.5	2993.7
1	0805	98	580.	202.3	3015.1	*	1	1625	198	0.	7.6	2993.7	*	2	0045	298	0.	7.5	2993.7
1	0810	99	576.	198.3	3014.8	*	1	1630	199	0.	7.6	2993.7	*	2	0050	299	0.	7.5	2993.7
1	0815	100	571.	194.4	3014.5	*	1	1635	200	0.	7.6	2993.7	*	2	0055	300	0.	7.5	2993.7
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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 671.	5.58		599.	222.	213.	213.
		(INCHES)	1.267	1.876	1.876	1.876
		(AC-FT)	297.	440.	440.	440.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
304.	5.58	228.	72.	70.	70.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3021.95	5.58	3016.73	3000.92	3000.55	3000.55

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .93

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	562.	185.4	3013.9	1		1640	201	0.	7.6	2993.7
1		0005	2	0.	.0	2990.0	1		0825	102	557.	181.6	3013.6	1		1645	202	0.	7.6	2993.7
1		0010	3	0.	.0	2990.0	1		0830	103	553.	177.8	3013.3	1		1650	203	0.	7.6	2993.7
1		0015	4	0.	.0	2990.1	1		0835	104	549.	174.0	3013.0	1		1655	204	0.	7.6	2993.7
1		0020	5	0.	.0	2990.2	1		0840	105	545.	170.2	3012.7	1		1700	205	0.	7.6	2993.7
1		0025	6	0.	.0	2990.5	1		0845	106	540.	166.5	3012.4	1		1705	206	0.	7.6	2993.7
1		0030	7	0.	.1	2990.9	1		0850	107	536.	162.8	3012.1	1		1710	207	0.	7.6	2993.7
1		0035	8	0.	.1	2991.0	1		0855	108	532.	159.1	3011.8	1		1715	208	0.	7.6	2993.7
1		0040	9	0.	.2	2991.1	1		0900	109	528.	155.4	3011.6	1		1720	209	0.	7.6	2993.7
1		0045	10	0.	.2	2991.2	1		0905	110	524.	151.8	3011.3	1		1725	210	0.	7.6	2993.7
1		0050	11	0.	.3	2991.3	1		0910	111	520.	148.2	3011.0	1		1730	211	0.	7.5	2993.7
1		0055	12	0.	.4	2991.5	1		0915	112	516.	144.7	3010.7	1		1735	212	0.	7.5	2993.7
1		0100	13	0.	.5	2991.6	1		0920	113	512.	141.1	3010.5	1		1740	213	0.	7.5	2993.7
1		0105	14	0.	.6	2991.7	1		0925	114	508.	137.6	3010.2	1		1745	214	0.	7.5	2993.7
1		0110	15	0.	.7	2991.8	1		0930	115	504.	134.1	3009.9	1		1750	215	0.	7.5	2993.7
1		0115	16	0.	.8	2992.0	1		0935	116	499.	130.7	3009.6	1		1755	216	0.	7.5	2993.7
1		0120	17	0.	.9	2992.0	1		0940	117	494.	127.2	3009.3	1		1800	217	0.	7.5	2993.7
1		0125	18	0.	1.1	2992.1	1		0945	118	489.	123.8	3009.0	1		1805	218	0.	7.5	2993.7
1		0130	19	0.	1.3	2992.1	1		0950	119	483.	120.5	3008.6	1		1810	219	0.	7.5	2993.7
1		0135	20	0.	1.6	2992.2	1		0955	120	478.	117.2	3008.3	1		1815	220	0.	7.5	2993.7
1		0140	21	0.	2.1	2992.3	1		1000	121	472.	113.9	3007.9	1		1820	221	0.	7.5	2993.7
1		0145	22	0.	2.7	2992.5	1		1005	122	466.	110.7	3007.6	1		1825	222	0.	7.5	2993.7
1		0150	23	0.	3.4	2992.7	1		1010	123	461.	107.5	3007.3	1		1830	223	0.	7.5	2993.7
1		0155	24	0.	4.2	2992.9	1		1015	124	455.	104.3	3007.0	1		1835	224	0.	7.5	2993.7
1		0200	25	0.	5.1	2993.1	1		1020	125	450.	101.2	3006.6	1		1840	225	0.	7.5	2993.7
1		0205	26	0.	6.0	2993.3	1		1025	126	445.	98.1	3006.3	1		1845	226	0.	7.5	2993.7
1		0210	27	0.	6.8	2993.5	1		1030	127	439.	95.1	3006.0	1		1850	227	0.	7.5	2993.7
1		0215	28	5.	7.7	2993.7	1		1035	128	433.	92.1	3005.7	1		1855	228	0.	7.5	2993.7
1		0220	29	29.	8.6	2994.0	1		1040	129	427.	89.1	3005.3	1		1900	229	0.	7.5	2993.7
1		0225	30	54.	9.5	2994.2	1		1045	130	422.	86.2	3005.0	1		1905	230	0.	7.5	2993.7
1		0230	31	81.	10.5	2994.4	1		1050	131	414.	83.3	3004.7	1		1910	231	0.	7.5	2993.7
1		0235	32	107.	11.4	2994.7	1		1055	132	407.	80.5	3004.3	1		1915	232	0.	7.5	2993.7
1		0240	33	130.	12.2	2994.9	1		1100	133	400.	77.7	3003.9	1		1920	233	0.	7.5	2993.7
1		0245	34	145.	13.0	2995.0	1		1105	134	392.	75.0	3003.6	1		1925	234	0.	7.5	2993.7
1		0250	35	151.	13.8	2995.2	1		1110	135	385.	72.3	3003.2	1		1930	235	0.	7.5	2993.7
1		0255	36	158.	14.6	2995.3	1		1115	136	378.	69.7	3002.9	1		1935	236	0.	7.5	2993.7
1		0300	37	165.	15.5	2995.5	1		1120	137	371.	67.1	3002.5	1		1940	237	0.	7.5	2993.7
1		0305	38	172.	16.5	2995.6	1		1125	138	364.	64.6	3002.2	1		1945	238	0.	7.5	2993.7
1		0310	39	181.	17.5	2995.8	1		1130	139	357.	62.1	3001.9	1		1950	239	0.	7.5	2993.7
1		0315	40	192.	19.1	2996.1	1		1135	140	350.	59.7	3001.5	1		1955	240	0.	7.5	2993.7
1		0320	41	209.	21.9	2996.5	1		1140	141	344.	57.3	3001.2	1		2000	241	0.	7.5	2993.7
1		0325	42	235.	26.9	2997.2	1		1145	142	336.	54.9	3000.9	1		2005	242	0.	7.5	2993.7
1		0330	43	270.	35.3	2998.4	1		1150	143	329.	52.6	3000.6	1		2010	243	0.	7.5	2993.7
1		0335	44	315.	48.4	3000.1	1		1155	144	322.	50.4	3000.3	1		2015	244	0.	7.5	2993.7
1		0340	45	367.	65.9	3002.4	1		1200	145	315.	48.2	3000.0	1		2020	245	0.	7.5	2993.7
1		0345	46	422.	86.3	3005.0	1		1205	146	308.	46.1	2999.8	1		2025	246	0.	7.5	2993.7
1		0350	47	461.	107.7	3007.3	1		1210	147	301.	44.0	2999.5	1		2030	247	0.	7.5	2993.7
1		0355	48	496.	128.7	3009.4	1		1215	148	294.	41.9	2999.2	1		2035	248	0.	7.5	2993.7
1		0400	49	521.	148.9	3011.1	1		1220	149	287.	39.9	2999.0	1		2040	249	0.	7.5	2993.7
1		0405	50	542.	167.8	3012.5	1		1225	150	279.	38.0	2998.7	1		2045	250	0.	7.5	2993.7
1		0410	51	562.	185.4	3013.9	1		1230	151	272.	36.1	2998.4	1		2050	251	0.	7.5	2993.7
1		0415	52	579.	201.4	3015.1	1		1235	152	265.	34.2	2998.2	1		2055	252	0.	7.5	2993.7
1		0420	53	592.	215.3	3016.1	1		1240	153	259.	32.4	2998.0	1		2100	253	0.	7.5	2993.7
1		0425	54	603.	227.3	3016.9	1		1245	154	251.	30.7	2997.7	1		2105	254	0.	7.5	2993.7
1		0430	55	612.	237.4	3017.6	1		1250	155	244.	29.0	2997.5	1		2110	255	0.	7.5	2993.7
1		0435	56	620.	246.2	3018.2	1		1255	156	237.	27.3	2997.3	1		2115	256	0.	7.5	2993.7
1		0440	57	627.	253.9	3018.7	1		1300	157	230.	25.7	2997.1	1		2120	257	0.	7.5	2993.7
1		0445	58	632.	261.0	3019.2	1		1305	158	222.	24.1	2996.9	1		2125	258	0.	7.5	2993.7
1		0450	59	638.	267.5	3019.6	1		1310	159	214.	22.6	2996.6	1		2130	259	0.	7.5	2993.7
1		0455	60	642.	273.4	3020.0	1		1315	160	205.	21.2	2996.4	1		2135	260	0.	7.5	2993.7
1		0500	61	647.	278.8	3020.4	1		1320	161	197.	19.8	2996.2	1		2140	261	0.	7.5	2993.7
1		0505	62	650.	283.8	3020.7	1		1325	162	188.	18.5	2996.0	1		2145	262	0.	7.5	2993.7
1		0510	63	654.	288.2	3021.0	1		1330	163	178.	17.2	2995.7	1		2150	263	0.	7.5	2993.7
1		0515	64	657.	291.8	3021.2	1		1335	164	169.	16.0	2995.5	1		2155	264	0.	7.5	2993.7
1		0520	65	659.	294.6	3021.4	1		1340	165	160.	14.9	2995.4	1		2200	265	0.	7.5	2993.7
1		0525	66	660.	296.6	3021.5	1		1345	166	151.	13.8	2995.2	1		2205	266	0.	7.5	2993.7
1		0530	67	661.	297.9	3021.6	1		1350	167	144.	12.8	2995.0	1		2210	267	0.	7.5	2993.7
1		0535	68	661.	298.4	3021.6	1		1355	168	120.	11.9	2994.8	1		2215	268	0.	7.5	2993.7
1		0540	69	661.	298.3	3021.6	1		1400	169	99.	11.1	2994.6	1		2220	269	0.	7.5	2993.7
1		0545	70	661.	297.6	3021.5	1		1405	170	82.	10.5	2994.4	1		2225	270	0.	7.5	2993.7
1		0550	71	660.	296.3	3021.5	1		1410	171	68.	10.0	2994.3	1		2230	271	0.	7.5	2993.7
1		0555	72	659.	294.6	3021.3	1		1415	172	56.	9.6	2994.2	1		2235	272	0.	7.5	2993.7
1		0600	73	657.	292.5	3021.2	1		1420	173	46.	9.2	2994.1	1		2240	273	0.	7.5	2993.7
1		0605	74	655.	290.0	3021.1	1		1425	174	38.	8.9	2994.0	1		2245	274	0.	7.5	2993.7
1		0610	75	653.	287.2	3020.9	1		1430	175	32.	8.7	2994.0	1		2250	275	0.	7.5	2993.7
1		0615	76	651.	284.2	3020.7	1		1435	176	26.	8.5	2993.9	1		2255	276	0.	7.5	2993.7
1		0620	77	648.	280.9	3020.5	1		1440	177	22.	8.3	2993.9	1		2300	277	0.	7.5	2993.7
1		0625	78	645.	277.4	3020.3	1		1445	178	18.	8.2	2993.9	1		2305	278	0.	7.5	2993.7
1		0630	79	643.	273.8	3020.0	1		1450	179	15.	8.1	2993.8	1		2310	279	0.	7.5	2993.7
1		0635	80	640.	270.1	3019.8	1		1455	180	12.	8.0	2993.8	1		2315	280	0.	7.5	2993.7
1		0640	81	637.	266.2	3019.5	1		1500	181	10.	7.9	2993.8	1		2320	281	0.	7.5	2993.7
1		0645	82	633.	262.3	3019.3	1		1505	182	8.	7.8	2993.8	1		2325	282	0.	7.5	2993.7
1		0650	83	630.	258.3	3019.0	1		1510	183	7.	7.8	2993.8	1		2330	283	0.	7.5	2993.7
1		0655	84	627.	254.2	3018.7	1		1515	184	6.	7.8	2993.8	1		2335	284	0.	7.5	2993.7
1		0700	85	623.	250.1	3018.5	1		1520	185	5.	7.7	2993.7	1		2340	285	0.	7.5	2993.7
1		0705	86	620.	246.0	3018.2	1		1525	186	4.	7.7	2993.7	1		2345	286	0.	7.5	2993.7
1		0710	87	616.	241.9	3017.9	1		1530	187	3.	7.7	2993.7	1		2350	287	0.	7.5	2993.7
1		0715	88	613.	237.8	3017.6	1		1535	188	3.	7.6	2993.7	1		2355	288	0.	7.5	2993.7
1		0720	89	609.	233.6	3017.3	1		1540	189	2.	7.6	2993.7	2		0000	289	0.	7.5	2993.7
1		0725	90	605.	229.5	3017.0	1		1545	190	2.	7.6	2993.7	2		0005	290	0.	7.5	2993.7
1		0730	91	601.	225.4	3016.8	1		1550	191	1.	7.6	2993.7	2		0010	291	0.	7.5	2993.7
1		0735	92	597.	221.3	3016.5	1		1555	192	1.	7.6	2993.7	2		0015	292	0.	7.5	2993.7
1		0740	93	594.	217.2	3016.2	1		1600	193	1.	7.6	2993.7	2		0020	293	0.	7.5	2993.7
1		0745	94	590.	213.2	3015.9	1		1605	194	1.	7.6	2993.7	2		0025	294	0.	7.5	2993.7
1		0750	95	586.	209.1	3015.6	1		1610	195	1.	7.6	2993.7	2		0030	295	0.	7.5	2993.7
1		0755	96	583.	205.1	3015.3	1		1615	196	1.	7.6	2993.7	2		0035	296	0.	7.5	2993.7
1		0800	97	579.	201.1	3015.1	1		1620	197	0.	7.6	2993.7	2		0040	297	0.	7.5	2993.7
1		0805	98	575.	197.2	3014.8	1		1625	198	0.	7.6	2993.7	2		0045	298	0.	7.5	2993.7
1		0810	99	570.	193.2	3014.5	1		1630	199	0.	7.6	2993.7	2		0050	299	0.	7.5	2993.7

1	0815	100	566.	189.3	3014.2	*	1	1635	200	0.	7.6	2993.7	*	2	0055	300	0.	7.5	2993.7

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 661.	5.58	594.	218.	210.	210.
		(INCHES) 1.257	1.845	1.845	1.845
		(AC-FT) 294.	432.	432.	432.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
298.	5.58	223.	71.	68.	68.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3021.59	5.58	3016.38	3000.76	3000.39	3000.39

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .92

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	556.	180.5	3013.5	*	1		1640	201	0.	7.6	2993.7
1		0005	2	0.	.0	2990.0	*	1		0825	102	552.	176.7	3013.2	*	1		1645	202	0.	7.6	2993.7
1		0010	3	0.	.0	2990.0	*	1		0830	103	548.	172.9	3012.9	*	1		1650	203	0.	7.6	2993.7
1		0015	4	0.	.0	2990.1	*	1		0835	104	543.	169.1	3012.6	*	1		1655	204	0.	7.6	2993.7
1		0020	5	0.	.0	2990.2	*	1		0840	105	539.	165.4	3012.3	*	1		1700	205	0.	7.6	2993.7
1		0025	6	0.	.0	2990.5	*	1		0845	106	535.	161.7	3012.0	*	1		1705	206	0.	7.6	2993.7
1		0030	7	0.	.1	2990.9	*	1		0850	107	531.	158.0	3011.8	*	1		1710	207	0.	7.6	2993.7
1		0035	8	0.	.1	2991.0	*	1		0855	108	527.	154.4	3011.5	*	1		1715	208	0.	7.6	2993.7
1		0040	9	0.	.1	2991.1	*	1		0900	109	523.	150.8	3011.2	*	1		1720	209	0.	7.6	2993.7
1		0045	10	0.	.2	2991.2	*	1		0905	110	519.	147.2	3010.9	*	1		1725	210	0.	7.5	2993.7
1		0050	11	0.	.3	2991.3	*	1		0910	111	515.	143.6	3010.7	*	1		1730	211	0.	7.5	2993.7
1		0055	12	0.	.4	2991.4	*	1		0915	112	511.	140.1	3010.4	*	1		1735	212	0.	7.5	2993.7
1		0100	13	0.	.4	2991.5	*	1		0920	113	507.	136.6	3010.1	*	1		1740	213	0.	7.5	2993.7
1		0105	14	0.	.5	2991.6	*	1		0925	114	503.	133.1	3009.8	*	1		1745	214	0.	7.5	2993.7
1		0110	15	0.	.6	2991.7	*	1		0930	115	498.	129.7	3009.5	*	1		1750	215	0.	7.5	2993.7
1		0115	16	0.	.7	2991.9	*	1		0935	116	493.	126.3	3009.2	*	1		1755	216	0.	7.5	2993.7
1		0120	17	0.	.8	2992.0	*	1		0940	117	488.	122.9	3008.9	*	1		1800	217	0.	7.5	2993.7
1		0125	18	0.	1.0	2992.0	*	1		0945	118	482.	119.5	3008.5	*	1		1805	218	0.	7.5	2993.7
1		0130	19	0.	1.2	2992.1	*	1		0950	119	476.	116.2	3008.2	*	1		1810	219	0.	7.5	2993.7
1		0135	20	0.	1.5	2992.2	*	1		0955	120	470.	113.0	3007.8	*	1		1815	220	0.	7.5	2993.7
1		0140	21	0.	1.9	2992.3	*	1		1000	121	465.	109.8	3007.5	*	1		1820	221	0.	7.5	2993.7
1		0145	22	0.	2.5	2992.4	*	1		1005	122	459.	106.6	3007.2	*	1		1825	222	0.	7.5	2993.7
1		0150	23	0.	3.2	2992.6	*	1		1010	123	454.	103.4	3006.9	*	1		1830	223	0.	7.5	2993.7
1		0155	24	0.	4.0	2992.8	*	1		1015	124	448.	100.3	3006.5	*	1		1835	224	0.	7.5	2993.7
1		0200	25	0.	4.9	2993.0	*	1		1020	125	443.	97.3	3006.2	*	1		1840	225	0.	7.5	2993.7
1		0205	26	0.	5.7	2993.2	*	1		1025	126	438.	94.2	3005.9	*	1		1845	226	0.	7.5	2993.7
1		0210	27	0.	6.5	2993.4	*	1		1030	127	432.	91.2	3005.6	*	1		1850	227	0.	7.5	2993.7
1		0215	28	0.	7.4	2993.7	*	1		1035	128	426.	88.3	3005.3	*	1		1855	228	0.	7.5	2993.7
1		0220	29	20.	8.3	2993.9	*	1		1040	129	420.	85.4	3004.9	*	1		1900	229	0.	7.5	2993.7
1		0225	30	46.	9.2	2994.1	*	1		1045	130	412.	82.5	3004.5	*	1		1905	230	0.	7.5	2993.7
1		0230	31	73.	10.2	2994.4	*	1		1050	131	405.	79.7	3004.2	*	1		1910	231	0.	7.5	2993.7
1		0235	32	99.	11.1	2994.6	*	1		1055	132	398.	76.9	3003.8	*	1		1915	232	0.	7.5	2993.7
1		0240	33	122.	12.0	2994.8	*	1		1100	133	390.	74.2	3003.5	*	1		1920	233	0.	7.5	2993.7
1		0245	34	143.	12.7	2995.0	*	1		1105	134	383.	71.6	3003.1	*	1		1925	234	0.	7.5	2993.7
1		0250	35	149.	13.5	2995.1	*	1		1110	135	376.	68.9	3002.8	*	1		1930	235	0.	7.5	2993.7
1		0255	36	155.	14.3	2995.3	*	1		1115	136	369.	66.4	3002.4	*	1		1935	236	0.	7.5	2993.7
1		0300	37	162.	15.2	2995.4	*	1		1120	137	362.	63.9	3002.1	*	1		1940	237	0.	7.5	2993.7
1		0305	38	169.	16.1	2995.6	*	1		1125	138	355.	61.4	3001.8	*	1		1945	238	0.	7.5	2993.7
1		0310	39	177.	17.1	2995.7	*	1		1130	139	348.	59.0	3001.5	*	1		1950	239	0.	7.5	2993.7
1		0315	40	189.	18.7	2996.0	*	1		1135	140	342.	56.6	3001.1	*	1		1955	240	0.	7.5	2993.7
1		0320	41	206.	21.4	2996.4	*	1		1140	141	334.	54.3	3000.8	*	1		2000	241	0.	7.5	2993.7
1		0325	42	232.	26.2	2997.1	*	1		1145	142	327.	52.0	3000.5	*	1		2005	242	0.	7.5	2993.7
1		0330	43	266.	34.5	2998.2	*	1		1150	143	320.	49.8	3000.2	*	1		2010	243	0.	7.5	2993.7
1		0335	44	312.	47.3	2999.9	*	1		1155	144	313.	47.6	3000.0	*	1		2015	244	0.	7.5	2993.7
1		0340	45	363.	64.5	3002.2	*	1		1200	145	306.	45.5	2999.7	*	1		2020	245	0.	7.5	2993.7
1		0345	46	417.	84.5	3004.8	*	1		1205	146	299.	43.4	2999.4	*	1		2025	246	0.	7.5	2993.7
1		0350	47	457.	105.5	3007.1	*	1		1210	147	292.	41.3	2999.1	*	1		2030	247	0.	7.5	2993.7
1		0355	48	493.	126.2	3009.2	*	1		1215	148	285.	39.4	2998.9	*	1		2035	248	0.	7.5	2993.7
1		0400	49	518.	146.0	3010.8	*	1		1220	149	277.	37.4	2998.6	*	1		2040	249	0.	7.5	2993.7
1		0405	50	538.	164.7	3012.3	*	1		1225	150	270.	35.5	2998.4	*	1		2045	250	0.	7.5	2993.7
1		0410	51	558.	182.0	3013.6	*	1		1230	151	263.	33.7	2998.1	*	1		2050	251	0.	7.5	2993.7
1		0415	52	575.	197.6	3014.8	*	1		1235	152	257.	31.9	2997.9	*	1		2055	252	0.	7.5	2993.7
1		0420	53	588.	211.4	3015.8	*	1		1240	153	249.	30.2	2997.7	*	1		2100	253	0.	7.5	2993.7
1		0425	54	599.	223.1	3016.6	*	1		1245	154	242.	28.5	2997.4	*	1		2105	254	0.	7.5	2993.7
1		0430	55	608.	233.1	3017.3	*	1		1250	155	235.	26.8	2997.2	*	1		2110	255	0.	7.5	2993.7
1		0435	56	616.	241.6	3017.9	*	1		1255	156	228.	25.2	2997.0	*	1		2115	256	0.	7.5	2993.7
1		0440	57	623.	249.3	3018.4	*	1		1300	157	220.	23.7	2996.8	*	1		2120	257	0.	7.5	2993.7
1		0445	58	628.	256.2	3018.9	*	1		1305	158	211.	22.2	2996.5	*	1		2125	258	0.	7.5	2993.7
1		0450	59	634.	262.5	3019.3	*	1		1310	159	203.	20.8	2996.3	*	1		2130	259	0.	7.5	2993.7
1		0455	60	638.	268.3	3019.7	*	1		1315	160	194.	19.4	2996.1	*	1		2135	260	0.	7.5	2993.7
1		0500	61	643.	273.7	3020.0	*	1		1320	161	185.	18.1	2995.9	*	1		2140	261	0.	7.5	2993.7
1		0505	62	646.	278.6	3020.3	*	1		1325	162	175.	16.9	2995.7	*	1		2145	262	0.	7.5	2993.7
1		0510	63	650.	282.9	3020.6	*	1		1330	163	166.	15.7	2995.5	*	1		2150	263	0.	7.5	2993.7
1		0515	64	652.	286.4	3020.8	*	1		1335	164	157.	14.6	2995.3	*	1		2155	264	0.	7.5	2993.7
1		0520	65	654.	289.1	3021.0	*	1		1340	165	149.	13.5	2995.1	*	1		2200	265	0.	7.5	2993.7
1		0525	66	656.	291.0	3021.1	*	1		1345	166	138.	12.5	2995.0	*	1		2205	266	0.	7.5	2993.7
1		0530	67	657.	292.2	3021.2	*	1		1350	167	114.	11.7	2994.7	*	1		2210	267	0.	7.5	2993.7
1		0535	68	657.	292.8	3021.2	*	1		1355	168	94.	11.0	2994.6	*	1		2215	268	0.	7.5	2993.7
1		0540	69	657.	292.6	3021.2	*	1		1400	169	78.	10.4	2994.4	*	1		2220	269	0.	7.5	2993.7
1		0545	70	657.	291.9	3021.2	*	1		1405	170	64.	9.9	2994.3	*	1		2225	270	0.	7.5	2993.7

1	0550	71	656.	290.6	3021.1	*	1	1410	171	53.	9.5	2994.2	*	1	2230	271	0.	7.5	2993.7
1	0555	72	654.	288.9	3021.0	*	1	1415	172	44.	9.1	2994.1	*	1	2235	272	0.	7.5	2993.7
1	0600	73	653.	286.7	3020.9	*	1	1420	173	36.	8.9	2994.0	*	1	2240	273	0.	7.5	2993.7
1	0605	74	651.	284.2	3020.7	*	1	1425	174	30.	8.6	2994.0	*	1	2245	274	0.	7.5	2993.7
1	0610	75	649.	281.5	3020.5	*	1	1430	175	25.	8.4	2993.9	*	1	2250	275	0.	7.5	2993.7
1	0615	76	646.	278.4	3020.3	*	1	1435	176	20.	8.3	2993.9	*	1	2255	276	0.	7.5	2993.7
1	0620	77	644.	275.2	3020.1	*	1	1440	177	17.	8.2	2993.9	*	1	2300	277	0.	7.5	2993.7
1	0625	78	641.	271.7	3019.9	*	1	1445	178	14.	8.1	2993.8	*	1	2305	278	0.	7.5	2993.7
1	0630	79	638.	268.1	3019.7	*	1	1450	179	12.	8.0	2993.8	*	1	2310	279	0.	7.5	2993.7
1	0635	80	635.	264.4	3019.4	*	1	1455	180	9.	7.9	2993.8	*	1	2315	280	0.	7.5	2993.7
1	0640	81	632.	260.6	3019.2	*	1	1500	181	8.	7.8	2993.8	*	1	2320	281	0.	7.5	2993.7
1	0645	82	629.	256.7	3018.9	*	1	1505	182	6.	7.8	2993.8	*	1	2325	282	0.	7.5	2993.7
1	0650	83	626.	252.7	3018.6	*	1	1510	183	5.	7.7	2993.7	*	1	2330	283	0.	7.5	2993.7
1	0655	84	622.	248.7	3018.4	*	1	1515	184	4.	7.7	2993.7	*	1	2335	284	0.	7.5	2993.7
1	0700	85	619.	244.7	3018.1	*	1	1520	185	4.	7.7	2993.7	*	1	2340	285	0.	7.5	2993.7
1	0705	86	615.	240.6	3017.8	*	1	1525	186	3.	7.7	2993.7	*	1	2345	286	0.	7.5	2993.7
1	0710	87	611.	236.5	3017.5	*	1	1530	187	2.	7.6	2993.7	*	1	2350	287	0.	7.5	2993.7
1	0715	88	608.	232.4	3017.2	*	1	1535	188	2.	7.6	2993.7	*	1	2355	288	0.	7.5	2993.7
1	0720	89	604.	228.3	3017.0	*	1	1540	189	2.	7.6	2993.7	*	2	0000	289	0.	7.5	2993.7
1	0725	90	600.	224.2	3016.7	*	1	1545	190	1.	7.6	2993.7	*	2	0005	290	0.	7.5	2993.7
1	0730	91	596.	220.1	3016.4	*	1	1550	191	1.	7.6	2993.7	*	2	0010	291	0.	7.5	2993.7
1	0735	92	593.	216.1	3016.1	*	1	1555	192	1.	7.6	2993.7	*	2	0015	292	0.	7.5	2993.7
1	0740	93	589.	212.0	3015.8	*	1	1600	193	1.	7.6	2993.7	*	2	0020	293	0.	7.5	2993.7
1	0745	94	585.	208.0	3015.5	*	1	1605	194	1.	7.6	2993.7	*	2	0025	294	0.	7.5	2993.7
1	0750	95	581.	204.0	3015.3	*	1	1610	195	1.	7.6	2993.7	*	2	0030	295	0.	7.5	2993.7
1	0755	96	578.	200.0	3015.0	*	1	1615	196	0.	7.6	2993.7	*	2	0035	296	0.	7.5	2993.7
1	0800	97	573.	196.0	3014.7	*	1	1620	197	0.	7.6	2993.7	*	2	0040	297	0.	7.5	2993.7
1	0805	98	569.	192.1	3014.4	*	1	1625	198	0.	7.6	2993.7	*	2	0045	298	0.	7.5	2993.7
1	0810	99	565.	188.2	3014.1	*	1	1630	199	0.	7.6	2993.7	*	2	0050	299	0.	7.5	2993.7
1	0815	100	560.	184.3	3013.8	*	1	1635	200	0.	7.6	2993.7	*	2	0055	300	0.	7.5	2993.7
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 657.	5.58		589.	214.	206.	206.
		(INCHES)	1.247	1.815	1.815	1.815
		(AC-FT)	292.	425.	425.	425.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
293.	5.58	218.	69.	66.	66.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3021.23	5.58	3016.03	3000.60	3000.23	3000.23

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .91

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	551.	175.6	3013.1	*	1		1640	201	0.	7.6	2993.7
1		0005	2	0.	.0	2990.0	*	1		0825	102	546.	171.8	3012.8	*	1		1645	202	0.	7.6	2993.7
1		0010	3	0.	.0	2990.0	*	1		0830	103	542.	168.0	3012.5	*	1		1650	203	0.	7.6	2993.7
1		0015	4	0.	.0	2990.1	*	1		0835	104	538.	164.3	3012.2	*	1		1655	204	0.	7.6	2993.7
1		0020	5	0.	.0	2990.2	*	1		0840	105	534.	160.6	3012.0	*	1		1700	205	0.	7.6	2993.7
1		0025	6	0.	.0	2990.5	*	1		0845	106	530.	157.0	3011.7	*	1		1705	206	0.	7.6	2993.7
1		0030	7	0.	.1	2990.8	*	1		0850	107	526.	153.3	3011.4	*	1		1710	207	0.	7.6	2993.7
1		0035	8	0.	.1	2991.0	*	1		0855	108	522.	149.7	3011.1	*	1		1715	208	0.	7.6	2993.7
1		0040	9	0.	.1	2991.1	*	1		0900	109	518.	146.1	3010.8	*	1		1720	209	0.	7.5	2993.7
1		0045	10	0.	.2	2991.2	*	1		0905	110	514.	142.6	3010.6	*	1		1725	210	0.	7.5	2993.7
1		0050	11	0.	.3	2991.3	*	1		0910	111	510.	139.1	3010.3	*	1		1730	211	0.	7.5	2993.7
1		0055	12	0.	.3	2991.4	*	1		0915	112	506.	135.6	3010.0	*	1		1735	212	0.	7.5	2993.7
1		0100	13	0.	.4	2991.5	*	1		0920	113	501.	132.1	3009.7	*	1		1740	213	0.	7.5	2993.7
1		0105	14	0.	.5	2991.6	*	1		0925	114	496.	128.7	3009.4	*	1		1745	214	0.	7.5	2993.7
1		0110	15	0.	.6	2991.7	*	1		0930	115	491.	125.2	3009.1	*	1		1750	215	0.	7.5	2993.7
1		0115	16	0.	.7	2991.8	*	1		0935	116	486.	121.9	3008.8	*	1		1755	216	0.	7.5	2993.7
1		0120	17	0.	.8	2992.0	*	1		0940	117	480.	118.6	3008.4	*	1		1800	217	0.	7.5	2993.7
1		0125	18	0.	.9	2992.0	*	1		0945	118	474.	115.3	3008.1	*	1		1805	218	0.	7.5	2993.7
1		0130	19	0.	1.1	2992.1	*	1		0950	119	469.	112.0	3007.7	*	1		1810	219	0.	7.5	2993.7
1		0135	20	0.	1.4	2992.1	*	1		0955	120	463.	108.8	3007.4	*	1		1815	220	0.	7.5	2993.7
1		0140	21	0.	1.8	2992.3	*	1		1000	121	458.	105.6	3007.1	*	1		1820	221	0.	7.5	2993.7
1		0145	22	0.	2.3	2992.4	*	1		1005	122	452.	102.5	3006.8	*	1		1825	222	0.	7.5	2993.7
1		0150	23	0.	3.0	2992.6	*	1		1010	123	447.	99.4	3006.4	*	1		1830	223	0.	7.5	2993.7
1		0155	24	0.	3.8	2992.8	*	1		1015	124	442.	96.4	3006.1	*	1		1835	224	0.	7.5	2993.7
1		0200	25	0.	4.6	2993.0	*	1		1020	125	436.	93.3	3005.8	*	1		1840	225	0.	7.5	2993.7
1		0205	26	0.	5.4	2993.2	*	1		1025	126	430.	90.4	3005.5	*	1		1845	226	0.	7.5	2993.7
1		0210	27	0.	6.2	2993.4	*	1		1030	127	424.	87.4	3005.2	*	1		1850	227	0.	7.5	2993.7
1		0215	28	0.	7.0	2993.6	*	1		1035	128	417.	84.5	3004.8	*	1		1855	228	0.	7.5	2993.7
1		0220	29	11.	8.0	2993.8	*	1		1040	129	410.	81.7	3004.4	*	1		1900	229	0.	7.5	2993.7
1		0225	30	38.	8.9	2994.0	*	1		1045	130	403.	78.9	3004.1	*	1		1905	230	0.	7.5	2993.7
1		0230	31	65.	9.9	2994.3	*	1		1050	131	395.	76.1	3003.7	*	1		1910	231	0.	7.5	2993.7
1		0235	32	91.	10.8	2994.5	*	1		1055	132	388.	73.4	3003.4	*	1		1915	232	0.	7.5	2993.7
1		0240	33	115.	11.7	2994.7	*	1		1100	133	381.	70.8	3003.0	*	1		1920	233	0.	7.5	2993.7
1		0245	34	135.	12.4	2994.9	*	1		1105	134	374.	68.2	3002.7	*	1		1925	234	0.	7.5	2993.7
1		0250	35	146.	13.2	2995.1	*	1		1110	135	367.	65.6	3002.3	*	1		1930	235	0.	7.5	2993.7
1		0255	36	153.	14.0	2995.2	*	1		1115	136	360.	63.1	3002.0	*	1		1935	236	0.	7.5	2993.7
1		0300	37	159.	14.8	2995.3	*	1		1120	137	353.	60.7	3001.7	*	1		1940	237	0.	7.5	2993.7
1		0305	38	166.	15.7	2995.5	*	1		1125	138	346.	58.3	3001.4	*	1		1945	238	0.	7.5	2993.7
1		0310	39	174.	16.7	2995.7	*	1		1130	139	340.	55.9	3001.1	*	1		1950	239	0.	7.5	2993.7
1		0315	40	186.	18.2	2995.9	*	1		1135	140	332.	53.6	3000.7	*	1		1955	240	0.	7.5	2993.7
1		0320	41	203.	20.8	2996.3	*	1		1140	141	325.	51.3	3000.5	*	1		2000	241	0.	7.5	2993.7

1	0325	42	230.	25.6	2997.1	*	1	1145	142	317.	49.1	3000.2	*	1	2005	242	0.	7.5	2993.7
1	0330	43	263.	33.7	2998.1	*	1	1150	143	310.	47.0	2999.9	*	1	2010	243	0.	7.5	2993.7
1	0335	44	308.	46.3	2999.8	*	1	1155	144	304.	44.8	2999.6	*	1	2015	244	0.	7.5	2993.7
1	0340	45	360.	63.1	3002.0	*	1	1200	145	297.	42.8	2999.3	*	1	2020	245	0.	7.5	2993.7
1	0345	46	413.	82.7	3004.6	*	1	1205	146	290.	40.8	2999.1	*	1	2025	246	0.	7.5	2993.7
1	0350	47	454.	103.4	3006.9	*	1	1210	147	282.	38.8	2998.8	*	1	2030	247	0.	7.5	2993.7
1	0355	48	489.	123.7	3008.9	*	1	1215	148	275.	36.9	2998.6	*	1	2035	248	0.	7.5	2993.7
1	0400	49	515.	143.2	3010.6	*	1	1220	149	268.	35.0	2998.3	*	1	2040	249	0.	7.5	2993.7
1	0405	50	535.	161.5	3012.0	*	1	1225	150	261.	33.2	2998.1	*	1	2045	250	0.	7.5	2993.7
1	0410	51	554.	178.5	3013.3	*	1	1230	151	254.	31.4	2997.8	*	1	2050	251	0.	7.5	2993.7
1	0415	52	571.	193.8	3014.5	*	1	1235	152	247.	29.7	2997.6	*	1	2055	252	0.	7.5	2993.7
1	0420	53	585.	207.3	3015.5	*	1	1240	153	240.	28.0	2997.4	*	1	2100	253	0.	7.5	2993.7
1	0425	54	595.	218.9	3016.3	*	1	1245	154	233.	26.4	2997.2	*	1	2105	254	0.	7.5	2993.7
1	0430	55	604.	228.7	3017.0	*	1	1250	155	226.	24.8	2997.0	*	1	2110	255	0.	7.5	2993.7
1	0435	56	612.	237.1	3017.6	*	1	1255	156	217.	23.2	2996.7	*	1	2115	256	0.	7.5	2993.7
1	0440	57	619.	244.5	3018.1	*	1	1300	157	209.	21.8	2996.5	*	1	2120	257	0.	7.5	2993.7
1	0445	58	624.	251.3	3018.6	*	1	1305	158	200.	20.4	2996.3	*	1	2125	258	0.	7.5	2993.7
1	0450	59	630.	257.5	3019.0	*	1	1310	159	192.	19.0	2996.0	*	1	2130	259	0.	7.5	2993.7
1	0455	60	634.	263.2	3019.3	*	1	1315	160	182.	17.7	2995.8	*	1	2135	260	0.	7.5	2993.7
1	0500	61	638.	268.5	3019.7	*	1	1320	161	173.	16.5	2995.6	*	1	2140	261	0.	7.5	2993.7
1	0505	62	642.	273.3	3020.0	*	1	1325	162	163.	15.4	2995.4	*	1	2145	262	0.	7.5	2993.7
1	0510	63	645.	277.5	3020.3	*	1	1330	163	155.	14.3	2995.3	*	1	2150	263	0.	7.5	2993.7
1	0515	64	648.	280.9	3020.5	*	1	1335	164	147.	13.2	2995.1	*	1	2155	264	0.	7.5	2993.7
1	0520	65	650.	283.6	3020.7	*	1	1340	165	131.	12.3	2994.9	*	1	2200	265	0.	7.5	2993.7
1	0525	66	652.	285.4	3020.8	*	1	1345	166	108.	11.4	2994.7	*	1	2205	266	0.	7.5	2993.7
1	0530	67	653.	286.6	3020.8	*	1	1350	167	89.	10.8	2994.5	*	1	2210	267	0.	7.5	2993.7
1	0535	68	653.	287.1	3020.9	*	1	1355	168	74.	10.2	2994.4	*	1	2215	268	0.	7.5	2993.7
1	0540	69	653.	286.9	3020.9	*	1	1400	169	61.	9.7	2994.3	*	1	2220	269	0.	7.5	2993.7
1	0545	70	652.	286.2	3020.8	*	1	1405	170	50.	9.4	2994.2	*	1	2225	270	0.	7.5	2993.7
1	0550	71	651.	284.9	3020.7	*	1	1410	171	41.	9.0	2994.1	*	1	2230	271	0.	7.5	2993.7
1	0555	72	650.	283.1	3020.6	*	1	1415	172	34.	8.8	2994.0	*	1	2235	272	0.	7.5	2993.7
1	0600	73	648.	281.0	3020.5	*	1	1420	173	28.	8.6	2994.0	*	1	2240	273	0.	7.5	2993.7
1	0605	74	646.	278.5	3020.3	*	1	1425	174	23.	8.4	2993.9	*	1	2245	274	0.	7.5	2993.7
1	0610	75	644.	275.7	3020.2	*	1	1430	175	19.	8.2	2993.9	*	1	2250	275	0.	7.5	2993.7
1	0615	76	642.	272.7	3020.0	*	1	1435	176	16.	8.1	2993.8	*	1	2255	276	0.	7.5	2993.7
1	0620	77	639.	269.5	3019.7	*	1	1440	177	13.	8.0	2993.8	*	1	2300	277	0.	7.5	2993.7
1	0625	78	636.	266.1	3019.5	*	1	1445	178	11.	7.9	2993.8	*	1	2305	278	0.	7.5	2993.7
1	0630	79	634.	262.5	3019.3	*	1	1450	179	9.	7.9	2993.8	*	1	2310	279	0.	7.5	2993.7
1	0635	80	631.	258.8	3019.0	*	1	1455	180	7.	7.8	2993.8	*	1	2315	280	0.	7.5	2993.7
1	0640	81	627.	255.0	3018.8	*	1	1500	181	6.	7.8	2993.8	*	1	2320	281	0.	7.5	2993.7
1	0645	82	624.	251.1	3018.5	*	1	1505	182	5.	7.7	2993.7	*	1	2325	282	0.	7.5	2993.7
1	0650	83	621.	247.2	3018.3	*	1	1510	183	4.	7.7	2993.7	*	1	2330	283	0.	7.5	2993.7
1	0655	84	617.	243.2	3018.0	*	1	1515	184	3.	7.7	2993.7	*	1	2335	284	0.	7.5	2993.7
1	0700	85	614.	239.1	3017.7	*	1	1520	185	3.	7.7	2993.7	*	1	2340	285	0.	7.5	2993.7
1	0705	86	610.	235.1	3017.4	*	1	1525	186	2.	7.6	2993.7	*	1	2345	286	0.	7.5	2993.7
1	0710	87	606.	231.0	3017.2	*	1	1530	187	2.	7.6	2993.7	*	1	2350	287	0.	7.5	2993.7
1	0715	88	603.	227.0	3016.9	*	1	1535	188	2.	7.6	2993.7	*	1	2355	288	0.	7.5	2993.7
1	0720	89	599.	222.9	3016.6	*	1	1540	189	1.	7.6	2993.7	*	2	0000	289	0.	7.5	2993.7
1	0725	90	595.	218.9	3016.3	*	1	1545	190	1.	7.6	2993.7	*	2	0005	290	0.	7.5	2993.7
1	0730	91	591.	214.8	3016.0	*	1	1550	191	1.	7.6	2993.7	*	2	0010	291	0.	7.5	2993.7
1	0735	92	588.	210.8	3015.7	*	1	1555	192	1.	7.6	2993.7	*	2	0015	292	0.	7.5	2993.7
1	0740	93	584.	206.8	3015.5	*	1	1600	193	1.	7.6	2993.7	*	2	0020	293	0.	7.5	2993.7
1	0745	94	580.	202.8	3015.2	*	1	1605	194	1.	7.6	2993.7	*	2	0025	294	0.	7.5	2993.7
1	0750	95	576.	198.8	3014.9	*	1	1610	195	0.	7.6	2993.7	*	2	0030	295	0.	7.5	2993.7
1	0755	96	572.	194.9	3014.6	*	1	1615	196	0.	7.6	2993.7	*	2	0035	296	0.	7.5	2993.7
1	0800	97	568.	190.9	3014.3	*	1	1620	197	0.	7.6	2993.7	*	2	0040	297	0.	7.5	2993.7
1	0805	98	563.	187.1	3014.0	*	1	1625	198	0.	7.6	2993.7	*	2	0045	298	0.	7.5	2993.7
1	0810	99	559.	183.2	3013.7	*	1	1630	199	0.	7.6	2993.7	*	2	0050	299	0.	7.5	2993.7
1	0815	100	555.	179.4	3013.4	*	1	1635	200	0.	7.6	2993.7	*	2	0055	300	0.	7.5	2993.7

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
653.	5.58		584.	211.	203.	203.
		(INCHES)	1.236	1.784	1.784	1.784
		(AC-FT)	290.	418.	418.	418.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
(AC-FT)	(HR)				
287.	5.58	213.	67.	65.	65.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
(FEET)	(HR)				
3020.88	5.58	3015.67	3000.43	3000.07	3000.07

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .70

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	*	1		0820	101	411.	81.8	3004.4	*	1		1640	201	0.	7.5	2993.7
1		0005	2	0.	.0	2990.0	*	1		0825	102	403.	79.0	3004.1	*	1		1645	202	0.	7.5	2993.7
1		0010	3	0.	.0	2990.0	*	1		0830	103	396.	76.2	3003.7	*	1		1650	203	0.	7.5	2993.7
1		0015	4	0.	.0	2990.0	*	1		0835	104	388.	73.5	3003.4	*	1		1655	204	0.	7.5	2993.7
1		0020	5	0.	.0	2990.1	*	1		0840	105	381.	70.9	3003.0	*	1		1700	205	0.	7.5	2993.7
1		0025	6	0.	.0	2990.2	*	1		0845	106	374.	68.3	3002.7	*	1		1705	206	0.	7.5	2993.7
1		0030	7	0.	.0	2990.4	*	1		0850	107	367.	65.7	3002.3	*	1		1710	207	0.	7.5	2993.7
1		0035	8	0.	.0	2990.6	*	1		0855	108	360.	63.2	3002.0	*	1		1715	208	0.	7.5	2993.7
1		0040	9	0.	.1	2990.8	*	1		0900	109	353.	60.8	3001.7	*	1		1720	209	0.	7.5	2993.7
1		0045	10	0.	.1	2991.0	*	1		0905	110	346.	58.3	3001.4	*	1		1725	210	0.	7.5	2993.7
1		0050	11	0.	.1	2991.0	*	1		0910	111	340.	56.0	3001.1	*	1		1730	211	0.	7.5	2993.7
1		0055	12	0.	.1	2991.0	*	1		0915	112	332.	53.7	3000.8	*	1		1735	212	0.	7.5	2993.7

1	0100	13	0.	.1	2991.0	*	1	0920	113	325.	51.4	3000.5	*	1	1740	213	0.	7.5	2993.7
1	0105	14	0.	.1	2991.0	*	1	0925	114	318.	49.2	3000.2	*	1	1745	214	0.	7.5	2993.7
1	0110	15	0.	.1	2991.0	*	1	0930	115	311.	47.0	2999.9	*	1	1750	215	0.	7.5	2993.7
1	0115	16	0.	.1	2991.0	*	1	0935	116	304.	44.9	2999.6	*	1	1755	216	0.	7.5	2993.7
1	0120	17	0.	.1	2991.0	*	1	0940	117	297.	42.8	2999.3	*	1	1800	217	0.	7.5	2993.7
1	0125	18	0.	.1	2991.0	*	1	0945	118	290.	40.8	2999.1	*	1	1805	218	0.	7.5	2993.7
1	0130	19	0.	.1	2991.1	*	1	0950	119	283.	38.8	2998.8	*	1	1810	219	0.	7.5	2993.7
1	0135	20	0.	.2	2991.1	*	1	0955	120	276.	36.9	2998.6	*	1	1815	220	0.	7.5	2993.7
1	0140	21	0.	.2	2991.2	*	1	1000	121	269.	35.1	2998.3	*	1	1820	221	0.	7.5	2993.7
1	0145	22	0.	.3	2991.4	*	1	1005	122	262.	33.2	2998.1	*	1	1825	222	0.	7.5	2993.7
1	0150	23	0.	.5	2991.6	*	1	1010	123	255.	31.4	2997.8	*	1	1830	223	0.	7.5	2993.7
1	0155	24	0.	.7	2991.9	*	1	1015	124	247.	29.7	2997.6	*	1	1835	224	0.	7.5	2993.7
1	0200	25	0.	1.0	2992.0	*	1	1020	125	240.	28.0	2997.4	*	1	1840	225	0.	7.5	2993.7
1	0205	26	0.	1.2	2992.1	*	1	1025	126	233.	26.4	2997.2	*	1	1845	226	0.	7.5	2993.7
1	0210	27	0.	1.5	2992.2	*	1	1030	127	226.	24.8	2997.0	*	1	1850	227	0.	7.5	2993.7
1	0215	28	0.	1.8	2992.3	*	1	1035	128	217.	23.3	2996.7	*	1	1855	228	0.	7.5	2993.7
1	0220	29	0.	2.1	2992.3	*	1	1040	129	209.	21.8	2996.5	*	1	1900	229	0.	7.5	2993.7
1	0225	30	0.	2.6	2992.5	*	1	1045	130	200.	20.4	2996.3	*	1	1905	230	0.	7.5	2993.7
1	0230	31	0.	3.2	2992.6	*	1	1050	131	192.	19.1	2996.1	*	1	1910	231	0.	7.5	2993.7
1	0235	32	0.	3.8	2992.8	*	1	1055	132	182.	17.8	2995.8	*	1	1915	232	0.	7.5	2993.7
1	0240	33	0.	4.5	2992.9	*	1	1100	133	173.	16.6	2995.6	*	1	1920	233	0.	7.5	2993.7
1	0245	34	0.	5.3	2993.1	*	1	1105	134	164.	15.4	2995.4	*	1	1925	234	0.	7.5	2993.7
1	0250	35	0.	6.1	2993.3	*	1	1110	135	155.	14.3	2995.3	*	1	1930	235	0.	7.5	2993.7
1	0255	36	0.	7.0	2993.6	*	1	1115	136	147.	13.3	2995.1	*	1	1935	236	0.	7.5	2993.7
1	0300	37	10.	7.9	2993.8	*	1	1120	137	131.	12.3	2994.9	*	1	1940	237	0.	7.5	2993.7
1	0305	38	34.	8.8	2994.0	*	1	1125	138	109.	11.5	2994.7	*	1	1945	238	0.	7.5	2993.7
1	0310	39	57.	9.6	2994.2	*	1	1130	139	90.	10.8	2994.5	*	1	1950	239	0.	7.5	2993.7
1	0315	40	84.	10.6	2994.5	*	1	1135	140	74.	10.2	2994.4	*	1	1955	240	0.	7.5	2993.7
1	0320	41	125.	12.1	2994.8	*	1	1140	141	61.	9.8	2994.3	*	1	2000	241	0.	7.5	2993.7
1	0325	42	157.	14.6	2995.3	*	1	1145	142	51.	9.4	2994.2	*	1	2005	242	0.	7.5	2993.7
1	0330	43	192.	19.1	2996.1	*	1	1150	143	42.	9.1	2994.1	*	1	2010	243	0.	7.5	2993.7
1	0335	44	234.	26.5	2997.2	*	1	1155	144	34.	8.8	2994.0	*	1	2015	244	0.	7.5	2993.7
1	0340	45	275.	36.8	2998.5	*	1	1200	145	28.	8.6	2994.0	*	1	2020	245	0.	7.5	2993.7
1	0345	46	317.	49.1	3000.2	*	1	1205	146	24.	8.4	2993.9	*	1	2025	246	0.	7.5	2993.7
1	0350	47	357.	62.2	3001.9	*	1	1210	147	19.	8.3	2993.9	*	1	2030	247	0.	7.5	2993.7
1	0355	48	393.	75.1	3003.6	*	1	1215	148	16.	8.1	2993.8	*	1	2035	248	0.	7.5	2993.7
1	0400	49	424.	87.5	3005.2	*	1	1220	149	13.	8.0	2993.8	*	1	2040	249	0.	7.5	2993.7
1	0405	50	446.	99.2	3006.4	*	1	1225	150	11.	7.9	2993.8	*	1	2045	250	0.	7.5	2993.7
1	0410	51	465.	110.0	3007.5	*	1	1230	151	9.	7.9	2993.8	*	1	2050	251	0.	7.5	2993.7
1	0415	52	482.	119.8	3008.5	*	1	1235	152	7.	7.8	2993.8	*	1	2055	252	0.	7.5	2993.7
1	0420	53	496.	128.3	3009.4	*	1	1240	153	6.	7.8	2993.8	*	1	2100	253	0.	7.5	2993.7
1	0425	54	506.	135.5	3010.0	*	1	1245	154	5.	7.7	2993.7	*	1	2105	254	0.	7.5	2993.7
1	0430	55	513.	141.6	3010.5	*	1	1250	155	4.	7.7	2993.7	*	1	2110	255	0.	7.5	2993.7
1	0435	56	519.	146.7	3010.9	*	1	1255	156	3.	7.7	2993.7	*	1	2115	256	0.	7.5	2993.7
1	0440	57	524.	151.2	3011.2	*	1	1300	157	3.	7.7	2993.7	*	1	2120	257	0.	7.5	2993.7
1	0445	58	528.	155.3	3011.5	*	1	1305	158	2.	7.6	2993.7	*	1	2125	258	0.	7.5	2993.7
1	0450	59	532.	159.0	3011.8	*	1	1310	159	2.	7.6	2993.7	*	1	2130	259	0.	7.5	2993.7
1	0455	60	536.	162.3	3012.1	*	1	1315	160	2.	7.6	2993.7	*	1	2135	260	0.	7.5	2993.7
1	0500	61	539.	165.4	3012.3	*	1	1320	161	1.	7.6	2993.7	*	1	2140	261	0.	7.5	2993.7
1	0505	62	542.	168.1	3012.5	*	1	1325	162	1.	7.6	2993.7	*	1	2145	262	0.	7.5	2993.7
1	0510	63	545.	170.5	3012.7	*	1	1330	163	1.	7.6	2993.7	*	1	2150	263	0.	7.5	2993.7
1	0515	64	547.	172.3	3012.9	*	1	1335	164	1.	7.6	2993.7	*	1	2155	264	0.	7.5	2993.7
1	0520	65	548.	173.6	3013.0	*	1	1340	165	1.	7.6	2993.7	*	1	2200	265	0.	7.5	2993.7
1	0525	66	549.	174.4	3013.0	*	1	1345	166	1.	7.6	2993.7	*	1	2205	266	0.	7.5	2993.7
1	0530	67	550.	174.6	3013.0	*	1	1350	167	0.	7.6	2993.7	*	1	2210	267	0.	7.5	2993.7
1	0535	68	549.	174.4	3013.0	*	1	1355	168	0.	7.6	2993.7	*	1	2215	268	0.	7.5	2993.7
1	0540	69	549.	173.7	3013.0	*	1	1400	169	0.	7.6	2993.7	*	1	2220	269	0.	7.5	2993.7
1	0545	70	547.	172.7	3012.9	*	1	1405	170	0.	7.6	2993.7	*	1	2225	270	0.	7.5	2993.7
1	0550	71	546.	171.2	3012.8	*	1	1410	171	0.	7.6	2993.7	*	1	2230	271	0.	7.5	2993.7
1	0555	72	544.	169.4	3012.6	*	1	1415	172	0.	7.6	2993.7	*	1	2235	272	0.	7.5	2993.7
1	0600	73	541.	167.3	3012.5	*	1	1420	173	0.	7.6	2993.7	*	1	2240	273	0.	7.5	2993.7
1	0605	74	539.	165.0	3012.3	*	1	1425	174	0.	7.6	2993.7	*	1	2245	274	0.	7.5	2993.7
1	0610	75	536.	162.5	3012.1	*	1	1430	175	0.	7.6	2993.7	*	1	2250	275	0.	7.5	2993.7
1	0615	76	533.	159.9	3011.9	*	1	1435	176	0.	7.6	2993.7	*	1	2255	276	0.	7.5	2993.7
1	0620	77	530.	157.1	3011.7	*	1	1440	177	0.	7.6	2993.7	*	1	2300	277	0.	7.5	2993.7
1	0625	78	527.	154.1	3011.5	*	1	1445	178	0.	7.6	2993.7	*	1	2305	278	0.	7.5	2993.7
1	0630	79	523.	151.1	3011.2	*	1	1450	179	0.	7.6	2993.7	*	1	2310	279	0.	7.5	2993.7
1	0635	80	520.	148.0	3011.0	*	1	1455	180	0.	7.6	2993.7	*	1	2315	280	0.	7.5	2993.7
1	0640	81	516.	144.8	3010.7	*	1	1500	181	0.	7.5	2993.7	*	1	2320	281	0.	7.5	2993.7
1	0645	82	513.	141.6	3010.5	*	1	1505	182	0.	7.5	2993.7	*	1	2325	282	0.	7.5	2993.7
1	0650	83	509.	138.3	3010.2	*	1	1510	183	0.	7.5	2993.7	*	1	2330	283	0.	7.5	2993.7
1	0655	84	505.	135.0	3010.0	*	1	1515	184	0.	7.5	2993.7	*	1	2335	284	0.	7.5	2993.7
1	0700	85	501.	131.7	3009.7	*	1	1520	185	0.	7.5	2993.7	*	1	2340	285	0.	7.5	2993.7
1	0705	86	496.	128.4	3009.4	*	1	1525	186	0.	7.5	2993.7	*	1	2345	286	0.	7.5	2993.7
1	0710	87	491.	125.1	3009.1	*	1	1530	187	0.	7.5	2993.7	*	1	2350	287	0.	7.5	2993.7
1	0715	88	486.	121.8	3008.8	*	1	1535	188	0.	7.5	2993.7	*	1	2355	288	0.	7.5	2993.7
1	0720	89	480.	118.5	3008.4	*	1	1540	189	0.	7.5	2993.7	*	2	0000	289	0.	7.5	2993.7
1	0725	90	474.	115.3	3008.1	*	1	1545	190	0.	7.5	2993.7	*	2	0005	290	0.	7.5	2993.7
1	0730	91	469.	112.0	3007.7	*	1	1550	191	0.	7.5	2993.7	*	2	0010	291	0.	7.5	2993.7
1	0735	92	463.	108.9	3007.4	*	1	1555	192	0.	7.5	2993.7	*	2	0015	292	0.	7.5	2993.7
1	0740	93	458.	105.7	3007.1	*	1	1600	193	0.	7.5	2993.7	*	2	0020	293	0.	7.5	2993.7
1	0745	94	452.	102.6	3006.8	*	1	1605	194	0.	7.5	2993.7	*	2	0025	294	0.	7.5	2993.7
1	0750	95	447.	99.5	3006.5	*	1	1610	195	0.	7.5	2993.7	*	2	0030	295	0.	7.5	2993.7
1	0755	96	442.	96.4	3006.1	*	1	1615	196	0.	7.5	2993.7	*	2	0035	296	0.	7.5	2993.7
1	0800	97	436.	93.4	3005.8	*	1	1620	197	0.	7.5	2993.7	*	2	0040	297	0.	7.5	2993.7
1	0805	98	430.	90.4	3005.5	*	1	1625	198	0.	7.5	2993.7	*	2	0045	298	0.	7.5	2993.7
1	0810	99	424.	87.5	3005.2	*	1	1630	199	0.	7.5	2993.7	*	2	0050	299	0.	7.5	2993.7
1	0815	100	418.	84.6	3004.8	*	1	1635	200	0.	7.5	2993.7	*	2	0055	300	0.	7.5	2993.7

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 550.	5.50		462.	137.	132.	132.
		(INCHES)	.977	1.158	1.158	1.158
		(AC-FT)	229.	271.	271.	271.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
+ 175.	5.50	117.	36.	35.	35.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3013.03	5.50	3007.72	2997.34	2997.09	2997.09

CUMULATIVE AREA = 4.39 SQ MI

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HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .54

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DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2990.0	1		0820	101	251.	30.7	2997.7	1		1640	201	0.	7.5	2993.7
1		0005	2	0.	.0	2990.0	1		0825	102	244.	29.0	2997.5	1		1645	202	0.	7.5	2993.7
1		0010	3	0.	.0	2990.0	1		0830	103	237.	27.3	2997.3	1		1650	203	0.	7.5	2993.7
1		0015	4	0.	.0	2990.0	1		0835	104	230.	25.7	2997.1	1		1655	204	0.	7.5	2993.7
1		0020	5	0.	.0	2990.0	1		0840	105	222.	24.1	2996.9	1		1700	205	0.	7.5	2993.7
1		0025	6	0.	.0	2990.0	1		0845	106	214.	22.6	2996.6	1		1705	206	0.	7.5	2993.7
1		0030	7	0.	.0	2990.1	1		0850	107	205.	21.2	2996.4	1		1710	207	0.	7.5	2993.7
1		0035	8	0.	.0	2990.2	1		0855	108	197.	19.8	2996.2	1		1715	208	0.	7.5	2993.7
1		0040	9	0.	.0	2990.3	1		0900	109	188.	18.5	2996.0	1		1720	209	0.	7.5	2993.7
1		0045	10	0.	.0	2990.4	1		0905	110	178.	17.2	2995.7	1		1725	210	0.	7.5	2993.7
1		0050	11	0.	.0	2990.5	1		0910	111	169.	16.0	2995.5	1		1730	211	0.	7.5	2993.7
1		0055	12	0.	.0	2990.5	1		0915	112	160.	14.9	2995.4	1		1735	212	0.	7.5	2993.7
1		0100	13	0.	.0	2990.5	1		0920	113	151.	13.8	2995.2	1		1740	213	0.	7.5	2993.7
1		0105	14	0.	.0	2990.5	1		0925	114	144.	12.8	2995.0	1		1745	214	0.	7.5	2993.7
1		0110	15	0.	.0	2990.5	1		0930	115	120.	11.9	2994.8	1		1750	215	0.	7.5	2993.7
1		0115	16	0.	.0	2990.5	1		0935	116	99.	11.1	2994.6	1		1755	216	0.	7.5	2993.7
1		0120	17	0.	.0	2990.6	1		0940	117	82.	10.5	2994.4	1		1800	217	0.	7.5	2993.7
1		0125	18	0.	.0	2990.6	1		0945	118	68.	10.0	2994.3	1		1805	218	0.	7.5	2993.7
1		0130	19	0.	.0	2990.7	1		0950	119	56.	9.6	2994.2	1		1810	219	0.	7.5	2993.7
1		0135	20	0.	.1	2990.8	1		0955	120	46.	9.2	2994.1	1		1815	220	0.	7.5	2993.7
1		0140	21	0.	.1	2991.0	1		1000	121	38.	8.9	2994.0	1		1820	221	0.	7.5	2993.7
1		0145	22	0.	.1	2991.0	1		1005	122	32.	8.7	2994.0	1		1825	222	0.	7.5	2993.7
1		0150	23	0.	.1	2991.0	1		1010	123	26.	8.5	2993.9	1		1830	223	0.	7.5	2993.7
1		0155	24	0.	.1	2991.1	1		1015	124	22.	8.3	2993.9	1		1835	224	0.	7.5	2993.7
1		0200	25	0.	.1	2991.1	1		1020	125	18.	8.2	2993.9	1		1840	225	0.	7.5	2993.7
1		0205	26	0.	.1	2991.1	1		1025	126	15.	8.1	2993.8	1		1845	226	0.	7.5	2993.7
1		0210	27	0.	.2	2991.1	1		1030	127	12.	8.0	2993.8	1		1850	227	0.	7.5	2993.7
1		0215	28	0.	.2	2991.2	1		1035	128	10.	7.9	2993.8	1		1855	228	0.	7.5	2993.7
1		0220	29	0.	.2	2991.2	1		1040	129	8.	7.8	2993.8	1		1900	229	0.	7.5	2993.7
1		0225	30	0.	.3	2991.3	1		1045	130	7.	7.8	2993.8	1		1905	230	0.	7.5	2993.7
1		0230	31	0.	.4	2991.5	1		1050	131	6.	7.8	2993.8	1		1910	231	0.	7.5	2993.7
1		0235	32	0.	.6	2991.7	1		1055	132	5.	7.7	2993.7	1		1915	232	0.	7.5	2993.7
1		0240	33	0.	.7	2991.9	1		1100	133	4.	7.7	2993.7	1		1920	233	0.	7.5	2993.7
1		0245	34	0.	1.0	2992.0	1		1105	134	3.	7.7	2993.7	1		1925	234	0.	7.5	2993.7
1		0250	35	0.	1.2	2992.1	1		1110	135	3.	7.6	2993.7	1		1930	235	0.	7.5	2993.7
1		0255	36	0.	1.5	2992.2	1		1115	136	2.	7.6	2993.7	1		1935	236	0.	7.5	2993.7
1		0300	37	0.	1.9	2992.3	1		1120	137	2.	7.6	2993.7	1		1940	237	0.	7.5	2993.7
1		0305	38	0.	2.3	2992.4	1		1125	138	1.	7.6	2993.7	1		1945	238	0.	7.5	2993.7
1		0310	39	0.	2.7	2992.5	1		1130	139	1.	7.6	2993.7	1		1950	239	0.	7.5	2993.7
1		0315	40	0.	3.3	2992.6	1		1135	140	1.	7.6	2993.7	1		1955	240	0.	7.5	2993.7
1		0320	41	0.	4.2	2992.9	1		1140	141	1.	7.6	2993.7	1		2000	241	0.	7.5	2993.7
1		0325	42	0.	5.9	2993.3	1		1145	142	1.	7.6	2993.7	1		2005	242	0.	7.5	2993.7
1		0330	43	36.	8.8	2994.0	1		1150	143	1.	7.6	2993.7	1		2010	243	0.	7.5	2993.7
1		0335	44	146.	13.2	2995.1	1		1155	144	0.	7.6	2993.7	1		2015	244	0.	7.5	2993.7
1		0340	45	192.	19.1	2996.1	1		1200	145	0.	7.6	2993.7	1		2020	245	0.	7.5	2993.7
1		0345	46	233.	26.3	2997.2	1		1205	146	0.	7.6	2993.7	1		2025	246	0.	7.5	2993.7
1		0350	47	265.	34.1	2998.2	1		1210	147	0.	7.6	2993.7	1		2030	247	0.	7.5	2993.7
1		0355	48	294.	42.0	2999.2	1		1215	148	0.	7.6	2993.7	1		2035	248	0.	7.5	2993.7
1		0400	49	319.	49.5	3000.2	1		1220	149	0.	7.6	2993.7	1		2040	249	0.	7.5	2993.7
1		0405	50	342.	56.6	3001.1	1		1225	150	0.	7.6	2993.7	1		2045	250	0.	7.5	2993.7
1		0410	51	360.	63.2	3002.0	1		1230	151	0.	7.6	2993.7	1		2050	251	0.	7.5	2993.7
1		0415	52	376.	69.1	3002.8	1		1235	152	0.	7.6	2993.7	1		2055	252	0.	7.5	2993.7
1		0420	53	390.	74.3	3003.5	1		1240	153	0.	7.6	2993.7	1		2100	253	0.	7.5	2993.7
1		0425	54	402.	78.6	3004.0	1		1245	154	0.	7.6	2993.7	1		2105	254	0.	7.5	2993.7
1		0430	55	412.	82.2	3004.5	1		1250	155	0.	7.6	2993.7	1		2110	255	0.	7.5	2993.7
1		0435	56	419.	85.1	3004.9	1		1255	156	0.	7.6	2993.7	1		2115	256	0.	7.5	2993.7
1		0440	57	424.	87.6	3005.2	1		1300	157	0.	7.6	2993.7	1		2120	257	0.	7.5	2993.7
1		0445	58	429.	89.8	3005.4	1		1305	158	0.	7.5	2993.7	1		2125	258	0.	7.5	2993.7
1		0450	59	433.	91.8	3005.6	1		1310	159	0.	7.5	2993.7	1		2130	259	0.	7.5	2993.7
1		0455	60	436.	93.6	3005.8	1		1315	160	0.	7.5	2993.7	1		2135	260	0.	7.5	2993.7
1		0500	61	440.	95.2	3006.0	1		1320	161	0.	7.5	2993.7	1		2140	261	0.	7.5	2993.7
1		0505	62	442.	96.6	3006.2	1		1325	162	0.	7.5	2993.7	1		2145	262	0.	7.5	2993.7
1		0510	63	444.	97.7	3006.3	1		1330	163	0.	7.5	2993.7	1		2150	263	0.	7.5	2993.7
1		0515	64	445.	98.5	3006.4	1		1335	164	0.	7.5	2993.7	1		2155	264	0.	7.5	2993.7
1		0520	65	446.	99.0	3006.4	1		1340	165	0.	7.5	2993.7	1		2200	265	0.	7.5	2993.7
1		0525	66	446.	99.1	3006.4	1		1345	166	0.	7.5	2993.7	1		2205	266	0.	7.5	2993.7
1		0530	67	446.	98.8	3006.4	1		1350	167	0.	7.5	2993.7	1		2210	267	0.	7.5	2993.7
1		0535	68	445.	98.2	3006.3	1		1355	168	0.	7.5	2993.7	1		2215	268	0.	7.5	2993.7
1		0540	69	443.	97.4	3006.2	1		1400	169	0.	7.5	2993.7	1		2220	269	0.	7.5	2993.7
1		0545	70	441.	96.2	3006.1	1		1405	170	0.	7.5	2993.7	1		2225	270	0.	7.5	2993.7
1		0550	71	439.	94.8	3006.0	1		1410	171	0.	7.5	2993.7	1		2230	271	0.	7.5	2993.7
1		0555	72	436.	93.2	3005.8	1		1415	172	0.	7.5	2993.7	1		2235	272	0.	7.5	2993.7
1		0600	73	432.	91.4	3005.6	1		1420	173	0.	7.5	2993.7	1		2240	273	0.	7.5	2993.7
1		0605	74	428.	89.5	3005.4	1		1425	174	0.	7.5	2993.7	1		2245	274	0.	7.5	2993.7
1		0610	75	424.	87.4	3005.2	1		1430	175	0.	7.5	2993.7	1		2250	275	0.	7.5	2993.7
1		0615	76	419.	85.3	3004.9	1		1435	176	0.	7.5	2993.7	1		2255	276	0.	7.5	2993.7
1		0620	77	414.	83.1	3004.6	1		1440	177	0.	7.5	2993.7	1		2300	277	0.	7.5	2993.7
1		0625	78	408.	80.8	3004.3	1		1445	178	0.	7.5	2993.7	1		2305	278	0.	7.5	2993.7
1		0630	79	402.	78.4	3004.0	1		1450	179	0.	7.5	2993.7	1		2310	279	0.	7.5	2993.7
1		0635	80	395.	76.1	3003.7	1		1455	180	0.	7.5	2993.7	1		2315	280	0.	7.5	2993.7
1		0640	81	389.	73.7	3003.4	1		1500	181	0.	7.5	2993.7	1		2320	281	0.	7.5	2993.7
1		0645	82	382.	71.3	3003.1	1		1505	182	0.	7.5	2993.7	1		2325	282	0.	7.5	2993.7
1		0650	83	375.	68.9	3002.8	1		1510	183	0.	7.5	2993.7	1		2330	283	0.	7.5	2993.7
1		0655	84	369.	66.5	3002.4	1		1515	184	0.	7.5	2993.7	1		2335	284	0.	7.5	2993.7
1		0700	85	362.	64.1	3002.1	1		1520	185	0.	7.5	2993.7	1		2340	285	0.	7.5	2993.7
1		0705	86	356.	61.7	3001.8	1		1525	186	0.	7.5	2993.7	1		2345	286	0.	7.5	2993.7
1		0710	87	349.	59.4	3001.5	1		1530	187	0.	7.5	2993.7	1		2350	287	0.	7.5	2993.7

1	0715	88	343.	57.1	3001.2	*	1	1535	188	0.	7.5	2993.7	*	1	2355	288	0.	7.5	2993.7
1	0720	89	336.	54.8	3000.9	*	1	1540	189	0.	7.5	2993.7	*	2	0000	289	0.	7.5	2993.7
1	0725	90	329.	52.5	3000.6	*	1	1545	190	0.	7.5	2993.7	*	2	0005	290	0.	7.5	2993.7
1	0730	91	321.	50.3	3000.3	*	1	1550	191	0.	7.5	2993.7	*	2	0010	291	0.	7.5	2993.7
1	0735	92	314.	48.1	3000.0	*	1	1555	192	0.	7.5	2993.7	*	2	0015	292	0.	7.5	2993.7
1	0740	93	307.	46.0	2999.8	*	1	1600	193	0.	7.5	2993.7	*	2	0020	293	0.	7.5	2993.7
1	0745	94	301.	43.9	2999.5	*	1	1605	194	0.	7.5	2993.7	*	2	0025	294	0.	7.5	2993.7
1	0750	95	294.	41.9	2999.2	*	1	1610	195	0.	7.5	2993.7	*	2	0030	295	0.	7.5	2993.7
1	0755	96	287.	39.9	2999.0	*	1	1615	196	0.	7.5	2993.7	*	2	0035	296	0.	7.5	2993.7
1	0800	97	279.	38.0	2998.7	*	1	1620	197	0.	7.5	2993.7	*	2	0040	297	0.	7.5	2993.7
1	0805	98	272.	36.1	2998.4	*	1	1625	198	0.	7.5	2993.7	*	2	0045	298	0.	7.5	2993.7
1	0810	99	265.	34.2	2998.2	*	1	1630	199	0.	7.5	2993.7	*	2	0050	299	0.	7.5	2993.7
1	0815	100	259.	32.4	2998.0	*	1	1635	200	0.	7.5	2993.7	*	2	0055	300	0.	7.5	2993.7
						*							*						

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)	(CFS)				
+ 446.	5.42		332.	85.	82.	82.
		(INCHES)	.702	.721	.721	.721
		(AC-FT)	165.	169.	169.	169.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
99.	5.42	59.	20.	19.	19.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3006.41	5.42	3001.35	2995.38	2995.19	2995.19

CUMULATIVE AREA = 4.39 SQ MI

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .99	RATIO 3 .98	RATIO 4 .94	RATIO 5 .93	RATIO 6 .92	RATIO 7 .91	RATIO 8 .70	RATIO 9 .54
HYDROGRAPH AT													
+	1-1A	2.34	1	FLOW	2541.	2505.	2469.	2325.	2289.	2253.	2217.	1477.	942.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	1-1B	.17	1	FLOW	226.	223.	219.	203.	199.	195.	192.	115.	63.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.67
ROUTED TO													
+	R2	.17	1	FLOW	220.	218.	215.	200.	194.	193.	189.	112.	62.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CP1	2.51	1	FLOW	2670.	2632.	2594.	2442.	2404.	2366.	2329.	1549.	986.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	R3	2.51	1	FLOW	2610.	2572.	2535.	2386.	2349.	2312.	2275.	1512.	960.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	1-2A	.86	1	FLOW	1584.	1562.	1541.	1453.	1432.	1410.	1388.	938.	608.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO													
+	R4	.86	1	FLOW	1516.	1494.	1473.	1388.	1366.	1345.	1324.	884.	565.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	1-2B	.22	1	FLOW	315.	310.	305.	286.	281.	276.	271.	173.	103.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT													
+	CP2	3.59	1	FLOW	3324.	3275.	3228.	3037.	2989.	2941.	2894.	1914.	1209.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	R5	3.59	1	FLOW	3291.	3243.	3196.	3007.	2959.	2912.	2865.	1894.	1197.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	4.00
HYDROGRAPH AT													
+	1-2CR	.57	1	FLOW	885.	872.	859.	807.	794.	781.	768.	503.	313.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT													
+	CP3	4.17	1	FLOW	3812.	3756.	3700.	3476.	3419.	3365.	3309.	2171.	1365.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.83	3.83
ROUTED TO													
+	R6	4.17	1	FLOW	3790.	3734.	3681.	3460.	3404.	3351.	3296.	2168.	1360.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	1-3P	.03	1	FLOW	63.	62.	61.	58.	58.	57.	56.	42.	31.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													

+	CP4	4.19	1	FLOW	3806.	3750.	3697.	3475.	3419.	3366.	3311.	2179.	1368.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO +	R7	4.19	1	FLOW	3795.	3740.	3685.	3462.	3408.	3353.	3298.	2163.	1362.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.92
HYDROGRAPH AT +	1-12P	.18	1	FLOW	230.	227.	223.	209.	206.	202.	199.	128.	78.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT +	CP5	4.37	1	FLOW	3974.	3917.	3859.	3626.	3569.	3511.	3454.	2266.	1416.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT +	1-14	.00	1	FLOW	3.	3.	3.	3.	3.	2.	2.	2.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT +	1-15	.01	1	FLOW	10.	10.	10.	9.	9.	9.	9.	6.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT +	1-16	.00	1	FLOW	5.	5.	5.	5.	5.	5.	5.	3.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT +	1-17	.00	1	FLOW	7.	7.	7.	6.	6.	6.	6.	4.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT +	1-18	.00	1	FLOW	7.	7.	6.	6.	6.	6.	6.	4.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
6 COMBINED AT +	CP5B	4.39	1	FLOW	3985.	3927.	3870.	3636.	3579.	3521.	3464.	2273.	1421.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO +	EXDB	4.39	1	FLOW	1007.	960.	908.	671.	661.	657.	653.	550.	446.
				TIME	5.42	5.42	5.42	5.58	5.58	5.58	5.58	5.50	5.42
			** PEAK STAGES IN FEET **										
			1	STAGE	3023.31	3023.12	3022.91	3021.95	3021.59	3021.23	3020.88	3013.03	3006.41
				TIME	5.42	5.42	5.42	5.58	5.58	5.58	5.58	5.50	5.42
HYDROGRAPH AT +	1-4R	.05	1	FLOW	100.	98.	97.	91.	90.	89.	87.	58.	37.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT +	1-5R	.03	1	FLOW	63.	62.	61.	58.	57.	56.	55.	37.	24.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT +	CP6	.09	1	FLOW	163.	161.	158.	149.	147.	145.	142.	95.	61.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO +	R8	.09	1	FLOW	156.	154.	152.	143.	141.	138.	136.	92.	60.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.58	3.58
HYDROGRAPH AT +	1-6R	.02	1	FLOW	28.	28.	27.	26.	25.	25.	25.	16.	11.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT +	1-7R	.03	1	FLOW	50.	50.	49.	46.	45.	45.	44.	30.	19.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT +	CP7	.04	1	FLOW	79.	77.	76.	72.	71.	70.	69.	46.	29.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO +	R9	.04	1	FLOW	76.	75.	74.	70.	69.	68.	67.	45.	30.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT +	1-8R	.00	1	FLOW	5.	5.	4.	4.	4.	4.	4.	3.	2.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT +	1-10R	.06	1	FLOW	101.	100.	99.	93.	91.	90.	89.	59.	38.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT +	CP8	.06	1	FLOW	106.	105.	103.	97.	96.	94.	93.	62.	39.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO +	R10	.06	1	FLOW	102.	101.	99.	94.	92.	90.	89.	61.	39.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT +	1-11P	.18	1	FLOW	219.	215.	212.	198.	194.	191.	188.	118.	69.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
4 COMBINED AT +	CP9	.37	1	FLOW	543.	536.	528.	495.	487.	480.	472.	308.	192.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													

+	1-13	.00	1	FLOW	1.	1.	1.	1.	1.	1.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT													
+	LMT1R	1.96	1	FLOW	2144.	2114.	2085.	1966.	1937.	1907.	1878.	1267.	821.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
3 COMBINED AT													
+	CP10	2.33	1	FLOW	2429.	2395.	2361.	2224.	2190.	2156.	2123.	1422.	913.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION INTERVAL PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .00									
R2	MANE	3.62	221.26	220.72	1.60	5.00	220.26	220.00	1.60

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1495E+02 EXCESS= .0000E+00 OUTFLOW= .1496E+02 BASIN STORAGE= .1444E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.64	219.12	218.16	1.57	5.00	217.69	220.00	1.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1469E+02 EXCESS= .0000E+00 OUTFLOW= .1470E+02 BASIN STORAGE= .1118E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.65	216.76	219.24	1.55	5.00	215.22	220.00	1.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1444E+02 EXCESS= .0000E+00 OUTFLOW= .1444E+02 BASIN STORAGE= .1367E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.73	200.37	220.08	1.44	5.00	200.09	220.00	1.44

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1341E+02 EXCESS= .0000E+00 OUTFLOW= .1341E+02 BASIN STORAGE= .1137E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.75	194.48	221.26	1.41	5.00	193.59	220.00	1.41

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1315E+02 EXCESS= .0000E+00 OUTFLOW= .1315E+02 BASIN STORAGE= .1366E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.77	194.78	218.70	1.38	5.00	193.14	220.00	1.38

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1291E+02 EXCESS= .0000E+00 OUTFLOW= .1292E+02 BASIN STORAGE= .1037E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.79	189.65	219.91	1.36	5.00	189.47	220.00	1.36

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1265E+02 EXCESS= .0000E+00 OUTFLOW= .1265E+02 BASIN STORAGE= .1202E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R2	MANE	3.75	114.28	221.25	.82	5.00	112.11	220.00	.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7650E+01 EXCESS= .0000E+00 OUTFLOW= .7654E+01 BASIN STORAGE= .1004E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00									
R2	MANE	2.25	64.30	222.75	.47	5.00	61.71	220.00	.47

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4359E+01 EXCESS= .0000E+00 OUTFLOW= .4361E+01 BASIN STORAGE= .1019E-02 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .00									
R6	MANE	1.32	3798.53	227.06	2.11	5.00	3790.18	230.00	2.11

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4682E+03 EXCESS= .0000E+00 OUTFLOW= .4681E+03 BASIN STORAGE= .5398E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R6	MANE	1.33	3743.79	227.90	2.07	5.00	3734.37	230.00	2.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4612E+03 EXCESS= .0000E+00 OUTFLOW= .4611E+03 BASIN STORAGE= .5897E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
R6	MANE	1.33	3688.44	227.43	2.04	5.00	3681.22	230.00	2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4542E+03 EXCESS= .0000E+00 OUTFLOW= .4541E+03 BASIN STORAGE= .5356E-03 PERCENT ERROR= .0

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 FOR PLAN = 1  RATIO=  .00
      R6  MANE          1.35   3465.50    228.32      1.92      5.00   3459.93    230.00        1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4264E+03 EXCESS= .0000E+00 OUTFLOW= .4263E+03 BASIN STORAGE= .6080E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R6  MANE          1.36   3410.14    227.90      1.89      5.00   3403.62    230.00        1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4195E+03 EXCESS= .0000E+00 OUTFLOW= .4194E+03 BASIN STORAGE= .5400E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R6  MANE          1.36   3355.30    227.45      1.86      5.00   3350.78    230.00        1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4126E+03 EXCESS= .0000E+00 OUTFLOW= .4125E+03 BASIN STORAGE= .5832E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R6  MANE          1.37   3299.90    228.42      1.83      5.00   3295.94    230.00        1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4057E+03 EXCESS= .0000E+00 OUTFLOW= .4056E+03 BASIN STORAGE= .5145E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R6  MANE          1.52   2168.16    229.48      1.20      5.00   2167.85    230.00        1.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2660E+03 EXCESS= .0000E+00 OUTFLOW= .2660E+03 BASIN STORAGE= .5661E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R6  MANE          1.71   1362.06    232.09       .76      5.00   1359.64    230.00         .76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1682E+03 EXCESS= .0000E+00 OUTFLOW= .1682E+03 BASIN STORAGE= .5203E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R7  MANE          1.79   3795.45    229.59      2.11      5.00   3794.91    230.00        2.11

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4720E+03 EXCESS= .0000E+00 OUTFLOW= .4718E+03 BASIN STORAGE= .7223E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R7  MANE          1.80   3741.61    230.44      2.08      5.00   3739.99    230.00        2.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4650E+03 EXCESS= .0000E+00 OUTFLOW= .4648E+03 BASIN STORAGE= .6922E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R7  MANE          1.81   3685.33    229.46      2.05      5.00   3685.10    230.00        2.05

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4579E+03 EXCESS= .0000E+00 OUTFLOW= .4577E+03 BASIN STORAGE= .8797E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R7  MANE          1.83   3463.28    231.21      1.92      5.00   3461.86    230.00        1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4300E+03 EXCESS= .0000E+00 OUTFLOW= .4298E+03 BASIN STORAGE= .7379E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R7  MANE          1.84   3409.50    230.31      1.89      5.00   3407.75    230.00        1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4230E+03 EXCESS= .0000E+00 OUTFLOW= .4228E+03 BASIN STORAGE= .7225E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R7  MANE          1.85   3354.16    231.21      1.86      5.00   3352.63    230.00        1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4161E+03 EXCESS= .0000E+00 OUTFLOW= .4159E+03 BASIN STORAGE= .8684E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R7  MANE          1.86   3300.08    230.31      1.83      5.00   3298.02    230.00        1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4091E+03 EXCESS= .0000E+00 OUTFLOW= .4090E+03 BASIN STORAGE= .8486E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R7  MANE          2.06   2169.12    230.96      1.20      5.00   2163.45    230.00        1.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2685E+03 EXCESS= .0000E+00 OUTFLOW= .2684E+03 BASIN STORAGE= .8290E-03 PERCENT ERROR=    .0

 FOR PLAN = 1  RATIO=  .00
      R7  MANE          2.32   1364.06    233.98       .76      5.00   1361.92    235.00         .76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1700E+03 EXCESS= .0000E+00 OUTFLOW= .1700E+03 BASIN STORAGE= .7714E-03 PERCENT ERROR=    .0
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          FOR PLAN = 1  RATIO=  .00
               R8  MANE          .93    162.44    211.19      2.06      5.00    156.28    210.00         2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9673E+01 EXCESS= .0000E+00 OUTFLOW= .9673E+01 BASIN STORAGE= .1111E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R8  MANE          .94    160.11    211.79      2.03      5.00    154.20    210.00         2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9530E+01 EXCESS= .0000E+00 OUTFLOW= .9530E+01 BASIN STORAGE= .1067E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R8  MANE          .94    157.86    211.45      2.00      5.00    151.74    210.00         2.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9386E+01 EXCESS= .0000E+00 OUTFLOW= .9386E+01 BASIN STORAGE= .1011E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R8  MANE          .95    148.79    211.13      1.88      5.00    142.96    210.00         1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8822E+01 EXCESS= .0000E+00 OUTFLOW= .8822E+01 BASIN STORAGE= .9884E-04 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R8  MANE          .95    146.53    211.78      1.85      5.00    140.79    210.00         1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8682E+01 EXCESS= .0000E+00 OUTFLOW= .8682E+01 BASIN STORAGE= .1118E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R8  MANE          .96    144.27    211.49      1.82      5.00    138.40    210.00         1.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8540E+01 EXCESS= .0000E+00 OUTFLOW= .8540E+01 BASIN STORAGE= .1059E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R8  MANE          .96    141.99    211.20      1.79      5.00    136.26    210.00         1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8401E+01 EXCESS= .0000E+00 OUTFLOW= .8401E+01 BASIN STORAGE= .9888E-04 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R8  MANE         1.04     95.18    212.20      1.18      5.00     92.29    215.00         1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5549E+01 EXCESS= .0000E+00 OUTFLOW= .5549E+01 BASIN STORAGE= .1036E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R8  MANE         1.14     61.18    212.58       .76      5.00     60.41    215.00          .76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3541E+01 EXCESS= .0000E+00 OUTFLOW= .3541E+01 BASIN STORAGE= .1150E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R9  MANE         2.21     77.94    213.91      2.07      5.00     75.83    215.00         2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4663E+01 EXCESS= .0000E+00 OUTFLOW= .4663E+01 BASIN STORAGE= .2195E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R9  MANE         2.21     76.93    212.31      2.04      5.00     75.47    215.00         2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4596E+01 EXCESS= .0000E+00 OUTFLOW= .4596E+01 BASIN STORAGE= .2595E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R9  MANE         2.22     75.81    212.92      2.01      5.00     74.35    215.00         2.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4526E+01 EXCESS= .0000E+00 OUTFLOW= .4526E+01 BASIN STORAGE= .2157E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R9  MANE         2.24     71.46    213.22      1.88      5.00     69.79    215.00         1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4250E+01 EXCESS= .0000E+00 OUTFLOW= .4250E+01 BASIN STORAGE= .2037E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R9  MANE         2.25     70.38    213.87      1.86      5.00     68.57    215.00         1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4185E+01 EXCESS= .0000E+00 OUTFLOW= .4185E+01 BASIN STORAGE= .2368E-03 PERCENT ERROR=    .0

          FOR PLAN = 1  RATIO=  .00
               R9  MANE         2.26     69.30    212.28      1.83      5.00     68.25    215.00         1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4120E+01 EXCESS= .0000E+00 OUTFLOW= .4121E+01 BASIN STORAGE= .2804E-03 PERCENT ERROR=    .0
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          FOR PLAN = 1  RATIO=  .00
               R9  MANE          2.27     68.22    212.96      1.80      5.00     67.01    215.00         1.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4050E+01 EXCESS= .0000E+00 OUTFLOW= .4050E+01 BASIN STORAGE= .2266E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R9  MANE          2.45     45.90    213.56      1.19      5.00     45.08    215.00         1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2676E+01 EXCESS= .0000E+00 OUTFLOW= .2676E+01 BASIN STORAGE= .2443E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R9  MANE          2.68     29.81    214.60       .76      5.00     29.57    215.00          .76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1707E+01 EXCESS= .0000E+00 OUTFLOW= .1708E+01 BASIN STORAGE= .2506E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R10 MANE          1.91    105.41    212.23      2.03      5.00    102.04    215.00         2.03

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6281E+01 EXCESS= .0000E+00 OUTFLOW= .6282E+01 BASIN STORAGE= .1837E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R10 MANE          1.92    103.90    212.84      2.00      5.00    100.78    215.00         2.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6191E+01 EXCESS= .0000E+00 OUTFLOW= .6192E+01 BASIN STORAGE= .2091E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R10 MANE          1.92    102.41    213.46      1.97      5.00     98.79    215.00         1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6100E+01 EXCESS= .0000E+00 OUTFLOW= .6100E+01 BASIN STORAGE= .2350E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R10 MANE          1.95     96.48    212.14      1.85      5.00     93.59    215.00         1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5728E+01 EXCESS= .0000E+00 OUTFLOW= .5728E+01 BASIN STORAGE= .1973E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R10 MANE          1.95     95.02    212.79      1.82      5.00     92.45    215.00         1.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5636E+01 EXCESS= .0000E+00 OUTFLOW= .5637E+01 BASIN STORAGE= .2226E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R10 MANE          1.96     93.59    213.47      1.79      5.00     90.47    215.00         1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5545E+01 EXCESS= .0000E+00 OUTFLOW= .5545E+01 BASIN STORAGE= .2464E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R10 MANE          1.96     92.04    212.18      1.76      5.00     89.47    215.00         1.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5453E+01 EXCESS= .0000E+00 OUTFLOW= .5453E+01 BASIN STORAGE= .1980E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R10 MANE          2.13     61.63    213.03      1.16      5.00     60.64    215.00         1.16

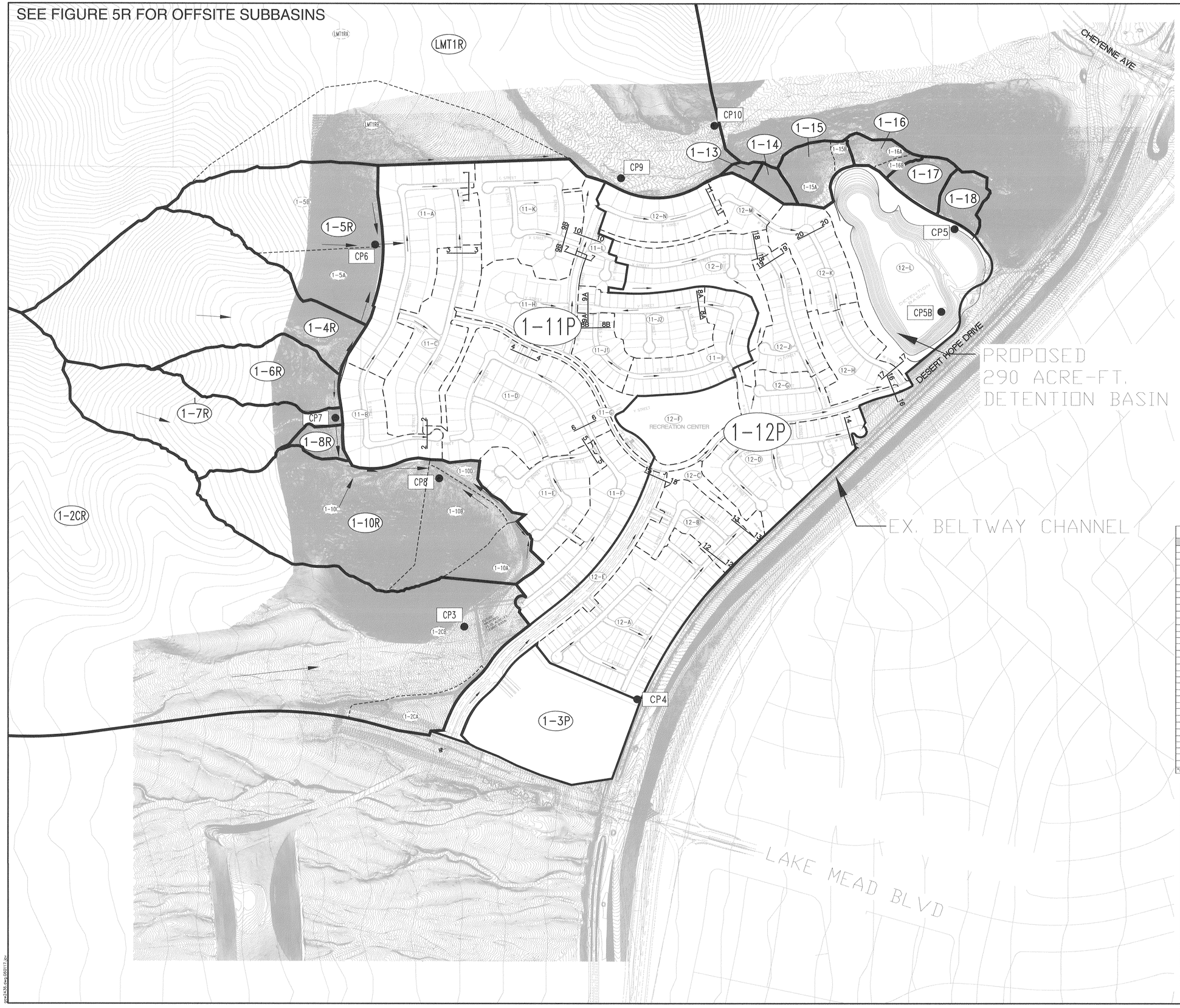
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3593E+01 EXCESS= .0000E+00 OUTFLOW= .3593E+01 BASIN STORAGE= .1886E-03 PERCENT ERROR=     .0

          FOR PLAN = 1  RATIO=  .00
               R10 MANE          2.33     39.86    214.40       .74      5.00     39.34    215.00          .74

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2284E+01 EXCESS= .0000E+00 OUTFLOW= .2284E+01 BASIN STORAGE= .2420E-03 PERCENT ERROR=     .0


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

SEE FIGURE 5R FOR OFFSITE SUBBASINS



NORTH

SCALE 1" = 300'

GRAPHIC SCALE

300 0 150 300

(IN FEET)

1 inch = 300 ft.

LEGEND

- 1-3P — DRAINAGE BASIN
- 3-E — PRORATED DRAINAGE BASIN
- CP3 — CONCENTRATION POINT
- BASIN BOUNDARY
- PRORATE BASIN BOUNDARY
- FLOW DIRECTION
- 1 1 — STREET CROSS SECTION

SUMMARY OF ULTIMATE CONDITIONS HEC-1 MODEL

SB OR CP	AREA (AC)	100 YR (CFS)	25 YR (CFS)	10 YR (CFS)
1-1A	1497.2	2289	1477	942
1-1B	111.8	226	115	63
CP1	-	2404	1549	986
1-2A	552.7	1541	938	608
1-2B	137.7	315	173	103
CP2	-	2941	1914	1209
1-2CR	367.6	859	503	313
CP3	-	3309	2171	1365
1-3P	16.5	63	42	31
CP4	-	3311	2179	1368
1-12P	116.1*	230*	128	78
CP5	-	3454*	2266*	1416*
1-14	1.0	3	2	1
1-15	3.6	10	6	4
1-16	1.9	5	3	2
1-17	2.5	7	4	2
1-18	2.4	7	4	2
CP5B	-	3464	2273	1421
EXDB	-	653	550	446
1-4R	34.3	100	58	37
1-5R	22	63	37	24
CP6	-	163	95	61
1-6R	9.7	28	16	11
1-7R	17.3	50	30	19
CP7	-	79	46	29
1-8R	1.6	5	3	2
1-10R	35.6	101	59	38
CP8	-	106	62	39
1-11P	113.6*	219*	118	69
CP9	-	536*	308	192
1-13	0.5	1	1	1
LMT1R	1256.6	1966	1267	821
CP10	-	2190	1422	913

ONSITE PRORATED FLOW SUMMARY

Subbasin	Q_{100} (cfs)	New Area	cfs/acre
1-11P	219*	113.6*	1.93
1-12P	230*	116.1*	1.98
Onsite Prorated Basins			
Subbasin	Q_{100} (cfs)	New Area (acres)	cfs/acre
11-A	30*	15.6*	1.93
11-B	12	6.3*	1.93
11-C	21	10.7*	1.93
11-D	33*	17.1*	1.93
11-E	17*	9.0*	1.93
11-F	18	9.2*	1.93
11-G	5*	2.3*	1.93
11-H	19	9.7*	1.93
11-I	14	7.4	1.93
11-J1	6	3.3	1.93
11-J2	15*	7.5	1.93
11-K	23	12.1*	1.93
11-L	6	3.4*	1.93
Total	**219***	**113.6***	**N/A**
12-A	33	16.5	1.98
12-B	11	5.8	1.98
12-C	3	1.7*	1.98
12-D	24	12.0	1.98
12-E	15	7.4*	1.98
12-F	14	7.0	1.98
12-G	13*	6.6*	1.98
12-H	12*	5.9*	1.98
12-I	17*	8.8*	1.98
12-J	13	6.7*	1.98
12-K	13	6.4	1.98
12-L	43	21.5	1.98
12-M	7	3.8	1.98
12-N	12	6*	1.98
TOTAL	**230***	**116.1***	**N/A**

*Revised from Previous Submittal

OFFSITE PRORATED FLOW SUMMARY

Subbasin	Q_{100} (cfs)	Area (acres)	cfs/acre
1-2CR	859	367.6	2.34
1-5R	63	22.0	2.86
1-10R	101	35.6	2.84
1-15	10	3.6	2.78
1-16	5	1.9	2.63
LM1TR	1966	1256.6	1.56
Offsite Prorated Basins			
Subbasin	Q_{100} (cfs)	Area (acres)	cfs/acre
1-2CA	9	3.7	2.34
1-2CB	850	363.9	2.34
TOTAL	**859**	**367.6**	**N/A**
1-5A	18	6.2	2.86
1-5B	45	15.8	2.86
TOTAL	**63**	**22.0**	**N/A**
1-10A	10	3.5	2.84
1-10B	21	7.4	2.84
1-10C	66	23.2	2.84
1-10D	4	1.5	2.84
TOTAL	**101**	**35.6**	**N/A**
1-15A	9	3.1	2.78
1-15B	1	0.5	2.78
TOTAL	**10**	**3.6**	**N/A**
1-16A	4	1.4	2.63
1-16B	1	0.5	2.63
TOTAL	**5**	**1.9**	**N/A**
LM1TRA	1935	1236.8	1.56
LM1TRB	31	19.8	1.56
TOTAL	**1966**	**1256.6**	**N/A**

100-YEAR STREET FLOW CHARACTERISTICS ULTIMATE CONDITIONS

Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V	Tributary Subbasins
Section 1	6.00	32	0.44	6.59	2.9	11-A + $Q_{Byp\text{-}Sect3}$
Section 2	2.80	12	0.38	3.89	1.5	11-B
Section 3	3.20	21	0.43	4.68	2.0	11-C
Section 4	3.80	35	0.48	5.63	2.7	11-D + $Q_{Byp\text{-}Sect6}$
Section 5	2.66	17	0.42	4.14	1.7	11-E
Section 6	2.30	20	0.44	4.09	1.8	11-F + $Q_{Byp\text{-}Sect5}$
Section 7	2.54	21	0.44	4.29	1.9	11-H + $Q_{Byp\text{-}Sect9A}$
Section 8A	0.50	14	0.50	2.08	1.0	11-I
Section 8B	2.34	6	0.32	3.10	1.0	11-J1
Section 9A	2.54	19	0.43	4.19	1.8	11-J2 + $Q_{Byp\text{-}Sect8A}$ + $Q_{Byp\text{-}Sect8B}$
Section 9B	3.07	23	0.44	4.70	2.1	11-K
Section 10	5.67	10	0.33	4.90	1.6	11-L + $Q_{Byp\text{-}Sect7}$ + $Q_{Byp\text{-}Sect9B}$
Section 11	0.50	12	0.48	2.02	1.0	12-N
Section 12	5.55	33	0.45	6.44	2.9	12-A
Section 13	5.20	13	0.36	5.02	1.8	12-B + $Q_{Byp\text{-}Sect12}$
Section 14	5.00	24	0.42	5.72	2.4	12-D
Section 15	2.96	15	0.40	4.19	1.7	12-E
Section 16	6.00	29	0.43	6.42	2.8	12-G + 12-F + $Q_{Byp\text{-}Sect15}$
Section 17	0.50	12	0.48	2.02	1.0	12-H
Section 18	1.80	17	0.44	3.56	1.6	12-I
Section 19	5.00	13	0.36	4.95	1.8	12-J
Section 20	0.49	13	0.49	2.05	1.0	12-K

*$Q_{Byp\text{-}Sect8}$: Assumes 2 cfs bypasses the upstream street cross section

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PLOT TIME: 13:23:28

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DESCRIPTION
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DATE: ENGR. APP.
DATE: CONST. APP.

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F:\Projects\700\784-204-01\Graphics\Ref\Figures\RTO\Fig. 5A.dwg

PULTE HOMES

REVERENCE

MASTER DRAINAGE STUDY
ULTIMATE CONDITIONS DRAINAGE MAP

DRAWING
FIG 5AR
OF SHTS

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F:\Projects\700\764-204-011\Division\Fctl\Figures\RTC\Fig5R.dwgark

PULTE HOMES

REVERENCE

MASTER DRAINAGE STUDY
ULTIMATE CONDITIONS OVERALL DRAINAGE MAP

DRAWING
FIG 5R
OF SHTS

ONSITE FLOOD PROTECTION FACILITIES

LOCATION	Q_{100} ULT (cfs)	TRIBUTARIES	DESIGN SLOPE (%)	FACILITY
1	163	CP6	0.5%	66" RCP
2	21	11-C	0.5%	36" RCP
4	214	FACILITY 1 (163 cfs) + FACILITY 2 (21 cfs) + 11-A (30 cfs)	1.0%	66" RCP
6	79	CP7	4.5%	36" RCP
7	91	FACILITY 6 (79 cfs) + 11-B (12 cfs)	2.0%	42" RCP
8	95	1-8R (5 cfs) + 1-10C (66 cfs) + 1-10B (21 cfs) + 1-10D (4 cfs)	0.5%	54" RCP
9	187	FACILITY 7 (91 cfs) + FACILITY 8 (96 cfs)	0.5%	72" RCP
10	27	11-E (17 cfs) + 1-10A (10 cfs)	1.5%	30" RCP
11	45	FACILITY 10 (27 cfs) + 11-F (18 cfs)	0.5%	42" RCP
12	220	FACILITY 9 (187 cfs) + 11-D (33 cfs)	0.5%	72" RCP
13A	5	11-G	1.0%	24" RCP
13B	270	FACILITY 11 (45 cfs) + FACILITY 12 (220 cfs) + FACILITY 13A (5 cfs)	1.0%	72" RCP
14A	14	11-I	0.5%	30" RCP
14B	6	11-J1	0.5%	24" RCP
15	35	FACILITY 14A (14 cfs) + FACILITY 14B (6 cfs) + 11-J2 (15 cfs)	0.5%	42" RCP
16	305	FACILITY 13B (270 cfs) + FACILITY 15 (35 cfs)	1.0%	72" RCP
17A	23	11-K	2.0%	30" RCP
17B	328	FACILITY 16 (305 cfs) + FACILITY 17A (23 cfs)	1.0%	72" RCP
18	536	CP9	0.5%	8'X7' RCB
19	30	12-I (17 cfs)+ 12-J (13 cfs)	1.0%	36" RCP
20	62	FACILITY 19 (30 cfs) + 12-K (13 cfs) + 12-M (7 cfs) + 12-N (12 cfs)	1.0%	42" RCP
21	9	1-2CA	6.0%	24" RCP
22*	3309	CP3	0.5%	20'X14' RCB
23*	3311	CP4	0.5%	14'X14' RCB (CCRFCD FACILITY GOL3)
24	63	1-3P	0.5%	48" RCP
25*	3311	CP4	3.5%	20' X 7.5' CONCRETE CHANNEL (CCRFCD FACILITY GOL3)
26A	33	12-A	4.5%	30" RCP
26B	47	FACILITY 26A (33 cfs) + 12-B (11 cfs) + 12-C (3 cfs)	0.5%	42" RCP
27*	3358	FACILITY 25 (3311 cfs) + FACILITY 26B (47 cfs)	6.5%	20' X 7.5' CONCRETE CHANNEL (CCRFCD FACILITY 0137)
28	24	12-D	0.5%	36" RCP
29*	3382	FACILITY 27 (3358 cfs) + FACILITY 28 (24 cfs)	6.5%	20' X 7.5' CONCRETE CHANNEL (CCRFCD FACILITY 0137)
30	14	12-F	4.0%	24" RCP
30A	12	12-H	0.5%	30" RCP
31	54	12-E (15 cfs) + FACILITY 30 (14 cfs) + 12-G (13 cfs) + FACILITY 30A (12 cfs)	5.5%	36" RCP
32*	3454	CP5	4.0%	20'X7' RCB
33	958	CSV22-3**	0.5%	17'W 7.5'-9'D CONCRETE CHANNEL (EX CCRFCD FACILITY GOBE 0065)
34	958	CSV22-3**	2.5%	15'W 7.5'D CONCRETE CHANNEL (EX CCRFCD FACILITY GOBE 0001)
35	958	CSV22-3**	2.5%	11'W 6.8'D CONCRETE CHANNEL (EX CCRFCD FACILITY GOBE 0001)
36	32	1-14 (3 cfs) + 1-15 (10 cfs) + 1-16 (5 cfs) + 1-17 (7 cfs) + 1-18 (7 cfs)	0.5%	42" RCP
E1	653	EXDB	N/A	EXISTING 65" ORIFACE PLATE
E2	653	EXDB	N/A	EXISTING 96" OUTFALL PIPE (EX CCRFCD FACILITY GOL3 0115)

*FACILITY SIZES REFERENCED FROM THE OFFSITE STUDY
**FLOW REFERENCED FROM THE 2013 MPU

OFFSITE FLOOD PROTECTION FACILITIES

LOCATION	Q_{100} ULT (cfs)	TRIBUTARIES	DESIGN SLOPE (%)	FACILITY
1-2CA	5	1-2CA	5.7%	Conc. Rect. Channel- 5' BW, 1.5' Deep
1-4R	100	1-4R	7.0%	Conc. Rect. Channel- 5' BW, 2.5' Deep
1-5A	118	1-4R (100 cfs) + 1-5A (18 cfs)	3.5%	Conc. Rect. Channel- 5' BW, 3' Deep
1-5B	45	1-5B	12.5%	Conc. Rect. Channel- 5' BW, 2' Deep
1-6R	28	1-6R	0.5%	Conc. Rect. Channel- 5' BW, 2' Deep
1-7R	78	1-7R (50 cfs) + 1-6R (28 cfs)	0.5%	Conc. Rect. Channel- 5' BW, 3.5' Deep
1-8R	5	1-8R	12.0%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-10A	10	1-10A	11.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-10C	71	1-8R (5 cfs) + 1-10C (66 cfs)	9.0%	Conc. Rect. Channel- 5' BW, 2.5' Deep
1-10D	4	1-10D	0.5%	Unlined V-Ditch- 3:1/3:1 Side Slopes,1.5' Deep
1-13	1	1-13 (1 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-14	4	1-13 (1 cfs) + 1-14A (3 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-15A	9	1-15A	0.5%	Unlined V-Ditch- 3:1/3:1 Side Slopes, 2' Deep
1-15B	1	1-15B	0.5%	Unlined V-Ditch- 3:1/3:1 Side Slopes, 1.5' Deep
1-16A	4	1-16A	0.5%	Unlined V-Ditch- 3:1/3:1 Side Slopes,1.5' Deep
1-16B	1	1-16B	0.5%	Unlined V-Ditch- 3:1/3:1 Side Slopes,1.5' Deep
1-17	7	1-17	0.5%	Unlined V-Ditch- 3:1/3:1 Side Slopes, 2' Deep
1-18	7	1-18	0.5%	Unlined V-Ditch- 3:1/3:1 Side Slopes,1.5' Deep
LMT1RB	31	LMT1RB	7.0%	Conc. Rect. Channel- 5' BW, 2' Deep

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F:\Projects\7000\764-204-01\Division\Fed\Figures\ARTC\Fig6R.dwg

PULTE HOMES INC

VILLAGE 26 - REVERENCE
MASTER DRAINAGE STUDY
FLOOD CONTROL FACILITIES MAP

DRAWING
FIG 6R
OF SHTS

arc24x36_dwg 050117.ctb

Rainbow Lib. PL 60.1

RESPONSE TO COMMENTS ON THE MASTER DRAINAGE STUDY FOR VILLAGE 26 AT SUMMERLIN WEST (TECHNICAL DRAINAGE STUDY FOR MODEL HOMES, ACCESS ROAD, AND ROUGH GRADING)

764-201-02

November 2006

Prepared for:

Pulte Homes, Inc.
8345 West Sunset Road
Las Vegas, Nevada 89113
Phone: (702) 914-4800
Fax: (702) 914-4997

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

CITY OF LAS VEGAS **INTER-OFFICE MEMORANDUM**			**DATE:** April 2, 2007
TO: **Land Development Services** Department of Public Works			**FROM:** Oh Sang Kwon, P.E. Flood Control Department of Public Works
SUBJECT:	Master Drainage Study for:		**COPIES TO:**
Village 26 At Summerlin West			G.C. Wallace, Inc.
Cross Streets:	Cheyenne Road and I-215		Pulte Homes
File Number:	F:\Depot\DSMemos\DS4073D.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-14-501-003		CCRFCD
Zoning Action:			CCPW
FEMA Flood Zone	YES	NO X	
Proposed Storm Drain	YES X	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	9/22/2006	10/5/2006	Not Approved	$1000.00	53543: $1000
2nd Submittal	11/14/2006	11/22/2006	Not Approved	$400.00	57509: $400
3rd Submittal	12/13/2006	12/29/2006	Not Approved	$400.00	59354: $400
4th Submittal	1/3/2007 & 1/12/2007	1/4/2007 & 1/18/2007	Conditional Approval	----	----
CCPW	3/20/2007	4/2/2007	Concurrence	N/C	N/C
CCRFCD	3/28/2007	4/2/2007	Concurrence	N/C	N/C
			TOTAL FEES (LDDRS):	$1800.00	----

REMARKS:

The Master Drainage Study for the subject project has been reviewed and:

X	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Department of Public Works concurrence.
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

The following comments are for the Master Drainage Study for Village 26 at Summerlin West:

1. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (ie. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the City of Las Vegas Flood Control Section prior to final approval of technical drainage study.
2. Please note that storm drain facilities required to reduce and/or convey the interim flows must be substantially completed prior to development as stated in the Master Drainage Study. Each phase of the development must be individually flood protected.
3. Please note that the proposed flood protection facilities identified on Figure 6R and in this Master Drainage Study must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the infrastructure improvements. The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval for the

Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies.

4. Technical drainage studies are required for each of the POD's. The technical drainage studies for the POD's may not be submitted until the conditional approval of the pertinent infrastructure drainage study is obtained. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted POD drainage studies.
5. Building permits for the homes within the individual POD's will not be issued until construction of the street and flood control infrastructure around the POD is substantially complete.
6. Modification of the existing Village 26 Detention Basin will require following:
    a. A technical drainage study is required with CCRFCD concurrence.
    b. A 12-ft wide access road must be provided around the top of the entire detention basin and will be located a minimum of 6-inch above the 100-year detention basin water surface elevation.
    c. Proposed grading within the footprint of the detention basin will not change the slope of the embankments or operating characteristics of the detention basin. Additionally, the bottom of all retaining wall footing around the detention basin must be a minimum of 8-inch above the 100-year detention basin water surface elevation.
    d. All finished floors adjacent to the detention basin will be designed to be 6-inch above the weir water surface elevation assuming the outlet pipe is 100 percent clogged.
    e. All surface waters are not allowed to flow down the embankment of the detention basin and must be conveyed in a storm drain system.

The following comments are for the Model Park and Mass Grading for Village 26 at Summerlin West:

1. The proposed project involves huge amount of mass grading. Obtain City of Las Vegas Planning Department's conditions and approval prior to the final acceptance of the drainage study.
2. Non-standard structures (Type "CM" drop inlet with a depth greater than 10-foot, Manhole with a depth greater than 25-ft, and USBR Type VI Stilling Basins) require a special detail and structural calculations. Please provide a soils report, structural calculations, and specifications, two (2) wet stamped structural sets, and a grading plan to the Building Department for processing. The engineer must provide a copy of Building Department approval of the structures to Flood Control prior to final acceptance of the drainage study.
3. The engineer must provide a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. All drainage improvements within Public Drainage Easements must be bonded and inspected.
4. Sheet G-2: Show lot drainage for Lots 651 thru 653. High point of the swale must be lower than the Finished Floor elevation and Garage Finished Floor elevation.
5. Sheet D-1: Show future maintenance access road on cross-sections X/D-1 and Y/D-1.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved master drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

END OF REMARKS
osk

T/R/S: T20S/R59E/14
AREA K-14

REGIONAL FLOOD CONTROL DISTRICT

Gale Wm. Fraser, II, P.E.
General Manager/Chief Engineer

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Andy Hafen
City of Henderson

Mayor Bill Nicholes
City of Mesquite

Roger Tobler
City of Boulder City

Bruce L. Woodbury
Clark County

March 12, 2007

Mr. Randy Fultz, P.E.
City of Las Vegas Public Works
731 S. 4th Street
Las Vegas, NV 89101

DISTRICT CONCURRENCE: **VILLAGE 26 AT SUMMERLIN WEST (DS4073) (RFCD No. 07-7161)**

Dear Mr. Fultz:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated September 11, 2006, Supplement No. 1 dated September 12, 2006, Addendum No. 1 dated November 8, 2006, Addendum No. 2 dated December 12, 2006, and Supplement No. 2 dated January 11, 2007, for above-mentioned project as submitted by G. C. WALLACE, INC. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Public Works dated January 22, 2007.

District concurs with acceptance of this Technical Drainage Study by City of Las Vegas Public Works.

District's review of this project was limited to issues of Regional Flood Control Significance as defined in *Uniform Regulations for the Control of Drainage.*

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by G. C. WALLACE, INC., may be superseded. Compliance with regulatory elements and design standards specified in *Uniform Regulations for the Control of Drainage* does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

GALE WM. FRASER, II, P.E.
General Manager/Chief Engineer

BY: _____
Abigail Mayrena, P.E.
Associate Engineer

_____
Andrew R. Trelease, P.E., CFM
Principal Civil Engineer

AM:ART:jb

c: James A. Monroe, Jr., P.E., G. C. WALLACE, INC.

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600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 455-3139 • FAX: (702) 455-3870
Website: *http://www.regionalflood.org*

Department of Public Works

500 S Grand Central Pky • Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

Denis Cederburg, P.E., Director • E-Mail: dlc@co.clark.nv.us

March 14, 2007

Mr. James Monroe JR, P.E.
G. C. Wallace, Incorporated
1555 South Rainbow Boulevard
Las Vegas, Nevada 89146

CLARK COUNTY 215 BRUCE WOODBURY BELTWAY – SUMMERLIN PARKWAY TO CRAIG ROAD - DRAINAGE STUDY CONCURRENCE OF SUMMERLIN VILLAGE 26

Dear Mr. Monroe:

Clark County Public Works reviewed the drainage study and grading plans for the project approximately located on the northwest corner of Clark County 215 Bruce Woodbury Beltway and Lake Mead Boulevard, APN# 137-14-501-003.

With regards to the drainage facilities as shown on that plan set we concur with the project as it stands based on the understanding that there will be no change in the patterns or intensity of drainage flows adjacent to the Beltway. Due to the size and proximity of the improvements as well as the possible impact during construction (or reconstruction) of the Beltway channel we require that the following conditions be met prior to removal of any part(s) of that channel.

1) Pulte Homes must provide protection for the Clark County 215 Bruce Woodbury Beltway during the re-construction of the proposed channel. Such protection would include directing flows to a temporary onsite channel of similar or larger capacity during the entire construction process.
2) Pulte Homes must provide plan sheets to Clark County Public Works showing the ultimate alignment of the utilities and regional trail facilities adjacent to the Beltway.

Clark County Public Works reserves the right to review and comment on the improvement plans prior to the construction of any facilities within or abutting the Beltway. Items that we may provide comments on will include but not be limited to: perimeter walls, retaining walls, vertical wall channel(s), pedestrian fence along channels, transition structures and grading.

Clark County Public Works is providing this letter of concurrence at your request and per the requirements of a review conducted by Mr. Oh Sang Kwon at the City of Las Vegas dated January 22, 2007.

BOARD OF COUNTY COMMISSIONERS
RORY REID, Chairman • CHIP MAXFIELD, Vice-Chairman
SUSAN BRAGER • TOM COLLINS • CHRIS GIUNCHIGLIANI • LAWRENCE WEEKLY • BRUCE L. WOODBURY
VIRGINIA VALENTINE, P.E., County Manager

Our concurrence with your plans does not imply that Clark County Public Works checked the accuracy of the drainage study, nor does it provide approval for your client or its contractors to use any part of the Beltway right-of-way for temporary or permanent access to the site.

An encroachment permit from the Clark County Department of Development Services is required for any work within or abutting the right-of-way for the Clark County 215 Bruce Woodbury Beltway – contact Chris Lund for details at (702) 455-4600.

Should you have any questions or require any additional information, please contact me at (702) 455-6081.

Sincerely,

Michael Mamer
Associate Engineer

MM:ab

cc: Oh Sang Kwon, City of Las Vegas
Randy Fultz, City of Las Vegas
Greg Radig, G.C. Wallace, Inc.
Ryan Belsick, G. C. Wallace, Inc.

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

G. C. WALLACE, INC.
G. C. WALLACE OF CALIFORNIA, INC.
G. C. WALLACE HOLDINGS, INC.

Writer's Contact Information:
(702) 804-4394

764.201.02

November 8, 2006

Oh Sang Kwon, PE
City of Las Vegas
Land Development Services
731 South Fourth Street
Las Vegas, Nevada 89101

Re: Response to Comments on the Technical Drainage Study for Village 26 at Summerlin West
Cross Streets: Cheyenne Road and I-215
Parcel Number: 137-14-501-003

Dear Mr. Kwon:

The purpose of this letter is to address the comments from the City of Las Vegas (CLV), dated October 12, 2006, regarding the above-referenced project. The comments are individually addressed as follows:

Comment: "1. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study."

Response: Noted. Upon approval by CLV, the Study will be submitted to CCRFCD for concurrence.

Comment: "2. The proposed project impacts the *Western Beltway 215.* Obtain concurrence from *Clark County Public Works Department* prior to the final approval of the drainage study."

Response: Noted. Upon approval by CLV, the Study will be submitted to CCPW for concurrence.

Comment: "3. Provide an explanation/documentation on who will be modifying the existing detention basin, Village 26 Detention Basin, to accommodate the increased storage volume."

Response: The Village 26 Detention Basin volume will be increased by raising grades along the northeastern embankment with a retaining wall. See Sections Q and X on Sheet D-1 that show the roadway with respect to the detention basin embankment. Note that proposed grades at the northeastern embankment of the Village 26 Detention Basin have been raised by approximately 6 feet from existing grades. Additional detention basin modifications, which will include installing a restrictor plate at the outfall facility, will be addressed in a future drainage study submittal. These improvements will be included with proposed improvements for the future Village 26 Debris Basin and Outfall Facility.

Comment: "4. Provide an explanation/documentation on how the increased storage volume is excavated from the existing Village 26 Detention Basin with proposed Respectful Drive and Desert Hope Drive surrounding the detention basin."

Response: Excavation will not be required to increase the Village 26 Detention Basin storage volume. See Response to Comment No. 3.

The Following Comments are for the Model Park and Mass Grading for Village 26 at Summerlin West:

Comment: "1. The proposed project involves huge amount of mass grading. Obtain CLV Planning Department's conditions and approval prior to the final acceptance of the drainage study."

Response: CLV Planning Department's conditions and approval are required and will be obtained. GCW requests that the Study be conditionally approved pending final acceptance from CLV's Planning Department.

Comment: "2. Provide a detail hydraulic calculation for the proposed "Ditch INT6C" since the proposed ditch borders the existing beltway channel and impacts Village 26 Detention Basin. Address the adequacy of riprap channel, entrance condition (transition from 400-ft wash to 50-ft channel) and exit condition of the channel. Provide erosion protection for the Village 26 Detention Basin embankment."

Response: For this submittal, Ditch INT6C has been renamed INT6A. A HEC-RAS model for Ditch INT6A has been included in Appendix B. Note that the channel sections have been widened to include a 200-foot-bottom-width trapezoidal section with 3 to 1 side slopes at the upstream end and transitions to a 400-foot-bottom-width trapezoidal section with 3 to 1 side slopes and then to a 300-foot-bottom-width trapezoidal section with 3 to 1 side slopes at the downstream end. Please refer to revised Figure 7A included in the Appendix for HEC-RAS section locations. Note that due to the revised mass grading in the vicinity of the channels, basin boundaries and calculations for prorated subbasins have been revised on Figure 7A. Riprap with a d_{50} equal to 24 inches and 12 inches have been proposed within the 200-foot- and 400-foot-bottom-width sections respectively. Riprap will be provided on the side slopes equal to a height of depth of flow + freeboard. Channel velocities will be less than 12 fps downstream of the entrance. Freeboard calculations for Ditch INT6A have been included in Appendix B and the channel will provide a minimum of 1.2 feet

of freeboard. Note that riprap (d_{50} equal to 24 inches) has been included along the Village 26 Detention Basin embankment where the channel outlets at the Detention Basin.

Comment: "3. Provide an erosion protection to the proposed "Ditch INT1G" and "Ditch INT1I"."

Response: For this submittal, Ditch 1G has been broken up and renamed Ditch 1G, 1H, 1K, and 1L. Ditch 1I has been renamed Ditch 1J. Note that Subbasin INT1 has been further delineated in order to determine specific flowrates impacting Ditches INT1G, 1H, 1K, and 1L. Please refer to revised Figure 7A for revised subbasin boundaries, flowrates, and ditch names. Channel geometry for Ditches 1K, 1L, and 1J have been revised to be a 100-foot-bottom-width trapezoid section with 3 to 1 side slopes. A HEC-RAS model for Ditches INT1G, 1H, 1K, 1L, and 1J have been included in Appendix B. Erosion protection (d_{50} = 12", thickness = 24") for Ditches INT1G, 1H, 1K, 1L, and INT1J has been provided.

Comment: "4. Label the corresponding drop inlet ID and Standard Form 6 calculations on Figure 6, "Flood Control Facilities Map"."

Response: Drop inlet ID's have been labeled on Figure 6 "Flood Control Facilities Map". Below is a summary of the facilities associated with Standard Form 6 calculations.

"Mainline" – Facilities 19, 22, 23, 25, 26, 27, 29, and 32
"Respectful Drive East" – Facilities 38 and 39
"Respectful Drive West" – Facilities 33, 35, and 37
"SD INLET #9 Lateral" – Facilities 30 and 31
"SDMH #5 Lateral" – Facilities 20 and 21
"SDMH #9 Lateral" – Facility 24
"SDMH #16 Lateral" – Facility 28
"SDMH #21 Lateral" – Facility 34
"SDMH #22 Lateral" – Facility 36

Comment: "5. General Grading Plan Comments:

a. Label the minimum depth for the proposed ditches and D50 for the proposed riprap.

b. Label existing storm drain facility with type, size and ID or CLV Dwg. Number.

c. Label all future street names.

d. Provide construction notes and label all constructing items.

e. Revise all drop inlets to Type "CM" or Neenah Pre-cast inlets. Contact Raul Cruz at 229-6171 for an AutoCAD detail to be included within the improvement plans if Type "CM" dorp inlets are used.

f. Label grates elevations.

g. Label cross-sections for the proposed streets on each sheet.

h. Provide inlet protection for the interim pipes at the low points."

Response: a. Minimum channel depths and d_{50}, depths, and thickness for the proposed riprap have been called out in the grading plans.

b. Information for the existing 96-inch RCP Village 26 Detention Basin Outfall Facility has been included on the grading plans.

c. Names for future streets have been included on the profile sheets.

d. Construction notes and call-outs have been included on the grading plans.

e. Drop inlets have been labeled as Type "CM" where applicable on the profile sheets. Details for proposed NDOT drop inlets labeled in the grading plans have been included.

f. Top-of-curb elevations have been labeled on the grading plans where drop inlets have been proposed. According to Detail A on Sheet D-2, grate elevations for Type CM Drop Inlets are 10-inches below top-of-curb elevations.

g. Cross section call-outs for the proposed streets have been provided on the profile sheets.

h. Inlet protection for the interim stubs has been provided.

Comment: "6. Sheet G-1:

a. Provide additional cross-sections west of Lot 1, south of Lot 3, east and north of "Future Parking Area.

b. The following finished floors do not meet the Regional Flood Control District minimum criteria of twice the Q100 depth of flow up to 18-inches above the water surface (CCRFCD Manual Section 304.4.E.1) or 6-inch minimum above the highest adjacent top of curb (CCRFCD Manual Section 1602 304.4.E.1). The following finish floors should be revised or alternate flood protection provided.

Lot	FF shown	Min FF
3	52.1	53.39

As an alternate, each lot must be discussed in the drainage study, shown to be flood protected, and any necessary flood improvements shown on the grading plan."

Response: a. Cross sections have been provided at the requested locations.

b. Note that Lot 3 has been relabeled as Lot 1483 in the Grading Plans. A floodwall, solid grouted two courses above TC elevations, has been included along the side of Lot 1483. See Detail O on Sheet D-1.

Comment: "7. Sheet G-2:

a. Provide additional cross-sections west of Lot 7, south of future road, south of Lot 11, and east of "Future Parking Area".

b. Provide a concrete valley gutter across the alley way at the future Peaceful Place.

c. Provide TC elevations at the curb return on Peaceful Place."

Response: a. Cross sections have been provided at the requested locations.

b. A concrete valley gutter has been provided at the requested location.

c. TC elevations have been provided at the requested location.

Comment: "8. Sheet MG-3 & 4:

a. Extend the storm drain pipe to the bottom of detention basin with energy dissipater.

b. Label slope of the proposed grading along the detention basin embankment.

c. Label the existing facility name and CLV Dwg. Number if applicable."

Response: a. The storm drain has been extended to the bottom of the detention basin. A 10-foot-wide by 21-foot-long riprap pad with d_{50} equal to 17 inches has been included at the outlet for protection. Additionally, note that outlet protection has been included for all pipes that outlet into the Village 26 Detention Basin. Outlet protection calculations have been included in Appendix B. The future technical drainage study for the Village 26 Debris Basin, Outfall Facility, and Detention Basin Modifications will address the extension of the storm drain facilities to the existing 96-inch RCP Outfall Facility to avoid nuisance flows from flowing along the detention basin sides and bottom.

b. Slopes for the proposed grading along the detention basin have been shown on the MG Sheets. Additionally, see Sections Q and X on Sheet D-1 for sections adjacent to the detention basin embankment.

c. Information for the existing Village 26 Detention Basin has been included on the MG Sheets.

Comment: "9. Sheet MG-10: Provide a maintenance access road to the detention basin from Respectful Drive with access control."

Response: A maintenance road that ties into the existing maintenance road has been included. Additionally, see Section V on Sheet D-1 for a typical section of the proposed maintenance road.

Comment: "10. Sheet MG-11: Label the D50 and thickness for the proposed riprap at the entrance of storm drain pipe on Reverence Parkway."

Response: The storm drain in Reverence Parkway is no longer used as an interim stub. Flows in this location are now directed to the INT6 Channel.

Comment: "11. Sheet MG-17: Provide a cross-section across the berm and riprap lined ditch."

Response: A cross section across the berm and riprap-lined ditch has been provided. See Section T on Sheet D-1.

Comment: "12. Sheet P-5:

a. On "Loquat Drive Stub", show the proposed grading from the edge of the road to top of storm drain pipe and label the slopes.

b. On "Loquat Drive Stub", provide inlet protection."

Response: a. Proposed grading above the storm drain pipe has been included on the "Loquat Drive Stub".

b. The storm drain in Loquat is no longer used as an interim stub. Flows in this location are now directed to the INT6 Channel.

Comment: "13. Sheet P-8: Label the missing lateral pipe sizes on profile sheet."

Response: The pipe sizes for the laterals have been labeled on Sheet P-8.

Comment: "14. Sheet P-9:

a. Label the missing elevation mark for "Lateral Near Manhole 16 & 17" profile.

b. Show proposed grading to the north of inlet and from the proposed edge of the road to the bottom of detention basin with slope labeled.

c. Check the Q100 labeled on the profile for main storm drain and on Lateral for manhole 17."

Response: a. The missing elevation mark has been included.

b. Proposed grading has been included on all lateral profiles.

c. The correct Q100 has been labeled on the storm drain profiles.

Comment: "15. Sheet P-10: Show the proposed grading to the north of inlet for "Lateral near Manhole 18 & 21"."

Response: Proposed grading has been included on all lateral profiles.

Comment: "16. Sheet P-11

a. Address the low point at the north of Inlet #12.

b. Show proposed grading from the edge of the road to the bottom of detention basin on "Lateral at Manhole 22" profile.

c. Label the storm drain manhole type.

d. Check the proposed grade shown on "Lateral at Manhole 22", north of Inlet #12.

e. What is the purpose of 18-inch pipe, north Inlet #12?

f. Check the Q100 shown on profile of "Lateral at Manhole 22"."

Response: a. An NDOT Type 2 Drop Inlet has been included to collect 6 cfs within a 2-foot-deep sump drain at this location. A calculation for the NDOT Type 2 Drop Inlet has been included in Appendix B. A minimum of 1-foot of freeboard has been provided at that location.

b. Proposed grading has been included on all lateral profiles.

c. Storm drain manhole types have been labeled on the profiles.

d. The correct grading has been shown on the "Lateral at Manhole 22" profile.

e. The pipe has been shortened, and an NDOT Type 2 Drop Inlet has been included. See Response to Comment No. 16 a.

f. The correct Q100 has been labeled on the storm drain profiles.

Comment: "17. Sheet P-12:

a. On "Lateral at Manhole 23" profile, show the proposed grade to the top of pipe and to the north of the pipe.

b. On Lateral at Manhole 23" profile, check the finished grade from the edge of the road to the top of pipe."

Response: a. Proposed grading has been verified and included on all lateral profiles.

b. Proposed grading has been verified and included on all lateral profiles.

Comment: "18. Sheet P-13: Label the pipe size for the lateral at storm drain manhole #5."

Response: The pipe sizes for the laterals have been labeled on Sheet P-13.

Comment: "19. Sheet D-1:

a. Cross Section D, label the minimum and maximum height of the retaining wall.

b. Cross Section J, provide additional freeboard."

Response: a. The minimum and maximum height of the retaining wall have been labeled on Section D.

b. Adequate freeboard has been provided. See revised Figure 7A included in Appendix A.

"**NOTE:** Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429."

Additional Comments:

Since the previous submittal, grading for the site has been revised in order to balance the mass grading. As a result, grades within the model homes and access road have been raised and street and storm drain slopes have been revised. Although general drainage patterns were not affected by the grading revisions, street section, drop inlet, and storm drain calculations were revised to reflect the revised slopes and grades.

The revised calculations have been included in Appendix B. Please refer to the revised street section discussion (from Pages 16 and 17 of the original text) included in Appendix B.

If you have any questions or require additional information, please contact us at 804-2000.

Very truly yours,

G. C. WALLACE, INC.

James A. Monroe, Jr., PE
Project Manager
Flood Control Division

JAM/mjj

Enclosures

c: Pulte Homes
Chris Anderson, GCW
Greg Radig, GCW
Jerry E. Pruitt, GCW
Ryan R. Belsick, GCW

UPDATE #2 TO THE MASTER DRAINAGE STUDY FOR VILLAGE 26 AT SUMMERLIN WEST (TECHNICAL DRAINAGE STUDY FOR MODEL HOMES, ACCESS ROAD, AND ROUGH GRADING)

764-201-02

October 2007

Prepared For:

Pulte Homes
8345 W. Sunset Road
Las Vegas, Nevada 89113
Phone: (702) 437-7999
Fax: (702) 256-7900

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: April 29, 2008
TO: Land Development Services Department of Public Works				FROM: Oh Sang Kwon, P.E. Flood Control Department of Public Works
SUBJECT:	Master Drainage Study for:			COPIES TO:
Village 26 At Summerlin West – Update #2				G.C. Wallace, Inc.
Cross Streets:	Cheyenne Road and I-215			Pulte Homes
File Number:	F:\Depot\DSMemos\DS4073L.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-14-501-003			CCRFCD
Zoning Action:				CCPW
FEMA Flood Zone	YES	NO X		CCDDS
Proposed Storm Drain	YES X	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	9/22/2006	10/5/2006	Not Approved	$1000.00	53543: $1000
2nd Submittal	11/14/2006	11/22/2006	Not Approved	$400.00	57509: $400
3rd Submittal	12/13/2006	12/29/2006	Not Approved	$400.00	59354: $400
4th Submittal	1/3/2007 & 1/12/2007	1/4/2007 & 1/18/2007	Conditional Approval	----	----
CCPW	3/20/2007	4/2/2007	Concurrence	N/C	N/C
CCRFCD	3/28/2007	4/2/2007	Concurrence	N/C	N/C
5th Submittal	4/26/2007	5/15/2007	Not Approved	$400.00	67876: $400
6th Submittal	6/6/2007 & 6/25/2007	6/20/2007 & 6/26/2007	Conditionally Approved	$400.00	70789: $400
CCRFCD	8/7/2007	8/22/2007	Concurrence	N/C	N/C
7th Submittal	10/2/2007	10/31/2007	Not Approved	$400.00	78864: $400
8th Submittal	4/16/2008	4/29/2008	See Comments Below	$400.00	92781: $400
			TOTAL FEES (LDDRS):	$3400.00	----

REMARKS:

7th & 8th Submittal: Number of Model Homes and Reverence Parkway street section has been revised. Minor storm drain and grading has been revised.

10/8/07: City of Las Vegas Planning Department's approval on mass grading.

5th & 6th Submittal: Revised storm drain on Respectful Drive around detention basin and low flow pipe. Revised the interim INT6A channel, additional model homes, and minor changes in mass grading.

The Master Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Department of Public Works concurrence.
	is conditionally approved subject to Clark County Regional Flood Control District

	concurrence.
	is conditionally approved subject to Clark County Department of Development Service concurrence.
X	is conditionally approved subject to approval of conditions listed below.

The following comments are for the Master Drainage Study for Village 26 at Summerlin West:

1. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (i.e. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the City of Las Vegas Flood Control Section prior to final approval of technical drainage study.
2. Please note that storm drain facilities required to reduce and/or convey the interim flows must be substantially completed prior to development as stated in the Master Drainage Study. Each phase of the development must be individually flood protected.
3. Please note that the proposed flood protection facilities identified on Figure 6U2 and in this Master Drainage Study must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the infrastructure improvements. The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval for the Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies.
4. Technical drainage studies are required for each of the POD's. The technical drainage studies for the POD's may not be submitted until the conditional approval of the pertinent infrastructure drainage study is obtained. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted POD drainage studies.
5. Building permits for the homes within the individual POD's will not be issued until construction of the street and flood control infrastructure around the POD is substantially complete.
6. Modification of the existing Village 26 Detention Basin will require following:
    a. A technical drainage study is required with CCRFCD concurrence.
    b. A 12-ft wide access road must be provided around the top of the entire detention basin and will be located a minimum of 6-inch above the 100-year detention basin water surface elevation.
    c. Proposed grading within the footprint of the detention basin will not change the slope of the embankments or operating characteristics of the detention basin. Additionally, the bottom of all retaining wall footing around the detention basin must be a minimum of 8-inch above the 100-year detention basin water surface elevation.
    d. All finished floors adjacent to the detention basin will be designed to be 6-inch above the weir water surface elevation assuming the outlet pipe is 100 percent clogged.
    e. All surface waters are not allowed to flow down the embankment of the detention basin and must be conveyed in a storm drain system.

The following comments are for the Model Park and Mass Grading for Village 26 at Summerlin West:

1. Non-standard structures (Type "CM" drop inlet with a depth greater than 10-foot, Manhole with a depth greater than 25-ft, and trash rack/outlet pipe) require a special detail and structural calculations. Please provide a soils report, structural calculations, and specifications, two (2) wet stamped structural sets, and a grading plan to the Building Department for processing. The

engineer must provide a copy of Building Department approval of the structures to Flood Control prior to final acceptance of the drainage study.

2. The project proposes to build interim/temporary drainage. Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (off-site berms, channels, etc.) and post a minimum maintenance bond of $25,000 or 25-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an 8.5-inch by 11-inch exhibit that adequately shows the location and limits of the drainage facility to *Flood Control* for approval. Once the drainage study is conditionally approved, the engineer should contact the City's Land Development Section (229-6371) to begin the agreement process.
3. The proposed improvement plans show drainage facilities of a size that must be reviewed for Maintenance and Access concerns. The engineer must submit an extra set of improvement plans to the *Streets & Sanitation Department* for there review. *Streets & Sanitation* approval must be secured prior to drainage study approval.
4. The engineer must provide a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. It appears to be missing a few items (trash rack, riprap, etc.) All drainage improvements within Public Drainage Easements must be bonded and inspected. Please note that trash rack is shown as existing on Village 26 Offsite Improvements.
5. Proposed Reverence Parkway cross-section is deviation from the standards on the improvements. Obtain Public Works approval for the deviation from Standards.
6. If the proposed curved storm drain pipes are "pulled" to make the radius, deflection (pull) must be per Table 801 of the manual. If the proposed curved storm drain pipes are precast concrete pipe, than provide a letter from the manufacturer stating that those precast curved storm drain pipe sections are available.
7. General Grading Plan comments:
    a) Callout the correct detail for proposed Type "CM" drop inlets which have a depth greater than 10-ft.
    b) Sheet G-2: Provide a cross-section between Lot 570 and proposed riprap swale. Label the minimum depth of swale.
    c) Sheet D-2: Label the minimum depth of swale in Section D/D-2.
    d) Sheet D-2: Extend the protective face angle plate to the top of curb.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved master drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

END OF REMARKS
osk

T/R/S: T20S/R59E/14
AREA K-14

HYDROLOGIC CRITERIA AND DESIGN MANUAL

TIME OF CONCENTRATION

G. C. WALLACE, INC.
Engineers/Planners/Surveyors

Summerlin Village 26
Ultimate Conditions - UPDATE #2

Project No: 764-201-1M11
Date: 09/21/07
Calculated by: REH

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc CHECK URBANIZED BASINS		Tc	Tlag	REMARKS
DESIG: (1)	DEV./EX. (D or E)	CN (16)	K (2)	AREA Ac (3)	AREA Sq Mi (4)	INITIAL LENGTH Feet (5)	SLOPE % (6)	Ti Min (7)	TRAVEL LENGTH Feet (8)	SLOPE % (9a)	V1 VELOCITY fps (9b)	V2 VELOCITY fps (10)	Tt Min (11)	TOTAL LENGTH Feet (12)	Tc = (L/180)+10 Min (13)	Min (14)	Tlag = 0.6Tc/60 Hours (15)	Remarks:
1-1A*	E	86.2	0.7478	1497.2	2.3394	500	34.0	4.4	14575	8.4	4.3	8.5	29.5	15075	N/A	33.8	0.488	USBR Method
1-1B*	D	84.1	0.7201	111.8	0.1747	100	1.0	6.8	4775	8.5	5.9	8.9	9.4	4875	37.1	16.2	0.162	
1-2A*	E	86.8	0.7558	552.7	0.8636	500	56.0	3.6	5905	17.4	6.2	12.3	8.7	6405	N/A	12.3	0.123	
1-2B*	D	86.1	0.7465	137.7	0.2152	100	1.0	6.4	5100	7.5	5.5	8.4	10.7	5200	38.9	17.0	0.170	
1-2CR*	E	86.2	0.7478	365.5	0.5711	500	52.0	3.8	9505	16.3	6.0	11.9	14.0	10005	N/A	17.8	0.178	
1-4R	E	87	0.7584	34.3	0.0535	500	60.0	3.5	1890	36.2	8.9	17.7	2.2	2390	N/A	5.8	0.100	
1-5R	E	87	0.7584	21.5	0.0336	330	65.0	2.8	1160	39.0	9.2	18.4	1.5	1490	N/A	4.3	0.100	
1-6R	E	87	0.7584	9.6	0.0151	360	56.9	3.0	840	34.4	8.7	17.2	1.3	1200	N/A	4.3	0.100	
1-7R	E	87	0.7584	17.3	0.0270	500	72.0	3.3	1490	26.8	7.7	15.2	2.2	1990	N/A	5.5	0.100	
1-8R	E	87	0.7584	1.6	0.0026	210	38.3	2.6	205	20.0	6.6	13.1	0.5	415	N/A	3.2	0.100	
1-10R	E	87	0.7584	33.5	0.0524	500	24.0	4.8	1030	21.9	6.9	13.8	1.8	1530	N/A	6.6	0.100	
1-3P	D	94.5	0.8574	30.4	0.0475	100	1.0	4.4	2316	2.9	3.4	5.2	8.2	2416	23.4	12.6	0.126	
1-11P	D	90.1	0.7993	119.0	0.1859	100	1.0	5.4	4082	4.4	4.2	6.4	11.3	4182	33.2	16.7	0.167	
1-12P	D	90	0.7980	105.8	0.1654	100	1.0	5.4	3621	4.8	4.4	6.7	9.7	3721	30.7	15.1	0.151	
1-13	E	87	0.7584	0.6	0.0009	50	40.0	1.3	333	25.0	7.4	14.7	0.8	383	N/A	2.0	0.100	
1-14	E	86.9	0.7571	1.2	0.0019	50	40.0	1.3	406	18.0	6.3	12.5	1.1	456	N/A	2.4	0.100	
1-15	E	87	0.7584	2.8	0.0044	50	26.0	1.5	575	19.7	6.6	13.0	1.4	625	N/A	2.8	0.100	
1-16	E	87	0.7584	1.5	0.0024	50	32.0	1.4	334	6.9	3.9	7.7	1.4	384	N/A	2.8	0.100	
1-17	E	87	0.7584	2.1	0.0033	50	62.0	1.1	452	38.1	9.1	18.1	0.8	502	N/A	1.9	0.100	
1-18	E	86.7	0.7544	2.9	0.0046	50	58.0	1.1	657	24.8	7.4	14.6	1.3	707	N/A	2.4	0.100	

$Tc = Ti + Tt$ $Tlag = 0.6\ Tc$

$Ti = 1.8\ (1.1 - K)\ L^{1/2} / S^{1/3}$

$K = 0.0132\ (CN) - 0.39$

For the travel time (Tt) calculations,
V1 applies to the first 500 feet of travel distance;
V2 applies to the remaining travel distance.

Existing: $V1 = 14.8*(S/100)^{1/2}$ $V2 = 29.4*(S/100)^{1/2}$

Developed: $V1 = 20.2*(S/100)^{1/2}$ $V2 = 30.6*(S/100)^{1/2}$

* Basin paramaters referenced from the Summerlin West MPU

REFERENCE:

STANDARD FORM 4

```
1*************************************                                                  *************************************
*                                   *                                                  *                                   *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                              *    U.S. ARMY CORPS OF ENGINEERS     *
*              JUN   1998             *                                              *    HYDROLOGIC ENGINEERING CENTER    *
*            VERSION 4.1              *                                              *          609 SECOND STREET          *
*                                   *                                              *       DAVIS, CALIFORNIA 95616       *
*  RUN DATE   19SEP07  TIME  09:18:12   *                                              *           (916) 756-1104            *
*                                   *                                              *                                   *
*************************************                                                  *************************************
```

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

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
1                                                HEC-1 INPUT                                                    PAGE  1

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

              *DIAGRAM
  1           ID   ***************************************************************
  2           ID   * .......................................................... *
  3           ID   * :              UPDATE #2 SUMMERLIN VILLAGE 26              : *
  4           ID   * :                  ULTIMATE CONDITION                      : *
  5           ID   * :        THIS MODEL DETERMINES THE RUNOFF DURING           : *
  6           ID   * :            ULTIMATE DEVELOPMENT CONDITIONS               : *
  7           ID   * :......................................................... : *
  8           ID   * :              RETURN PERIOD_ _ _ _100-YEAR                : *
  9           ID   * :              DISTRIBUTION_ _ _ _ 6-HOUR SDN3             : *
 10           ID   * :              PROJECT NO_ _ _ _ _ 764.20101               : *
 11           ID   * :              FILENAME_ _ _ _ _ _ V26ULT.H1               : *
 12           ID   * :              DATE_ _ _ _ _ _ _ _ 9/13/07                 : *
 13           ID   * :              MODELED BY_ _ _ _ _ REH/BJK                 : *
 14           ID   * :                                                          : *
 15           ID   * :             DEPTH AREA REDUCTION FACTORS:                : *
 16           ID   * :               AREA                DARF                   : *
 17           ID   * :             0.00 TO 0.24 SQ MI     1.00                  : *
 18           ID   * :             0.25 TO 0.49 SQ MI     0.99                  : *
 19           ID   * :             0.50 TO 0.99 SQ MI     0.98                  : *
 20           ID   * :             1.00 TO 1.24 SQ MI     0.97                  : *
 21           ID   * :             1.25 TO 1.50 SQ MI     0.96                  : *
 22           ID   * :             1.51 TO 1.74 SQ MI     0.95                  : *
 23           ID   * :             1.75 TO 1.99 SQ MI     0.94                  : *
 24           ID   * :             2.00 TO 2.99 SQ MI     0.93                  : *
 25           ID   * :             3.00 TO 3.99 SQ MI     0.92                  : *
 26           ID   * :             4.00 TO 4.99 SQ MI     0.91                  : *
 27           ID   * :......................................................... : *
 28           ID   ***************************************************************
 29           ID
 30           ID
 31           IT       5       0       0     300
 32           IO       5
 33           IN       5       0       0
 34           JR    PREC     1.0    0.99    0.98    0.94    0.93    0.92    0.91
              *

 35           KK    1-1A
 36           BA   2.339
 37           PB    3.66
 38           PC   0.000   .0200   .0570   .0700   .0870   .1080   .1240   .1300   .1300   .1300
 39           PC   .1300   .1300   .1300   .1330   .1400   .1420   .1480   .1580   .1720   .1810
 40           PC   .1900   .1970   .1990    2000   .2010   .2040   .2140   .2290   .2410   .2490
 41           PC   .2510   .2560   .2700   .2780   .2810   .2830   .2950   .3220   .3520   .4090
 42           PC   .4990   .5900   .7100   .7440   .7810   .8120   .8190   .8350   .8510   .8560
 43           PC   .8600   .8680   .8760   .8880   .9100   .9260   .9370   .9500   .9700   .9760
 44           PC   .9820   .9850   .9870   .9890   .9900   .9930   .9930   .9940   .9950   .9980
 45           PC   .9980   .9990   1.000
 46           LS       0    86.2
 47           UD   0.488
              *
```

```
1                                                HEC-1 INPUT                                                    PAGE  2

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

 48           KK    1-1B
 49           PB    3.61
 50           BA   0.175
 51           LS       0    84.1
 52           UD    .162
              *

 53           KK      R2
 54           KM   ROUTE 1-1B THROUGH PORTION OF 1-1A
 55           KM   ASSUME EXISTING WASH
 56           KM     LEN   SLOPE     n              SHAPE      BW      SS
 57           RD    1885  0.0680    0.04       0    TRAP      20      10
              *

 58           KK     CP1
 59           KM    COMBINE 1-1A AND R2
 60           HC       2
              *
```

```
 61          KK      R3
 62          KM   ROUTE CP1 THROUGH 1-2B TO CP2
 63          KM   ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 64          KM   NSTEPS      K      X
 65          RM       1    .092     .15
             *

 66          KK    1-2A
 67          PB    3.52
 68          BA   0.864
 69          LS       0    86.8
 70          UD    .123
             *

 71          KK      R4
 72          KM   ROUTE 1-2A THROUGH 1-2B TO CP2
 73          KM   ASSUME EXISTING WASH IS MAINTAINED THROUGH DEVELOPED AREA
 74          KM   NSTEPS      K      X
 75          RM       1     054     .15
             *

 76          KK    1-2B
 77          PB    3.51
 78          BA   0.215
 79          LS       0    86.1
 80          UD    .170
             *

 81          KK     CP2
 82          KM    COMBINE 1-2B. R4 AND R3
 83          HC       3
             *
```



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

 84          KK      R5
 85          KM   ROUTE CP2 THROUGH 1-2C TO CP3
 86          KM   ASSUME EXISTING WASH
 87          KM   NSTEPS      K      X
 88          RM       1    .087     .15
             *

 89          KK   1-2CR
 90          PB    3.52
 91          BA   0.571
 92          LS       0    86.2
 93          UD    .178
             *

 94          KK     CP3
 95          KM    COMBINE 1-2C AND R5
 96          HC       2
             *

 97          KK      R6
 98          KM   ROUTE CP3 TO CP4
 99          KM   ASSUME BOX CULVERT
100          KM     LEN   SLOPE     n              SHAPE      BW
101          RD    1745  0.0050   0.015       0    DEEP      14
             *

102          KK    1-3P
103          PB    3.35
104          BA   .0475
105          LS       0    94.5
106          UD    .126
             *

107          KK     CP4
108          KM    COMBINE CP3 and 1-3P
109          HC       2
             *

110          KK      R7
111          KM   ROUTE CP4 THROUGH 1-12P TO CP5 (DETENTION BASIN)
112          KM   ASSUME RCP
113          KM     LEN   SLOPE     n              SHAPE      BW
114          RD    2258  0.0050   0.016       0    DEEP      12
             *

115          KK   1-12P
116          PB    3.32
117          BA   .1654
118          LS       0    90.0
119          UD    .151
             *
```



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

120          KK     CP5
121          KM    COMBINE CP4 AND 1-12P
122          HC       2
             *

123          KK    1-14
124          PB    3.31
125          BA   .0019
126          LS       0    86.9
127          UD    .100
             *

128          KK    1-15
129          PB    3.32
130          BA   .0044
131          LS       0      87
132          UD    .100
             *

133          KK    1-16
```

```
 134          PB    3.31
 135          BA    .0024
 136          LS       0      87
 137          UD    .100
              *

 138          KK    1-17
 139          PB    3.28
 140          BA    .0033
 141          LS       0      87
 142          UD    .100
              *

 143          KK    1-18
 144          PB    3.28
 145          BA    .0046
 146          LS       0    86.7
 147          UD    .100
              *

 148          KK    CP5B
 149          KM    COMBINE CP5. 1-14. 1-15, 1-16, 1-17, AND 1-18 AT DETENTION BASIN
 150          HC       6
              *

 151          KK    EXDB
 152          KO       1
 153          KM   DETENTION BASIN CHEYENNE AND BELTWAY
 154          KM   LOW-FLOW OUTLET IS 66" PIPE
 155          RS       1    STOR       0
 156          SV       0   20.95   29.57   38.62  169.33  234.33  276.38  290.95  305.66  320.37
 157          SV  335.08
 158          SE    2991    2996    2997    2998    3010    3015    3018    3019    3020    3021
 159          SE    3022
1                                        HEC-1 INPUT                                          PAGE  5

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

 160          SL  2993.8   23.76     0.7     0.5
 161          SS  3021.9     200     2.6     1.5
              *

 162          KK    1-4R
 163          PB    3.44
 164          BA    .0535
 165          LS       0      87
 166          UD    .100
              *

 167          KK    1-5R
 168          PB    3.42
 169          BA    .0336
 170          LS       0      87
 171          UD    .100
              *

 172          KK     CP6
 173          KM    COMBINE 1-4R AND 1-5R
 174          HC       2
              *

 175          KK      R8
 176          KM   ROUTE CP6 THROUGH 1-11P TO CP9
 177          KM   ASSUME RCP
 178          KM     LEN   SLOPE      n              SHAPE   DIAMETER
 179          RD    1800  0.0610   0.013       0    CIRC       4
              *

 180          KK    1-6R
 181          PB    3.43
 182          BA    .0151
 183          LS       0      87
 184          UD     100
              *

 185          KK    1-7R
 186          PB    3.44
 187          BA    .0270
 188          LS       0      87
 189          UD     100
              *

 190          KK     CP7
 191          KM    COMBINE 1-6R AND 1-7R
 192          HC       2
              *

 193          KK      R9
 194          KM   ROUTE CP7 THROUGH 1-11P TO CP9
 195          KM   ASSUME RCP
 196          KM     LEN   SLOPE      n              SHAPE   DIAMETER
 197          RD    3150  0.0400   0.013       0    CIRC       4.5
              *
1                                        HEC-1 INPUT                                          PAGE  6

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

 198          KK    1-8R
 199          PB    3.42
 200          BA    .0026
 201          LS       0      87
 202          UD    .100
              *

 203          KK   1-10R
 204          PB    3.41
 205          BA    .0524
 206          LS       0      87
 207          UD    .100
              *

 208          KK     CP8
```

```
209           KM    COMBINE 1-8R AND 1-10R
210           HC       2
              *

211           KK     R10
212           KM   ROUTE CP8 IHROUGH 1-11P TO CP9
213           KM   ASSUME RCP
214           KM     LEN   SLOPE      n              SHAPE   DIAMETER
215           RD    2900  0.0400   0.013       0    CIRC     4.5
              *

216           KK   1-11P
217           PB    3.38
218           BA   .1859
219           LS       0    90.1
220           UD    .167
              *

221           KK     CP9
222           KM    COMBINE CP6, CP7, CP8 AND 1-11P
223           HC       4
              *

224           KK    1-13
225           PB    3.34
226           BA   .0009
227           LS       0      87
228           UD    .100
              *

229           KK   LMT1R
230           PB    3.44
231           BA   1.959
232           LS       0    87.4
233           UD    .435
              *
```

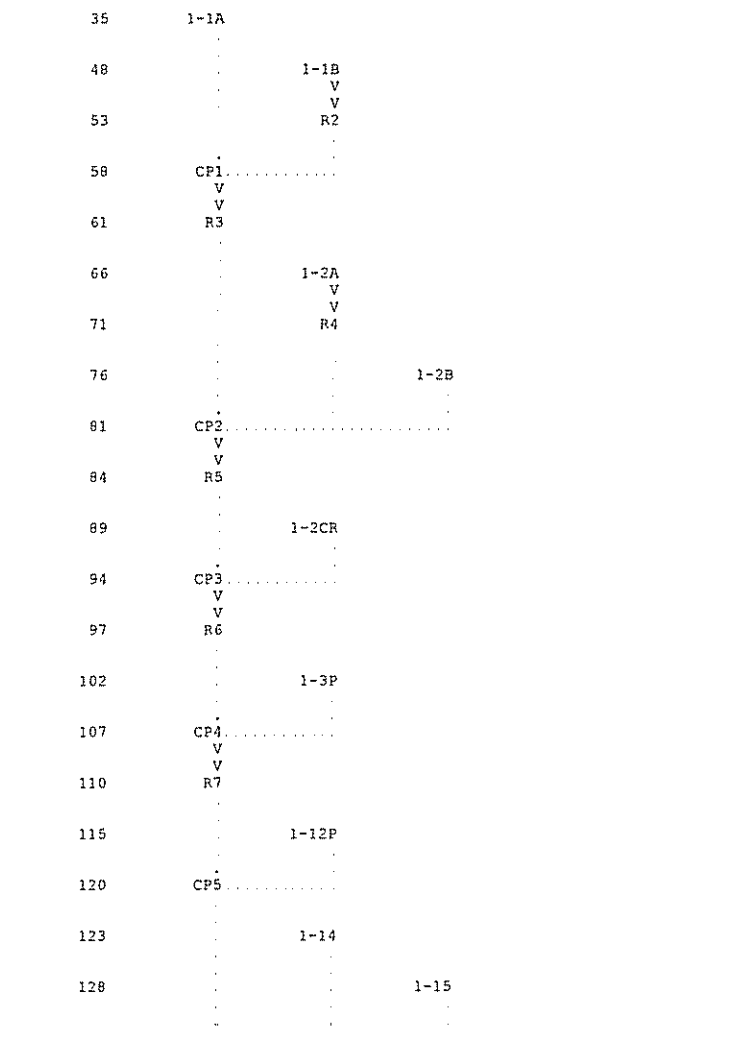


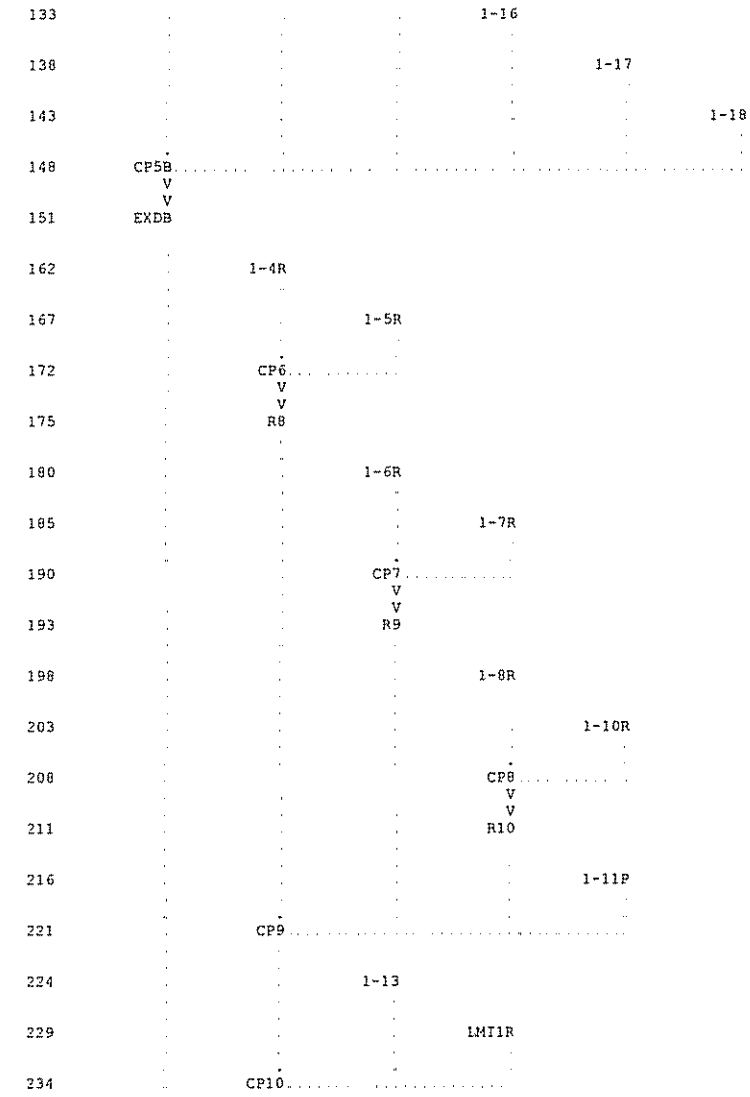
```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

234           KK    CP10
235           KM    COMBINE CP9. 1-13. AND IMT1R
236           HC       3
              *
237           ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK





(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   19SEP07  TIME  09:18:12   *
*                                       *
*****************************************
```

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

```
************************************************************
* ........................................................ *
* :            UPDATE #2 SUMMERLIN VILLAGE 26            : *
* :                  ULTIMATE CONDITION                  : *
* :       THIS MODEL DETERMINES THE RUNOFF DURING         : *
* :           ULTIMATE DEVELOPMENT CONDITIONS             : *
* :.....................................................: *
* :            RETURN PERIOD_ _ _ _100-YEAR               : *
* :            DISTRIBUTION_ _ _ _ 6-HOUR SDN3            : *
* :            PROJECT NO_ _ _ _ _ 764.20101              : *
* :            FILENAME_ _ _ _ _ _ V26ULT.H1              : *
* :            DATE_ _ _ _ _ _ _ _ 9/13/07                : *
* :            MODELED BY_ _ _ _ _ REH/BJK                : *
* :                                                       : *
* :            DEPTH AREA REDUCTION FACTORS:              : *
* :              AREA                 DARF                : *
* :            0.00 TO 0.24 SQ MI     1.00                : *
* :            0.25 TO 0.49 SQ MI     0.99                : *
* :            0.50 TO 0.99 SQ MI     0.98                : *
* :            1.00 TO 1.24 SQ MI     0.97                : *
* :            1.25 TO 1.50 SQ MI     0.96                : *
* :            1.51 TO 1.74 SQ MI     0.95                : *
* :            1.75 TO 1.99 SQ MI     0.94                : *
* :            2.00 TO 2.99 SQ MI     0.93                : *
* :            3.00 TO 3.99 SQ MI     0.92                : *
* :            4.00 TO 4.99 SQ MI     0.91                : *
* :.....................................................: *
************************************************************
```

```
32 IO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
```

```
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                     NMIN          5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      2   0  ENDING DATE
                   NDTIME       0055  ENDING TIME
                    ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL      .08 HOURS
                      TOTAL TIME BASE   24.92 HOURS

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

    JP          MULTI-PLAN OPTION
                    NPLAN          1  NUMBER OF PLANS

    JR          MULTI-RATIO OPTION
                   RATIOS OF PRECIPITATION
                  1.00       .99       98        94        .93       .92       .91


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


            *************
            *           *
 151 KK     *     EXDB  *
            *           *
            *************

 152 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          1  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL         0.  HYDROGRAPH PLOT SCALE
                        DETENTION BASIN CHEYENNE AND BELTWAY
                        LOW-FLOW OUTLET IS 66" PIPE

              HYDROGRAPH ROUTING DATA

 155 RS          STORAGE ROUTING
                    NSTPS          1  NUMBER OF SUBREACHES
                     ITYP       STOR  TYPE OF INITIAL CONDITION
                   RSVRIC         00  INITIAL CONDITION
                        X        .00 WORKING R AND D COEFFICIENT

 156 SV            STORAGE          .0      21.0      29.6      38.6     169.3     234.3     276.4     291.0     305.7     320.4
                                335.1

 158 SE          ELEVATION     2991.00   2996.00   2997.00   2998.00   3010.00   3015.00   3018.00   3019.00   3020.00   3021.00
                               3022.00

 160 SL          LOW-LEVEL OUTLET
                    ELEVL     2993.80  ELEVATION AT CENTER OF OUTLET
                    CAREA       23.76  CROSS-SECTIONAL AREA
                     COQL         .70  COEFFICIENT
                     EXPL         .50  EXPONENT OF HEAD

 161 SS          SPILLWAY
                     CREL     3021.90  SPILLWAY CREST ELEVATION
                    SPWID      200.00  SPILLWAY WIDTH
                     COQW        2.60  WEIR COEFFICIENT
                     EXPW        1.50  EXPONENT OF HEAD

                                                    ***

                                          COMPUTED OUTFLOW-ELEVATION DATA

          OUTFLOW        .00       .00    223.27    247.47    277.53    315.91    366.62    436.71    539.94    707.08
        ELEVATION    2991.00   2993.80   2996.60   2997.24   2998.13   2999.41   3001.35   3004.52   3010.19   3021.90

          OUTFLOW     707.16    707.39    707.84    708.63    709.81    711.51    713.77    716.66    720.33    724.81
        ELEVATION    3021.90   3021.91   3021.91   3021.92   3021.93   3021.94   3021.95   3021.97   3021.98   3022.00


                                       COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

          STORAGE        .00     11.73     20.95     26.14     29.57     31.76     38.62     40.03     53.97     75.16
          OUTFLOW        .00       .00    197.85    223.27    238.61    247.47    273.36    277.53    315.91    366.62
        ELEVATION    2991.00   2993.80   2996.00   2996.60   2997.00   2997.24   2998.00   2998.13   2999.41   3001.35

          STORAGE     109.63    169.33    171.74    234.33    276.38    290.95    305.66    320.37    333.61    333.77
          OUTFLOW     436.71    536.88    539.94    614.17    656.18    669.61    682.76    695.67    707.08    707.84
        ELEVATION    3004.52   3010.00   3010.19   3015.00   3018.00   3019.00   3020.00   3021.00   3021.90   3021.91

          STORAGE     334.01    334.17    334.36    334.57    334.81    335.08
          OUTFLOW     709.81    711.51    713.77    716.66    720.33    724.81
        ELEVATION    3021.93   3021.94   3021.95   3021.97   3021.98   3022.00

WARNING --- ROUTED OUTFLOW (    781.) IS GREATER THAN MAXIMUM OUTFLOW (    725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    863.) IS GREATER THAN MAXIMUM OUTFLOW (    725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    926.) IS GREATER THAN MAXIMUM OUTFLOW (    725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    967.) IS GREATER THAN MAXIMUM OUTFLOW (    725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    990.) IS GREATER THAN MAXIMUM OUTFLOW (    725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    996.) IS GREATER THAN MAXIMUM OUTFLOW (    725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (    988.) IS GREATER THAN MAXIMUM OUTFLOW (    725.) IN STORAGE-OUTFLOW TABLE
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WARNING --- ROUTED OUTFLOW (969.) IS GREATER THAN MAXIMUM OUTFLOW (725) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (941.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (905.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (864.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (818.) IS GREATER THAN MAXIMUM OUTFLOW (725) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (770) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION EXDB
PLAN 1. RATIO = 1 00

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0	.0	2991.0	1		0820	101	600.	222.7	3014.1	1		1640	201	3.	11.9	2993.8
1		0005	2	0.	.0	2991.0	1		0825	102	595.	218.5	3013.8	1		1645	202	3.	11.8	2993.8
1		0010	3	0.	.0	2991.0	1		0830	103	591.	214.5	3013.5	1		1650	203	2.	11.8	2993.8
1		0015	4	0.	.0	2991.0	1		0835	104	586.	210.4	3013.2	1		1655	204	2.	11.8	2993.8
1		0020	5	0.	.0	2991.0	1		0840	105	581.	206.4	3012.9	1		1700	205	2.	11.8	2993.8
1		0025	6	0.	.1	2991.0	1		0845	106	576.	202.4	3012.5	1		1705	206	1	11.8	2993.8
1		0030	7	0.	.2	2991.0	1		0850	107	572.	198.5	3012.2	1		1710	207	1.	11.8	2993.8
1		0035	8	0.	.3	2991.1	1		0855	108	567.	194.5	3011.9	1		1715	208	1.	11.8	2993.8
1		0040	9	0.	.6	2991.1	1		0900	109	562.	190.6	3011.6	1		1720	209	1.	11.8	2993.8
1		0045	10	0.	.9	2991.2	1		0905	110	558.	186.8	3011.3	1		1725	210	1.	11.8	2993.8
1		0050	11	0	1.2	2991.3	1		0910	111	553.	183.0	3011.0	1		1730	211	1	11.8	2993.8
1		0055	12	0	1.5	2991.4	1		0915	112	549.	179.2	3010.8	1		1735	212	1.	11.8	2993.8
1		0100	13	0.	1.8	2991.4	1		0920	113	544.	175.4	3010.5	1		1740	213	0	11.8	2993.8
1		0105	14	0.	2.0	2991.5	1		0925	114	540.	171.7	3010.2	1		1745	214	0	11.8	2993.8
1		0110	15	0.	2.3	2991.5	1		0930	115	535.	168.0	3009.9	1		1750	215	0	11.7	2993.8
1		0115	16	0.	2.6	2991.6	1		0935	116	528.	164.3	3009.5	1		1755	216	0.	11.7	2993.8
1		0120	17	0.	2.9	2991.7	1		0940	117	522.	160.7	3009.2	1		1800	217	0.	11.7	2993.8
1		0125	18	0.	3.3	2991.8	1		0945	118	516.	157.1	3008.9	1		1805	218	0.	11.7	2993.8
1		0130	19	0.	3.8	2991.9	1		0950	119	510.	153.6	3008.6	1		1810	219	0.	11.7	2993.8
1		0135	20	0.	4.4	2992.1	1		0955	120	505.	150.1	3008.2	1		1815	220	0.	11.7	2993.8
1		0140	21	0.	5.3	2992.3	1		1000	121	499.	146.6	3007.9	1		1820	221	0	11.7	2993.8
1		0145	22	0.	6.4	2992.5	1		1005	122	493.	143.2	3007.6	1		1825	222	0	11.7	2993.8
1		0150	23	0.	7.7	2992.8	1		1010	123	487.	139.8	3007.3	1		1830	223	0	11.7	2993.8
1		0155	24	0.	9.1	2993.2	1		1015	124	482.	136.5	3007.0	1		1835	224	0.	11.7	2993.8
1		0200	25	0.	10.4	2993.5	1		1020	125	476.	133.2	3006.7	1		1840	225	0.	11.7	2993.8
1		0205	26	1.	11.8	2993.8	1		1025	126	471.	129.9	3006.4	1		1845	226	0.	11.7	2993.8
1		0210	27	27.	13.0	2994.1	1		1030	127	465.	126.7	3006.1	1		1850	227	0.	11.7	2993.8
1		0215	28	50.	14.0	2994.4	1		1035	128	460.	123.5	3005.8	1		1855	228	0	11.7	2993.8
1		0220	29	73.	15.1	2994.6	1		1040	129	455.	120.4	3005.5	1		1900	229	0.	11.7	2993.8
1		0225	30	99.	16.4	2994.9	1		1045	130	450.	117.3	3005.2	1		1905	230	0.	11.7	2993.8
1		0230	31	127.	17.7	2995.2	1		1050	131	444.	114.2	3004.9	1		1910	231	0.	11.7	2993.8
1		0235	32	154.	18.9	2995.5	1		1055	132	439.	111.1	3004.7	1		1915	232	0.	11.7	2993.8
1		0240	33	179	20.1	2995.8	1		1100	133	434.	108.1	3004.4	1		1920	233	0.	11.7	2993.8
1		0245	34	199	21.1	2996.0	1		1105	134	428.	105.2	3004.1	1		1925	234	0.	11.7	2993.8
1		0250	35	204	22.2	2996.1	1		1110	135	422.	102.2	3003.8	1		1930	235	0.	11.7	2993.8
1		0255	36	210.	23.4	2996.3	1		1115	136	416.	99.4	3003.6	1		1935	236	0	11.7	2993.8
1		0300	37	216.	24.6	2996.4	1		1120	137	410.	96.5	3003.3	1		1940	237	0.	11.7	2993.8
1		0305	38	222.	25.9	2996.6	1		1125	138	404.	93.7	3003.1	1		1945	238	0.	11.7	2993.8
1		0310	39	229.	27.4	2996.8	1		1130	139	399.	91.0	3002.8	1		1950	239	0.	11.7	2993.8
1		0315	40	239.	29.8	2997.0	1		1135	140	393.	88.2	3002.6	1		1955	240	0.	11.7	2993.8
1		0320	41	255.	33.8	2997.5	1		1140	141	388.	85.5	3002.3	1		2000	241	0.	11.7	2993.8
1		0325	42	280.	40.8	2998.2	1		1145	142	382.	82.9	3002.1	1		2005	242	0.	11.7	2993.8
1		0330	43	312.	52.4	2999.3	1		1150	143	377.	80.3	3001.8	1		2010	243	0	11.7	2993.8
1		0335	44	353.	69.6	3000.8	1		1155	144	372.	77.7	3001.6	1		2015	244	0.	11.7	2993.8
1		0340	45	400.	91.6	3002.9	1		1200	145	367.	75.1	3001.4	1		2020	245	0.	11.7	2993.8
1		0345	46	448.	116.3	3005.1	1		1205	146	361.	72.6	3001.1	1		2025	246	0.	11.7	2993.8
1		0350	47	491.	141.8	3007.5	1		1210	147	355.	70.2	3000.9	1		2030	247	0.	11.7	2993.8
1		0355	48	532.	166.5	3009.7	1		1215	148	349.	67.8	3000.7	1		2035	248	0.	11.7	2993.8
1		0400	49	561.	189.8	3011.6	1		1220	149	343.	65.4	3000.5	1		2040	249	0.	11.7	2993.8
1		0405	50	587.	211.6	3013.3	1		1225	150	338.	63.0	3000.2	1		2045	250	0.	11.7	2993.8
1		0410	51	611.	231.7	3014.8	1		1230	151	332.	60.7	3000.0	1		2050	251	0	11.7	2993.8
1		0415	52	630	249.9	3016.1	1		1235	152	327.	58.5	2999.8	1		2055	252	0.	11.7	2993.8
1		0420	53	646	265.7	3017.2	1		1240	153	321.	56.2	2999.6	1		2100	253	0.	11.7	2993.8
1		0425	54	659.	279.3	3018.2	1		1245	154	316.	54.0	2999.4	1		2105	254	0.	11.7	2993.8
1		0430	55	670.	290.9	3019.0	1		1250	155	310.	51.9	2999.2	1		2110	255	0.	11.7	2993.8
1		0435	56	679.	300.9	3019.7	1		1255	156	304	49.8	2999.0	1		2115	256	0.	11.7	2993.8
1		0440	57	686.	309.9	3020.3	1		1300	157	299.	47.7	2998.8	1		2120	257	0.	11.7	2993.8
1		0445	58	694.	318.1	3020.8	1		1305	158	293.	45.6	2998.6	1		2125	258	0	11.7	2993.8
1		0450	59	700.	325.5	3021.3	1		1310	159	287.	43.6	2998.5	1		2130	259	0	11.7	2993.8
1		0455	60	706.	332.3	3021.8	1		1315	160	282.	41.7	2998.3	1		2135	260	0.	11.7	2993.8
1		0500	61	781.	338.4	3022.2	1		1320	161	277.	39.8	2998.1	1		2140	261	0.	11.7	2993.8
1		0505	62	863.	343.3	3022.6	1		1325	162	271.	37.9	2997.9	1		2145	262	0.	11.7	2993.8
1		0510	63	926.	347.0	3022.8	1		1330	163	264.	36.0	2997.7	1		2150	263	0.	11.7	2993.8
1		0515	64	967.	349.5	3023.0	1		1335	164	257.	34.2	2997.5	1		2155	264	0.	11.7	2993.8
1		0520	65	990.	350.8	3023.1	1		1340	165	250.	32.5	2997.3	1		2200	265	0	11.7	2993.8
1		0525	66	996.	351.2	3023.1	1		1345	166	244.	30.8	2997.1	1		2205	266	0.	11.7	2993.8
1		0530	67	988.	350.7	3023.1	1		1350	167	237.	29.1	2997.0	1		2210	267	0.	11.7	2993.8
1		0535	68	969.	349.6	3023.0	1		1355	168	230.	27.5	2996.8	1		2215	268	0.	11.7	2993.8
1		0540	69	941.	347.9	3022.9	1		1400	169	223	26.0	2996.6	1		2220	269	0.	11.7	2993.8
1		0545	70	905	345.8	3022.7	1		1405	170	215.	24.5	2996.4	1		2225	270	0.	11.7	2993.8
1		0550	71	864	343.3	3022.6	1		1410	171	208.	23.0	2996.2	1		2230	271	0	11.7	2993.8
1		0555	72	818.	340.6	3022.4	1		1415	172	201.	21.6	2996.1	1		2235	272	0.	11.7	2993.8
1		0600	73	770.	337.8	3022.2	1		1420	173	194.	20.3	2995.8	1		2240	273	0.	11.7	2993.8
1		0605	74	722.	334.9	3022.0	1		1425	174	158.	19.1	2995.6	1		2245	274	0.	11.7	2993.8
1		0610	75	706.	331.9	3021.8	1		1430	175	136.	18.1	2995.3	1		2250	275	0.	11.7	2993.8
1		0615	76	703.	328.6	3021.6	1		1435	176	118.	17.2	2995.1	1		2255	276	0.	11.7	2993.8
1		0620	77	700.	325.1	3021.3	1		1440	177	102.	16.5	2994.9	1		2300	277	0.	11.7	2993.8
1		0625	78	697.	321.4	3021.1	1		1445	178	88.	15.8	2994.8	1		2305	278	0	11.7	2993.8
1		0630	79	693.	317.5	3020.8	1		1450	179	75.	15.2	2994.6	1		2310	279	0.	11.7	2993.8
1		0635	80	690.	313.5	3020.5	1		1455	180	65.	14.8	2994.5	1		2315	280	0.	11.7	2993.8
1		0640	81	686.	309.3	3020.2	1		1500	181	56	14.3	2994.4	1		2320	281	0.	11.7	2993.8
1		0645	82	682.	305.1	3020.0	1		1505	182	48	14.0	2994.3	1		2325	282	0.	11.7	2993.8
1		0650	83	678.	300.8	3019.7	1		1510	183	42.	13.7	2994.3	1		2330	283	0.	11.7	2993.8
1		0655	84	675.	296.4	3019.4	1		1515	184	36.	13.4	2994.2	1		2335	284	0.	11.7	2993.8
1		0700	85	671.	292.0	3019.1	1		1520	185	31.	13.2	2994.1	1		2340	285	0.	11.7	2993.8
1		0705	86	667	287.6	3018.8	1		1525	186	27.	13.0	2994.1	1		2345	286	0.	11.7	2993.8
1		0710	87	662	283.2	3018.5	1		1530	187	23.	12.8	2994.1	1		2350	287	0.	11.7	2993.8
1		0715	88	658.	278.7	3018.2	1		1535	188	20.	12.7	2994.0	1		2355	288	0.	11.7	2993.8
1		0720	89	654.	274.3	3017.9	1		1540	189	17.	12.5	2994.0	2		0000	289	0.	11.7	2993.8
1		0725	90	650.	269.9	3017.5	1		1545	190	15.	12.4	2994.0	2		0005	290	0.	11.7	2993.8
1		0730	91	645.	265.5	3017.2	1		1550	191	13.	12.3	2993.9	2		0010	291	0.	11.7	2993.8

1	0735	92	641.	261.1	3016.9	*	1	1555	192	11.	12.2	2993.9	*	2	0015	292	0.	11.7	2993.8
1	0740	93	637.	256.7	3016.6	*	1	1600	193	9.	12.2	2993.9	*	2	0020	293	0.	11.7	2993.8
1	0745	94	632.	252.4	3016.3	*	1	1605	194	8.	12.1	2993.9	*	2	0025	294	0.	11.7	2993.8
1	0750	95	628.	248.0	3016.0	*	1	1610	195	7.	12.1	2993.9	*	2	0030	295	0.	11.7	2993.8
1	0755	96	624.	243.7	3015.7	*	1	1615	196	6.	12.0	2993.9	*	2	0035	296	0.	11.7	2993.8
1	0800	97	619.	239.5	3015.4	*	1	1620	197	5.	12.0	2993.9	*	2	0040	297	0.	11.7	2993.8
1	0805	98	615.	235.2	3015.1	*	1	1625	198	5.	11.9	2993.9	*	2	0045	298	0.	11.7	2993.8
1	0810	99	610.	231.0	3014.7	*	1	1630	199	4.	11.9	2993.8	*	2	0050	299	0.	11.7	2993.8
1	0815	100	605.	226.8	3014.4	*	1	1635	200	3.	11.9	2993.8	*	2	0055	300	0	11.7	2993.8

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
996.	5.42		674.	256.	246.	246.
		(INCHES)	1.427	2.166	2.166	2.166
		(AC-FT)	334.	507.	507	507

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
(AC-FT)	(HR)				
351.	5.42	266.	89.	86.	86.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
(FEET)	(HR)				
3023.09	5.42	3017.09	3001.30	3000.92	3000.92

CUMULATIVE AREA = 4.39 SQ MI

WARNING --- ROUTED OUTFLOW (785.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (854.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (901.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (929.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (941.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (938.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (924.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (900.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (867.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (829.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (787.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (742.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION EXDB
PLAN 1. RATIO = .99

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0	.0	2991.0	1		0820	101	599.	221.3	3014.0	1		1640	201	3.	11.9	2993.8
1		0005	2	0.	.0	2991.0	1		0825	102	594.	217.2	3013.7	1		1645	202	2.	11.8	2993.8
1		0010	3	0.	.0	2991.0	1		0830	103	589.	213.1	3013.4	1		1650	203	2	11.8	2993.8
1		0015	4	0.	.0	2991.0	1		0835	104	584.	209.1	3013.1	1		1655	204	2.	11.8	2993.8
1		0020	5	0.	.0	2991.0	1		0840	105	579.	205.1	3012.7	1		1700	205	2.	11.8	2993.8
1		0025	6	0.	.1	2991.0	1		0845	106	575.	201.1	3012.4	1		1705	206	1.	11.8	2993.8
1		0030	7	0.	.2	2991.0	1		0850	107	570	197.2	3012.1	1		1710	207	1.	11.8	2993.8
1		0035	8	0.	3	2991.1	1		0855	108	565.	193.3	3011.8	1		1715	208	1.	11.8	2993.8
1		0040	9	0.	6	2991.1	1		0900	109	561.	189.4	3011.5	1		1720	209	1.	11.8	2993.8
1		0045	10	0.	9	2991.2	1		0905	110	556.	185.5	3011.2	1		1725	210	1.	11.8	2993.8
1		0050	11	0.	1.2	2991.3	1		0910	111	552.	181.7	3011.0	1		1730	211	1	11.8	2993.8
1		0055	12	0.	1.4	2991.3	1		0915	112	547.	177.9	3010.7	1		1735	212	1.	11.8	2993.8
1		0100	13	0.	1.7	2991.4	1		0920	113	543.	174.2	3010.4	1		1740	213	0.	11.8	2993.8
1		0105	14	0.	1.9	2991.5	1		0925	114	538.	170.4	3010.1	1		1745	214	0.	11.8	2993.8
1		0110	15	0.	2.2	2991.5	1		0930	115	533.	166.8	3009.8	1		1750	215	0.	11.7	2993.8
1		0115	16	0.	2.4	2991.6	1		0935	116	526.	163.1	3009.4	1		1755	216	0.	11.7	2993.8
1		0120	17	0.	2.7	2991.7	1		0940	117	520.	159.5	3009.1	1		1800	217	0.	11.7	2993.8
1		0125	18	0.	3.1	2991.7	1		0945	118	514.	155.9	3008.8	1		1805	218	0.	11.7	2993.8
1		0130	19	0.	3.6	2991.9	1		0950	119	509.	152.4	3008.4	1		1810	219	0.	11.7	2993.8
1		0135	20	0.	4.2	2992.0	1		0955	120	503.	148.9	3008.1	1		1815	220	0	11.7	2993.8
1		0140	21	0.	5.1	2992.2	1		1000	121	497.	145.5	3007.8	1		1820	221	0.	11.7	2993.8
1		0145	22	0.	6.1	2992.5	1		1005	122	491.	142.1	3007.5	1		1825	222	0.	11.7	2993.8
1		0150	23	0	7.4	2992.8	1		1010	123	486.	138.7	3007.2	1		1830	223	0.	11.7	2993.8
1		0155	24	0	8.7	2993.1	1		1015	124	480.	135.4	3006.9	1		1835	224	0.	11.7	2993.8
1		0200	25	0.	10.1	2993.4	1		1020	125	474	132.1	3006.6	1		1840	225	0.	11.7	2993.8
1		0205	26	0.	11.4	2993.7	1		1025	126	469.	128.9	3006.3	1		1845	226	0.	11.7	2993.8
1		0210	27	18.	12.6	2994.0	1		1030	127	464.	125.7	3006.0	1		1850	227	0.	11.7	2993.8
1		0215	28	41.	13.7	2994.3	1		1035	128	458.	122.5	3005.7	1		1855	228	0.	11.7	2993.8
1		0220	29	65.	14.8	2994.5	1		1040	129	453.	119.3	3005.4	1		1900	229	0.	11.7	2993.8
1		0225	30	92.	16.0	2994.8	1		1045	130	448.	116.2	3005.1	1		1905	230	0.	11.7	2993.8
1		0230	31	120.	17.3	2995.1	1		1050	131	443.	113.2	3004.8	1		1910	231	0.	11.7	2993.8
1		0235	32	147.	18.6	2995.4	1		1055	132	438.	110.1	3004.6	1		1915	232	0.	11.7	2993.8
1		0240	33	171.	19.7	2995.7	1		1100	133	432.	107.2	3004.3	1		1920	233	0.	11.7	2993.8
1		0245	34	194.	20.8	2996.0	1		1105	134	426.	104.2	3004.0	1		1925	234	0.	11.7	2993.8
1		0250	35	202.	21.8	2996.1	1		1110	135	420.	101.3	3003.8	1		1930	235	0	11.7	2993.8
1		0255	36	208.	23.0	2996.2	1		1115	136	414.	98.4	3003.5	1		1935	236	0	11.7	2993.8
1		0300	37	214.	24.1	2996.4	1		1120	137	408.	95.6	3003.2	1		1940	237	0.	11.7	2993.8
1		0305	38	220.	25.4	2996.5	1		1125	138	402.	92.8	3003.0	1		1945	238	0.	11.7	2993.8
1		0310	39	227.	26.9	2996.7	1		1130	139	397.	90.0	3002.7	1		1950	239	0.	11.7	2993.8
1		0315	40	237.	29.2	2997.0	1		1135	140	391	87.3	3002.5	1		1955	240	0.	11.7	2993.8
1		0320	41	253.	33.1	2997.4	1		1140	141	386	84.7	3002.2	1		2000	241	0.	11.7	2993.8
1		0325	42	277.	40.0	2998.1	1		1145	142	381.	82.0	3002.0	1		2005	242	0.	11.7	2993.8
1		0330	43	309.	51.4	2999.2	1		1150	143	375.	79.4	3001.7	1		2010	243	0.	11.7	2993.8
1		0335	44	350.	68.3	3000.7	1		1155	144	370.	76.8	3001.5	1		2015	244	0.	11.7	2993.8
1		0340	45	397	90.0	3002.7	1		1200	145	365.	74.3	3001.3	1		2020	245	0.	11.7	2993.8
1		0345	46	445.	114.4	3005.0	1		1205	146	359.	71.8	3001.0	1		2025	246	0.	11.7	2993.8
1		0350	47	487.	139.5	3007.3	1		1210	147	353.	69.4	3000.8	1		2030	247	0.	11.7	2993.8

1	0355	48	528.	163.8	3009.5	*	1	1215	148	347.	67.0	3000.6	*	1	2035	248	0.	11.7	2993.8
1	0400	49	558.	186.7	3011.3	*	1	1220	149	341.	64.6	3000.4	*	1	2040	249	0.	11.7	2993.8
1	0405	50	583.	208.2	3013.0	*	1	1225	150	336.	62.3	3000.2	*	1	2045	250	0.	11.7	2993.8
1	0410	51	607.	228.1	3014.5	*	1	1230	151	330.	60.0	3000.0	*	1	2050	251	0.	11.7	2993.8
1	0415	52	626.	245.9	3015.8	*	1	1235	152	325.	57.7	2999.8	*	1	2055	252	0.	11.7	2993.8
1	0420	53	641.	261.6	3016.9	*	1	1240	153	320.	55.5	2999.5	*	1	2100	253	0	11.7	2993.8
1	0425	54	655.	275.0	3017.9	*	1	1245	154	314.	53 3	2999.3	*	1	2105	254	0.	11.7	2993.8
1	0430	55	665.	286.4	3018.7	*	1	1250	155	308.	51.2	2999.2	*	1	2110	255	0.	11.7	2993.8
1	0435	56	674.	296.2	3019.4	*	1	1255	156	302.	49.1	2999.0	*	1	2115	256	0.	11.7	2993.8
1	0440	57	682.	305.1	3020.0	*	1	1300	157	297.	47.0	2998.8	*	1	2120	257	0.	11.7	2993.8
1	0445	58	689.	313 1	3020.5	*	1	1305	158	291.	45.0	2998.6	*	1	2125	258	0.	11.7	2993.8
1	0450	59	696.	320 4	3021 0	*	1	1310	159	286.	43.0	2998 4	*	1	2130	259	0.	11.7	2993.8
1	0455	60	701.	327 1	3021 5	*	1	1315	160	280.	41.0	2998.2	*	1	2135	260	0	11.7	2993.8
1	0500	61	707.	333.3	3021.9	*	1	1320	161	275	39.1	2998.0	*	1	2140	261	0.	11.7	2993.8
1	0505	62	785.	338.6	3022.2	*	1	1325	162	268.	37.3	2997.9	*	1	2145	262	0.	11.7	2993.8
1	0510	63	854.	342.7	3022.5	*	1	1330	163	261.	35.4	2997.6	*	1	2150	263	0.	11.7	2993.8
1	0515	64	901.	345.6	3022.7	*	1	1335	164	255.	33.7	2997.5	*	1	2155	264	0.	11.7	2993.8
1	0520	65	929.	347.2	3022.8	*	1	1340	165	248.	31.9	2997.3	*	1	2200	265	0	11.7	2993.8
1	0525	66	941.	347 9	3022 9	*	1	1345	166	241.	30.2	2997.1	*	1	2205	266	0	11 7	2993.8
1	0530	67	938.	347.7	3022.9	*	1	1350	167	234	28.6	2996.9	*	1	2210	267	0.	11.7	2993.8
1	0535	68	924.	346.9	3022 8	*	1	1355	168	227.	27.0	2996.7	*	1	2215	268	0.	11.7	2993.8
1	0540	69	900.	345.5	3022.7	*	1	1400	169	220.	25.5	2996.5	*	1	2220	269	0	11 7	2993.8
1	0545	70	867	343.5	3022.6	*	1	1405	170	213.	24.0	2996.4	*	1	2225	270	0	11.7	2993.8
1	0550	71	829.	341.3	3022.4	*	1	1410	171	206.	22.5	2996 2	*	1	2230	271	0	11.7	2993.8
1	0555	72	787	338.8	3022.3	*	1	1415	172	199.	21.2	2996 0	*	1	2235	272	0	11.7	2993.8
1	0600	73	742.	336.1	3022.1	*	1	1420	173	175.	19.9	2995.7	*	1	2240	273	0	11.7	2993.8
1	0605	74	707.	333.3	3021 9	*	1	1425	174	151.	18.7	2995.5	*	1	2245	274	0.	11.7	2993.8
1	0610	75	704.	330 4	3021 7	*	1	1430	175	130	17.8	2995.2	*	1	2250	275	0.	11.7	2993 8
1	0615	76	701.	327 1	3021.5	*	1	1435	176	112.	16.9	2995.0	*	1	2255	276	0.	11.7	2993.8
1	0620	77	698.	323.6	3021.2	*	1	1440	177	97.	16.2	2994.9	*	1	2300	277	0	11.7	2993.8
1	0625	78	695.	319.8	3021.0	*	1	1445	178	83.	15.6	2994.7	*	1	2305	278	0	11.7	2993.8
1	0630	79	692.	315.9	3020.7	*	1	1450	179	72.	15.1	2994.6	*	1	2310	279	0	11.7	2993.8
1	0635	80	688.	311.9	3020.4	*	1	1455	180	62.	14 6	2994.5	*	1	2315	280	0.	11.7	2993.8
1	0640	81	685.	307.8	3020.1	*	1	1500	181	53	14.2	2994.4	*	1	2320	281	0.	11.7	2993.8
1	0645	82	681.	303 5	3019.9	*	1	1505	182	46.	13.9	2994.3	*	1	2325	282	0.	11.7	2993.8
1	0650	83	677.	299.3	3019.6	*	1	1510	183	40.	13.6	2994.2	*	1	2330	283	0.	11.7	2993.8
1	0655	84	673.	294.9	3019.3	*	1	1515	184	34.	13.3	2994.2	*	1	2335	284	0.	11.7	2993.8
1	0700	85	669.	290.5	3019.0	*	1	1520	185	30.	13.1	2994.1	*	1	2340	285	0.	11.7	2993.8
1	0705	86	665.	286.1	3018.7	*	1	1525	186	25.	12.9	2994.1	*	1	2345	286	0.	11.7	2993.8
1	0710	87	661.	281.7	3018.4	*	1	1530	187	22.	12.8	2994.0	*	1	2350	287	0.	11.7	2993.8
1	0715	88	657.	277.3	3018.1	*	1	1535	188	19.	12.6	2994.0	*	1	2355	288	0.	11.7	2993.8
1	0720	89	653.	272.8	3017.7	*	1	1540	189	16.	12.5	2994.0	*	2	0000	289	0.	11.7	2993 8
1	0725	90	648.	268.4	3017.4	*	1	1545	190	14.	12.4	2994.0	*	2	0005	290	0	11.7	2993.8
1	0730	91	644.	264.0	3017 1	*	1	1550	191	12.	12.3	2993.9	*	2	0010	291	0	11.7	2993.8
1	0735	92	639.	259.6	3016 8	*	1	1555	192	10.	12.2	2993.9	*	2	0015	292	0	11.7	2993.8
1	0740	93	635.	255.3	3016.5	*	1	1600	193	9.	12 2	2993.9	*	2	0020	293	0.	11.7	2993.8
1	0745	94	631.	250.9	3016.2	*	1	1605	194	8	12.1	2993.9	*	2	0025	294	0.	11.7	2993.8
1	0750	95	626.	246.6	3015.9	*	1	1610	195	7	12.0	2993.9	*	2	0030	295	0.	11.7	2993.8
1	0755	96	622.	242 3	3015.6	*	1	1615	196	6.	12.0	2993 9	*	2	0035	296	0.	11 7	2993.8
1	0800	97	618.	238.0	3015.3	*	1	1620	197	5.	12.0	2993 9	*	2	0040	297	0.	11 7	2993.8
1	0805	98	614.	233.8	3015.0	*	1	1625	198	4.	11.9	2993.8	*	2	0045	298	0.	11.7	2993.8
1	0810	99	609.	229.6	3014.6	*	1	1630	199	4.	11.9	2993.8	*	2	0050	299	0.	11 7	2993.8
1	0815	100	604.	225.4	3014.3	*	1	1635	200	3.	11.9	2993.8	*	2	0055	300	0.	11.7	2993.8

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
941.	5.42		663.	252.	243.	243.
		(INCHES)	1.403	2.134	2.134	2.134
		(AC-FT)	329.	500.	500.	500.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
(AC-FT)	(HR)				
348.	5.42	264.	89.	85.	85.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
(FEET)	(HR)				
3022.87	5.42	3016.94	3001.24	3000.86	3000.86

CUMULATIVE AREA = 4.39 SQ MI

WARNING --- ROUTED OUTFLOW (770.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (825.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (860) IS GREATER THAN MAXIMUM OUTFLOW (725) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (878.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (881.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (872) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (852.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (824.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (790) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

WARNING --- ROUTED OUTFLOW (752.) IS GREATER THAN MAXIMUM OUTFLOW (725.) IN STORAGE-OUTFLOW TABLE

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .98

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2991.0	1		0820	101	597	219.7	3013.9	1		1640	201	3.	11.9	2993.8
1		0005	2	0.	.0	2991.0	1		0825	102	592.	215.6	3013.6	1		1645	202	2.	11.8	2993.8
1		0010	3	0.	.0	2991.0	1		0830	103	587.	211.5	3013.2	1		1650	203	2.	11.8	2993.8
1		0015	4	0.	0	2991 0	1		0835	104	582.	207 5	3012.9	1		1655	204	2.	11.8	2993.8
1		0020	5	0.	0	2991.0	1		0840	105	578.	203.5	3012.6	1		1700	205	1.	11.8	2993 8
1		0025	6	0.	.1	2991.0	1		0845	106	573.	199.6	3012.3	1		1705	206	1	11.8	2993.8
1		0030	7	0.	.1	2991.0	1		0850	107	568.	195.6	3012.0	1		1710	207	1	11.8	2993.8

| | | |

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .94

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2991.0	1		0820	101	581.	206.4	3012.8	1		1640	201	2.	11.8	2993.8
1		0005	2	0.	.0	2991.0	1		0825	102	576.	202.4	3012.5	1		1645	202	1.	11.8	2993.8
1		0010	3	0.	.0	2991.0	1		0830	103	572.	198.4	3012.2	1		1650	203	1.	11.8	2993.8
1		0015	4	0.	.0	2991.0	1		0835	104	567.	194.5	3011.9	1		1655	204	1.	11.8	2993.8
1		0020	5	0.	.0	2991.0	1		0840	105	562.	190.6	3011.6	1		1700	205	1.	11.8	2993.8
1		0025	6	0.	.0	2991.0	1		0845	106	558.	186.8	3011.3	1		1705	206	1.	11.8	2993.8
1		0030	7	0.	.1	2991.0	1		0850	107	553.	182.9	3011.0	1		1710	207	1.	11.8	2993.8
1		0035	8	0.	.2	2991.1	1		0855	108	549.	179.1	3010.8	1		1715	208	1	11.8	2993.8
1		0040	9	0.	.4	2991.1	1		0900	109	544.	175.4	3010.5	1		1720	209	0	11.8	2993.8
1		0045	10	0.	.7	2991.2	1		0905	110	540.	171.7	3010.2	1		1725	210	0.	11.8	2993.8
1		0050	11	0.	.9	2991.2	1		0910	111	535.	168.0	3009.9	1		1730	211	0.	11.7	2993.8
1		0055	12	0.	1.1	2991.3	1		0915	112	528.	164.3	3009.5	1		1735	212	0.	11.7	2993.8
1		0100	13	0.	1.3	2991.3	1		0920	113	522.	160.7	3009.2	1		1740	213	0.	11.7	2993.8
1		0105	14	0.	1.4	2991.3	1		0925	114	516.	157.1	3008.9	1		1745	214	0.	11.7	2993.8
1		0110	15	0.	1.6	2991.4	1		0930	115	510.	153.6	3008.6	1		1750	215	0.	11.7	2993.8
1		0115	16	0.	1.8	2991.4	1		0935	116	505.	150.1	3008.2	1		1755	216	0.	11.7	2993.8
1		0120	17	0.	2.0	2991.5	1		0940	117	499.	146.6	3007.9	1		1800	217	0.	11.7	2993.8
1		0125	18	0.	2.3	2991.6	1		0945	118	493.	143.2	3007.6	1		1805	218	0.	11.7	2993.8
1		0130	19	0.	2.7	2991.7	1		0950	119	487.	139.8	3007.3	1		1810	219	0.	11.7	2993.8
1		0135	20	0.	3.3	2991.8	1		0955	120	482.	136.5	3007.0	1		1815	220	0.	11.7	2993.8
1		0140	21	0.	4.0	2992.0	1		1000	121	476.	133.2	3006.7	1		1820	221	0	11.7	2993.8
1		0145	22	0.	4.9	2992.2	1		1005	122	471.	129.9	3006.4	1		1825	222	0.	11.7	2993.8
1		0150	23	0.	5.9	2992.4	1		1010	123	465.	126.7	3006.1	1		1830	223	0.	11.7	2993.8
1		0155	24	0.	7.1	2992.7	1		1015	124	460.	123.5	3005.8	1		1835	224	0.	11.7	2993.8
1		0200	25	0.	8.3	2993.0	1		1020	125	455.	120.4	3005.5	1		1840	225	0.	11.7	2993.8
1		0205	26	0.	9.4	2993.2	1		1025	126	449.	117.2	3005.2	1		1845	226	0.	11.7	2993.8
1		0210	27	0.	10.5	2993.5	1		1030	127	444.	114.2	3004.9	1		1850	227	0.	11.7	2993.8
1		0215	28	0.	11.6	2993.8	1		1035	128	439.	111.1	3004.7	1		1855	228	0.	11.7	2993.8
1		0220	29	24.	12.8	2994.1	1		1040	129	434.	108.1	3004.4	1		1900	229	0.	11.7	2993.8
1		0225	30	52.	14.1	2994.4	1		1045	130	428.	105.2	3004.1	1		1905	230	0.	11.7	2993.8
1		0230	31	81.	15.5	2994.7	1		1050	131	422.	102.2	3003.8	1		1910	231	0.	11.7	2993.8
1		0235	32	108.	16.8	2995.0	1		1055	132	416.	99.3	3003.6	1		1915	232	0.	11.7	2993.8
1		0240	33	133.	17.9	2995.3	1		1100	133	410.	96.5	3003.3	1		1920	233	0.	11.7	2993.8
1		0245	34	156.	19.0	2995.5	1		1105	134	404.	93.7	3003.1	1		1925	234	0.	11.7	2993.8
1		0250	35	178.	20.0	2995.8	1		1110	135	399.	90.9	3002.8	1		1930	235	0.	11.7	2993.8
1		0255	36	198.	21.0	2996.0	1		1115	136	393.	88.2	3002.6	1		1935	236	0	11.7	2993.8
1		0300	37	203.	22.0	2996.1	1		1120	137	388.	85.5	3002.3	1		1940	237	0	11.7	2993.8
1		0305	38	208.	23.0	2996.2	1		1125	138	382.	82.9	3002.1	1		1945	238	0.	11.7	2993.8
1		0310	39	214.	24.3	2996.4	1		1130	139	377.	80.3	3001.8	1		1950	239	0.	11.7	2993.8
1		0315	40	224.	26.3	2996.6	1		1135	140	372.	77.7	3001.6	1		1955	240	0.	11.7	2993.8
1		0320	41	240.	29.8	2997.0	1		1140	141	367.	75.1	3001.4	1		2000	241	0.	11.7	2993.8
1		0325	42	264.	36.1	2997.7	1		1145	142	361.	72.6	3001.1	1		2005	242	0	11.7	2993.8
1		0330	43	295.	46.4	2998.7	1		1150	143	355.	70.2	3000.9	1		2010	243	0.	11.7	2993.8
1		0335	44	335.	61.9	3000.1	1		1155	144	349.	67.7	3000.7	1		2015	244	0.	11.7	2993.8
1		0340	45	380.	81.8	3002.0	1		1200	145	343	65.4	3000.5	1		2020	245	0.	11.7	2993.8
1		0345	46	426.	104.3	3004.0	1		1205	146	338.	63.0	3000.2	1		2025	246	0.	11.7	2993.8
1		0350	47	467.	127.5	3006.2	1		1210	147	332.	60.7	3000.0	1		2030	247	0.	11.7	2993.8
1		0355	48	504.	150.0	3008.2	1		1215	148	327.	58.4	2999.8	1		2035	248	0.	11.7	2993.8
1		0400	49	539.	171.3	3010.1	1		1220	149	321.	56.2	2999.6	1		2040	249	0.	11.7	2993.8
1		0405	50	563.	191.1	3011.7	1		1225	150	316.	54.0	2999.4	1		2045	250	0.	11.7	2993.8
1		0410	51	585.	209.5	3013.1	1		1230	151	310.	51.9	2999.2	1		2050	251	0.	11.7	2993.8
1		0415	52	604.	226.0	3014.4	1		1235	152	304.	49.7	2999.0	1		2055	252	0	11.7	2993.8
1		0420	53	620.	240.5	3015.4	1		1240	153	299.	47.7	2998.8	1		2100	253	0.	11.7	2993.8
1		0425	54	633.	252.8	3016.3	1		1245	154	293.	45.6	2998.6	1		2105	254	0	11.7	2993.8
1		0430	55	643.	263.3	3017.1	1		1250	155	287.	43.6	2998.5	1		2110	255	0.	11.7	2993.8
1		0435	56	652.	272.4	3017.7	1		1255	156	282.	41.7	2998.3	1		2115	256	0.	11.7	2993.8
1		0440	57	660.	280.5	3018.3	1		1300	157	277.	39.7	2998.1	1		2120	257	0.	11.7	2993.8
1		0445	58	667.	287.9	3018.8	1		1305	158	271.	37.9	2997.9	1		2125	258	0.	11.7	2993.8
1		0450	59	673.	294.6	3019.2	1		1310	159	264.	36.0	2997.7	1		2130	259	0.	11.7	2993.8
1		0455	60	678.	300.8	3019.7	1		1315	160	257.	34.2	2997.5	1		2135	260	0.	11.7	2993.8
1		0500	61	683.	306.4	3020.1	1		1320	161	250.	32.5	2997.3	1		2140	261	0.	11.7	2993.8
1		0505	62	688	311.5	3020.4	1		1325	162	244.	30.8	2997.1	1		2145	262	0.	11.7	2993.8
1		0510	63	692.	315.9	3020.7	1		1330	163	237.	29.1	2996.9	1		2150	263	0.	11.7	2993.8
1		0515	64	695.	319.5	3020.9	1		1335	164	229.	27.5	2996.8	1		2155	264	0.	11.7	2993.8
1		0520	65	697.	322.2	3021.1	1		1340	165	222.	26.0	2996.6	1		2200	265	0.	11.7	2993.8
1		0525	66	699.	324.0	3021.2	1		1345	166	215.	24.5	2996.4	1		2205	266	0.	11.7	2993.8
1		0530	67	700.	325.1	3021.3	1		1350	167	208.	23.0	2996.2	1		2210	267	0.	11.7	2993.8
1		0535	68	700.	325.6	3021.4	1		1355	168	201	21.6	2996.1	1		2215	268	0.	11.7	2993.8
1		0540	69	700.	325.3	3021.3	1		1400	169	193.	20.3	2995.8	1		2220	269	0.	11.7	2993.8
1		0545	70	699.	324.4	3021.3	1		1405	170	158.	19.1	2995.6	1		2225	270	0.	11.7	2993.8
1		0550	71	698.	323.0	3021.2	1		1410	171	136.	18.1	2995.3	1		2230	271	0.	11.7	2993.8
1		0555	72	696.	321.0	3021.0	1		1415	172	118.	17.2	2995.1	1		2235	272	0.	11.7	2993.8
1		0600	73	694.	318.7	3020.9	1		1420	173	101.	16.5	2994.9	1		2240	273	0.	11.7	2993.8
1		0605	74	692.	316.0	3020.7	1		1425	174	87.	15.8	2994.8	1		2245	274	0	11.7	2993.8
1		0610	75	689	313.0	3020.5	1		1430	175	75.	15.2	2994.6	1		2250	275	0.	11.7	2993.8
1		0615	76	686.	309.8	3020.3	1		1435	176	65.	14.8	2994.5	1		2255	276	0.	11.7	2993.8
1		0620	77	683.	306.3	3020.0	1		1440	177	56.	14.3	2994.4	1		2300	277	0.	11.7	2993.8
1		0625	78	680.	302.6	3019.8	1		1445	178	48	14.0	2994.3	1		2305	278	0.	11.7	2993.8
1		0630	79	677.	298.7	3019.5	1		1450	179	42	13.7	2994.3	1		2310	279	0.	11.7	2993.8
1		0635	80	673.	294.8	3019.3	1		1455	180	36	13.4	2994.2	1		2315	280	0.	11.7	2993.8
1		0640	81	669.	290.7	3019.0	1		1500	181	31.	13.2	2994.1	1		2320	281	0.	11.7	2993.8
1		0645	82	666.	286.6	3018.7	1		1505	182	27.	13.0	2994.1	1		2325	282	0.	11.7	2993.8
1		0650	83	662	282.4	3018.4	1		1510	183	23.	12.8	2994.1	1		2330	283	0.	11.7	2993.8
1		0655	84	658.	278.1	3018.1	1		1515	184	20.	12.7	2994.0	1		2335	284	0	11.7	2993.8
1		0700	85	654.	273.8	3017.8	1		1520	185	17.	12.5	2994.0	1		2340	285	0.	11.7	2993.8
1		0705	86	649.	269.5	3017.5	1		1525	186	15.	12.4	2994.0	1		2345	286	0.	11.7	2993.8
1		0710	87	645.	265.2	3017.2	1		1530	187	13.	12.3	2993.9	1		2350	287	0.	11.7	2993.8
1		0715	88	641	260.8	3016.9	1		1535	188	11.	12.2	2993.9	1		2355	288	0.	11.7	2993.8
1		0720	89	636	256.5	3016.6	1		1540	189	9	12.2	2993.9	2		0000	289	0.	11.7	2993.8
1		0725	90	632.	252.2	3016.3	1		1545	190	8	12.1	2993.9	2		0005	290	0.	11.7	2993.8
1		0730	91	628.	247.9	3016.0	1		1550	191	7.	12.1	2993.9	2		0010	291	0.	11.7	2993.8
1		0735	92	623.	243.6	3015.7	1		1555	192	6.	12.0	2993.9	2		0015	292	0.	11.7	2993.8
1		0740	93	619.	239.4	3015.4	1		1600	193	5.	12.0	2993.9	2		0020	293	0.	11.7	2993.8
1		0745	94	615.	235.2	3015.1	1		1605	194	5.	11.9	2993.9	2		0025	294	0.	11.7	2993.8
1		0750	95	610.	230.9	3014.7	1		1610	195	4.	11.9	2993.8	2		0030	295	0.	11.7	2993.8
1		0755	96	605	226.8	3014.4	1		1615	196	3.	11.9	2993.8	2		0035	296	0.	11.7	2993.8
1		0800	97	600.	222.6	3014.1	1		1620	197	3.	11.9	2993.8	2		0040	297	0.	11.7	2993.8
1		0805	98	595.	218.5	3013.8	1		1625	198	3.	11.8	2993.8	2		0045	298	0.	11.7	2993.8
1		0810	99	591.	214.4	3013.5	1		1630	199	2.	11.8	2993.8	2		0050	299	0.	11.7	2993.8
1		0815	100	586.	210.4	3013.2	1		1635	200	2.	11.8	2993.8	2		0055	300	0.	11.7	2993.8

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)					
		(CFS)				
700.	5.58		620.	233.	225.	225.
		(INCHES)	1.311	1.974	1.974	1.974
		(AC-FT)	307	463.	463.	463.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
(AC-FT)	(HR)				
326.	5.58	246	82.	79.	79.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
(FEET)	(HR)				
3021.35	5.58	3015.65	3000.69	3000.34	3000.34

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1, RATIO = .93

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2991.0	1		0820	101	575.	201.5	3012.5	1		1640	201	1.	11.8	2993.8
1		0005	2	0.	.0	2991.0	1		0825	102	571.	197.5	3012.2	1		1645	202	1.	11.8	2993.8
1		0010	3	0.	.0	2991.0	1		0830	103	566.	193.6	3011.9	1		1650	203	1.	11.8	2993.8
1		0015	4	0.	.0	2991.0	1		0835	104	561.	189.7	3011.6	1		1655	204	1.	11.8	2993.8
1		0020	5	0.	.0	2991.0	1		0840	105	557.	185.9	3011.3	1		1700	205	1.	11.8	2993.8
1		0025	6	0.	.0	2991.0	1		0845	106	552.	182.1	3011.0	1		1705	206	1.	11.8	2993.8
1		0030	7	0.	.1	2991.0	1		0850	107	548.	178.3	3010.7	1		1710	207	1.	11.8	2993.8
1		0035	8	0.	.2	2991.1	1		0855	108	543.	174.5	3010.4	1		1715	208	0.	11.8	2993.8
1		0040	9	0.	.4	2991.1	1		0900	109	539.	170.8	3010.1	1		1720	209	0.	11.8	2993.8
1		0045	10	0.	.6	2991.1	1		0905	110	533.	167.1	3009.8	1		1725	210	0.	11.7	2993.8
1		0050	11	0.	.8	2991.2	1		0910	111	527.	163.5	3009.5	1		1730	211	0.	11.7	2993.8
1		0055	12	0.	1.0	2991.2	1		0915	112	521.	159.9	3009.1	1		1735	212	0	11.7	2993.8
1		0100	13	0.	1.2	2991.3	1		0920	113	515.	156.3	3008.8	1		1740	213	0	11.7	2993.8
1		0105	14	0.	1.3	2991.3	1		0925	114	509.	152.8	3008.5	1		1745	214	0.	11.7	2993.8
1		0110	15	0.	1.5	2991.4	1		0930	115	503.	149.3	3008.2	1		1750	215	0.	11.7	2993.8
1		0115	16	0.	1.7	2991.4	1		0935	116	497.	145.8	3007.8	1		1755	216	0.	11.7	2993.8
1		0120	17	0.	1.9	2991.5	1		0940	117	492.	142.4	3007.5	1		1800	217	0.	11.7	2993.8
1		0125	18	0.	2.2	2991.5	1		0945	118	486.	139.1	3007.2	1		1805	218	0	11.7	2993.8
1		0130	19	0.	2.6	2991.6	1		0950	119	480.	135.7	3006.9	1		1810	219	0.	11.7	2993.8
1		0135	20	0.	3.1	2991.7	1		0955	120	475.	132.4	3006.6	1		1815	220	0.	11.7	2993.8
1		0140	21	0.	3.8	2991.9	1		1000	121	470.	129.2	3006.3	1		1820	221	0.	11.7	2993.8
1		0145	22	0.	4.7	2992.1	1		1005	122	464.	126.0	3006.0	1		1825	222	0.	11.7	2993.8
1		0150	23	0.	5.7	2992.4	1		1010	123	459.	122.8	3005.7	1		1830	223	0.	11.7	2993.8
1		0155	24	0.	6.8	2992.6	1		1015	124	454.	119.6	3005.4	1		1835	224	0.	11.7	2993.8
1		0200	25	0.	7.9	2992.9	1		1020	125	448.	116.5	3005.2	1		1840	225	0.	11.7	2993.8
1		0205	26	0.	9.0	2993.2	1		1025	126	443.	113.5	3004.9	1		1845	226	0.	11.7	2993.8
1		0210	27	0.	10.1	2993.4	1		1030	127	438.	110.4	3004.6	1		1850	227	0.	11.7	2993.8
1		0215	28	0.	11.2	2993.7	1		1035	128	432.	107.4	3004.3	1		1855	228	0	11.7	2993.8
1		0220	29	14.	12.4	2994.0	1		1040	129	426.	104.5	3004.0	1		1900	229	0.	11.7	2993.8
1		0225	30	43.	13.7	2994.3	1		1045	130	420.	101.6	3003.8	1		1905	230	0.	11.7	2993.8
1		0230	31	72.	15.1	2994.6	1		1050	131	414.	98.7	3003.5	1		1910	231	0.	11.7	2993.8
1		0235	32	100.	16.4	2994.9	1		1055	132	409.	95.9	3003.3	1		1915	232	0.	11.7	2993.8
1		0240	33	125.	17.6	2995.2	1		1100	133	403.	93.1	3003.0	1		1920	233	0.	11.7	2993.8
1		0245	34	148.	18.6	2995.4	1		1105	134	397.	90.3	3002.7	1		1925	234	0.	11.7	2993.8
1		0250	35	170.	19.7	2995.7	1		1110	135	392.	87.6	3002.5	1		1930	235	0.	11.7	2993.8
1		0255	36	192.	20.7	2995.9	1		1115	136	386.	84.9	3002.2	1		1935	236	0.	11.7	2993.8
1		0300	37	201.	21.6	2996.1	1		1120	137	381.	82.3	3002.0	1		1940	237	0.	11.7	2993.8
1		0305	38	206.	22.6	2996.2	1		1125	138	376.	79.7	3001.8	1		1945	238	0	11.7	2993.8
1		0310	39	212.	23.9	2996.3	1		1130	139	371.	77.1	3001.5	1		1950	239	0.	11.7	2993.8
1		0315	40	222.	25.8	2996.6	1		1135	140	365.	74.6	3001.3	1		1955	240	0.	11.7	2993.8
1		0320	41	237.	29.2	2997.0	1		1140	141	359.	72.1	3001.1	1		2000	241	0.	11.7	2993.8
1		0325	42	261.	35.3	2997.6	1		1145	142	353.	69.6	3000.8	1		2005	242	0.	11.7	2993.8
1		0330	43	293.	45.5	2998.6	1		1150	143	348.	67.2	3000.6	1		2010	243	0.	11.7	2993.8
1		0335	44	332.	60.6	3000.0	1		1155	144	342.	64.8	3000.4	1		2015	244	0	11.7	2993.8
1		0340	45	377.	80.2	3001.8	1		1200	145	336.	62.5	3000.2	1		2020	245	0.	11.7	2993.8
1		0345	46	422.	102.4	3003.9	1		1205	146	331.	60.2	3000.0	1		2025	246	0.	11.7	2993.8
1		0350	47	463.	125.2	3005.9	1		1210	147	325.	57.9	2999.8	1		2030	247	0.	11.7	2993.8
1		0355	48	500.	147.3	3008.0	1		1215	148	320.	55.7	2999.6	1		2035	248	0	11.7	2993.8
1		0400	49	535.	168.2	3009.9	1		1220	149	315.	53.5	2999.4	1		2040	249	0.	11.7	2993.8
1		0405	50	559.	187.8	3011.4	1		1225	150	309.	51.4	2999.2	1		2045	250	0.	11.7	2993.8
1		0410	51	580.	205.8	3012.8	1		1230	151	303.	49.3	2999.0	1		2050	251	0.	11.7	2993.8
1		0415	52	600.	222.1	3014.1	1		1235	152	297.	47.2	2998.8	1		2055	252	0.	11.7	2993.8
1		0420	53	616.	236.3	3015.1	1		1240	153	292.	45.2	2998.6	1		2100	253	0	11.7	2993.8
1		0425	54	628.	248.5	3016.0	1		1245	154	286.	43.2	2998.4	1		2105	254	0.	11.7	2993.8
1		0430	55	639.	258.8	3016.7	1		1250	155	281.	41.2	2998.2	1		2110	255	0.	11.7	2993.8
1		0435	56	648.	267.7	3017.4	1		1255	156	275.	39.3	2998.1	1		2115	256	0.	11.7	2993.8
1		0440	57	655.	275.7	3018.0	1		1300	157	269.	37.4	2997.9	1		2120	257	0.	11.7	2993.8
1		0445	58	662.	282.9	3018.4	1		1305	158	262.	35.6	2997.7	1		2125	258	0	11.7	2993.8
1		0450	59	668.	289.5	3018.9	1		1310	159	255.	33.8	2997.5	1		2130	259	0.	11.7	2993.8
1		0455	60	674.	295.5	3019.3	1		1315	160	249.	32.1	2997.3	1		2135	260	0.	11.7	2993.8
1		0500	61	679.	301.1	3019.7	1		1320	161	242.	30.4	2997.1	1		2140	261	0.	11.7	2993.8
1		0505	62	683.	306.1	3020.0	1		1325	162	235.	28.8	2996.9	1		2145	262	0.	11.7	2993.8
1		0510	63	687.	310.4	3020.3	1		1330	163	228.	27.2	2996.7	1		2150	263	0.	11.7	2993.8
1		0515	64	690.	313.9	3020.6	1		1335	164	221.	25.6	2996.5	1		2155	264	0	11.7	2993.8
1		0520	65	692.	316.5	3020.7	1		1340	165	213.	24.1	2996.4	1		2200	265	0.	11.7	2993.8
1		0525	66	694.	318.3	3020.9	1		1345	166	206.	22.7	2996.2	1		2205	266	0.	11.7	2993.8
1		0530	67	695.	319.4	3020.9	1		1350	167	199.	21.3	2996.0	1		2210	267	0.	11.7	2993.8
1		0535	68	695.	319.8	3021.0	1		1355	168	177.	20.0	2995.8	1		2215	268	0	11.7	2993.8
1		0540	69	695.	319.5	3020.9	1		1400	169	153.	18.9	2995.5	1		2220	269	0.	11.7	2993.8
1		0545	70	694.	318.6	3020.9	1		1405	170	132.	17.9	2995.3	1		2225	270	0.	11.7	2993.8
1		0550	71	693.	317.2	3020.8	1		1410	171	114.	17.0	2995.1	1		2230	271	0.	11.7	2993.8
1		0555	72	691.	315.2	3020.7	1		1415	172	98.	16.3	2994.9	1		2235	272	0.	11.7	2993.8
1		0600	73	689.	312.9	3020.5	1		1420	173	85.	15.7	2994.7	1		2240	273	0.	11.7	2993.8
1		0605	74	687.	310.2	3020.3	1		1425	174	73.	15.1	2994.6	1		2245	274	0.	11.7	2993.8
1		0610	75	684.	307.2	3020.1	1		1430	175	63.	14.7	2994.5	1		2250	275	0.	11.7	2993.8
1		0615	76	681.	304.0	3019.9	1		1435	176	54.	14.3	2994.4	1		2255	276	0.	11.7	2993.8
1		0620	77	678.	300.5	3019.7	1		1440	177	47.	13.9	2994.3	1		2300	277	0.	11.7	2993.8
1		0625	78	675.	296.9	3019.4	1		1445	178	40.	13.6	2994.2	1		2305	278	0	11.7	2993.8
1		0630	79	671.	293.0	3019.1	1		1450	179	35.	13.4	2994.2	1		2310	279	0.	11.7	2993.8
1		0635	80	668.	289.1	3018.9	1		1455	180	30.	13.1	2994.1	1		2315	280	0.	11.7	2993.8

1	0640	81	664.	285.1	3018.6	*	1	1500	181	26.	12.9	2994.1	*	1	2320	281	0.	11.7	2993.8
1	0645	82	660.	281.0	3018.3	*	1	1505	182	22.	12.8	2994.0	*	1	2325	282	0.	11.7	2993.8
1	0650	83	657.	276.8	3018.0	*	1	1510	183	19.	12.6	2994.0	*	1	2330	283	0.	11.7	2993.8
1	0655	84	652.	272.5	3017.7	*	1	1515	184	17.	12.5	2994.0	*	1	2335	284	0.	11.7	2993.8
1	0700	85	648.	268.3	3017.4	*	1	1520	185	14.	12.4	2994.0	*	1	2340	285	0.	11.7	2993.8
1	0705	86	644.	264.0	3017.1	*	1	1525	186	12.	12.3	2993.9	*	1	2345	286	0.	11.7	2993.8
1	0710	87	640.	259.7	3016.8	*	1	1530	187	11.	12.2	2993.9	*	1	2350	287	0.	11.7	2993.8
1	0715	88	635.	255.4	3016.5	*	1	1535	188	9.	12.2	2993.9	*	1	2355	288	0.	11.7	2993.8
1	0720	89	631.	251.2	3016.2	*	1	1540	189	8.	12.1	2993.9	*	2	0000	289	0.	11.7	2993.8
1	0725	90	627.	246.9	3015.9	*	1	1545	190	7.	12.0	2993.9	*	2	0005	290	0.	11.7	2993.8
1	0730	91	622.	242.6	3015.6	*	1	1550	191	6.	12.0	2993.9	*	2	0010	291	0.	11.7	2993.8
1	0735	92	618.	238.4	3015.3	*	1	1555	192	5.	12.0	2993.9	*	2	0015	292	0.	11.7	2993.8
1	0740	93	614.	234.2	3015.0	*	1	1600	193	4.	11.9	2993.8	*	2	0020	293	0.	11.7	2993.8
1	0745	94	609.	230.0	3014.7	*	1	1605	194	4.	11.9	2993.8	*	2	0025	294	0.	11.7	2993.8
1	0750	95	604.	225.8	3014.3	*	1	1610	195	3.	11.9	2993.8	*	2	0030	295	0.	11.7	2993.8
1	0755	96	599.	221.7	3014.0	*	1	1615	196	3.	11.9	2993.8	*	2	0035	296	0.	11.7	2993.8
1	0800	97	594.	217.6	3013.7	*	1	1620	197	2.	11.8	2993.8	*	2	0040	297	0.	11.7	2993.8
1	0805	98	589.	213.5	3013.4	*	1	1625	198	2.	11.8	2993.8	*	2	0045	298	0.	11.7	2993.8
1	0810	99	585.	209.5	3013.1	*	1	1630	199	2.	11.8	2993.8	*	2	0050	299	0.	11.7	2993.8
1	0815	100	580.	205.5	3012.8	*	1	1635	200	2.	11.8	2993.8	*	2	0055	300	0.	11.7	2993.8

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
(CFS)	(HR)				
		(CFS)			
695	5.58	614.	229.	221.	221.
		(INCHES) 1.300	1.942	1.942	1.942
		(AC-FT) 305.	455.	455.	455.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
(AC-FT)	(HR)				
320.	5.58	241.	80.	77.	77.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
(FEET)	(HR)				
3020.96	5.58	3015.28	3000.53	3000.18	3000.18

CUMULAITVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1. RATIO = .92

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	2991.0	1		0820	101	569.	196.6	3012.1	1		1640	201	1.	11.8	2993.8
1		0005	2	0.	.0	2991.0	1		0825	102	565.	192.7	3011.8	1		1645	202	1.	11.8	2993.8
1		0010	3	0.	.0	2991.0	1		0830	103	560.	188.9	3011.5	1		1650	203	1.	11.8	2993.8
1		0015	4	0.	.0	2991.0	1		0835	104	556.	185.0	3011.2	1		1655	204	1.	11.8	2993.8
1		0020	5	0.	.0	2991.0	1		0840	105	551.	181.2	3010.9	1		1700	205	1.	11.8	2993.8
1		0025	6	0.	.0	2991.0	1		0845	106	547.	177.4	3010.6	1		1705	206	1.	11.8	2993.8
1		0030	7	0.	.1	2991.0	1		0850	107	542.	173.7	3010.3	1		1710	207	0.	11.8	2993.8
1		0035	8	0.	2	2991.1	1		0855	108	538.	170.0	3010.0	1		1715	208	0.	11.8	2993.8
1		0040	9	0.	4	2991.1	1		0900	109	532.	166.3	3009.7	1		1720	209	0.	11.7	2993.8
1		0045	10	0.	6	2991.1	1		0905	110	526.	162.6	3009.4	1		1725	210	0.	11.7	2993.8
1		0050	11	0.	.8	2991.2	1		0910	111	520.	159.0	3009.1	1		1730	211	0.	11.7	2993.8
1		0055	12	0.	1.0	2991.2	1		0915	112	514.	155.5	3008.7	1		1735	212	0.	11.7	2993.8
1		0100	13	0.	1.1	2991.3	1		0920	113	508.	152.0	3008.4	1		1740	213	0.	11.7	2993.8
1		0105	14	0.	1.3	2991.3	1		0925	114	502.	148.5	3008.1	1		1745	214	0.	11.7	2993.8
1		0110	15	0.	1.4	2991.3	1		0930	115	496.	145.0	3007.8	1		1750	215	0.	11.7	2993.8
1		0115	16	0.	1.6	2991.4	1		0935	116	490.	141.6	3007.5	1		1755	216	0.	11.7	2993.8
1		0120	17	0.	1.8	2991.4	1		0940	117	485.	138.3	3007.2	1		1800	217	0.	11.7	2993.8
1		0125	18	0.	2.1	2991.5	1		0945	118	479.	135.0	3006.8	1		1805	218	0.	11.7	2993.8
1		0130	19	0.	2.4	2991.6	1		0950	119	474.	131.7	3006.5	1		1810	219	0.	11.7	2993.8
1		0135	20	0.	2.9	2991.7	1		0955	120	468.	128.4	3006.2	1		1815	220	0.	11.7	2993.8
1		0140	21	0.	3.6	2991.9	1		1000	121	463.	125.2	3006.0	1		1820	221	0.	11.7	2993.8
1		0145	22	0.	4.4	2992.1	1		1005	122	458.	122.1	3005.7	1		1825	222	0.	11.7	2993.8
1		0150	23	0.	5.4	2992.3	1		1010	123	452.	118.9	3005.4	1		1830	223	0.	11.7	2993.8
1		0155	24	0.	6.5	2992.6	1		1015	124	447.	115.8	3005.1	1		1835	224	0.	11.7	2993.8
1		0200	25	0.	7.6	2992.8	1		1020	125	442.	112.8	3004.8	1		1840	225	0.	11.7	2993.8
1		0205	26	0.	8.7	2993.1	1		1025	126	437.	109.8	3004.5	1		1845	226	0.	11.7	2993.8
1		0210	27	0.	9.7	2993.3	1		1030	127	431.	106.8	3004.3	1		1850	227	0.	11.7	2993.8
1		0215	28	0.	10.8	2993.6	1		1035	128	425.	103.8	3004.0	1		1855	228	0.	11.7	2993.8
1		0220	29	5.	12.0	2993.9	1		1040	129	419.	100.9	3003.7	1		1900	229	0.	11.7	2993.8
1		0225	30	34.	13.3	2994.2	1		1045	130	413.	98.0	3003.5	1		1905	230	0.	11.7	2993.8
1		0230	31	63.	14.7	2994.5	1		1050	131	407.	95.2	3003.2	1		1910	231	0.	11.7	2993.8
1		0235	32	92.	16.0	2994.8	1		1055	132	402.	92.4	3002.9	1		1915	232	0.	11.7	2993.8
1		0240	33	117.	17.2	2995.1	1		1100	133	396.	89.7	3002.7	1		1920	233	0	11.7	2993.8
1		0245	34	140.	18.3	2995.4	1		1105	134	391	87.0	3002.4	1		1925	234	0	11.7	2993.8
1		0250	35	162.	19.3	2995.6	1		1110	135	385	84.3	3002.2	1		1930	235	0.	11.7	2993.8
1		0255	36	184.	20.3	2995.8	1		1115	136	380.	81.7	3002.0	1		1935	236	0.	11.7	2993.8
1		0300	37	199.	21.2	2996.0	1		1120	137	375.	79.1	3001.7	1		1940	237	0.	11.7	2993.8
1		0305	38	204.	22.2	2996.1	1		1125	138	369.	76.5	3001.5	1		1945	238	0.	11.7	2993.8
1		0310	39	210.	23.4	2996.3	1		1130	139	364.	74.0	3001.2	1		1950	239	0.	11.7	2993.8
1		0315	40	219.	25.3	2996.5	1		1135	140	358.	71.5	3001.0	1		1955	240	0.	11.7	2993.8
1		0320	41	234.	28.6	2996.9	1		1140	141	352.	69.1	3000.8	1		2000	241	0.	11.7	2993.8
1		0325	42	258.	34.6	2997.6	1		1145	142	346.	66.7	3000.6	1		2005	242	0.	11.7	2993.8
1		0330	43	290.	44.5	2998.5	1		1150	143	341.	64.3	3000.4	1		2010	243	0.	11.7	2993.8
1		0335	44	329.	59.5	2999.9	1		1155	144	335.	62.0	3000.1	1		2015	244	0	11.7	2993.8
1		0340	45	374.	78.7	3001.7	1		1200	145	330.	59.7	2999.9	1		2020	245	0.	11.7	2993.8
1		0345	46	418.	100.5	3003.7	1		1205	146	324.	57.4	2999.7	1		2025	246	0.	11.7	2993.8
1		0350	47	459	122.9	3005.7	1		1210	147	319.	55.2	2999.5	1		2030	247	0.	11.7	2993.8
1		0355	48	496.	144.7	3007.7	1		1215	148	313.	53.0	2999.3	1		2035	248	0.	11.7	2993.8
1		0400	49	530	165.3	3009.6	1		1220	149	307.	50.9	2999.1	1		2040	249	0.	11.7	2993.8
1		0405	50	555.	184.5	3011.2	1		1225	150	302.	48.8	2998.9	1		2045	250	0.	11.7	2993.8
1		0410	51	576.	202.2	3012.5	1		1230	151	296.	46.7	2998.7	1		2050	251	0.	11.7	2993.8
1		0415	52	595.	218.2	3013.8	1		1235	152	290.	44.7	2998.6	1		2055	252	0.	11.7	2993.8
1		0420	53	612.	232.2	3014.8	1		1240	153	285.	42.7	2998.4	1		2100	253	0.	11.7	2993.8
1		0425	54	624.	244.2	3015.7	1		1245	154	280	40.8	2998.2	1		2105	254	0.	11.7	2993.8
1		0430	55	634.	254.3	3016.4	1		1250	155	274	38.9	2998.0	1		2110	255	0.	11.7	2993.8
1		0435	56	643.	263.1	3017.1	1		1255	156	267.	37.0	2997.8	1		2115	256	0.	11.7	2993.8
1		0440	57	651.	270.9	3017.6	1		1300	157	260.	35.2	2997.6	1		2120	257	0.	11.7	2993.8
1		0445	58	658.	278.0	3018.1	1		1305	158	254.	33.4	2997.4	1		2125	258	0.	11.7	2993.8
1		0450	59	664	284.5	3018.6	1		1310	159	247.	31.7	2997.2	1		2130	259	0.	11.7	2993.8
1		0455	60	669.	290.4	3019.0	1		1315	160	240.	30.0	2997.1	1		2135	260	0.	11.7	2993.8

1	0500	61	674.	295.8	3019.3	*	1	1320	161	233.	28.4	2996.9	*	1	2140	261	0.	11.7	2993.8
1	0505	62	678.	300.7	3019.7	*	1	1325	162	226.	26.8	2996.7	*	1	2145	262	0.	11.7	2993.8
1	0510	63	682.	305.0	3020.0	*	1	1330	163	219.	25.3	2996.5	*	1	2150	263	0.	11.7	2993.8
1	0515	64	685.	308.4	3020.2	*	1	1335	164	212.	23.8	2996.3	*	1	2155	264	0.	11.7	2993.8
1	0520	65	687.	310.9	3020.4	*	1	1340	165	205.	22.4	2996.2	*	1	2200	265	0.	11.7	2993.8
1	0525	66	689.	312.7	3020.5	*	1	1345	166	198.	21.0	2996.0	*	1	2205	266	0.	11.7	2993.8
1	0530	67	690.	313.8	3020.6	*	1	1350	167	171.	19.7	2995.7	*	1	2210	267	0.	11.7	2993.8
1	0535	68	690.	314.1	3020.6	*	1	1355	168	148.	18.6	2995.4	*	1	2215	268	0.	11.7	2993.8
1	0540	69	690.	313.8	3020.6	*	1	1400	169	127.	17.7	2995.2	*	1	2220	269	0.	11.7	2993.8
1	0545	70	689.	312.9	3020.5	*	1	1405	170	110.	16.8	2995.0	*	1	2225	270	0.	11.7	2993.8
1	0550	71	688.	311.4	3020.4	*	1	1410	171	95.	16.1	2994.9	*	1	2230	271	0.	11.7	2993.8
1	0555	72	686.	309.5	3020.3	*	1	1415	172	82.	15.5	2994.7	*	1	2235	272	0.	11.7	2993.8
1	0600	73	684.	307.1	3020.1	*	1	1420	173	70.	15.0	2994.6	*	1	2240	273	0.	11.7	2993.8
1	0605	74	682.	304.5	3019.9	*	1	1425	174	61.	14.6	2994.5	*	1	2245	274	0.	11.7	2993.8
1	0610	75	679.	301.5	3019.7	*	1	1430	175	52.	14.2	2994.4	*	1	2250	275	0.	11.7	2993.8
1	0615	76	676.	298.3	3019.5	*	1	1435	176	45.	13.8	2994.3	*	1	2255	276	0.	11.7	2993.8
1	0620	77	673.	294.8	3019.3	*	1	1440	177	39.	13.5	2994.2	*	1	2300	277	0.	11.7	2993.8
1	0625	78	670.	291.2	3019.0	*	1	1445	178	34.	13.3	2994.2	*	1	2305	278	0.	11.7	2993.8
1	0630	79	666.	287.4	3018.8	*	1	1450	179	29.	13.1	2994.1	*	1	2310	279	0	11.7	2993.8
1	0635	80	663.	283.5	3018.5	*	1	1455	180	25.	12.9	2994.1	*	1	2315	280	0	11.7	2993.8
1	0640	81	659.	279.5	3018.2	*	1	1500	181	22.	12.7	2994.0	*	1	2320	281	0.	11.7	2993.8
1	0645	82	655.	275.4	3017.9	*	1	1505	182	19.	12.6	2994.0	*	1	2325	282	0	11.7	2993.8
1	0650	83	651.	271.3	3017.6	*	1	1510	183	16.	12.5	2994.0	*	1	2330	283	0.	11.7	2993.8
1	0655	84	647.	267.1	3017.3	*	1	1515	184	14.	12.4	2994.0	*	1	2335	284	0.	11.7	2993.8
1	0700	85	643.	262.8	3017.0	*	1	1520	185	12.	12.3	2993.9	*	1	2340	285	0.	11.7	2993.8
1	0705	86	638.	258.6	3016.7	*	1	1525	186	10.	12.2	2993.9	*	1	2345	286	0	11.7	2993.8
1	0710	87	634.	254.3	3016.4	*	1	1530	187	9.	12.1	2993.9	*	1	2350	287	0	11.7	2993.8
1	0715	88	630.	250.1	3016.1	*	1	1535	188	8.	12.1	2993.9	*	1	2355	288	0.	11.7	2993.8
1	0720	89	626.	245.8	3015.8	*	1	1540	189	7.	12.0	2993.9	*	2	0000	289	0.	11.7	2993.8
1	0725	90	621.	241.6	3015.5	*	1	1545	190	6.	12.0	2993.9	*	2	0005	290	0.	11.7	2993.8
1	0730	91	617.	237.4	3015.2	*	1	1550	191	5.	12.0	2993.9	*	2	0010	291	0.	11.7	2993.8
1	0735	92	613.	233.2	3014.9	*	1	1555	192	4.	11.9	2993.8	*	2	0015	292	0.	11.7	2993.8
1	0740	93	608.	229.0	3014.6	*	1	1600	193	4.	11.9	2993.8	*	2	0020	293	0.	11.7	2993.8
1	0745	94	603.	224.8	3014.3	*	1	1605	194	3.	11.9	2993.8	*	2	0025	294	0.	11.7	2993.8
1	0750	95	598.	220.7	3014.0	*	1	1610	195	3.	11.9	2993.8	*	2	0030	295	0.	11.7	2993.8
1	0755	96	593.	216.6	3013.6	*	1	1615	196	2.	11.8	2993.8	*	2	0035	296	0	11.7	2993.8
1	0800	97	588.	212.6	3013.3	*	1	1620	197	2.	11.8	2993.8	*	2	0040	297	0.	11.7	2993.8
1	0805	98	584.	208.5	3013.0	*	1	1625	198	2.	11.8	2993.8	*	2	0045	298	0.	11.7	2993.8
1	0810	99	579.	204.5	3012.7	*	1	1630	199	1.	11.8	2993.8	*	2	0050	299	0.	11.7	2993.8
1	0815	100	574.	200.6	3012.4	*	1	1635	200	1.	11.8	2993.8	*	2	0055	300	0.	11.7	2993.8

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)					
		(CFS)				
+ 690.	5.58		609.	226.	217.	217.
		(INCHES)	1.288	1.911	1.911	1.911
		(AC-FT)	302.	448.	448.	448.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
314.	5.58	236.	78.	76.	76.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3020.57	5.58	3014.91	3000.38	3000.03	3000.03

CUMULATIVE AREA = 4.39 SQ MI

HYDROGRAPH AT STATION EXDB
PLAN 1. RATIO = .91

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1	0000		1	0.	.0	2991.0	*	1	0820		101	564.	191.8	3011.7	*	1	1640		201	1.	11.8	2993.8
1	0005		2	0.	.0	2991.0	*	1	0825		102	559.	187.9	3011.4	*	1	1645		202	1.	11.8	2993.8
1	0010		3	0.	.0	2991.0	*	1	0830		103	555.	184.1	3011.1	*	1	1650		203	1.	11.8	2993.8
1	0015		4	0.	.0	2991.0	*	1	0835		104	550.	180.3	3010.8	*	1	1655		204	1.	11.8	2993.8
1	0020		5	0.	.0	2991.0	*	1	0840		105	546.	176.5	3010.6	*	1	1700		205	1.	11.8	2993.8
1	0025		6	0.	.0	2991.0	*	1	0845		106	541.	172.8	3010.3	*	1	1705		206	0.	11.8	2993.8
1	0030		7	0.	.1	2991.0	*	1	0850		107	536.	169.1	3010.0	*	1	1710		207	0.	11.7	2993.8
1	0035		8	0.	.2	2991.1	*	1	0855		108	530.	165.4	3009.6	*	1	1715		208	0	11.7	2993.8
1	0040		9	0.	.4	2991.1	*	1	0900		109	524.	161.8	3009.3	*	1	1720		209	0.	11.7	2993.8
1	0045		10	0.	.5	2991.1	*	1	0905		110	518.	158.2	3009.0	*	1	1725		210	0	11.7	2993.8
1	0050		11	0.	.7	2991.2	*	1	0910		111	512.	154.6	3008.7	*	1	1730		211	0.	11.7	2993.8
1	0055		12	0.	.9	2991.2	*	1	0915		112	506.	151.1	3008.3	*	1	1735		212	0.	11.7	2993.8
1	0100		13	0.	1.0	2991.2	*	1	0920		113	501.	147.7	3008.0	*	1	1740		213	0.	11.7	2993.8
1	0105		14	0.	1.2	2991.3	*	1	0925		114	495.	144.2	3007.7	*	1	1745		214	0.	11.7	2993.8
1	0110		15	0.	1.3	2991.3	*	1	0930		115	489.	140.8	3007.4	*	1	1750		215	0.	11.7	2993.8
1	0115		16	0.	1.5	2991.4	*	1	0935		116	483.	137.5	3007.1	*	1	1755		216	0.	11.7	2993.8
1	0120		17	0.	1.7	2991.4	*	1	0940		117	478.	134.2	3006.8	*	1	1800		217	0.	11.7	2993.8
1	0125		18	0.	1.9	2991.5	*	1	0945		118	472.	130.9	3006.5	*	1	1805		218	0.	11.7	2993.8
1	0130		19	0.	2.3	2991.5	*	1	0950		119	467.	127.7	3006.2	*	1	1810		219	0.	11.7	2993.8
1	0135		20	0.	2.7	2991.7	*	1	0955		120	462.	124.5	3005.9	*	1	1815		220	0.	11.7	2993.8
1	0140		21	0.	3.4	2991.8	*	1	1000		121	456.	121.3	3005.6	*	1	1820		221	0.	11.7	2993.8
1	0145		22	0.	4.2	2992.0	*	1	1005		122	451.	118.2	3005.3	*	1	1825		222	0.	11.7	2993.8
1	0150		23	0.	5.2	2992.2	*	1	1010		123	446.	115.1	3005.0	*	1	1830		223	0	11.7	2993.8
1	0155		24	0.	6.2	2992.5	*	1	1015		124	441.	112.0	3004.7	*	1	1835		224	0.	11.7	2993.8
1	0200		25	0.	7.3	2992.7	*	1	1020		125	435.	109.0	3004.5	*	1	1840		225	0.	11.7	2993.8
1	0205		26	0	8.3	2993.0	*	1	1025		126	429.	106.1	3004.2	*	1	1845		226	0.	11.7	2993.8
1	0210		27	0	9.3	2993.2	*	1	1030		127	423.	103.1	3003.9	*	1	1850		227	0.	11.7	2993.8
1	0215		28	0.	10.3	2993.5	*	1	1035		128	418.	100.2	3003.7	*	1	1855		228	0.	11.7	2993.8
1	0220		29	0.	11.5	2993.8	*	1	1040		129	412.	97.4	3003.4	*	1	1900		229	0.	11.7	2993.8
1	0225		30	25.	12.9	2994.1	*	1	1045		130	406.	94.5	3003.1	*	1	1905		230	0.	11.7	2993.8
1	0230		31	54.	14.3	2994.4	*	1	1050		131	400.	91.8	3002.9	*	1	1910		231	0.	11.7	2993.8
1	0235		32	83.	15.6	2994.7	*	1	1055		132	395.	89.0	3002.6	*	1	1915		232	0.	11.7	2993.8
1	0240		33	109.	16.8	2995.0	*	1	1100		133	389.	86.3	3002.4	*	1	1920		233	0.	11.7	2993.8
1	0245		34	132.	17.9	2995.3	*	1	1105		134	384.	83.7	3002.1	*	1	1925		234	0.	11.7	2993.8
1	0250		35	154.	18.9	2995.5	*	1	1110		135	379.	81.0	3001.9	*	1	1930		235	0.	11.7	2993.8
1	0255		36	176.	19.9	2995.8	*	1	1115		136	373.	78.5	3001.7	*	1	1935		236	0.	11.7	2993.8
1	0300		37	196.	20.8	2996.0	*	1	1120		137	368.	75.9	3001.4	*	1	1940		237	0	11.7	2993.8
1	0305		38	202.	21.8	2996.1	*	1	1125		138	362.	73.4	3001.2	*	1	1945		238	0	11.7	2993.8
1	0310		39	208.	22.9	2996.2	*	1	1130		139	356.	70.9	3001.0	*	1	1950		239	0.	11.7	2993.8
1	0315		40	217.	24.8	2996.4	*	1	1135		140	351.	68.5	3000.7	*	1	1955		240	0.	11.7	2993.8

1	0320	41	232.	28.0	2996.8	*	1	1140	141	345.	66.1	3000.5	*	1	2000	241	0.	11.7	2993.8
1	0325	42	255.	33.8	2997.5	*	1	1145	142	339.	63.7	3000.3	*	1	2005	242	0.	11.7	2993.8
1	0330	43	287.	43.6	2998.5	*	1	1150	143	334.	61.4	3000.1	*	1	2010	243	0	11.7	2993.8
1	0335	44	326.	58.2	2999.8	*	1	1155	144	328.	59.1	2999.9	*	1	2015	244	0.	11.7	2993.8
1	0340	45	371.	77.1	3001.5	*	1	1200	145	323.	56.9	2999.7	*	1	2020	245	0.	11.7	2993.8
1	0345	46	414.	98.5	3003.5	*	1	1205	146	318.	54.7	2999.5	*	1	2025	246	0.	11.7	2993.8
1	0350	47	455.	120.6	3005.5	*	1	1210	147	312.	52.5	2999.3	*	1	2030	247	0	11.7	2993.8
1	0355	48	491.	142.0	3007.5	*	1	1215	148	306.	50.4	2999.1	*	1	2035	248	0.	11.7	2993.8
1	0400	49	525.	162.2	3009.3	*	1	1220	149	300.	48.3	2998.9	*	1	2040	249	0.	11.7	2993.8
1	0405	50	551.	181.1	3010.9	*	1	1225	150	295.	46.2	2998.7	*	1	2045	250	0.	11.7	2993.8
1	0410	51	572.	198.6	3012.3	*	1	1230	151	289.	44.2	2998.5	*	1	2050	251	0.	11.7	2993.8
1	0415	52	590.	214.3	3013.5	*	1	1235	152	284.	42.3	2998.3	*	1	2055	252	0.	11.7	2993.8
1	0420	53	607	228.1	3014.5	*	1	1240	153	278.	40.3	2998.2	*	1	2100	253	0.	11.7	2993.8
1	0425	54	620.	239.8	3015.4	*	1	1245	154	273.	38.4	2998.0	*	1	2105	254	0.	11.7	2993.8
1	0430	55	630	249.8	3016.1	*	1	1250	155	266.	36.6	2997.8	*	1	2110	255	0.	11.7	2993.8
1	0435	56	638.	258.4	3016.7	*	1	1255	156	259.	34.8	2997.6	*	1	2115	256	0	11.7	2993.8
1	0440	57	646.	266.1	3017.3	*	1	1300	157	252.	33.0	2997.4	*	1	2120	257	0	11.7	2993.8
1	0445	58	653.	273.1	3017.8	*	1	1305	158	246.	31.3	2997.2	*	1	2125	258	0.	11.7	2993.8
1	0450	59	659.	279.4	3018.2	*	1	1310	159	239.	29.6	2997.0	*	1	2130	259	0.	11.7	2993.8
1	0455	60	664.	285.2	3018.6	*	1	1315	160	232.	28.0	2996.8	*	1	2135	260	0.	11.7	2993.8
1	0500	61	669.	290.6	3019.0	*	1	1320	161	225.	26.4	2996.6	*	1	2140	261	0.	11.7	2993.8
1	0505	62	674.	295.4	3019.3	*	1	1325	162	217.	24.9	2996.5	*	1	2145	262	0	11.7	2993.8
1	0510	63	677.	299.5	3019.6	*	1	1330	163	210.	23.4	2996.3	*	1	2150	263	0.	11.7	2993.8
1	0515	64	680.	302.8	3019.8	*	1	1335	164	203.	22.0	2996.1	*	1	2155	264	0.	11.7	2993.8
1	0520	65	682.	305.3	3020.0	*	1	1340	165	192	20.7	2995.9	*	1	2200	265	0.	11.7	2993.8
1	0525	66	684.	307.1	3020.1	*	1	1345	166	165	19.4	2995.6	*	1	2205	266	0.	11.7	2993.8
1	0530	67	685.	308.1	3020.2	*	1	1350	167	143.	18.4	2995.4	*	1	2210	267	0.	11.7	2993.8
1	0535	68	685.	308.4	3020.2	*	1	1355	168	123.	17.5	2995.2	*	1	2215	268	0.	11.7	2993.8
1	0540	69	685.	308.0	3020.2	*	1	1400	169	106.	16.7	2995.0	*	1	2220	269	0	11.7	2993.8
1	0545	70	684.	307.1	3020.1	*	1	1405	170	91.	16.0	2994.8	*	1	2225	270	0.	11.7	2993.8
1	0550	71	683.	305.6	3020.0	*	1	1410	171	79.	15.4	2994.7	*	1	2230	271	0	11.7	2993.8
1	0555	72	681.	303.7	3019.9	*	1	1415	172	68.	14.9	2994.6	*	1	2235	272	0	11.7	2993.8
1	0600	73	679.	301.4	3019.7	*	1	1420	173	59.	14.5	2994.5	*	1	2240	273	0.	11.7	2993.8
1	0605	74	677.	298.7	3019.5	*	1	1425	174	51.	14.1	2994.4	*	1	2245	274	0.	11.7	2993.8
1	0610	75	674.	295.8	3019.3	*	1	1430	175	44.	13.8	2994.3	*	1	2250	275	0.	11.7	2993.8
1	0615	76	671.	292.6	3019.1	*	1	1435	176	38.	13.5	2994.2	*	1	2255	276	0.	11.7	2993.8
1	0620	77	668.	289.1	3018.9	*	1	1440	177	32.	13.2	2994.2	*	1	2300	277	0.	11.7	2993.8
1	0625	78	665.	285.5	3018.6	*	1	1445	178	28.	13.0	2994.1	*	1	2305	278	0.	11.7	2993.8
1	0630	79	661.	281.8	3018.4	*	1	1450	179	24.	12.9	2994.1	*	1	2310	279	0.	11.7	2993.8
1	0635	80	658.	277.9	3018.1	*	1	1455	180	21.	12.7	2994.0	*	1	2315	280	0.	11.7	2993.8
1	0640	81	654.	273.9	3017.8	*	1	1500	181	18.	12.6	2994.0	*	1	2320	281	0.	11.7	2993.8
1	0645	82	650.	269.8	3017.5	*	1	1505	182	15.	12.5	2994.0	*	1	2325	282	0.	11.7	2993.8
1	0650	83	646.	265.7	3017.2	*	1	1510	183	13.	12.4	2993.9	*	1	2330	283	0.	11.7	2993.8
1	0655	84	641.	261.6	3016.9	*	1	1515	184	11.	12.3	2993.9	*	1	2335	284	0.	11.7	2993.8
1	0700	85	637.	257.4	3016.6	*	1	1520	185	10.	12.2	2993.9	*	1	2340	285	0.	11.7	2993.8
1	0705	86	633.	253.2	3016.3	*	1	1525	186	9.	12.1	2993.9	*	1	2345	286	0.	11.7	2993.8
1	0710	87	629.	249.0	3016.0	*	1	1530	187	7.	12.1	2993.9	*	1	2350	287	0.	11.7	2993.8
1	0715	88	625.	244.7	3015.7	*	1	1535	188	6.	12.0	2993.9	*	1	2355	288	0.	11.7	2993.8
1	0720	89	620.	240.5	3015.4	*	1	1540	189	5.	12.0	2993.9	*	2	0000	289	0.	11.7	2993.8
1	0725	90	616.	236.3	3015.1	*	1	1545	190	5.	12.0	2993.9	*	2	0005	290	0.	11.7	2993.8
1	0730	91	612.	232.1	3014.8	*	1	1550	191	4.	11.9	2993.8	*	2	0010	291	0.	11.7	2993.8
1	0735	92	607.	228.0	3014.5	*	1	1555	192	4.	11.9	2993.8	*	2	0015	292	0.	11.7	2993.8
1	0740	93	602.	223.8	3014.2	*	1	1600	193	3.	11.9	2993.8	*	2	0020	293	0.	11.7	2993.8
1	0745	94	597.	219.7	3013.9	*	1	1605	194	3.	11.9	2993.8	*	2	0025	294	0.	11.7	2993.8
1	0750	95	592.	215.6	3013.6	*	1	1610	195	2.	11.8	2993.8	*	2	0030	295	0.	11.7	2993.8
1	0755	96	587.	211.6	3013.3	*	1	1615	196	2	11.8	2993.8	*	2	0035	296	0.	11.7	2993.8
1	0800	97	582.	207.6	3012.9	*	1	1620	197	2.	11.8	2993.8	*	2	0040	297	0.	11.7	2993.8
1	0805	98	578.	203.6	3012.6	*	1	1625	198	1.	11.8	2993.8	*	2	0045	298	0.	11.7	2993.8
1	0810	99	573.	199.6	3012.3	*	1	1630	199	1.	11.8	2993.8	*	2	0050	299	0.	11.7	2993.8
1	0815	100	568.	195.7	3012.0	*	1	1635	200	1.	11.8	2993.8	*	2	0055	300	0	11.7	2993.8

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	24.92-HR
+ (CFS)	(HR)				
		(CFS)			
+ 685.	5.58	603.	222.	214.	214.
		(INCHES) 1.277	1.879	1.879	1.879
		(AC-FT) 299.	440	440	440

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (AC-FT)	(HR)				
308.	5.58	231.	77.	74.	74.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	24.92-HR
+ (FEET)	(HR)				
3020.18	5.58	3014.54	3000.22	2999.88	2999.88

CUMULATIVE AREA = 4.39 SQ MI

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PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

					RATIOS APPLIED TO PRECIPITATION						
OPERATION	STATION	AREA	PLAN		RATIO 1 1.00	RATIO 2 .99	RATIO 3 .98	RATIO 4 .94	RATIO 5 .93	RATIO 6 .92	RATIO 7 .91
HYDROGRAPH AT											
+	1-1A	2.34	1	FLOW	2600.	2564.	2528.	2383.	2347.	2311.	2275.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT											
+	1-1B	.17	1	FLOW	294.	290.	286.	268.	264.	260.	256.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO											
+	R2	.17	1	FLOW	282.	277.	271.	255.	254.	249.	243.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT											
+	CP1	2.51	1	FLOW	2745.	2707.	2669.	2517.	2479.	2441.	2403.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO											
+	R3	2.51	1	FLOW	2685.	2648.	2611.	2462.	2424.	2387.	2350.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00

HYDROGRAPH AT											
+	1-2A	.86	1	FLOW	1615.	1593.	1572.	1485.	1463.	1442.	1420.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO											
+	R4	86	1	FLOW	1556.	1535.	1513.	1428.	1406.	1385.	1364.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT											
+	1-2B	.22	1	FLOW	365.	360.	355.	334.	329.	324.	319.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT											
+	CP2	3.59	1	FLOW	3438.	3392.	3344.	3152.	3103.	3057.	3009.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO											
+	R5	3.59	1	FLOW	3407.	3360.	3312.	3122.	3074.	3028.	2981.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT											
+	1-2CR	.57	1	FLOW	957.	943.	930.	876.	863.	850.	836.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT											
+	CP3	4.16	1	FLOW	4014.	3956.	3899.	3672.	3617.	3559.	3503.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO											
+	R6	4.16	1	FLOW	3971.	3919.	3857.	3633.	3577.	3521.	3465.
				TIME	3.75	3.75	3.75	3.75	3.83	3.83	3.83
HYDROGRAPH AT											
+	1-3P	.05	1	FLOW	102.	101.	99.	95.	94.	93.	92.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT											
+	CP4	4.21	1	FLOW	4027.	3974.	3912.	3686.	3629.	3570.	3516.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO											
+	R7	4.21	1	FLOW	4008.	3951.	3895.	3669.	3614.	3557.	3501.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT											
+	1-12P	.17	1	FLOW	306.	302.	298.	283.	279.	275.	271.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT											
+	CP5	4.38	1	FLOW	4157.	4098.	4040.	3808.	3751.	3692.	3634.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT											
+	1-14	.00	1	FLOW	3.	3.	3.	3.	3.	3.	3.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	1-15	.00	1	FLOW	8.	8.	8.	7.	7.	7.	7.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	1-16	.00	1	FLOW	4.	4.	4.	4.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	1-17	.00	1	FLOW	6.	6.	6.	5.	5.	5.	5.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	1-18	.00	1	FLOW	8.	8.	8.	7.	7.	7.	7.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
6 COMBINED AT											
+	CP5B	4.39	1	FLOW	4167.	4108.	4050.	3817.	3760.	3701.	3643.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO											
+	EXDB	4.39	1	FLOW	996.	941.	881.	700.	695.	690.	685.
				TIME	5.42	5.42	5.50	5.58	5.58	5.58	5.58
			** PEAK STAGES IN FEET **								
			1	STAGE	3023.09	3022.87	3022.63	3021.35	3020.96	3020.57	3020.18
				TIME	5.42	5.42	5.50	5.58	5.58	5.58	5.58
HYDROGRAPH AT											
+	1-4R	.05	1	FLOW	102.	100.	99.	93.	92.	91.	89.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	1-5R	03	1	FLOW	63.	63.	62.	58.	57.	56.	56.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT											
+	CP6	.09	1	FLOW	165.	163.	161.	152.	149.	147.	145.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO											
+	R8	.09	1	FLOW	159.	156.	154.	145.	143.	141.	139.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	1-6R	.02	1	FLOW	29.	28.	28.	26.	26.	25.	25.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT											
+	1-7R	03	1	FLOW	51.	51.	50.	47.	46.	46.	45.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT											
+	CP7	.04	1	FLOW	80.	79.	78.	73.	72.	71.	70.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50

ROUTED TO												
+	R9	.04	1	FLOW	78.	77.	75.	71.	70.	70.	68.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	1-8R	.00	1	FLOW	5.	5.	5.	5.	4.	4.	4.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	1-10R	.05	1	FLOW	99.	97.	96.	90.	89.	88.	86.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT												
+	CP8	.05	1	FLOW	103.	102.	101.	95.	94.	92.	91.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO												
+	R10	.05	1	FLOW	99.	98.	97.	91.	90.	89.	87.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	1-11P	19	1	FLOW	343.	339.	335.	317.	313.	309.	304.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
4 COMBINED AT												
+	CP9	.37	1	FLOW	677.	669.	660.	624.	615.	608.	598.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT												
+	1-13	.00	1	FLOW	2.	2.	2.	2.	1.	1.	1.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50
HYDROGRAPH AT												
+	LMT1R	1.96	1	FLOW	2207.	2176.	2146.	2024.	1994.	1963.	1933.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83
3 COMBINED AT												
+	CP10	2.33	1	FLOW	2526.	2492.	2458.	2320.	2286.	2252.	2218.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83

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

ISIAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .00									
	R2 MANE	3.36	289.22	218.58	2.04	5.00	281.80	220.00	2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1903E+02 EXCESS= .0000E+00 OUTFLOW= .1904E+02 BASIN STORAGE= .1383E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
	R2 MANE	3.38	279.68	219.48	2.01	5.00	276.51	220.00	2.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1874E+02 EXCESS= .0000E+00 OUTFLOW= .1874E+02 BASIN STORAGE= .1082E-02 PERCENT ERROR= 0

FOR PLAN = 1 RATIO= .00									
	R2 MANE	3.39	276.43	217.01	1.98	5.00	271.33	220.00	1.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1845E+02 EXCESS= .0000E+00 OUTFLOW= .1846E+02 BASIN STORAGE= .1361E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
	R2 MANE	3.45	260.99	217.36	1.85	5.00	255.02	220.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1729E+02 EXCESS= .0000E+00 OUTFLOW= .1730E+02 BASIN STORAGE= .1236E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
	R2 MANE	3.47	260.70	218.34	1.82	5.00	253.66	220.00	1.82

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1702E+02 EXCESS= .0000E+00 OUTFLOW= .1702E+02 BASIN STORAGE= .9940E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
	R2 MANE	3.48	252.51	219.33	1.79	5.00	249.03	220.00	1.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1672E+02 EXCESS= .0000E+00 OUTFLOW= .1672E+02 BASIN STORAGE= .1186E-02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00									
	R2 MANE	3.50	245.74	216.85	1.76	5.00	243.41	220.00	1.76

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1644E+02 EXCESS= .0000E+00 OUTFLOW= .1645E+02 BASIN STORAGE= .9486E-03 PERCENT ERROR= 0

FOR PLAN = 1 RATIO= .00									
	R6 MANE	1.30	3994.06	226.77	2.21	5.00	3970.75	225.00	2.21

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4905E+03 EXCESS= .0000E+00 OUTFLOW= .4904E+03 BASIN STORAGE= .5558E-03 PERCENT ERROR= 0

FOR PLAN = 1 RATIO= .00									
	R6 MANE	1.31	3938.21	226.28	2.18	5.00	3918.59	225.00	2.18

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4834E+03 EXCESS= .0000E+00 OUTFLOW= .4832E+03 BASIN STORAGE= .5097E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

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          R6  MANE          1.31   3879.36    227.10      2.14      5.00   3856.62    225.00        2.14

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4762E+03 EXCESS= .0000E+00 OUTFLOW= .4761E+03 BASIN STORAGE= .5558E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   00
          R6  MANE          1.33   3655.79    226.54      2.02      5.00   3633.25    225.00        2.02

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4479E+03 EXCESS= .0000E+00 OUTFLOW= .4478E+03 BASIN STORAGE= .5423E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   00
          R6  MANE          1.34   3598.11    227.40      1.98      5.00   3577.13    230.00        1.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4408E+03 EXCESS= .0000E+00 OUTFLOW= .4407E+03 BASIN STORAGE= .5914E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   00
          R6  MANE          1.34   3542.71    226.97      1.95      5.00   3520.75    230.00        1.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4338E+03 EXCESS= .0000E+00 OUTFLOW= .4337E+03 BASIN STORAGE= .5276E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   00
          R6  MANE          1.35   3487.55    226.53      1.92      5.00   3465.03    230.00        1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4268E+03 EXCESS= .0000E+00 OUTFLOW= .4267E+03 BASIN STORAGE= .5687E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   .00
          R7  MANE          1.77   4009.51    228.14      2.21      5.00   4008.02    230.00        2.21

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4974E+03 EXCESS= .0000E+00 OUTFLOW= .4972E+03 BASIN STORAGE= .7540E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   00
          R7  MANE          1.77   3956.84    228.90      2.18      5.00   3950.55    230.00        2.18

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4903E+03 EXCESS= .0000E+00 OUTFLOW= .4901E+03 BASIN STORAGE= .7525E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   .00
          R7  MANE          1.78   3896.50    229.01      2.15      5.00   3894.59    230.00        2.15

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4829E+03 EXCESS= .0000E+00 OUTFLOW= .4827E+03 BASIN STORAGE= .7143E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   00
          R7  MANE          1.81   3672.14    229.63      2.02      5.00   3669.15    230.00        2.02

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4543E+03 EXCESS= .0000E+00 OUTFLOW= .4541E+03 BASIN STORAGE= .8126E-03 PERCENT ERROR=     0

     FOR PLAN = 1  RATIO=   .00
          R7  MANE          1.82   3617.64    228.71      1.99      5.00   3613.95    230.00        1.99

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4472E+03 EXCESS= .0000E+00 OUTFLOW= .4470E+03 BASIN STORAGE= .7630E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   .00
          R7  MANE          1.82   3559.59    229.66      1.96      5.00   3557.13    230.00        1.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4401E+03 EXCESS= .0000E+00 OUTFLOW= .4399E+03 BASIN STORAGE= .7378E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   .00
          R7  MANE          1.83   3504.76    228.70      1.93      5.00   3501.22    230.00        1.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4329E+03 EXCESS= .0000E+00 OUTFLOW= .4328E+03 BASIN STORAGE= .7018E-03 PERCENT ERROR=     0

     FOR PLAN = 1  RATIO=   .00
          R8  MANE           .93    164.73    211.50      2.12      5.00    158.64    210.00        2.12

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9855E+01 EXCESS= .0000E+00 OUTFLOW= .9855E+01 BASIN STORAGE= .1154E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   .00
          R8  MANE           .93    162.53    211.16      2.09      5.00    156.50    210.00        2.09

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9714E+01 EXCESS= .0000E+00 OUTFLOW= .9714E+01 BASIN STORAGE= .1114E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   .00
          R8  MANE           .94    160.17    211.75      2.06      5.00    154.37    210.00        2.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9570E+01 EXCESS= .0000E+00 OUTFLOW= .9570E+01 BASIN STORAGE= .1072E-03 PERCENT ERROR=     0

     FOR PLAN = 1  RATIO=   .00
          R8  MANE           .95    151.20    211.39      1.94      5.00    145.32    210.00        1.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9003E+01 EXCESS= .0000E+00 OUTFLOW= .9003E+01 BASIN STORAGE= .1063E-03 PERCENT ERROR=     .0

     FOR PLAN = 1  RATIO=   .00
          R8  MANE           .95    148.97    211.07      1.91      5.00    143.29    210.00        1.91
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CONTINUITY SUMMARY (AC-FT) - INFLOW= .8863E+01 EXCESS= .0000E+00 OUTFLOW= .8863E+01 BASIN STORAGE= .1001E-03 PERCENT ERROR= 0

FOR PLAN = 1 RATIO= .00

R8	MANE	.95	146.68	211.72	1.88	5.00	141.02	210.00	1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8722E+01 EXCESS= .0000E+00 OUTFLOW= .8722E+01 BASIN STORAGE= .1129E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R8	MANE	.96	144.44	211.42	1.85	5.00	138.69	210.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8580E+01 EXCESS= .0000E+00 OUTFLOW= .8580E+01 BASIN STORAGE= .1073E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.23	79.33	214.25	2.13	5.00	77.52	215.00	2.13

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4774E+01 EXCESS= .0000E+00 OUTFLOW= .4775E+01 BASIN STORAGE= .2191E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.24	78.39	212.60	2.10	5.00	77.06	215.00	2.10

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4704E+01 EXCESS= .0000E+00 OUTFLOW= .4704E+01 BASIN STORAGE= .2595E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.24	77.25	213.20	2.06	5.00	75.32	215.00	2.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4631E+01 EXCESS= .0000E+00 OUTFLOW= .4631E+01 BASIN STORAGE= .2176E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.27	72.91	213.43	1.94	5.00	71.01	215.00	1.94

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4358E+01 EXCESS= .0000E+00 OUTFLOW= .4358E+01 BASIN STORAGE= .2098E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.28	71.80	214.07	1.91	5.00	70.07	215.00	1.91

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4289E+01 EXCESS= .0000E+00 OUTFLOW= .4290E+01 BASIN STORAGE= .2467E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.28	70.78	212.44	1.88	5.00	69.79	215.00	1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4226E+01 EXCESS= .0000E+00 OUTFLOW= .4226E+01 BASIN STORAGE= .2036E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R9	MANE	2.29	69.68	213.10	1.85	5.00	68.21	215.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4155E+01 EXCESS= .0000E+00 OUTFLOW= .4155E+01 BASIN STORAGE= .2377E-03 PERCENT ERROR= 0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.92	102.72	213.27	2.10	5.00	99.09	215.00	2.10

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6168E+01 EXCESS= .0000E+00 OUTFLOW= .6168E+01 BASIN STORAGE= .2447E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.93	101.45	211.93	2.07	5.00	97.72	215.00	2.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6078E+01 EXCESS= .0000E+00 OUTFLOW= .6078E+01 BASIN STORAGE= .2047E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.93	99.98	212.53	2.04	5.00	96.90	215.00	2.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5986E+01 EXCESS= .0000E+00 OUTFLOW= .5986E+01 BASIN STORAGE= .2316E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.95	94.32	213.07	1.92	5.00	91.44	215.00	1.92

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5634E+01 EXCESS= .0000E+00 OUTFLOW= .5634E+01 BASIN STORAGE= .1981E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.96	92.89	213.71	1.89	5.00	89.69	215.00	1.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5544E+01 EXCESS= .0000E+00 OUTFLOW= .5544E+01 BASIN STORAGE= .2258E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.97	91.53	212.40	1.86	5.00	88.91	215.00	1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5455E+01 EXCESS= .0000E+00 OUTFLOW= .5455E+01 BASIN STORAGE= .1833E-03 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .00

R10	MANE	1.97	90.11	213.07	1.83	5.00	87.48	215.00	1.83

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5369E+01 EXCESS= .0000E+00 OUTFLOW= .5369E+01 BASIN STORAGE= .2071E-03 PERCENT ERROR= .0

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

NORTH

SCALE 1" = 300'

GRAPHIC SCALE

300 0 150 300

(IN FEET)

1 inch = 300 ft.

LEGEND

- (1-3P) **DRAINAGE BASIN**
- (3-E) **PRORATED DRAINAGE BASIN**
- CP3 ● **CONCENTRATION POINT**
- **BASIN BOUNDARY**
- **FLOW DIRECTION**
- A A **STREET CROSS SECTION**

ONSITE PRORATED FLOW SUMMARY			
Subbasin	Q_{100} (cfs)	Area (acres)	cfs/acre
1-3P	102	30.4	3.36
1-11P	343	119.0	2.88
1-12P	306	105.8	2.89
Onsite Prorated Basins			
Subbasin	Q_{100} (cfs)	Area (acres)	cfs/acre
3-A	11	3.4	3.36
3-B	7	2.0	3.36
3-C	21	6.2	3.36
3-D	8	2.5	3.36
3-E	3	0.9	3.36
3-F	6	1.8	3.36
3-G	3	0.8	3.36
3-H	3	0.9	3.36
3-I	22	6.5	3.36
3-J	5	1.6	3.36
3-K	13	3.8	3.36
Total	**102**	**30.4**	
11-A	12	4.1	2.88
11-B	9	3.0	2.88
11-C	12	4.1	2.88
11-D	15	5.3	2.88
11-E	7	2.4	2.88
11-F	35	12.3	2.88
11-G	27	9.5	2.88
11-H	11	3.9	2.88
11-I	12	4.0	2.88
11-J	9	3.2	2.88
11-K	16	5.5	2.88
11-L	15	5.1	2.88
11-M	15	5.3	2.88
11-N	38	13.0	2.88
11-O	10	3.6	2.88
11-P1	18	6.2	2.88
11-P2	3	1.0	2.88
11-Q	20	7.0	2.88
11-R	19	6.6	2.88
11-S	40	13.9	2.88
Total	**343**	**119.0**	
12-A	20	7.0	2.89
12-B	10	3.4	2.89
12-C	9	3.1	2.89
12-D1	13	4.6	2.89
12-D2	8	2.8	2.89
12-E	20	6.9	2.89
12-F	26	9.0	2.89
12-G	5	1.9	2.89
12-H	18	6.3	2.89
12-I	24	8.2	2.89
12-J	19	6.6	2.89
12-K	12	4.0	2.89
12-L	8	2.7	2.89
12-M	11	3.9	2.89
12-N	5	1.6	2.89
12-O	6	2.2	2.89
12-P	8	2.7	2.89
12-Q	9	3.1	2.89
12-R	60	20.6	2.89
12-S	15	5.3	2.89
Total	**306**	**105.8**	

SUMMARY OF ULTIMATE CONDITIONS HEC-1 MODEL		
SB OR CP	AREA (AC)	100 YR (CFS)
1-1A	1497.2	2347
1-1B	111.8	294
1-2A	552.7	1572
1-2B	137.7	365
1-2CR	365.5	930
1-4R	34.3	102
1-5R	21.5	63
1-6R	9.6	29
1-7R	17.3	51
1-8R	1.6	5
1-10R	33.5	99
1-3P	30.4	102
1-11P	119.0	343
1-12P	105.8	306
1-13	0.6	2
1-14	1.2	3
1-15	2.8	8
1-16	1.5	4
1-17	2.1	6
1-18	2.9	8
CP1	N/A	2479
CP2	N/A	3057
CP3	N/A	3503
CP4	N/A	3516
CP5	N/A	3634
CP5B	N/A	3643
CP6	N/A	165
CP7	N/A	80
CP8	N/A	103
CP9	N/A	669
CP10	N/A	2286

OFFSITE PRORATED FLOW SUMMARY			
Subbasin	Q_{100} (cfs)	Area (acres)	cfs/acre
1-2CR	930	365.5	2.54
1-4R	102	34.3	2.98
1-5R	63	21.5	2.93
1-10R	99	33.5	2.96
1-14	3	1.2	2.52
1-15	8	2.8	2.87
1-16	4	1.5	2.65
1-17	6	2.1	2.80
Offsite Prorated Basins			
Subbasin	Q_{100} (cfs)	Area (acres)	cfs/acre
1-2CA	5	2.1	2.54
1-2CB	925	363.42	2.54
Total	**930**	**365.5**	
1-4A	3	1.0	2.98
1-4B	99	33.2	2.98
Total	**102**	**34.2**	
1-5A	30	10.2	2.93
1-5B	33	11.3	2.93
Total	**63**	**21.5**	
1-10A	21	7.0	2.96
1-10B	21	7.3	2.96
1-10C	57	19.2	2.96
Total	**99**	**33.5**	
1-14A	3	1.0	2.52
1-14B	0	0.2	2.52
Total	**3**	**1.2**	
1-15A	7	2.4	2.87
1-15B	1	0.4	2.87
Total	**8**	**2.8**	
1-16A	3	1.1	2.65
1-16B	1	0.4	2.65
Total	**4**	**1.5**	
1-17A	1	0.4	2.80
1-17B	5	1.8	2.80
Total	**6**	**2.1**	

100-YEAR STREET FLOW CHARACTERISTICS ULTIMATE CONDITIONS					
Location	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (ft/s)	D*V
Section 1-1	7.1	8	0.30	5.1	1.5
Section 2-2	1.6	26	0.50	3.8	1.9
Section 3-3	5.2	30	0.44	6.2	2.7
Section 4-4	3.8	17	0.40	4.7	1.9
Section 5-5	5.0	20	0.40	5.5	2.2
Section 6-6	0.5	13	0.49	2.1	1.0
Section 7-7	0.5	11	0.47	2.0	0.9
Section 8-8	3.8	9	0.34	4.1	1.4
Section 9-9	5.1	21	0.40	5.6	2.2
Section 10-10	1.7	23	0.48	3.7	1.8

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE:10-02-07
PLOT TIME: 08:17:35

DATE:
DATE: CGW. APP
DATE: AGEN. APP
DESCRIPTION
REV DATE:

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD - LAS VEGAS, NV 89146
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PULTE HOMES INC.

VILLAGE 26 AT SUMMERLIN WEST

UPDATE #2 TO THE MASTER DRAINAGE STUDY

ULTIMATE CONDITIONS DRAINAGE MAP

DRAWING
FIG 5AU2
SHT OF SHTS

acad2435.dwg,100117.lay

ONSITE FLOOD PROTECTION FACILITIES

LOCATION	Q_{100} ULT (cfs)	TRIBUTARIES	DESIGN SLOPE (%)	FACILITY
1	3555	CP2-(3555 cfs)	0.5%	14'x 14' RCB
2	21	3-C-(21 cfs)	3.5%	36" RCP
3	3520	FACILITY 7 (3520 cfs) + FACILITY 2 (21 cfs) = 3-H (3 cfs)	0.5%	14'x 14' RCB
4	6	3-D-(6 cfs)	1.3%	24" RCP
5	3538	FACILITY 3 (3527 cfs) + FACILITY 4 (6 cfs) = 3-E (3 cfs)	0.5%	14'x 14' RCB
6	3	3-E-(3 cfs)	1.0%	18" RCP
7	4	3-F-(4 cfs)	1.0%	24" RCP
8	3547	FACILITY 5 (3538 cfs) + FACILITY 6 (6 cfs) = 3-G (3 cfs)	0.5%	14'x 14' RCB
9	18	3-A (11 cfs) + 3-B (7 cfs)	0.5%	36" RCP
10	3565	FACILITY 8 (3547 cfs) + FACILITY 9 (18 cfs)	3.0%	20' X 7.5' RECTANGULAR CHANNEL
11	5	3-J-(5 cfs)	1.4%	24" RCP
11A	38	FACILITY 10 (5 cfs) + 3-K (13 cfs) + 12-E (20 cfs)	0.5%	30" RCP
11B	13	12-D1 (13 cfs)	0.5%	30" RCP
11C	8	12-D2 (8 cfs)	4.9%	24" RCP
11D	21	FACILITY 11B (13 cfs) + FACILITY 11C (8 cfs)	0.5%	36" RCP
12	59	FACILITY 11A (38 cfs) + FACILITY 11D (21 cfs)	0.5%	36" RCP
12A	3624	FACILITY 9 (3565 cfs) + FACILITY 12A (59 cfs)	6.5%	20' X 7.5' RECTANGULAR CHANNEL
12B	8	12-L-(8 cfs)	5.0%	18" RCP
13	12	12-K (12 cfs)	5.0%	24" RCP
14	21	FACILITY 12 (8 cfs) + FACILITY 14 (12 cfs) = 12-M (21 cfs)	0.5%	36" RCP
15	19	12-J (19 cfs)	5.0%	24" RCP
16	50	FACILITY 13 (21 cfs) + FACILITY 15 (19 cfs)	0.5%	42" RCP
17	74	FACILITY 17 (50 cfs) + 12-I (24 cfs)	0.5%	42" RCP
17A	3666	FACILITY 12B (3624cfs) + FACILITY 17A (74 cfs)	4.0%	20' X 7' RCB
17B	52	12-H (22 cfs) + 12-G (16 cfs) + 3-I (23 cfs)	2.0%	30" RCP
18	4	DI#18 (4 cfs)	NA	1-10.6 TYPE CM
19A	4	DI#19A (4 cfs)	NA	1-10.6 TYPE CM
19B	6	DI#19 A (4 cfs) + DI#19 B (6 cfs)	NA	18" RCP
20	65	FACILITY 19 (52 cfs) + FACILITY 21 (6 cfs)	NA	30" RCP
20A	5	DI#20 A (5 cfs)	NA	2-5.6 TYPE CM
21	65	FACILITY 22 (65 cfs) + DI#15 B (0 cfs)	NA	30" RCP
22	17	DI#22 (13 cfs) + DI#16 (5 cfs)	NA	24" RCP
22A	17	DI#23 (12 cfs) + DI#16 (5 cfs)	NA	1-10.6 TYPE CM + 1-5.6 TYPE CM
23	82	FACILITY 23 (65 cfs) + FACILITY 24 (17 cfs)	NA	30" RCP
24	23	DI#15 A (6 cfs) + DI#7 A (16 cfs) + DI#7 B (1 cfs)	NA	4-7.5-6 TYPE CM
24A	105	FACILITY 25 (82 cfs) + DI#15 A (6 cfs) + DI#7 A (16 cfs)	NA	36" RCP
25	15	12-G (15 cfs)	NA	24" RCP
25A	120	FACILITY 26 (105 cfs) + FACILITY 27 (15 cfs)	NA	36" RCP
26	129	FACILITY 27B (129 cfs)	NA	42" RCP
27	3	1-13 (3 cfs)	NA	18" RCP
27A	16.5	FACILITY 29 (3 cfs) + DI #10 (13.5 cfs)	NA	18" RCP
27B	13	DI #9 & #10 (13 cfs)	NA	2-12.5-6 TYPE CM
29	138	FACILITY 29 (129 cfs) + FACILITY 31 (13.5 cfs) + DI #12 (3 cfs)	NA	48" RCP

ONSITE FLOOD PROTECTION FACILITIES

LOCATION	Q_{100} ULT (cfs)	TRIBUTARIES	DESIGN SLOPE (%)	FACILITY
DI#1	9	1-10 (9 cfs)	NA	18" RCP
DI#2	146	FACILITY 33B (139 cfs) + FACILITY 33A (6 cfs)	NA	48" RCP
DI#3	4	1-16 (4 cfs)	NA	18" RCP
DI#4	4	DI#16 (4 cfs)	NA	1-2.5 x 2.5 NDOT TYPE 2A
DI#5	150	FACILITY 33B (146 cfs) + FACILITY 34 (4 cfs)	NA	54" RCP
DI#6	11	DI #15 & #13 (11 cfs)	NA	3-7.5-6 TYPE CM
DI#8	1	1-17A (1 cfs)	NA	1-2.5 x 2.5 NDOT TYPE 2A
DI#9	162	FACILITY 32 (150 cfs) + FACILITY 35 (11 cfs) + FACILITY 36B(1 cfs)	NA	54" RCP
DI#10	13	1-17B (5 cfs) + 1-18 (8 cfs)	NA	1-2.5 x 2.5 NDOT TYPE 2A
DI#11	13	DI #14 (13 cfs)	NA	24" RCP
DI#12	11	DI #15 & #14 (11 cfs)	NA	2-10.6 TYPE CM
DI#13	186	FACILITY 37 (162 cfs) + FACILITY 38A (13 cfs) + DI #13 & #14 (11 cfs)	NA	54" RCP
DI#14	13	11-L-(13 cfs)	2.5%	24" RCP
DI#15	43	11-E (7 cfs) + 11-F (36 cfs)	2.2%	36" RCP
DI#16	89	FACILITY 41 (43 cfs) + 11-D (37 cfs)	1.3%	42" RCP
DI#17	11	11-H (11 cfs)	8.5%	24" RCP
DI#18	99	FACILITY 42 (89 cfs) + FACILITY 43 (11 cfs)	1.3%	42" RCP
DI#19	62	FACILITY 40 (12 cfs) + FACILITY 44 (50 cfs)	8.6%	42" RCP
DI#20	103	CP8 (103 cfs)	1.0%	48" RCP
DI#21	12	11-A (12 cfs)	0.5%	30" RCP
DI#22	16	11-B (16 cfs)	0.3%	30" RCP
DI#23	131	FACILITY 45 (103 cfs) + FACILITY 46 (28 cfs) + FACILITY 48 (28 cfs)	0.3%	60" RCP
DI#24	80	CP7 (80 cfs)	1.3%	42" RCP
DI#25	85	FACILITY 50 (80 cfs) + 11-L (15 cfs)	1.3%	48" RCP
DI#26	236	FACILITY 49 (131 cfs) + FACILITY 51 (105 cfs)	3.3%	54" RCP
DI#27	15	11-M (15 cfs)	6.8%	30" RCP
DI#28	13	DI #17 & #18 (13 cfs)	NA	2-10.6 TYPE CM
DI#29	13	DI #17 & #18 (13 cfs)	NA	24" RCP
DI#30	19	DI #19 & #20 (19 cfs)	NA	2-12.5-6 TYPE CM
DI#31	32	FACILITY 53B (13 cfs) + DI #19 & #20 (19 cfs)	NA	36" RCP
DI#32	287	FACILITY 53B (236 cfs) + FACILITY 52 (36 cfs) + 11-C (15 cfs) + 11-G (16 cfs)	3.0%	66" RCP
DI#33	36	11-N (36 cfs)	3.5%	30" RCP
DI#34	67	FACILITY 55A (36 cfs) + 11-I (31 cfs)	4.5%	36" RCP
DI#35	365	FACILITY 55B (67 cfs) + 11-P1 (36 cfs) + 11-P2 (262 cfs)	4.5%	60" RCP
DI#36	165	CP6 (165 cfs)	5.5%	42" RCP
DI#37	165	CP6 (165 cfs)	NA	60" RCP MITERED INLET
DI#38	205	FACILITY 56 (165 cfs) + 11-Q (40 cfs)	6.3%	48" RCP
DI#39	590	FACILITY 57 (205 cfs) + FACILITY 57 (205 cfs) + 11-O (180 cfs)	1.5%	7' X 6' RCB
DI#40	691	FACILITY 45 (62 cfs) + FACILITY 58 (629) + 11-J (0 cfs)	2.0%	7' X 6' RCB

SUMMARY - DROP INLET CALCULATIONS

DI#[1]	Q_{100}[2]	Slope %	Depth (ft)	Q_{INT} (cfs)	Q_{BYP} (cfs)	DI Type[3] (ft)
DI#1A &1B	9	3.8	0.34	8	1	2-10
DI# 1 & 2	8	7.1	0.30	5	3	2-5
DI#3	13	1.6	0.50	12	1	1-15
DI#4	13	1.6	0.50	5	8	1-5
DI# 5 & 6	30	5.2	0.44	13	17	2-7.5
DI# 7 & 8	17	3.8	0.40	10	7	2-7.5
DI#9 & 10	20	5.0	0.40	15	5	2-12.5
DI# 11 & 12	13	0.5	0.49	11	2	2-7.5
DI# 13 & 14	11	0.5	0.47	11	0	2-10
DI#15	4	SUMP	0.60	4	0	1 - 2.5 x 2.5 NDOT Type 2A
DI#16	13	SUMP	2.23	13	0	1 - 2.5 x 2.5 NDOT Type 2A
DI# 17 & 18	21	5.1	0.40	13	8	2-10
DI# 19 & 20	23	1.7	0.48	19	4	2-12.5

OFFSITE FLOOD PROTECTION FACILITIES

LOCATION	Q_{100} ULT (cfs)	TRIBUTARIES	DESIGN SLOPE (%)	FACILITY
1-2CA	5	1-2CA (5 cfs)	5.7%	Conc. Rect. Channel- 5' BW, 1.5' Deep
1-4A	3	1-4A (3 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-4B	102	1-4A (3 cfs) + 1-4B (99 cfs)	7.0%	Conc. Rect. Channel- 5' BW, 2.5' Deep
1-5A	132	1-4A (3 cfs) + 1-4B (99 cfs) + 1-5A (30 cfs)	3.5%	Conc. Rect. Channel- 5' BW, 3' Deep
1-5B	33	1-5B (33 cfs)	12.5%	Conc. Rect. Channel- 3' BW, 2' Deep
1-6	29	1-6 (29 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 3' Deep
1-7	51	1-7 (51 cfs)	0.5%	Conc. Rect. Channel- 5' BW, 3' Deep
1-8	5	1-8 (5 cfs)	12.0%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-10A	21	1-10A (21 cfs)	11.5%	Conc. Rect. Channel- 4' BW, 2' Deep
1-10B	83	1-8 (5 cfs) + 1-10B (21 cfs) + 1-10C (57 cfs)	0.5%	Conc. Rect. Channel- 6' BW, 3' Deep
1-10C	62	1-8 (5 cfs) + 1-10C (57 cfs)	8.7%	Conc. Rect. Channel- 5' BW, 2' Deep
1-13	2	1-13 (2 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-14A	3	1-14A (3 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-14B	1	1-14B (1 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-15A	7	1-15A (7 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 2' Deep
1-15B	1	1-15B (1 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-16A	3	1-16A (3 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-16B	1	1-16B (1 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-17A	1	1-17A (1 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-17B	5	1-17B (5 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 1.5' Deep
1-18	13	1-18 (8 cfs) + 1-17B (5 cfs)	0.5%	Conc. Rect. Channel- 3' BW, 2' Deep

NORTH

SCALE 1" = 200'

LEGEND

- 1 — FACILITY IDENTIFICATION
- FLOOD PROTECTION FACILITY
- FACILITY BREAK LINE
- DROP INLET
- FLOW DIRECTION

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 10-02-07
PLOT TIME: 08:30:35

REV	DATE	DESCRIPTION	DATE: AGEN. APP.	DATE: GCW APP.	DATE:

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD · LAS VEGAS, NV 89146
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM

H:\2501\764-20101\dwg\Hydro\Update2\Figures\Fig 6U(FPM).dwg/tunter

PULTE HOMES INC.

VILLAGE 26 AT SUMMERLIN WEST

UPDATE #2 TO THE MASTER DRAINAGE STUDY

FLOOD CONTROL FACILITIES MAP

DRAWING
FIG 6U2
SHT OF SHTS

24x36 dwg 3/30/24 wtb

UPDATE #3 TO THE MASTER DRAINAGE STUDY FOR VILLAGE 26 AT SUMMERLIN WEST (TECHNICAL DRAINAGE STUDY FOR REVERENCE INTERIM BERM)

764-201-300

December 2012

Prepared for:

Pulte Homes, Inc.
8345 W. Sunset Road
Las Vegas, Nevada 89113
Phone: (702) 914-4800
Fax: (702) 256-7900

Prepared by:

G. C. Wallace Companies
1555 S. Rainbow Blvd.
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2299

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: March 14, 2013
TO: **Land Development Services** Department of Public Works				FROM: Oh Sang Kwon, R.E. Flood Control Department of Public Works
SUBJECT:	Master Drainage Study for:			**COPIES TO:**
Village 26 At Summerlin West – Update #3 for Reverence Interim Berm				G.C. Wallace, Inc.
Cross Streets:	Cheyenne Road and I-215			Pulte Homes
File Number:	F:\Depot\DSMemos\DS4073Q.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-14-501-003			CCRFCD
Zoning Action:	N/A			CCPW
FEMA Flood Zone	YES	NO X		
Proposed Storm Drain	YES X	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	9/22/2006	10/5/2006	Not Approved	$1000.00	53543: $1000
2nd Submittal	11/14/2006	11/22/2006	Not Approved	$400.00	57509: $400
3rd Submittal	12/13/2006	12/29/2006	Not Approved	$400.00	59354: $400
4th Submittal	1/3/2007 & 1/12/2007	1/4/2007 & 1/18/2007	Conditional Approval	----	----
CCPW	3/20/2007	4/2/2007	Concurrence	N/C	N/C
CCRFCD	3/28/2007	4/2/2007	Concurrence	N/C	N/C
5th Submittal	4/26/2007	5/15/2007	Not Approved	$400.00	67876: $400
6th Submittal	6/6/2007 & 6/25/2007	6/20/2007 & 6/26/2007	Conditionally Approved	$400.00	70789: $400
CCRFCD	8/7/2007	8/22/2007	Concurrence	N/C	N/C
7th Submittal	10/2/2007	10/31/2007	Not Approved	$400.00	78864: $400
8th Submittal	4/16/2008	4/29/2008	Conditionally Approved	$400.00	92781: $400
9th Submittal	12/10/2012	12/24/2012	Not Approved	$100.00	304450: $100
10th Submittal	1/14/2013	1/29/2013	Conditional Approval	$400.00	307465: $400
CCRFCD	3/12/2013	3/13/2013	Concurrence Recv'd	N/C	N/C
CCPW	3/14/2013	3/14/2013	Concurrence Recv'd	N/C	N/C
			TOTAL FEES (LDDRS):	$3,900.00	----

REMARKS:

10th Submittal: Addendum to Update #3

9th Submittal: Update #3 for a revision on the Reverence Interim Berm/Channel

7th & 8th Submittal: Number of Model Homes and Reverence Parkway street section has been revised. Minor storm drain and grading has been revised.

10/8/07: City of Las Vegas Planning Department's approval on mass grading.

5th & 6th Submittal: Revised storm drain on Respectful Drive around detention basin and low flow pipe. Revised the interim INT6A channel, additional model homes, and minor changes in mass grading.

The Master Drainage Study for the subject project has been reviewed and:

X	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Department of Public Works concurrence.
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

1. The engineer and developer (*Pulte Homes*) proposes to build a temporary drainage facility to convey flows to the *Summerlin Village 26 Detention Basin.* The engineer/developer also proposes not to place riprap at the top of the existing *Summerlin Village 26 Detention Basin* and agrees to inspect and maintain eroded areas of the property after each storm event.

   Prior to final plan approval the engineer/developer must complete a maintenance and liability agreement for the interim drainage improvements and post a minimum maintenance bond of $50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an exhibit that adequately shows the location and limits of the drainage facility to *Flood Control* for approval. Once the drainage study is conditionally approved, the engineer should contact the *City's Land Development Section* (229-6371) to begin the agreement process.

   In order for the maintenance bond to be released in the future, a drainage update / letter will be required to justify that the offsite berms / channels are no longer necessary and can be removed.

2. The final approval of this technical drainage study for the interim berm does not imply approval or protection for future residential development. Additional drainage studies and drainage structures are required to be provided by *Pulte Homes* in the future to accompany proposed residential developments.

The following comments for the *Master Drainage Study* for *Village 26 at Summerlin West* are repeated until they are complete or resolved:

1. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (i.e. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the *City of Las Vegas Flood Control Section* prior to final approval of technical drainage study.
2. Please note that the proposed flood protection facilities identified on Figure 6U2 and in this Master Drainage Study must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the infrastructure improvements. The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval for the Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies.
3. Please note that storm drain facilities required to reduce and/or convey the interim flows must be substantially completed prior to development as stated in the Master Drainage Study. Each phase of the development must be individually flood protected.

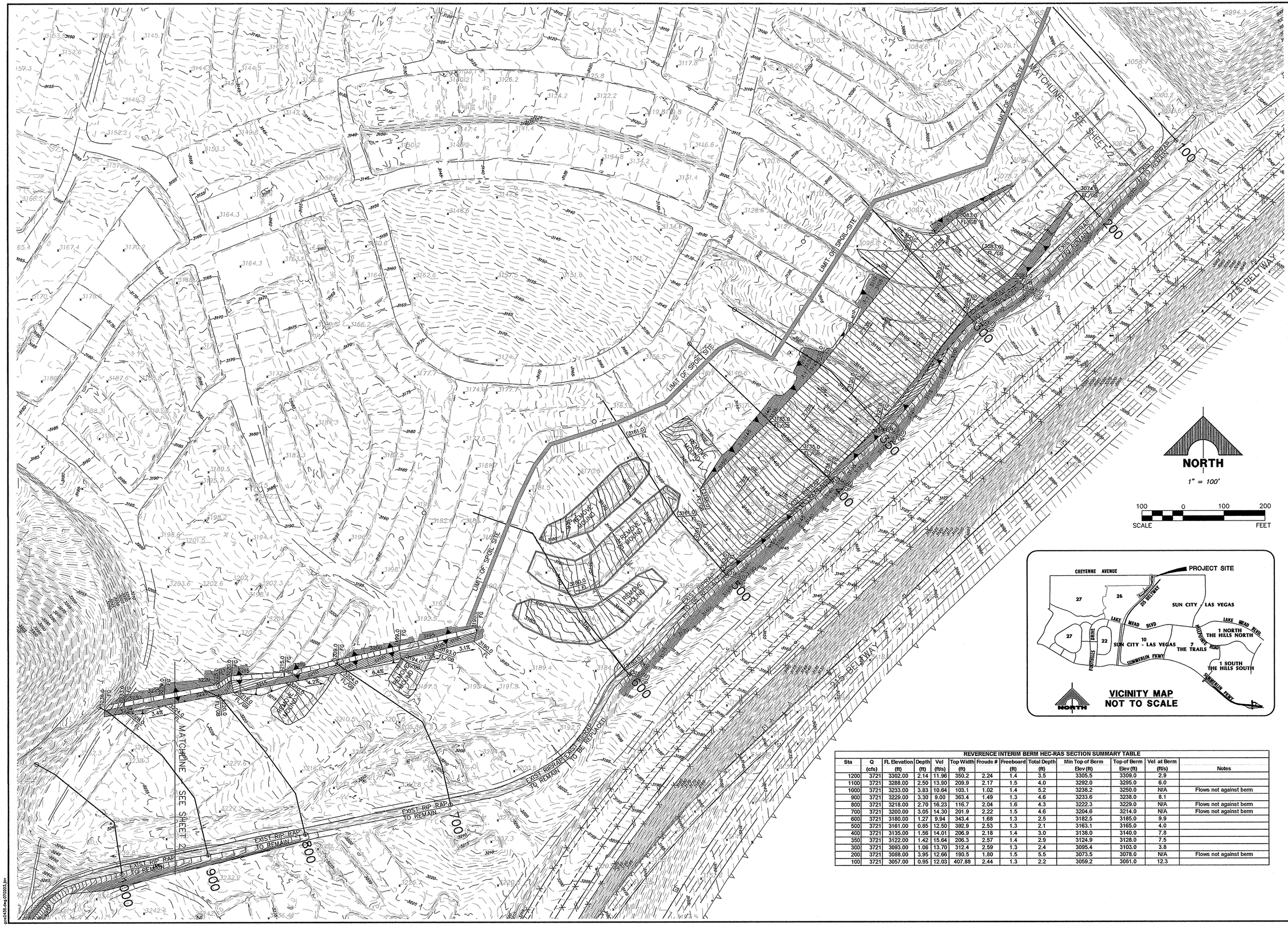
4. Technical drainage studies are required for each of the POD's. The technical drainage studies for the POD's may not be submitted until the conditional approval of the pertinent infrastructure drainage study is obtained. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted POD drainage studies.
5. Building permits for the homes within the individual POD's will not be issued until construction of the street and flood control infrastructure around the POD is substantially complete.
6. Modification of the existing Village 26 Detention Basin will require following:
    a. A technical drainage study is required with CCRFCD concurrence.
    b. A 12-ft wide access road must be provided around the top of the entire detention basin and will be located a minimum of 6-inch above the 100-year detention basin water surface elevation.
    c. Proposed grading within the footprint of the detention basin will not change the slope of the embankments or operating characteristics of the detention basin. Additionally, the bottom of all retaining wall footing around the detention basin must be a minimum of 8-inch above the 100-year detention basin water surface elevation.
    d. All finished floors adjacent to the detention basin will be designed to be 6-inch above the weir water surface elevation assuming the outlet pipe is 100 percent clogged.
    e. All surface waters are not allowed to flow down the embankment of the detention basin and must be conveyed in a storm drain system.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved master drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

END OF REMARKS
Osk/ays

T/R/S: T20S/R59E/14
AREA K-14



REVERENCE INTERIM BERM HEC-RAS SECTION SUMMARY TABLE

Sta	Q	Fl. Elevation	Depth	Vel	Top Width	Froude #	Freeboard	Total Depth	Min Top of Berm	Top of Berm	Vel at Berm	
	(cfs)	(ft)	(ft)	(ft/s)	(ft)		(ft)	(ft)	Elev (ft)	Elev (ft)	(ft/s)	Notes
1200	3721	3302.00	2.14	11.96	350.2	2.24	1.4	3.5	3305.5	3309.0	2.9	
1100	3721	3288.00	2.50	13.90	209.9	2.17	1.5	4.0	3292.0	3295.0	6.0	
1000	3721	3233.00	3.83	10.64	103.1	1.02	1.4	5.2	3236.2	3250.0	N/A	Flows not against berm
900	3721	3229.00	3.30	9.00	363.4	1.49	1.3	4.6	3233.6	3238.0	8.1	
800	3721	3218.00	2.70	16.23	116.7	2.04	1.6	4.3	3222.3	3229.0	N/A	Flows not against berm
700	3721	3200.00	3.05	14.30	201.9	2.22	1.5	4.6	3204.6	3214.0	N/A	Flows not against berm
600	3721	3180.00	1.27	9.94	343.4	1.68	1.3	2.5	3182.5	3185.0	9.9	
500	3721	3161.00	0.85	12.80	392.9	2.53	1.3	2.1	3163.1	3165.0	4.0	
400	3721	3135.00	1.56	14.01	206.9	2.18	1.4	3.0	3138.0	3140.0	7.8	
350	3721	3122.00	1.42	15.64	206.3	2.57	1.4	2.9	3124.9	3128.0	7.5	
300	3721	3093.00	1.06	13.70	312.4	2.59	1.3	2.4	3095.4	3103.0	3.8	
200	3721	3068.00	3.95	12.66	190.5	1.80	1.5	5.5	3073.5	3078.0	N/A	Flows not against berm
100	3721	3057.00	0.95	12.03	407.88	2.44	1.3	2.2	3059.2	3061.0	12.3	

REV	DATE	DESCRIPTION	DATE	AGEN APP	DATE	GCW APP	DATE

PROJECT NO.
764-201-201

DESIGN:
DRAWN:
CHECK:

PLOT DATE: 12-03-12
PLOT TIME: 09:24:17

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD. - LAS VEGAS, NV 89146
T: 702.804.2000 - F: 702.804.2299 - GCWALLACE.COM

LAS VEGAS

F:\Projects\700\764-201-201\Division Fest\Figures\Figure2-hec-ras-exhibit.dgn
Grant Tokumi

PULTE HOMES, INC.

REVERENCE INTERIM BERM

HEC-RAS EXHIBIT

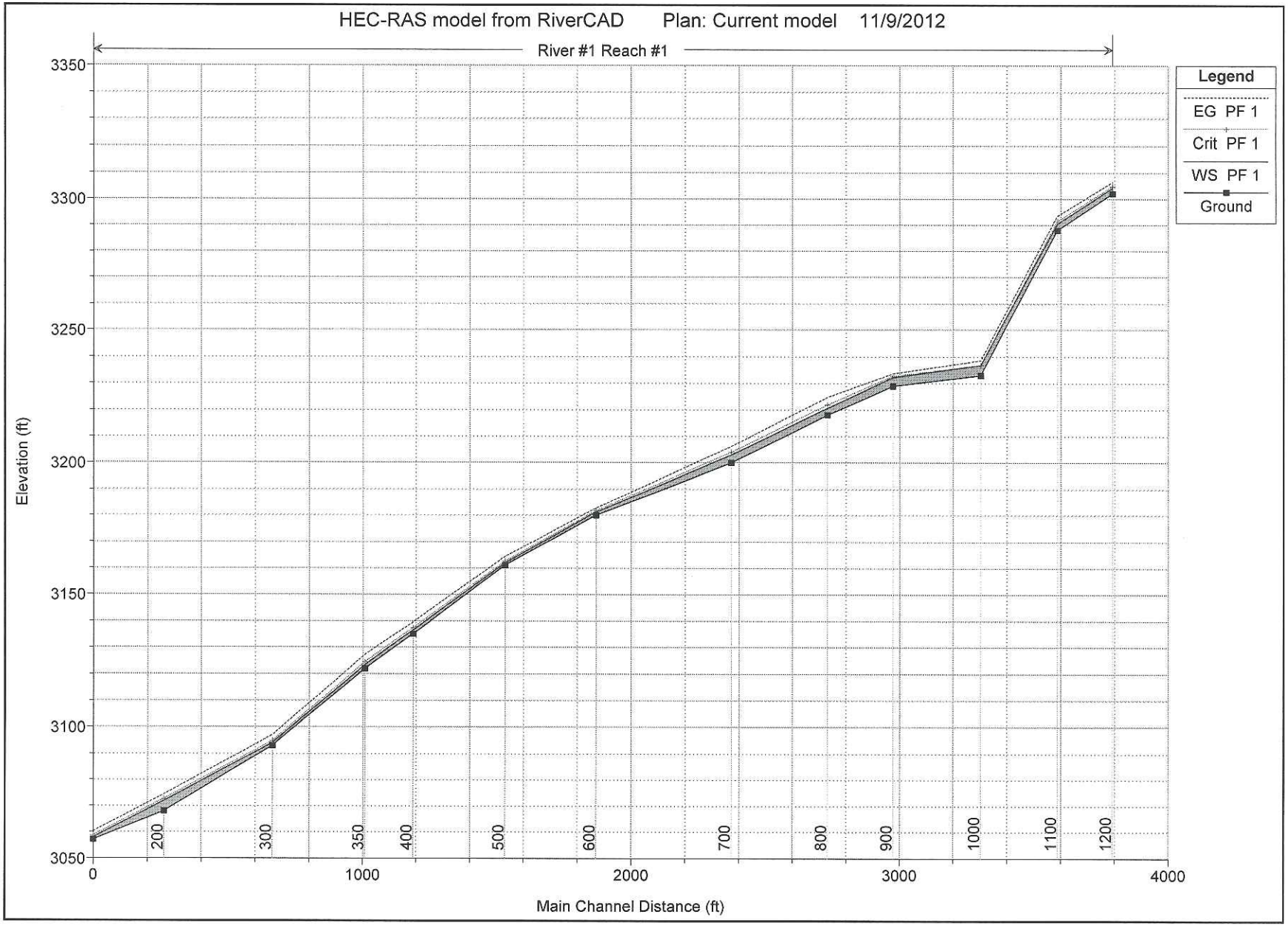
DRAWING
FIG 2
SHT 1 OF 2 SHTS

gcr2438.dwg 070203.pr

REVERENCE INTERIM BERM HEC-RAS SECTION SUMMARY TABLE												
Sta	Q (cfs)	FL Elevation (ft)	Depth (ft)	Vel (ft/s)	Top Width (ft)	Froude #	Freeboard (ft)	Total Depth (ft)	Min Top of Berm Elev (ft)	Top of Berm Elev (ft)	Vel at Berm (ft/s)	Notes
1200	3721	3302.00	2.14	11.96	350.2	2.24	1.4	3.5	3305.5	3309.0	2.9	
1100	3721	3288.00	2.50	13.90	209.9	2.17	1.5	4.0	3292.0	3295.0	6.0	
1000	3721	3233.00	3.83	10.64	103.1	1.02	1.4	5.2	3238.2	3250.0	N/A	Flows not against berm
900	3721	3229.00	3.30	9.00	363.4	1.49	1.3	4.6	3233.6	3238.0	8.1	
800	3721	3218.00	2.70	16.23	116.7	2.04	1.6	4.3	3222.3	3229.0	N/A	Flows not against berm
700	3721	3200.00	3.05	14.30	201.9	2.22	1.5	4.6	3204.6	3214.0	N/A	Flows not against berm
600	3721	3180.00	1.27	9.94	343.4	1.68	1.3	2.5	3182.5	3185.0	9.9	
500	3721	3161.00	0.85	12.50	392.9	2.53	1.3	2.1	3163.1	3165.0	4.0	
400	3721	3135.00	1.56	14.01	206.9	2.18	1.4	3.0	3138.0	3140.0	7.8	
350	3721	3122.00	1.42	15.64	206.3	2.57	1.4	2.9	3124.9	3128.0	7.5	
300	3721	3093.00	1.06	13.70	312.4	2.59	1.3	2.4	3095.4	3103.0	3.8	
200	3721	3068.00	3.95	12.66	190.5	1.80	1.5	5.5	3073.5	3078.0	N/A	Flows not against berm
100	3721	3057.00	0.95	12.03	407.88	2.44	1.3	2.2	3059.2	3061.0	12.3	

HEC-RAS Plan: Current mode River: River #1 Reach: Reach #1 Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Max Chl Dpth	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)	(ft/s)	(sq ft)	(ft)	
Reach #1	1200	PF 1	3721.00	3302.00	3304.14	2.14	3304.78	3306.36	0.068433	11.96	310.99	350.20	2.24
Reach #1	1100	PF 1	3721.00	3288.00	3290.50	2.50	3291.42	3293.50	0.057196	13.90	267.68	209.91	2.17
Reach #1	1000	PF 1	3721.00	3233.00	3236.83	3.83	3236.83	3238.59	0.009253	10.64	349.64	103.11	1.02
Reach #1	900	PF 1	3721.00	3229.00	3232.30	3.30	3232.66	3233.56	0.028054	9.00	413.58	363.43	1.49
Reach #1	800	PF 1	3721.00	3218.00	3220.70	2.70	3221.92	3224.79	0.044090	16.23	229.20	116.70	2.04
Reach #1	700	PF 1	3721.00	3200.00	3203.05	3.05	3203.99	3206.23	0.059749	14.30	260.19	201.93	2.22
Reach #1	600	PF 1	3721.00	3180.00	3181.27	1.27	3181.74	3182.80	0.035967	9.94	374.22	343.38	1.68
Reach #1	500	PF 1	3721.00	3161.00	3161.85	0.85	3162.51	3164.28	0.092277	12.50	297.65	392.86	2.53
Reach #1	400	PF 1	3721.00	3135.00	3136.56	1.56	3137.43	3139.60	0.057399	14.01	265.67	206.86	2.18
Reach #1	350	PF 1	3721.00	3122.00	3123.42	1.42	3124.43	3127.22	0.082616	15.64	237.88	206.26	2.57
Reach #1	300	PF 1	3721.00	3093.00	3094.06	1.06	3094.83	3096.97	0.092169	13.70	271.65	312.41	2.59
Reach #1	200	PF 1	3721.00	3068.00	3071.95	3.95	3072.73	3074.44	0.037280	12.66	293.86	190.47	1.80
Reach #1	100	PF 1	3721.00	3057.00	3057.95	0.95	3058.58	3060.20	0.085425	12.03	309.21	407.88	2.44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River #1 Reach #1
Legend
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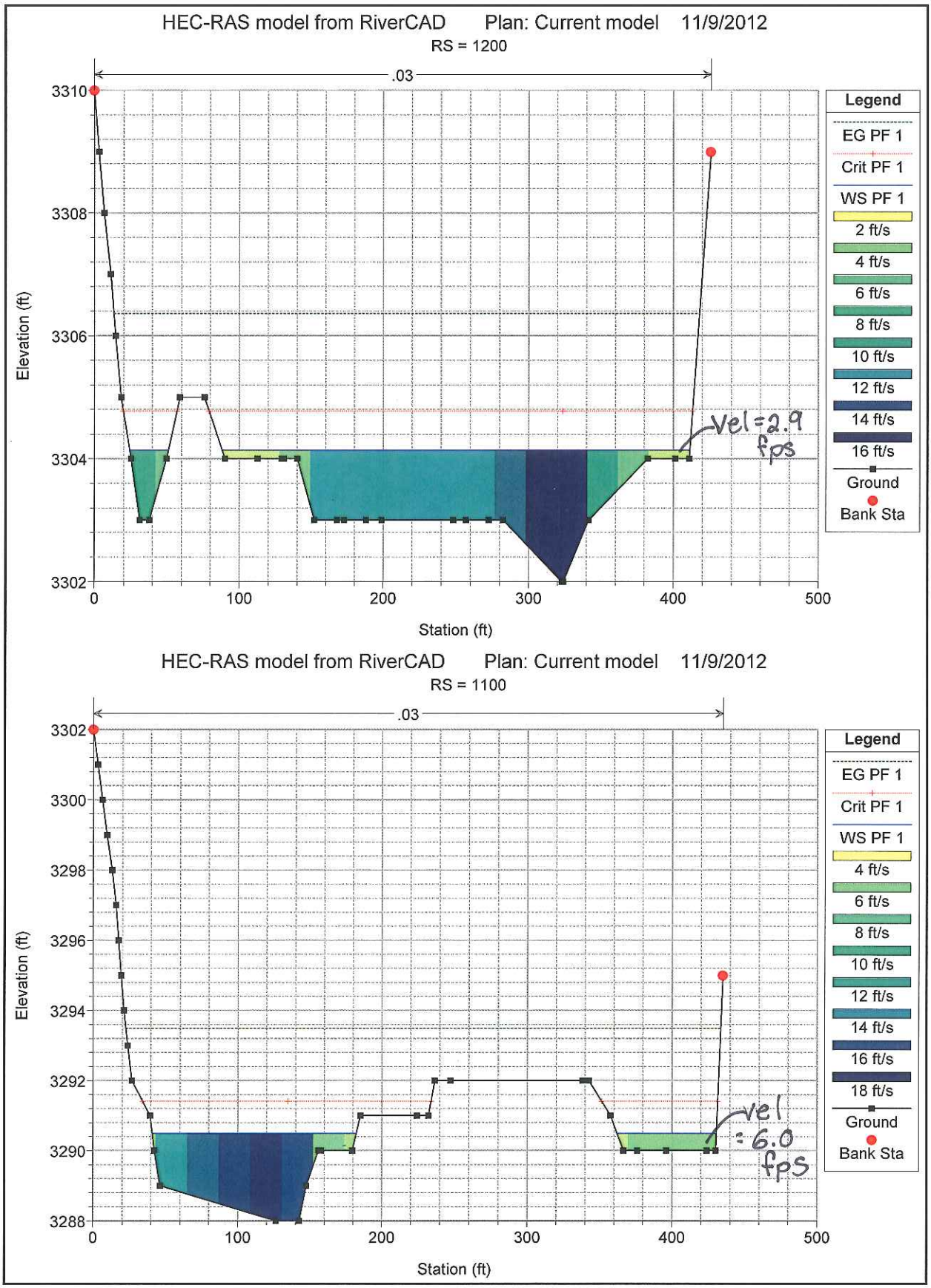
Crit PF 1
WS PF 1
Ground
Elevation (ft)
3350
3300
3250
3200
3150
3100
3050
0
1000
2000
3000
4000
Main Channel Distance (ft)
200
300
350
400
500
600
700
800
900
1000
1100
1200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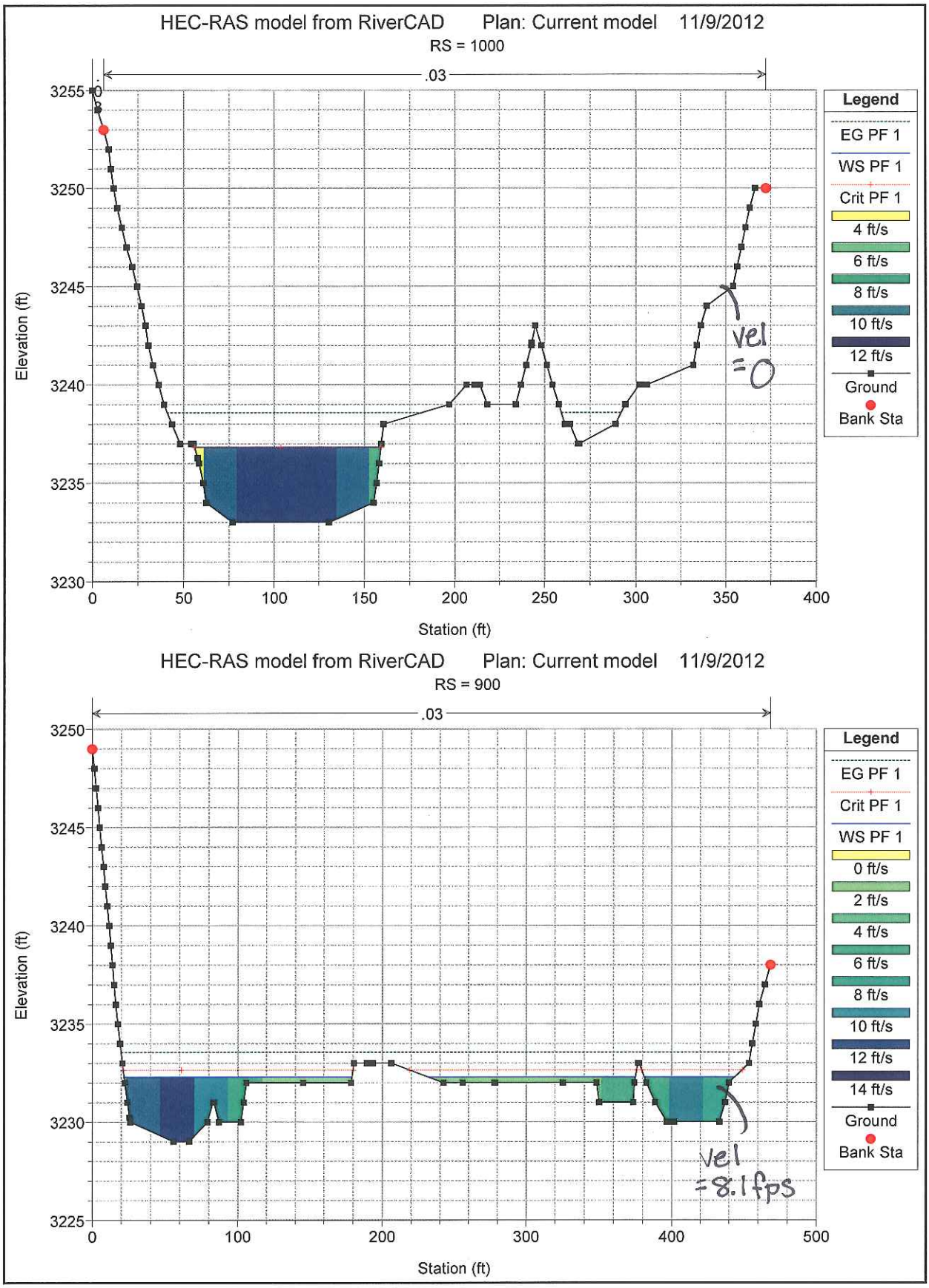
RS = 1200
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta
Vel=2.9 fps
HEC-RAS model from RiverCAD Plan: Current model 11/9/2012
RS = 1100
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta
Vel = 6.0 fps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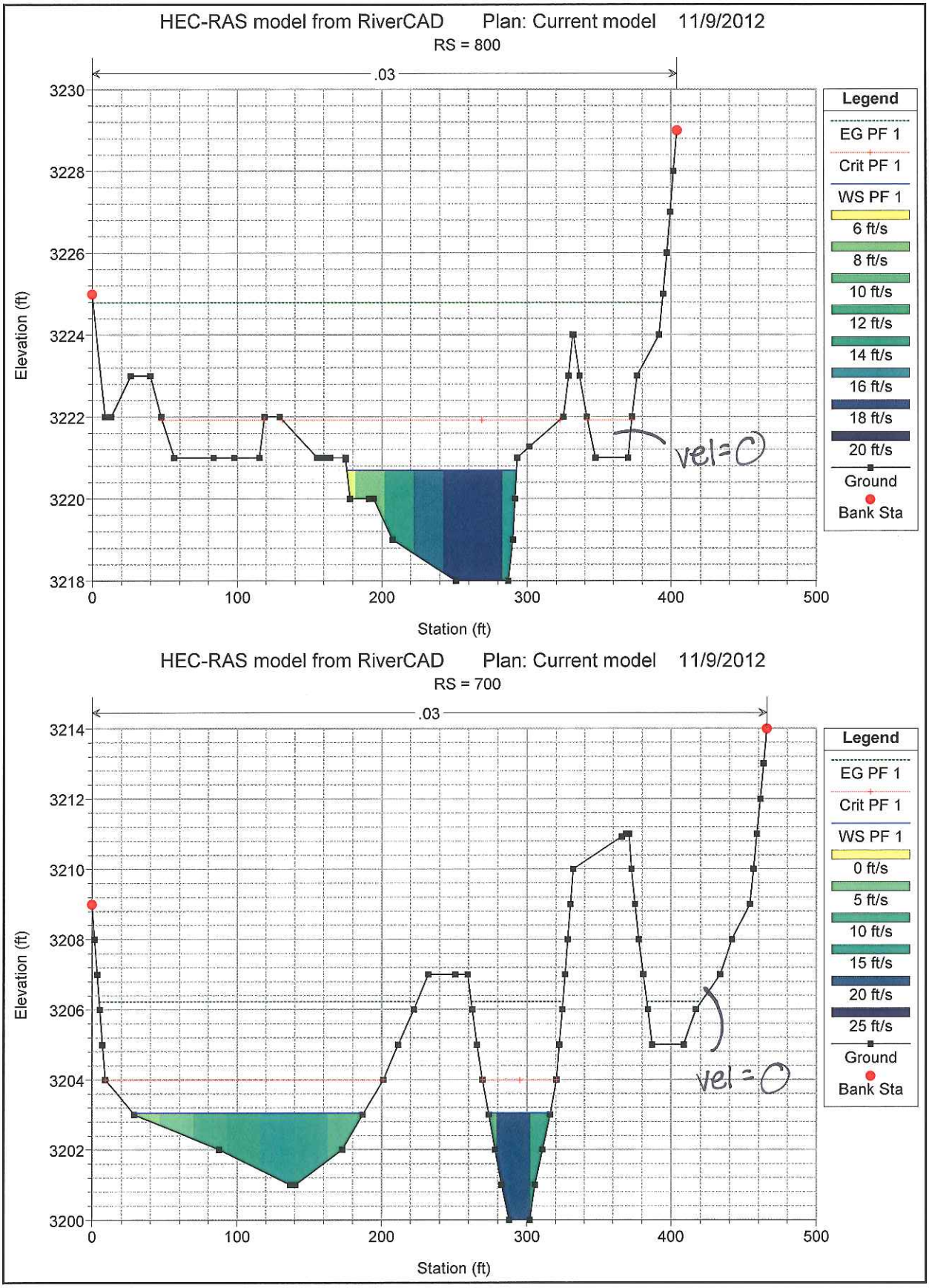
RS = 1000
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
WS PF 1
Crit PF 1
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta
vel =0
HEC-RAS model from RiverCAD Plan: Current model 11/9/2012
RS = 900
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
Ground
Bank Sta
vel =8.1fps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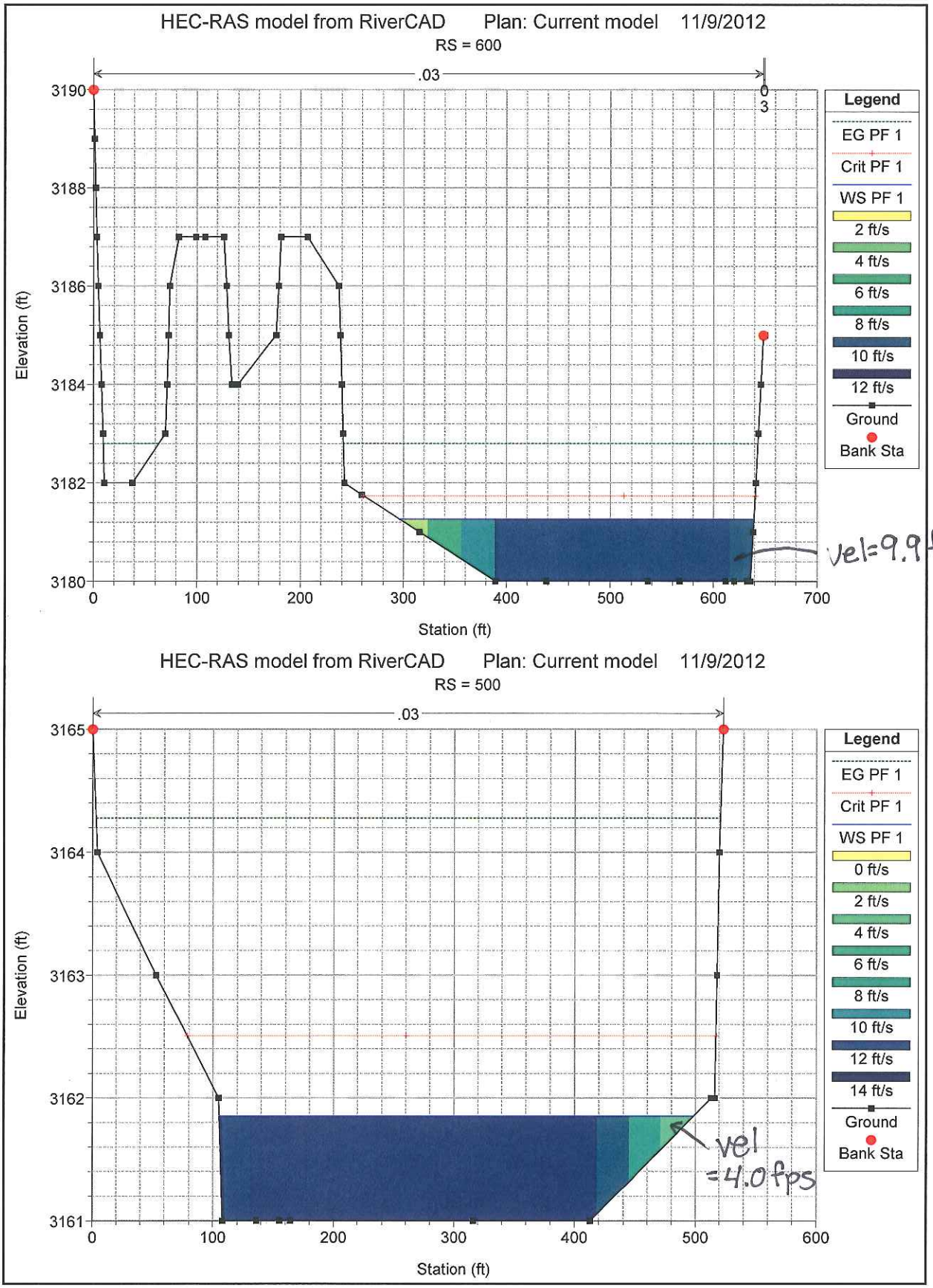
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
20 ft/s
Ground
Bank Sta
vel=0
HEC-RAS model from RiverCAD Plan: Current model 11/9/2012
RS = 700
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
5 ft/s
10 ft/s
15 ft/s
20 ft/s
25 ft/s
Ground
Bank Sta
vel=0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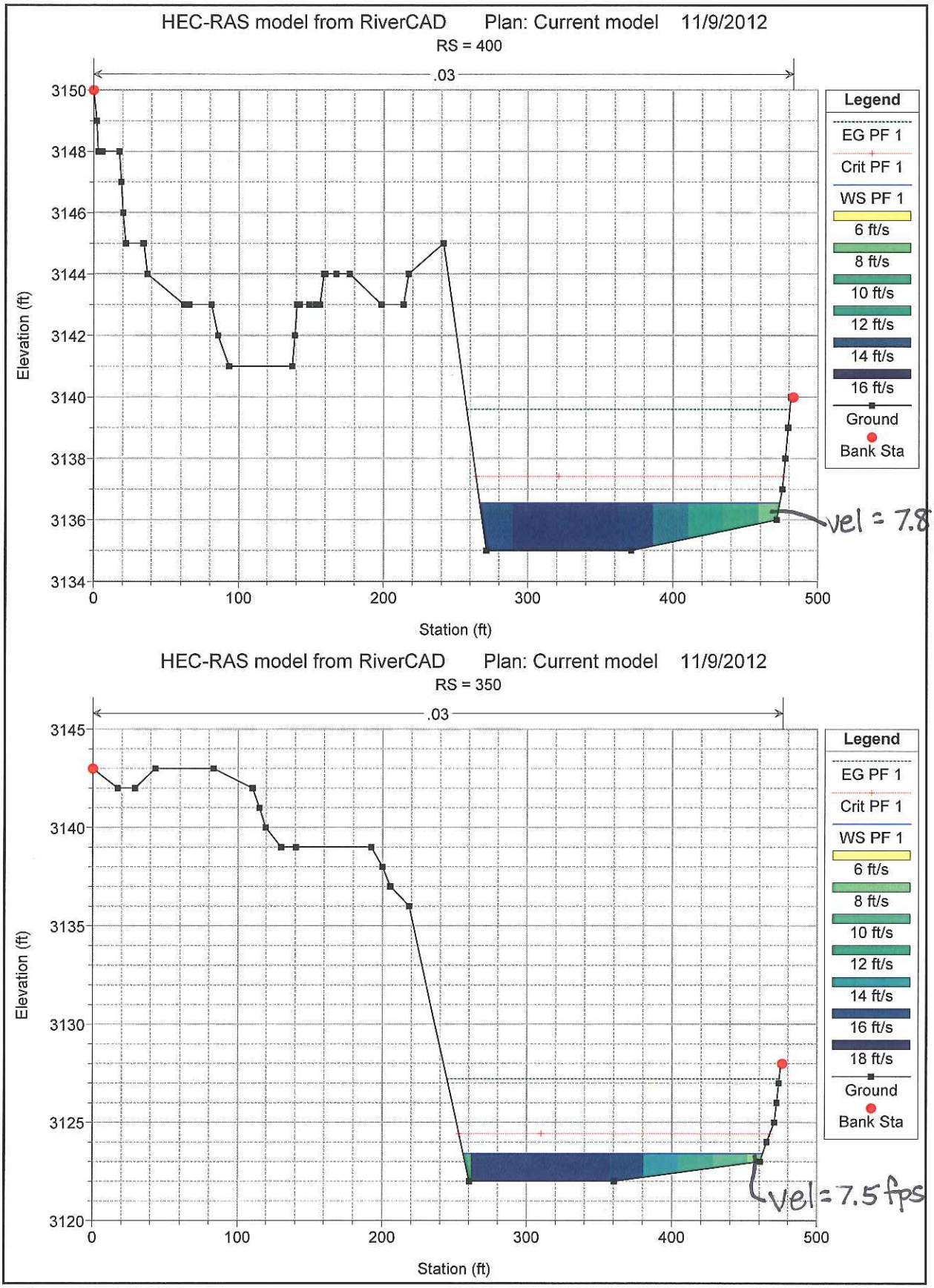
RS = 600
.03
0
3
Legend
EG PF 1
Crit PF 1
WS PF 1
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
Ground
Bank Sta
Elevation (ft)
3190
3188
3186
3184
3182
3180
0
100
200
300
400
500
600
700
Station (ft)
vel=9.9fps
HEC-RAS model from RiverCAD Plan: Current model 11/9/2012
RS = 500
.03
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
Ground
Bank Sta
Elevation (ft)
3165
3164
3163
3162
3161
0
100
200
300
400
500
600
Station (ft)
vel
=4.0fps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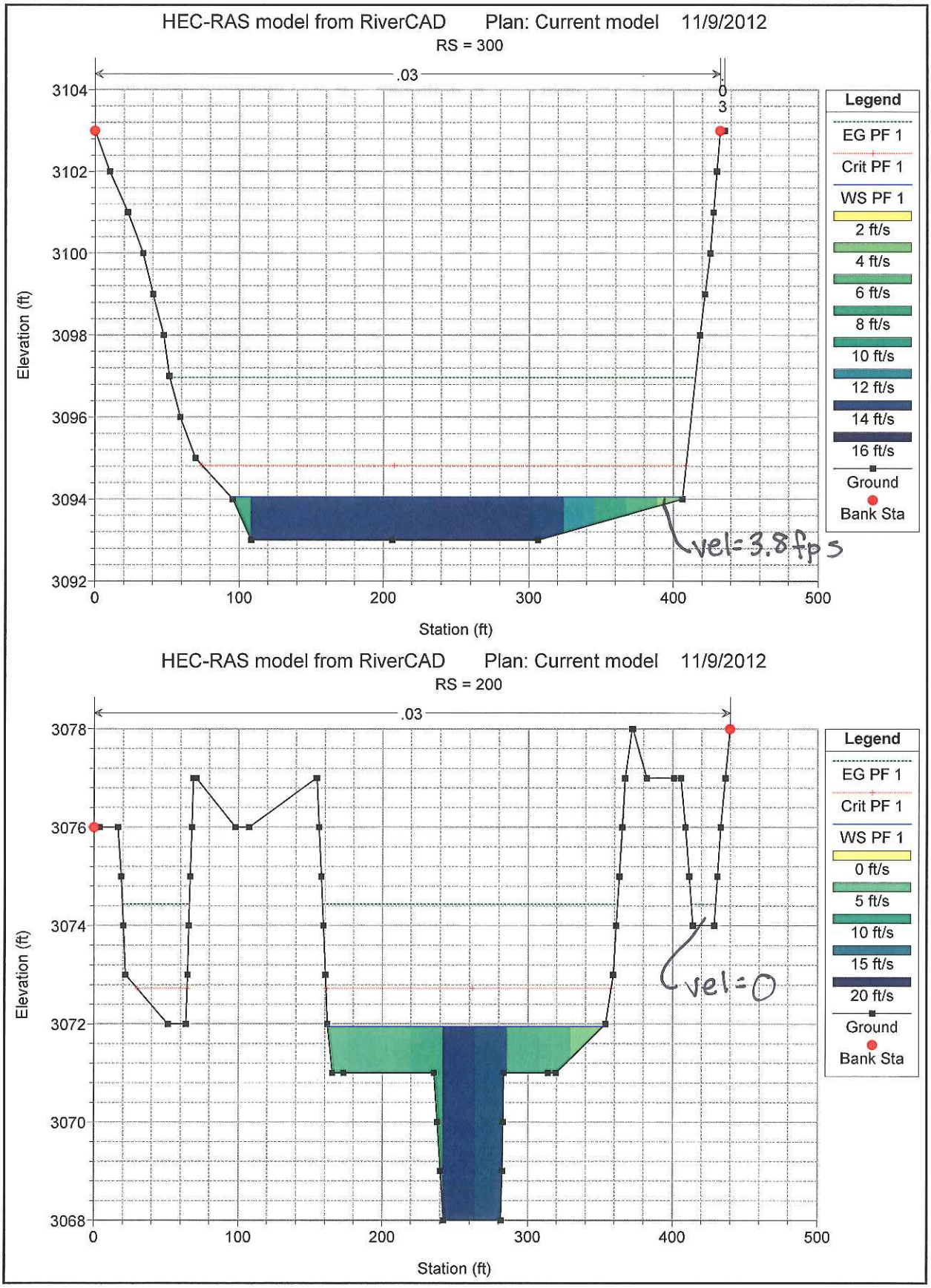
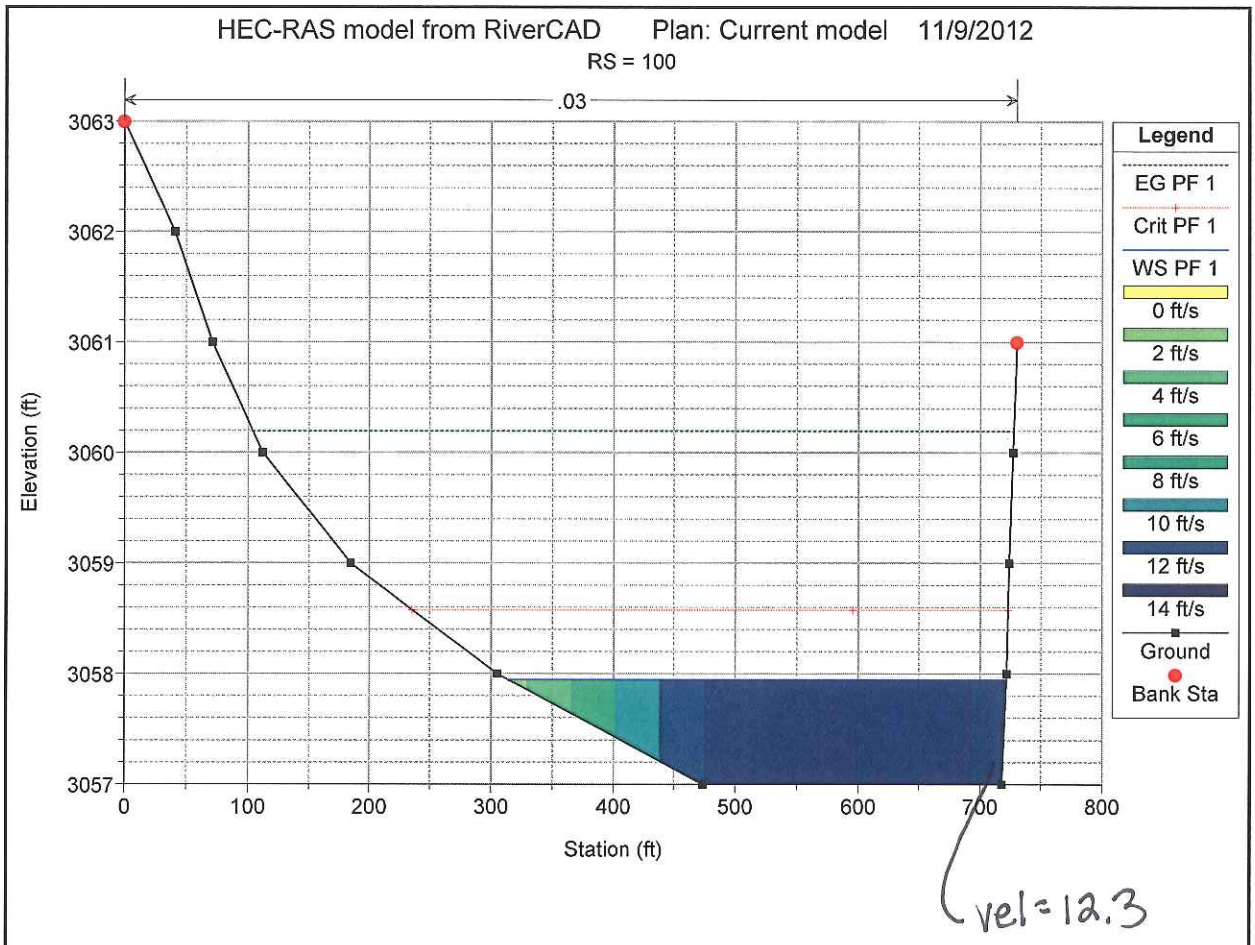
RS = 400
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta
vel = 7.8fps
HEC-RAS model from RiverCAD Plan: Current model 11/9/2012
RS = 350
.03
Elevation (ft)
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
18 ft/s
Ground
Bank Sta
vel = 7.5 fps


HEC-RAS model from RiverCAD Plan: Current model 11/9/2012
RS = 300
.03
.03
Elevation (ft)
3104
3102
3100
3098
3096
3094
3092
0
100
200
300
400
500
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
16 ft/s
Ground
Bank Sta
vel=3.8fps
HEC-RAS model from RiverCAD Plan: Current model 11/9/2012
RS = 200
.03
Elevation (ft)
3078
3076
3074
3072
3070
3068
0
100
200
300
400
500
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
5 ft/s
10 ft/s
15 ft/s
20 ft/s
Ground
Bank Sta
vel=0


HEC-RAS model from RiverCAD Plan: Current model 11/9/2012
RS = 100
.03
Elevation (ft)
3063
3062
3061
3060
3059
3058
3057
0
100
200
300
400
500
600
700
800
Station (ft)
Legend
EG PF 1
Crit PF 1
WS PF 1
0 ft/s
2 ft/s
4 ft/s
6 ft/s
8 ft/s
10 ft/s
12 ft/s
14 ft/s
Ground
Bank Sta
vel = 12.3

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
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: HEC-RAS model from RiverCAD
Project File : RIVERCAD.prj
Run Date and Time: 11/9/2012 11:08:09 AM

Project in English units

PLAN DATA

Plan Title: Current model
Plan File : f:\Projects\700\764-201-201\Division\Fctl\Calcs\HEC-RAS\RIVERCAD.P01

Geometry Title: Base Conditions Geometry
Geometry File : f:\Projects\700\764-201-201\Division\Fctl\Calcs\HEC-RAS\RIVERCAD.G01

Flow Title : 1 Flow Profiles
Flow File : f:\Projects\700\764-201-201\Division\Fctl\Calcs\HEC-RAS\RIVERCAD.F01

Plan Summary Information:

Number of:	Cross Sections	= 13	Multiple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculation tolerance	= 0.01
Maximum number of iterations	= 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: 1 Flow Profiles
Flow File : f:\Projects\700\764-201-201\Division\Fctl\Calcs\HEC-RAS\RIVERCAD.F01

Flow Data (cfs)

River	Reach	RS	PF 1
River #1	Reach #1	1200	3721

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
River #1	Reach #1	PF 1	Normal S = 0.068326	Normal S = 0.036881

GEOMETRY DATA

Geometry Title: Base Conditions Geometry
Geometry File : f:\Projects\700\764-201-201\Division\Fctl\Calcs\HEC-RAS\RIVERCAD.G01

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1200

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3310	3.09	3309	6.64	3308	11.17	3307	14.36	3306
18.23	3305	25.12	3304	31.18	3303	38	3303	49.85	3304
58.93	3305	76.04	3305	90.22	3304	112.69	3304	129.37	3304
130.91	3304	140.23	3304	151.97	3303	167.93	3303	172.8	3303
188.14	3303	199.14	3303	248.41	3303	256.99	3303	272.5	3303
282.52	3303	322.89	3302	324.09	3302	341.53	3303	382.55	3304
401.42	3304	411	3304	426	3309				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	426	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	426	241.36	204.9 234.97	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3306.36	Element			
Vel Head (ft)	2.22	Wt. n-Val.		0.030	
W.S. Elev (ft)	3304.14	Reach Len. (ft)	241.36	204.90	234.97
Crit W.S. (ft)	3304.78	Flow Area (sq ft)		310.99	
E.G. Slope (ft/ft)	0.068433	Area (sq ft)		310.99	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	350.20	Top Width (ft)		350.20	
Vel Total (ft/s)	11.96	Avg. Vel. (ft/s)		11.96	
Max Chl Dpth (ft)	2.14	Hydr. Depth (ft)		0.89	
Conv. Total (cfs)	14224.2	Conv. (cfs)		14224.2	
Length Wtd. (ft)	204.90	Wetted Per. (ft)		350.46	
Min Ch El (ft)	3302.00	Shear (lb/sq ft)		3.79	
Alpha	1.00	Stream Power (lb/ft s)	426.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)		26.03	
C & E Loss (ft)		Cum SA (acres)		22.14	

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1100

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3302	3.11	3301	6.22	3300	9.38	3299	12.68	3298
15.56	3297	17.33	3296	19.16	3295	21.02	3294	23.66	3293
26.66	3292	39.42	3291	42.36	3290	46.33	3289	126.38	3288
142.46	3288	147.28	3289	155.61	3290	157.67	3290	179.45	3290
185.29	3291	224.3	3291	232.4	3291	236.81	3292	247.44	3292
338.11	3292	342.53	3292	357.49	3291	366.54	3290	376.21	3290
396.04	3290	423.99	3290	430	3290	435	3295		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	435	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	435	190.38	285.14 405.9	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3293.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.00	Wt. n-Val.		0.030	
W.S. Elev (ft)	3290.50	Reach Len. (ft)	190.38	285.14	405.90
Crit W.S. (ft)	3291.42	Flow Area (sq ft)		267.68	
E.G. Slope (ft/ft)	0.057196	Area (sq ft)		267.68	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	209.91	Top Width (ft)		209.91	
Vel Total (ft/s)	13.90	Avg. Vel. (ft/s)		13.90	
Max Chl Dpth (ft)	2.50	Hydr. Depth (ft)		1.28	
Conv. Total (cfs)	15558.8	Conv. (cfs)		15558.8	
Length Wtd. (ft)		Wetted Per. (ft)		210.57	
Min Ch El (ft)	3288.00	Shear (lb/sq ft)		4.54	
Alpha	1.00	Stream Power (lb/ft s)	435.00	0.00	0.00
Frctn Loss (ft)	12.79	Cum Volume (acre-ft)		24.67	
C & E Loss (ft)	0.08	Cum SA (acres)		20.82	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 1000

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3255	2.84	3254	6.23	3253	8.97	3252	10.11	3251
11.59	3250	13.61	3249	16.15	3248	18.67	3247	21.79	3246
24.39	3245	26.84	3244	29.04	3243	30.56	3242	33.21	3241
36.32	3240	39.2	3239	43.56	3238	48	3237	54.06	3237
55.48	3237	57.64	3236.27	58.44	3236	60.67	3235	62.22	3234
76.96	3233	130.48	3233	155.14	3234	156.81	3235	158.1	3236
159.31	3237	160.52	3238	196.84	3239	206.68	3240	211.01	3240
211.68	3240	214.04	3240	218.19	3239	234.04	3239	236.88	3240
239.87	3241	242.61	3242	242.88	3242.13	244.76	3243	244.81	3243
248.22	3242	251.3	3241	254.39	3240	257.95	3239	261.25	3238
263.63	3238	263.91	3238	268.46	3237	269	3237	288.93	3238
293.97	3239	301.92	3240	303.34	3240	306.29	3240	331.94	3241
333.99	3242	336.11	3243	339.46	3244	354.31	3245	356.58	3246
358.91	3247	361.26	3248	363.59	3249	366.62	3250	372.47	3250

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	6.23	.03	372.47	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
6.23	372.47	208.44	326.91 214.82	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3238.59	Element		Left OB	Channel	Right OB
Vel Head (ft)	1.76	Wt. n-Val.			0.030	
W.S. Elev (ft)	3236.83	Reach Len. (ft)		208.44	326.91	214.82
Crit W.S. (ft)	3236.83	Flow Area (sq ft)			349.64	
E.G. Slope (ft/ft)	0.009253	Area (sq ft)			349.64	
Q Total (cfs)	3721.00	Flow (cfs)			3721.00	
Top Width (ft)	103.11	Top Width (ft)			103.11	
Vel Total (ft/s)	10.64	Avg. Vel. (ft/s)			10.64	
Max Chl Dpth (ft)	3.83	Hydr. Depth (ft)			3.39	
Conv. Total (cfs)	38683.1	Conv. (cfs)			38683.1	
Length Wtd. (ft)	326.91	Wetted Per. (ft)			104.73	
Min Ch El (ft)	3233.00	Shear (lb/sq ft)			1.93	
Alpha	1.00	Stream Power (lb/ft s)		372.47	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)			22.64	
C & E Loss (ft)		Cum SA (acres)			19.80	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth
for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 900

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3249	1.31	3248	2.62	3247	3.89	3246	5.13	3245
6.36	3244	7.77	3243	9.05	3242	10.32	3241	11.62	3240
12.81	3239	13.95	3238	14.98	3237	16.13	3236	17.69	3235
19.3	3234	20.9	3233	22.57	3232	24.25	3231	25.76	3230.23
26.2	3230	55.92	3229	66.65	3229	78.92	3230	82.8	3231
83.31	3231	87.04	3230	102.19	3230	104.17	3231	105.83	3232
145.35	3232	178.58	3232	180.46	3233	189.44	3233	193.64	3233
206.11	3233	206.47	3233	242.43	3232	255.82	3232	278.05	3232
278.58	3232	325.34	3232	348.39	3232	350.26	3231	373.43	3231
374.26	3232	376.6	3233	377.63	3233	382.75	3232	388.52	3231
396.47	3230	400.72	3230	401.94	3230	433.28	3230	437.12	3231
440.02	3232	454.01	3233	456.33	3234	458.66	3235	461.22	3236
464.94	3237	468.66	3238						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	468.66	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	468.66	148.02	244.37 242.24	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3233.56	Element		Left OB	Channel	Right OB
Vel Head (ft)	1.26	Wt. n-Val.			0.030	
W.S. Elev (ft)	3232.30	Reach Len. (ft)		148.02	244.37	242.24
Crit W.S. (ft)	3232.66	Flow Area (sq ft)			413.58	

E.G. Slope (ft/ft)	0.028054	Area (sq ft)		413.58	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	363.43	Top Width (ft)		363.43	
Vel Total (ft/s)	9.00	Avg. Vel. (ft/s)		9.00	
Max Chl Dpth (ft)	3.30	Hydr. Depth (ft)		1.14	
Conv. Total (cfs)	22215.6	Conv. (cfs)		22215.6	
Length Wtd. (ft)	244.37	Wetted Per. (ft)		366.21	
Min Ch El (ft)	3229.00	Shear (lb/sq ft)		1.98	
Alpha	1.00	Stream Power (lb/ft s)	468.66	0.00	0.00
Frctn Loss (ft)	4.88	Cum Volume (acre-ft)		19.78	
C & E Loss (ft)	0.15	Cum SA (acres)		18.05	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 800

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3225	9	3222	12.95	3222	26.22	3223	39.88	3223
47.09	3222	56.09	3221	83.53	3221	97.92	3221	115.21	3221
118.84	3222	129.39	3222	155.28	3221	157.37	3221	161.06	3221
164.14	3221	174.86	3221	174.99	3220.96	178.08	3220	191.13	3220
194.41	3220	207.59	3219	250.97	3218	286.84	3218	290	3219
291.47	3220	292.99	3221	301.51	3221.27	324.99	3222	328.64	3223
331.64	3224	332.16	3224	336.42	3223	341.49	3222	347.63	3221
370.12	3221	372.85	3222	376.44	3223	391.85	3224	394.52	3225
397.18	3226	399.52	3227	401.82	3228	404.2	3229		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	404.2	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	404.2	326.86	358.35	361.96	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3224.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.09	Wt. n-Val.		0.030	
W.S. Elev (ft)	3220.70	Reach Len. (ft)	326.86	358.35	361.96
Crit W.S. (ft)	3221.92	Flow Area (sq ft)		229.20	
E.G. Slope (ft/ft)	0.044090	Area (sq ft)		229.20	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	116.70	Top Width (ft)		116.70	
Vel Total (ft/s)	16.23	Avg. Vel. (ft/s)		16.23	
Max Chl Dpth (ft)	2.70	Hydr. Depth (ft)		1.96	
Conv. Total (cfs)	17721.0	Conv. (cfs)		17721.0	
Length Wtd. (ft)	358.35	Wetted Per. (ft)		117.53	
Min Ch El (ft)	3218.00	Shear (lb/sq ft)		5.37	
Alpha	1.00	Stream Power (lb/ft s)	404.20	0.00	0.00
Frctn Loss (ft)	8.49	Cum Volume (acre-ft)		17.98	
C & E Loss (ft)	0.28	Cum SA (acres)		16.70	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 700

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3209	1.82	3208	3.68	3207	5.5	3206	7.3	3205
9.26	3204	29.11	3203	87.66	3202	136.96	3201	140.42	3201
172.8	3202	186.79	3203	201.31	3204	211.52	3205	222.48	3206
232.39	3207	250.83	3207	259.35	3207	262.47	3206	265.63	3205
269.42	3204	274.05	3203	278.19	3202	282.55	3201	287.71	3200
302.07	3200	305.54	3201	310.63	3202	315.93	3203	320.38	3204
322.37	3205	324.36	3206	326.3	3207	328.24	3208	330.16	3209
332.08	3210	365.94	3210.92	368.71	3211	370.85	3211	372.6	3210
375.13	3209	377.76	3208	380.94	3207	384.21	3206	387.06	3205
408.79	3205	416.94	3206	433.68	3207	441.81	3208	453.92	3209
456.36	3210	458.78	3211	461.11	3212	463.44	3213	465.58	3214

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	465.58	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	465.58	426.05	502.88	540.06	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3206.23	Element		Left OB	Channel	Right OB
Vel Head (ft)	3.18	Wt. n-Val.			0.030	
W.S. Elev (ft)	3203.05	Reach Len. (ft)		426.05	502.88	540.06
Crit W.S. (ft)	3203.99	Flow Area (sq ft)			260.19	
E.G. Slope (ft/ft)	0.059749	Area (sq ft)			260.19	
Q Total (cfs)	3721.00	Flow (cfs)			3721.00	
Top Width (ft)	201.93	Top Width (ft)			201.93	
Vel Total (ft/s)	14.30	Avg. Vel. (ft/s)			14.30	
Max Chl Dpth (ft)	3.05	Hydr. Depth (ft)			1.29	
Conv. Total (cfs)	15222.8	Conv. (cfs)			15222.8	
Length Wtd. (ft)	502.88	Wetted Per. (ft)			202.67	
Min Ch El (ft)	3200.00	Shear (lb/sq ft)			4.79	
Alpha	1.00	Stream Power (lb/ft s)		465.58	0.00	0.00
Frctn Loss (ft)	18.29	Cum Volume (acre-ft)			15.96	
C & E Loss (ft)	0.28	Cum SA (acres)			15.39	

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 600

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3190	1.13	3189	2.11	3188	3.11	3187	4.53	3186
6.18	3185	7.8	3184	9.28	3183	10.53	3182	38.06	3182

69.86	3183	71.42	3184	72.79	3185	74.13	3186	82.47	3187
99.11	3187	108.06	3187	126.08	3187	128.95	3186	130.84	3185
133.84	3184	139.44	3184	176.41	3185	178.89	3186	181.16	3187
207.05	3187	237.19	3186	238.72	3185	240.14	3184	241.31	3183
242.56	3182	259.87	3181.76	315.74	3181	389.3	3180	438.67	3180
536.17	3180	566.8	3180	612	3180	620.17	3180	633.14	3180
635.99	3180	638.71	3181	641.27	3182	643.63	3183	646	3184
648.41	3185	649.88	3185						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	648.41	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	648.41	472.7	338.14 340.16	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3182.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.54	Wt. n-Val.		0.030	
W.S. Elev (ft)	3181.27	Reach Len. (ft)	472.70	338.14	340.16
Crit W.S. (ft)	3181.74	Flow Area (sq ft)		374.22	
E.G. Slope (ft/ft)	0.035967	Area (sq ft)		374.22	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	343.38	Top Width (ft)		343.38	
Vel Total (ft/s)	9.94	Avg. Vel. (ft/s)		9.94	
Max Chl Dpth (ft)	1.27	Hydr. Depth (ft)		1.09	
Conv. Total (cfs)	19620.5	Conv. (cfs)		19620.5	
Length Wtd. (ft)	338.14	Wetted Per. (ft)		343.62	
Min Ch El (ft)	3180.00	Shear (lb/sq ft)		2.45	
Alpha	1.00	Stream Power (lb/ft s)	649.88	0.00	0.00
Frctn Loss (ft)	22.94	Cum Volume (acre-ft)		12.30	
C & E Loss (ft)	0.49	Cum SA (acres)		12.24	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 500

INPUT
Description:
Station Elevation Data num= 15

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3165	4	3164	53	3163	105	3162	108	3161
136	3161	155	3161	164	3161	316	3161	413	3161
513	3162	516	3162	518	3163	520	3164	523	3165

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	523	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	523	299.7	343.12 345.13	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3164.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.43	Wt. n-Val.		0.030	
W.S. Elev (ft)	3161.85	Reach Len. (ft)	299.70	343.12	345.13
Crit W.S. (ft)	3162.51	Flow Area (sq ft)		297.65	
E.G. Slope (ft/ft)	0.092277	Area (sq ft)		297.65	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	392.86	Top Width (ft)		392.86	

Vel Total (ft/s)	12.50	Avg. Vel. (ft/s)		12.50	
Max Chl Dpth (ft)	0.85	Hydr. Depth (ft)		0.76	
Conv. Total (cfs)	12249.4	Conv. (cfs)		12249.4	
Length Wtd. (ft)	343.12	Wetted Per. (ft)		393.00	
Min Ch El (ft)	3161.00	Shear (lb/sq ft)		4.36	
Alpha	1.00	Stream Power (lb/ft s)	523.00	0.00	0.00
Frctn Loss (ft)	18.44	Cum Volume (acre-ft)		9.70	
C & E Loss (ft)	0.09	Cum SA (acres)		9.38	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 400

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3150	2.11	3149	3.12	3148	6	3148	17.7	3148
18.95	3147	20.24	3146	22.2	3145	34.28	3145	34.68	3145
37.2	3144	61.99	3143	66	3143	81.14	3143	85.69	3142
93.37	3141	137.32	3141	139.07	3142	140.58	3143	142.32	3143
148.75	3143	153.27	3143	156.31	3143	159.11	3144	160.11	3144
167.6	3144	176.77	3144	198.59	3143	213.54	3143	217.14	3144
241.41	3145	271.41	3135	371.41	3135	471.41	3136	475.34	3137
477.53	3138	479.49	3139	481.46	3140	483.11	3140		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	483.11	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	483.11	134.85	180.11	179.45	.1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3139.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.05	Wt. n-Val.		0.030	
W.S. Elev (ft)	3136.56	Reach Len. (ft)	134.85	180.11	179.45
Crit W.S. (ft)	3137.43	Flow Area (sq ft)		265.67	
E.G. Slope (ft/ft)	0.057399	Area (sq ft)		265.67	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	206.86	Top Width (ft)		206.86	
Vel Total (ft/s)	14.01	Avg. Vel. (ft/s)		14.01	
Max Chl Dpth (ft)	1.56	Hydr. Depth (ft)		1.28	
Conv. Total (cfs)	15531.3	Conv. (cfs)		15531.3	
Length Wtd. (ft)	180.11	Wetted Per. (ft)		207.19	
Min Ch El (ft)	3135.00	Shear (lb/sq ft)		4.59	
Alpha	1.00	Stream Power (lb/ft s)	483.11	0.00	0.00
Frctn Loss (ft)	24.62	Cum Volume (acre-ft)		7.48	
C & E Loss (ft)	0.06	Cum SA (acres)		7.02	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 350

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3143	17.19	3142	29.22	3142	43.2	3143	83.07	3143
110.18	3142	115.02	3141	119.41	3140	130.3	3139	140.33	3139
192.19	3139	200.05	3138	205.42	3137	218.27	3136	260.27	3122
360.27	3122	460.27	3123	465	3124	470.45	3125	472.07	3126
473.53	3127	475.08	3128	475.99	3128				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	475.99	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	475.99	416.03	344 346.84	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	3127.22	Element			
Vel Head (ft)	3.80	Wt. n-Val.		0.030	
W.S. Elev (ft)	3123.42	Reach Len. (ft)	416.03	344.00	346.84
Crit W.S. (ft)	3124.43	Flow Area (sq ft)		237.88	
E.G. Slope (ft/ft)	0.082616	Area (sq ft)		237.88	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	206.26	Top Width (ft)		206.26	
Vel Total (ft/s)	15.64	Avg. Vel. (ft/s)		15.64	
Max Chl Dpth (ft)	1.42	Hydr. Depth (ft)		1.15	
Conv. Total (cfs)	12945.7	Conv. (cfs)		12945.7	
Length Wtd. (ft)	344.00	Wetted Per. (ft)		206.54	
Min Ch El (ft)	3122.00	Shear (lb/sq ft)		5.94	
Alpha	1.00	Stream Power (lb/ft s)	475.99	0.00	0.00
Frctn Loss (ft)	12.30	Cum Volume (acre-ft)		6.44	
C & E Loss (ft)	0.08	Cum SA (acres)		6.17	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 300

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3103	10.23	3102	22.49	3101	33.36	3100	40.38	3099
47.85	3098	51.79	3097	59.05	3096	69.83	3095	95.58	3094
108.45	3093	206.4	3093	306.4	3093	406.4	3094	418.4	3098
421.96	3099	425.63	3100	427.84	3101	430.23	3102	432.62	3103
435.47	3103								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	432.62	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	432.62	400.32	402.05 400.72	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3096.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.91	Wt. n-Val.		0.030	
W.S. Elev (ft)	3094.06	Reach Len. (ft)	400.32	402.05	400.72
Crit W.S. (ft)	3094.83	Flow Area (sq ft)		271.65	
E.G. Slope (ft/ft)	0.092169	Area (sq ft)		271.65	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	312.41	Top Width (ft)		312.41	
Vel Total (ft/s)	13.70	Avg. Vel. (ft/s)		13.70	
Max Chl Dpth (ft)	1.06	Hydr. Depth (ft)		0.87	
Conv. Total (cfs)	12256.5	Conv. (cfs)		12256.5	
Length Wtd. (ft)	402.05	Wetted Per. (ft)		312.47	
Min Ch El (ft)	3093.00	Shear (lb/sq ft)		5.00	
Alpha	1.00	Stream Power (lb/ft s)	435.47	0.00	0.00
Frctn Loss (ft)	30.00	Cum Volume (acre-ft)		4.42	
C & E Loss (ft)	0.27	Cum SA (acres)		4.12	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 200

INPUT
Description:
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3076	3.85	3076	16.55	3076	18.84	3075	20.21	3074
21.69	3073	51.37	3072	63.74	3072	64.87	3073	65.78	3074
66.82	3075	67.86	3076	68.86	3077	71	3077	97.94	3076
107.47	3076	153.64	3077	154.13	3077	155.72	3076	157.3	3075
158.81	3074	160.19	3073	161.52	3072	165.14	3071	173.1	3071
235.87	3071	238.14	3070	240.38	3069	242.52	3068	281.45	3068
282.44	3069	282.97	3070	283.5	3071	314.17	3071	319.48	3071
353.91	3072	359.14	3073	361.17	3074	363.19	3075	365.13	3076
367.07	3077	371.98	3078	372.63	3078	382.4	3077	400.98	3077
405.66	3077	408.73	3076	411.53	3075	413.99	3074	428.93	3074
431.09	3075	433.35	3076	436.49	3077	439.77	3078		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	439.77	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	439.77	394.44	262 263.09	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3074.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.49	Wt. n-Val.		0.030	
W.S. Elev (ft)	3071.95	Reach Len. (ft)	394.44	262.00	263.09
Crit W.S. (ft)	3072.73	Flow Area (sq ft)		293.86	
E.G. Slope (ft/ft)	0.037280	Area (sq ft)		293.86	
Q Total (cfs)	3721.00	Flow (cfs)		3721.00	
Top Width (ft)	190.47	Top Width (ft)		190.47	
Vel Total (ft/s)	12.66	Avg. Vel. (ft/s)		12.66	
Max Chl Dpth (ft)	3.95	Hydr. Depth (ft)		1.54	
Conv. Total (cfs)	19271.9	Conv. (cfs)		19271.9	
Length Wtd. (ft)	262.00	Wetted Per. (ft)		192.88	
Min Ch El (ft)	3068.00	Shear (lb/sq ft)		3.55	
Alpha	1.00	Stream Power (lb/ft s)	439.77	0.00	0.00
Frctn Loss (ft)	22.40	Cum Volume (acre-ft)		1.81	
C & E Loss (ft)	0.13	Cum SA (acres)		1.80	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

CROSS SECTION

RIVER: River #1
REACH: Reach #1 RS: 100

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	3063	40.77	3062	71.11	3061	112.08	3060	184.48	3059
304.84	3058	473.56	3057	717.7	3057	721.61	3058	723.75	3059
726.8	3060	730.31	3061						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	730.31	.03

Bank Sta: Left	Right	Coeff Contr.	Expan.
0	730.31	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	3060.20	Element	Left OB	Channel	Right OB	
Vel Head (ft)	2.25	Wt. n-Val.		0.030		
W.S. Elev (ft)	3057.95	Reach Len. (ft)				
Crit W.S. (ft)	3058.58	Flow Area (sq ft)		309.21		
E.G. Slope (ft/ft)	0.085425	Area (sq ft)		309.21		
Q Total (cfs)	3721.00	Flow (cfs)		3721.00		
Top Width (ft)	407.88	Top Width (ft)		407.88		
Vel Total (ft/s)	12.03	Avg. Vel. (ft/s)		12.03		
Max Chl Dpth (ft)	0.95	Hydr. Depth (ft)		0.76		
Conv. Total (cfs)	12731.2	Conv. (cfs)		12731.2		
Length Wtd. (ft)		Wetted Per. (ft)		408.00		
Min Ch El (ft)	3057.00	Shear (lb/sq ft)		4.04		
Alpha	1.00	Stream Power (lb/ft s)	730.31	0.00	0.00	
Frctn Loss (ft)	14.17	Cum Volume (acre-ft)				
C & E Loss (ft)	0.07	Cum SA (acres)				

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4.
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Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the
need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:River #1

Reach	River Sta.	n1	n2	n3
Reach #1	1200	.03	.03	.03
Reach #1	1100	.03	.03	.03
Reach #1	1000	.03	.03	.03
Reach #1	900	.03	.03	.03
Reach #1	800	.03	.03	.03
Reach #1	700	.03	.03	.03
Reach #1	600	.03	.03	.03
Reach #1	500	.03	.03	.03

Reach #1	400	.03	.03	.03
Reach #1	350	.03	.03	.03
Reach #1	300	.03	.03	.03
Reach #1	200	.03	.03	.03
Reach #1	100	.03	.03	.03

SUMMARY OF REACH LENGTHS

River: River #1

Reach	River Sta.	Left	Channel	Right
Reach #1	1200	241.36	204.9	234.97
Reach #1	1100	190.38	285.14	405.9
Reach #1	1000	208.44	326.91	214.82
Reach #1	900	148.02	244.37	242.24
Reach #1	800	326.86	358.35	361.96
Reach #1	700	426.05	502.88	540.06
Reach #1	600	472.7	338.14	340.16
Reach #1	500	299.7	343.12	345.13
Reach #1	400	134.85	180.11	179.45
Reach #1	350	416.03	344	346.84
Reach #1	300	400.32	402.05	400.72
Reach #1	200	394.44	262	263.09
Reach #1	100			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: River #1

Reach	River Sta.	Contr.	Expan.
Reach #1	1200	.1	.3
Reach #1	1100	.1	.3
Reach #1	1000	.1	.3
Reach #1	900	.1	.3
Reach #1	800	.1	.3
Reach #1	700	.1	.3
Reach #1	600	.1	.3
Reach #1	500	.1	.3
Reach #1	400	.1	.3
Reach #1	350	.1	.3
Reach #1	300	.1	.3
Reach #1	200	.1	.3
Reach #1	100	.1	.3

TECHNICAL DRAINAGE STUDY
FOR
VILLAGE 26 AT SUMMERLIN WEST
OFFSITE IMPROVEMENTS

764.201.05

February 2007

Prepared for:

Pulte Homes
8345 West Sunset Road
Las Vegas, Nevada 89113
Phone: (702) 437-7999
Fax: (702) 256-7900

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: December 2, 2008
TO: **Land Development Services** Department of Public Works			FROM: Oh Sang Kwon, P.E. Flood Control Department of Public Works
SUBJECT:	Drainage Study for:		**COPIES TO:**
Village 26 at Summerlin West Offsite Improvements			G.C. Wallace, Inc.
Cross Streets:	Cheyenne Road and I-215		Pulte Homes
File Number:	F:\Depot\DSMemos\DS4135B.doc		Bart Anderson, P.E., DevCo
Parcel Number:	137-14-501-003		CCRFCD
Zoning Action:			CCPW
FEMA Flood Zone	YES	NO X	NPC
Proposed Storm Drain	YES X	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	2/16/2007	3/16/2007	Not Accepted	$400.00	63332: $400
2nd Submittal	5/18/2007	6/7/2007	Not Accepted	$400.00	69406: $400
3rd Submittal	6/20/2007	6/28/2007	Conditionally Approved	$400.00	71698: $400
4th Submittal	11/7/2008	12/2/2008	See Comments Below	$400.00	108840: $400
			TOTAL FEES (LDDRS):	$1600.00	----

REMARKS: 4th Submittal: Address CCRFCD comments.

The Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Department of Public Works concurrence.

1. Address the following comments regarding Tatewar and Ingle Method:
   a. Provide an explanation on why 12.5-ft high step was used instead of 2.5-ft as shown on the calculation for the Detention Basin. Also, isn't 12.5-ft high step too high?
   b. Provide an explanation on why the calculated Manning's n for Debris Basin and Detention Basin were not used in HEC-RAS analysis.
2. Incorporate hinge in the trash rack design to lift the entire trash rack for equipment access and maintenance. Also, provide a complete detail of Man Access Gate including locking system. Provide CLV Street & Sanitation approval for access & maintenance.
3. Provide a monitoring system for Village 26 Detention Basin per CCRFCD design standard.
4. **Final approval for the Update to Master Drainage Study must be obtained prior to final approval of the infrastructure drainage studies.**
5. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

6. The proposed improvement plans show drainage facilities of a size that must be reviewed for Maintenance and Access concerns. The engineer must submit an extra set of improvement plans to the *Streets & Sanitation Department* for their review. *Street & Sanitation* approval must be secured prior to drainage study approval.
7. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (ie. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the City of Las Vegas Flood Control Section prior to final approval of technical drainage study.
8. Please note that the proposed flood protection facilities identified on Figure 6R and in the Master Drainage Study must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the infrastructure improvements.
9. The proposed project impacts the *Western Beltway 215*. Obtain concurrence from *Clark County Public Works Department* prior to the final approval of the drainage study (on file).
10. The proposed project impacts the Nevada Power Company (NPC) easement. Obtain concurrence from NPC.
11. The proposed debris and detention basins will require coordination with the State of Nevada, Division of Water Resources Dam Safety and will require the State's approval prior to permitting.
12. The project proposes to build a temporary drainage facility at (location). Prior to final plan approval the developer must complete a maintenance and liability agreement for the interim drainage improvements (off-site berms) and post a minimum maintenance bond of $25,000 or 25-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for constructing the facility and an 8.5-inch by 11-inch exhibit that adequately shows the location and limits of the drainage facility to *Flood Control* for approval. Once the drainage study is conditionally approved, the engineer should contact the City's Land Development Section (229-6371) to begin the agreement process.
13. Applicable right-of-way must be dedicated for the proposed debris and detention basins prior to the final approval of improvement plans.
14. This drainage study assumes that the project will be constructed in one phase. If improvement plans are submitted to break the project into separate phases, a drainage study update will be required for each phase addressing the interim condition.
15. Structural plans for the storm drain improvements must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to *Flood Control* prior to final acceptance of the drainage study.
16. Provide complete design information for the proposed Roller Compacted Concrete (RCC) spillway into the detention basin and debris basin. The RCC will require Special Inspection and must be noted on the plans.
17. Provide detailed design of proposed outfall structures for the debris basin and the detention basin. Included structural sections and details. Provide restrictor plate details.
18. Provide complete channel and box details. Include transition structures and connection details to existing facilities.
19. Provide an Access Agreement to all the public drainage facilities thru the proposed development prior to final approval of drainage study.

20. Planning Department approval is required for the excessive wall height prior to final approval of drainage study.

21. Provide a Maintenance Agreement for the non-standard flood control facilities (decorative debris basin wall, etc.).

22. Provide Sediment Gage in the proposed Debris Basin and Detention Basin.

23. Provide Maintenance Access Road from Lake Mead Drive to the both side of proposed 17-ft by 8-ft channel.

24. General Grading Plan Comments:

    a) The engineer must provide a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. All drainage improvements within Public Drainage Easements must be bonded and inspected.

    b) Provide missing structural details (orifice plate, steps for detention basin, etc.).

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

END OF REMARKS
osk

T/R/S: T20S/R59E/14
AREA K-14

Comment: "4. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (ie. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the City of Las Vegas Flood Control Section prior to final approval of technical drainage study."

Response: Noted. An update that addresses differences in the current design from that presented in the approved Master Drainage Study was submitted to CLV on April 26, 2007.

Comment: "5. Please note that the proposed flood protection facilities identified on Figure 6R and in the Master Drainage Study must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the infrastructure improvements."

Response: Noted.

Comment: "6. The proposed project impacts the *Western Beltway 215*. Obtain concurrence from *Clark County Public Works Department* prior to the final approval of the drainage study."

Response: Upon conditional approval of this study by CLV, the study will be submitted to Clark County Public Works Department for concurrence.

Comment: "7. The proposed debris and detention basins will require coordination with the State of Nevada, Division of Water Resources Dam Safety and will require the State's approval prior to permitting."

Response: Upon conditional approval of this study by CLV, the study will be submitted to the State of Nevada, Division of Water Resources Dam Safety.

Comment: "8. Please address the interim protection of the proposed dual channel during construction. Provide analysis for construction of interim facility. An implementation plan must be provided to ensure flood protection during each phase of the construction."

Response: An interim channel will provide protection for the dual channel during construction. The proposed channel will begin at the outlet of the dual 10-foot by 9-foot RCB structure under Lake Mead. The interim channel will have a 20-foot bottom width with 2:1 side slopes and riprap (d50=17 inches) until combining with the 200-foot bottom width trapezoidal interim channel provided in the Master Drainage Study Update. The combined flow will be 4,956 cfs. An Interim Conditions HEC-1 Analysis showing the combination of the Beltway Channel Flows with flows impacting Village 26 is provided in Appendix A. Applicable reference material is provided in Appendix C.

Please note that modifications to the construction sequence are necessary due to the diversion of the Beltway Channel Flows. The Village 26 detention basin access road will be built prior to the diversion of the Beltway Channel Flows to achieve an elevation of 3,023.0 feet. After the completion of the dual channel structure, the 66-inch restrictor plate will be added to the detention basin outlet structure.

Comment: "9. Applicable right-of-way must be dedicated for the proposed debris and detention basins prior to the final approval of improvement plans."

Response: Right-of-way will be dedicated for the proposed Debris and Detention Basin. A 12-foot-wide access road to the Debris Basin has been provided from the Summerlin Village 26 Model Homes Roadways.

Comment: "10. This drainage study assumes that the project will be constructed in one phase. If improvement plans are submitted to break the project into separate phases, a drainage study update will be required for each phase addressing the interim condition."

Response: Noted.

Comment: "11. Structural plans for the storm drain improvements must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the *Building Department* for processing. The engineer must provide a copy of *Building Department* approval of the structures to *Flood Control* prior to final acceptance of the drainage study."

Response: A soils report, structural calculations, and plans will be submitted to the *Building Department* hereafter. We request that the structural calculations be a condition of approval.

Comment: "12. Provide a stage/discharge curve calculation for the proposed debris basin and Village 26 detention basins. Provide an exhibit showing the inflow hydrograph, basin characteristics, discharge rate, contour elevations, etc. to verify the calculations. Also, provide an overflow path, supporting calculations, and show the overflow path on a figure. Ensure that all properties are flood protected."

Response: Exhibits showing inflow-outflow hydrographs, stage-storage relationships, stage-discharge relationships, and drain time for the Village 26 Detention Basin have been included in Appendix A. Emergency overflow paths to the Village 26 Detention Basin during ultimate conditions have been provided via interior roadways and the Village 26 Channel. Flows overtopping the Debris Basin will cross Reverence Parkway and be conveyed in Calm Desert Drive, to the Village 26 Channel, to the Village 26 Detention Basin. Flows conveyed in Reverence Parkway will be conveyed to Loquat Drive, to Rain Water Drive, to Emory Oak Lane, to the Village 26 Detention Basin. Please refer to Figure 5AU from the Update to the Master Drainage Study, provided in Appendix C.

Comment: "13. Provide an explanation on why the peak stage elevation with proposed 66-inch restrictor plate is lower than the existing condition with 96-inch RCP outlet. Review and revise the calculations accordingly."

Response: As stated in the original submittal, "In the 2006 Update and Master Study, the orifice elevation for the proposed outflow pipe had been based on the centerline of the existing 96-inch pipe. For this submittal, the ultimate conditions HEC-1 model has been revised to show the orifice elevation taken at the centerline of the proposed 66-inch diameter restrictor plate (elevation 2993.8 feet)."

Comment: "14. Address the following comments regarding the "14' x 14' RCB" WSPG analysis:

a. Show junction structure at station 1565.38 on the plan and profile.

b. Add wall entrance card."

Response: a. The junction at Station 1565.38 has been included on the plan and profile.

b. A wall entrance card has been included in the WSPGW analysis. The revised WSPGW analysis is included in the Appendix.

Comment: "15. Address the following comments regarding the "Village 26 Channel" HEC-RAS analysis:

a. Provide a mixed regime flow computation.

b. Provide additional cross-sections to represent the channel width/alignment transitions at stations 25+65.76, 26+20.85 and 26+31.10."

Response: a. The HEC-RAS analysis has been modified to include the mixed flow regime.

b. Additional cross-sections have been added to represent the subject channel width/channel alignment transitions. The revised HEC-RAS analysis is included in the Appendix.

Comment: "16. Address the following comments regarding the "Western Beltway Channel – Interim Conditions" HEC-RAS analysis:

a. Provide additional cross-sections in between stations 2178.02 & 2565.76, 2646.67 & 3171.51, and 4881.48 & 4981.68 to address erupted flow regime changes.

Response: a. Additional cross-sections have been added to the HEC-RAS analysis. The revised HEC-RAS analysis has been included in the Appendix.

FLO-2D SECTION SUMMARY TABLE								
Section	Q (cfs)	Depth (ft)	Vel (ft/s)	Top Width (ft)	Froude #	Freeboard (ft)	Total Depth (ft)	Notes
1	318	1.70	8.60	140.0	1.16	1.3	3.0	Use 3.0 feet above grade
2	365	1.80	10.40	100.0	1.37	1.3	3.1	Use 3.0 feet above grade
3	447	1.70	10.00	120.0	1.35	1.3	3.0	Use 3.0 feet above grade
4	447	0.70	5.90	100.0	1.24	1.1	1.8	Use 3.0 feet above grade
5	447	0.80	5.80	80.0	1.14	1.1	1.9	Use 3.0 feet above grade
6	2008	6.60	24.20	120.0	1.66	2.1	8.7	Use 15.0 feet above grade

RESPONSE TO CCRFCD COMMENTS ON THE TECHNICAL DRAINAGE STUDY FOR VILLAGE 26 AT SUMMERLIN WEST OFFSITE IMPROVEMENTS

764-201-05

November 2008

Prepared for:

Pulte Homes
8345 West Sunset Road
Las Vegas, Nevada 89113
Phone: (702) 437-7999
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G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

REGIONAL FLOOD CONTROL DISTRICT

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General Manager/Chief Engineer

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Clark County

September 4, 2007

Mr. Randy Fultz, P.E.
City of Las Vegas Public Works
731 S. 4th Street
Las Vegas, NV 89101

DISTRICT COMMENTS: **VILLAGE 26 AT SUMMERLIN WEST OFFSITE IMPROVEMENTS (DS4135) (RFCD No. 07-7227)**

Dear Mr. Fultz:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated February 16, 2007, Addendum No. 1 dated May 17, 2007, Addendum No. 2 dated June 20, 2007 for above-mentioned project as submitted by G.C.WALLACE, INC. In addition, District is in receipt of the Conditional Letter of Acceptance from City of Las Vegas Public Works dated June 28, 2007.

District has the following comments:

1. District has many concerns about the design and construction procedure for the proposed improvements. The Engineer should schedule a meeting with the District and City of Las Vegas prior to the next submittal.

2. Provide a discussion on the progress of incorporating the proposed flood control facilities on the Master Plan Update.

3. Provide structural plans for the proposed flood control facilities.

4. Provide design project specifications and/or special inspection requirements for the Roller Compacted Concrete (RCC) and Mechanically Stabilized Earthen Walls. Any information necessary for construction should be added on the plans.

5. Address the following items regarding the Debris Basin:

   a. The analysis shows a super-critical flow regime entering the stepped inflow structure at the top of the Debris Basin. The reference documentation provided in the study used to design the facility assumes a sub-critical overflow section entering the steps. Verify that the design is applicable for the super-critical flow entering the top of the structure.

   b. Based on the reference documentation provided, the Froude number at the toe of the spillway governs the type of stilling basin. Based on the analysis, it does not appear that the proposed USBR Type I stilling basin is applicable. A USBR Type

IV stilling basin should be used when the Froude Number is between 2.5 to 4.5. Revise accordingly.

c. Discuss how the boundary conditions were determined for the Debris Basin. Provide additional HEC-RAS cross-section upstream of the "stepped inflow structure" location.

d. The Debris Basin is 70 feet deep at 1:1 slope. This slope is difficult to construct and there may be construction hazards. Provide a discussion on how the Debris Basin will be excavated to such a depth and discuss the construction procedure of the RCC stepped spillway.

e. Provide scour protection at the RCC stepped spillway inlet. Submit scour calculations justifying the depth.

f. Provide width and height dimension of the RCC steps. Please note, District recommends uniform lift thickness for the RCC steps.

g. Provide weep holes to address a saturated condition behind the RCC stepped spillway.

h. Address the maintenance of the rip-rap section in the debris basin. It is difficult for mechanical equipment to remove debris from uneven surfaces. District suggests an alternative design for the rip-rap section.

i. District discourages the use of trash racks as it may collect debris which could prevent the facility from adequately conveying storm flows. District recommends an alternate design. If the Engineer intends to proceed with a trash rack facility, the proposed trash rack is significant in size, address how the structure will be maintained to remove debris collected in the trash rack. Provide necessary structural drawings. Also, based on the 10- inch opening between the trash rack bars, smaller debris will still enter the proposed (2)10-foot by 14-foot RCB. District recommends an alternative design to minimize the amount of debris in the storm drain facility.

j. Discuss how flow from the west wall of the trash rack drains into the facility (Section D/D1).

k. The calculated sediment load of 28.4 ac-ft relates to a sediment depth of approximately 20 feet in the Debris Basin. The sediment berm shown on the plans will not be effective in addressing this amount of sediment. The engineer must address the impact of the sediment to the proposed facilities. Consider raising the invert elevation of the outfall facility and provide a low-flow perforated pipe inlet tower as an alternative.

l. For safety requirement per Section 707.3 of the HCDDM, provide a 6-foot high galvanized coated chain link perimeter fence to prevent unauthorized access to the open channel section. Provide a gate for authorized maintenance access. Provide adequate fall protection above retaining walls, headwall and channel walls.

m. Provide adequate turning radius for large maintenance vehicles at the top and bottom of the maintenance road. Provide a section detail of the access road.

n. Label proposed contours.

o. Provide a sediment level gauge in the debris basin.

p. D1, Section B: Provide a guardrail for maintenance vehicles along the maintenance road.

q. Sta. 10+38.56: Provide bull nose or pier nose, as necessary at upstream end of piers.

6. Address the following regarding the Detention Basin:

a. The analysis shows a super-critical flow regime entering the stepped inflow structure at the top of the Debris Basin. The reference documentation provided in the study used to design the facility assumes a sub-critical overflow section entering the steps. Verify that the design is applicable for the super-critical flow entering the top of the structure.

b. Based on the reference documentation provided, the Froude number at the toe of the spillway governs the type of stilling basin. Based on the analysis, it does not appear that the proposed USBR Type I stilling basin is applicable. A USBR Type IV stilling basin should be used when the Froude Number is between 2.5 to 4.5. Revise accordingly.

c. It is assumed that the maintenance of the existing Village 26 Detention Basin will be transferred to City of Las Vegas and maintained with District funds. Discuss ultimate use and proposed facilities which may be used as amenities in the Detention Basin. Proposed facilities must be in compliance with District design criteria for the Detention Basin to be eligible for District maintenance funds.

d. Verify the stability of the existing Debris Basin embankment.

e. Discuss the impacts of the orifice plate to the Detention Basin.

REGIONAL FLOOD CONTROL DISTRICT

f. P9: Show the 36-inch RCP lateral on the profile view.

g. D2, Section D: Revise the sidewall heights from "inches" to "feet"

h. District requests a rain and water level gauge to be constructed in the detention basin. Contact Tim Sutko (455-3139) at the District for typical drawings and requirements.

7. Address how the Mechanically Stabilized Earthen Walls will perform under saturated and draw-down conditions.

8. P15: District recommends a rectangular-to-trapezoidal channel transition per the attached schematic detail.

9. D3, Section G: Revise riprap callout to D50=18 inches.

District's review of this project was limited to issues of Regional Flood Control Significance as defined in *Uniform Regulations for the Control of Drainage*. The consultant must be advised to submit any revisions to the Technical Drainage Study and Improvement Plans to City of Las Vegas Public Works for review/re-approval. District review of any such revisions will commence upon City of Las Vegas Public Works' acceptance.

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by G.C.WALLACE, INC. may be superseded. Compliance with regulatory elements and design standards specified in *Uniform Regulations for the Control of Drainage* does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

GALE WM. FRASER, II, P.E.
General Manager/Chief Engineer

BY: _____
Abigail Mayrena, P.E.
Associate Engineer

_____
Andrew R. Trelease, P.E., CFM
Principal Civil Engineer

AM:ART:ph

Enclosure

c: James Monroe Jr., P.E., G.C.WALLACE, INC.

G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

G. C. WALLACE, INC.
G. C. WALLACE OF CALIFORNIA, INC.
G. C. WALLACE HOLDINGS, INC.

Writer's Contact Information:
(702) 804-4394

764-201-05

November 4, 2008

Andrew R. Trelease, PE – Principal Civil Engineer
Clark County Regional Flood Control District
600 South Grand Central Parkway, Suite 300
Las Vegas, Nevada 89106-4511

Re: Response to Comments on the Technical Drainage Study for Village 26 at Summerlin West Offsite Improvements
Cross Streets: Cheyenne Road and I-215
Parcel Number: 137-14-501-003

Dear Mr. Trelease:

The purpose of this letter is to address the comments from the Clark County Regional Flood Control District (CCRFCD), dated September 4, 2007, regarding the above-referenced project. The comments are individually addressed as follows:

Comment: "1. District has many concerns about the design and construction procedure for the proposed improvements. The Engineer should schedule a meeting with the District and City of Las Vegas prior to the next submittal."

Response: A meeting was held with G. C. Wallace, Inc. (GCW), Clark County Regional Flood Control District (CCRFCD), and City of Las Vegas (CLV) on October 11, 2007 to discuss District's concerns. Since the Project was put on hold for almost a year after the October 11, 2007 Meeting, GCW met with CCRFCD again on September 25, 2008 to discuss the plan to address CCRFCD concerns. This Submittal incorporates items discussed in the October 11, 2007 and the September 25, 2008 meetings.

Comment: "2. Provide a discussion on the progress of incorporating the proposed flood control facilities on the Master Plan Update."

Response: GCW has provided PBS&J with information on the proposed facilities. PBS&J is currently incorporating them into the 2008 MPU.

Comment: "3. Provide structural plans for the proposed flood control facilities."

Response: Structural plans by Wright Engineers have been included herewith.

Comment: "4. Provide design project specifications and/or special inspection requirements for the Roller Compacted Concrete (RCC) and Mechanically Stabilized Earthen Walls. Any information necessary for construction should be added on the plans.

Response: Specifications for the RCC have been included on the structural plans submitted herewith. Plans and Specifications for the MSE Walls have been included on CD in Appendix C.

Comment: "5. Address the following items regarding the Debris Basin:

a. The analysis shows a super-critical flow regime entering the stepped inflow structure at the top of the Debris Basin. The reference documentation provided in the study used to design the facility assumes a sub-critical overflow section entering the steps. Verify that the design is applicable for the super-critical flow entering the top of the structure.

b. Based on the reference documentation provided, the Froude number at the toe of the spillway governs the type of stilling basin. Based on the analysis, it does not appear that the proposed USBR Type I stilling basin is applicable. A USBR Type IV stilling basin should be used when the Froude Number is between 2.5 to 4.5. Revise accordingly.

c. Discuss how the boundary conditions were determined for the debris Basin. Provide additional HEC-RAS cross-section upstream of the "stepped inflow structure" location.

d. The Debris Basin is 70 feet deep at 1:1 slope. This slope is difficult to construct and there may be construction hazards. Provide a discussion on how the Debris Basin will be excavated to such a depth and discuss the construction procedure of the RCC stepped spillway.

e. Provide scour protection at the RCC stepped spillway inlet. Submit scour calculations justifying the depth.

f. Provide width and height dimension of the RCC steps. Please note, District recommends uniform lift thickness for the RCC steps.

g. Provide weep holes to address a saturated condition behind the RCC stepped spillway.

h. Address the maintenance of the rip-rap section in the debris basin. It is difficult for mechanical equipment to remove debris from uneven surfaces. District suggests an alternative design for the rip-rap section.

i. District discourages the use of trash racks as it may collect debris which could prevent the facility from adequately conveying storm flows. District recommends an alternate design. If the Engineer intends to proceed with a trash rack facility, the proposed trash rack is significant in size, address how the structure will be maintained to remove debris collected in the trash rack. Provide necessary structural drawings. Also, based on the 10-inch opening between the trash rack bars, smaller debris will still enter the proposed (2) 10-foot by 14-foot RCB. District recommends an alternative design to minimize the amount of debris in the storm drain facility.

j. Discuss how flow from the west wall of the trash rack drains into the facility (Section D/D1).

k. The calculated sediment load of 28.4 ac-ft relates to a sediment depth of approximately 20 feet in the Debris Basin. The sediment berm shown on the plans will not be effective in addressing this amount of sediment. The engineer must address the impact of the sediment to the proposed facilities. Consider raising the invert elevation of the outfall facility and provide a low-flow perforated pipe inlet tower as an alternative.

l. For safety requirement per Section 707.3 of the HCDDM, provide a 6-foot high galvanized coated chain link perimeter fence to prevent unauthorized access to the open channel section. Provide a gate for authorized maintenance access. Provide adequate fall protection above retaining walls, headwall and channel walls.

m. Provide adequate turning radius for large maintenance vehicles at the top and bottom of the maintenance road. Provide a section detail of the access road.

n. Label proposed contours.

o. Provide a sediment level gauge in the debris basin.

p. D1, Section B: Provide a guardrail for maintenance vehicles along the maintenance road.

q. Sta. 10+38.56: Provide bull nose or pier nose, as necessary at upstream end of piers."

Response: a. The referenced documentation for the Tatewar and Ingle method has been provided in Appendix C. As stated in the abstract on page 195 of the study, the analysis was based on skimming flow regime. The definition of skimming flow, as stated in the introduction of the study, is flow "*in which the steps are completely submerged and no nappe is formed, the flow being supercritical throughout*". It is the opinion of GCW that the description of dam overflow entering the spillway was merely a statement of the typical use of a stepped spillway, and not design criteria. It appears that the curved top of the structure and use of transition steps in the example is meant to help the flow transition from a subcritical nappe flow regime to a supercritical skimming flow regime. As flow entering the Debris Basin stepped inflow structure is already supercritical, this transition structure was removed from the design.

b. The stilling basin has been revised to a USBR Type IV stilling basin. Calculations for the sizing of chute blocks, sill, and basin length have been included in Appendix B.

c. HEC-RAS cross-sections were added to 100 feet upstream of the Debris Basin stepped inflow structure. Please note that since the stilling basin has been revised to a Type IV stilling basin using USBR methods, it has been removed from the Debris Basin HEC-RAS model. The downstream end of the model is now the downstream end of the stepped inflow structure. Both the upstream and downstream boundary conditions were set at normal depth for the corresponding slopes.

d. The Debris Basin roller-compacted-concrete slope has been reduced to 1.33H: 1V per recommendation by Angle Engineering. The letter also discusses possible alternatives for construction of the stepped inflow structure.

e. The top four steps of the stepped inlet structure will be extended to provide scour protection to a depth of 10 feet to equal the scour protection calculated for the retaining wall upstream of the stepped inflow structure.

f. Step width and height dimensions have been clarified. A 4-inch minimum, 10-inch maximum uniform lift thickness will be used in construction of the stepped inflow structure.

g. Weepholes have been added to the structure (see Note 5 for Detail 110 on Sheet S2.2).

h. Due to the maintenance issues, the riprap pad has been removed from the design. A 6-foot cutoff wall has been provided at the end of the stilling basin to provide protection against scour.

i. The structural detail for the trash rack is included on Sheet S1.3. The trash rack design has been modified to include an 8.5-foot by 18-foot access gate and 2.5-foot openings. This will provide adequate protection from larger debris that can damage the storm drain during large flood events, while minimizing the collection of smaller debris against the trash rack during smaller storm events. Please note that the sediment berm will also provide protection for the outlet.

j. Positive drainage has been provided for the west wall.

k. Please note that the washload portion of the sedimentation calculations has been revised. A smaller soil density has been used to better agree with the geotechnical report for the site. The delivery ratio has been revised based on referenced information from the National Engineering Handbook, and represents the largest delivery ratio suggested for the tributary area. The result is an overall decrease in the washload volume to 13.1 acre-feet, and a total sediment volume of 16.9 acre-feet. Please see appendix B for the revised sedimentation calculations.

The washload portion of the total sediment volume is composed in large part from finer soils that are suspended in moving water. Slower velocities produced by the inflow structure and the expansion of the water into the debris basin will be

the main cause of the washload depositing into the basin. The sediment berm has been sized to protect the storm drain from the much larger rock and debris composing the bedload (3.9 acre-feet). The total volume behind the sediment berm was calculated utilizing AutoCad and was deterimined to be 7 acre feet. In the October 11, 2007 meeting it was decided that the volume behind the berm should be adequate to contain the bedload at a minimum. Therefore, the sediment berm will be effective in addressing the bedload portion of the total sediment yield.

l. A 6-foot high perimeter fence with a gate for authorized maintenance access above retaining walls and headwalls will be designed and provided by others. Seven strand post and cable per AASHTO has been provided along the channel wall.

m. Adequate turning radius has been provided at the top and bottom of the maintenance road. A section detail for the access road has been provided on Detail B/D1.

n. Proposed contours have been labeled.

o. A sediment level gauge has been provided in the debris basin.

p. As discussed in the September 25, 2008 Meeting with CCRFCD, an NDOT Type A Concrete Barrier Rail has been included along the maintenance road for fall protection.

q. A bull nose has been provided at the upstream end of the pier (see Structural Detail 7/SO.2).

Comment: "6. Address the following regarding the Detention Basin:

a. The analysis shows a super-critical flow regime entering the stepped inflow structure at the top of the Debris Basin. The reference documentation provided in the study used to design the facility assumes a sub-critical overflow section entering the steps. Verify that the design is applicable for the super-critical flow entering the top of the structure.

b. Based on the reference documentation provided, the Froude number at the toe of the spillway governs the type of stilling basin. Based on the analysis, it does not appear that the proposed USBR Type I stilling basin is applicable. A USBR Type IV stilling basin should be used when the Froude Number is between 2.5 to 4.5. Revise accordingly.

c. It is assumed that the maintenance of the existing Village 26 Detention Basin will be transferred to City of Las Vegas and maintained with District funds. Discuss ultimate use and proposed facilities which may be used as amenities in the detention Basin. Proposed facilities must be in compliance with District design criteria for the Detention Basin to be eligible for District maintenance funds.

d. Verify the stability of the existing Debris Basin embankment.

e. Discuss the impacts of the orifice plate to the Detention Basin.

f. P9: Show the 36-inch RCP lateral on the profile view.

g. D2, Section D: Revise the sidewall heights from "inches" to "feet".

h. District requests a rain and water level gauge to be constructed in the detention basin. Contact Tim Sutko (455-3139) at the District for typical drawings and requirements."

Response: a. Please refer to response to Comment 5a.

b. The stilling basin has been revised to a USBR Type IV stilling basin. Calculations for the sizing of chute blocks, sill, and basin length have been included in Appendix B.

c. There are no amenities proposed for the Village 26 Detention Basin at this time.

d. As stated in the response to Comment 5d, the slope for the Debris Basin roller compacted concrete has been reduced to 1.33H: 1V. A letter from Angle Engineering verifying the stability of the Debris Basin roller-compacted concrete slope and the existing slopes in the Detention Basin are stable is included in Appendix C.

e. Please note that flows impacting the Village 26 Detention Basin were revised per *Update #2 to the Master Drainage Study for Village 26 at Summerlin West* (hereinafter referred to as Update #2). Pertinent reference material is included in Appendix C. With the revised flows, the 100-year WSE for the Detention Basin is 3020.18 with a 685 cfs peak outflow. The resultant WSE for the Lone Mountain Detention Basin is 2643.68, which is equal to an slight increase of only 0.02 feet above the WSE shown in the Summerlin West Update.

Additionally, a 4-inch PVC vent pipe has been included above the 96-inch RCP outfall for cavitation.

f. The 36-inch RCP has been shown in the profile view.

g. The sidewall heights have been revised from "inches" to "feet".

h. A basin depth gauge has been provided (see Detail 3/D1).

Comment: "7. Address how the Mechanically Stabilized Earthen Walls will perform under saturated and draw-down conditions."

Response: A letter from Terracon regarding the performance of the MSE walls is included in Appendix C.

Comment: "8. P15: District recommends a rectangular-to-trapezoidal channel transition per the attached schematic detail."

Response: A rectangular-to-trapezoidal channel transition has been designed per the schematic detail provided with the CCRFCD comment letter (see Detail P/D3).

Comment: "9. D3, Section G: Revise riprap callout to D50=18 inches.

Response: The riprap callout has been revised.

Additional Comments

As stated above in response to Comment 6E, flows presented in this study were revised per Update #2. Pertinent reference material is included in Appendix C. Revised HEC-1 models have been included in Appendix A. An additional RCP stub has been included at Station 37+84.78, and flows were revised in the RCP storm drain at Station 50+54.25 of the Village 26 Channel per revisions in flow patterns from Update #2. Revised HEC-RAS models for the Village 26 Channel and Detention Basin Stepped Inflow Structure and a revised WSPGW model for the 20-foot wide by 7-foot high RCB portion of the channel have been included in Appendix B.

In order to protect the retaining walls and landscaping along the embankment, interim ditches have been added on the southwest of the Village 26 Detention Basin. The ditches will convey flows from portions of Basin INT6 that were previously shown to be conveyed down the detention basin embankment. The storm drain Station 50+54.25 of the Village 26 Channel will be extended to collect the flows from the ditches. An exhibit showing the prorated basins tributary to these interim ditches is included in Appendix A. Pertinent hydraulic calculations for the interim ditches and the RCP storm drain are included in Appendix B.

If you have any questions or require additional information, please contact me at 804-4394.

Very truly yours,

G. C. WALLACE, INC.

James A. Monroe, Jr., PE
Project Manager
Flood Control Division

JAM/RH/jj

Enclosures

c: Pulte Homes
Jerry E. Pruitt, GCW
Ryan R. Belsick, GCW

2006 SUMMERLIN WEST PLANNING AREA FLOOD CONTROL MASTER PLAN UPDATE

62A.W04.007

August 2006

Prepared for:

Howard Hughes Corporation
10000 West Charleston Boulevard; Ste. 200
Las Vegas, Nevada 89135
Phone: (702) 791-4300
Fax: (702) 791-4453

Prepared by:

G. C. Wallace, Inc.
1555 S. Rainbow Boulevard
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2297

CITY OF LAS VEGAS **INTER-OFFICE MEMORANDUM**				**DATE:** April 13, 2007
TO: **Land Development Services** Department of Public Works				**FROM:** Oh Sang Kwon, P.E. Flood Control Department of Public Works
SUBJECT:	Drainage Study for:			**COPIES TO:**
Master Summerlin West Planning Area				G.C. Wallace, Inc.
Cross Streets:	Charleston Blvd/Cheyenne and I-215/BLM			Howard Hughes Corporation
File Number:	F:\Depot\DSMemos\DS3983E.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-22-000-013			CCRFCD
Zoning Action:				CCDDS
FEMA Flood Zone	YES X	NO		CCDPW
Proposed Storm Drain	YES X	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	8/7/2006	8/30/2006	Not Approved	$400.00	288923: $400
2nd Submittal	9/29/2006 & 10/30/2006	10/20/2006 & 11/13/2006	Not Approved	$400.00	Paid: $400
3rd Submittal	11/22/2006	12/4/2006	Conditional Approval	$400.00	58324: $400
4th Submittal	3/29/2007	4/13/2007	Approved	$400.00	66016: $400
CCRFCD	2/12/2007	2/12/2007	Concurrence	N/C	-
CCDDS	1/16/2007	1/16/2007	Concurrence	N/C	-
CCDPW	4/11/2007	4/13/2007	Concurrence	N/C	-
			TOTAL FEES (LDDRS):	**$1600.00**	---

REMARKS:

4th Submittal: Response to CCDPW comments.

The Master Drainage Study for the subject project has been reviewed and:

X	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Department of Development Service concurrence.
	is conditionally approved subject to Clark County Department of Public Works concurrence.

1. As condition of final approval, any change to land uses/densities will require an update to this Master Drainage Study. Detention basin or other mitigation will be required if the flow values and assumed land uses/densities are increased from this Master Drainage Study.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent"

to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

END OF REMARKS
osk

T/R/S: T21S/R59E/3 & 4
AREA K-21

Department of Public Works

500 S Grand Central Pky • Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

Denis Cederburg, P.E., Director • E-Mail: dlc@co.clark.nv.us

April 5, 2007

William Meyer, P.E.
G. C. Wallace, Incorporated
1555 South Rainbow Boulevard
Las Vegas, Nevada 89146

CLARK COUNTY 215 BRUCE WOODBURY BELTWAY, SUMMERLIN SYSTEM TO SYSTEM INTERCHANGE B053315 DRAINAGE STUDY CONCURRENCE FOR SUMMERLIN WEST – MASTER PLAN UPDATE

Dear Mr. Meyer:

Clark County Public Works has reviewed the drainage study and grading plans for the project approximately located west of the Clark County 215 Bruce Woodbury Beltway between Charleston Boulevard and Cheyenne Avenue.

With regards to the drainage facilities as shown on that plan set we concur with the project as it stands based on the understanding that there will be no change in the patterns or intensity of drainage flows adjacent to the Beltway. We are providing this letter of concurrence at your request and per the requirements of a review conducted by Mr. Oh Sang Kwon at the City of Las Vegas dated December 11, 2006.

Clark County Public Works reserves the right to review and comment on the improvement plans prior to the construction of any facilities within or abutting the Beltway. Items that we may provide comments on will include but not be limited to: perimeter walls, retaining walls, vertical wall channel(s), pedestrian fence along channels, transition structures and grading.

Our concurrence with your plans does not imply that Clark County Public Works checked the accuracy of the drainage study, nor does it provide approval for your client or its contractors to use any part of the Beltway right-of-way for temporary or permanent access to the site.

BOARD OF COUNTY COMMISSIONERS
RORY REID, Chairman • CHIP MAXFIELD, Vice-Chairman
SUSAN BRAGER • TOM COLLINS • CHRIS GIUNCHIGLIANI • LAWRENCE WEEKLY • BRUCE L. WOODBURY
VIRGINIA VALENTINE, P.E., County Manager

An encroachment permit from the Clark County Department of Development Services is required for any work within or abutting the right-of-way for the Clark County 215 Bruce Woodbury Beltway – contact Clark County Development Services for details at (702) 455-4600.

Should you have any questions or require any additional information, please call the undersigned at (702) 455-6081.

Sincerely,

Michael Mamer
Associate Engineer

MM:dm

cc: Oh Sang Kwon, City of Las Vegas
Robert Welch, City of Las Vegas
Abi Mayrena, Clark County Regional Flood Control District
Jack Sjostrom, Parsons
Jeremy Leavitt, VTN Nevada
Mike Hand, Manager, Clark County Public Works Design Engineering Division

TABLE 2								
REGIONAL FACILITY Q100 COMPARISON								
MPU ID	MPU MILE	MPU Conc. Pt.	MPU Q (cfs)	MPU Model	Summerlin Conc. Pt.	Q (cfs)	DARF	Summerlin Model
GOBE	0070	CSB3	1526	GW3SC	C9	880	0.990	SDN3-North
GOBE	0069	CSB3	1526	GW3SC	C9	880	0.990	SDN3-North
GOBE	0000	CSB3	1526	GW3SC	C9	880	0.990	SDN3-North
GOL3	0129	VIL26OT	1104	GW3SC	EXDB	676	0.908	SDN3-North
GOL3	0128	VIL26IN	3684	GW3SC	CP4	3696	0.908	SDN3-North
GOL3	0083	CRCSB3	1784	ALLGOW3	CPCH2	1178	0.903	SDN3-North
GOL3	0009	CRLMT1	3841	ALLGOW3	CRLMT1	3147	0.885	SDN3-North
GOL4	0000	LMT1	2309	GW3SC	CCLMT1	2295	0.925	SDN3-North
GOLM	0240	CUVB2	1925	GW3SC	CUVB2	1925	0.950	SDN3-North
GOLM	0166	CLMT5	5561	GW3SC	CCLMT5	5496	0.903	SDN3-North
GOLM	0155	CGABW	5724	GW3SC	CGABW	5681	0.903	SDN3-North
GOLM	0146	LMTNIN	5724	ALLGOW4	LMTNIN	5271	0.850	SDN4-North
GOLM	0101	LMTNDB	188	ALLGOW4	LMTNDB	188	0.850	SDN4-North

NORTH

SCALE 1"=2000'

2000 0 2000 4000

SCALE FEET

TABLE 2								
Regional Facility Q_{100} Comparison Angel Park Detention Basin								
Q (cfs)	MPU MILE	MPU Conc. Pt.	MPU Q (cfs)	MPU Model	Summerlin Conc. Pt.	Q (cfs)	DARF	Summerlin Model
APMD	0200	C11A-1	5590	GW3SC	C11A-1	5580	0.908	SDN3 South
APMD	0170	C11A-1	5590	GW3SC	C11A-1	5580	0.908	SDN3 South
APMD	0150	C11A-3	5780	GW3SC	C11A-3	5794	0.908	SDN3 South
APMD	0133	C11A-3	5780	GW3SC	C11A-3	5794	0.908	SDN3 South
APMD	0030	C11A-3	5780	GW3SC	C11A-3	5794	0.908	SDN3 South
APMD	0027	C11A-3	5780	GW3SC	C11A-3	5794	0.908	SDN3 South
APMD	0000	C11A-3	5780	GW3SC	C11A-3	5794	0.908	SDN3 South
APNO	0013	CSF2-C	6743	GW4SC	CSF2-C	6848	0.875	SDN4 South
APNO	0005	CSF2-C	6743	GW4SC	CSF2-C	6848	0.875	SDN4 South
APNO	00000	ANGLPKDB	8623	ALLGOW5	ANGLPKDB	8627	0.765	SDN5 South

LEGEND

- *LMT1* BASIN ID
- CCLMT1 COMBINATION POINT
- SUBBASIN BOUNDARY
- FACILITY
- FLOW DIRECTION

W LONE MOUNTAIN

W CHEYENNE

SUMMERLIN PKWY

215

615

LMT2 LMT3 LMT1 LMT5 UVB2 CRBW CRBW2 GABW

CUVB2 CCLMT5 CGABW LMTNIN LMTNDB CCLMT1 CRLMT1 EXDB CP4 CPCH2 C9 C11A-1 C11A-3 CSF2-C ANGLPKDB

1-1A 1-2A 1-2C 1-2B 1-1B 1-3P 1-11P 1-12P 1-13P 1-5 1-4 1-6 1-7 1-8 1-9 1-10

2-5A 2-8A 2-4A 2-7A 2-6A 2-3P

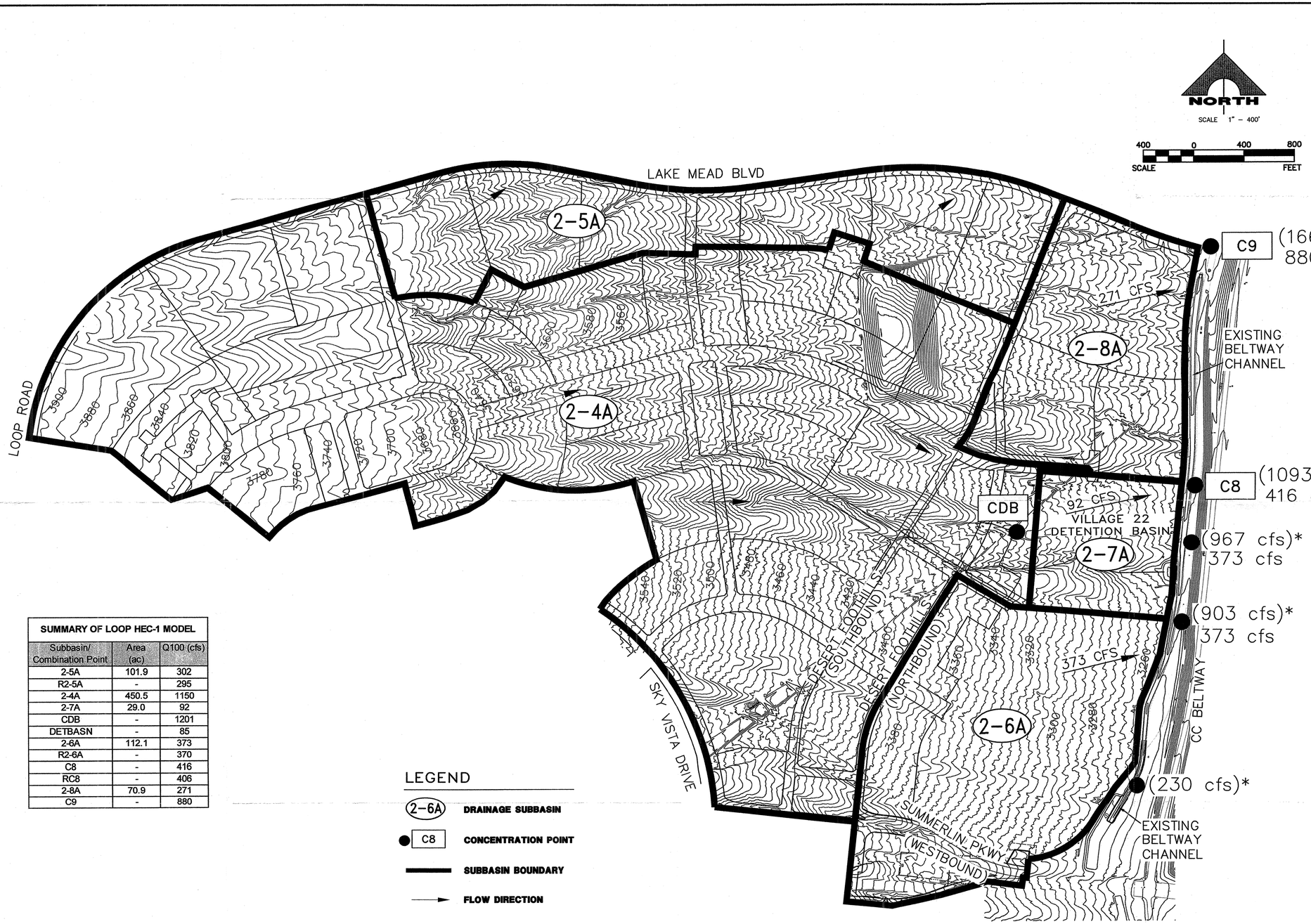
4-1 4-5 4-3 4-2 4-4A 4-6A 4-7A 4-8

3-1B 3-3C 3-1A 3-3A 3-2A 3-3B 3-4A 3-5A 3-6A

5-1 5-3 5-4A 5-5A 5-2A 5-6A 5-8A 5-10AR 5-10A 5-9A

11B-1 11B-2 11A-1 11A-2 11A-3 8B-1 8B-2 8A 3B-2A 3B-2B 3B-1 3A 3C 57BA 57B-3 57B-4 57B-2 57B-1 38B 38A 12A 12B 19A 13B-1 13B-2 13A-1 13A-2 6-1 6-2 PIC-A PIC-B PIC-C

APSD0059 APSD0060 APSD0061 APSD0062 APSD0063 APSD0064 APSD0065 APSD0066 APSD0067 APSD0068 APSD0069 APSD0070 APSD0071 APSD0072 APSD0073 APSD0074 APSD0075 APSD0076 APSD0077 APSD0078 APSD0079 APSD0080 APSD0081 APSD0082 APSD0083 APSD0084 APSD0085 APSD0086 APSD0087 APSD0088 APSD0089 APSD0090 APSD0091 APSD0092 APSD0093 APSD0094 APSD0095 APSD0096 APSD0097 APSD0098



SUMMARY OF LOOP HEC-1 MODEL		
Subbasin/ Combination Point	Area (ac)	Q100 (cfs)
2-5A	101.9	302
R2-5A	-	295
2-4A	450.5	1150
2-7A	29.0	92
CDB	-	1201
DETBASN	-	85
2-6A	112.1	373
R2-6A	-	370
C8	-	416
RC8	-	406
2-8A	70.9	271
C9	-	880

LEGEND

- (2-6A) DRAINAGE SUBBASIN
- ● C8 CONCENTRATION POINT
- SUBBASIN BOUNDARY
- FLOW DIRECTION
- (903 cfs)* REFERENCED FLOW FROM THE GCW WESTERN BELTWAY STUDY (REFERENCE 11)
- 348 cfs Q100 FLOW FROM HEC-1 MODEL

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
ISSUE EDITOR:
PLOT DATE: 09-28-06
PLOT TIME: 11:07:13

REV. DATE DESCRIPTION DATE AGEN. APP. DATE GCW. APP. DATE:

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD · LAS VEGAS, NV 89146
T: 702.804.2000 · F: 702.804.2299 · GCWALLACE.COM

G:\62A-W04-007\dwg\Hydro\SupRTC\Fig 7R.dwg mlomakema

2006 SUMMERLIN WEST PLANNING AREA
FLOOD CONTROL MASTER PLAN UPDATE

FIGURE 7

PROPOSED CONDITION DRAINAGE BASIN MAP
TRIBUTARY TO THE BELTWAY CHANNEL
(NORTH OF SUMMERLIN PARKWAY)

SHEET
FIG 7R
SHT OF SHTS

Curve Number Calculations

Developed Conditions

Project site consists of soils 112 (HSG "A"), 152 (HSG "D"), 155 (HSG "D"), 191 (HSG "B"), 360 (HSG "D"), 502 (HSG "C") 640 (HSG "D"), 1321 (HSG "D"), 1351 (HSG "D")
Composite curve numbers were calculated.

Area within Loop Road

	DENSITY	LOT	LOT	CN TYPE				
USAGE	(units/acres)	SIZE	VALUE	A	B	C	D	
SF2	6	7260	7000	76	84	89	91	7,000 sq. ft. lots
SF3	10	4356	4000	80	87	90	92	Townhouses/6,000 sq. ft. lots or less
SFA	18	2420	2000	89	92	94	95	COMMERCIAL
MF2	21	2074	2000	89	92	94	95	COMMERCIAL
MF3	21	2074	2000	89	92	94	95	COMMERCIAL
NF	N/A	N/A	N/A	89	92	94	95	COMMERCIAL
COS	N/A	N/A	N/A	68	79	86	89	PARK, POOR CONDITION
COS*	N/A	N/A	N/A	63	77	85	88	UNDISTURBED LAND, POOR CONDITION
COM	N/A	N/A	N/A	89	92	94	95	COMMERCIAL
H-1	N/A	N/A	N/A	89	92	94	95	COMMERCIAL
BLM	N/A	N/A	N/A	63	77	85	88	UNDISTURBED LAND, POOR CONDITION
Property	N/A	N/A	N/A	81	88	91	93	INDUSTRIAL
Golf Course	N/A	N/A	N/A	68	79	86	89	PARK, POOR CONDITION

Notes:
1. Densities of SF2 and SF3 were reduced beyond the Loop Road - see calculations below.
2. NF (Neighborhood Focus) - consists of schools
3. COS (Community Open Space) - consists of manmade parks w/desert and grass landscaping
4. COS* (Community Open Space) - consists of natural terrain, i.e. Red Rock outcrops, preserved waterways
   2002 MPU HEC-1 used Fair Conditions for tributary basins north of Summerlin Pkwy and Poor Conditions for tributary basins south of Summerlin Pkwy
5. H-1 (Limited Resort and Apartment District) - considered high density/commercial
6. BLM (Bureau of Land Management Land) - undisturbed land
7. Undevelopable Property - shown as white on the Land Use Plan and will be reserved for water reservoirs, power substations, undevelopable terrain and U.S. Waters
8. Golf Course - shown as teal on the Land Use Plan and will consist of turf

Area beyond Loop Road

	DENSITY	LOT	LOT	CN TYPE				
USAGE	RANGE	SIZE	VALUE	A	B	C	D	
SF2	4	10890	10000	61	75	83	87	8000 SF LOTS
SF3	8	5445	5000	80	87	90	92	Townhouses/6,000 sq. ft. lots or less

2006 Summerlin West Planning Area Flood Control Master Plan Update
Proposed Condition

Land Use Distribution (Acres)/Curve Number Calculation												
Basin	Total Acres	SF2	SF3	COS (Park and Golf Course)	COS* (undisturbed/ BLM)	SFA, MF2, MF3, NF, COM, H-1	Undevelopable Property	Percent in Soil Group A	Percent in Soil Group B	Percent in Soil Group C	Percent in Soil Group D	Composite CN
Village 26 Offsite/Onsite												
1-1B	111.8	68.0			12.5	2.2	29.1		48.15%		51.85%	84.1
1-2B	137.7	109.5			28.2				0.76%	27.62%	71.62%	86.1
1-3P	40.9					40.9				7.56%	92.44%	94.9
1-11P	136		129.5	3.0	3.5					45.52%	54.48%	90.9
1-12P	116.8		77.8	3.5	35.5					79.43%	20.57%	88.8
1-13P	24	6.0			18.0					23.86%	76.14%	87.0
Tributary to Western Beltway Channel (north of Summerlin Parkway)												
2-4A	450.5	119.1	94.9	49.5		187.0			0.95%	22.95%	76.10%	92.2
2-5A	101.9	39.0	26.0			36.9					100.00%	92.7
2-6A	112.1					112.1				58.19%	41.81%	94.4
2-7A	29			29.0						8.29%	91.71%	88.8
2-8A	70.9			1.9		69.0					100.00%	94.8
Tributary to Detention Basin No. 5/Alta Drive												
3-1A	74.6	34.3		40.3							100.00%	88.1
3-1B	375.3	189.1		115.1	31.1	40.0		6.63%	3.86%		89.51%	86.7
3-2A	168.7	116.6	13.4	3.6		26.6	8.5			0.12%	99.88%	91.8
3-3A	238.3	160.7	58.4	9.0			10.2				100.00%	91.3
3-3B	276.2	40.9	112.2	7.8		115.3				4.65%	95.35%	92.9
3-3C	91.1	59.9	31.2						0.36%	36.90%	62.74%	90.6
3-4A	208.4	44.1	118.3			16.1	29.9				100.00%	92.2
3-5A	193.9	34.0	47.9	8.1		103.9				1.00%	99.00%	93.3
3-6A	84.3		9.0			49.7	25.6			0.60%	99.40%	94.1
4-4A	171.7	52.5		55.4	52.5		11.3				100.00%	88.3
4-6A	545.2	130.1	83.9	100.0	225.8	1.2	4.2	3.07%		2.19%	94.74%	87.9
5-2A	59	8.6		14.1	5.9	30.4					100.00%	91.7
5-4A	142.8	27.1		42.1	56.9		16.7				100.00%	88.7
5-5A	122.4	58.2	15.4	39.5	9.3						100.00%	88.4
5-6A	57	13.2			8.8	35.0					100.00%	92.1
5-7A	282.2	46.2	65.6	42.0	40.1	74.8	13.5				100.00%	91.0
5-8A	347.3	143.5	90.4	38.0	42.0	33.4				1.51%	98.49%	89.4
5-9A	64.7		23.0	41.7						19.52%	80.48%	89.6
5-10A	123.1	63.5	10.3	13.3		36.0				41.07%	58.93%	88.8
Tributary to Red Rock Detention Basin												
7-2A	288.8	179.3	6.5	29.0	46.0	28.0					100.00%	88.2
7-2B	60.4				60.4						100.00%	88.0
7-4A	214.1				214.1						100.00%	88.0
7-5A	190	183.5			6.5						100.00%	87.0
7-7A	51.9	32.3	16.2	3.4							100.00%	88.7

2006 Summerlin West Planning Area Flood Control Master Plan Update
Proposed Condition

Land Use Distribution (Acres)/Curve Number Calculation												
Basin	Total Acres	SF2	SF3	COS (Park and Golf Course)	COS* (undisturbed/ BLM)	SFA, MF2, MF3, NF, COM, H-1	Undevelopable Property	Percent in Soil Group A	Percent in Soil Group B	Percent in Soil Group C	Percent in Soil Group D	Composite CN
Area within Loop Road - Onsite												
21-37	15.2		15.2							11.51%	88.49%	91.8
22-11	11.2					11.2				66.91%	33.09%	94.3
22-12	10.6					10.6				44.46%	55.54%	94.6
22-13A	9.8					9.8				1.83%	98.17%	95.0
22-13B	29			29.0						8.11%	91.89%	88.8
22-13C	85.8					85.8				69.72%	30.28%	94.3
22-14	6.9					6.9				79.70%	20.30%	94.2
22-16	11.0					11.0				71.15%	28.85%	94.3
22-6	17.9					17.9				3.66%	96.34%	95.0
22-7	12.5					12.5				76.63%	23.37%	94.2
22-8	29			29.0						56.82%	43.18%	87.3
25-2	8.3		8.3							38.87%	61.13%	91.2
25-4	7.5		7.5							0.10%	99.90%	92.0
25-5	9.2					9.2				39.04%	60.96%	94.6
25-6	10.4					10.4				47.32%	52.68%	94.5
27-10A	5.6	5.6								83.29%	16.71%	89.3
27-10B	5.7	5.7								4.55%	95.45%	90.9
27-11	9.7		9.7							30.64%	69.36%	91.4
27-12	14.2		14.2							70.85%	29.15%	90.6
27-13	11.4	11.4								0.10%	99.90%	91.0
27-15	17		17.0							71.64%	28.36%	90.6
27-16	9.9		9.9							11.70%	88.30%	91.8
27-17	10.8					10.8				96.83%	3.17%	94.0
28-1	29.8	29.8							14.88%	18.33%	66.79%	89.6
28-10	12.8		12.8							88.74%	11.26%	90.2
28-11	3.6			3.6						60.78%	39.22%	87.2
28-12	14.5					14.5				69.30%	30.70%	94.3
28-13	14.1	14.1								43.93%	56.07%	90.1
28-2	26.9	26.9							1.48%	3.75%	94.77%	90.8
28-3	10.4		10.4							72.60%	27.40%	90.5
28-4	3.6			3.6						100.00%		86.0
28-5	13.9	13.9								6.28%	93.72%	90.9
28-9	8.5	8.5								10.95%	89.05%	90.8

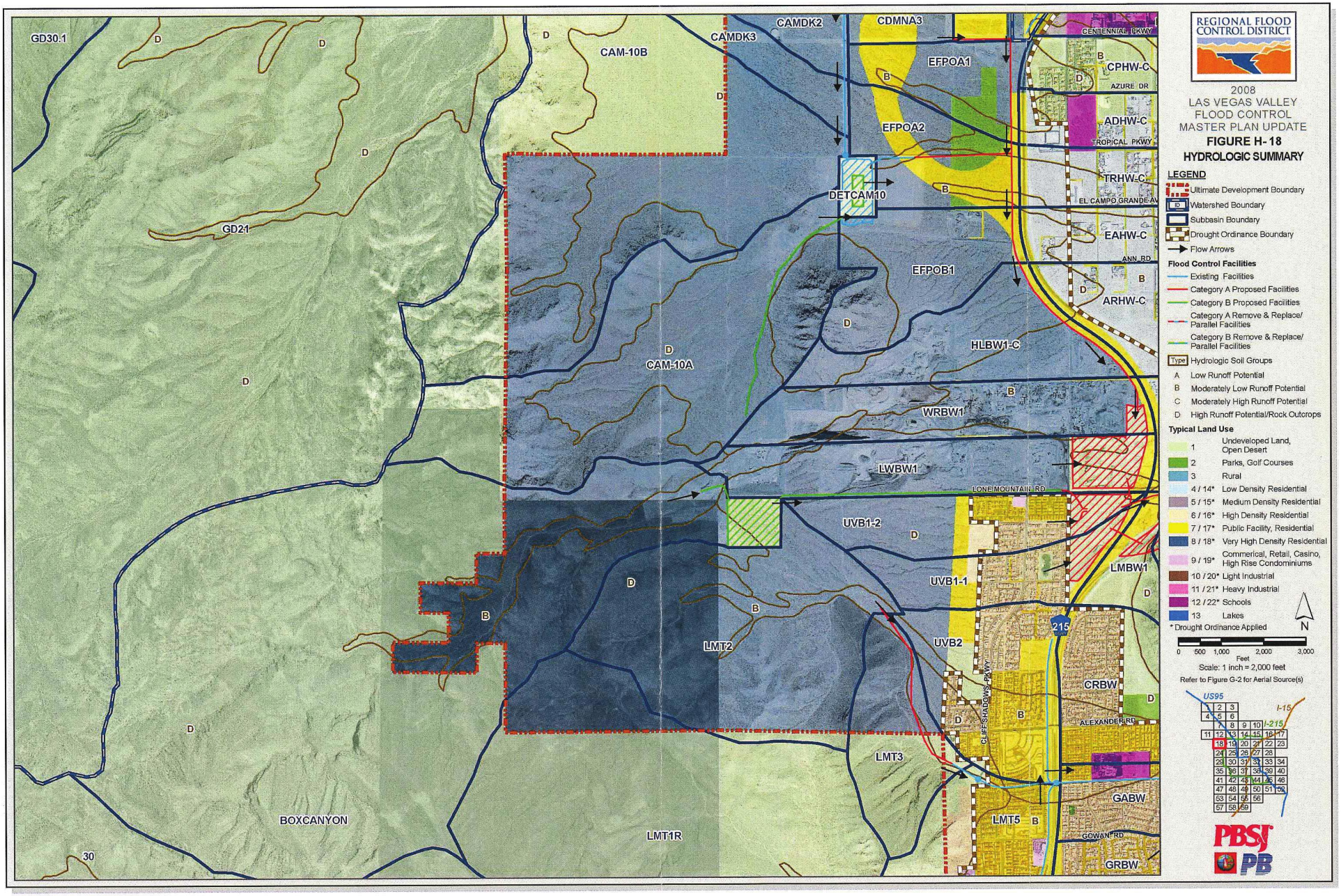
BASIN ID	SOILS	HG	PERCENT
Tributary to Village 26 Offsite/Onsite			
1-1B	191	B	48.15%
1-1B	155	D	51.46%
1-1B	360	D	0.39%
1-2B	191	B	0.76%
1-2B	502	C	27.62%
1-2B	155	D	69.14%
1-2B	360	D	2.48%
1-3P	502	C	7.56%
1-3P	152	D	34.70%
1-3P	155	D	57.74%
1-3	502	C	23.90%
1-3	152	D	26.43%
1-3	155	D	32.47%
1-3	360	D	17.21%
1-11P	502	C	45.52%
1-11P	155	D	3.24%
1-11P	360	D	51.24%
1-11	502	C	44.21%
1-11	360	D	55.79%
1-12P	502	C	79.43%
1-12P	152	D	7.65%
1-12P	360	D	12.91%
1-13P	502	C	23.86%
1-13P	360	D	76.14%
SB2A	502	C	84.20%
SB2A	152	D	1.10%
SB2A	360	D	14.70%
Tributary to Western Beltway Channel (north of Summerlin Parkway)			
2-4A	191	B	0.95%
2-4A	502	C	22.95%
2-4A	152	D	1.36%
2-4A	155	D	74.75%
2-5A	155	D	100.00%
2-6A	502	C	58.19%
2-6A	155	D	41.82%
2-7A	502	C	8.29%
2-7A	152	D	22.78%
2-7A	155	D	68.93%

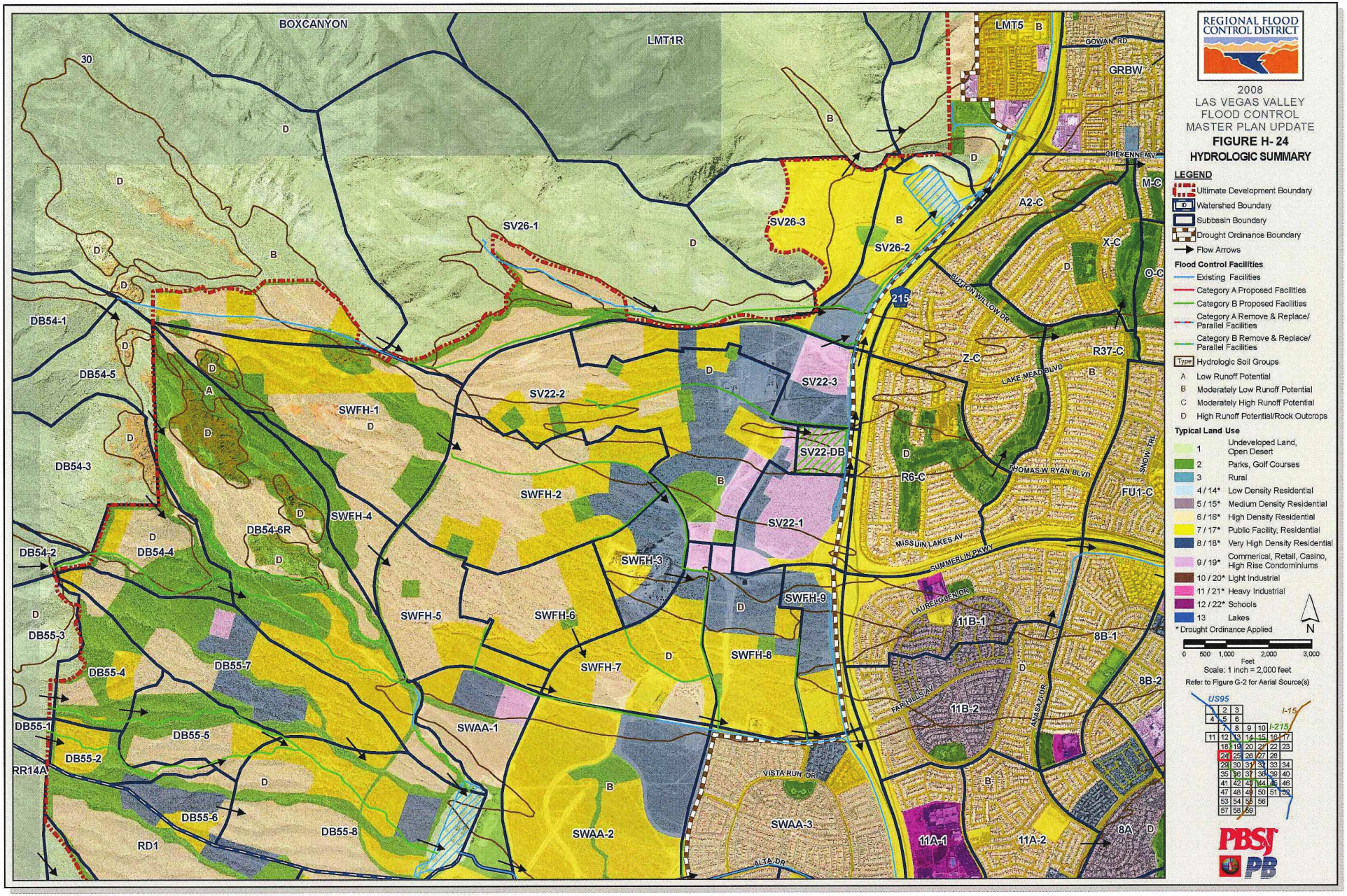
BASIN ID	SOILS	HG	PERCENT
2-8A	152	D	0.02%
2-8A	155	D	99.98%
Tributary to Detention Basin No. 5/Alta Drive			
3-1A	155	D	100.00%
3-1B	112	A	6.63%
3-1B	191	B	3.86%
3-1B	155	D	87.13%
3-1B	640	D	2.37%
3-2A	502	C	0.12%
3-2A	155	D	99.87%
3-3A	155	D	100.00%
3-3B	502	C	4.65%
3-3B	152	D	6.29%
3-3B	155	D	89.06%
3-3C	191	B	0.36%
3-3C	502	C	36.90%
3-3C	155	D	62.74%
3-4A	152	D	100.00%
3-5A	502	C	1.00%
3-5A	152	D	23.95%
3-5A	155	D	75.05%
3-6A	502	C	0.60%
3-6A	152	D	26.84%
3-6A	155	D	72.56%
4-4A	155	D	31.34%
4-4A	360	D	67.41%
4-4A	640	D	1.25%
4-6A	112	A	3.07%
4-6A	502	C	2.19%
4-6A	155	D	74.20%
4-6A	360	D	0.16%
4-6A	640	D	20.38%
5-2A	155	D	100.00%
5-4A	155	D	91.57%
5-4A	360	D	8.43%
5-5A	155	D	100.00%

BASIN ID	SOILS	HG	PERCENT
5-6A	155	D	100.00%
5-7A	155	D	100.00%
5-8A	502	C	1.51%
5-8A	155	D	98.49%
5-9A	502	C	19.52%
5-9A	155	D	80.48%
5-10A	502	C	41.07%
5-10A	155	D	58.93%
Tributary to Red Rock Detention Basin			
7-2A	155	D	100.00%
7-2B	155	D	100.00%
7-4A	155	D	96.66%
7-4A	360	D	3.34%
7-5A	155	D	100.00%
7-7A	155	D	100.00%

ULTIMATE CONDITIONS WEIGHTED CURVE NUMBER CALCULATIONS

AREA	ACRE	BASINID	CN	SOILS	HG	PERCENT	
1140.625324	0.026185154	1-1A	66	112	A	0.00%	0.0
7795.535496	0.17896087	1-1A	66	112	A	0.01%	0.0
3570026.099	81.95652201	1-1A	77	191	B	5.49%	4.2
305821.9839	7.0207067	1-1A	77	191	B	0.47%	0.4
13595755.2	312.1155923	1-1A	86	155	D	20.91%	18.0
495565.9151	11.37662799	1-1A	86	155	D	0.76%	0.7
42945.85068	0.985901072	1-1A	86	155	D	0.07%	0.1
19956.69833	0.458142753	1-1A	86	155	D	0.03%	0.0
45020997.78	1033.539894	1-1A	87	360	D	69.25%	60.2
589112.8052	13.52416908	1-1A	90	640	D	0.91%	0.8
424233.946	9.739071304	1-1A	90	640	D	0.65%	0.6
669690.7874	15.37398502	1-1A	88	1321	D	1.03%	0.9
274193.666	6.294620433	1-1A	88	1351	D	0.42%	0.4
							86.2
938592.5071	21.54711908	1-2A	81	502	C	3.89%	3.1
31693.37558	0.727579788	1-2A	86	155	D	0.13%	0.1
9633.969488	0.221165507	1-2A	86	155	D	0.04%	0.0
204726.5591	4.699875094	1-2A	86	155	D	0.85%	0.7
22955124.46	526.9771456	1-2A	87	360	D	95.09%	82.7
							86.8
89499.3591	2.054622569	1-2C	81	502	C	0.57%	0.5
118057.4089	2.710225182	1-2C	81	502	C	0.75%	0.6
1877796.749	43.10828166	1-2C	81	502	C	11.99%	9.7
15467.30653	0.355080499	1-2C	86	155	D	0.10%	0.1
359721.7261	8.25807452	1-2C	86	155	D	2.30%	2.0
13196910.28	302.9593727	1-2C	87	360	D	84.29%	73.3
							86.2
1383317.086	31.7565906	1-4	87	360	D	100.00%	87.0
994403.6429	22.82836646	1-5	87	360	D	100.00%	87.0
376599.5865	8.64553688	1-6	87	360	D	100.00%	87.0
728954.6812	16.73449681	1-7	87	360	D	100.00%	87.0
38881.712	0.892601286	1-8	87	360	D	100.00%	87.0
225128.2635	5.168233782	1-9	87	360	D	100.00%	87.0
1116101.403	25.62216261	1-10	87	360	D	100.00%	87.0


GD30.1
CAMDK2
CAMDK3
CDMNA3
CAM-10B
EFPOA1
EFPOA2
CENTENNIAL PKWY
CPHW-C
AZURE DR
ADHW-C
TROPICAL PKWY
TRHW-C
EL CAMPO GRANDE AV
DETCAM10
GD21
EAHW-C
ANN RD
EFPOB1
ARHW-C
HLBW1-C
CAM-10A
WRBW1
LWBW1
LONE MOUNTAIN RD
UVB1-2
UVB1-1
LMBW1
215
UVB2
LMT2
CRBW
CLIFF SHADOWS PKWY
ALEXANDER RD
LMT3
GABW
LMT5
GOWAN RD
GRBW
BOXCANYON
LMT1R
30
REGIONAL FLOOD CONTROL DISTRICT
2008
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE
FIGURE H-18
HYDROLOGIC SUMMARY
LEGEND
Ultimate Development Boundary
Watershed Boundary
Subbasin Boundary
Drought Ordinance Boundary
Flow Arrows
Flood Control Facilities
Existing Facilities
Category A Proposed Facilities
Category B Proposed Facilities
Category A Remove & Replace/ Parallel Facilities
Category B Remove & Replace/ Parallel Facilities
Type Hydrologic Soil Groups
A Low Runoff Potential
B Moderately Low Runoff Potential
C Moderately High Runoff Potential
D High Runoff Potential/Rock Outcrops
Typical Land Use
1 Undeveloped Land, Open Desert
2 Parks, Golf Courses
3 Rural
4 / 14* Low Density Residential
5 / 15* Medium Density Residential
6 / 16* High Density Residential
7 / 17* Public Facility, Residential
8 / 18* Very High Density Residential
9 / 19* Commerical, Retail, Casino, High Rise Condominiums
10 / 20* Light Industrial
11 / 21* Heavy Industrial
12 / 22* Schools
13 Lakes
* Drought Ordinance Applied
N
0 500 1,000 2,000 3,000
Feet
Scale: 1 inch = 2,000 feet
Refer to Figure G-2 for Aerial Source(s)
US95
I-15
I-215
PBSJ
PB


BOXCANYON
LMT1R
LMT5
GOWAN RD
GRBW
CHEYENNE AV
30
SV26-1
SV26-3
SV26-2
M-C
A2-C
X-C
O-C
BUFFALO WILLOW DR
215
DB54-1
DB54-5
DB54-3
SV22-2
SV22-3
SWFH-1
SV22-DB
Z-C
R37-C
LAKE MEAD BLVD
SNOW TRL
R6-C
THOMAS W RYAN BLVD
FU1-C
SWFH-2
SWFH-4
DB54-6R
SV22-1
DB54-2
DB54-4
MISSION LAKES AV
SUMMERLIN PKWY
SWFH-3
SWFH-9
LAUREL GLEN DR
11B-1
8B-1
DB55-3
SWFH-5
SWFH-6
SWFH-8
DB55-7
DB55-4
SWFH-7
8B-2
FAIR HILLS AV
AMAZZI DR
11B-2
DB55-1
DB55-5
SWAA-1
DB55-2
RR14A
VISTA RUN DR
SWAA-3
11A-1
11A-2
8A
DB55-6
DB55-8
SWAA-2
RD1
ALTA DR
REGIONAL FLOOD CONTROL DISTRICT
2008
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE
FIGURE H- 24
HYDROLOGIC SUMMARY
LEGEND
Ultimate Development Boundary
Watershed Boundary
Subbasin Boundary
Drought Ordinance Boundary
Flow Arrows
Flood Control Facilities
Existing Facilities
Category A Proposed Facilities
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Type Hydrologic Soil Groups
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8 / 18* Very High Density Residential
9 / 19* Commerical, Retail, Casino, High Rise Condominiums
10 / 20* Light Industrial
11 / 21* Heavy Industrial
12 / 22* Schools
13 Lakes
* Drought Ordinance Applied
N
0 500 1,000 2,000 3,000
Feet
Scale: 1 inch = 2,000 feet
Refer to Figure G-2 for Aerial Source(s)
US95
I-15
I-215
PBS
PB

RESPONSE TO COMMENTS
ON THE
TECHNICAL DRAINAGE STUDY
FOR
SUMMERLIN
LAKE MEAD BOULEVARD
IMPROVEMENTS

62022.204

September 2007

Prepared For:

Howard Hughes Corporation, Inc.
a Delaware Corporation
10000 West Charleston Boulevard, Suite 200
Las Vegas, Nevada 89135
Phone: (702) 791-4300
Fax: (702) 791-4450

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: November 1, 2007
TO: Land Development Services Department of Public Works				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: Summerlin Lake Mead Boulevard Improvements			COPIES TO: G. C. Wallace, Inc.
Cross Streets:	Lake Mead Blvd. & West Beltway Channel			Howard Hughes Corp.
File Number:	F:\Depot\DSMemos\DS4146B.doc			Bart Anderson, P.E., DevCo
Parcel Number:	137-14-501-004 & 137-14-401-002			CCRFCD
Zoning Action:				CCPW
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES	NO	X	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	3/14/2007	4/2/2007	Not Approved	$400.00	64969: $400
2nd Submittal	9/10/2007 & 10/29/2007	10/31/2007	See Comments Below	$400.00	77404: $400
			TOTAL FEES (LDDRS):	$800.00	---

REMARKS:

The Drainage Study for the subject project has been reviewed and:

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Department of Development Services concurrence.

1. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.
2. The site is also adjacent to the ongoing Clark County Beltway project. The engineer must coordinate with *Clark County Public Works Department* and incorporate any concerns for boundary conditions. CCPW concurrence is required prior to final acceptance of the study.
3. The 100-year velocity in the proposed 66"-72" RCP exceeds 25ft/s and does not meet the *Clark County Regional Flood Control District*'s design criteria. Remedial measures must be provided. 2"-sacrificial concrete in the pipes is a viable option. If this is used, provide cross section in the next submittal. Since this will not meet the ASTM standard, submit one set of structural design and calculations to *City of Las Vegas Building & Safety Department* for review and approval prior to the final acceptance of the drainage study.
4. Drawings U1 to U3: In the profiles, show water, sewer and utilities crossings at the 66"-72" RCP to verify proper vertical clearances.

5. Sheet U3: Provide an access road to the Beltway Channel for future maintenance purpose. Coordinate with *Clark County Public Works Department* to resolve the issue.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see http://ndep.nv.gov/bwpc/storm01.htm or call (775) 687-9429.

END OF REMARKS
ays

T/R/S: T20S/R59E/14
AREA K-14

SUMMERLIN

SM

LAKE MEAD BOULEVARD IMPROVEMENT PLAN

FROM STA. 103+61.73 TO STA. 116+67.12

2007

A.P.N. 137-14-501-004
A.P.N. 137-14-401-002

DEVELOPER

The Howard Hughes Corporation SM
an affiliate of General Growth Properties, Inc.

THE HOWARD HUGHES CORPORATION
10000 W. CHARLESTON, SUITE 200
LAS VEGAS, NEVADA 89135
OFFICE PHONE NO. (702) 791-4300
OFFICE FAX NO. (702) 791-4450

ENGINEER

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
OFFICE: (702) 804-2000, FAX: (702) 804-2299
SUMMERLIN OFFICE 10000 CHARLESTON BLVD., STE. 130
OFFICE: (702) 804-2160, FAX: (702) 804-2295

EMBARQ DISCLAIMER

NOTE:
THE AFFIXED EMBARQ APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

EMBARQ _____ REVIEWED BY _____ DATE

APPROVED FOR CONSTRUCTION

_____ DATE
LAS VEGAS VALLEY WATER DISTRICT (LVVWD PROJECT #)

APPROVED FOR CONSTRUCTION

_____ DATE
CITY OF LAS VEGAS FIRE DEPARTMENT

CLV PLANNING DEPARTMENT
THIS PLAN MEETS THE APPLICABLE STANDARDS IF THE PLANNING AND DEVELOPMENT DEPARTMENT

_____ DATE
M. MARGO WHEELER, AICP, CURRENT PLANNING MANAGER

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

_____ _____
DERICK YORO R.P.E. 16396 DATE

THE HOWARD HUGHES CORPORATION,
a Delaware corporation

By: _____ _____
KEVIN ORROCK DATE

Title: EXECUTIVE VICE PRESIDENT

NEVADA POWER COMPANY DISCLAIMER

NOTE:
EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS.

CALL BEFORE YOU DIG: 1(800)227-2600

NEVADA POWER Co. _____ REVIEWED BY _____ DATE

"APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHTS-OF-WAY AND / OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND / OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER DEVIATIONS FROM STANDARD. THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN DEVIATIONS FROM STANDARDS IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA."

This grading plan is a part of drainage study # 1442 which was received on 9/10/07 and revised on 1/1/08. Page 4 of #14.

_____ _____
JORGE CERVANTES, P.E. DATE
CITY ENGINEER
CITY OF LAS VEGAS

CLV DRAWING NO. _____

DESIGN: _____
DRAWN: _____
CHECK: DY
ISSUE DATE: _____
ISSUE BY: _____
PLOT DATE: 09-27-07
PLOT TIME: 07:43:40

REV	DATE	DESCRIPTION	DATE	ASSOC. APP	DATE	ECM. APP	DATE

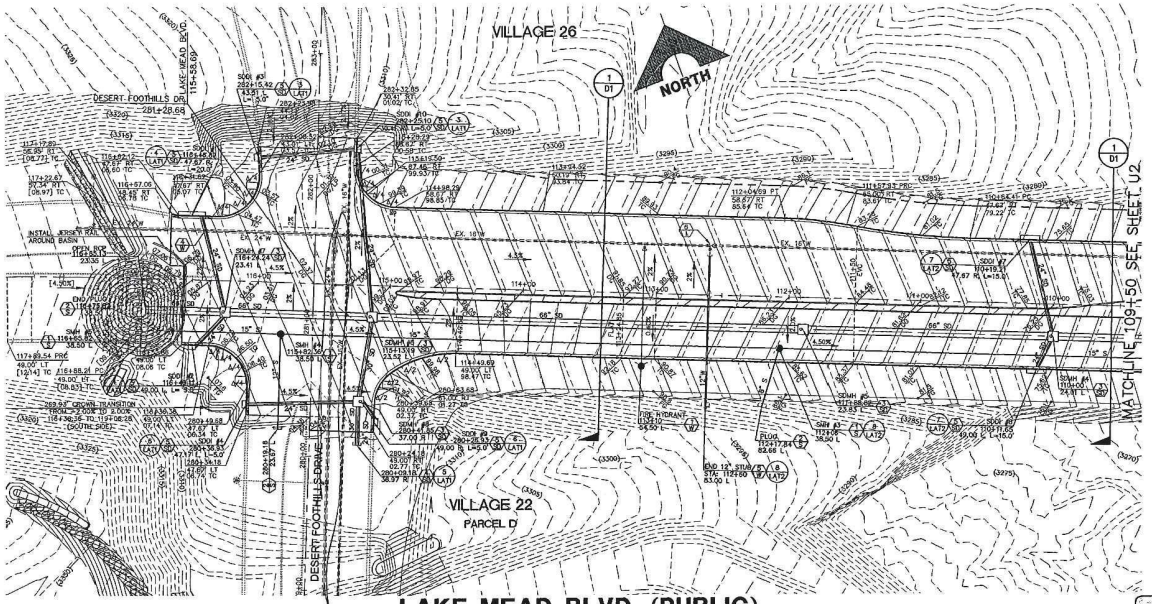
G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD - LAS VEGAS, NV 89146
TEL 702.804.2000 - FAX 702.804.2299 - GCWALLACE.COM

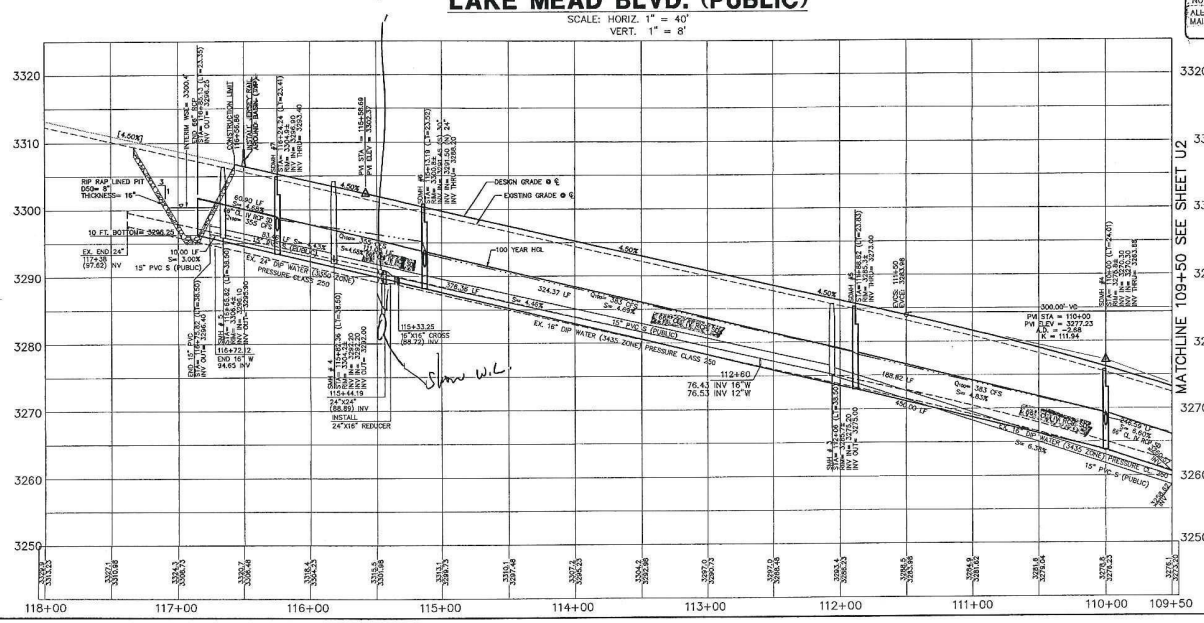
\\S2022\204\Dwg\Land\Improve\LK204ck01-C01.dwg plotter

SUMMERLIN
LAKE MEAD IMPROVEMENT PLAN
COVER SHEET

DRAWING
C1
1 OF 17 SHTS

JOB NO. 62022.204





NOTE:
ALL TEMPORARY BERMS/ CHANNELS TO BE PRIVATELY MAINTAINED BY HOWARD HUGHES CORPORATION.

SCALE: 40 0 40 80 FEET

CONSTRUCTION NOTES

WATER

1. INSTALL FIRE HYDRANT ASSEMBLY (7 / U05)
2. INSTALL 12" GATE VALVE & BOX W/ 1' RADIUS CONCRETE COLLAR (8 / U05, 1 / U05)
3. INSTALL 8" GATE VALVE & BOX W/ 1' RADIUS CONCRETE COLLAR (8 / U05, 1 / U05)
4. REMOVE CAP & CONNECT TO EXISTING WATER LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING WATER LINE) (4A / U15) (NOTE 1 ONLY)
5. INSTALL CAP W/ 2" BLOW-OFF ASSEMBLY (4A / U05)
6. INSTALL 12"X8" TEE
7. INSTALL 12"X90° BEND
8. INSTALL 1 1/2" IRRIGATION METER WITH 1 1/2" RPPA (11A / U05)

CONSTRUCTION NOTES

SEWER

1. INSTALL 48" DIA. SEWER MANHOLE (201 / 20)
2. INSTALL TEMPORARY PLUG AND CAP
3. REMOVE PLUG & CONNECT TO EX. SEWER LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING SEWER LINE) PRIOR TO CONSTRUCTION
4. INSTALL 60" DIA. DEEP SEWER MANHOLE (201-B / 20)

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL TYPE I STORM DRAIN MANHOLE (100 / 100)
2. INSTALL TYPE II STORM DRAIN MANHOLE (100 / 100)
3. INSTALL TYPE IV STORM DRAIN MANHOLE (4A / 100)
4. INSTALL TEMPORARY PLUG AND CAP
5. INSTALL MODIFIED TYPE "CM" DROP INLET (1 / 02, 4 / 02)
6. INSTALL JUNCTION STRUCTURE (1 / 01)
7. NOT USED
8. CONNECT TO EXISTING STORM DRAIN LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING STORM DRAIN LINE)

BENCHMARK

BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
GLVD-34356	NDOT BRASS CAP, 50 FEET NORTH OF STATION 787+13.42 OF CHARLESTON BOULEVARD.	3209.81 (FEET)	978.351 (METERS)

NOTE

THIS SET OF DRAWINGS IS BASED UPON NAVD 88 DATUM. PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUM. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS.

BASIS OF BEARINGS

NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA

CONTRACTOR NOTE:

ALL EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND RELOCATE THESE UTILITIES AS NECESSARY. NO REPRESENTATION IS MADE THAT ALL UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO LIABILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS.

Avoid cutting underground utility lines. It's costly.
Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE ALERT (USA)

Avoid hitting underground traffic signal system and underground system conduits. It's costly.
Call before you UnderGround.
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-229-6611
LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

Avoid hitting overhead power lines. It's costly.
CALL BEFORE YOU DIG OVERHEAD
CALL 1-702-227-2600

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY FOR [illegible] WHICH WAS APPROVED ON THIS PROJECT.

DERICK D. [illegible] DATE

This grading plan is a [illegible] drainage study [illegible] and was approved on DATE 11/1/07. Page 8 of 13.

CLV DRAWING NO. [illegible]

STATE OF NEVADA — DERICK D. TODD — No. 16368 — REGISTERED PROFESSIONAL ENGINEER — DATE: 9/1/07

DESIGN:	
DRAWN:	
CHECKED:	
ISSUE DATE:	
ISSUE EDITOR:	
PLOT DATE:	09-07-07

NO.	DESCRIPTION	BY	DATE

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
2030 SOUTH GREEN VALLEY PARKWAY, SUITE 440
LAS VEGAS, NEVADA 89052 P: (702) 364-1339 F: (702) 364-1331 GCWALLACE.COM

SUMMERLIN
LAKE MEAD IMPROVEMENT PLAN
LAKE MEAD BOULEVARD
PLAN AND PROFILE - STA. 109+50 TO STA. 117+50

DRAWING U1
8 OF 17 SHTS

JOB NO. 62022.204

CONSTRUCTION NOTES

SEWER

1. INSTALL 48" DIA. SEWER MANHOLE (201-48/SDMH)
2. INSTALL TEMPORARY PLUG AND CAP
3. REMOVE PLUG & CONNECT TO EX. SEWER LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING SEWER LINE) PRIOR TO CONSTRUCTION
4. INSTALL 60" DIA. DEEP SEWER MANHOLE (201-60/SDMH, 4/SD)

CONSTRUCTION NOTES

WATER

1. INSTALL FIRE HYDRANT ASSEMBLY (7/SD5)
2. INSTALL 12" GATE VALVE & BOX W/ 1' RADIUS CONCRETE COLLAR (8/SD5, 3/SD5)
3. INSTALL 8" GATE VALVE & BOX W/ 1' RADIUS CONCRETE COLLAR (8/SD5, 3/SD5)
4. REMOVE CAP & CONNECT TO EXISTING WATER LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING WATER LINE) (4A/SD5) (NOTE 1 ONLY)
5. INSTALL CAP W/ 2" BLOW-OFF ASSEMBLY (8A/SD5)
6. INSTALL 12"X8" TEE
7. INSTALL 12"X90° BEND
8. INSTALL 1 1/2" IRRIGATION METER WITH 1 1/2" RPPA (11A/SD5)

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL TYPE I STORM DRAIN MANHOLE (403/SD5)
2. INSTALL TYPE II STORM DRAIN MANHOLE (402/SD5)
3. INSTALL TYPE IV STORM DRAIN MANHOLE (4A/SD5)
4. INSTALL TEMPORARY PLUG AND CAP
5. INSTALL MODIFIED TYPE "CM" DROP INLET (1/SD2, 2/SD2)
6. INSTALL JUNCTION STRUCTURE (1/SD1)
7. NOT USED
8. CONNECT TO EXISTING STORM DRAIN LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING STORM DRAIN LINE)

BENCHMARK

BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
BLV09-34SSE6	NDOT BRASS CAP, 50 FEET NORTH OF STATION 787+18.42 OF CHARLESTON BOULEVARD.	3209.81 (FEET)	978.351 (METERS)

NOTE

THIS SET OF DRAWINGS IS BASED UPON NAVD 88 DATUM. PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUM. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS.

BASIS OF BEARINGS

NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA

CONTRACTOR NOTE:

ALL EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION AND RELOCATE THESE UTILITIES AS NECESSARY. NO REPRESENTATION IS MADE THAT ALL UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO LIABILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS.

Avoid cutting underground utility lines. It's costly. Call before you Dig. 1-800-227-2600 (NEVADA ONE CALL)

Avoid hitting underground traffic signal system and streetlight system conduits. It's costly. Call before you UnderGround. 1-702-455-7511 CLARK COUNTY TRAFFIC OPERATIONS AND 1-702-229-6611 LAS VEGAS AREA COMPUTERIZED TRAFFIC SYSTEM

Avoid hitting overhead power lines. It's costly. CALL BEFORE YOU DIG OVERHEAD CALL 1-702-227-2929

NOTE:
1. ALL TEMPORARY BERMS, CHANNELS TO BE PRIVATELY MAINTAINED BY HOWARD HUGHES CORPORATION.

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS#4160 FOR TRACT MAP 5396 WHICH WAS RECEIVED ON 9/10/07 AND REVIEWED ON 11/1/07.

DERICK O.J. YORO, P.E. #14396 — 11/1/07

part of drainage study

Page ___ OF ___

STATE OF NEVADA — DERICK O.J. YORO — No. 14396 — PROFESSIONAL ENGINEER — 9/11/07

DATE	DESCRIPTION
9/11/07	DATE:
	DATE LAYOUT SENT:
	DATE SENT:
	REV. DATE

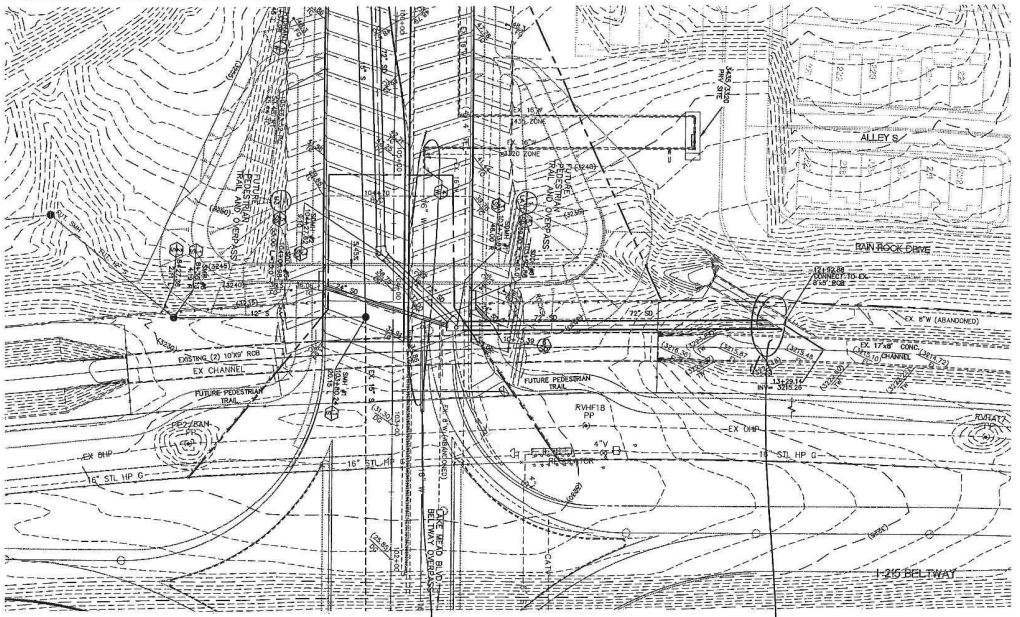
DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
SCALE:
PLOT DATE: 09-07-07
PLOT TIME: 09:15:54

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
2035 S. RAINBOW BOULEVARD • LAS VEGAS, NV 89146
T 702.804.3300 • F 702.804.3299 • GCWALLACE.COM

SUMMERLIN
LAKE MEAD IMPROVEMENT PLAN
LAKE MEAD BOULEVARD
PLAN AND PROFILE STA. 100+00 TO STA. 109+50

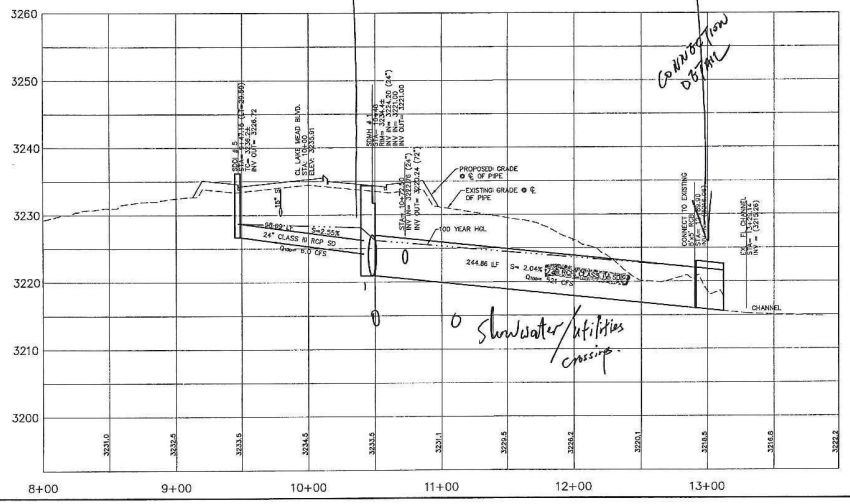
DRAWING U2
9 OF 17 SHTS

JOB NO. 62022.204

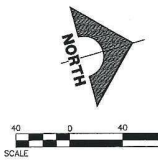


LAKE MEAD BLVD- OFFSITE STORM DRAIN

SCALE: HORIZ. 1" = 40'
VERT. 1" = 8'



NOTE:
ALL TEMPORARY BERMS, CHANNELS TO BE PRIVATELY MAINTAINED BY HOWARD HUGHES CORPORATION.



CONSTRUCTION NOTES

WATER

1. INSTALL FIRE HYDRANT ASSEMBLY (12/U05)
2. INSTALL 12" GATE VALVE & BOX W/ 1' RADIUS CONCRETE COLLAR (8/U05 & 7/U05)
3. INSTALL 8" GATE VALVE & BOX W/ 1' RADIUS CONCRETE COLLAR (7/U05 & 7/U05)
4. REMOVE CAP & CONNECT TO EXISTING WATER LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING WATER LINE) (4A/U05) (NOTE 1 ONLY)
5. INSTALL CAP W/ 2" BLOW-OFF ASSEMBLY (4A/U05)
6. INSTALL 12"X8" TEE
7. INSTALL 12"X90° BEND
8. INSTALL 1 1/2" IRRIGATION METER WITH 1 1/2" RPPA (11A/U06)

CONSTRUCTION NOTES

SEWER

1. INSTALL 48" DIA. SEWER MANHOLE (501-B/R06)
2. INSTALL TEMPORARY PLUG AND CAP
3. REMOVE PLUG & CONNECT TO EX. SEWER LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING SEWER LINE) PRIOR TO CONSTRUCTION
4. INSTALL 60" DIA. DEEP SEWER MANHOLE (501-B/R06 & 4/R06)

CONSTRUCTION NOTES

STORM DRAIN

1. INSTALL TYPE I STORM DRAIN MANHOLE (403/U05)
2. INSTALL TYPE II STORM DRAIN MANHOLE (404/U05)
3. INSTALL TYPE IV STORM DRAIN MANHOLE (4.7/R07)
4. INSTALL TEMPORARY PLUG AND CAP
5. INSTALL MODIFIED TYPE "CM" DROP INLET (1/101 & 1/102)
6. INSTALL JUNCTION STRUCTURE (4/101)
7. NOT USED
8. CONNECT TO EXISTING STORM DRAIN LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING STORM DRAIN LINE)

NOTE

THIS SET OF DRAWINGS IS BASED UPON NAVD 88 DATUM. PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUM. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS.

BASIS OF BEARINGS

NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA

BENCHMARK

CLV BM NO.	DESC.	NAVD 88 DATUM (FEET)	NAVD 88 DATUM (METERS)
D368 3	U.S.C.& G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)	989.559 (METERS)

Avoid cutting underground utility lines. It's costly.
Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE ALERT (USA)

AVOID HITTING OVERHEAD POWER LINES. IT'S DEADLY.
CALL BEFORE YOU DO OVERHEAD
CALL 1-702-593-8111

DRAINAGE CERTIFICATION

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY DS4146A DATED 4/16/07 FOR THE GTR-01 USA QUAD, FOR THIS PROJECT.

DERRICK D.J. YORO, PE NO. 16308 DATE

This grading plan is a # 4146 which was received on 9/10/07 and reviewed on 11/16/07 by Miller. Page 1 of 4

G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
2330 S. RAINBOW BOULEVARD - LAS VEGAS, NV 89146
T: 702.804.3000 F: 702.804.3299 GCWALLACE.COM

DESIGN:
DRAWN:
CHECK:
ISSUE DATE:
SCALE: 1:40
PLOT DATE: 09-07-07
PLOT TIME: 08:13:13
I:\62022\204\Dwg\Land\Mmmm\U3-204x510-U03.dwg
sander

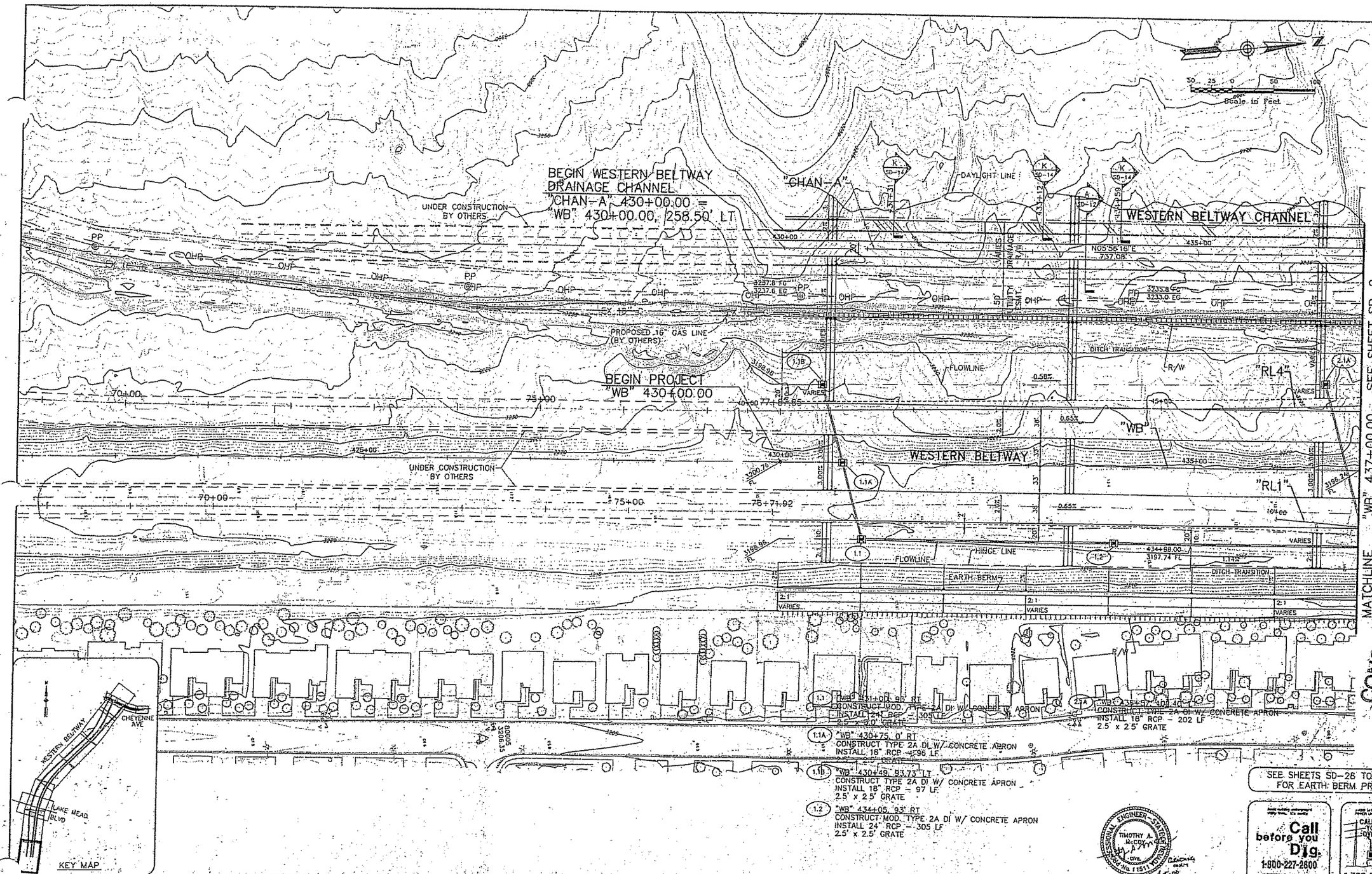
NO.	DESCRIPTION	DATE	APP.	DATE
1	ADDED PARCEL	4/16/07	DOK	4/16/07

SUMMERLIN
LAKE MEAD IMPROVEMENT PLAN
LAKE MEAD BLVD.- STORM DRAIN OFFSITE
PLAN AND PROFILE

DRAWING
U3
10 OF 17 SHTS

JOB NO. 62022.204

Technical Drainage Study for Western Segment Las Vegas Beltway from Summerlin Parkway to Cheyenne Avenue



REV. NO.	DATE	DESCRIPTION	APPROVED

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE

GRADING & DRAINAGE PLAN

"WB" 430+00 TO "WB" 437+00

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

CONSTRUCTION ISSUE

TIMOTHY A. McCOY — Professional Engineer — State of Nevada — No. 11511 — 4-5-00

RANDALL R. GREENWICH — Professional Engineer — State of Nevada — No. 8312 — 4/5/00

PROJECT No: 500.840 DRAWN BY: FJG
DESIGNED BY: FJG CHECKED BY: TAM
APPROVED BY RKG

G.C. WALLACE, INC. Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

SCALE: HORIZ: AS SHOWN VERT: AS SHOWN
FIELD BOOK
L-1614
DRAWING NO. SD-1
SHT. 43 OF 119

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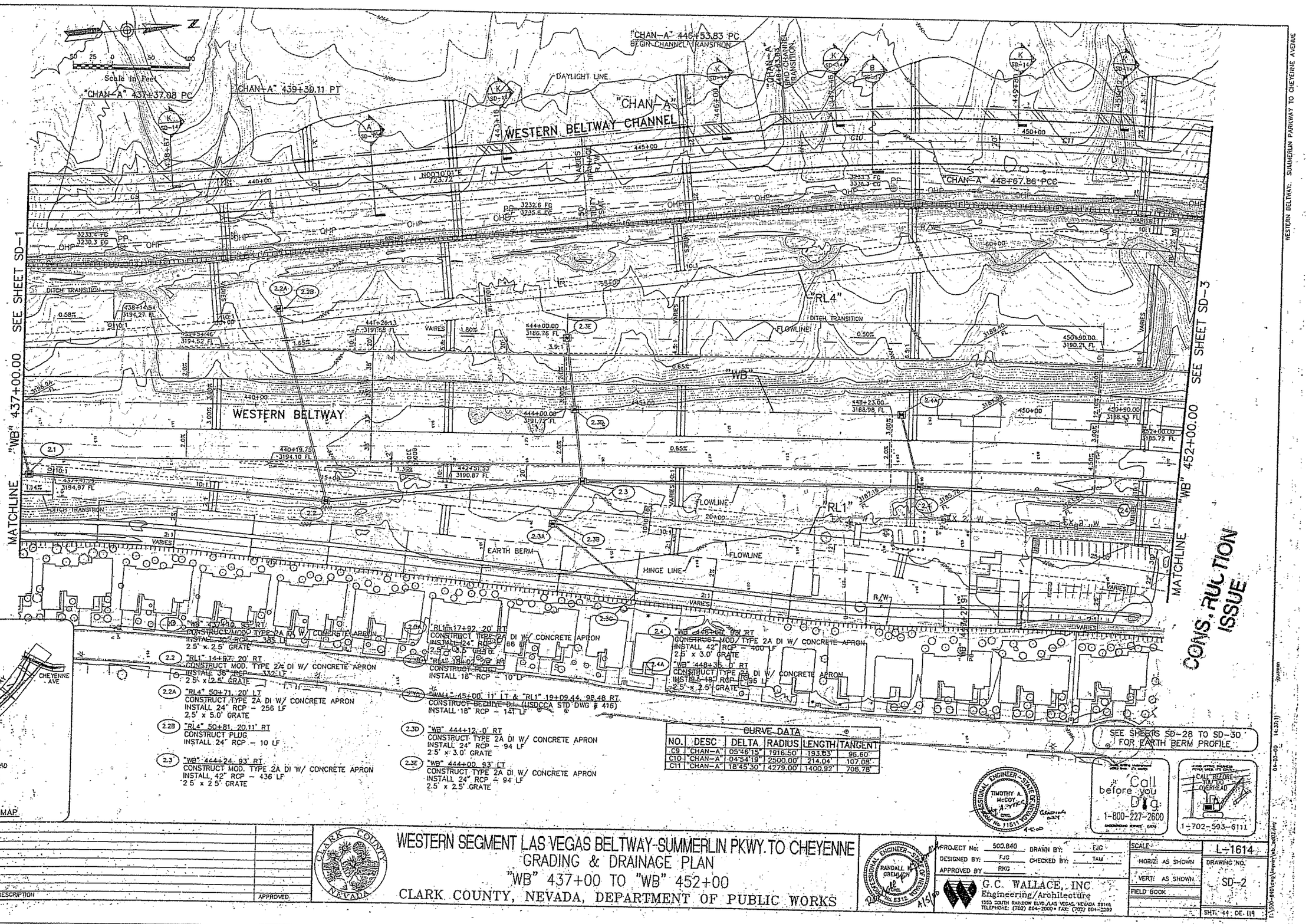

REV. NO. | DATE | DESCRIPTION | APPROVED

CLARK COUNTY NEVADA

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY. TO CHEYENNE
GRADING & DRAINAGE PLAN
"WB" 437+00 TO "WB" 452+00
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

TIMOTHY A. McCOY PROFESSIONAL ENGINEER STATE OF NEVADA No. 11511

RANDALL GREMMER PROFESSIONAL ENGINEER STATE OF NEVADA No. 8312

PROJECT No: 500.840 DRAWN BY: FJC
DESIGNED BY: FJC CHECKED BY: TAM
APPROVED BY: RKG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD.,LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2099

SCALE
HORIZ: AS SHOWN
VERT: AS SHOWN
FIELD BOOK

L-1614
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SHT. 44 OF 119

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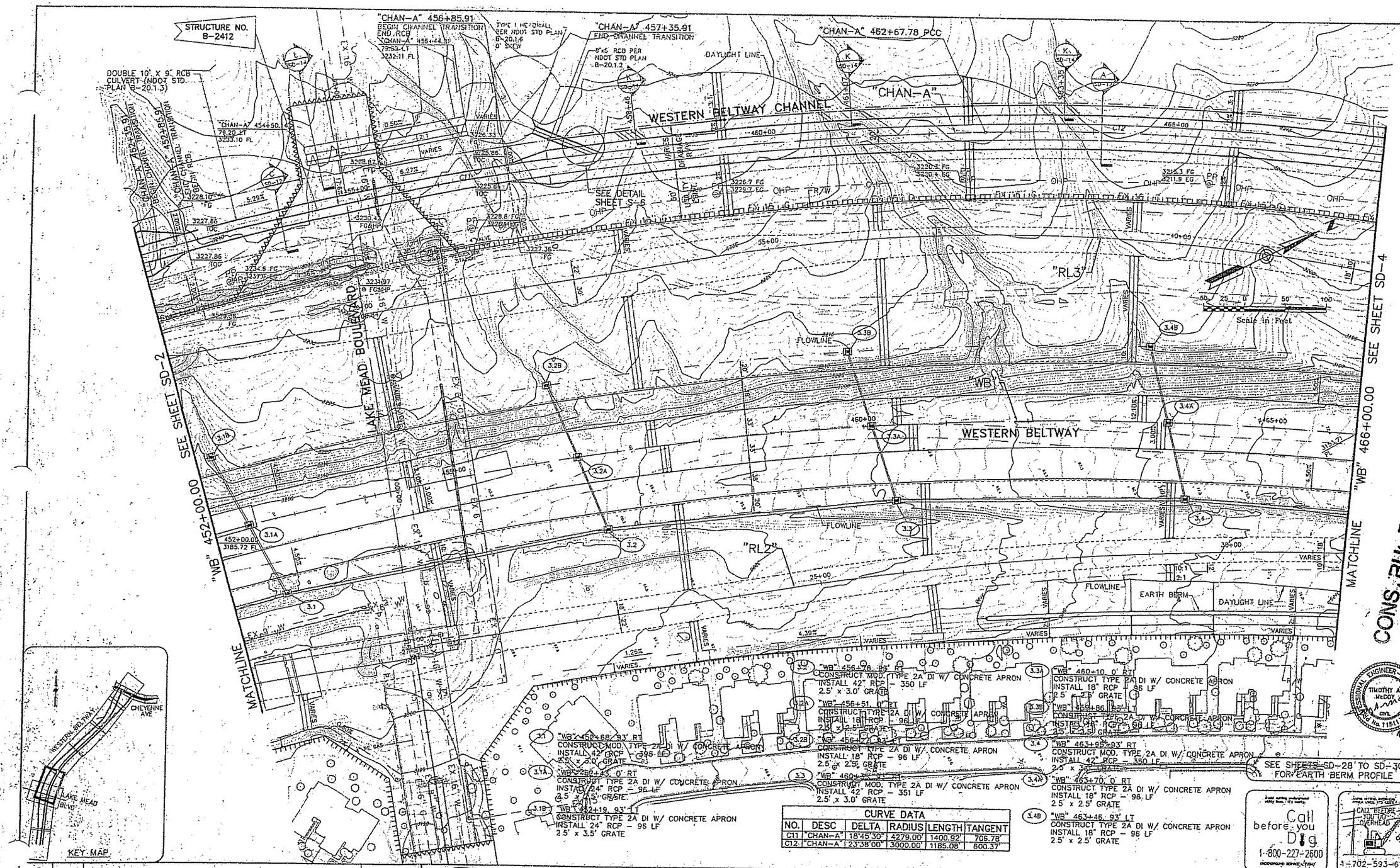

REV. NO. | DATE | DESCRIPTION | APPROVED

CLARK COUNTY NEVADA

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
GRADING & DRAINAGE PLAN
"WB" 452+00 TO "WB" 466+00
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

RANDALL R. GRENLUN — No. 8312 — 4/15/08

PROJECT No: 500.840 | DRAWN BY: FJG
DESIGNED BY: FJG | CHECKED BY: TAM
APPROVED BY: RKG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

SCALE | HORIZ: AS SHOWN | VERT: AS SHOWN | FIELD BOOK
L-1614
DRAWING NO. SD-3
SHT: 45 OF 116

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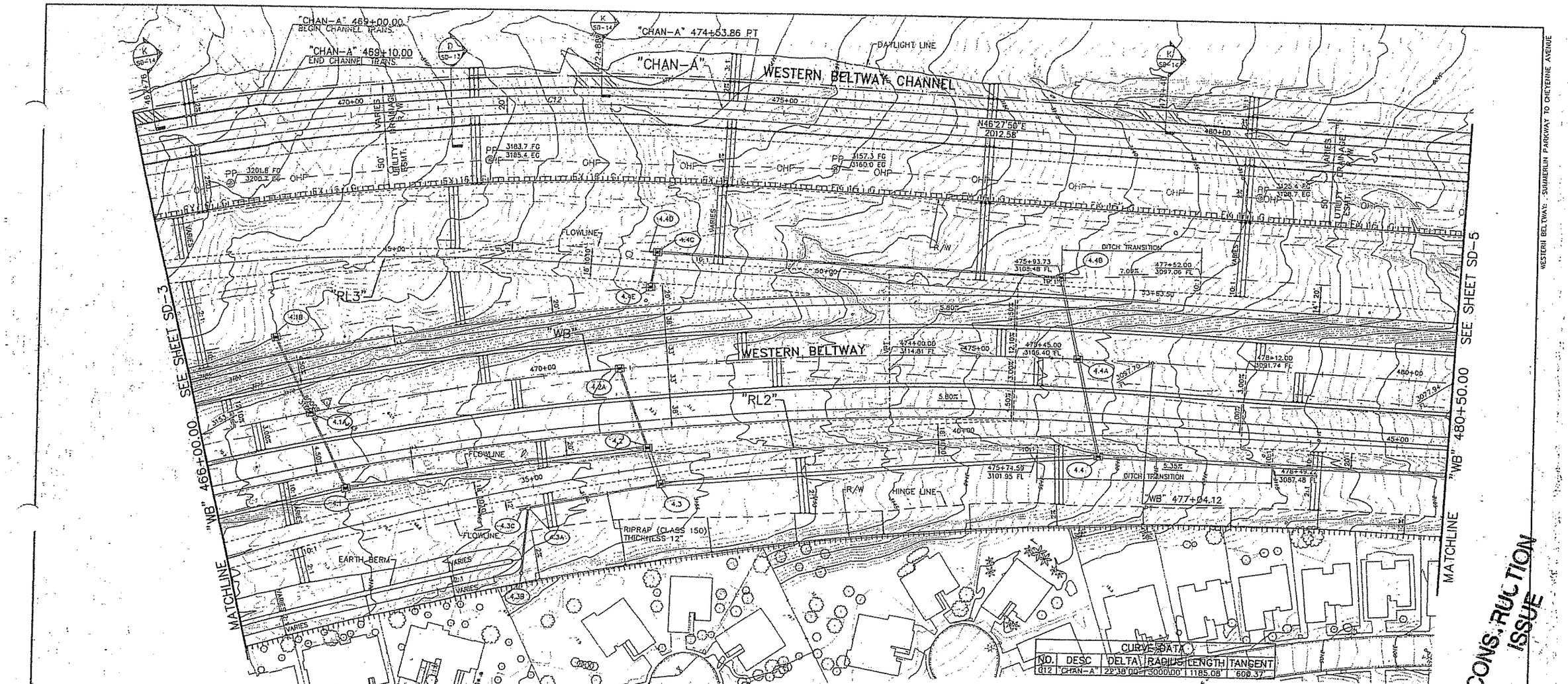


(4.1) "WB" 466+54, 93' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP – 350 LF
2.5' x 3.0' GRATE

(4.1A) "WB" 467+29, 0' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 96 LF
2.5' x 2.5' GRATE

(4.1B) "WB" 467+05, 93' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 96 LF
2.5' x 2.5' GRATE

(4.2) "WB" 471+13, 93' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP – 44 LF
2.5' x 3.0' GRATE

(4.2A) "WB" 470+88, 0' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 96 LF
2.5' x 2.5' GRATE

(4.3) "RL2" 36+46, 20' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP – 506 LF
2.5' x 4.5' GRATE

(4.3A) "RL2" 34+90, 23' RT
CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD DWG #403)
INSTALL 18" RCP – 155 LF
2.5' x 2.5' GRATE

(4.3B) "WALL" 68+75, 11' LT & "RL2" 34+68.75, 95.48' RT
CONSTRUCT BEEHIVE D.I. (USDCCA STD DWG # 416)
INSTALL 18" RCP – 75 LF

(4.3C) "RL2" 34+79.94, 23.32' RT
CONSTRUCT PLUG
INSTALL 18" RCP – 10 LF

(4.4) "WB" 476+48, 110.74' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP – 492 LF
2.5' x 3.5' GRATE

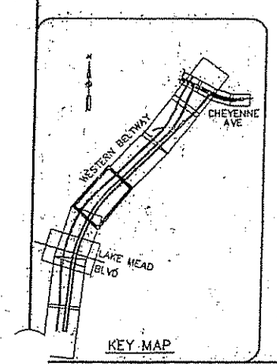
(4.4A) "WB" 476+18, 0' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 30" RCP – 115 LF
2.5' x 2.5' GRATE

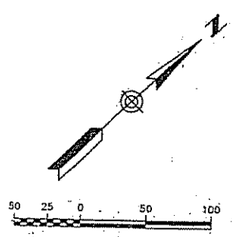
(4.4B) "WB" 475+94, 94.58' LT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 30" RCP – 98 LF
2.5' x 3.5' GRATE

(4.4C) "RL3" 48+03, 20' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 24" RCP – 468 LF
2.5' x 5.0' GRATE

(4.4D) "RL3" 47+93, 19.84' LT
CONSTRUCT PLUG
INSTALL 18" RCP – 10 LF
2.5' x 2.5' GRATE

(4.4E) "WB" 471+30, 93' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 43 LF
2.5' x 2.5' GRATE





SEE SHEETS SD-28 TO SD-30
FOR EARTH BERM PROFILE

Call before you Dig 1-800-227-2600

CALL BEFORE YOU DIG OVERHEAD 1-702-593-6111

CONSTRUCTION ISSUE

TIMOTHY A. McCOY NEVADA No. 11511 PROFESSIONAL ENGINEER STATE OF NEVADA

WESTERN BELTWAY - SUMMERLIN PARKWAY TO CHEYENNE AVENUE

REV. NO.	DATE	DESCRIPTION	APPROVED

CLARK COUNTY NEVADA

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
GRADING & DRAINAGE PLAN
"WB" 466+00 TO "WB" 480+50
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

RANDALL J. GREMLEY NEVADA No. 8312 PROFESSIONAL ENGINEER STATE OF NEVADA 4/15/10

PROJECT No: 500.840 DRAWN BY: FJC
DESIGNED BY: FJC CHECKED BY: TAH
APPROVED BY RKG

G.C. WALLACE, INC
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE (702) 804-2000 FAX (702) 804-2299

SCALE
HORIZ: AS SHOWN
VERT: AS SHOWN
FIELD BOOK

L-1614
DRAWING NO.
SD-4
SHT. 45 OF 114

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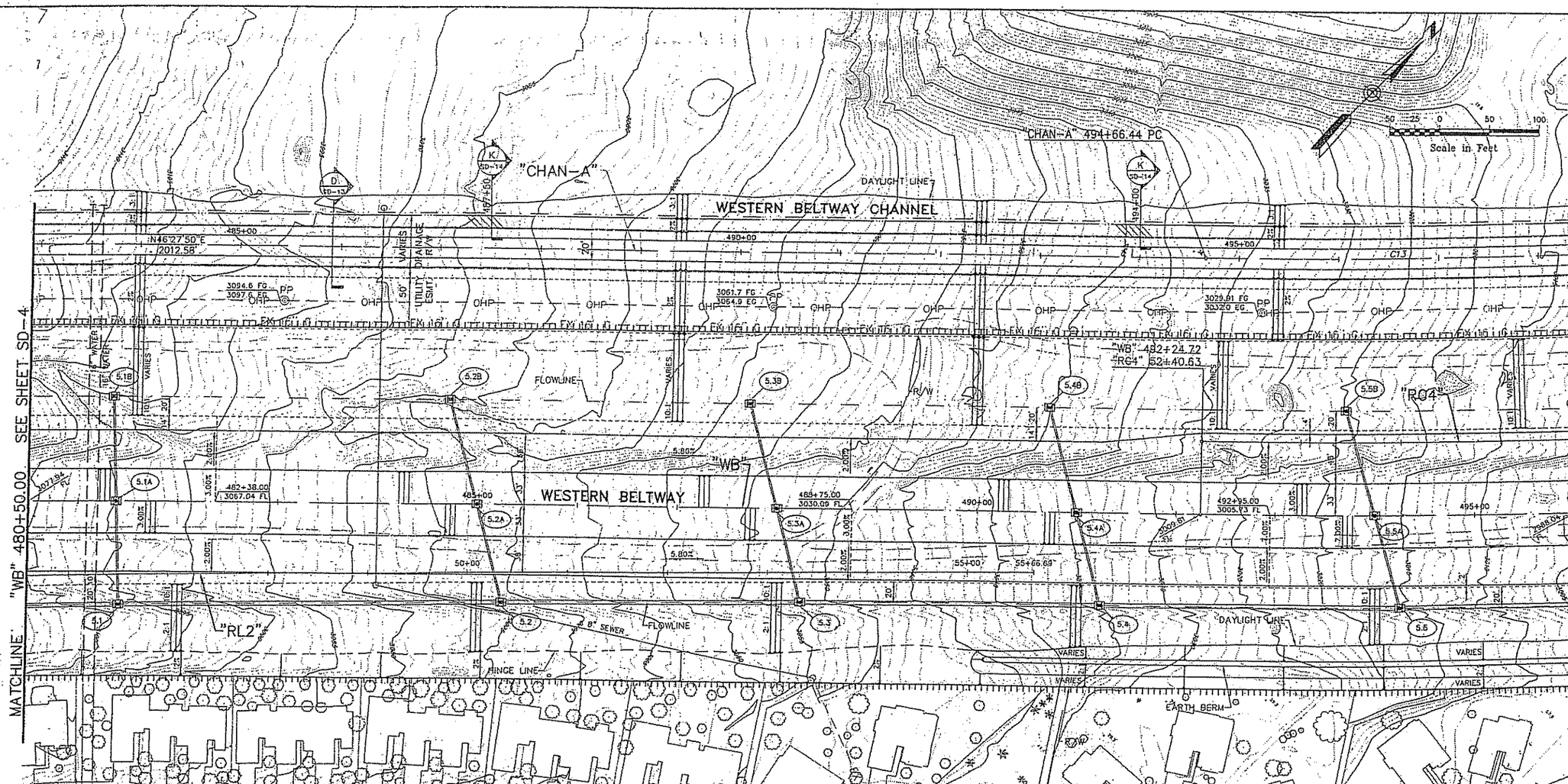
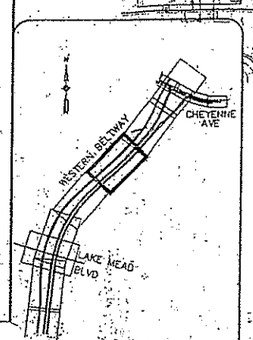




KEY MAP

5.1 "WB" 481+42, 104.10' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP – 384 LF
2.5' x 3.0' GRATE

5.1A "WB" 481+38, 0' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 104 LF
2.5' x 2.5' GRATE

5.1B "WB" 481+34, 105' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 105 LF
2.5' x 2.5' GRATE

5.2 "WB" 485+26, 98.61' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP – 299 LF
2.5' x 3.0' GRATE

5.2A "WB" 485+00, 0' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 102 LF
2.5' x 2.5' GRATE

5.3 "WB" 484+71, 105' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 109 LF
2.5' x 2.5' GRATE

5.3 "WB" 488+25, 94.34' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP – 300 LF
2.5' x 2.5' GRATE

5.3A "WB" 488+00, 0' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 98 LF
2.5' x 2.5' GRATE

5.3B "WB" 487+71, 105' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 109 LF
2.5' x 2.5' GRATE

5.4 "WB" 491+25, 93' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP – 302 LF
2.5' x 2.5' GRATE

5.4A "WB" 491+00, 0' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 96 LF
2.5' x 2.5' GRATE

5.4B "WB" 490+71, 105' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 109 LF
2.5' x 2.5' GRATE

5.5 "WB" 494+25, 93' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP – 303 LF
2.5' x 2.5' GRATE

5.5A "WB" 494+00, 0' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 96 LF
2.5' x 2.5' GRATE

5.5B "WB" 493+71, 105' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP – 109 LF
2.5' x 2.5' GRATE

CURVE DATA

NO.	DESC	DELTA	RADIUS	LENGTH	TANGENT
C13	"CHAN-A"	05°30'01"	7744.50'	743.47'	372.02'

CONSTRUCTION ISSUE

SEE SHEETS SD-2B TO SD-30 FOR EARTH BERM PROFILE

PROFESSIONAL ENGINEER – STATE OF NEVADA TIMOTHY A. McCOY CIVIL No. 11511 4-5-00

Call before you Dig. 1-800-227-2600

CALL BEFORE YOU DO OVERHEAD 1-702-593-6111

REV. NO.	DATE	DESCRIPTION	APPROVED

CLARK COUNTY NEVADA

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
GRADING & DRAINAGE PLAN
"WB" 480+50 TO "WB" 496+00
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER – STATE OF NEVADA RANDALL GREMLICH No. 8312 4/5/00

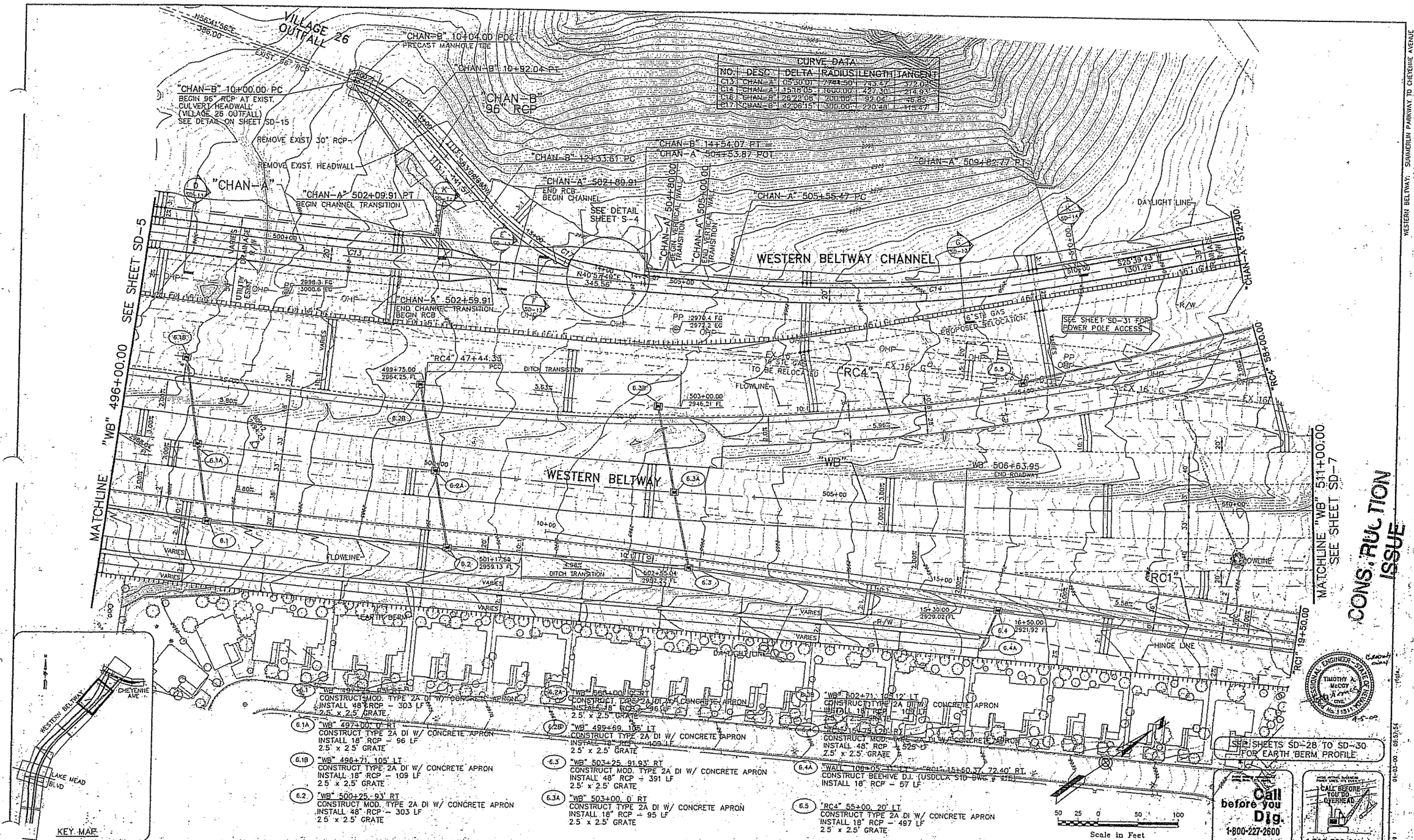
PROJECT No: 500.840 DRAWN BY: FJG
DESIGNED BY: FJG CHECKED BY: TAM
APPROVED BY: RKG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

SCALE
HORIZ: AS SHOWN
VERT: AS SHOWN
FIELD BOOK

L-1614
DRAWING NO. SD-5
SHT. 47 OF 119

WESTERN BELTWAY: SUMMERLIN PARKWAY TO CHEYENNE AVENUE



CURVE DATA					
NO.	DESC	DELTA	RADIUS	LENGTH	TANGENT
C13	"CHAN-A"	05°50'01"	7744.50'	745.47'	372.93'
C14	"CHAN-A"	15°18'05"	1600.00'	427.30'	214.91'
C16	"CHAN-B"	26°22'08"	200.00'	92.04'	46.85'
C17	"CHAN-B"	42°06'15"	300.00'	220.48'	115.47'

(6.1) "WB" 496+00, 0' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP - 303 LF
2.5' x 2.5' GRATE

(6.1A) "WB" 497+00, 0' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP - 96 LF
2.5' x 2.5' GRATE

(6.1B) "WB" 496+71, 105' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP - 109 LF
2.5' x 2.5' GRATE

(6.2) "WB" 500+25, 93' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP - 303 LF
2.5' x 2.5' GRATE

(6.2A) "WB" 500+00, 105' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP - 96 LF
2.5' x 2.5' GRATE

(6.2B) "WB" 499+69, 105' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP - 109 LF
2.5' x 2.5' GRATE

(6.3) "WB" 503+25, 91.93' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP - 391 LF
2.5' x 2.5' GRATE

(6.3A) "WB" 503+00, 0' RT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP - 95 LF
2.5' x 2.5' GRATE

(6.3B) "WB" 502+71, 105.12' LT
CONSTRUCT TYPE 2A DITCH CONCRETE APRON
INSTALL 18" RCP - 109 LF
2.5' x 2.5' GRATE

(6.4) "RC1" 15+79.79' RT
CONSTRUCT MOD. TYPE 2A DI W/ CONCRETE APRON
INSTALL 48" RCP - 529 LF
2.5' x 2.5' GRATE

(6.4A) "WALL" 106+05.00' LT, "RC1" 15+50.77' 72.40' RT
CONSTRUCT BEEHIVE D.I. (USDCCA STD DWG. # 221.1)
INSTALL 18" RCP - 57 LF

(6.5) "RC4" 55+00, 20' LT
CONSTRUCT TYPE 2A DI W/ CONCRETE APRON
INSTALL 18" RCP - 497 LF
2.5' x 2.5' GRATE

REV. NO.	DATE	DESCRIPTION	APPROVED

CLARK COUNTY NEVADA

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
GRADING & DRAINAGE PLAN
"WB" 496+00 TO "WB" 511+00
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

RANDALL R. GREINUS PROFESSIONAL ENGINEER STATE OF NEVADA No. 8512

PROJECT No:	500.640	DRAWN BY:	FJG
DESIGNED BY:	FJG	CHECKED BY:	TAM
APPROVED BY	RKG		

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

SCALE	L-1614
HORIZ. AS SHOWN	DRAWING NO.
VERT. AS SHOWN	SD-6
FIELD BOOK	
	SHT. 48 OF 114

WESTERN BELTWAY: SUMMERLIN PARKWAY TO CHEYENNE AVENUE

CONSTRUCTION ISSUE

TIMOTHY A. McCOY PROFESSIONAL ENGINEER STATE OF NEVADA No. 11511

4-5-00

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REV. NO.	DATE	DESCRIPTION	APPROVED
1	4/18/00	ADDENDUM NO. 1	

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
GRADING & DRAINAGE PLAN
"WB" 511+00 TO "WB" 517+85.43
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

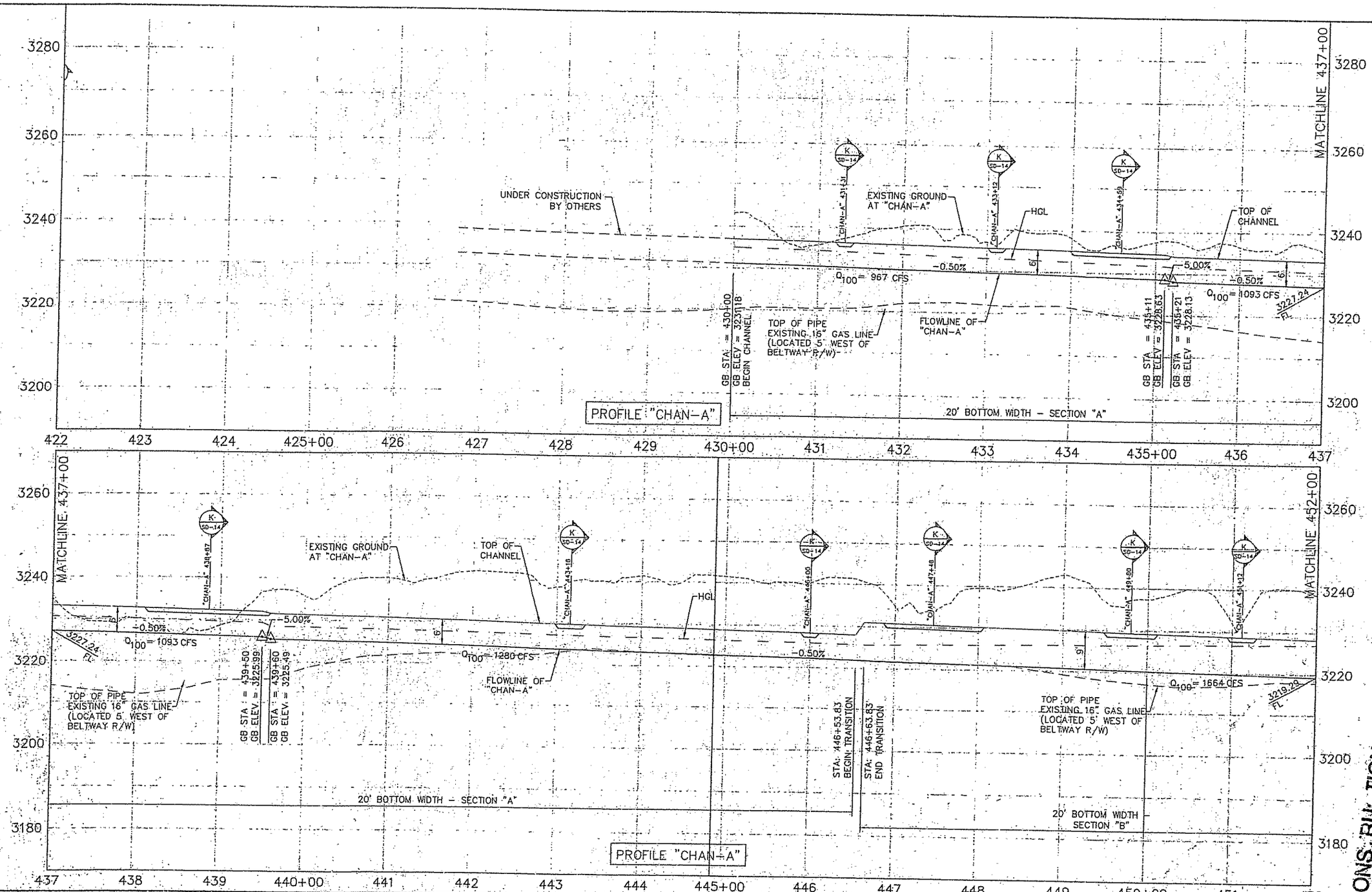
PROJECT No: 500.840 DRAWN BY: FJG
DESIGNED BY: FJG CHECKED BY: TAM
APPROVED BY: RKG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

SCALE
HORIZ: AS SHOWN
VERT: AS SHOWN
FIELD BOOK

L-1614
DRAWING NO.
SD-7

SHT. 49 OF 119



CONSTRUCTION ISSUE

REV. NO.	DATE	DESCRIPTION	APPROVED

CLARK COUNTY NEVADA

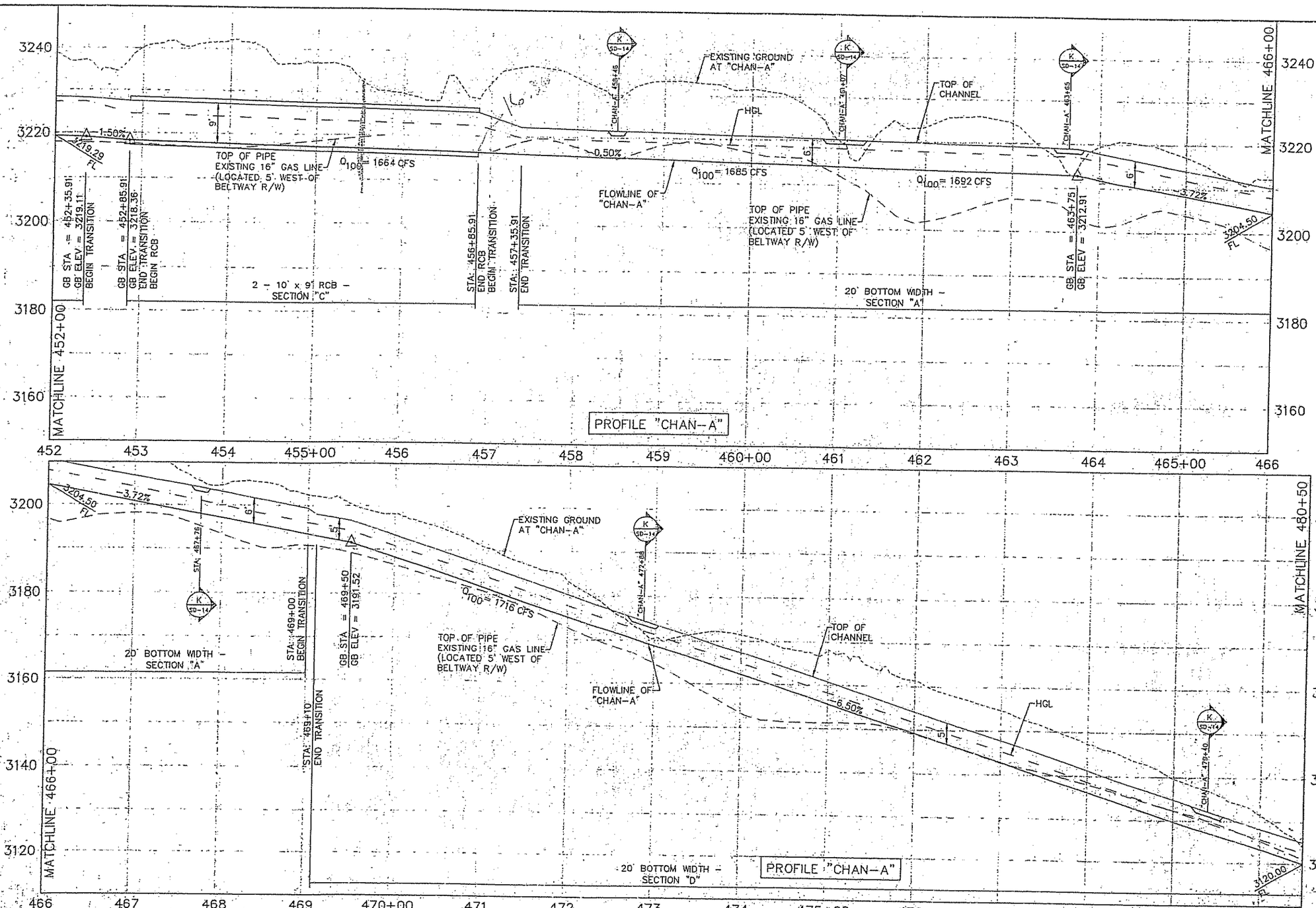
WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
CHANNEL PROFILE
"CHAN-A" 430+00 TO "CHAN-A" 452+00
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA RANDALL A. GREMLICH No. 8312

PROJECT No: 500.840	DRAWN BY: FJG	SCALE	L-1614
DESIGNED BY: FJG	CHECKED BY: TAM	HORIZ: AS SHOWN	DRAWING NO.
APPROVED BY: RKG		VERT: AS SHOWN	SD-8
		FIELD BOOK	SHT. 50 OF 119

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

WESTERN BELTWAY: SUMMERLIN PARKWAY TO CHEYENNE AVENUE



WESTERN BELTWAY- SUMMERLIN PARKWAY TO CHEYENNE AVENUE

CONSTRUCTION ISSUE

REV. NO.	DATE	DESCRIPTION	APPROVED

CLARK COUNTY NEVADA

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE

CHANNEL PROFILE

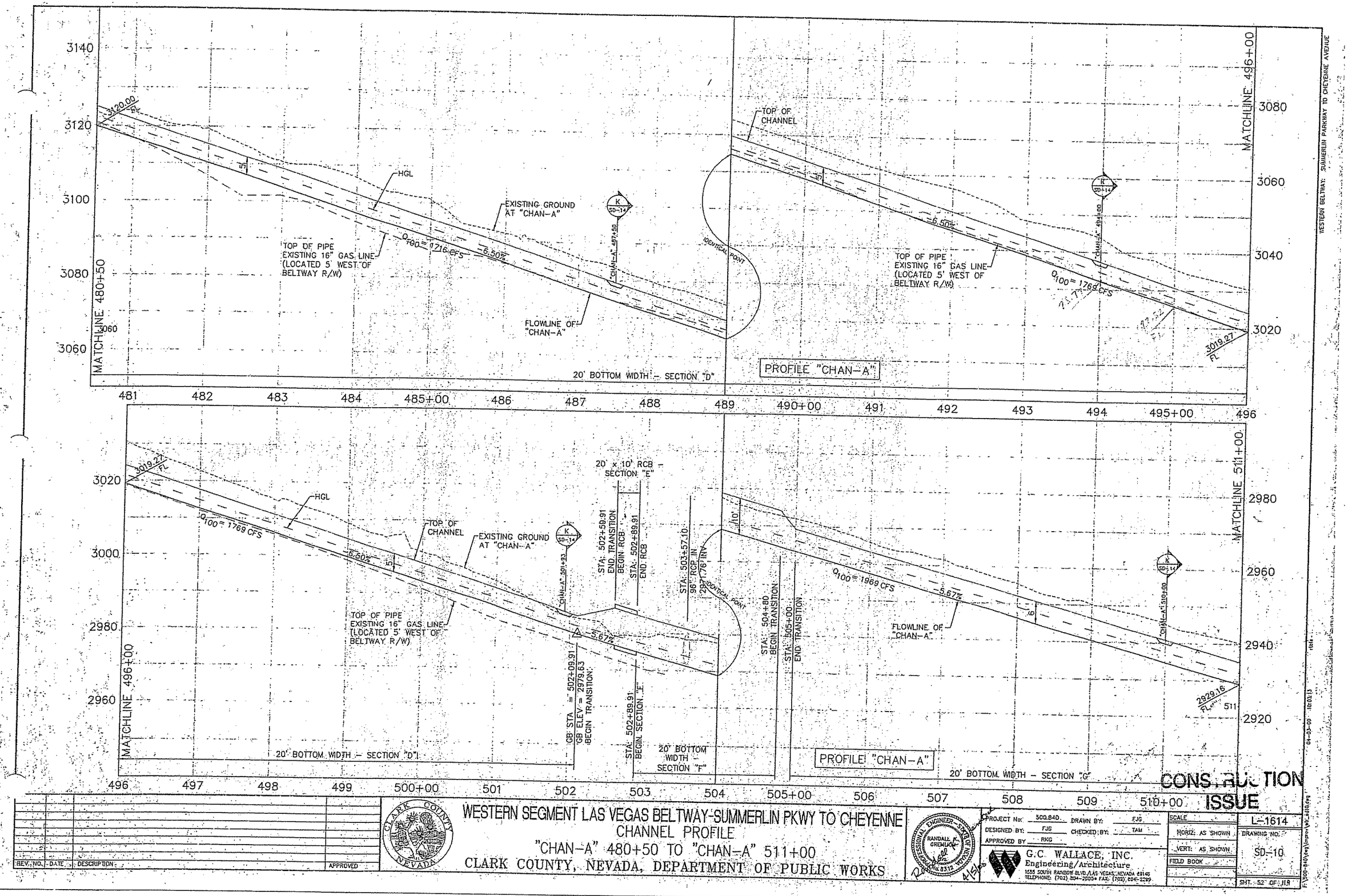
"CHAN-A" 452+00 TO "CHAN-A" 480+50

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA - RANDALL R. GRENTZ - No. 8312

PROJECT No: 500.840	DRAWN BY: FJG	SCALE	L-1614
DESIGNED BY: FJG	CHECKED BY: TAM	HORIZ: AS SHOWN	DRAWING NO.
APPROVED BY: RKG		VERT: AS SHOWN	SD-9
		FIELD BOOK	SHT. 54 OF 114

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89140
TELEPHONE: (702) 804-2000 FAX: (702) 804-2099



REV. NO.	DATE	DESCRIPTION	APPROVED

CLARK COUNTY NEVADA

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
CHANNEL PROFILE
"CHAN-A" 480+50 TO "CHAN-A" 511+00
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA - RANDALL K. GREMLEY - No. 8312 - 4/15/04

CONSTRUCTION ISSUE

PROJECT No: 500.840	DRAWN BY: FJG	SCALE	L-1614
DESIGNED BY: FJG	CHECKED BY: TAM	HORIZ: AS SHOWN	DRAWING NO.
APPROVED BY: RKG		VERT: AS SHOWN	SD-10
		FIELD BOOK	SHT. 52 OF 119

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

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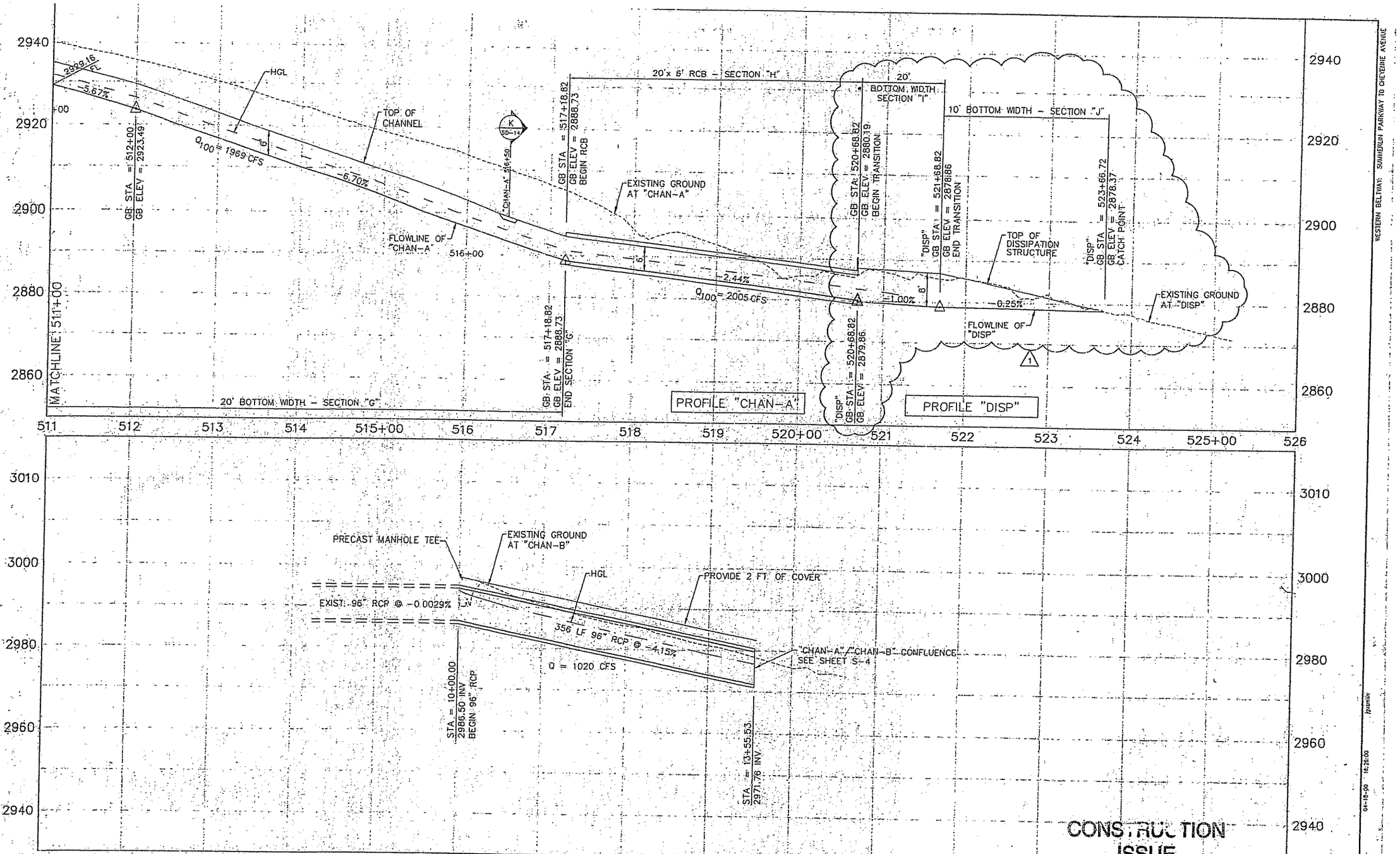

CONSTRUCTION ISSUE

REV. NO.	DATE	DESCRIPTION	APPROVED
1	4/18/00	ADDENDUM NO. 1	

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
CHANNEL PROFILE
"CHAN-A" 511+00 TO "DISP" 523+66.72-"CHAN-B" 10+00 TO "CHAN-B" 13+62.73
CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROJECT No: 500.840 DRAWN BY: FJG
DESIGNED BY: FJG CHECKED BY: TAM
APPROVED BY: RKG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

SCALE: HORIZ: AS SHOWN VERT: AS SHOWN FIELD BOOK

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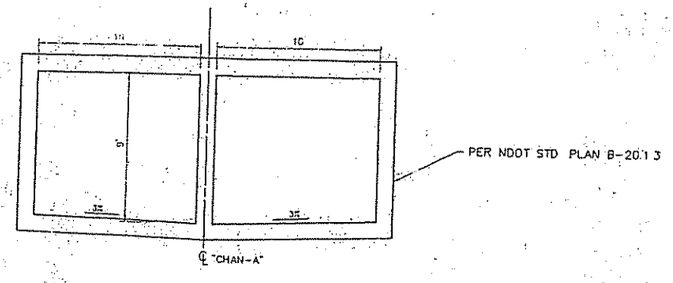
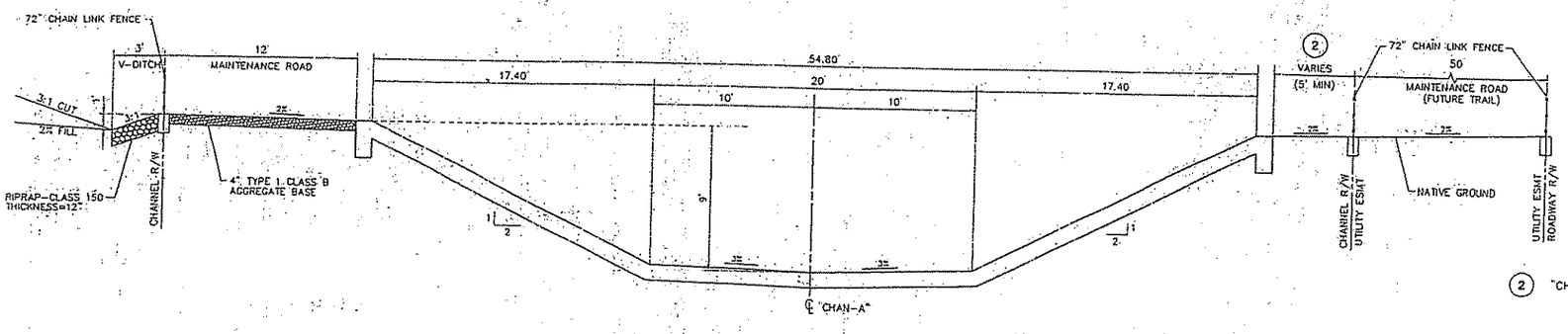
DRAWING NO. SD-11
SHT. 53 OF 119

WESTERN BELTWAY: SUMMERLIN PARKWAY TO CHEYENNE AVENUE



2 – 10' X 9' RCB (C)

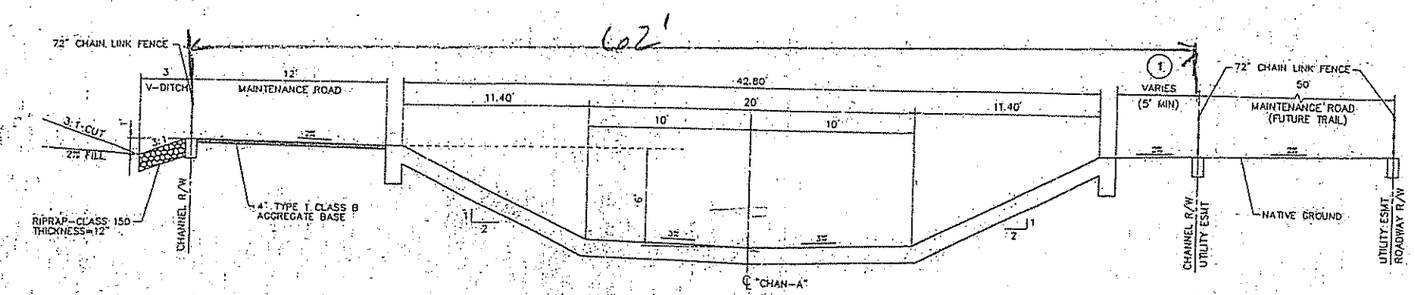
"CHAN-A" 452+85.91 TO "CHAN-A" 456+85.91



CONCRETE-LINED CHANNEL (B)

"CHAN-A" 446+63.83 TO "CHAN-A" 452+35.91

(2) "CHAN-A" 446+63.83 TO "CHAN-A" 452+35.91 : 5.08' TO 5.47'



CONCRETE-LINED CHANNEL (A)

"CHAN-A" 430+00.00 TO "CHAN-A" 446+53.83
"CHAN-A" 457+35.91 TO "CHAN-A" 469+00.00

(1) "CHAN-A" 430+00.00 TO "CHAN-A" 446+53.83 : 11.10'
"CHAN-A" 457+35.90 TO "CHAN-A" 461+66.86 : 11.60'
"CHAN-A" 461+66.86 TO "CHAN-A" 465+00.00 : 11.60' TO 11.84'
"CHAN-A" 465+00.00 TO "CHAN-A" 469+00.00 : 11.60' TO 11.30'

CONSTRUCTION ISSUE

SEE S-SHEETS FOR CHANNEL STRUCTURE DETAILS

REV. NO.	DATE	DESCRIPTION	APPROVED

CLARK COUNTY NEVADA

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
CHANNEL SECTIONS

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER - STATE OF NEVADA - RANDALL GREMLICH - No. 8312 - 4/15/00

PROJECT No. 500.840 DRAWN BY: TAM
DESIGNED BY: TAM CHECKED BY: TAM
APPROVED BY: RKG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

SCALE
HORIZ: AS SHOWN
VERT: AS SHOWN
FIELD BOOK

L-1614
DRAWING NO.: SD-12
SHT. 54 OF 119

WESTERN BELTWAY: SUMMERLIN PARKWAY TO CHEYENNE AVENUE

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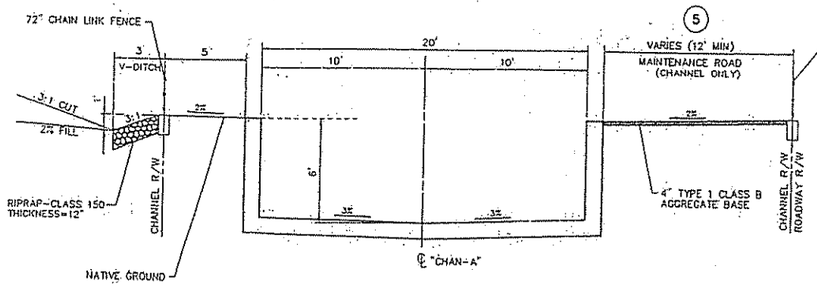
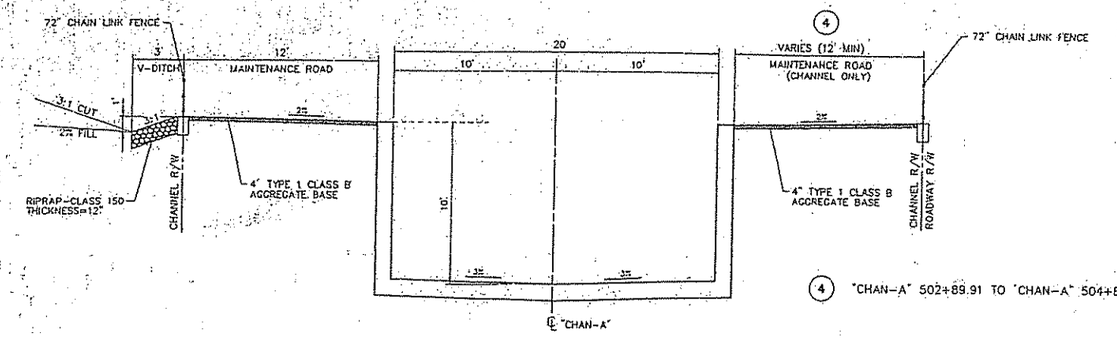


CONCRETE-LINED CHANNEL (G)

"CHAN-A" 505+00.00 TO "CHAN-A" 517+18.62

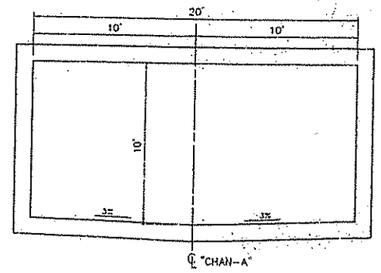
(5) "CHAN-A" 505+00.00 TO "CHAN-A" 507+89.92 : 19.67' TO 41.88'
"CHAN-A" 507+89.92 TO "CHAN-A" 509+82.77 : 41.88' TO 12'
"CHAN-A" 509+82.77 TO "CHAN-A" 517+18.62 : 12'



CONCRETE-LINED CHANNEL (F)

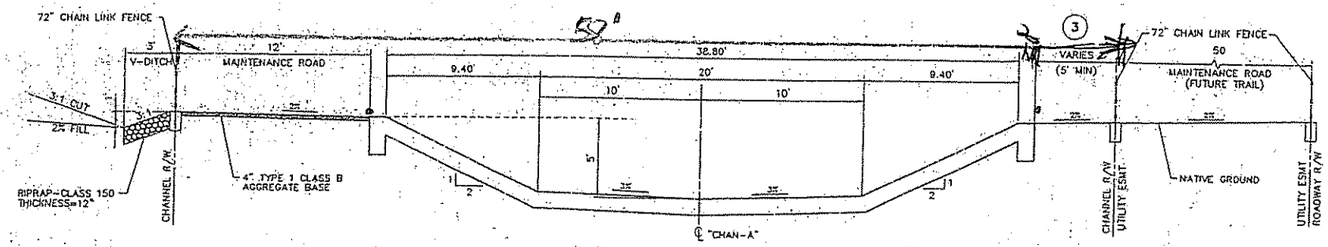
"CHAN-A" 502+89.91 TO "CHAN-A" 503+62.62 &
"CHAN-A" 504+53.87 TO "CHAN-A" 504+80.00

(4) "CHAN-A" 502+89.91 TO "CHAN-A" 504+80.00 : 19.55' TO 19.67'



20' X 10' RCB (E)

"CHAN-A" 502+59.91 TO "CHAN-A" 502+89.91



CONCRETE-LINED CHANNEL (D)

"CHAN-A" 469+10.00 TO "CHAN-A" 502+09.91

(3) "CHAN-A" 469+10.00 TO "CHAN-A" 474+78.68 : 13.27' TO 10.10'
"CHAN-A" 474+78.68 TO "CHAN-A" 502+09.91 : 10.10

CONSTRUCTION ISSUE

SEE S-SHEETS FOR CHANNEL STRUCTURE DETAILS

REV. NO.	DATE	DESCRIPTION	APPROVED

CLARK COUNTY NEVADA

WESTERN SEGMENT LAS VEGAS BELTWAY-SUMMERLIN PKWY TO CHEYENNE
CHANNEL SECTIONS

CLARK COUNTY, NEVADA, DEPARTMENT OF PUBLIC WORKS

PROFESSIONAL ENGINEER STATE OF NEVADA RANDALL K. GREULICH No. 8312 CIVIL

PROJECT No: 500.840	DRAWN BY: TAM	SCALE:	L-1614
DESIGNED BY: TAM	CHECKED BY: TAM	HORIZ: AS SHOWN	DRAWING NO.
APPROVED BY: RKG		VERT: AS SHOWN	SD-13
		FIELD BOOK	
			SHT. 55 OF 119

G.C. WALLACE, INC.
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1555 SOUTH RAINBOW BLVD. LAS VEGAS, NEVADA, 89146
TELEPHONE: (702)-804-3000 • FAX: (702)-804-2209

WESTERN BELTWAY: SUMMERLIN PARKWAY TO CHEYENNE AVENUE

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TECHNICAL DRAINAGE STUDY
FOR THE
WESTERN SEGMENT LAS VEGAS BELTWAY
FROM
SUMMERLIN PARKWAY TO CHEYENNE AVENUE

January 2000

500.840

Prepared for:

Clark County Department of Public Works
500 South Grand Central Parkway
Las Vegas, NV 89155-4000
Phone: (702) 455-6000
Fax: (702) 455-6113

calculating Tc is outlined in Section 602 of the Manual. Lag time calculations for the project site are included in Appendix A.

VI. EXISTING CONDITIONS

The existing offsite flows generally flow east until they are intercepted by the rough graded Western Beltway (rough graded during the gravel extraction plan). They then combine with onsite flows from the Western Beltway and flow north along the Western Beltway until they reach Cheyenne Avenue then flow north east into the Borden berm and diversion channel.

The HEC-1 computer program from the USACOE (Reference 4) was used to conduct a hydrologic analysis of the offsite drainage patterns for the Initial Condition Plan. See Figure 5, and Appendix A for detailed hydrologic analysis data).

- The existing condition flows were greater than the ultimate condition flows and were used for the detailed hydraulic design of the Western Beltway Channel. See Table 1 for the design discharges used in the Western Beltway Channel hydraulic analysis.

TABLE 1
PROPOSED (EXISTING) OFFSITE DRAINAGE CONDITIONS
HEC-1 SUMMARY

Basin/ Location*	Q100 (cfs)	Basin/ Location*	Q100 (cfs)	Basin/ Location*	Q100 (cfs)
X-1N	611	X-9N	15	C-4 (Comb. C-3 & X-5N)	1093
X-2N	197	X-10N	46	C-5 (Comb. C-4 & X-6N)	1280
X-3N	248	X-11N	57	C-6 (Comb. C-5 & X-7N)	1664
X-4N	120	X-12N	59	C-7 (Comb. C-6 & X-8N)	1685
X-5N	196	X-13N	59	C-8 (Comb. C-7 & X-9N)	1692
X-6N	230	C-1 (Comb. X-1N & X-2N)	709	C-9 (Comb. C-8 & X-10N)	1769
X-7N	470	C-2 (Comb. C-1 & X-3N)	903	C-10 (Comb. C-9, X-11N, & X-12N)	1969
X-8N	41	C-3 (Comb. C-2 & X-4N)	967	C-11 (Comb. C-10 & X-13N)	2005

*See Figure 5

WESTERN BELTWAY
SUMMERLIN PARKWAY TO CHEYENNE AVENUE
100 YEAR INITIAL PLAN DESIGN COMPUTATIONS AND STANDARDS CHECKS

IWBC-23.WB2

Stations																				
Plans (ft)	Channel (ft)	Q (cfs)	Invert Elev. (ft)	W.S. Elev. (ft)	V (ft/s)	A (sq ft)	Tw (ft)	Fr	d (ft)	dc (ft)	Fb (ft)	Curve r (ft)	SE (ft)	Min. Ch. Depth (ft)	USE Ch. Depth (ft)	P (ft)	Delta P (ft)	Fr Check	Flow Depth Check	EGL Min. DEPTH (ft)	Fr Limiting Check
43000.00	20000.00	967.00	3231.18	3235.05	9.68	99.90	34.28	1.00	3.87	3.87	1.96	0.00	0.00	5.82	6	35.97	-0.62	NG	NG	5.33	OK Fr <= Fr Limit
43003.71	19996.29	967.00	3231.16	3234.89	10.16	95.18	33.72	1.07	3.73	3.87	1.39	0.00	0.00	5.12	5	35.35	-0.59	NG	NG	5.34	OK Fr <= Fr Limit
43017.38	19982.62	967.00	3231.09	3234.69	10.66	90.71	33.19	1.14	3.60	3.87	1.41	0.00	0.00	5.01	5	34.76	-0.57	> 1.13	NG	5.36	OK Fr <= Fr Limit
43048.44	19951.56	967.00	3230.94	3234.41	11.18	86.49	32.68	1.21	3.47	3.87	1.42	0.00	0.00	4.89	5	34.19	-0.55	> 1.13	< 0.9dc	5.41	OK Fr <= Fr Limit
43115.12	19884.88	967.00	3230.60	3233.95	11.72	82.51	32.18	1.29	3.35	3.87	1.44	0.00	0.00	4.78	5	33.63	-0.54	> 1.13	< 0.9dc	5.48	OK Fr <= Fr Limit
43315.25	19684.75	967.00	3229.60	3232.83	12.29	78.68	31.70	1.38	3.23	3.87	1.45	0.00	0.00	4.68	5	33.09	-0.09	> 1.13	< 0.9dc	5.57	OK Fr <= Fr Limit
43511.00	19489.00	967.00	3228.62	3231.83	12.40	77.98	31.62	1.39	3.21	3.87	1.46	0.00	0.00	4.66	5	33.01	1.18	> 1.13	< 0.9dc	5.59	OK Fr <= Fr Limit
43521.00	19479.00	1093.00	3228.12	3231.59	12.64	86.47	32.68	1.37	3.47	4.15	1.48	0.00	0.00	4.95	5	34.18	-0.17	> 1.13	< 0.9dc	5.95	OK Fr <= Fr Limit
43737.08	19262.92	1093.00	3227.04	3230.47	12.83	85.19	32.52	1.40	3.43	4.15	1.48	0.00	0.00	4.91	5	34.01	-0.03	> 1.13	< 0.9dc	5.99	OK Fr <= Fr Limit
43930.11	19069.89	1093.00	3226.08	3229.50	12.86	84.99	32.50	1.40	3.42	4.15	1.48	1916.50	0.09	5.00	5	33.98	-0.00	> 1.13	< 0.9dc	5.99	OK Fr <= Fr Limit
43950.00	19050.00	1093.00	3225.98	3229.40	12.86	84.99	32.49	1.40	3.42	4.15	1.48	0.00	0.00	4.91	5	33.98	-0.55	> 1.13	< 0.9dc	5.99	OK Fr <= Fr Limit
43953.00	19047.00	1093.00	3225.83	3229.13	13.49	81.02	32.00	1.50	3.30	4.15	1.50	0.00	0.00	4.80	5	33.43	-0.53	> 1.13	< 0.9dc	6.13	OK Fr <= Fr Limit
43956.73	19043.27	1093.00	3225.64	3228.83	14.15	77.24	31.52	1.59	3.18	4.15	1.52	0.00	0.00	4.70	5	32.89	-0.38	> 1.13	< 0.9dc	6.29	OK Fr <= Fr Limit
43960.00	19040.00	1093.00	3225.48	3228.58	14.66	74.56	31.18	1.67	3.10	4.15	1.53	0.00	0.00	4.63	5	32.51	3.38	> 1.13	< 0.9dc	6.43	OK Fr <= Fr Limit
43965.05	19034.95	1280.00	3225.45	3229.30	12.89	99.30	34.21	1.33	3.85	4.53	1.51	0.00	0.00	5.36	6	35.89	-0.60	> 1.13	< 0.9dc	6.43	OK Fr <= Fr Limit
44347.89	18652.11	1280.00	3223.54	3227.26	13.52	94.67	33.67	1.42	3.72	4.53	1.52	0.00	0.00	5.24	6	35.29	0.00	> 1.13	< 0.9dc	6.55	OK Fr <= Fr Limit
44663.83	18336.17	1280.00	3221.96	3225.68	13.52	94.67	33.67	1.42	3.72	4.53	1.52	2500.00	0.08	5.32	6	35.29	0.00	> 1.13	< 0.9dc	6.55	OK Fr <= Fr Limit
44742.84	18257.16	1280.00	3221.57	3225.28	13.52	94.67	33.67	1.42	3.72	4.53	1.52	2500.00	0.08	5.32	6	35.29	7.71	> 1.13	< 0.9dc	6.55	OK Fr <= Fr Limit
44742.84	18257.16	1280.00	3221.57	3227.01	8.07	158.61	40.56	0.72	5.44	4.53	1.51	2500.00	0.03	6.99	7	43.00	0.25	< 0.86	>1.1dc	6.45	Subcritical
44750.37	18249.63	1280.00	3221.53	3227.03	7.95	161.01	40.79	0.71	5.50	4.53	1.48	2500.00	0.03	7.01	7	43.26	0.85	< 0.86	>1.1dc	6.48	Subcritical
44776.12	18223.88	1280.00	3221.40	3227.09	7.58	168.87	41.56	0.66	5.69	4.53	1.39	2500.00	0.03	7.11	7	44.11	0.88	< 0.86	>1.1dc	6.58	Subcritical
44804.27	18195.73	1280.00	3221.26	3227.14	7.23	177.04	42.34	0.62	5.89	4.53	1.31	2500.00	0.03	7.22	8	44.99	0.90	< 0.86	>1.1dc	6.69	Subcritical
44834.84	18165.16	1280.00	3221.11	3227.19	6.89	185.78	43.15	0.59	6.09	4.53	1.24	2500.00	0.03	7.35	8	45.89	0.93	< 0.86	>1.1dc	6.82	Subcritical
44867.86	18132.14	1280.00	3220.94	3227.24	6.57	194.82	43.98	0.55	6.30	4.53	1.17	2500.00	0.02	7.49	8	46.82	0.46	< 0.86	>1.1dc	6.97	Subcritical
44884.31	18115.69	1280.00	3220.86	3227.26	6.42	199.38	44.39	0.53	6.40	4.53	1.14	4279.00	0.01	7.55	8	47.28	0.97	< 0.86	>1.1dc	7.03	Subcritical
44920.04	18079.96	1280.00	3220.68	3227.29	6.12	209.15	45.26	0.50	6.62	4.53	1.08	4279.00	0.01	7.71	8	48.25	1.00	< 0.86	>1.1dc	7.20	Subcritical
44957.92	18042.08	1280.00	3220.49	3227.33	5.84	219.18	46.16	0.47	6.84	4.53	1.03	4279.00	0.01	7.88	8	49.25	1.02	< 0.86	>1.1dc	7.37	Subcritical
44997.42	18002.58	1280.00	3220.29	3227.36	5.57	229.80	47.07	0.45	7.07	4.53	1.00	4279.00	0.01	8.08	8	50.28	1.06	< 0.86	>1.1dc	7.55	Subcritical
45039.05	17960.95	1280.00	3220.08	3227.39	5.31	241.05	48.02	0.42	7.31	4.53	1.00	4279.00	0.01	8.31	9	51.34	-1.71	< 0.86	>1.1dc	7.74	Subcritical
45049.05	17950.95	1664.00	3220.03	3226.95	7.46	223.06	46.49	0.60	6.92	5.24	1.36	4279.00	0.02	8.30	9	49.62	0.66	< 0.86	>1.1dc	7.78	Subcritical
45071.90	17928.10	1664.00	3219.92	3226.99	7.23	230.15	47.08	0.58	7.07	5.24	1.31	4279.00	0.02	8.40	9	50.29	1.06	< 0.86	>1.1dc	7.88	Subcritical
45109.45	17890.55	1664.00	3219.73	3227.04	6.90	241.16	48.02	0.54	7.31	5.24	1.24	4279.00	0.02	8.56	9	51.34	1.08	< 0.86	>1.1dc	8.04	Subcritical
45149.19	17850.81	1664.00	3219.53	3227.08	6.58	252.89	48.99	0.51	7.55	5.24	1.17	4279.00	0.02	8.74	9	52.42	1.12	< 0.86	>1.1dc	8.22	Subcritical
45191.47	17808.53	1664.00	3219.32	3227.12	6.27	265.39	49.99	0.48	7.80	5.24	1.11	4279.00	0.01	8.92	9	53.54	1.15	< 0.86	>1.1dc	8.41	Subcritical
45235.91	17764.09	1664.00	3219.10	3227.16	5.98	278.26	51.02	0.45	8.06	5.24	1.06	4279.00	0.01	9.12	9	54.69	-22.18	< 0.86	>1.1dc	8.61	Subcritical
45285.91	17714.09	1664.00	3218.35	3224.42	13.72	121.28	21.00	1.01	6.07	5.99	1.63	4279.00	0.03	7.72	8	32.51	0.00	NG	NG	8.99	OK Fr <= Fr Limit
45668.69	17331.31	1664.00	3216.44	3222.50	13.72	121.28	21.00	1.01	6.07	5.99	1.63	4279.00	0.03	7.72	8	32.51	-0.15	NG	NG	8.98	OK Fr <= Fr Limit
45685.91	17314.09	1664.00	3216.35	3222.34	13.89	119.80	21.00	1.03	5.99	5.99	1.63	4279.00	0.03	7.65	8	32.36	2.64	NG	NG	8.99	OK Fr <= Fr Limit
45735.91	17264.09	1664.00	3216.10	3219.75	17.99	92.50	33.41	1.91	3.65	5.24	1.69	4279.00	0.08	5.42	6	35.00	0.60	> 1.13	< 0.9dc	8.68	OK Fr <= Fr Limit
45829.60	17170.40	1664.00	3215.63	3219.42	17.15	97.03	33.94	1.79	3.79	5.24	1.67	4279.00	0.07	5.53	6	35.60	0.38	> 1.13	< 0.9dc	8.35	OK Fr <= Fr Limit
45897.88	17102.12	1664.00	3215.29	3219.16	16.66	99.88	34.28	1.72	3.87	5.24	1.65	4279.00	0.07	5.59	6	35.97	0.51	> 1.13	< 0.9dc	8.18	OK Fr <= Fr Limit
45907.88	17092.12	1685.00	3215.24	3219.22	16.23	103.82	34.73	1.66	3.98	5.28	1.64	4279.00	0.07	5.69	6	36.48	0.64	> 1.13	< 0.9dc	8.08	OK Fr <= Fr Limit
46090.65	16909.35	1685.00	3214.33	3218.46	15.48	108.85	35.31	1.56	4.13	5.28	1.62	4279.00	0.06	5.81	6	37.12	0.30	> 1.13	< 0.9dc	7.85	OK Fr <= Fr Limit
46230.61	16769.39	1685.00	3213.63	3217.83	15.14	111.29	35.58	1.51	4.20	5.28	1.61	4279.00	0.06	5.86	6	37.43	0.21	> 1.13	< 0.9dc	7.76	OK Fr <= Fr Limit
46240.61	16759.39	1692.00	3213.58	3217.82	14.98	112.95	35.77	1.49	4.24	5.29	1.61	4279.00	0.06	5.91	6	37.64	-0.00	> 1.13	< 0.9dc	7.73	OK Fr <= Fr Limit
46268.78	16731.22	1692.00	3213.43	3217.67	14.98	112.95	35.77	1.49	4.24	5.29	1.61	4279.00	0.06	5.91	6	37.64	0.10	> 1.13	< 0.9dc	7.73	OK Fr <= Fr Limit
46375.00	16625.00	1692.00	3212.90	3217.16	14.88	113.71	35.86	1.47	4.26	5.29	1.60	3000.00	0.08	5.95	6	37.74	-0.67	> 1.13	< 0.9dc	7.70	OK Fr <= Fr Limit

WESTERN BELTWAY
SUMMERLIN PARKWAY TO CHEYENNE AVENUE
100 YEAR INITIAL PLAN DESIGN COMPUTATIONS AND STANDARDS CHECKS

IWBC-23.WB2

Stations																					
Plans (ft)	Channel (ft)	Q (cfs)	Invert Elev. (ft)	W.S. Elev. (ft)	V (ft/s)	A (sq ft)	Tw (ft)	Fr	d (ft)	dc (ft)	Fb (ft)	Curve r (ft)	SE (ft)	Min. Ch. Depth (ft)	USE Ch. Depth (ft)	P (ft)	Delta P (ft)	Fr Check	Flow Depth Check	EGL Min. DEPTH (ft)	Fr Limiting Check
46381.15	16618.85	1692.00	3212.67	3216.79	15.60	108.46	35.26	1.57	4.12	5.29	1.62	3000.00	0.09	5.83	6	37.07	-0.64	> 1.13	< 0.9dc	7.90	OK Fr <= Fr Limit
46388.76	16611.24	1692.00	3212.39	3216.36	16.37	103.36	34.68	1.67	3.97	5.29	1.65	3000.00	0.10	5.72	6	36.43	-0.63	> 1.13	< 0.9dc	8.13	OK Fr <= Fr Limit
46398.00	16602.00	1692.00	3212.05	3215.88	17.17	98.54	34.12	1.78	3.83	5.29	1.67	3000.00	0.10	5.61	6	35.80	-0.61	> 1.13	< 0.9dc	8.40	OK Fr <= Fr Limit
46409.16	16590.84	1692.00	3211.63	3215.33	18.00	94.00	33.58	1.90	3.70	5.29	1.70	3000.00	0.11	5.50	6	35.19	-0.59	> 1.13	< 0.9dc	8.73	OK Fr <= Fr Limit
46422.65	16577.35	1692.00	3211.13	3214.69	18.88	89.62	33.06	2.02	3.56	5.29	1.72	3000.00	0.12	5.41	6	34.61	-0.57	> 1.13	< 0.9dc	9.10	OK Fr <= Fr Limit
46438.94	16561.06	1692.00	3210.52	3213.96	19.80	85.45	32.55	2.16	3.44	5.29	1.75	3000.00	0.13	5.32	6	34.04	-0.12	> 1.13	< 0.9dc	9.53	OK Fr <= Fr Limit
46442.83	16557.17	1692.00	3210.38	3213.79	20.01	84.56	32.44	2.19	3.41	5.29	1.75	3000.00	0.13	5.30	6	33.92	0.10	> 1.13	< 0.9dc	9.63	OK Fr <= Fr Limit
46452.83	16547.17	1716.00	3210.01	3213.44	20.12	85.29	32.53	2.19	3.43	5.33	1.76	3000.00	0.14	5.33	6	34.02	-0.55	> 1.13	< 0.9dc	9.72	OK Fr <= Fr Limit
46473.70	16526.30	1716.00	3209.23	3212.54	21.10	81.33	32.04	2.34	3.31	5.33	1.79	3000.00	0.15	5.24	6	33.47	-0.53	> 1.13	< 0.9dc	10.23	OK Fr <= Fr Limit
46499.38	16500.62	1716.00	3208.28	3211.47	22.13	77.54	31.56	2.49	3.19	5.33	1.81	3000.00	0.16	5.16	6	32.93	-0.51	> 1.13	< 0.9dc	10.80	OK Fr <= Fr Limit
46531.52	16468.48	1716.00	3207.08	3210.16	23.21	73.93	31.10	2.65	3.08	5.33	1.84	3000.00	0.17	5.09	5	32.42	-0.50	> 1.13	< 0.9dc	11.45	OK Fr <= Fr Limit
46572.87	16427.13	1716.00	3205.54	3208.51	24.35	70.47	30.66	2.83	2.96	5.33	1.87	3000.00	0.19	5.03	5	31.92	-0.48	> 1.13	< 0.9dc	12.17	OK Fr <= Fr Limit
46628.37	16371.63	1716.00	3203.48	3206.33	25.54	67.19	30.22	3.02	2.86	5.33	1.91	3000.00	0.20	4.97	5	31.44	-0.47	> 1.13	< 0.9dc	12.98	OK Fr <= Fr Limit
46708.92	16291.08	1716.00	3200.48	3203.23	26.78	64.08	29.81	3.22	2.75	5.33	1.94	3000.00	0.22	4.91	5	30.97	-0.45	> 1.13	< 0.9dc	13.89	OK Fr <= Fr Limit
46845.64	16154.36	1716.00	3195.39	3198.04	28.09	61.09	29.40	3.44	2.65	5.33	1.97	3000.00	0.24	4.86	5	30.52	-0.10	> 1.13	< 0.9dc	14.91	OK Fr <= Fr Limit
46900.00	16100.00	1716.00	3193.37	3196.00	28.42	60.38	29.31	3.49	2.63	5.33	1.98	3000.00	0.25	4.85	5	30.42	-0.08	> 1.13	< 0.9dc	15.17	OK Fr <= Fr Limit
46950.00	16050.00	1716.00	3191.51	3194.12	28.65	59.90	29.24	3.53	2.61	5.33	1.99	3000.00	0.25	4.85	5	30.34	-0.43	> 1.13	< 0.9dc	15.36	OK Fr <= Fr Limit
46991.05	16008.95	1716.00	3188.84	3191.36	30.05	57.10	28.86	3.77	2.51	5.33	2.02	3000.00	0.27	4.81	5	29.91	-0.41	> 1.13	< 0.9dc	16.54	OK Fr <= Fr Limit
47047.44	15952.56	1716.00	3185.18	3187.60	31.51	54.46	28.49	4.02	2.42	5.33	2.06	3000.00	0.29	4.77	5	29.50	-0.40	> 1.13	< 0.9dc	17.84	OK Fr <= Fr Limit
47133.19	15866.81	1716.00	3179.60	3181.94	33.05	51.92	28.13	4.29	2.33	5.33	2.10	3000.00	0.32	4.75	5	29.10	-0.38	> 1.13	< 0.9dc	19.30	OK Fr <= Fr Limit
47299.82	15700.18	1716.00	3168.77	3171.02	34.67	49.50	27.78	4.58	2.25	5.33	2.14	3000.00	0.35	4.73	5	28.71	-0.14	> 1.13	< 0.9dc	20.91	OK Fr <= Fr Limit
47453.86	15546.14	1716.00	3158.76	3160.98	35.28	48.64	27.66	4.69	2.22	5.33	2.15	0.00	0.00	4.36	5	28.57	-0.11	> 1.13	< 0.9dc	21.54	OK Fr <= Fr Limit
47853.95	15146.05	1716.00	3132.76	3134.95	35.77	47.97	27.56	4.78	2.19	5.33	2.16	0.00	0.00	4.35	5	28.47	0.00	> 1.13	< 0.9dc	22.05	OK Fr <= Fr Limit
49260.51	13739.49	1716.00	3041.33	3043.52	35.77	47.97	27.56	4.78	2.19	5.33	2.16	0.00	0.00	4.35	5	28.47	0.43	> 1.13	< 0.9dc	22.06	OK Fr <= Fr Limit
49270.51	13729.49	1769.00	3040.68	3042.97	34.93	50.64	27.95	4.58	2.29	5.42	2.15	0.00	0.00	4.44	5	28.90	-0.18	> 1.13	< 0.9dc	21.24	OK Fr <= Fr Limit
49466.44	13533.56	1769.00	3027.94	3030.19	35.71	49.54	27.79	4.72	2.25	5.42	2.17	7744.50	0.14	4.56	5	28.72	-0.09	> 1.13	< 0.9dc	22.05	OK Fr <= Fr Limit
49876.12	13123.88	1769.00	3001.31	3003.54	36.13	48.96	27.71	4.79	2.23	5.42	2.18	7744.50	0.15	4.55	5	28.63	0.00	> 1.13	< 0.9dc	22.50	OK Fr <= Fr Limit
50209.91	12790.09	1769.00	2979.62	2981.85	36.13	48.96	27.71	4.79	2.23	5.42	2.18	0.00	0.00	4.41	5	28.63	1.82	> 1.13	< 0.9dc	22.49	OK Fr <= Fr Limit
50259.91	12740.09	1769.00	2976.78	2979.41	35.61	49.68	29.34	4.83	2.63	6.39	2.23	0.00	0.00	4.86	5	30.45	-5.79	> 1.13	< 0.9dc	22.32	OK Fr <= Fr Limit
50289.91	12710.09	1769.00	2975.08	2977.70	35.76	49.47	20.00	4.01	2.62	6.39	2.23	0.00	0.00	4.86	5	24.66	-0.08	> 1.13	< 0.9dc	22.48	OK Fr <= Fr Limit
50443.87	12556.13	1769.00	2966.35	2968.94	36.33	48.69	20.00	4.11	2.59	6.39	2.25	0.00	0.00	4.83	5	24.58	0.95	> 1.13	< 0.9dc	23.08	OK Fr <= Fr Limit
50453.87	12546.13	1969.00	2965.79	2968.85	33.84	58.19	20.00	3.50	3.06	6.85	2.23	0.00	0.00	5.29	6	25.53	-0.08	> 1.13	< 0.9dc	20.84	OK Fr <= Fr Limit
50480.00	12520.00	1969.00	2964.30	2967.32	34.30	57.41	20.00	3.57	3.02	6.85	2.24	0.00	0.00	5.26	6	25.45	-0.05	> 1.13	< 0.9dc	21.29	OK Fr <= Fr Limit
50500.00	12500.00	1969.00	2963.17	2966.17	34.61	56.89	20.00	3.62	3.00	6.85	2.25	0.00	0.00	5.24	6	25.40	-0.12	> 1.13	< 0.9dc	21.59	OK Fr <= Fr Limit
50555.47	12444.53	1969.00	2960.03	2962.97	35.36	55.68	20.00	3.74	2.94	6.85	2.27	0.00	0.00	5.20	6	25.28	-0.26	> 1.13	< 0.9dc	22.34	OK Fr <= Fr Limit
50761.13	12238.87	1969.00	2948.37	2951.17	37.08	53.10	20.00	4.01	2.81	6.85	2.31	1600.00	0.53	5.65	6	25.02	-0.11	> 1.13	< 0.9dc	24.15	OK Fr <= Fr Limit
50982.77	12017.23	1969.00	2935.80	2938.55	37.83	52.05	20.00	4.14	2.75	6.85	2.33	0.00	0.00	5.08	5	24.91	-0.04	> 1.13	< 0.9dc	24.98	OK Fr <= Fr Limit
51200.00	11800.00	1969.00	2923.48	2926.21	38.12	51.65	20.00	4.18	2.73	6.85	2.33	0.00	0.00	5.07	5	24.87	-0.24	> 1.13	< 0.9dc	25.29	OK Fr <= Fr Limit
51516.63	11483.37	1969.00	2902.27	2904.88	39.98	49.25	20.00	4.49	2.61	6.85	2.38	0.00	0.00	4.99	5	24.63	-0.03	> 1.13	< 0.9dc	27.42	OK Fr <= Fr Limit
51718.82	11281.18	1969.00	2888.72	2891.32	40.26	48.91	20.00	4.54	2.60	6.85	2.38	0.00	0.00	4.98	5	24.60	0.24	> 1.13	< 0.9dc	27.76	OK Fr <= Fr Limit
51777.21	11222.79	1969.00	2887.30	2890.01	38.38	51.30	20.00	4.23	2.71	6.85	2.34	0.00	0.00	5.05	5	24.84	0.25	> 1.13	< 0.9dc	25.59	OK Fr <= Fr Limit
51845.04	11154.96	1969.00	2885.64	2888.48	36.60	53.80	20.00	3.94	2.84	6.85	2.30	0.00	0.00	5.14	5	25.09	0.10	> 1.13	< 0.9dc	23.64	OK Fr <= Fr Limit
51873.66	11126.34	1969.00	2884.94	2887.83	35.95	54.77	20.00	3.83	2.89	6.85	2.28	0.00	0.00	5.17	6	25.19	0.25	> 1.13	< 0.9dc	22.95	OK Fr <= Fr Limit
51883.66	11116.34	2005.00	2884.70	2887.71	35.01	57.27	20.00	3.65	3.01	6.93	2.26	0.00	0.00	5.28	6	25.43	0.28	> 1.13	< 0.9dc	22.05	OK Fr <= Fr Limit
51989.20	11010.80	2005.00	2882.12	2885.28	33.38	60.07	20.00	3.40	3.15	6.93	2.22	0.00	0.00	5.38	6	25.71	0.17	> 1.13	< 0.9dc	20.46	OK Fr <= Fr Limit
52068.82	10931.18	2005.00	2880.18	2883.42	32.47	61.75	20.00	3.26	3.24	6.93	2.20	0.00	0.00	5.44	6	25.88	4.78	> 1.13	< 0.9dc	19.61	OK Fr <= Fr Limit
52118.82	10881.18	2005.00	2878.96	2881.64	32.33	62.02	29.53	3.93	2.68	5.81	2.12	0.00	0.00	4.81	5	30.67	NA	> 1.13	< 0.9dc	18.91	OK Fr <= Fr Limit

WESTERN BELTWAY
SUMMERLIN PARKWAY TO CHEYENNE AVENUE
100 YEAR INITIAL PLAN DESIGN COMPUTATIONS AND STANDARDS CHECKS

IWBC-23.WB2

Stations		Q	Invert Elev.	W.S. Elev.	V	A	Tw	Fr	d	dc	Fb	Curve r	SE	Min. Ch. Depth	USE Ch. Depth	P	Delta P	Fr Check	Flow Depth Check	EGL Min. DEPTH	Fr Limiting Check
Plans (ft)	Channel (ft)	(cfs)	(ft)	(ft)	(ft/s)	(sq ft)	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)			(ft)	
52168.82	10831.18	2005.00	2878.84	2888.13	7.74	259.04	46.54	0.58	9.29	7.13	NA	0.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52189.23	10810.77	2005.00	2878.79	2888.00	7.85	255.41	46.23	0.59	9.21	7.13	NA	0.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52244.40	10755.60	2005.00	2878.65	2887.60	8.23	243.62	45.19	0.63	8.95	7.13	NA	0.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52284.05	10715.95	2005.00	2878.55	2887.24	8.64	232.06	44.18	0.67	8.69	7.13	NA	0.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52307.87	10692.13	2005.00	2878.49	2886.99	8.97	223.52	43.38	0.70	8.50	7.13	NA	250.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52329.87	10670.13	2005.00	2878.43	2886.69	9.41	213.07	42.42	0.74	8.25	7.13	NA	250.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52345.45	10654.55	2005.00	2878.39	2886.41	9.87	203.14	41.47	0.79	8.02	7.13	NA	250.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52355.94	10644.06	2005.00	2878.37	2886.15	10.35	193.72	40.54	0.84	7.79	7.13	NA	250.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52362.36	10637.64	2005.00	2878.35	2885.91	10.85	184.79	39.65	0.89	7.56	7.13	NA	250.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52365.87	10634.13	2005.00	2878.34	2885.68	11.38	176.19	38.77	0.94	7.34	7.13	NA	250.00	NA	NA	NA	NA	NA	NA	NA	NA	Subcritical
52366.83	10633.17	2005.00	2878.34	2885.47	11.94	167.92	37.92	1.00	7.13	7.13	NA	250.00	NA	NA	NA	NA	NA	NA	NA	NA	OK Fr <= Fr Limit

WESTERN BELTWAY
SUMMERLIN PARKWAY TO CHEYENNE AVENUE
INITIAL CONDITION - PROPOSED DESIGN DATA

IWBC-23.WB2

PLAN STATION	CHANNEL STATION	INVERT ELEV	FLOW DEPTH	W.S. ELEV	Q cfs	V fps	VH ft	EGL ft	dc ft	b ft	Z1	Z2	d1 ft	d2 ft	A ft	TW ft	P ft	R ft	EGL Min Depth	Y*	Nv	Fr	Fr Limit
52366.83	10633.17	2878.34	7.13	2885.47	2005	11.94	2.213	2887.682	7.129	10	2	33	6.98	0.15	167.92	37.92	41.22	4.07	9.34	0.71	0.27	1.00	2.00
52365.87	10634.13	2878.34	7.34	2885.68	2005	11.38	2.012	2887.696	7.129	10	2	33	7.19	0.15	176.19	38.77	42.17	4.18	9.36	0.73	0.27	0.94	2.00
52362.36	10637.64	2878.35	7.56	2885.91	2005	10.85	1.829	2887.742	7.129	10	2	33	7.41	0.15	184.79	39.65	43.15	4.28	9.39	0.76	0.27	0.89	2.00
52355.94	10644.06	2878.37	7.79	2886.15	2005	10.35	1.663	2887.817	7.129	10	2	33	7.64	0.15	193.72	40.54	44.15	4.39	9.45	0.78	0.26	0.84	2.00
52345.45	10654.55	2878.39	8.02	2886.41	2005	9.87	1.511	2887.922	7.129	10	2	33	7.87	0.15	203.14	41.47	45.19	4.50	9.53	0.80	0.26	0.79	2.00
52329.87	10670.13	2878.43	8.25	2886.69	2005	9.41	1.374	2888.062	7.129	10	2	33	8.10	0.15	213.07	42.42	46.25	4.61	9.63	0.83	0.25	0.74	2.00
52307.87	10692.13	2878.49	8.50	2886.99	2005	8.97	1.249	2888.235	7.129	10	2	33	8.35	0.15	223.52	43.38	47.33	4.72	9.75	0.85	0.25	0.70	2.00
52284.05	10715.95	2878.55	8.69	2887.24	2005	8.64	1.158	2888.402	7.129	10	2	33	8.54	0.15	232.06	44.18	48.21	4.81	9.85	0.87	0.24	0.67	2.00
52244.40	10755.60	2878.65	8.95	2887.60	2005	8.23	1.053	2888.650	7.129	10	2	33	8.80	0.15	243.62	45.19	49.35	4.94	10.00	0.89	0.24	0.63	2.00
52189.23	10810.77	2878.79	9.21	2888.00	2005	7.85	0.957	2888.953	7.129	10	2	33	9.06	0.15	255.41	46.23	50.51	5.06	10.16	0.92	0.23	0.59	2.00
52168.82	10831.18	2878.84	9.29	2888.13	2005	7.74	0.930	2889.056	7.129	10	2	33	9.14	0.15	259.04	46.54	50.86	5.09	10.22	0.93	0.23	0.58	2.00
52118.82	10881.18	2878.96	2.68	2881.64	2005	32.33	16.229	2897.872	5.807	20	2	33	2.38	0.30	62.02	29.53	30.67	2.02	18.91	0.13	0.53	3.93	2.00
52068.82	10931.18	2880.18	3.24	2883.42	2005	32.47	16.370	2899.788	6.934	20	0	33	2.94	0.30	61.75	20.00	25.88	2.39	19.61	0.16	0.50	3.26	1.99
51989.20	11010.80	2882.12	3.15	2885.28	2005	33.38	17.307	2902.583	6.934	20	0	33	2.85	0.30	60.07	20.00	25.71	2.34	20.46	0.16	0.51	3.40	1.97
51883.66	11116.34	2884.70	3.01	2887.71	2005	35.01	19.037	2906.750	6.934	20	0	33	2.71	0.30	57.27	20.00	25.43	2.25	22.05	0.15	0.51	3.65	1.95
51873.66	11126.34	2884.94	2.89	2887.83	1969	35.95	20.064	2907.893	6.853	20	0	33	2.59	0.30	54.77	20.00	25.19	2.17	22.95	0.14	0.52	3.83	1.93
51845.04	11154.96	2885.64	2.84	2888.48	1969	36.60	20.798	2909.277	6.853	20	0	33	2.54	0.30	53.80	20.00	25.09	2.14	23.64	0.14	0.52	3.94	1.93
51777.21	11222.79	2887.30	2.71	2890.01	1969	38.38	22.877	2912.886	6.853	20	0	33	2.41	0.30	51.30	20.00	24.84	2.07	25.59	0.14	0.52	4.23	1.91
51718.82	11281.18	2888.72	2.60	2891.32	1969	40.26	25.166	2916.482	6.853	20	0	33	2.30	0.30	48.91	20.00	24.60	1.99	27.76	0.13	0.53	4.54	1.89
51516.63	11483.37	2902.27	2.61	2904.88	1969	39.98	24.814	2929.692	6.853	20	0	33	2.31	0.30	49.25	20.00	24.63	2.00	27.42	0.13	0.53	4.49	1.89
51200.00	11800.00	2923.48	2.73	2926.21	1969	38.12	22.559	2948.772	6.853	20	0	33	2.43	0.30	51.65	20.00	24.87	2.08	25.29	0.14	0.52	4.18	1.91
50982.77	12017.23	2935.80	2.75	2938.55	1969	37.83	22.224	2960.776	6.853	20	0	33	2.45	0.30	52.05	20.00	24.91	2.09	24.98	0.14	0.52	4.14	1.91
50761.13	12238.87	2948.37	2.81	2951.17	1969	37.08	21.351	2972.524	6.853	20	0	33	2.50	0.30	53.10	20.00	25.02	2.12	24.15	0.14	0.52	4.01	1.92
50555.47	12444.53	2960.03	2.94	2962.97	1969	35.36	19.410	2982.375	6.853	20	0	33	2.63	0.30	55.68	20.00	25.28	2.20	22.34	0.15	0.52	3.74	1.94
50500.00	12500.00	2963.17	3.00	2966.17	1969	34.61	18.600	2984.765	6.853	20	0	33	2.69	0.30	56.89	20.00	25.40	2.24	21.59	0.15	0.51	3.62	1.95
50480.00	12520.00	2964.30	3.02	2967.32	1969	34.30	18.266	2985.586	6.853	20	0	33	2.72	0.30	57.41	20.00	25.45	2.26	21.29	0.15	0.51	3.57	1.95
50453.87	12546.13	2965.79	3.06	2968.85	1969	33.84	17.778	2986.628	6.853	20	0	33	2.76	0.30	58.19	20.00	25.53	2.28	20.84	0.15	0.51	3.50	1.96
50443.87	12556.13	2966.35	2.59	2968.94	1769	36.33	20.496	2989.431	6.391	20	0	33	2.28	0.30	48.69	20.00	24.58	1.98	23.08	0.13	0.53	4.11	1.89
50289.91	12710.09	2975.08	2.62	2977.70	1769	35.76	19.853	2997.557	6.391	20	0	33	2.32	0.30	49.47	20.00	24.66	2.01	22.48	0.13	0.53	4.01	1.89
50259.91	12740.09	2976.78	2.63	2979.41	1769	35.61	19.687	2999.101	6.391	20	2	33	2.33	0.30	49.68	29.34	30.45	1.63	22.32	0.13	0.53	4.83	2.00
50209.91	12790.09	2979.62	2.23	2981.85	1769	36.13	20.266	3002.113	5.422	20	2	33	1.93	0.30	48.96	27.71	28.63	1.71	22.49	0.11	0.55	4.79	2.00
49876.12	13123.88	3001.31	2.23	3003.54	1769	36.13	20.266	3023.807	5.422	20	2	33	1.93	0.30	48.96	27.71	28.63	1.71	22.50	0.11	0.55	4.79	2.00
49466.44	13533.56	3027.94	2.25	3030.19	1769	35.71	19.804	3049.991	5.422	20	2	33	1.95	0.30	49.54	27.79	28.72	1.73	22.05	0.11	0.54	4.72	2.00
49270.51	13729.49	3040.68	2.29	3042.97	1769	34.93	18.948	3061.915	5.422	20	2	33	1.99	0.30	50.64	27.95	28.90	1.75	21.24	0.11	0.54	4.58	2.00
49260.51	13739.49	3041.33	2.19	3043.52	1716	35.77	19.869	3063.390	5.331	20	2	33	1.89	0.30	47.97	27.56	28.47	1.69	22.06	0.11	0.55	4.78	2.00
47853.95	15146.05	3132.76	2.19	3134.95	1716	35.77	19.869	3154.815	5.331	20	2	33	1.89	0.30	47.97	27.56	28.47	1.69	22.05	0.11	0.55	4.78	2.00
47453.86	15546.14	3158.76	2.22	3160.98	1716	35.28	19.326	3180.301	5.331	20	2	33	1.91	0.30	48.64	27.66	28.57	1.70	21.54	0.11	0.55	4.69	2.00
47299.82	15700.18	3168.77	2.25	3171.02	1716	34.67	18.660	3189.679	5.331	20	2	33	1.95	0.30	49.50	27.78	28.71	1.72	20.91	0.11	0.54	4.58	2.00
47133.19	15866.81	3179.60	2.33	3181.94	1716	33.05	16.964	3198.899	5.331	20	2	33	2.03	0.30	51.92	28.13	29.10	1.78	19.30	0.12	0.54	4.29	2.00
47047.44	15952.56	3185.18	2.42	3187.60	1716	31.51	15.422	3203.021	5.331	20	2	33	2.12	0.30	54.46	28.49	29.50	1.85	17.84	0.12	0.54	4.02	2.00
46991.05	16008.95	3188.84	2.51	3191.36	1716	30.05	14.020	3205.376	5.331	20	2	33	2.21	0.30	57.10	28.86	29.91	1.91	16.54	0.13	0.53	3.77	2.00
46950.00	16050.00	3191.51	2.61	3194.12	1716	28.65	12.745	3206.866	5.331	20	2	33	2.31	0.30	59.90	29.24	30.34	1.97	15.36	0.13	0.53	3.53	2.00

WESTERN BELTWAY
SUMMERLIN PARKWAY TO CHEYENNE AVENUE
INITIAL CONDITION - PROPOSED DESIGN DATA

IWBC-23.WB2

PLAN STATION	CHANNEL STATION	INVERT ELEV	FLOW DEPTH	W.S. ELEV	Q cfs	V fps	VH ft	EGL ft	dc ft	b ft	Z1	Z2	d1 ft	d2 ft	A ft	TW ft	P ft	R ft	EGL Min Depth	Y*	Nv	Fr	Fr Limit
46900.00	16100.00	3193.37	2.63	3196.00	1716	28.42	12.539	3208.537	5.331	20	2	33	2.33	0.30	60.38	29.31	30.42	1.98	15.17	0.13	0.53	3.49	2.00
46845.64	16154.36	3195.39	2.65	3198.04	1716	28.09	12.252	3210.296	5.331	20	2	33	2.35	0.30	61.09	29.40	30.52	2.00	14.91	0.13	0.53	3.44	2.00
46708.92	16291.08	3200.48	2.75	3203.23	1716	26.78	11.138	3214.370	5.331	20	2	33	2.45	0.30	64.08	29.81	30.97	2.07	13.89	0.14	0.52	3.22	2.00
46628.37	16371.63	3203.48	2.86	3206.33	1716	25.54	10.126	3216.460	5.331	20	2	33	2.56	0.30	67.19	30.22	31.44	2.14	12.98	0.14	0.52	3.02	2.00
46572.87	16427.13	3205.54	2.96	3208.51	1716	24.35	9.205	3217.712	5.331	20	2	33	2.66	0.30	70.47	30.66	31.92	2.21	12.17	0.15	0.51	2.83	2.00
46531.52	16468.48	3207.08	3.08	3210.16	1716	23.21	8.368	3218.525	5.331	20	2	33	2.77	0.30	73.93	31.10	32.42	2.28	11.45	0.15	0.51	2.65	2.00
46499.38	16500.62	3208.28	3.19	3211.47	1716	22.13	7.608	3219.076	5.331	20	2	33	2.89	0.30	77.54	31.56	32.93	2.35	10.80	0.16	0.51	2.49	2.00
46473.70	16526.30	3209.23	3.31	3212.54	1716	21.10	6.916	3219.458	5.331	20	2	33	3.01	0.30	81.33	32.04	33.47	2.43	10.23	0.17	0.50	2.34	2.00
46452.83	16547.17	3210.01	3.43	3213.44	1716	20.12	6.287	3219.730	5.331	20	2	33	3.13	0.30	85.29	32.53	34.02	2.51	9.72	0.17	0.50	2.19	2.00
46442.83	16557.17	3210.38	3.41	3213.79	1692	20.01	6.216	3220.007	5.291	20	2	33	3.11	0.30	84.56	32.44	33.92	2.49	9.63	0.17	0.50	2.19	2.00
46438.94	16561.06	3210.52	3.44	3213.96	1692	19.80	6.090	3220.051	5.291	20	2	33	3.14	0.30	85.45	32.55	34.04	2.51	9.53	0.17	0.50	2.16	2.00
46422.65	16577.35	3211.13	3.56	3214.69	1692	18.88	5.536	3220.230	5.291	20	2	33	3.26	0.30	89.62	33.06	34.61	2.59	9.10	0.18	0.49	2.02	2.00
46409.16	16590.84	3211.63	3.70	3215.33	1692	18.00	5.033	3220.359	5.291	20	2	33	3.39	0.30	94.00	33.58	35.19	2.67	8.73	0.18	0.49	1.90	2.00
46398.00	16602.00	3212.05	3.83	3215.88	1692	17.17	4.575	3220.452	5.291	20	2	33	3.53	0.30	98.54	34.12	35.80	2.75	8.40	0.19	0.48	1.78	2.00
46388.76	16611.24	3212.39	3.97	3216.36	1692	16.37	4.159	3220.519	5.291	20	2	33	3.67	0.30	103.36	34.68	36.43	2.84	8.13	0.20	0.48	1.67	2.00
46381.15	16618.85	3212.67	4.12	3216.79	1692	15.60	3.781	3220.567	5.291	20	2	33	3.81	0.30	108.46	35.26	37.07	2.93	7.90	0.21	0.47	1.57	2.00
46375.00	16625.00	3212.90	4.26	3217.16	1692	14.88	3.437	3220.601	5.291	20	2	33	3.96	0.30	113.71	35.86	37.74	3.01	7.70	0.21	0.47	1.47	2.00
46268.78	16731.22	3213.43	4.24	3217.67	1692	14.98	3.485	3221.157	5.291	20	2	33	3.94	0.30	112.95	35.77	37.64	3.00	7.73	0.21	0.47	1.49	2.00
46240.61	16759.39	3213.58	4.24	3217.82	1692	14.98	3.483	3221.306	5.291	20	2	33	3.94	0.30	112.95	35.77	37.64	3.00	7.73	0.21	0.47	1.49	2.00
46230.61	16769.39	3213.63	4.20	3217.83	1685	15.14	3.562	3221.387	5.278	20	2	33	3.89	0.30	111.29	35.58	37.43	2.97	7.76	0.21	0.47	1.51	2.00
46090.65	16909.35	3214.33	4.13	3218.46	1685	15.48	3.720	3222.175	5.278	20	2	33	3.83	0.30	108.85	35.31	37.12	2.93	7.85	0.21	0.47	1.56	2.00
45907.88	17092.12	3215.24	3.98	3219.22	1685	16.23	4.092	3223.315	5.278	20	2	33	3.68	0.30	103.82	34.73	36.48	2.85	8.08	0.20	0.48	1.66	2.00
45897.88	17102.12	3215.29	3.87	3219.16	1664	16.66	4.308	3223.468	5.242	20	2	33	3.57	0.30	99.88	34.28	35.97	2.78	8.18	0.19	0.48	1.72	2.00
45829.60	17170.40	3215.63	3.79	3219.42	1664	17.15	4.567	3223.984	5.242	20	2	33	3.49	0.30	97.03	33.94	35.60	2.73	8.35	0.19	0.48	1.79	2.00
45735.91	17264.09	3216.10	3.65	3219.75	1664	17.99	5.023	3224.775	5.242	20	2	33	3.35	0.30	92.50	33.41	35.00	2.64	8.68	0.18	0.49	1.91	2.00
45685.91	17314.09	3216.35	5.99	3222.34	1664	13.89	2.994	3225.336	5.992	21	0	33	5.68	0.32	119.80	21.00	32.36	3.70	8.99	0.29	0.42	1.03	2.00
45668.69	17331.31	3216.44	6.07	3222.50	1664	13.72	2.922	3225.423	5.992	21	0	33	5.75	0.32	121.28	21.00	32.51	3.73	8.98	0.29	0.42	1.01	2.00
45285.91	17714.09	3218.35	6.07	3224.42	1664	13.72	2.922	3227.337	5.992	21	0	33	5.75	0.32	121.28	21.00	32.51	3.73	8.99	0.29	0.42	1.01	2.00
45235.91	17764.09	3219.10	8.06	3227.16	1664	5.98	0.555	3227.710	5.242	20	2	33	7.75	0.30	278.26	51.02	54.69	5.09	8.61	0.40	0.37	0.45	2.00
45191.47	17808.53	3219.32	7.80	3227.12	1664	6.27	0.610	3227.729	5.242	20	2	33	7.50	0.30	265.39	49.99	53.54	4.96	8.41	0.39	0.37	0.48	2.00
45149.19	17850.81	3219.53	7.55	3227.08	1664	6.58	0.671	3227.751	5.242	20	2	33	7.25	0.30	252.89	48.99	52.42	4.82	8.22	0.38	0.38	0.51	2.00
45109.45	17890.55	3219.73	7.31	3227.04	1664	6.90	0.738	3227.773	5.242	20	2	33	7.01	0.30	241.16	48.02	51.34	4.70	8.04	0.37	0.39	0.54	2.00
45071.90	17928.10	3219.92	7.07	3226.99	1664	7.23	0.812	3227.798	5.242	20	2	33	6.77	0.30	230.15	47.08	50.29	4.58	7.88	0.35	0.39	0.58	2.00
45049.05	17950.95	3220.03	6.92	3226.95	1664	7.46	0.863	3227.815	5.242	20	2	33	6.62	0.30	223.06	46.49	49.62	4.49	7.78	0.35	0.39	0.60	2.00
45039.05	17960.95	3220.08	7.31	3227.39	1280	5.31	0.437	3227.822	4.531	20	2	33	7.00	0.30	241.05	48.02	51.34	4.70	7.74	0.37	0.39	0.42	2.00
44997.42	18002.58	3220.29	7.07	3227.36	1280	5.57	0.481	3227.838	4.531	20	2	33	6.77	0.30	229.80	47.07	50.28	4.57	7.55	0.35	0.39	0.45	2.00
44957.92	18042.08	3220.49	6.84	3227.33	1280	5.84	0.529	3227.856	4.531	20	2	33	6.54	0.30	219.18	46.16	49.25	4.45	7.37	0.34	0.40	0.47	2.00
44920.04	18079.96	3220.68	6.62	3227.29	1280	6.12	0.582	3227.875	4.531	20	2	33	6.31	0.30	209.15	45.26	48.25	4.33	7.20	0.33	0.40	0.50	2.00
44884.31	18115.69	3220.86	6.40	3227.26	1280	6.42	0.640	3227.895	4.531	20	2	33	6.10	0.30	199.38	44.39	47.28	4.22	7.03	0.32	0.41	0.53	2.00
44867.86	18132.14	3220.94	6.30	3227.24	1280	6.57	0.670	3227.906	4.531	20	2	33	6.00	0.30	194.82	43.98	46.82	4.16	6.97	0.31	0.41	0.55	2.00
44834.84	18165.16	3221.11	6.09	3227.19	1280	6.89	0.737	3227.929	4.531	20	2	33	5.79	0.30	185.78	43.15	45.89	4.05	6.82	0.30	0.41	0.59	2.00
44804.27	18195.73	3221.26	5.89	3227.14	1280	7.23	0.811	3227.954	4.531	20	2	33	5.58	0.30	177.04	42.34	44.99	3.94	6.69	0.29	0.42	0.62	2.00

WESTERN BELTWAY
SUMMERLIN PARKWAY TO CHEYENNE AVENUE
INITIAL CONDITION - PROPOSED DESIGN DATA

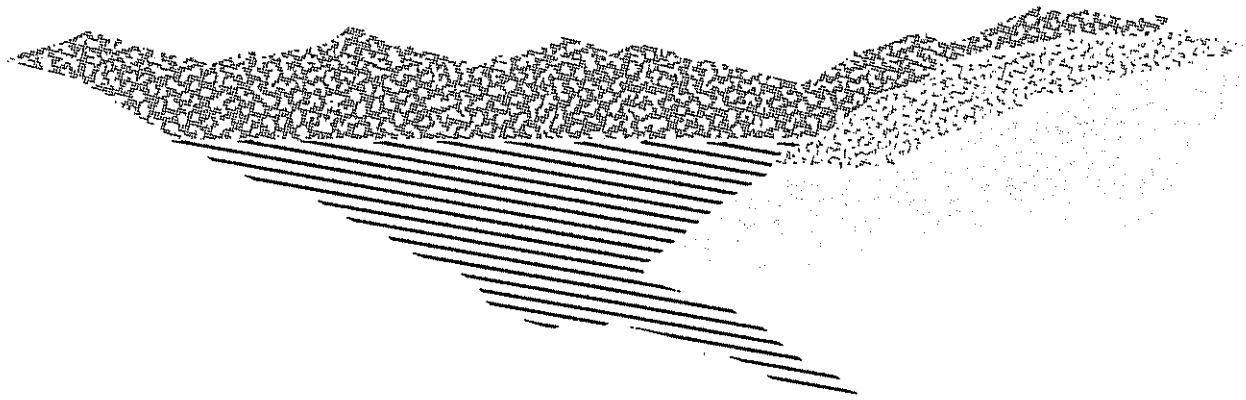
IWBC-23.WB2

PLAN STATION	CHANNEL STATION	INVERT ELEV	FLOW DEPTH	W.S. ELEV	Q cfs	V fps	VH ft	EGL ft	dc ft	b ft	Z1	Z2	d1 ft	d2 ft	A ft	TW ft	P ft	R ft	EGL Min Depth	Y*	Nv	Fr	Fr Limit
44776.12	18223.88	3221.40	5.69	3227.09	1280	7.58	0.892	3227.980	4.531	20	2	33	5.39	0.30	168.87	41.56	44.11	3.83	6.58	0.28	0.42	0.66	2.00
44750.37	18249.63	3221.53	5.50	3227.03	1280	7.95	0.981	3228.006	4.531	20	2	33	5.20	0.30	161.01	40.79	43.26	3.72	6.48	0.27	0.43	0.71	2.00
44742.84	18257.16	3221.57	5.44	3227.01	1280	8.07	1.011	3228.017	4.531	20	2	33	5.14	0.30	158.61	40.56	43.00	3.69	6.45	0.27	0.43	0.72	2.00
44742.84	18257.16	3221.57	3.72	3225.28	1280	13.52	2.837	3228.119	4.531	20	2	33	3.42	0.30	94.67	33.67	35.29	2.68	6.55	0.19	0.49	1.42	2.00
44663.83	18336.17	3221.96	3.72	3225.68	1280	13.52	2.837	3228.514	4.531	20	2	33	3.42	0.30	94.67	33.67	35.29	2.68	6.55	0.19	0.49	1.42	2.00
44347.89	18652.11	3223.54	3.72	3227.26	1280	13.52	2.837	3230.092	4.531	20	2	33	3.42	0.30	94.67	33.67	35.29	2.68	6.55	0.19	0.49	1.42	2.00
43965.05	19034.95	3225.45	3.85	3229.30	1280	12.89	2.581	3231.883	4.531	20	2	33	3.55	0.30	99.30	34.21	35.89	2.77	6.43	0.19	0.48	1.33	2.00
43960.00	19040.00	3225.48	3.10	3228.58	1093	14.66	3.336	3231.912	4.146	20	2	33	2.80	0.30	74.56	31.18	32.51	2.29	6.43	0.15	0.51	1.67	2.00
43956.73	19043.27	3225.64	3.18	3228.83	1093	14.15	3.109	3231.934	4.146	20	2	33	2.88	0.30	77.24	31.52	32.89	2.35	6.29	0.16	0.51	1.59	2.00
43953.00	19047.00	3225.83	3.30	3229.13	1093	13.49	2.826	3231.956	4.146	20	2	33	3.00	0.30	81.02	32.00	33.43	2.42	6.13	0.17	0.50	1.50	2.00
43950.00	19050.00	3225.98	3.42	3229.40	1093	12.86	2.569	3231.972	4.146	20	2	33	3.12	0.30	84.99	32.49	33.98	2.50	5.99	0.17	0.50	1.40	2.00
43930.11	19069.89	3226.08	3.42	3229.50	1093	12.86	2.567	3232.071	4.146	20	2	33	3.12	0.30	84.99	32.50	33.98	2.50	5.99	0.17	0.50	1.40	2.00
43737.08	19262.92	3227.04	3.43	3230.47	1093	12.83	2.557	3233.027	4.146	20	2	33	3.13	0.30	85.19	32.52	34.01	2.51	5.99	0.17	0.50	1.40	2.00
43521.00	19479.00	3228.12	3.47	3231.59	1093	12.64	2.480	3234.069	4.146	20	2	33	3.17	0.30	86.47	32.68	34.18	2.53	5.95	0.17	0.49	1.37	2.00
43511.00	19489.00	3228.62	3.21	3231.83	967	12.40	2.386	3234.212	3.869	20	2	33	2.91	0.30	77.98	31.62	33.01	2.36	5.59	0.16	0.50	1.39	2.00
43315.25	19684.75	3229.60	3.23	3232.83	967	12.29	2.347	3235.174	3.869	20	2	33	2.93	0.30	78.68	31.70	33.09	2.38	5.57	0.16	0.50	1.38	2.00
43115.12	19884.88	3230.60	3.35	3233.95	967	11.72	2.133	3236.082	3.869	20	2	33	3.05	0.30	82.51	32.18	33.63	2.45	5.48	0.17	0.50	1.29	2.00
43048.44	19951.56	3230.94	3.47	3234.41	967	11.18	1.940	3236.347	3.869	20	2	33	3.17	0.30	86.49	32.68	34.19	2.53	5.41	0.17	0.49	1.21	2.00
43017.38	19982.62	3231.09	3.60	3234.69	967	10.66	1.763	3236.454	3.869	20	2	33	3.30	0.30	90.71	33.19	34.76	2.61	5.36	0.18	0.49	1.14	2.00
43003.71	19996.29	3231.16	3.73	3234.89	967	10.16	1.603	3236.495	3.869	20	2	33	3.43	0.30	95.18	33.72	35.35	2.69	5.34	0.19	0.49	1.07	2.00
43000.00	20000.00	3231.18	3.87	3235.05	967	9.68	1.456	3236.505	3.869	20	2	33	3.57	0.30	99.90	34.28	35.97	2.78	5.33	0.19	0.48	1.00	2.00

CCRFCD Hydrologic Criteria and Drainage Design Manual

CLARK COUNTY

REGIONAL FLOOD CONTROL DISTRICT



HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

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704.2.1 Natural Channel Morphology and Response

The hydraulic and geomorphic response of channels to imposed natural and human-induced changes can be evaluated utilizing different relationships, methods, and levels of analysis. In all cases, it is of value to initially analyze the behavior and response of a system utilizing qualitative geomorphic and hydraulic response relationships. These methods of analysis are simple to apply and even with the most sophisticated methods of analysis, this geomorphic and hydraulic analysis provides a valuable check on the final quantitative results.

704.2.1.1 Slope

The slope of the energy gradient plays an extremely important role in the hydraulics of natural channels. Slope is utilized in velocity equations such as Manning's equation to estimate velocity. It is also utilized in the tractive force equation to estimate the tractive force exerted on the bed and banks of open channels. A long reach of natural channel may be subjected to a general lowering or raising of the bed level over a long period of time due to changing incoming sediment supply caused by activities such as urbanization, construction of a detention pond, etc. An equilibrium channel slope is defined as the slope at which the channel's sediment transporting capacity is equal to the incoming sediment supply.

That is, $(Q_s)_{in} = (Q_s)_{out}$

Where, $(Q_s)_{in}$ = Supply Rate of Sediment into the Channel Reach

$(Q_s)_{out}$ = Supply Rate of Sediment Out of the Channel Reach.

Under this condition, the channel neither aggrades nor degrades.

The equilibrium channel slope is used to predict the wash response to human-induced changes. The evaluation will provide an understanding of what the long-term effects of such measures as channelization or reducing sediment supply due to urbanization will have on the channel profile.

704.2.1.2 - Degradation and Aggradation

A long reach of channel may be subjected to a general degradation or aggradation of the bed level over a long period of time. Degradation and aggradation must be accurately anticipated; otherwise foundation depths may be inadequate or excessive depending on the magnitude of degradation or aggradation.

The basic principle of degradation and aggradation is to compare in a reach, the sediment supply and the sediment transport. When sediment supply is

less than sediment transport, the flow will remove additional sediment from the channel bed and banks to eliminate the deficit. This results in degradation of the channel bed and possible failure of the banks. If the supply entering the reach is greater than the capacity, the excess supply will be deposited. Utilization of a sediment routing model (e.g., QUASED by Simons, Li & Associates; HEC-6 by USACE; FLUVIAL by Howard Chang; ONETWOD by Y. H. Chen; see FERC (1992) for reference) of the stream system is the best method of estimating the general degradation and aggradation on a reach by reach basis. However, less elaborate methods using rigid bed hydraulic and sediment transport calculations may be used to estimate the unbalance between sediment transport capacity and sediment supply between adjacent reaches.

The determination of sediment transport as presented in this design standard is based on easy to apply power relationships between sediment transport rate and velocity and depth as follows:

$$q_s = C_1 (Y)^{C_2} (V)^{C_3} \qquad (704)$$

where q_s = Sediment Transport Rate in cfs/ft of Width

Y = Flow Depth in ft

V = Flow Velocity in fps

C_1, C_2, C_3 = Constants

Values of C_1, C_2, and C_3 for sand materials are presented in **Table 703A** with limitations noted. These power relations were developed from a computer solution of the Meyer-Peter and Muller bedload transport equation and Einstein's integration of the suspended bed-material discharge (SIMONS, LI & ASSOCIATES, 1982). For flow conditions within the ranges outlined in **Table 703B**, the regression equation should be accurate within 10 percent. This simplified equation with the recommended values for C_1, C_2 and C_3 will provide the design engineer with a reasonable first-order estimate of sediment transport as long as it is used within the specified limits of particle size and flow velocity. The final sediment transport rate should be determined for a variety of flow conditions and sediment sizes likely to occur in the study reach.

Determination of the equilibrium channel slope is a key to determining the stable channel condition. **Equation 704** can be utilized to determine the equilibrium channel slope by combining that with Manning's equation:

$$q = \frac{1.486}{n} (R)^{5/3} (S_e)^{1/2} \quad (705)$$

where: q = Flow Discharge Per Unit Width in cfs/ft

n = Manning's Roughness Coefficient

R = Hydraulic Radius in ft, Approximated by Y for Wide Channel

S_e = Energy Slope, in ft/ft

Substituting Manning's equation in **Equation 704** and solving for depth gives:

$$q_s = C_1 (q)^{C_3} [\frac{qn}{1.486 S_e^{1/2}}]^{3/5(C_2 - C_3)} \quad (706)$$

Rearranging and solving for slope yields:

$$S_e = (\frac{C_1}{q_s})^{\frac{10}{3(C_2 - C_3)}} (q)^{\frac{2(3C_2 + 2C_3)}{3(C_2 - C_3)}} (\frac{n}{1.486})^2 \quad (707)$$

For a known upstream supply, channel roughness and sediment transport relationship, the above equation reduces to a simple function of unit discharge. This equation can be used to estimate long-term degradation and aggradation.

The equilibrium slope for areas outside of Clark County is typically determined for the more frequent flood flows such as the minor storm event because this event generally dominates the long-term degradation or aggradation process. Then, in addition to the prediction of the long-term equilibrium channel slope, degradation or aggradation from a rare flood event such as the major storm event is also evaluated because the maximum short-term degradation or aggradation usually will occur during the rare storm. However, due to the minimal number of rainstorms which occur each year in the Clark County area, the maximum long term degradation or aggradation is expected to be mainly caused by only the major type storms. Similarly, the minor type storms are expected to only produce minor changes in degradation or aggradation in the Clark County area. Therefore, the major storm event (100-year) shall be used for analysis of the equilibrium slope and provide an unobstructed flow path for events greater than the design discharge.

704.2.1.3 - Anti-Dune Trough Depth

Anti-dunes are bed forms in the shape of dunes which move in an upstream rather than a downstream direction within the channel; hence the term "anti-dunes." They form as trains of waves that build up from a plane bed and a plane water surface. Anti-dunes can form either during transitional flow, between sub-critical and super-critical flow, or during super-critical flow. The wave length is proportional to the velocity of flow. The corresponding surface waves, which are in phase with the anti-dunes, tend to break like surf when the waves reach a height approximately equal to 0.14 times the wave length. A relationship between average channel velocity, V, and anti-dune trough depth, Z_a can therefore be developed (SIMONS, LI & ASSOCIATES, 1982). This relationship is:

$$Z_a = \frac{1}{2}(0.14)\frac{2\pi V^2}{g} = 0.0137 V^2 \qquad (708)$$

A restriction on the above equation is that the anti-dune trough depth can never exceed one-half the depth of flow. Therefore, if the computed depth of Z_a obtained by using the above equation exceeds one-half of the depth of flow, the anti-dune trough depth should then be taken as equal to one-half the depth of flow.

704.2.1.4 - Bend Scour

Bend scour normally occurs along the outside of bends, and is caused by spiral, transverse currents which form within the flow as the water moves around the bend. Presently, there is no single procedure which will consistently and accurately predict bend scour over a wide range of hydraulic conditions. However, the following relationship has been developed by Zeller for estimating bend scour in sand-bed channels based upon the assumption of the maintenance of constant stream power within the channel bend (SIMONS, LI & ASSOCIATES, 1989):

$$Z_{bs} = \frac{0.0685\ Y_{MAX} V^{0.8}}{Y_h^{0.4}\ S_e^{0.5}} \left[2.1\left[\frac{Sin^2(\alpha/2)}{Cos\,\alpha}\right]^{0.2} - 1\right] \qquad (709)$$

where: Z_{bs} = Bend-Scour Component of Total Scour Depth, in ft;

= 0, When $r_c / T \geq 10.0$, or $\alpha \leq 17.8$ degrees

= Computed Value, When $0.5 < r_c / T < 10.0$, or $17.8 < \alpha < 60$ degrees

= Computed Value, When $r_c / T \leq 0.5$, or $\alpha > 60°$

V = Average Velocity of Flow Immediately Upstream of Bend, in fps

Y_{MAX} = Maximum Depth of Flow Immediately Upstream of Bend; in ft

Y_h = Hydraulic Depth of Flow Immediately Upstream of Bend, in ft (Hydraulic Depth = $\frac{\text{Flow Area}}{\text{Flow Top Width}}$)

S_e = Energy Slope Immediately Upstream of Bend (or Bed Slope for Uniform-Flow Conditions), in ft/ft; and

α = Angle Formed by the Projection of the Channel Centerline From the Point of Curvature to a Point Which Meets a Line Tangent to the Outer Bank of the Channel, in Degrees (see **Figure 703A**).

Mathematically, it can be shown that, for a simple circular curve, the following relationship exists between α and the ratio of the centerline radius of curvature, r_c, to channel top width, T:

$$\frac{r_c}{T} = \frac{Cos\,\alpha}{4\,Sin^2(\alpha/2)} \qquad (710)$$

If the bend deviates significantly from a simple circular curve, the curve should be divided into a series of circular curves, and the bend scour computed for each segment should be based upon the angle, α, applicable to that segment.

The above two equations can be applied to obtain an approximation of the scour depth that can be expected in a bend during a specific water discharge. The impact that other simultaneously occurring phenomena such as sand waves, local scour, long-term degradation, etc., might have upon bend scour is not known for certain, given the present state of the art. Therefore, in order that the maximum scour in a bend not be underestimated, it is recommended that bend scour be considered as an independent channel adjustment that should be added to those adjustments computed for long-term degradation, contraction, and sand-wave troughs.

The longitudinal extent of the bend-scour component is as difficult to quantify as the vertical extent. Rozovskii developed an expression for predicting the distance from the end of a bend at which the secondary currents will have decayed to a negligible magnitude. This relationship, in a simplified form, can be expressed as:

$$X = \frac{0.6}{n} Y^{1.17} \qquad (711)$$

where: X = Distance From the End of Channel Curvature (Point of Tangency, PT) to the Downstream Point at Which Secondary Currents Have Dissipated in ft

n = Manning's Roughness Coefficient

Y = Depth of Flow (to be Conservative, Use Maximum Depth of Flow, Exclusive of Scour, Within the Bend) in ft

The above equation should be used for determining the distance downstream of a curve that secondary currents will continue to be effective in producing bend scour. As a conservative estimate of the longitudinal extent of bend scour, both through and downstream of the curve, it would be advisable to consider bend scour as commencing at the upstream point of curvature, PC, and extending a distance, X, (computed with the above equation) beyond the downstream point of tangency, PT.

704.2.1.5 - Contraction Scour

Contraction scour occurs when the flow area is contracted by embankments, channelization, bridges and accumulation of debris. Scour at contractions occurs because the flow area becomes smaller than the normal stream and average velocity and bed shear stress increase. Hence, there is an increase in stream power at the contraction and more bed material is transported through the contracted section than is transported into the section. As bed level is lowered, banks erode, velocity decreases, shear stress decreases, and equilibrium is restored when the transport rate of sediment through the contracted section is equal to the incoming rate.

There are two forms of contraction scour that can occur depending on how much bed material is being transported upstream of the contraction reach. The two types of contraction scour are called live-bed contraction scour and clear-water contraction scour. Live-bed contraction scour occurs when bed

material is already being transported into the contracted section from upstream of the approach section (before the contraction reach). Clear-water contraction scour occurs when the bed material sediment transport in the uncontracted approach section is negligible or less than the carrying capacity of the flow.

To determine if the flow upstream is transporting bed material (i.e., live-bed contraction scour), a critical velocity for beginning of motion, V_c, (for the D_{50} size of bed material) can be calculated and compared with the mean velocity, V, of the flow in the main channel or overbank area upstream of the contraction reach. If the critical velocity of the bed material is greater than the mean velocity at the approach section, $V_c > V$, then clear-water contraction scour is assumed. If the critical velocity of the bed material is less than the mean velocity at the approach section, $V_c < V$, then live-bed contraction scour is assumed. The following equation by LAURSEN (1963) can be used to calculate the critical velocity:

$$V_c = 10.95\ Y^{\frac{1}{6}}\ d_{50}^{\frac{1}{3}} \tag{712}$$

where V_c = Critical Velocity Above Which Material of Size d_{50} and Smaller Will Be Transported, in fps

Y = Average Depth of Flow in the Main Channel or Overbank Area at the Approach Section, in ft

d_{50} = Bed Material Particle Size in a Mixture of Which 50 percent are Smaller, in ft

(a) Live-Bed Contraction Scour

The Hydraulic Engineering Circular No. 18 (HEC No. 18, FHWA, 1995) publication recommends using a modified version of LAURSEN's (1960) live-bed scour equation:

$$Y_2 = Y_1 \left[\frac{Q_2}{Q_1}\right]^{\frac{6}{7}} \left[\frac{W_1}{W_2}\right]^{K_1} \tag{713}$$

$$Z_{cs} = Y_2 - Y_o \tag{714}$$

where: Z_{cs} = Average Depth of Contraction Scour, in ft

Y_2 = Average Depth After Scour in the Contracted Section, in ft

Y_1 = Average Depth in the Main Channel or Floodplain at the Approach Section, in ft

Y_o = Average Depth in the Main Channel or Floodplain at the Contracted Section Before Scour, in ft

Q_1 = Flow in the Main Channel or Floodplain at the Approach Section, Which is Transporting Sediment, in cfs

Q_2 = Flow in the main channel or floodplain at the contracted section, which is transporting sediment, in cfs, (Q_2 is greater than Q_1 approximately by the amount of flow blocked by the structure causing channel contraction).

W_1 = Top Width of the Active Flow Area at the Approach Section

W_2 = Top Width of the Active Flow Area at the Contracted Section

K_1 = Exponent for Mode of Bed Material Transport

(1) $V_*/\omega < 0.5$, $K_1 = 0.59$: Mostly Contact Bed Material Discharge

(2) $V_*/\omega = 0.50$ to 2.0, $K_1 = 0.64$: Some Suspended Bed Material Discharge

(3) $V_*/\omega > 2.0$, $K_1 = 0.59$: Mostly Contact Bed Material Discharge

V_* = $(gY_1S_e)^{1/2}$, Shear Velocity in the Main Channel or Floodplain at the Approach Section, in fps

ω = Fall Velocity of Bed Material Based on d_{50}, in fps
(See Stokes Equation, Page 73-77, Fluvial Processes in River Engineering, H. CHANG, 1998)

g = Acceleration of Gravity, in ft/sec^2

S_e = Slope of the Energy Grade Line at the Approach Section in ft/ft

(b) Clear-Water Contraction Scour

The recommended clear-water contraction scour equation by the HEC No. 18 publication is an equation based on research from LAURSEN (1963):

$$Y_2 = \left[\frac{Q_2^{\,2}}{C d_m^{\,2/3} W_2^{\,2}}\right]^{3/7} \qquad (715)$$

$$Z_{cs} = Y_2 - Y_o \qquad (716)$$

Where: d_m = Diameter of the Smallest Non-Transportable Particle in the Bed Material (1.25 d_{50}) in the Contracted Section, in ft

d_{50} = Median Diameter of the Bed Material, in ft

C = 120 for English Units (40 for Metric)

704.2.1.6 - Local Scour

Local scour occurs in the bed at embankments due to the actions of vortex (flow jets) induced by obstruction of the flow. The basic mechanism causing local scour are flow jets which result from the backup of water on the upstream edge of the embankment and piers and subsequent acceleration of this flow around the nose of the embankment. The action of the jet is to erode bed materials away from the base region. If the transport rate of sediment away from the local region is greater than the transport rate into the region, a scour hole develops. As the depth is increased, the strength of the flow jet and the sediment transport rate is reduced, equilibrium is re-established and scouring ceases.

The depth of scour varies with time because sediment transported into the scour hole from upstream varies depending upon the upstream sediment load. The mean scour depth between the oscillation of minimum and maximum scour depths is referred to as the equilibrium scour depth.

(a) Local Scour at Abutments

Local scour occurs at abutments when the abutment obstructs the flow. The obstruction of the flow forms a horizontal vortex, starting at the upstream end of the abutment and running along the toe of the abutment, and forms a vertical wake vortex at the downstream end of the abutment.

The HEC No. 18 report recommends two equations for the computation of live-bed abutment scour. When the wetted embankment length, L', divided by the approach flow depth, Y_1, is greater than 25, the HEC No. 18 report suggests using the HIRE equation (RICHARDSON, 1990). When the wetted embankment length divided by the approach depth is less than or equal to 25, the HEC No. 18 report suggests using an equation by Froehlich (FROEHLICH, 1989).

The HIRE equation is based on field data of scour at the end of spurs in the Mississippi River (obtained by the USACE). The HIRE equation is:

$$Z_s = 4Y_1\left(\frac{K_1}{0.55}\right) K_2 \, Fr_1^{0.33} \qquad (717)$$

where: Z_s = Scour Depth, in ft

Y_1 = Depth of Flow at the Toe of the Abutment on the Overbank or in the Main Channel, in ft, Taken at the Cross Section Just Upstream of the Abutment

K_1 = Correction Factor for Abutment Shape

= 1.00, for Vertical-Wall Abutment

= 0.82, for Vertical-Wall Abutment with Wing Walls

= 0.55, for Spill-Through Abutment

K_2 = Correction Factor for Angle of Attack (θ) of Flow With Abutment, θ = 90 degrees When Abutments are Perpendicular to the Flow, θ < 90 degrees If Embankment Points Downstream, and θ > 90 degrees If Embankment Points Upstream:

$$= (\theta/90)^{0.4}$$

Fr_1 = Froude Number Based on Velocity and Depth Adjacent and Just Upstream of the Abutment Toe

Froehlich analyzed 170 live-bed scour measurements in laboratory flumes by regression analysis to obtain the following equation:

$$Z_s = 2.27 K_1 K_2 (L')^{0.43} Y_a^{0.57} Fr^{0.61} + Y_a \qquad (718)$$

where: Z_s = Scour depth, in ft

K_1 = Correction Factor for Abutment Shape:

= 1.1, for Square Nose

= 1.0, for Round Nose, Circular Cylinder and Group of Cylinders

= 0.9, for Sharp Nose (Triangular)

K_2 = Correction Factor for Angle of Attack (θ) of Flow With Abutment, θ = 90 degrees When Abutments are Perpendicular to the Flow, θ < 90 degrees If Embankment Points Downstream, and θ > 90 degrees If Embankment Points Upstream: $K_2 = (\theta/90)^{0.4}$

L' = Length of Abutment (Embankment) Projected Normal to Flow, in ft

Y_a = Average Depth of Flow on the Floodplain at the Approach Section, in ft

Fr = Froude Number of the Floodplain Flow at the Approach Section, $Fr = V_a / (gY_a)^{½}$

V_a = Average Velocity of the Approach Flow $V_a = Q_a/A_a$, in fps

Q_a = Flow Obstructed by the Abutment and Embankment at the Approach Section, in cfs

A_a = Flow Area of the Approach Section Obstructed by the Abutment and Embankment, in ft^2

(b) Local Scour at Pier

Pier scour occurs due to the acceleration of flow around the pier and the formation of flow vortices (known as the horseshoe vortex). The horseshoe vortex removes material from the base of the pier, creating a scour hole. As the depth of scour increases, the magnitude of the horseshoe vortex decreases, thereby reducing the rate at which material is removed from the scour hole. Eventually an equilibrium between bed material inflow and outflow is reached, and the scour hole ceases to grow.

The factors that affect the depth of local scour at a pier are: velocity of the flow just upstream of the pier, depth of flow, width of the pier, length of the pier if skewed to the flow, size and gradation of bed material, angle of attack of approach flow, shape of the pier; bed configuration, and the formation of ice jams and debris.

The HEC No. 18 report recommends the use of the Colorado State University (CSU) equation (RICHARDSON, 1990) for the computation of pier scour under both live-bed and clear-water conditions. In addition to the CSU equation, an equation developed by Dr. David Froehlich (1991) has also been added as an alternative pier scour equation. The Froehlich equation has been shown to compare well with observed data.

The CSU equation predicts maximum pier scour depths for both live-bed and clear-water pier scour. The equation is:

$$Z_s = 2.0\ K_1\ K_2\ K_3\ K_4\ a^{0.65}\ Y_1^{0.35}\ Fr_1^{0.43} \quad (719)$$

where: Z_s = Depth of Scour, in ft

a = Pier width, in ft

K_1 = Correction Factor for Pier Nose Shape:

= 1.1, for Square Nose

= 1.0, for Round Nose, Circular Cylinder and Group of Cylinders

= 0.9, for Sharp Nose (Triangular)

K_2 = Correction Factor for Angle of Attack of Flow:

= $[(L/a)\ Sin\ \theta + Cos\ \theta]^{0.65}$, where L = length of the pier along the flow line in ft, and θ = angle of attack of the flow, with respect to the pier. If L/a is larger than 12, use $L/a = 12$ as a maximum for estimating K_2. If the angle of attack is greater than 5 degrees, K_2 dominates and K_1 should be set to 1.0.

K_3 = Correction Factor for Bed Condition:

= 1.1, for Clear-Water Scour, Plane Bed, Anti-Dune Flow, and Small Dunes ($10 >$ H (Dune Height) ≥ 2 ft)

= 1.1 to 1.2, Medium Dunes ($30 >$ H ≥ 10 ft)

= 1.3, Large Dunes (H ≥ 30)

K_4 = Correction Factor for Armoring of Bed Material:

The correction factor, K_4, decreases scour depths for armoring of the scour hole for bed materials that have a d_{50} equal to or larger than 0.20 feet. The correction factor results from recent research by A. Molinas at CSU which showed that when the velocity, V_1, is less than the critical velocity, V_{c90}, of the d_{90} size of the bed material, and there is a gradation in sizes in the bed material, the d_{90} will limit the scour depth. The equation developed by J. S. Jones from analysis of the data is:

$$K_4 = [1 - 0.89\ (1 - V_R)^2]^{0.5} \quad (720)$$

where:

$$V_R = [\frac{V_1 - V_i}{V_{c90} - V_i}] \quad (721)$$

$$V_i = 0.645\ [\frac{d_{50}}{a}]^{0.053}\ V_{c50} \quad (722)$$

V_R = Velocity Ratio

V_1 = Average Velocity in the Main Channel or Overbank Area at the Cross Section Just Upstream of the Bridge, in fps

V_i = Velocity When Particles at a Pier Begin to Move, in fps.

V_{c90} = Critical Velocity for d_{90} Bed Material Size, in fps:

$$V_{c90} = 10.95\ Y^{1/6}\ d_{90}^{1/3}$$

Vc_{50} = Critical Velocity for d_{50} Bed Material Size, in fps:

$$V_{c50} = 10.95\, Y^{1/6}\, d_{50}^{1/3}$$

a = Pier Width, in ft

Y = The Depth of Water Just Upstream of the Pier, in ft

Limiting K_4 values and bed material size are:

$$K_4 \geq 0.7;\ V_R \geq 1.0;\ d_{50} \geq 0.2 \text{ ft}$$

A local pier scour equation developed by Dr. David Froehlich (FROEHLICH, 1991) has been shown to compare well against observed data (FHWA, 1996). The equation is:

where:

$$Z_s = 0.32\ \phi\ (a')^{0.62}\ Y_1^{0.47}\ Fr_1^{0.22}\ d_{50}^{-0.09} + a \qquad (723)$$

Φ = Correction Factor for Pier Nose Shape: $\Phi = 1.3$ for Square Nose Piers, $\Phi = 1.0$ for Rounded Nose Piers, and $\Phi = 0.7$ for Sharp Nose (Triangular) Piers

a' = Projected Pier Width With Respect to the Direction of the Flow, in ft

This form of Froehlich's equation is use to predict maximum pier scour for design purposes. The addition of one pier width, + a, is placed in the equation as a factor of safety. If the equation is to be used in an analysis mode (i.e., for predicting the scour of a particular event), Froehlich suggests dropping the addition of the pier width, + a, pier scour from this equation. The pier scour from this equation is limited to a maximum in the same manner as the CSU equation. Maximum scour $Z_s \leq 2.4$ times the pier width for $Fr_1 \leq 0.8$, and $Z_s \leq 3.0$ times the pier width for $Fr_1 > 0.8$.

704.2.1.7 - Total Scour

The total scour that can occur at a structure or pertinent location is equal to the combination of long-term bed elevation changes, one-half of anti-dune trough depth, bend scour, contraction scour and local scour:

$$Z_t = Z_{lt} + \frac{1}{2}Z_a + Z_{bs} + Z_{cs} + Z_s \qquad (724)$$

Bank protection and protection at structures should extend to a depth below the channel bed equal to the total scour.

704.2.1.8 - Scour Below Channel Drops

Scour below channel drops, such as grade-control structures, is a special case of local scour. Where the drop consists of a free, unsubmerged overfall, the depth of scour below the drop (U. S. BUREAU OF RECLAMATION, 1977) shall be computed from:

$$Z_{fd} = 1.32\ q^{0.54}\ H_t^{0.255} - T_w \qquad (725)$$

where: Z_{fd} = Depth of Local Scour Due to a Free-Overfall Drop, in ft, Measured Below the Streambed Surface Downstream of the Drop

q = Discharge Per Unit Width of the Channel Bottom, in cfs

H_t = Total Drop in Head, Measured From the Upstream Energy Grade Line to the Downstream Energy Grade Line, in ft

T_w = Tailwater Elevation or Depth (Downstream Water-Surface Elevation or Depth), in ft

Where the drop is submerged, as will be the case for most instances involving grade-control structures placed along watercourses for the depth scour below the drop, (SIMONS, LI & ASSOCIATES, 1986) can be computed from:

$$Z_{sd} = 0.581\ q^{0.667}\ (h/Y)^{0.411}\ [1 - (h/Y)]^{-0.118} \qquad (726)$$

where:

Z_{sd} = Depth of Local Scour Due to a Submerged Drop, in ft, Measured Below the Streambed Surface Downstream of the Drop

q = Discharge Per Unit Width of the Channel Bottom, in cfs

h = Drop Height, in ft, Above the Immediate Downstream Bed, in ft

Y = Downstream Depth of Flow, in ft (Note: $h/Y \leq 0.99$)

If $h/Y > 0.85$, the predicted scour below a channel drop should be computed using both of the above equations. The smaller of the two values thus computed should then be used for design purposes.

The longitudinal extent of a scour hole created by either a free or submerged overfall is represented by the distance from the drop to the deepest scour depth, X_s, and the distance from the drop to the end of the scour hole, L_s. These dimensions are given by the equations:

$X_s = 6.0\ Z_{fd}$, or $6.0\ Z_{sd}$

$L_s = 12.0\ Z_{fd}$, or $12.0\ Z_{sd}$

Bank protection toe-downs downstream of a grade-control structure shall extend to the computed depth of scour for a distance equal to X_s beyond the grade-control structure. They shall then taper back to the normal toe-down depth within a total distance downstream of the grade-control structure equal to L_s.

In the absence of bridge piers and/or abutments, the depth of scour below grade-control structures is not added to the other scour components. Rather, the depth of scour caused by the grade-control structure is compared to the depth of scour computed for the long-term degradation, and the larger of the two values is then used for toe-down design.

g. Ease of repair of damage section

h. Past case history (if available) of the lining system in other arid areas

These linings will be allowed on a case by case basis. Because of the potential significant unknown problems with these lining types, concurrence with the local entity and/or the CCRFCD on the design items to be addressed as well as the final design will be required. The local entity and/or the CCRFCD reserve the right to reject the proposed lining system in the interests of operation, maintenance, and protecting the public safety.

706 HYDRAULIC DESIGN STANDARDS FOR IMPROVED CHANNELS

Presented in this section are the hydraulic design standards for design of improved channels. The standards included herein are those standards which are the same for all improved channels. Standards which are specific to a lining type are included in the discussion for the specific lining under consideration. For the design of channel confluences, information is included in publications such as the U. S. Army Corps of Engineers' Hydraulic Design of Flood Control Channels (EM-1110-2-1601).

706.1 Sub-Critical Flow Design Standards

The following design standards are to be used when the design runoff in the channel is flowing in a sub-critical condition ($F_r < 1.0$). Furthermore, all super-critical channels must be designed with the limits as stated in Section 702.2.

706.1.1 Transitions

For the purposes of this MANUAL, sub-critical transitions occur when transitioning one sub-critical channel section to another sub-critical channel section (expansion or contraction) or when a sub-critical channel section is steepened to create a super-critical flow condition downstream (i.e., sloping spillway entrance). Several typical sub-critical transition sections are presented in **Figure 707**. The warped transition section, although most efficient, should only be used in extreme cases where minimum loss of energy is required since the section is very difficult and costly to construct. Conversely, the square-ended transition should only be used when either a straight-line transition or a cylinder-quadrant transition cannot be used due to topographic constraints or utility conflicts.

706.1.1.1 *Transition Energy Loss*

The energy loss created by a contracting section may be calculated using the following equation:

$$H_t = K_{tc} [(V_2^2 / 2g) - (V_1^2 / 2g)] \quad (737)$$

Where H_t = Energy Loss (ft)

K_{tc} = Transition Coefficient-Contraction

V_1 = Upstream Velocity (fps)

V_2 = Downstream Velocity (fps)

g = Acceleration of Gravity (ft/sec^2)

K_{tc} values for the typical transition sections are presented in **Figure 707**.

Similarly, the energy loss created by an expanding transition section may be calculated using the following equation:

$$H_t = K_{te} [(V_1^2 / 2g) - (V_2^2 / 2g)] \quad (738)$$

Where H_t = Energy Loss (ft)

K_{te} = Transition Coefficient-Expansion

V_1 = Upstream Velocity (fps)

V_2 = Downstream Velocity (fps)

g = Acceleration of Gravity (ft/sec^2)

K_{te} values for the typical transition sections are also presented in **Figure 707**.

The energy loss in a contracting transition for straight-line or warped transitions is allowed to be partially or totally accommodated by sloping the transition channel bottom from the transition entrance to the exit.

706.1.1.2 Transition Length

The length of the transition section should be long enough to keep the streamlines smooth and nearly parallel throughout the expanding (contracting) section. Experimental data and performance of existing structures have to be used to estimate the minimum transition length necessary to maintain the stated flow conditions. Based on this information, the minimum length of the transition section shall be as follows:

$$L_t = \geq 0.5\, L_c\, (T_w) \qquad (739)$$

Where L_t = Minimum Transition Length (ft)

L_c = Length Coefficient

T_w = Difference in the Top Width of the Normal Water Surface Upstream and Downstream of the Transition

For an approach flow velocity less than 12 feet per second, $L_c = 4.5$. This represents a 4.5 (length) to 1.0 (width) wall expansion or contraction with the angle of expansion or contraction of 12.5 degrees from the channel centerline. For an approach flow velocity equal to or greater than 12 feet per second, $L_c = 10.0$. This represents a 10.0 (length) to 1.0 (width) expansion or contraction with the angle of expansion or contraction of about 5.75 degrees from the channel centerline.

The transition length equation is not applicable to cylinder-quadrant or square-ended transitions.

706.1.2 Bends

The allowed radius of curvature in sub-critical channels is based on a theoretical maximum allowed rise in the super-elevated water surface of 0.5 feet. Therefore, the minimum allowed radius of curvature of the channel centerline shall be determined from the following equation:

$$r = C\, (V^2\, T_w) / S_e\, (g) \qquad (740)$$

Where r = Radius of Curvature (ft)

C = Super-Elevation Coefficient (= 1 for Sub-Critical Flow)

S_e = Super-Elevation Water Surface Increase (ft)

T_w = Top Width of the Design Water Surface (ft)

V = Mean Design Velocity (fps)

g = Acceleration of Gravity (ft/sec^2)

In no case shall the radius of curvature be less than 50 feet.

706.1.3 Freeboard

All channels shall be constructed with a minimum freeboard determined as follows:

$$F_b = 0.5 + V^2 / 2g \qquad (741)$$

Where F_b = Freeboard Height (ft)

V = Mean Design Velocity (fps)

g = Acceleration of Gravity (ft/sec^2)

In no case shall the freeboard be less than 1 foot. All channel linings must extend to the freeboard height. At channel bends, 0.5 feet shall be added to the above determined freeboard elevation.

706.2 Super-Critical Flow Design Standards

The following design standards are to be used when the design runoff in the channel is flowing in a super-critical condition ($F_r > 1.0$). Furthermore, all super-critical channels must be designed within the limits as situated in Section 702.2. Based on the phenomenon that occurs with high velocity, super-critical, concrete lined channels, a rectangular cross-section shall be the preferred section shape.

706.2.1 Super-Critical Transitions

The design of a super-critical flow to super-critical flow transition is much more complicated and requires special attention than a sub-critical transition design due to the potential damaging effects of the oblique hydraulic jump which occurs in the transition. The oblique jump results in cross waves and higher flow depths which can cause severe damage if not properly accounted for in the design. The simpler design analysis is to force a hydraulic jump (super-critical flow to sub-critical flow). However, hydraulic jumps must also be

carefully designed to assure the jump will remain where the jump is designed to occur. For the Clark County area, hydraulic jumps shall not be designed to occur in an erodable channel section but only in an energy dissipation or drop structure. The design of these structures is presented in Section 1100 (Additional Hydraulic Structures).

706.2.1.1 Contracting Transitions

Presented in **Figure 708** is an example of super-critical contracting transition. As shown in this figure, the upstream flow is contracted from width b_1 to b_3 with a wall diffraction angle of θ. The oblique jump occurs at the points A and B where the diffraction angles start. Wave fronts generated by the oblique jumps on both sides propagate toward the centerline with a wave angle β_1. Since the flow pattern is symmetrical, the centerline acts as if there was a solid wall that causes a subsequent oblique jump and generates a backward wave front toward the wall with another angle, β_2. These continuous oblique jumps result in turbulent fluctuations in the water surface.

To minimize the turbulence, the first two wave fronts are designed to meet at the center and then end at the exit of the contraction. Using the contraction geometry, the length of the transition shall be as follows:

$$L_t = (b_1 - b_3) / 2 \tan \theta \qquad (742)$$

Where L_t = Transition Length (ft)

b_1, b_3 = Upstream and Downstream Topwidth of Flow (ft)

θ = Wall Angle as Related to the Channel Centerline (Degrees)

Using the continuity principle,

$$b_1 / b_3 = (Y_3^{1.5} / Y_1) (F_3 / F_1) \qquad (743)$$

Where Y_1, Y_3 = Upstream and Downstream Depths of Flow (ft)

F_1, F_3 = Upstream and Downstream Froude Numbers

Also, by the continuity and momentum principals, the following relationship between the Froude number, wave angle, and wall angle is found to be:

$$\tan\theta = \frac{\tan\beta_1\,[(1+8F_1{}^2\sin^2\beta_1)^{0.5} - 3]}{2\tan^2\beta_1 + (1+8F_1{}^2\sin^2\beta_1)^{0.5} - 1} \qquad (744)$$

Where β_1 = Initial Wave Angle (Degrees)

Equations 742, **743**, and **744** can be used by trial and error to determine the transition length and wall angle. However, **Figure 709** is provided to allow a quicker trial and error solution than by using the equations. The procedure to determine the transition length and wall angle between two pre-determined channel sections using **Figure 709** is as follows:

Step 1: Determine the upstream and downstream channel flow conditions including flow depths, velocities, and Froude numbers.

Step 2: If either or both sections are trapezoidal, convert the trapezoidal flow parameters to equivalent rectangular flow parameters by calculating an equivalent flow width equal to the flow area divided by the flow depth. This computed flow width is used for all calculations.

Step 3: Compute Y_3 / Y_1

Step 4: Assume a trial wall angle, θ

Step 5: Using θ and F_1, read the values of F_2 and Y_2/Y_1 for Section 1 from **Figure 709**. Then, replacing F_1 with F_2, read a second F_2 (really F_3) and second Y_2/Y_1 (really Y_3/Y_2) from **Figure 709** for Section 2.

Step 6: Compute the first trial value of Y_3/Y_1 by multiplying the Y_2/Y_1 for Section 1 by the Y_2/Y_1 (really Y_3/Y_2) for Section 2.

Step 7: Compare the first trial Y_3/Y_1 to the actual Y_3/Y_1 (Step 3). If the trial value Y_3/Y_1 is larger than the actual Y_3/Y_1, assume a smaller θ and redo Steps 5 through 7. If the trial value Y_3/Y_1 is smaller than the actual Y_3/Y_1, assume a larger θ and redo Steps 5 through 7.

Step 8: Repeat the trial and error procedure until the computed Y_3/Y_1 is within the 5 percent of the actual Y_3/Y_1.

Step 9: Compute transition length using **Equation 742** and the last assumed value of θ.

Figure 709 can also be used to determine the wave angle, β, or may be used with the equations to determine the required downstream depth or width parameter if a certain transition length is designed or required.

To minimize the length of the transition section, Y_3 / Y_1 should generally be between 2 and 3. However, F_3 shall not be less than 1.7 for all transition designs. For further discussion on oblique jumps and super-critical contractions, refer to CHOW, 1959.

706.2.1.2 Expanding Transitions

The goal of a properly designed expansion transition is to expand the flow boundaries at the same rate as the natural flow expansion. Based on experimental and analytical data results, the minimum length of a super-critical expansion shall be as follows:

$$L_t \geq 1.5 (T_w) F_{r1} \qquad (745)$$

Where L_t = Minimum Transition Length (ft)

T_w = Difference in the Top Width of the Normal Water Surface Upstream and Downstream of the Transition

F_{r1} = Upstream Froude Number

706.2.2 Bends

Bends in super-critical channels create crosswaves and super-elevated flow in the bend section as well as further downstream from the bend. In order to minimize these disturbances, the minimum radius of curvature in the bend shall be based on the super-elevation of the water surface not exceeding 2 feet. **Equation 740** in Section 706.1.2 shall be utilized to determine allowable radius. In no case shall the radius of curvature be less than 50 feet.

An $S_e = 1.0$ shall be used for all trapezoidal channels and for rectangular channels without transition curves. For rectangular channels with transition curves, a $S_e = 0.5$ value may be used.

706.2.3 Spiral Transition Curves

When a designer desires to reduce the required amount of freeboard and radius of curvature in a rectangular channel, spiral transition curves may be