Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update and Physical Map Revision (PMR)

Prepared for:

CITY OF BOULDER
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SECTION 1.0: INTRODUCTION

1.1 Purpose

ICON Engineering, Inc. has been placed under contract by the City of Boulder (COB) to prepare a floodplain update and Physical Map Revision (PMR) to the Flood Insurance Rate Map (FIRM) for Skunk Creek, Bluebell Canyon Creek and King's Gulch. The purpose of this report is to document the approach taken to update the regulatory 100-year (1% annual chance) floodplain along with the 5-, 10-, 25-, 50-, and 500-year floodplains and the conveyance zone (floodway) and high hazard areas. Application and certification forms for the PMR are included in Appendix A.

1.2 Project Area

Skunk Creek, Bluebell Canyon Creek, and King's Gulch are located on the south west side of the City of Boulder. The project area is bounded on the north by the Boulder Creek drainage basin, on the east and south by Bear Canyon Creek drainage, and on the west by Green Mountain. A vicinity map for the Skunk Creek, Bluebell Canyon Creek, and King's Gulch study area is shown in Figure 1.1.

1.3 Background

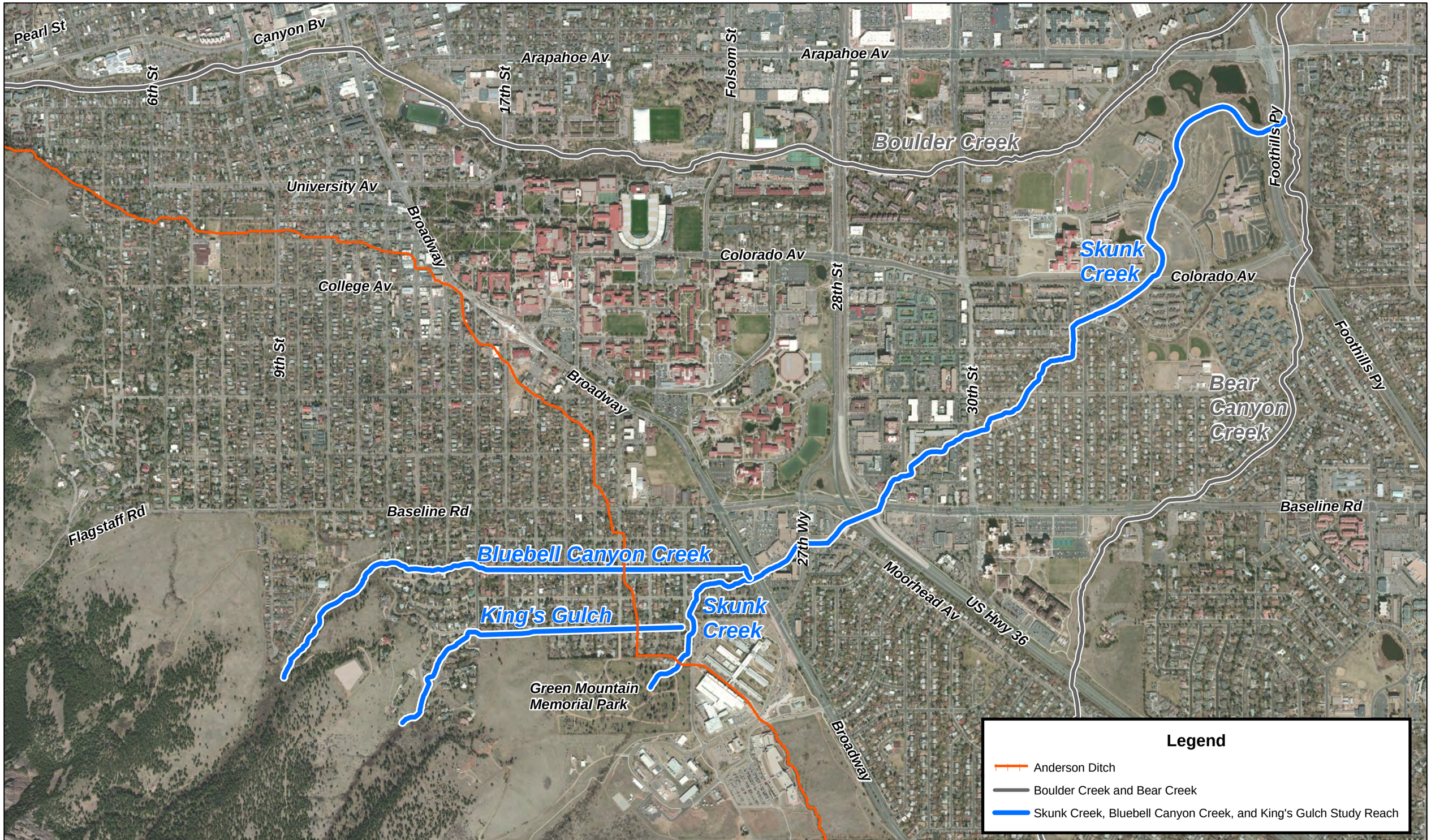
Hydrologic and hydraulic information for Skunk Creek, Bluebell Canyon Creek, and King's Gulch was previously developed as part of the May 1987 Flood Hazard Area Delineation (1987 FHAD) for Boulder and Adjacent County Drainageways. The 1987 FHAD was prepared by Greenhorne & O'Mara, Inc. The hydrologic and hydraulic information presented in the 1987 FHAD was originally prepared by the MSM/SP Group (Greiner Engineering Services) as part of the original Flood Insurance Study update. Floodplain excerpts from the 1987 FHAD are included in Appendix B.

Effective hydraulic information for Skunk Creek, Bluebell Canyon Creek, and King's Gulch is also provided in the December 18, 2012 Flood Insurance Study (FIS). Excerpts from the 2012 FIS are also included in Appendix B.

This floodplain mapping update began in 2007 as a Letter of Map Revision (LOMR) to reflect the pedestrian underpass and culvert on Skunk Creek at 27th Way. The project was then expanded to include the entire regulatory reaches of Skunk Creek, Bluebell Canyon Creek, and King's Gulch. In 2013 the original engineering consulting firm working on the floodplain mapping update closed their offices. The City of Boulder then contracted with ICON Engineering to complete minor changes to the previous work to reflect observations from the September 2013 flooding event. The mapping update was then presented to the Water Resources Advisory Board (WRAB) who recommended that the project undergo an additional peer review.

In January 2015 the additional peer review recommended, in addition to other items, that the spill flows north across Baseline Road from Bluebell Canyon Creek and spill flows north and east across US Highway 36 from Skunk Creek be incorporated into the floodplain mapping update. Subsequently, the City of Boulder determined that the spill flows identified by the peer

review should be incorporated into the study, in addition to re-evaluating the 1987 hydrology. The City then contracted with ICON Engineering to incorporate these spill flows along with developing an updated hydrologic model and a 2-dimensional hydraulic model to assist with split flow discharge used for floodplain mapping. Additionally, the hydraulic modeling has now been completed utilizing the City's 2013 LiDAR information for ground elevations. LiDAR mapping was not available during the time of the previous modeling efforts.



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Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure 1.1: Vicinity Map

N

1,000 Feet

1.4 Methodology and Approach

The 1987 FHAD hydrology did not adequately account for split flow paths and their associated impacts to contributing drainage area and ultimately the discharge in the main stem of Skunk Creek. Additionally, several pedestrian underpasses have been installed below Broadway since the original hydrology was completed. These underpasses allow water to drain to the east of Broadway and alter the drainage patterns of the area. Furthermore, several storm drain systems drain into the Skunk Creek drainage basin from surface areas that are within the Boulder Creek and Bear Canyon Creek drainage basins. For these reasons, and to develop overflow split flow paths, the hydrology was evaluated using 2013 topographical mapping, the Colorado Urban Hydrograph Procedure (CUHP 1.4.4.2), FLO-2D (Build No. 15.07.12), and the Environmental Protection Agency (EPA) Storm Water Management Model (SWMM 5.0.022).

The hydrologic model for the watershed was developed through an iterative process using CUHP, FLO-2D and SWMM computer programs. First, CUHP was used to determine sub-basin runoff hydrographs for the full range of effective discharges at various design points. Second, sub-basin hydrographs were converted to a steady state condition and routed though the project area using FLO-2D to identify watershed flow patterns and areas of split flows diverting to and from the major flow paths. This FLO-2D model was used to develop diversion rating curves for the major split flow locations which were then numerically incorporated into SWMM to establish peak flows along major tributaries. Finally, the resulting flows from SWMM were incorporated into the FLO-2D model to establish main channel and split flow discharges for the reaches that were selected for detailed floodplain modeling. Additional discussion on the hydrology is provided in Section 3.0 of this report.

Utilizing the FLO-2D model results, flow paths were then selected for detailed hydraulic modeling. Flow paths for the study were defined based on flow concentration locations with depths, on average, of greater than 1 foot for the 1% annual chance event. Flooding areas outside of this threshold would generally be consistent with non-regulatory Zone X (shaded) mapping zones. This zone is also coincident with FEMA's 0.2% annual chance flood event. Discharges for detailed study reaches were taken directly from applicable cross sections in the FLO-2D model, reflecting routed flows in the SWMM model. Using a steady state, the FLO-2D model differentiates discharges between the main flow paths and split flows. Additional discussion on the hydraulics is provided in Section 4.0 of this report.

Based on the topography of split flow paths for Skunk Creek, Bluebell Canyon Creek, and King's Gulch, extensive reaches of HEC-RAS modeling include vertically extended cross sections. For these areas, shallow flooding limits were defined beyond the cross section designations. For reaches of vertically extended cross sections that averaged spill depths less than 0.5 feet, no shallow flooding zones were identified, with the exception to areas otherwise covered by the 0.2%-annual-chance flooding as determined by the FLO-2D model. For reaches with average spill depths between 0.5 feet and 1.0 feet, Zone X (shaded) shallow flooding zones were established. These Zone X (shaded) areas are non-regulatory flood zones based on shallow average depths. For reaches with average spill depths greater than 1.0 feet, Zone AO shallow flooding zones were established with depth values based on the average spill depth of

the extended cross sections or from depths determined subsequently by the FLO-2D model. Zone X and Zone AO shallow flooding areas were delineated based on the mapping data and the shallow flooding extents. No additional calculations or modeling was completed for shallow flooding areas. Additional discussion on the shallow flooding zones is provided in Section 5.0 of this report. This approach meets the criteria as developed by the Federal Emergency Management Agency (FEMA).

Conveyance (floodway) zones throughout the major flow paths were developed based on a 0.5 foot rise criteria. For flow paths along City of Boulder streets, the conveyance zone encroachment was generally limited to the City's right-of-way limits on each side of the roadway. No additional optimization of the conveyance zone was completed provided the encroachment limited the conveyance zone to within the City of Boulder roadway right-of-way. For conveyance zones within channels or other low-lying areas, the conveyance zone was optimized in greater detail in order to maximize the 0.5 foot rise encroachment criteria. For minor split flow reaches where the full discharge could be carried within the more dominant flow path and still meet the 0.5 foot rise criteria, a conveyance zone was not developed for the minor split flow reach. Additional discussion on the conveyance zone is provided in Section 5.4 of this report.

High hazard areas were delineated based on depth and product of depth and velocity values following the City of Boulder Criteria. High hazard areas were computed using output from both FLO-2D and HEC-RAS. High hazard areas were only designated in locations where *both* the 1D HEC-RAS model and the 2D FLO-2D model indicated concurrent high hazard areas. The high hazard areas presented in this report are for the use of the City of Boulder in local floodplain regulatory efforts, and are not applicable to the changes in the FIS or FIRM as a result of this PMR.

Due to the complexity of this project, two interactive websites have been developed to assist with review of the hydrologic and hydraulic data. These websites include much of the data that is illustrated on the figures within this report, but the menu options allow for the user to turn data on and off to fit their needs (see "Layers" drop down) and the ability to pan and zoom as desired is available. This information can be found at:

Hydrology:

http://iconengineering.github.io/boulder/sbk-map/

Hydraulics:

http://iconengineering.github.io/boulder/sbk-hydraulics/

SECTION 2.0: FIELD SURVEY AND DOCUMENTATION

Field survey for culvert and bridge structures was obtained through three data collection efforts. Original field survey was completed by Boulder Land Consultants in May of 2010 under contract with Belt Collins West. This information was utilized where applicable; however, subsequent crossing structures were identified as needing field survey data for completion of the floodplain mapping update. These remaining crossing structures were surveyed over two sessions in early 2016 by Daley Land Surveying Inc. under contract with ICON Engineering, Inc. Figure 2.1 below illustrates the locations of all field survey data and identifies the source of the information. Please note that not all surveyed crossing structures were modeled within the detailed HEC-RAS model depending which reaches were ultimately selected for detailed study. Also, please note that the 27th Way culvert crossing was modeled based on as-built drawings provided by the city and was not field surveyed in either 2010 or 2016. All field survey information references the Colorado State Plane NAD 83 HARN North Zone horizontal control and the North American Vertical Datum (NAVD) of 1988 vertical datum. All field survey information and as-built drawings for 27th Way are provided in Appendix I.

Table 2.1 below summarizes the detailed crossing structure information from the field surveys along with blockage assumptions used at each crossing. The recommended debris blockage values have been estimated based on the size of the bridge or culvert opening and the general presence of vegetation and other debris upstream of the crossing that has potential to block the conveyance area during major storm events, in accordance with previous floodplain mapping studies within the City of Boulder.

Manning's n values were determined based on previous modeling efforts and by field observations and aerial imaging. Manning's n value maps for both the FLO-2D modeling and HEC-RAS modeling are provided in Appendix I.

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Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 2.1: Field Survey Data Overview

Table 2.1: Channel Crossing Summary

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

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	Channel Crossing			Critical Elevations			HEC-RAS Coefficients		1987 FHAD	Recommended	Debris Blockage
Channel	**Name**	**Type**	**Culvert / Bridge Size**	**Invert In**	**Crest**	**Invert Out**	**Contraction**	**Expansion**	**Debris Blockage**	**Debris Blockage**	**Reasoning**
Skunk Creek	Foothills Parkway	Culvert	Double 12'W x 6'H RCB	5237.23	5248.48	5236.38	0.3	0.5	0	0%	Large opening; limited large vegetation upstream
	Low Flow Culvert	Culvert	Double 9'W x 3'H; single 12'W x 3'H	5241.36	5252.85	5241.32	N/A	N/A	N/A	100%	Not utilized in model due to configuration with channel
	Discovery Drive	Bridge	46' span; 10.4' rise (varies)	5251.10	5266.30	5250.70	0.3	0.5	N/A	0%	Large opening; limited large vegetation upstream
	Colorado Avenue	Culvert	9.9'W x 8.2'H (invert) 9.9'W x 7.3'H (ped)	5260.03	5271.00	5256.94	0.3	0.5	0	5%	Large opening; some large vegetation upstream
	Wellman Canal	Culvert	24-inch RCP	5272.77	5274.56	5263.26	N/A	N/A	N/A	**100%**	small pipe; vegetation available upstream
	35th Street	Culvert	Double 6'W x 4'H RCB	5275.61	5281.69	5275.40	0.3	0.5	50%	30%	medium culvert size; vegetation available upstream
	Madison Avenue	Culvert	Double 6'W x 4'H RCB	5276.78	5283.35	5276.10	0.3	0.5	30%	30%	medium culvert size; vegetation available upstream
	34th Street	Culvert	Double 6'W x 3.5'H RCB	5283.50	5288.82	5283.70	0.3	0.5	20%	20%	no change from FHAD
	Aurora Avenue	Culvert	8'W x 6'H RCB	5290.80	5298.10	5290.35	0.3	0.5	10%	20%	to be consistent with other similar sized culverts
	Arrowwood Park Bridge	Bridge	31' span; 7.5' rise (max)	5297.39	5305.49	5297.01	0.3	0.5	30%	30%	no change from FHAD
	30th Street	Culvert	8'W x 6'H RCB	5304.89	5312.32	5304.12	0.3	0.5	30%	30%	no change from FHAD
	Covered Bridge (pedestrian)	Bridge	36' span; 8' rise (max)	5305.91	5313.51	5305.99	0.3	0.5	N/A	30%	Low clearance, lots of veg.
	Pedestrian Access Bridge	Bridge	11' span; 4.4' rise (max)	5319.57	5324.26	5319.52	0.3	0.5	N/A	30%	Low clearance.
	29th Street (with pedestrian bridge)	Culvert	Double 7'W x 4'H RCB	5329.21	5334.38	5328.10	0.3	0.5	10%	20%	to be consistent with other similar sized culverts
	Multi-use Path downstream of US 36	Culvert	14.7'W x 1.3 to 3.5'H	N/A	N/A	N/A	N/A	N/A	N/A	**100%**	small opening
	US Highway 36	Culvert	Double 6'W x 4'H RCB	5348.69	5366.60	5336.70	0.3	0.5	0%	0%	skew allows for blockage to not affect actual opening
	Moorhead Avenue	Culvert	Double 10'W x 5.8'H RCB	5357.11	5365.22	5356.39	0.3	0.5	0%	15%	to be consistent with other similar sized culverts
	27th Way	Culvert	20'W x 8'H RCB	5360.07	5370.02	5359.64	0.3	0.5	0	5%	to be consistent with other similar sized culverts
	Multi-use Path upstream of 27th Way	Culvert	12'W x 4'H RCB	5361.22	5366.17	5361.01	N/A	N/A	N/A	**100%**	small opening
	Broadway	Culvert	22'W x 8'+/-H RCB	5382.59	5392.90	5379.26	0.3	0.5	30%	5%	to be consistent with other similar sized culverts
	Bluebell Avenue	Culvert	6'W x 6'H RCB	5403.12	5408.77	5403.79	0.3	0.5	30%	30%	no change from FHAD
	Driveway at 2200 Bluebell	Bridge	21' span; 5.3' rise (max)	5403.95	5410.70	5403.83	0.3	0.5	40%	40%	no change from FHAD
	Driveway at 322 22nd	Bridge	30' span; 5.4' rise (max)	5408.31	5414.58	5407.42	0.3	0.5	40%	40%	no change from FHAD
	King Avenue	Culvert	7'W x 4'H RCB	5414.84	5422.00	5414.87	0.3	0.5	50%	50%	no change from FHAD
	Cemetery Roadway	Culvert	~24" CMP	N/A	N/A	N/A	N/A	N/A	N/A	**100%**	small opening
Bluebell Canyon Creek	Trail Crossing	Culvert	12.5' span x 6.25' rise (max) semi circular concrete	5760.28	5773.13	5759.62	0.3	0.5	N/A	50%	match previous modeling efforts (BCW)
King's Gulch	15th Street	Culvert	30-inch RCP (ends as 36-inch CMP)	5540.72	5545.08	5529.78	N/A	N/A	25%	100%	match previous modeling efforts (BCW)
	Driveway (260 and 1425 Belleview Dr.)	Culvert	48-inch CMP	5570.29	5575.56	5568.77	0.3	0.5	25%	25%	no change from FHAD
	Belleview Drive	Culvert	48-inch RCP	5601.80	5613.00	5596.47	0.3	0.5	50%	50%	no change from FHAD

SECTION 3.0: HYDROLOGIC ANALYSIS

Hydrologic information for Skunk Creek, Bluebell Canyon Creek, and King's Gulch was previously included as part of the May 1987 FHAD for Boulder and Adjacent County Drainageways. In the 1987 FHAD, hydrology was presented for the 10-, 50-, and 100-year events. Equivalent discharges for Skunk Creek are shown in the 2012 FIS, including 500-year discharge values. Excerpts from the 1987 FHAD and 2012 FIS are included in Appendix B.

The 1987 FHAD hydrology did not adequately account for split flow paths and their associated impacts to contributing drainage area and ultimately the discharge in the main stem of Skunk Creek. Additionally, several pedestrian underpasses have been installed below Broadway since the original hydrology was completed. These underpasses allow water to drain to the east of Broadway and alter the drainage patterns of the area. Furthermore, several storm drain systems drain into the Skunk Creek drainage basin from surface areas that are within the Boulder Creek and Bear Canyon Creek drainage basins. For these reasons, and to develop overflow split flow paths, the hydrology was evaluated using 2013 topographical mapping, the Colorado Urban Hydrograph Procedure (CUHP 1.4.4.2), FLO-2D (Build No. 15.07.12), and the Environmental Protection Agency (EPA) Storm Water Management Model (SWMM 5.0.022).

3.1 Drainage Sub-Basins

Area

The City of Boulder's 2013 LiDAR mapping was utilized to delineate drainage basins within the project area. These drainage basins generally corresponded to the 1987 FHAD boundaries with exception to sub-basins that flow directly to Boulder Creek or into Bear Canyon Creek that were identified in the 1987 FHAD as contributing to Skunk Creek. These areas were excluded from the study with exception to the contribution from local storm drain systems which drain flow back into the Skunk Creek drainage basin. These basins include CU_01, CU_02, BC_01, BC_02, and BC_03. The storm drain inflow from these basins into the Skunk Creek, Bluebell Canyon Creek, and King's Gulch drainage basin is discussed in section 3.3 below.

Sub-basin boundaries are illustrated in Figure 3.1 below. Basin area data is included in Table 3.1 below.

Impervious

The City of Boulder's impervious data set was utilized to calculate impervious percentages for each sub-basin within the drainage basin. The City's data set was supplemented in the western portion of the basins (in sub-basins BL_02, SK_08) to reflect bedrock of the Flatirons as identified by aerial imagery. Sub-basin impervious areas are illustrated in Figure 3.2 below. Basin impervious data is included in Table 3.1 below. The 1987 FHAD had an overall average basin impervious value of 25%. This study has an overall average basin impervious value of 26%.

Sub-basin Length, Length to Centroid, and Slope

The sub-basin lengths, lengths to centroids, and slope were developed using UDFCD criteria and guidance. Sub-basin lengths, lengths to centroid, and slope values are included in Table 3.1 below.

Maximum Depression Storage

The maximum depression storage values for pervious areas were set to 0.35 for urbanized areas and 0.4 for open space areas per the CUHP recommended values. The maximum depression storage values for impervious areas were set to 0.1 for all areas per the CUHP recommended values. Sub-basin maximum depression storage values are included in Table 3.1 below.

Horton's Infiltration Parameters

The Horton's infiltration parameters were calculated based on the CUHP recommended values for each NRCS hydrologic soils group and the corresponding portion of the sub-basin that covered each soils group. NRCS hydrologic soils groups are illustrated in Figure 3.3 below. Sub-basin Horton's infiltration parameters values are included in Table 3.1 below.

3.2 Design Rainfall

The 10-year, 25-year, 50-year, 100-year, and 500-year rainfall values were obtained from the National Oceanic and Atmospheric Administration Precipitation-Frequency Atlas of the United States (NOAA Atlas 14), using the precipitation frequency data server for the Boulder Colorado location (see server expert in Appendix D). The 60-minute duration point precipitation estimates are as follows:

10-year	1.29 inches
25-year	1.69 inches
50-year	2.04 inches
100-year	2.43 inches
500-year	3.48 inches

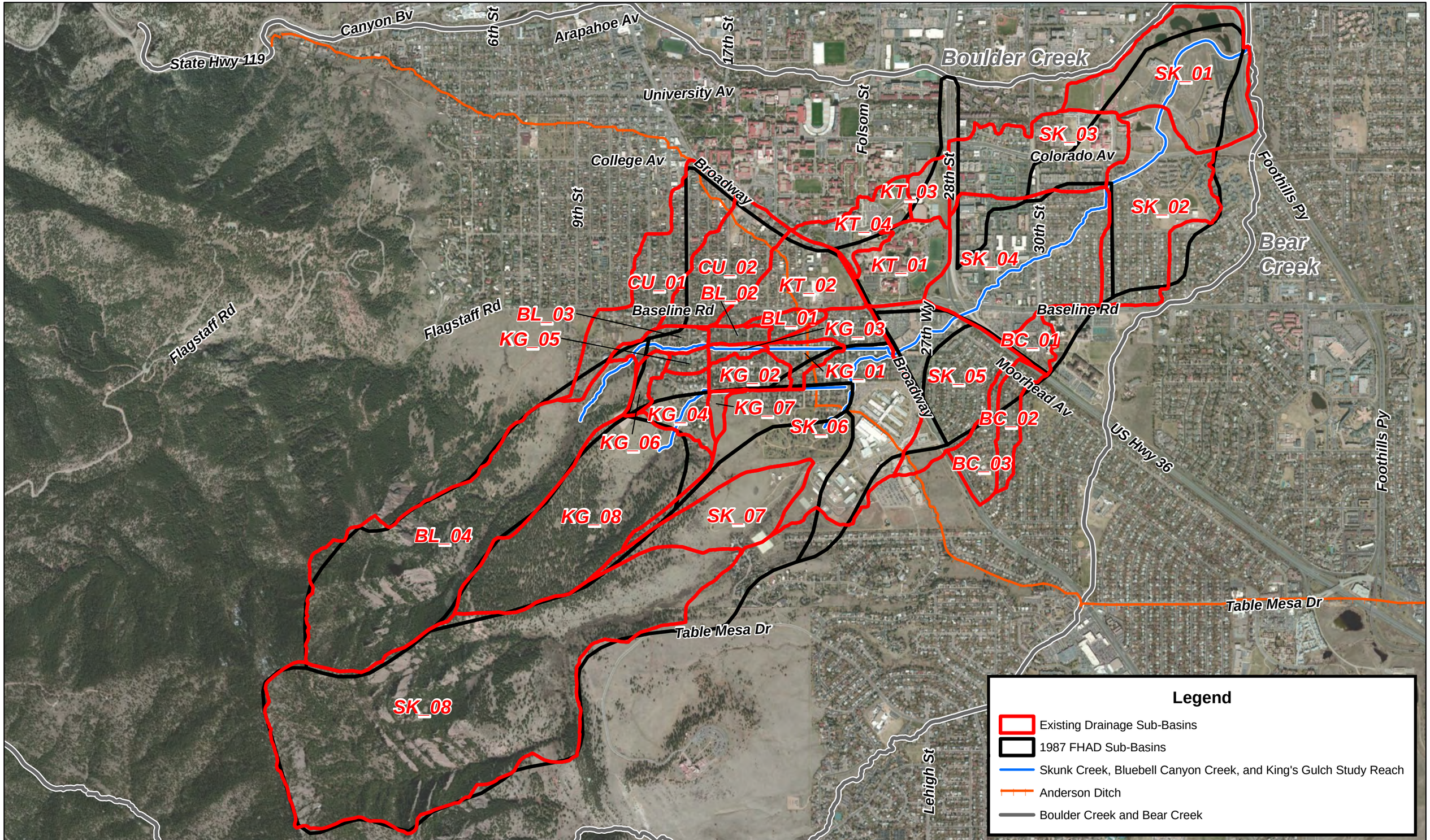

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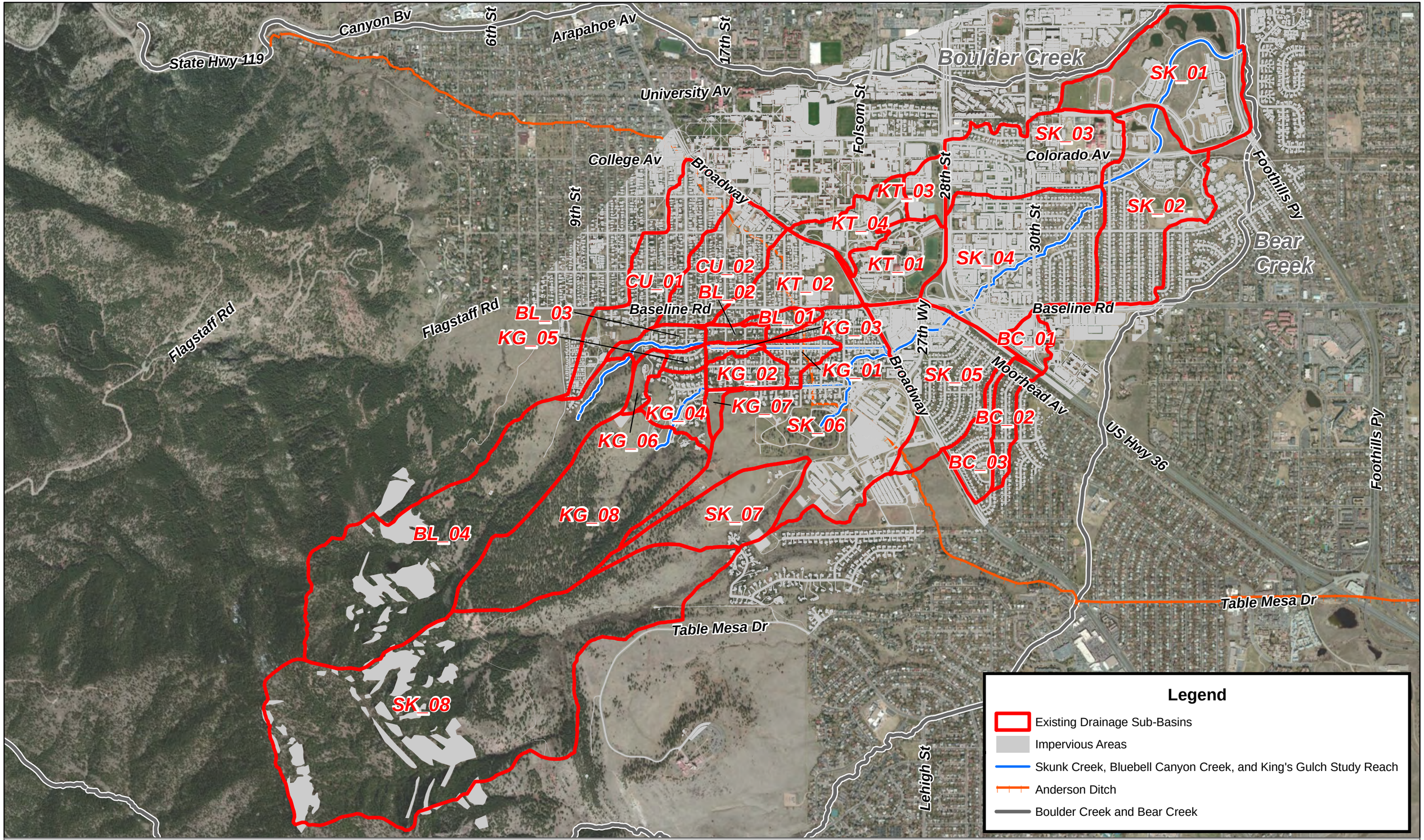
Figure 3.1: Sub-Basin Boundaries



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Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure 3.2: Sub-Basin Impervious

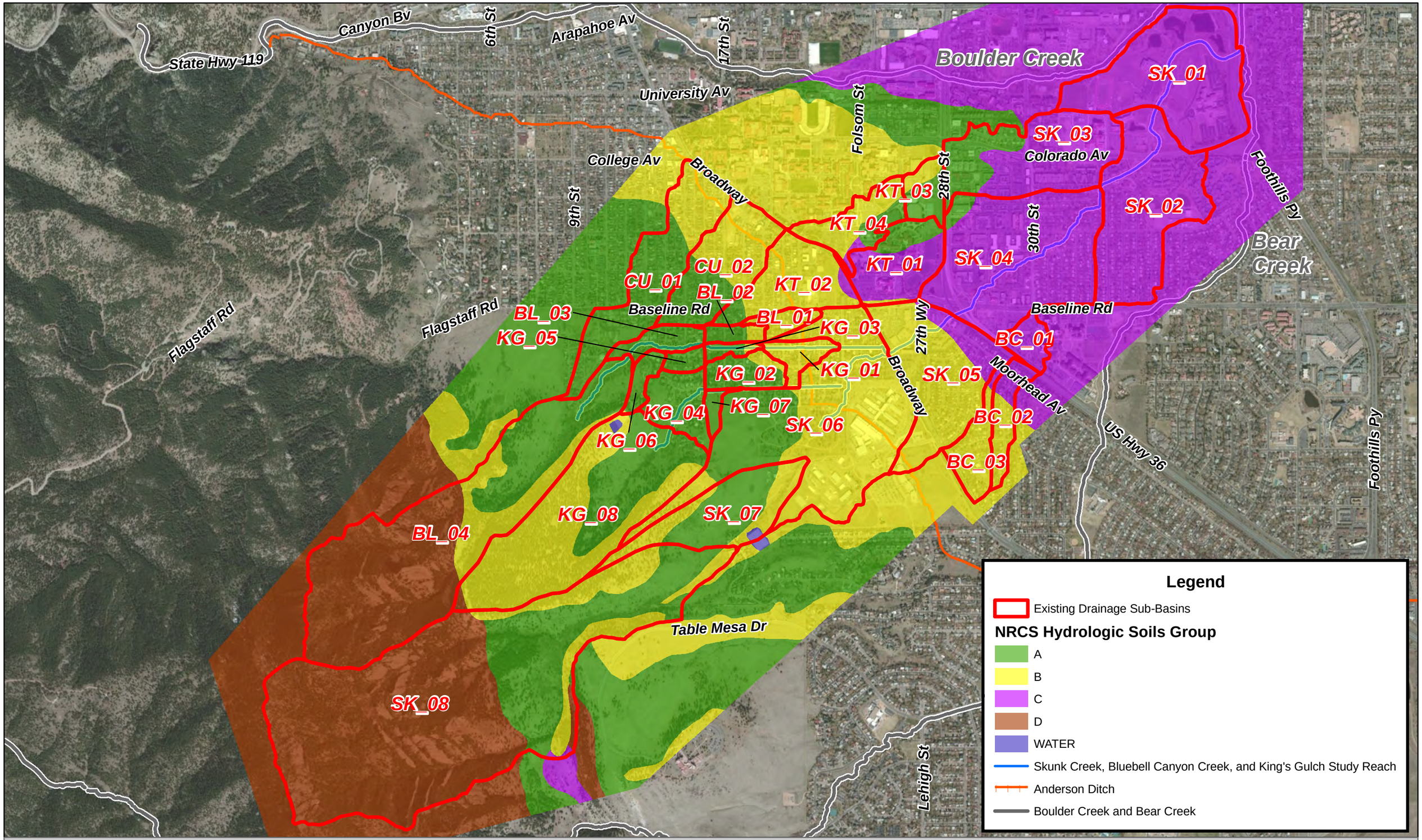

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Figure 3.3: Sub-Basin Soil Types

Table 3.1: CUHP Parameters

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

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							Maximum Depression Storage (Watershed inches)		Horton's Infiltration Parameters		
Drainage Sub-Basin	Area (acres)	Area (mi^2)	Length to Centroid (ft)	Length (ft)	Slope (ft/ft)	Percent Imperviousness	Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
BC_01	13.38	0.02090	885	1305	0.0129	70.43	0.35	0.10	3	0.0018	0.5
BC_02	19.07	0.02979	1249	2515	0.01	34.69	0.35	0.08	3.9	0.0018	0.6
BC_03	22.47	0.03510	1742	2617	0.0199	42.09	0.35	0.08	4.4	0.0018	0.6
BL_01	9.21	0.01439	885	1077	0.0399	40.4	0.35	0.08	4.5	0.0018	0.6
BL_02	7.73	0.01207	702	1213	0.0499	38.89	0.35	0.08	4.9	0.001	0.9
BL_03	14.64	0.02287	865	1817	0.057	28.31	0.37	0.08	5	0.0007	1
BL_04	240.1	0.37504	5167	8270	0.0599	10.86	0.40	0.09	3.7	0.0015	0.6
CU_01	77.25	0.12066	2247	4984	0.0553	45.77	0.36	0.08	4.8	0.001	0.9
CU_02	58.28	0.09103	1279	2669	0.0551	47.69	0.35	0.08	4.7	0.0014	0.8
KG_01	13.05	0.02038	854	1337	0.0399	48.69	0.35	0.08	4.5	0.0018	0.6
KG_02	18.75	0.02929	820	1425	0.0499	41.35	0.35	0.08	4.9	0.0009	0.9
KG_03	5.3	0.00828	642	1043	0.0499	42.5	0.35	0.08	4.9	0.0009	0.9
KG_04	26.62	0.04158	589	1560	0.0599	27.14	0.36	0.08	5	0.0007	1
KG_05	6.19	0.00967	416	717	0.0499	43.5	0.35	0.08	5	0.0007	1
KG_06	8.99	0.01404	662	1290	0.0576	25.27	0.38	0.08	5	0.0007	1
KG_07	5.11	0.00798	1023	1445	0.0554	2	0.40	0.10	5	0.0007	1
KG_08	160.16	0.25017	2363	5380	0.0599	2	0.40	0.08	4.6	0.0014	0.7
KT_01	43.43	0.06784	1442	2087	0.024	44.91	0.35	0.08	3.5	0.0015	0.6
KT_02	49.18	0.07682	1017	2913	0.043	49.77	0.35	0.08	4.5	0.0017	0.6
KT_03	16.02	0.02502	869	1290	0.0438	44.32	0.35	0.10	4.8	0.001	0.9
KT_04	31.75	0.04959	1272	2747	0.0259	48.93	0.35	0.09	4.5	0.0015	0.7
SK_01	114.29	0.17852	1977	3989	0.01	24.89	0.38	0.09	3	0.0018	0.5
SK_02	104.77	0.16365	2138	3989	0.0185	38.23	0.35	0.08	3	0.0018	0.5
SK_03	87.18	0.13618	2003	3662	0.0169	57.23	0.35	0.09	3.6	0.0015	0.6
SK_04	139.39	0.21773	2270	4027	0.0215	58.5	0.35	0.09	3.1	0.0018	0.5
SK_05	91.18	0.14242	1423	3745	0.026	55.69	0.35	0.08	4.2	0.0018	0.6
SK_06	189.24	0.29559	2219	4440	0.0432	35.54	0.38	0.09	4.6	0.0015	0.7
SK_07	61.09	0.09542	2297	4144	0.057	3.93	0.40	0.09	4.7	0.0011	0.8
SK_08	421.16	0.65785	6067	11400	0.0581	8.67	0.40	0.08	3.7	0.0015	0.6

3.3 Hydrograph Development

The above sub-basin data and rainfall values were entered into the CUHP (version 1.4.4.2) software in order to produce sub-basin inflow hydrographs. The resulting discharges for each sub-basin and for each return interval are included in Appendix D.

As noted above, five of the sub-basins drain on the surface to either Boulder Creek or Bear Canyon Creek, however, the underlying local storm drain systems route a portion of the sub-basin discharge into Skunk Creek. In addition to the storm drain inflows, it was assumed that during flooding events the Anderson Ditch has the ability to contribute flow into Skunk Creek at its crossing of Skunk Creek near Green Mountain Memorial Park. The Boulder Creek, Bear Canyon Creek and Anderson Ditch contributions to the Skunk Creek, Bluebell Canyon Creek, and King's Gulch drainage basin are discussed in detail below. Culvert capacities were estimated using FlowMaster software. Computational results are included in Appendix D.

Anderson Ditch

The Anderson Ditch is assumed to have some capacity to import discharges into the Skunk Creek, Bluebell Canyon Creek, and King's Gulch drainage basin. In an effort to account for this discharge, a single discharge input to the main stem of Skunk Creek was used and based on a typical Anderson Ditch crossing comprised of a 58-inch by 36-inch CMP culvert. Given the nature of the canal, and relatively flat slope (0.001 ft/ft), a ditch capacity of 25 cfs was added to the models through a constant 25 cfs inflow applied to Skunk Creek at the Anderson Ditch crossing location. This direct discharge was not accounted for in the FHAD, and is a contributing factor for the differences in hydrology between the FHAD and this study.

Sub-Basin CU_01

This sub-basin was delineated in order to cover a portion of the B-2 sub-basin from the 1987 FHAD. As a result of the new pedestrian underpass at Broadway and 16th/Euclid, the discharges from sub-basin CU_01 can pass directly through Broadway and continue north and east through the University of Colorado campus and eventually into Boulder Creek. There is no storm drain system that directly links CU_01 to the Skunk Creek, Bluebell Canyon Creek, and King's Gulch drainage basin.

Sub-Basin CU_02

A 42-inch RCP storm drain system collects discharges on the west/south side of Broadway at the downstream limits of the CU_02 sub-basin. This storm drain then routes flows south/east along Broadway and ultimately discharges on the north/east side of Broadway just south of Regent Drive. Using City of Boulder manhole data, a storm drain slope of 0.004 ft/ft was estimated for this 42-inch storm drain resulting in an estimated capacity of 83 cfs. Inflow hydrographs for sub-basin CU_02 were revised to reflect the sub-basin discharge up to the storm drain capacity of 83 cfs. This discharge was then applied at the storm drain outfall location in the KT_04 sub-basin. Surface flows in excess of the 83 cfs storm drain capacity are expected to spill over Broadway

and continue north and east through the University of Colorado campus and eventually into Boulder Creek.

Sub-Basin BC_01

This sub-basin is located on the north side of US Highway 36 and drains north to Baseline Road. A 21-inch RCP storm drain then collects flows and routes them north along 31st Street to Skunk Creek. Surface flows that exceed the storm drain capacity will flow east along Baseline Road and eventually enter into Bear Canyon Creek. City of Boulder manhole data was unavailable for this reach of storm drain, however, the roadway slope was used to estimate the storm drain slope of 0.016 ft/ft resulting in an estimated capacity of 26 cfs. Inflow hydrographs for sub-basin BC_01 were revised to reflect the sub-basin discharge up to the storm drain capacity of 26 cfs. This discharge was then applied at the storm drain outfall location in Skunk Creek just downstream of 30th Street.

Sub-Basin BC_02

This sub-basin is located on the south side of US Highway 36 and drains north to the US Highway 36 embankment. A 24-inch RCP storm drain then collects flows and routes them north under US Highway 36 into the BC_01 sub-basin. Surface flows that exceed the storm drain capacity will flow east along the south side of US Highway 36 and eventually enter into Bear Canyon Creek. City of Boulder manhole data was unavailable for this storm drain, however, a 1 percent slope was estimated for capacity analysis purposes, resulting in an estimated capacity of 29 cfs. Inflow hydrographs for sub-basin BC_02 were revised to reflect the sub-basin discharge up to the storm drain capacity of 29 cfs. This discharge was then applied at the storm drain outfall location in sub-basin BC_01.

Sub-Basin BC_03

This sub-basin is located on the south side of US Highway 36 and drains north to Moorhead Avenue. A 30-inch RCP storm drain then collects flows and routes them north and west into the large culvert on the main stem of Skunk Creek that passes under US Highway 36. Surface flows that exceed the storm drain capacity will flow east along Moorhead Avenue and into sub-basin BC_02 (see above). Flows that then exceed the BC_02 storm drain capacity will continue east and eventually enter into Bear Canyon Creek. Using City of Boulder manhole data, a storm drain slope of 0.004 ft/ft was estimated resulting in an estimated capacity of 34 cfs. Inflow hydrographs for sub-basin BC_03 were revised to reflect the sub-basin discharge up to the storm drain capacity of 34 cfs. This discharge was then applied at the Skunk Creek culvert exit on the downstream side of US Highway 36.

3.4 Diversion Curves

In order to develop a SWMM model of the Skunk Creek, Bluebell Canyon Creek, and King's Gulch drainage basin, 14 flow diversion areas (including the four storm drain diversions noted

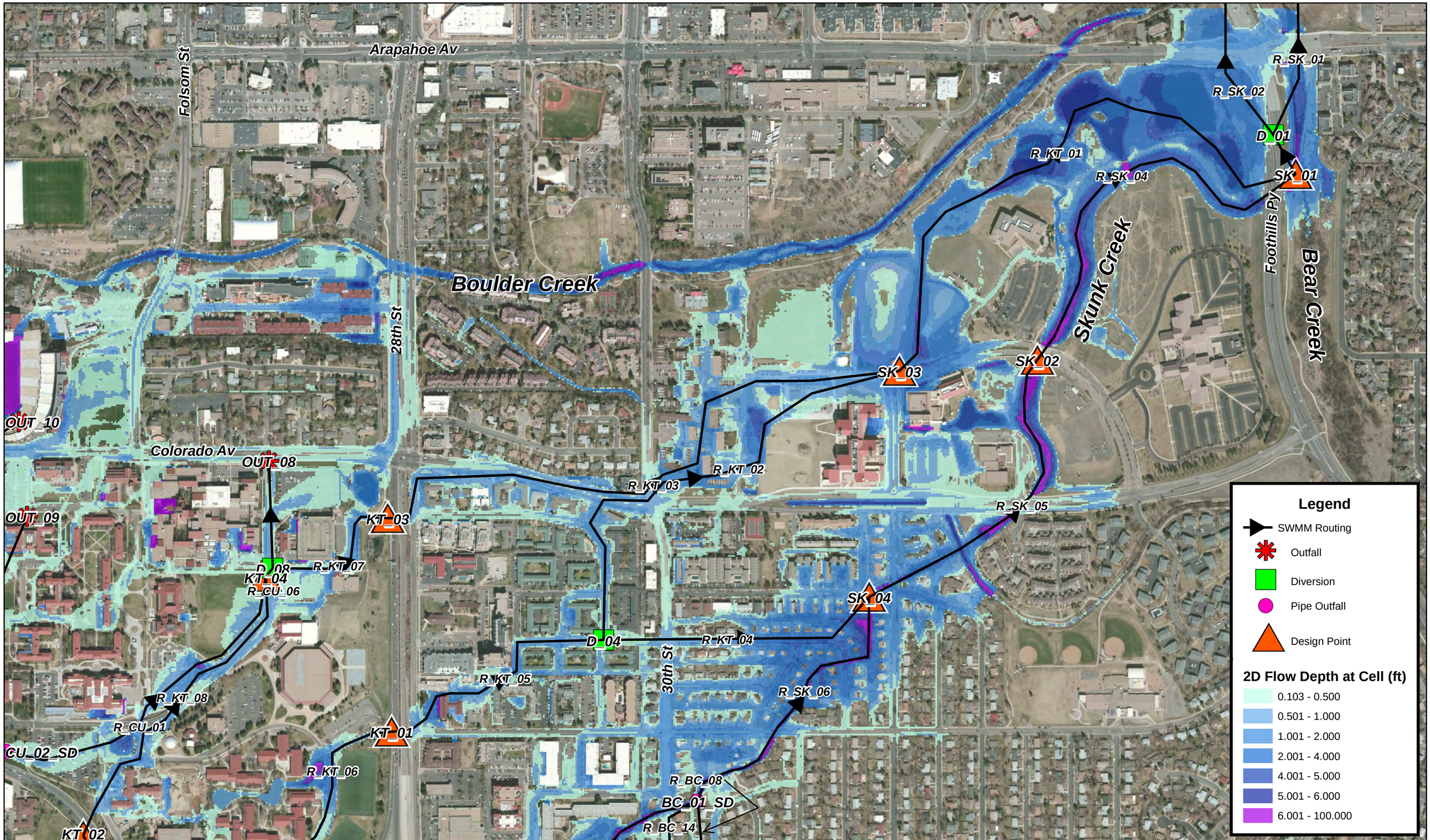
above) were observed in initial FLO-2D modeling efforts which would ultimately require diversion rating curve data for use in SWMM. A FLO-2D hydraulic model (discussed in additional detail in section 4.2) was developed to define diversion curves (inflow verses outflow) for these flow diversion areas in order to develop the diversion rating curves. For the diversion curves, a range in discharges (generally reflecting FEMA recurrence intervals) was modeled under steady state conditions in FLO-2D. Peak discharge values were obtained at selectively placed floodplain cross sections. Using the discharge values at applicable cross sections, storm drain pipe capacity values, and culvert discharge values, the flow in and flow diverted values were computed for each of the 13 flow diversions.

This process was repeated for all modeled return intervals (10-, 25-, 50-, 100-, and 500-year events) and the resulting diversion rating curves were incorporated into the Skunk Creek, Bluebell Canyon Creek, and King's Gulch SWMM model as discussed in Section 3.5 below. Diversion curves and comments discussing the basis of the analysis are included in Appendix D.

3.5 Hydrograph Routing

In order to determine peak flow discharges throughout the Skunk Creek, Bluebell Canyon Creek, and King's Gulch drainage basin that reflect the timing influence of hydrograph routing and are not influenced by inadvertent floodplain storage (as occurs in non-steady state FLO-2D models), an EPA SWMM model was developed for the basin. This model was developed using UDFCD criteria and utilizes the CUHP inflow hydrographs as discussed in Section 3.3. Additionally, the SWMM model includes 14 flow diversions that were identified by the steady state FLO-2D model (see Section 4.2) and have diversion rating curves as discussed above.

The SWMM model layout is illustrated in Figure 3.4 (north), 3.5 (south), and 3.6 (west) below. Output data from the SWMM models are included in Appendix D. Electronic files for the SWMM models are included in Appendix J.



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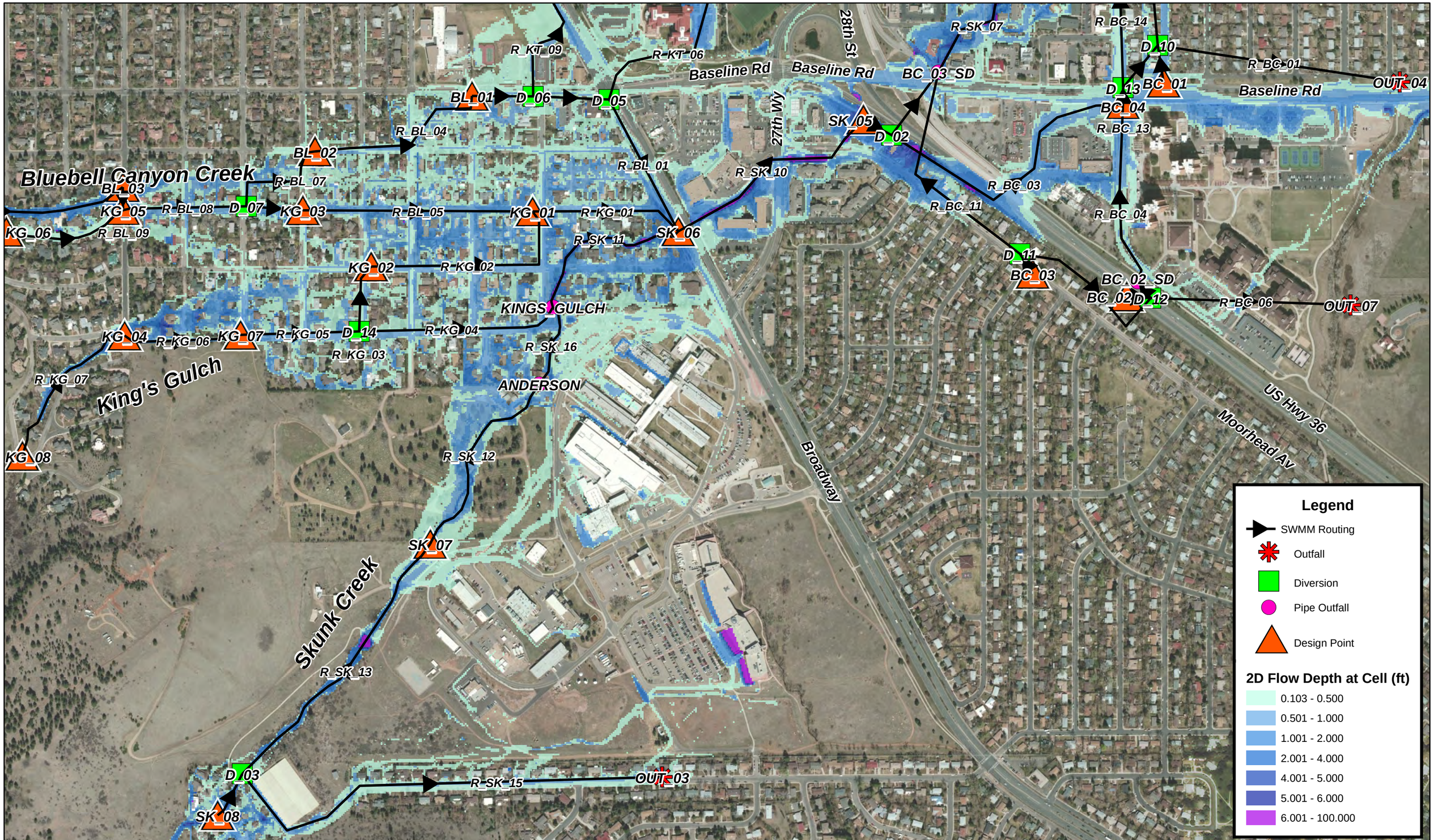
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 3.4: SWMM Model (north)



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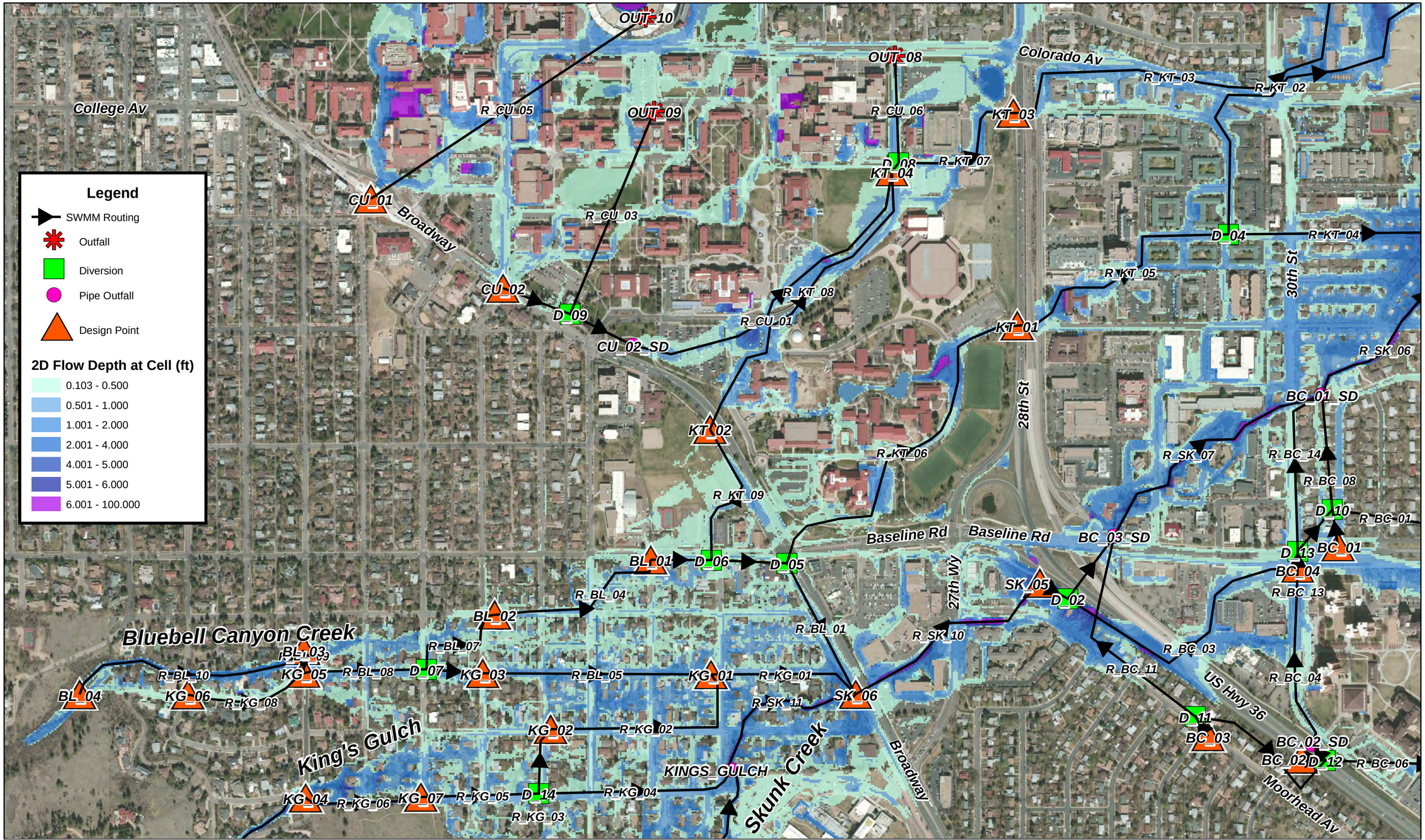
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 3.5: SWMM Model (south)



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Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure 3.6: SWMM Model (west)

N

500 Feet

3.6 Discharge Comparisons

The resulting discharge values from the SWMM model generally compare favorably with the 1987 FHAD discharges. A summary of the 100-year discharges is provided in Table 3.2 below. Please note that much of the differences between the 1987 FHAD and current SWMM modeling is attributed to defining and accounting for discharges along the major split flow paths, including the split flow to Bear Canyon Creek located upstream of Baseline Road. The 1987 FHAD did not previously remove these flows from the main stem of Skunk Creek. The SWMM model developed as part of this analysis does account for spill flows that are not in the main stem at the reporting location. Additionally, the use of NOAA Atlas 14 also contributed to the change in discharges compared to the FHAD which used the NOAA Atlas 2 information.

Table 3.2 includes main stem and spill flow values for each location and provides a total discharge summary and a percentage comparison to the 1987 FHAD values. Based on the discharge comparison, the project team determined that CUHP calibration was not necessary.

3.7 Recommended Discharges

Using the CUHP and SWMM models as discussed above, the recommended discharges for the Skunk Creek, Bluebell Canyon Creek, and King's Gulch drainage basin were integrated into a steady state FLO-2D model. For this analysis, inflow hydrographs in FLO-2D were defined based on incremental changes in overall peak flows from SWMM, verses modeling individual sub-basin hydrographs. The resulting discharges reflect the recommended discharges along the reaches that have been modeled in HEC-RAS as discussed in Section 4 of this report. Table 3.3 below includes both the main stem discharges and the spill flow discharges at each hydrology design point. Figures 3.7 through 3.11 illustrate the hydrology design points along with key SWMM routing discharges used to determine the incremental discharge increases at each location. Recommended discharges for each detailed study reach are discussed in Section 4 of this report.

Table 3.2: 100-Year Discharge Summary

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

	1987 FHAD		SWMM Model					SWMM vs. FHAD	
Flooding Source	Drainage Area (sq mi.)	Main Stem (cfs)	Design Point	Drainage Area [1] (sq mi.)	Main Stem (cfs)	Spills [2] (cfs)	Total (cfs)	% Change in Drainage Area	% Change in Discharge
Skunk Creek									
Confluence with Bear Creek	2.83	**2230**	SK_01	2.91	2065	341	**2406**	3	8
Madison Avenue	2.43	**1870**	SK_04	2.22	1280	372	**1652**	-9	-12
US HWY 36	2.08	**1350**	SK_05	2.06	1174	107	**1281**	-1	-5
Broadway	1.36	**710**	SK_06	1.85	1017	107	**1124**	36	58
Bluebell Canyon Creek									
Confluence with Skunk Creek[3]	0.68	**737**	BL_01	0.42	18	232	**250**	-38	-66
Chautauqua Park[4]	0.40	**227**	BL_04	0.38	215	0	**215**	-6	-5
King's Gulch									
Confluence with Skunk Creek	0.32	**373**	KG_01	0.38	401	40	**441**	18	18
Design Point 111[5]	0.23	**214**	KG_08	0.25	170	0	**170**	9	-21

[1] Overall average basin imperviousness: FHAD = 25%, Update = 26%

[2] See Table 3.3 for spill flow notes

[3] Main Stem = (R_BL_01), Spills = [(R_BL_09)-(R_BL_07)]+(R_KT_09)+(R_KT_06); does not match downstream limits of sub-basins as shown in Table 3.3
Reduction in discharge attributed to change in percent impervious (FHAD = 22%, this analysis = 13.6%) and spill flows that go to King's Gulch sub-basin

[4] FHAD 5% impervious; Update 11% impervious

[5] FHAD 5% impervious; Update 2% impervious

Table 3.3: Recommended Discharges

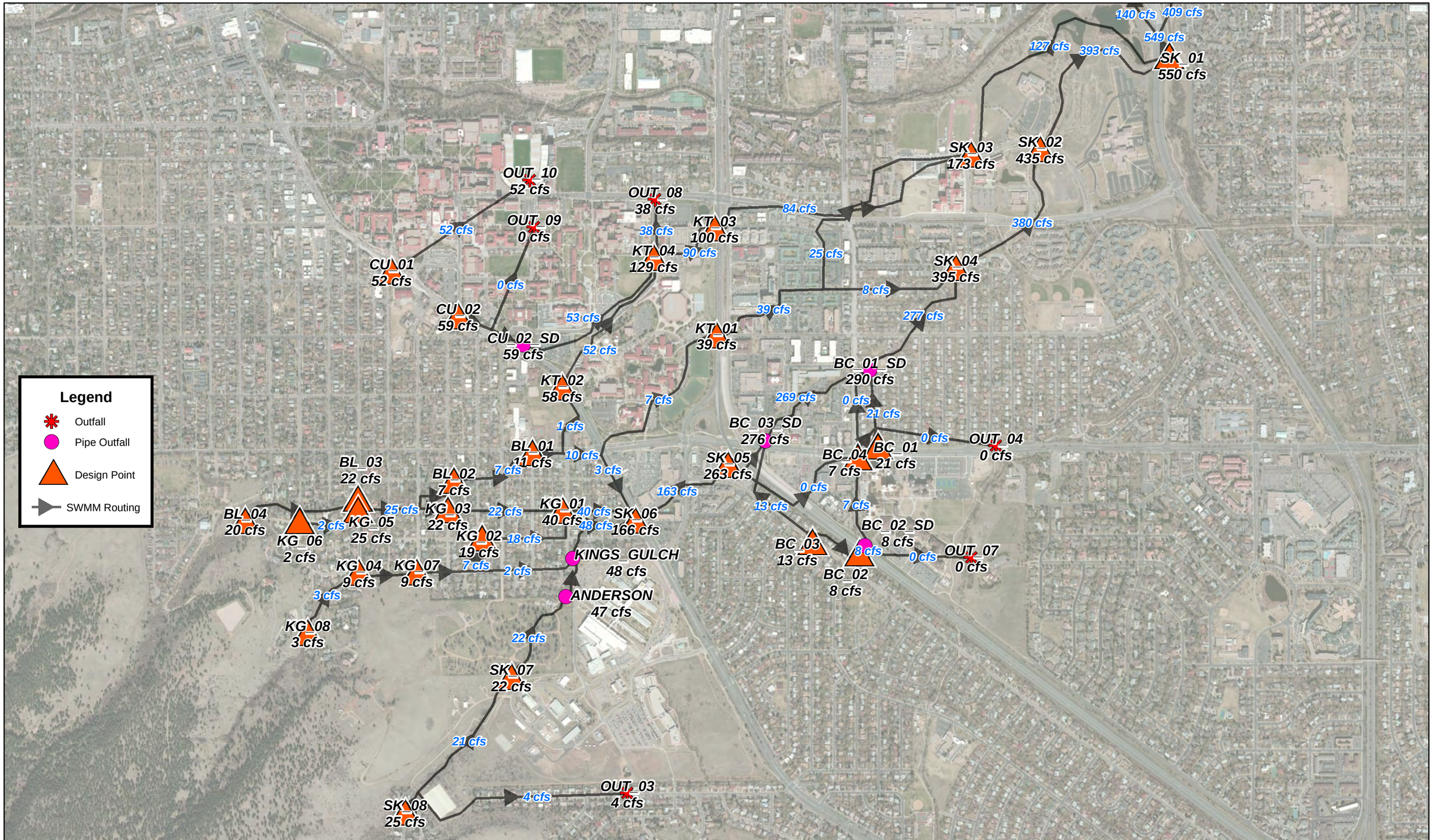
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

Flooding Source	Drainage Area (sq mi.)	Main Stem Design Point	Spill Notes	10-Year Discharges				25-Year Discharges				50-Year Discharges				100-Year Discharges				500-Year Discharges			
				Main Stem (cfs)	Incremental Increase in Discharge (cfs)	Spills (cfs)	Total (cfs)	Main Stem (cfs)	Incremental Increase in Discharge (cfs)	Spills (cfs)	Total (cfs)	Main Stem (cfs)	Incremental Increase in Discharge (cfs)	Spills (cfs)	Total (cfs)	Main Stem (cfs)	Incremental Increase in Discharge (cfs)	Spills (cfs)	Total (cfs)	Main Stem (cfs)	Incremental Increase in Discharge (cfs)	Spills (cfs)	Total (cfs)
Skunk Creek																							
Confluence with Bear Creek	2.91	SK_01	1	550	0	42	**592**	1101	0	113	**1214**	1527	0	184	**1711**	2065	9	341	**2406**	3434	38	600	**4034**
Discovery Drive	2.38	SK_02	2	435	40	30	**465**	803	96	111	**914**	1090	130	194	**1284**	1454	174	372	**1826**	2428	281	704	**3132**
Madison Avenue	2.22	SK_04	3	395	97	30	**425**	707	162	111	**818**	960	168	194	**1154**	1280	220	372	**1652**	2147	376	704	**2851**
30th Street	--	BC_01_SD	4	290	14	12	**302**	533	25	72	**605**	777	24	139	**916**	1045	24	292	**1337**	1755	23	569	**2324**
Baseline Road	--	BC_03_SD	5	276	13	12	**288**	503	21	77	**580**	740	29	152	**892**	957	32	356	**1313**	1532	33	769	**2301**
US HWY 36	2.06	SK_05	6	263	97	12	**275**	516	77	43	**559**	794	110	69	**863**	1174	157	107	**1281**	2063	266	205	**2268**
Broadway	1.85	SK_06	7	166	75	12	**178**	439	107	43	**482**	684	168	69	**753**	1017	236	107	**1124**	1797	409	205	**2002**
King Avenue	--	KINGS_GULCH	8	48	1	4	**52**	158	9	22	**180**	238	15	37	**275**	362	34	59	**421**	618	52	109	**727**
Anderson Ditch	--	ANDERSON	9	47	25	4	**51**	149	25	22	**171**	223	25	37	**260**	328	25	59	**387**	566	24	109	**675**
Green Mountain Cemetery	0.75	SK_07	10	22	1	4	**26**	124	8	22	**146**	198	19	37	**235**	303	37	59	**362**	542	79	109	**651**
Bluebell Canyon Creek																							
Downstream Limits of Sub-basins	0.42	BL_01	11	11	4	22	**33**	31	8	87	**118**	46	11	135	**181**	67	16	184	**251**	122	26	352	**474**
18th Street	0.41	BL_02	12	7	2	22	**29**	23	4	87	**110**	35	6	135	**170**	51	9	184	**235**	96	16	352	**448**
15th Street	0.40	BL_03	13	22	2	0	**22**	99	5	0	**99**	152	7	0	**152**	226	11	0	**226**	398	23	0	**398**
Chautauqua Park	0.38	BL_04	14	20	n/a	0	**20**	94	n/a	0	**94**	145	n/a	0	**145**	215	n/a	0	**215**	375	n/a	0	**375**
King's Gulch																							
Downstream Limits of Sub-basins	0.38	KG_01	15	40	-1	2	**42**	165	8	11	**176**	264	9	23	**287**	401	12	40	**441**	745	19	60	**805**
19th Street	0.33	KG_02	16	19	12	2	**21**	70	12	11	**81**	120	20	23	**143**	189	30	40	**229**	374	54	60	**434**
17th Street	0.30	KG_07	17	9	0	0	**9**	68	-1	0	**68**	124	1	0	**124**	199	1	0	**199**	380	4	0	**380**
15th Street	0.29	KG_04	18	9	6	0	**9**	69	10	0	**69**	123	17	0	**123**	198	28	0	**198**	376	61	0	**376**
Bellevue Drive	0.25	KG_08	19	3	n/a	0	**3**	59	n/a	0	**59**	106	n/a	0	**106**	170	n/a	0	**170**	315	n/a	0	**315**
King's Gulch - North																							
Confluence with King's Gulch	0.03	KG_03	20	22	2	5	**27**	87	3	19	**106**	135	4	29	**164**	200	6	42	**242**	352	11	80	**432**
15th Street	0.02	KG_05	21	25	1	0	**25**	103	0	0	**103**	160	2	0	**160**	237	1	0	**237**	421	3	0	**421**
13th Street	0.01	KG_06	22	2	n/a	0	**2**	4	n/a	0	**4**	6	n/a	0	**6**	10	n/a	0	**10**	20	n/a	0	**20**

Spill Notes

1 (Out_03)+(Out_08)+[(R_BC_03)-(R_BC_14)] *when R_BC_03 is greater than 0, otherwise (Out_03)+(Out_08)
2 (Out_03)+[(R_BC_03)-(R_BC_14)]+(R_KT_09)+(R_KT_02) *when R_BC_03 is greater than 0, otherwise (Out_03)+(R_KT_09)+(R_KT_02)
3 (Out_03)+[(R_BC_03)-(R_BC_14)]+(R_KT_09)+(R_KT_02) *when R_BC_03 is greater than 0, otherwise (Out_03)+(R_KT_09)+(R_KT_02)
4 (Out_03)+[(R_BC_03)-(R_BC_14)]+(R_KT_09)+(R_KT_06) *when R_BC_03 is greater than 0, otherwise (Out_03)+(R_KT_06)+(R_KT_07)
5 (Out_03)+(R_KT_06)+(R_KT_09)+(R_BC_03)
6 (Out_03)+(R_KT_06)+(R_KT_09)
7 (Out_03)+(R_KT_06)+(R_KT_09)
8 (Out_03)
9 (Out_03)
10 (Out_03)
11 (R_BL_09)-(R_BL_07)
12 (R_BL_09)-(R_BL_07)
13 No spill
14 No spill
15 (R_KG_04)
16 (R_KG_04)
17 No spill
18 No spill
19 No spill
20 (R_BL_07)
21 No spill
22 No spill



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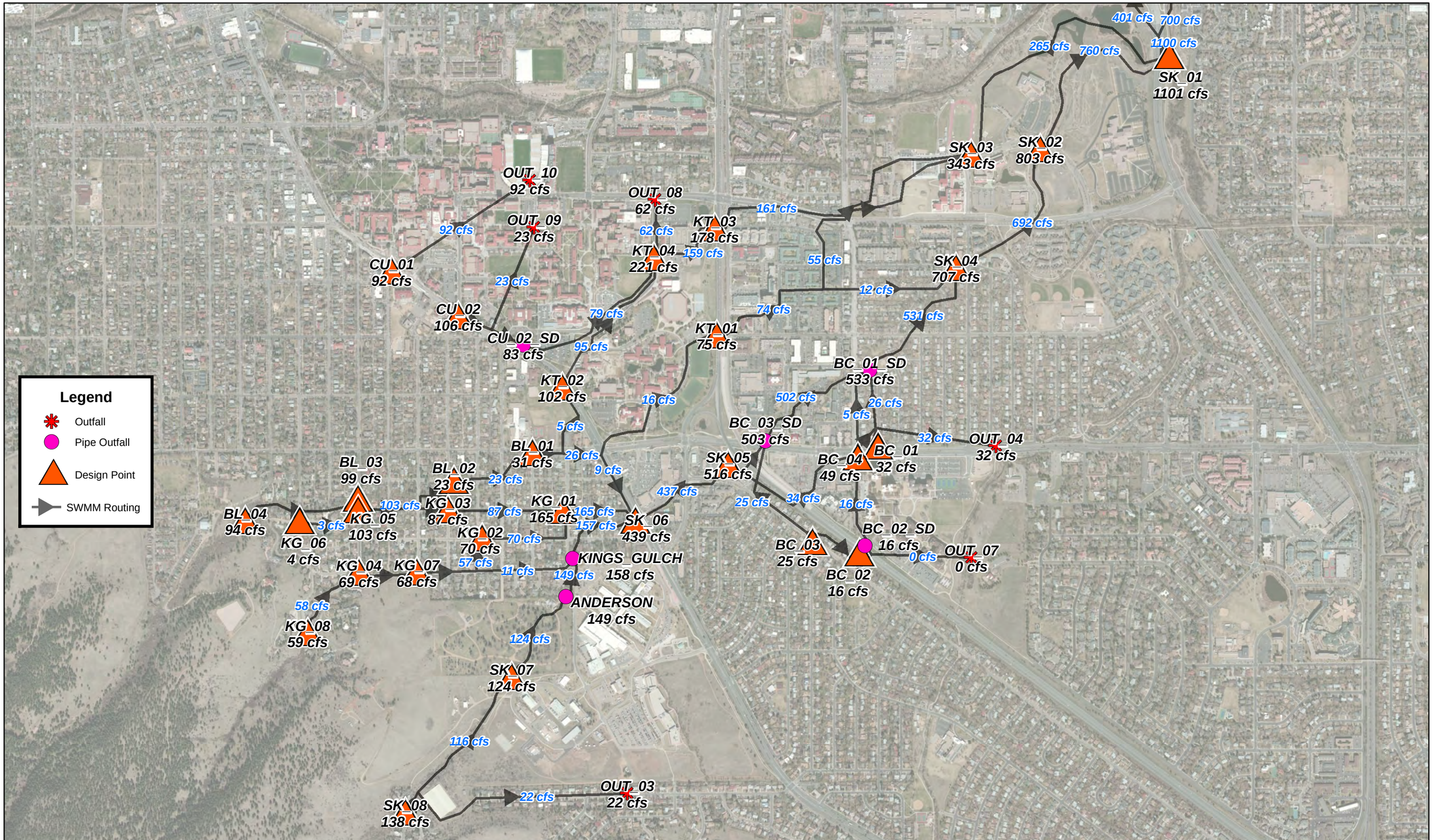
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 3.7: Hydrology Model Discharges - 10-YR

N

1,000 Feet



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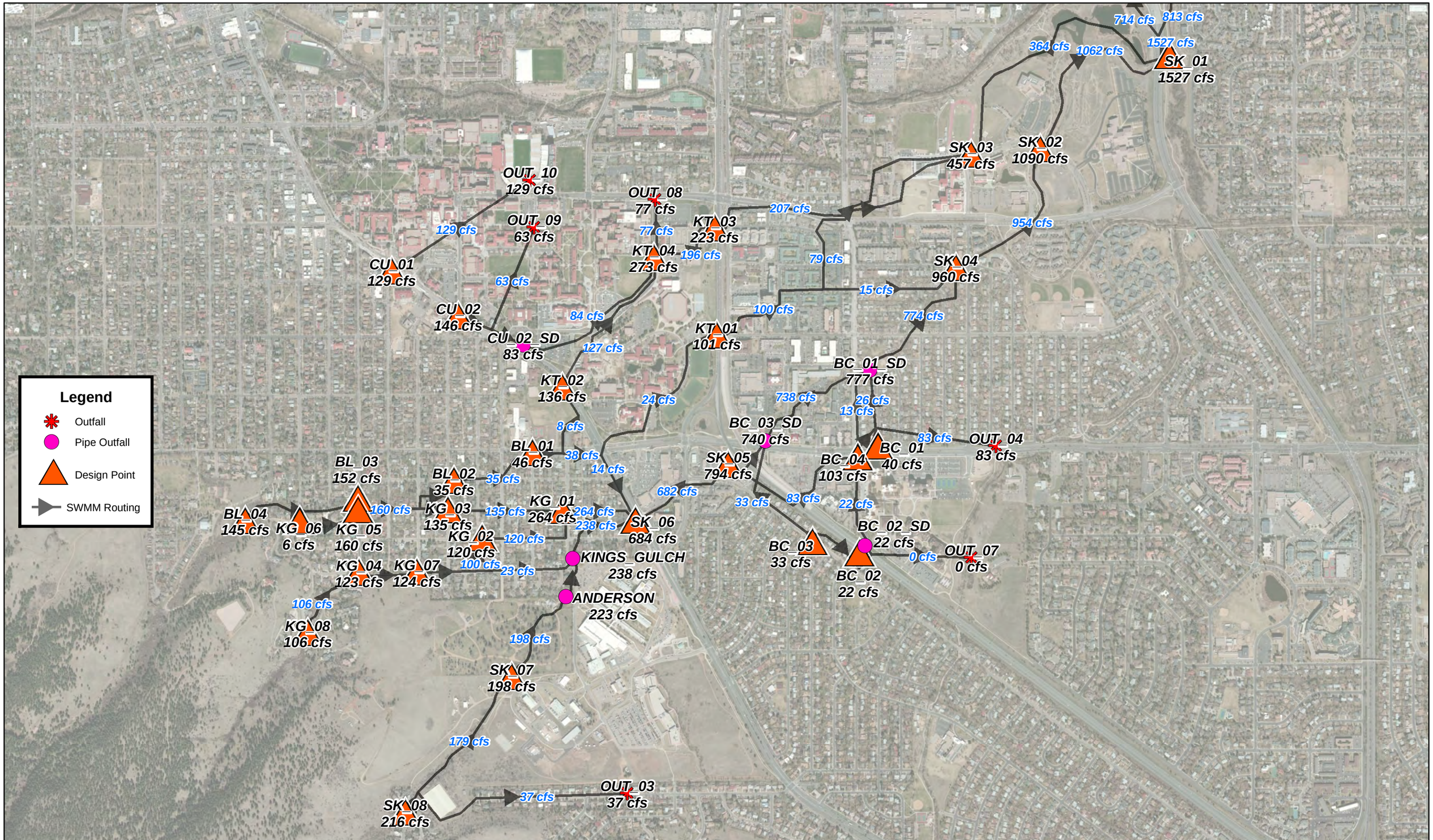
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 3.8: Hydrology Model Discharges - 25-YR

N

1,000 Feet



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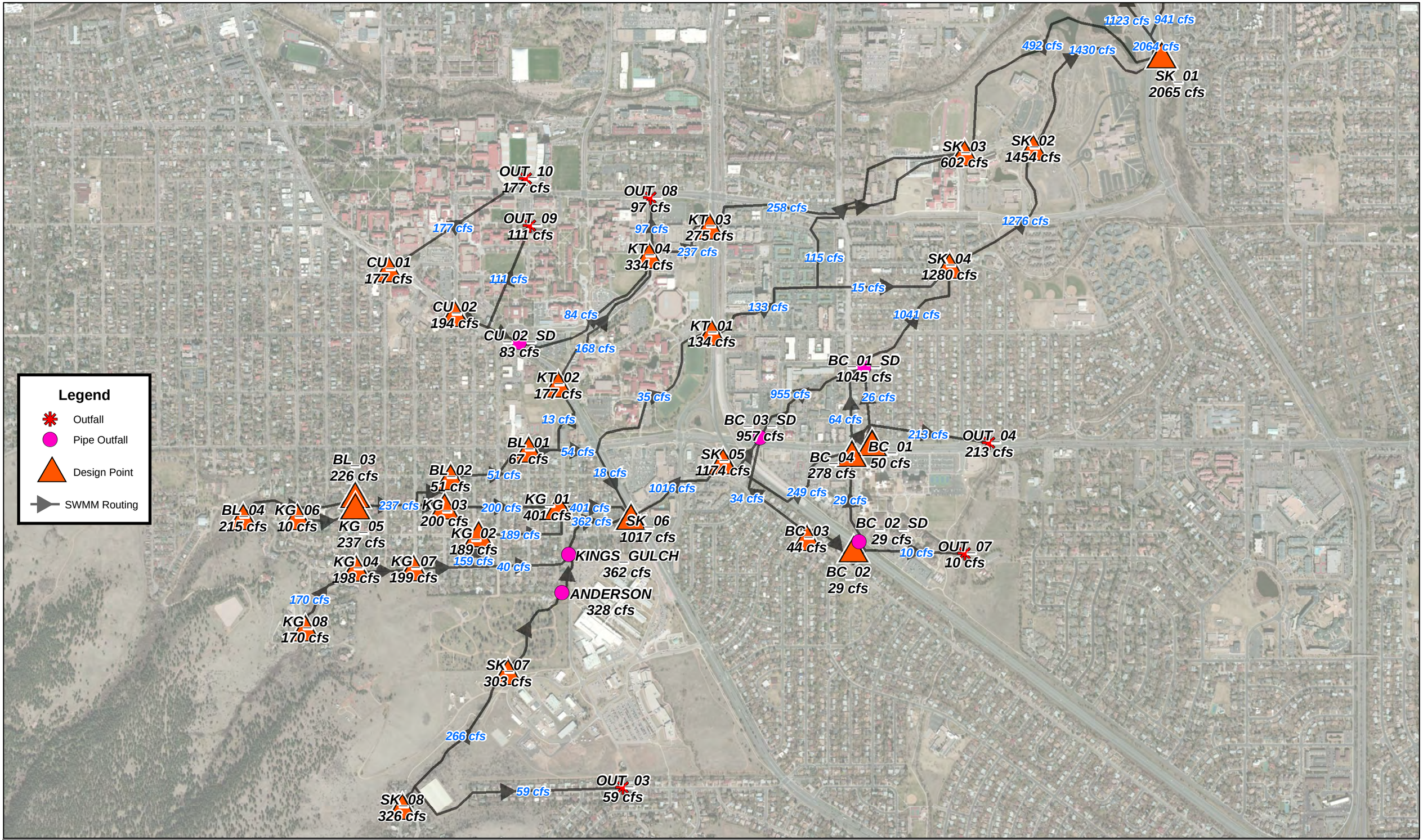
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 3.9: Hydrology Model Discharges - 50-YR

N

1,000 Feet



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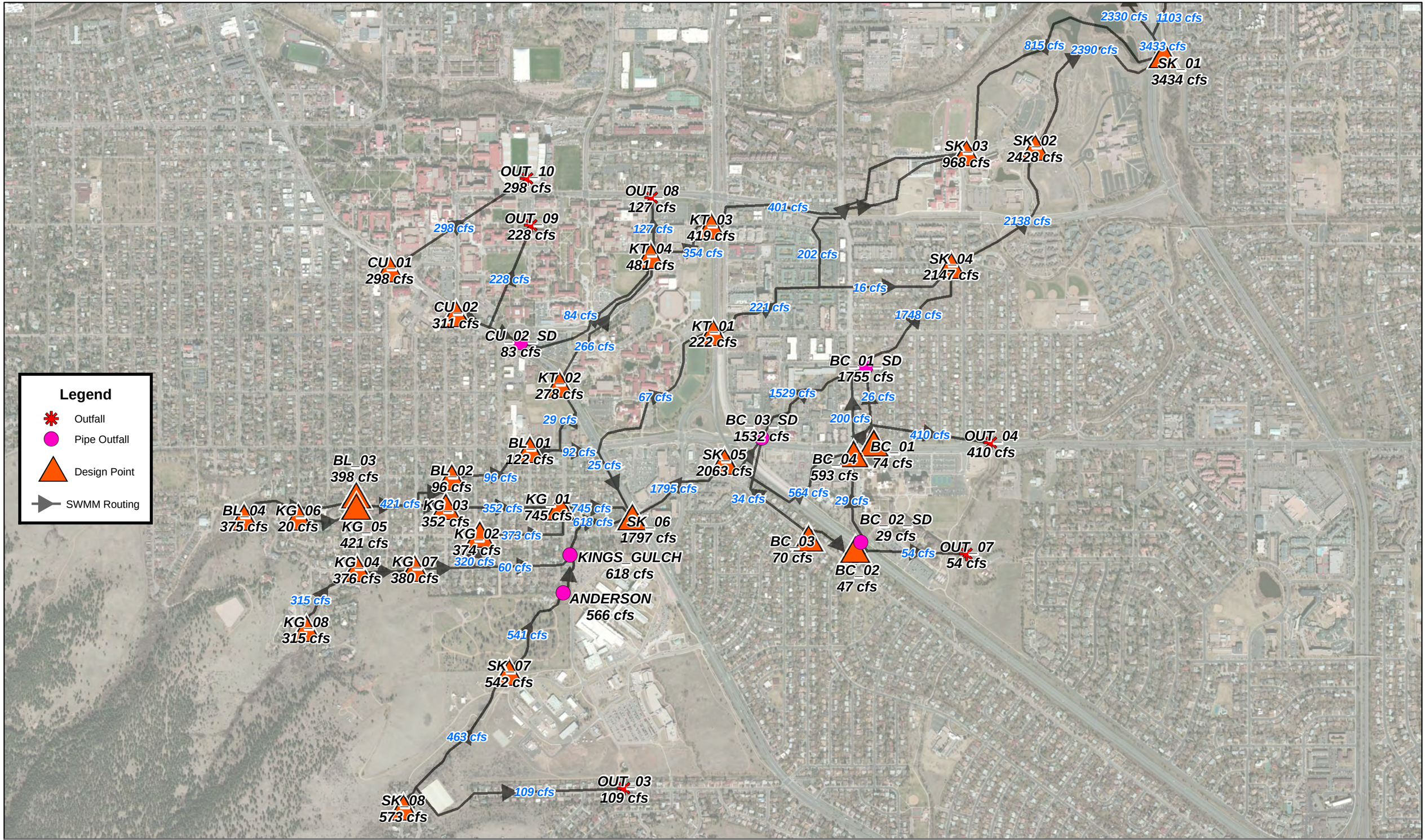
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 3.10: Hydrology Model Discharges - 100-YR

N

1,000 Feet



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Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 3.11: Hydrology Model Discharges - 500-YR

N

1,000 Feet

SECTION 4.0: HYDRAULIC ANALYSIS

4.1 Mapping

Topographic LiDAR data used in this hydraulic analysis was provided by the City of Boulder. The parameters of this data are as follows:

Date of Mapping:	2013
Source of Mapping:	City of Boulder
Horizontal Datum:	Colorado State Plane NAD 83 HARN North Zone
Vertical Datum:	NAVD 88
Units:	US Survey Feet
Contour Interval:	1-foot

This topographic LiDAR data was also used to develop a digital elevation surface (DEM) for use in GIS and ultimately for cross section station and elevation data imported into HEC-RAS using the GeoRAS software.

Building footprint information was also provided by the City of Boulder. This information was used to create areas of blocked obstruction in both the FLO-2D and HEC-RAS models.

4.2 FLO-2D Modeling

As previously noted, a FLO-2D hydraulic model was developed in order to determine the major flow paths along Skunk Creek, Bluebell Canyon Creek, and King's Gulch. These major flow paths were used as a roadmap to develop the HEC-RAS hydraulic model. Parameters used within the FLO-2D model are discussed below. Figures 4.1 and 4.2 illustrate the 100-year FLO-2D floodplain and the associated peak discharges. FLO-2D input and output files are included in Appendix J.

Elevation Data

Elevation data used in the FLO-2D model was taken directly from the 2013 LiDAR data provided by the City of Boulder.

Grid Size

The FLO-2D grid size was set at 10-foot by 10-foot. All LiDAR elevation data points that fall within a given 10-foot grid are then averaged by the FLO-2D software and a typical elevation is set for each grid cell.

Manning's 'n' Values

Manning's 'n' values for the FLO-2D model were selected based on the typical values provided in the FLO-2D user manual. A Manning's 'n' value workmap is provided in Appendix E for reference. The Manning's 'n' values were set based on GIS shape files that were imported in to the FLO-2D software. This approach allows FLO-2D to calculate a weighted Manning's 'n' value for each grid cell based on the area of the grid covered by a particular Manning's 'n' value (i.e. a

grid that had 50% of its area covering an n value of 0.4 and 50% of the area covering a value of 0.2 would be given a weighted Manning's 'n' value of 0.3).

Buildings

Building footprint information provided by the City of Boulder was imported into the FLO-2D software. FLO-2D then calculates and sets the appropriate width and area reduction factors for each grid cell based on the amount and location of the building obstruction within the grid cell.

Culverts and Bridges

Culvert and bridge crossing structure rating curves were developed for the FLO-2D model by utilizing previously completed HEC-RAS modeling for the Skunk Creek, Bluebell Canyon Creek, and King's Gulch drainages. Discharges increasing in increments of 100 cfs were run though the model as developed by the previous consultant. A discharge vs. depth at the upstream face relationship was established and used as the rating curve within the FLO-2D model. Rating curve data is included in Appendix E.

Inflow – for Determination of SWMM Diversion Curves

Inflow hydrographs for the FLO-2D model used to develop the SWMM diversion curves were based on a steady state version of sub-basin hydrographs developed by the CUHP program. The CUHP hydrographs were modified such that the peak discharge remained constant through 10 hours of model run time, creating a steady state conditions. Inflow hydrographs and diversion curves are included in Appendix D for reference.

Inflow – for Determination of Peak Discharges

Inflow hydrographs for the FLO-2D model used to determine peak discharges along detailed study reaches were based on a steady state hydrograph that reflected the peak discharge determined by the SWMM model. That is, the most upstream hydrograph was taken from CUHP and adjusted to a steady state condition. Then subsequent inflow locations were capped at the incremental increase in discharge required to be added to the upstream value such that the total peak discharge matched the routed SWMM peak discharge values at any given location as discussed in Section 3 of this report. Table 3.3 and Figures 3.7 through 3.11 illustrate the peak discharge values at each design point.

Outflow

Outflow grid elements were placed along the entire boundary of the FLO-2D model. Discharges that enter these grid elements are removed from the model.

Cross Sections / Peak Discharges

106 floodplain cross sections were used to show results from the FLO-2D model. Peak discharge values through these cross sections were used as the basis for

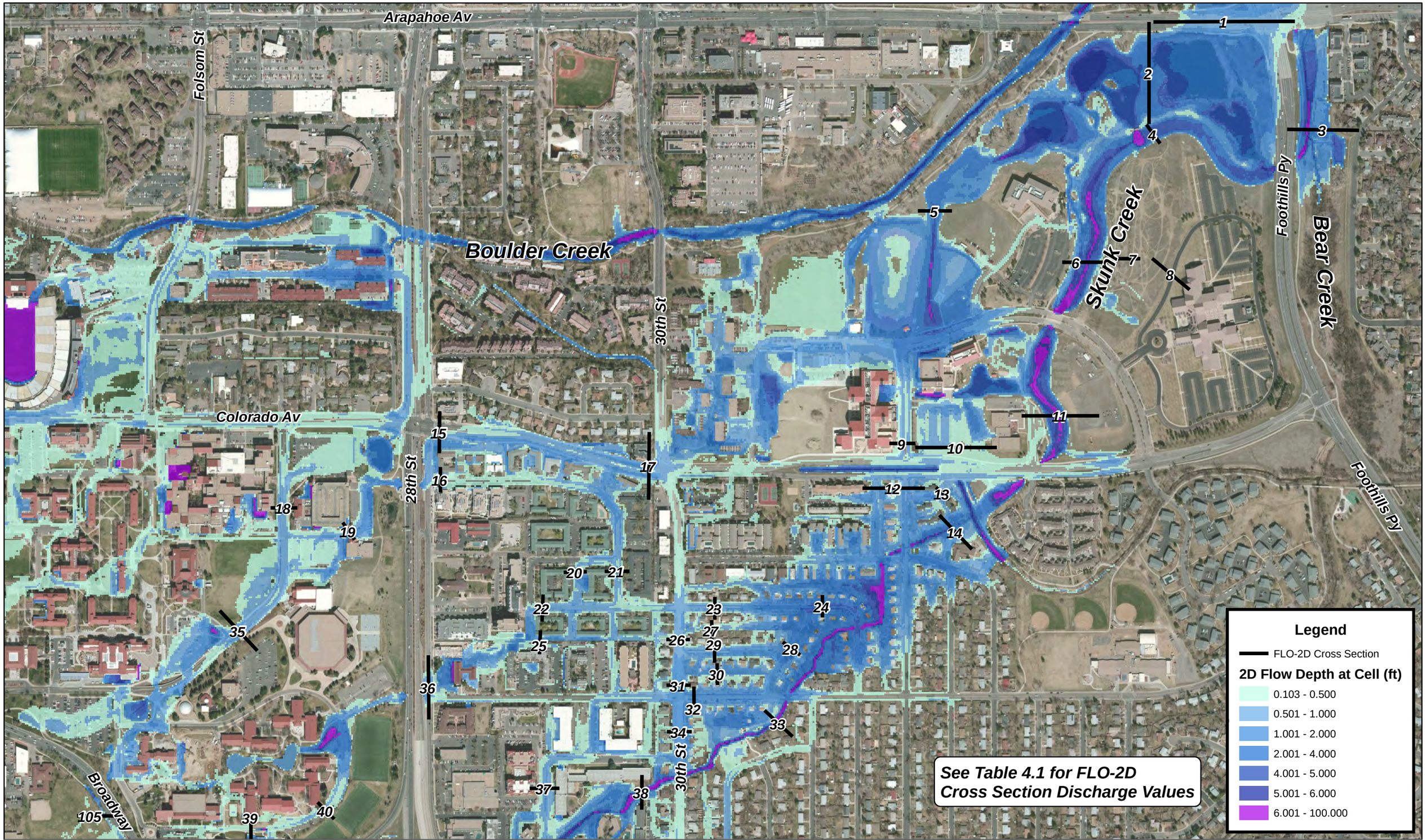
split flow distributions in the HEC-RAS model. Cross section locations are illustrated in Figure 4.1 and detailed in Table 4.1. The discharges used in the HEC-RAS models are detailed in Table 4.2.

Model Run time

The FLO-2D model was run over a 9 hour period of time to allow a fully steady state condition to develop. In general a steady state computational condition is achieved after 5 hours of the simulation.

Model Output

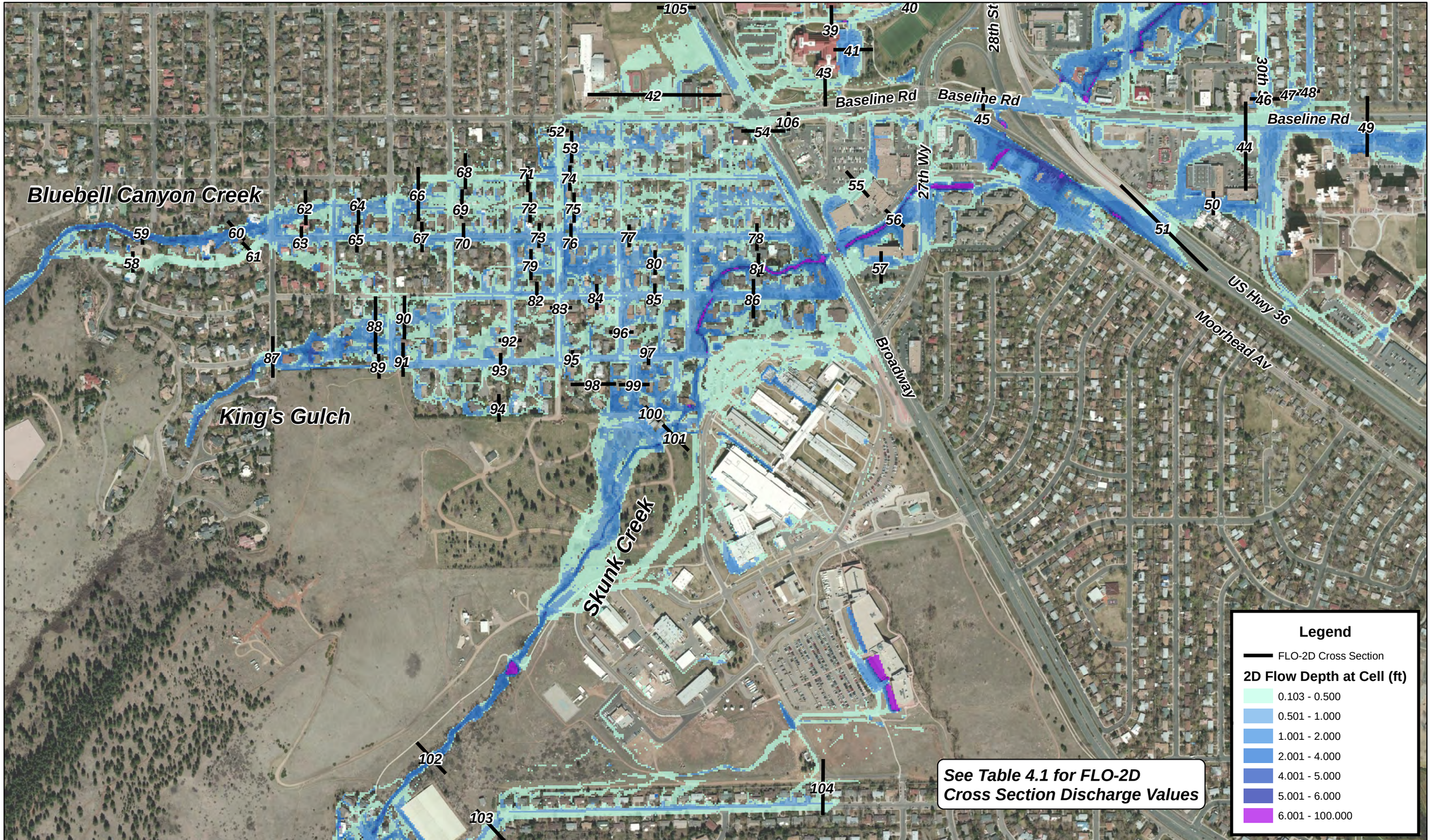
All FLO-2D modeling information and output files are included in Appendix J as electronic files. The 100-year FLO-2D floodplain is illustrated in Figure 4.1 and 4.2 and discharges are detailed in Table 4.1.



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 4.1: FLO-2D Floodplain Workmap (north)



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure 4.2: FLO-2D Floodplain Workmap (south)

Table 4.1: FLO-2D Cross Section Discharges

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR
ICON Engineering, Inc.

FLO-2D Cross Section	10-Year Discharge (cfs)	25-Year Discharge (cfs)	50-Year Discharge (cfs)	100-Year Discharge (cfs)	500-Year Discharge (cfs)
1	68	434	690	1078	2125
2	160	450	700	1000	1900
3	530	736	824	929	1123
4	440	730	863	1001	1263
5	160	323	434	577	892
6	438	821	1076	1430	2211
7	0	0	0	1	58
8	0	0	0	0	47
9	0	8	37	91	250
10	16	116	181	270	499
11	383	631	794	1000	1600
12	20	114	182	288	607
13	43	104	147	204	342
14	318	464	562	693	1007
15	94	142	170	200	267
16	2	5	8	12	30
17	120	211	269	338	516
18	44	83	102	126	187
19	85	136	164	197	274
20	14	32	42	56	96
21	11	34	51	77	124
22	17	43	60	82	140
23	10	35	69	109	209
24	65	275	450	500	500
25	16	36	47	60	97
26	2	24	57	96	217
27	0	2	3	4	14
28	39	234	404	600	700
29	2	51	98	151	315
30	0	4	9	16	41
31	4	76	161	256	536
32	7	138	245	355	633
33	261	305	325	364	478
34	7	192	362	545	1032
35	119	180	209	244	320
36	33	80	110	146	241
37	4	28	60	97	210
38	274	518	706	898	1431
39	2	3	5	9	20
40	6	14	20	29	48
41	5	14	16	21	30
42	8	20	27	40	71
43	7	13	17	22	33
44	0	1	32	99	230
45	1	3	5	60	539
46	0	0	5	32	126
47	0	0	1	5	14
48	0	0	11	37	76
49	7	18	97	235	412
50	0	5	60	180	374

...continued on next page

Table 4.1: FLO-2D Cross Section Discharges (continued)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

FLO-2D Cross Section	10-Year Discharge (cfs)	25-Year Discharge (cfs)	50-Year Discharge (cfs)	100-Year Discharge (cfs)	500-Year Discharge (cfs)
51	0	7	98	284	608
52	5	8	10	12	16
53	2	10	14	20	40
54	2	7	9	11	14
55	0	1	6	21	110
56	169	451	705	1003	1510
57	0	0	1	42	257
58	3	5	9	12	21
59	19	90	137	203	354
60	20	89	134	196	331
61	3	10	17	30	73
62	7	26	38	54	94
63	18	90	121	177	313
64	6	22	33	47	86
65	20	82	130	185	318
66	5	21	30	43	79
67	21	84	133	191	329
68	5	17	25	37	76
69	3	7	9	12	20
70	22	87	129	191	321
71	7	22	34	49	95
72	2	5	8	14	28
73	20	73	111	159	250
74	1	7	14	20	44
75	1	4	7	12	26
76	18	63	96	143	251
77	25	90	144	220	401
78	16	65	100	151	254
79	2	9	17	30	83
80	6	15	25	33	63
81	68	164	201	242	324
82	14	33	63	107	236
83	4	19	26	35	47
84	7	31	49	81	173
85	8	43	72	112	207
86	1	69	160	303	610
87	10	72	126	199	378
88	4	43	90	156	311
89	6	27	35	44	72
90	0	12	26	50	133
91	9	62	102	145	245
92	2	8	13	20	40
93	9	63	92	133	208
94	0	1	3	7	19
95	3	33	58	90	139
96	3	19	31	47	76
97	7	55	85	134	243
98	0	4	7	12	23
99	10	46	75	115	205
100	3	19	33	55	111
101	14	59	79	113	177
102	23	118	180	268	466
103	4	22	34	60	109
104	3	24	33	50	89
105	1	3	5	8	17
106	1	2	3	4	6

4.3 Storm Drain Analysis

There are two storm drains that run parallel to detailed study reaches within this project area. They are:

1. East Aurora Avenue between 30th Street and the Skunk Creek Channel
2. King Avenue between 17th Street and 22nd Street/Skunk Creek Channel

Based on the small size of these storm drain systems – less than 36 inches in diameter – and the potential for the inlet at the upstream end of the King Avenue storm drain to be blocked by debris (as seen in the 2013 flood event), the capacity of these storm drain systems were not considered in this floodplain analysis.

4.4 HEC-RAS Modeling

As noted previously, a HEC-RAS hydraulic model was developed based on selected flow paths as identified by the FLO-2D model. The general characteristics of this HEC-RAS model are discussed below. HEC-RAS model reports and cross sections are provided in Appendix E. Floodplain and conveyance zone data are provided in Tables 4.4, 4.5, and 4.6 at the end of this report section.

Flow Paths

The peak discharge FLO-2D model as discussed above was utilized to determine discharges and flooding depths within the drainage basin. Flow paths for detailed modeling and mapping within the Skunk Creek, Bluebell Canyon Creek, and King's Gulch drainageways were placed where discharges exceeded 50 cfs and where average depths generally meet or exceed 1 foot during the 100-year event. Exceptions to the depth criteria were made along Mariposa Avenue and King Avenue in order to provide a continuous detailed study reach between the upstream channels and Skunk Creek.

The selected flow paths for detailed modeling and mapping are illustrated in Figure 4.3.

Discharges

Discharges used in the HEC-RAS model for detailed study reaches were taken from the FLO-2D floodplain cross section peak discharge values as shown in Figure 4.1 and 4.2 and detailed in Table 4.1. Table 4.2 provides a summary of discharges within the HEC-RAS detailed study reaches.

Cross Section Station and Elevation Data

Cross section station and elevation data was extracted from the GIS DEM created from the 2013 LiDAR data provided by the City of Boulder. Additional cross section modifications were completed in some areas adjacent to bridge or culvert structures to reflect survey information including channel invert elevations and typical channel cross section geometry.

Bank Stations
Bank station locations were estimated in GIS and extracted to HEC-RAS. Bank station locations were then modified as needed based on the actual cross section shape and preferred bank station location in HEC-RAS.

Downstream Reach Lengths
Downstream reach lengths were calculated based on the flow paths as assigned in GIS.

Ineffective Flow Areas
Ineffective flow areas were initially estimated and assigned in GIS based on structure locations in close proximity to cross sections. The ineffective flow areas were then adjusted or otherwise modified directly in HEC-RAS as needed for continuity and elevation. Additional areas of ineffective flow were added to reflect ground obstructions and crossing structures as needed.

Blocked Obstructions
Blocked obstructions were extracted from GIS based on the building footprint data provided by the City of Boulder.

Manning's n Values
Manning's n values for the overbank areas were selected based on typical values as determined by field observations. Manning's n values for the channel areas were determined by a modified Cowan's method that calculated the n value based on channel bed material (base value), cross section irregularity, variations of the channel, obstructions, vegetation, and meandering. Channel Manning's n value calculations are detailed in Table 4.3 below. Manning's n value workmaps are provided in Appendix I for reference.

Starting Water Surface Conditions
Starting water surface conditions for the main channel of Skunk Creek was based on normal depth at the confluence with Bear Canyon Creek. Based on drainage basin sizes, the peak flows for Skunk Creek and Bear Canyon Creek are considered non-coincidental. However, profiles and floodplain workmaps will reflect backwater effects from peak discharges on Bear Canyon Creek.

Starting water surface elevations for the Bear Creek Split Flow, 35th Street Split Flow, and 29th Street Split Flow were based on normal depth.

All other starting water surface elevations are based on the respective junction calculations.

Channel Crossing Structures

Channel crossing structures were added into the HEC-RAS model at all crossing structure locations as noted in Table 2.1. The deck elevations, invert in and invert out elevations, bridge width, and railing information (as applicable) were taken from the field survey or as-built information and incorporated into the HEC-RAS model. Expansion and contraction coefficients were adjusted at cross sections adjacent to channel crossing structures as noted in Table 2.1.

In order to achieve the recommended debris blockage for the crossing structures as noted in Table 2.1, the upstream face of the structures were modeled with blocked obstructions encroaching into the crossing structure opening from each side. Additionally, at culvert crossings the culvert size was modified to reduce the culvert open area in order to reflect the debris blockage value. This was done by reducing the culvert width for box culverts and by reducing the culvert diameter for pipe culverts. Notes for debris blockage values and culvert size adjustments are also included in the HEC-RAS model.

The Skunk Creek / US Highway 36 culvert area is complex as a result of several factors including:

1. Split flows that run south east along the highway and ultimately spill north over the highway.
2. Spill flows within Baseline Road.
3. Spill flows through a pedestrian underpass located above the Skunk Creek culvert (spills onto Baseline Road).
4. Steep culvert (1.8% slope) with bend.

As a result of this complex area, the HEC-RAS modeling of the culvert was not providing results that were consistent with the FLO-2D model. In order to achieve better model correlation, the US Highway 36 culvert was removed from the HEC-RAS model and a rating curve was completed at cross section 8576. The rating curve is based on water surface elevations and discharges taken from the FLO-2D model (which is based on the HY-8 analysis of the culvert). Discharge and water surface elevation / stage data is included in Table E.1 in Appendix E. The annotated profiles will show the US Highway 36 culvert in place, though the water surface elevations will be based on the HEC-RAS model that is using the rating curve at cross section 8576.

Floodplain Tie-in to Effective Information

The downstream tie-in for Skunk Creek is tied directly into the effective Bear Canyon Creek floodplain. The left overbank area of Skunk Creek upstream of Foothills Parkway is tied into the effective* Boulder Creek floodplain (*using the best available information that is the pending PMR data). The Bear Canyon Creek split flow is tied into the effective Bear Canyon Creek floodplain where the split flow joins the main channel of Bear Canyon Creek just upstream of Baseline

Road. All floodplain tie-ins to the effective information are shown on the floodplain workmaps in Appendix F.

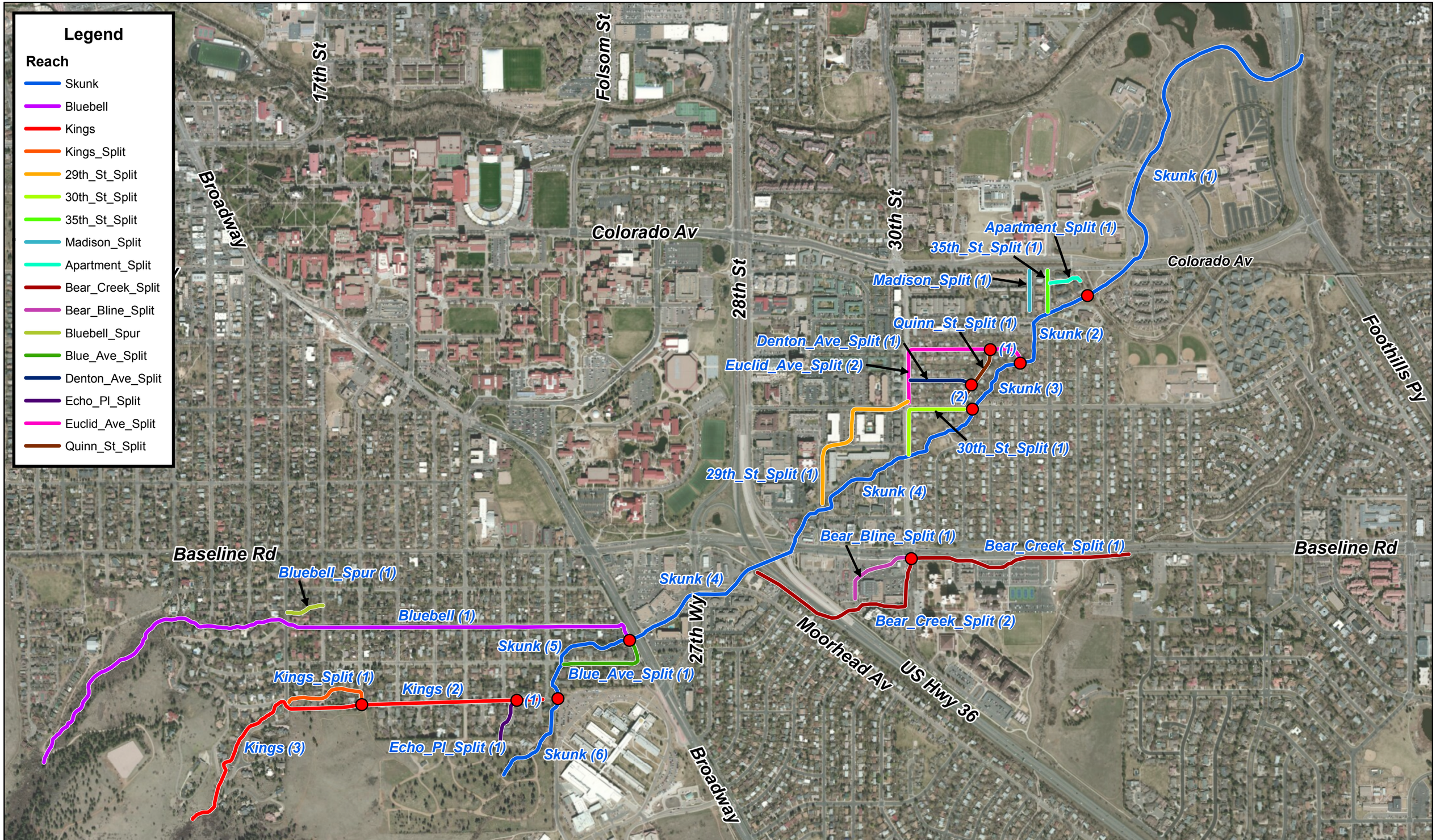
Confluence Area (Boulder Creek and Bear Canyon Creek)

At the downstream end of Skunk Creek water will spill north out of the Skunk Creek channel. The 100-year discharge that spills out of Skunk creek and flows into Boulder Creek is approximately 1123 cfs based on the SWMM model and 1078 cfs based on the 2D model. This is less than the effective (i.e pending PMR) Boulder Creek model discharge within the spill flow path that is located just north of the Skunk Creek channel. Given that the anticipated spill out of Skunk Creek is less than the discharge for the Boulder Creek floodplain, the Boulder Creek floodplain was considered the most conservative and the existing conditions Skunk Creek floodplain was tied into the Boulder Creek PMR floodplain limits. Given the design channel and lack of expected redevelopment along Skunk Creek downstream of the start of the spill flows to the north, the full discharge was kept within Skunk Creek for BFE and floodplain delineation purposes.

As Skunk Creek flows east of Foothills Parkway it confluences with Bear Canyon Creek. Based on the approach noted above of keeping the full Skunk Creek discharge for modeling and delineation purposes, the Skunk Creek 100-year discharge entering Bear Canyon Creek is 1430 cfs. This is significantly less than the regulatory 100-year discharge within this reach of Bear Canyon Creek of 4880 cfs. Accordingly, the Skunk Creek floodplain was tied into the effective Bear Canyon Creek floodplain where applicable.

Conveyance Zone (Floodway)

Conveyance zone (floodway) encroachments were completed based on a 0.5 foot water surface elevation rise criteria. Conveyance zone encroachments were completed using a combination of method 4 and method 1 encroachments in HEC-RAS. For conveyance zones along roadways, the encroachments were limited to the flowlines on each side of the roadway. This was done to maintain a consistent conveyance zone width within the City of Boulder street right-of-ways. Additional discussion on the conveyance zone is provided in Section 5.3 of this report.



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure 4.3: HEC-RAS Reach Workmap

N

800 Feet

Table 4.2: HEC-RAS Discharge Summary
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR
ICON Engineering, Inc.

Flooding Source and Location	HEC-RAS Reach	HEC-RAS Cross Section	10-Year Discharge (cfs)	25-Year Discharge (cfs)	50-Year Discharge (cfs)	100-Year Discharge (cfs)	Floodway Discharge (cfs)	500-Year Discharge (cfs)	FLO-2D Model Source of Discharge Value Notes (may not be applicable to Floodway Discharge)
Skunk Creek									
Upstream Limit of Study	6	11882	14	59	79	113	113	177	XS 101
Confluence with Anderson Ditch	6	11457	39	84	104	138	138	202	XS 101 + 25 cfs from Anderson Ditch
Confluence with King's Gulch	5	10981	49	158	222	327	327	556	XS 101 + 25 cfs from Anderson Ditch + XS 100 + XS 97
Downstream of Blue Ave. Split Flow	5	10616	68	164	201	242	242	324	XS 81
Broadway	4	9894	169	451	705	1003	1003	1510	XS 56
US Highway 36 / 28th Street	4	8576	263	509	696	890	890	1455	SK_05 - XS 51
29th Street	4	7478	274	518	706	898	898	1431	XS 38
30th Street	4	6479	261	305	325	364	364	478	XS 33
Aurora Ave.	3	5737	261	305	325	364	364	478	XS 33 (not reduced per Quinn St. discharges)
34th Street	2	4999	381	682	891	1185	1185	1956	XS 12 + XS 13 + XS 14
Downstream of Madison Ave. Split Flow	2	4489	377	598	748	957	957	1508	[XS 12 + XS 13 + XS 14] - Madison Split Flow (see below)
Downstream of 35th Street Split Flow	2	4364	318	464	562	693	693	1007	XS 14
Wellman Canal	1	4009	365	558	673	824	824	1207	[XS 12 + XS 13 + XS 14] - XS 9 - XS 10
Colorado Avenue	1	3385	383	631	794	1000	1000	1600	XS 11
Discovery Drive	1	2560	438	821	1076	1430	1430	2211	XS 6
Skunk Creek - Echo Pl. Split Flow									
Echo Place	1	289	10	46	75	115	115	205	XS 99
Skunk Creek - Blue Ave. Split Flow									
Bluebell Avenue	1	818	1	69	160	303	303	610	XS 86
Skunk Creek - Bear Creek Split Flow									
US Highway 36	2	4014	0	7	98	284	284	608	XS 51
Upstream of 30th Street	2	2787	0	5	60	180	180	374	XS 50
30th Street and Baseline Road	1	2046	7	18	97	235	235	412	XS 49
Skunk Creek - Bear BLine Split Flow									
Upstream limit of split	1	723	0	1	32	99	99	230	XS 44
Skunk Creek - 29th St. Split Flow									
29th Street	1	1539	4	28	60	97	97	210	XS 37
Skunk Creek - 30th St. Split Flow									
30th Street	1	875	7	192	362	545	545	1032	XS 34
Aurora Avenue	1	471	7	138	245	355	355	633	XS 32
Skunk Creek - Euclid Ave. Split Flow									
30th Street and Aurora Avenue	2	1563	4	76	161	256	256	536	XS 31
30th Street and Denton Avenue	2	1311	2	24	57	96	96	217	XS 26
30th Street and Euclid Avenue	2	1124	10	35	69	109	109	209	XS 23
Euclid Avenue and Quinn Street	1	308	65	275	450	500	500	500	XS 24
Skunk Creek - Denton Ave. Split Flow									
30th Street	1	534	2	51	98	151	151	315	XS 29
Skunk Creek - Quinn St. Split Flow									
Aurora Avenue and Quinn Street	2	488	37	183	306	449	449	385	XS 28 - XS 29
Denton Avenue and Quinn Street	1	278	39	234	404	600	600	700	XS 28
Skunk Creek - 35th St. Split Flow									
35th Street	1	346	59	134	186	264	264	501	[XS 12 + XS 13] - Madison Split Flow (at Madison Avenue)
Colorado Avenue	1	43	16	55	86	134	134	305	[XS 12] - Madison Split Flow (at Colorado Avenue)
Skunk Creek - Madison Split Flow									
Madison Avenue	1	346	4	84	143	228	228	448	sum of north flow at FLO-2D nodes 618356, 618938, 619520, 620101, 620682, 621263, 621844, 622425, 623006, 623587
Colorado Avenue	1	45	4	59	96	154	154	302	sum of north flow at FLO-2D nodes 618919, 619501, 620082, 620663, 621244, 621825, 622406, 622987, 623568
Skunk Creek - Apartment Split Flow									
35th Street	1	237	43	104	147	204	204	342	XS 13
Bluebell Canyon Creek									
Upstream Limit of Study	1	6245	20	94	145	215	215	375	BL_04
Big Rock Split	1	4671	19	90	137	203	203	354	XS 59
15th Street	1	3360	23	99	151	226	226	404	XS 60 + XS 61
Downstream of 15th Street	1	3215	18	90	121	177	177	313	XS 63
Downstream of 17th Street	1	2415	21	84	133	191	191	329	XS 67
19th Street	1	1839	20	73	111	159	159	250	XS 73
20th Street	1	1536	18	63	96	143	143	251	XS 76
21st Street	1	1194	25	90	144	220	220	401	XS 77
22nd Street	1	799	16	65	100	151	151	254	XS 78
Bluebell Canyon Creek - Bluebell Spur									
15th Street	1	314	7	26	38	54	54	94	XS 62
King's Gulch									
Upstream Limit of Study	3	3674	3	59	106	170	170	315	KG_08
15th Street	3	2330	6	43	74	119	119	224	sum of east flow at FLO-2D nodes 92742, 92743, 92744, 92745, 92746
17th Street	2	1621	9	62	102	145	145	245	XS 91
18th Street	2	1320	9	63	92	133	133	208	XS 93
19th Street	2	981	7	55	79	113	113	168	XS 93 - XS 92
20th Street	2	665	3	33	58	90	90	139	XS 95
Echo Place	1	215	7	55	85	134	134	243	XS 97
King's Gulch - King's Split Flow									
15th Street	1	775	3	27	49	79	79	152	sum of east flow at FLO-2D nodes 95246, 95247, 95248, 95249

Table 4.3: Channel Manning's n Value Calculations

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

Channel	Downstream Limit	Upstream Limit	Base Value n_0		Cross Section Irregularity n_1		Variations of the Channel n_2		Obstructions n_3		Vegetation n_4		Meander Multiplier m		Calculated[1] Manning's n Value
Skunk Creek	Bear Canyon Creek	Discovery Drive	Gravel	0.025	Minor	0.005	Gradual	0.000	Minor	0.015	Medium	0.025	Minor	1.0	**0.070**
	Discovery Drive	Colorado Avenue	Gravel	0.025	Minor	0.005	Gradual	0.000	Minor	0.015	Medium	0.025	Minor	1.0	**0.070**
	Colorado Avenue	35th Street	Gravel	0.025	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.100**
	35th Street	Aurora Avenue	Cobble	0.027	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.102**
	Aurora Avenue	30th Street	Cobble	0.027	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.102**
	30th Street	29th Street	Cobble	0.027	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Medium	0.025	Minor	1.0	**0.077**
	29th Street	Baseline Road	Cobble	0.027	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.102**
	Moorhead Frontage Road	Broadway	Cobble	0.027	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.102**
	Broadway	Bluebell Avenue	Cobble	0.027	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.102**
	Bluebell Avenue	King Avenue	Cobble	0.027	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.102**
	King Avenue	Upstream Limit of Study	Cobble	0.027	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.102**
Bluebell Canyon Creek	15th Street	12th Street	Cobble	0.027	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.102**
	12th Street	Upstream Limit of Study	Boulder	0.03	Minor	0.005	Alternating frequently	0.015	Minor	0.015	Large	0.05	Minor	1.0	**0.115**
King's Gulch	17th Street	15th Street	Cobble	0.027	Smooth	0.000	Gradual	0.000	Negligable	0.004	Medium	0.025	Minor	1.0	**0.056**
	15th Street	Bellevue Drive	Boulder	0.03	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.105**
	Bellevue Drive	Upstream Limit of Study	Boulder	0.03	Minor	0.005	Alternating occasionally	0.005	Minor	0.015	Large	0.05	Minor	1.0	**0.105**

[1] Calculated Manning's n value = $(n_0 + n_1 + n_2 + n_3 + n_4)*m$

Table 4.4: Summary of Floodplain and Floodway Data - Skunk Creek (page 1 of 6)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

River	HEC-RAS Reach	HEC-RAS Cross Section	Channel Invert (ft - NAVD 88)	Peak Discharge[1] Floodplain (cfs)	Peak Discharge[1] Conveyance Zone (cfs)	Water Surface Elevation (ft - NAVD 88)	Top Width (ft)	0.5-foot Rise Conveyance Zone Width (ft)	Area (sf)	Mean Vel. (ft/s)	Regulatory (ft - NAVD 88)	With Conveyance Zone (ft - NAVD 88)	Increase (ft)
Skunk Creek	1	25	5238.75	1430	1430	5245.56	259	80	327	4.4	5245.56	5245.96	0.40
	1	109	5236.30	1430	1430	5246.24	321	42	354	4.0	5246.24	5246.69	0.45
	1	286	5237.20	1430	1430	5248.42	361	135	889	2.9	5248.42	5248.90	0.48
	1	378	5240.45	1430	1430	5248.60	172	148	1051	1.4	5248.60	5249.09	0.49
	1	480	5241.14	1430	1430	5248.63	153	120	787	1.8	5248.63	5249.12	0.49
	1	579	5241.63	1430	1430	5248.70	120	110	707	2.0	5248.70	5249.18	0.48
	1	680	5242.01	1430	1430	5248.81	136	110	674	2.1	5248.81	5249.26	0.45
	1	779	5242.22	1430	1430	5248.91	154	110	659	2.2	5248.91	5249.36	0.45
	1	875	5242.67	1430	1430	5249.03	152	80	519	2.8	5249.03	5249.45	0.42
	1	975	5243.15	1430	1430	5249.18	120	80	490	2.9	5249.18	5249.62	0.44
	1	1073	5243.79	1430	1430	5249.38	116	80	451	3.2	5249.38	5249.83	0.45
	1	1173	5244.27	1430	1430	5249.64	123	80	439	3.3	5249.64	5250.09	0.45
	1	1273	5245.10	1430	1430	5250.01	128	70	249	5.8	5250.01	5250.40	0.39
	1	1373	5247.45	1430	1430	5251.50	161	80	285	5.0	5251.50	5251.82	0.32
	1	1473	5247.66	1430	1430	5252.33	147	90	367	3.9	5252.33	5252.78	0.45
	1	1572	5248.02	1430	1430	5252.93	142	80	349	4.1	5252.93	5253.33	0.40
	1	1675	5248.41	1430	1430	5253.44	163	90	405	3.5	5253.44	5253.91	0.47
	1	1802	5248.88	1430	1430	5254.07	121	75	329	4.4	5254.07	5254.49	0.42
	1	1918	5249.54	1430	1430	5254.79	162	95	401	3.6	5254.79	5255.22	0.43
	1	1982	5250.14	1430	1430	5255.13	149	70	292	4.9	5255.13	5255.50	0.37
	1	2034	5250.58	1430	1430	5255.52	133	95	373	3.8	5255.52	5256.02	0.50
	1	2084	5250.83	1430	1430	5255.85	125	90	347	4.1	5255.85	5256.30	0.45
	1	2184	5251.62	1430	1430	5256.51	112	80	344	4.2	5256.51	5256.95	0.44
	1	2280	5252.07	1430	1430	5257.10	111	80	369	3.9	5257.10	5257.52	0.42
	1	2342	5252.63	1430	1430	5257.42	117	70	334	4.3	5257.42	5257.82	0.40
	1	2388	5252.64	1430	1430	5257.64	107	75	350	4.1	5257.64	5258.10	0.46
	1	2445	5250.70	1430	1430	5258.00	51	45	283	5.1	5258.00	5258.39	0.39
	1	2541	5251.10	1430	1430	5258.84	50	45	304	4.7	5258.84	5258.99	0.15
	1	2560	5253.63	1430	1430	5258.93	74	50	230	6.2	5258.93	5258.98	0.05
	1	2591	5254.16	1000	1000	5259.40	109	50	237	4.2	5259.40	5259.63	0.23
	1	2638	5254.35	1000	1000	5259.62	101	50	277	3.6	5259.62	5259.93	0.31
	1	2688	5254.29	1000	1000	5259.73	120	70	409	2.5	5259.73	5260.16	0.43
	1	2740	5254.17	1000	1000	5259.80	120	70	391	2.6	5259.80	5260.24	0.44
	1	2794	5254.23	1000	1000	5259.88	142	76	352	2.8	5259.88	5260.34	0.46
	1	2906	5254.31	1000	1000	5260.12	155	105	456	2.2	5260.12	5260.62	0.50
	1	3022	5255.63	1000	1000	5260.40	97	85	321	3.1	5260.40	5260.85	0.45
	1	3126	5256.07	1000	1000	5260.98	111	65	262	3.8	5260.98	5261.29	0.31
	1	3234	5256.63	1000	1000	5261.46	111	70	280	3.6	5261.46	5261.90	0.44
	1	3336	5257.62	1000	1000	5262.06	77	50	204	4.9	5262.06	5262.48	0.42
	1	3385	5257.78	1000	1000	5262.56	65	45	193	5.2	5262.56	5262.94	0.38
	1	3428	5256.94	824	824	5262.92	35	28	156	5.3	5262.92	5263.37	0.45
	1	3629	5260.03	824	824	5266.87	33	28	174	4.8	5266.87	5266.87	0.00
	1	3722	5262.78	824	824	5268.78	106	40	173	4.8	5268.78	5268.92	0.14
	1	3812	5264.45	824	824	5269.77	103	60	254	3.2	5269.77	5270.21	0.44
	1	3882	5270.20	824	824	5272.09	89	60	109	7.6	5272.09	5272.28	0.19
	1	3940	5274.52	824	824	5276.79	139	70	153	5.4	5276.79	5277.05	0.26
	1	4009	5275.17	824	824	5278.41	252	95	148	5.6	5278.41	5278.55	0.14
	2	4139	5274.96	693	693	5279.83	198	85	158	4.4	5279.83	5280.11	0.28
	2	4252	5275.51	693	693	5281.39	233	40	140	5.0	5281.39	5281.77	0.38
	2	4364	5275.40	693	693	5282.63	491	55	194	3.6	5282.63	5283.03	0.40
	2	4448	5275.61	957	957	5284.07	199	65	281	3.4	5284.07	5284.52	0.45

Table 4.4: Summary of Floodplain and Floodway Data - Skunk Creek (page 2 of 6)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

River	HEC-RAS Reach	HEC-RAS Cross Section	Channel Invert (ft - NAVD 88)	Peak Discharge[1] Floodplain (cfs)	Peak Discharge[1] Conveyance Zone (cfs)	Water Surface Elevation (ft - NAVD 88)	Top Width (ft)	0.5-foot Rise Conveyance Zone Width (ft)	Area (sf)	Mean Vel. (ft/s)	Regulatory (ft - NAVD 88)	With Conveyance Zone (ft - NAVD 88)	Increase (ft)
Skunk Creek	2	4489	5275.61	957	957	5284.21	246	50	196	4.9	5284.21	5284.66	0.45
	2	4511	5276.10	1185	1185	5284.38	348	35	163	7.3	5284.38	5284.53	0.15
	2	4594	5276.78	1185	1185	5286.58	440	103	521	3.2	5286.58	5286.79	0.21
	2	4662	5278.55	1185	1185	5287.44	312	84	426	4.4	5287.44	5287.56	0.12
	2	4748	5279.26	1185	1185	5288.24	482	130	664	1.8	5288.24	5288.48	0.24
	2	4848	5279.86	1185	1185	5288.52	205	70	359	3.3	5288.52	5288.80	0.28
	2	4911	5281.10	1185	1185	5288.91	170	77	313	3.8	5288.91	5289.31	0.40
	2	4999	5282.58	1185	1185	5290.00	53	30	164	7.2	5290.00	5290.49	0.49
	3	5039	5283.40	364	364	5291.26	165	60	272	1.3	5291.26	5291.73	0.47
	3	5099	5283.50	364	364	5291.28	272	66	263	1.4	5291.28	5291.78	0.50
	3	5190	5285.15	364	364	5291.55	115	28	126	2.9	5291.55	5292.04	0.49
	3	5285	5286.86	364	364	5292.08	197	90	243	1.5	5292.08	5292.57	0.49
	3	5380	5287.34	364	364	5292.58	133	50	126	2.9	5292.58	5293.04	0.46
	3	5469	5288.74	364	364	5293.48	87	31	113	3.2	5293.48	5293.95	0.47
	3	5536	5288.95	364	364	5294.39	45	15	75	4.9	5294.39	5294.81	0.42
	3	5602	5289.10	364	364	5295.50	28	20	103	3.5	5295.50	5295.94	0.44
	3	5656	5290.35	364	364	5296.30	23	15	79	4.6	5296.30	5296.61	0.31
	3	5737	5290.80	364	364	5298.39	58	28	106	3.4	5298.39	5298.50	0.11
	4	5788	5291.96	364	364	5299.00	30	30	137	2.7	5299.00	5299.07	0.07
	4	5845	5293.33	364	364	5299.34	32	32	124	2.9	5299.34	5299.40	0.06
	4	5935	5295.70	364	364	5300.35	27	27	84	4.3	5300.35	5300.36	0.01
	4	6023	5296.78	364	364	5302.14	76	27	88	4.1	5302.14	5302.14	0.00
	4	6060	5297.01	364	364	5302.83	131	32	99	3.7	5302.83	5302.83	0.00
	4	6087	5297.39	364	364	5303.28	120	17	84	4.3	5303.28	5303.28	0.00
	4	6158	5298.24	364	364	5304.40	145	25	98	3.7	5304.40	5304.40	0.00
	4	6254	5299.50	364	364	5305.50	32	32	118	3.1	5305.50	5305.50	0.00
	4	6330	5299.81	364	364	5306.43	20	20	76	4.8	5306.43	5306.43	0.00
	4	6423	5302.77	364	364	5308.38	29	29	95	3.8	5308.38	5308.38	0.00
	4	6479	5303.53	364	364	5309.33	24	24	85	4.3	5309.33	5309.33	0.00
	4	6532	5304.12	898	898	5311.12	20	14	86	10.4	5311.12	5311.41	0.29
	4	6605	5304.89	898	898	5314.91	90	65	273	3.5	5314.91	5315.24	0.33
	4	6636	5305.45	898	898	5315.06	53	30	206	4.4	5315.06	5315.38	0.32
	4	6666	5305.99	898	898	5315.26	58	25	195	4.6	5315.26	5315.53	0.27
	4	6685	5305.99	898	898	5315.33	71	35	213	4.2	5315.33	5315.70	0.37
	4	6704	5305.91	898	898	5316.36	88	55	294	3.1	5316.36	5316.80	0.44
	4	6719	5307.24	898	898	5316.40	57	41	278	3.2	5316.40	5316.83	0.43
	4	6781	5308.67	898	898	5316.55	53	34	188	4.8	5316.55	5316.95	0.40
	4	6889	5311.09	898	898	5317.59	53	50	217	4.1	5317.59	5317.79	0.20
	4	6958	5312.54	898	898	5318.33	56	41	128	7.0	5318.33	5318.35	0.02
	4	7040	5317.17	898	898	5320.97	166	99	145	6.2	5320.97	5321.40	0.43
	4	7118	5317.72	898	898	5323.44	107	45	143	6.3	5323.44	5323.85	0.41
	4	7189	5320.08	898	898	5324.91	133	65	189	4.8	5324.91	5325.35	0.44
	4	7216	5319.52	898	898	5325.36	145	70	195	4.6	5325.36	5325.76	0.40
	4	7240	5319.57	898	898	5327.27	195	85	322	2.8	5327.27	5327.72	0.45
	4	7259	5320.42	898	898	5327.32	185	70	279	3.2	5327.32	5327.77	0.45
	4	7318	5321.84	898	898	5327.54	86	50	180	5.0	5327.54	5328.00	0.46
	4	7416	5323.52	898	898	5329.29	68	35	142	6.3	5329.29	5329.37	0.08
	4	7478	5325.02	898	898	5330.44	52	38	153	5.9	5330.44	5330.60	0.16
	4	7566	5326.33	890	890	5332.10	42	17	96	9.3	5332.10	5332.52	0.42
	4	7622	5329.21	890	890	5335.00	99	91	168	5.3	5335.00	5335.13	0.13
	4	7639	5329.99	890	890	5335.59	61	58	132	6.7	5335.59	5335.76	0.17

Table 4.4: Summary of Floodplain and Floodway Data - Skunk Creek (page 3 of 6)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

River	HEC-RAS Reach	HEC-RAS Cross Section	Channel Invert (ft - NAVD 88)	Peak Discharge[1] Floodplain (cfs)	Peak Discharge[1] Conveyance Zone (cfs)	Water Surface Elevation (ft - NAVD 88)	Top Width (ft)	0.5-foot Rise Conveyance Zone Width (ft)	Area (sf)	Mean Vel. (ft/s)	Regulatory (ft - NAVD 88)	With Conveyance Zone (ft - NAVD 88)	Increase (ft)
Skunk Creek	4	7651	5334.43	890	890	5336.58	85	61	74	12.0	5336.58	5336.56	-0.02
	4	7705	5335.40	890	890	5339.46	135	77	145	6.2	5339.46	5339.46	0.00
	4	7839	5335.69	890	890	5340.61	198	135	338	2.6	5340.61	5341.10	0.49
	4	7890	5335.88	890	890	5341.52	116	116	150	5.9	5341.52	5341.52	0.00
	4	7934	5336.33	890	890	5343.10	146	27	111	8.0	5343.10	5343.23	0.13
	4	7984	5336.85	890	890	5345.57	111	35	243	3.7	5345.57	5345.70	0.13
	4	7989	5336.89	890	890	5345.59	102	35	251	3.5	5345.59	5345.75	0.16
	4	7996	5336.70	890	890	5345.60	94	29	227	3.9	5345.60	5345.77	0.17
	4	8576	5348.69	890	890	5361.27	305	31	288	3.7	5361.27	5361.27	0.00
	4	8654	5352.02	1003	1003	5361.49	165	70	354	2.8	5361.49	5361.71	0.22
	4	8713	5355.62	1003	1003	5361.45	37	37	157	6.4	5361.45	5361.92	0.47
	4	8873	5357.27	1003	1003	5366.38	127	82	313	3.8	5366.38	5366.38	0.00
	4	8937	5357.97	1003	1003	5366.96	68	57	329	3.1	5366.96	5366.96	0.00
	4	9001	5358.09	1003	1003	5367.27	39	37	211	4.8	5367.27	5367.28	0.01
	4	9041	5358.45	1003	1003	5367.88	57	54	256	4.2	5367.88	5367.88	0.00
	4	9076	5358.61	1003	1003	5368.33	73	58	298	3.7	5368.33	5368.33	0.00
	4	9109	5358.84	1003	1003	5368.59	56	26	212	4.7	5368.59	5368.60	0.01
	4	9194	5359.18	1003	1003	5369.59	52	30	261	3.9	5369.59	5369.60	0.01
	4	9234	5360.70	1003	1003	5369.97	62	43	235	4.3	5369.97	5370.04	0.07
	4	9246	5361.01	1003	1003	5370.10	55	36	215	4.7	5370.10	5370.15	0.05
	4	9270	5361.22	1003	1003	5371.68	82	37	248	4.3	5371.68	5371.96	0.28
	4	9304	5366.48	1003	1003	5372.61	109	109	168	6.0	5372.61	5372.64	0.03
	4	9444	5369.49	1003	1003	5375.94	165	74	222	4.5	5375.94	5375.96	0.02
	4	9586	5370.82	1003	1003	5377.88	89	54	211	4.8	5377.88	5377.93	0.05
	4	9710	5373.94	1003	1003	5380.35	120	76	154	6.5	5380.35	5380.35	0.00
	4	9780	5379.29	1003	1003	5383.06	164	38	162	7.1	5383.06	5383.14	0.08
	4	9794	5378.87	1003	1003	5383.48	69	24	143	9.2	5383.48	5383.65	0.17
	4	9894	5382.59	1003	1003	5389.08	53	22	142	7.1	5389.08	5389.08	0.00
	5	9943	5382.77	242	242	5390.42	118	30	172	1.4	5390.42	5390.58	0.16
	5	9997	5383.74	242	242	5390.48	90	30	161	1.5	5390.48	5390.65	0.17
	5	10073	5384.67	242	242	5390.55	31	31	114	2.1	5390.55	5390.81	0.26
	5	10168	5386.58	242	242	5391.28	20	20	65	3.7	5391.28	5391.40	0.12
	5	10238	5387.85	242	242	5392.60	19	19	61	4.0	5392.60	5392.62	0.02
	5	10317	5394.34	242	242	5397.39	16	16	31	7.9	5397.39	5397.39	0.00
	5	10421	5397.19	242	242	5401.88	31	31	76	3.2	5401.88	5401.88	0.00
	5	10488	5398.46	242	242	5402.95	24	24	67	3.6	5402.95	5402.95	0.00
	5	10560	5402.83	242	242	5405.16	23	23	38	6.4	5405.16	5405.16	0.00
	5	10616	5403.10	242	242	5407.20	42	25	78	3.1	5407.20	5407.23	0.03
	5	10655	5403.42	327	327	5407.81	24	18	60	5.5	5407.81	5407.91	0.10
	5	10722	5403.68	327	327	5411.02	127	45	151	2.2	5411.02	5411.46	0.44
	5	10745	5403.80	327	327	5411.10	87	25	135	2.4	5411.10	5411.58	0.48
	5	10778	5404.00	327	327	5412.65	74	46	160	2.1	5412.65	5413.15	0.50
	5	10826	5405.61	327	327	5412.89	72	24	137	2.4	5412.89	5413.35	0.46
	5	10873	5407.42	327	327	5413.17	26	25	103	3.2	5413.17	5413.59	0.42
	5	10910	5408.31	327	327	5415.95	66	30	128	2.6	5415.95	5416.27	0.32
	5	10981	5413.34	327	327	5416.61	19	19	47	6.9	5416.61	5416.99	0.38
	6	11049	5415.62	138	138	5420.54	26	9	39	3.5	5420.54	5420.62	0.08
	6	11110	5417.14	138	138	5423.08	65	35	90	1.5	5423.08	5423.48	0.40
	6	11185	5422.87	138	138	5424.76	17	17	21	6.5	5424.76	5424.76	0.00
	6	11272	5424.05	138	138	5427.96	35	12	42	3.3	5427.96	5428.40	0.44
	6	11364	5427.05	138	138	5430.46	17	10	22	6.2	5430.46	5430.87	0.41

Table 4.4: Summary of Floodplain and Floodway Data - Skunk Creek (page 4 of 6)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

River	HEC-RAS Reach	HEC-RAS Cross Section	Channel Invert (ft - NAVD 88)	Peak Discharge[1] Floodplain (cfs)	Peak Discharge[1] Conveyance Zone (cfs)	Water Surface Elevation (ft - NAVD 88)	Top Width (ft)	0.5-foot Rise Conveyance Zone Width (ft)	Area (sf)	Mean Vel. (ft/s)	Regulatory (ft - NAVD 88)	With Conveyance Zone (ft - NAVD 88)	Increase (ft)
Skunk Creek	6	11457	5430.77	138	138	5434.43	40	21	45	3.1	5434.43	5434.45	0.02
	6	11524	5433.94	113	113	5436.27	13	13	21	5.5	5436.27	5436.27	0.00
	6	11613	5436.05	113	113	5441.17	66	21	95	1.2	5441.17	5441.59	0.42
	6	11673	5439.08	113	113	5441.32	12	12	17	6.5	5441.32	5441.41	0.09
	6	11713	5440.02	113	113	5445.27	173	40	105	1.1	5445.27	5445.68	0.41
	6	11882	5445.82	113	113	5447.67	16	16	18	6.1	5447.67	5447.67	0.00
Skunk Creek Echo Pl. Split Flow	1	76	5434.17	115	115	5435.06	45	25	22	5.3	5435.06	5435.28	0.22
	1	167	5435.88	115	115	5436.78	67	63	30	3.8	5436.78	5436.78	0.00
	1	219	5437.65	115	115	5438.80	89	22	56	5.5	5438.80	5439.21	0.41
	1	289	5439.50	115	115	5441.63	51	37	67	1.7	5441.63	5441.88	0.25
Skunk Creek Blue Ave. Split Flow	1	88	5389.11	303	303	5392.42	89	50	142	2.1	5392.42	5392.78	0.36
	1	185	5390.31	303	303	5392.52	101	50	105	2.9	5392.52	5392.84	0.32
	1	251	5391.26	303	303	5392.82	79	30	44	6.8	5392.82	5393.06	0.24
	1	364	5393.80	303	303	5395.14	79	30	44	6.9	5395.14	5395.49	0.35
	1	474	5396.18	303	303	5397.59	89	30	44	6.9	5397.59	5397.90	0.31
	1	564	5398.27	303	303	5399.71	79	28	43	7.1	5399.71	5400.18	0.47
	1	655	5401.00	303	303	5402.53	54	28	43	7.1	5402.53	5402.85	0.32
	1	748	5403.92	303	303	5405.43	86	28	43	7.1	5405.43	5405.83	0.40
	1	818	5406.16	303	303	5407.69	81	28	43	7.1	5407.69	5408.13	0.44
Skunk Creek Bear Creek Split Flow	1	276	5319.01	235	235	5320.30	177	30	38	6.3	5320.30	5320.60	0.30
	1	444	5320.67	235	235	5322.03	84	30	38	6.3	5322.03	5322.35	0.32
	1	610	5322.12	235	235	5323.43	134	40	41	5.8	5323.43	5323.54	0.11
	1	740	5323.14	235	235	5324.50	102	30	37	6.4	5324.50	5324.71	0.21
	1	965	5325.08	235	235	5326.44	116	25	35	6.7	5326.44	5326.79	0.35
	1	1135	5326.83	235	235	5327.89	168	90	95	2.5	5327.89	5328.30	0.41
	1	1354	5327.47	235	235	5329.49	174	65	72	3.2	5329.49	5329.50	0.01
	1	1577	5329.08	235	235	5330.76	167	64	103	2.3	5330.76	5331.25	0.49
	1	1838	5331.59	235	235	5333.06	161	25	35	6.7	5333.06	5333.46	0.40
	1	2046	5333.92	235	235	5334.76	130	40	41	5.7	5334.76	5335.26	0.50
	2	2276	5335.12	180	180	5336.15	125	40	35	5.2	5336.15	5336.32	0.17
	2	2446	5337.10	180	180	5337.98	131	40	34	5.3	5337.98	5338.41	0.43
	2	2637	5339.48	180	180	5340.47	73	20	27	6.7	5340.47	5340.90	0.43
	2	2787	5341.25	180	180	5342.89	65	35	68	2.6	5342.89	5343.38	0.49
	2	2972	5343.82	284	284	5344.86	167	50	67	4.2	5344.86	5345.27	0.41
	2	3053	5344.56	284	284	5345.73	218	105	138	2.1	5345.73	5346.23	0.50
	2	3174	5355.66	284	284	5356.24	232	105	64	4.4	5356.24	5356.37	0.13
	2	3352	5350.71	284	284	5356.48	104	75	246	1.2	5356.48	5356.74	0.26
	2	3574	5354.05	284	284	5356.17	28	28	55	5.2	5356.17	5356.64	0.47
	2	3824	5355.03	284	284	5357.71	198	50	140	2.0	5357.71	5357.99	0.28
	2	4014	5355.34	284	284	5357.93	37	37	91	3.1	5357.93	5358.30	0.37

Table 4.4: Summary of Floodplain and Floodway Data - Skunk Creek (page 5 of 6)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

River	HEC-RAS Reach	HEC-RAS Cross Section	Channel Invert (ft - NAVD 88)	Peak Discharge[1] Floodplain (cfs)	Peak Discharge[1] Conveyance Zone (cfs)	Water Surface Elevation (ft - NAVD 88)	Top Width (ft)	0.5-foot Rise Conveyance Zone Width (ft)	Area (sf)	Mean Vel. (ft/s)	Regulatory (ft - NAVD 88)	With Conveyance Zone (ft - NAVD 88)	Increase (ft)
Skunk Creek	1	94	5303.93	97	97	5305.01	56	38	22	4.4	5305.01	5305.13	0.12
29th St. Split Flow	1	245	5306.29	97	97	5307.33	67	38	22	4.4	5307.33	5307.48	0.15
	1	397	5309.31	97	97	5310.16	106	38	22	4.3	5310.16	5310.46	0.30
	1	529	5312.61	97	97	5313.72	80	15	17	5.9	5313.72	5313.96	0.24
	1	585	5313.57	97	97	5314.62	54	25	33	3.0	5314.62	5315.04	0.42
	1	744	5314.15	97	97	5315.70	57	25	45	2.2	5315.70	5316.11	0.41
	1	897	5321.14	97	97	5321.86	104	45	24	4.1	5321.86	5321.97	0.11
	1	964	5322.95	97	97	5324.03	56	15	16	5.9	5324.03	5324.27	0.24
	1	1070	5326.70	97	97	5327.63	80	22	18	5.3	5327.63	5327.98	0.35
	1	1197	5328.50	97	97	5329.63	54	20	18	5.4	5329.63	5329.77	0.14
	1	1304	5329.62	97	97	5330.63	73	30	22	4.5	5330.63	5330.66	0.03
	1	1456	5331.08	97	97	5332.33	46	20	18	5.5	5332.33	5332.34	0.01
	1	1539	5332.21	97	97	5333.42	45	15	17	5.9	5333.42	5333.78	0.36
Skunk Creek	1	68	5298.69	355	355	5300.38	89	37	52	6.8	5300.38	5300.81	0.43
30th St. Split Flow	1	226	5300.17	355	355	5301.72	85	38	53	6.7	5301.72	5302.08	0.36
	1	373	5301.62	355	355	5303.14	84	38	53	6.7	5303.14	5303.48	0.34
	1	471	5302.51	355	355	5304.06	70	37	52	6.8	5304.06	5304.40	0.34
	1	556	5304.09	545	545	5305.67	95	48	76	7.2	5305.67	5306.14	0.47
	1	643	5305.53	545	545	5307.07	99	49	76	7.1	5307.07	5307.50	0.43
	1	758	5307.63	545	545	5309.17	92	45	74	7.3	5309.17	5309.65	0.48
	1	875	5309.80	545	545	5311.40	97	47	75	7.2	5311.40	5311.77	0.37
Skunk Creek	1	76	5288.32	500	500	5291.36	99	40	110	4.6	5291.36	5291.63	0.27
Euclid Ave. Split Flow	1	129	5288.65	500	500	5291.42	103	40	103	4.9	5291.42	5291.64	0.22
	1	224	5289.02	500	500	5291.50	99	40	90	5.6	5291.50	5291.69	0.19
	1	308	5289.61	500	500	5291.48	85	44	70	7.1	5291.48	5291.65	0.17
	2	422	5290.26	109	109	5292.21	92	40	80	1.4	5292.21	5292.60	0.39
	2	502	5290.64	109	109	5292.21	76	30	45	2.4	5292.21	5292.57	0.36
	2	593	5291.41	109	109	5292.44	48	30	22	4.9	5292.44	5292.60	0.16
	2	698	5293.01	109	109	5293.94	51	30	22	4.9	5293.94	5294.05	0.11
	2	801	5294.37	109	109	5295.31	55	28	22	5.0	5295.31	5295.48	0.17
	2	934	5296.31	109	109	5297.13	49	28	22	5.0	5297.13	5297.28	0.15
	2	1036	5297.59	109	109	5298.47	50	32	23	4.8	5298.47	5298.57	0.10
	2	1124	5298.98	109	109	5299.68	99	78	30	3.6	5299.68	5299.72	0.04
	2	1193	5299.30	96	96	5300.24	61	46	25	3.8	5300.24	5300.26	0.02
	2	1311	5300.73	96	96	5301.51	60	49	24	4.0	5301.51	5301.54	0.03
	2	1445	5301.79	256	256	5302.97	94	54	47	5.4	5302.97	5303.20	0.23
	2	1563	5303.09	256	256	5304.24	77	56	48	5.3	5304.24	5304.34	0.10
Skunk Creek	1	41	5294.24	151	151	5295.37	77	30	28	5.5	5295.37	5295.59	0.22
Denton Ave. Split Flow	1	75	5294.34	151	151	5295.60	61	29	27	5.5	5295.60	5295.93	0.33
	1	179	5295.30	151	151	5296.47	57	32	28	5.4	5296.47	5296.66	0.19
	1	283	5296.49	151	151	5297.55	57	32	28	5.5	5297.55	5297.76	0.21
	1	414	5298.57	151	151	5299.64	67	30	27	5.5	5299.64	5299.92	0.28
	1	534	5300.52	151	151	5301.55	65	30	27	5.5	5301.55	5301.73	0.18

Table 4.4: Summary of Floodplain and Floodway Data - Skunk Creek (page 6 of 6)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

River	HEC-RAS Reach	HEC-RAS Cross Section	Channel Invert (ft - NAVD 88)	Peak Discharge[1] Floodplain (cfs)	Peak Discharge[1] Conveyance Zone (cfs)	Water Surface Elevation (ft - NAVD 88)	Top Width (ft)	0.5-foot Rise Conveyance Zone Width (ft)	Area (sf)	Mean Vel. (ft/s)	Regulatory (ft - NAVD 88)	With Conveyance Zone (ft - NAVD 88)	Increase (ft)
Skunk Creek	1	41	5290.61	600	600	5292.44	90	40	77	7.8	5292.44	5292.82	0.38
Quinn St. Split Flow	1	109	5290.90	600	600	5292.90	93	45	93	6.4	5292.90	5293.35	0.45
	1	195	5291.24	600	600	5293.34	92	40	76	7.9	5293.34	5293.61	0.27
	1	278	5292.15	600	600	5294.24	76	40	76	7.9	5294.24	5294.48	0.24
	2	406	5294.79	449	449	5296.60	66	33	60	7.5	5296.60	5296.96	0.36
	2	488	5296.77	449	449	5298.61	77	33	60	7.5	5298.61	5299.06	0.45
Skunk Creek	1	43	5279.56	134	134	5280.57	89	38	27	4.9	5280.57	5280.81	0.24
35th St. Split Flow	1	165	5280.29	264	264	5281.52	95	44	45	5.8	5281.52	5281.75	0.23
	1	240	5280.74	264	264	5282.05	97	38	43	6.1	5282.05	5282.25	0.20
	1	346	5281.22	264	264	5282.45	51	38	45	5.8	5282.45	5282.66	0.21
Skunk Creek	1	20	5277.85	204	204	5279.48	45	18	32	6.4	5279.48	5279.79	0.31
Apartment Split Flow	1	99	5278.04	204	204	5279.77	54	19	34	6.1	5279.77	5280.06	0.29
	1	237	5279.31	204	204	5280.33	76	27	33	6.3	5280.33	5280.58	0.25
Skunk Creek	1	45	5281.72	154	154	5282.49	70	23	26	6.0	5282.49	5282.92	0.43
Madison Split Flow	1	163	5282.26	228	228	5283.43	81	25	34	6.7	5283.43	5283.71	0.28
	1	252	5281.77	228	228	5283.94	115	25	52	4.4	5283.94	5284.30	0.36
	1	346	5283.04	228	228	5284.15	76	25	34	6.7	5284.15	5284.50	0.35
Skunk Creek	1	118	5335.71	99	99	5336.55	71	15	17	5.9	5336.55	5336.97	0.42
Bear Bline Split Flow	1	262	5338.05	99	99	5338.80	99	25	20	5.0	5338.80	5339.21	0.41
	1	446	5340.76	99	99	5341.55	112	40	48	2.0	5341.55	5342.04	0.49
	1	586	5341.45	99	99	5342.84	53	15	23	4.3	5342.84	5343.27	0.43
	1	723	5342.44	99	99	5343.79	63	37	61	1.6	5343.79	5344.28	0.49

Table 4.5: Summary of Floodplain and Floodway Data - Bluebell Canyon Creek (page 1 of 2)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

River	HEC-RAS Reach	HEC-RAS Cross Section	Channel Invert (ft - NAVD 88)	Peak Discharge[1] Floodplain (cfs)	Peak Discharge[1] Conveyance Zone (cfs)	Water Surface Elevation (ft - NAVD 88)	Top Width (ft)	0.5-foot Rise Conveyance Zone Width (ft)	Area (sf)	Mean Vel. (ft/s)	Regulatory (ft - NAVD 88)	With Conveyance Zone (ft - NAVD 88)	Increase (ft)
Bluebell Canyon Creek	1	122	5390.27	151	151	5391.98	72	20	39	3.9	5391.98	5392.44	0.46
	1	219	5391.99	151	151	5392.99	77	28	27	5.6	5392.99	5393.14	0.15
	1	289	5394.27	151	151	5395.27	55	28	27	5.6	5395.27	5395.46	0.19
	1	367	5396.92	151	151	5397.91	59	28	27	5.6	5397.91	5398.12	0.21
	1	481	5400.82	151	151	5401.84	83	30	28	5.5	5401.84	5402.01	0.17
	1	599	5405.29	151	151	5406.41	64	28	27	5.5	5406.41	5406.60	0.19
	1	732	5410.70	151	151	5411.68	54	28	27	5.6	5411.68	5411.87	0.19
	1	799	5413.50	151	151	5414.47	80	28	27	5.5	5414.47	5414.69	0.22
	1	915	5417.01	220	220	5418.29	72	30	35	6.2	5418.29	5418.68	0.39
	1	1053	5419.90	220	220	5421.40	57	30	35	6.2	5421.40	5421.72	0.32
	1	1194	5424.69	220	220	5426.06	59	28	35	6.4	5426.06	5426.41	0.35
	1	1280	5428.67	143	143	5429.68	55	28	26	5.5	5429.68	5430.01	0.33
	1	1413	5434.07	143	143	5435.21	61	27	26	5.5	5435.21	5435.58	0.37
	1	1536	5441.13	143	143	5442.34	42	29	26	5.4	5442.34	5442.59	0.25
	1	1651	5444.45	159	159	5445.56	65	28	28	5.6	5445.56	5445.92	0.36
	1	1764	5450.44	159	159	5451.61	59	30	28	5.6	5451.61	5451.91	0.30
	1	1839	5454.74	159	159	5455.93	47	28	28	5.7	5455.93	5456.29	0.36
	1	1926	5459.31	191	191	5460.50	83	25	30	6.3	5460.50	5460.94	0.44
	1	2039	5465.21	191	191	5466.48	74	28	31	6.1	5466.48	5466.82	0.34
	1	2182	5472.65	191	191	5473.88	82	28	32	6.0	5473.88	5474.24	0.36
	1	2284	5477.85	191	191	5479.20	43	28	32	6.0	5479.20	5479.42	0.22
	1	2415	5486.29	191	191	5487.58	57	28	31	6.1	5487.58	5487.96	0.38
	1	2533	5493.34	177	177	5494.50	63	27	30	6.0	5494.50	5494.88	0.38
	1	2623	5497.51	177	177	5498.77	39	29	30	5.9	5498.77	5498.96	0.19
	1	2764	5507.35	177	177	5508.65	42	27	29	6.0	5508.65	5508.95	0.30
	1	2864	5514.24	177	177	5515.44	42	28	30	5.9	5515.44	5515.69	0.25
	1	2972	5521.69	177	177	5522.78	42	28	30	5.9	5522.78	5522.96	0.18
	1	3070	5529.13	177	177	5530.25	68	29	30	5.9	5530.25	5530.56	0.31
	1	3215	5539.47	177	177	5540.59	56	30	31	5.8	5540.59	5540.80	0.21
	1	3283	5542.95	226	226	5543.65	213	50	43	5.2	5543.65	5544.08	0.43
	1	3360	5547.39	226	226	5548.37	143	30	37	6.2	5548.37	5548.70	0.33
	1	3480	5555.72	203	203	5557.98	37	19	47	4.4	5557.98	5558.34	0.36
	1	3599	5563.86	203	203	5565.95	49	15	27	7.5	5565.95	5566.32	0.37
	1	3709	5571.36	203	203	5573.80	46	22	48	4.2	5573.80	5574.28	0.48
	1	3809	5576.59	203	203	5579.14	34	11	30	6.8	5579.14	5579.53	0.39
	1	3929	5585.20	203	203	5586.82	43	28	50	4.1	5586.82	5587.30	0.48
	1	4054	5590.34	203	203	5593.95	17	10	31	6.6	5593.95	5594.13	0.18
	1	4197	5600.50	203	203	5602.82	24	17	41	5.0	5602.82	5603.19	0.37
	1	4278	5606.54	203	203	5609.00	22	10	24	8.4	5609.00	5609.23	0.23
	1	4422	5621.14	203	203	5623.54	20	20	38	5.4	5623.54	5623.83	0.29
	1	4538	5631.55	203	203	5634.25	31	14	30	6.8	5634.25	5634.36	0.11
	1	4671	5643.03	203	203	5645.32	29	29	50	4.1	5645.32	5645.61	0.29
	1	4720	5649.08	215	215	5651.29	50	20	30	7.1	5651.29	5651.63	0.34
	1	4745	5650.35	215	215	5653.12	55	31	72	3.0	5653.12	5653.60	0.48
	1	4793	5653.54	215	215	5656.12	35	12	26	8.4	5656.12	5656.50	0.38
	1	4910	5662.77	215	215	5666.37	38	18	48	4.4	5666.37	5666.61	0.24

Table 4.5: Summary of Floodplain and Floodway Data - Bluebell Canyon Creek (page 2 of 2)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

River	HEC-RAS Reach	HEC-RAS Cross Section	Channel Invert (ft - NAVD 88)	Peak Discharge[1] Floodplain (cfs)	Peak Discharge[1] Conveyance Zone (cfs)	Water Surface Elevation (ft - NAVD 88)	Top Width (ft)	0.5-foot Rise Conveyance Zone Width (ft)	Area (sf)	Mean Vel. (ft/s)	Regulatory (ft - NAVD 88)	With Conveyance Zone (ft - NAVD 88)	Increase (ft)
Bluebell Canyon Creek	1	5080	5674.93	215	215	5677.76	54	12	29	7.5	5677.76	5677.93	0.17
	1	5136	5679.68	215	215	5682.06	53	37	63	3.4	5682.06	5682.52	0.46
	1	5157	5680.97	215	215	5683.18	52	38	61	3.5	5683.18	5683.36	0.18
	1	5194	5684.17	215	215	5686.15	46	21	31	7.0	5686.15	5686.31	0.16
	1	5322	5691.96	215	215	5695.20	25	25	56	3.9	5695.20	5695.36	0.16
	1	5445	5703.85	215	215	5706.27	29	29	34	6.3	5706.27	5706.26	-0.01
	1	5481	5706.42	215	215	5709.28	57	57	75	2.9	5709.28	5709.27	-0.01
	1	5527	5710.53	215	215	5711.99	67	67	52	4.1	5711.99	5711.99	0.00
	1	5672	5722.72	215	215	5725.40	44	26	46	4.7	5725.40	5725.40	0.00
	1	5866	5734.49	215	215	5737.00	43	43	59	3.6	5737.00	5737.00	0.00
	1	5998	5744.55	215	215	5746.00	47	47	51	4.2	5746.00	5746.00	0.00
	1	6113	5752.91	215	215	5755.52	36	36	51	4.3	5755.52	5755.52	0.00
	1	6196	5758.65	215	215	5761.72	16	16	37	5.9	5761.72	5761.72	0.00
	1	6245	5760.28	215	215	5764.63	14	14	36	5.9	5764.63	5764.63	0.00
Bluebell Canyon Creek Bluebell Spur	1	40	5519.23	54	54	5520.96	20	20	16	3.3	5520.96	5520.96	0.00
	1	102	5525.17	54	54	5526.53	67	20	19	2.9	5526.53	5526.56	0.03
	1	183	5530.94	54	54	5531.88	49	20	20	2.7	5531.88	5532.18	0.30
	1	256	5535.50	54	54	5536.55	81	25	21	2.6	5536.55	5536.98	0.43
	1	314	5539.67	54	54	5541.71	13	13	14	3.9	5541.71	5541.77	0.06

Table 4.6: Summary of Floodplain and Floodway Data - King's Gulch (page 1 of 1)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

River	HEC-RAS Reach	HEC-RAS Cross Section	Channel Invert (ft - NAVD 88)	Peak Discharge[1] Floodplain (cfs)	Peak Discharge[1] Conveyance Zone (cfs)	Water Surface Elevation (ft - NAVD 88)	Top Width (ft)	0.5-foot Rise Conveyance Zone Width (ft)	Area (sf)	Mean Vel. (ft/s)	Regulatory (ft - NAVD 88)	With Conveyance Zone (ft - NAVD 88)	Increase (ft)
King's Gulch	1	82	5425.50	134	134	5426.58	49	20	22	6.0	5426.58	5426.93	0.35
	1	215	5430.19	134	134	5431.17	55	20	22	6.1	5431.17	5431.57	0.40
	2	311	5433.38	90	90	5434.44	47	15	16	5.8	5434.44	5434.82	0.38
	2	435	5437.88	90	90	5438.82	48	14	15	5.9	5438.82	5439.27	0.45
	2	561	5442.45	90	90	5443.47	99	12	14	6.2	5443.47	5443.92	0.45
	2	665	5446.83	90	90	5447.84	47	11	14	6.4	5447.84	5448.31	0.47
	2	771	5450.76	113	113	5451.62	46	30	23	5.0	5451.62	5451.73	0.11
	2	873	5455.25	113	113	5456.13	53	32	23	4.9	5456.13	5456.28	0.15
	2	981	5461.18	113	113	5462.12	56	31	23	4.9	5462.12	5462.30	0.18
	2	1079	5465.53	133	133	5466.43	51	29	25	5.3	5466.43	5466.62	0.19
	2	1221	5472.31	133	133	5473.22	71	28	25	5.4	5473.22	5473.47	0.25
	2	1320	5476.93	133	133	5477.81	52	32	26	5.1	5477.81	5477.96	0.15
	2	1419	5480.28	145	145	5481.38	59	30	27	5.4	5481.38	5481.69	0.31
	2	1514	5483.92	145	145	5484.97	48	28	26	5.5	5484.97	5485.23	0.26
	2	1621	5488.64	145	145	5490.03	54	30	27	5.3	5490.03	5490.21	0.18
	3	1733	5494.52	119	119	5496.55	47	14	18	6.5	5496.55	5496.55	0.00
	3	1873	5501.99	119	119	5503.75	13	13	18	6.7	5503.75	5503.75	0.00
	3	2018	5516.96	119	119	5518.80	12	12	18	6.8	5518.80	5518.80	0.00
	3	2175	5525.19	119	119	5527.03	12	12	17	6.9	5527.03	5527.03	0.00
	3	2268	5528.05	119	119	5530.26	12	12	22	5.5	5530.26	5530.26	0.00
	3	2330	5529.19	119	119	5531.56	13	13	25	4.7	5531.56	5531.56	0.00
	3	2396	5536.74	170	170	5537.54	81	30	30	5.7	5537.54	5537.81	0.27
	3	2444	5540.04	170	170	5541.18	84	25	29	6.0	5541.18	5541.63	0.45
	3	2504	5541.81	170	170	5545.32	27	6	18	9.7	5545.32	5545.50	0.18
	3	2628	5547.11	170	170	5550.40	33	20	61	2.8	5550.40	5550.85	0.45
	3	2724	5553.70	170	170	5555.95	26	11	21	8.0	5555.95	5556.04	0.09
	3	2821	5560.28	170	170	5562.95	26	14	39	4.4	5562.95	5563.42	0.47
	3	2900	5568.26	170	170	5571.46	15	6	17	9.7	5571.46	5571.46	0.00
	3	2938	5570.29	170	170	5575.82	70	33	77	2.5	5575.82	5576.17	0.35
	3	2990	5573.09	170	170	5576.86	28	15	47	3.6	5576.86	5577.19	0.33
	3	3083	5577.44	170	170	5579.55	26	14	34	5.0	5579.55	5580.00	0.45
	3	3179	5584.63	170	170	5586.48	28	14	28	6.0	5586.48	5586.82	0.34
	3	3268	5595.02	170	170	5597.93	11	9	21	8.4	5597.93	5597.94	0.01
	3	3459	5601.80	170	170	5613.54	67	20	195	1.5	5613.54	5614.01	0.47
	3	3575	5610.34	170	170	5614.12	33	20	80	2.1	5614.12	5614.60	0.48
	3	3674	5614.00	170	170	5616.47	16	8	19	8.9	5616.47	5616.77	0.30
King's Gulch	1	105	5492.60	79	79	5493.34	67	67	24	3.3	5493.34	5493.36	0.02
King's Split Flow	1	150	5494.15	79	79	5497.63	199	39	20	4.0	5497.63	5498.12	0.49
	1	222	5499.96	79	79	5501.53	134	30	43	1.8	5501.53	5501.72	0.19
	1	308	5505.13	79	79	5506.90	130	30	18	4.4	5506.90	5507.24	0.34
	1	416	5510.95	79	79	5512.59	115	28	43	2.0	5512.59	5512.78	0.19
	1	523	5518.63	79	79	5519.66	150	26	17	4.6	5519.66	5520.09	0.43
	1	597	5521.86	79	79	5524.58	98	10	28	2.8	5524.58	5525.02	0.44
	1	701	5526.81	79	79	5528.13	40	20	29	2.7	5528.13	5528.42	0.29
	1	775	5531.83	79	79	5533.39	18	10	15	5.4	5533.39	5533.67	0.28

SECTION 5.0: DETERMINATION OF FLOODPLAIN BOUNDARIES

Floodplain workmaps have been prepared for Skunk Creek, Bluebell Canyon Creek, and King's Gulch and are included in Appendix F. Figure F.0 illustrates the floodplain workmap index, and Figures F.1 through F.9 are detailed floodplain workmaps for the 100- and 500-year events. Figures F.11 through F.19 illustrate the High Hazard area and Figures F.21 through F.29 depict the 10-, 25-, and 50-year floodplains. Floodplain elements shown on the workmaps and their general development are discussed below.

5.1 Zone AE with BFEs

The HEC-RAS model results were delineated in GIS to develop the 100-year (Zone AE) floodplain and associated Base Flood Elevations (BFEs). Floodplain delineation and BFE placements were based on 1-foot topographical mapping developed from the LiDAR data provided by the City of Boulder. As previously noted, there are extensive reaches of HEC-RAS modeling that result in vertically extended cross sections. For areas of vertically extended cross sections that averaged spill depths less than 0.5 feet, no shallow flooding zone was shown and the 100-year floodplain delineation was limited to the outer limits of the HEC-RAS cross sections. As a consequence the 100-year floodplain delineation and BFE placement do not correlate exactly with the ground surface in these areas.

For vertically extended cross section reaches that averaged spill depths greater than 0.5 feet but less than 1.0 feet, Zone X shallow flooding zones were developed based on anticipated shallow flooding. For these areas the 100-year floodplain is also drawn to the outer limits of the HEC-RAS cross sections which then abuts the Zone X boundary. The BFEs adjacent to these areas are shown to extend to the limits of the Zone AE boundary.

There are several locations where an upstream cross section indicates a wide floodplain top width but the next downstream cross section indicates that the floodplain is contained in the channel or low area with a much smaller top width. Typically these areas were addressed by using a Zone X designation, but in minor cases the 100-year floodplain was just shown to spill through the next downstream cross section resulting in a larger top width at the downstream cross section than the model indicates.

5.2 Zone X

The Zone X floodplain, beyond those areas determined by vertically extended cross sections, is based on the FLO-2D model results for the 500-year event. As discussed with the project team and FEMA representatives, the 500-year floodplain extents from the FLO-2D model were limited to areas of 0.25 feet of depth or greater. The Zone X floodplain (including the Zone X extents identified by the 100-year modeling) was then delineated according to the FLO-2D limits and is shown on the floodplain workmaps.

Additionally, based on the desire of the City of Boulder for local regulation purposes, a 100-Year shallow flooding zone was delineated at locations adjacent to the Zone AE boundary where vertically extended cross sections occur. This delineation was based on the extent of the

vertically extended cross sections and the downstream topography for the expected spill flows. The 100-Year shallow flooding is illustrated in Figures F.17 through F.23.

5.3 Zone AO

Areas with HEC-RAS cross sections that are vertically extended along the main flow path are indicative of locations where flow will diverge and continue overland along a different path. This flow is generally shallow and spread out by nature, typical of a FEMA Zone AO shallow flooding designation. For areas with cross section extensions greater than 0.5 feet in depth, shallow flooding zones were added to the flood map. Zone AO areas were generally delineated based on topographic boundaries leaving and re-entering the main flow paths. For areas with an average overland flow depth between 1.0 feet and 1.5 feet, a Zone AO (1 foot) designation was used. For areas with an average overland flow depth between 1.5 feet and 2.5 feet, a Zone AO (2 foot) designation was used.

5.4 Conveyance Zone (Floodway)

Conveyance zones throughout the major flow paths were developed based on a 0.5 foot water surface rise criteria. For flow paths along City of Boulder streets, the conveyance zone encroachment was generally limited to gutter flowline on each side of the roadway. No additional optimization of the conveyance zone was completed provided the encroachment limited the conveyance zone to within the City of Boulder right-of-way. For conveyance zones within channels or other low-lying areas, the conveyance zone was optimized in greater detail in order to maximize the 0.5 foot water surface elevation rise criteria.

Conveyance zone topwidths are based on the HEC-RAS output at each cross section. Between cross sections the conveyance zone has been estimated based on the channel or low lying area shape and conveyance zone topwidths at adjacent cross sections. Significant reaches of conveyance zone occur where the 100-year floodplain and conveyance zone are coincident.

5.5 Comparison to the Effective Floodplain

A comparison of the proposed existing conditions and the effective floodplains is presented on the annotated FIRMs in Appendix C. The general alignment of the proposed Skunk Creek, Bluebell Canyon Creek and King's Gulch floodplains is similar to that of the effective floodplain with two notable differences including the split flows at Euclid Avenue, the split flow to Bear Canyon Creek. Several previous Zone A areas were not modeled in detail, notably along Bluebell Avenue between 17th and 22nd Streets, and along Columbine Avenue between 15th and Broadway. It should be noted that these areas were generally replaced with a shaded Zone X designation.

The effective 100-year floodplain impacts approximately 191 structures, while the proposed 100-year floodplain impacts approximately 129 structures within the project reach. Of the 129 structures that are in the proposed floodplain, 88 are currently located in the effective 100-year floodplain. All adverse impacts to insurable structures are a result of existing conditions.

5.6 High Hazard Area

The high hazard areas were determined based on depth and product of depth and velocity values per the City of Boulder Criteria. Areas of 100-year floodplain depth equal to or greater than 4.0 feet, and/or areas where the depth multiplied by the velocity is equal or greater than 4.0 feet^2 per second were shown as high hazard. Depth and velocity values were taken from the 1D HEC-RAS model and interpolated using the Post-RAS GIS software. Depth and velocity values were also taken from the 2D FLO-2D model. Due to the nature of flooding within this watershed, City staff elected to only map the proposed high hazard zone in areas where both the HEC-RAS and FLO-2D indications were coincident. The resulting High Hazard areas are illustrated in Figures F.10 through F.16.

5.7 10-, 25-, and 50-year Floodplains

Floodplains for the 10-, 25-, and 50-year events were delineated based on HEC-RAS model results. Shallow flooding areas were delineated in areas of vertically extended cross sections in similar fashion as the 100-year event. However, distinctions between Zone AO and Zone X were not made. The 10-, 25-, and 50-year floodplains are illustrated in Figures F.17 through and F.23.

5.8 Modifications to the Flood Hazard Information

A comparison of the proposed and effective floodplains is presented in the annotated FIRMs located in Appendix C. The general alignment of the proposed Skunk Creek, Bluebell Canyon Creek and King's Gulch floodplains is similar to that of the effective floodplain with two notable differences including the split flows at Euclid Avenue, the split flow to Bear Canyon Creek. Several previous Zone A areas were not modeled in detail, notably along Bluebell Avenue between 17th and 22nd Streets, and along Columbine Avenue between 15th and Broadway. It should be noted that these areas were generally replaced with a shaded Zone X designation.

Annotated Flood Insurance Rate Maps are included in Appendix C. Floodplain workmaps are included in Appendix F.

5.9 Property Impacts and Insurable Structure Certification (65.12 Compliance)

The effective 100-year floodplain impacts approximately 191 structures, while the proposed 100-year floodplain impacts approximately 129 structures within the project reach. Of the 129 structures that are in the proposed floodplain, 88 are currently located in the effective 100-year floodplain. All adverse impacts to insurable structures are a result of existing conditions.

All properties within the proposed Zone AE, Zone AO, and Zone X areas have been individually notified by the City of Boulder. Additionally, public notifications of the proposed floodplain and floodway modifications were completed in a local newspaper. See Appendix H for notification information.

There is a single parcel of property within Boulder County impacted by this analysis (along King's Gulch, between 15th and 17th Streets), and it is owned by the City of Boulder. In order to meet FEMA requirements, the public notifications of the proposed floodplain and floodway

modifications that were printed in the local newspaper were listed as originating from both the City of Boulder and Boulder County. No individual notice from the County for this City owned parcel was completed, as the City of Boulder, being the applicant in this map revision, is aware of the impacts to their property.

5.10 NFIP Regulation Compliance

Tie-ins

The downstream tie-in for Skunk Creek is tied directly into the effective Bear Canyon Creek floodplain. The left overbank area of Skunk Creek upstream of Foothills Parkway is tied into the effective* Boulder Creek floodplain (*using the best available information that is the pending PMR data). The Bear Canyon Creek split flow is tied into the effective Bear Canyon Creek floodplain where the split flow joins the main channel of Bear Canyon Creek just upstream of Baseline Road. All floodplain tie-ins to the effective information are shown on the floodplain workmaps in Appendix F.

The upstream tie-in locations for Skunk Creek, Bluebell Canyon Creek, and King's Gulch occur at the upstream limit of study for each flooding source.

LOMR Notifications

As noted previously, all properties within the proposed Zone AE, Zone AO, and Zone X areas have been individually notified by the City of Boulder. Additionally, public notifications of the proposed floodplain and floodway modifications were completed in a local newspaper. See Appendix H for notification information.

Certification and Concurrence

All necessary certifications and concurrences for this LOMR are provided by the signatures on MT-2 Form 1, this LOMR report, and the signature and seal on the floodplain workmaps located in Appendix F.

SECTION 6.0: REFERENCES

1. Greenhorne & O'mara Inc., Flood Hazard Area Delineation – Boulder and Adjacent County Drainageways, May 1987.

2. City of Boulder LiDAR, spring 2013

3. City of Boulder September 2013 Flooding Extents Data, April 2014.

4. Federal Emergency Management Agency, Flood Insurance Study – Boulder County, Colorado and Incorporated Areas, October 4, 2002.

5. Federal Emergency Management Agency, Flood Insurance Study – Boulder County, Colorado and Incorporated Areas, December 18, 2012.

6. United States Army Corps of Engineers, HEC-RAS (v. 4.1.0), January 2010.

7. FLO-2D Software Inc., FLO-2D PRO Flood Routing Model (build no. 15.07.12).

8. United States Army Corps of Engineers, HEC-GeoRAS (v. 4.3.93), February 2011.

9. ESRI, ArcMAP (v. 9.3).

10. ESRI Resource Center, http://www.arcgis.com (aerial imaging), accessed starting October 2011.

11. Open-Channel Hydraulics, Ven Te Chow, 1988.

12. https://bouldercolorado.gov/open-data/tag/gis

Appendix A –
Application / Certification Forms

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless it displays a valid OMB control number. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☐ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☒ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
080024	City of Boulder	CO	08013C	0394J	12/18/12
080024	City of Boulder	CO	08013C	0413J	12/18/12

2. a. Flooding Source: Skunk Creek, Bluebell Canyon Creek, and King's Gulch

   b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH) ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

4. FEMA zone designations affected: A, AO, AE, X (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☒ Improved Methodology/Data ☒ Regulatory Floodway Revision ☒ Base Map Changes
   ☐ Coastal Analysis ☒ Hydraulic Analysis ☒ Hydrologic Analysis ☐ Corrections
   ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☒ Natural Changes
   ☒ New Topographic Data ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

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A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☐ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☒ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
080024	City of Boulder	CO	08013C	0557J	12/18/12
080024	City of Boulder	CO	08013C	0576J	12/18/12

2. a. Flooding Source: Skunk Creek, Bluebell Canyon Creek, and King's Gulch

   b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH) ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

4. FEMA zone designations affected: A, AO, AE, X (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☒ Improved Methodology/Data ☒ Regulatory Floodway Revision ☒ Base Map Changes
   ☐ Coastal Analysis ☒ Hydraulic Analysis ☒ Hydrologic Analysis ☐ Corrections
   ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☒ Natural Changes
   ☒ New Topographic Data ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert

☐ Dam ☐ Fill ☐ Other (Attach Description)

6. ☐ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $8,000

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Katie Knapp	Company: City of Boulder - Utilities	
Mailing Address: 1739 Broadway, 2nd Floor Boulder, CO 80302	Daytime Telephone No.: 303.441.4077	Fax No.: n/a
	E-Mail Address: KnappK@bouldercolorado.gov	
Signature of Requester (required):	Date:	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Jessica Stevens, Floodplain and Wetland Administrator	Community Name: City of Boulder	
Mailing Address: 1739 Broadway, 3rd Floor Boulder, CO 80302	Daytime Telephone No.: 303.441.3121	Fax No.: n/a
	E-Mail Address: stevensj@bouldercolorado.gov	
Community Official's Signature (required):	Date:	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Brian LeDoux	License No.: 40262	Expiration Date: 2017-10-31
Company Name: ICON Engineering Inc.	Telephone No.: 303.221.0802	Fax No.: n/a
Signature:	Date:	E-Mail Address: bledoux@iconeng.com

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

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PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a (NFIP) Flood Insurance Rate Maps (FIRM).

A. REQUESTED RESPONSE FROM DHS-FEMA

This request is for a (check one):

☐ CLOMR: A letter from DHS-FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☒ LOMR: A letter from DHS-FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See 44 CFR Ch. 1, Parts 60, 65 & 72)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Example: 480301 480287	City of Katy Harris County	TX TX	48473C 48201C	0005D 0220G	02/08/83 09/28/90
080023	Boulder County	CO	08013C	0557J	12/18/12

2. a. Flooding Source: Skunk Creek, Bluebell Canyon Creek, and King's Gulch

   b. Types of Flooding: ☒ Riverine ☐ Coastal ☐ Shallow Flooding (e.g., Zones AO and AH)
   ☐ Alluvial fan ☐ Lakes ☐ Other (Attach Description)

3. Project Name/Identifier: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

4. FEMA zone designations affected: A (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☒ Improved Methodology/Data ☒ Regulatory Floodway Revision ☒ Base Map Changes
   ☐ Coastal Analysis ☒ Hydraulic Analysis ☒ Hydrologic Analysis ☐ Corrections
   ☐ Weir-Dam Changes ☐ Levee Certification ☐ Alluvial Fan Analysis ☒ Natural Changes
   ☒ New Topographic Data ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

b. The area of revision encompasses the following structures (check all that apply)

Structures: ☒ Channelization ☐ Levee/Floodwall ☒ Bridge/Culvert

☐ Dam ☐ Fill ☐ Other (Attach Description)

6. ☐ Documentation of ESA compliance is submitted (required to initiate CLOMR review). Please refer to the instructions for more information.

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $8,000

☐ No, Attach Explanation

Please see the DHS-FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm **for Fee Amounts and Exemptions.**

D. SIGNATURE

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Katie Knapp	Company: City of Boulder - Utilities	
Mailing Address: 1739 Broadway, 2nd Floor Boulder, CO 80302	Daytime Telephone No.: 303.441.4077	Fax No.: n/a
	E-Mail Address: KnappK@bouldercolorado.gov	
Signature of Requester (required):	Date:	

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirements for when fill is placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. For Conditional LOMR requests, the applicant has documented Endangered Species Act (ESA) compliance to FEMA prior to FEMA's review of the Conditional LOMR application. For LOMR requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title: Varda Blum, Floodplain Program Manager	Community Name: Boulder County	
Mailing Address: Boulder County Transportation Department PO Box 471, Boulder CO 80306	Daytime Telephone No.: 720.564.2859	Fax No.: n/a
	E-Mail Address: vblum@bouldercounty.org	
Community Official's Signature (required):	Date:	

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information data, hydrologic and hydraulic analysis, and any other supporting information as per NFIP regulations paragraph 65.2(b) and as described in the MT-2 Forms Instructions. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: Brian LeDoux	License No.: 40262	Expiration Date: 2017-10-31
Company Name: ICON Engineering Inc.	Telephone No.: 303.221.0802	Fax No.: n/a
Signature:	Date:	E-Mail Address: bledoux@iconeng.com

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if …
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans

Seal (Optional)

U.S. DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 1660-0016
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 3.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington VA 20958-3005, Paperwork Reduction Project (1660-0016). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

PRIVACY ACT STATEMENT

AUTHORITY: The National Flood Insurance Act of 1968, Public Law 90-448, as amended by the Flood Disaster Protection Act of 1973, Public Law 93-234.

PRINCIPAL PURPOSE(S): This information is being collected for the purpose of determining an applicant's eligibility to request changes to National Flood Insurance Program (NFIP) Flood Insurance Rate Maps (FIRM).

ROUTINE USE(S): The information on this form may be disclosed as generally permitted under 5 U.S.C § 552a(b) of the Privacy Act of 1974, as amended. This includes using this information as necessary and authorized by the routine uses published in DHS/FEMA/NFIP/LOMA-1 National Flood Insurance Program (NFIP); Letter of Map Amendment (LOMA) February 15, 2006, 71 FR 7990.

DISCLOSURE: The disclosure of information on this form is voluntary; however, failure to provide the information requested may delay or prevent FEMA from processing a determination regarding a requested change to a NFIP Flood Insurance Rate Maps (FIRM).

Flooding Source: Skunk Creek, Bluebell Canyon Creek, King's Gulch

Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section B) ☐ No existing analysis ☒ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	Effective/FIS (cfs)	Revised (cfs)
At Confluence with Bear C	2.91	2230	2065
At US Highway 36	2.05	1350	1174
At Broadway	1.85	710	1017

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model → Specify Model: CUHP/SWMM
☐ Regional Regression Equations ☐ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters), and documentation to support the new analysis.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Is the hydrology for the revised flooding source(s) affected by sediment transport? ☐ Yes ☒ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation..

Impacts of Sediment Transport on Hydrology

The impact of sediment transport on hydrology was not addressed by this study. The detailed study area is generally an urban setting with minimal opportunities for sediment transport to affect hydrology or base flood elevations. The City of Boulder routinely removes sediment from the urban portions of the Skunk Creek, Bluebell Canyon Creek, and King's Gulch channels in order to minimize adverse impacts.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.) Effective	Water-Surface Elevations (ft.) Proposed/Revised
Downstream Limit*	Conf. with Bear Canyon Creek	25	5245.6	5245.56
Upstream Limit*	Limit of Study (X3)	n/a	n/a	n/a

*Proposed/Revised elevations must tie-into the Effective elevations within 0.5 foot at the downstream and upstream limits of revision.

2. Hydraulic Method/Model Used: HEC-RAS (v. 4.1.0)

3. Pre-Submittal Review of Hydraulic Models*

DHS-FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS.

4.

Models Submitted	Natural Run		Floodway Run		Datum
Duplicate Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Corrected Effective Model*	File Name:	Plan Name:	File Name:	Plan Name:	
Existing or Pre-Project Conditions Model	File Name: SBK_PMR.prj	Plan Name: SBK_PMR.p04	File Name: same	Plan Name: same	NAVD88
Revised or Post-Project Conditions Model	File Name:	Plan Name:	File Name:	Plan Name:	
Other - (attach description)	File Name:	Plan Name:	File Name:	Plan Name:	

* For details, refer to the corresponding section of the instructions.

☒ Digital Models Submitted? (Required)

C. MAPPING REQUIREMENTS

A **certified topographic work map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

☒ Digital Mapping (GIS/CADD) Data Submitted (preferred)

Topographic Information: City of Boulder 2013 LiDAR

Source: City of Boulder Date: 2013

Accuracy: 1-foot contours

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM**, at the same scale as the original, annotated to show the boundaries of the revised 1%-and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%-and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area on revision.

☒ Annotated FIRM and/or FBFM (Required)

D. COMMON REGULATORY REQUIREMENTS*

1. For LOMR/CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

   a. For CLOMR requests, if either of the following is true, please submit **evidence of compliance with Section 65.12 of the NFIP regulations**:

      - The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot compared to pre-project conditions.
      - The proposed project encroaches upon a SFHA with or without BFEs established and would result in increases above 1.00 foot compared to pre-project conditions.

   b. Does this LOMR request cause increase in the BFE and/or SFHA compared with the effective BFEs and/or SFHA? ☒ Yes ☐ No

      If Yes, please attach **proof of property owner notification and acceptance (if available)**. Elements of and examples of property owner notifications can be found in the MT-2 Form 2 Instructions.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☒ No

   If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(A)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☒ Yes ☐ No

   If Yes, attach **evidence of regulatory floodway revision notification**. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being established. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For CLOMR requests, please submit documentation to FEMA and the community to show that you have complied with Sections 9 and 10 of the Endangered Species Act (ESA).

For actions authorized, funded, or being carried out by Federal or State agencies, please submit documentation from the agency showing its compliance with Section 7(a)(2) of the ESA. Please see the MT-2 instructions for more detail.

* Not inclusive of all applicable regulatory requirements. For details, see 44 CFR parts 60 and 65.

DEPARTMENT OF HOMELAND SECURITY
FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. NO. 1660-0016
Expires February 28, 2014

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Flooding Source: Skunk Creek, Bluebell Canyon Creek, King's Gulch

Note**:** Fill out one form for each flooding source studied.

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam.....complete Section D
Levee/Floodwall.....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Modeled Structure

1. Name of Structure: Multiple - see report text (Table 2.1)

Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: _____

Downstream Limit/Cross Section: _____

Upstream Limit/Cross Section: _____

2. Name of Structure: _____

Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: _____

Downstream Limit/Cross Section: _____

Upstream Limit/Cross Section: _____

3. Name of Structure: _____

Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

Location of Structure: _____

Downstream Limit/Cross Section: _____

Upstream Limit/Cross Section: _____

NOTE: FOR MORE STRUCTURES, ATTACH ADDITIONAL PAGES AS NEEDED.

B. CHANNELIZATION

Flooding Source: _____

Name of Structure: _____

1. Hydraulic Considerations

The channel was designed to carry _____ (cfs) and/or the _____-year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☐ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions

☐ Other locations (specify): _____

2. Channel Design Plans

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Accessory Structures

The channelization includes (check one):

☐ Levees [Attach Section E (Levee/Floodwall)] ☐ Drop structures ☐ Superelevated sections

☐ Transitions in cross sectional geometry ☐ Debris basin/detention basin [Attach Section D (Dam/Basin)] ☐ Energy dissipator

☐ Weir ☐ Other (Describe):

4. Sediment Transport Considerations

Are the hydraulics of the channel affected by sediment transport? ☐ Yes ☐ No

If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Skunk Creek, Bluebell Canyon Creek, King's Gulch

Name of Structure: Multiple - see report text (Table 2.1)

1. This revision reflects (check one):

☐ Bridge/culvert not modeled in the FIS

☐ Modified bridge/culvert previously modeled in the FIS

☐ Revised analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-RAS & HY8
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

☒ Dimensions (height, width, span, radius, length)

☒ Shape (culverts only)

☒ Material

☐ Beveling or Rounding

☒ Wing Wall Angle

☐ Skew Angle

☒ Distances Between Cross Sections

☐ Erosion Protection

☒ Low Chord Elevations – Upstream and Downstream

☒ Top of Road Elevations – Upstream and Downstream

☒ Structure Invert Elevations – Upstream and Downstream

☒ Stream Invert Elevations – Upstream and Downstream

☒ Cross-Section Locations

4. Sediment Transport Considerations

Are the hydraulics of the structure affected by sediment transport? ☐ Yes ☒ No

If Yes, then fill out Section F (Sediment Transport) of Form 3. If no, then attach an explanation.

Appendix B –
Effective Flood Hazard Information

FLOOD HAZARD AREA DELINEATION

CITY OF BOULDER

BOULDER AND ADJACENT COUNTY DRAINAGEWAYS

MAY 1987

Prepared For:
URBAN DRAINAGE and FLOOD CONTROL DISTRICT
The CITY OF BOULDER
BOULDER COUNTY, COLORADO

Prepared By:
GREENHORNE & O'MARA, INC.
Consulting Engineers
Denver, Colorado

Flood water surface elevations and floodplain boundaries are often revised by road and bridge construction, floodplain development, flood control improvements, or natural process. Prior to utilization of this report for planning or design purposes, the user is advised to contact the Urban Drainage and Flood Control District, the City of Boulder, and Boulder County to determine if the information in this report has been amended.

BASIN DESCRIPTIONS

The major drainage basin and sub-basin boundaries along with their respective drainage areas, are shown on Sheets 2 and 3 in the Appendix. A description of each basin is presented below.

Bear Canyon Creek

Bear Canyon Creek drainage basin is the southernmost region of the study area. Its overall length is about 5 miles. The source of the creek is near Kossler Lake. The drainage basin is rugged, steep and narrow as the creek drains Boulder Mountain and its surrounding areas. As it leaves the Foothills, the creek flows to the south of the National Center for Atmospheric Research.

Near Table Mesa Drive and Lehigh Street the basin enters residential and commercially developed areas. As the stream crosses the southern line of the City of Boulder, the basin remains highly developed. North of the Empson Ditch, the basin is again undeveloped. The slope of the land is gradual, and the vegetation is dense with native grasses and weeds.

The stream channel within the upstream reaches of the Bear Canyon Creek drainage basin reflects the characteristics of the basin. The creek bed at Bear Mountain Drive and Wildwood Road is very rocky with 10 to 12 foot banks, with 3:1 side slopes. As the channel enters the developed reaches of the basin, it becomes more defined. From Table Mesa Drive and Ithaca to Table Mesa Drive and Broadway, there are several drop structures and culverts. The stream channel is grasslined approximately six feet wide with 2:1 side slopes. As the creek approaches its confluence with Boulder Creek, the channel becomes wide and shallow.

Skunk Canyon Creek

The Skunk Canyon Creek drainage basin originates in the Flatirons southwest of Boulder and drains to the northeast a distance of about 2 miles. The undeveloped portion of the basin which exists in the mountains is steep, narrow and rocky. As the drainage enters and crosses the Boulder City limits, the basin becomes less steep in slope, and wider. Skunk Creek flows into Bear Canyon Creek 2000 feet south of the confluence of Bear Canyon Creek and Boulder Creek.

Skunk Canyon Creek flows notheast from the Flatirons past Kohler Reservoir. The stream channel is 10 to 12 feet high and very rocky. Stream banks rise from the channel at 2:1 side slopes. Downstream, the creet flows through Green Mountain Cemetery. The Creek banks within this reach are grass or rip-rapped, and range in height from 2 to 5 feet. The width of the channel ranges from 5 to 10 feet. As the creek leaves the cemetery, it crosses the Anderson Extension Ditch.

Northeast of the ditch, the creek approaches developed residential and commercial areas. The creek crosses Highway 36 at Baseline Road. Within the developed areas of the basin the channel is natural with 4 foot banks at approximately a 2:1 side slope. The channel reflects the basin conditions as it approaches its confluence with Bear Creek. Under a smaller gradient, the channel is wide and shallow.

Bluebell Canyon Creek

Bluebell Canyon Creek also drains east from the Boulder Flatirons. The overall length of the basin is about 1.8 miles. Approximately half of this distance is within Bluebell Canyon, which is undeveloped. In this portion of the basin, the channel is steep, rocky and well defined. The lower half of the basin is located in fully developed residential areas. Again, the drainage channel is all but obliterated by development. The channel enters this portion of the basin at 15th Street. A small ditch carries trickle flows eastward along the backyard property lines between Mariposa and Columbine Avenues. The drainage flows directly into the Anderson Extension Ditch at 20th Street. During a storm event, the creek

will overflow the ditch and sheet flow west through properties with the water eventually draining into Skunk Creek.

Kings Gulch

The Kings Gulch drainage basin starts in the Boulder Flatirons and drains eastward from the mountains to lower-lying residential areas which start around 15th Street. From 15th Street to the stream's confluence at 22nd Street near King Avenue, the grade of the land is moderately steep. The basin is fully developed as a residential area. As such, the natural drainage channel is obliterated.

Gregory Canyon Creek

The Gregory Canyon Creek drainage basin is steep, narrow, and approximately 1.9 miles long in its upstream and undeveloped section. The drainage starts near Green Mountain and continues northeastward towards the Boulder City limits. The drainage traverses fully developed residential areas between Baseline and Arapahoe Road along 9th Street for a distance of about 1 mile. The creek eventually empties into Boulder Creek north of 9th Street and Arapahoe Avenue.

The channel within the upstream portion of the basin mirrors basin conditions. It is steep, rocky, and narrow. The downstream section of the channel through the developed areas is open and relatively steep in grade. Within the developed areas there are numerous road crossings. The channel within this section is narrow with steep banks at several locations. Deciduous vegetation borders and overhangs the channels.

Sunshine Canyon Creek

The Sunshine Canyon Creek drainage basin has its source in the mountains west of Boulder. The drainage runs from the mountains to Boulder Creek south of Canyon Boulevard at 3rd Street, an approximate distance of 2.2 miles. The majority of the basin exists in the mountains under undeveloped conditions. This portion of the basin is very steep, rocky, narrow and approximately 1.6 miles long. The basin enters the city limits near Memorial Hospital. It then turns to the south, and parallels 4th Street along a steep grade to Boulder Creek. The drainage basin within the city limits is fully developed. A small tributary about 0.5 miles long enters the main Sunshine Canyon Creek drainage basin at Memorial Hospital. This tributary drains the area directly north of the hospital. The entire basin of this tributary is undeveloped.

The channel within the undeveloped section of the basin is rocky, steep and narrow. The channel within the developed section is well defined, steep and narrow.

Goose Creek

The Goose Creek drainageway originates one block north of 9th Street and Alpine through overland flow drainage of an area of approximately 200 acres. This area naturally drains to the east side of North Boulder Park. From here floodwaters enter Balsam Street from 9th Street. There is no stream visible within this portion of the drainage basin. The stream appears at 19th Street and Tyler Road, which is one block north of Alpine Avenue.

The drainage basin between North Boulder Park and the Boulder and Whiterocks Ditch has a moderate slope and is situated in developed residential areas. The stream bed within this area is very well-defined with heavy growth adjacent to the channel. The width of the channel within this section is as large as 25 feet with 6- to 15-foot high channel walls. The stream runs south of and parallel to Edgewood Drive. Homes border the stream along its length within this section.

Under non-flood conditions, Goose Creek flows into the Boulder and Whiterocks Ditch. During a flood event, floodwaters traverse the ditch. The basin area east of the Boulder and Whiterocks Ditch is largely developed by a variety of commercial business. The channel through this area has been largely obliterated with development. Culverts under Foothills Parkway flows directly into two improved channels downstream for approximately 0.8 miles before joining again at a sediment pond just above the confluence with Boulder Creek.

- Fourmile Creek
- Wonderland Creek
- Twomile Creek
- Elmer's Twomile Creek
- Goose Creek
- Bear Canyon Creek *
- Skunk Creek **

* Bear Canyon Creek from Boulder Creek to Yale Road.
** Skunk Creek from Bear Creek to King Avenue.

The floodplain information for the additional streams and stream reaches listed below was completed as part of this study.

- Bluebell Canyon Creek
- King's Gulch
- Gregory Creek
- Sunshine Canyon Creek
- Bear Canyon Creek *
- Skunk Creek **

* Bear Canyon Creek upstream of Yale Road.
** Skunk Creek upstream of King Avenue.

Hydrologic Analyses

Historic stream flow measurements were not available for any of the streams under study, and hence, hydrologic modelling was used to develop frequency discharge information. The Colorado Urban Hydrograph Procedure (CUHP), (Reference 2,3), was used to determine the runoff hydrographs for each sub-basin. Basins and sub-basins used in the analysis are shown on Figures 1 and 2. These hydrographs were then lagged and routed through the basin using the HEC-1 computer model (Reference 4) to account for stream travel times and flow attenuation due to channel or reservoir storage.

The CUHP model was used to develop hydrology for future basin conditions along each drainageway. An investigation was completed by the MSM/SP Group to compare existing vs full development hydrology. The results of this study showed that the increase in discharges and associated water surface elevations for full development was relatively small. Representatives of the City of Boulder, the Urban Drainage and Flood Control District and the Federal Emergency Management Agency reviewed the information and agreed that the use of future condition hydrology was appropriate for the Flood Insurance Study as well as this study.

Frequency discharges were developed for each of the drainageways for the 2-, 5-, 10-, 50-, and 100-year storm events. The CUHP model was used to calculate the 10-, 50-, and 100-year events for each stream included in the Flood Insurance Study (Fourmile Creek, Wonderland Creek, Twomile Creek, Elmer's Twomile Creek, Goose Creek, Bear Canyon Creek, and Skunk Creek). The 2-year and 5-year discharges for these streams were determined by extrapolating the modelled discharge information downward on a log probability graph. Frequency discharges for the 2-, 5-, 10-, 50-, and 100-year events for the remaining streams (King's Gulch, Bluebell Canyon Creek, Gregory Creek, and Sunshine Canyon Creek) were all calculated using the CUHP method.

Rainfall data was developed based on the revised guidelines dated September 15th, 1982, set forth in the Urban Storm Drainage Criteria Manual. Rainfall depths presented in these guidelines were obtained from the Precipitation Frequency Atlas of the Western United States (Reference 5). The total rainfall depths for the flood events analyzed for each drainageway included in this study are presented in Table 2.

TABLE 2

Rainfall Depths (Inches) / 1-Hour Duration

Basin	2-Year	5-Year	10-Year	50-Year	100-Year
Kings Gulch	1.00	1.41	1.70	2.30	2.65
Bluebell Canyon Creek	0.94	1.35	1.65	2.25	2.55
Gregory Creek	0.95	1.36	1.63	2.28	2.58
Sunshine Canyon Creek	0.94	1.35	1.62	2.25	2.55
Skunk Creek	*N/A	*N/A	1.65	2.25	2.55
Bear Canyon Creek	*N/A	*N/A	1.65	2.25	2.50
Elmer's Twomile Creek	*N/A	*N/A	1.70	2.35	2.65
Goose Creek	*N/A	*N/A	1.70	2.30	2.55
Wonderland Creek	*N/A	*N/A	1.60	2.25	2.50
Fourmile Canyon Creek (Upper Basin)	*N/A	*N/A	1.65	2.30	2.55
Fourmile Canyon Creek (Lower Basin)	*N/A	*N/A	1.70	2.35	2.65
Twomile Canyon Creek (Upper Basin)	*N/A	*N/A	1.60	2.20	2.45
Twomile Canyon Creek (Lower Basin)	*N/A	*N/A	1.70	2.30	2.65

*(N/A) The 2-year and 5-year events for these streams were extrapolated.

The 1-hour duration rainfall obtained from the NOAA Atlas is distributed into a 2-hour design storm for use with the CUHP program. The desired 2-hour storm duration is calculated for each recurrence frequency by multiplying each time increment by the percentages as shown in Table 3. The resulting 2-hour storm depth is comparable to the 2-hour depth found in the NOAA Atlas.

TABLE 3

Design Storm Distributions of 1-Hour NOAA Atlas Depths

Time	Percent of NOAA Rainfall Atlas Depth				
Minutes	2-Year	5-Year	10-Year	50-Year	100-Year
5	2.0	2.0	2.0	1.3	1.0
10	4.0	3.7	3.7	3.5	3.0
15	8.4	8.7	8.2	5.0	4.6
20	16.0	15.3	15.0	8.0	8.0
25	25.0	25.0	25.0	15.0	14.0
30	14.0	13.0	12.0	25.0	25.0
35	6.3	5.8	5.6	12.0	14.0
40	5.0	4.4	4.3	8.0	8.0
45	3.0	3.6	3.8	5.0	6.2
50	3.0	3.6	3.2	5.0	5.0
55	3.0	3.0	3.2	3.2	4.0
60	3.0	3.0	3.2	3.2	4.0
65	3.0	3.0	3.2	3.2	4.0
70	2.0	3.0	3.2	2.4	2.0
75	2.0	2.5	3.2	2.4	2.0
80	2.0	2.2	2.5	1.8	1.2
85	2.0	2.2	1.9	1.8	1.2
90	2.0	2.2	1.9	1.4	1.2
95	2.0	2.2	1.9	1.4	1.2
100	2.0	1.5	1.9	1.4	1.2
105	2.0	1.5	1.9	1.4	1.2
110	2.0	1.5	1.9	1.4	1.2
115	1.0	1.5	1.7	1.4	1.2
120	1.0	1.3	1.3	1.4	1.2
Totals	**15.7**	**115.7**	**115.7**	**115.6**	**115.6**

The Colorado Urban Hydrograph Procedure was completed utilizing the computerized model (CUHPB) as currently approved by the Urban Drainage and Flood Control District. The basin parameters required as input into the CUHPB model include the Basin Area (A), basin length along the flow path (L), length to centroid

TABLE 5

CUHPB Basin Parameters

* Sub-Basin Designation	AREA (mi2)	Basin Length (mi)	L_{ca} (mi)	%I	C_t*	C_p	Pervious Depression (Inches)	Impervious Depression (Inches)	Initial Infl. (In/Hr)	Decay Rate (per sec.)	Final Infl. Rate (In/Hr)
Twomile Canyon Creek											
601	1.40	2.41	1.35	7.0	0.33	0.32	0.50	0.10	3.0	0.0018	0.5
602	0.28	0.86	0.51	25.0	0.19	0.30	0.40	0.10	4.0	0.0018	0.6
603	0.51	1.48	0.76	41.0	0.22	0.48	0.40	0.10	4.0	0.0018	0.6
Goose Creek											
701	0.48	1.52	0.59	27.0	0.20	0.34	0.40	0.10	3.0	0.0018	0.5
702	0.80	1.44	0.66	42.0	0.23	0.52	0.40	0.10	4.0	0.0018	0.6
703	0.04	0.52	0.28	28.0	0.16	0.24	0.50	0.10	3.0	0.0018	0.5
704	0.12	0.66	0.21	41.0	0.18	0.39	0.40	0.10	3.0	0.0018	0.5
705	0.62	1.57	0.76	64.0	0.25	0.66	0.40	0.10	3.0	0.0018	0.5
706	0.69	1.63	0.80	53.0	0.27	0.59	0.40	0.10	3.0	0.0018	0.5
Wonderland Creek											
801	0.38	0.72	0.38	11.0	0.22	0.26	0.50	0.10	3.0	0.0018	0.5
802	0.47	1.21	0.57	16.0	0.23	0.27	0.50	0.10	3.0	0.0018	0.5
803	0.29	0.88	0.57	30.0	0.23	0.34	0.40	0.10	4.0	0.0018	0.6
804	0.21	0.81	0.47	36.0	0.21	0.38	0.40	0.10	3.0	0.0018	0.5
805	0.24	1.14	0.43	31.0	0.25	0.33	0.40	0.10	3.0	0.0018	0.5
806	0.32	1.42	0.76	10.0	0.37	0.25	0.50	0.10	3.0	0.0018	0.5
Fourmile Canyon Creek											
901	3.93	4.17	1.37	5.0	0.39	0.38	0.50	0.10	3.0	0.0018	0.5
902	3.28	3.08	1.18	6.0	0.35	0.37	0.50	0.10	3.0	0.0018	0.5
903	0.71	1.10	0.49	15.0	0.22	0.29	0.50	0.10	3.0	0.0018	0.5
904	0.68	1.89	1.02	41.0	0.27	0.50	0.40	0.10	4.0	0.0018	0.6
905	0.49	1.25	0.49	12.0	0.31	0.27	0.50	0.10	3.0	0.0018	0.5
906	0.94	2.50	1.21	13.0	0.42	0.30	0.50	0.10	3.0	0.0018	0.5
Skunk Creek											
301	0.88	2.79	1.40	8.0	0.34	0.30	0.50	0.10	3.0	0.0018	0.5
302	0.16	0.99	0.23	51.0	0.14	0.45	0.40	0.10	4.0	0.0018	0.6
303	0.04	0.26	0.16	78.0	0.11	6.48	0.40	0.10	4.0	0.0018	0.6
304	0.11	0.38	0.19	50.0	0.12	0.43	0.40	0.10	4.0	0.0018	0.6
305	0.35	1.33	0.51	6.0	0.23	0.57	0.40	0.10	3.0	0.0018	0.5
306	0.29	1.00	0.53	22.0	0.27	0.28	0.50	0.10	3.0	0.0018	0.5

* Design Points for each sub-basin designation are shown on Figures 1 and 2, respectively.

TABLE 5

CUHPB Basin Parameters

*Sub-Basin Designation	AREA (mi2)	Basin Length (mi)	L_{ca} (mi)	%I	C_t*	C_p	Pervious Depression (Inches)	Impervious Depression (Inches)	Initial Infl. (In/Hr)	Decay Rate (per sec.)	Final Infl. Rate (In/Hr)
King's Gulch											
K1	0.23	1.00	0.44	5.0	0.26	0.24	0.50	0.10	3.0	0.0018	0.5
K2	0.09	0.57	0.38	35.0	0.32	0.15	0.40	0.10	3.0	0.0018	0.5
Bluebell Canyon Creek											
B1	0.40	1.55	0.95	5.0	0.30	0.26	0.50	0.10	3.0	0.0018	0.5
B2	0.28	0.88	0.35	46.0	0.14	0.47	0.40	0.10	3.0	0.0018	0.5
Gregory Creek											
G1	1.16	1.61	0.87	5.0	0.34	0.30	0.50	0.10	3.0	0.0018	0.5
G2	0.40	0.93	0.45	5.0	0.29	0.24	0.50	0.10	3.0	0.0018	0.5
G3	0.73	1.20	0.72	33.0	0.42	0.19	0.40	0.10	3.0	0.0018	0.5
Sunshine Canyon Creek											
S1	1.13	2.56	0.95	.5	0.33	0.33	0.50	0.10	3.0	0.0018	0.5
S2	0.30	0.91	0.46	5.0	0.27	0.24	0.50	0.10	3.0	0.0018	0.5
S3	0.29	0.91	0.40	5.0	0.27	0.28	0.50	0.10	3.0	0.0018	0.5
S4	0.10	0.47	0.40	43.0	0.39	0.13	0.40	0.10	3.0	0.0018	0.5
Bear Canyon Creek											
401	2.84	4.43	2.05	7.0	0.40	0.34	0.50	0.10	3.0	0.0018	0.5
402	0.87	1.59	0.76	27.0	0.22	0.37	0.50	0.10	4.0	0.0018	0.6
403	0.37	1.10	0.68	53.0	0.20	0.54	0.40	0.10	4.0	0.0018	0.6
404	0.26	0.83	0.57	42.0	0.24	0.43	0.40	0.10	4.0	0.0018	0.6
405	0.37	1.04	0.38	28.0	0.18	0.33	0.40	0.10	4.0	0.0018	0.6
406	0.18	0.64	0.27	40.0	0.19	0.40	0.40	0.10	4.0	0.0018	0.6
407	0.07	0.47	0.25	20.0	0.21	0.22	0.50	0.10	3.0	0.0018	0.5
408	0.39	1.74	0.95	32.0	0.31	0.32	0.40	0.10	3.0	0.0018	0.5
409	0.06	0.38	0.27	5.0	0.31	0.19	0.50	0.10	3.0	0.0018	0.5
Elmer's Twomile											
501	0.12	0.52	0.25	30.0	0.16	0.30	0.40	0.10	3.0	0.0018	0.5
502	0.19	0.72	0.22	36.0	0.18	0.37	0.40	0.10	3.0	0.0018	0.5
503	0.21	1.06	0.64	47.0	0.23	0.44	0.40	0.10	3.0	0.0018	0.5

* Design Points for each sub-basin designation are shown on Figures 1 and 2, respectively.

TABLE 6

SUMMARY OF PEAK DISCHARGE

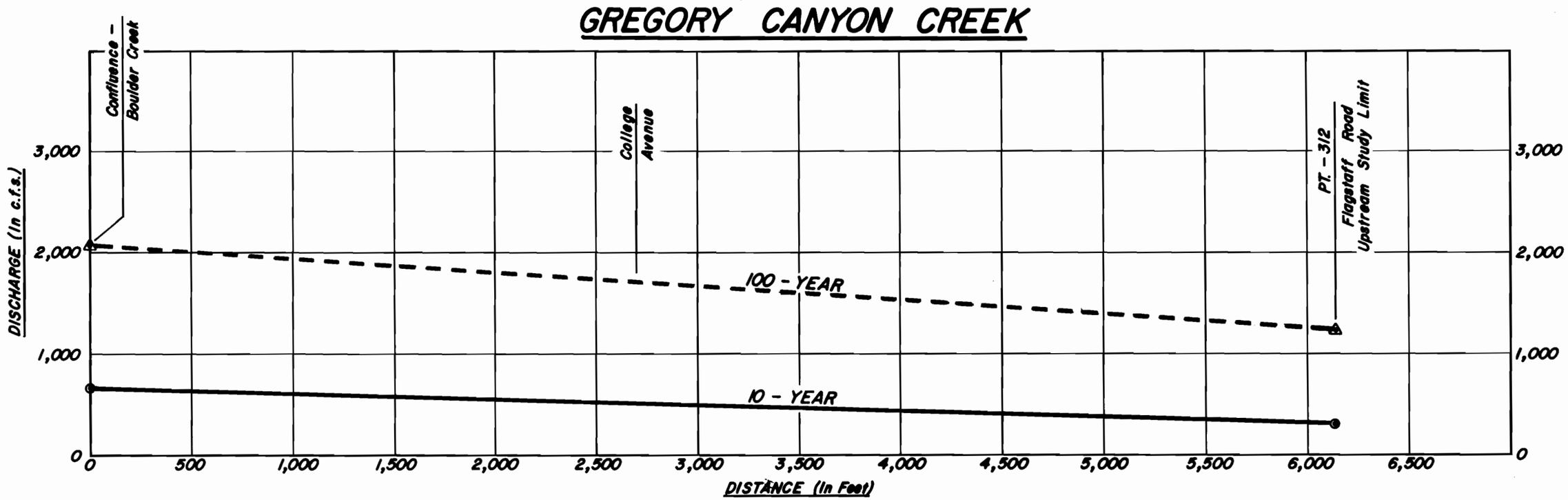
Design Point	Flooding Source	Drainage Area (sq mi)	Peak Discharges (cfs) 2-Yr	5-Yr	10-Yr	50-Yr	100-Yr
	BEAR CANYON CREEK - (Figure 2)						
409	Confluence - Boulder Creek	8.24	720	1415	2050	3762	4880
408	Confluence - Skunk Creek	5.35	355	780	1170	2360	3070
407	Baseline Road	4.96	330	740	1110	2352	2930
404	U.S. 36	4.34	240	540	820	1780	2210
403	Broadway	4.08	140	440	680	1512	1930
402	Yale Road	3.71	110	290	480	1190	1600
401	500' u/s of Lehigh	2.84	68	180	307	791	1063
	SKUNK CANYON CREEK - (Figure 2)						
306	Confluence - Bear Creek	2.83	350	700	980	1830	2230
305	Madison Avenue	2.43	340	690	920	1580	1870
303	U.S. 36	2.08	270	480	650	1130	1350
302	Broadway	1.36	47	125	210	520	710
301	Anderson Ditch	1.20	39	105	180	460	640
	BLUEBELL CANYON CREEK - (Figure 2)						
211	Chautauqua Park	0.40	6	31	63	168	227
212	Confluence with Skunk Creek	0.68	139	247	360	627	737
	KING'S GULCH - (Figure 1)						
111	Design Point	0.23	6	32	64	164	214
112	Confluence with Skunk Creek	0.32	41	82	132	292	373
	GREGORY CREEK - (Figure 2)						
311	0.4 mi. u/s Flagstaff Road	1.16	22	117	229	659	890
312	Flagstaff Road	1.56	30	163	321	932	1239
313	Confluence with Boulder Creek	2.29	161	435	673	1672	2092
	SUNSHINE CANYON CREEK - (Figure 1)						
411	Confluence w/Sunshine Creek Tributary	1.13	17	89	169	538	678
412	Design Point d/s of Memorial Hospital	1.72	27	139	266	869	1103
414	Confluence with Boulder Creek	1.82	45	155	286	914	1159
	SUNSHINE CANYON TRIB. - (Figure 1)						
414	Confluence with Sunshine Canyon Creek	0.29	10	26	51	161	200
	GOOSE CREEK - (Figure 1)						
706	Confluence - Boulder Creek	5.46	650	1260	1740	3300	4180
705	Colorado & Southern Railroad	4.77	520	1040	1520	2960	3761
704	Confluence - Elmer's Twomile	3.63	340	710	1050	2100	2680
703	Confluence - Twomile Canyon	1.32	240	470	670	1270	1590
702	19th Street	1.28	260	500	700	1320	1600
701	Upstream Study Limit	.48	90	183	260	520	620
	TWOMILE CANYON CREEK - (Figure 1)						
603	Confluence - Goose Creek	2.19	110	255	360	840	1120
602	Broadway	1.68	48	138	210	675	890
601	Upstream Study Limit (Maxwell Reservoir)	1.40	40	112	210	540	710
	ELMER'S TWOMILE - (Figure 2)						
503	Confluence - Goose Creek	0.52	84	190	280	630	790
502	Iris Avenue	0.31	93	185	270	510	610
501	Upstream Study Limit	0.12	40	78	110	210	250

TABLE 7

ESTIMATED BLOCKAGE AT MAJOR DRAINAGE STRUCTURES

DRAINAGEWAY	LOCATION	% BLOCKAGE
Bear Canyon Creek		
	Wildwood	40
	Boiler Pipe Culvert	100
	Footbridge	30
	Lehigh	75
	All Table Mesa Drive Culverts	50
	Security Bank	0
	Broadway	75
	2 Footbridges	20
	Martin	50
	Moorhead	20
	Turnpike	0
	Bike Bridge	0
	Church Culvert	30
	Baseline	50
	Gilpin	10
	Mohawk	0
	Low Flow Crossing at Wellman	100
	47th	0
	Arapahoe	30
Skunk Creek		
	King	50
	Driveway	40
	Driveway	40
	Bluebell	30
	Broadway	30
	Footbridge	30
	27th	0
	Moorhead U.S. 36	0

DRAINAGEWAY	LOCATION	% BLOCKAGE
Skunk Creek		
	U.S. 36	0
	Baseline	0
	29th	10
	Pedestrian Bridge	30
	30th	30
	Footbridge	30
	Aurora	10
	34th	20
	Madison (East Cell)	30
	(West Cell)	100
	Skunk/35th	50
	Colorado	0
	47th Parkway	0
Bluebell Canyon Creek		
	15th Street	0
	16th Street	100
	17th Street	100
	18th Street	100
	19th Street	100
	20th Street	100
King's Gulch		
	Bellevue Drive	50
	Driveway	25
	15th Street	25
	17th Street	25


GREGORY CANYON CREEK
Confluence - Boulder Creek
College Avenue
PT. - 312
Flagstaff Road
Upstream Study Limit
100 - YEAR
10 - YEAR
DISCHARGE (In c.f.s.)
DISTANCE (In Feet)
0
1,000
2,000
3,000
500
1,500
2,500
3,500
4,000
4,500
5,000
5,500
6,000
6,500

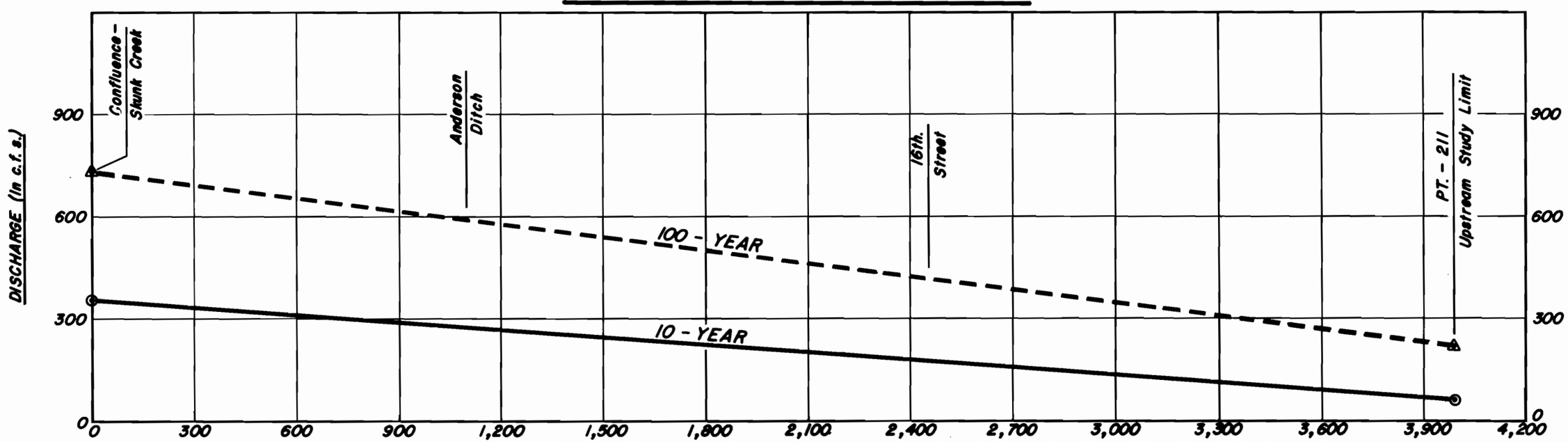
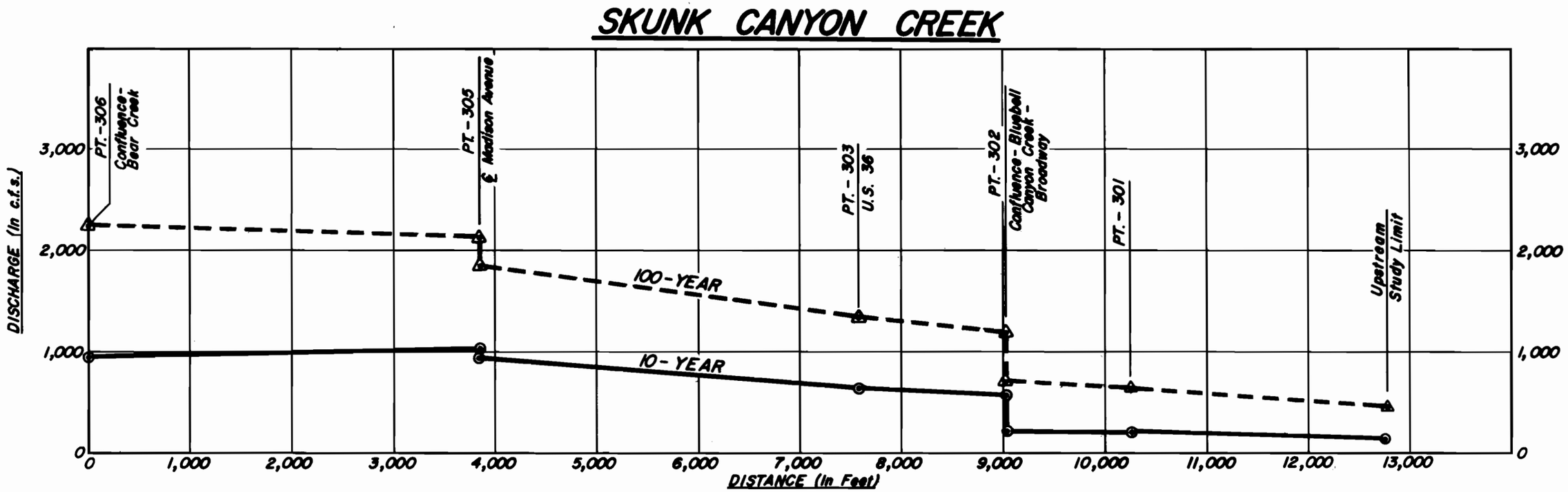

BLUEBELL CANYON CREEK
Confluence - Skunk Creek
Anderson Ditch
16th. Street
PT. - 211
Upstream Study Limit
100 - YEAR
10 - YEAR
DISCHARGE (In c.f.s.)
0
300
600
900
1,200
1,500
1,800
2,100
2,400
2,700
3,000
3,300
3,600
3,900
4,200

Figure 9


SKUNK CANYON CREEK
DISCHARGE (In c.f.s.)
DISTANCE (In Feet)
PT.-306 Confluence-Bear Creek
PT.-305 ℄ Madison Avenue
PT.-303 U.S. 36
PT.-302 Confluence-Bluebell Canyon Creek-Broadway
PT.-301
Upstream Study Limit
100-YEAR
10-YEAR
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
11,000
12,000
13,000

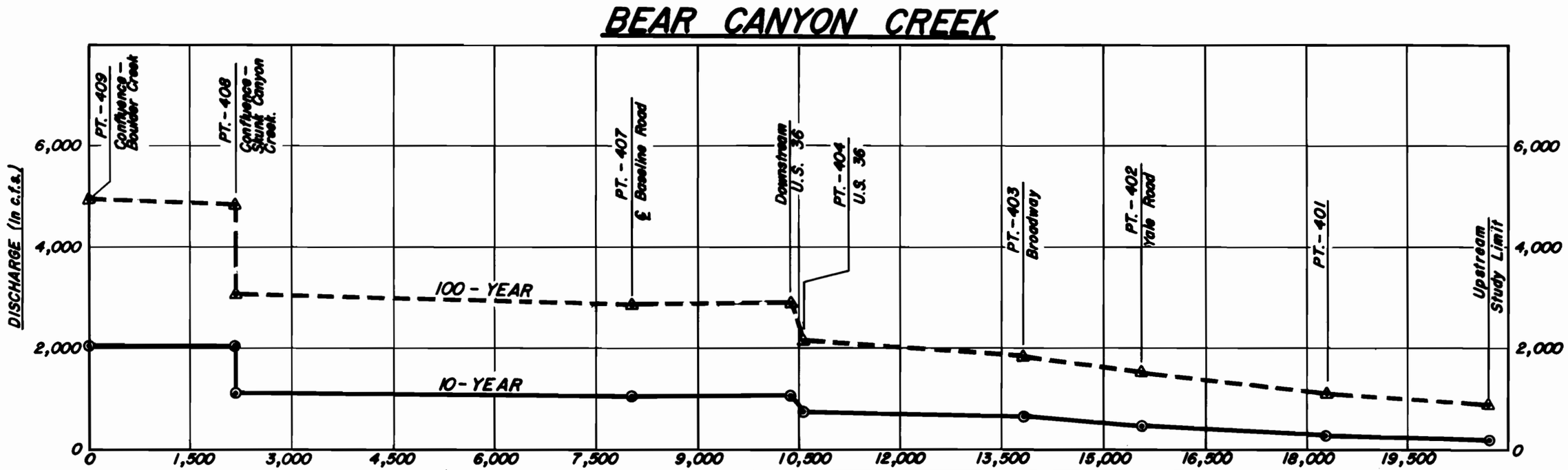

BEAR CANYON CREEK
DISCHARGE (In c.f.s.)
PT.-409 Confluence-Boulder Creek
PT.-408 Confluence-Skunk Canyon Creek.
PT.-407 ℄ Baseline Road
Downstream U.S. 36
PT.-404 U.S. 36
PT.-403 Broadway
PT.-402 Yale Road
PT.-401
Upstream Study Limit
100-YEAR
10-YEAR
0
1,500
3,000
4,500
6,000
7,500
9,000
10,500
12,000
13,500
15,000
16,500
18,000
19,500

Figure 10

KINGS GULCH

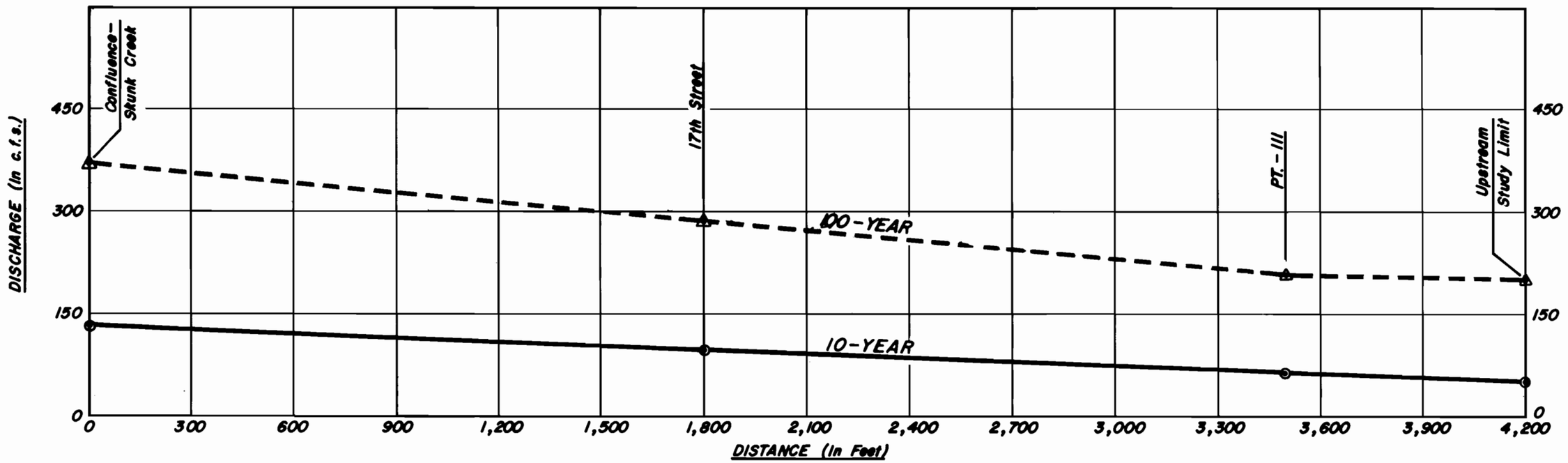


Figure 11

Between Lehigh Street and Broadway, the floodplain generally follows the exterior boundaries of Table Mesa Drive. The floodplain widens at cross streets with Table Mesa. This is caused by the culverts built for those streets. As the creek approaches Broadway, the floodplain becomes wider. Downstream from Gillaspie Drive, the floodplain extends eastward as the terrain starts to flatten out. Commercial development also increases in this area. The floodplain crosses approximately 450 feet of Broadway. Again damages are not heavy, as only 2 buildings are within the floodplain.

Downstream from Broadway, the wide floodplain intersects Eastman Avenue on the west side of the stream. Eastman conveys its water to 35th Street, and 35th Street carries the water down to Martin Drive. Between Martin Drive and Highway 36, a continuous floodplain boundary lies to the east of the creek. This boundary is 250 feet east of the creek at Martin Drive. It follows along the western half of Chase Circle and returns very close to the creek at Moorhead Avenue. The floodplain on the west side of the creek between Martin Drive and Highway 36 is not continuous. Three-fourths of the area west of the creek and between Martin and Berkeley Avenue is not flooded. Immediately downstream from this area, a residential area which is built around Berkeley Avenue is flooded. Twenty homes are effected by the floodplain in this area.

Downstream of Highway 36 broad, shallow flooding occurs to Baseline Road. The floodplain approaches 1300 feet in width at its widest point. Only a commercial building is located within the floodplain near Baseline Road. North of Baseline Road, the floodplain becomes narrow as the creek's channel is larger and street flow occurs along Gilpin Drive.

The floodplain is narrow along the creek bed and Gilpin Drive, leaving most of the area between the creek and the street dry. Floodwaters from Gilpin Drive flow onto Inca Parkway and then onto Mohawk Drive. A large amount of property damage occurs as a result of this flooding pattern. Twenty-two residential buildings incur shallow flooding.

From Mohawk Drive to the creek's confluence with Boulder Creek, the floodplain ranges from being narrow to very extensive. The width of the floodplain is influenced by Skunk Creek, which flows into Bear Creek approximately 530 feet south of Arapahoe Road. The floodplain is a fairly uniform 75 feet in width for 750 feet downstream of Mohawk Drive. As the stream approaches Foothills Parkway and the Skunk Creek floodplain, the Bear Creek floodplain widens on the west side of the creek. On the east side of the creek, the floodplain extends to within 100 feet of Hancock Drive near Foothills Parkway. The flood profiles and floodplain delineation immediately upstream of Arapahoe have been revised to reflect the installation of larger culverts by the Highway Department and overbank grading by a developer. North of Arapahoe Road to the creek's confluence with Boulder Creek, a broad area is flooded to approximately 1 foot of depth. The widest area of the floodplain extends approximately 200 feet on the east side of the creek. Property damage is light in this downstream portion of the creek, as only 3 small buildings are within the floodplain.

Skunk Creek

The floodplain upstream from the Kings Gulch confluence with Skunk Creek ranges from narrow and confined in steep channel banks to wide where overland shallow flooding occurs within Green Mountain Cemetery. Street flooding occurs near the upstream study limit.

The floodplain maintains a fairly uniform width of about 200 feet as it enters Green Mountain Cemetery. However, about halfway through the cemetery, the land slopes off to the north. This results in shallow overland flooding which flows northward from the cemetery. Some of the flow returns to the floodplain while the rest of the flow enters Kings Avenue east of 21st Street. North of the Kings Gulch confluence with Skunk Creek, the floodplain is approximately 1700 feet wide. This width is maintained as the floodplain crosses Broadway. Property damages are moderately heavy in this area as 27 buildings are flooded.

Between Broadway and 30th Streets, the floodplain ranges from 1700 feet to 100 feet. The floodplain is restricted as it passes through large culverts, notably, the culverts at U.S. 36 and Baseline Road. Some street flow occurs down 29th Street to Bixby. All of the water returns to the channel. Property damage remains moderately heavy upstream of U.S. 36, but becomes light downstream of U.S. 36. From 30th Street where the floodplain is 500 feet wide, to Colorado Avenue where the floodplain is 2000 feet wide, a large amount of property damage

occurs. More than 75 residential and commercial buildings are flooded. Colorado Avenue intercepts the floodwaters and conducts them eastward. This decreases the width of the floodplain. Downstream of Colorado Avenue, a broad floodplain occurs near the creek's confluence with Bear Creek. Although the floodplain is at places more than 1500 feet wide, a small amount of damage results as this is a very sparsely developed area.

Bluebell Canyon Creek

The Bluebell Canyon Creek Floodplain is narrow and well confined in its upstream reaches and is dominated by the street pattern over its lower reaches. From the upstream study limit to 15th Street, the floodplain is narrow (about 50 feet wide) within Bluebell Canyon.

Downstream, from 15th Street to the creek's confluence with Skunk Creek, the floodplain is basically determined through shallow street flooding. Mariposa Avenue conveys floodwaters to Broadway. At 20th Street, floodwaters travel northward and then eastward on Baseline Road. Twenty-first Street is also flooded between Columbine and Baseline. Flood damage is generally light within the street flooding area. However, approximately 12 buildings are affected by overland flooding between 15th and 19th Streets.

Kings Gulch

Kings Gulch has a flooding pattern similar to Bluebell Canyon Creek. A narrow floodplain exists in the mountainous upstream portions of the basin. Approximately 800 feet downstream of the upstream study limit overland flooding occurs eastward from the storm channel. Floodwaters travel down East Belleview Drive to 15th Street. Two buildings are flooded. At 15th Street, the floodplain is 200 feet wide.

From 15th Street, floodwaters flow down King Avenue to Skunk Creek. Between 15th and 17th Streets, overland flow affects 7 buildings. At 17th Street, the floodplain is 450 feet wide. Overland shallow flooding covers the half block area between 17th and 18th Streets. Floodwaters reach Bluebell Avenue and travel to Skunk Creek. Property damage to the downstream sections of the basins is very light.

Gregory Creek

The floodplain for Gregory Canyon Creek is significantly affected by the streets within the drainage basin. Street flow occurs when the floodplain intersects a street and floodwaters are then carried off down the street.

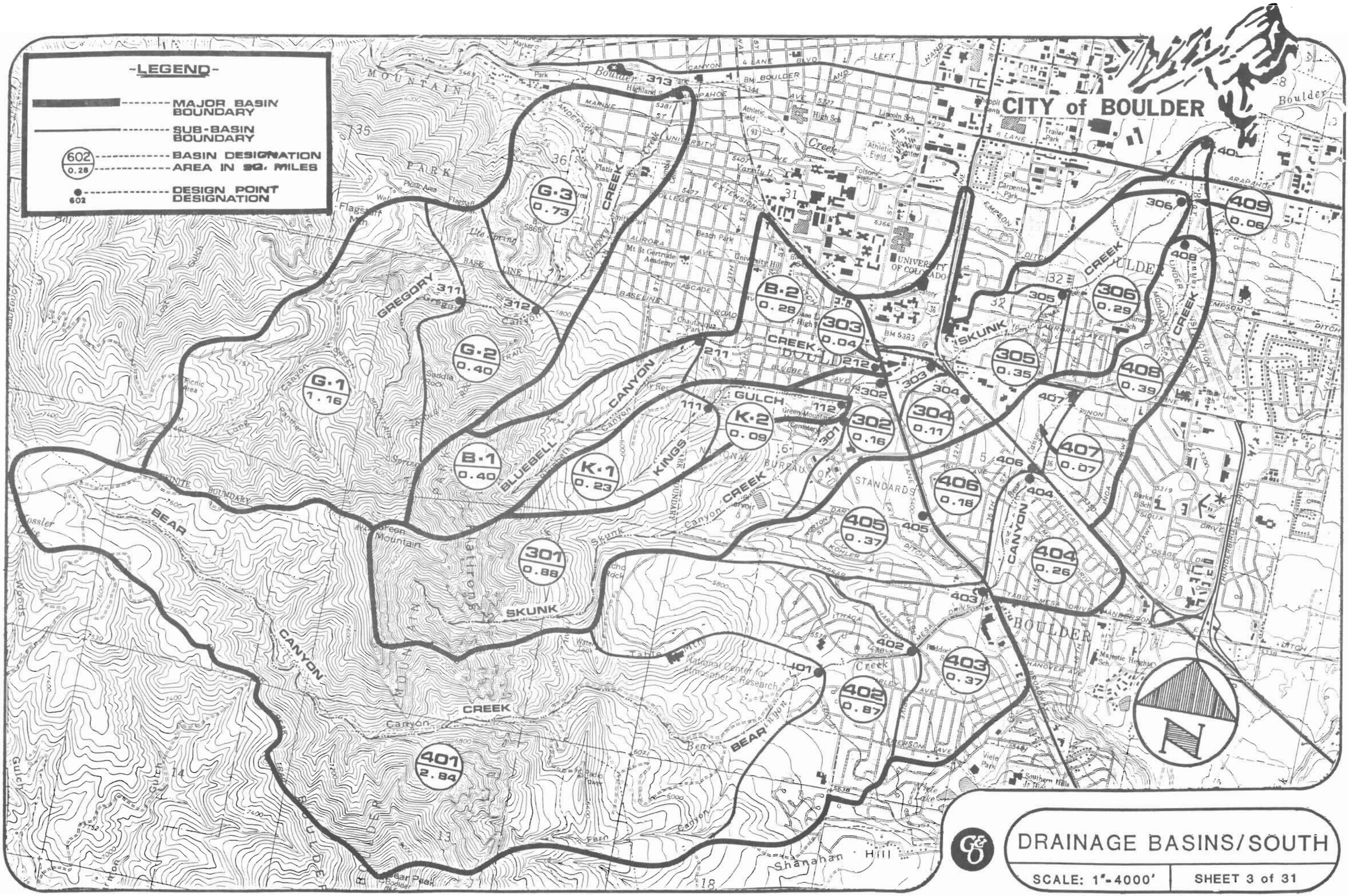
The floodplain is basically narrow between the upstream study limit and College Avenue. However, street flow results in shallow flooding in areas along Baseline Road, Willow Street (north and south of the creek), Gilbert Street and Rose Hill Drive. The streets generally do not overflow onto adjacent areas. Property damage is moderate within this section of the creek as 13 residential buildings are flooded.

Between College Avenue and the stream's confluence with Boulder Creek the floodplain becomes wider and continues to be affected by street flows. The floodplain is 300 feet wide between College and Pleasant Avenues. Rose Hill Drive conveys floodwaters across Arapahoe Road and into Boulder Creek. As the floodplain intersects Pleasant Avenue on the east side of the creek, floodwaters travel eastward along the street and overflow the street creating a shallow flooding zone between Pleasant Avenue and University Avenue. Floodwaters reach 9th Street and travel northward on 9th Street north of University Avenue. The floodplain downstream of Arapahoe Avenue is approximately 400 feet wide. Property damage within this downstream portion of the creek is heavy. More than 50 residential and commercial buildings are flooded.

Sunshine Canyon Gulch and Sunshine Canyon Tributary

The upstream floodplain of Sunshine Canyon Gulch and its tributary are very similar. This portion of the stream flows from the upstream study limit to Sunshine Canyon Road near Memorial Hospital. Both floodplains are narrow and follow the creek beds within their steep channels. Damage is very light within the floodplain as few buildings are present within the upstream reaches.

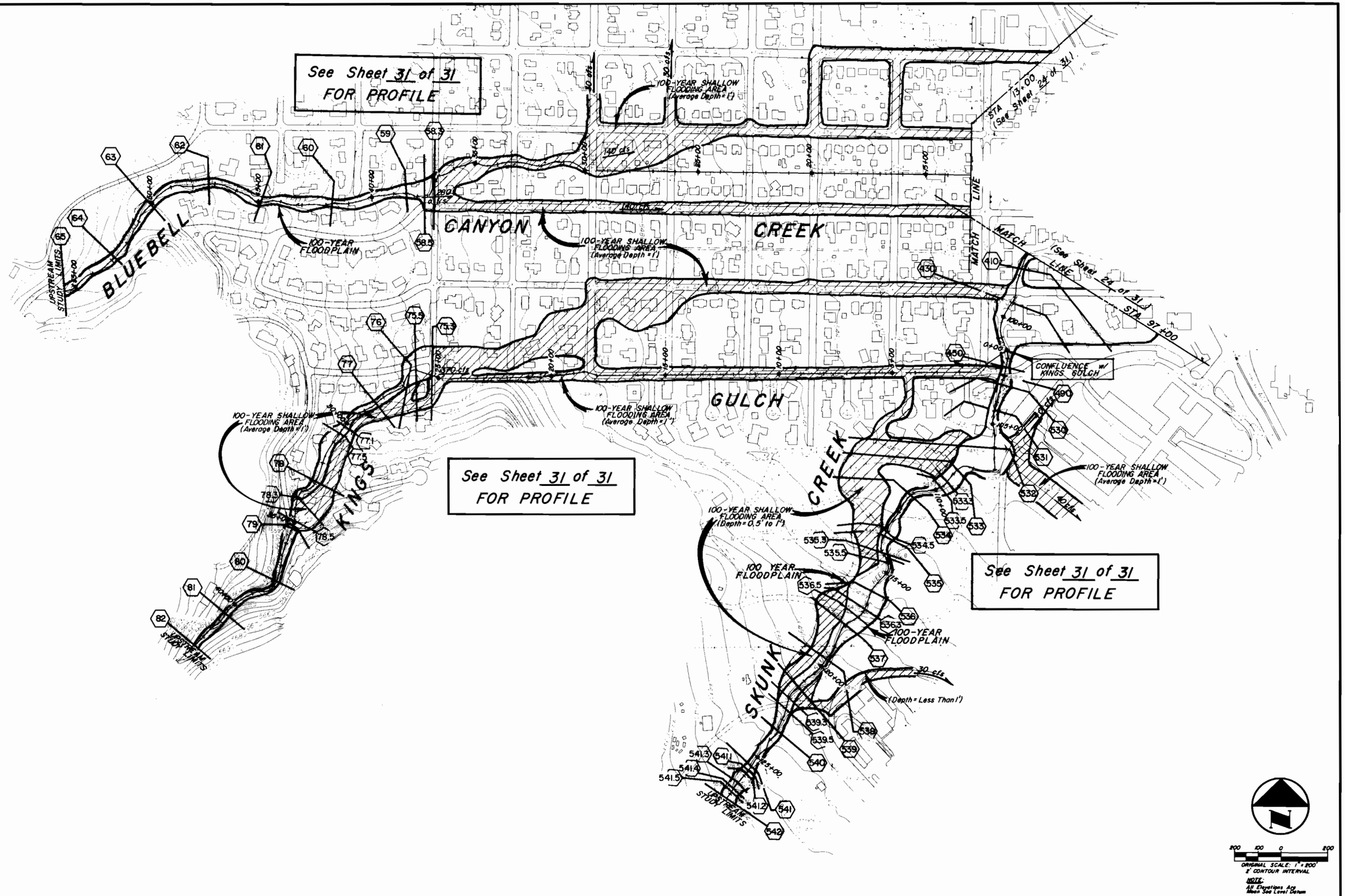
The floodplain between Sunshine Canyon Road and Spruce Street, range in width from less than 50 feet, near Sunshine Canyon Road, to more than 300 feet at Spruce Street. Eight buildings are flooded north of Spruce Street. Shallow



DRAINAGE BASINS/SOUTH

SCALE: 1"=4000'

SHEET 3 of 31



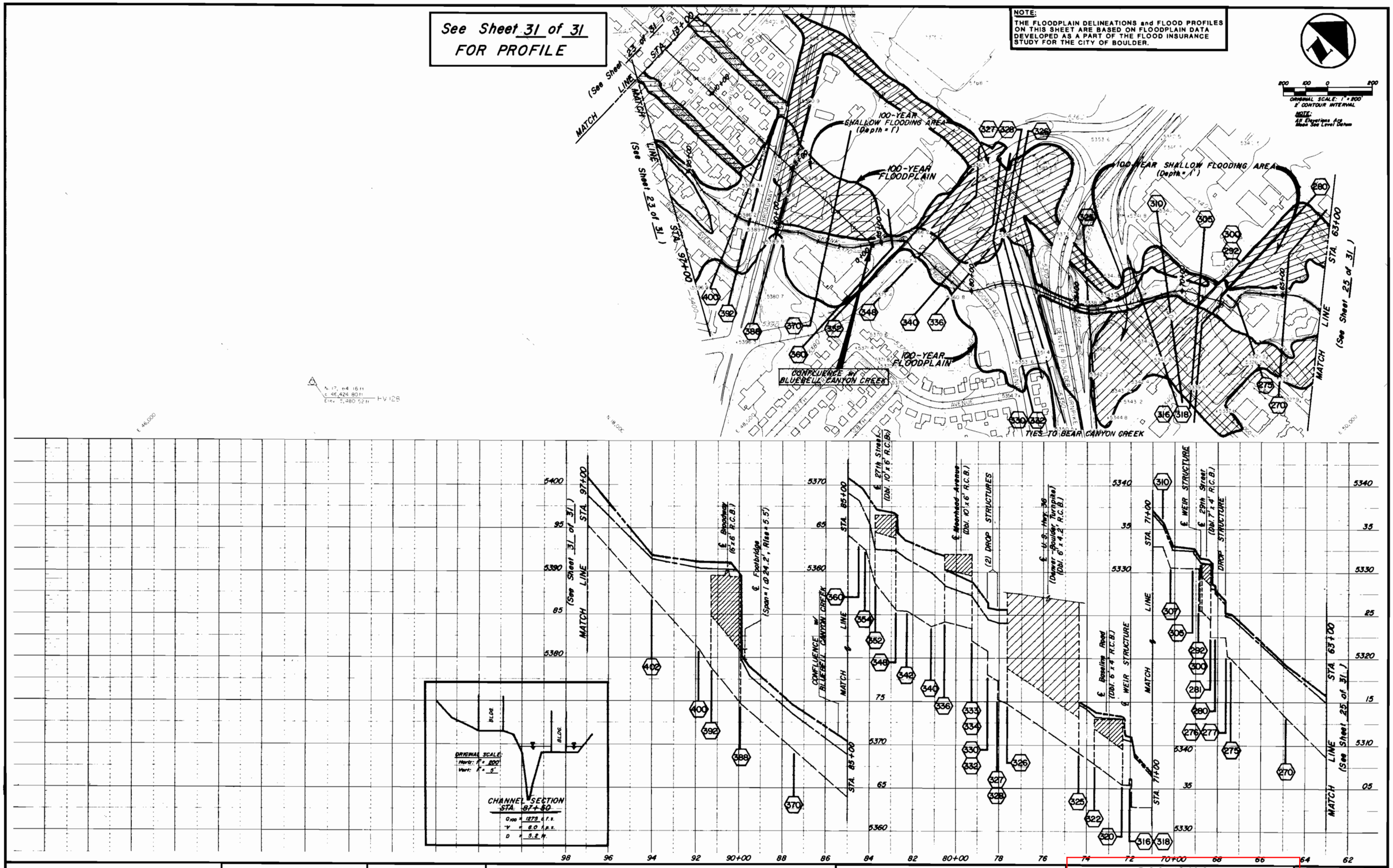
NOTE:
All Elevations Are Above Sea Level Datum

ORIGINAL SCALE: 1" = 200'
2' CONTOUR INTERVAL

GREENHORNE and O'MARA, INC. Engineers · Architects · Planners · Surveyors · Photogrammetrists 1325 South Colorado Boulevard · Suite 405 · Denver, Colorado 80222 · (303) 758-5250	Ground Control Survey By: MSM CONSULTANTS, INC. Aerial Photography By: GENGE AERIAL SURVEYS Topographic Mapping By: GENGE AERIAL SURVEYS Contour Interval: 2' Date Flown: OCTOBER 10, 1981	Designed By: MKP Date: 6/84 Drawn By: CDS Date: 9/84 Checked By: RLL Date: 9/84 Revised By: ____ Date: ____	URBAN DRAINAGE AND FLOOD CONTROL DISTRICT CITY OF BOULDER - BOULDER COUNTY	FLOOD HAZARD AREA DELINEATION CITY of BOULDER and ADJACENT COUNTY DRAINAGEWAYS	BLUEBELL CANYON CREEK KINGS GULCH SKUNK CREEK	JOB NO. 0680-FHD-415 SHEET 23 OF 31

See Sheet 31 of 31
FOR PROFILE

NOTE:
THE FLOODPLAIN DELINEATIONS and FLOOD PROFILES ON THIS SHEET ARE BASED ON FLOODPLAIN DATA DEVELOPED AS A PART OF THE FLOOD INSURANCE STUDY FOR THE CITY OF BOULDER.



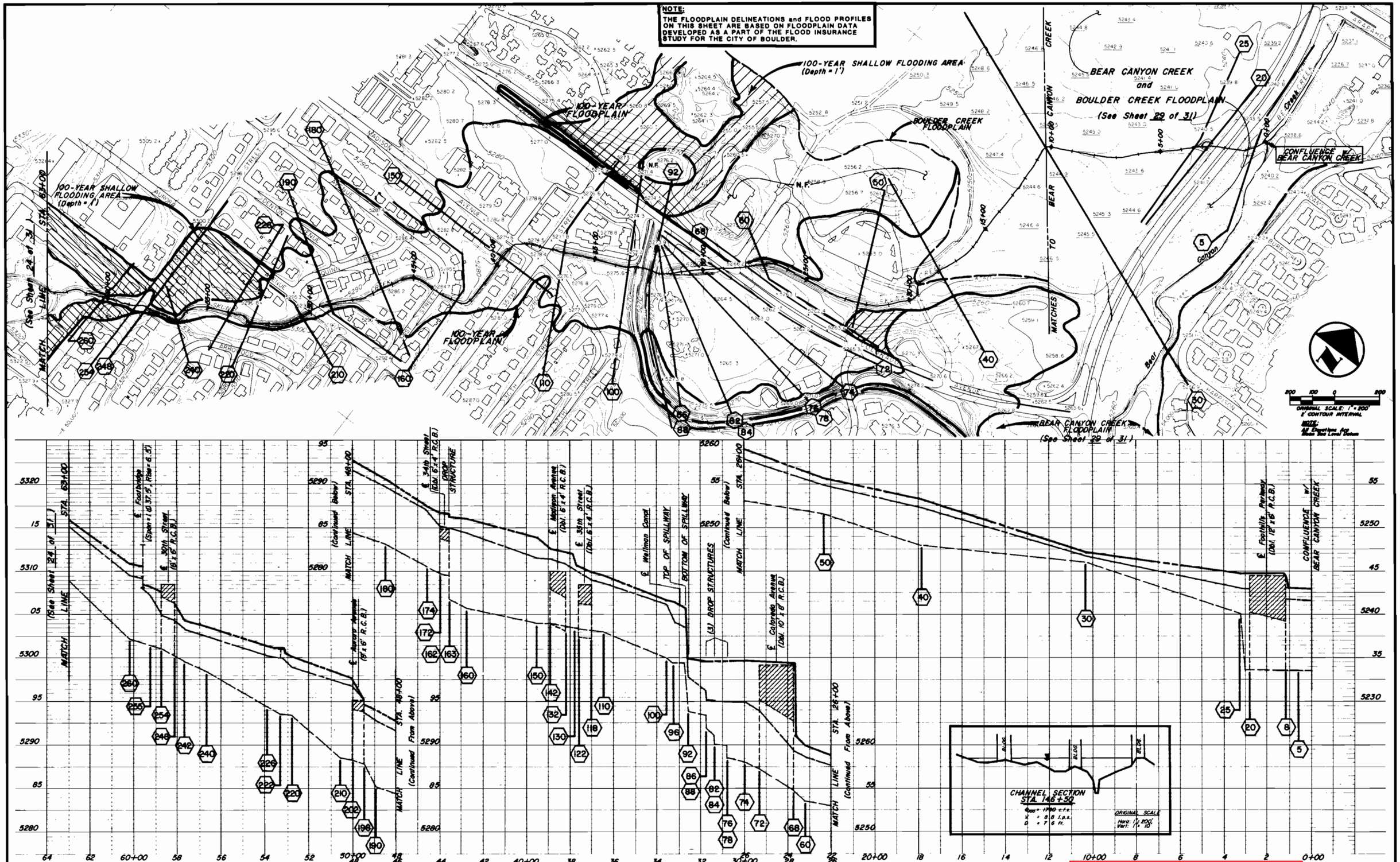
GREENHORNE and O'MARA, INC. Engineers · Architects · Planners · Surveyors · Photogrammetrists. 1325 South Colorado Boulevard · Suite 405 · Denver, Colorado 80222 · (303) 758-5250	Ground Control Survey By: MSM CONSULTANTS, INC. Aerial Photography By: GENGE AERIAL SURVEYS. Topographic Mapping By: GENGE AERIAL SURVEYS. Contour Interval: 2' Date Flown: OCTOBER 10, 1981	Designed By: ____ Date: ____ Drawn By: CDS Date: 4/84 Checked By: RLL Date: 4/84 Revised By: ____ Date: ____	URBAN DRAINAGE AND FLOOD CONTROL DISTRICT CITY OF BOULDER – BOULDER COUNTY

FLOOD HAZARD AREA DELINEATION
CITY of BOULDER
and
ADJACENT COUNTY DRAINAGEWAYS

SKUNK CREEK
(STA. 63+00 TO STA. 97+00)

JOB NO. 0680-FHD-415
SHEET 24 OF 31

NOTE:
THE FLOODPLAIN DELINEATIONS and FLOOD PROFILES ON THIS SHEET ARE BASED ON FLOODPLAIN DATA DEVELOPED AS A PART OF THE FLOOD INSURANCE STUDY FOR THE CITY OF BOULDER.

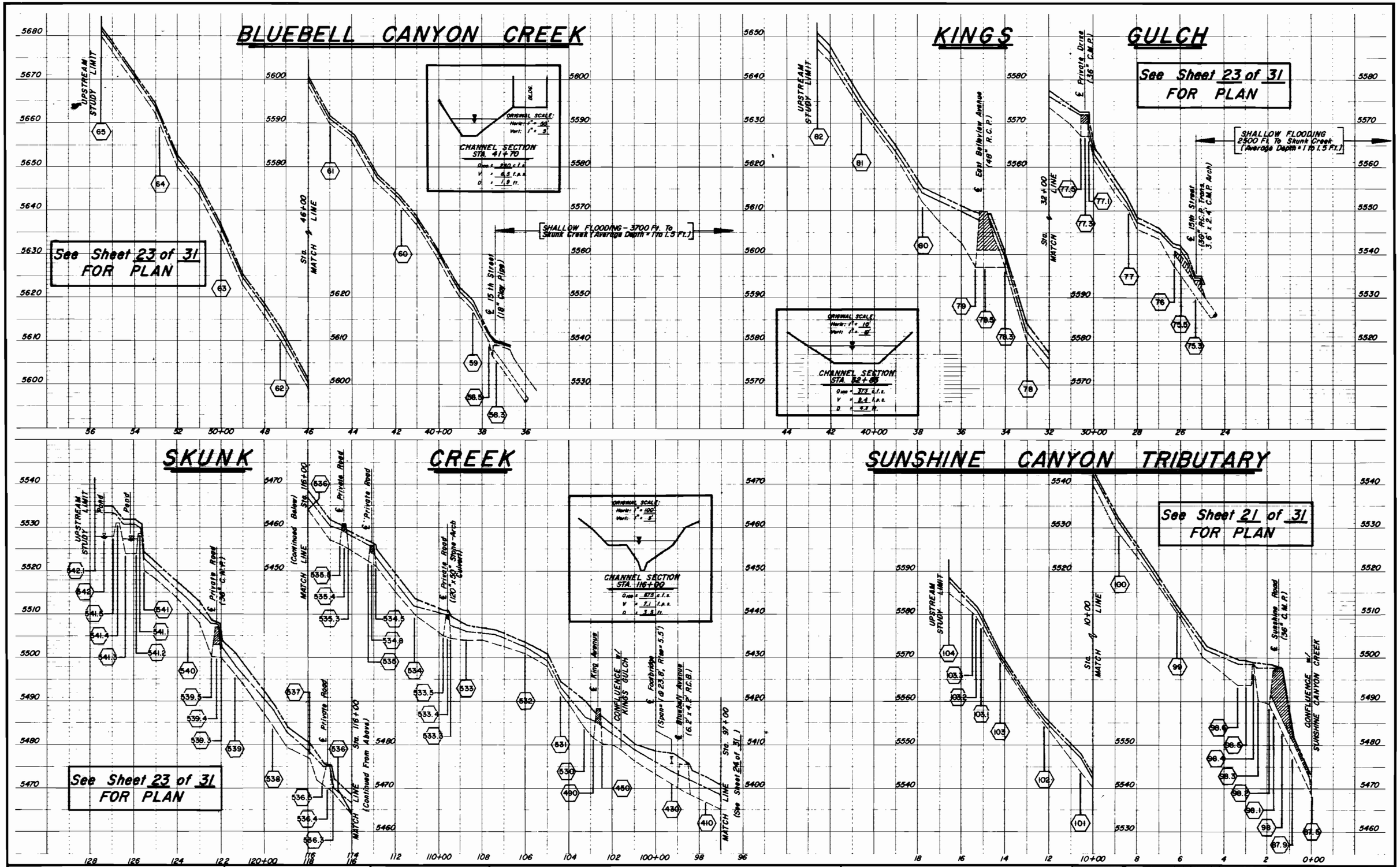


GREENHORNE and O'MARA, INC. Engineers · Architects · Planners · Surveyors · Photogrammetrists 1325 South Colorado Boulevard · Suite 405 · Denver, Colorado 80222 · (303) 758-5250	Ground Control Survey By: MSM CONSULTANTS, INC. Aerial Photography By: GENGE AERIAL SURVEYS Topographic Mapping By: GENGE AERIAL SURVEYS Contour Interval: 2' Date Flown: OCTOBER 10, 1981	Designed By: ____ Date: ____ Drawn By: DPS Date: 1/84 Checked By: RLL Date: 1/84 Revised By: ____ Date: ____	URBAN DRAINAGE AND FLOOD CONTROL DISTRICT CITY OF BOULDER – BOULDER COUNTY

FLOOD HAZARD AREA DELINEATION
CITY of BOULDER and ADJACENT COUNTY DRAINAGEWAYS

SKUNK CREEK
(STA. 0+00 TO STA. 63+00)

JOB NO. 0680-FHD-415
SHEET 25 OF 31



GREENHORNE and O'MARA, INC. Engineers · Architects · Planners · Surveyors · Photogrammetrists 1325 South Colorado Boulevard · Suite 405 · Denver, Colorado 80222 · (303) 758-5250	Ground Control Survey By: MSM CONSULTANTS, INC. Aerial Photography By: GENGE AERIAL SURVEYS Topographic Mapping By: GENGE AERIAL SURVEYS Contour Interval: 2' Date Flown: OCTOBER 10, 1981	Designed By: NRP Date: 6/84 Drawn By: DDS Date: 9/84 Checked By: RCL Date: 9/84 Revised By: ____ Date ____	URBAN DRAINAGE AND FLOOD CONTROL DISTRICT CITY OF BOULDER - BOULDER COUNTY	**FLOOD HAZARD AREA DELINEATION** CITY of BOULDER and ADJACENT COUNTY DRAINAGEWAYS

BLUEBELL CANYON CREEK
KINGS GULCH · SKUNK CREEK
SUNSHINE CANYON TRIBUTARY

JOB NO. 0680-FHD-415
SHEET 31
OF 31

FLOODING SOURCE				FLOODPLAIN DATA			FLOODWAY DATA			
IDENTIFICATION	CROSS-SECTION	STATION	100-YR. DISCHARGE (c.f.s.)	STREAM BED ELEVATION (m.s.l.)	100-YR. FLOOD ELEVATION (m.s.l.)	100-YR. WIDTH (Feet)	FLOODWAY WIDTH (1) LEFT (Feet)	RIGHT (Feet)	TOTAL (Feet)	FLOODWAY ELEVATION (m.s.l.)
CONFLUENCE WITH BEAR CANYON CREEK		0+00								
	5	0+60	2225	5233.6	5243.0	(2)	670	225	925	5243.0
FOOTHILLS PARKWAY										
	20	2+80	2225	5233.6	5244.8	(2)	675	460	1135	5244.8
	25	3+20	2225	5240.0	5244.8	(2)	675	425	1100	5244.8
	30	10+30	2225	5246.0	5247.6	(2)	300	565	865	5247.2
	40	17+80	2225	5248.0	5253.0	420	135	135	270	5253.3
	50	22+30	2225	5251.5	5255.8	660	350	25	375	5255.7
	60	27+20	2225	5253.5	5259.9	630	25	30	55	5259.9
COLORADO AVENUE		28+50								
BOTTOM OF SPILLWAY	92	32+60	2225	5263.8	5269.9	530	15	25	40	5269.2
WELLMAN CANAL		33+00								
	100	33+60	2225	5270.0	5276.6	605	325	220	545	5276.6
	110	36+50	2225	5273.0	5279.5	685	325	220	545	5279.5
35th STREET		37+30								
MADISON AVENUE		38+55								
	150	39+50	2225	5274.0	5283.9	560	210	185	395	5283.9
	160	42+70	1875	5275.7	5286.0	535	290	15	305	5286.2
34th STREET		43+75								

NOTES:

(1) FLOODWAY WIDTHS MEASURED LOOKING DOWNSTREAM.
(2) INFLUENCED BY FLOODING FROM BOULDER AND BEAR CREEKS. REFER TO MAP SHEET.

FLOODING SOURCE				FLOODPLAIN DATA			FLOODWAY DATA			
IDENTIFICATION	CROSS-SECTION	STATION	100-YR. DISCHARGE (c.f.s.)	STREAM BED ELEVATION (m.s.l.)	100-YR. FLOOD ELEVATION (m.s.l.)	100-YR. WIDTH (Feet)	FLOODWAY WIDTH (1) LEFT (Feet)	RIGHT (Feet)	TOTAL (Feet)	FLOODWAY ELEVATION (m.s.l.)
	180	46+50	1780	5283.2	5290.7	820	200	250	450	5290.8
	190	48+90	1780	5285.2	5294.1	735	215	365	580	5294.2
AURORA AVENUE		49+75								
	210	50+60	1780	5288.6	5297.9	675	140	20	160	5297.9
	220	52+80	1690	5293.5	5300.2	310	140	15	155	5300.2
	226	53+90	1690	5294.5	5301.3	380	120	30	150	5301.3
	240	56+70	1690	5298.5	5303.6	285	270	15	285	5303.6
	248	58+10	1690	5300.3	5306.9	490	200	15	215	5307.0
30th STREET		58+40								
	260	60+20	899	5302.2	5310.8	260	35	15	50	5310.8
	270	64+90	819	5313.3	5320.5	775	25	50	75	5320.5
	280	68+10	819	5322.5	5329.9	610	75	20	95	5329.9
29th STREET		68+50								
WEIR		68+80								
	305	69+20	744	5330.5	5332.7	595	90	60	150	5332.7
	310	70+50	744	5333.0	5335.6	680	35	60	95	5335.7
WEIR	316	72+00	744	5333.0	5340.8	540	85	20	105	5340.8
	318	72+00	744	5336.0	5340.8	540	85	20	105	5340.8

NOTES:

(1) FLOODWAY WIDTHS MEASURED LOOKING DOWNSTREAM.
(2) INFLUENCED BY FLOODING FROM BOULDER AND BEAR CREEKS. REFER TO MAP SHEET.

FLOODING SOURCE				FLOODPLAIN DATA			FLOODWAY DATA			
IDENTIFICATION	CROSS-SECTION	STATION	100-YR. DISCHARGE (c.f.s.)	STREAM BED ELEVATION (m.s.l.)	100-YR. FLOOD ELEVATION (m.s.l.)	100-YR. WIDTH (Feet)	FLOODWAY WIDTH (1) LEFT (Feet)	RIGHT (Feet)	TOTAL (Feet)	FLOODWAY ELEVATION (m.s.l.)
BASELINE ROAD		73+10								
	325	74+10	674	5339.2	5345.0	570	20	75	95	5345.0
U.S. HIGHWAY 36		76+05								
DROP STRUCTURE	330	78+50	1350	5348.0	5357.9	1010	35	395	430	5357.9
DROP STRUCTURE	332	78+50	1350	5350.8	5357.6	1010	35	395	430	5357.6
MOORHEAD AVENUE		79+95								
	340	81+20	1350	5353.7	5362.6	655	40	45	85	5362.6
	348	82+80	1350	5355.5	5364.4	570	55	25	80	5364.4
27th STREET		83+80								
	360	84+50	1275	5363.3	5369.6	410	20	170	190	5369.7
CONFLUENCE WITH BLUEBELL CANYON CREEK		85+40								
	370	87+50	1275	5369.5	5374.7	630	20	265	285	5374.7
	388	89+90	1275	5374.3	5380.2	850	265	20	285	5380.2
BROADWAY		90+60								
	400	91+80	1275	5381.0	5391.1	580	205	225	430	5391.1
	410	97+80	675	5397.3	5402.9	535	15	25	40	5402.9
	430	99+25	675	5399.3	5408.2	360	30	30	60	5408.2
KING AVENUE	450	102+40	675	5410.5	5416.6	30	15	15	30	5416.6

NOTES:

(1) FLOODWAY WIDTHS MEASURED LOOKING DOWNSTREAM.
(2) INFLUENCED BY FLOODING FROM BOULDER AND BEAR CREEKS. REFER TO MAP SHEET.

FLOODING SOURCE				FLOODPLAIN DATA			FLOODWAY DATA			
IDENTIFICATION	CROSS-SECTION	STATION	100-YR. DISCHARGE (c.f.s.)	STREAM BED ELEVATION (m.s.l.)	100-YR. FLOOD ELEVATION (m.s.l.)	100-YR. WIDTH (Feet)	FLOODWAY WIDTH (1) LEFT (Feet)	RIGHT (Feet)	TOTAL (Feet)	FLOODWAY ELEVATION (m.s.l.)
	490	102+80	675	5411.5	5419.0	50	20	30	50	5418.0
	530	103+20	675	5414.0	5420.3	65	20	45	65	5420.3
	531	104+35	675	5422.0	5424.6	25	10	15	25	5424.6
	532	106+05	675	5431.0	5433.5	215	45	55	100	5433.5
	533	108+75	675	5433.7	5437.3	80	20	30	50	5437.3
	533.3	109+40	675	5434.5	5439.3	100	45	50	95	5439.3
	533.5	109+80	675	5435.0	5441.2	70	35	35	70	5441.2
	534	111+20	675	5440.0	5443.4	40	20	20	40	5443.4
	534.5	113+00	675	5451.0	5454.7	215	165	50	215	5454.7
CEMETERY ROAD 2	535	113+25	675	5451.0	5456.9	185	140	45	185	5456.9
	535.3	114+10	675	5455.0	5459.0	145	130	15	145	5459.0
CEMETERY ROAD 3	535.5	114+45	675	5455.5	5460.8	160	140	20	160	5460.8
	536	116+00	675	5465.0	5468.5	175	100	75	175	5468.5
	536.3	116+90	675	5469.0	5472.4	215	150	65	215	5472.4
CEMETERY ROAD 4	536.5	117+35	675	5471.0	5475.9	220	165	55	220	5475.9
	537	117+95	675	5477.0	5480.3	230	165	65	230	5480.3
	538	119+65	675	5485.0	5489.5	115	20	15	35	5489.5
	539	121+35	675	5496.0	5501.5	225	20	10	30	5500.7

NOTES:

(1) FLOODWAY WIDTHS MEASURED LOOKING DOWNSTREAM.
(2) INFLUENCED BY FLOODING FROM BOULDER AND BEAR CREEKS. REFER TO MAP SHEET.

FLOODING SOURCE				FLOODPLAIN DATA			FLOODWAY DATA			
IDENTIFICATION	CROSS-SECTION	STATION	100-YR. DISCHARGE (c.f.s.)	STREAM BED ELEVATION (m.s.l.)	100-YR. FLOOD ELEVATION (m.s.l.)	100-YR. WIDTH (Feet)	FLOODWAY WIDTH (1) LEFT (Feet)	RIGHT (Feet)	TOTAL (Feet)	FLOODWAY ELEVATION (m.s.l.)
	539.3	112+00	675	5500.0	5504.0	130	15	20	35	5504.3
	539.5	122+52	675	5500.0	5508.5	75	25	20	45	5508.5
	540	123+50	675	5511.0	5515.1	50	30	20	50	5515.1
	541	125+45	675	5520.0	5524.1	40	20	20	40	5524.1
	541.1	125+65	675	5528.5	5530.9	70	30	40	70	5530.9
	541.2	125+85	675	5524.0	5531.7	85	35	50	85	5531.7
	541.3	126+40	675	5524.0	5531.7	80	35	45	80	5531.7
	541.4	126+75	675	5531.0	5533.6	70	35	35	70	5533.6
	541.5	126+90	675	5528.0	5534.6	70	35	35	70	5534.6
	542	127+25	675	5531.0	5534.7	75	30	45	75	5534.7

NOTES:

(1) FLOODWAY WIDTHS MEASURED LOOKING DOWNSTREAM.
(2) INFLUENCED BY FLOODING FROM BOULDER AND BEAR CREEKS. REFER TO MAP SHEET.

FLOODING SOURCE				FLOODPLAIN DATA			FLOODWAY DATA			
IDENTIFICATION	CROSS-SECTION	STATION	100-YR. DISCHARGE (c.f.s.)	STREAM BED ELEVATION (m.s.l.)	100-YR. FLOOD ELEVATION (m.s.l.)	100-YR. WIDTH (Feet)	FLOODWAY WIDTH (1) LEFT (Feet)	RIGHT (Feet)	TOTAL (Feet)	FLOODWAY ELEVATION (m.s.l.)
15th STREET	58.3	37+00	269	5539.0	5540.1	165	35	130	165	5540.5
	58.5	37+60	280	5540.0	5541.7	145	75	70	145	5541.7
	59.0	38+50	280	5547.0	5549.0	75	55	20	75	5549.1
	60.0	41+75	280	5571.0	5572.9	35	20	15	35	5572.9
	61.0	44+90	280	5590.0	5591.7	40	25	15	40	5591.8
	62.0	47+30	280	2610.0	2612.9	30	15	15	30	5612.9
	63.0	50+10	280	5634.0	5636.0	35	15	20	35	5636.0
	64.0	52+80	280	5660.0	5662.2	40	25	15	40	5662.2
	65.0	55+50	280	5680.0	5682.0	40	15	25	40	5682.0

NOTES:

(1) FLOODWAY WIDTHS MEASURED LOOKING DOWNSTREAM.

FLOODING SOURCE				FLOODPLAIN DATA			FLOODWAY DATA			
IDENTIFICATION	CROSS-SECTION	STATION	100-YR. DISCHARGE (c.f.s.)	STREAM BED ELEVATION (m.s.l.)	100-YR. FLOOD ELEVATION (m.s.l.)	100-YR. WIDTH (Feet)	FLOODWAY WIDTH (1) LEFT (Feet)	RIGHT (Feet)	TOTAL (Feet)	FLOODWAY ELEVATION (m.s.l.)
15th STREET	75.3	25+30	339	5533.9	5534.7	270	125	12	137	5535.2
	75.5	26+00	339	5540.0	5541.9	270	40	25	65	5541.9
	76.0	26+30	373	5538.0	5542.5	265	40	15	55	5542.5
	77.0	28+50	373	5550.0	5552.6	100	10	10	20	5552.6
	77.1	30+20	373	5567.0	5569.9	75	14	10	24	5569.9
	77.5	30+60	373	5566.8	5573.1	105	45	25	70	5574.0
	78.0	32+90	373	5580.0	5584.1	110	12	12	24	5584.1
	78.3	34+05	373	5597.0	5600.9	160	10	12	22	5600.9
BELLEVUE AVENUE	78.5	34+90	373	5597.5	5609.6	115	15	43	58	5609.7
	79.0	35+25	373	5598.0	5609.9	60	30	20	50	5610.0
	80.0	37+70	373	5612.0	5615.7	25	10	10	20	5615.7
	81.0	40+55	373	5633.0	5635.9	40	12	14	26	5636.0
U/S STUDY LIMIT	82.0	42+50	373	5647.0	5650.8	30	6	15	21	5651.1

NOTES:

(1) FLOODWAY WIDTHS MEASURED LOOKING DOWNSTREAM.

FLOOD INSURANCE STUDY

VOLUME 1 OF 4

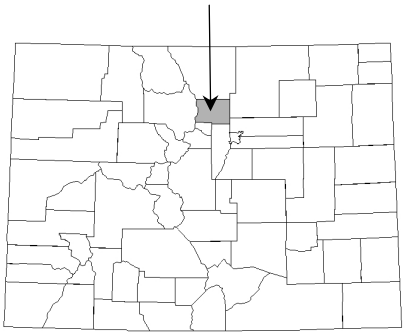
BOULDER COUNTY, COLORADO

AND INCORPORATED AREAS

Community Name	*Community Number*
BOULDER, CITY OF	080024
BOULDER COUNTY (UNINCORPORATED AREAS)	080023
ERIE, TOWN OF	080181
JAMESTOWN, TOWN OF	080216
LAFAYETTE, CITY OF	080026
LONGMONT, CITY OF	080027
LOUSIVILLE, CITY OF	085076
LYONS, TOWN OF	080029
NEDERLAND, TOWN OF	080255
SUPERIOR, TOWN OF	080203
*WARD, TOWN OF	080292

* No Special Flood Hazard Areas Identified

Boulder County



Revised: December 18, 2012

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
08013CV001B

Stream/Reach	Average Conversion	Beginning Station	End Station
	4.3	Just Downstream of Lefthand Canyon Dr & Sawmill Rd	Just Downstream of Lick Skillet Gulch
	3.8	Just Downstream of Lick Skillet Gulch	Just Downstream of James Creek
	3.4	Just Downstream of James Creek	At Confluence w/ St. Vrain Creek
Lefthand Creek North Overflow Channel	3.2	Entire Reach	
Lefthand Creek South Overflow Channel	3.2	Entire Reach	
Little James Creek	4.1	Entire Reach	
Little Thompson River	3.3	Entire Reach	
Middle Boulder Creek	4.5	Entire Reach	
Middle St. Vrain Creek	4.6	Uppermost Point of Reach	Approx. 33,000' Upstream of Confluence South St. Vrain Creek
	4.2	Approx. 33,000' Upstream of Confluence South St. Vrain Creek	Confluence w/ South St. Vrain Creek
North Beaver Creek	4.5	Entire Reach	
North Goose Creek	3.2	Entire Reach	
North St. Vrain Creek	3.5	Entire Reach	
Prince Tributary, East Branch	3.1	Entire Reach	
Prince Tributary, West Branch	3.1	Entire Reach	
Rock Creek	3.2	Entire Reach	
St. Vrain Creek	3.2	Entire Reach	
St. Vrain Creek (Vicinity of Lyons)	3.3	Entire Reach	
Skunk Creek	3.3	Entire Reach	

Table 4 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Prince Tributary[1]					
Just Downstream of Confluence with Bullhead Gulch	8.16	--[2]	--[2]	4,772	--[2]
Just Upstream of Confluence with Bullhead Gulch	2.55	--[2]	--[2]	2,130	--[2]
At Upstream Limit of Detailed Study	0.58	--[2]	--[2]	423	--[2]
Rock Creek					
At Confluence with Coal Creek	21.6	2,870	5,350	6,690	10,240
Rock Creek (continued)					
At 2,400 feet Upstream of Confluence with Coal Creek	21.5	2,900	5,400	6,710	10,270
At South 120th Street	21.3	2,910	5,410	6,740	10,310
At 16,450 feet Upstream of Confluence with Coal Creek	18.7	2,900	5,360	6,640	10,050
At Denver-Boulder Turnpike	9.3	1,256	3,229	4,520	9,176
At McCaslin Boulevard	4.9	594	1,800	2,717	7,000
At Upstream Limit of Detailed Study	4.1	504	1,587	2,396	6,182
St. Vrain Creek					
At Boulder-Weld County Line	351.0	5,520	10,950	14,850	28,670
At 85th Street	241.0	3,160	6,890	9,580	19,680
Just Downstream of the Confluence of North St. Vrain Creek and South St. Vrain Creek	211.0	2,040	6,670	8,880	20,260
St. Vrain Creek (Vicinity of Lyons)					
At Second Avenue	219.0	2,040	5,570	8,880	20,260
Skunk Creek					
At Confluence with Bear Canyon Creek	2.83	980	1,830	2,230	3,500
At Madison Avenue	2.43	920	1,580	1,870	2,650
At U.S. Highway 36	2.08	650	1,130	1,350	1,900
At Broadway	1.36	210	520	710	1,320

[1] Separate Data for East and West Branches Not Available
[2] Data Not Available

Table 4 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Skunk Creek (continued)					
At Upstream Limit of Detailed Study	1.20	180	460	640	1,200
South Boulder Creek					
Near Eldorado Springs	--[1]	1,310	2,640	4,340	7,400
At State Highway 93	--[1]	1,450	3,270	6,200	9,950
At US Highway 36	--[1]	1,300	3,530	7,240	11,640
At Baseline Road	--[1]	1,390	3,050	5,610	9,210
At Confluence with Boulder Creek	--[1]	1,570	3,180	4,980	7,750
Spring Gulch					
At Confluence with St. Vrain Creek	--[1]	1,950	3,150	3,650	4,200
Steele Lakes Tributary					
At 75th Street	--[1]	494	1,165	1,512	2,428
Twomile Canyon Creek					
At Confluence with Goose Creek	2.9	360	840	1,120	2,000
At Broadway	1.68	210	675	890	1,800
At Upstream Limit of Detailed Study	1.40	210	540	710	1,430
Wonderland Creek[2]					
At Confluence with North Goose Creek	1.91	607	1,419	2,107	4,620
At 28th Street	1.35	404	1,032	1,484	3,799
At Broadway	0.85	205	415	531	1,600
At Upstream Limit of Detailed Study	0.38	92	192	253	860

[1] Data Not Available
[2] Includes Flow Diversions From Fourmile Canyon Creek

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
SKUNK CREEK								
A	1,020	103	304	6.6	5,247.1	5,247.1	5,247.1	0.0
B	2,020	126	375	5.9	5,254.9	5,254.9	5,254.9	0.0
C	2,721	148	593	3.8	5,259.8	5,259.8	5,260.2	0.4
D	3,637	100	759	2.9	5,273.1	5,273.1	5,273.3	0.2
E	3,913	218	497	4.5	5,279.9	5,279.9	5,280.7	0.8
F	4,218	310	783	2.8	5,282.8	5,282.8	5,283.7	0.9
G	4,518	190	455	4.9	5,287.2	5,287.2	5,287.4	0.2
H	4,848	287	1,025	1.8	5,289.3	5,289.3	5,289.8	0.5
I	5,223	196	538	3.3	5,294.0	5,294.0	5,295.0	1.0
J	5,468	190	318	5.6	5,297.4	5,297.4	5,297.8	0.5
K	5,618	150	326	5.5	5,301.2	5,301.2	5,301.2	0.0
L	6,233	670	541	3.1	5,306.9	5,306.9	5,307.3	0.4
M	6,588	43	456	3.5	5,319.3	5,319.3	5,319.6	0.3
N	7,058	65	178	8.6	5,323.8	5,323.8	5,323.8	0.0
O	7,633	52	150	9.6	5,340.2	5,340.2	5,340.2	0.0
P	7,978	37	133	5.1	5,347.8	5,347.8	5,348.0	0.2
Q	8,428	38	211	6.4	5,359.4	5,359.4	5,359.8	0.4
R	8,698	68	296	4.6	5,365.6	5,365.6	5,365.8	0.2
S	9,018	49	187	6.8	5,372.9	5,372.9	5,373.0	0.1
T	9,318	79	257	5.0	5,378.0	5,378.0	5,378.4	0.4
U	9,753	420	1,471	0.9	5,394.4	5,394.4	5,394.7	0.3
V	10,338	40	127	5.3	5,406.2	5,406.2	5,406.2	0.0
W	10,758	22	86	7.9	5,418.1	5,418.1	5,418.2	0.1

[1]Feet above confluence with Bear Canyon Creek

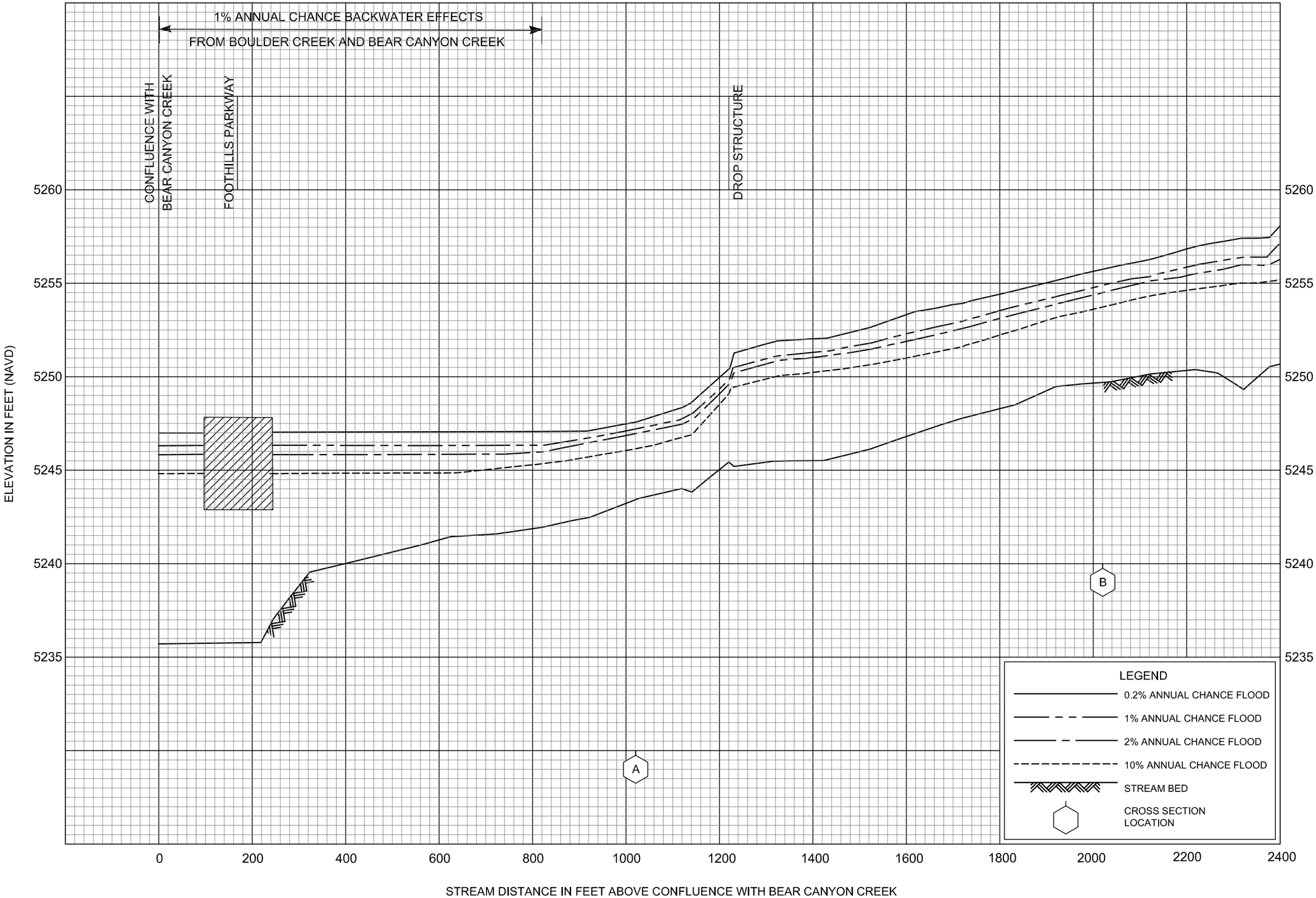
TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

SKUNK CREEK



FLOOD PROFILES

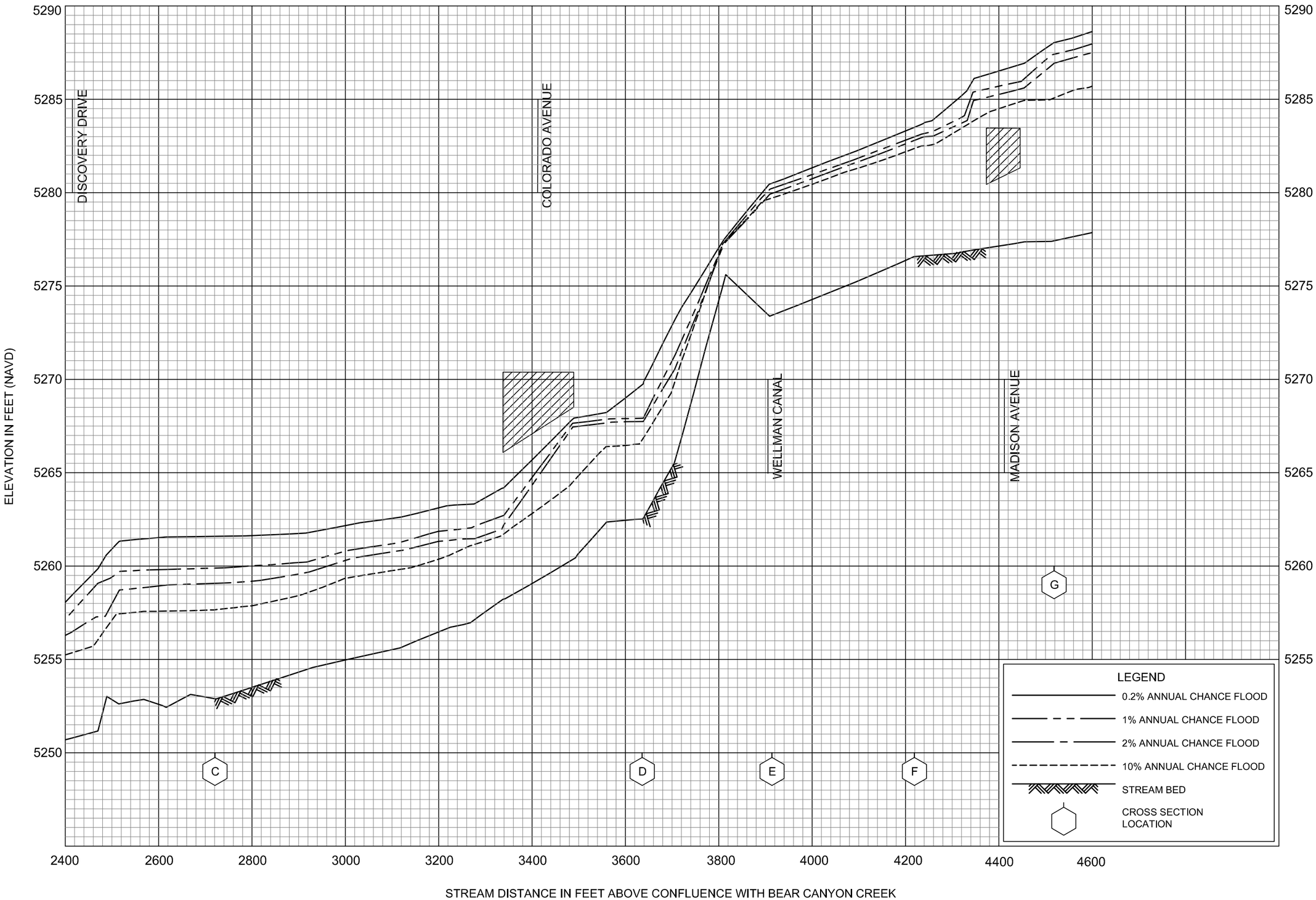
SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO

AND INCORPORATED AREAS

298P



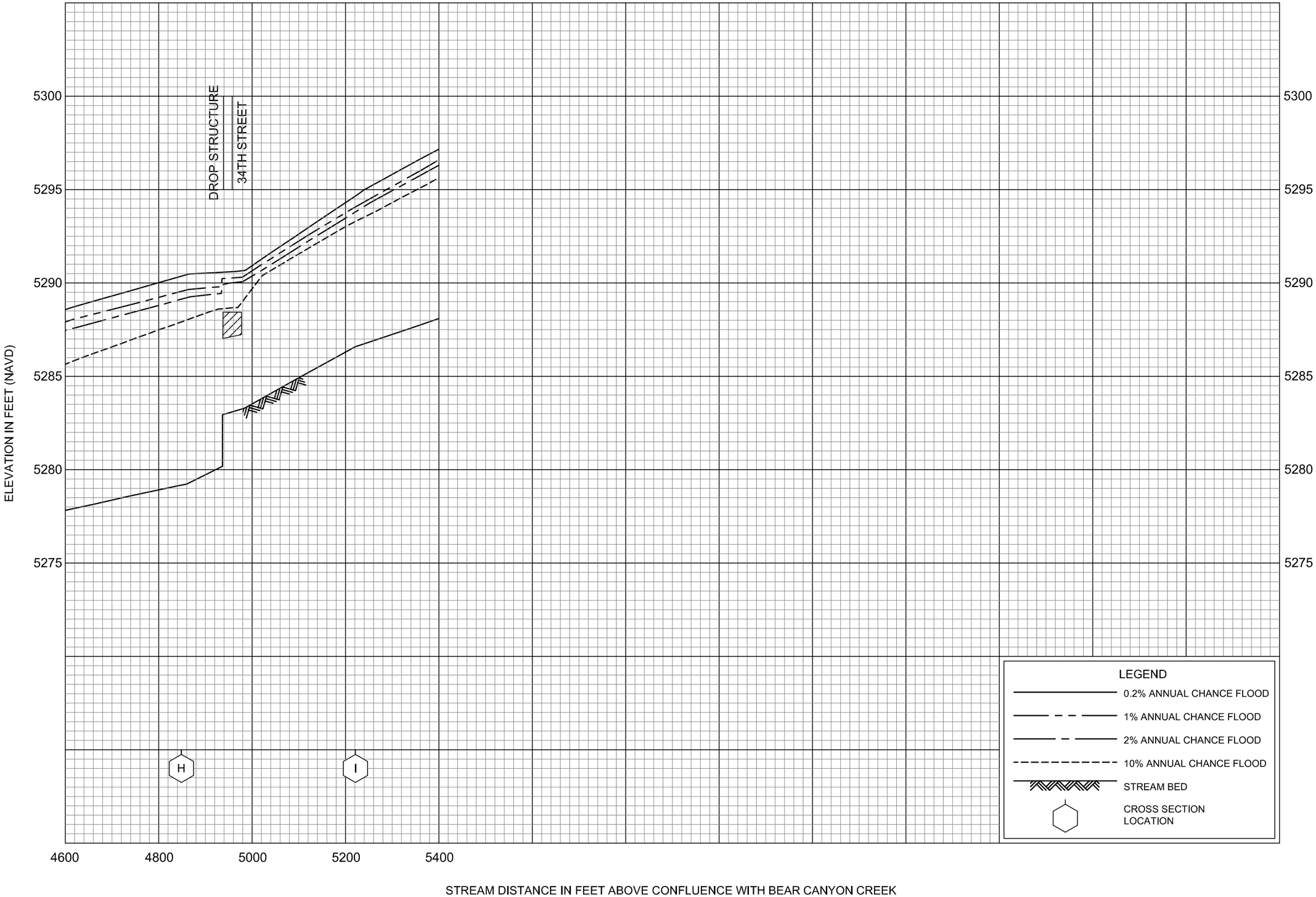
FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO

AND INCORPORATED AREAS



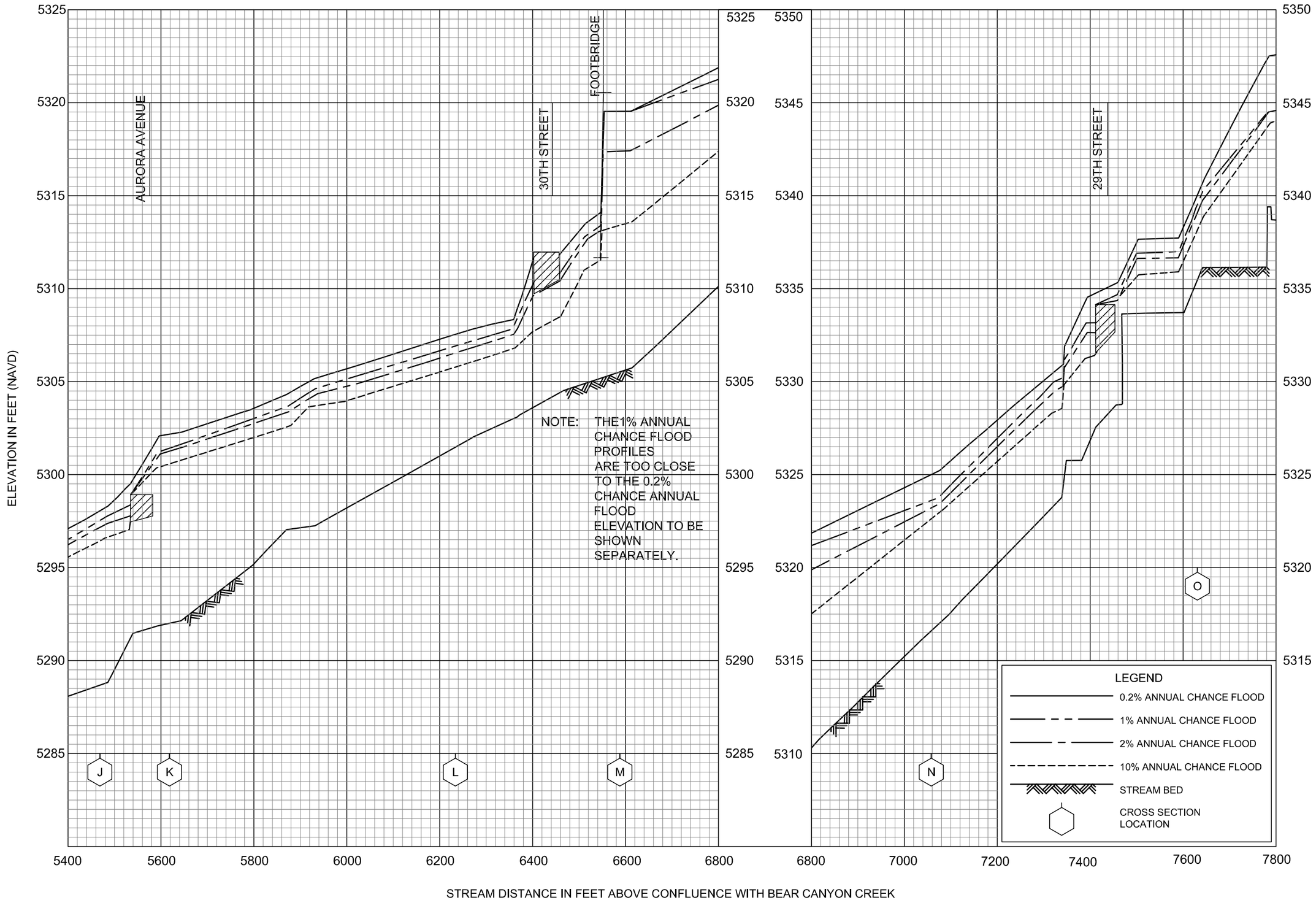
FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO

AND INCORPORATED AREAS



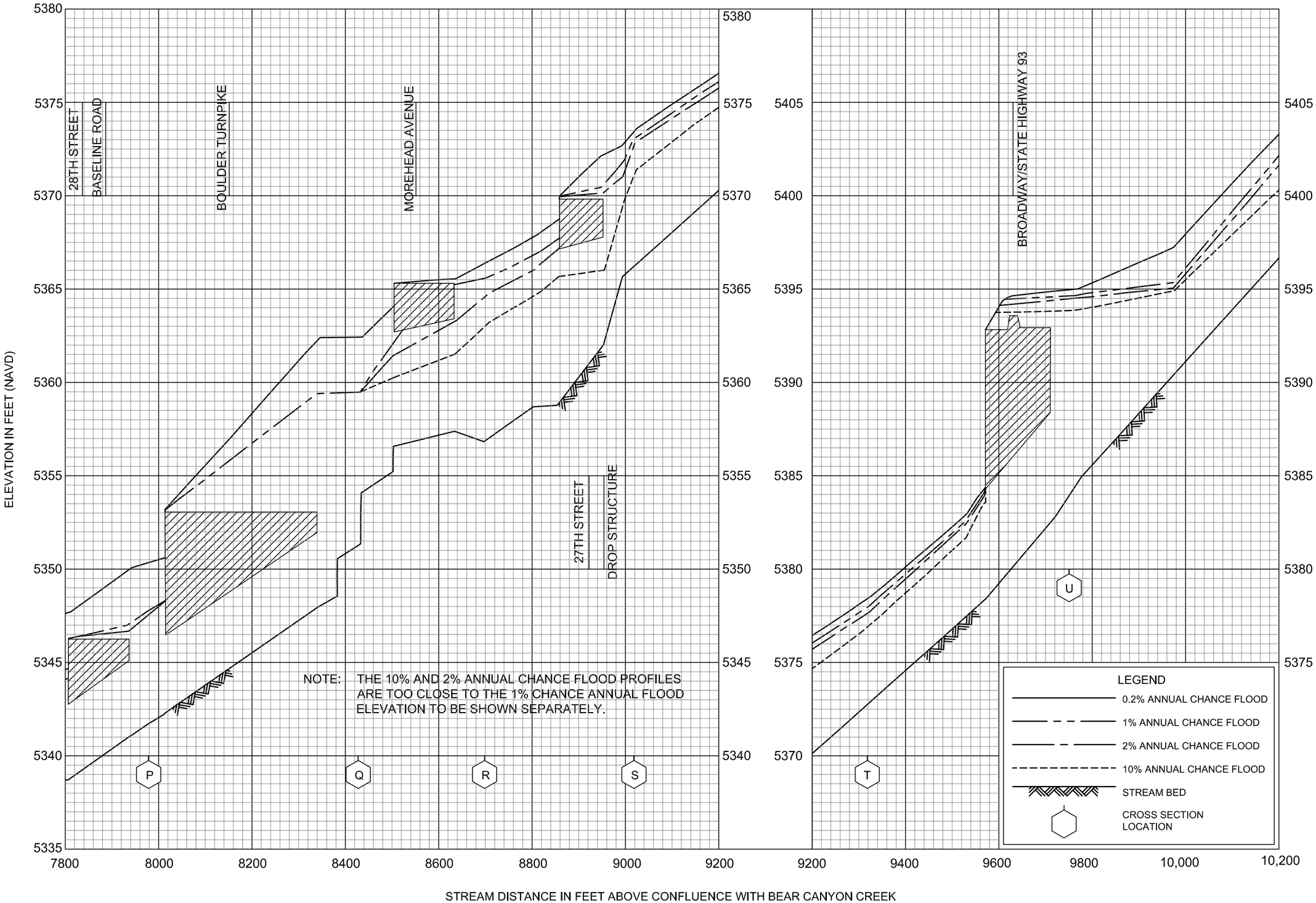
FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO

AND INCORPORATED AREAS



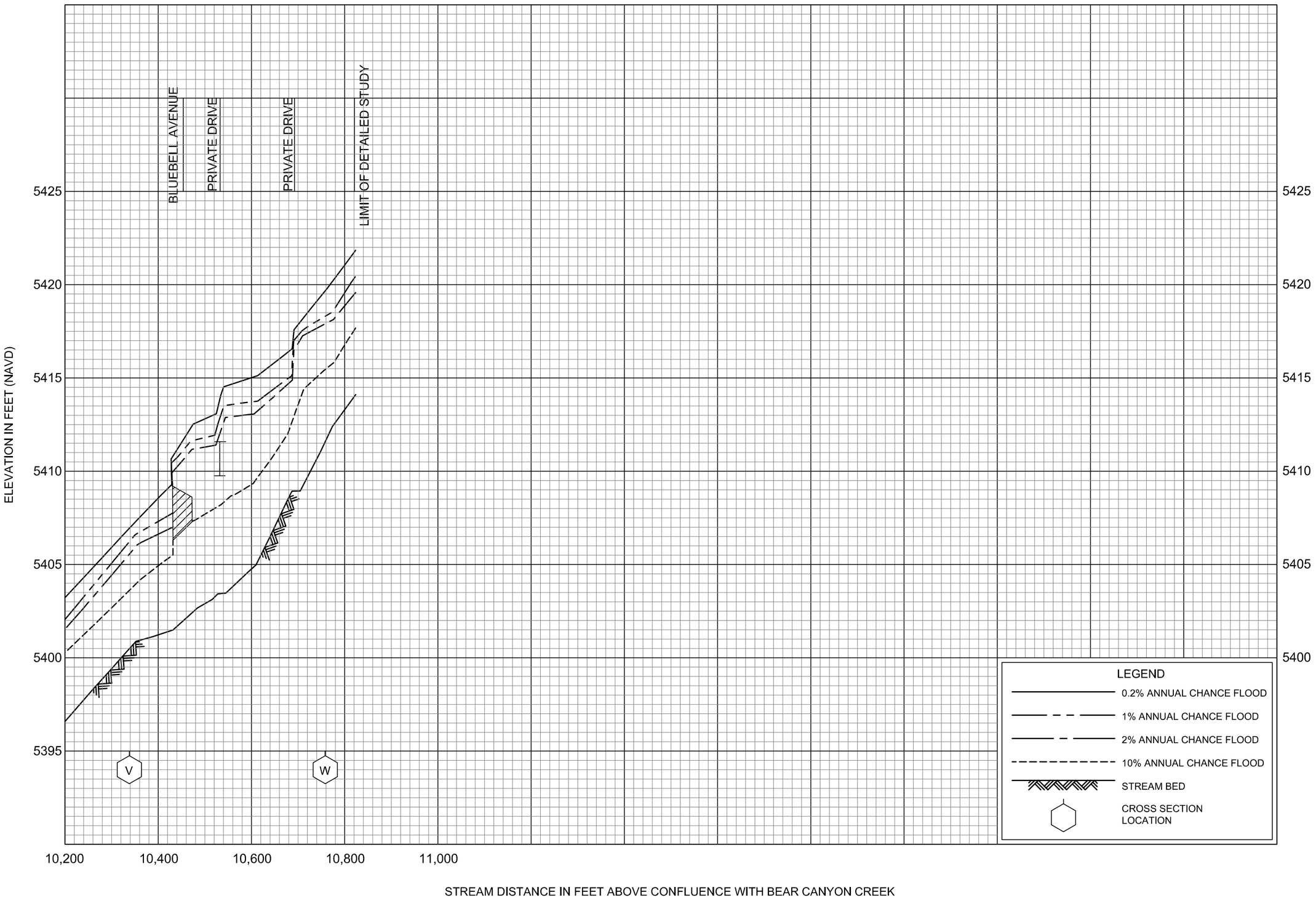
FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO

AND INCORPORATED AREAS



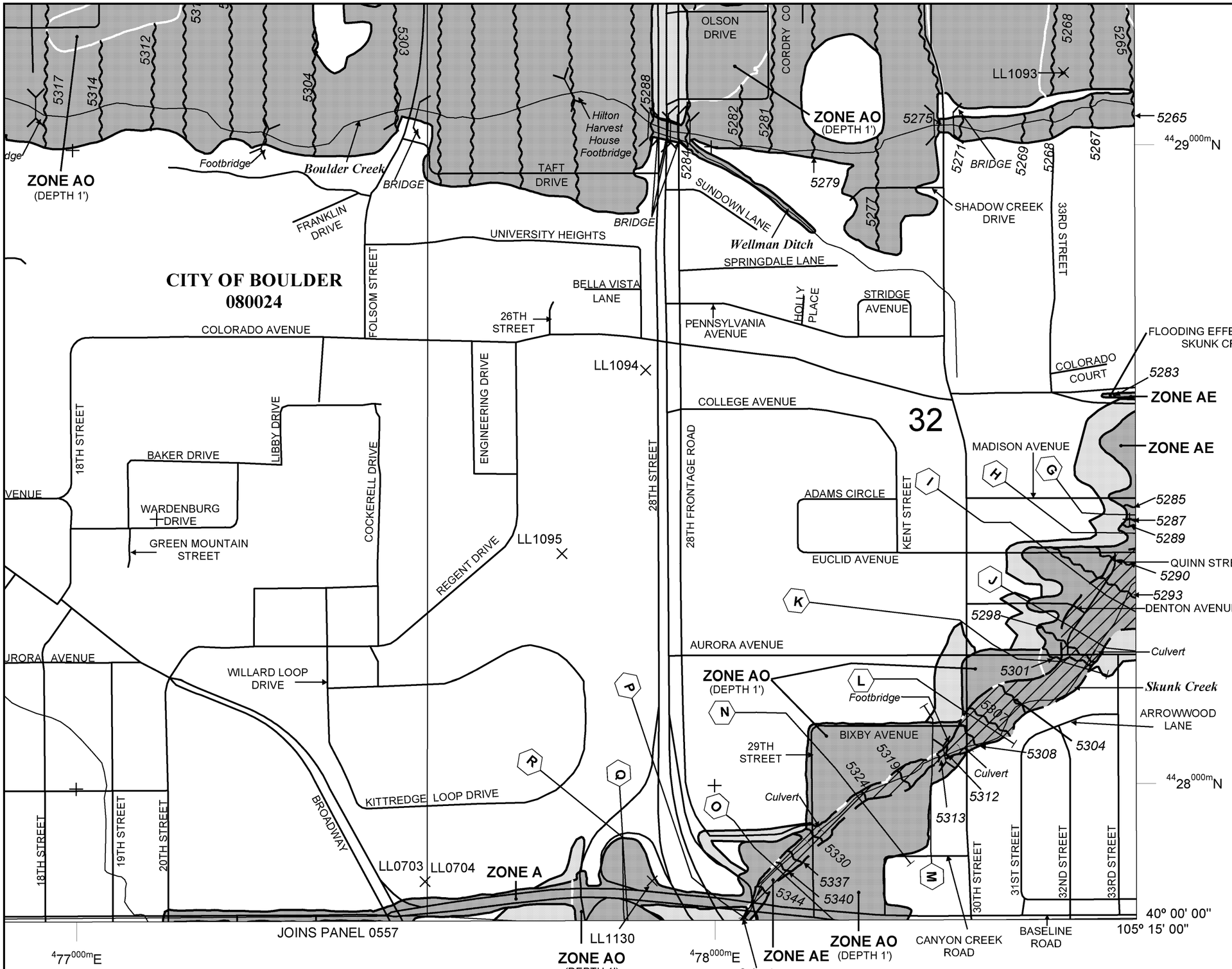
FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO

AND INCORPORATED AREAS



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0394J

FIRM

FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO

AND INCORPORATED AREAS

PANEL 394 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER, CITY OF	080024	0394	J

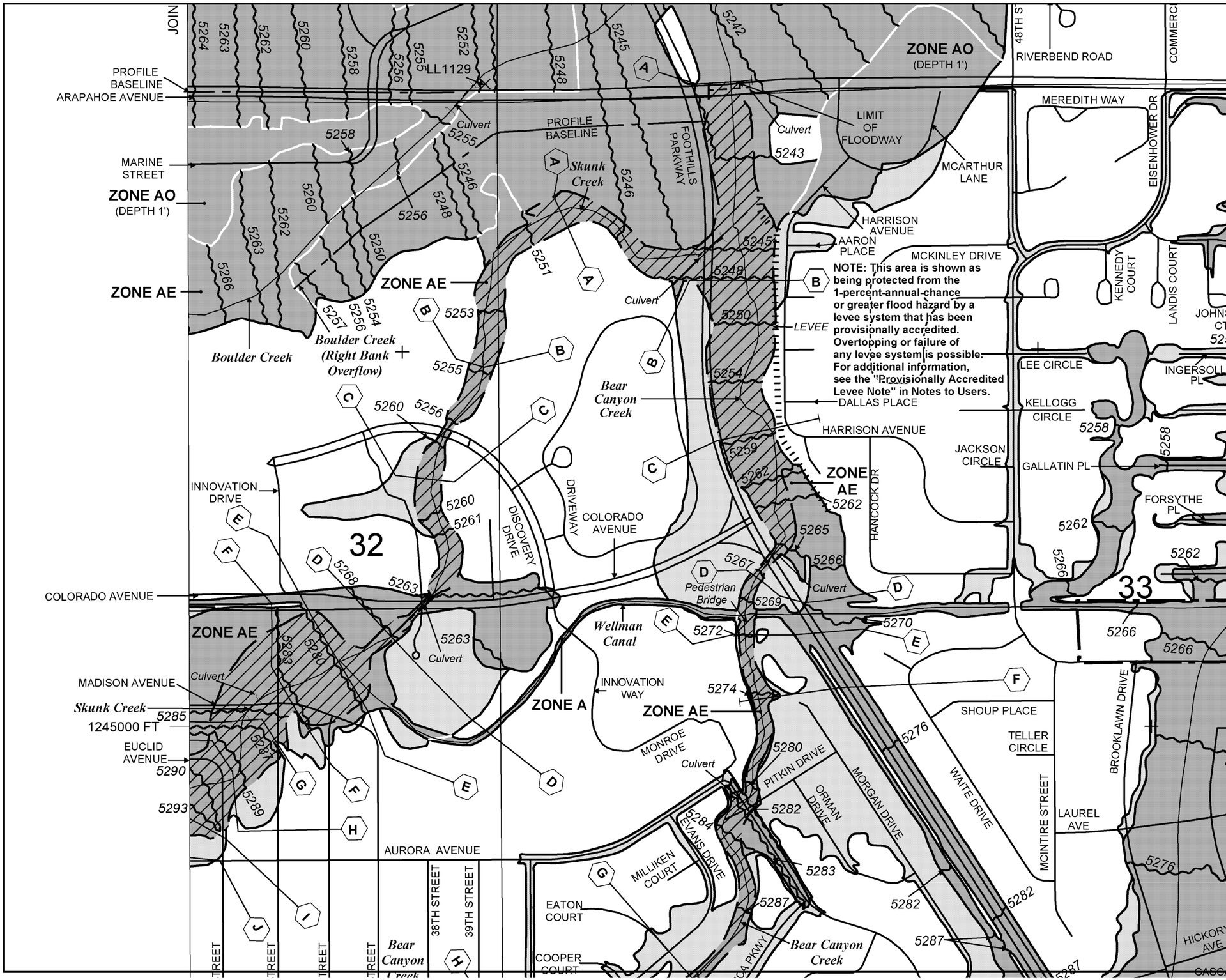
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08013C0394J

MAP REVISED
DECEMBER 18, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0413J

FIRM

FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO

AND INCORPORATED AREAS

PANEL 413 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER , CITY OF	080024	0413	J
BOULDER COUNTY	080023	0413	J

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
08013C0413J

MAP REVISED
DECEMBER 18, 2012

Federal Emergency Management Agency

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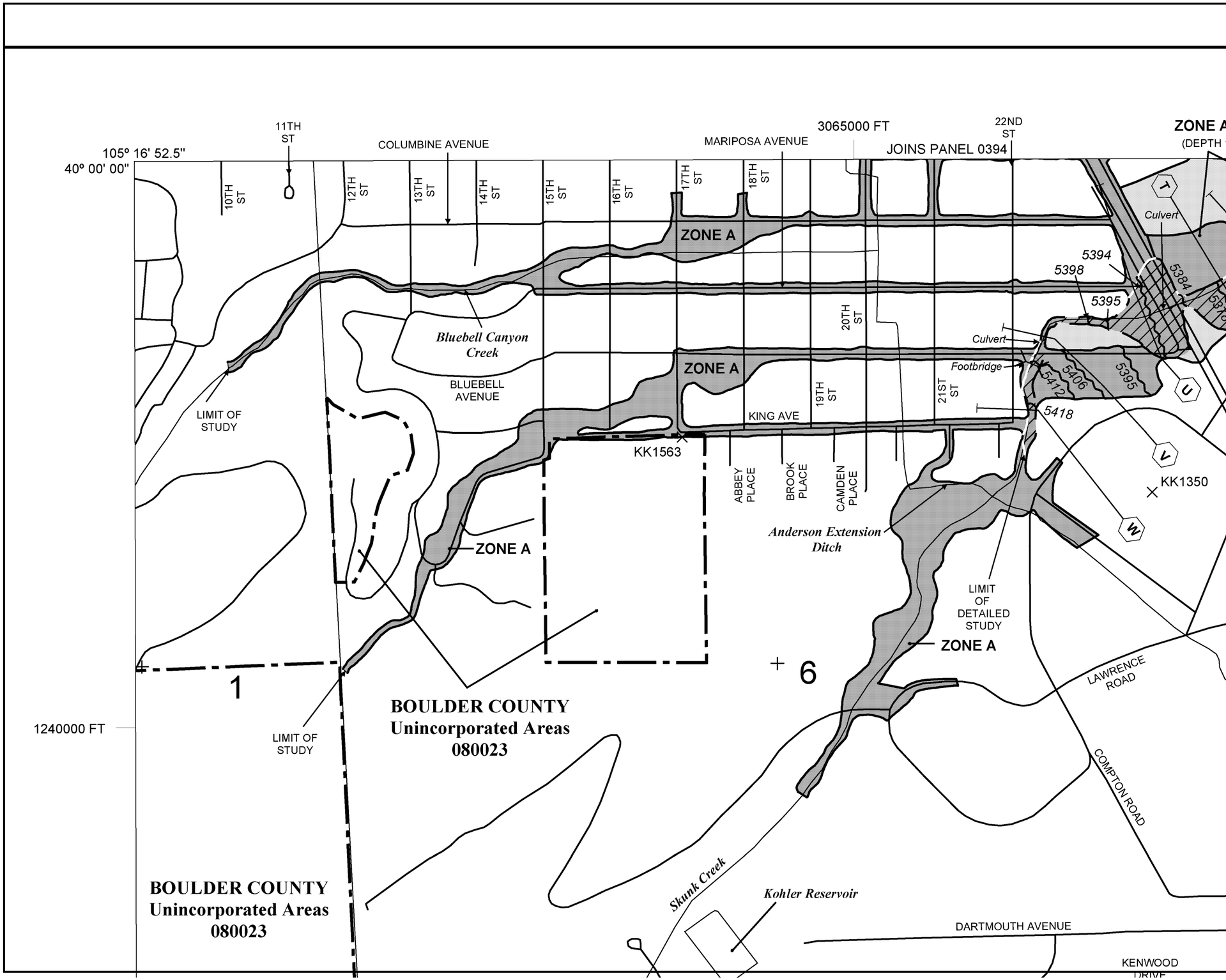

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0557J

FIRM

FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO

AND INCORPORATED AREAS

PANEL 557 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER, CITY OF	080024	0557	J
BOULDER COUNTY	080023	0557	J

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
08013C0557J

MAP REVISED
DECEMBER 18, 2012

Federal Emergency Management Agency

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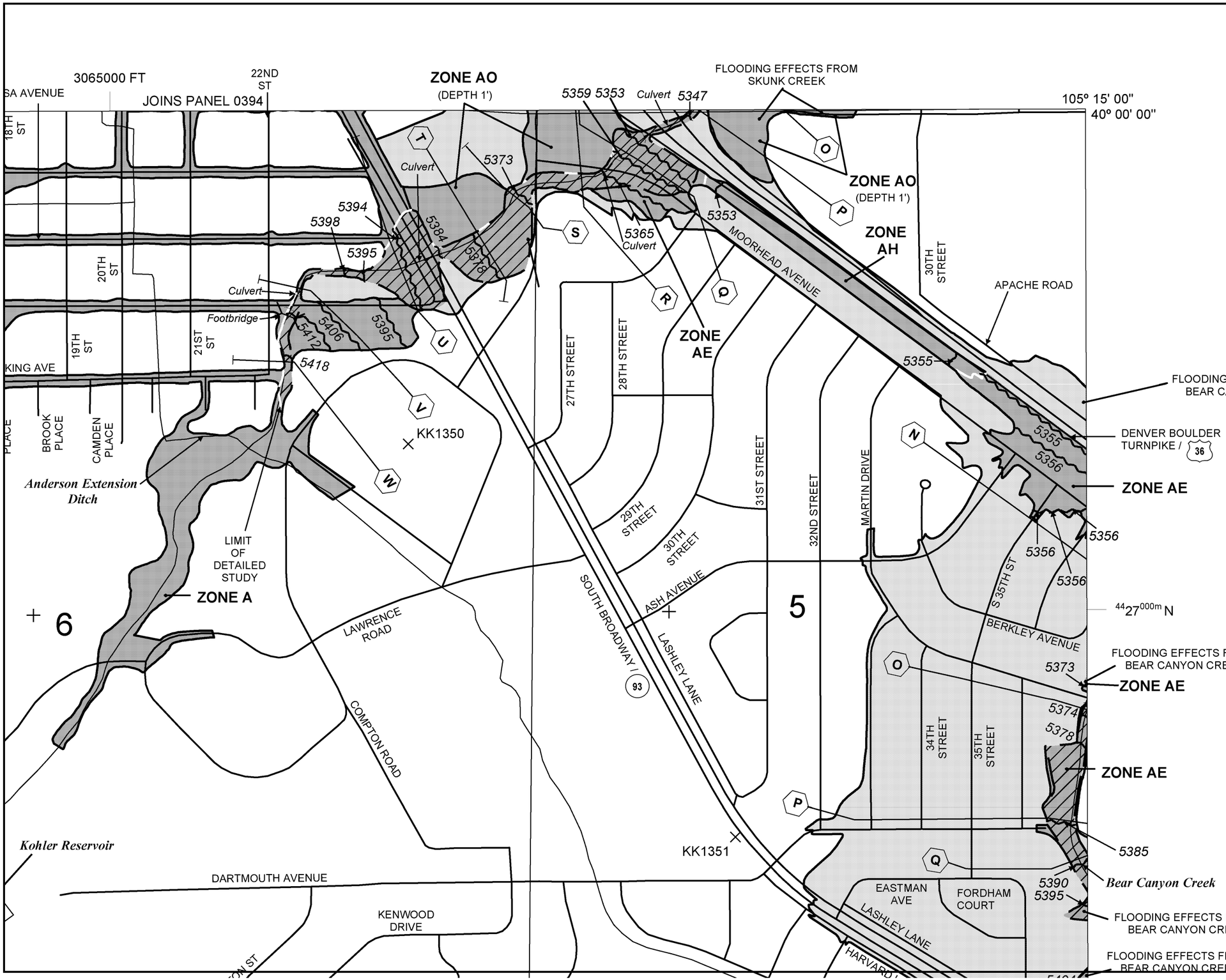

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0557J

FIRM

FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO

AND INCORPORATED AREAS

PANEL 557 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER, CITY OF	080024	0557	J
BOULDER COUNTY	080023	0557	J

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
08013C0557J

MAP REVISED
DECEMBER 18, 2012

Federal Emergency Management Agency

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MAP SCALE 1" = 500'

250 0 500 1000 FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0576J

FIRM

FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO

AND INCORPORATED AREAS

PANEL 576 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER, CITY OF	080024	0576	J
BOULDER COUNTY	080023	0576	J

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
08013C0576J

MAP REVISED
DECEMBER 18, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	City of Boulder Boulder County Colorado	CULVERT EXCAVATION FILL LEVEE	FLOODWAY HYDRAULIC ANALYSIS LEVEE CERTIFICATION UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 080024		
IDENTIFIER	Lower Bear Canyon Creek and Harrison Levee Improvements	APPROXIMATE LATITUDE AND LONGITUDE: 40.014, -105.240 SOURCE: Google Earth DATUM: NAD 83	

ANNOTATED MAPPING ENCLOSURES	ANNOTATED STUDY ENCLOSURES
TYPE: FIRM* NO.: 08013C0413J DATE: December 18, 2012	DATE OF EFFECTIVE FLOOD INSURANCE STUDY: December 18, 2012 FLOOD PROFILEs: 14P and 15P FLOODWAY DATA TABLE: 6

Enclosures reflect changes to flooding sources affected by this revision.
* FIRM - Flood Insurance Rate Map

FLOODING SOURCE AND REVISED REACH See Page 2 for Additional Flooding Sources

Bear Canyon Creek - from approximately 140 feet downstream of Arapahoe Avenue to just upstream of Foothills Parkway

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Bear Canyon Creek	Zone AE	Zone AE	YES	YES
	Zone X (shaded)	Zone X (shaded)	YES	YES
	BFEs*	BFEs	YES	YES
	Floodway	Floodway	YES	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304. Additional Information about the NFIP is available on our Web site at http://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

OTHER FLOODING SOURCES AFFECTED BY THIS REVISION

FLOODING SOURCE AND REVISED REACH

Bear Canyon Creek - from approximately 140 feet downstream of Arapahoe Avenue to just downstream of Foothills Parkway

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Bear Canyon Creek	Zone AO	Zone AO	YES	YES

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304. Additional Information about the NFIP is available on our Web site at http://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that any permits required by Federal or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304. Additional Information about the NFIP is available on our Web site at http://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

This revision has met our criteria for removing an area from the 1-percent-annual-chance floodplain to reflect the placement of fill. However, we encourage you to require that the lowest adjacent grade and lowest floor (including basement) of any structure placed within the subject area be elevated to or above the Base (1-percent-annual-chance) Flood Elevation.

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Jeanine D. Petterson
Director, Mitigation Division
Federal Emergency Management Agency, Region VIII
Denver Federal Center, Building 710
P.O. Box 25267
Denver, CO 80225-0267
(303) 235-4830

STATUS OF THE COMMUNITY NFIP MAPS

We are processing a revised FIRM and FIS report for Boulder County in our countywide format; therefore, we will not physically revise and republish the FIRM and FIS report for your community to incorporate the modifications made by this LOMR at this time. Preliminary copies of the countywide FIRM and FIS report, which present information from the effective FIRMs and FIS reports for your community and incorporated communities in Boulder County, were submitted to your community for review on July 23, 2015. We will incorporate the modifications made by this LOMR into the countywide FIRM and FIS report before they become effective.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304. Additional Information about the NFIP is available on our Web site at http://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

Federal Emergency Management Agency
Washington, D.C. 20472

LETTER OF MAP REVISION
DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below and through FEMA's Flood Hazard Mapping Web site at https://www.floodmaps.fema.gov/fhm/Scripts/bfe_main.asp.

LOCAL NEWSPAPER Name: *The Daily Camera*
Dates: March 17, 2016 and March 24, 2016

Within 90 days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised flood hazard determination information presented in this LOMR may be changed.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304. Additional Information about the NFIP is available on our Web site at http://www.fema.gov/national-flood-insurance-program.

Patrick "Rick" F. Sacbibit, P.E., Branch Chief
Engineering Services Branch
Federal Insurance and Mitigation Administration

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
BEAR CANYON CREEK								
A	1,554	124	805	6.1	5,243.0	5,242.9[2]	5,242.9	0.0
B	2,487	210	508	6.1	5,247.6	5,247.6	5,248.1	0.5
C	3,302	90	305	10.1	5,258.3	5,258.3	5,258.3	0.1
D	4,191	70	321	9.6	5,267.4	5,267.4	5,267.4	0.0
E	4,498	78	362	8.5	5,272.4	5,272.4	5,272.4	0.0
F	4,844	138	389	7.9	5,273.8	5,273.8	5,273.8	0.0
G	6,512	70	272	11.3	5,290.3	5,290.3	5,290.3	0.0
H	7,489	300	987	3.1	5,306.2	5,306.2	5,307.0	0.8
I	7,567	100	796	3.9	5,307.4	5,307.4	5,307.7	0.3
J	8,363	335	539	5.4	5,319.6	5,319.6	5,319.6	0.0
K	8,498	276	590	5.0	5,322.1	5,322.1	5,322.3	0.2
L	9,474	260	658	4.4	5,332.2	5,332.2	5,333.1	0.9
M	9,855	175	492	6.0	5,336.2	5,336.2	5,336.8	0.6
N	11,104	51	217	10.2	5,360.6	5,360.6	5,360.6	0.0
O	11,717	73	386	4.1	5,374.4	5,374.4	5,374.4	0.0
P	12,334	137	275	7.6	5,384.8	5,384.8	5,384.8	0.0
Q	12,536	101	256	8.2	5,390.1	5,390.1	5,390.1	0.0
R	13,695	65	199	10.0	5,416.3	5,416.3	5,416.3	0.0
S	14,807	99	208	8.8	5,443.6	5,443.6	5,443.6	0.0
T	15,213	116	204	8.5	5,455.7	5,455.7	5,455.7	0.0
U	15,553	121	205	8.5	5,465.6	5,465.6	5,465.6	0.0
V	15,910	133	218	7.6	5,477.1	5,477.1	5,477.1	0.0

REVISED DATA

[1]Feet above confluence with Boulder Creek
[2]Elevation computed without consideration of flooding controlled by Boulder Creek

REVISED TO REFLECT LOMR EFFECTIVE: July 22, 2016

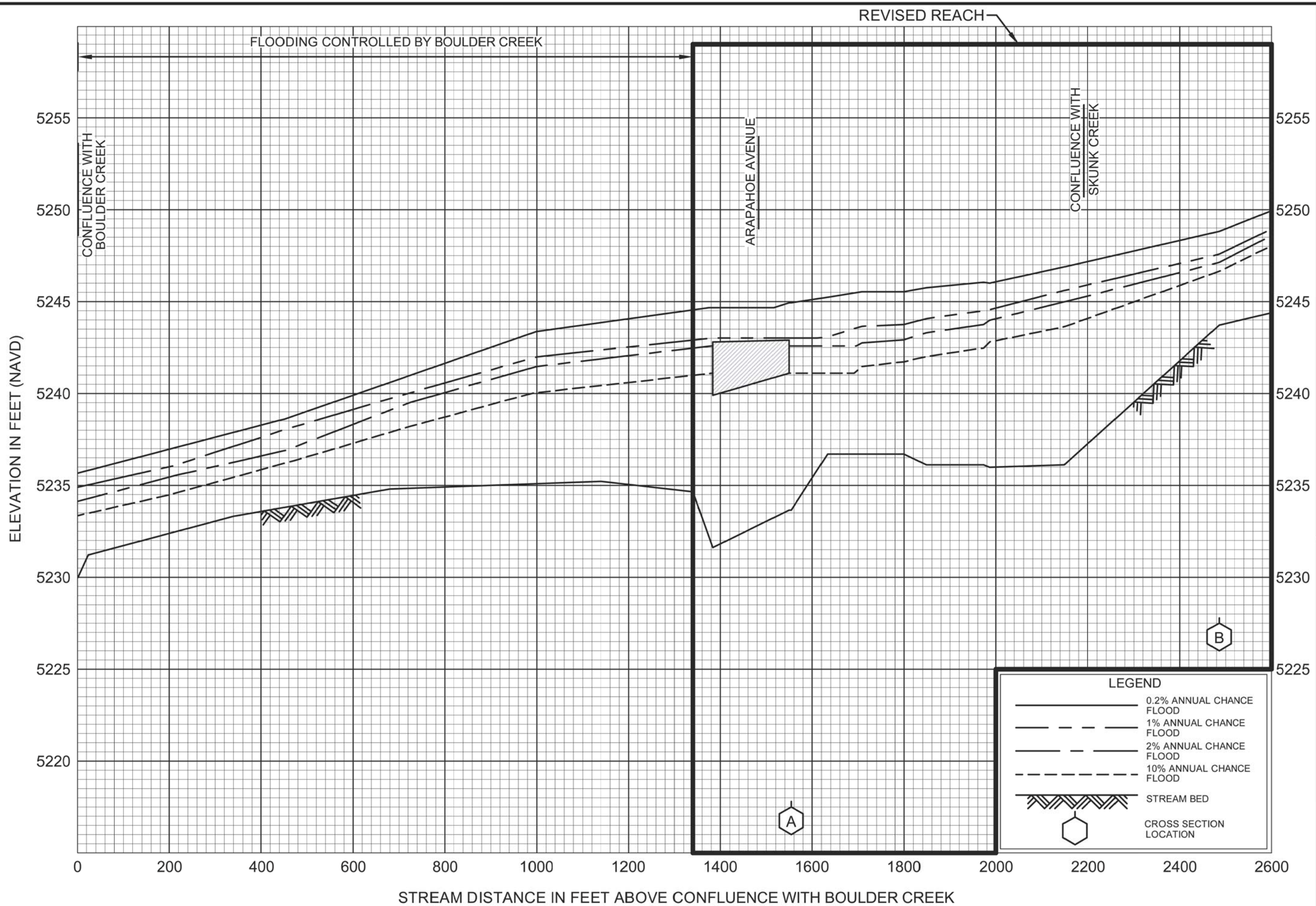
TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

FLOODWAY DATA

BEAR CANYON CREEK



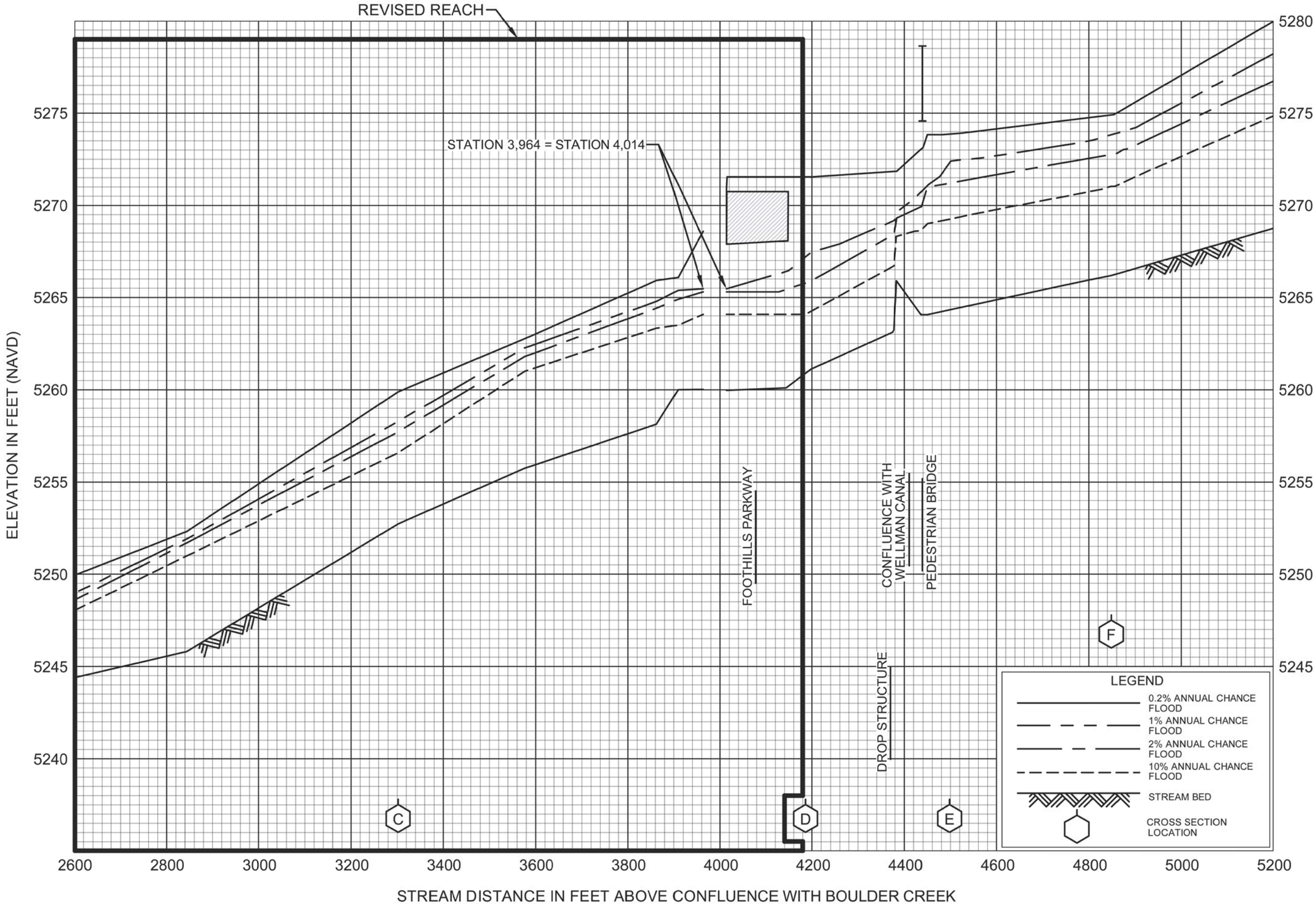
FLOOD PROFILES

REVISED TO REFLECT LOMR
EFFECTIVE: July 22, 2016

BEAR CANYON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS



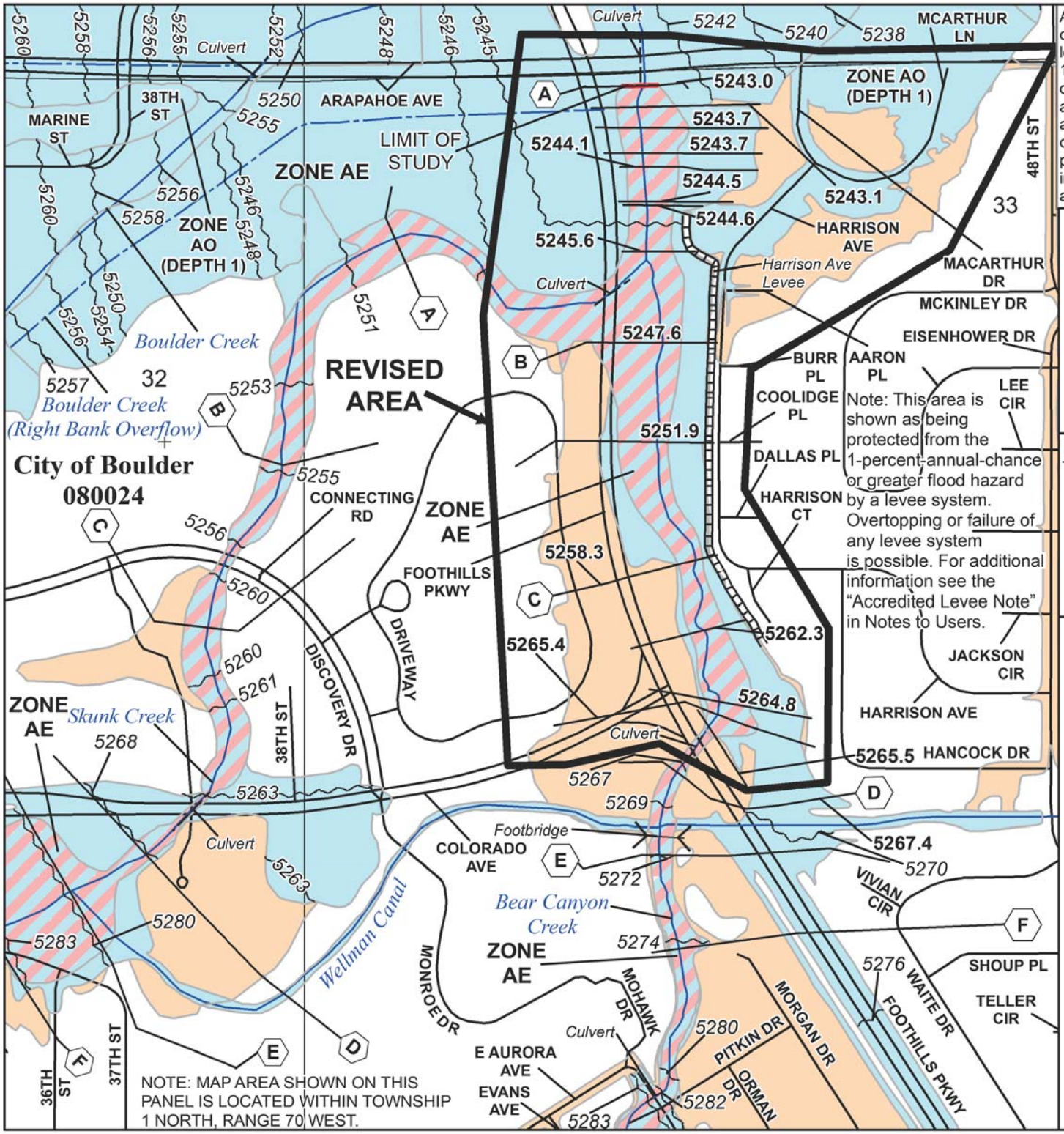
FLOOD PROFILES

REVISED TO REFLECT LOMR EFFECTIVE: July 22, 2016

BEAR CANYON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO AND INCORPORATED AREAS



Accredited Levee Notes to Users: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA website at http://www.fema.gov/national-flood-insurance-program.

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee See Notes *Zone X*

SCALE

Map Projection:
NAD83 UTM Zone 13N
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 250 500 1,000 Feet

0 75 150 300 Meters

FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO
and Incorporated Areas

PANEL 413 OF 615

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER, CITY OF	080024	0413	J
BOULDER COUNTY	080023	0413	J

REVISED TO REFLECT LOMR EFFECTIVE: July 22, 2016

VERSION NUMBER
1.1.1.0
MAP NUMBER
08013C0413J
MAP REVISED
DECEMBER 18, 2012

Appendix C –
Annotated Flood Hazard Information

Table 4 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Prince Tributary[1]					
Just Downstream of Confluence with Bullhead Gulch	8.16	--[2]	--[2]	4,772	--[2]
Just Upstream of Confluence with Bullhead Gulch	2.55	--[2]	--[2]	2,130	--[2]
At Upstream Limit of Detailed Study	0.58	--[2]	--[2]	423	--[2]
Rock Creek					
At Confluence with Coal Creek	21.6	2,870	5,350	6,690	10,240
Rock Creek (continued)					
At 2,400 feet Upstream of Confluence with Coal Creek	21.5	2,900	5,400	6,710	10,270
At South 120th Street	21.3	2,910	5,410	6,740	10,310
At 16,450 feet Upstream of Confluence with Coal Creek	18.7	2,900	5,360	6,640	10,050
At Denver-Boulder Turnpike	9.3	1,256	3,229	4,520	9,176
At McCaslin Boulevard	4.9	594	1,800	2,717	7,000
At Upstream Limit of Detailed Study	4.1	504	1,587	2,396	6,182
St. Vrain Creek					
At Boulder-Weld County Line	351.0	5,520	10,950	14,850	28,670
At 85th Street	241.0	3,160	6,890	9,580	19,680
Just Downstream of the Confluence of North St. Vrain Creek and South St. Vrain Creek	211.0	2,040	6,670	8,880	20,260
St. Vrain Creek (Vicinity of Lyons)					
At Second Avenue	219.0	2,040	5,570	8,880	20,260
Skunk Creek					
At Confluence with Bear Canyon Creek	~~2.83~~ 2.91	~~980~~ 550	~~1,830~~ 1527	~~2,230~~ 2065	~~3,500~~ 3434
At Madison Avenue	~~2.43~~ 2.22	~~920~~ 395	~~1,580~~ 960	~~1,870~~ 1280	~~2,650~~ 2147
At U.S. Highway 36	~~2.08~~ 2.06	~~650~~ 263	~~1,130~~ 794	~~1,350~~ 1174	~~1,900~~ 2063
At Broadway	~~1.36~~ 1.85	~~210~~ 166	~~520~~ 684	~~710~~ 1017	~~1,320~~ 1797

[1] Separate Data for East and West Branches Not Available
[2] Data Not Available

Please note: annotated discharges reflect main stem discharges and do not account for spills that have left the main channel at the location of interest. See Table 3.3 for additional discharge information.

Table 4 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent Annual Chance	2-Percent Annual Chance	1-Percent Annual Chance	0.2-Percent Annual Chance
Skunk Creek (continued)					
At Upstream Limit of Detailed Study	~~1.20~~ 0.75	~~180~~ 22	~~460~~ 198	~~640~~ 303	~~1,200~~ 542
South Boulder Creek					
Near Eldorado Springs	--[1]	1,310	2,640	4,340	7,400
At State Highway 93	--[1]	1,450	3,270	6,200	9,950
At US Highway 36	--[1]	1,300	3,530	7,240	11,640
At Baseline Road	--[1]	1,390	3,050	5,610	9,210
At Confluence with Boulder Creek	--[1]	1,570	3,180	4,980	7,750
Spring Gulch					
At Confluence with St. Vrain Creek	--[1]	1,950	3,150	3,650	4,200
Steele Lakes Tributary					
At 75th Street	--[1]	494	1,165	1,512	2,428
Twomile Canyon Creek					
At Confluence with Goose Creek	2.9	360	840	1,120	2,000
At Broadway	1.68	210	675	890	1,800
At Upstream Limit of Detailed Study	1.40	210	540	710	1,430
Wonderland Creek[2]					
At Confluence with North Goose Creek	1.91	607	1,419	2,107	4,620
At 28th Street	1.35	404	1,032	1,484	3,799
At Broadway	0.85	205	415	531	1,600
At Upstream Limit of Detailed Study	0.38	92	192	253	860
Bluebell Canyon Creek					
At Confluence with Skunk Creek	0.42	11	46	67	122
At Upstream Limit of Detailed Study	0.38	20	145	215	375
King's Gulch					
At Confluence with Skunk Creek	0.38	40	264	401	745
At Upstream Limit of Detailed Study	0.25	3	106	170	315

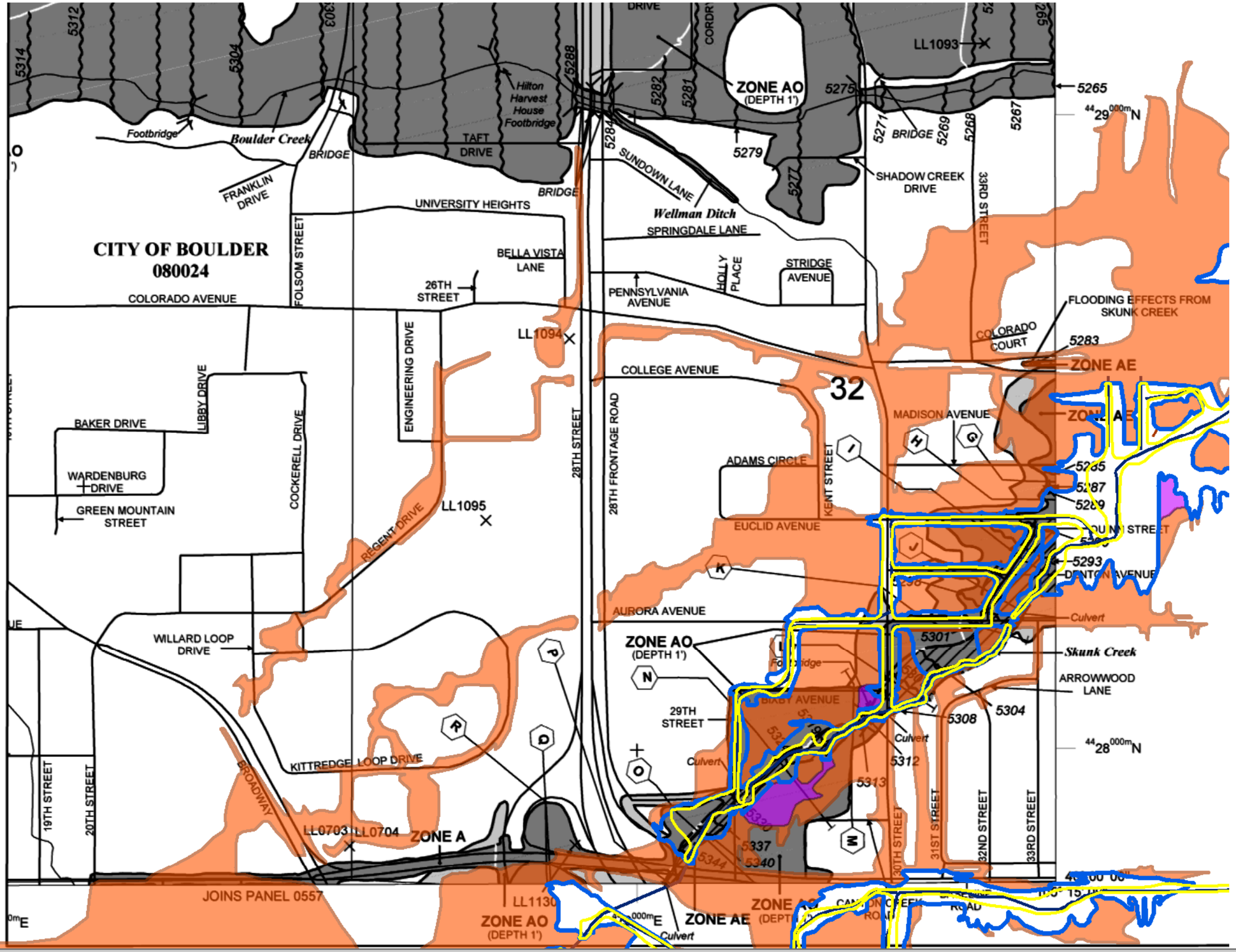
[1] Data Not Available
[2] Includes Flow Diversions From Fourmile Canyon Creek

Please note: annotated discharges reflect main stem discharges and do not account for spills that have left the main channel at the location of interest. See Table 3.3 for additional discharge information.

Note: Proposed revisions at Boulder Creek tie into effective information reflected in the pending Boulder Creek PMR.

Legend

- Conveyance Zone (Floodway)
- 1% Annual Chance Floodplain (Zone AE)
- Gutter Line
- Zone AO (1 ft)
- Zone AO (2 ft)
- Zone X
- Flow Path



NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0394J

FIRM

FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO

AND INCORPORATED AREAS

PANEL 394 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER, CITY OF	080024	0394	J

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
08013C0394J

MAP REVISED
DECEMBER 18, 2012

Federal Emergency Management Agency

ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure: Annotated FIRM 0394

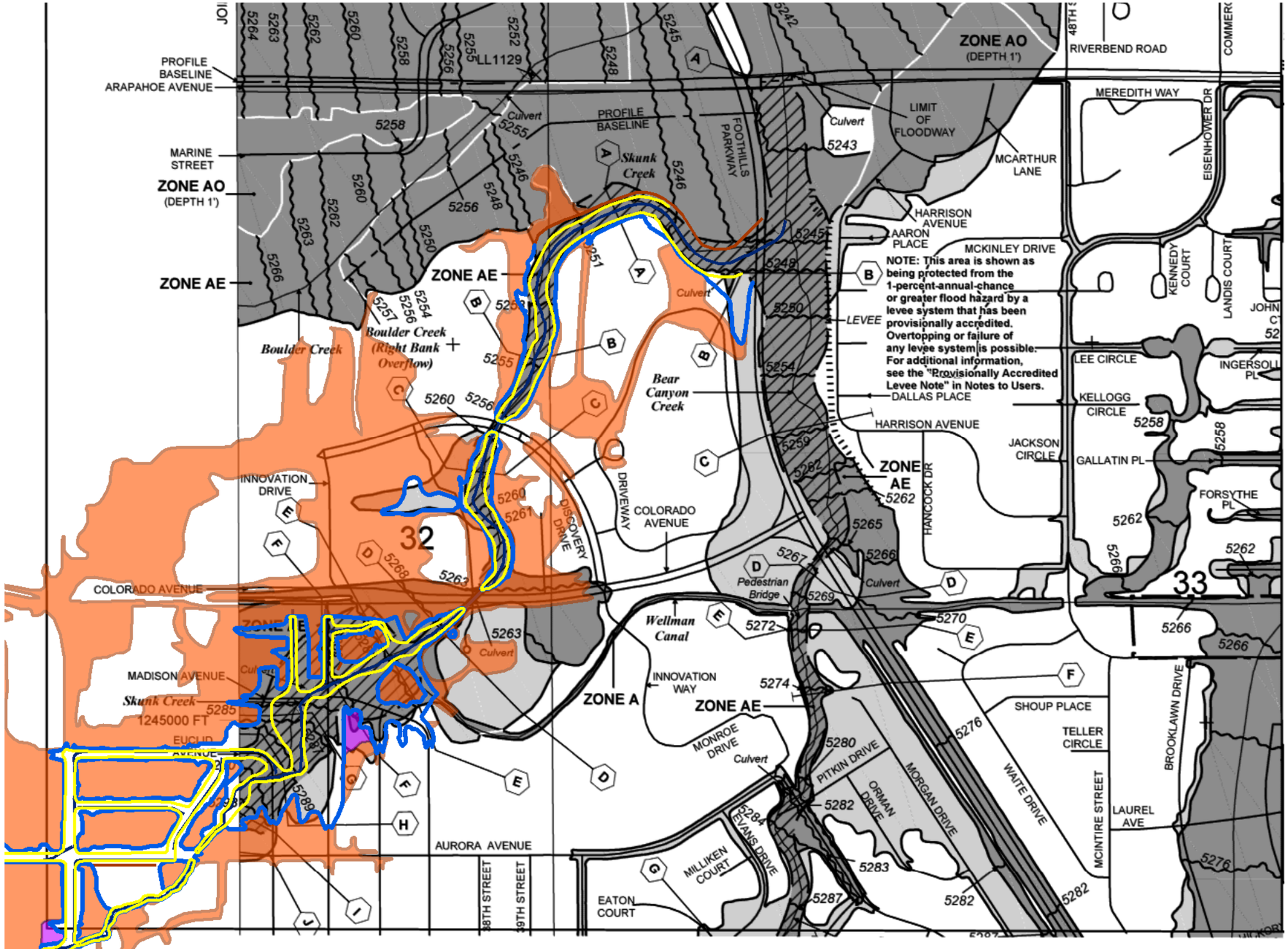
N

500 Feet

Note: Proposed revisions at Boulder Creek tie into effective information reflected in the pending Boulder Creek PMR.

Legend

- Conveyance Zone (Floodway)
- 1% Annual Chance Floodplain (Zone AE)
- Gutter Line
- Zone AO (1 ft)
- Zone AO (2 ft)
- Zone X
- Flow Path



NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0413J

FIRM

FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 413 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER, CITY OF	080024	0413	J
BOULDER COUNTY	080023	0413	J

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
08013C0413J

MAP REVISED
DECEMBER 18, 2012

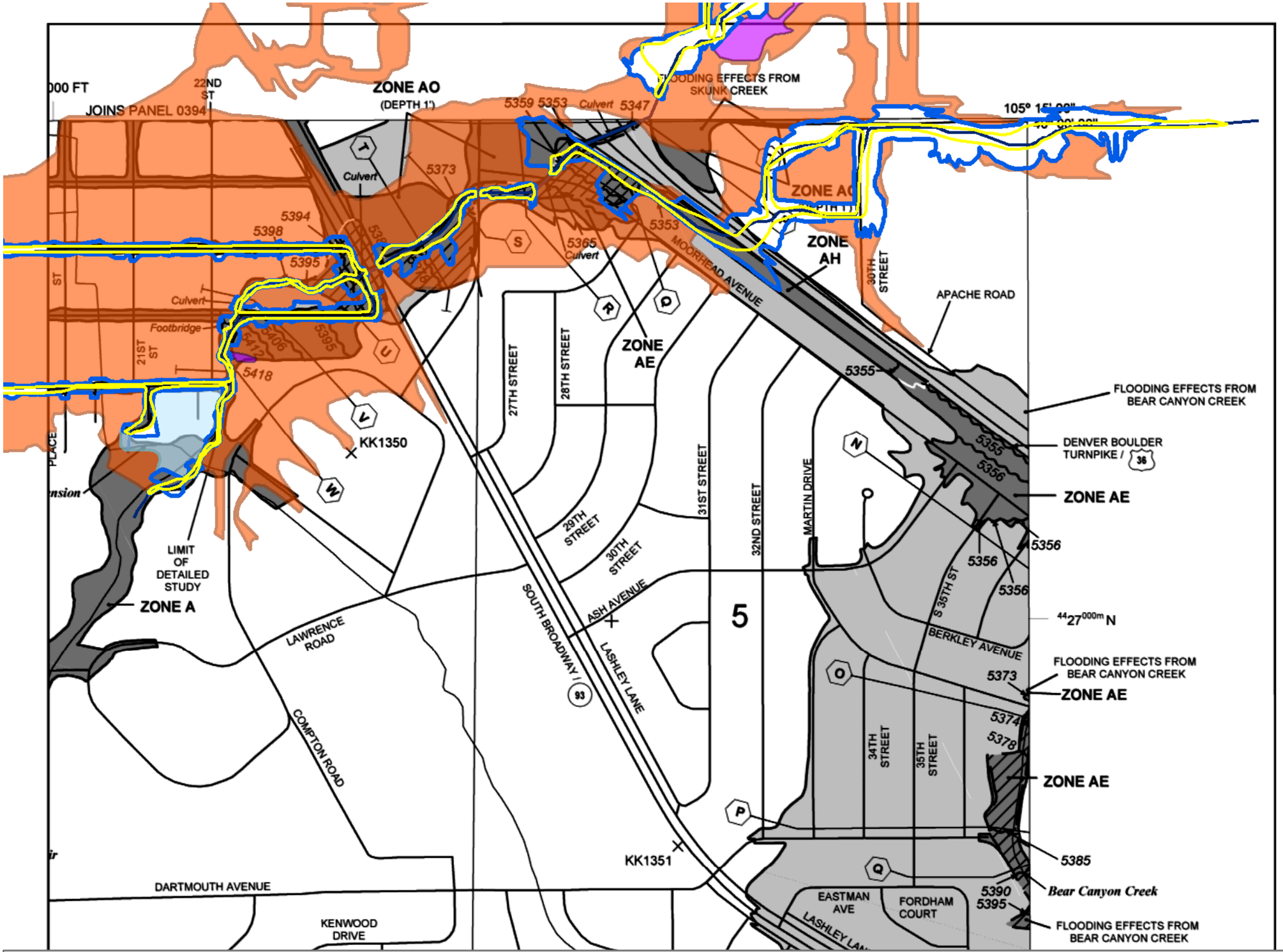
Federal Emergency Management Agency

ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure: Annotated FIRM 0413

N

500 Feet



Legend

- Conveyance Zone (Floodway)
- 1% Annual Chance Floodplain (Zone AE)
- Gutter Line
- Zone AO (1 ft)
- Zone AO (2 ft)
- Zone X
- Flow Path

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0557J

FIRM

FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO

AND INCORPORATED AREAS

PANEL 557 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER, CITY OF	080024	0557	J
BOULDER COUNTY	080023	0557	J

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
08013C0557J

MAP REVISED
DECEMBER 18, 2012

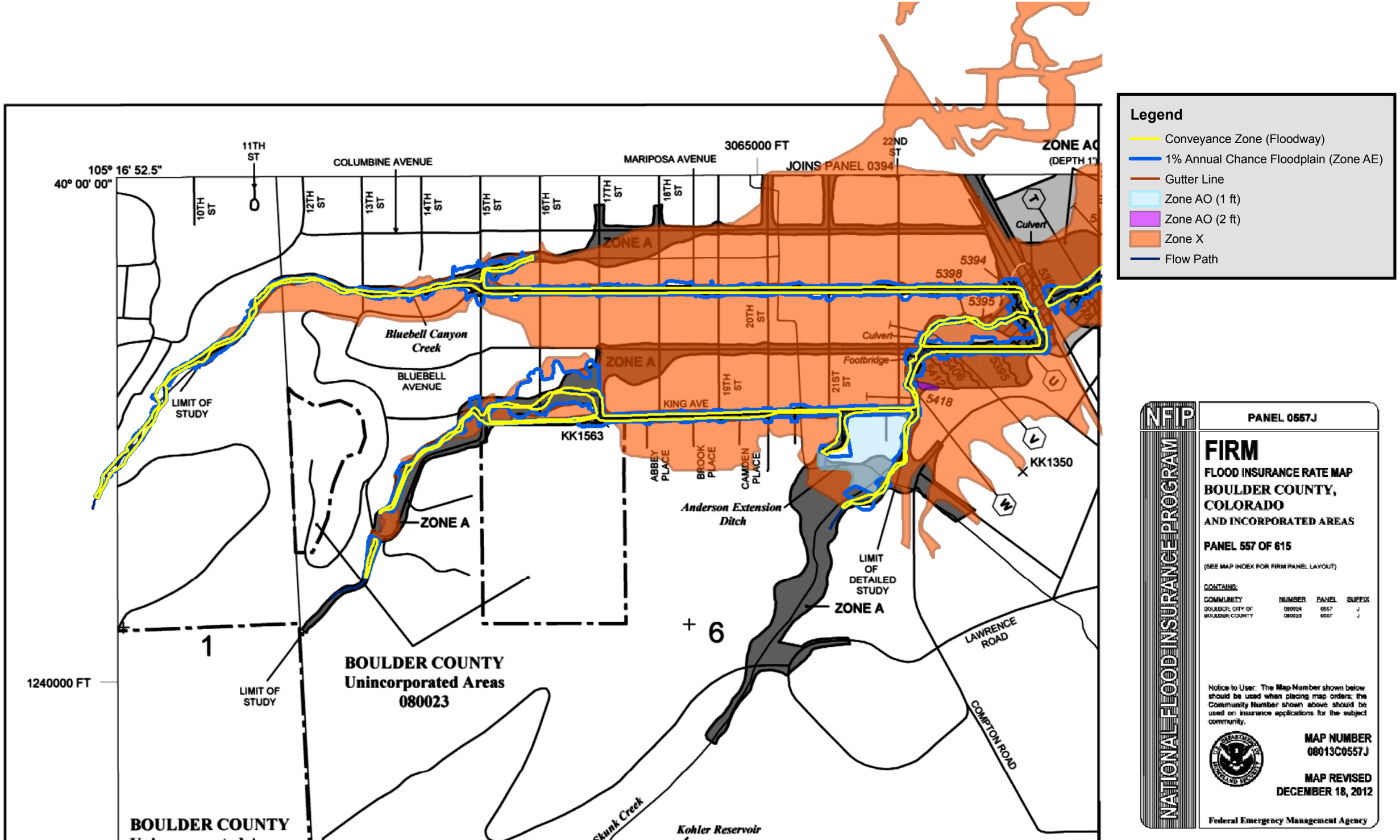
Federal Emergency Management Agency

ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure: Annotated FIRM 0557 (east)

N

500 Feet

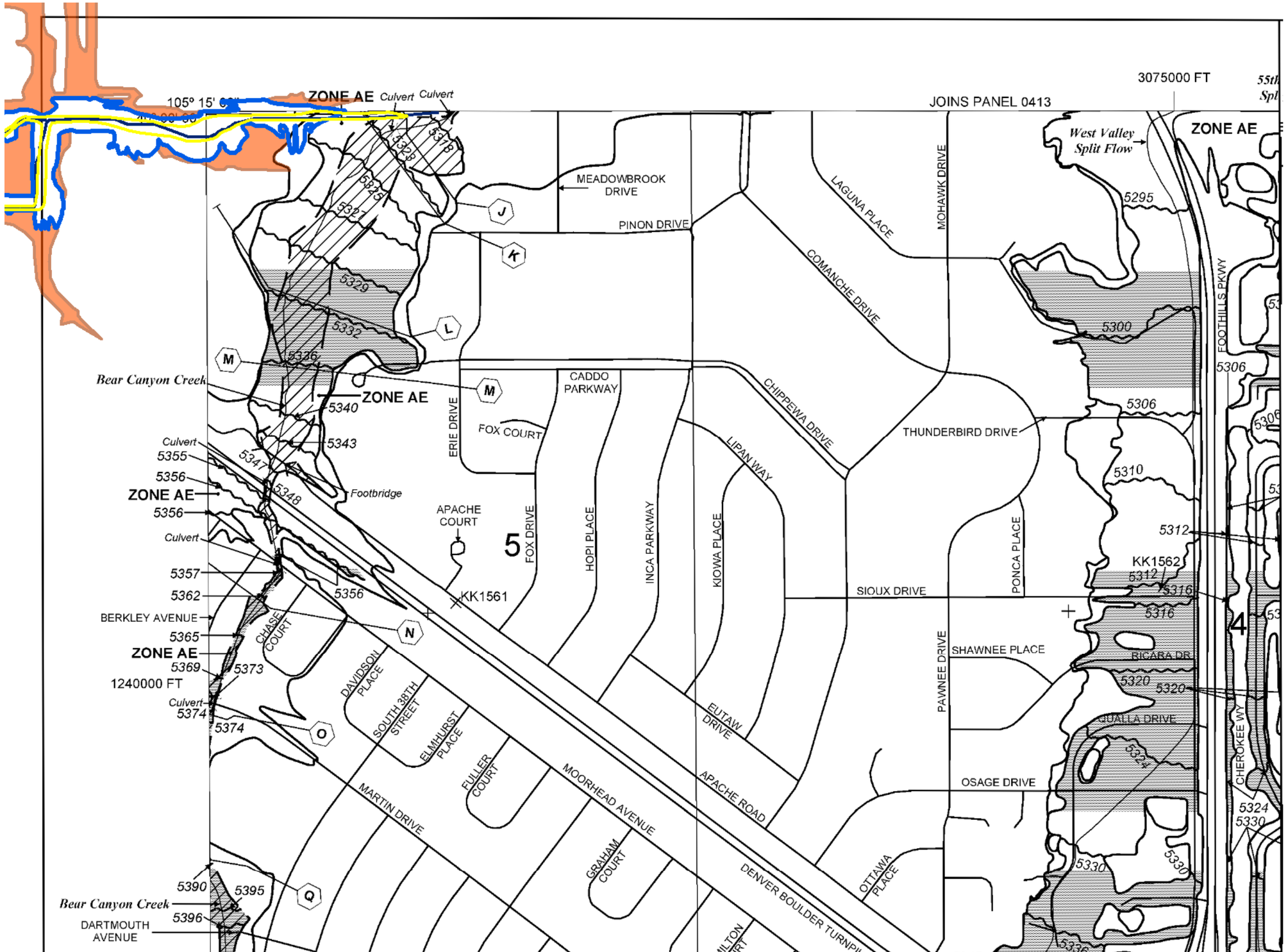


ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure: Annotated FIRM 0557 (west)

N

500 Feet



Legend

- Conveyance Zone (Floodway)
- 1% Annual Chance Floodplain (Zone AE)
- Gutter Line
- Zone AO (1 ft)
- Zone AO (2 ft)
- Zone X
- Flow Path

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0576J

FIRM

FLOOD INSURANCE RATE MAP

BOULDER COUNTY, COLORADO

AND INCORPORATED AREAS

PANEL 576 OF 615

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BOULDER, CITY OF	080024	0576	J
BOULDER COUNTY	080027	0576	J

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
08013C0576J

MAP REVISED
DECEMBER 18, 2012

Federal Emergency Management Agency

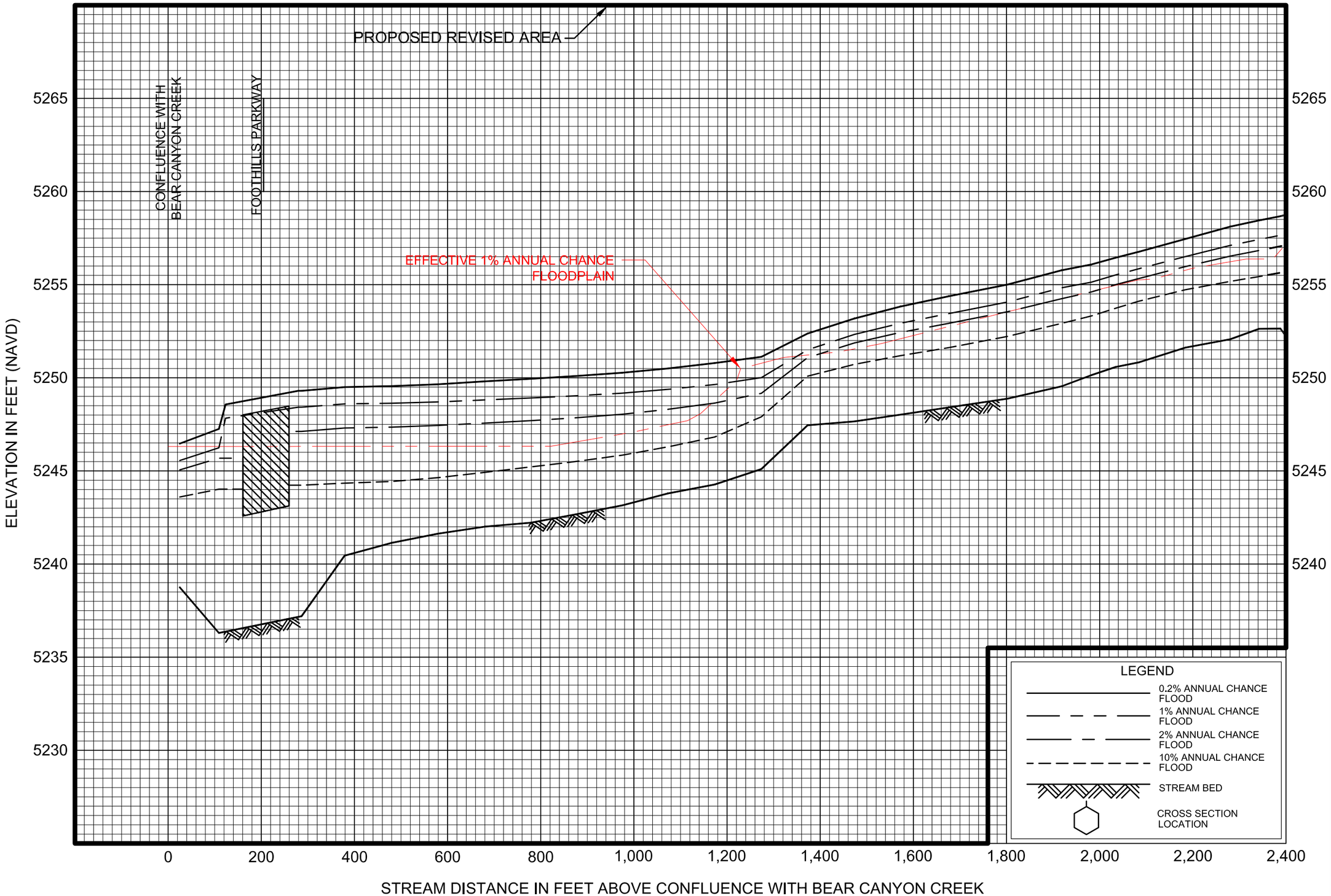
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure: Annotated FIRM 0576

N

500 Feet

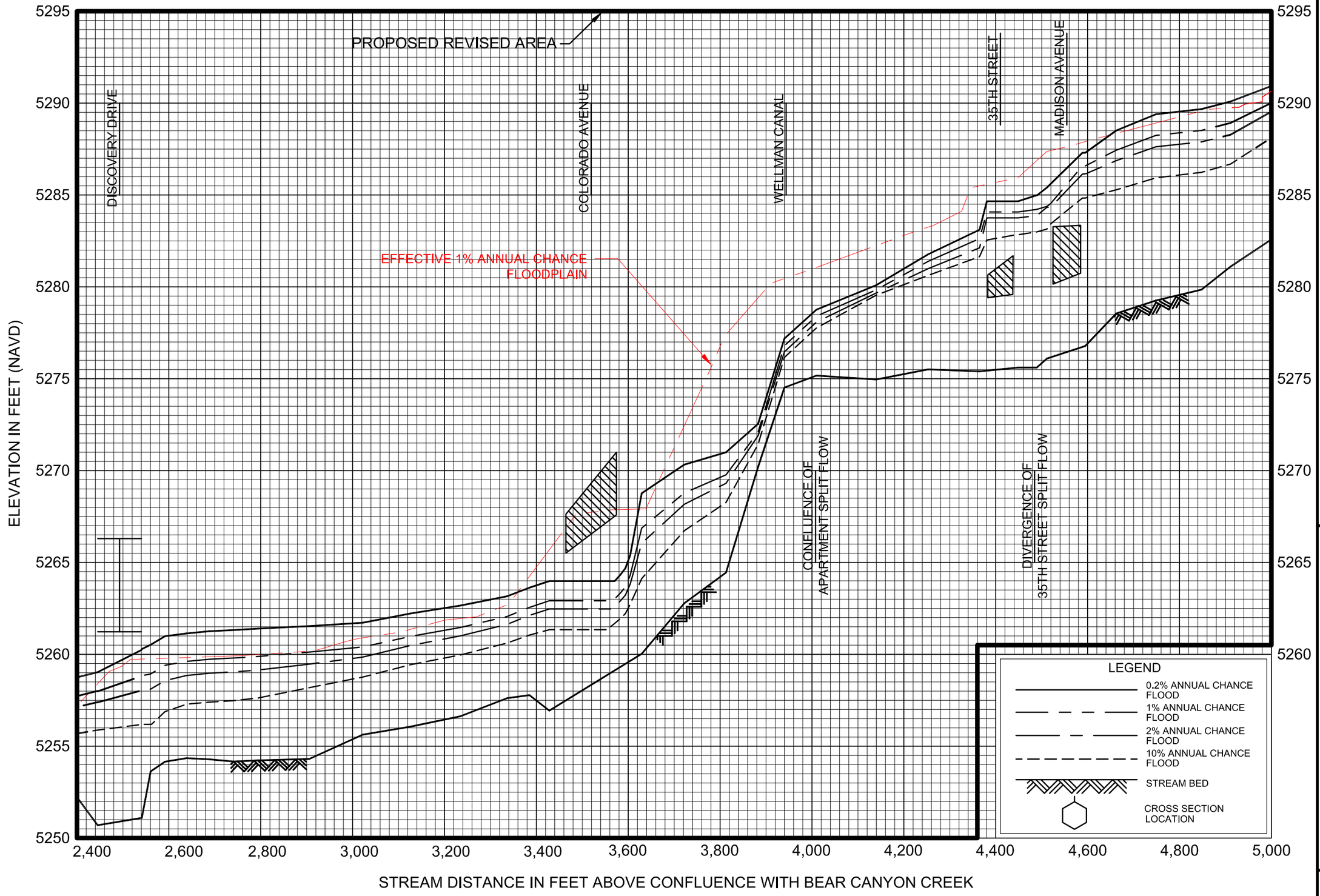


FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

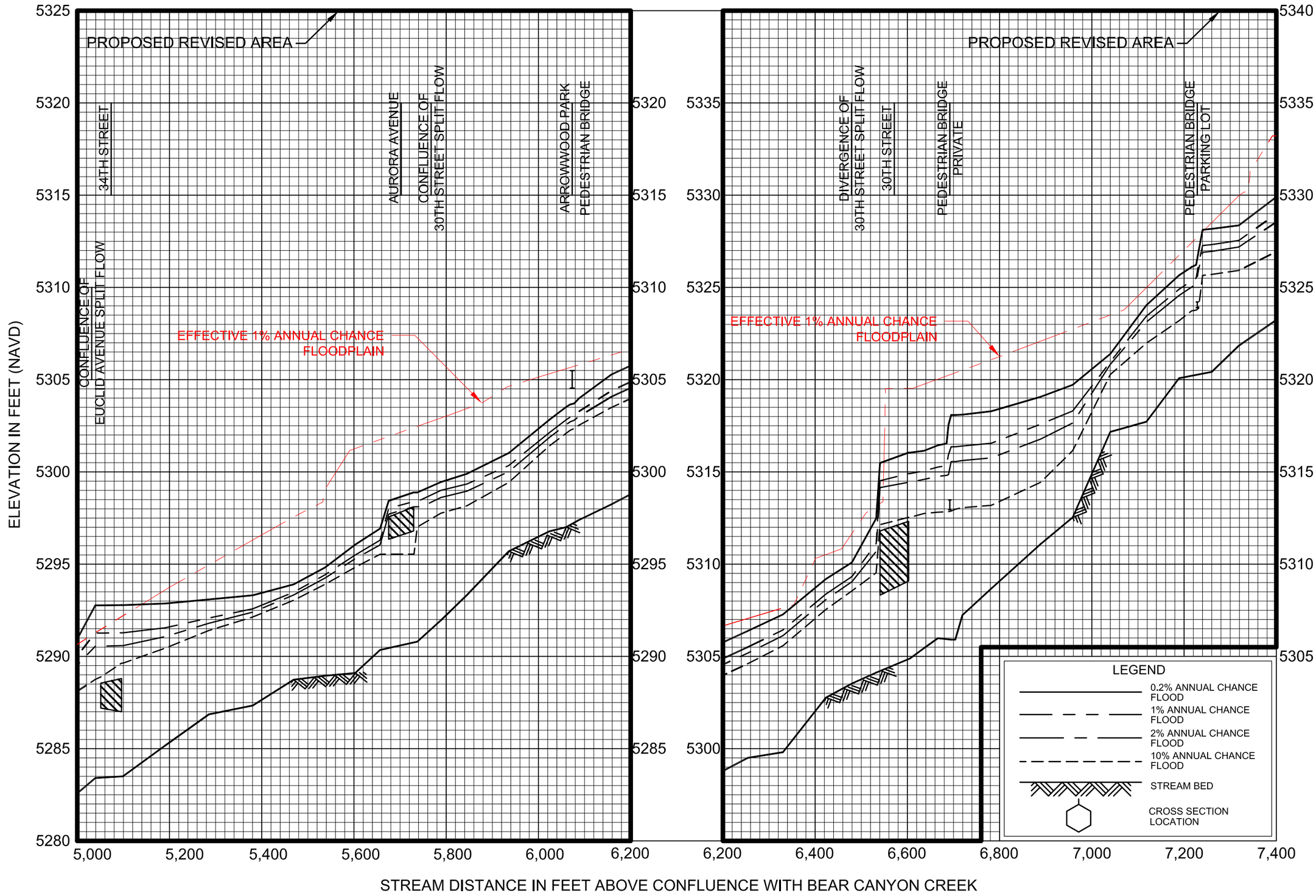


FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

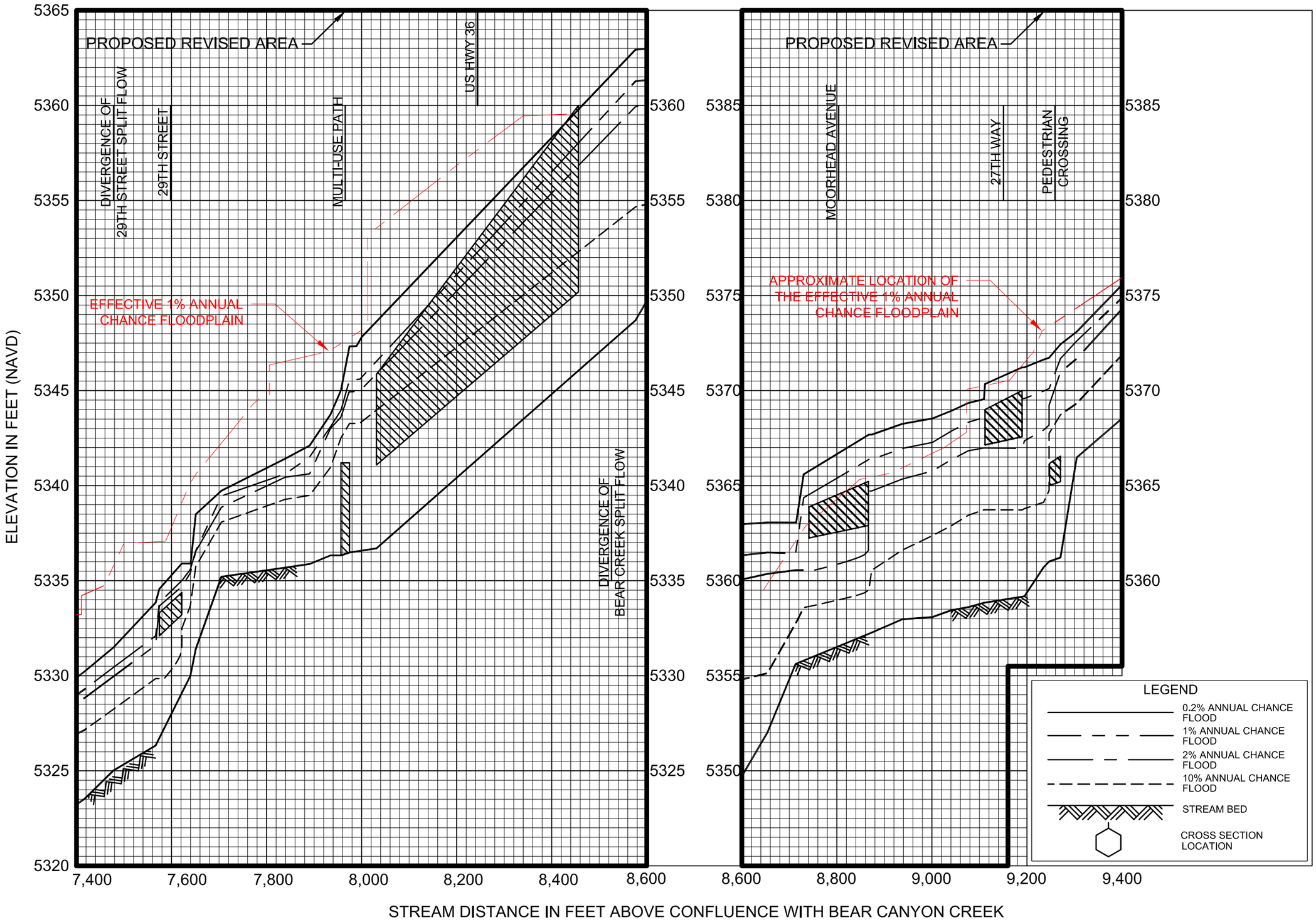


FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

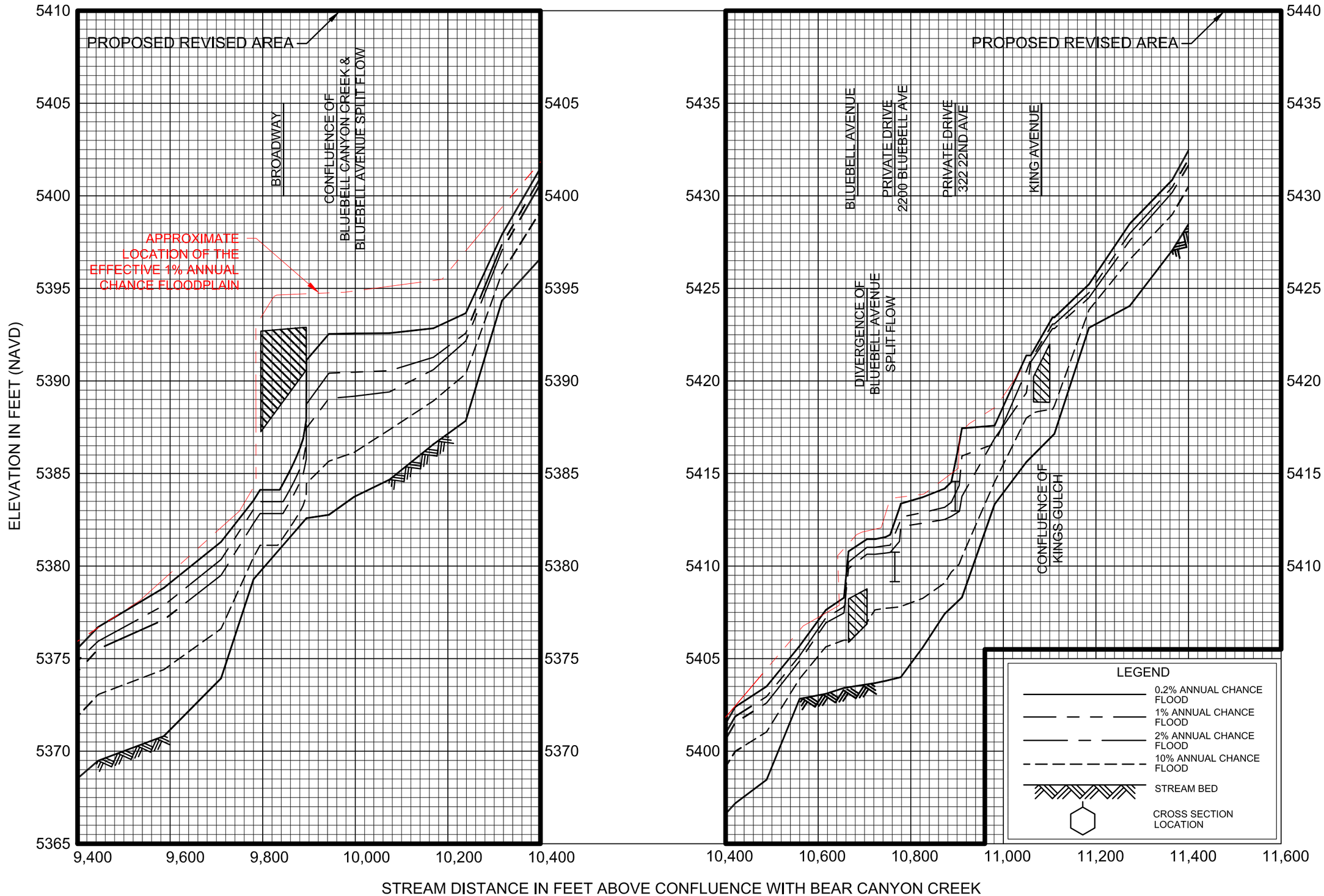


FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

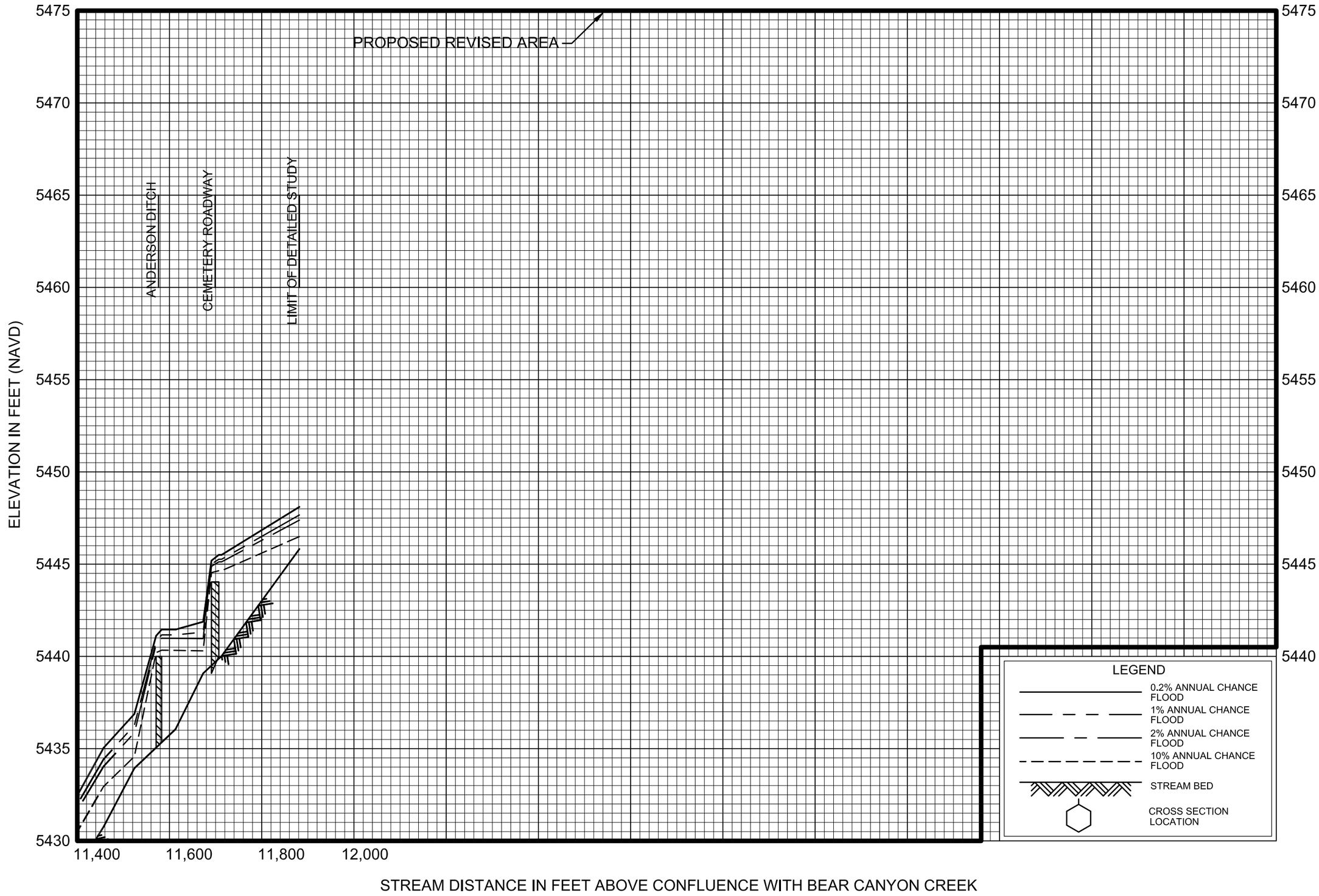


FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

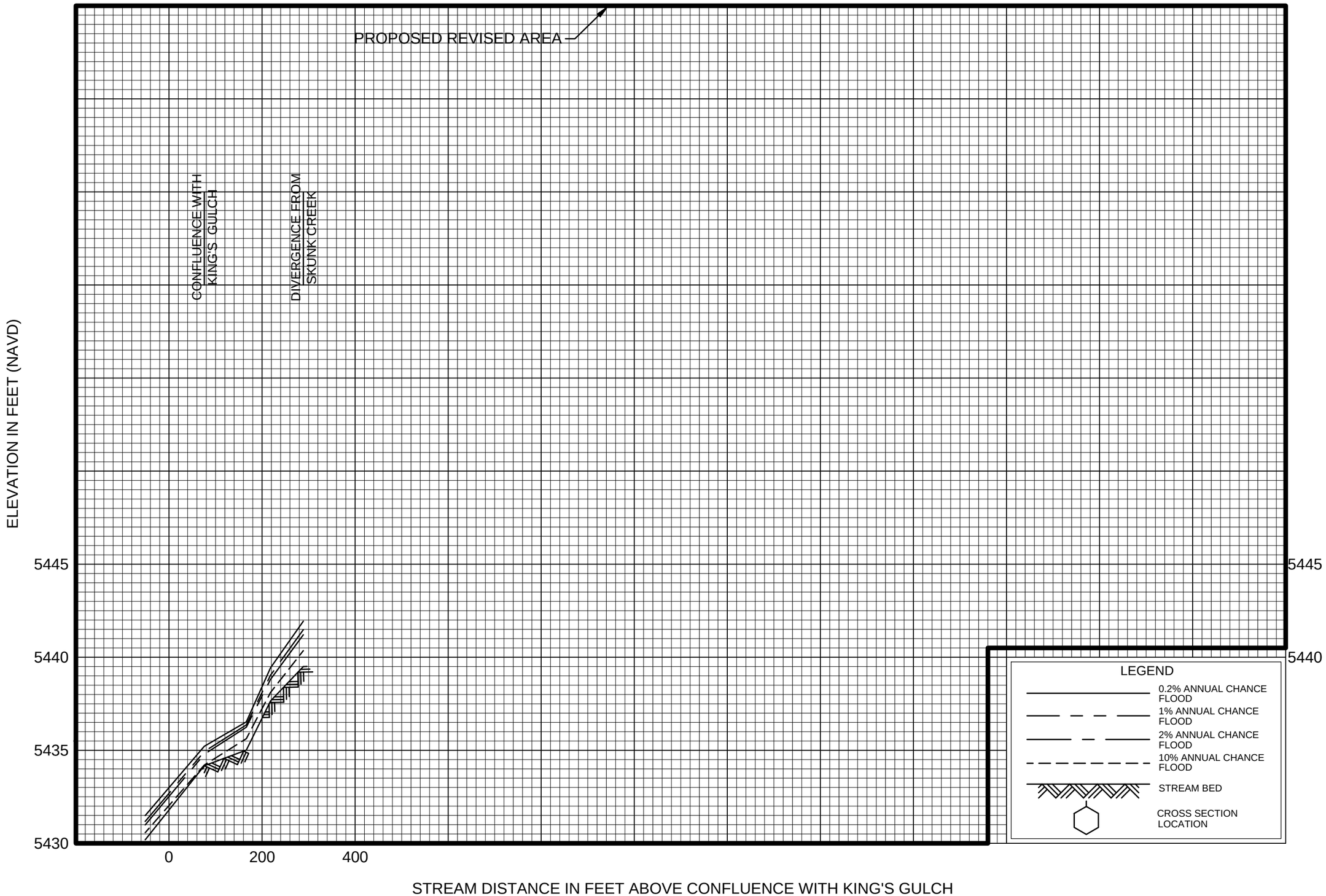


FLOOD PROFILES

SKUNK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS



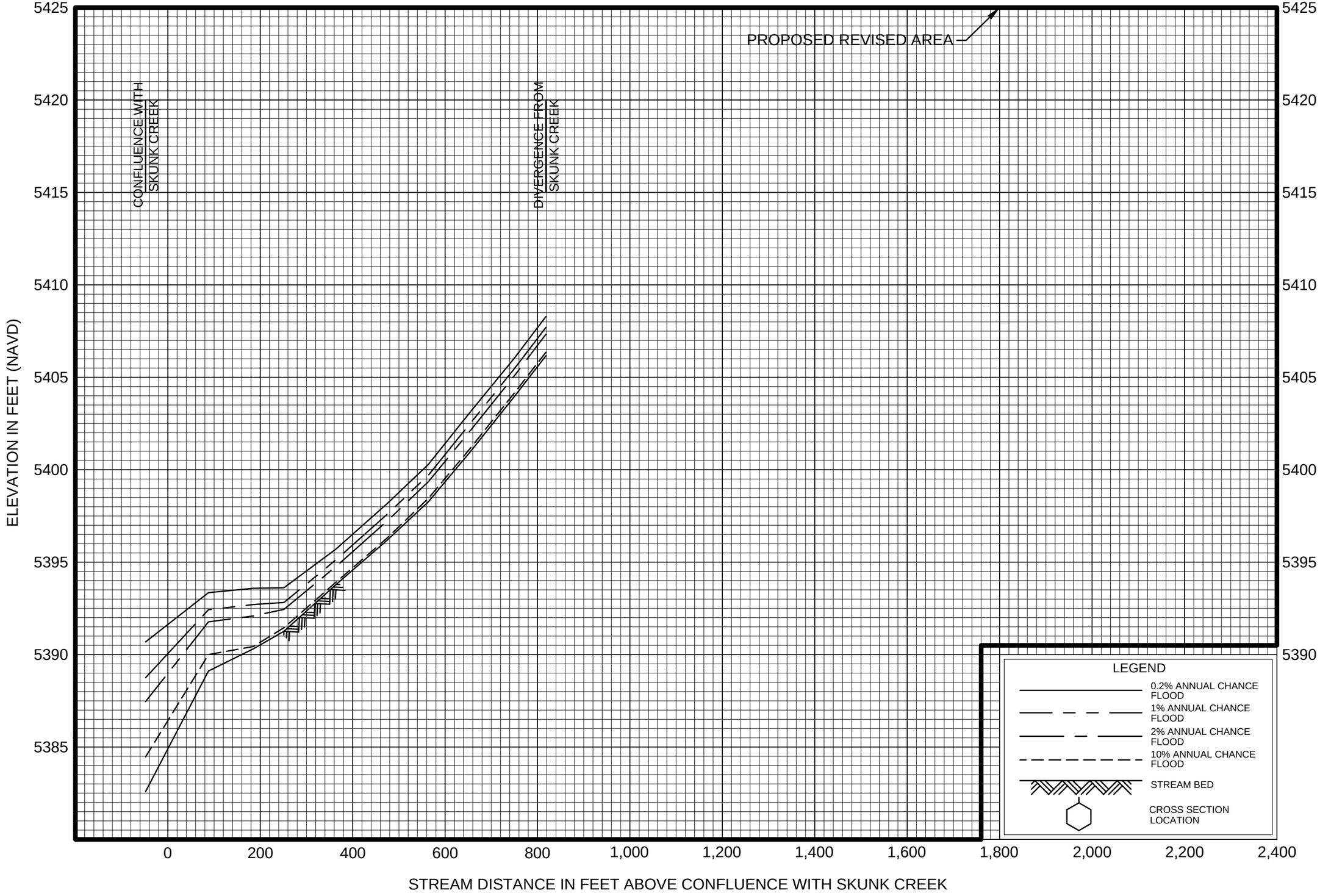
FLOOD PROFILES

SKUNK CREEK - ECHO PLACE SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



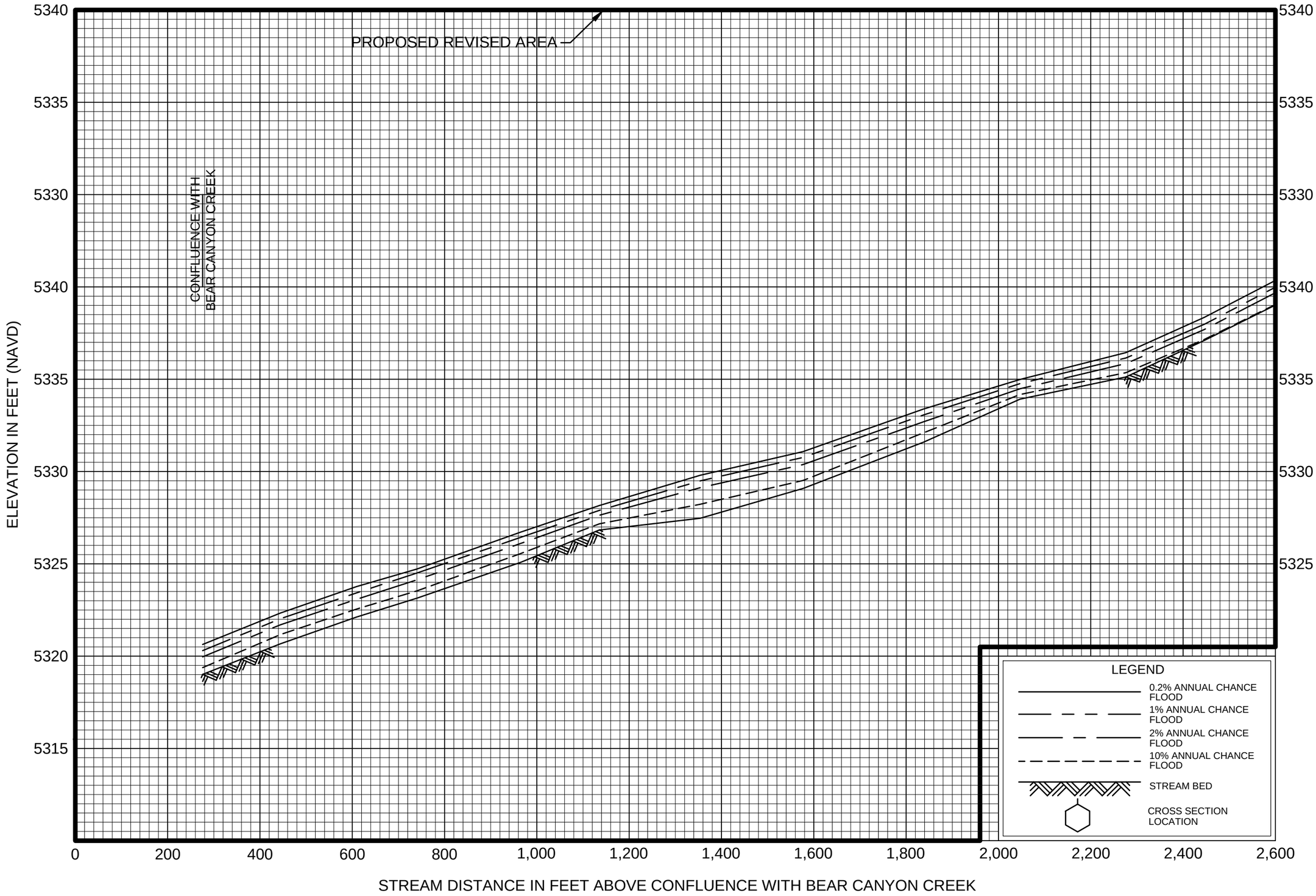
FLOOD PROFILES

SKUNK CREEK - BLUE AVE SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



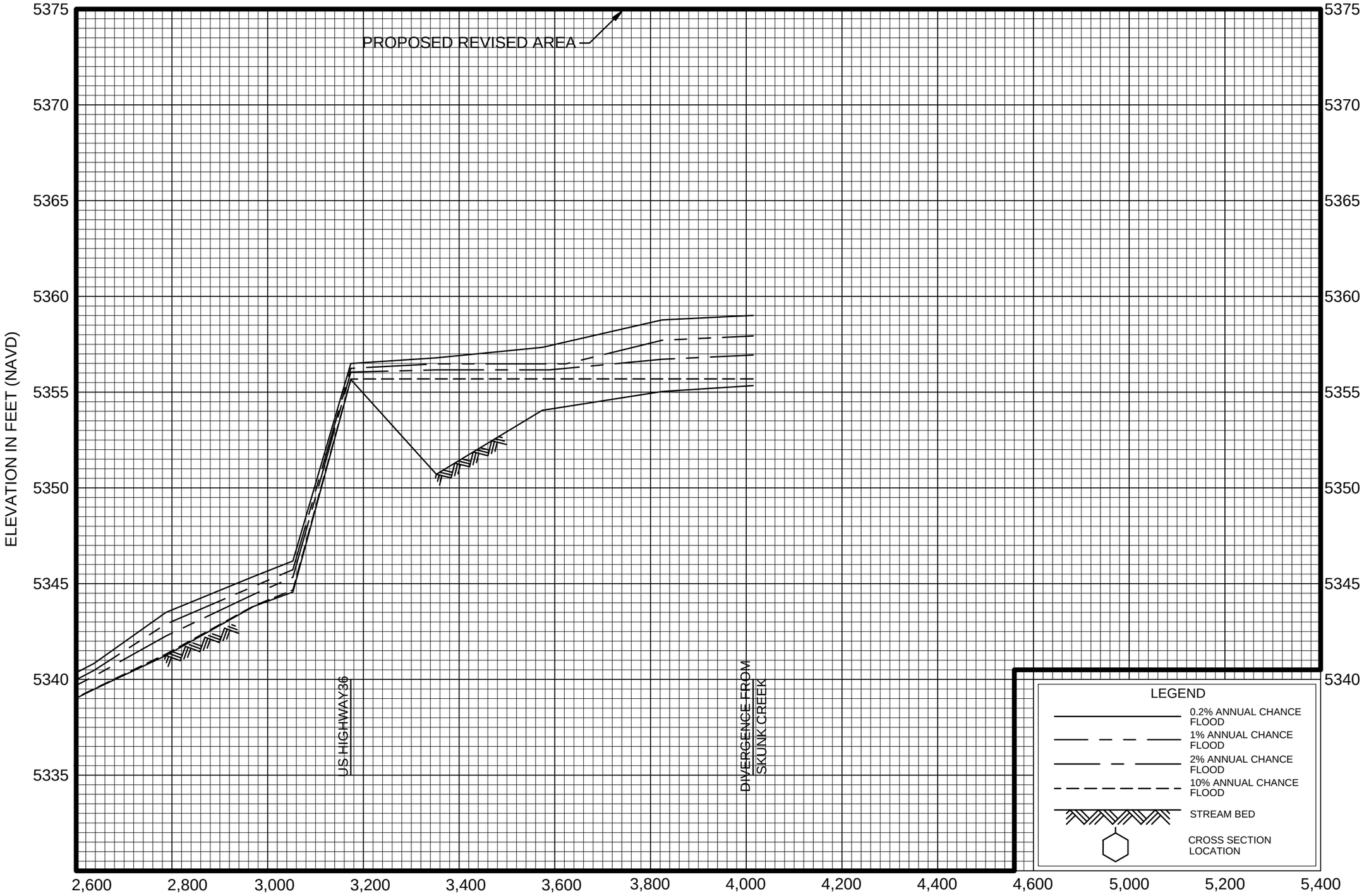
FLOOD PROFILES

SKUNK CREEK - BEAR CREEK SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



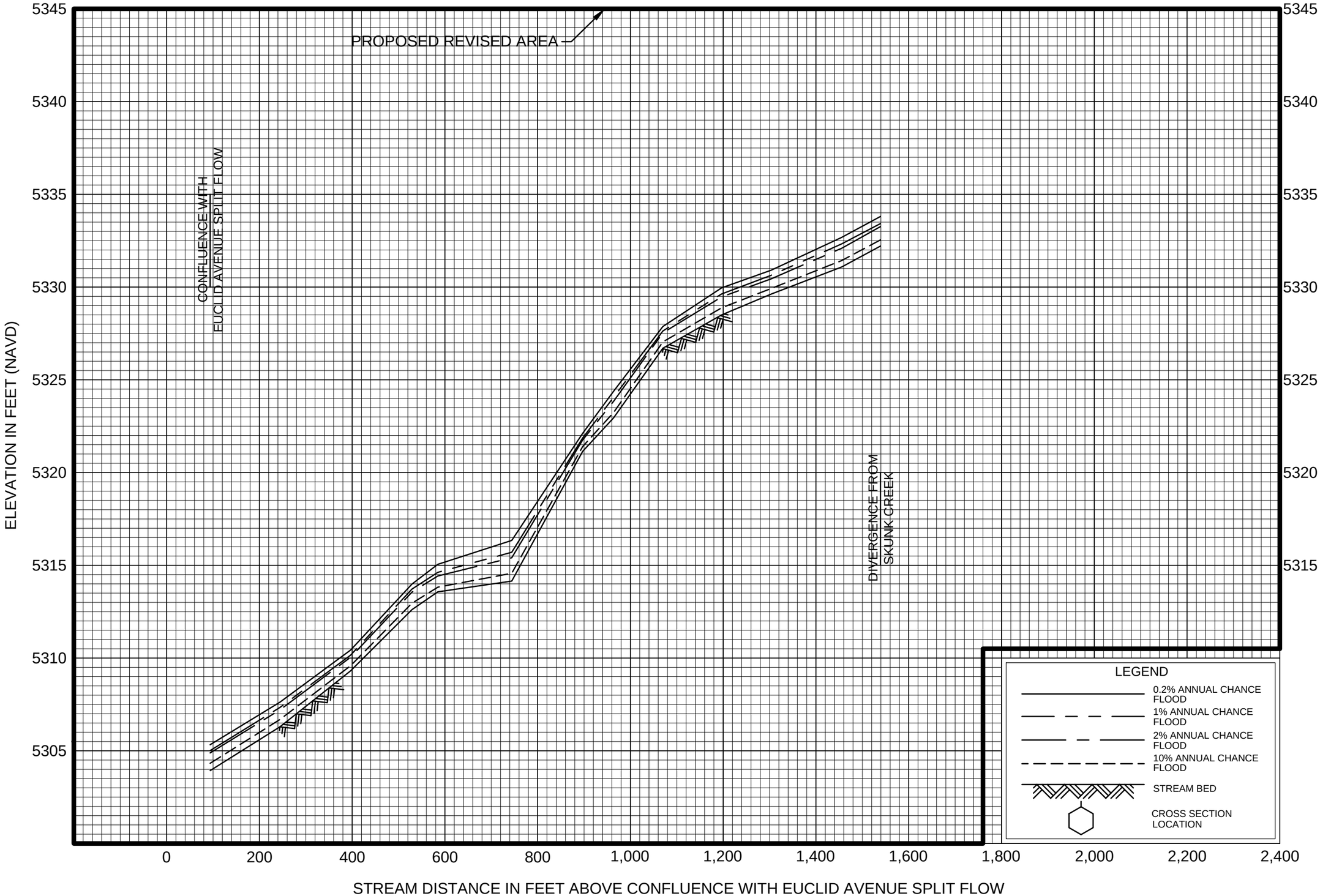
FLOOD PROFILES

SKUNK CREEK - BEAR CREEK SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

002P



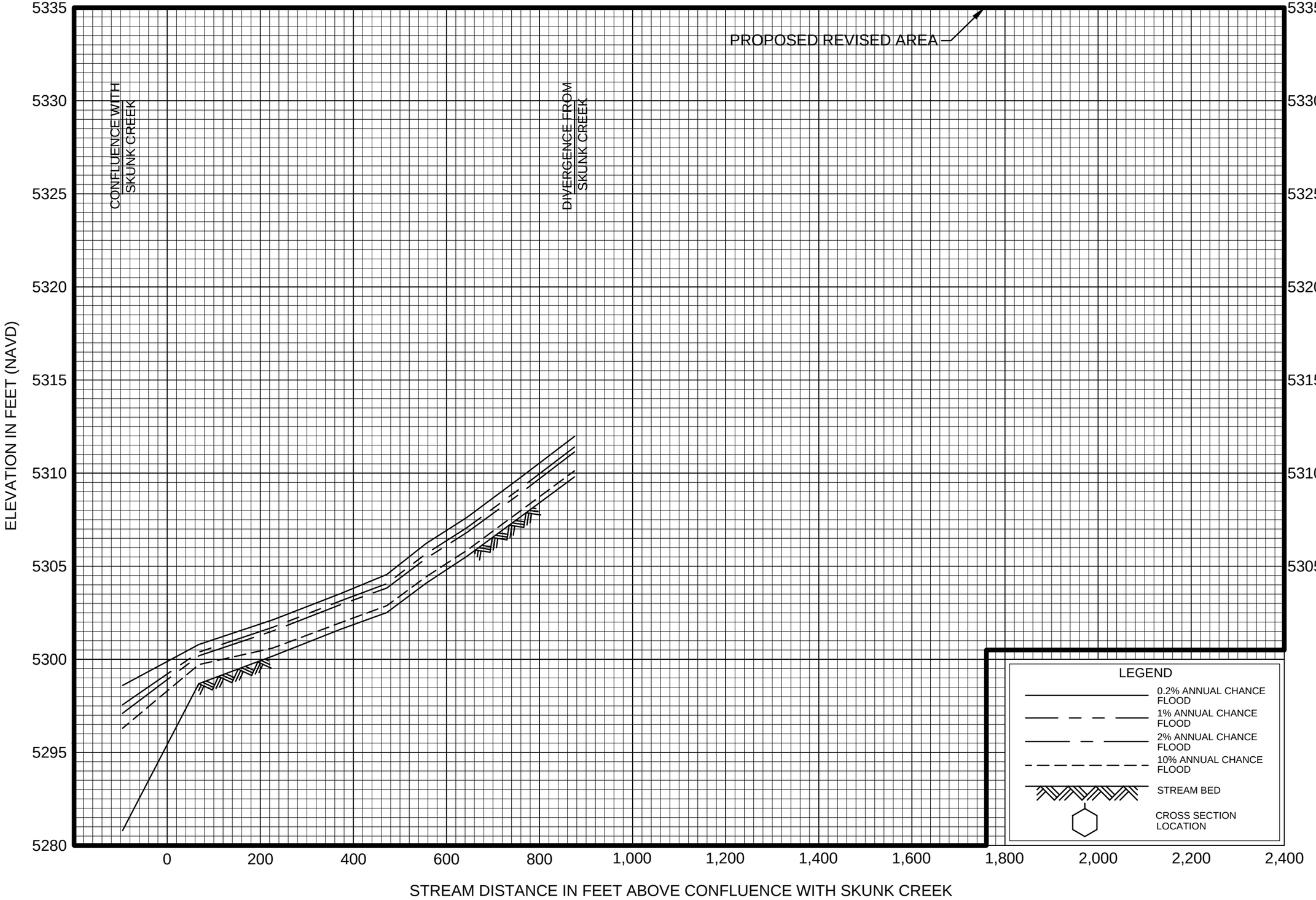
FLOOD PROFILES

SKUNK CREEK - 29TH STREET SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



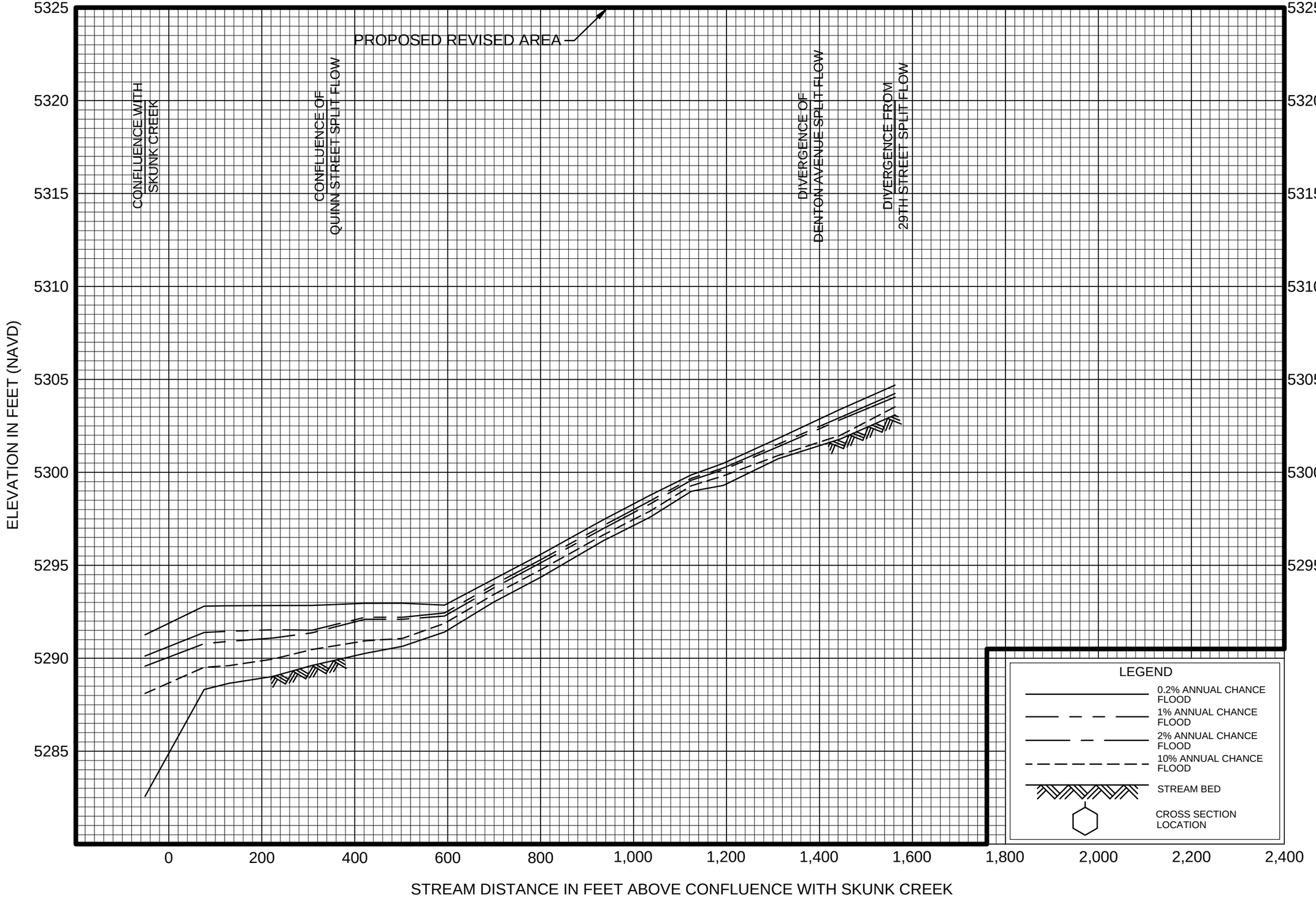
FLOOD PROFILES

SKUNK CREEK - 30TH STREET SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



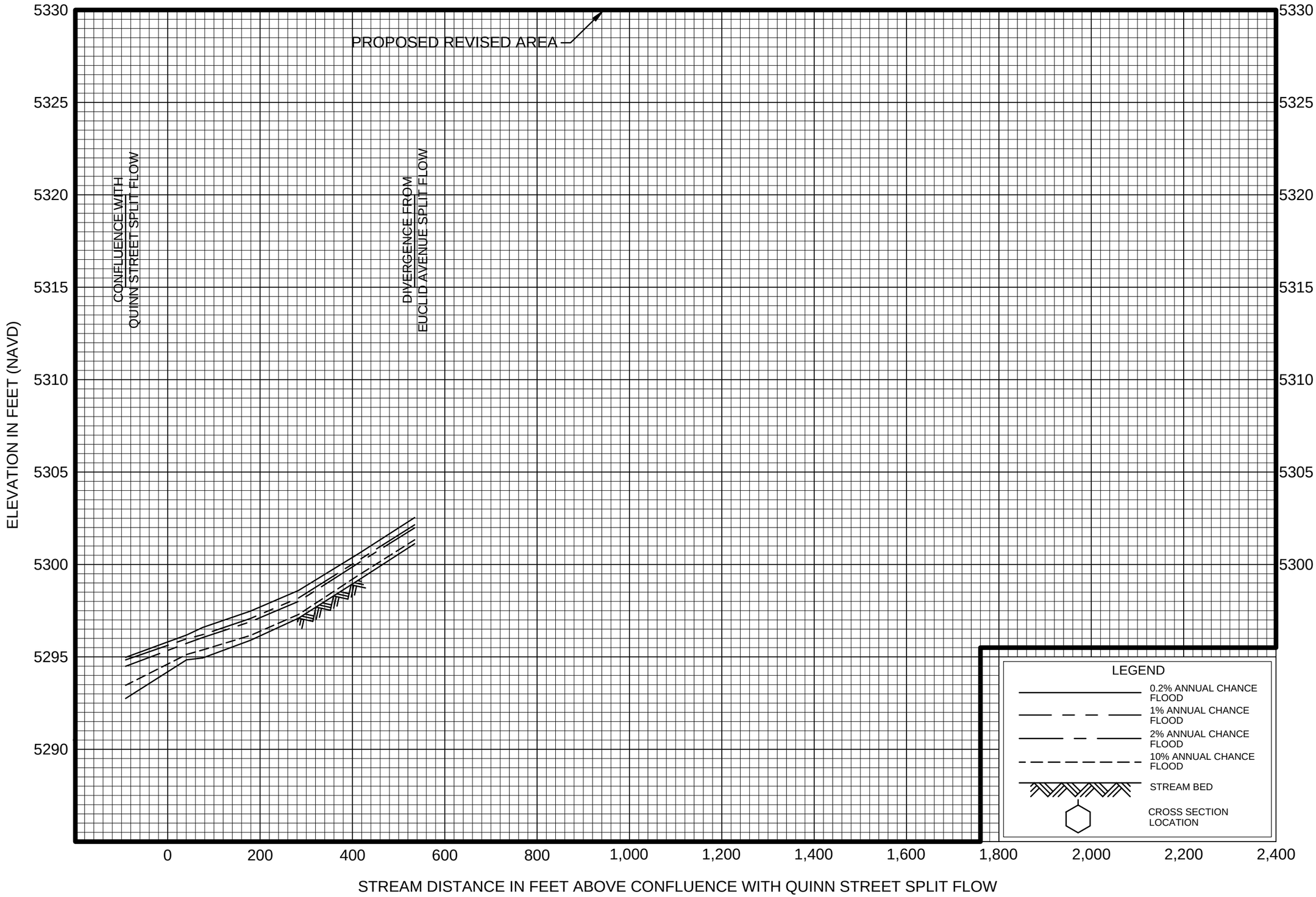
FLOOD PROFILES

SKUNK CREEK - EUCLID AVENUE SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



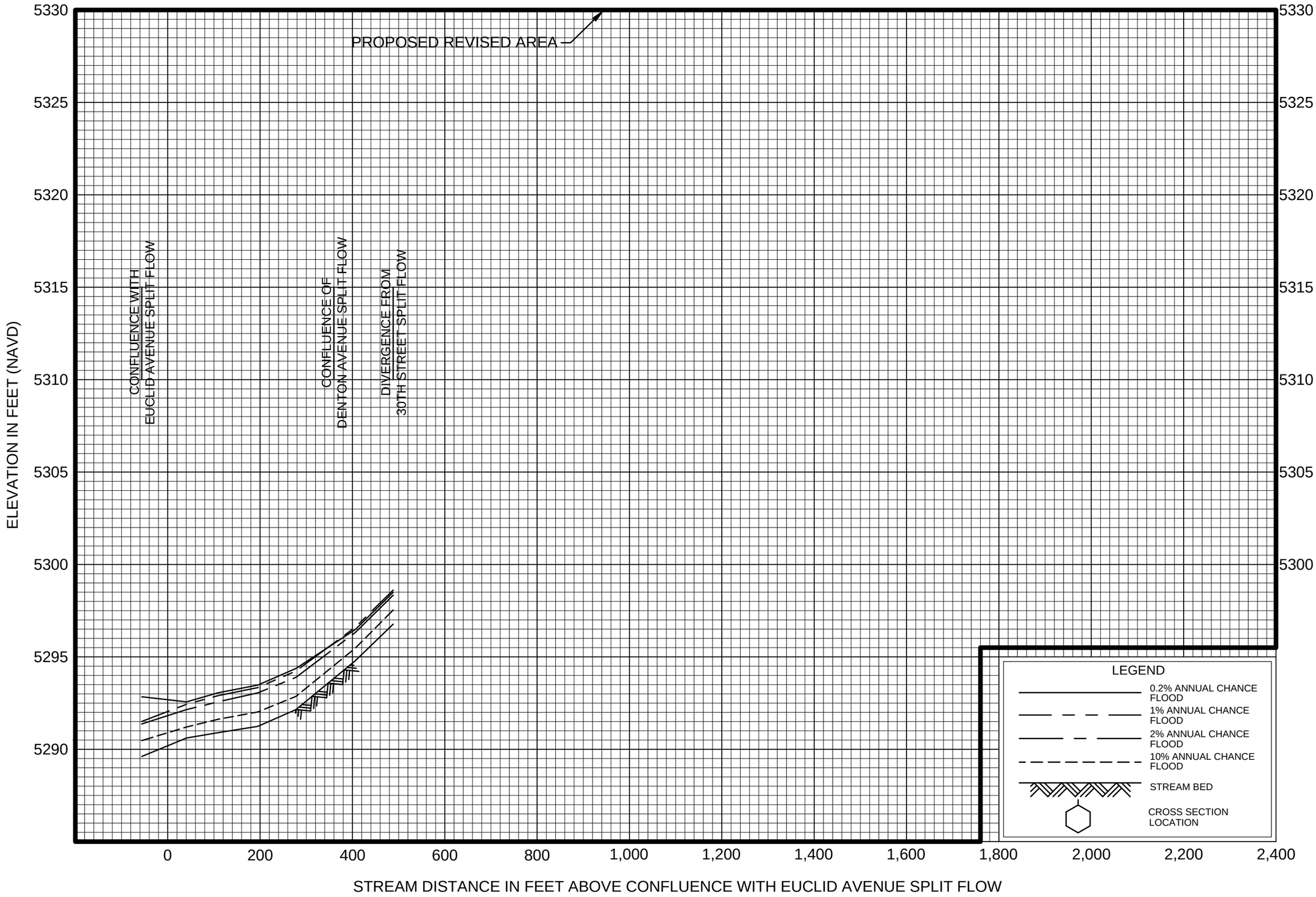
FLOOD PROFILES

SKUNK CREEK - DENTON AVENUE SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P

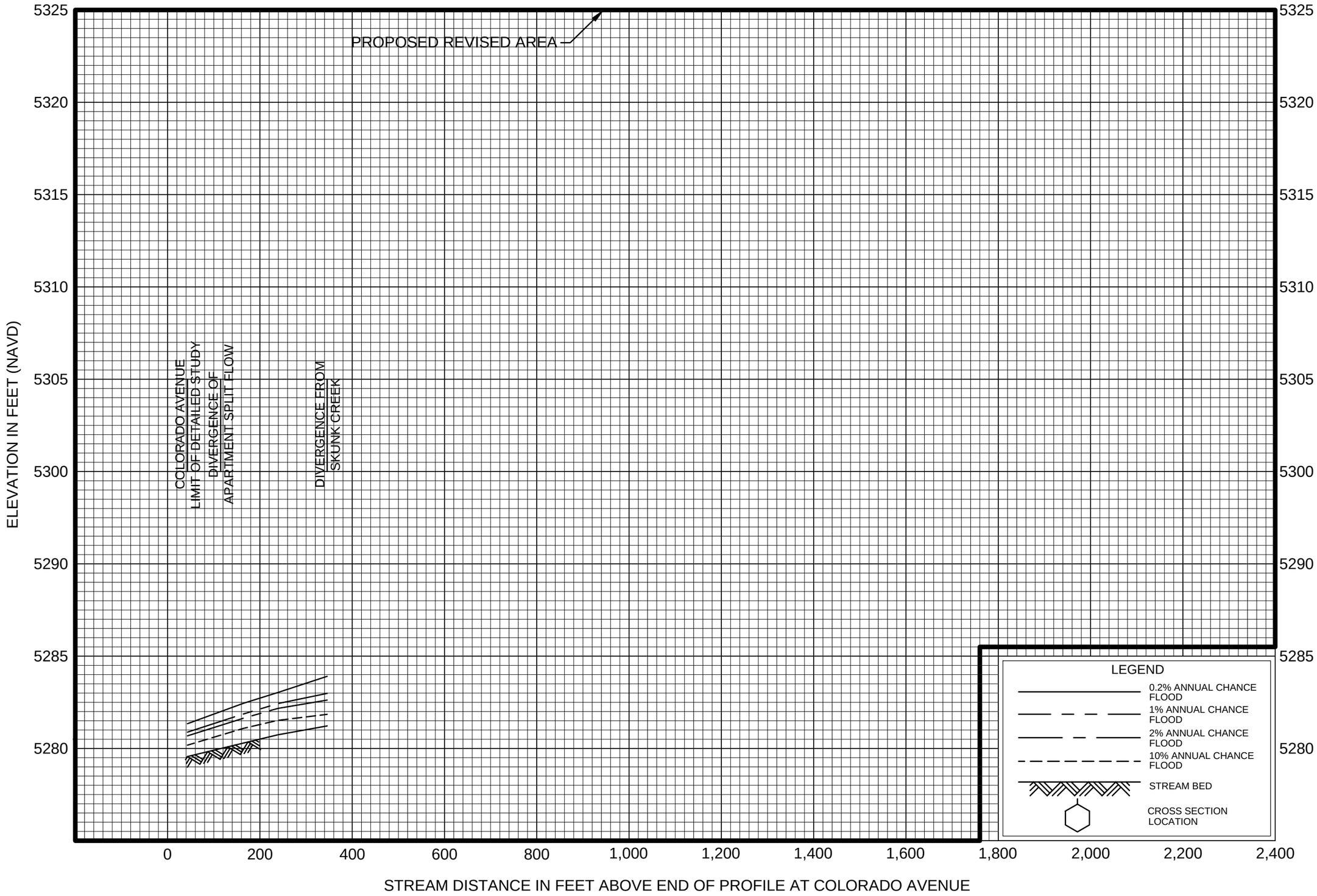


FLOOD PROFILES

SKUNK CREEK - QUINN STREET SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

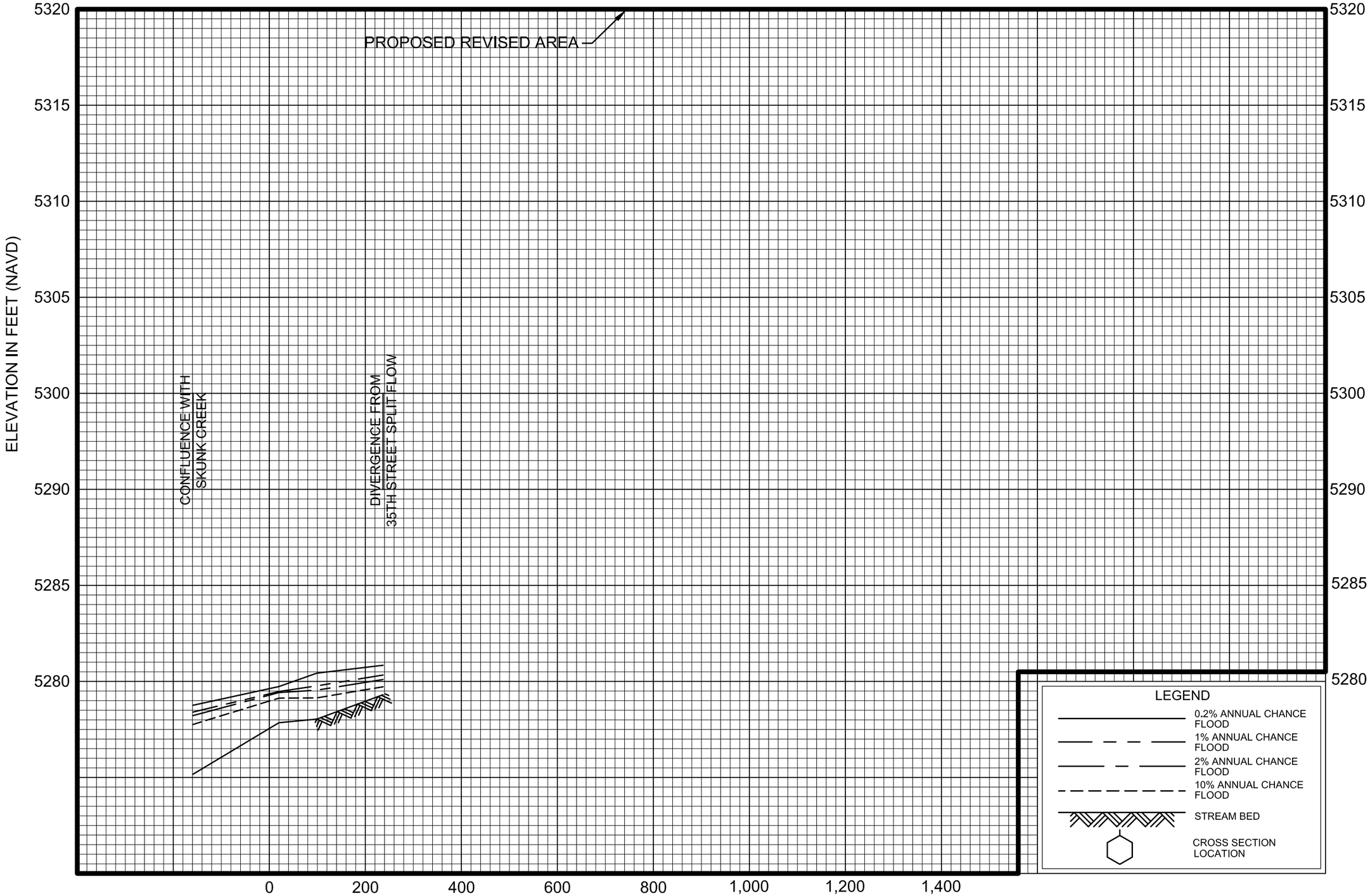


FLOOD PROFILES

SKUNK CREEK - 35TH STREET SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS



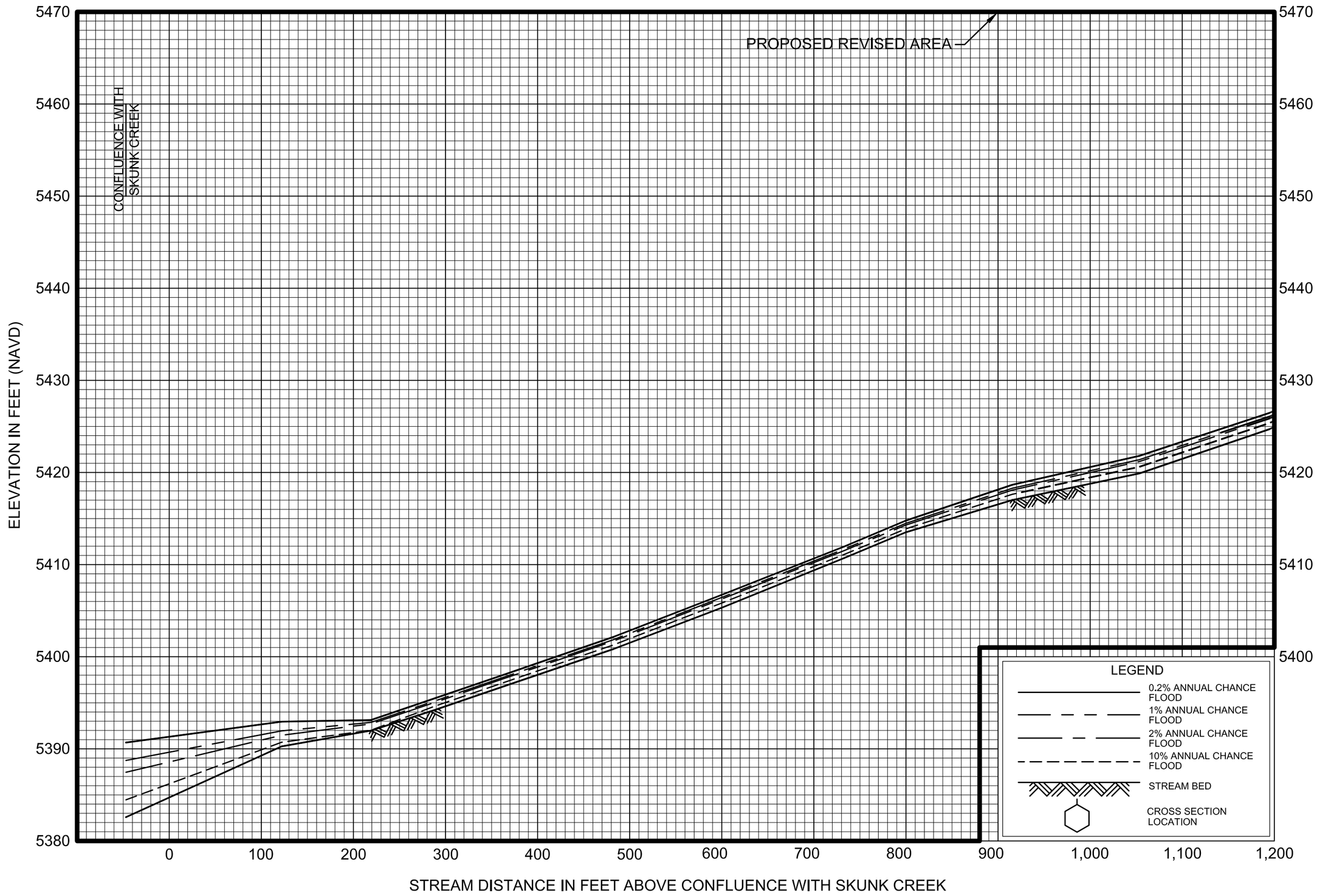
FLOOD PROFILES

SKUNK CREEK - APARTMENT SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



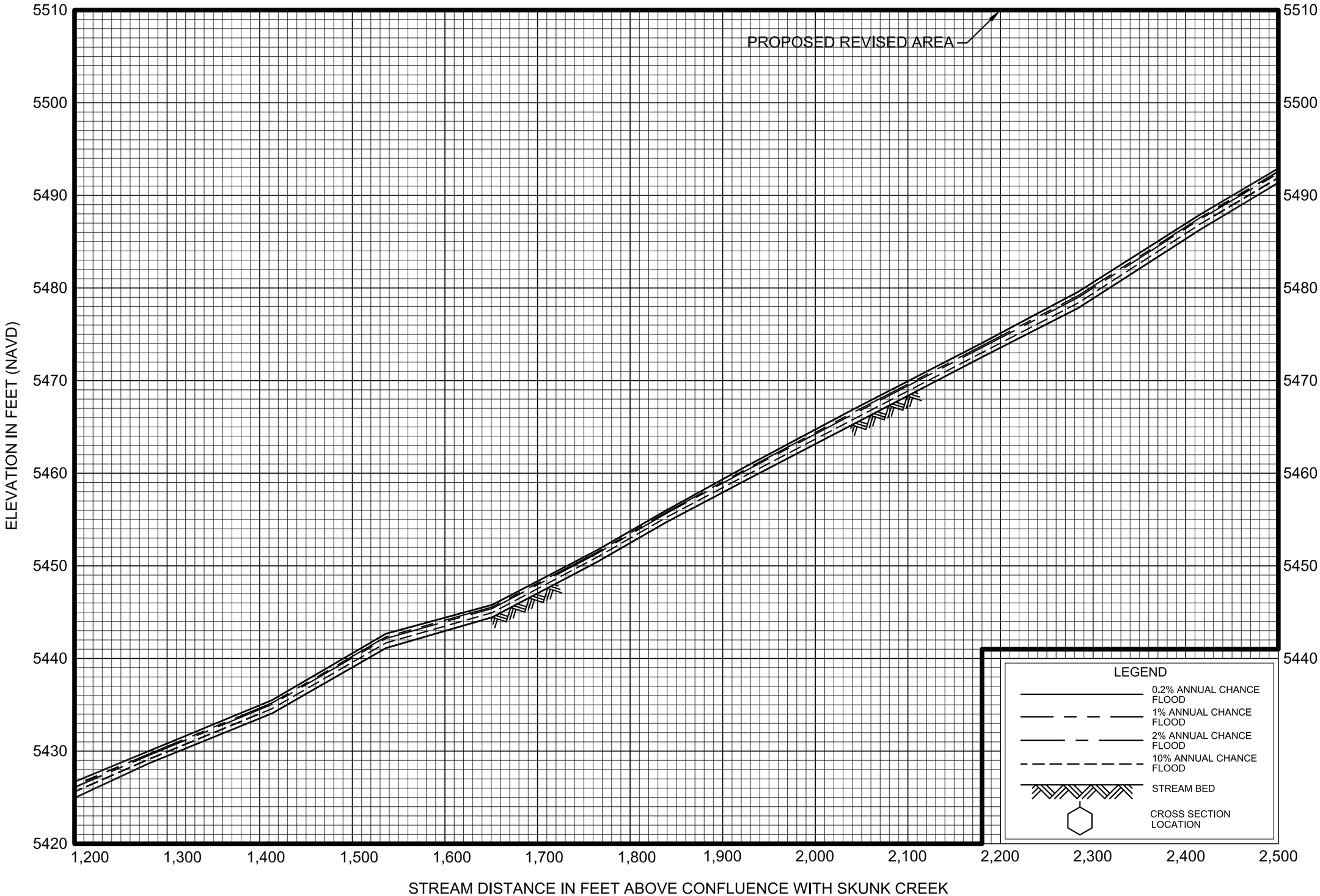
FLOOD PROFILES

BLUEBELL CANYON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



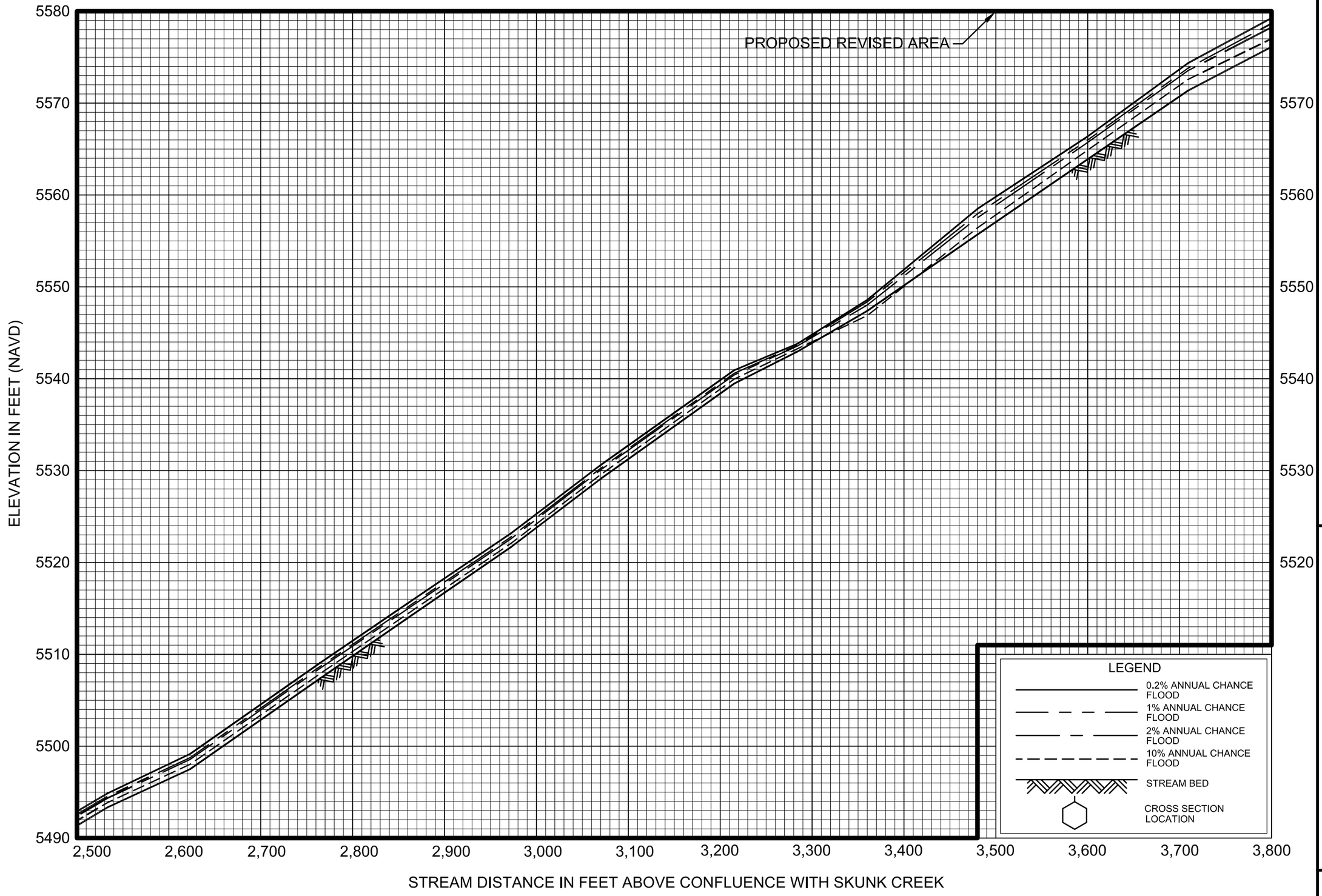
FLOOD PROFILES

BLUEBELL CANYON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

002P

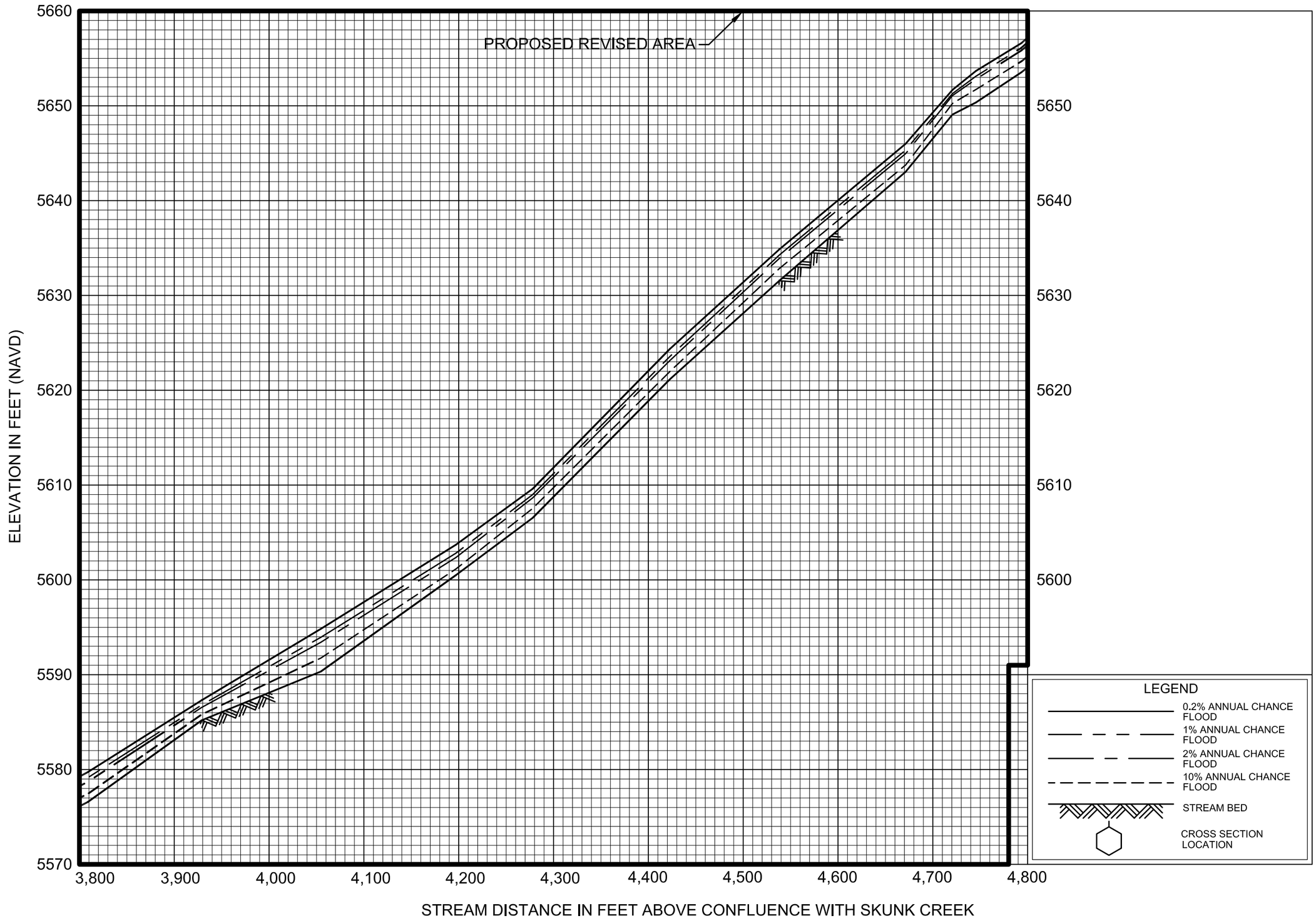


FLOOD PROFILES

BLUEBELL CANYON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

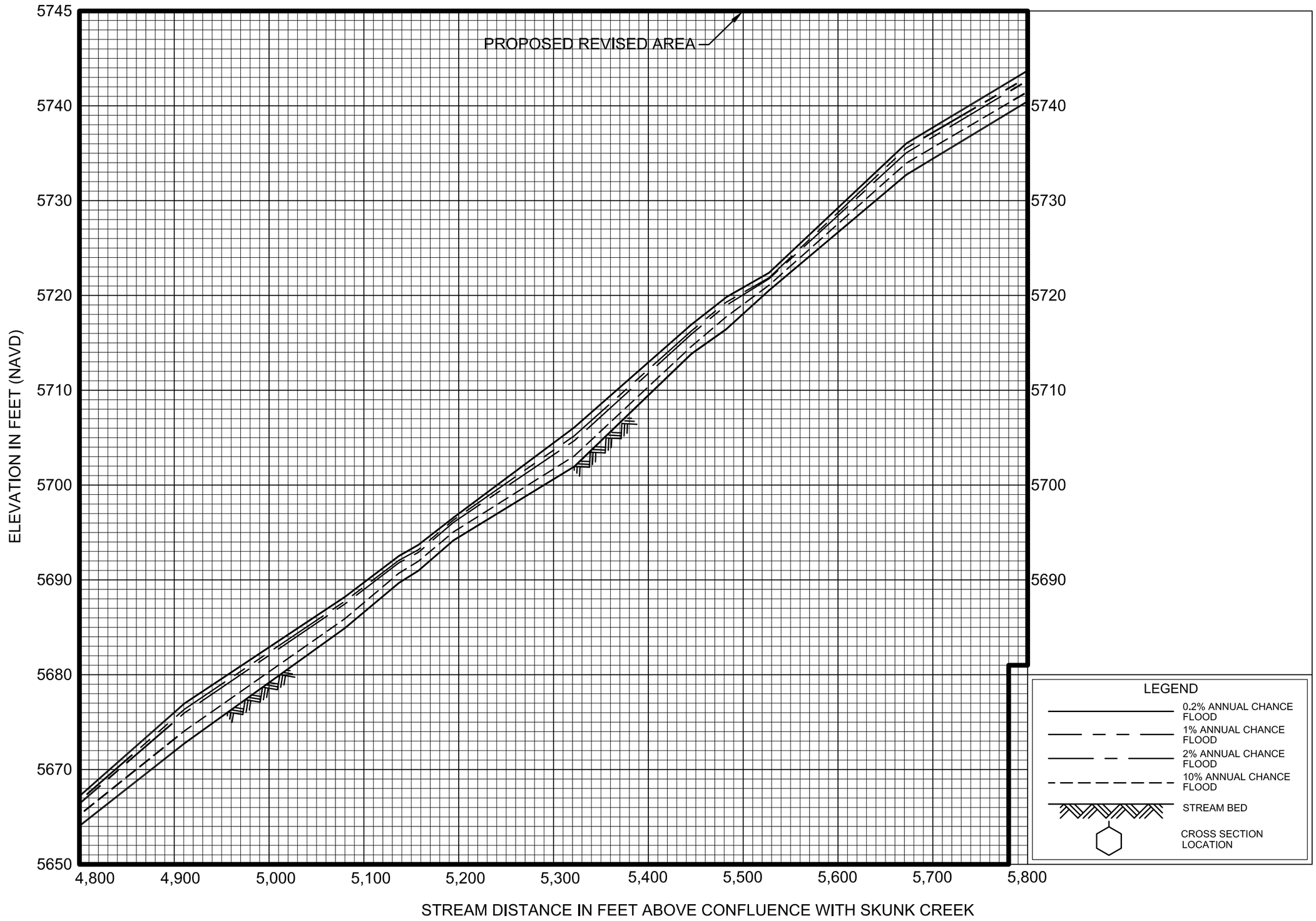


FLOOD PROFILES

BLUEBELL CANYON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

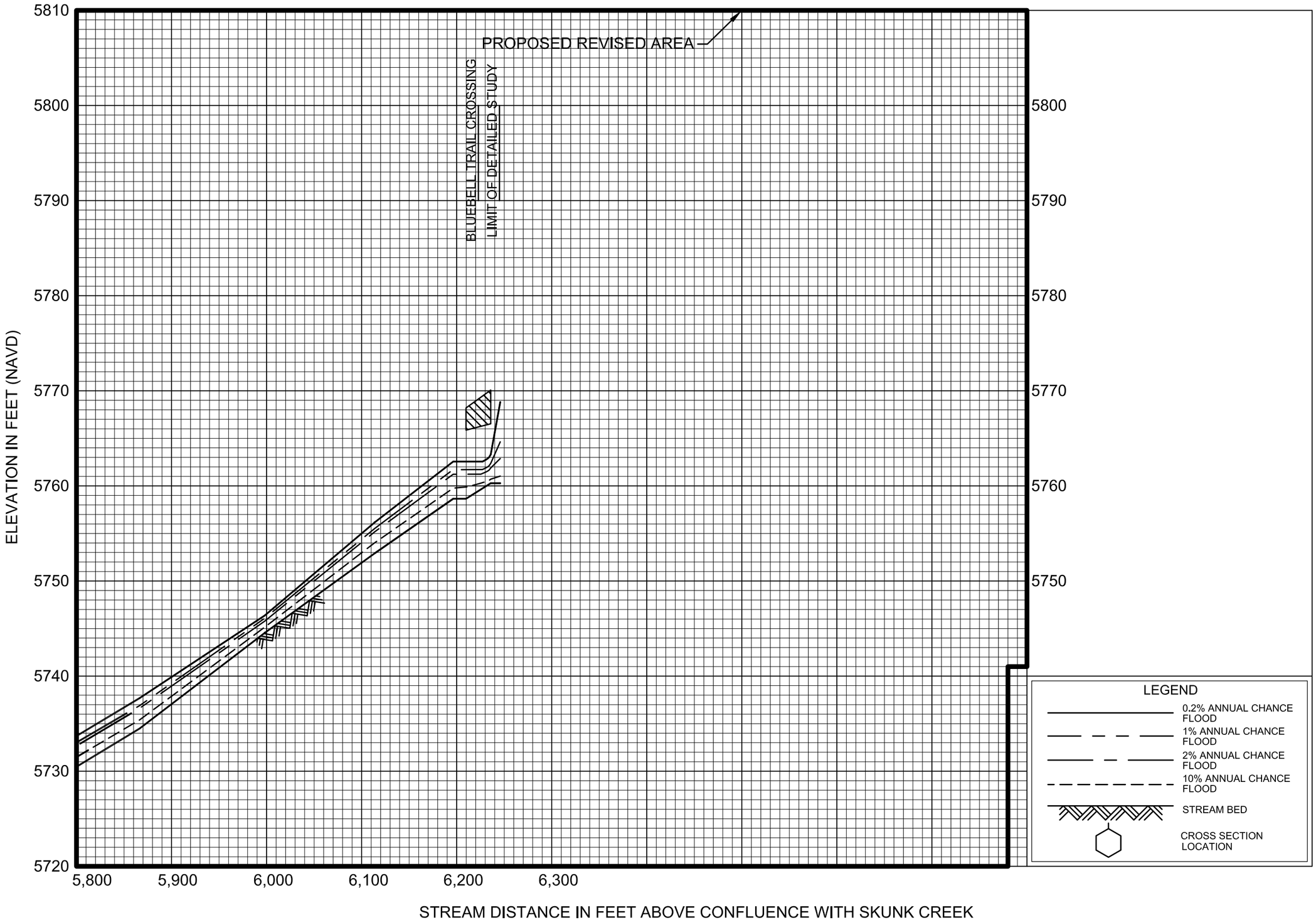


FLOOD PROFILES

BLUEBELL CANYON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS



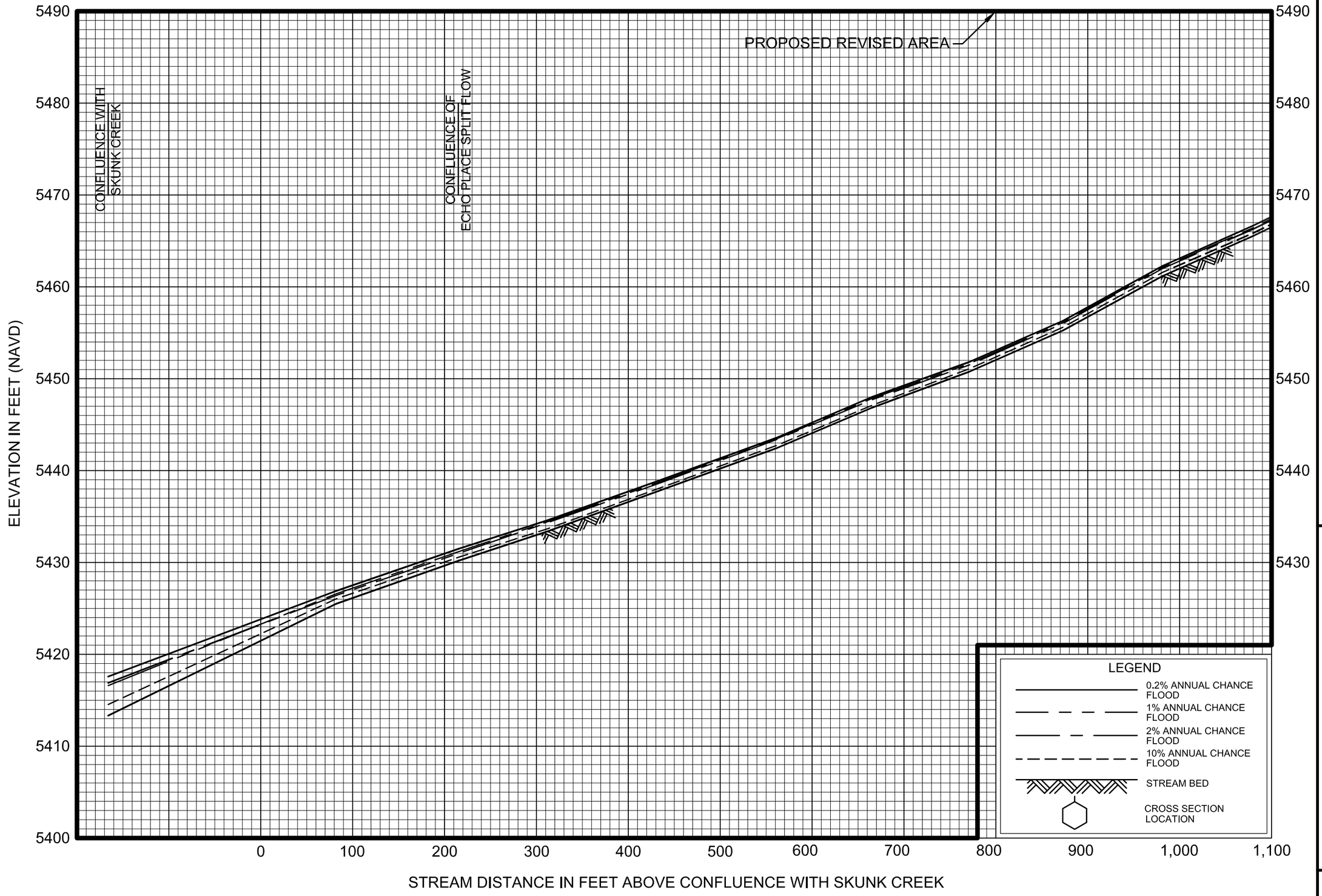
FLOOD PROFILES

BLUEBELL CANYON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

006P



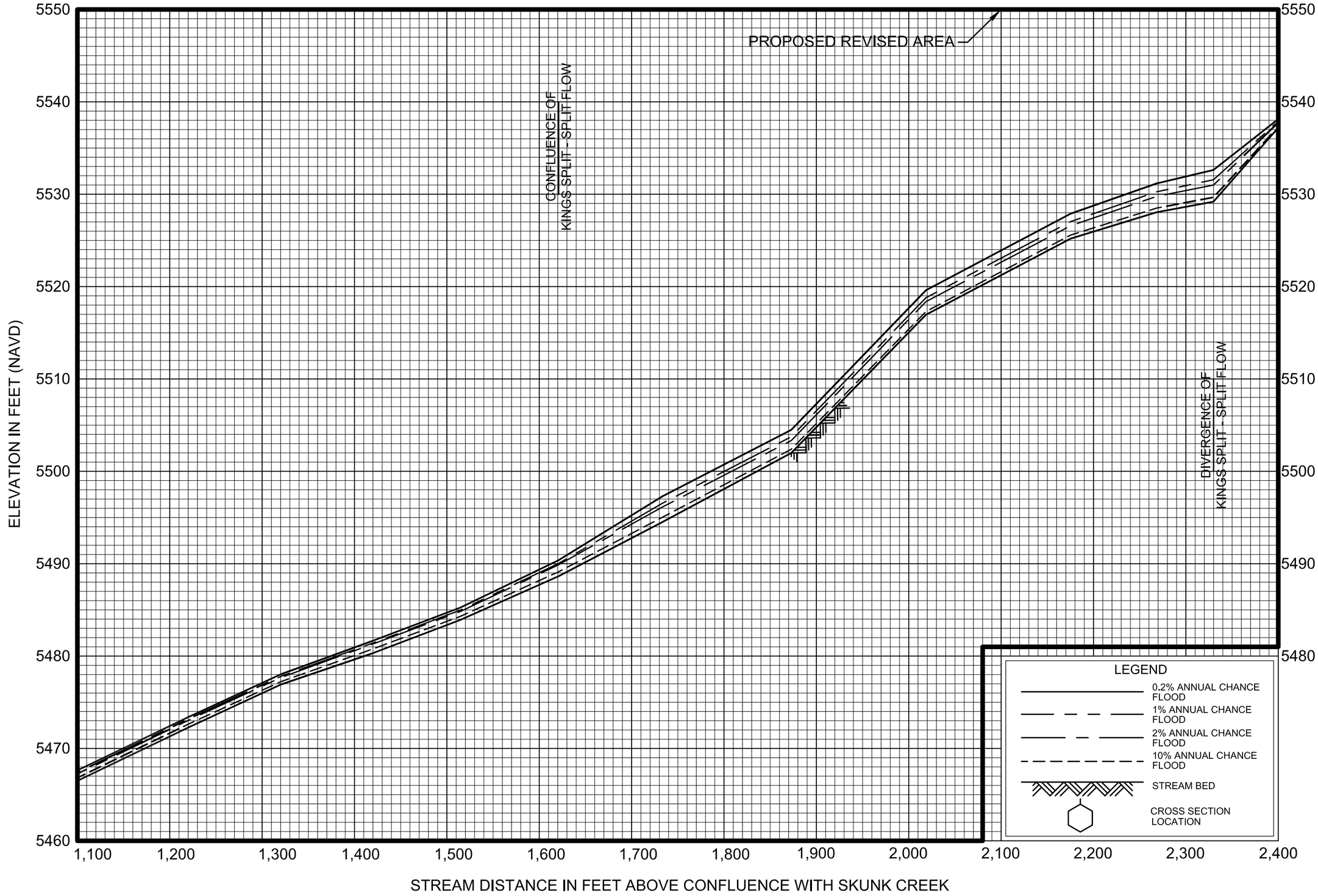
FLOOD PROFILES

KINGS GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



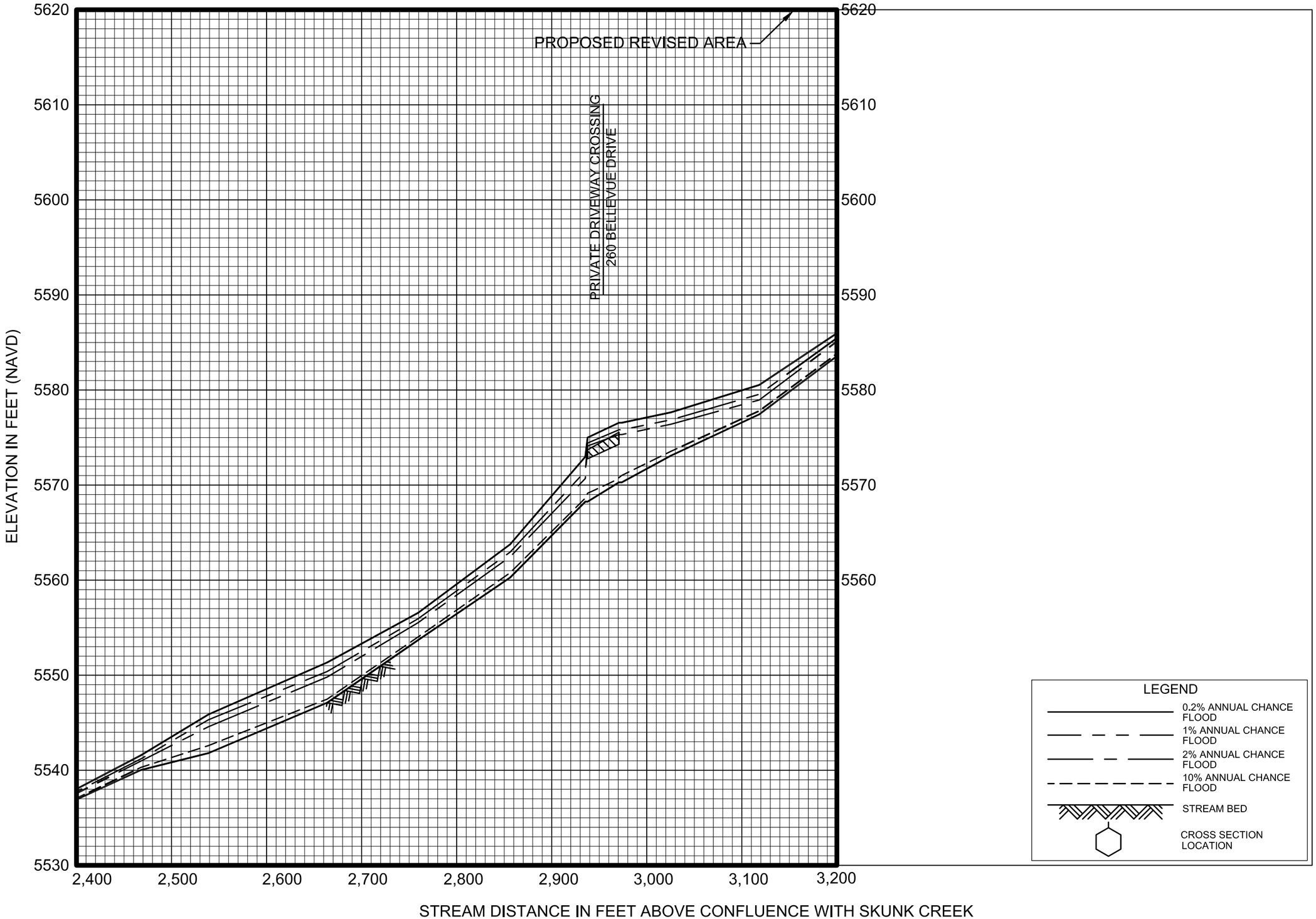
FLOOD PROFILES

KINGS GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

002P

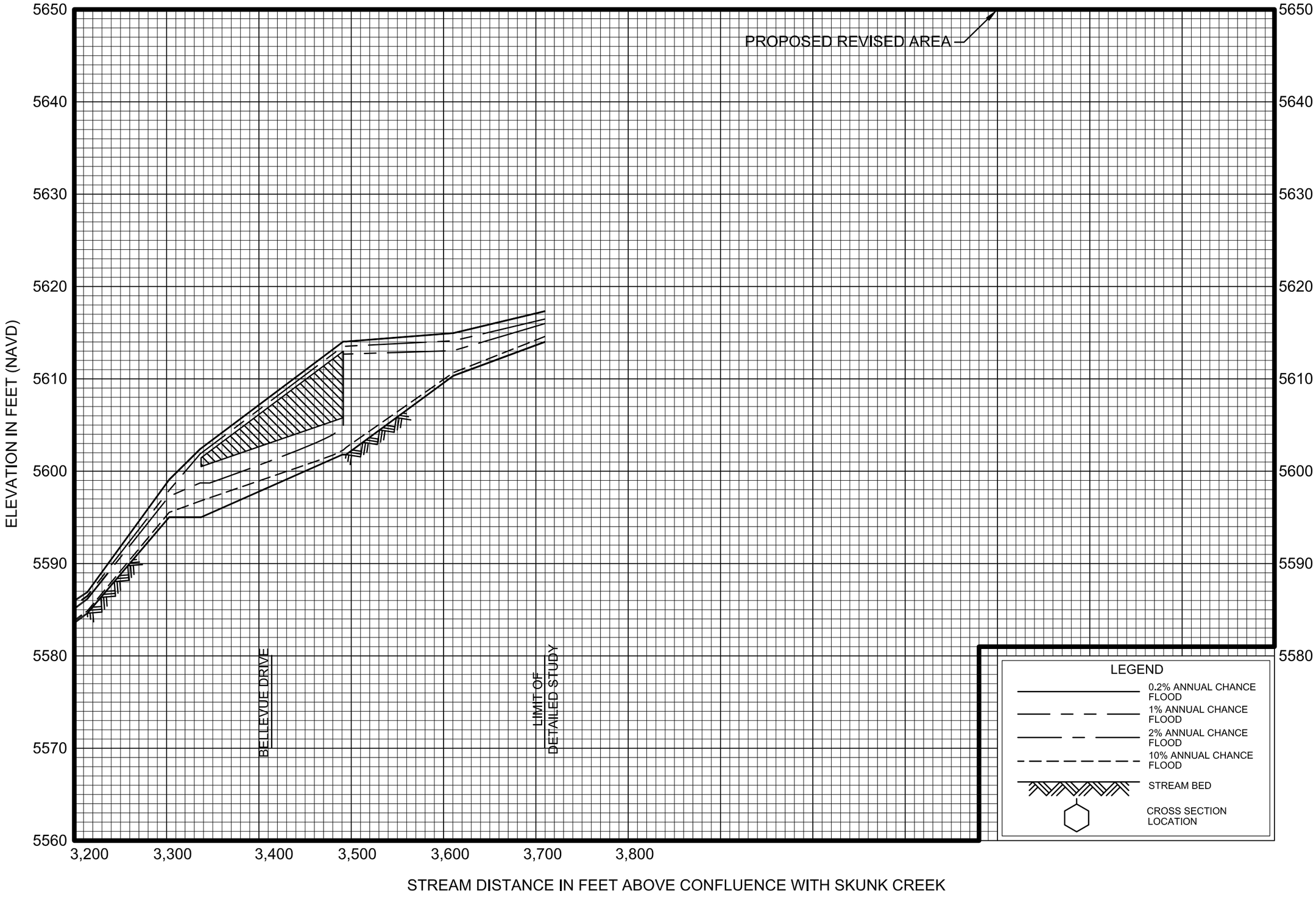


FLOOD PROFILES

KINGS GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS



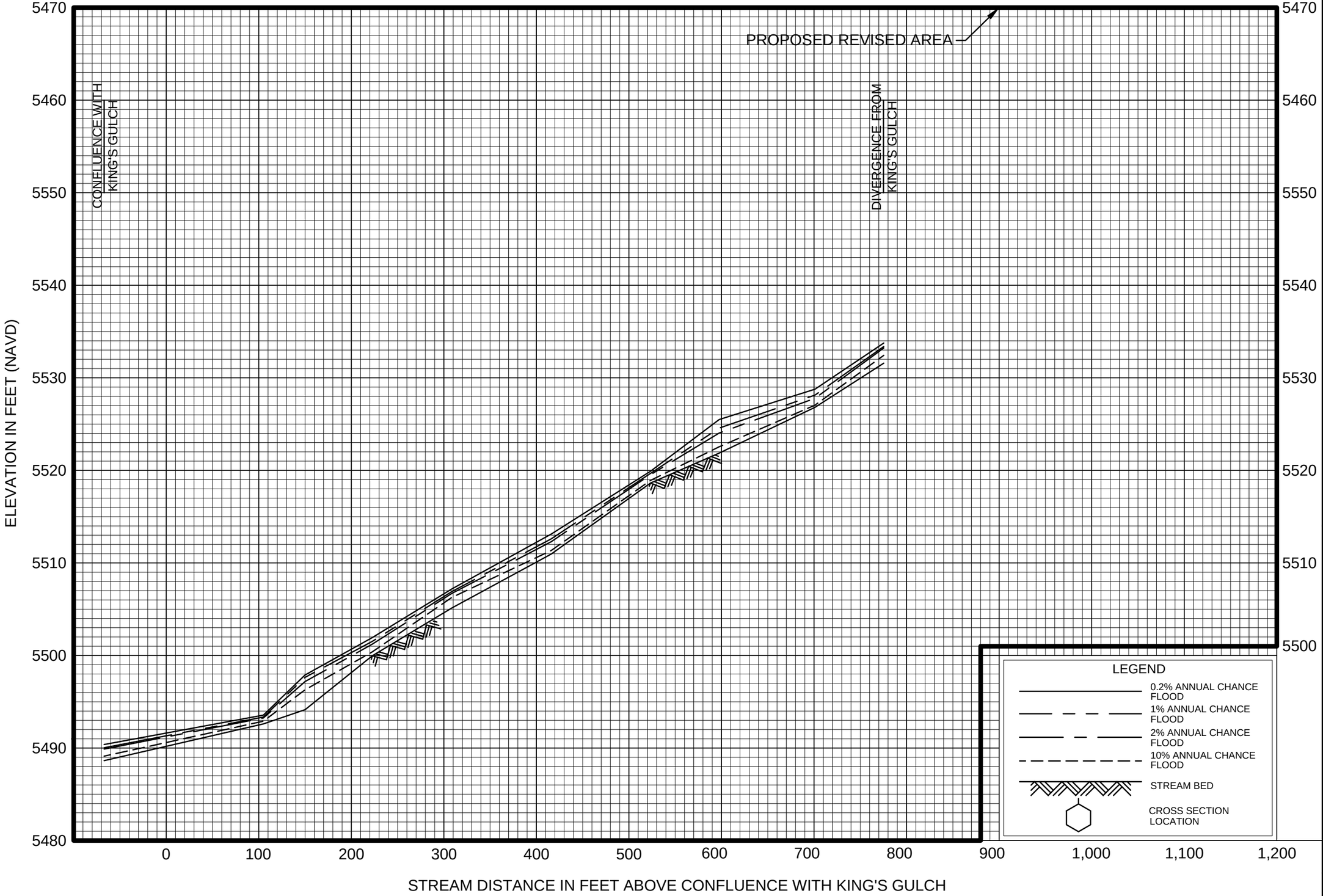
FLOOD PROFILES

KINGS GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

004P



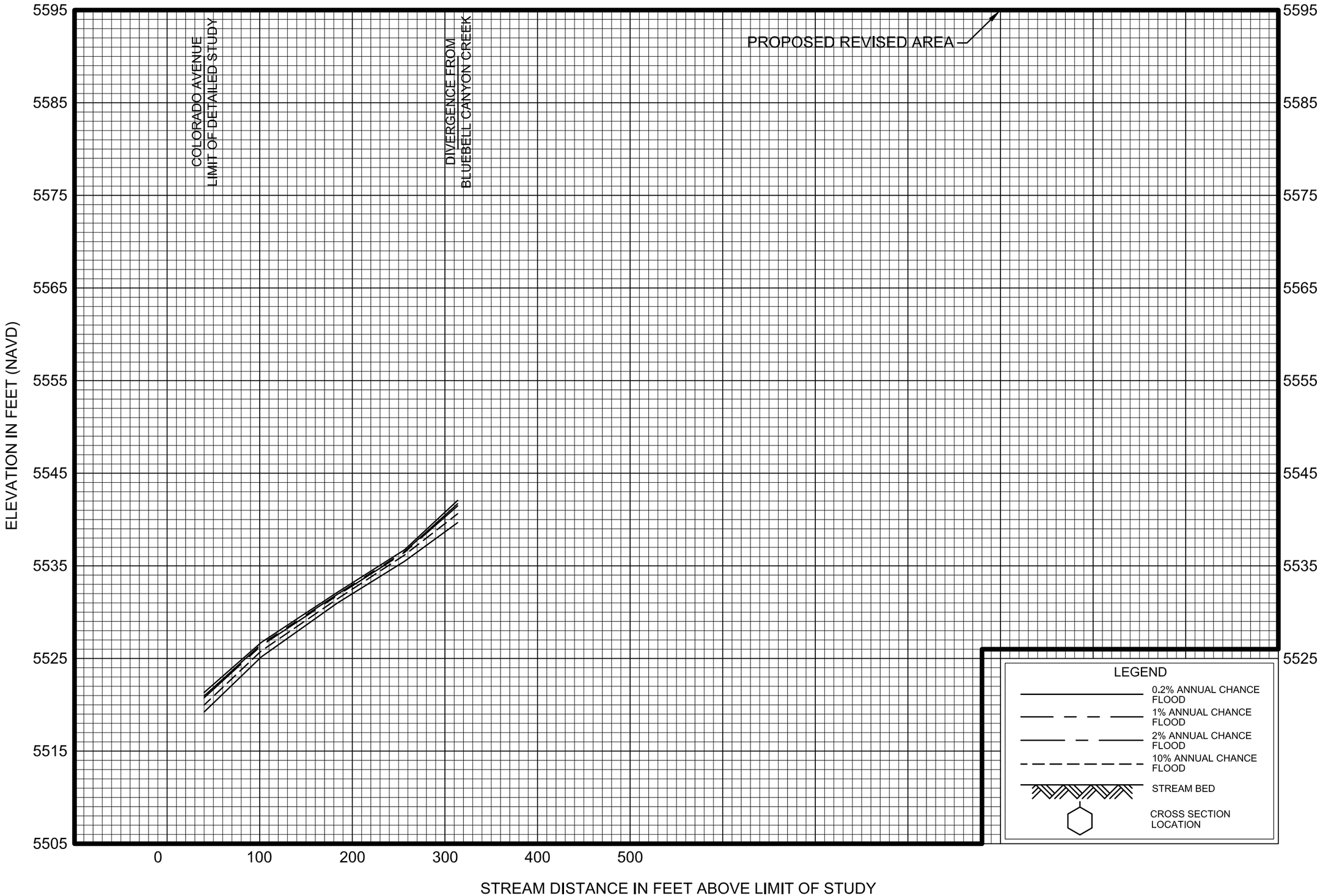
FLOOD PROFILES

KINGS GULCH - KINGS SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



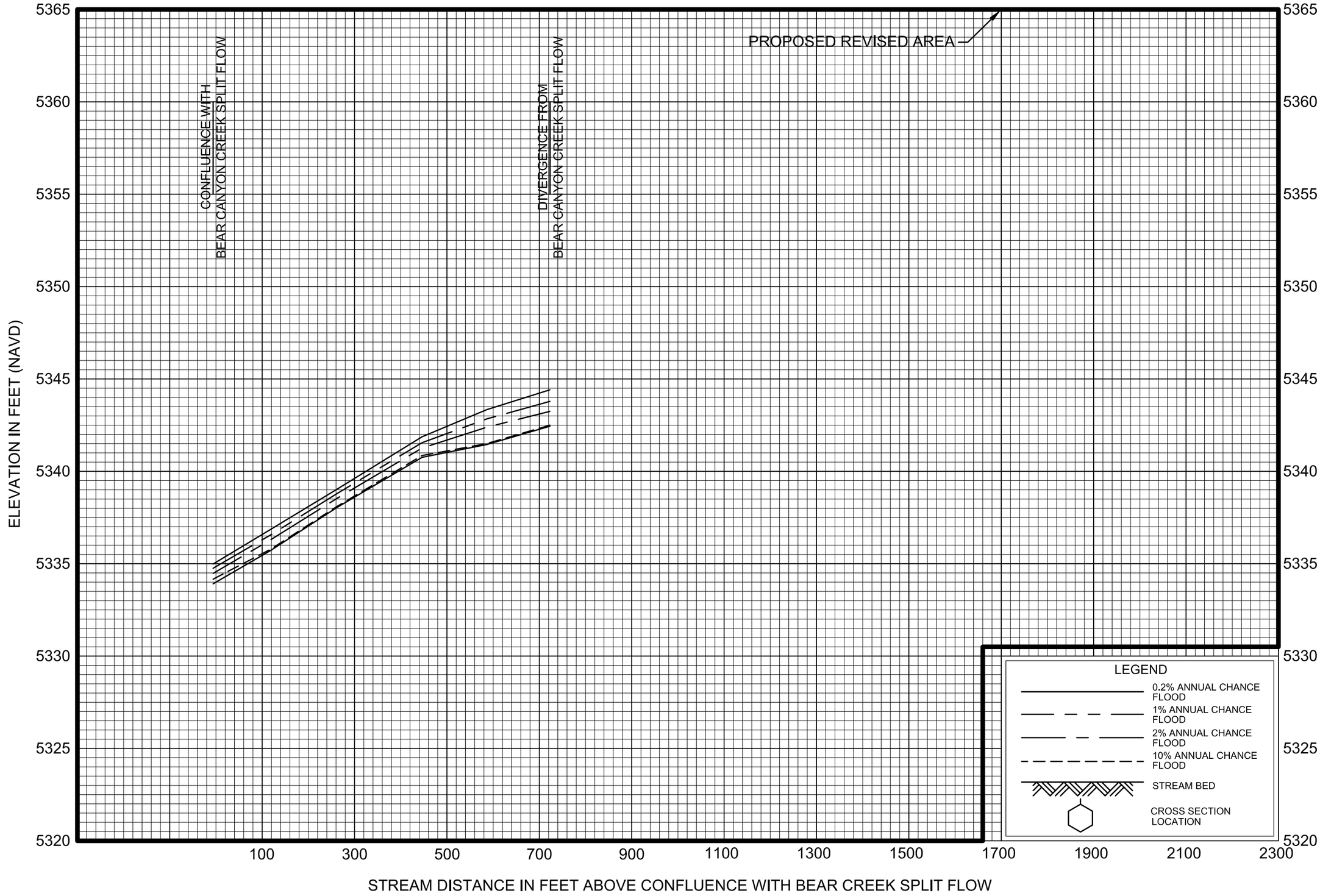
FLOOD PROFILES

BLUEBELL CANYON CREEK - BLUEBELL SPUR

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



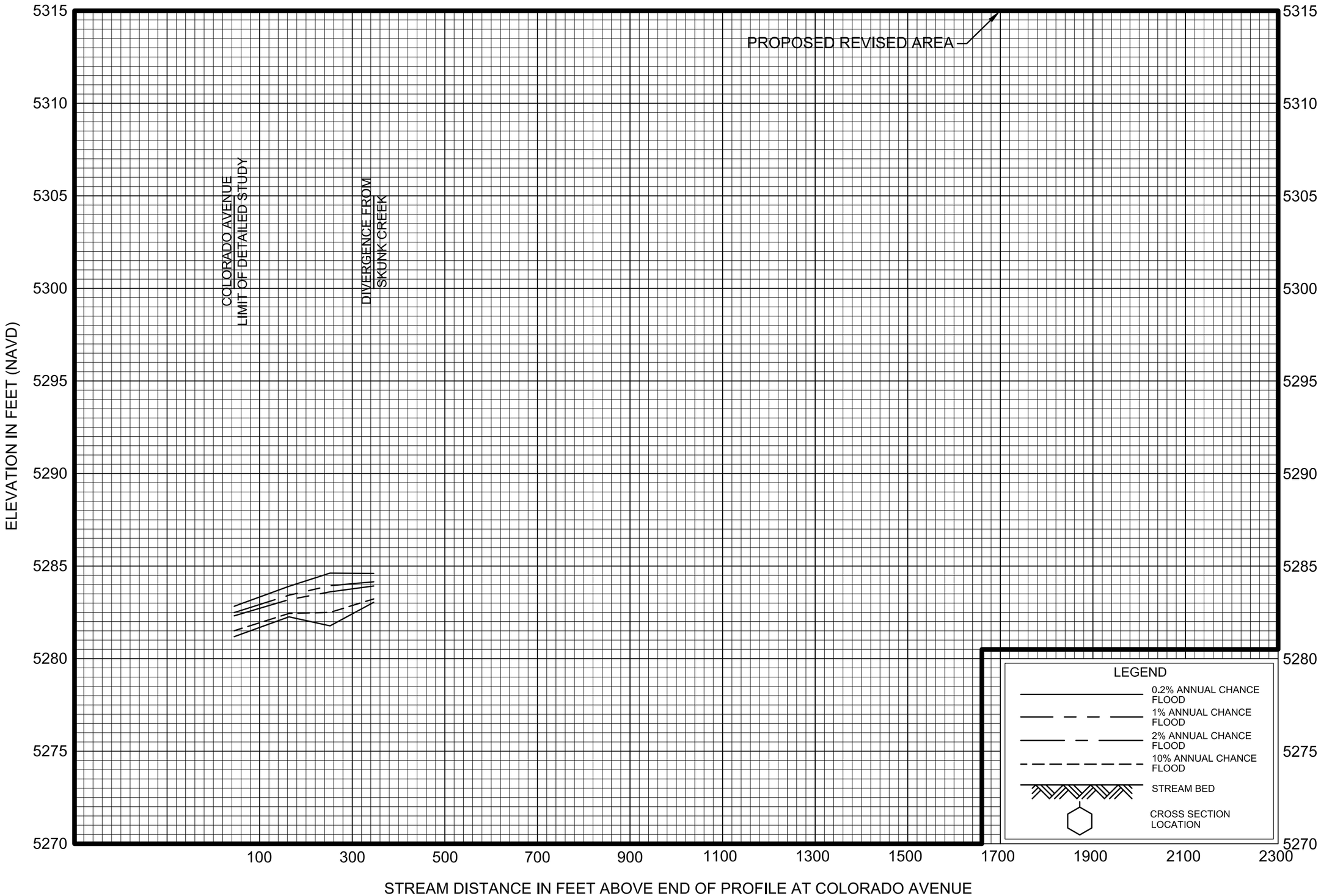
FLOOD PROFILES

SKUNK CREEK - BEAR CANYON CREEK SPLIT - BLINE SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P



FLOOD PROFILES

SKUNK CREEK - MADISON SPLIT

FEDERAL EMERGENCY MANAGEMENT AGENCY

BOULDER COUNTY, CO
AND INCORPORATED AREAS

001P

Appendix D –
Existing Conditions Hydrologic Models

NOAA Atlas 14, Volume 8, Version 2
Location name: Boulder, Colorado, US*
Latitude: 40.0040°, Longitude: -105.2689°
Elevation: 5426 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.202 (0.168-0.245)	0.249 (0.207-0.302)	0.338 (0.279-0.411)	0.424 (0.347-0.516)	0.558 (0.444-0.721)	0.675 (0.518-0.875)	0.804 (0.589-1.06)	0.947 (0.656-1.28)	1.15 (0.760-1.59)	1.32 (0.838-1.83)
10-min	0.296 (0.246-0.359)	0.365 (0.303-0.442)	0.495 (0.409-0.602)	0.620 (0.508-0.756)	0.817 (0.650-1.05)	0.989 (0.758-1.28)	1.18 (0.862-1.56)	1.39 (0.960-1.87)	1.69 (1.11-2.33)	1.94 (1.23-2.68)
15-min	0.361 (0.300-0.437)	0.445 (0.369-0.539)	0.604 (0.498-0.734)	0.757 (0.620-0.922)	0.997 (0.793-1.29)	1.21 (0.925-1.56)	1.44 (1.05-1.90)	1.69 (1.17-2.28)	2.06 (1.36-2.84)	2.37 (1.50-3.27)
30-min	0.508 (0.422-0.615)	0.623 (0.517-0.755)	0.843 (0.695-1.02)	1.05 (0.863-1.28)	1.39 (1.10-1.79)	1.68 (1.29-2.18)	2.00 (1.46-2.64)	2.35 (1.63-3.18)	2.87 (1.89-3.96)	3.30 (2.09-4.55)
60-min	0.640 (0.531-0.774)	0.777 (0.644-0.941)	1.04 (0.856-1.26)	1.29 (1.06-1.57)	1.69 (1.35-2.18)	2.04 (1.57-2.65)	2.43 (1.78-3.21)	2.86 (1.98-3.86)	3.48 (2.29-4.80)	4.00 (2.53-5.52)
2-hr	0.771 (0.645-0.926)	0.930 (0.776-1.12)	1.23 (1.02-1.48)	1.53 (1.26-1.84)	1.99 (1.60-2.56)	2.40 (1.86-3.09)	2.85 (2.11-3.75)	3.36 (2.35-4.50)	4.09 (2.73-5.60)	4.70 (3.01-6.43)
3-hr	0.858 (0.720-1.02)	1.03 (0.860-1.23)	1.35 (1.13-1.62)	1.66 (1.38-2.00)	2.15 (1.74-2.74)	2.58 (2.01-3.31)	3.06 (2.27-3.99)	3.59 (2.53-4.78)	4.35 (2.92-5.93)	4.99 (3.21-6.81)
6-hr	1.07 (0.906-1.27)	1.28 (1.08-1.52)	1.67 (1.40-1.98)	2.03 (1.69-2.42)	2.59 (2.10-3.26)	3.08 (2.41-3.89)	3.61 (2.71-4.66)	4.20 (2.98-5.54)	5.04 (3.41-6.80)	5.73 (3.74-7.76)
12-hr	1.39 (1.18-1.63)	1.67 (1.42-1.96)	2.17 (1.83-2.55)	2.62 (2.20-3.10)	3.31 (2.69-4.10)	3.89 (3.06-4.85)	4.51 (3.40-5.75)	5.18 (3.72-6.76)	6.13 (4.20-8.20)	6.91 (4.56-9.28)
24-hr	1.73 (1.48-2.01)	2.09 (1.79-2.44)	2.73 (2.33-3.18)	3.29 (2.79-3.85)	4.12 (3.36-5.02)	4.79 (3.80-5.91)	5.51 (4.19-6.94)	6.27 (4.54-8.09)	7.33 (5.06-9.69)	8.17 (5.46-10.9)
2-day	2.03 (1.75-2.34)	2.45 (2.12-2.83)	3.18 (2.73-3.68)	3.82 (3.26-4.43)	4.74 (3.90-5.72)	5.49 (4.39-6.70)	6.27 (4.82-7.82)	7.10 (5.19-9.07)	8.24 (5.76-10.8)	9.14 (6.19-12.1)
3-day	2.21 (1.92-2.53)	2.63 (2.28-3.02)	3.36 (2.90-3.87)	4.01 (3.43-4.63)	4.95 (4.10-5.95)	5.72 (4.61-6.96)	6.54 (5.05-8.12)	7.40 (5.45-9.43)	8.61 (6.06-11.2)	9.57 (6.52-12.6)
4-day	2.35 (2.05-2.69)	2.77 (2.41-3.17)	3.51 (3.03-4.02)	4.16 (3.57-4.78)	5.11 (4.25-6.13)	5.90 (4.76-7.14)	6.73 (5.22-8.33)	7.62 (5.64-9.67)	8.85 (6.27-11.5)	9.84 (6.75-12.9)
7-day	2.71 (2.37-3.07)	3.17 (2.77-3.60)	3.96 (3.44-4.50)	4.65 (4.02-5.31)	5.65 (4.72-6.70)	6.46 (5.25-7.75)	7.31 (5.71-8.97)	8.20 (6.12-10.3)	9.44 (6.74-12.2)	10.4 (7.21-13.6)
10-day	3.03 (2.66-3.42)	3.53 (3.09-3.99)	4.37 (3.81-4.95)	5.09 (4.42-5.79)	6.12 (5.13-7.21)	6.95 (5.67-8.28)	7.80 (6.12-9.51)	8.69 (6.51-10.9)	9.90 (7.11-12.7)	10.9 (7.57-14.1)
20-day	3.99 (3.52-4.46)	4.56 (4.02-5.10)	5.50 (4.84-6.17)	6.29 (5.50-7.08)	7.39 (6.23-8.58)	8.25 (6.78-9.71)	9.12 (7.23-11.0)	10.0 (7.58-12.4)	11.2 (8.14-14.2)	12.1 (8.56-15.6)

30-day	**4.77** (4.24-5.31)	**5.43** (4.81-6.04)	**6.50** (5.74-7.25)	**7.38** (6.48-8.27)	**8.58** (7.26-9.88)	**9.51** (7.85-11.1)	**10.4** (8.30-12.5)	**11.4** (8.65-14.0)	**12.6** (9.19-15.9)	**13.5** (9.60-17.3)
45-day	**5.74** (5.11-6.34)	**6.55** (5.83-7.25)	**7.85** (6.97-8.72)	**8.91** (7.86-9.93)	**10.3** (8.75-11.8)	**11.4** (9.43-13.2)	**12.4** (9.92-14.7)	**13.4** (10.3-16.4)	**14.7** (10.8-18.4)	**15.7** (11.2-20.0)
60-day	**6.54** (5.84-7.20)	**7.53** (6.72-8.30)	**9.09** (8.09-10.0)	**10.3** (9.14-11.5)	**12.0** (10.2-13.6)	**13.2** (10.9-15.2)	**14.3** (11.5-16.9)	**15.4** (11.8-18.7)	**16.8** (12.4-21.0)	**17.8** (12.8-22.7)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical

Time		BC_01 (Surface)					BC_01	BC_01 (Pipe)					BC_02 (Surface)					BC_02	BC_02 (Pipe)					BC_03 (Surface)					BC_03
Min.	Hour	10-YR	25-YR	50-YR	100-YR	500-YR	Pipe Capacity	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	Pipe Capacity	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	Pipe Capacity
5	0.08	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
10	0.17	0	0	0	0	1	26	0	0	0	0	1	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
15	0.25	1	1	2	2	4	26	1	1	2	2	4	0	0	0	0	1	29	0	0	0	0	1	1	0	1	1	2	34
20	0.33	6	4	6	7	11	26	6	4	6	7	11	1	1	1	1	2	29	1	1	1	1	2	2	2	2	3	5	34
25	0.42	15	10	13	16	26	26	15	10	13	16	26	3	2	3	3	7	29	3	2	3	3	7	6	4	6	7	13	34
30	0.50	21	23	29	35	54	26	21	23	26	26	26	5	6	8	11	20	29	5	6	8	11	20	10	11	16	19	34	34
35	0.58	19	32	40	50	74	26	19	26	26	26	26	7	11	15	20	34	29	7	11	15	20	29	13	20	27	35	57	34
40	0.67	15	29	37	47	69	26	15	26	26	26	26	8	15	20	26	44	29	8	15	20	26	29	13	24	33	43	69	34
45	0.75	12	24	30	39	58	26	12	24	26	26	26	8	16	22	29	47	29	8	16	22	29	29	12	25	33	44	70	34
50	0.83	9	19	24	32	47	26	9	19	24	26	26	7	16	22	29	47	29	7	16	22	29	29	11	24	31	42	66	34
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110	1.83	2	2	3	3	5	26	2	2	3	3	5	3	5	7	9	16	29	3	5	7	9	16	4	5	7	9	14	34
115	1.92	2	2	3	3	5	26	2	2	3	3	5	3	5	6	9	14	29	3	5	6	9	14	3	5	6	7	12	34
120	2.00	2	2	3	3	5	26	2	2	3	3	5	3	4	6	8	13	29	3	4	6	8	13	3	4	5	6	9	34
125	2.08	2	2	2	2	4	26	2	2	2	2	4	2	4	5	7	12	29	2	4	5	7	12	2	3	4	5	7	34
130	2.17	1	1	1	1	2	26	1	1	1	1	2	2	4	5	6	10	29	2	4	5	6	10	2	2	3	4	6	34
135	2.25	1	1	1	1	1	26	1	1	1	1	1	2	3	4	5	9	29	2	3	4	5	9	2	2	2	3	4	34
140	2.33	0	0	1	1	1	26	0	0	1	1	1	2	3	4	5	7	29	2	3	4	5	7	1	1	2	2	3	34
145	2.42	0	0	0	0	0	26	0	0	0	0	0	1	2	3	4	6	29	1	2	3	4	6	1	1	1	2	3	34
150	2.50	0	0	0	0	0	26	0	0	0	0	0	1	2	2	3	5	29	1	2	2	3	5	1	1	1	1	2	34
155	2.58	0	0	0	0	0	26	0	0	0	0	0	1	2	2	2	4	29	1	2	2	2	4	1	1	1	1	1	34
160	2.67	0	0	0	0	0	26	0	0	0	0	0	1	1	1	2	3	29	1	1	1	2	3	1	1	1	1	1	34
165	2.75	0	0	0	0	0	26	0	0	0	0	0	1	1	1	1	2	29	1	1	1	1	2	0	0	1	0	1	34
170	2.83	0	0	0	0	0	26	0	0	0	0	0	0	1	1	1	2	29	0	1	1	1	2	0	0	0	0	1	34
175	2.92	0	0	0	0	0	26	0	0	0	0	0	0	0	1	1	1	29	0	0	1	1	1	0	0	0	0	0	34
180	3.00	0	0	0	0	0	26	0	0	0	0	0	0	0	0	1	1	29	0	0	0	1	1	0	0	0	0	0	34
185	3.08	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	1	29	0	0	0	0	1	0	0	0	0	0	34
190	3.17	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	1	29	0	0	0	0	1	0	0	0	0	0	34
195	3.25	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
200	3.33	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
205	3.42	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
210	3.50	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
215	3.58	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
220	3.67	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
225	3.75	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
230	3.83	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
235	3.92	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
240	4.00	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
245	4.08	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
250	4.17	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
255	4.25	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
260	4.33	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
265	4.42	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
270	4.50	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
275	4.58	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
280	4.67	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
285	4.75	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
290	4.83	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
295	4.92	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
300	5.00	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
305	5.08	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
310	5.17	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
315	5.25	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
320	5.33	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
325	5.42	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
330	5.50	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
335	5.58	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
340	5.67	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
345	5.75	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
350	5.83	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
355	5.92	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
360	6.00	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
365	6.08	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
370	6.17	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
375	6.25	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
380	6.33	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0	0	34
	Max	**21**	**32**	**40**	**50**	**74**	**26**	**21**	**26**	**26**	**26**	**26**	**8**	**16**	**22**	**29**	**47**	**29**	**8**	**16**	**22**	**29**	**29**	**13**	**25**	**33**	**44**	**70**	**34**

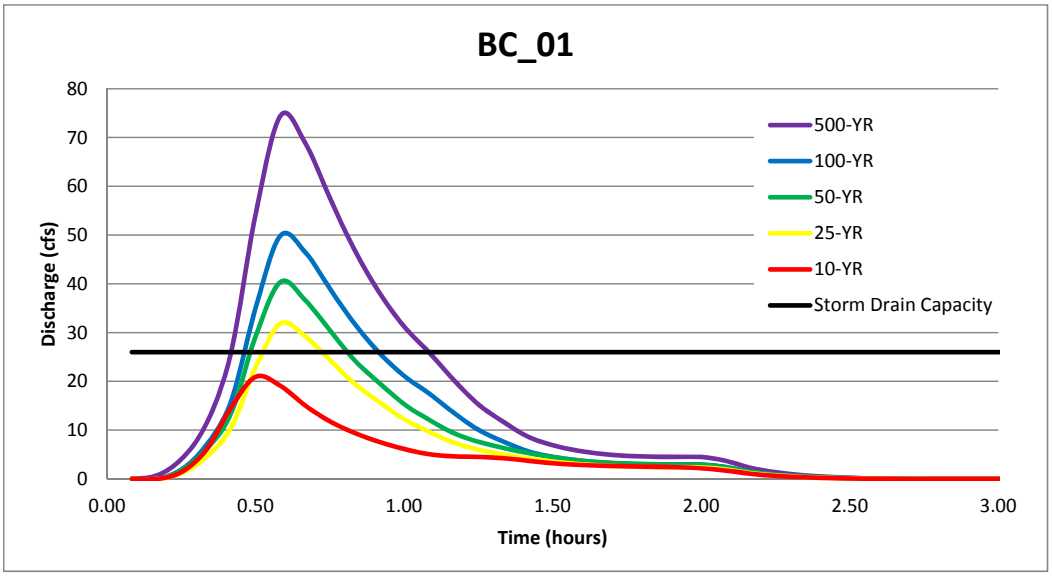
Time		BC_03 (Pipe)					BL_01					BL_02					BL_03					BL_04					CU_01				
Min.	Hour	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR
5	0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
15	0.25	1	0	1	1	2	1	1	1	1	1	0	0	1	1	1	0	0	0	0	1	0	0	0	0	0	3	3	5	5	10
20	0.33	2	2	2	3	5	2	1	2	2	4	1	1	1	2	3	1	1	1	1	2	0	0	0	1	2	14	11	14	16	26
25	0.42	6	4	6	7	13	5	3	4	5	11	3	2	3	4	7	2	2	2	3	5	3	2	3	3	15	33	24	31	36	60
30	0.50	10	11	16	19	34	7	9	13	16	28	4	5	8	11	19	4	4	6	9	20	8	12	21	30	73	50	52	72	90	158
35	0.58	13	20	27	34	34	7	13	18	24	38	4	7	11	15	27	4	6	10	16	32	13	34	58	84	168	52	83	118	157	272
40	0.67	13	24	33	34	34	6	13	18	23	37	3	8	11	15	26	3	7	11	17	34	17	59	96	138	258	45	92	129	177	298
45	0.75	12	25	33	34	34	5	12	16	21	33	3	7	10	14	24	3	6	10	16	33	19	78	123	178	320	38	83	116	162	270
50	0.83	11	24	31	34	34	4	10	14	19	29	3	6	8	12	21	3	6	9	15	30	20	90	139	201	356	33	71	99	141	236
55	0.92	10	21	29	34	34	4	9	12	16	25	2	5	7	10	18	3	5	8	13	27	20	94	145	213	372	28	60	83	120	202
60	1.00	9	19	26	34	34	3	7	9	14	21	2	4	6	9	15	2	5	7	12	24	19	94	145	215	375	24	49	67	99	169
65	1.08	8	17	23	33	34	3	6	8	12	19	2	3	5	8	14	2	4	6	11	22	18	90	139	211	367	22	41	56	86	147
70	1.17	7	15	21	30	34	3	5	7	10	16	2	3	4	6	11	2	4	6	9	19	17	84	132	203	355	20	35	48	73	126
75	1.25	7	13	18	26	34	2	4	6	8	13	2	3	3	5	9	2	3	5	8	16	17	79	124	193	340	18	30	39	59	100
80	1.33	6	12	16	22	34	2	3	4	6	10	1	2	3	4	7	2	3	4	6	13	16	73	116	181	321	16	24	32	45	76
85	1.42	6	10	14	19	30	2	3	3	4	7	1	2	2	3	5	2	2	4	6	11	15	68	107	168	299	14	19	25	33	55
90	1.50	5	9	12	16	26	1	2	2	3	5	1	1	2	2	4	1	2	3	5	10	15	63	99	154	276	12	15	19	24	39
95	1.58	5	8	11	14	23	1	1	2	2	4	1	1	1	2	3	1	2	3	4	8	14	58	92	142	256	11	12	15	18	30
100	1.67	4	7	9	12	19	1	1	2	2	3	1	1	1	1	2	1	2	2	4	7	13	54	85	132	238	10	11	13	15	24
105	1.75	4	6	8	10	17	1	1	1	2	3	1	1	1	1	2	1	2	2	3	6	12	50	80	123	221	9	10	12	13	20
110	1.83	4	5	7	9	14	1	1	1	1	2	1	1	1	1	2	1	1	2	2	4	11	47	74	114	206	9	9	11	12	18
115	1.92	3	5	6	7	12	1	1	1	1	2	1	1	1	1	1	1	1	2	2	3	11	44	69	106	191	9	9	11	11	16
120	2.00	3	4	5	6	9	1	1	1	1	2	1	1	1	1	1	1	1	1	2	2	10	40	64	98	177	8	8	10	10	15
125	2.08	2	3	4	5	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	9	37	59	90	163	7	7	9	9	13
130	2.17	2	2	3	4	6	0	0	1	1	1	0	0	0	0	1	1	1	1	1	1	8	34	54	83	149	5	6	7	7	10
135	2.25	2	2	2	3	4	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	8	31	49	75	135	4	4	5	5	7
140	2.33	1	1	2	2	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	7	28	44	68	122	3	3	3	3	5
145	2.42	1	1	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	25	40	61	111	2	2	2	2	3
150	2.50	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	23	37	56	103	1	1	2	2	2
155	2.58	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	21	34	52	95	1	1	1	1	2
160	2.67	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	20	32	49	89	1	1	1	1	1
165	2.75	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	19	30	45	82	0	0	0	0	1
170	2.83	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	18	28	42	77	0	0	0	0	0
175	2.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	16	26	39	71	0	0	0	0	0
180	3.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	15	24	37	66	0	0	0	0	0
185	3.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	14	22	34	61	0	0	0	0	0
190	3.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	13	21	32	57	0	0	0	0	0
195	3.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	12	19	29	52	0	0	0	0	0
200	3.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	11	17	26	47	0	0	0	0	0
205	3.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10	16	24	42	0	0	0	0	0
210	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9	14	21	38	0	0	0	0	0
215	3.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8	12	19	33	0	0	0	0	0
220	3.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7	11	16	28	0	0	0	0	0
225	3.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	9	14	24	0	0	0	0	0
230	3.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	7	11	19	0	0	0	0	0
235	3.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	6	9	15	0	0	0	0	0
240	4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	6	10	0	0	0	0	0
245	4.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	4	7	0	0	0	0	0
250	4.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	5	0	0	0	0	0
255	4.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	4	0	0	0	0	0
260	4.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	0	0	0	0	0
265	4.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0
270	4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
275	4.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
280	4.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
285	4.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	4.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295	4.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
305	5.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	5.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
315	5.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	5.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
325	5.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
335	5.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	5.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
345	5.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	5.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
355	5.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	6.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365	6.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	6.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
375	6.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	6.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	**13**	**25**	**33**	**34**	**34**	**7**	**13**	**18**	**24**	**38**	**4**	**8**	**11**	**15**	**27**	**4**	**7**	**11**	**17**	**34**	**20**	**94**	**145**	**215**	**375**	**52**	**92**	**129**	**177**	**298**

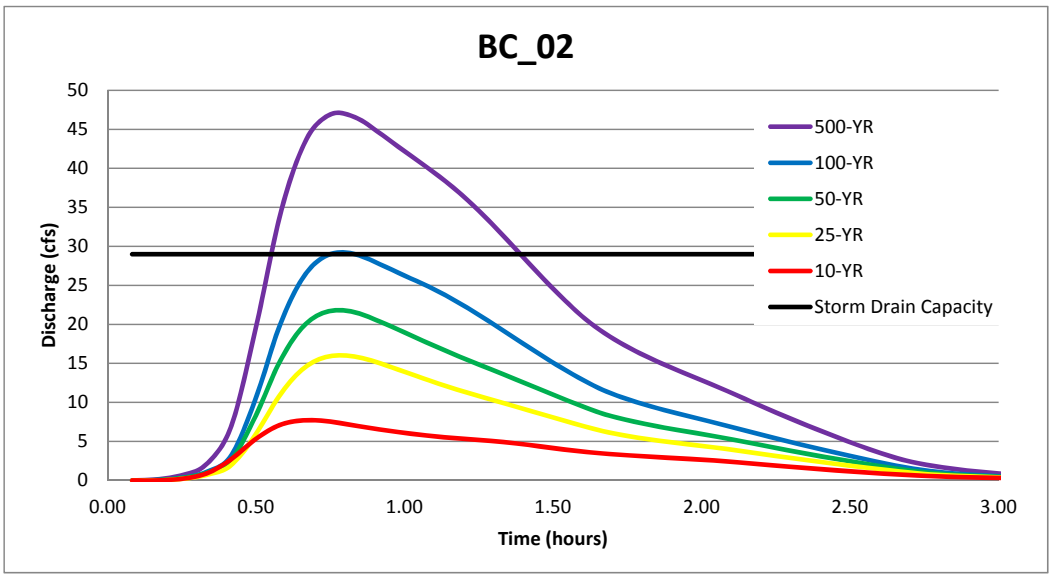
Time		CU_02 (Surface)					CU_02	CU_02 (Pipe)					KG_01					KG_02					KG_03					KG_04				
Min.	Hour	10-YR	25-YR	50-YR	100-YR	500-YR	Pipe Capacity	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR
5	0.08	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.17	0	0	1	1	4	83	0	0	1	1	4	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
15	0.25	6	6	8	9	16	83	6	6	8	9	16	1	1	2	2	3	2	2	2	2	4	0	0	0	1	1	1	1	1	1	2
20	0.33	21	16	20	23	36	83	21	16	20	23	36	4	3	4	5	8	5	4	5	6	9	1	1	1	1	2	3	2	3	3	5
25	0.42	47	33	42	50	91	83	47	33	42	50	83	10	7	9	11	21	11	8	10	12	22	3	2	2	3	5	8	4	7	9	16
30	0.50	59	78	108	137	232	83	59	78	83	83	83	14	18	25	31	51	13	18	27	35	64	3	4	6	8	14	9	13	21	31	67
35	0.58	49	106	146	194	311	83	49	83	83	83	83	13	24	33	42	66	11	23	33	47	82	3	5	8	11	20	8	16	27	44	89
40	0.67	37	96	129	174	274	83	37	83	83	83	83	10	23	30	39	60	9	21	30	43	73	3	5	8	11	19	7	15	25	42	81
45	0.75	28	76	101	140	219	83	28	76	83	83	83	8	19	25	33	51	7	17	24	36	61	2	5	7	10	17	6	13	21	35	70
50	0.83	22	57	77	109	172	83	22	57	77	83	83	6	16	20	27	42	6	14	19	29	49	2	4	6	8	14	5	11	17	29	58
55	0.92	16	43	58	84	134	83	16	43	58	83	83	5	12	16	22	35	5	11	15	23	40	2	3	5	7	12	4	9	14	23	46
60	1.00	13	31	41	64	103	83	13	31	41	64	83	4	10	13	19	29	4	9	12	18	33	1	3	4	6	10	3	7	11	18	38
65	1.08	11	22	29	50	83	83	11	22	29	50	83	4	8	10	16	25	4	7	9	15	28	1	2	3	5	9	3	6	9	16	33
70	1.17	11	17	22	38	63	83	11	17	22	38	63	3	6	8	12	19	3	5	7	11	20	1	2	3	4	8	3	5	7	12	26
75	1.25	11	14	18	27	44	83	11	14	18	27	44	3	4	6	8	13	3	4	5	8	14	1	2	2	3	6	2	4	6	9	19
80	1.33	10	12	15	19	31	83	10	12	15	19	31	3	3	5	6	10	3	3	4	5	10	1	1	2	3	5	2	3	4	6	12
85	1.42	9	10	12	14	22	83	9	10	12	14	22	2	3	4	4	7	2	3	3	4	7	1	1	1	2	3	2	2	3	4	8
90	1.50	8	9	11	11	17	83	8	9	11	11	17	2	2	3	3	5	2	2	3	3	5	1	1	1	1	2	1	2	2	3	6
95	1.58	7	7	9	9	13	83	7	7	9	9	13	2	2	2	3	4	2	2	3	3	4	1	1	1	1	2	1	2	2	2	4
100	1.67	7	7	8	8	12	83	7	7	8	8	12	2	2	2	2	4	2	2	2	2	4	1	1	1	1	1	1	1	2	2	3
105	1.75	7	7	8	8	11	83	7	7	8	8	11	2	2	2	2	3	2	2	2	2	3	1	1	1	1	1	1	1	2	2	3
110	1.83	7	6	8	8	11	83	7	6	8	8	11	2	2	2	2	3	2	2	2	2	3	1	1	1	1	1	1	1	1	1	2
115	1.92	6	6	8	8	11	83	6	6	8	8	11	1	1	2	2	3	2	2	2	2	3	1	1	1	1	1	1	1	1	1	2
120	2.00	6	6	8	8	11	83	6	6	8	8	11	1	1	2	2	3	2	2	2	2	3	0	1	1	1	1	1	1	1	1	2
125	2.08	4	5	6	6	8	83	4	5	6	6	8	1	1	1	1	2	1	1	2	2	2	0	0	1	1	1	1	1	1	1	1
130	2.17	2	3	3	3	5	83	2	3	3	3	5	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1
135	2.25	1	2	2	2	3	83	1	2	2	2	3	0	0	1	1	1	0	1	1	1	1	0	0	0	0	0	0	0	1	1	1
140	2.33	1	1	1	1	1	83	1	1	1	1	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
145	2.42	0	0	0	0	1	83	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	2.50	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	2.58	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	2.67	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	2.75	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	2.83	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	2.92	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	3.00	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
185	3.08	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	3.17	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
195	3.25	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	3.33	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
205	3.42	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	3.50	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
215	3.58	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	3.67	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225	3.75	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	3.83	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
235	3.92	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	4.00	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
245	4.08	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	4.17	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
255	4.25	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	4.33	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
265	4.42	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	4.50	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
275	4.58	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	4.67	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
285	4.75	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	4.83	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295	4.92	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	5.00	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
305	5.08	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	5.17	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
315	5.25	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	5.33	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
325	5.42	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	5.50	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
335	5.58	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	5.67	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
345	5.75	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	5.83	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
355	5.92	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	6.00	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365	6.08	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	6.17	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
375	6.25	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	6.33	0	0	0	0	0	83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	**59**	**106**	**146**	**194**	**311**	**83**	**59**	**83**	**83**	**83**	**83**	**14**	**24**	**33**	**42**	**66**	**13**	**23**	**33**	**47**	**82**	**3**	**5**	**8**	**11**	**20**	**9**	**16**	**27**	**44**	**89**

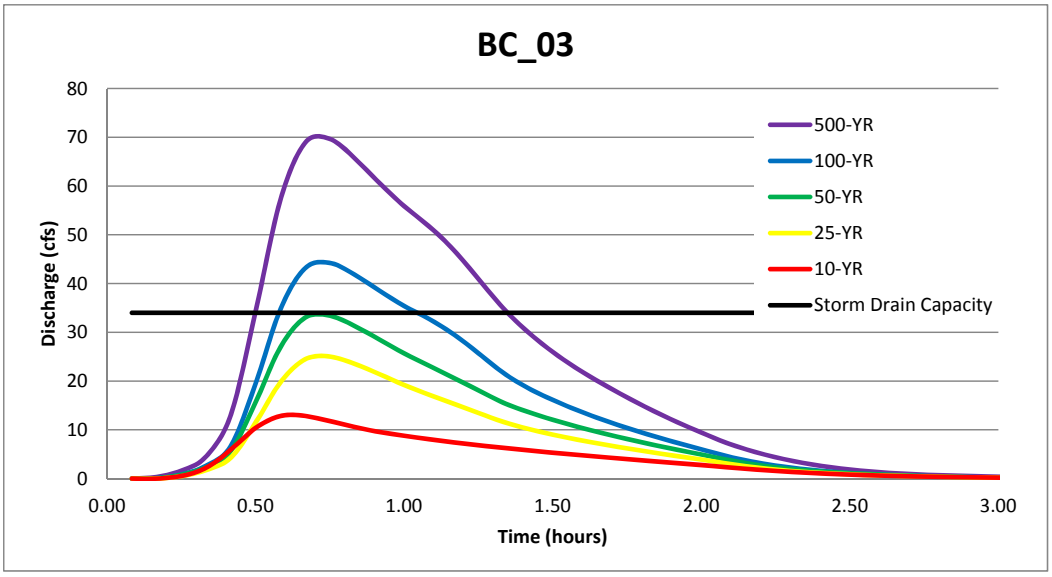
Time		KG_05					KG_06					KG_07					KG_08					KT_01					KT_02				
Min.	Hour	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR
5	0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.17	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	1	1	3
15	0.25	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	4	4	8	5	5	7	7	13
20	0.33	2	2	2	3	4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	11	8	11	12	20	18	14	18	20	32
25	0.42	5	3	4	5	9	1	1	1	1	3	0	0	0	0	0	1	0	0	1	11	26	18	24	28	54	42	29	38	45	83
30	0.50	5	7	10	14	26	2	2	3	5	12	0	0	0	0	1	2	7	21	34	86	39	47	64	80	137	58	73	98	122	202
35	0.58	4	7	11	16	28	2	3	5	9	18	0	0	0	1	2	2	26	58	94	196	38	72	97	126	199	51	101	135	176	272
40	0.67	3	6	9	13	23	2	3	6	10	20	0	0	0	1	3	3	45	90	142	276	31	71	94	124	194	38	92	119	158	241
45	0.75	2	5	7	10	18	2	3	5	9	19	0	0	0	1	4	3	56	105	166	312	26	62	81	109	169	29	74	96	128	195
50	0.83	2	4	5	8	14	1	3	5	8	17	0	0	0	1	4	2	59	106	170	315	21	52	69	93	144	22	57	74	101	155
55	0.92	1	3	4	6	11	1	3	4	7	15	0	0	0	1	4	2	55	100	162	301	17	42	56	77	119	17	44	58	80	122
60	1.00	1	2	3	4	8	1	2	4	7	14	0	0	0	1	4	2	49	90	152	285	15	34	45	64	101	13	31	42	62	95
65	1.08	1	2	2	3	6	1	2	3	6	13	0	0	0	1	4	2	43	80	142	268	13	28	37	56	88	12	23	31	49	77
70	1.17	1	1	2	2	4	1	2	3	5	11	0	0	0	1	4	2	38	71	131	249	11	22	30	45	72	11	18	24	38	60
75	1.25	1	1	1	2	3	1	2	3	4	9	0	0	0	1	4	2	33	63	118	227	10	17	23	33	53	11	14	19	26	44
80	1.33	1	1	1	1	2	1	1	2	4	8	0	0	0	1	3	2	30	56	105	204	8	12	17	23	37	10	12	15	19	32
85	1.42	1	1	1	1	2	1	1	2	3	7	0	0	0	1	3	1	26	50	92	180	7	10	13	16	27	9	9	12	13	22
90	1.50	1	1	1	1	1	1	1	2	3	6	0	0	0	1	3	1	23	43	80	156	6	8	10	12	20	7	8	10	10	17
95	1.58	1	1	1	1	1	1	1	2	2	5	0	0	0	1	3	1	20	37	69	135	6	6	8	9	16	7	7	9	8	14
100	1.67	1	1	1	1	1	1	1	1	2	4	0	0	0	1	2	1	17	32	59	115	5	6	7	8	13	6	6	8	7	12
105	1.75	1	1	1	1	1	1	1	1	2	3	0	0	0	1	2	1	14	27	52	101	5	5	6	7	11	6	6	7	7	11
110	1.83	1	1	1	1	1	1	1	1	1	3	0	0	0	1	2	1	13	24	46	90	5	5	6	6	10	6	6	7	7	11
115	1.92	1	1	1	1	1	0	1	1	1	2	0	0	0	1	2	1	11	22	41	80	5	5	6	6	9	6	6	7	7	11
120	2.00	1	1	1	1	1	0	1	1	1	2	0	0	0	1	2	1	10	19	36	71	4	4	5	5	9	5	6	7	7	11
125	2.08	0	0	0	0	1	0	0	1	1	1	0	0	0	1	2	1	9	17	32	63	3	4	4	4	7	4	4	5	5	8
130	2.17	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	8	15	28	55	2	2	3	3	5	2	2	3	3	5
135	2.25	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	7	13	24	48	2	2	2	2	3	1	1	2	2	3
140	2.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	6	11	21	41	1	1	1	1	2	1	1	1	1	1
145	2.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	5	9	17	34	1	1	1	1	1	0	0	0	0	1
150	2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4	7	14	27	0	0	1	1	1	0	0	0	0	0
155	2.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3	5	10	20	0	0	0	0	1	0	0	0	0	0
160	2.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	3	7	14	0	0	0	0	0	0	0	0	0	0
165	2.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	4	9	0	0	0	0	0	0	0	0	0	0
170	2.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	6	0	0	0	0	0	0	0	0	0	0
175	2.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	4	0	0	0	0	0	0	0	0	0	0
180	3.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0
185	3.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0
190	3.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
195	3.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	3.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
205	3.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
215	3.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	3.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225	3.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	3.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
235	3.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
245	4.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	4.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
255	4.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	4.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
265	4.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
275	4.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	4.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
285	4.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	4.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295	4.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
305	5.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	5.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
315	5.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	5.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
325	5.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
335	5.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	5.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
345	5.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	5.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
355	5.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	6.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365	6.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	6.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
375	6.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	6.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	**5**	**7**	**11**	**16**	**28**	**2**	**3**	**6**	**10**	**20**	**0**	**0**	**0**	**1**	**4**	**3**	**59**	**106**	**170**	**315**	**39**	**72**	**97**	**126**	**199**	**58**	**101**	**135**	**176**	**272**

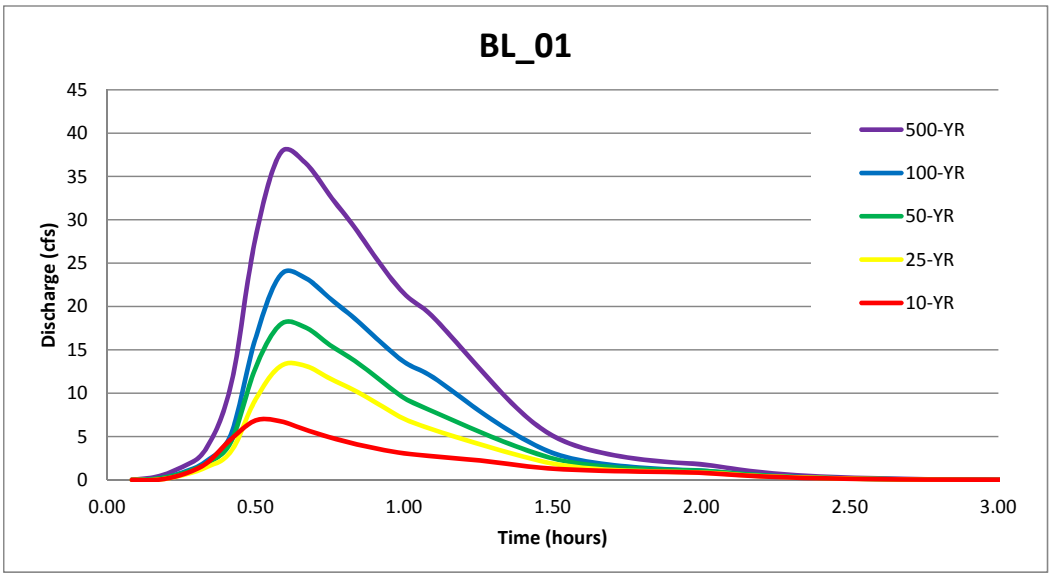
Time		KT_03					KT_04					SK_01					SK_02					SK_03					SK_04				
Min.	Hour	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR
5	0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.17	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	1	2	0	0	0	0	2	0	0	1	1	4
15	0.25	1	1	2	2	3	2	1	2	2	5	1	1	1	1	2	3	3	5	5	9	4	4	6	6	14	8	7	11	12	28
20	0.33	5	3	5	5	8	7	5	7	8	13	3	2	3	4	9	13	10	13	15	27	21	17	23	26	42	43	34	45	51	83
25	0.42	10	7	10	11	20	17	12	16	19	34	12	8	11	15	39	39	26	34	44	86	55	40	51	60	102	110	78	100	120	202
30	0.50	13	17	24	32	56	25	30	40	50	85	28	32	47	62	121	68	76	103	131	227	93	90	119	143	241	191	180	234	287	474
35	0.58	11	22	31	43	72	25	46	63	81	130	39	65	93	124	216	80	128	173	223	362	98	156	206	258	403	193	314	408	505	773
40	0.67	9	20	28	39	65	21	48	64	84	132	44	87	122	164	274	75	148	198	258	405	82	164	213	275	420	152	306	391	503	756
45	0.75	7	16	23	33	55	18	43	57	76	119	43	96	133	180	293	65	140	185	244	381	66	145	187	243	370	116	258	328	422	630
50	0.83	6	13	18	26	44	15	37	49	67	104	40	95	131	178	287	56	126	165	220	343	53	121	156	207	314	90	201	254	338	505
55	0.92	5	10	14	21	36	13	31	41	57	89	36	90	124	170	274	49	111	146	197	307	44	99	127	170	258	69	161	204	270	405
60	1.00	4	8	11	17	30	11	25	33	48	75	34	83	115	160	258	42	96	127	175	272	37	78	101	141	214	54	121	154	215	322
65	1.08	3	7	9	14	25	10	21	28	42	66	31	76	105	150	244	37	82	109	155	242	31	63	82	120	183	44	92	118	174	261
70	1.17	3	5	7	10	18	9	18	23	35	56	29	70	97	140	228	34	70	93	135	212	27	51	66	98	151	40	71	91	139	212
75	1.25	3	4	5	7	13	8	14	19	27	44	27	64	89	128	210	31	60	81	114	181	24	38	50	71	110	39	55	73	101	157
80	1.33	3	3	4	5	9	7	11	15	20	32	26	58	81	115	188	28	51	69	94	150	22	30	39	51	82	38	46	60	76	120
85	1.42	2	3	3	4	6	6	9	11	14	23	23	51	72	101	165	24	43	57	76	120	20	24	31	37	60	33	37	49	54	85
90	1.50	2	2	3	3	5	5	7	9	11	17	21	45	63	87	143	20	35	47	60	94	17	20	26	28	45	28	32	41	41	65
95	1.58	2	2	2	3	4	5	6	7	8	13	19	39	55	75	124	17	27	37	46	72	16	17	21	23	36	25	27	34	33	52
100	1.67	2	2	2	2	3	4	5	6	7	11	17	35	49	66	110	14	21	28	34	53	14	15	19	19	30	23	23	29	28	45
105	1.75	2	2	2	2	3	4	4	5	6	9	16	31	44	60	98	12	16	22	26	42	14	14	17	17	27	22	22	27	26	41
110	1.83	2	2	2	2	3	4	4	5	5	8	15	28	40	53	88	11	13	18	21	34	13	13	16	16	24	21	21	25	25	40
115	1.92	2	2	2	2	3	4	4	5	5	7	14	25	36	48	79	10	12	16	18	29	13	12	15	15	23	20	20	25	25	39
120	2.00	1	2	2	2	3	4	4	4	4	7	12	23	32	43	71	9	10	14	16	26	12	12	15	15	23	19	20	24	25	39
125	2.08	1	1	1	1	2	3	3	4	4	6	11	21	29	38	62	8	9	12	13	21	10	11	13	13	21	16	18	22	22	35
130	2.17	1	1	1	1	1	2	2	3	3	4	10	18	25	33	53	6	7	9	10	16	7	8	9	9	14	10	11	13	14	22
135	2.25	0	0	1	1	1	1	2	2	2	3	8	15	21	28	44	5	5	7	7	11	4	5	6	6	9	6	6	8	8	13
140	2.33	0	0	0	0	1	1	1	1	1	2	7	13	17	23	36	4	4	5	5	8	3	3	4	4	6	3	4	4	4	7
145	2.42	0	0	0	0	0	1	1	1	1	1	6	10	14	18	28	3	3	4	4	6	2	2	2	2	4	2	2	2	2	4
150	2.50	0	0	0	0	0	0	1	1	1	1	4	8	11	13	21	2	2	3	3	5	1	1	1	1	2	1	1	1	1	2
155	2.58	0	0	0	0	0	0	0	0	0	1	3	6	7	9	15	1	2	2	2	3	1	1	1	1	1	0	0	0	0	0
160	2.67	0	0	0	0	0	0	0	0	0	0	3	4	5	7	11	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0
165	2.75	0	0	0	0	0	0	0	0	0	0	2	3	4	5	8	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0
170	2.83	0	0	0	0	0	0	0	0	0	0	2	2	3	4	6	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
175	2.92	0	0	0	0	0	0	0	0	0	0	1	2	2	3	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
180	3.00	0	0	0	0	0	0	0	0	0	0	1	1	2	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
185	3.08	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
190	3.17	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
195	3.25	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
200	3.33	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
205	3.42	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
210	3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
215	3.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
220	3.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225	3.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	3.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
235	3.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240	4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
245	4.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
250	4.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
255	4.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
260	4.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
265	4.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
275	4.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
280	4.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
285	4.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
290	4.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295	4.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
300	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
305	5.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
310	5.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
315	5.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
320	5.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
325	5.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
335	5.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	5.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
345	5.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	5.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
355	5.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	6.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365	6.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	6.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
375	6.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	6.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	**13**	**22**	**31**	**43**	**72**	**25**	**48**	**64**	**84**	**132**	**44**	**96**	**133**	**180**	**293**	**80**	**148**	**198**	**258**	**405**	**98**	**164**	**213**	**275**	**420**	**193**	**314**	**408**	**505**	**773**

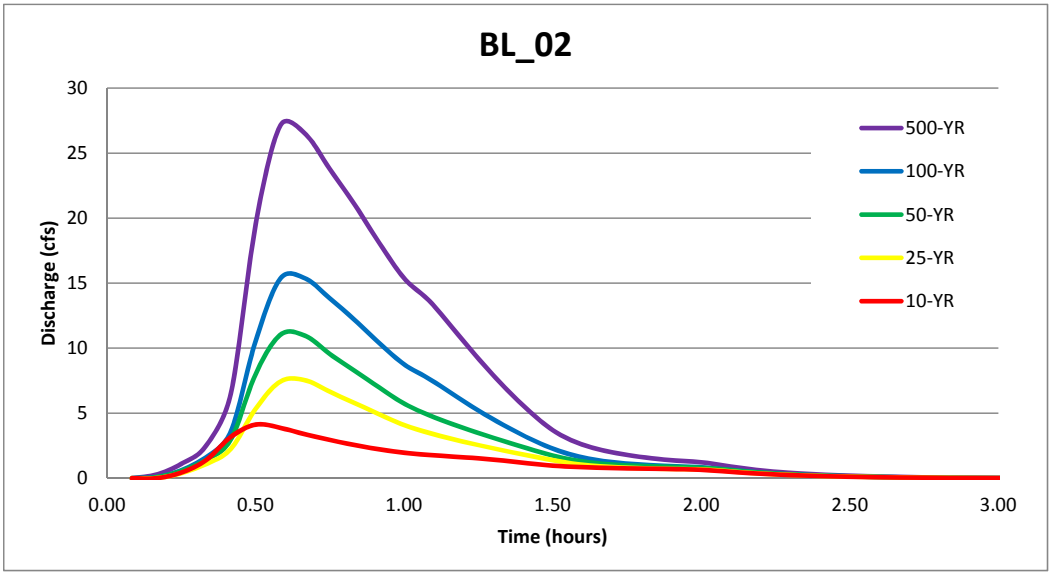
Time		SK_05					SK_06					SK_07					SK_08				
Min.	Hour	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR	10-YR	25-YR	50-YR	100-YR	500-YR
5	0.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.17	0	0	1	1	5	0	0	1	1	4	0	0	0	0	0	0	0	0	0	0
15	0.25	8	7	11	12	24	7	6	9	10	19	0	0	0	0	0	0	0	0	0	0
20	0.33	33	26	34	38	60	27	20	27	31	53	0	0	0	0	0	0	0	0	0	1
25	0.42	77	56	71	83	144	72	49	66	80	161	0	0	0	0	2	2	1	2	3	14
30	0.50	120	128	168	204	341	107	137	203	263	474	1	1	4	7	18	7	11	20	28	71
35	0.58	113	203	267	338	518	105	224	326	444	745	1	4	11	20	45	13	34	58	85	177
40	0.67	85	188	242	316	479	89	238	336	461	754	1	8	18	32	68	18	64	107	156	299
45	0.75	63	153	197	257	388	76	214	298	414	671	1	10	22	39	80	22	94	151	220	406
50	0.83	48	116	149	202	305	64	184	257	363	588	1	11	24	42	86	24	116	184	269	485
55	0.92	37	91	118	159	241	53	154	214	307	499	1	11	23	42	87	25	130	204	300	534
60	1.00	29	65	85	123	187	47	122	170	257	421	1	10	22	41	84	25	137	214	318	561
65	1.08	25	48	63	97	149	43	101	141	225	371	1	9	20	39	81	25	138	216	326	573
70	1.17	23	37	50	78	122	38	84	117	188	311	1	8	18	36	77	24	134	212	324	569
75	1.25	23	30	39	55	89	34	68	93	143	238	1	8	17	34	71	23	127	201	312	551
80	1.33	22	25	32	40	66	29	52	71	104	172	1	7	15	31	65	22	119	189	296	527
85	1.42	19	20	26	28	46	24	39	51	70	117	1	6	14	28	60	21	112	178	280	501
90	1.50	16	18	22	22	36	20	29	38	49	84	1	6	13	26	55	21	105	167	263	473
95	1.58	15	15	19	18	29	18	22	29	37	63	1	5	12	24	50	20	98	157	246	443
100	1.67	14	14	17	16	25	17	19	24	29	50	1	5	11	22	46	18	91	146	229	413
105	1.75	13	13	15	15	24	16	17	21	24	41	0	4	10	20	42	17	85	136	212	385
110	1.83	13	12	15	15	23	15	15	19	20	35	0	4	9	18	38	16	79	127	198	360
115	1.92	12	12	15	15	23	14	14	18	18	31	0	4	8	16	34	16	74	120	186	339
120	2.00	11	12	15	15	23	13	14	17	16	29	0	3	7	14	31	15	70	113	176	320
125	2.08	9	10	12	13	20	11	11	14	14	24	0	3	6	13	27	14	66	106	165	301
130	2.17	5	6	7	7	11	8	8	10	10	17	0	3	6	11	25	13	62	100	155	283
135	2.25	3	3	4	4	6	5	6	7	7	12	0	2	5	10	23	12	59	94	146	265
140	2.33	1	2	2	2	3	4	4	5	5	8	0	2	5	10	21	11	55	88	136	248
145	2.42	1	1	1	1	2	3	3	3	3	6	0	2	4	9	19	11	51	82	127	231
150	2.50	0	0	0	0	1	2	2	2	2	4	0	2	4	8	18	10	47	76	118	214
155	2.58	0	0	0	0	0	1	1	2	1	2	0	2	4	8	16	9	44	70	109	197
160	2.67	0	0	0	0	0	1	1	1	1	1	0	2	3	7	15	8	40	64	99	180
165	2.75	0	0	0	0	0	0	0	0	0	1	0	1	3	6	14	8	36	58	90	164
170	2.83	0	0	0	0	0	0	0	0	0	0	0	1	3	6	12	7	33	53	84	153
175	2.92	0	0	0	0	0	0	0	0	0	0	0	1	3	5	11	7	31	50	78	143
180	3.00	0	0	0	0	0	0	0	0	0	0	0	1	2	5	10	6	29	47	73	134
185	3.08	0	0	0	0	0	0	0	0	0	0	0	1	2	4	9	6	28	44	69	126
190	3.17	0	0	0	0	0	0	0	0	0	0	0	1	2	4	7	6	26	42	65	119
195	3.25	0	0	0	0	0	0	0	0	0	0	0	1	1	3	6	5	25	40	62	112
200	3.33	0	0	0	0	0	0	0	0	0	0	0	1	1	2	5	5	24	38	58	106
205	3.42	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	5	22	36	55	100
210	3.50	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	4	21	34	52	94
215	3.58	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	20	32	49	89
220	3.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	19	30	46	83
225	3.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	17	28	43	77
230	3.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	16	26	40	72
235	3.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	15	24	37	66
240	4.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	14	22	34	60
245	4.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	12	20	30	55
250	4.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	11	18	27	49
255	4.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	10	16	24	44
260	4.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	9	14	21	38
265	4.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7	12	18	32
270	4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	10	15	27
275	4.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	8	12	21
280	4.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	6	9	16
285	4.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	6	11
290	4.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	4	7
295	4.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3	5
300	5.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	4
305	5.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	3
310	5.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
315	5.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
320	5.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
325	5.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
330	5.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
335	5.58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
340	5.67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
345	5.75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
350	5.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
355	5.92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
360	6.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365	6.08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
370	6.17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
375	6.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
380	6.33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	**120**	**203**	**267**	**338**	**518**	**107**	**238**	**336**	**461**	**754**	**1**	**11**	**24**	**42**	**87**	**25**	**138**	**216**	**326**	**573**

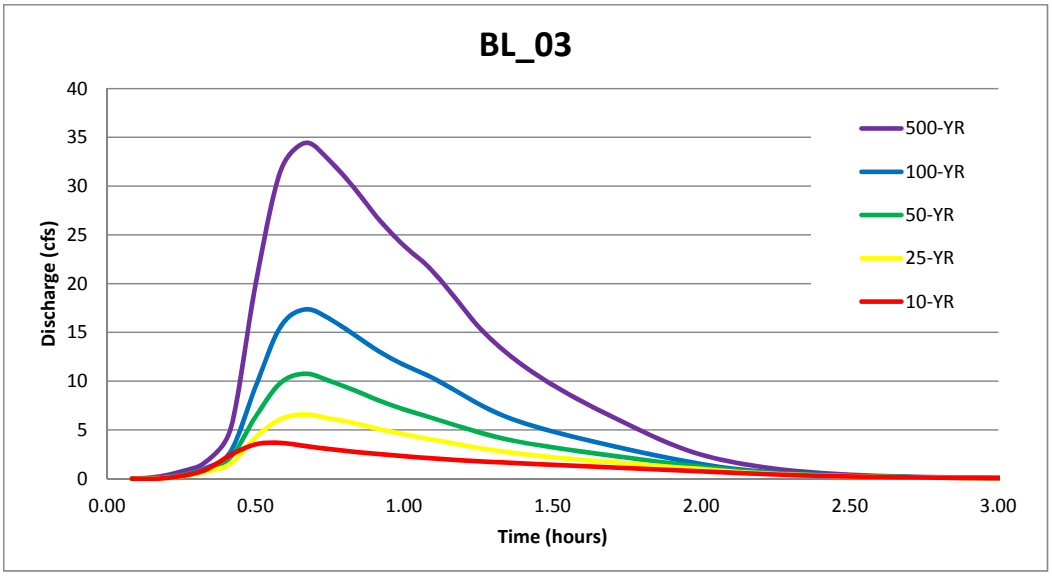

BC_01
Discharge (cfs)
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR
Storm Drain Capacity

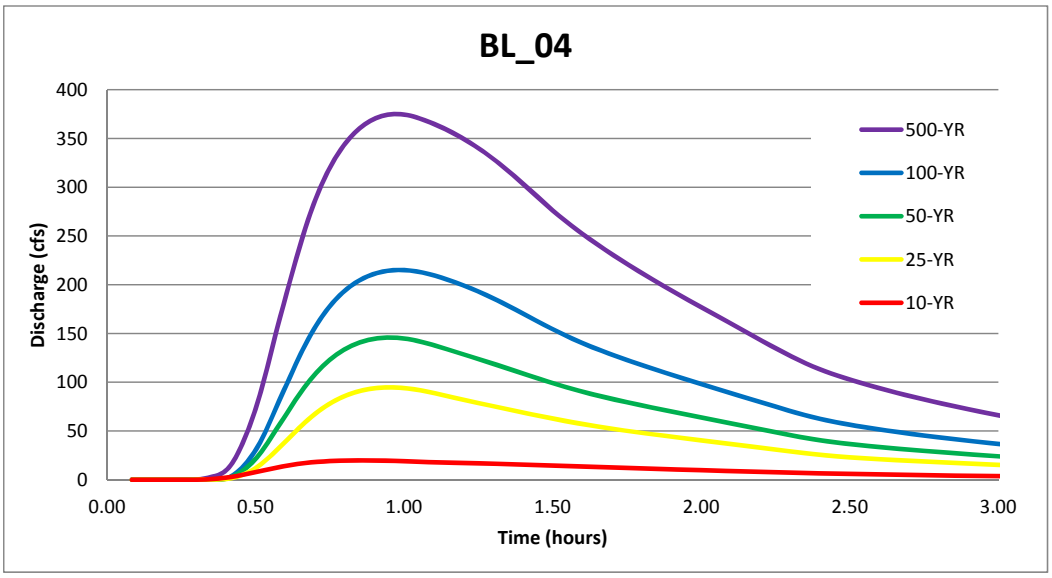

BC_02
Discharge (cfs)
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR
Storm Drain Capacity

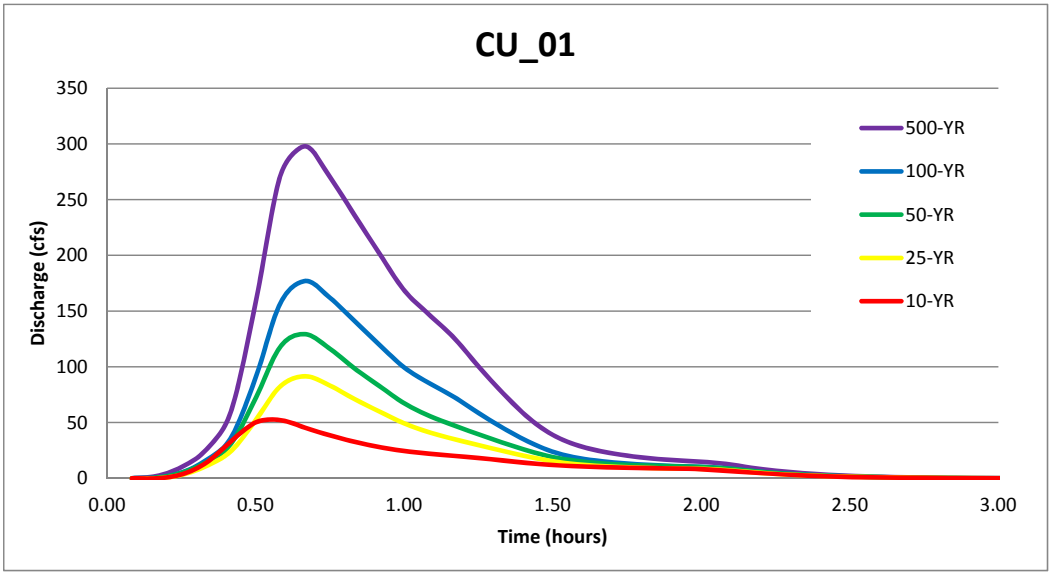

BC_03
Discharge (cfs)
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR
Storm Drain Capacity

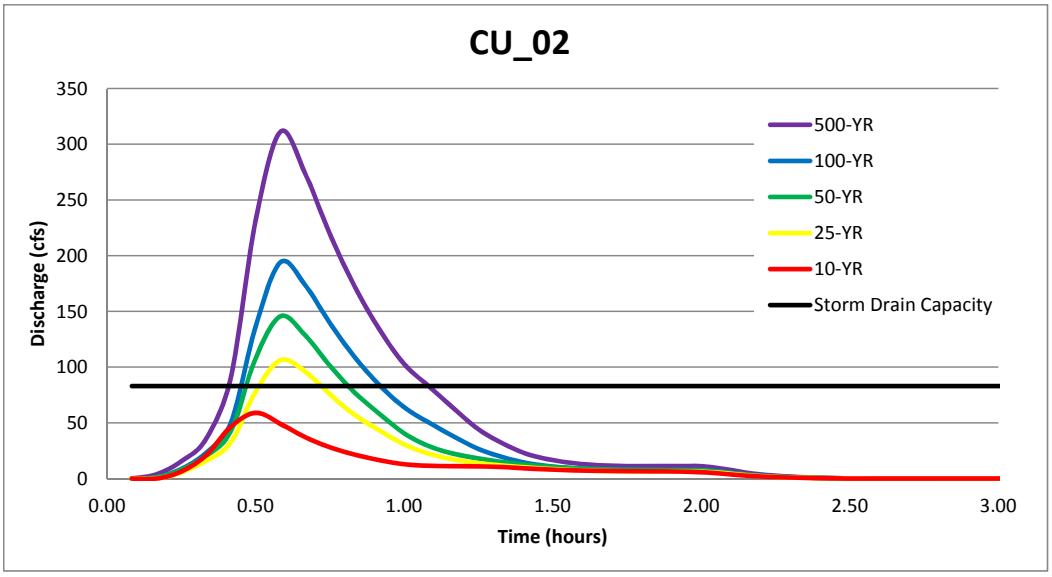

BL_01
Discharge (cfs)
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

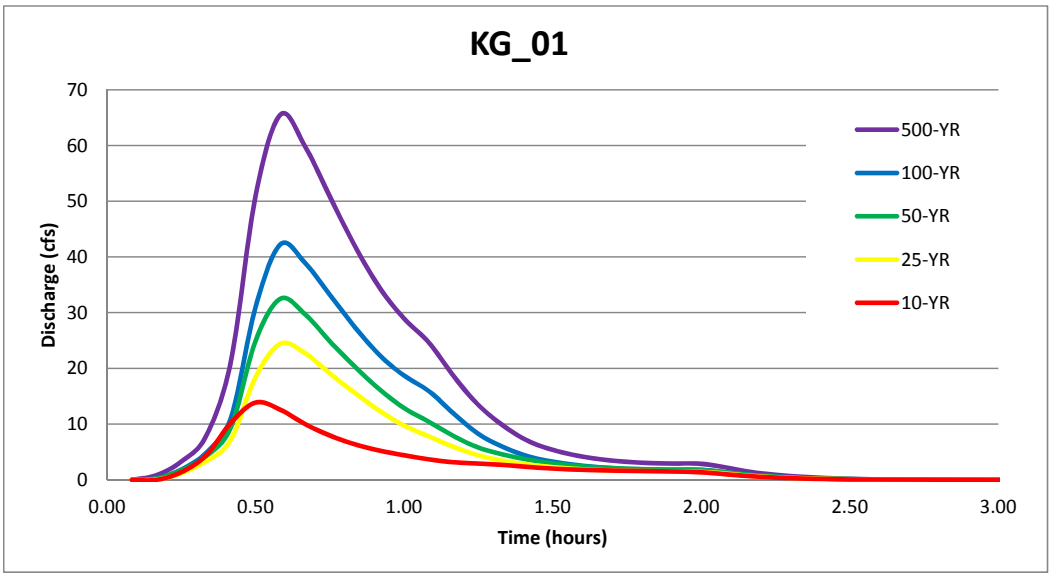

BL_02
Discharge (cfs)
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

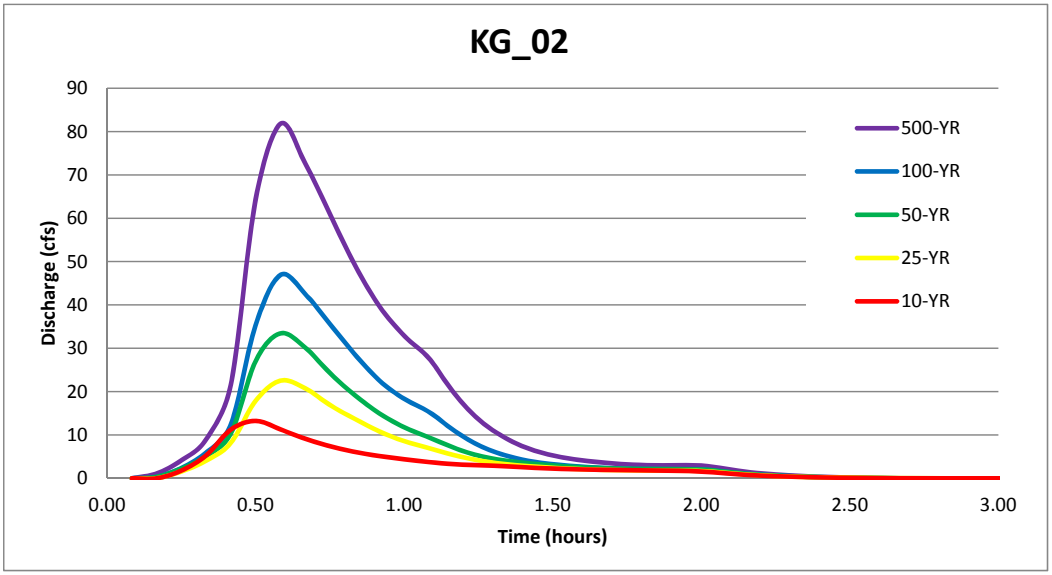

BL_03
Discharge (cfs)
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

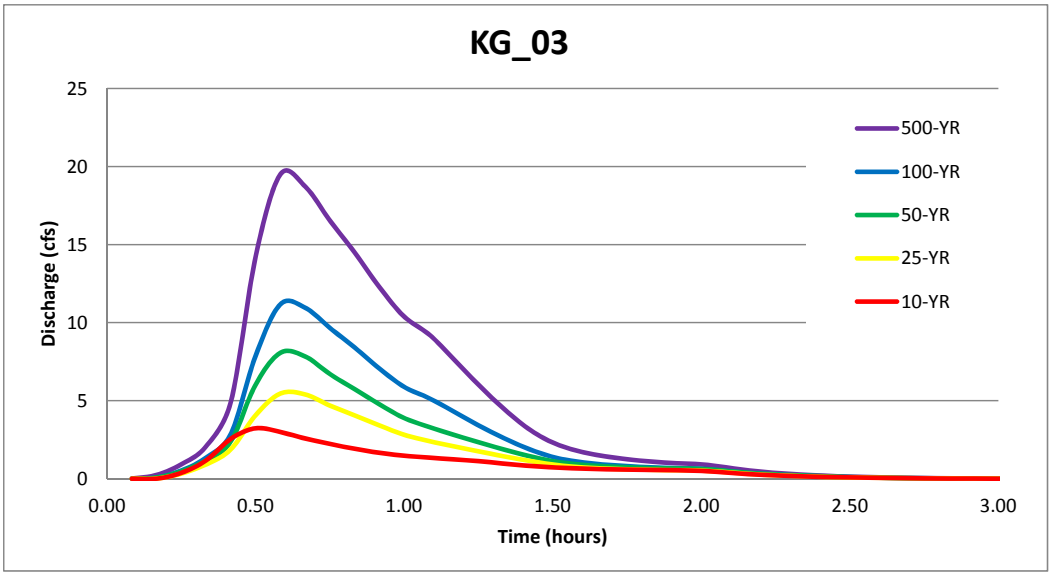

BL_04
Discharge (cfs)
400
350
300
250
200
150
100
50
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

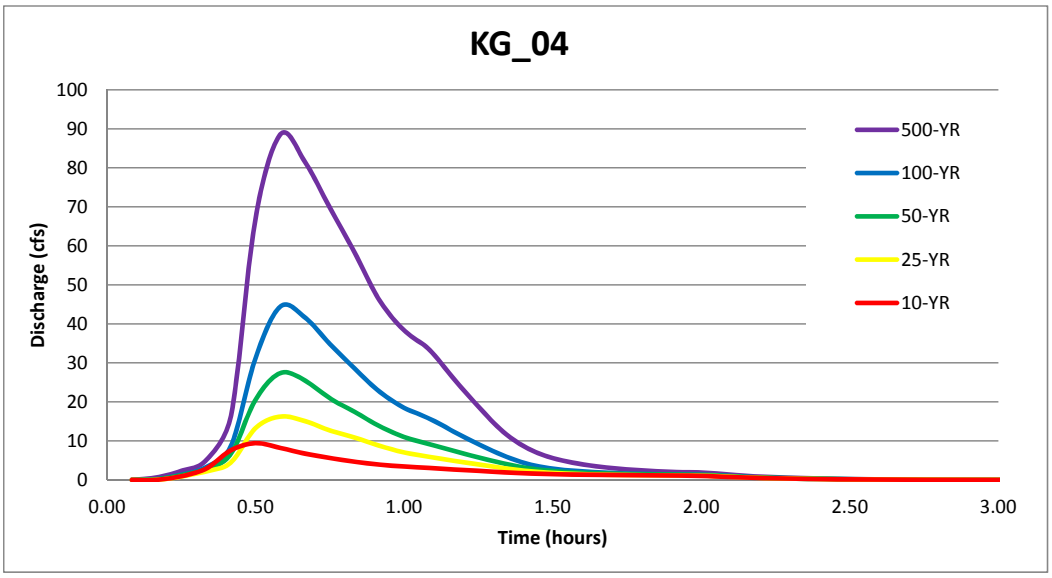

CU_01
Discharge (cfs)
350
300
250
200
150
100
50
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

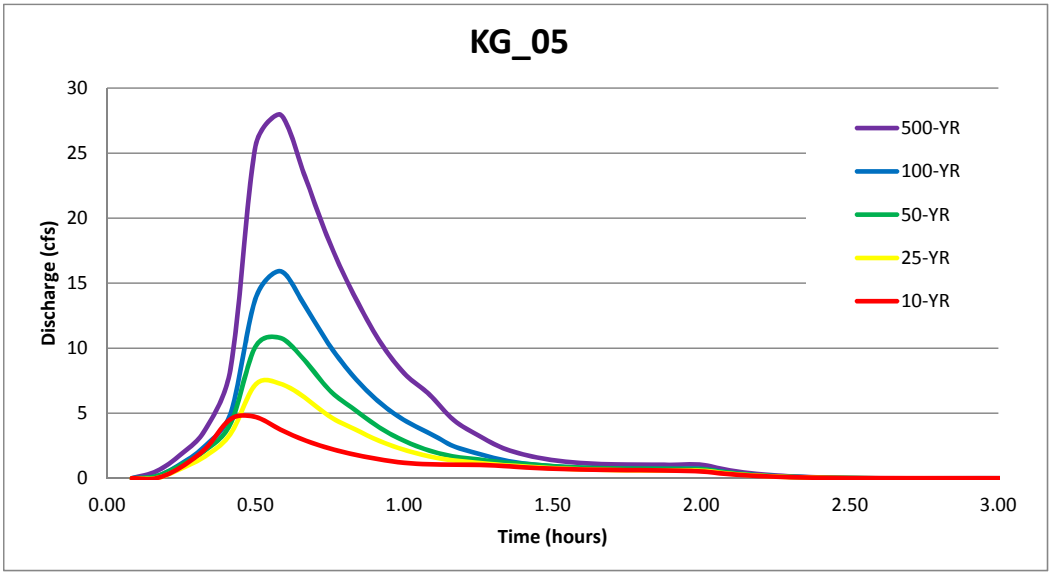

CU_02
Discharge (cfs)
350
300
250
200
150
100
50
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR
Storm Drain Capacity

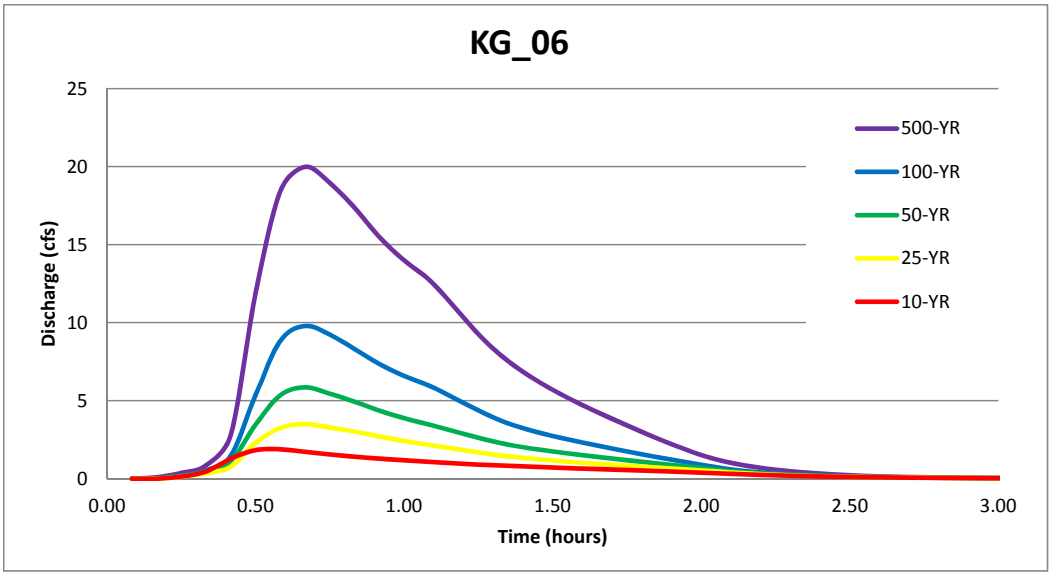

KG_01
Discharge (cfs)
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

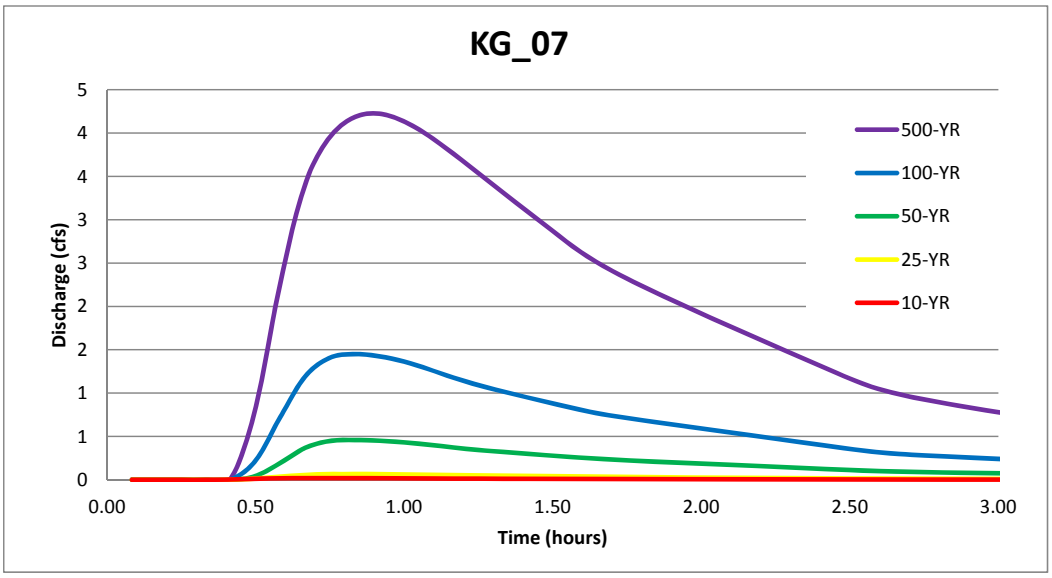

KG_02
Discharge (cfs)
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

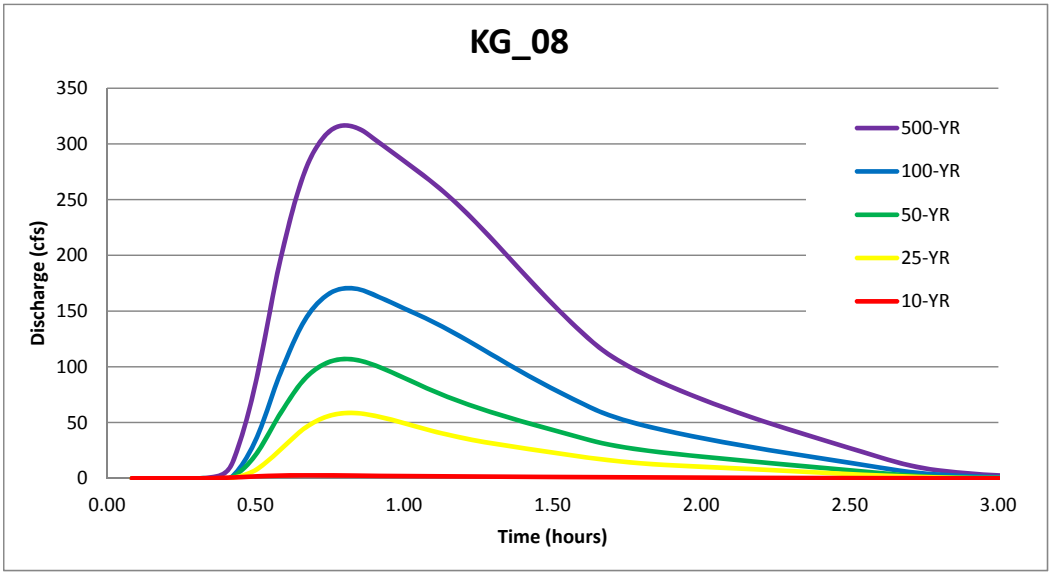

KG_03
Discharge (cfs)
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

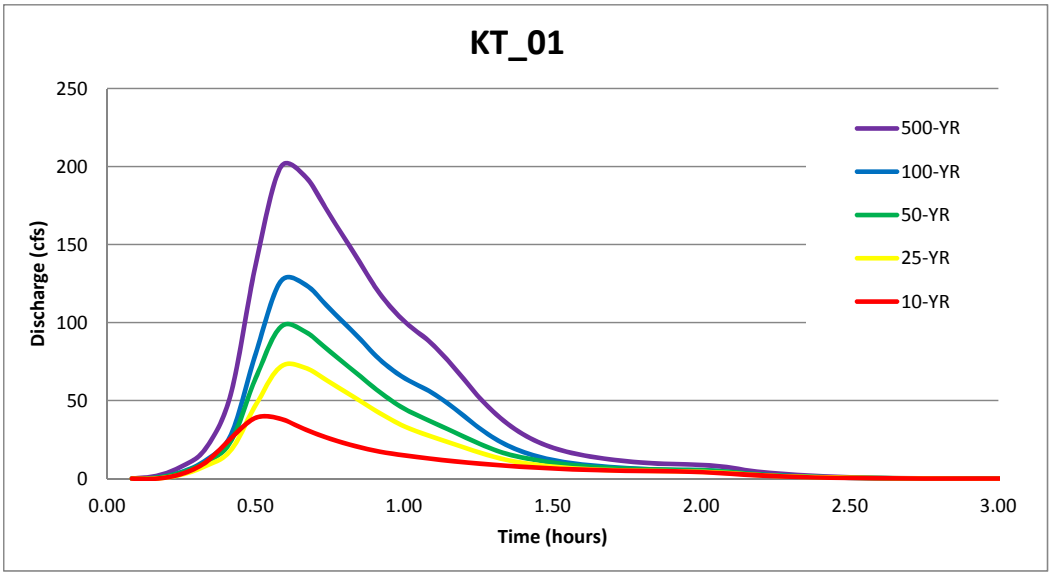

KG_04
Discharge (cfs)
100
90
80
70
60
50
40
30
20
10
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

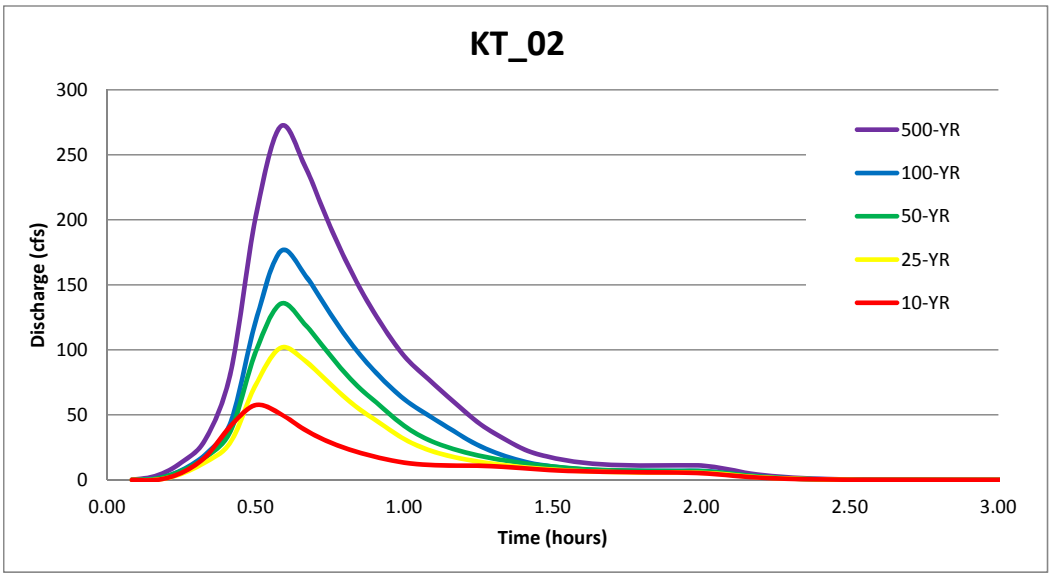

KG_05
Discharge (cfs)
30
25
20
15
10
5
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

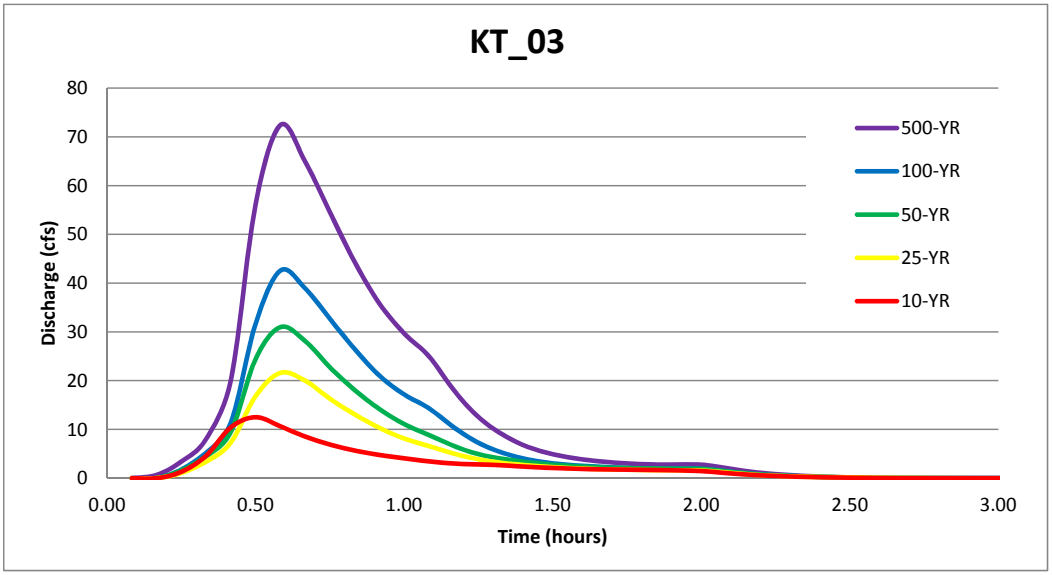

KG_06
Discharge (cfs)
25
20
15
10
5
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

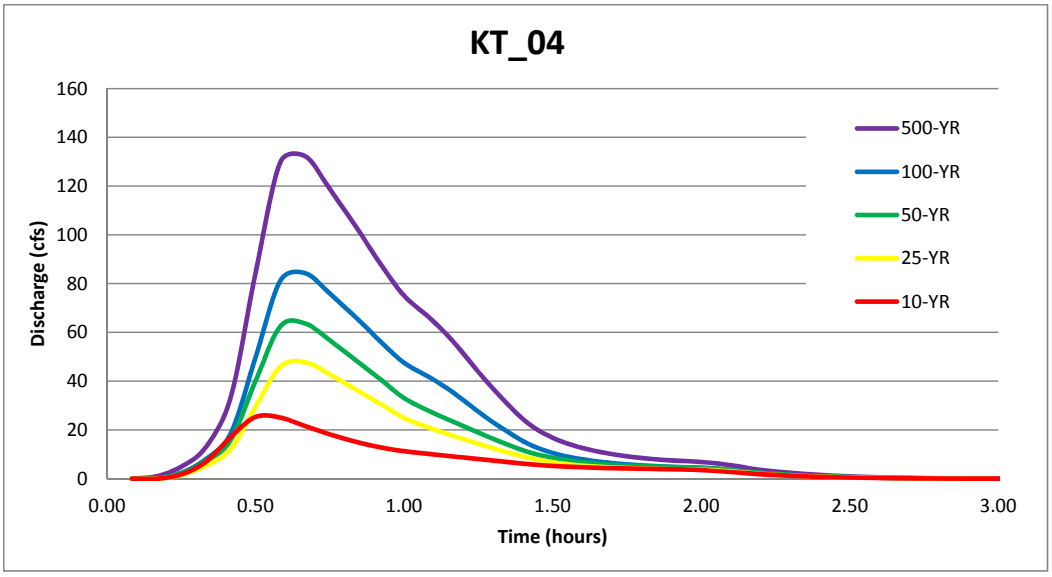

KG_07
Discharge (cfs)
5
4
4
3
3
2
2
1
1
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

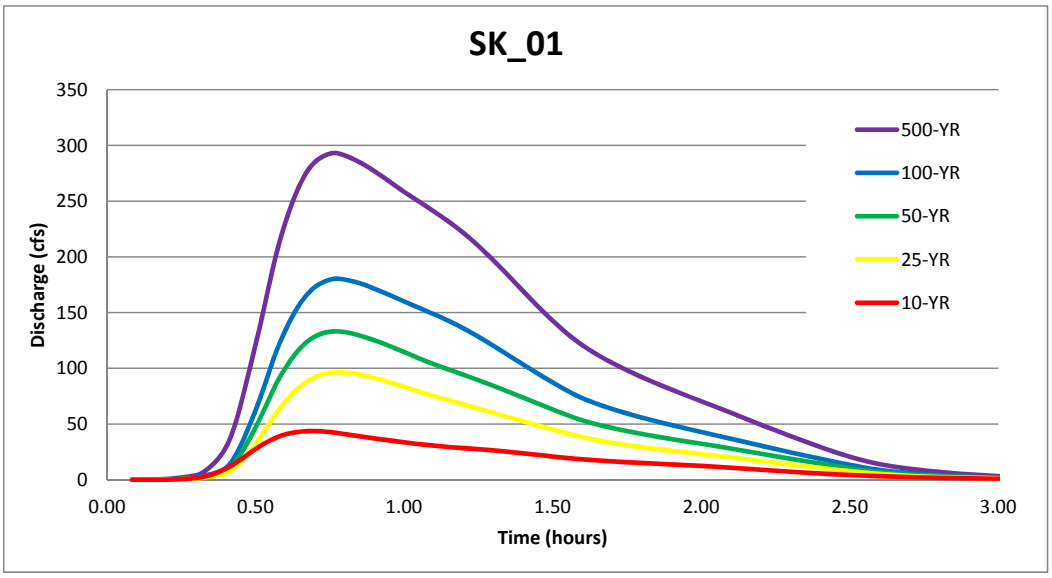

KG_08
Discharge (cfs)
350
300
250
200
150
100
50
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

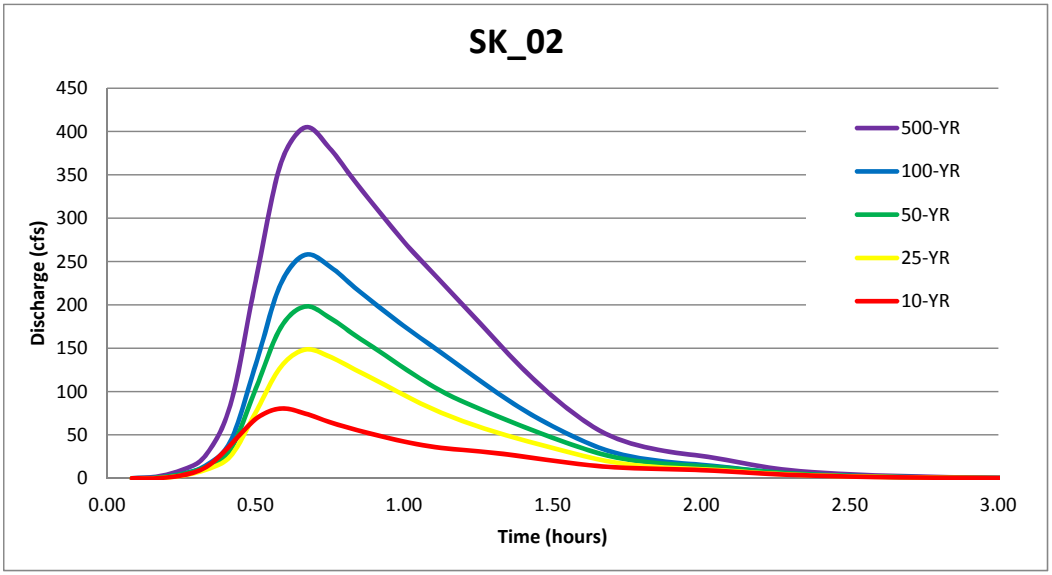

KT_01
Discharge (cfs)
250
200
150
100
50
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

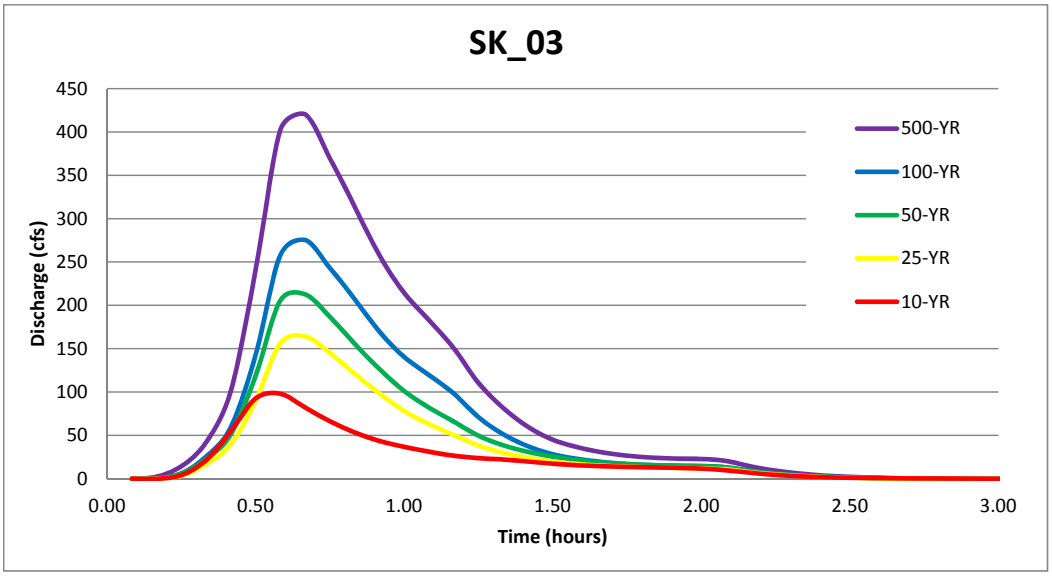

KT_02
Discharge (cfs)
300
250
200
150
100
50
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

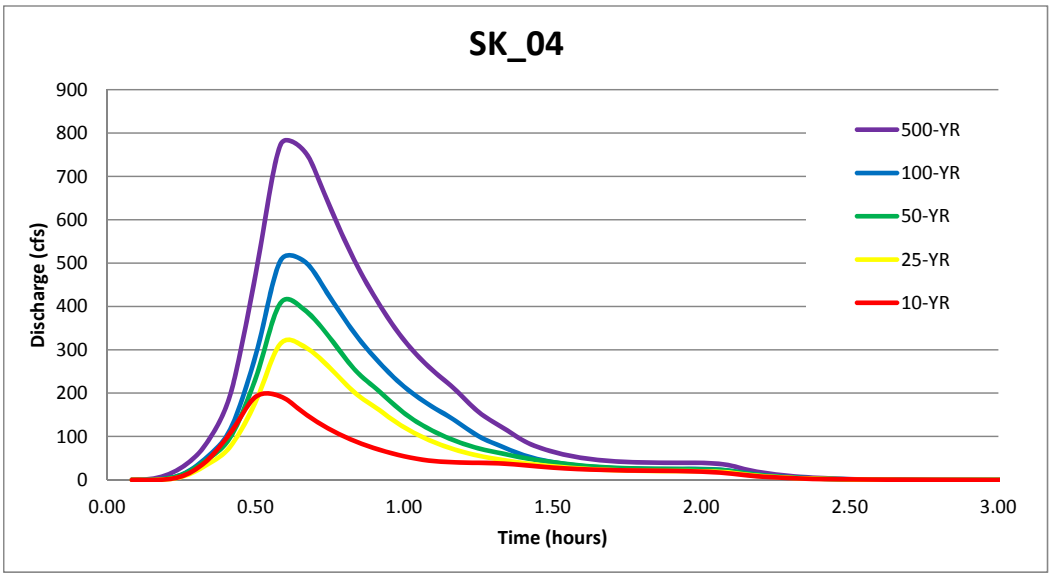

KT_03
Discharge (cfs)
80
70
60
50
40
30
20
10
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

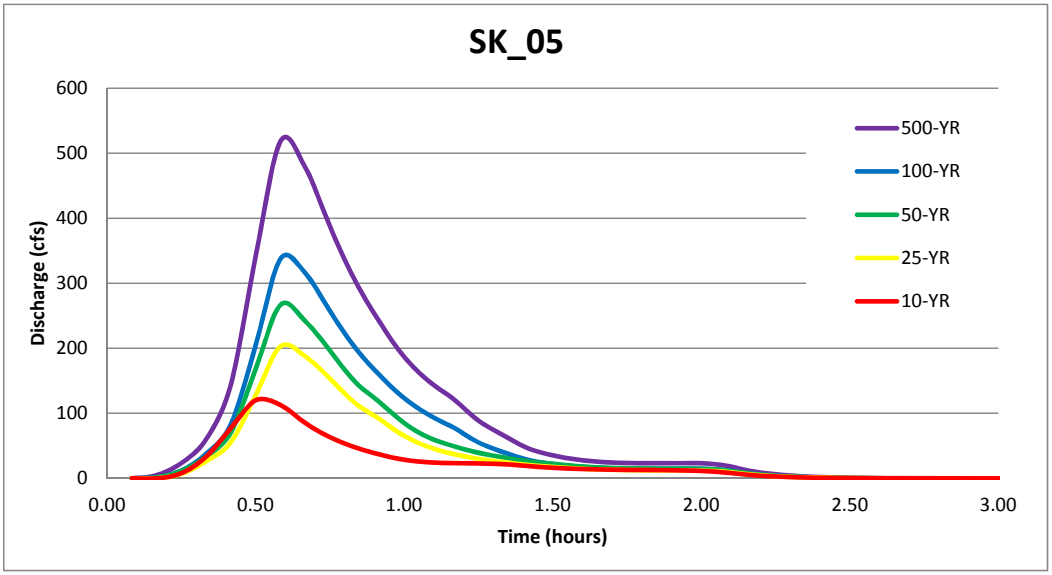

KT_04
Discharge (cfs)
160
140
120
100
80
60
40
20
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

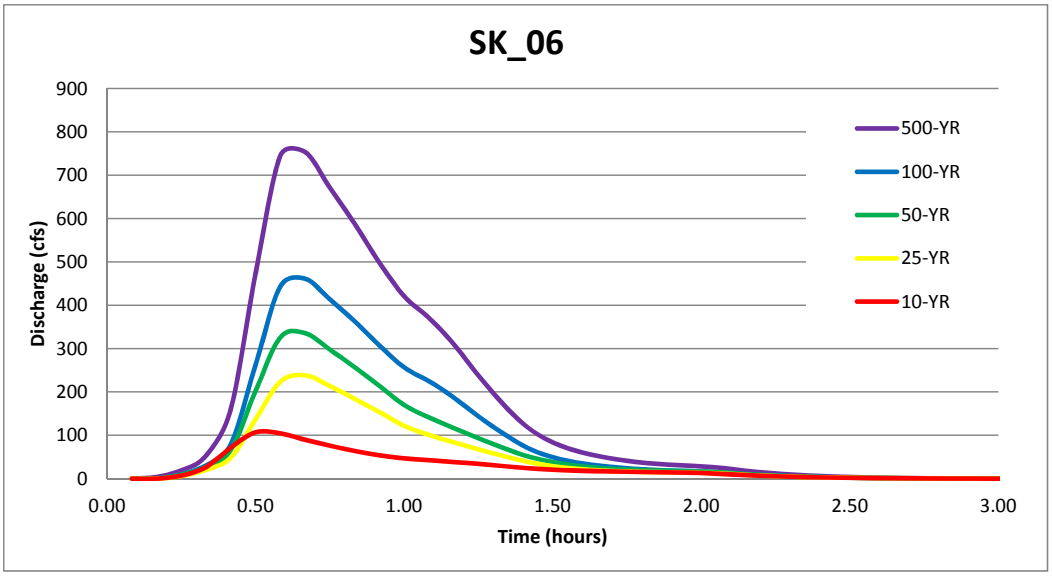

SK_01
Discharge (cfs)
350
300
250
200
150
100
50
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

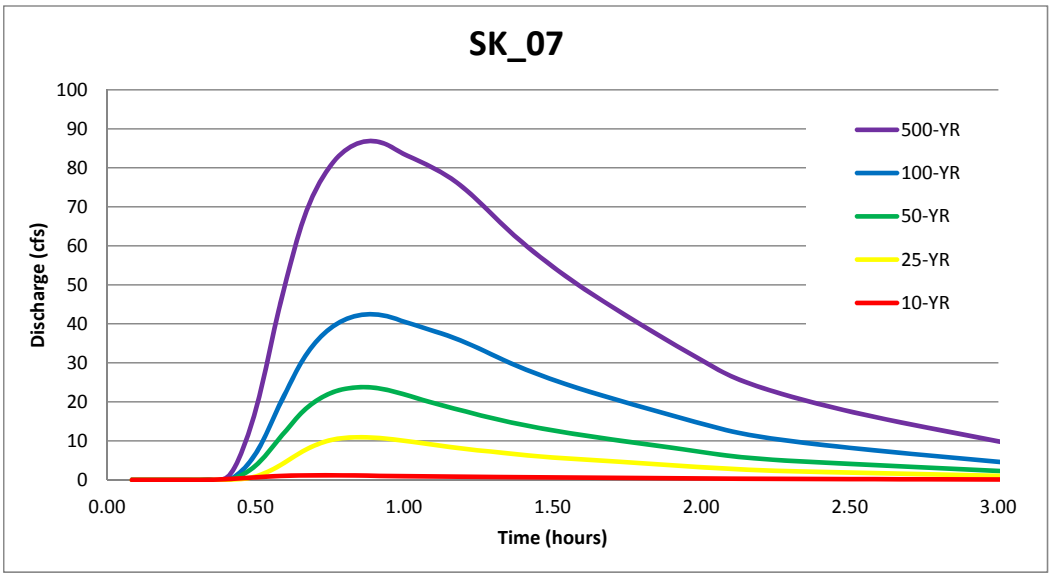

SK_02
Discharge (cfs)
450
400
350
300
250
200
150
100
50
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

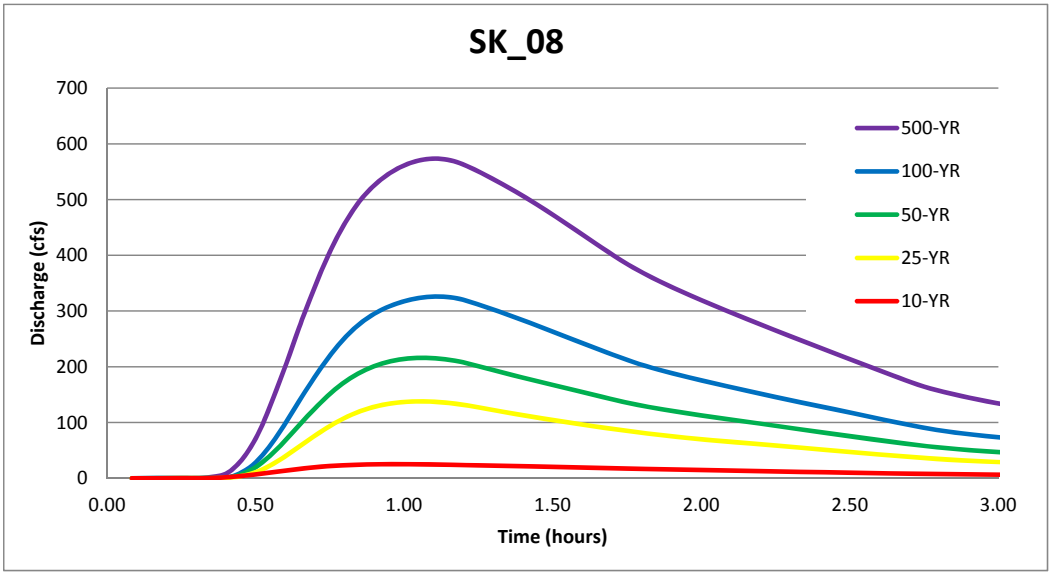

SK_03
Discharge (cfs)
450
400
350
300
250
200
150
100
50
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR


SK_04
Discharge (cfs)
900
800
700
600
500
400
300
200
100
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR


SK_05
Discharge (cfs)
600
500
400
300
200
100
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR


SK_06
Discharge (cfs)
900
800
700
600
500
400
300
200
100
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR


SK_07
Discharge (cfs)
100
90
80
70
60
50
40
30
20
10
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR


SK_08
Discharge (cfs)
700
600
500
400
300
200
100
0
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Time (hours)
500-YR
100-YR
50-YR
25-YR
10-YR

Worksheet for Anderson_Ditch_Pipe

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.024	
Channel Slope	0.00100	ft/ft
Normal Depth	4.00	ft
Diameter	4.00	ft

Results

Discharge	24.60	ft^3/s
Flow Area	12.57	ft^2
Wetted Perimeter	12.57	ft
Hydraulic Radius	1.00	ft
Top Width	0.00	ft
Critical Depth	1.47	ft
Percent Full	100.0	%
Critical Slope	0.01219	ft/ft
Velocity	1.96	ft/s
Velocity Head	0.06	ft
Specific Energy	4.06	ft
Froude Number	0.00	
Maximum Discharge	26.47	ft^3/s
Discharge Full	24.60	ft^3/s
Slope Full	0.00100	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s

Worksheet for Anderson_Ditch_Pipe

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	4.00	ft
Critical Depth	1.47	ft
Channel Slope	0.00100	ft/ft
Critical Slope	0.01219	ft/ft

Worksheet for BC_01_Pipe

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.01600	ft/ft
Normal Depth	1.75	ft
Diameter	1.75	ft

Results

Discharge	26.05	ft^3/s
Flow Area	2.41	ft^2
Wetted Perimeter	5.50	ft
Hydraulic Radius	0.44	ft
Top Width	0.00	ft
Critical Depth	1.69	ft
Percent Full	100.0	%
Critical Slope	0.01401	ft/ft
Velocity	10.83	ft/s
Velocity Head	1.82	ft
Specific Energy	3.57	ft
Froude Number	0.00	
Maximum Discharge	28.03	ft^3/s
Discharge Full	26.05	ft^3/s
Slope Full	0.01600	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s

Worksheet for BC_01_Pipe

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	1.75	ft
Critical Depth	1.69	ft
Channel Slope	0.01600	ft/ft
Critical Slope	0.01401	ft/ft

Worksheet for BC_02_Pipe

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.01000	ft/ft
Normal Depth	2.00	ft
Diameter	2.00	ft

Results

Discharge	29.41	ft³/s
Flow Area	3.14	ft²
Wetted Perimeter	6.28	ft
Hydraulic Radius	0.50	ft
Top Width	0.00	ft
Critical Depth	1.85	ft
Percent Full	100.0	%
Critical Slope	0.00866	ft/ft
Velocity	9.36	ft/s
Velocity Head	1.36	ft
Specific Energy	3.36	ft
Froude Number	0.00	
Maximum Discharge	31.63	ft³/s
Discharge Full	29.41	ft³/s
Slope Full	0.01000	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s

Worksheet for BC_02_Pipe

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	2.00	ft
Critical Depth	1.85	ft
Channel Slope	0.01000	ft/ft
Critical Slope	0.00866	ft/ft

Worksheet for BC_03_Pipe

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.00400	ft/ft
Normal Depth	2.50	ft
Diameter	2.50	ft

Results

Discharge	33.72	ft^3/s
Flow Area	4.91	ft^2
Wetted Perimeter	7.85	ft
Hydraulic Radius	0.63	ft
Top Width	0.00	ft
Critical Depth	1.98	ft
Percent Full	100.0	%
Critical Slope	0.00429	ft/ft
Velocity	6.87	ft/s
Velocity Head	0.73	ft
Specific Energy	3.23	ft
Froude Number	0.00	
Maximum Discharge	36.28	ft^3/s
Discharge Full	33.72	ft^3/s
Slope Full	0.00400	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s

Worksheet for BC_03_Pipe

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	2.50	ft
Critical Depth	1.98	ft
Channel Slope	0.00400	ft/ft
Critical Slope	0.00429	ft/ft

Worksheet for CU_02_Pipe

Project Description

Friction Method	Manning Formula
Solve For	Discharge

Input Data

Roughness Coefficient	0.010	
Channel Slope	0.00400	ft/ft
Normal Depth	3.50	ft
Diameter	3.50	ft

Results

Discharge	82.72	ft^3/s
Flow Area	9.62	ft^2
Wetted Perimeter	11.00	ft
Hydraulic Radius	0.88	ft
Top Width	0.00	ft
Critical Depth	2.84	ft
Percent Full	100.0	%
Critical Slope	0.00408	ft/ft
Velocity	8.60	ft/s
Velocity Head	1.15	ft
Specific Energy	4.65	ft
Froude Number	0.00	
Maximum Discharge	88.98	ft^3/s
Discharge Full	82.72	ft^3/s
Slope Full	0.00400	ft/ft
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
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	100.00	%
Downstream Velocity	Infinity	ft/s

Worksheet for CU_02_Pipe

GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	3.50	ft
Critical Depth	2.84	ft
Channel Slope	0.00400	ft/ft
Critical Slope	0.00408	ft/ft

Diversion : D_01

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	850	217	26
25-Yr	1609	774	48
50-Yr	2142	1183	55
100-Yr	2791	1720	62
500-Yr	4169	3029	73
500-Yr + 50%	5611	4664	83

2D Cross Sections

Flow In	Flow Diverted
2	1
4	

Diversion : D_02

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	321	0	0
25-Yr	804	85	11
50-Yr	1180	253	21
100-Yr	1662	449	27
500-Yr	2775	770	28
500-Yr + 50%	3247	1131	35

2D Cross Sections

Flow In	Flow Diverted
45	51
Ped Underpass	
US HWY 36 Culv.	
51	

Diversion : D_03

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	27	4	15
25-Yr	139	22	16
50-Yr	217	37	17
100-Yr	326	59	18
500-Yr	575	109	19
500-Yr + 50%	864	167	19

2D Cross Sections

Flow In	Flow Diverted
102	103
103	

Diversion : D_04

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	39	30	77
25-Yr	89	74	83
50-Yr	126	114	90
100-Yr	170	154	91
500-Yr	282	267	95
500-Yr + 50%	443	415	94

2D Cross Sections

Flow In	Flow Diverted
22	20
25	21

Diversion : D_05

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	10	7	70
25-Yr	25	16	64
50-Yr	35	22	63
100-Yr	46	29	63
500-Yr	74	52	70
500-Yr + 50%	111	83	75

2D Cross Sections

Flow In	Flow Diverted
39	39
43	43
54	
106	

Diversion : D_06

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	11	1	9
25-Yr	25	4	16
50-Yr	35	6	17
100-Yr	46	8	17
500-Yr	80	16	20
500-Yr + 50%	120	29	24

2D Cross Sections

Flow In	Flow Diverted
52	105
53	

Diversion : D_07

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	21	4	19
25-Yr	97	18	19
50-Yr	150	27	18
100-Yr	213	38	18
500-Yr	363	66	18
500-Yr + 50%	531	106	20

2D Cross Sections

Flow In	Flow Diverted
66	66
67	

Diversion : D_08

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	141	99	70
25-Yr	230	166	72
50-Yr	280	201	72
100-Yr	344	244	71
500-Yr	468	344	74
500-Yr + 50%	700	518	74

2D Cross Sections

Flow In	Flow Diverted
18	19
19	

Diversion : D_09

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	58	58	100
25-Yr	106	83	78
50-Yr	145	83	57
100-Yr	194	83	43
500-Yr	311	83	27
500-Yr + 50%	467	83	18

2D Cross Sections

Flow In	Flow Diverted
CU_02	CU_02
	Pipe Capacity

Diversion : D_10

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	21	21	100
25-Yr	32	26	81
50-Yr	40	26	65
100-Yr	50	26	52
500-Yr	74	26	35
500-Yr + 50%	111	26	23

2D Cross Sections

Flow In	Flow Diverted
BC_01	BC_01
	Pipe Capacity

Diversion : D_11

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	13	13	100
25-Yr	25	25	100
50-Yr	33	33	100
100-Yr	44	34	77
500-Yr	70	34	49
500-Yr + 50%	105	34	32

2D Cross Sections

Flow In	Flow Diverted
BC_03	BC_03
	Pipe Capacity

Diversion : D_12

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	8	8	100
25-Yr	16	16	100
50-Yr	22	22	100
100-Yr	29	29	100
500-Yr	47	29	62
500-Yr + 50%	71	29	41

2D Cross Sections

Flow In	Flow Diverted
BC_02	BC_02
	Pipe Capacity

Diversion : D_13

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	7	0	0
25-Yr	98	12	12
50-Yr	266	60	23
100-Yr	468	135	29
500-Yr	780	298	38
500-Yr + 50%	1123	495	44

2D Cross Sections

Flow In	Flow Diverted
46	46
47	47
48	48
49	

Diversion : D_14

	Flow In	Flow Diverted	% Diverted
No Flow	0	0	0
10-Yr	5	1	20
25-Yr	51	8	16
50-Yr	107	17	16
100-Yr	152	34	22
500-Yr	294	51	17
500-Yr + 50%	451	68	15

2D Cross Sections

Flow In	Flow Diverted
90	95 less 96
91	

```
[TITLE]
INP file created on 2016-04-15 10:08:49 AM by Bledoux with inpPINS version 0.0.2.0
Title/Notes:

[OPTIONS]
FLOW_UNITS           CFS
INFILTRATION         HORTON
FLOW_ROUTING         KINWAVE
START_DATE           01/01/2005
START_TIME           00:00:00
REPORT_START_DATE    01/01/2005
REPORT_START_TIME    00:00:00
END_DATE             01/01/2005
END_TIME             10:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:15:00
WET_STEP             00:05:00
DRY_STEP             01:00:00
ROUTING_STEP         0:00:30
ALLOW_PONDING        NO
INERTIAL_DAMPING     PARTIAL
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
NORMAL_FLOW_LIMITED  BOTH
SKIP_STEADY_STATE    NO
FORCE_MAIN_EQUATION  D-W
LINK_OFFSETS         DEPTH
MIN_SLOPE            0

[FILES]
USE INFLOWS "P:\P\14008SBK_1\Hydrology\CUHP\SBK_CUHP_1442_SWMM_100_YR.txt"

[EVAPORATION]
;;Type       Parameters
;;---------- ----------
CONSTANT     0.0
DRY_ONLY     NO

[JUNCTIONS]
;;               Invert     Max.       Init.      Surcharge  Ponded
;;Name           Elev.      Depth      Depth      Depth      Area
;;-------------- ---------- ---------- ---------- ---------- ----------
;Pipe Outfall
ANDERSON         5431.32    20         0          0          100
;Design Point
BC_01            5333.54    20         0          0          100
;Pipe Outfall
BC_01_SD         5301.56    10         0          0          100
;Design Point
BC_02            5355.33    10         0          0          100
;Pipe Outfall
BC_02_SD         5353.76    10         0          0          100
;Design Point
BC_03            5360.11    10         0          0          100
;Pipe Outfall
BC_03_SD         5338.8     10         0          0          100
;Design Point
BC_04            5336.24    10         0          0          100
;Design Point
BL_01            5423.4     10         0          0          100
;Design Point
BL_02            5469       10         0          0          100
;Design Point
BL_03            5544       10         0          0          100
;Design Point
BL_04            5650.88    10         0          0          100
;Design Point
CU_01            5420.62    10         0          0          100
;Design Point
CU_02            5423.97    10         0          0          100
;Pipe Outfall
CU_02_SD         5408.87    10         0          0          100
;Design Point
KG_01            5417       10         0          0          100
;Design Point
KG_02            5455       10         0          0          100
;Design Point
KG_03            5475       10         0          0          100
```

```
;Design Point
KG_04            5536       10         0          0          100
;Design Point
KG_05            5543       10         0          0          100
;Design Point
KG_06            5598       10         0          0          100
;Design Point
KG_07            5494       10         0          0          100
;Design Point
KG_08            5604       10         0          0          100
;Pipe Outfall
KINGS_GULCH      5414       10         0          0          100
;Design Point
KT_01            5340.76    10         0          0          100
;Design Point
KT_02            5388.61    10         0          0          100
;Design Point
KT_03            5314.42    10         0          0          100
;Design Point
KT_04            5355.13    10         0          0          100
;Design Point
SK_01            5238.62    10         0          0          100
;Design Point
SK_02            5253.07    10         0          0          100
;Design Point
SK_03            5261.6     10         0          0          100
;Design Point
SK_04            5280.57    10         0          0          100
;Design Point
SK_05            5357.14    10         0          0          100
;Design Point
SK_06            5383.83    10         0          0          100
;Design Point
SK_07            5486.72    10         0          0          100
;Design Point
SK_08            5635.92    10         0          0          100

[OUTFALLS]
;;               Invert     Outfall    Stage/Table      Tide
;;Name           Elev.      Type       Time Series      Gate
;;-------------- ---------- ---------- ---------------- ----
;Outfall
OUT_01           5237.72    FREE                        NO
;Outfall
OUT_02           5237       FREE                        NO
;Outfall
OUT_03           5474.24    FREE                        NO
;Outfall
OUT_04           5322.8     FREE                        NO
;Outfall
OUT_07           5342       FREE                        NO
;Outfall
OUT_08           5341.91    FREE                        NO
;Outfall
OUT_09           5382.21    FREE                        NO
;Outfall
OUT_10           5357       FREE                        NO

[DIVIDERS]
;;               Invert     Diverted         Divider
;;Name           Elev.      Link             Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
;Diversion
D_01             5238       R_SK_02          TABULAR    D_01             20         0          0
0
;Diversion
D_02             5355.47    R_BC_03          TABULAR    D_02             50         0          0
0
;Diversion
D_03             5614.73    R_SK_15          TABULAR    D_03             10         0          0
0
;Diversion
D_04             5303.64    R_KT_02          TABULAR    D_04             10         0          0
0
;Diversion
D_05             5397.52    R_KT_06          TABULAR    D_05             10         0          0
0
;Diversion
D_06             5413.17    R_KT_09          TABULAR    D_06             10         0          0
0
;Diversion
```

```
D_07            5480.04    R_BL_07          TABULAR    D_07             10         0          0
0
;Diversion
D_08            5348.39    R_KT_07          TABULAR    D_08             10         0          0
0
;Diversion
D_09            5423.2     R_CU_02          TABULAR    D_09             10         0          0
0
;Diversion
D_10            5326.68    R_BC_08          TABULAR    D_10             10         0          10
0
;Diversion
D_11            5359       R_BC_11          TABULAR    D_11             10         0          0
0
;Diversion
D_12            5354       R_BC_05          TABULAR    D_12             10         0          0
0
;Diversion
D_13            5335       R_BC_14          TABULAR    D_13             10         0          0
0
;Diversion
D_14            5463       R_KG_04          TABULAR    D_14             10         0          0
0

[CONDUITS]
;;              Inlet            Outlet                      Manning    Inlet      Outlet     Init.
Max.
;;Name           Node             Node             Length     N          Offset     Offset     Flow
Flow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ----------
----------
;R_BC_01
R_BC_01         D_10             OUT_04           1425       0.02       0          0          0
0
;R_BC_02
R_BC_02         D_13             D_10             318        0.02       0          0          0
0
;R_BC_03
R_BC_03         D_02             BC_04            1743       0.02       0          0          0
0
;R_BC_04
R_BC_04         BC_02_SD         BC_04            1071       0.02       0          0          0
0
;R_BC_05
R_BC_05         D_12             BC_02_SD         121        0.02       0          0          0
0
;R_BC_06
R_BC_06         D_12             OUT_07           1164       0.02       0          0          0
0
;R_BC_07
R_BC_07         BC_02            D_12             141        0.02       0          0          0
0
;R_BC_08
R_BC_08         D_10             BC_01_SD         674        0.02       0          0          0
0
;R_BC_09
R_BC_09         BC_01            D_10             220        0.02       0          0          0
0
;R_BC_10
R_BC_10         D_11             D_12             2092       0.02       0          0          0
0
;R_BC_11
R_BC_11         D_11             BC_03_SD         1374       0.02       0          0          0
0
;R_BC_12
R_BC_12         BC_03            D_11             138        0.02       0          0          0
0
;R_BC_13
R_BC_13         BC_04            D_13             97         0.02       0          0          0
0
;R_BC_14
R_BC_14         D_13             BC_01_SD         1015       0.02       0          0          0
0
;R_BL_01
R_BL_01         D_05             SK_06            867        0.02       0          0          0
0
;R_BL_02
R_BL_02         D_06             D_05             442        0.02       0          0          0
0
;R_BL_03
R_BL_03         BL_01            D_06             357        0.02       0          0          0
```

```
0
;R_BL_04
R_BL_04          BL_02            BL_01            1089       0.02       0          0          0
0
;R_BL_05
R_BL_05          KG_03            KG_01            1337       0.02       0          0          0
0
;R_BL_06
R_BL_06          D_07             KG_03            330        0.02       0          0          0
0
;R_BL_07
R_BL_07          D_07             BL_02            671        0.02       0          0          0
0
;R_BL_08
R_BL_08          KG_05            D_07             719        0.02       0          0          0
0
;R_BL_09
R_BL_09          BL_03            KG_05            134        0.02       0          0          0
0
;R_BL_10
R_BL_10          BL_04            BL_03            1454       0.07       0          0          0
0
;R_CU_01
R_CU_01          CU_02_SD         KT_04            2030       0.02       0          0          0
0
;R_CU_02
R_CU_02          D_09             CU_02_SD         411        0.02       0          0          0
0
;R_CU_03
R_CU_03          D_09             OUT_09           1287       0.02       0          0          0
0
;R_CU_04
R_CU_04          CU_02            D_09             421        0.02       0          0          0
0
;R_CU_05
R_CU_05          CU_01            OUT_10           1933       0.02       0          0          0
0
;R_CU_06
R_CU_06          D_08             OUT_08           627        0.02       0          0          0
0
;R_CU_07
R_CU_07          KT_04            D_08             65         0.02       0          0          0
0
;R_KG_01
R_KG_01          KG_01            SK_06            898        0.02       0          0          0
0
;R_KG_02
R_KG_02          KG_02            KG_01            1300       0.02       0          0          0
0
;R_KG_03
R_KG_03          D_14             KG_02            399        0.02       0          0          0
0
;R_KG_04
R_KG_04          D_14             KINGS_GULCH      1181       0.02       0          0          0
0
;R_KG_05
R_KG_05          KG_07            D_14             691        0.02       0          0          0
0
;R_KG_06
R_KG_06          KG_04            KG_07            691        0.05       0          0          0
0
;R_KG_07
R_KG_07          KG_08            KG_04            987        0.07       0          0          0
0
;R_KG_08
R_KG_08          KG_06            KG_05            734        0.02       0          0          0
0
;R_KT_01
R_KT_01          SK_03            SK_01            3546       0.07       0          0          0
0
;R_KT_02
R_KT_02          D_04             SK_03            2914       0.02       0          0          0
0
;R_KT_03
R_KT_03          KT_03            SK_03            3582       0.02       0          0          0
0
;R_KT_04
R_KT_04          D_04             SK_04            1656       0.02       0          0          0
0
;R_KT_05
R_KT_05          KT_01            D_04             1547       0.02       0          0          0
```

```
0
;R_KT_06
R_KT_06          D_05             KT_01            2235       0.02       0          0          0
0
;R_KT_07
R_KT_07          D_08             KT_03            891        0.02       0          0          0
0
;R_KT_08
R_KT_08          KT_02            KT_04            1987       0.02       0          0          0
0
;R_KT_09
R_KT_09          D_06             KT_02            908        0.02       0          0          0
0
;R_SK_01
R_SK_01          D_01             OUT_01           1110       0.07       0          0          0
0
;R_SK_02
R_SK_02          D_01             OUT_02           1055       0.07       0          0          0
0
;R_SK_03
R_SK_03          SK_01            D_01             264        0.07       0          0          0
0
;R_SK_04
R_SK_04          SK_02            SK_01            2477       0.07       0          0          0
0
;R_SK_05
R_SK_05          SK_04            SK_02            1979       0.07       0          0          0
0
;R_SK_06
R_SK_06          BC_01_SD         SK_04            1756       0.07       0          0          0
0
;R_SK_07
R_SK_07          BC_03_SD         BC_01_SD         1592       0.07       0          0          0
0
;R_SK_08
R_SK_08          D_02             BC_03_SD         457        0.07       0          0          0
0
;R_SK_09
R_SK_09          SK_05            D_02             188        0.07       0          0          0
0
;R_SK_10
R_SK_10          SK_06            SK_05            1338       0.07       0          0          0
0
;R_SK_11
R_SK_11          KINGS_GULCH      SK_06            1044       0.07       0          0          0
0
;R_SK_12
R_SK_12          SK_07            ANDERSON         1229       0.07       0          0          0
0
;R_SK_13
R_SK_13          D_03             SK_07            1755       0.07       0          0          0
0
;R_SK_14
R_SK_14          SK_08            D_03             285        0.07       0          0          0
0
;R_SK_15
R_SK_15          D_03             OUT_03           2690       0.07       0          0          0
0
;R_SK_16
R_SK_16          ANDERSON         KINGS_GULCH      495        0.07       0          0          0
0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels
;;-------------- ------------ ---------------- ---------- ---------- ---------- ----------
R_BC_01          DUMMY        10               0          0          0          1
R_BC_02          DUMMY        10               0          0          0          1
R_BC_03          TRAPEZOIDAL  50               44         1          1          1
R_BC_04          TRAPEZOIDAL  50               60         1          1          1
R_BC_05          DUMMY        0                0          0          0          1
R_BC_06          DUMMY        10               0          0          0          1
R_BC_07          DUMMY        0                0          0          0          1
R_BC_08          DUMMY        10               0          0          0          1
R_BC_09          DUMMY        10               0          0          0          1
R_BC_10          DUMMY        10               0          0          0          1
R_BC_11          DUMMY        10               0          0          0          1
R_BC_12          DUMMY        10               0          0          0          1
R_BC_13          TRAPEZOIDAL  50               60         1          1          1
R_BC_14          TRAPEZOIDAL  50               60         1          1          1
R_BL_01          TRAPEZOIDAL  50               50         1          1          1
R_BL_02          TRAPEZOIDAL  50               35         1          1          1
```

```
R_BL_03          TRAPEZOIDAL  50               35         1          1          1
R_BL_04          TRAPEZOIDAL  50               30         1          1          1
R_BL_05          TRAPEZOIDAL  50               30         1          1          1
R_BL_06          TRAPEZOIDAL  50               30         1          1          1
R_BL_07          TRAPEZOIDAL  50               30         1          1          1
R_BL_08          TRAPEZOIDAL  50               30         1          1          1
R_BL_09          TRAPEZOIDAL  50               30         1          1          1
R_BL_10          TRAPEZOIDAL  50               20         3          3          1
R_CU_01          TRAPEZOIDAL  50               60         1          1          1
R_CU_02          DUMMY        10               0          0          0          1
R_CU_03          DUMMY        10               0          0          0          1
R_CU_04          DUMMY        10               0          0          0          1
R_CU_05          DUMMY        10               0          0          0          1
R_CU_06          DUMMY        10               0          0          0          1
R_CU_07          DUMMY        10               0          0          0          1
R_KG_01          TRAPEZOIDAL  50               30         1          1          1
R_KG_02          TRAPEZOIDAL  50               30         1          1          1
R_KG_03          TRAPEZOIDAL  50               30         1          1          1
R_KG_04          TRAPEZOIDAL  50               30         1          1          1
R_KG_05          TRAPEZOIDAL  50               30         1          1          1
R_KG_06          TRAPEZOIDAL  50               8          2          2          1
R_KG_07          TRAPEZOIDAL  50               15         2          2          1
R_KG_08          TRAPEZOIDAL  50               30         1          1          1
R_KT_01          TRAPEZOIDAL  50               80         4          4          1
R_KT_02          TRAPEZOIDAL  50               45         1          1          1
R_KT_03          TRAPEZOIDAL  50               65         1          1          1
R_KT_04          TRAPEZOIDAL  50               35         1          1          1
R_KT_05          TRAPEZOIDAL  50               35         1          1          1
R_KT_06          TRAPEZOIDAL  50               40         1          1          1
R_KT_07          TRAPEZOIDAL  50               40         1          1          1
R_KT_08          TRAPEZOIDAL  50               60         1          1          1
R_KT_09          TRAPEZOIDAL  50               40         1          1          1
R_SK_01          DUMMY        0                0          0          0          1
R_SK_02          DUMMY        0                0          0          0          1
R_SK_03          TRAPEZOIDAL  50               15         4          4          1
R_SK_04          TRAPEZOIDAL  50               70         4          4          1
R_SK_05          TRAPEZOIDAL  50               70         4          4          1
R_SK_06          TRAPEZOIDAL  50               10         4          4          1
R_SK_07          TRAPEZOIDAL  50               10         4          4          1
R_SK_08          RECT_OPEN    50               6          0          0          2
R_SK_09          DUMMY        10               0          0          0          1
R_SK_10          TRAPEZOIDAL  50               20         4          4          1
R_SK_11          TRAPEZOIDAL  50               10         3          3          1
R_SK_12          TRAPEZOIDAL  50               8          3          3          1
R_SK_13          TRAPEZOIDAL  50               5          3          3          1
R_SK_14          TRAPEZOIDAL  50               10         3          3          1
R_SK_15          DUMMY        50               0          0          0          1
R_SK_16          TRAPEZOIDAL  50               10         3          3          1

[LOSSES]
;;Link           Inlet      Outlet     Average    Flap Gate
;;-------------- ---------- ---------- ---------- ----------

[INFLOWS]
;;                                                Param    Units    Scale    Baseline Baseline
;;Node           Parameter        Time Series      Type     Factor   Factor   Value    Pattern
;;-------------- ---------------- ---------------- -------- -------- -------- -------- --------
ANDERSON         FLOW             ""               FLOW     1.0      1.0      25

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
D_01             Diversion  0          0
D_01                        850        217
D_01                        1609       774
D_01                        2142       1183
D_01                        2791       1720
D_01                        4169       3029
D_01                        5611       4664

D_02             Diversion  0          0
D_02                        321        0
D_02                        804        85
D_02                        1180       253
D_02                        1662       449
D_02                        2775       770
D_02                        3247       1131

D_03             Diversion  0          0
D_03                        27         4
D_03                        139        22
```

```
D_03                        217        37
D_03                        326        59
D_03                        575        109
D_03                        864        167

D_04             Diversion  0          0
D_04                        39         30
D_04                        89         74
D_04                        126        114
D_04                        170        154
D_04                        282        267
D_04                        443        415

D_05             Diversion  0          0
D_05                        10         7
D_05                        25         16
D_05                        35         22
D_05                        46         29
D_05                        74         52
D_05                        111        83

D_06             Diversion  0          0
D_06                        11         1
D_06                        25         4
D_06                        35         6
D_06                        46         8
D_06                        80         16
D_06                        120        29

D_07             Diversion  0          0
D_07                        21         4
D_07                        97         18
D_07                        150        27
D_07                        213        38
D_07                        363        66
D_07                        531        106

D_08             Diversion  0          0
D_08                        141        99
D_08                        230        166
D_08                        280        201
D_08                        344        244
D_08                        468        344
D_08                        700        518

D_09             Diversion  0          0
D_09                        58         58
D_09                        106        83
D_09                        145        83
D_09                        194        83
D_09                        311        83
D_09                        467        83

D_10             Diversion  0          0
D_10                        21         21
D_10                        32         26
D_10                        40         26
D_10                        50         26
D_10                        74         26
D_10                        111        26

D_11             Diversion  0          0
D_11                        13         13
D_11                        25         25
D_11                        33         33
D_11                        44         34
D_11                        70         34
D_11                        105        34

D_12             Diversion  0          0
D_12                        8          8
D_12                        16         16
D_12                        22         22
D_12                        29         29
D_12                        47         29
D_12                        71         29

D_13             Diversion  0          0
D_13                        7          0
D_13                        98         12
D_13                        266        60
```

```
D_13                        468        135
D_13                        780        298
D_13                        1123       495

D_14             Diversion  0          0
D_14                        5          1
D_14                        51         8
D_14                        107        17
D_14                        152        34
D_14                        294        51
D_14                        451        68

[REPORT]
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]
Node       ANDERSON         ANDERSON
Node       BC_01            BC_01
Node       BC_01_SD         BC_01_SD
Node       BC_02            BC_02
Node       BC_02_SD         BC_02_SD
Node       BC_03            BC_03
Node       BC_03_SD         BC_03_SD
Node       BC_04            BC_04
Node       BL_01            BL_01
Node       BL_02            BL_02
Node       BL_03            BL_03
Node       BL_04            BL_04
Node       CU_01            CU_01
Node       CU_02            CU_02
Node       CU_02_SD         CU_02_SD
Node       KG_01            KG_01
Node       KG_02            KG_02
Node       KG_03            KG_03
Node       KG_04            KG_04
Node       KG_05            KG_05
Node       KG_06            KG_06
Node       KG_07            KG_07
Node       KG_08            KG_08
Node       KINGS_GULCH      KINGS_GULCH
Node       KT_01            KT_01
Node       KT_02            KT_02
Node       KT_03            KT_03
Node       KT_04            KT_04
Node       SK_01            SK_01
Node       SK_02            SK_02
Node       SK_03            SK_03
Node       SK_04            SK_04
Node       SK_05            SK_05
Node       SK_06            SK_06
Node       SK_07            SK_07
Node       SK_08            SK_08
Node       OUT_01           OUT_01
Node       OUT_02           OUT_02
Node       OUT_03           OUT_03
Node       OUT_04           OUT_04
Node       OUT_07           OUT_07
Node       OUT_08           OUT_08
Node       OUT_09           OUT_09
Node       OUT_10           OUT_10
Node       D_01             D_01
Node       D_02             D_02
Node       D_03             D_03
Node       D_04             D_04
Node       D_05             D_05
Node       D_06             D_06
Node       D_07             D_07
Node       D_08             D_08
Node       D_09             D_09
Node       D_10             D_10
Node       D_11             D_11
Node       D_12             D_12
Node       D_13             D_13
Node       D_14             D_14
Link       R_BC_01          R_BC_01
Link       R_BC_02          R_BC_02
Link       R_BC_03          R_BC_03
```

```
Link       R_BC_04          R_BC_04
Link       R_BC_05          R_BC_05
Link       R_BC_06          R_BC_06
Link       R_BC_07          R_BC_07
Link       R_BC_08          R_BC_08
Link       R_BC_09          R_BC_09
Link       R_BC_10          R_BC_10
Link       R_BC_11          R_BC_11
Link       R_BC_12          R_BC_12
Link       R_BC_13          R_BC_13
Link       R_BC_14          R_BC_14
Link       R_BL_01          R_BL_01
Link       R_BL_02          R_BL_02
Link       R_BL_03          R_BL_03
Link       R_BL_04          R_BL_04
Link       R_BL_05          R_BL_05
Link       R_BL_06          R_BL_06
Link       R_BL_07          R_BL_07
Link       R_BL_08          R_BL_08
Link       R_BL_09          R_BL_09
Link       R_BL_10          R_BL_10
Link       R_CU_01          R_CU_01
Link       R_CU_02          R_CU_02
Link       R_CU_03          R_CU_03
Link       R_CU_04          R_CU_04
Link       R_CU_05          R_CU_05
Link       R_CU_06          R_CU_06
Link       R_CU_07          R_CU_07
Link       R_KG_01          R_KG_01
Link       R_KG_02          R_KG_02
Link       R_KG_03          R_KG_03
Link       R_KG_04          R_KG_04
Link       R_KG_05          R_KG_05
Link       R_KG_06          R_KG_06
Link       R_KG_07          R_KG_07
Link       R_KG_08          R_KG_08
Link       R_KT_01          R_KT_01
Link       R_KT_02          R_KT_02
Link       R_KT_03          R_KT_03
Link       R_KT_04          R_KT_04
Link       R_KT_05          R_KT_05
Link       R_KT_06          R_KT_06
Link       R_KT_07          R_KT_07
Link       R_KT_08          R_KT_08
Link       R_KT_09          R_KT_09
Link       R_SK_01          R_SK_01
Link       R_SK_02          R_SK_02
Link       R_SK_03          R_SK_03
Link       R_SK_04          R_SK_04
Link       R_SK_05          R_SK_05
Link       R_SK_06          R_SK_06
Link       R_SK_07          R_SK_07
Link       R_SK_08          R_SK_08
Link       R_SK_09          R_SK_09
Link       R_SK_10          R_SK_10
Link       R_SK_11          R_SK_11
Link       R_SK_12          R_SK_12
Link       R_SK_13          R_SK_13
Link       R_SK_14          R_SK_14
Link       R_SK_15          R_SK_15
Link       R_SK_16          R_SK_16

[MAP]
DIMENSIONS 3061527.476 1238238.218 3073383.852 1249371.035
Units      Feet

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
ANDERSON         3065804.277        1241253.748
BC_01            3069438.985        1243008.273
BC_01_SD         3069345.349        1243896.448
BC_02            3069223.004        1241764.017
BC_02_SD         3069287.924        1241849.045
BC_03            3068676.462        1241895.861
BC_03_SD         3068128.082        1243069.961
BC_04            3069203.595        1242883.258
BL_01            3065411.970        1242931.535
BL_02            3064497.874        1242608.344
BL_03            3063379.555        1242400.403
BL_04            3062066.402        1242141.121
```

```
CU_01            3063771.732        1245046.510
CU_02            3064547.251        1244522.908
CU_02_SD         3065308.087        1244187.662
KG_01            3065764.946        1242259.372
KG_02            3064825.150        1241937.988
KG_03            3064427.550        1242265.588
KG_04            3063390.088        1241536.553
KG_05            3063381.282        1242266.318
KG_06            3062700.293        1242140.979
KG_07            3064065.104        1241540.594
KG_08            3062794.699        1240835.320
KINGS_GULCH      3065884.142        1241700.767
KT_01            3067559.080        1244302.767
KT_02            3065759.726        1243695.417
KT_03            3067536.650        1245548.919
KT_04            3066825.223        1245205.773
SK_01            3072834.937        1247556.777
SK_02            3071327.256        1246472.232
SK_03            3070522.316        1246408.018
SK_04            3070346.076        1245089.195
SK_05            3067691.035        1242793.989
SK_06            3066612.918        1242143.164
SK_07            3065168.961        1240323.105
SK_08            3063931.275        1238744.255
OUT_01           3072844.926        1248864.998
OUT_02           3072425.846        1248746.390
OUT_03           3066519.536        1238967.375
OUT_04           3070814.368        1243012.967
OUT_07           3070527.590        1241715.112
OUT_08           3066843.384        1245883.995
OUT_09           3065432.470        1245560.048
OUT_10           3065384.417        1246112.650
D_01             3072704.857        1247786.838
D_02             3067855.934        1242702.748
D_03             3064075.867        1238985.358
D_04             3068796.603        1244837.917
D_05             3066210.811        1242910.900
D_06             3065768.836        1242929.180
D_07             3064098.817        1242288.862
D_08             3066865.428        1245257.020
D_09             3064939.933        1244370.751
D_10             3069405.051        1243225.342
D_11             3068602.497        1242012.178
D_12             3069363.990        1241754.614
D_13             3069202.975        1242979.547
D_14             3064756.006        1241560.568

[VERTICES]
;;Link           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
R_BC_03          3068448.540        1242325.769
R_BC_03          3068685.627        1242508.733
R_BC_03          3068718.280        1242722.792
R_BC_03          3068819.867        1242806.239
R_BC_03          3069044.811        1242875.173
R_BC_04          3069309.663        1241917.350
R_BC_04          3069193.563        1242102.384
R_BC_04          3069182.679        1242367.236
R_BC_10          3068830.752        1241975.400
R_BC_10          3069023.042        1241826.647
R_BC_10          3069218.960        1241590.819
R_BC_11          3067993.753        1242475.719
R_BC_14          3069177.000        1243800.763
R_BL_04          3064700.008        1242626.993
R_BL_04          3065053.199        1242644.521
R_BL_04          3065203.326        1242853.627
R_BL_04          3065405.284        1242858.989
R_BL_07          3064105.213        1242429.016
R_BL_07          3064411.439        1242434.188
R_BL_07          3064417.646        1242515.918
R_BL_07          3064445.579        1242600.751
R_BL_08          3063417.881        1242274.564
R_BL_10          3062091.755        1242208.436
R_BL_10          3062206.138        1242313.883
R_BL_10          3062434.903        1242338.904
R_BL_10          3062592.180        1242263.840
R_BL_10          3062758.392        1242256.691
R_BL_10          3062912.094        1242251.330
R_BL_10          3063033.626        1242265.628
R_BL_10          3063265.966        1242315.670
R_CU_01          3065530.878        1244135.466
```

R_CU_01	3065924.864	1244241.376
R_CU_01	3066090.083	1244338.813
R_CU_01	3066128.211	1244448.959
R_CU_01	3066420.523	1244694.671
R_CU_01	3066568.797	1244749.744
R_CU_01	3066789.090	1244991.219
R_KG_01	3066497.283	1242262.053
R_KG_02	3065803.164	1241949.661
R_KG_02	3065803.164	1242205.575
R_KG_03	3064766.451	1241868.709
R_KG_04	3065721.297	1241583.810
R_KG_04	3065795.722	1241594.442
R_KG_04	3065842.503	1241632.718
R_KG_06	3063443.890	1241498.753
R_KG_06	3063994.635	1241517.891
R_KG_07	3062824.049	1240930.936
R_KG_07	3062829.306	1240992.273
R_KG_07	3062883.633	1241029.075
R_KG_07	3062909.920	1241086.907
R_KG_07	3062943.217	1241167.520
R_KG_07	3063008.059	1241270.916
R_KG_07	3063030.841	1241305.966
R_KG_07	3063074.131	1241341.259
R_KG_07	3063134.237	1241367.302
R_KG_07	3063190.316	1241409.362
R_KG_07	3063256.978	1241457.085
R_KG_07	3063290.787	1241517.891
R_KG_07	3063322.683	1241530.649
R_KG_08	3062831.311	1242114.806
R_KG_08	3063023.504	1242097.334
R_KG_08	3063119.601	1242106.070
R_KG_08	3063189.490	1242129.366
R_KG_08	3063276.850	1242178.870
R_KG_08	3063323.443	1242225.462
R_KT_01	3070626.670	1246510.546
R_KT_01	3070662.951	1247192.632
R_KT_01	3070793.563	1247337.757
R_KT_01	3071007.622	1247439.344
R_KT_01	3071192.656	1247551.816
R_KT_01	3071390.435	1247618.390
R_KT_01	3071484.893	1247750.087
R_KT_01	3071544.583	1247925.512
R_KT_01	3071736.874	1247998.075
R_KT_01	3071892.883	1247936.397
R_KT_01	3072164.991	1247881.975
R_KT_01	3072368.166	1247711.453
R_KT_01	3072535.059	1247479.254
R_KT_02	3068806.949	1245382.380
R_KT_02	3068717.732	1245520.950
R_KT_02	3068795.559	1245655.723
R_KT_02	3069053.717	1245650.029
R_KT_02	3069144.831	1245758.227
R_KT_02	3069463.732	1245801.886
R_KT_02	3069702.907	1245877.815
R_KT_02	3069737.075	1246096.110
R_KT_02	3070010.419	1246276.440
R_KT_03	3067662.324	1245549.423
R_KT_03	3067707.881	1245781.006
R_KT_03	3068269.753	1245801.886
R_KT_03	3068628.516	1245727.855
R_KT_03	3068803.152	1245701.280
R_KT_03	3069032.837	1245691.789
R_KT_03	3069141.035	1245801.886
R_KT_03	3069344.144	1245868.324
R_KT_03	3069393.498	1246225.188
R_KT_03	3069685.823	1246348.573
R_KT_03	3070010.419	1246350.471
R_KT_04	3070131.904	1244850.879
R_KT_05	3067670.377	1244311.227
R_KT_05	3067761.861	1244379.588
R_KT_05	3067821.175	1244509.274
R_KT_05	3067899.590	1244526.365
R_KT_05	3068068.483	1244526.365
R_KT_05	3068151.925	1244580.652
R_KT_05	3068288.776	1244656.543
R_KT_05	3068293.013	1244825.999
R_KT_06	3066252.432	1243052.010
R_KT_06	3066325.708	1243128.861
R_KT_06	3066516.942	1243171.754
R_KT_06	3066704.602	1243187.839
R_KT_06	3066802.788	1243540.148

R_KT_06	3066963.639	1243586.392
R_KT_06	3067053.532	1243636.495
R_KT_06	3067114.436	1243688.935
R_KT_06	3067168.723	1243800.525
R_KT_06	3067212.957	1243975.450
R_KT_06	3067212.957	1244178.525
R_KT_06	3067286.346	1244225.775
R_KT_06	3067442.170	1244291.120
R_KT_07	3067180.427	1245252.999
R_KT_07	3067319.831	1245298.573
R_KT_07	3067345.300	1245514.382
R_KT_07	3067381.491	1245557.275
R_KT_08	3065823.190	1243843.154
R_KT_08	3065975.700	1244114.284
R_KT_08	3066090.083	1244143.938
R_KT_08	3066111.265	1244292.213
R_KT_08	3066238.357	1244372.704
R_KT_08	3066433.232	1244639.598
R_KT_08	3066594.215	1244707.380
R_KT_08	3066835.690	1244974.273
R_KT_09	3065765.910	1243175.324
R_KT_09	3065805.624	1243237.882
R_KT_09	3065903.921	1243271.839
R_KT_09	3065948.602	1243362.988
R_SK_01	3072852.833	1248113.817
R_SK_02	3072425.846	1248145.445
R_SK_04	3071428.484	1246612.134
R_SK_04	3071569.980	1246920.524
R_SK_04	3071588.121	1247029.367
R_SK_04	3071551.840	1247203.517
R_SK_04	3071584.493	1247341.385
R_SK_04	3071715.105	1247493.766
R_SK_04	3071925.536	1247609.866
R_SK_04	3072117.826	1247649.775
R_SK_04	3072248.438	1247573.585
R_SK_04	3072408.075	1247381.295
R_SK_04	3072538.688	1247348.642
R_SK_04	3072631.397	1247410.361
R_SK_05	3070880.638	1245371.318
R_SK_05	3071185.400	1245574.492
R_SK_05	3071290.615	1245679.708
R_SK_05	3071366.806	1245817.576
R_SK_05	3071341.409	1245973.585
R_SK_05	3071254.334	1246111.453
R_SK_05	3071250.706	1246245.694
R_SK_05	3071267.071	1246387.396
R_SK_06	3069385.854	1244010.774
R_SK_06	3069530.978	1244072.452
R_SK_06	3069610.797	1244090.592
R_SK_06	3069697.872	1244137.758
R_SK_06	3069766.806	1244253.857
R_SK_06	3069810.343	1244326.420
R_SK_06	3069944.584	1244482.429
R_SK_06	3069989.857	1244603.880
R_SK_06	3070064.312	1244685.603
R_SK_06	3070165.899	1244707.372
R_SK_06	3070340.048	1244740.025
R_SK_06	3070343.677	1244921.431
R_SK_07	3068261.137	1243317.803
R_SK_07	3068442.543	1243368.597
R_SK_07	3068460.684	1243470.184
R_SK_07	3068663.858	1243633.449
R_SK_07	3068830.752	1243637.077
R_SK_07	3068892.430	1243716.896
R_SK_07	3069099.232	1243829.368
R_SK_07	3069262.498	1243865.649
R_SK_10	3066967.109	1242340.157
R_SK_10	3067043.036	1242426.075
R_SK_10	3067148.935	1242559.947
R_SK_10	3067506.594	1242571.936
R_SK_10	3067580.523	1242677.835
R_SK_11	3065874.151	1241736.733
R_SK_11	3065942.087	1241896.580
R_SK_11	3065958.071	1241986.494
R_SK_11	3066033.999	1242074.411
R_SK_11	3066107.928	1242092.393
R_SK_11	3066197.843	1242106.380
R_SK_11	3066253.789	1242100.386
R_SK_11	3066309.736	1242060.424
R_SK_11	3066353.694	1242062.422
R_SK_11	3066433.618	1242092.393

R_SK_11	3066505.549	1242126.361
R_SK_11	3066582.369	1242109.564
R_SK_12	3065210.784	1240408.000
R_SK_12	3065248.748	1240451.959
R_SK_12	3065304.695	1240475.936
R_SK_12	3065352.649	1240523.890
R_SK_12	3065388.615	1240617.800
R_SK_12	3065390.613	1240723.699
R_SK_12	3065378.624	1240807.619
R_SK_12	3065410.594	1240871.558
R_SK_12	3065478.529	1240979.455
R_SK_12	3065526.483	1241039.398
R_SK_12	3065642.373	1241055.383
R_SK_12	3065694.323	1241091.348
R_SK_12	3065730.289	1241119.322
R_SK_12	3065753.060	1241178.723
R_SK_13	3064275.677	1239187.165
R_SK_13	3064399.558	1239289.068
R_SK_13	3064435.524	1239370.990
R_SK_13	3064473.488	1239412.950
R_SK_13	3064575.391	1239494.872
R_SK_13	3064647.635	1239537.949
R_SK_13	3064708.280	1239629.396
R_SK_13	3064945.038	1239986.403
R_SK_13	3064967.017	1240040.351
R_SK_13	3064983.178	1240101.435
R_SK_13	3065004.981	1240136.260
R_SK_13	3065078.910	1240216.183
R_SK_13	3065118.872	1240254.147
R_SK_14	3063967.843	1238773.718
R_SK_15	3064335.619	1238655.672
R_SK_15	3064569.396	1238733.598
R_SK_15	3064759.215	1238915.425
R_SK_16	3065858.167	1241327.124
R_SK_16	3065874.151	1241494.963
R_SK_16	3065918.110	1241544.916
R_SK_16	3065926.102	1241588.874
R_SK_16	3065914.113	1241666.799

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------

INP file created on 2016-04-15 10:08:49 AM by Bledoux with inpPINS version 0.0.2.0
Title/Notes:

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ JAN-01-2005 00:00:00
Ending Date .............. JAN-01-2005 10:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Routing Time Step ........ 30.00 sec


WARNING 02: maximum depth increased for Node ANDERSON

WARNING 02: maximum depth increased for Node BC_01_SD

WARNING 02: maximum depth increased for Node BC_02_SD

WARNING 02: maximum depth increased for Node BC_03_SD

WARNING 02: maximum depth increased for Node BC_04

WARNING 02: maximum depth increased for Node BL_01

WARNING 02: maximum depth increased for Node BL_02

WARNING 02: maximum depth increased for Node BL_03

WARNING 02: maximum depth increased for Node BL_04

WARNING 02: maximum depth increased for Node CU_02_SD

WARNING 02: maximum depth increased for Node KG_01

WARNING 02: maximum depth increased for Node KG_02

WARNING 02: maximum depth increased for Node KG_03

WARNING 02: maximum depth increased for Node KG_04

WARNING 02: maximum depth increased for Node KG_05

WARNING 02: maximum depth increased for Node KG_06

WARNING 02: maximum depth increased for Node KG_07

WARNING 02: maximum depth increased for Node KG_08

WARNING 02: maximum depth increased for Node KINGS_GULCH

WARNING 02: maximum depth increased for Node KT_01

WARNING 02: maximum depth increased for Node KT_02

WARNING 02: maximum depth increased for Node KT_03

WARNING 02: maximum depth increased for Node KT_04

WARNING 02: maximum depth increased for Node SK_01

WARNING 02: maximum depth increased for Node SK_02
```

```
WARNING 02: maximum depth increased for Node SK_03

WARNING 02: maximum depth increased for Node SK_04

WARNING 02: maximum depth increased for Node SK_05

WARNING 02: maximum depth increased for Node SK_06

WARNING 02: maximum depth increased for Node SK_07

WARNING 02: maximum depth increased for Node SK_08

WARNING 02: maximum depth increased for Node D_01

WARNING 02: maximum depth increased for Node D_03

WARNING 02: maximum depth increased for Node D_04

WARNING 02: maximum depth increased for Node D_05

WARNING 02: maximum depth increased for Node D_06

WARNING 02: maximum depth increased for Node D_07

WARNING 02: maximum depth increased for Node D_08

WARNING 02: maximum depth increased for Node D_13

WARNING 02: maximum depth increased for Node D_14
**************************        Volume         Volume
Flow Routing Continuity        acre-feet       10^6 gal
**************************     ---------      ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.000          0.000
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........        84.727         27.609
External Outflow .........        83.095         27.078
Internal Outflow .........         0.000          0.000
Storage Losses ...........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         4.515          1.471
Continuity Error (%) .....        -3.403


*******************************
Highest Flow Instability Indexes
*******************************
Link R_KG_01 (3)
Link R_SK_08 (3)
Link R_SK_09 (3)
Link R_SK_10 (3)
Link R_SK_07 (2)


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00


******************
Node Depth Summary
******************

----------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max
                                  Depth    Depth      HGL   Occurrence
Node                 Type         Feet     Feet     Feet  days hr:min
----------------------------------------------------------------------
ANDERSON             JUNCTION     0.78     1.04  5432.36     0  01:10
BC_01                JUNCTION     0.00     0.00  5333.54     0  00:00
BC_01_SD             JUNCTION     1.27     3.31  5304.87     0  00:41
BC_02                JUNCTION     0.00     0.00  5355.33     0  00:00
BC_02_SD             JUNCTION     0.01     0.08  5353.84     0  00:40
```

BC_03	JUNCTION	0.00	0.00	5360.11	0	00:00
BC_03_SD	JUNCTION	1.13	3.82	5342.62	0	00:36
BC_04	JUNCTION	0.01	0.08	5336.32	0	00:49
BL_01	JUNCTION	0.02	0.11	5423.51	0	00:36
BL_02	JUNCTION	0.02	0.08	5469.08	0	01:00
BL_03	JUNCTION	0.08	0.34	5544.34	0	00:57
BL_04	JUNCTION	0.08	0.35	5651.23	0	00:50
CU_01	JUNCTION	0.00	0.00	5420.62	0	00:00
CU_02	JUNCTION	0.00	0.00	5423.97	0	00:00
CU_02_SD	JUNCTION	0.02	0.22	5409.09	0	00:30
KG_01	JUNCTION	0.05	0.24	5417.24	0	00:49
KG_02	JUNCTION	0.02	0.16	5455.16	0	00:34
KG_03	JUNCTION	0.05	0.21	5475.21	0	00:57
KG_04	JUNCTION	0.04	0.33	5536.33	0	00:30
KG_05	JUNCTION	0.06	0.27	5543.27	0	00:57
KG_06	JUNCTION	0.00	0.03	5598.03	0	00:35
KG_07	JUNCTION	0.04	0.33	5494.33	0	00:32
KG_08	JUNCTION	0.02	0.13	5604.13	0	00:40
KINGS_GULCH	JUNCTION	0.83	1.11	5415.11	0	01:11
KT_01	JUNCTION	0.03	0.25	5341.01	0	00:35
KT_02	JUNCTION	0.02	0.25	5388.86	0	00:30
KT_03	JUNCTION	0.04	0.35	5314.77	0	00:36
KT_04	JUNCTION	0.02	0.23	5355.36	0	00:37
SK_01	JUNCTION	2.05	5.91	5244.53	0	01:03
SK_02	JUNCTION	0.65	2.18	5255.25	0	00:50
SK_03	JUNCTION	0.17	1.14	5262.74	0	00:44
SK_04	JUNCTION	1.27	3.24	5283.81	0	00:47
SK_05	JUNCTION	0.74	1.68	5358.82	0	00:39
SK_06	JUNCTION	0.89	1.70	5385.53	0	00:35
SK_07	JUNCTION	0.19	0.75	5487.47	0	01:06
SK_08	JUNCTION	0.15	0.59	5636.51	0	01:00
OUT_01	OUTFALL	0.00	0.00	5237.72	0	00:00
OUT_02	OUTFALL	0.00	0.00	5237.00	0	00:00
OUT_03	OUTFALL	0.00	0.00	5474.24	0	00:00
OUT_04	OUTFALL	0.00	0.00	5322.80	0	00:00
OUT_07	OUTFALL	0.00	0.00	5342.00	0	00:00
OUT_08	OUTFALL	0.00	0.00	5341.91	0	00:00
OUT_09	OUTFALL	0.00	0.00	5382.21	0	00:00
OUT_10	OUTFALL	0.00	0.00	5357.00	0	00:00
D_01	DIVIDER	2.04	5.91	5243.91	0	01:05
D_02	DIVIDER	1.09	3.83	5359.30	0	00:35
D_03	DIVIDER	0.19	0.76	5615.49	0	01:00
D_04	DIVIDER	0.04	0.24	5303.88	0	00:37
D_05	DIVIDER	0.02	0.10	5397.62	0	00:39
D_06	DIVIDER	0.02	0.11	5413.28	0	00:37
D_07	DIVIDER	0.05	0.21	5480.25	0	00:55
D_08	DIVIDER	0.03	0.33	5348.72	0	00:35
D_09	DIVIDER	0.00	0.00	5423.20	0	00:00
D_10	DIVIDER	0.00	0.00	5326.68	0	00:00
D_11	DIVIDER	0.00	0.00	5359.00	0	00:00
D_12	DIVIDER	0.00	0.00	5354.00	0	00:00
D_13	DIVIDER	0.01	0.08	5335.08	0	00:49
D_14	DIVIDER	0.01	0.11	5463.11	0	00:35

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
ANDERSON	JUNCTION	25.00	47.22	0	01:10	6.738	7.839
BC_01	JUNCTION	20.95	20.95	0	00:30	0.352	0.352
BC_01_SD	JUNCTION	0.00	289.63	0	00:41	0.000	14.300
BC_02	JUNCTION	7.72	7.72	0	00:40	0.260	0.260
BC_02_SD	JUNCTION	0.00	7.72	0	00:40	0.000	0.260
BC_03	JUNCTION	12.88	12.88	0	00:40	0.359	0.359
BC_03_SD	JUNCTION	0.00	275.59	0	00:36	0.000	13.792
BC_04	JUNCTION	0.00	7.42	0	00:49	0.000	0.255
BL_01	JUNCTION	6.86	11.20	0	00:36	0.141	0.431
BL_02	JUNCTION	4.13	6.82	0	00:54	0.092	0.296
BL_03	JUNCTION	3.67	22.11	0	00:56	0.100	0.969
BL_04	JUNCTION	19.86	19.86	0	00:50	0.871	0.871
CU_01	JUNCTION	52.19	52.19	0	00:35	1.129	1.129
CU_02	JUNCTION	59.03	59.03	0	00:30	0.914	0.914
CU_02_SD	JUNCTION	0.00	58.53	0	00:30	0.000	0.914
KG_01	JUNCTION	13.88	40.15	0	00:49	0.237	1.620

KG_02	JUNCTION	13.25	18.57	0	00:34	0.240	0.436
KG_03	JUNCTION	3.23	21.74	0	00:55	0.070	0.948
KG_04	JUNCTION	9.42	9.48	0	00:30	0.171	0.244
KG_05	JUNCTION	4.71	24.85	0	00:54	0.081	1.090
KG_06	JUNCTION	1.89	1.89	0	00:35	0.051	0.051
KG_07	JUNCTION	0.02	9.22	0	00:32	0.001	0.244
KG_08	JUNCTION	2.69	2.69	0	00:40	0.075	0.075
KINGS_GULCH	JUNCTION	0.00	48.37	0	01:11	0.000	7.855
KT_01	JUNCTION	38.96	39.02	0	00:35	0.724	0.996
KT_02	JUNCTION	57.58	57.61	0	00:30	0.890	0.918
KT_03	JUNCTION	12.51	99.97	0	00:36	0.222	1.892
KT_04	JUNCTION	25.34	128.74	0	00:35	0.527	2.380
SK_01	JUNCTION	43.58	549.86	0	01:03	1.325	25.098
SK_02	JUNCTION	80.44	434.95	0	00:50	1.727	19.107
SK_03	JUNCTION	98.05	172.50	0	00:44	1.802	4.546
SK_04	JUNCTION	192.67	395.46	0	00:44	3.179	17.579
SK_05	JUNCTION	119.99	263.26	0	00:35	1.879	13.461
SK_06	JUNCTION	106.97	166.34	0	00:35	2.162	11.687
SK_07	JUNCTION	1.18	22.27	0	01:04	0.040	1.105
SK_08	JUNCTION	25.26	25.26	0	01:00	1.252	1.252
OUT_01	OUTFALL	0.00	409.14	0	01:05	0.000	18.656
OUT_02	OUTFALL	0.00	140.26	0	01:05	0.000	6.396
OUT_03	OUTFALL	0.00	3.74	0	01:00	0.000	0.185
OUT_04	OUTFALL	0.00	0.43	0	00:35	0.000	0.001
OUT_07	OUTFALL	0.00	0.00	0	00:00	0.000	0.000
OUT_08	OUTFALL	0.00	38.35	0	00:35	0.000	0.709
OUT_09	OUTFALL	0.00	0.49	0	00:30	0.000	0.000
OUT_10	OUTFALL	0.00	52.19	0	00:35	0.000	1.129
D_01	DIVIDER	0.00	549.39	0	01:05	0.000	25.052
D_02	DIVIDER	0.00	263.26	0	00:35	0.000	13.461
D_03	DIVIDER	0.00	25.25	0	01:00	0.000	1.248
D_04	DIVIDER	0.00	38.54	0	00:37	0.000	0.998
D_05	DIVIDER	0.00	10.12	0	00:39	0.000	0.391
D_06	DIVIDER	0.00	11.18	0	00:37	0.000	0.431
D_07	DIVIDER	0.00	24.84	0	00:55	0.000	1.085
D_08	DIVIDER	0.00	128.74	0	00:35	0.000	2.380
D_09	DIVIDER	0.00	59.03	0	00:30	0.000	0.914
D_10	DIVIDER	0.00	21.79	0	00:35	0.000	0.606
D_11	DIVIDER	0.00	12.88	0	00:40	0.000	0.359
D_12	DIVIDER	0.00	7.72	0	00:40	0.000	0.260
D_13	DIVIDER	0.00	7.41	0	00:49	0.000	0.254
D_14	DIVIDER	0.00	9.11	0	00:35	0.000	0.242

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
BC_01	JUNCTION	10.01	0.000	20.000
BC_02	JUNCTION	10.01	0.000	10.000
BC_03	JUNCTION	10.01	0.000	10.000
CU_01	JUNCTION	10.01	0.000	10.000
CU_02	JUNCTION	10.01	0.000	10.000
D_09	DIVIDER	10.01	0.000	10.000
D_10	DIVIDER	10.01	0.000	10.000
D_11	DIVIDER	10.01	0.000	10.000
D_12	DIVIDER	10.01	0.000	10.000

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal

OUT_01	97.17	71.25	409.14	18.656
OUT_02	97.17	24.42	140.26	6.396
OUT_03	45.55	1.51	3.74	0.185
OUT_04	1.50	0.20	0.43	0.001
OUT_07	0.00	0.00	0.00	0.000
OUT_08	28.06	9.37	38.35	0.709
OUT_09	0.17	0.26	0.49	0.000
OUT_10	28.98	14.46	52.19	1.129
System	37.32	121.47	588.11	27.076

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
R_BC_01	DUMMY	0.43	0 00:35			
R_BC_02	DUMMY	7.36	0 00:49			
R_BC_03	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
R_BC_04	CONDUIT	7.42	0 00:49	1.69	0.00	0.00
R_BC_05	DUMMY	7.72	0 00:40			
R_BC_06	DUMMY	0.00	0 00:00			
R_BC_07	DUMMY	7.72	0 00:40			
R_BC_08	DUMMY	21.36	0 00:35			
R_BC_09	DUMMY	20.95	0 00:30			
R_BC_10	DUMMY	0.00	0 00:00			
R_BC_11	DUMMY	12.88	0 00:40			
R_BC_12	DUMMY	12.88	0 00:40			
R_BC_13	CONDUIT	7.41	0 00:49	1.55	0.00	0.00
R_BC_14	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
R_BL_01	CONDUIT	2.86	0 00:57	1.23	0.00	0.00
R_BL_02	CONDUIT	10.12	0 00:39	2.96	0.00	0.00
R_BL_03	CONDUIT	11.18	0 00:37	2.89	0.00	0.00
R_BL_04	CONDUIT	6.79	0 00:58	2.83	0.00	0.00
R_BL_05	CONDUIT	21.68	0 00:59	4.53	0.00	0.00
R_BL_06	CONDUIT	20.12	0 00:57	3.20	0.00	0.00
R_BL_07	CONDUIT	4.69	0 01:00	1.84	0.00	0.00
R_BL_08	CONDUIT	24.84	0 00:55	5.90	0.00	0.00
R_BL_09	CONDUIT	22.10	0 00:57	2.67	0.00	0.01
R_BL_10	CONDUIT	19.68	0 00:57	2.75	0.00	0.01
R_CU_01	CONDUIT	53.23	0 00:35	4.42	0.00	0.00
R_CU_02	DUMMY	58.53	0 00:30			
R_CU_03	DUMMY	0.49	0 00:30			
R_CU_04	DUMMY	59.03	0 00:30			
R_CU_05	DUMMY	52.19	0 00:35			
R_CU_06	DUMMY	38.35	0 00:35			
R_CU_07	DUMMY	128.74	0 00:35			
R_KG_01	CONDUIT	40.12	0 00:50	5.49	0.00	0.00
R_KG_02	CONDUIT	18.14	0 00:38	3.80	0.00	0.00
R_KG_03	CONDUIT	7.45	0 00:37	2.35	0.00	0.00
R_KG_04	CONDUIT	1.51	0 00:49	1.57	0.00	0.00
R_KG_05	CONDUIT	9.11	0 00:35	3.24	0.00	0.00
R_KG_06	CONDUIT	9.21	0 00:32	3.28	0.00	0.01
R_KG_07	CONDUIT	2.53	0 00:50	1.39	0.00	0.00
R_KG_08	CONDUIT	1.85	0 00:37	2.02	0.00	0.00
R_KT_01	CONDUIT	127.08	0 01:07	1.78	0.00	0.02
R_KT_02	CONDUIT	24.97	0 00:51	3.05	0.00	0.00
R_KT_03	CONDUIT	84.14	0 00:47	4.38	0.00	0.01
R_KT_04	CONDUIT	7.76	0 00:48	2.08	0.00	0.00
R_KT_05	CONDUIT	38.54	0 00:37	4.53	0.00	0.00
R_KT_06	CONDUIT	6.55	0 01:02	2.17	0.00	0.00
R_KT_07	CONDUIT	90.13	0 00:37	6.85	0.00	0.01
R_KT_08	CONDUIT	51.69	0 00:37	3.84	0.00	0.00
R_KT_09	CONDUIT	0.95	0 00:58	1.01	0.00	0.00
R_SK_01	DUMMY	409.14	0 01:05			
R_SK_02	DUMMY	140.26	0 01:05			
R_SK_03	CONDUIT	549.39	0 01:05	2.41	0.01	0.12
R_SK_04	CONDUIT	393.44	0 01:03	2.56	0.00	0.04
R_SK_05	CONDUIT	380.27	0 00:51	3.29	0.00	0.03
R_SK_06	CONDUIT	277.15	0 00:47	3.84	0.00	0.06
R_SK_07	CONDUIT	269.23	0 00:41	4.83	0.00	0.05
R_SK_08	CONDUIT	262.74	0 00:36	5.75	0.05	0.08
R_SK_09	DUMMY	263.26	0 00:35			
R_SK_10	CONDUIT	162.52	0 00:39	3.67	0.00	0.03
R_SK_11	CONDUIT	48.32	0 01:14	3.29	0.00	0.02
R_SK_12	CONDUIT	22.22	0 01:10	3.13	0.00	0.01

R_SK_13	CONDUIT	21.39	0	01:06	3.93	0.00	0.02
R_SK_14	CONDUIT	25.25	0	01:00	3.67	0.00	0.01
R_SK_15	DUMMY	3.74	0	01:00			
R_SK_16	CONDUIT	47.21	0	01:11	3.48	0.00	0.02

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
R_BC_01	0.01	0.01	0.01	10.01	0.01
R_BC_02	0.01	0.01	0.01	10.01	0.01
R_BC_05	0.01	0.01	0.01	10.01	0.01
R_BC_06	0.01	0.01	0.01	10.01	0.01
R_BC_07	0.01	0.01	0.01	10.01	0.01
R_BC_08	0.01	0.01	0.01	10.01	0.01
R_BC_09	0.01	0.01	0.01	10.01	0.01
R_BC_10	0.01	0.01	0.01	10.01	0.01
R_BC_11	0.01	0.01	0.01	10.01	0.01
R_BC_12	0.01	0.01	0.01	10.01	0.01
R_CU_02	0.01	0.01	0.01	10.01	0.01
R_CU_03	0.01	0.01	0.01	10.01	0.01
R_CU_04	0.01	0.01	0.01	10.01	0.01
R_CU_05	0.01	0.01	0.01	10.01	0.01
R_CU_06	0.01	0.01	0.01	10.01	0.01
R_CU_07	0.01	0.01	0.01	10.01	0.01
R_SK_01	0.01	0.01	0.01	10.01	0.01
R_SK_02	0.01	0.01	0.01	10.01	0.01
R_SK_09	0.01	0.01	0.01	10.01	0.01
R_SK_15	0.01	0.01	0.01	10.01	0.01

Analysis begun on: Wed Apr 20 13:59:42 2016
Analysis ended on: Wed Apr 20 13:59:42 2016

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------

INP file created on 2016-04-15 10:08:49 AM by Bledoux with inpPINS version 0.0.2.0
Title/Notes:

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ JAN-01-2005 00:00:00
Ending Date .............. JAN-01-2005 10:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Routing Time Step ........ 30.00 sec


WARNING 02: maximum depth increased for Node ANDERSON

WARNING 02: maximum depth increased for Node BC_01_SD

WARNING 02: maximum depth increased for Node BC_02_SD

WARNING 02: maximum depth increased for Node BC_03_SD

WARNING 02: maximum depth increased for Node BC_04

WARNING 02: maximum depth increased for Node BL_01

WARNING 02: maximum depth increased for Node BL_02

WARNING 02: maximum depth increased for Node BL_03

WARNING 02: maximum depth increased for Node BL_04

WARNING 02: maximum depth increased for Node CU_02_SD

WARNING 02: maximum depth increased for Node KG_01

WARNING 02: maximum depth increased for Node KG_02

WARNING 02: maximum depth increased for Node KG_03

WARNING 02: maximum depth increased for Node KG_04

WARNING 02: maximum depth increased for Node KG_05

WARNING 02: maximum depth increased for Node KG_06

WARNING 02: maximum depth increased for Node KG_07

WARNING 02: maximum depth increased for Node KG_08

WARNING 02: maximum depth increased for Node KINGS_GULCH

WARNING 02: maximum depth increased for Node KT_01

WARNING 02: maximum depth increased for Node KT_02

WARNING 02: maximum depth increased for Node KT_03

WARNING 02: maximum depth increased for Node KT_04

WARNING 02: maximum depth increased for Node SK_01

WARNING 02: maximum depth increased for Node SK_02
```

```
WARNING 02: maximum depth increased for Node SK_03

WARNING 02: maximum depth increased for Node SK_04

WARNING 02: maximum depth increased for Node SK_05

WARNING 02: maximum depth increased for Node SK_06

WARNING 02: maximum depth increased for Node SK_07

WARNING 02: maximum depth increased for Node SK_08

WARNING 02: maximum depth increased for Node D_01

WARNING 02: maximum depth increased for Node D_03

WARNING 02: maximum depth increased for Node D_04

WARNING 02: maximum depth increased for Node D_05

WARNING 02: maximum depth increased for Node D_06

WARNING 02: maximum depth increased for Node D_07

WARNING 02: maximum depth increased for Node D_08

WARNING 02: maximum depth increased for Node D_13

WARNING 02: maximum depth increased for Node D_14
```

Flow Routing Continuity	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	151.337	49.316
External Outflow	150.154	48.930
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	4.593	1.497
Continuity Error (%)	-2.253	

```
*********************************
Highest Flow Instability Indexes
*********************************
Link R_KT_05 (2)
Link R_KT_01 (2)
Link R_KT_02 (2)
Link R_KG_01 (2)
Link R_SK_09 (2)
```

```
*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00
```

```
******************
Node Depth Summary
******************
```

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min
ANDERSON	JUNCTION	0.95	1.93	5433.25	0 01:09
BC_01	JUNCTION	0.00	0.00	5333.54	0 00:00
BC_01_SD	JUNCTION	1.59	4.39	5305.95	0 00:59
BC_02	JUNCTION	0.00	0.00	5355.33	0 00:00
BC_02_SD	JUNCTION	0.02	0.12	5353.88	0 00:45

BC_03	JUNCTION	0.00	0.00	5360.11	0	00:00
BC_03_SD	JUNCTION	1.63	6.19	5344.99	0	00:56
BC_04	JUNCTION	0.03	0.25	5336.49	0	01:00
BL_01	JUNCTION	0.04	0.20	5423.60	0	00:55
BL_02	JUNCTION	0.04	0.20	5469.20	0	01:03
BL_03	JUNCTION	0.17	0.86	5544.86	0	01:01
BL_04	JUNCTION	0.17	0.86	5651.74	0	00:55
CU_01	JUNCTION	0.00	0.00	5420.62	0	00:00
CU_02	JUNCTION	0.00	0.00	5423.97	0	00:00
CU_02_SD	JUNCTION	0.02	0.27	5409.14	0	00:35
KG_01	JUNCTION	0.10	0.56	5417.56	0	00:55
KG_02	JUNCTION	0.05	0.36	5455.36	0	00:51
KG_03	JUNCTION	0.10	0.49	5475.49	0	01:00
KG_04	JUNCTION	0.14	1.05	5537.05	0	00:51
KG_05	JUNCTION	0.13	0.67	5543.67	0	01:01
KG_06	JUNCTION	0.01	0.05	5598.05	0	00:40
KG_07	JUNCTION	0.14	1.05	5495.05	0	00:52
KG_08	JUNCTION	0.10	0.80	5604.80	0	00:50
KINGS_GULCH	JUNCTION	1.01	2.09	5416.09	0	01:09
KT_01	JUNCTION	0.05	0.36	5341.12	0	00:40
KT_02	JUNCTION	0.03	0.35	5388.96	0	00:35
KT_03	JUNCTION	0.05	0.49	5314.91	0	00:41
KT_04	JUNCTION	0.03	0.34	5355.47	0	00:41
SK_01	JUNCTION	2.54	8.08	5246.70	0	01:06
SK_02	JUNCTION	0.86	3.11	5256.18	0	00:54
SK_03	JUNCTION	0.22	1.71	5263.31	0	00:47
SK_04	JUNCTION	1.59	4.38	5284.95	0	01:03
SK_05	JUNCTION	0.98	2.86	5360.00	0	00:59
SK_06	JUNCTION	1.12	2.87	5386.70	0	00:56
SK_07	JUNCTION	0.44	1.79	5488.51	0	01:07
SK_08	JUNCTION	0.35	1.51	5637.43	0	01:05
OUT_01	OUTFALL	0.00	0.00	5237.72	0	00:00
OUT_02	OUTFALL	0.00	0.00	5237.00	0	00:00
OUT_03	OUTFALL	0.00	0.00	5474.24	0	00:00
OUT_04	OUTFALL	0.00	0.00	5322.80	0	00:00
OUT_07	OUTFALL	0.00	0.00	5342.00	0	00:00
OUT_08	OUTFALL	0.00	0.00	5341.91	0	00:00
OUT_09	OUTFALL	0.00	0.00	5382.21	0	00:00
OUT_10	OUTFALL	0.00	0.00	5357.00	0	00:00
D_01	DIVIDER	2.53	8.08	5246.08	0	01:07
D_02	DIVIDER	1.59	6.19	5361.66	0	00:55
D_03	DIVIDER	0.43	1.79	5616.52	0	01:05
D_04	DIVIDER	0.05	0.36	5304.00	0	00:42
D_05	DIVIDER	0.03	0.17	5397.69	0	00:57
D_06	DIVIDER	0.04	0.20	5413.37	0	00:56
D_07	DIVIDER	0.10	0.49	5480.53	0	00:59
D_08	DIVIDER	0.04	0.46	5348.85	0	00:40
D_09	DIVIDER	0.00	0.00	5423.20	0	00:00
D_10	DIVIDER	0.00	0.00	5326.68	0	00:00
D_11	DIVIDER	0.00	0.00	5359.00	0	00:00
D_12	DIVIDER	0.00	0.00	5354.00	0	00:00
D_13	DIVIDER	0.03	0.25	5335.25	0	01:00
D_14	DIVIDER	0.05	0.36	5463.36	0	00:53

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
ANDERSON	JUNCTION	25.00	149.17	0	01:09	6.738	12.172
BC_01	JUNCTION	31.85	31.85	0	00:35	0.512	0.512
BC_01_SD	JUNCTION	0.00	532.69	0	00:59	0.000	26.205
BC_02	JUNCTION	15.93	15.93	0	00:45	0.483	0.483
BC_02_SD	JUNCTION	0.00	15.93	0	00:45	0.000	0.483
BC_03	JUNCTION	25.03	25.03	0	00:45	0.622	0.622
BC_03_SD	JUNCTION	0.00	502.53	0	00:56	0.000	25.208
BC_04	JUNCTION	0.00	48.85	0	00:59	0.000	1.063
BL_01	JUNCTION	13.17	30.98	0	00:55	0.247	1.133
BL_02	JUNCTION	7.54	23.17	0	00:58	0.150	0.887
BL_03	JUNCTION	6.58	98.68	0	01:01	0.161	3.767
BL_04	JUNCTION	94.39	94.39	0	00:55	3.604	3.604
CU_01	JUNCTION	91.51	91.51	0	00:40	1.745	1.745
CU_02	JUNCTION	106.21	106.21	0	00:35	1.514	1.514
CU_02_SD	JUNCTION	0.00	83.00	0	00:35	0.000	1.387
KG_01	JUNCTION	24.42	164.68	0	00:55	0.390	5.489

KG_02	JUNCTION	22.53	69.89	0	00:51	0.370	1.777
KG_03	JUNCTION	5.46	87.15	0	00:59	0.107	3.324
KG_04	JUNCTION	16.25	68.52	0	00:51	0.278	1.678
KG_05	JUNCTION	7.27	103.41	0	00:58	0.116	3.960
KG_06	JUNCTION	3.50	3.50	0	00:40	0.085	0.085
KG_07	JUNCTION	0.07	68.49	0	00:52	0.003	1.680
KG_08	JUNCTION	58.61	58.61	0	00:50	1.399	1.399
KINGS_GULCH	JUNCTION	0.00	157.61	0	01:09	0.000	12.418
KT_01	JUNCTION	71.63	74.53	0	00:40	1.226	1.885
KT_02	JUNCTION	101.45	101.60	0	00:35	1.457	1.597
KT_03	JUNCTION	21.61	177.88	0	00:41	0.348	3.100
KT_04	JUNCTION	47.72	221.03	0	00:40	0.883	3.883
SK_01	JUNCTION	95.94	1100.69	0	01:06	2.720	44.555
SK_02	JUNCTION	148.46	802.58	0	00:54	3.002	34.119
SK_03	JUNCTION	164.13	342.98	0	00:47	2.812	7.491
SK_04	JUNCTION	313.94	706.77	0	00:49	4.863	31.331
SK_05	JUNCTION	202.81	516.03	0	00:55	2.944	25.176
SK_06	JUNCTION	238.44	438.95	0	00:56	4.168	22.337
SK_07	JUNCTION	10.91	124.38	0	01:07	0.337	5.435
SK_08	JUNCTION	137.62	137.62	0	01:05	6.033	6.033
OUT_01	OUTFALL	0.00	699.60	0	01:07	0.000	31.990
OUT_02	OUTFALL	0.00	400.63	0	01:07	0.000	12.518
OUT_03	OUTFALL	0.00	21.77	0	01:05	0.000	0.937
OUT_04	OUTFALL	0.00	32.48	0	00:49	0.000	0.478
OUT_07	OUTFALL	0.00	0.00	0	00:00	0.000	0.000
OUT_08	OUTFALL	0.00	61.78	0	00:40	0.000	1.131
OUT_09	OUTFALL	0.00	23.21	0	00:35	0.000	0.127
OUT_10	OUTFALL	0.00	91.51	0	00:40	0.000	1.745
D_01	DIVIDER	0.00	1100.23	0	01:07	0.000	44.508
D_02	DIVIDER	0.00	516.03	0	00:55	0.000	25.176
D_03	DIVIDER	0.00	137.56	0	01:05	0.000	6.031
D_04	DIVIDER	0.00	73.65	0	00:42	0.000	1.886
D_05	DIVIDER	0.00	25.76	0	00:57	0.000	0.980
D_06	DIVIDER	0.00	30.97	0	00:56	0.000	1.133
D_07	DIVIDER	0.00	103.40	0	00:59	0.000	3.956
D_08	DIVIDER	0.00	221.03	0	00:40	0.000	3.883
D_09	DIVIDER	0.00	106.21	0	00:35	0.000	1.514
D_10	DIVIDER	0.00	58.48	0	00:49	0.000	1.480
D_11	DIVIDER	0.00	25.03	0	00:45	0.000	0.622
D_12	DIVIDER	0.00	15.93	0	00:45	0.000	0.483
D_13	DIVIDER	0.00	48.84	0	01:00	0.000	1.063
D_14	DIVIDER	0.00	68.42	0	00:53	0.000	1.679

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
BC_01	JUNCTION	10.01	0.000	20.000
BC_02	JUNCTION	10.01	0.000	10.000
BC_03	JUNCTION	10.01	0.000	10.000
CU_01	JUNCTION	10.01	0.000	10.000
CU_02	JUNCTION	10.01	0.000	10.000
D_09	DIVIDER	10.01	0.000	10.000
D_10	DIVIDER	10.01	0.000	10.000
D_11	DIVIDER	10.01	0.000	10.000
D_12	DIVIDER	10.01	0.000	10.000

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal

OUT_01	97.17	122.17	699.60	31.990
OUT_02	97.09	47.85	400.63	12.518
OUT_03	47.63	7.30	21.77	0.937
OUT_04	10.16	17.44	32.48	0.478
OUT_07	0.00	0.00	0.00	0.000
OUT_08	30.81	13.62	61.78	1.131
OUT_09	3.66	12.85	23.21	0.127
OUT_10	29.06	22.29	91.51	1.745
System	39.45	243.51	1211.06	48.926

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
R_BC_01	DUMMY	32.48	0 00:49			
R_BC_02	DUMMY	43.32	0 01:00			
R_BC_03	CONDUIT	33.92	0 01:00	4.29	0.00	0.00
R_BC_04	CONDUIT	15.76	0 00:52	2.28	0.00	0.00
R_BC_05	DUMMY	15.93	0 00:45			
R_BC_06	DUMMY	0.00	0 00:00			
R_BC_07	DUMMY	15.93	0 00:45			
R_BC_08	DUMMY	26.00	0 00:34			
R_BC_09	DUMMY	31.85	0 00:35			
R_BC_10	DUMMY	0.00	0 00:00			
R_BC_11	DUMMY	25.03	0 00:45			
R_BC_12	DUMMY	25.03	0 00:45			
R_BC_13	CONDUIT	48.84	0 01:00	3.29	0.00	0.00
R_BC_14	CONDUIT	5.46	0 01:05	1.87	0.00	0.00
R_BL_01	CONDUIT	9.21	0 01:01	1.95	0.00	0.00
R_BL_02	CONDUIT	25.76	0 00:57	4.29	0.00	0.00
R_BL_03	CONDUIT	30.97	0 00:56	4.32	0.00	0.00
R_BL_04	CONDUIT	23.13	0 01:00	4.59	0.00	0.00
R_BL_05	CONDUIT	87.03	0 01:01	7.83	0.00	0.01
R_BL_06	CONDUIT	84.30	0 01:00	5.62	0.00	0.01
R_BL_07	CONDUIT	19.07	0 01:03	3.21	0.00	0.00
R_BL_08	CONDUIT	103.40	0 00:59	10.36	0.00	0.01
R_BL_09	CONDUIT	98.67	0 01:01	4.79	0.00	0.01
R_BL_10	CONDUIT	94.23	0 01:01	4.85	0.00	0.02
R_CU_01	CONDUIT	79.43	0 00:41	5.06	0.00	0.01
R_CU_02	DUMMY	83.00	0 00:35			
R_CU_03	DUMMY	23.21	0 00:35			
R_CU_04	DUMMY	106.21	0 00:35			
R_CU_05	DUMMY	91.51	0 00:40			
R_CU_06	DUMMY	61.78	0 00:40			
R_CU_07	DUMMY	221.03	0 00:40			
R_KG_01	CONDUIT	164.60	0 00:56	9.55	0.00	0.01
R_KG_02	CONDUIT	69.68	0 00:53	6.38	0.00	0.01
R_KG_03	CONDUIT	57.59	0 00:53	5.26	0.00	0.01
R_KG_04	CONDUIT	10.70	0 00:56	3.39	0.00	0.00
R_KG_05	CONDUIT	68.42	0 00:53	7.19	0.00	0.01
R_KG_06	CONDUIT	68.42	0 00:52	6.50	0.00	0.02
R_KG_07	CONDUIT	58.16	0 00:51	4.45	0.00	0.02
R_KG_08	CONDUIT	3.44	0 00:42	2.55	0.00	0.00
R_KT_01	CONDUIT	265.40	0 01:06	2.37	0.00	0.03
R_KT_02	CONDUIT	55.33	0 00:52	4.13	0.00	0.01
R_KT_03	CONDUIT	160.95	0 00:49	5.55	0.00	0.01
R_KT_04	CONDUIT	12.44	0 00:52	2.46	0.00	0.00
R_KT_05	CONDUIT	73.65	0 00:42	5.80	0.00	0.01
R_KT_06	CONDUIT	16.07	0 01:05	3.09	0.00	0.00
R_KT_07	CONDUIT	158.96	0 00:41	8.55	0.00	0.01
R_KT_08	CONDUIT	94.72	0 00:41	4.77	0.00	0.01
R_KT_09	CONDUIT	5.13	0 01:00	1.98	0.00	0.00
R_SK_01	DUMMY	699.60	0 01:07			
R_SK_02	DUMMY	400.63	0 01:07			
R_SK_03	CONDUIT	1100.23	0 01:07	2.88	0.01	0.16
R_SK_04	CONDUIT	760.33	0 01:06	3.13	0.00	0.06
R_SK_05	CONDUIT	692.32	0 00:56	3.98	0.00	0.04
R_SK_06	CONDUIT	531.32	0 01:03	4.45	0.00	0.09
R_SK_07	CONDUIT	501.77	0 00:59	5.61	0.00	0.07
R_SK_08	CONDUIT	481.57	0 00:56	6.49	0.10	0.12
R_SK_09	DUMMY	516.03	0 00:55			
R_SK_10	CONDUIT	437.25	0 00:59	4.88	0.00	0.06
R_SK_11	CONDUIT	157.43	0 01:12	4.66	0.00	0.04
R_SK_12	CONDUIT	124.17	0 01:09	5.21	0.00	0.04

R_SK_13	CONDUIT	115.58	0	01:07	6.29	0.00	0.04
R_SK_14	CONDUIT	137.56	0	01:05	6.27	0.00	0.03
R_SK_15	DUMMY	21.77	0	01:05			
R_SK_16	CONDUIT	149.13	0	01:10	4.90	0.00	0.04

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
R_BC_01	0.01	0.01	0.01	10.01	0.01
R_BC_02	0.01	0.01	0.01	10.01	0.01
R_BC_05	0.01	0.01	0.01	10.01	0.01
R_BC_06	0.01	0.01	0.01	10.01	0.01
R_BC_07	0.01	0.01	0.01	10.01	0.01
R_BC_08	0.01	0.01	0.01	10.01	0.01
R_BC_09	0.01	0.01	0.01	10.01	0.01
R_BC_10	0.01	0.01	0.01	10.01	0.01
R_BC_11	0.01	0.01	0.01	10.01	0.01
R_BC_12	0.01	0.01	0.01	10.01	0.01
R_CU_02	0.01	0.01	0.01	10.01	0.01
R_CU_03	0.01	0.01	0.01	10.01	0.01
R_CU_04	0.01	0.01	0.01	10.01	0.01
R_CU_05	0.01	0.01	0.01	10.01	0.01
R_CU_06	0.01	0.01	0.01	10.01	0.01
R_CU_07	0.01	0.01	0.01	10.01	0.01
R_SK_01	0.01	0.01	0.01	10.01	0.01
R_SK_02	0.01	0.01	0.01	10.01	0.01
R_SK_09	0.01	0.01	0.01	10.01	0.01
R_SK_15	0.01	0.01	0.01	10.01	0.01

Analysis begun on: Wed Apr 20 14:01:26 2016
Analysis ended on: Wed Apr 20 14:01:26 2016

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------

INP file created on 2016-04-15 10:08:49 AM by Bledoux with inpPINS version 0.0.2.0
Title/Notes:

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ JAN-01-2005 00:00:00
Ending Date .............. JAN-01-2005 10:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Routing Time Step ........ 30.00 sec


WARNING 02: maximum depth increased for Node ANDERSON

WARNING 02: maximum depth increased for Node BC_01_SD

WARNING 02: maximum depth increased for Node BC_02_SD

WARNING 02: maximum depth increased for Node BC_03_SD

WARNING 02: maximum depth increased for Node BC_04

WARNING 02: maximum depth increased for Node BL_01

WARNING 02: maximum depth increased for Node BL_02

WARNING 02: maximum depth increased for Node BL_03

WARNING 02: maximum depth increased for Node BL_04

WARNING 02: maximum depth increased for Node CU_02_SD

WARNING 02: maximum depth increased for Node KG_01

WARNING 02: maximum depth increased for Node KG_02

WARNING 02: maximum depth increased for Node KG_03

WARNING 02: maximum depth increased for Node KG_04

WARNING 02: maximum depth increased for Node KG_05

WARNING 02: maximum depth increased for Node KG_06

WARNING 02: maximum depth increased for Node KG_07

WARNING 02: maximum depth increased for Node KG_08

WARNING 02: maximum depth increased for Node KINGS_GULCH

WARNING 02: maximum depth increased for Node KT_01

WARNING 02: maximum depth increased for Node KT_02

WARNING 02: maximum depth increased for Node KT_03

WARNING 02: maximum depth increased for Node KT_04

WARNING 02: maximum depth increased for Node SK_01

WARNING 02: maximum depth increased for Node SK_02
```

```
WARNING 02: maximum depth increased for Node SK_03

WARNING 02: maximum depth increased for Node SK_04

WARNING 02: maximum depth increased for Node SK_05

WARNING 02: maximum depth increased for Node SK_06

WARNING 02: maximum depth increased for Node SK_07

WARNING 02: maximum depth increased for Node SK_08

WARNING 02: maximum depth increased for Node D_01

WARNING 02: maximum depth increased for Node D_03

WARNING 02: maximum depth increased for Node D_04

WARNING 02: maximum depth increased for Node D_05

WARNING 02: maximum depth increased for Node D_06

WARNING 02: maximum depth increased for Node D_07

WARNING 02: maximum depth increased for Node D_08

WARNING 02: maximum depth increased for Node D_13

WARNING 02: maximum depth increased for Node D_14

**************************        Volume         Volume
Flow Routing Continuity        acre-feet       10^6 gal
**************************     ---------      ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.000          0.000
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........       206.037         67.140
External Outflow .........       205.234         66.879
Internal Outflow .........         0.000          0.000
Storage Losses ...........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         4.597          1.498
Continuity Error (%) .....        -1.841


*******************************
Highest Flow Instability Indexes
*******************************
Link R_KT_02 (2)
Link R_KT_01 (2)
Link R_SK_16 (2)
Link R_KG_01 (2)
Link R_SK_11 (2)


************************
Routing Time Step Summary
************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00


******************
Node Depth Summary
******************

----------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max
                                  Depth    Depth      HGL   Occurrence
Node                 Type         Feet     Feet     Feet  days hr:min
----------------------------------------------------------------------
ANDERSON             JUNCTION     1.06     2.37  5433.69     0  01:08
BC_01                JUNCTION     0.00     0.00  5333.54     0  00:00
BC_01_SD             JUNCTION     1.77     5.20  5306.76     0  00:58
BC_02                JUNCTION     0.00     0.00  5355.33     0  00:00
BC_02_SD             JUNCTION     0.02     0.14  5353.90     0  00:45
```

BC_03	JUNCTION	0.00	0.00	5360.11	0	00:00
BC_03_SD	JUNCTION	1.98	8.58	5347.38	0	00:55
BC_04	JUNCTION	0.05	0.43	5336.67	0	00:58
BL_01	JUNCTION	0.05	0.26	5423.66	0	00:53
BL_02	JUNCTION	0.05	0.25	5469.25	0	01:00
BL_03	JUNCTION	0.22	1.11	5545.11	0	01:01
BL_04	JUNCTION	0.22	1.11	5651.99	0	00:55
CU_01	JUNCTION	0.00	0.00	5420.62	0	00:00
CU_02	JUNCTION	0.00	0.00	5423.97	0	00:00
CU_02_SD	JUNCTION	0.03	0.27	5409.14	0	00:30
KG_01	JUNCTION	0.13	0.75	5417.75	0	00:54
KG_02	JUNCTION	0.07	0.50	5455.50	0	00:51
KG_03	JUNCTION	0.13	0.64	5475.64	0	00:59
KG_04	JUNCTION	0.19	1.45	5537.45	0	00:48
KG_05	JUNCTION	0.17	0.87	5543.87	0	01:01
KG_06	JUNCTION	0.01	0.06	5598.06	0	00:40
KG_07	JUNCTION	0.19	1.45	5495.45	0	00:49
KG_08	JUNCTION	0.14	1.13	5605.13	0	00:50
KINGS_GULCH	JUNCTION	1.12	2.58	5416.58	0	01:08
KT_01	JUNCTION	0.06	0.44	5341.20	0	00:40
KT_02	JUNCTION	0.04	0.42	5389.03	0	00:35
KT_03	JUNCTION	0.06	0.56	5314.98	0	00:40
KT_04	JUNCTION	0.04	0.40	5355.53	0	00:40
SK_01	JUNCTION	2.84	9.33	5247.95	0	01:05
SK_02	JUNCTION	0.99	3.71	5256.78	0	00:56
SK_03	JUNCTION	0.26	2.02	5263.62	0	00:46
SK_04	JUNCTION	1.77	5.19	5285.76	0	01:02
SK_05	JUNCTION	1.12	3.60	5360.74	0	00:57
SK_06	JUNCTION	1.27	3.60	5387.43	0	00:55
SK_07	JUNCTION	0.57	2.26	5488.98	0	01:06
SK_08	JUNCTION	0.46	1.92	5637.84	0	01:05
OUT_01	OUTFALL	0.00	0.00	5237.72	0	00:00
OUT_02	OUTFALL	0.00	0.00	5237.00	0	00:00
OUT_03	OUTFALL	0.00	0.00	5474.24	0	00:00
OUT_04	OUTFALL	0.00	0.00	5322.80	0	00:00
OUT_07	OUTFALL	0.00	0.00	5342.00	0	00:00
OUT_08	OUTFALL	0.00	0.00	5341.91	0	00:00
OUT_09	OUTFALL	0.00	0.00	5382.21	0	00:00
OUT_10	OUTFALL	0.00	0.00	5357.00	0	00:00
D_01	DIVIDER	2.83	9.33	5247.33	0	01:06
D_02	DIVIDER	1.95	8.58	5364.05	0	00:54
D_03	DIVIDER	0.55	2.20	5616.93	0	01:05
D_04	DIVIDER	0.07	0.43	5304.07	0	00:41
D_05	DIVIDER	0.04	0.22	5397.74	0	00:54
D_06	DIVIDER	0.05	0.26	5413.43	0	00:54
D_07	DIVIDER	0.13	0.64	5480.68	0	00:58
D_08	DIVIDER	0.05	0.52	5348.91	0	00:40
D_09	DIVIDER	0.00	0.00	5423.20	0	00:00
D_10	DIVIDER	0.00	0.00	5326.68	0	00:00
D_11	DIVIDER	0.00	0.00	5359.00	0	00:00
D_12	DIVIDER	0.00	0.00	5354.00	0	00:00
D_13	DIVIDER	0.04	0.39	5335.39	0	00:57
D_14	DIVIDER	0.07	0.50	5463.50	0	00:50

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
ANDERSON	JUNCTION	25.00	222.88	0	01:08	6.738	15.577
BC_01	JUNCTION	40.38	40.38	0	00:35	0.645	0.645
BC_01_SD	JUNCTION	0.00	776.80	0	00:58	0.000	35.346
BC_02	JUNCTION	21.73	21.73	0	00:45	0.657	0.657
BC_02_SD	JUNCTION	0.00	22.11	0	00:45	0.000	0.658
BC_03	JUNCTION	33.42	33.42	0	00:45	0.830	0.830
BC_03_SD	JUNCTION	0.00	739.50	0	00:54	0.000	33.980
BC_04	JUNCTION	0.00	103.46	0	00:57	0.000	2.335
BL_01	JUNCTION	17.93	46.06	0	00:53	0.332	1.679
BL_02	JUNCTION	11.03	34.69	0	00:55	0.209	1.350
BL_03	JUNCTION	10.77	152.23	0	01:00	0.244	5.927
BL_04	JUNCTION	145.39	145.39	0	00:55	5.680	5.680
CU_01	JUNCTION	129.28	129.28	0	00:40	2.370	2.370
CU_02	JUNCTION	145.61	145.61	0	00:35	2.018	2.018
CU_02_SD	JUNCTION	0.00	83.00	0	00:30	0.000	1.661
KG_01	JUNCTION	32.50	264.29	0	00:54	0.512	8.822

KG_02	JUNCTION	33.45	120.19	0	00:48	0.514	3.097
KG_03	JUNCTION	8.07	134.98	0	00:58	0.148	5.214
KG_04	JUNCTION	27.41	123.37	0	00:48	0.431	3.084
KG_05	JUNCTION	10.79	159.58	0	00:58	0.158	6.211
KG_06	JUNCTION	5.86	5.86	0	00:40	0.133	0.133
KG_07	JUNCTION	0.46	123.77	0	00:49	0.017	3.101
KG_08	JUNCTION	106.49	106.49	0	00:50	2.649	2.649
KINGS_GULCH	JUNCTION	0.00	238.06	0	01:08	0.000	16.067
KT_01	JUNCTION	97.04	100.56	0	00:40	1.629	2.567
KT_02	JUNCTION	135.32	136.05	0	00:35	1.912	2.152
KT_03	JUNCTION	31.00	223.14	0	00:40	0.476	4.028
KT_04	JUNCTION	63.67	272.85	0	00:40	1.168	4.996
SK_01	JUNCTION	132.94	1527.28	0	01:05	3.790	59.685
SK_02	JUNCTION	198.15	1090.22	0	00:56	4.006	45.741
SK_03	JUNCTION	212.73	457.35	0	00:46	3.635	9.829
SK_04	JUNCTION	407.76	959.68	0	00:53	6.233	41.947
SK_05	JUNCTION	266.73	794.38	0	00:54	3.806	34.834
SK_06	JUNCTION	335.50	684.07	0	00:55	5.812	31.133
SK_07	JUNCTION	23.68	198.09	0	01:06	0.750	8.840
SK_08	JUNCTION	215.94	215.94	0	01:05	9.638	9.638
OUT_01	OUTFALL	0.00	813.12	0	01:06	0.000	39.709
OUT_02	OUTFALL	0.00	713.67	0	01:06	0.000	19.929
OUT_03	OUTFALL	0.00	36.78	0	01:05	0.000	1.552
OUT_04	OUTFALL	0.00	83.07	0	00:53	0.000	1.516
OUT_07	OUTFALL	0.00	0.00	0	00:00	0.000	0.000
OUT_08	OUTFALL	0.00	76.85	0	00:40	0.000	1.442
OUT_09	OUTFALL	0.00	62.61	0	00:35	0.000	0.357
OUT_10	OUTFALL	0.00	129.28	0	00:40	0.000	2.370
D_01	DIVIDER	0.00	1526.79	0	01:06	0.000	59.638
D_02	DIVIDER	0.00	794.38	0	00:54	0.000	34.834
D_03	DIVIDER	0.00	215.83	0	01:05	0.000	9.636
D_04	DIVIDER	0.00	99.77	0	00:41	0.000	2.569
D_05	DIVIDER	0.00	38.03	0	00:54	0.000	1.428
D_06	DIVIDER	0.00	46.05	0	00:54	0.000	1.678
D_07	DIVIDER	0.00	159.56	0	00:58	0.000	6.208
D_08	DIVIDER	0.00	272.85	0	00:40	0.000	4.996
D_09	DIVIDER	0.00	145.61	0	00:35	0.000	2.018
D_10	DIVIDER	0.00	109.07	0	00:53	0.000	2.720
D_11	DIVIDER	0.00	33.42	0	00:45	0.000	0.830
D_12	DIVIDER	0.00	22.11	0	00:45	0.000	0.658
D_13	DIVIDER	0.00	103.46	0	00:57	0.000	2.335
D_14	DIVIDER	0.00	123.73	0	00:50	0.000	3.099

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
BC_01	JUNCTION	10.01	0.000	20.000
BC_02	JUNCTION	10.01	0.000	10.000
BC_03	JUNCTION	10.01	0.000	10.000
CU_01	JUNCTION	10.01	0.000	10.000
CU_02	JUNCTION	10.01	0.000	10.000
D_09	DIVIDER	10.01	0.000	10.000
D_10	DIVIDER	10.01	0.000	10.000
D_11	DIVIDER	10.01	0.000	10.000
D_12	DIVIDER	10.01	0.000	10.000

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal

OUT_01	97.42	151.25	813.12	39.709
OUT_02	97.25	76.04	713.67	19.929
OUT_03	48.96	11.76	36.78	1.552
OUT_04	13.57	41.45	83.07	1.516
OUT_07	0.00	0.00	0.00	0.000
OUT_08	35.80	14.94	76.85	1.442
OUT_09	4.83	27.39	62.61	0.357
OUT_10	29.06	30.26	129.28	2.370
System	40.86	353.09	1723.36	66.874

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
R_BC_01	DUMMY	83.07	0 00:53			
R_BC_02	DUMMY	89.90	0 00:57			
R_BC_03	CONDUIT	82.78	0 00:58	4.43	0.00	0.01
R_BC_04	CONDUIT	21.56	0 00:51	2.58	0.00	0.00
R_BC_05	DUMMY	22.11	0 00:45			
R_BC_06	DUMMY	0.00	0 00:00			
R_BC_07	DUMMY	21.73	0 00:45			
R_BC_08	DUMMY	26.00	0 00:31			
R_BC_09	DUMMY	40.38	0 00:35			
R_BC_10	DUMMY	0.38	0 00:45			
R_BC_11	DUMMY	33.04	0 00:45			
R_BC_12	DUMMY	33.42	0 00:45			
R_BC_13	CONDUIT	103.46	0 00:57	4.43	0.00	0.01
R_BC_14	CONDUIT	13.42	0 01:01	2.67	0.00	0.00
R_BL_01	CONDUIT	14.03	0 00:59	2.30	0.00	0.00
R_BL_02	CONDUIT	38.03	0 00:54	5.00	0.00	0.00
R_BL_03	CONDUIT	46.05	0 00:54	5.06	0.00	0.01
R_BL_04	CONDUIT	34.68	0 00:59	5.39	0.00	0.00
R_BL_05	CONDUIT	134.86	0 01:00	9.28	0.00	0.01
R_BL_06	CONDUIT	130.88	0 00:59	6.66	0.00	0.01
R_BL_07	CONDUIT	28.64	0 01:00	3.76	0.00	0.01
R_BL_08	CONDUIT	159.56	0 00:58	12.28	0.00	0.01
R_BL_09	CONDUIT	152.22	0 01:01	5.66	0.00	0.02
R_BL_10	CONDUIT	145.25	0 01:01	5.63	0.00	0.02
R_CU_01	CONDUIT	83.83	0 00:45	5.18	0.00	0.01
R_CU_02	DUMMY	83.00	0 00:30			
R_CU_03	DUMMY	62.61	0 00:35			
R_CU_04	DUMMY	145.61	0 00:35			
R_CU_05	DUMMY	129.28	0 00:40			
R_CU_06	DUMMY	76.85	0 00:40			
R_CU_07	DUMMY	272.85	0 00:40			
R_KG_01	CONDUIT	264.19	0 00:55	11.46	0.00	0.02
R_KG_02	CONDUIT	120.00	0 00:50	7.87	0.00	0.01
R_KG_03	CONDUIT	100.40	0 00:51	6.53	0.00	0.01
R_KG_04	CONDUIT	23.24	0 00:54	4.64	0.00	0.00
R_KG_05	CONDUIT	123.73	0 00:50	9.07	0.00	0.01
R_KG_06	CONDUIT	123.31	0 00:49	7.80	0.00	0.03
R_KG_07	CONDUIT	106.28	0 00:51	5.49	0.00	0.02
R_KG_08	CONDUIT	5.77	0 00:42	3.16	0.00	0.00
R_KT_01	CONDUIT	363.74	0 01:04	2.62	0.00	0.03
R_KT_02	CONDUIT	79.26	0 00:50	4.71	0.00	0.01
R_KT_03	CONDUIT	207.16	0 00:48	6.10	0.00	0.01
R_KT_04	CONDUIT	14.72	0 00:55	2.63	0.00	0.00
R_KT_05	CONDUIT	99.77	0 00:41	6.53	0.00	0.01
R_KT_06	CONDUIT	23.50	0 01:01	3.58	0.00	0.00
R_KT_07	CONDUIT	195.73	0 00:41	9.27	0.00	0.01
R_KT_08	CONDUIT	127.21	0 00:40	5.34	0.00	0.01
R_KT_09	CONDUIT	7.97	0 00:58	2.36	0.00	0.00
R_SK_01	DUMMY	813.12	0 01:06			
R_SK_02	DUMMY	713.67	0 01:06			
R_SK_03	CONDUIT	1526.79	0 01:06	3.13	0.02	0.19
R_SK_04	CONDUIT	1061.74	0 01:07	3.51	0.01	0.07
R_SK_05	CONDUIT	954.21	0 00:59	4.45	0.00	0.05
R_SK_06	CONDUIT	773.99	0 01:02	4.90	0.00	0.10
R_SK_07	CONDUIT	737.89	0 00:58	6.20	0.00	0.09
R_SK_08	CONDUIT	710.86	0 00:55	6.92	0.15	0.17
R_SK_09	DUMMY	794.38	0 00:54			
R_SK_10	CONDUIT	682.21	0 00:57	5.54	0.00	0.07
R_SK_11	CONDUIT	237.92	0 01:11	5.22	0.00	0.05
R_SK_12	CONDUIT	197.88	0 01:08	5.92	0.00	0.05

R_SK_13	CONDUIT	178.69	0	01:07	7.04	0.00	0.04
R_SK_14	CONDUIT	215.83	0	01:05	7.14	0.00	0.04
R_SK_15	DUMMY	36.78	0	01:05			
R_SK_16	CONDUIT	222.82	0	01:09	5.49	0.00	0.05

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
R_BC_01	0.01	0.01	0.01	10.01	0.01
R_BC_02	0.01	0.01	0.01	10.01	0.01
R_BC_05	0.01	0.01	0.01	10.01	0.01
R_BC_06	0.01	0.01	0.01	10.01	0.01
R_BC_07	0.01	0.01	0.01	10.01	0.01
R_BC_08	0.01	0.01	0.01	10.01	0.01
R_BC_09	0.01	0.01	0.01	10.01	0.01
R_BC_10	0.01	0.01	0.01	10.01	0.01
R_BC_11	0.01	0.01	0.01	10.01	0.01
R_BC_12	0.01	0.01	0.01	10.01	0.01
R_CU_02	0.01	0.01	0.01	10.01	0.01
R_CU_03	0.01	0.01	0.01	10.01	0.01
R_CU_04	0.01	0.01	0.01	10.01	0.01
R_CU_05	0.01	0.01	0.01	10.01	0.01
R_CU_06	0.01	0.01	0.01	10.01	0.01
R_CU_07	0.01	0.01	0.01	10.01	0.01
R_SK_01	0.01	0.01	0.01	10.01	0.01
R_SK_02	0.01	0.01	0.01	10.01	0.01
R_SK_09	0.01	0.01	0.01	10.01	0.01
R_SK_15	0.01	0.01	0.01	10.01	0.01

Analysis begun on: Wed Apr 20 14:02:14 2016
Analysis ended on: Wed Apr 20 14:02:14 2016

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------

INP file created on 2016-04-15 10:08:49 AM by Bledoux with inpPINS version 0.0.2.0
Title/Notes:

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ JAN-01-2005 00:00:00
Ending Date .............. JAN-01-2005 10:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Routing Time Step ........ 30.00 sec


WARNING 02: maximum depth increased for Node ANDERSON

WARNING 02: maximum depth increased for Node BC_01_SD

WARNING 02: maximum depth increased for Node BC_02_SD

WARNING 02: maximum depth increased for Node BC_03_SD

WARNING 02: maximum depth increased for Node BC_04

WARNING 02: maximum depth increased for Node BL_01

WARNING 02: maximum depth increased for Node BL_02

WARNING 02: maximum depth increased for Node BL_03

WARNING 02: maximum depth increased for Node BL_04

WARNING 02: maximum depth increased for Node CU_02_SD

WARNING 02: maximum depth increased for Node KG_01

WARNING 02: maximum depth increased for Node KG_02

WARNING 02: maximum depth increased for Node KG_03

WARNING 02: maximum depth increased for Node KG_04

WARNING 02: maximum depth increased for Node KG_05

WARNING 02: maximum depth increased for Node KG_06

WARNING 02: maximum depth increased for Node KG_07

WARNING 02: maximum depth increased for Node KG_08

WARNING 02: maximum depth increased for Node KINGS_GULCH

WARNING 02: maximum depth increased for Node KT_01

WARNING 02: maximum depth increased for Node KT_02

WARNING 02: maximum depth increased for Node KT_03

WARNING 02: maximum depth increased for Node KT_04

WARNING 02: maximum depth increased for Node SK_01

WARNING 02: maximum depth increased for Node SK_02
```

```
WARNING 02: maximum depth increased for Node SK_03

WARNING 02: maximum depth increased for Node SK_04

WARNING 02: maximum depth increased for Node SK_05

WARNING 02: maximum depth increased for Node SK_06

WARNING 02: maximum depth increased for Node SK_07

WARNING 02: maximum depth increased for Node SK_08

WARNING 02: maximum depth increased for Node D_01

WARNING 02: maximum depth increased for Node D_03

WARNING 02: maximum depth increased for Node D_04

WARNING 02: maximum depth increased for Node D_05

WARNING 02: maximum depth increased for Node D_06

WARNING 02: maximum depth increased for Node D_07

WARNING 02: maximum depth increased for Node D_08

WARNING 02: maximum depth increased for Node D_13

WARNING 02: maximum depth increased for Node D_14
**************************        Volume         Volume
Flow Routing Continuity        acre-feet       10^6 gal
**************************     ---------      ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.000          0.000
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........       281.131         91.611
External Outflow .........       280.821         91.510
Internal Outflow .........         0.000          0.000
Storage Losses ...........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         4.601          1.499
Continuity Error (%) .....        -1.526


*******************************
Highest Flow Instability Indexes
*******************************
Link R_KT_04 (2)
Link R_KT_02 (2)
Link R_KT_01 (2)
Link R_KT_05 (2)
Link R_SK_16 (2)


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00


******************
Node Depth Summary
******************

----------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max
                                  Depth    Depth      HGL   Occurrence
Node                 Type         Feet     Feet     Feet  days hr:min
----------------------------------------------------------------------
ANDERSON             JUNCTION     1.18     2.88  5434.20     0  01:10
BC_01                JUNCTION     0.00     0.00  5333.54     0  00:00
BC_01_SD             JUNCTION     1.97     5.92  5307.48     0  00:57
BC_02                JUNCTION     0.00     0.00  5355.33     0  00:00
BC_02_SD             JUNCTION     0.03     0.17  5353.93     0  00:38
```

BC_03	JUNCTION	0.00	0.00	5360.11	0	00:00
BC_03_SD	JUNCTION	2.42	10.75	5349.55	0	00:54
BC_04	JUNCTION	0.08	0.83	5337.07	0	00:56
BL_01	JUNCTION	0.06	0.32	5423.72	0	00:53
BL_02	JUNCTION	0.07	0.32	5469.32	0	01:02
BL_03	JUNCTION	0.29	1.39	5545.39	0	01:01
BL_04	JUNCTION	0.28	1.39	5652.27	0	01:00
CU_01	JUNCTION	0.00	0.00	5420.62	0	00:00
CU_02	JUNCTION	0.00	0.00	5423.97	0	00:00
CU_02_SD	JUNCTION	0.03	0.27	5409.14	0	00:28
KG_01	JUNCTION	0.17	0.96	5417.96	0	00:53
KG_02	JUNCTION	0.10	0.67	5455.67	0	00:50
KG_03	JUNCTION	0.16	0.81	5475.81	0	01:02
KG_04	JUNCTION	0.26	1.88	5537.88	0	00:48
KG_05	JUNCTION	0.22	1.10	5544.10	0	01:01
KG_06	JUNCTION	0.01	0.08	5598.08	0	00:40
KG_07	JUNCTION	0.26	1.88	5495.88	0	00:49
KG_08	JUNCTION	0.20	1.48	5605.48	0	00:50
KINGS_GULCH	JUNCTION	1.26	3.17	5417.17	0	01:11
KT_01	JUNCTION	0.08	0.52	5341.28	0	00:40
KT_02	JUNCTION	0.05	0.49	5389.10	0	00:35
KT_03	JUNCTION	0.07	0.64	5315.06	0	00:40
KT_04	JUNCTION	0.05	0.48	5355.61	0	00:40
SK_01	JUNCTION	3.17	10.63	5249.25	0	01:05
SK_02	JUNCTION	1.14	4.36	5257.43	0	00:58
SK_03	JUNCTION	0.30	2.37	5263.97	0	00:45
SK_04	JUNCTION	1.98	5.91	5286.48	0	01:02
SK_05	JUNCTION	1.30	4.39	5361.53	0	00:57
SK_06	JUNCTION	1.44	4.40	5388.23	0	00:54
SK_07	JUNCTION	0.71	2.79	5489.51	0	01:08
SK_08	JUNCTION	0.58	2.37	5638.29	0	01:05
OUT_01	OUTFALL	0.00	0.00	5237.72	0	00:00
OUT_02	OUTFALL	0.00	0.00	5237.00	0	00:00
OUT_03	OUTFALL	0.00	0.00	5474.24	0	00:00
OUT_04	OUTFALL	0.00	0.00	5322.80	0	00:00
OUT_07	OUTFALL	0.00	0.00	5342.00	0	00:00
OUT_08	OUTFALL	0.00	0.00	5341.91	0	00:00
OUT_09	OUTFALL	0.00	0.00	5382.21	0	00:00
OUT_10	OUTFALL	0.00	0.00	5357.00	0	00:00
D_01	DIVIDER	3.16	10.62	5248.62	0	01:06
D_02	DIVIDER	2.39	10.75	5366.22	0	00:53
D_03	DIVIDER	0.68	2.65	5617.38	0	01:05
D_04	DIVIDER	0.08	0.51	5304.15	0	00:42
D_05	DIVIDER	0.05	0.27	5397.79	0	00:55
D_06	DIVIDER	0.06	0.32	5413.49	0	00:54
D_07	DIVIDER	0.16	0.81	5480.85	0	01:01
D_08	DIVIDER	0.06	0.59	5348.98	0	00:40
D_09	DIVIDER	0.00	0.00	5423.20	0	00:00
D_10	DIVIDER	0.00	0.00	5326.68	0	00:00
D_11	DIVIDER	0.00	0.00	5359.00	0	00:00
D_12	DIVIDER	0.00	0.00	5354.00	0	00:00
D_13	DIVIDER	0.07	0.70	5335.70	0	00:56
D_14	DIVIDER	0.09	0.67	5463.67	0	00:50

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
ANDERSON	JUNCTION	25.00	327.65	0	01:10	6.738	20.489
BC_01	JUNCTION	49.88	49.88	0	00:35	0.803	0.803
BC_01_SD	JUNCTION	0.00	1044.90	0	00:57	0.000	47.156
BC_02	JUNCTION	29.00	29.00	0	00:45	0.887	0.887
BC_02_SD	JUNCTION	0.00	29.00	0	00:38	0.000	0.907
BC_03	JUNCTION	44.23	44.23	0	00:45	1.099	1.099
BC_03_SD	JUNCTION	0.00	956.86	0	00:54	0.000	44.766
BC_04	JUNCTION	0.00	277.84	0	00:56	0.000	5.765
BL_01	JUNCTION	23.64	67.09	0	00:53	0.442	2.444
BL_02	JUNCTION	15.37	51.44	0	00:57	0.293	2.004
BL_03	JUNCTION	17.36	226.03	0	01:01	0.377	9.000
BL_04	JUNCTION	215.20	215.20	0	01:00	8.617	8.617
CU_01	JUNCTION	177.03	177.03	0	00:40	3.218	3.218
CU_02	JUNCTION	194.07	194.07	0	00:35	2.699	2.699
CU_02_SD	JUNCTION	0.00	83.00	0	00:28	0.000	1.925
KG_01	JUNCTION	42.26	401.05	0	00:53	0.667	13.625

KG_02	JUNCTION	46.92	189.20	0	00:48	0.708	5.045
KG_03	JUNCTION	11.18	200.23	0	00:59	0.205	7.914
KG_04	JUNCTION	44.47	197.81	0	00:48	0.671	5.295
KG_05	JUNCTION	15.92	237.01	0	01:01	0.217	9.425
KG_06	JUNCTION	9.79	9.79	0	00:40	0.213	0.213
KG_07	JUNCTION	1.45	199.17	0	00:49	0.056	5.351
KG_08	JUNCTION	170.33	170.33	0	00:50	4.618	4.618
KINGS_GULCH	JUNCTION	0.00	362.33	0	01:11	0.000	21.476
KT_01	JUNCTION	126.15	134.17	0	00:40	2.147	3.487
KT_02	JUNCTION	175.72	177.36	0	00:35	2.492	2.885
KT_03	JUNCTION	42.58	275.27	0	00:40	0.650	5.181
KT_04	JUNCTION	84.31	334.19	0	00:40	1.546	6.372
SK_01	JUNCTION	179.59	2064.75	0	01:05	5.192	79.077
SK_02	JUNCTION	257.75	1454.13	0	00:58	5.281	60.575
SK_03	JUNCTION	275.47	601.89	0	00:45	4.661	12.872
SK_04	JUNCTION	505.44	1279.70	0	00:56	7.905	55.498
SK_05	JUNCTION	337.58	1173.72	0	00:53	4.883	48.605
SK_06	JUNCTION	461.35	1017.41	0	00:54	8.077	43.826
SK_07	JUNCTION	42.35	302.98	0	01:08	1.447	13.751
SK_08	JUNCTION	325.56	325.56	0	01:05	14.796	14.796
OUT_01	OUTFALL	0.00	940.93	0	01:06	0.000	48.158
OUT_02	OUTFALL	0.00	1123.40	0	01:06	0.000	30.872
OUT_03	OUTFALL	0.00	58.89	0	01:05	0.000	2.498
OUT_04	OUTFALL	0.00	212.83	0	00:54	0.000	4.084
OUT_07	OUTFALL	0.00	10.24	0	00:45	0.000	0.060
OUT_08	OUTFALL	0.00	96.78	0	00:40	0.000	1.840
OUT_09	OUTFALL	0.00	111.07	0	00:35	0.000	0.774
OUT_10	OUTFALL	0.00	177.03	0	00:40	0.000	3.218
D_01	DIVIDER	0.00	2064.33	0	01:06	0.000	79.030
D_02	DIVIDER	0.00	1173.72	0	00:53	0.000	48.605
D_03	DIVIDER	0.00	325.46	0	01:05	0.000	14.794
D_04	DIVIDER	0.00	132.91	0	00:42	0.000	3.489
D_05	DIVIDER	0.00	54.11	0	00:55	0.000	2.043
D_06	DIVIDER	0.00	67.08	0	00:54	0.000	2.444
D_07	DIVIDER	0.00	236.96	0	01:01	0.000	9.422
D_08	DIVIDER	0.00	334.19	0	00:40	0.000	6.372
D_09	DIVIDER	0.00	194.07	0	00:35	0.000	2.699
D_10	DIVIDER	0.00	238.83	0	00:54	0.000	5.493
D_11	DIVIDER	0.00	44.23	0	00:45	0.000	1.099
D_12	DIVIDER	0.00	39.24	0	00:45	0.000	0.967
D_13	DIVIDER	0.00	277.81	0	00:56	0.000	5.765
D_14	DIVIDER	0.00	199.13	0	00:50	0.000	5.348

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
BC_01	JUNCTION	10.01	0.000	20.000
BC_02	JUNCTION	10.01	0.000	10.000
BC_03	JUNCTION	10.01	0.000	10.000
CU_01	JUNCTION	10.01	0.000	10.000
CU_02	JUNCTION	10.01	0.000	10.000
D_09	DIVIDER	10.01	0.000	10.000
D_10	DIVIDER	10.01	0.000	10.000
D_11	DIVIDER	10.01	0.000	10.000
D_12	DIVIDER	10.01	0.000	10.000

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal

OUT_01	97.42	183.43	940.93	48.158
OUT_02	97.34	117.69	1123.40	30.872
OUT_03	49.54	18.71	58.89	2.498
OUT_04	17.32	87.49	212.83	4.084
OUT_07	3.58	6.22	10.24	0.060
OUT_08	40.05	17.05	96.78	1.840
OUT_09	6.16	46.60	111.07	0.774
OUT_10	29.06	41.09	177.03	3.218
System	42.56	518.28	2446.29	91.503

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
R_BC_01	DUMMY	212.83	0 00:54			
R_BC_02	DUMMY	213.43	0 00:56			
R_BC_03	CONDUIT	248.84	0 00:56	6.76	0.00	0.02
R_BC_04	CONDUIT	29.26	0 01:00	2.94	0.00	0.00
R_BC_05	DUMMY	29.00	0 00:38			
R_BC_06	DUMMY	10.24	0 00:45			
R_BC_07	DUMMY	29.00	0 00:45			
R_BC_08	DUMMY	26.00	0 00:29			
R_BC_09	DUMMY	49.88	0 00:35			
R_BC_10	DUMMY	10.23	0 00:45			
R_BC_11	DUMMY	34.00	0 00:44			
R_BC_12	DUMMY	44.23	0 00:45			
R_BC_13	CONDUIT	277.81	0 00:56	6.53	0.00	0.01
R_BC_14	CONDUIT	64.16	0 00:58	4.90	0.00	0.00
R_BL_01	CONDUIT	18.42	0 00:58	2.56	0.00	0.00
R_BL_02	CONDUIT	54.11	0 00:55	5.75	0.00	0.01
R_BL_03	CONDUIT	67.08	0 00:54	5.87	0.00	0.01
R_BL_04	CONDUIT	51.42	0 00:59	6.30	0.00	0.01
R_BL_05	CONDUIT	200.13	0 01:00	10.82	0.00	0.01
R_BL_06	CONDUIT	194.46	0 01:02	7.76	0.00	0.02
R_BL_07	CONDUIT	42.46	0 01:02	4.40	0.00	0.01
R_BL_08	CONDUIT	236.96	0 01:01	14.33	0.00	0.01
R_BL_09	CONDUIT	226.03	0 01:01	6.58	0.00	0.02
R_BL_10	CONDUIT	214.69	0 01:01	6.40	0.00	0.03
R_CU_01	CONDUIT	83.91	0 00:52	5.19	0.00	0.01
R_CU_02	DUMMY	83.00	0 00:28			
R_CU_03	DUMMY	111.07	0 00:35			
R_CU_04	DUMMY	194.07	0 00:35			
R_CU_05	DUMMY	177.03	0 00:40			
R_CU_06	DUMMY	96.78	0 00:40			
R_CU_07	DUMMY	334.19	0 00:40			
R_KG_01	CONDUIT	400.91	0 00:54	13.44	0.00	0.02
R_KG_02	CONDUIT	188.83	0 00:50	9.38	0.00	0.01
R_KG_03	CONDUIT	159.47	0 00:50	7.82	0.00	0.01
R_KG_04	CONDUIT	39.62	0 00:53	5.67	0.00	0.00
R_KG_05	CONDUIT	199.13	0 00:50	10.91	0.00	0.01
R_KG_06	CONDUIT	197.73	0 00:49	8.96	0.00	0.04
R_KG_07	CONDUIT	169.81	0 00:51	6.42	0.00	0.03
R_KG_08	CONDUIT	9.67	0 00:42	3.88	0.00	0.00
R_KT_01	CONDUIT	491.67	0 01:03	2.87	0.00	0.04
R_KT_02	CONDUIT	115.17	0 00:51	5.45	0.00	0.01
R_KT_03	CONDUIT	258.26	0 00:47	6.57	0.00	0.01
R_KT_04	CONDUIT	14.68	0 01:12	2.66	0.00	0.00
R_KT_05	CONDUIT	132.91	0 00:42	7.29	0.00	0.01
R_KT_06	CONDUIT	35.22	0 01:01	4.19	0.00	0.00
R_KT_07	CONDUIT	237.11	0 00:41	9.99	0.00	0.01
R_KT_08	CONDUIT	167.71	0 00:40	5.93	0.00	0.01
R_KT_09	CONDUIT	12.92	0 00:57	2.86	0.00	0.00
R_SK_01	DUMMY	940.93	0 01:06			
R_SK_02	DUMMY	1123.40	0 01:06			
R_SK_03	CONDUIT	2064.33	0 01:06	3.38	0.02	0.21
R_SK_04	CONDUIT	1430.13	0 01:07	3.85	0.01	0.09
R_SK_05	CONDUIT	1275.74	0 01:00	4.91	0.00	0.06
R_SK_06	CONDUIT	1041.20	0 01:02	5.27	0.01	0.12
R_SK_07	CONDUIT	954.93	0 00:57	6.60	0.00	0.10
R_SK_08	CONDUIT	923.29	0 00:54	7.17	0.19	0.21
R_SK_09	DUMMY	1173.72	0 00:53			
R_SK_10	CONDUIT	1015.54	0 00:57	6.17	0.00	0.09
R_SK_11	CONDUIT	362.09	0 01:12	5.86	0.00	0.06
R_SK_12	CONDUIT	302.65	0 01:10	6.64	0.00	0.06

R_SK_13	CONDUIT	266.06	0	01:11	7.81	0.00	0.05
R_SK_14	CONDUIT	325.46	0	01:05	8.01	0.00	0.05
R_SK_15	DUMMY	58.89	0	01:05			
R_SK_16	CONDUIT	327.60	0	01:11	6.10	0.00	0.06

****
Conduit Surcharge Summary
****

Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
R_BC_01	0.01	0.01	0.01	10.01	0.01
R_BC_02	0.01	0.01	0.01	10.01	0.01
R_BC_05	0.01	0.01	0.01	10.01	0.01
R_BC_06	0.01	0.01	0.01	10.01	0.01
R_BC_07	0.01	0.01	0.01	10.01	0.01
R_BC_08	0.01	0.01	0.01	10.01	0.01
R_BC_09	0.01	0.01	0.01	10.01	0.01
R_BC_10	0.01	0.01	0.01	10.01	0.01
R_BC_11	0.01	0.01	0.01	10.01	0.01
R_BC_12	0.01	0.01	0.01	10.01	0.01
R_CU_02	0.01	0.01	0.01	10.01	0.01
R_CU_03	0.01	0.01	0.01	10.01	0.01
R_CU_04	0.01	0.01	0.01	10.01	0.01
R_CU_05	0.01	0.01	0.01	10.01	0.01
R_CU_06	0.01	0.01	0.01	10.01	0.01
R_CU_07	0.01	0.01	0.01	10.01	0.01
R_SK_01	0.01	0.01	0.01	10.01	0.01
R_SK_02	0.01	0.01	0.01	10.01	0.01
R_SK_09	0.01	0.01	0.01	10.01	0.01
R_SK_15	0.01	0.01	0.01	10.01	0.01

Analysis begun on: Wed Apr 20 14:03:04 2016
Analysis ended on: Wed Apr 20 14:03:05 2016

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)
--------------------------------------------------------------

INP file created on 2016-04-15 10:08:49 AM by Bledoux with inpPINS version 0.0.2.0
Title/Notes:

*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ JAN-01-2005 00:00:00
Ending Date .............. JAN-01-2005 10:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:15:00
Routing Time Step ........ 30.00 sec


WARNING 02: maximum depth increased for Node ANDERSON

WARNING 02: maximum depth increased for Node BC_01_SD

WARNING 02: maximum depth increased for Node BC_02_SD

WARNING 02: maximum depth increased for Node BC_03_SD

WARNING 02: maximum depth increased for Node BC_04

WARNING 02: maximum depth increased for Node BL_01

WARNING 02: maximum depth increased for Node BL_02

WARNING 02: maximum depth increased for Node BL_03

WARNING 02: maximum depth increased for Node BL_04

WARNING 02: maximum depth increased for Node CU_02_SD

WARNING 02: maximum depth increased for Node KG_01

WARNING 02: maximum depth increased for Node KG_02

WARNING 02: maximum depth increased for Node KG_03

WARNING 02: maximum depth increased for Node KG_04

WARNING 02: maximum depth increased for Node KG_05

WARNING 02: maximum depth increased for Node KG_06

WARNING 02: maximum depth increased for Node KG_07

WARNING 02: maximum depth increased for Node KG_08

WARNING 02: maximum depth increased for Node KINGS_GULCH

WARNING 02: maximum depth increased for Node KT_01

WARNING 02: maximum depth increased for Node KT_02

WARNING 02: maximum depth increased for Node KT_03

WARNING 02: maximum depth increased for Node KT_04

WARNING 02: maximum depth increased for Node SK_01

WARNING 02: maximum depth increased for Node SK_02
```

```
WARNING 02: maximum depth increased for Node SK_03

WARNING 02: maximum depth increased for Node SK_04

WARNING 02: maximum depth increased for Node SK_05

WARNING 02: maximum depth increased for Node SK_06

WARNING 02: maximum depth increased for Node SK_07

WARNING 02: maximum depth increased for Node SK_08

WARNING 02: maximum depth increased for Node D_01

WARNING 02: maximum depth increased for Node D_03

WARNING 02: maximum depth increased for Node D_04

WARNING 02: maximum depth increased for Node D_05

WARNING 02: maximum depth increased for Node D_06

WARNING 02: maximum depth increased for Node D_07

WARNING 02: maximum depth increased for Node D_08

WARNING 02: maximum depth increased for Node D_13

WARNING 02: maximum depth increased for Node D_14
**************************        Volume         Volume
Flow Routing Continuity        acre-feet       10^6 gal
**************************     ---------      ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.000          0.000
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........       462.192        150.612
External Outflow .........       462.463        150.701
Internal Outflow .........         0.000          0.000
Storage Losses ...........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         4.606          1.501
Continuity Error (%) .....        -1.055


*******************************
Highest Flow Instability Indexes
*******************************
Link R_KT_01 (2)
Link R_KT_02 (2)
Link R_SK_16 (2)
Link R_KT_04 (2)
Link R_KT_05 (2)


*************************
Routing Time Step Summary
*************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.00


******************
Node Depth Summary
******************

----------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max
                                  Depth    Depth      HGL   Occurrence
Node                 Type         Feet     Feet     Feet  days hr:min
----------------------------------------------------------------------
ANDERSON             JUNCTION     1.40     3.77  5435.09     0  01:09
BC_01                JUNCTION     0.00     0.00  5333.54     0  00:00
BC_01_SD             JUNCTION     2.34     7.41  5308.97     0  00:55
BC_02                JUNCTION     0.00     0.00  5355.33     0  00:00
BC_02_SD             JUNCTION     0.03     0.17  5353.93     0  00:31
```

BC_03	JUNCTION	0.00	0.00	5360.11	0	00:00
BC_03_SD	JUNCTION	3.32	16.54	5355.34	0	00:52
BC_04	JUNCTION	0.16	1.35	5337.59	0	00:53
BL_01	JUNCTION	0.09	0.46	5423.86	0	00:53
BL_02	JUNCTION	0.10	0.47	5469.47	0	00:59
BL_03	JUNCTION	0.40	1.90	5545.90	0	01:01
BL_04	JUNCTION	0.40	1.90	5652.78	0	01:00
CU_01	JUNCTION	0.00	0.00	5420.62	0	00:00
CU_02	JUNCTION	0.00	0.00	5423.97	0	00:00
CU_02_SD	JUNCTION	0.04	0.27	5409.14	0	00:26
KG_01	JUNCTION	0.25	1.40	5418.40	0	00:51
KG_02	JUNCTION	0.14	1.01	5456.01	0	00:48
KG_03	JUNCTION	0.23	1.14	5476.14	0	00:58
KG_04	JUNCTION	0.38	2.64	5538.64	0	00:46
KG_05	JUNCTION	0.32	1.55	5544.55	0	01:01
KG_06	JUNCTION	0.01	0.13	5598.13	0	00:40
KG_07	JUNCTION	0.38	2.64	5496.64	0	00:47
KG_08	JUNCTION	0.30	2.10	5606.10	0	00:50
KINGS_GULCH	JUNCTION	1.50	4.11	5418.11	0	01:09
KT_01	JUNCTION	0.11	0.70	5341.46	0	00:40
KT_02	JUNCTION	0.06	0.64	5389.25	0	00:35
KT_03	JUNCTION	0.09	0.82	5315.24	0	00:39
KT_04	JUNCTION	0.07	0.63	5355.76	0	00:39
SK_01	JUNCTION	3.77	13.19	5251.81	0	01:01
SK_02	JUNCTION	1.43	5.81	5258.88	0	00:56
SK_03	JUNCTION	0.39	3.13	5264.73	0	00:44
SK_04	JUNCTION	2.34	7.40	5287.97	0	00:58
SK_05	JUNCTION	1.61	5.80	5362.94	0	00:55
SK_06	JUNCTION	1.75	5.80	5389.63	0	00:52
SK_07	JUNCTION	0.96	3.68	5490.40	0	01:07
SK_08	JUNCTION	0.80	3.15	5639.07	0	01:05
OUT_01	OUTFALL	0.00	0.00	5237.72	0	00:00
OUT_02	OUTFALL	0.00	0.00	5237.00	0	00:00
OUT_03	OUTFALL	0.00	0.00	5474.24	0	00:00
OUT_04	OUTFALL	0.00	0.00	5322.80	0	00:00
OUT_07	OUTFALL	0.00	0.00	5342.00	0	00:00
OUT_08	OUTFALL	0.00	0.00	5341.91	0	00:00
OUT_09	OUTFALL	0.00	0.00	5382.21	0	00:00
OUT_10	OUTFALL	0.00	0.00	5357.00	0	00:00
D_01	DIVIDER	3.76	13.19	5251.19	0	01:02
D_02	DIVIDER	3.29	16.54	5372.01	0	00:51
D_03	DIVIDER	0.91	3.40	5618.13	0	01:05
D_04	DIVIDER	0.11	0.70	5304.34	0	00:43
D_05	DIVIDER	0.07	0.37	5397.89	0	00:54
D_06	DIVIDER	0.09	0.46	5413.63	0	00:54
D_07	DIVIDER	0.23	1.14	5481.18	0	00:58
D_08	DIVIDER	0.08	0.74	5349.13	0	00:39
D_09	DIVIDER	0.00	0.00	5423.20	0	00:00
D_10	DIVIDER	0.00	0.00	5326.68	0	00:00
D_11	DIVIDER	0.00	0.00	5359.00	0	00:00
D_12	DIVIDER	0.00	0.00	5354.00	0	00:00
D_13	DIVIDER	0.14	1.10	5336.10	0	00:53
D_14	DIVIDER	0.14	1.01	5464.01	0	00:48

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days	hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
ANDERSON	JUNCTION	25.00	566.48	0	01:09	6.738	31.808
BC_01	JUNCTION	74.45	74.45	0	00:35	1.213	1.213
BC_01_SD	JUNCTION	0.00	1755.01	0	00:55	0.000	73.832
BC_02	JUNCTION	46.91	46.91	0	00:45	1.453	1.453
BC_02_SD	JUNCTION	0.00	29.00	0	00:31	0.000	1.212
BC_03	JUNCTION	69.68	69.68	0	00:45	1.766	1.766
BC_03_SD	JUNCTION	0.00	1531.85	0	00:52	0.000	67.944
BC_04	JUNCTION	0.00	592.99	0	00:53	0.000	15.382
BL_01	JUNCTION	37.70	121.51	0	00:53	0.713	4.350
BL_02	JUNCTION	27.14	96.23	0	00:57	0.508	3.637
BL_03	JUNCTION	34.44	397.69	0	01:00	0.750	16.237
BL_04	JUNCTION	374.53	374.53	0	01:00	15.483	15.483
CU_01	JUNCTION	297.90	297.90	0	00:40	5.408	5.408
CU_02	JUNCTION	311.19	311.19	0	00:35	4.351	4.351
CU_02_SD	JUNCTION	0.00	83.00	0	00:26	0.000	2.359
KG_01	JUNCTION	65.54	744.63	0	00:51	1.056	25.198

KG_02	JUNCTION	81.81	373.50	0	00:47	1.226	9.870
KG_03	JUNCTION	19.51	352.36	0	00:57	0.353	14.272
KG_04	JUNCTION	88.60	376.20	0	00:46	1.345	10.290
KG_05	JUNCTION	27.97	421.07	0	00:57	0.381	17.054
KG_06	JUNCTION	19.99	19.99	0	00:40	0.440	0.440
KG_07	JUNCTION	4.22	380.05	0	00:47	0.176	10.467
KG_08	JUNCTION	315.18	315.18	0	00:50	8.942	8.942
KINGS_GULCH	JUNCTION	0.00	618.42	0	01:09	0.000	33.601
KT_01	JUNCTION	199.41	221.62	0	00:40	3.436	5.834
KT_02	JUNCTION	271.68	277.94	0	00:35	3.939	4.792
KT_03	JUNCTION	72.43	419.08	0	00:39	1.100	8.021
KT_04	JUNCTION	132.33	481.02	0	00:39	2.464	9.635
SK_01	JUNCTION	292.66	3433.68	0	01:01	8.578	124.488
SK_02	JUNCTION	404.86	2428.29	0	00:56	8.424	94.842
SK_03	JUNCTION	420.39	968.37	0	00:44	7.254	20.473
SK_04	JUNCTION	772.63	2147.10	0	00:54	12.163	86.618
SK_05	JUNCTION	518.29	2063.04	0	00:51	7.603	80.820
SK_06	JUNCTION	753.72	1796.60	0	00:52	13.480	73.318
SK_07	JUNCTION	86.64	541.96	0	01:07	3.068	25.068
SK_08	JUNCTION	573.20	573.20	0	01:05	26.792	26.792
OUT_01	OUTFALL	0.00	1103.14	0	01:02	0.000	63.305
OUT_02	OUTFALL	0.00	2329.64	0	01:02	0.000	61.136
OUT_03	OUTFALL	0.00	108.61	0	01:05	0.000	4.795
OUT_04	OUTFALL	0.00	410.42	0	00:49	0.000	10.620
OUT_07	OUTFALL	0.00	53.60	0	00:45	0.000	0.720
OUT_08	OUTFALL	0.00	127.26	0	00:39	0.000	2.714
OUT_09	OUTFALL	0.00	228.19	0	00:35	0.000	1.992
OUT_10	OUTFALL	0.00	297.90	0	00:40	0.000	5.408
D_01	DIVIDER	0.00	3432.77	0	01:02	0.000	124.441
D_02	DIVIDER	0.00	2063.04	0	00:51	0.000	80.820
D_03	DIVIDER	0.00	573.05	0	01:05	0.000	26.789
D_04	DIVIDER	0.00	221.16	0	00:43	0.000	5.836
D_05	DIVIDER	0.00	92.48	0	00:54	0.000	3.490
D_06	DIVIDER	0.00	121.50	0	00:54	0.000	4.349
D_07	DIVIDER	0.00	421.04	0	00:58	0.000	17.050
D_08	DIVIDER	0.00	481.02	0	00:39	0.000	9.635
D_09	DIVIDER	0.00	311.19	0	00:35	0.000	4.351
D_10	DIVIDER	0.00	436.42	0	00:49	0.000	12.358
D_11	DIVIDER	0.00	69.68	0	00:45	0.000	1.766
D_12	DIVIDER	0.00	82.60	0	00:45	0.000	1.932
D_13	DIVIDER	0.00	592.97	0	00:53	0.000	15.384
D_14	DIVIDER	0.00	379.95	0	00:48	0.000	10.462

****
Node Surcharge Summary
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Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
BC_01	JUNCTION	10.01	0.000	20.000
BC_02	JUNCTION	10.01	0.000	10.000
BC_03	JUNCTION	10.01	0.000	10.000
CU_01	JUNCTION	10.01	0.000	10.000
CU_02	JUNCTION	10.01	0.000	10.000
D_09	DIVIDER	10.01	0.000	10.000
D_10	DIVIDER	10.01	0.000	10.000
D_11	DIVIDER	10.01	0.000	10.000
D_12	DIVIDER	10.01	0.000	10.000

****
Node Flooding Summary
****

No nodes were flooded.

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal

OUT_01	97.92	239.90	1103.14	63.305
OUT_02	97.84	231.87	2329.64	61.136
OUT_03	52.37	33.97	108.61	4.795
OUT_04	22.31	176.60	410.42	10.620
OUT_07	8.66	30.84	53.60	0.720
OUT_08	44.13	22.82	127.26	2.714
OUT_09	8.16	90.56	228.19	1.992
OUT_10	29.06	69.05	297.90	5.408
System	45.06	895.60	4215.58	150.689

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Link Flow Summary
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Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
R_BC_01	DUMMY	410.42	0	00:49			
R_BC_02	DUMMY	392.68	0	00:53			
R_BC_03	CONDUIT	564.00	0	00:53	9.22	0.00	0.03
R_BC_04	CONDUIT	29.22	0	01:24	2.93	0.00	0.00
R_BC_05	DUMMY	29.00	0	00:31			
R_BC_06	DUMMY	53.60	0	00:45			
R_BC_07	DUMMY	46.91	0	00:45			
R_BC_08	DUMMY	26.00	0	00:26			
R_BC_09	DUMMY	74.45	0	00:35			
R_BC_10	DUMMY	35.68	0	00:45			
R_BC_11	DUMMY	34.00	0	00:32			
R_BC_12	DUMMY	69.68	0	00:45			
R_BC_13	CONDUIT	592.97	0	00:53	8.78	0.00	0.02
R_BC_14	CONDUIT	200.12	0	00:54	7.66	0.00	0.01
R_BL_01	CONDUIT	24.96	0	00:57	2.89	0.00	0.00
R_BL_02	CONDUIT	92.48	0	00:54	7.10	0.00	0.01
R_BL_03	CONDUIT	121.50	0	00:54	7.41	0.00	0.01
R_BL_04	CONDUIT	96.23	0	00:58	8.05	0.00	0.01
R_BL_05	CONDUIT	352.21	0	00:59	13.44	0.00	0.02
R_BL_06	CONDUIT	341.20	0	00:58	9.60	0.00	0.02
R_BL_07	CONDUIT	79.77	0	00:59	5.62	0.00	0.01
R_BL_08	CONDUIT	421.04	0	00:58	17.89	0.00	0.02
R_BL_09	CONDUIT	397.71	0	01:01	8.12	0.00	0.03
R_BL_10	CONDUIT	374.22	0	01:01	7.66	0.00	0.04
R_CU_01	CONDUIT	83.85	0	01:00	5.16	0.00	0.01
R_CU_02	DUMMY	83.00	0	00:26			
R_CU_03	DUMMY	228.19	0	00:35			
R_CU_04	DUMMY	311.19	0	00:35			
R_CU_05	DUMMY	297.90	0	00:40			
R_CU_06	DUMMY	127.26	0	00:39			
R_CU_07	DUMMY	481.02	0	00:39			
R_KG_01	CONDUIT	744.60	0	00:51	16.96	0.00	0.03
R_KG_02	CONDUIT	373.08	0	00:48	12.17	0.00	0.02
R_KG_03	CONDUIT	319.60	0	00:48	10.20	0.00	0.02
R_KG_04	CONDUIT	60.20	0	00:50	6.68	0.00	0.01
R_KG_05	CONDUIT	379.95	0	00:48	13.98	0.00	0.02
R_KG_06	CONDUIT	375.99	0	00:47	10.74	0.00	0.05
R_KG_07	CONDUIT	314.91	0	00:50	7.82	0.00	0.04
R_KG_08	CONDUIT	19.84	0	00:41	5.16	0.00	0.00
R_KT_01	CONDUIT	814.77	0	00:58	3.34	0.00	0.06
R_KT_02	CONDUIT	202.24	0	00:49	6.75	0.00	0.01
R_KT_03	CONDUIT	401.13	0	00:45	7.81	0.00	0.02
R_KT_04	CONDUIT	16.03	0	01:03	2.73	0.00	0.00
R_KT_05	CONDUIT	221.16	0	00:43	8.87	0.00	0.01
R_KT_06	CONDUIT	67.04	0	00:58	5.39	0.00	0.01
R_KT_07	CONDUIT	353.59	0	00:40	11.67	0.00	0.01
R_KT_08	CONDUIT	266.41	0	00:39	7.07	0.00	0.01
R_KT_09	CONDUIT	29.03	0	00:58	3.94	0.00	0.00
R_SK_01	DUMMY	1103.14	0	01:02			
R_SK_02	DUMMY	2329.64	0	01:02			
R_SK_03	CONDUIT	3432.77	0	01:02	3.84	0.04	0.26
R_SK_04	CONDUIT	2389.98	0	01:03	4.53	0.01	0.11
R_SK_05	CONDUIT	2137.65	0	00:58	5.83	0.01	0.08
R_SK_06	CONDUIT	1748.04	0	00:58	6.01	0.01	0.15
R_SK_07	CONDUIT	1528.93	0	00:55	7.44	0.01	0.12
R_SK_08	CONDUIT	1497.85	0	00:52	7.56	0.31	0.33
R_SK_09	DUMMY	2063.04	0	00:51			
R_SK_10	CONDUIT	1794.99	0	00:55	7.18	0.01	0.12
R_SK_11	CONDUIT	618.08	0	01:11	6.74	0.00	0.08
R_SK_12	CONDUIT	541.48	0	01:09	7.74	0.00	0.07

R_SK_13	CONDUIT	463.31	0	01:08	8.99	0.00	0.07
R_SK_14	CONDUIT	573.05	0	01:05	9.35	0.00	0.06
R_SK_15	DUMMY	108.61	0	01:05			
R_SK_16	CONDUIT	566.39	0	01:10	7.07	0.00	0.08

****
Conduit Surcharge Summary
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Conduit	Hours Full Both Ends	Hours Full Upstream	Hours Full Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
R_BC_01	0.01	0.01	0.01	10.01	0.01
R_BC_02	0.01	0.01	0.01	10.01	0.01
R_BC_05	0.01	0.01	0.01	10.01	0.01
R_BC_06	0.01	0.01	0.01	10.01	0.01
R_BC_07	0.01	0.01	0.01	10.01	0.01
R_BC_08	0.01	0.01	0.01	10.01	0.01
R_BC_09	0.01	0.01	0.01	10.01	0.01
R_BC_10	0.01	0.01	0.01	10.01	0.01
R_BC_11	0.01	0.01	0.01	10.01	0.01
R_BC_12	0.01	0.01	0.01	10.01	0.01
R_CU_02	0.01	0.01	0.01	10.01	0.01
R_CU_03	0.01	0.01	0.01	10.01	0.01
R_CU_04	0.01	0.01	0.01	10.01	0.01
R_CU_05	0.01	0.01	0.01	10.01	0.01
R_CU_06	0.01	0.01	0.01	10.01	0.01
R_CU_07	0.01	0.01	0.01	10.01	0.01
R_SK_01	0.01	0.01	0.01	10.01	0.01
R_SK_02	0.01	0.01	0.01	10.01	0.01
R_SK_09	0.01	0.01	0.01	10.01	0.01
R_SK_15	0.01	0.01	0.01	10.01	0.01

Analysis begun on: Wed Apr 20 14:03:57 2016
Analysis ended on: Wed Apr 20 14:03:57 2016

Appendix E –
Existing Conditions Hydraulic Models

Crossing:	Foothills Parkway
HEC-RAS ID:	1500
U/S Invert:	5237.38
D/S Invert:	5236.95

Full Discharge	Culvert Discharge	5% Block Discharge	Upstream Face WSEL	Upstream Face Depth
0	0	**0**	--	**0**
100	100	**95**	5239.55	**2.17**
200	200	**190**	5240.41	**3.03**
300	300	285	5240.94	3.56
400	400	**380**	5241.36	**3.98**
500	500	475	5241.71	4.33
600	600	570	5242.03	4.65
700	700	**665**	5242.35	**4.97**
800	800	760	5242.7	5.32
900	900	855	5243.13	5.75
1000	1000	**950**	5243.56	**6.18**
1100	1100	1045	5243.99	6.61
1200	1200	**1140**	5244.57	**7.19**
1300	1300	1235	5244.34	6.96
1400	1400	1330	5245.14	7.76
1500	1500	**1425**	5245.68	**8.30**
1600	1600	1520	5246.13	8.75
1700	1700	1615	5246.58	9.20
1800	1800	**1710**	5247.03	**9.65**
1900	1900	1805	5247.49	10.11
2000	1950	**1853**	5247.74	**10.36**
2100	1944	1847	5247.74	10.36
2200	1938	1841	5247.74	10.36
	1975	**1876**		**50.00**

Crossing:	Trail Crossing (to side Channel)
HEC-RAS ID:	
U/S Invert:	
D/S Invert:	

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0		--	0
100			0.00
200			0.00
300			0.00
400			0.00
500			0.00
600			0.00
700			0.00
800			0.00
900			0.00
1000			0.00
1100			0.00
1200			0.00
1300			0.00
1400			0.00
1500			0.00
1600			0.00
1700			0.00
1800			0.00
1900			0.00
2000			0.00
2100			0.00
2200			0.00
2300			0.00
2400			0.00
2500			0.00
2600			0.00
2700			0.00
2800			0.00
2900			0.00
3000			0.00
3100			0.00
3200			0.00
3300			0.00
3400			0.00
3500			0.00
3600			0.00
3700			0.00
3800			0.00
3900			0.00
4000			0.00

Crossing:	Discovery Drive
HEC-RAS ID:	2400
U/S Invert:	5251.13
D/S Invert:	5250.43

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5253.92	**2.79**
200	200	5254.43	3.30
300	**300**	5254.85	**3.72**
400	400	5255.22	4.09
500	**500**	5255.55	**4.42**
600	600	5255.85	4.72
700	700	5256.12	4.99
800	800	5256.38	5.25
900	900	5256.62	5.49
1000	**1000**	5256.84	**5.71**
1100	1100	5257.06	5.93
1200	1200	5257.26	6.13
1300	1300	5257.46	6.33
1400	1400	5257.64	6.51
1500	**1500**	5257.82	**6.69**
1600	1600	5258.00	6.87
1700	1700	5258.16	7.03
1800	1800	5258.32	7.19
1900	1900	5258.47	7.34
2000	**2000**	5258.62	**7.49**
2100	2100	5258.77	7.64
2200	2200	5258.91	7.78
2300	2300	5259.04	7.91
2400	2400	5259.17	8.04
2500	**2500**	5259.3	**8.17**
2600	2600	5259.43	8.30
2700	2700	5259.55	8.42
2800	2800	5259.65	8.52
2900	2900	5259.76	8.63
3000	**3000**	5259.87	**8.74**
3100	3100	5259.98	8.85
3200	3200	5260.08	8.95
3300	3300	5260.18	9.05
3400	3400	5260.28	9.15
3500	**3500**	5260.38	**9.25**
3600	3600	5260.48	9.35
3700	3700	5260.57	9.44
3800	3800	5260.66	9.53
3900	3900	5260.76	9.63
4000	**4000**	5260.85	**9.72**

Crossing:	Colorado Avenue
HEC-RAS ID:	3400
U/S Invert:	5260.2
D/S Invert:	5257.8

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5262.11	**1.91**
200	200	5263.05	2.85
300	**300**	5263.83	**3.63**
400	400	5264.52	4.32
500	**500**	5265.15	**4.95**
600	600	5265.74	5.54
700	**700**	5266.31	**6.11**
800	800	5266.84	6.64
900	900	5267.35	7.15
1000	**1000**	5267.85	**7.65**
1100	1100	5268.33	8.13
1200	1200	5268.79	8.59
1300	1300	5269.24	9.04
1400	1400	5269.68	9.48
1500	**1500**	5270.11	**9.91**
1600	1600	5270.55	10.35
1700	1700	5271.06	10.86
1800	**1800**	5271.64	**11.44**
1900	**1857**	5271.86	**11.66**
2000	1893	5272.03	11.83
2100	1907	5272.18	11.98
2200	1934	5272.32	12.12
2300	**1963**	5272.42	**12.22**
2400	1968	5272.48	12.28
2500	1991	5272.63	12.43
2600	2003	5272.67	12.47
2700	**2026**	5272.82	**12.62**
2800	2026	5272.93	12.73
2900	2061	5273.03	12.83
3000	2046	5273.1	12.90
3100	2082	5273.13	12.93
3200	**2111**	5273.19	**12.99**
3300	2108	5273.28	13.08
3400	2118	5273.34	13.14
3500	2131	5273.42	13.22
3600	2142	5273.48	13.28
3700	**2192**	5273.93	**13.73**
3800	2257	5272.13	11.93
3900	2334	5272.94	12.74
4000	2392	5273.43	13.23
	2200		**50**

Crossing:	35th Street
HEC-RAS ID:	4300
U/S Invert:	5275.7
D/S Invert:	5275.6

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5278.12	**2.42**
200	200	5279.1	3.40
300	**300**	5279.89	**4.19**
400	**359**	5281.65	**5.95**
500	370	5281.7	6.00
600	376	5281.27	5.57
700	378	5282.31	6.61
800	386	5282.43	6.73
900	**391**	5282.59	**6.89**
1000	389	5282.69	6.99
1100	400	5282.76	7.06
1200	401	5282.86	7.16
1300	394	5282.93	7.23
1400	403	5282.99	7.29
1500	409	5282.97	7.27
1600	411	5283.21	7.51
1700	404	5283.25	7.55
1800	411	5283.28	7.58
1900	**435**	5283.28	**7.58**
2000	431	5283.28	7.58
2100	412	5283.51	7.81
2200	401	5283.53	7.83
	450		**50**

Crossing:	Madison Avenue
HEC-RAS ID:	4450
U/S Invert:	5277.1
D/S Invert:	5276.55

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5279.72	**2.62**
200	**200**	5281.62	**4.52**
300	**277**	5283.37	**6.27**
400	272	5284.09	6.99
500	265	5284.3	7.20
600	242	5284.44	7.34
700	243	5284.52	7.42
800	239	5284.57	7.47
900	227	5284.61	7.51
1000	223	5284.57	7.47
	280		**50.00**

Crossing:	34th Street
HEC-RAS ID:	5000
U/S Invert:	5283.5
D/S Invert:	5283.2

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5285.57	**2.07**
200	**200**	5286.75	**3.25**
300	**287**	5288.32	**4.82**
400	329	5288.87	5.37
500	**361**	5289.17	**5.67**
600	314	5289.66	6.16
700	220	5290	6.50
800	74	5290.35	6.85
900	113	5290.34	6.84
1000	91	5291.41	7.91
	365		**50**

Crossing:	Aurora Avenue
HEC-RAS ID:	5600
U/S Invert:	5290.8
D/S Invert:	5290.35

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5293.69	**2.89**
200	200	5295.22	4.42
300	**300**	5296.6	**5.80**
400	**390**	5298.02	**7.22**
500	**394**	5298.46	**7.66**
600	342	5298.89	8.09
700	240	5299.22	8.42
800	49	5299.68	8.88
900	247	5299.42	8.62
1000	253	5299.56	8.76
	398		**50**

Crossing:	30th Street
HEC-RAS ID:	6500
U/S Invert:	5305
D/S Invert:	5304.15

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5307.67	**2.67**
200	200	5309.18	4.18
300	**300**	5310.66	**5.66**
400	**347**	5311.8	**6.80**
500	360	5312.55	7.55
600	**362**	5313.05	**8.05**
700	327	5313.55	8.55
800	271	5311.19	6.19
900	245	5314.28	9.28
1000	241	5314.47	9.47
	365		**50**

Crossing:	29th Street
HEC-RAS ID:	7500
U/S Invert:	5329.2
D/S Invert:	5328.1

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5331.04	**1.84**
200	200	5332.13	2.93
300	**300**	5333.04	**3.84**
400	**382**	5333.73	**4.53**
500	417	5333.9	4.70
600	443	5333.84	4.64
700	465	5333.23	4.03
800	478	5333.56	4.36
900	**496**	5334.84	**5.64**
1000	563	5334.98	5.78
1100	571	5335.12	5.92
1200	583	5335.24	6.04
1300	**593**	5335.34	**6.14**
1400	577	5335.47	6.27
1500	566	5335.57	6.37
1600	573	5335.67	6.47
1700	572	5335.77	6.57
1800	557	5335.88	6.68
	600		**50**

Crossing:	Baseline Road
HEC-RAS ID:	N/A
U/S Invert:	5338
D/S Invert:	5338

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
	35	1	**1.00**
	0	2	2.00
	0	3	3.00
	0	4	4.00
	379	5	**5.00**
	0	6	6.00
	0	7	7.00
	706	8	**8.00**
	0	9	9.00
	936	10	**10.00**
	0	11	11.00
	0	12	12.00
	0	13	13.00
	0	14	14.00
	1535	15	**15.00**

Crossing:	US Highway 36 On Ramp (north)
HEC-RAS ID:	200
U/S Invert:	5338.8
D/S Invert:	5338.55

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5343.72	**4.92**
200	200	5344.34	5.54
300	**300**	5344.85	**6.05**
400	400	5345.18	6.38
500	500	5345.27	6.47
600	600	5345.21	6.41
700	**700**	5346.71	**7.91**
800	800	5346.92	8.12
900	**900**	5347.35	**8.55**
1000	**994**	5348.61	**9.81**
1100	1036	5348.97	10.17
1200	**1071**	5349.15	**10.35**
1300	979	5349.8	11.00
1400	991	5350.04	11.24
1500	1010	5350.17	11.37
1600	1000	5350.36	11.56
1700	1015	5350.42	11.62
	1075		**50**

Crossing:	US Highway 36
HEC-RAS ID:	8489; Weir out of system
U/S Invert:	5348.7
D/S Invert:	n/a

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
	0	--	**0**
	75	5350.49	**1.8**
	150	5351.55	**2.9**
	225	5352.66	**4.0**
	300	5354.07	**5.4**
	375	5355.9	**7.2**
	450	5358.27	**9.6**
	500	5360.19	**11.5**
	521	5361.05	**12.4**
	529	5361.38	**12.7**
	535	5361.67	**13.0**
	540		**50**
	By HY-8 (ICON)		
	0	0	0
	100	70	2.18
	200	140	3.43
	300	210	4.59
	400	280	5.88
	500	350	7.45
	550	385	8.37
	600	420	9.39
	650	455	10.51
	700	490	11.72
	750	525	13.12
	800	560	14.6
	850	595	16.29

Crossing:	US Highway 36 On Ramp (south)
HEC-RAS ID:	8350
U/S Invert:	5358
D/S Invert:	5358

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5360.01	**2.01**
200	**200**	5361.18	**3.18**
300	4	5361.59	3.59
400	105	5361.58	3.58
500	**201**	5361.57	**3.57**
600	258	5361.73	3.73
700	286	5361.99	3.99
800	316	5362.26	4.26
900	**332**	5362.47	**4.47**
1000	361	5362.65	4.65
1100	393	5362.86	4.86
1200	410	5363.08	5.08
1300	418	5363.28	5.28
1400	**426**	5363.54	**5.54**
1500	**478**	5363.65	**5.65**
1600	459	5363.93	5.93
1700	450	5364.18	6.18
1800	442	5364.41	6.41
1900	425	5364.62	6.62
2000	399	5364.85	6.85
	485		**50**

Crossing:	Moorhead Avenue
HEC-RAS ID:	8725
U/S Invert:	5357.12
D/S Invert:	5356.31

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5360.1	**2.98**
200	200	5361.28	4.16
300	300	5361.79	4.67
400	400	5361.94	4.82
500	**500**	5362.15	**5.03**
600	600	5362.58	5.46
700	700	5363.19	6.07
800	800	5363.87	6.75
900	900	5364.57	7.45
1000	**1000**	5365.31	**8.19**
1100	884	5366.1	8.98
1200	985	5366.05	8.93
1300	**1059**	5366.06	**8.94**
1400	1070	5366.32	9.20
1500	**1085**	5366.47	**9.35**
1600	1083	5366.58	9.46
1700	1086	5366.77	9.65
1800	1065	5366.92	9.80
1900	1039	5367.12	10.00
2000	992	5367.26	10.14
	1090		**50**

Crossing:	27th Way
HEC-RAS ID:	9065
U/S Invert:	5358.9
D/S Invert:	5358.51

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5361.96	**3.06**
200	**200**	5363.11	**4.21**
300	300	5363.95	5.05
400	400	5364.61	5.71
500	**500**	5365.2	**6.30**
600	600	5365.7	6.80
700	700	5366.14	7.24
800	800	5366.46	7.56
900	900	5366.79	7.89
1000	**1000**	5367.13	**8.23**
1100	1100	5367.51	8.61
1200	1200	5367.7	8.80
1300	1300	5367.87	8.97
1400	**1400**	5368.12	**9.22**
1500	1500	5368.65	9.75
1600	**1600**	5369.21	**10.31**
1700	1700	5370.01	11.11
1800	**1800**	5370.76	**11.86**
1900	1900	5371.41	12.51
2000	**2000**	5371.98	**13.08**
2100	2100	5372.52	13.62
2200	**2200**	5373.05	**14.15**

Crossing:	Broadway
HEC-RAS ID:	9765
U/S Invert:	5379.47
D/S Invert:	5376.87

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5383.6	**4.13**
200	200	5384.46	4.99
300	300	5384.95	5.48
400	400	5385.38	5.91
500	**500**	5385.77	**6.30**
600	600	5386.14	6.67
700	700	5386.51	7.04
800	800	5386.87	7.40
900	900	5387.21	7.74
1000	**1000**	5387.58	**8.11**
1100	1100	5387.94	8.47
1200	1200	5388.71	9.24
1300	1300	5389.16	9.69
1400	1400	5391.75	12.28
1500	**1500**	5391.99	**12.52**
1600	1600	5392.41	12.94
1700	1700	5392.85	13.38
1800	1800	5393.3	13.83
1900	**1900**	5393.95	**14.48**
2000	**1966**	5394.38	**14.91**
2100	1996	5394.57	15.10
2200	2029	5394.78	15.31
2300	2052	5394.96	15.49
2400	2066	5395.14	15.67
2500	2104	5395.15	15.68
2600	**2108**	5395.31	**15.84**
2700	2117	5395.48	16.01
2800	2159	5395.49	16.02
2900	2175	5395.64	16.17
3000	**2183**	5395.81	**16.34**

Crossing:	Bluebell Ave.
HEC-RAS ID:	10615
U/S Invert:	5402.4
D/S Invert:	5402.9

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5406.28	**3.88**
200	**177**	5408.53	**6.13**
300	197	5409.74	7.34
400	**202**	5410.42	**8.02**
500	203	5410.79	8.39
600	199	5410.97	8.57
700	194	5411.11	8.71
	205		**50**

Crossing:	Private Drive - 2200 Bluebell Avenue
HEC-RAS ID:	10685
U/S Invert:	5404.14
D/S Invert:	5402.4

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5407.73	**3.59**
200	**200**	5409.27	**5.13**
300	**267**	5411.33	**7.19**
400	265	5411.93	7.79
500	263	5412.27	8.13
600	271	5412.51	8.37
700	276	5412.67	8.53
800	275	5412.85	8.71
900	285	5413	8.86
1000	283	5413.12	8.98
1100	285	5413.23	9.09
1200	**290**	5413.36	**9.22**
1300	293	5413.43	9.29
1400	294	5413.52	9.38
1500	299	5413.56	9.42
1600	**301**	5413.67	**9.53**
1700	301	5413.75	9.61
1800	305	5413.78	9.64
1900	**309**	5413.84	**9.70**
2000	307	5413.91	9.77
2100	305	5414	9.86
2200	306	5414.09	9.95
	315		**50**

Crossing:	Private Drive - 322 22nd Street
HEC-RAS ID:	10825
U/S Invert:	5409.52
D/S Invert:	5406.73

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5412.69	**3.17**
200	**134**	5416.13	**6.61**
300	**146**	5416.46	**6.94**
400	125	5416.74	7.22
500	77	5417.21	7.69
600	80	5417.43	7.91
700	82	5417.64	8.12
	150		**50**

Crossing:	King Avenue
HEC-RAS ID:	11005
U/S Invert:	5416
D/S Invert:	5415

Full Discharge	Culvert Discharge	Upstream Face WSEL	Upstream Face Depth
0	**0**	--	**0**
100	**100**	5420.34	**4.34**
200	**138**	5423.29	**7.29**
300	**142**	5423.67	**7.67**
400	135	5424.01	8.01
500	125	5424.28	8.28
	145		**50**

HY-8 Analysis Results

Culvert Summary Table - US 36 DOUBLE BOX CULVERT

Culvert Crossing: US 36

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
0.00	0.00	5347.69	0.00	0.0	0-NF	0.00	0.00	0.00	0.00	0.00	0.00
100.00	100.00	5349.87	2.18	0.0*	1-S2n	0.75	1.29	0.75	1.49	11.13	0.00
200.00	200.00	5351.12	3.43	0.0*	1-S2n	1.20	2.05	1.20	2.35	13.90	0.00
300.00	300.00	5352.28	4.59	0.0*	5-S2n	1.59	2.69	1.59	3.22	15.74	0.00
400.00	400.00	5353.57	5.88	0.0*	5-S2n	1.94	3.26	1.94	4.09	17.14	0.00
500.00	500.00	5355.14	7.45	0.35	5-S2n	2.28	3.78	2.32	4.95	17.98	0.00
550.00	550.00	5356.06	8.37	1.71	5-S2n	2.45	4.00	2.48	5.38	18.45	0.00
600.00	600.00	5357.08	9.39	3.08	5-S2n	2.61	4.00	2.65	5.82	18.89	0.00
650.00	650.00	5358.20	10.51	4.57	5-S2n	2.77	4.00	2.81	6.25	19.29	0.00
700.00	700.00	5359.41	11.72	6.45	5-S2n	2.93	4.00	2.97	6.68	19.62	0.00
750.00	750.00	5360.81	13.12	8.62	5-S2n	3.08	4.00	3.13	7.12	19.96	0.00
1399.18	1399.18	5390.00	40.72	42.31	4-FFf	4.00	4.00	4.00	7.55	29.15	0.00

Table E.1: US Highway 36 Rating Curve (for HEC-RAS Cross Section 8576)

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR

ICON Engineering, Inc.

Flow Location	10-Year Discharge (cfs)	25-Year Discharge (cfs)	50-Year Discharge (cfs)	100-Year Discharge (cfs)	500-Year Discharge (cfs)
Baseline Road[1]	0	3	5	60	539
Pedestrian Underpass	0	0	82	183	281
Skunk Creek Culvert	265	521	650	717	773
US HWY 36 Overtopping[2]	0	7	98	284	608
Total Discharge FLO-2D	265	531	835	1244	2201
Total Discharge SWMM[3]	263	516	794	1174	2063
% differnce FLO-2D vs. SWMM	1%	3%	5%	6%	7%
Total Discharge XS 8576 FLO-2D	265	521	732	900	1054
Total Discharge XS 8576 HEC-RAS[4]	**263**	**509**	**696**	**890**	**1455**
% differnce FLO-2D vs. HEC-RAS	1%	2%	5%	1%	-28%

[1] XS 45

[2] XS 51

[3] SK_05

[4] (SK_05) - (US HWY 36 Overtopping)

Rating Cuve

Average WSEL[1]	Stage[2]	Flow
5348.70	0.00	0
5354.66	5.96	263
5357.63	8.93	509
5359.93	11.23	696
5361.27	12.57	890
5362.93	14.23	1455

[1] Average FLO-2D WSEL along Cross Section 8576

[2] Depth based on 5348.7 invert

```
                    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: SBK_PMR
Project File : SBK_PMR.prj
Run Date and Time: 2016-10-10 2:57:00 PM

Project in English units

Project Description:
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
& Physical Map Revision (PMR)
Prepared for: City of Boulder (Katie Knapp -
knappk@bouldercolorado.gov)
Prepared by: ICON Engineering Inc. (Brian LeDoux -
bledoux@iconeng.com)
Model uses City of Boulder LiDAR mapping from
2013
Vertical Datum is NAVD88
Horizontal Datum is Colorado State Plan NAD 83
HARN North Zone



PLAN DATA

Plan Title: SBK_PMR_Existing_Conditions_2016
Plan File : p:\P\14008SBK_1\Hydraulics\HEC_RAS_PMR\SBK_PMR.p04

           Geometry Title: SBK_PMR_Existing_Conditions_2016
           Geometry File : p:\P\14008SBK_1\Hydraulics\HEC_RAS_PMR\SBK_PMR.g02

           Flow Title    : SBK_PMR_Existing_Conditions_2016
           Flow File     : p:\P\14008SBK_1\Hydraulics\HEC_RAS_PMR\SBK_PMR.f03

Plan Description:
Skunk Creek, Bluebell Canyon Creek, and King's Gulch - PMR
Includes debris
blockage per Table 2.1 in PMR Report


Plan Summary Information:
Number of:  Cross Sections =  368    Multiple Openings  =    0
            Culverts       =   17    Inline Structures  =    3
            Bridges        =    6    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:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = Skunk            Reach = 01
RS      Profile           Method  Value1  Value2
4009    FW                     1      95     190
3940    FW                     1     140     210
3882    FW                     1     105     165
3812    FW                     1     105     165
3722    FW                     1      85     125
3629    FW                     1      76     105
3428    FW                     1     145     173
3385    FW                     1     180     225
3336    FW                     1     210     260
3234    FW                     1     180     250
3126    FW                     1     160     225
3022    FW                     1     120     205
2906    FW                     1      35     140
2794    FW                     1     170     246
2740    FW                     1     170     240
2688    FW                     1     150     220
2638    FW                     1     100     150
2591    FW                     1     120     170
2560    FW                     1      85     135
2541    FW                     1      95     140
2445    FW                     1      85     130
2388    FW                     1      75     150
2342    FW                     1      85     155
2280    FW                     1      70     150
2184    FW                     1      60     140
2084    FW                     1      70     160
2034    FW                     1      70     165
```

1982	FW	1	90	160
1918	FW	1	75	170
1802	FW	1	85	160
1675	FW	1	50	140
1572	FW	1	70	150
1473	FW	1	35	125
1373	FW	1	60	140
1273	FW	1	25	95
1173	FW	1	20	100
1073	FW	1	20	100
975	FW	1	20	100
875	FW	1	20	100
779	FW	1	10	120
680	FW	1	20	130
579	FW	1	5	115
480	FW	1	20	140
378	FW	1	2	150
286	FW	1	155	290
109	FW	1	111	153
25	FW	1	70	150

River = Skunk Reach = 02

RS	Profile	Method	Value1	Value2
4999	FW	1	35	65
4911	FW	1	18	95
4848	FW	1	40	110
4748	FW	1	435	565
4662	FW	1	408	580
4594	FW	1	370	550
4511	FW	1	155	190
4489	FW	1	65	115
4448	FW	1	55	120
4364	FW	1	0	55
4252	FW	1	60	100
4139	FW	1	45	130

River = Skunk Reach = 03

RS	Profile	Method	Value1	Value2
5737	FW	1	96.53	124.15
5656	FW	1	65	80
5602	FW	1	80	100
5536	FW	1	70	85
5469	FW	1	91.65	122.84
5380	FW	1	70	120
5285	FW	1	50	140
5190	FW	1	63.3	91.48
5099	FW	1	22	88
5039	FW	1	45	105

River = Skunk Reach = 04

RS	Profile	Method	Value1	Value2
9894	FW	1	115.5	138.5
9794	FW	1	79	114
9780	FW	1	66	110
9710	FW	1	51.11	126.85
9586	FW	1	120.71	174.51
9444	FW	1	104	178
9304	FW	1	114.4	223.63
9270	FW	1	128.16	165
9246	FW	1	98.79	135
9234	FW	1	92.04	135
9194	FW	1	79	109
9109	FW	1	44	70
9076	FW	1	34.44	92.84
9041	FW	1	34.39	88
9001	FW	1	49.47	86.02
8937	FW	1	29.65	86.88
8873	FW	1	12.02	94.27
8713	FW	1	117.54	154.34
8654	FW	1	135	205
8576	FW	1	360	390.75
7996	FW	1	100	129
7989	FW	1	95	130
7984	FW	1	95	130
7934	FW	1	300	327.12
7890	FW	1	38.84	268.62
7839	FW	1	35	210
7705	FW	1	8	93.27
7651	FW	1	30.88	122.63
7639	FW	1	60.28	147.72
7622	FW	1	5	96.07
7566	FW	1	76.5	93.8
7478	FW	1	130	168
7416	FW	1	7	42
7318	FW	1	66	116
7259	FW	1	130	200
7240	FW	1	125	210
7216	FW	1	150	220
7189	FW	1	115	180
7118	FW	1	87	132
7040	FW	1	100	198.82
6958	FW	1	179	220
6889	FW	1	100	150
6781	FW	1	60.32	94.07
6719	FW	1	55.47	96.95
6704	FW	1	27	82
6685	FW	1	30	65
6666	FW	1	25	50
6636	FW	1	20	50
6605	FW	1	5	70
6532	FW	1	16	30
6479	FW	1	36.49	60.73
6423	FW	1	30.21	59.06
6330	FW	1	95.63	115.65
6254	FW	1	145.38	177.68
6158	FW	1	171.96	197.44
6087	FW	1	156	173
6060	FW	1	131.45	163.29
6023	FW	1	123.59	150.28
5935	FW	1	99.9	126.52
5845	FW	1	74.62	106.62

5788	FW	1	90.63	120.22

River = Skunk Reach = 05

RS	Profile	Method	Value1	Value2
10981	FW	1	150.93	170.1
10910	FW	1	90	120
10873	FW	1	90	115
10826	FW	1	108	132.4
10778	FW	1	75	120.72
10745	FW	1	100	125
10722	FW	1	65	110
10655	FW	1	92.5	110.5
10616	FW	1	40	65
10560	FW	1	70.13	92.93
10488	FW	1	65.56	89.63
10421	FW	1	60.96	91.78
10317	FW	1	45.11	61.12
10238	FW	1	87.68	107.02
10168	FW	1	98.57	118.37
10073	FW	1	70.14	101.32
9997	FW	1	70	100
9943	FW	1	80	110

River = Skunk Reach = 06

RS	Profile	Method	Value1	Value2
11882	FW	1	58.48	74.56
11713	FW	1	100	140
11673	FW	1	79.44	90.95
11613	FW	1	84	105.22
11524	FW	1	89.65	102.18
11457	FW	1	46.35	67.52
11364	FW	1	62	71.91
11272	FW	1	67	79
11185	FW	1	28.17	44.89
11110	FW	1	125	160
11049	FW	1	175	184

River = Echo_Pl_Split Reach = 1

RS	Profile	Method	Value1	Value2
289	FW	1	55	92
219	FW	1	35.21	85
167	FW	1	43.78	107
76	FW	1	50	75

River = Blue_Ave_Split Reach = 1

RS	Profile	Method	Value1	Value2
818	FW	1	46	74
748	FW	1	52	80
655	FW	1	23	51
564	FW	1	53	81
474	FW	1	50	80
364	FW	1	45	75
251	FW	1	50	80
185	FW	1	40	90
88	FW	1	10	60

River = Bear_Creek_Split Reach = 2

RS	Profile	Method	Value1	Value2
4014	FW	1	31.45	68.44
3824	FW	1	60	110
3574	FW	1	76.53	104.98
3352	FW	1	25	100
3174	FW	1	165	270
3053	FW	1	170	275
2972	FW	1	150	200
2787	FW	1	25	60
2637	FW	1	55	75
2446	FW	1	135	175
2276	FW	1	235	275
2046	FW	1	135	175
1838	FW	1	95	120
1577	FW	1	126	190
1354	FW	1	155	220
1135	FW	1	100	190
965	FW	1	85	110
740	FW	1	120	150
610	FW	1	80	120
444	FW	1	45	75
276	FW	1	45	75

River = Bear_Creek_Split Reach = 1

RS	Profile	Method	Value1	Value2
2046	FW	1	135	175
1838	FW	1	95	120
1577	FW	1	126	190
1354	FW	1	155	220
1135	FW	1	100	190
965	FW	1	85	110
740	FW	1	120	150
610	FW	1	80	120
444	FW	1	45	75
276	FW	1	45	75

River = 29th_St_Split Reach = 1

RS	Profile	Method	Value1	Value2
1539	FW	1	95	110
1456	FW	1	110	130
1304	FW	1	145	175
1197	FW	1	80	100
1070	FW	1	100	122
964	FW	1	50	65
897	FW	1	72	117
744	FW	1	125	150
585	FW	1	125	150
529	FW	1	95	110
397	FW	1	62	100
245	FW	1	46	84
94	FW	1	42	80

River = 30th_St_Split Reach = 1

RS	Profile	Method	Value1	Value2

875	FW	1	50	97
758	FW	1	46	91
643	FW	1	44	93
556	FW	1	45	93
471	FW	1	42	79
373	FW	1	44	82
226	FW	1	44	82
68	FW	1	42	79

River = Euclid_Ave_Split Reach = 01

RS	Profile	Method	Value1	Value2
308	FW	1	33	77
224	FW	1	36	76
129	FW	1	42	82
76	FW	1	39	79

River = Euclid_Ave_Split Reach = 02

RS	Profile	Method	Value1	Value2
1563	FW	1	38	94
1445	FW	1	38	92
1311	FW	1	44	93
1193	FW	1	45	91
1124	FW	1	54	132
1036	FW	1	40	72
934	FW	1	41	69
801	FW	1	44	72
698	FW	1	41	71
593	FW	1	40	70
502	FW	1	38	68
422	FW	1	35	75

River = Quinn_St_Split Reach = 01

RS	Profile	Method	Value1	Value2
278	FW	1	34	74
195	FW	1	33	73
109	FW	1	26	71
41	FW	1	39	79

River = Quinn_St_Split Reach = 02

RS	Profile	Method	Value1	Value2
488	FW	1	38	71
406	FW	1	28	61

River = 35th_St_Split Reach = 1

RS	Profile	Method	Value1	Value2
346	FW	1	58	96
240	FW	1	58	96
165	FW	1	53	97
43	FW	1	77	115

River = Apartment_Split Reach = 1

RS	Profile	Method	Value1	Value2
237	FW	1	34	61
99	FW	1	24	43
20	FW	1	12	30

River = Bluebell Reach = 1

RS	Profile	Method	Value1	Value2
6245	FW	1	76.36	97.52
6196	FW	1	79.19	95.55
6113	FW	1	37.05	73.53
5998	FW	1	43.61	90.94
5866	FW	1	50.35	93.83
5672	FW	1	107.71	133.74
5527	FW	1	62.21	136.52
5481	FW	1	56.22	113.47
5445	FW	1	64.25	92.96
5322	FW	1	27	51.85
5194	FW	1	24	45
5157	FW	1	22	60
5136	FW	1	23	60
5080	FW	1	23	35
4910	FW	1	56	74
4793	FW	1	62	74
4745	FW	1	37	68
4720	FW	1	55	75
4671	FW	1	77.16	106.53
4538	FW	1	45	59
4422	FW	1	71.69	91.86
4278	FW	1	56	66
4197	FW	1	55	72
4054	FW	1	46	56
3929	FW	1	45	73
3809	FW	1	87	98
3709	FW	1	100	122
3599	FW	1	130	145
3480	FW	1	98	117
3360	FW	1	105	135
3283	FW	1	200	250
3215	FW	1	44	74
3070	FW	1	42	71
2972	FW	1	9	37
2864	FW	1	42	70
2764	FW	1	48	75
2623	FW	1	46	75
2533	FW	1	28	55
2415	FW	1	51	79
2284	FW	1	50	78
2182	FW	1	48	76
2039	FW	1	48	76
1926	FW	1	50	75
1839	FW	1	45	73
1764	FW	1	43	73
1651	FW	1	56	84
1536	FW	1	8	37
1413	FW	1	36	63
1280	FW	1	44	72
1194	FW	1	48	76
1053	FW	1	13	43
915	FW	1	31	61
799	FW	1	16	44

732	FW	1	34	62
599	FW	1	31	59
481	FW	1	48	78
367	FW	1	49	77
289	FW	1	16	44
219	FW	1	46	74
122	FW	1	67	87

River = Kings Reach = 01

RS	Profile	Method	Value1	Value2
215	FW	1	22	42
82	FW	1	35	55

River = Kings Reach = 02

RS	Profile	Method	Value1	Value2
1621	FW	1	37	67
1514	FW	1	52	80
1419	FW	1	8	38
1320	FW	1	22	54
1221	FW	1	32	60
1079	FW	1	20	49
981	FW	1	16	47
873	FW	1	18	50
771	FW	1	13	43
665	FW	1	34	45
561	FW	1	33	45
435	FW	1	35	49
311	FW	1	8	23

River = Kings Reach = 03

RS	Profile	Method	Value1	Value2
3674	FW	1	46	54
3575	FW	1	66	86
3459	FW	1	76	96
3268	FW	1	63.85	74.6
3179	FW	1	100	114
3083	FW	1	108	122
2990	FW	1	55	70
2938	FW	1	55	88
2900	FW	1	69	75
2821	FW	1	90	104
2724	FW	1	77	88
2628	FW	1	110	130
2504	FW	1	100	106
2444	FW	1	60	85
2396	FW	1	150	180
2330	FW	1	29.43	42.54
2268	FW	1	4.81	16.4
2175	FW	1	6.14	17.86
2018	FW	1	13.23	25.29
1873	FW	1	19.2	32
1733	FW	1	16.53	30.82

River = Kings_Split Reach = 1

RS	Profile	Method	Value1	Value2
775	FW	1	55	65
701	FW	1	60	80
597	FW	1	166	176
523	FW	1	205	235
416	FW	1	155	188
308	FW	1	145	175
222	FW	1	195	225
150	FW	1	200	250
105	FW	1	281.29	347.93

River = Bluebell_Spur Reach = 1

RS	Profile	Method	Value1	Value2
314	FW	1	16.25	28.86
256	FW	1	70	95
183	FW	1	60	80
102	FW	1	75	95
40	FW	1	61	80.55

River = Bear_Bline_Split Reach = 1

RS	Profile	Method	Value1	Value2
723	FW	1	45	82
586	FW	1	70	85
446	FW	1	80	120
262	FW	1	125	150
118	FW	1	35	50

River = Madison_Split Reach = 1

RS	Profile	Method	Value1	Value2
346	FW	1	40	65
252	FW	1	85	110
163	FW	1	40	65
45	FW	1	37	60

River = Denton_Ave_Split Reach = 1

RS	Profile	Method	Value1	Value2
534	FW	1	38	68
414	FW	1	38	68
283	FW	1	37	69
179	FW	1	38	70
75	FW	1	40	69
41	FW	1	37	67

FLOW DATA

Flow Title: SBK_PMR_Existing_Conditions_2016
Flow File : p:\P\14008SBK_1\Hydraulics\HEC_RAS_PMR\SBK_PMR.f03

Flow Data (cfs)

River	Reach	RS	100-yr	FW	10-yr	25-yr	50-yr	500-yr
29th_St_Split	1	1539	97	97	4	28	60	210
30th_St_Split	1	875	545	545	7	192	362	1032
30th_St_Split	1	471	355	355	7	138	245	633

35th_St_Split	1	346	264	264	59	134	186	501
35th_St_Split	1	43	134	134	16	55	86	305
Apartment_Split	1	237	204	204	43	104	147	342
Bear_Creek_Split	2	4014	284	284	.1	7	98	608
Bear_Creek_Split	2	2787	180	180	.1	5	60	374
Bear_Creek_Split	1	2046	235	235	7	18	97	412
Bluebell	1	6245	215	215	20	94	145	375
Bluebell	1	4671	203	203	19	90	137	354
Bluebell	1	3360	226	226	23	99	151	404
Bluebell	1	3215	177	177	18	90	121	313
Bluebell	1	2415	191	191	21	84	133	329
Bluebell	1	1839	159	159	20	73	111	250
Bluebell	1	1536	143	143	18	63	96	251
Bluebell	1	1194	220	220	25	90	144	401
Bluebell	1	799	151	151	16	65	100	254
Blue_Ave_Split	1	818	303	303	1	69	160	610
Denton_Ave_Split	1	534	151	151	2	51	98	315
Echo_Pl_Split	1	289	115	115	10	46	75	205
Euclid_Ave_Split	02	1563	256	256	4	76	161	536
Euclid_Ave_Split	02	1311	96	96	2	24	57	217
Euclid_Ave_Split	02	1124	109	109	10	35	69	209
Euclid_Ave_Split	01	308	500	500	65	275	450	500
Kings	03	3674	170	170	3	59	106	315
Kings	03	2330	119	119	6	43	74	224
Kings	02	1621	145	145	9	62	102	245
Kings	02	1320	133	133	9	63	92	208
Kings	02	981	113	113	7	55	79	168
Kings	02	665	90	90	3	33	58	139
Kings	01	215	134	134	7	55	85	243
Kings_Split	1	775	79	79	3	27	49	152
Quinn_St_Split	02	488	449	449	37	183	306	385
Quinn_St_Split	01	278	600	600	39	234	404	700
Skunk	06	11882	113	113	14	59	79	177
Skunk	06	11457	138	138	39	84	104	202
Skunk	05	10981	327	327	49	158	222	556
Skunk	05	10616	242	242	68	164	201	324
Skunk	04	9894	1003	1003	169	451	705	1510
Skunk	04	8576	890	890	263	509	696	1455
Skunk	04	7478	898	898	274	518	706	1431
Skunk	04	6479	364	364	261	305	325	478
Skunk	03	5737	364	364	261	305	325	478
Skunk	02	4999	1185	1185	381	682	891	1956
Skunk	02	4489	957	957	377	598	748	1508
Skunk	02	4364	693	693	318	464	562	1007
Skunk	01	4009	824	824	365	558	673	1207
Skunk	01	3385	1000	1000	383	631	794	1600
Skunk	01	2560	1430	1430	438	821	1076	2211
Bear_Bline_Split	1	723	99	99	.1	1	32	230
Bluebell_Spur	1	314	54	54	7	26	38	94
Madison_Split	1	346	228	228	4	84	143	448
Madison_Split	1	45	154	154	4	59	96	302

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
29th_St_Split	1	100-yr		Normal S = 0.019
29th_St_Split	1	FW		Normal S = 0.019
29th_St_Split	1	10-yr		Normal S = 0.019
29th_St_Split	1	25-yr		Normal S = 0.019
29th_St_Split	1	50-yr		Normal S = 0.019
29th_St_Split	1	500-yr		Normal S = 0.019
35th_St_Split	1	100-yr		Normal S = 0.006
35th_St_Split	1	FW		Normal S = 0.006
35th_St_Split	1	10-yr		Normal S = 0.006
35th_St_Split	1	25-yr		Normal S = 0.006
35th_St_Split	1	50-yr		Normal S = 0.006
35th_St_Split	1	500-yr		Normal S = 0.006
Bear_Creek_Split	1	100-yr		Normal S = 0.012
Bear_Creek_Split	1	FW		Normal S = 0.012
Bear_Creek_Split	1	10-yr		Normal S = 0.012
Bear_Creek_Split	1	25-yr		Normal S = 0.012
Bear_Creek_Split	1	50-yr		Normal S = 0.012
Bear_Creek_Split	1	500-yr		Normal S = 0.012
Bluebell_Spur	1	100-yr		Normal S = 0.11
Bluebell_Spur	1	FW		Normal S = 0.11
Bluebell_Spur	1	10-yr		Normal S = 0.11
Bluebell_Spur	1	25-yr		Normal S = 0.11
Bluebell_Spur	1	50-yr		Normal S = 0.11
Bluebell_Spur	1	500-yr		Normal S = 0.11
Madison_Split	1	100-yr		Normal S = 0.008
Madison_Split	1	FW		Normal S = 0.008
Madison_Split	1	10-yr		Normal S = 0.008
Madison_Split	1	25-yr		Normal S = 0.008
Madison_Split	1	50-yr		Normal S = 0.008
Madison_Split	1	500-yr		Normal S = 0.008
Skunk	01	100-yr		Normal S = 0.011
Skunk	01	FW		Normal S = 0.011
Skunk	01	10-yr		Normal S = 0.011
Skunk	01	25-yr		Normal S = 0.011
Skunk	01	50-yr		Normal S = 0.011
Skunk	01	500-yr		Normal S = 0.011

GEOMETRY DATA

Geometry Title: SBK_PMR_Existing_Conditions_2016
Geometry File : p:\P\14008SBK_1\Hydraulics\HEC_RAS_PMR\SBK_PMR.g02

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
29th_St_Split	1		
30th_St_Split	1		J_Skunk03
35th_St_Split	1		
Apartment_Split	1		J_Skunk01
Bear_Bline_Split	1		Bear_Split

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  Bear_Creek_Split 2                                        Bear_Split
  Bear_Creek_Split 1                   Bear_Split
  Bluebell         1                                        J_Skunk04
  Bluebell_Spur    1
  Blue_Ave_Split   1                                        J_Skunk04
  Denton_Ave_Split 1                                        J_Quinn01
  Echo_Pl_Split    1                                        J_Kings01
  Euclid_Ave_Split 02                                       J_Euclid01
  Euclid_Ave_Split 01                   J_Euclid01          J_Skunk02
  Kings            03                                       J_Kings02
  Kings            02                   J_Kings02           J_Kings01
  Kings            01                   J_Kings01           J_Skunk05
  Kings_Split      1                                        J_Kings02
  Madison_Split    1
  Quinn_St_Split   02                                       J_Quinn01
  Quinn_St_Split   01                   J_Quinn01           J_Euclid01
  Skunk            06                                       J_Skunk05
  Skunk            05                   J_Skunk05           J_Skunk04
  Skunk            04                   J_Skunk04           J_Skunk03
  Skunk            03                   J_Skunk03           J_Skunk02
  Skunk            02                   J_Skunk02           J_Skunk01
  Skunk            01                   J_Skunk01


JUNCTION INFORMATION

Name: J_Skunk01
Description:
Energy computation Method

    Length across Junction             Tributary
     River           Reach               River          Reach        Length   Angle
Skunk           02               to Skunk          01                129.85
Apartment_Split 1                to Skunk          01                   179

Name: J_Skunk02
Description:
Energy computation Method

    Length across Junction             Tributary
     River           Reach               River          Reach        Length   Angle
Skunk           03               to Skunk          02                 39.79
Euclid_Ave_Split01               to Skunk          02                   127

Name: J_Skunk03
Description:
Energy computation Method

    Length across Junction             Tributary
     River           Reach               River          Reach        Length   Angle
Skunk           04               to Skunk          03                 51.28
30th_St_Split   1                to Skunk          03                   164

Name: J_Skunk04
Description:
Energy computation Method

    Length across Junction             Tributary
     River           Reach               River          Reach        Length   Angle
Skunk           05               to Skunk          04                 48.62
Bluebell        1                to Skunk          04                   169
Blue_Ave_Split  1                to Skunk          04                   136

Name: J_Skunk05
Description:
Energy computation Method

    Length across Junction             Tributary
     River           Reach               River          Reach        Length   Angle
Skunk           06               to Skunk          05                 68.57
Kings           01               to Skunk          05                   248

Name: J_Euclid01
Description:
Energy computation Method

    Length across Junction             Tributary
     River           Reach               River          Reach        Length   Angle
Euclid_Ave_Split02               to Euclid_Ave_Split01               113.87
Quinn_St_Split  01               to Euclid_Ave_Split01                   97

Name: J_Quinn01
Description:
Energy computation Method

    Length across Junction             Tributary
     River           Reach               River          Reach        Length   Angle
Quinn_St_Split  02               to Quinn_St_Split  01               128.42
Denton_Ave_Split1                to Quinn_St_Split  01                  132

Name: J_Kings01
Description:
Energy computation Method

    Length across Junction             Tributary
     River           Reach               River          Reach        Length   Angle
Kings           02               to Kings          01                 96.37
Echo_Pl_Split   1                to Kings          01                   127

Name: J_Kings02
Description:
Energy computation Method

    Length across Junction             Tributary
     River           Reach               River          Reach        Length   Angle
Kings           03               to Kings          02                112.58
Kings_Split     1                to Kings          02                   172

Name: Bear_Split
Description:
Energy computation Method
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```
    Length across Junction             Tributary
     River           Reach               River           Reach        Length   Angle
Bear_Creek_Split2                to Bear_Creek_Split1                 229.36
Bear_Bline_Split1                to Bear_Creek_Split1                    124

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 1539

INPUT
Description:
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5336.2    1.97 5336.27    3.94 5336.34     5.9  5336.4    7.87 5336.37
    9.84 5336.36   11.81 5336.37   13.78 5336.39   15.75 5336.36   17.71  5336.3
   19.68 5336.22   21.65  5336.1   23.08 5336.05   23.62 5336.04   25.59 5335.94
   27.55 5335.85   29.52 5335.73   31.49 5335.59   33.46  5335.4   35.43 5335.25
    37.4 5335.11   39.36 5334.96   41.33 5334.88    43.3 5334.75   45.27 5334.66
   47.24 5334.56    49.2 5334.45   51.17 5334.39   53.14 5334.31   55.11 5334.26
   57.08 5334.18   59.05    5334   61.01 5333.96   62.96 5333.85    64.9 5333.83
   66.84 5333.78   68.78 5333.66   69.72 5333.54   70.72 5333.41   72.66 5333.14
   74.61 5333.24   76.55  5333.3   78.49  5333.3   80.43 5333.28   82.37 5333.27
   84.31 5333.24   86.26 5333.21    88.2 5333.13   90.14 5333.02   92.08 5333.01
   94.02  5332.9   95.96 5332.94   97.91 5332.84   99.85 5332.82  101.79 5332.72
  103.73 5332.69  105.67 5332.53  107.61 5332.46  109.56 5332.27  111.27 5332.22
   111.5 5332.21  111.64 5332.22  113.44 5332.37  115.38 5332.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   69.72    .015  111.64     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          59.05  115.38           83.52   83.63   83.71             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    5.295346.197

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 1456

INPUT
Description:
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5336.96    1.98 5336.96    3.96 5336.96    5.94 5336.96    7.93 5336.97
    9.91 5336.94   11.89  5336.8   13.87 5336.62   15.85 5336.56   17.83 5336.55
   19.82 5336.51    21.8 5336.43   23.78 5336.28   25.76 5336.12   27.74    5336
   29.72 5335.89   31.71 5335.77   33.69 5335.65   35.67 5335.51   37.65 5335.41
   39.63 5335.35   41.61 5335.25    43.6 5335.17   45.58 5335.14   47.56 5335.09
   48.98 5335.04   49.54 5335.01   51.52 5334.93    53.5 5334.79   55.49 5334.65
   57.47 5334.54   59.45 5334.46   61.43  5334.5   63.41 5334.44   65.39 5334.11
   67.38 5333.87   69.36 5333.69   71.34 5333.46   73.32 5333.28    75.3 5333.04
   77.28 5333.03   79.27 5333.07   81.25 5332.98   83.23 5332.85   85.21 5332.55
   86.05 5332.35   87.19 5332.07   89.17 5332.24   91.16 5332.35   93.14 5332.33
   95.12 5332.31    97.1 5332.27   99.08 5332.25  101.06 5332.17  103.05 5332.11
  105.03 5332.04  107.01 5331.98  108.99 5331.88  110.97 5331.83  112.95 5331.74
  114.94 5331.66  116.92 5331.58   118.9 5331.46  120.88 5331.42  122.86 5331.31
  124.84 5331.08  126.83 5331.13  127.12 5331.16  128.81 5331.33  130.79 5331.48
  131.28 5331.52  132.77 5331.63  134.75 5331.64

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   86.05    .015  127.12     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          83.23  131.28          152.42  152.28  152.89             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    9.075346.958

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 1304

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    5335    1.99 5334.95    3.97 5334.95    5.96 5334.94    7.94  5334.9
    9.93 5334.79   11.91 5334.72    13.9 5334.71   15.88 5334.65   17.87  5334.6
   19.85 5334.51   21.84 5334.41   23.82 5334.34   25.81 5334.29    27.8 5334.25
   29.78 5334.14   33.75  5334.1   35.74 5334.06   37.72 5333.94   39.71 5333.78
   41.69 5333.79   43.68 5333.79   45.66 5333.75   47.65 5333.65   49.63 5333.48
   51.62 5333.41   55.59 5333.31   57.58 5333.24   59.56 5333.08   61.55 5333.02
   63.53 5333.02   65.52  5332.9    67.5 5332.77   69.49  5332.7   71.47 5332.62
   75.44 5332.54   77.43 5332.43   79.41 5332.21    81.4 5332.19   83.39 5332.09
   85.37 5332.09   89.34 5332.11   91.33 5332.01   93.31 5332.05    95.3 5332.19
   97.28 5332.31   99.27 5332.26   99.85 5332.24  101.25 5332.18  103.24 5331.97
  105.22 5331.71  107.21 5331.47  109.19 5331.35  113.17 5331.23  115.15 5331.15
  117.14    5331  119.12 5330.56  119.81 5330.56  121.11 5330.57  123.09 5330.72
  125.08 5330.76  127.06 5330.71  129.05 5330.65  131.03 5330.63  133.02 5330.58
     135 5330.49  136.99 5330.45  142.95 5330.18  144.93 5330.07  146.92 5330.03
   148.9 5330.02  150.89    5330  152.87 5329.92  154.86 5329.83  156.84 5329.64
  158.83 5329.62  160.81 5329.78  161.48 5329.81   162.8 5329.85  164.79 5329.85
  166.77 5329.98  168.76 5330.08  170.74 5330.15  172.73  5330.2  174.71 5330.28
   176.7 5330.28  178.68 5330.26  180.67 5330.32  182.65 5330.34  186.62 5330.44
  188.61 5330.52  189.03 5330.53  190.59 5330.57  192.58 5330.54  194.57  5330.5
  196.55 5330.53  198.54 5330.53  200.52 5330.52  202.51 5330.56  212.43 5330.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  119.81    .015  161.48     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         99.85  189.03           106.51  106.66   107.1             .1       .3
Blocked Obstructions     num=        1
   Sta L   Sta R    Elev
  200.77  212.435340.531

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 1197

INPUT
Description:
Station Elevation Data    num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5333.91    1.98 5333.89    3.95 5333.88    5.93 5333.88    7.91 5333.83
    9.89 5333.66   11.86 5333.56   13.84 5333.54   15.82 5333.46   17.79 5333.36
   19.77 5333.25   21.75 5333.17   23.73 5333.09   24.43 5333.02    25.7  5332.9
   27.68 5332.53   29.66 5332.11   31.63 5331.65   33.61 5331.23   35.59 5330.82
   37.57 5330.43   39.54 5330.31   41.52 5330.24    43.5 5330.01   45.47 5329.87
   47.45  5329.7   48.51  5329.6   49.43 5329.51   51.41 5329.66   53.38  5329.8
   55.36 5329.82   57.34 5329.72   59.31 5329.77   61.29 5329.78   63.27  5329.7
   65.25 5329.68   67.22 5329.62    69.2 5329.54   71.18 5329.48   73.15 5329.41
   75.13 5329.34   77.11  5329.3   79.09 5329.17   81.06 5329.07   83.04 5328.96
   85.02 5328.85   86.99  5328.5   88.97 5328.66   90.61 5328.75   90.95 5328.76
   92.93 5328.78    94.9 5328.84   96.88 5329.11   98.86 5329.16  100.84 5329.11
  102.81 5329.09  104.79 5329.13  106.77 5329.12  108.74 5329.19  110.72 5329.29
   112.7 5329.37  114.67 5329.47  116.65 5329.56  118.63 5329.66  120.61  5329.8
  122.58  5329.9  124.56 5329.97  126.54 5329.88  128.52    5330  129.67 5330.04
  130.49 5330.07  132.47 5330.06  134.45 5330.22  136.42 5330.32   138.4 5330.44
  140.38 5330.47  142.36 5330.47  144.33 5330.46  146.31 5330.46  148.29 5330.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   48.51    .015   90.61     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         24.43  129.67           138.87  126.58  115.37             .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   10.635343.914  134.78  148.295340.256

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 1070

INPUT
Description:
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5333.59       2 5333.44    3.99 5333.29    5.99 5333.27    7.98 5333.26
    9.98 5333.14   11.56 5333.03   11.98 5332.99   13.97 5332.78   15.97 5332.48
   17.96  5331.1   19.96 5329.93   21.96 5329.84   23.95 5329.71   25.95 5329.68
   27.94 5329.62   29.94 5329.52   31.94 5329.39   33.93 5329.37   35.93 5329.31
   37.92 5329.24   39.92 5329.17   41.91 5329.08   43.91 5328.94   45.91 5328.78
    47.9 5328.67    49.9 5328.53   51.89 5328.37   53.89 5328.48   55.89 5328.45
   57.88 5328.22   59.88 5327.83   61.87 5327.64   63.87 5327.58   65.87 5327.54
   67.86 5327.49   68.31 5327.48   69.86 5327.47   71.85 5327.16   73.85 5327.11
   75.85  5327.2   77.84 5327.27   79.84 5327.34   81.83 5327.37   83.83 5327.44
   85.83 5327.46   87.82 5327.46   89.82 5327.44   91.81 5327.48   93.81 5327.53
   95.81 5327.45    97.8 5327.46    99.8 5327.42  101.79 5327.38  103.79 5327.38
  105.78 5327.34  107.78 5327.28  109.78 5327.19  111.77  5327.2  113.77 5327.14
  115.76 5327.04  117.76 5326.95  119.76 5326.74  121.75  5326.7  122.26 5326.76
  123.75 5326.93  125.74 5326.99  127.74 5327.06  129.74 5327.17  131.73 5327.15
  133.73 5327.13  135.72 5327.21  137.72 5327.31  139.72 5327.43  141.71 5327.59
  143.71 5327.75   145.7 5327.91   147.7 5328.16   149.7 5328.36  151.69 5328.55
  153.69 5328.87  155.68 5329.03  157.68 5329.23  159.68  5329.4  161.67 5329.47
  163.67 5329.33  164.85 5329.22  165.66 5329.15  167.66 5328.95  169.66 5328.69
  171.65 5328.51  173.65 5328.17  175.64  5327.9  177.64 5327.53  179.64 5327.01
  181.63 5326.54  183.63 5325.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   68.31    .015  122.26     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         55.89  153.69           119.59   106.2   89.19             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
  161.67  183.63 5329.47       T
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.435343.595  168.39  183.635338.813

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 964

INPUT
Description:
Station Elevation Data    num=      78
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5324.15       2 5324.17       4  5324.2       6 5324.22       8 5324.24
      10 5324.27   11.99 5324.29   13.99 5324.31   15.99 5324.34   17.99 5324.36
   19.99 5324.36   21.99  5324.3   23.99 5324.11   25.99 5323.97   27.99 5324.06
   29.99 5324.23   31.99 5324.34   33.99 5324.42   35.98 5324.51   37.98 5324.45
   38.11 5324.43   39.98 5324.26   41.98 5323.92   43.98 5323.47   45.98 5323.14
   47.98 5323.11   49.98 5323.14   51.98 5323.16   52.97 5323.11   53.98 5323.07
   55.98 5322.95   57.98 5323.12   59.97 5323.27   61.97 5323.29   63.97  5323.4
   65.97 5323.52   67.97 5323.65   69.97 5323.69   71.97 5323.79   73.97 5323.81
   75.97 5323.84   77.97 5323.94   79.97 5323.96   81.96 5323.92   83.96 5323.95
   85.96 5323.95   87.96 5323.96   89.96 5323.97   91.96  5323.9   93.34  5323.9
   93.96 5323.91   95.96 5324.28   97.96 5324.35   99.96 5324.43  101.96 5324.44
  103.96 5324.41  105.95 5324.52  107.95 5324.73  109.95 5324.88  111.95 5324.94
  113.95 5325.01  114.06 5325.02  115.95 5325.13  117.95 5325.21  119.95 5325.28
  121.95 5325.36  123.95  5325.4  125.95  5325.4  127.95 5325.38  129.94 5325.41
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  131.94 5325.49  133.94 5325.48  135.94 5325.35  137.94 5325.19  139.94 5324.83
  141.94 5325.08  143.94 5325.55  145.94 5326.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   52.97    .015   93.34     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          38.11   99.96           61.38   66.82   82.18             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   35.98 5324.51       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   23.455334.151  130.19  145.945335.421

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 897

INPUT
Description:
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5322.49    1.99 5322.45    3.97 5322.39    5.96 5322.32    7.94 5322.25
    9.93 5322.22   11.92 5322.16   13.9 5321.71   15.89 5321.38   17.87 5321.34
   19.86 5321.23   21.85 5321.18   23.83  5321.2   25.82 5321.28    27.8 5321.44
   29.79 5321.44   31.78 5321.47   33.76 5321.48   35.75 5321.47   37.73 5321.53
   39.72 5321.62   41.71 5321.59   43.69 5321.59   45.68 5321.65   47.66 5321.75
   49.65    5322   51.63 5322.23   53.45 5322.18   53.62 5322.17   55.61 5321.95
   57.59 5321.71   59.58 5321.55   61.56 5321.51   63.55 5321.55   65.54 5321.53
   67.52 5321.48   68.19 5321.44   69.51 5321.37   71.49 5321.14   73.48 5321.17
   75.47 5321.25   77.45  5321.3   79.44 5321.31   81.42 5321.37   83.41 5321.39
    85.4 5321.45   87.38 5321.48   89.37 5321.53   91.35 5321.52   93.34 5321.55
   95.33 5321.56   97.31 5321.55    99.3 5321.57  101.28  5321.6  103.27 5321.55
  105.26 5321.52  107.24 5321.46  109.23 5321.44  111.21 5321.49   113.2 5321.46
  115.19 5321.37  117.17 5321.28   118.5 5321.28  119.16 5321.28  121.14 5321.54
  123.13  5321.6  125.12 5321.67   127.1 5321.86  129.09 5322.13  131.07 5322.32
  133.06  5322.7  135.05 5323.08  137.03 5323.43  139.02 5323.77     141 5324.01
  142.99 5324.17  144.97 5324.36  146.96 5324.57  148.95 5324.71  150.93 5324.82
  152.92 5324.81   154.9 5324.83  155.93 5324.91  156.89 5324.99  158.88  5325.3
  160.86 5325.54  162.85 5325.59  164.83 5325.16  166.82 5324.69  168.81 5324.68
  170.79 5325.76  172.78 5325.91  174.76  5325.9  176.75 5325.86  178.74 5325.84
  180.72 5325.85  182.71 5325.84  184.69 5325.75  186.68 5325.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   68.19    .015   118.5     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          53.45  131.07          127.87  152.89  168.12             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   51.63 5322.23       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   15.615332.487  170.45  186.685335.573

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 744

INPUT
Description:
Station Elevation Data    num=      93
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5322.03    1.99 5322.05    3.99 5322.07    5.98 5321.82    7.98 5321.46
    9.97 5321.35   11.96 5321.23   13.96 5321.13   15.95 5320.92    16.4 5320.89
   17.95  5320.8   19.94 5320.66   21.94 5320.49   23.93 5320.26   25.92    5320
   27.92 5319.69   29.91  5319.4   31.91 5319.02    33.9 5318.66   35.89 5318.36
   37.89  5318.2   39.88 5318.42   41.88 5318.48   43.87 5318.62   45.87 5318.66
   47.86 5318.68   49.85  5318.8   51.85 5318.84   53.84  5318.8   55.84 5318.81
   57.83 5318.76   59.82 5318.74   61.82 5318.69   63.81 5318.74   65.81 5318.71
    67.8 5318.41    69.8 5318.33   71.79 5318.26   73.78 5318.18   75.78 5318.06
   77.77  5317.9   79.77 5317.84   81.76 5317.66   83.75 5317.53   85.75 5317.38
   87.74 5317.24   89.74 5317.11   91.73 5316.94   93.73 5316.77   95.72 5316.61
   97.71 5316.48   99.71 5316.35    101.7 5316.24   103.7 5316.07  105.69 5315.94
  107.68 5315.77  109.68 5315.65  111.67 5315.49  113.67 5315.33  115.66 5315.21
  117.65 5315.09  119.65 5314.96  121.64 5314.86  123.64 5314.74  125.63 5314.62
  127.63 5314.48  129.62 5314.33  131.61 5314.15  133.61 5314.29   135.6  5314.3
   137.6  5314.3  139.59 5314.29  141.58 5314.23  143.58 5314.26  145.57 5314.28
  147.57 5314.24  149.56 5314.29  151.56 5314.28  153.55 5314.25  155.54 5314.27
  157.54 5314.32  159.53 5314.36  161.53 5314.43  163.52 5314.44  164.23  5314.4
  165.51 5314.33  167.51 5313.22   169.5 5310.32   171.5 5309.65  173.49 5309.73
  175.49 5310.35  177.48  5311.3  179.47  5312.2

Manning's n Values        num=       1
     Sta   n Val
       0     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          97.71  163.52          159.38  159.24  159.05             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  163.52  179.47 5314.44       T
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0     7.45332.033  166.32  179.475323.972

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 585

INPUT
Description:
```

```
Station Elevation Data    num=      91
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5322.14       2 5322.06       4 5321.98       6 5321.25       8 5321.06
    8.71 5320.98      10 5320.83      12 5320.67      14  5320.4   15.99 5320.23
   17.99 5320.01   19.99 5319.79   21.99 5319.54   23.99 5319.34   25.99 5319.11
   27.99  5318.8   29.99 5318.59   31.99 5318.33   33.99 5318.11   35.99 5317.99
   37.99 5317.81   39.99 5317.68   41.99 5317.57   43.99 5317.44   45.99 5317.29
   47.98 5317.12   49.98 5317.24   51.98 5317.35   53.98 5317.44   55.98  5317.5
   57.98 5317.49   59.98 5317.54   61.98 5317.58   63.98  5317.6   65.98 5317.01
   67.98 5316.92   69.98 5316.85   71.98 5316.73   73.98 5316.56   75.98 5316.46
   77.98 5316.33   79.97  5316.2   81.97 5316.17   83.97 5316.01   85.97 5315.87
   87.97 5315.83   89.97 5315.66   91.97 5315.19   93.97 5315.08   95.97 5315.05
   97.97 5315.09   99.97 5315.04  101.97 5315.01  103.97 5314.96  105.97 5314.84
  107.97 5314.77  109.97 5314.69  111.96  5314.6  113.96 5314.54  115.96 5314.43
  117.96 5314.29  119.96 5314.15  121.96 5314.13  123.96  5313.9  125.96 5313.82
  127.96 5313.61  129.96 5313.57  131.96 5313.65  133.96 5313.63  135.96 5313.64
  137.96 5313.73  139.96 5313.74  141.95 5313.76  143.95 5313.75  145.95 5313.84
  147.95 5313.87  149.95 5313.86  151.95 5313.91  153.95 5313.95  155.95 5313.99
  157.95 5313.98  159.95 5313.97  161.95 5313.94  163.95 5313.84  165.08 5312.74
  165.95  5311.9  167.95 5309.69  169.95 5309.74  171.95 5309.76  173.94 5310.02
  175.94 5310.29

Manning's n Values        num=       1
     Sta   n Val
       0     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         97.97  155.95           76.02    55.7   36.35             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  155.95  175.94 5313.99       T
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.375332.143  165.08  175.945322.777

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 529

INPUT
Description:
Station Elevation Data    num=      89
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5313.67       2 5313.72       4 5313.72       6  5313.7       8 5313.73
      10 5313.72      12 5313.75      14 5314.01      16 5314.28      18 5314.52
   19.99 5314.77   21.99 5314.95   23.99 5315.19   25.99 5315.34   27.99 5315.41
   29.99 5315.32   31.99  5315.2   33.99 5315.12   35.99 5315.05   36.67 5315.01
   37.99 5314.94   39.99 5314.75   41.99  5314.4   43.99  5314.2   45.99 5314.04
   47.99 5313.78   48.76  5313.7   49.99 5313.56   51.99 5313.43   53.99 5313.39
   55.99 5313.45   57.99 5313.58   59.98 5313.64   61.98 5313.73   63.98 5313.83
   65.98 5313.87   67.98 5313.88   69.98 5313.91   71.98 5313.87   73.98 5313.84
   75.98 5313.84   77.98 5313.79   79.98 5313.69   81.98 5313.64   83.98  5313.5
   85.98 5313.41   87.98 5313.39   89.98 5313.24   91.98 5313.11   93.98 5312.98
   95.98 5312.84   97.97 5312.61   99.97 5312.65  100.23 5312.68  101.97 5312.89
  103.97 5312.87  105.97 5312.94  107.97 5313.07  109.97 5313.11  111.97 5313.14
  113.97 5313.22  115.97 5313.34  117.97 5313.35  119.97  5313.4  121.97 5313.49
  123.97 5313.58  125.97 5313.63  127.97 5313.69  129.97 5313.76  131.97 5313.75
  133.97 5313.69  135.97 5313.59  137.96  5313.5  139.96 5313.44  141.96 5313.47
  143.96 5313.54  145.96 5313.63  147.96 5313.72  149.19 5313.42  149.96 5313.23
  151.96 5311.64  153.96 5310.33  155.96 5309.86  157.96 5309.92  159.96    5310
  161.96 5310.37  163.96 5310.61  165.96 5310.59  167.96 5310.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   48.76    .015  100.23     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         36.67  149.19          144.68  132.29  122.94             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0      70    5318       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   11.075323.673  149.99  167.965323.216

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 397

INPUT
Description:
Station Elevation Data    num=      89
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5309.29       2 5309.37       3.99 5309.43    5.99 5309.42    7.99 5309.42
    9.98 5309.41   11.98 5309.49   13.98 5309.45   15.97 5309.52   17.97  5309.6
   19.96 5309.64   21.96 5309.52   23.96 5309.48   25.95 5309.39   27.95  5309.4
   29.95 5309.43   31.94 5309.49   33.94  5309.6   35.94 5309.64   37.93 5309.68
   39.93 5309.72   41.93  5309.7   43.92 5309.82   45.92 5309.85   47.61 5309.87
   47.92 5309.87   49.91 5309.82   51.91  5309.8   53.91 5309.77    55.9 5309.71
   57.73 5309.66    57.9 5309.66   59.89 5309.46   61.89 5309.31   63.89 5309.35
   65.88 5309.53   67.88 5309.72   69.88 5309.89   71.87 5309.96   73.87 5310.02
   75.87 5310.06   77.86 5310.12   79.86 5310.16   81.86 5310.11   83.85 5310.11
   85.85 5310.07   87.85 5310.02   89.84 5309.98   91.84 5309.91   93.84 5309.78
   95.83  5309.7   97.83 5309.57   99.82 5309.51  101.82 5309.74  102.15 5309.77
  103.82  5309.9  105.81 5310.12  107.81 5310.49  109.81  5310.7   111.8 5310.78
   113.8  5310.9   115.8 5311.04  117.79 5311.26  119.79 5311.39  121.79 5311.39
  123.78 5311.42  125.78 5311.52  127.78 5311.67  129.77 5311.78  131.77 5311.87
   133.4 5311.99  133.77 5312.01  135.76  5312.1  137.76 5312.07  139.76  5312.1
  141.75 5312.18  143.75 5312.17  145.74 5312.17  147.74 5312.22  149.74 5312.31
  151.73 5312.36  153.73 5312.38  155.73 5312.35  157.72 5312.38  159.72 5312.43
  161.72 5312.46  163.71 5312.46  165.71 5312.52  167.71 5312.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   57.73    .015  102.15     .06

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

```
         47.61  107.81           152.41  152.47  152.43             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0      24    5312       F

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 245

INPUT
Description:
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5308.54       2 5308.43       4 5308.24       6 5308.02       8 5307.81
    9.99 5307.63   11.99 5307.55   13.99 5307.57   15.99 5307.48   17.99 5307.43
   19.99 5307.38   21.99 5307.38   23.99 5307.34   25.99  5307.3   27.99 5307.31
   29.54 5307.25   29.98 5307.24   31.98  5307.2   33.98 5307.17   35.98 5307.06
   37.98 5306.94   39.98 5306.82   41.98 5306.74   42.43 5306.73   43.98 5306.68
   45.98 5306.29   47.98 5306.41   49.97 5306.56   51.97 5306.69   53.97 5306.83
   55.97 5306.97   57.97 5307.08   59.97 5307.12   61.97 5307.12   63.97 5307.13
   65.97 5307.15   67.97 5307.13   69.96 5307.09   71.96 5307.01   73.96 5306.98
   75.96 5306.98   77.96 5306.86   79.96 5306.77   81.96 5306.73   83.96 5306.71
   85.96 5306.76   87.96 5306.85   88.96 5306.92   89.95    5307   91.95 5307.48
   93.95 5307.88   95.95 5308.28   97.95 5308.68   99.95 5309.07  101.95 5309.48
  103.95 5310.08  105.95 5310.46  107.95  5310.7  109.94 5310.96  111.69 5311.13
  111.94 5311.16  113.94 5311.38  115.94 5311.56  117.94  5311.7  119.94  5311.8
  121.94 5311.87  123.94 5311.97  125.94 5311.96  127.94 5311.97  129.93 5312.05
  131.93 5312.09  133.93 5312.08  135.93 5312.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   42.43    .015   88.96     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         29.54   93.95           145.83  150.32  146.03             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   10.465318.537

CROSS SECTION


RIVER: 29th_St_Split
REACH: 1                  RS: 94

INPUT
Description:
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5305.67    1.99 5305.71    3.99 5305.69    5.98  5305.6    7.97 5305.53
    9.97 5305.56   11.96 5305.55   13.95 5305.59   15.94 5305.59   17.94 5305.58
   19.93 5305.54   21.92  5305.5    23.7 5305.48   23.92 5305.48   25.91 5305.54
    27.9 5305.53    29.9 5305.41   31.89 5304.98   33.88  5304.5   35.88 5304.59
   36.59 5304.64   37.87 5304.73   39.86 5304.51   41.86 5304.24   43.85 5304.43
   45.84 5304.48   47.83 5304.59   49.83 5304.65   51.82 5304.73   53.81 5304.74
   55.81 5304.75    57.8 5304.85   59.79 5304.89   61.79 5304.79   63.78 5304.76
   65.77  5304.7   67.77 5304.63   69.76 5304.56   71.75 5304.48   73.74 5304.37
   75.74 5304.19   77.73 5304.01   79.72 5303.93   81.72  5304.5   83.71 5304.52
   85.13 5304.62    85.7 5304.66    87.7 5305.09   89.69 5305.36   91.68 5305.54
   93.68 5305.88   95.67 5306.03   97.66 5306.24   99.65 5306.46  101.65 5306.64
  103.64 5306.77  104.79 5306.87  105.63 5306.95  107.63 5307.07  109.62 5307.27
  111.61 5307.43  113.61 5307.61   115.6 5307.66  117.59  5307.7  119.59 5307.69
  121.58 5307.63  123.57 5307.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   36.59    .015   85.13     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          27.9   91.68            34.16   94.33   22.26             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  114.53  123.575317.629       0   11.615315.668

CROSS SECTION


RIVER: 30th_St_Split
REACH: 1                  RS: 875

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5312.83    1.98 5312.88    3.97 5312.97    5.95 5312.91    7.93 5312.85
    9.91 5312.75    11.9 5312.71   13.88 5312.63   15.86 5312.56   17.84 5312.37
   19.83  5312.2   21.81 5312.06   21.92 5312.05   23.79 5311.97   25.77 5311.87
   27.76 5311.76   29.74 5311.63   31.72 5311.42   33.71  5311.3    35.7  5311.1
   37.68 5310.89   39.67 5310.76   40.24 5310.69   41.66 5310.54   43.65 5310.35
   45.63 5310.23   47.62 5310.12   49.61 5310.06    51.6 5310.18   53.58 5310.17
   55.57 5310.17   57.56 5310.15   59.55 5310.21   61.53  5310.2   63.52 5310.29
   65.51 5310.27    67.5 5310.28   69.48 5310.31   71.47 5310.31   73.46 5310.36
   75.45 5310.33   77.43 5310.28   79.42 5310.26   81.41 5310.21    83.4 5310.14
   85.38 5310.08   87.37 5310.03   89.36    5310   91.35 5309.95   93.33  5309.9
   95.32 5309.86   97.31  5309.8    99.3 5309.82  100.24 5309.98  101.28 5310.15
  103.27 5310.24  105.26 5310.55  107.25 5310.58  109.23 5310.61  111.22 5310.61
  113.21 5310.82   115.2 5310.91  117.18 5310.89  119.17 5310.83  121.16 5310.93
  123.15 5311.03  124.21 5311.12  125.13 5311.19  127.12 5311.26  129.11 5311.14
   131.1 5311.12  133.08 5311.15  135.07 5311.21  137.06 5311.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   40.24    .015  100.24     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         21.92  124.21           117.2  117.01  117.03             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    8.045322.835  129.55  137.065321.113
```

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CROSS SECTION


RIVER: 30th_St_Split
REACH: 1                  RS: 758

INPUT
Description:
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5310.61    1.97 5310.77    3.94 5310.93    5.91 5311.03    7.88 5310.96
    9.85  5310.8   11.82 5310.67   13.79  5310.5   15.76 5310.31   17.74 5310.11
   19.71 5309.88   21.68  5309.8   23.65 5309.98   25.62  5310.1   26.72  5310.1
   27.59  5310.1   29.56  5309.7   31.53 5309.26    33.5 5309.03   34.41 5308.89
   35.47 5308.74   37.44 5308.53   39.41 5308.26   41.38 5308.02   43.35 5308.04
   45.32 5308.02   47.29 5307.99   49.26    5308   51.23 5308.01   53.21 5308.03
   55.18 5308.08   57.15 5308.12   59.12 5308.13   61.09 5308.14   63.06 5308.18
   65.03 5308.19      67 5308.19   68.97 5308.16   70.94  5308.1   72.91 5308.06
   74.88 5307.99   76.85 5307.97   78.82 5307.93   80.79 5307.87   82.76 5307.82
   84.73 5307.75    86.7 5307.72   88.68 5307.71   90.65 5307.63   92.62 5307.71
   93.23 5307.81   94.59 5308.05   96.56 5308.12   98.53 5308.13   100.5 5308.06
  102.47 5308.01  104.44 5308.01  106.41 5308.06  108.38 5308.09  110.35 5308.18
  112.32 5308.23  114.29 5308.24  116.26 5308.31  117.04 5308.34  118.23 5308.38
   120.2 5308.55  122.17 5308.83  124.15 5308.91  126.12 5308.78  128.09 5308.73
  130.06 5308.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   34.41    .015   93.23     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         26.72  117.04            114.17  114.17  114.15              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.385320.613   124.4  130.065318.911

CROSS SECTION


RIVER: 30th_St_Split
REACH: 1                  RS: 643

INPUT
Description:
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5309.16    1.99 5309.22    3.97 5309.18    5.96 5309.12    7.94 5308.99
    9.93 5308.92   11.91 5308.92    13.9 5308.83   15.88 5308.71   17.87 5308.61
   19.85 5308.37   21.84 5308.06   23.82 5307.81   25.81 5307.68   27.79 5307.38
   29.78 5306.81   31.76 5306.56   32.73 5306.53   33.75  5306.5   35.73 5306.13
   37.72 5306.01    39.7    5306   41.69    5306   43.67 5305.99   45.66 5306.02
   47.64 5306.01   49.63 5306.01   51.61 5306.02    53.6 5306.06   55.58 5306.06
   57.57 5306.07   59.55 5306.07   61.54 5306.09   63.52  5306.1   65.51 5306.11
   67.49 5306.12   69.48 5306.13   71.46 5306.07   73.45    5306   75.43 5305.95
   77.42 5305.92    79.4 5305.88   81.39 5305.81   83.37 5305.76   85.36 5305.71
   87.34 5305.64   89.33 5305.58   91.31 5305.53    93.3 5305.53      95 5305.72
   95.28 5305.76   97.27 5305.98   99.25 5306.03  101.24 5306.03  103.22 5306.01
  105.21 5306.02  107.19 5306.07  109.18 5306.14  111.16 5306.16  113.15 5306.17
  115.13 5306.22  117.12  5306.3   119.1 5306.39  119.42  5306.4  121.09 5306.46
  123.07 5306.55  125.06 5306.65  127.04 5306.72  129.03 5306.71  131.01 5306.73
     133 5306.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   32.73    .015      95     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         21.84  119.42             88.22   87.48    87.4              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.265319.165  127.51     133 5316.72

CROSS SECTION


RIVER: 30th_St_Split
REACH: 1                  RS: 556

INPUT
Description:
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5307.48    1.97 5307.49    3.95 5307.52    5.92 5307.54    7.89 5307.57
    9.87 5307.58   11.84 5307.52   13.81  5307.4   15.78 5307.36   17.76 5307.33
   19.73 5307.19    21.7 5307.05   22.34    5307   23.68 5306.91   25.65 5306.56
   27.62 5306.07    29.6 5305.57   31.25 5305.24   31.57 5305.18   33.54 5305.06
   35.51 5304.62   37.49 5304.63   39.46 5304.62   41.43 5304.61   43.41  5304.6
   45.38 5304.63   47.35 5304.63   49.33 5304.63    51.3 5304.61   53.27 5304.56
   55.24 5304.63   57.22 5304.64   59.19 5304.67   61.16 5304.68   63.14  5304.7
   65.11 5304.75   67.08 5304.75   69.06 5304.76   71.03 5304.77      73 5304.71
   74.97 5304.67   76.95 5304.59   78.92 5304.53   80.89 5304.49   82.87  5304.4
   84.84 5304.36   86.81 5304.28   88.79 5304.21   90.76 5304.17   92.73 5304.09
   94.71 5304.13   96.17 5304.33   96.68  5304.4   98.65 5304.55  100.62 5304.31
   102.6 5304.41  104.57 5304.77  106.54 5304.86  108.52 5304.83  110.49 5304.79
  112.46  5304.7  114.44 5304.83  116.41 5305.06  118.38 5305.17  119.69 5305.22
  120.35 5305.24  122.33 5305.27   124.3  5305.3  126.27 5305.36  128.25 5305.44
  130.22 5305.45  132.19 5305.43  134.17  5305.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   31.25    .015   96.17     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         22.34  119.69            140.63   84.64   58.04              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0     8.75317.484  124.35  134.175315.299

CROSS SECTION
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```
RIVER: 30th_St_Split
REACH: 1                    RS: 471

INPUT
Description:
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5305.34    1.97 5305.54    3.95  5305.6    5.92 5305.31     7.9 5304.87
    9.87 5304.77   10.58 5304.71   11.84 5304.61   13.82 5304.56   15.79 5304.55
   17.77 5304.47   19.74 5304.36   21.72  5304.2   23.69 5304.11   25.66 5304.04
   27.64 5303.88   29.61 5303.72   31.59 5303.53   33.56 5303.27   35.53 5303.05
   37.51 5302.93   39.08 5302.86   39.48 5302.84   41.46 5302.56   43.43 5302.64
   45.41 5302.78   47.38 5302.86   49.35 5302.98   51.33 5303.04    53.3 5303.09
   55.28 5303.17   57.25 5303.24   59.22 5303.28    61.2 5303.28   63.17 5303.23
   65.15 5303.18   67.12 5303.09    69.1 5303.01   71.07 5302.94   73.04 5302.87
   75.02 5302.78   76.99 5302.66   78.97 5302.51   80.94  5302.7   82.91 5302.97
   83.04 5302.98   84.89 5303.08   86.86 5303.31   88.84 5303.53   90.81 5303.66
   92.78  5303.8   94.76 5304.05   96.73 5304.35   98.71 5304.51  100.68 5304.57
  101.26 5304.59  102.66 5304.62  104.63 5304.69   106.6 5304.88  108.58 5304.96
  110.55 5304.99  112.53 5305.05   114.5 5305.08  116.47 5305.16  118.45 5305.22
  120.42 5305.27   122.4 5305.31

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   39.08    .015   83.04     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         10.58  101.26            99.04   98.69   98.68             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   113.9   122.45315.049       0    6.78 5315.34

CROSS SECTION


RIVER: 30th_St_Split
REACH: 1                    RS: 373

INPUT
Description:
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5303.49    1.99 5303.55    3.99 5303.65    5.98  5303.6    7.97  5303.5
    9.97 5303.35   11.96 5303.27   13.95 5303.18   15.95 5303.16   16.12 5303.16
   17.94 5303.08   19.93 5302.98   21.93 5302.91   23.92 5302.88   25.91 5302.81
   27.91 5302.67    29.9 5302.58   31.89  5302.5   33.89 5302.42   35.88 5302.31
   37.87 5302.08   39.87    5302   41.13 5301.85   41.86 5301.77   43.85 5301.62
   45.85 5301.77   47.84  5301.9   49.83 5302.03   51.83 5302.12   53.82 5302.18
   55.81 5302.24   57.81 5302.31    59.8 5302.31   61.79 5302.32   63.79 5302.26
   65.78 5302.28   67.77 5302.28   69.77 5302.24   71.76 5302.19   73.75 5302.12
   75.75 5302.02   77.74 5301.91   79.73 5301.73   81.73 5301.62   83.72 5301.92
   85.57 5302.06   85.71 5302.07   87.71 5302.44    89.7  5302.6   91.69 5302.68
   93.69 5302.75   95.68  5302.8   97.67 5302.91   99.67  5303.1  101.66 5303.27
  102.26  5303.3  103.65 5303.38  105.65 5303.47  107.64 5303.54  109.63 5303.66
  111.62 5303.87  113.62 5303.93  115.61 5303.83   117.6 5303.79   119.6 5303.87
  121.59 5303.92  123.58 5303.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   41.13    .015   85.57     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         16.12  102.26           146.33   146.7   146.8             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  118.39  123.58  5313.8       0    6.715313.487

CROSS SECTION


RIVER: 30th_St_Split
REACH: 1                    RS: 226

INPUT
Description:
Station Elevation Data    num=      68
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5301.93    1.99 5301.95    3.98 5301.95    5.97 5301.96    7.96 5302.05
    9.95 5302.09   11.94 5301.99   12.26 5301.98   13.93 5301.92   15.92 5301.88
   17.91 5301.72    19.9 5301.56   21.88 5301.51   23.87 5301.49   25.86 5301.36
   27.85 5301.24   29.84 5301.16   31.83 5301.07   33.82 5300.96   35.81 5300.88
    37.8 5300.74   39.79 5300.63   41.78 5300.52   41.84 5300.51   43.77 5300.17
   45.76  5300.3   47.75 5300.46   49.74 5300.58   51.73 5300.71   53.72 5300.79
   55.71  5300.9    57.7 5300.85   59.69 5300.89   61.67  5300.9   63.66 5300.87
   65.65 5300.88   67.64 5300.83   69.63 5300.78   71.62 5300.81   73.61 5300.77
    75.6 5300.66   77.59 5300.57   79.58 5300.46   81.57 5300.33   83.56 5300.47
   85.55 5300.67   86.99 5300.71   87.54 5300.73   89.53 5300.91   91.52 5301.05
   93.51  5301.2    95.5 5301.38   97.49  5301.5   99.48 5301.53  101.46 5301.64
  101.83 5301.66  103.45 5301.73  105.44 5301.73  107.43 5302.01  109.42 5302.09
  111.41 5302.23   113.4 5302.31  115.39 5302.29  117.38 5302.29  119.37 5302.48
  121.36 5302.53  123.35 5302.57  125.34  5302.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   41.84    .015   86.99     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         12.26  101.83           158.14  158.47  158.55             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  116.39  125.34 5312.29       0    6.555311.928

CROSS SECTION


RIVER: 30th_St_Split
REACH: 1                    RS: 68

INPUT
Description:
```

```
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5300.37    1.99 5300.34    3.97 5300.35    5.96 5300.42    7.95 5300.36
    9.94  5300.3   11.92 5300.31   13.91 5300.33    15.9 5300.25   16.67 5300.22
   17.89 5300.16   19.87 5300.05   21.86 5299.98   23.85 5299.89   25.83  5299.8
   27.82 5299.74   29.81 5299.68    31.8 5299.65   33.78 5299.67   35.77 5299.44
   37.76 5299.21   39.58 5299.09   39.74 5299.08   41.73 5298.69   43.72 5298.91
   45.71  5299.1   47.69 5299.24   49.68 5299.36   51.67 5299.46   53.65 5299.51
   55.64 5299.61   57.63  5299.6   59.62 5299.67    61.6 5299.67   63.59 5299.66
   65.58 5299.65   67.56 5299.59   69.55 5299.56   71.54 5299.47   73.53 5299.34
   75.51 5299.21    77.5 5299.02   79.49 5298.88   81.48 5299.07   83.46 5299.18
   85.45 5299.58    85.5 5299.58   87.44 5299.85   89.42 5299.94   91.41 5300.02
    93.4 5300.16   95.39 5300.31   97.37 5300.46   99.36 5300.59  100.51 5300.63
  101.35 5300.66  103.33 5300.75  105.32 5300.83  107.31 5300.86   109.3 5300.89
  111.28 5301.04  113.27 5301.02  115.26    5301  117.25 5300.95  119.23 5300.94
  121.22    5301

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   39.58    .015    85.5     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         16.67  100.51            33.14   67.51   54.26              .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  114.54  121.225311.001       0     7.45310.373

CROSS SECTION


RIVER: 35th_St_Split
REACH: 1                  RS: 346

INPUT
Description:
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5283.67    3.99 5283.67    7.98 5283.66   11.98 5283.69   13.97 5283.69
   15.97 5283.63   17.97 5283.75   21.96 5283.73   23.96 5283.74   25.96 5283.62
   27.95 5283.64   29.95 5283.63   31.95 5283.32   33.94 5283.09   35.94 5282.83
   37.94  5282.6   39.93 5282.41   41.93 5282.54   45.93 5283.12   47.68 5283.11
   47.92 5283.11   49.92 5282.53   51.92 5281.99   53.91 5281.67   55.91 5281.55
   57.91 5281.22    59.9 5281.33    63.9 5281.43   65.89 5281.49   67.89 5281.54
   71.89 5281.58   73.88 5281.62   75.88  5281.6   77.88 5281.63   79.87  5281.6
   83.87 5281.53   85.86 5281.52   88.08 5281.44   89.86  5281.4   91.85 5281.34
   95.85 5281.09   97.85 5281.09   99.84 5281.27

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0     .06   51.92    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         47.68   88.08           106.72  106.63  106.54              .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 -151.77 -142.385295.354  -54.27    9.02 5293.78

CROSS SECTION


RIVER: 35th_St_Split
REACH: 1                  RS: 240

INPUT
Description:
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5282.89    5.97 5282.91    9.96 5282.84   11.95 5282.77   17.93 5282.51
   21.91 5282.46    25.9 5282.52   27.89  5282.5   31.88  5282.3   40.01 5282.05
   41.84 5281.99   47.82 5281.61    51.8 5281.44   53.18 5281.31   57.78 5280.84
   59.77  5280.8   63.76 5281.03   65.75 5281.02   69.73 5281.24   73.72 5281.29
    79.7 5281.29   83.68 5281.21   87.67 5281.17   93.64  5280.9   94.86 5280.81
   95.64 5280.74   97.63 5280.74   99.62 5280.95  101.61 5281.08   105.6 5281.13
  107.59 5281.08  111.58 5281.13  113.57 5281.13  117.56  5281.2  121.54 5281.24
  125.73 5281.17  127.52 5281.12  129.51    5281   131.5 5280.97   133.5 5281.02
  135.49 5281.12  137.48 5281.36  139.47  5281.7  141.47  5281.9  143.46 5281.95
  147.44 5281.79  149.44 5281.83  153.42 5281.99   159.4 5282.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   53.18    .015   94.86     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         40.01  125.73            74.87   74.95   75.03              .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   -47.4   21.965292.873  137.01   159.4 5291.28

CROSS SECTION


RIVER: 35th_St_Split
REACH: 1                  RS: 165

INPUT
Description:
Station Elevation Data    num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5282.6       4 5282.53      10  5282.2      12 5282.14   13.99 5282.12
   17.99 5281.98   19.99 5282.07   21.99 5282.07   25.99 5281.99   29.98  5281.8
   34.49 5281.67   35.98 5281.64   43.98 5281.37   45.97 5281.33   47.97 5281.25
   50.08 5281.07   51.97 5280.93   53.97 5280.69   55.97 5280.53   57.97 5280.72
   59.97 5280.79   61.96 5280.81   65.96 5280.89   71.96 5280.92   73.96 5280.92
   79.95 5280.81   83.95 5280.71   87.95 5280.55   89.95  5280.5   91.04 5280.43
   93.94 5280.29   95.94  5280.5   97.94 5280.64   99.94 5280.74  103.94 5280.82
  105.94 5280.93  107.93 5280.92  109.93 5280.87  111.93 5280.91  113.93 5280.98
  115.93 5281.02  117.93 5281.02  119.93 5281.07  121.93 5281.15  123.56 5281.13
  125.92 5281.01  127.92    5281  129.92 5281.08  131.92 5281.08  133.92 5281.13
  135.92 5281.25  141.91 5281.49  147.91 5281.72

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   50.08    .015   91.04     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         34.49  123.56            121.13  121.23  121.33             .1       .3
Blocked Obstructions     num=        3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  -151.9 -141.525294.474  -52.23    19.45292.468  134.11  147.915291.144

CROSS SECTION


RIVER: 35th_St_Split
REACH: 1                  RS: 43

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5281.63    7.98 5281.28    9.97 5281.28   11.97 5281.36   13.96  5281.3
   15.96 5281.19   19.95 5281.23   21.94 5281.32   23.94 5281.36   29.92 5281.33
   31.92 5281.38   33.91 5281.35   39.89 5281.33   41.89 5281.35   45.88 5281.28
   51.86 5281.25   53.86 5281.21   55.85 5281.23   57.02  5281.2   57.85 5281.18
   61.84 5280.98   69.81 5280.47   73.64 5280.27    75.8 5280.01   77.79 5279.84
   81.78 5280.08   83.78 5280.16   87.77 5280.17   93.75 5280.21   95.74 5280.25
  101.73 5280.24  103.72 5280.15  105.72  5280.1  109.71 5279.95  113.44 5279.74
  115.69 5279.56  117.68 5279.73  119.68 5279.82  123.67 5280.16  127.66 5280.11
  131.65 5280.18  133.64 5280.13  135.64 5279.99  141.62 5279.87   143.7 5279.79
   149.6 5279.54  153.59  5279.6  155.58 5279.71  157.58 5279.89  163.56 5280.17
  169.55 5280.32  173.53 5280.38

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   73.64    .015  113.44     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         57.02  131.65            43.36   43.31   43.27             .1       .3
Blocked Obstructions     num=        3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 -151.59 -124.465295.189  -45.04    11.75291.638  157.34  173.535289.871

CROSS SECTION


RIVER: Apartment_Split
REACH: 1                  RS: 237

INPUT
Description:
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5280.42    1.98 5280.45    3.96 5280.48    5.95 5280.48    7.93 5280.42
    9.91 5280.31   11.89 5280.05   13.87 5279.89   15.85    5280   17.84 5280.15
   19.82 5280.17    21.8    5280   23.78 5279.88   25.76 5279.78   27.75 5279.54
   29.29 5279.41   29.73 5279.37   31.71 5279.36   33.69 5279.35   35.67 5279.35
   37.65 5279.34   39.64 5279.31   41.62 5279.31    43.6 5279.32   44.36 5279.33
   45.58 5279.34   47.56 5279.39   49.55 5279.39   51.53 5279.41   53.51 5279.41
   55.49 5279.42   57.47 5279.44   59.45 5279.47   61.44 5279.44   63.42 5279.46
    65.4 5279.51   66.66 5279.52   67.38 5279.53   69.36 5279.52   71.35 5279.53
   73.33 5279.62   75.31 5279.65   77.29 5279.68   79.27 5279.71   81.25 5279.75
   83.24 5279.78   85.13 5279.81   85.22 5279.81    87.2  5280.1   89.18 5280.32
   91.16 5280.54   93.15 5280.86   95.13    5281   97.11  5281.4   99.09 5281.61
  101.07 5281.74  103.05 5281.67  105.04 5281.63

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   44.36    .015   66.66     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         19.82   89.18            130.88  138.11  145.34             .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   98.21  105.045291.523       0   12.815290.425

CROSS SECTION


RIVER: Apartment_Split
REACH: 1                  RS: 99

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5280.36    1.97 5280.32    3.93 5280.26     5.9  5280.1    7.86 5279.95
    9.83 5279.68   11.79 5279.36   13.76 5279.07   15.72 5279.12   17.06 5279.11
   17.69 5279.11   19.66 5279.04   21.62 5278.88   23.59 5278.74   24.74 5278.62
   25.55 5278.54   27.52  5278.2   29.48 5278.04   31.45  5278.1   33.41 5278.15
   35.38 5278.23   37.34 5278.31   39.31 5278.37   41.28 5278.43   43.24 5278.54
   45.21 5278.62   47.17 5278.77   48.31 5278.92   49.14 5279.03    51.1 5279.14
   53.07 5279.13   55.03 5279.23      57 5279.37   57.63 5279.38   58.97 5279.41
   60.93 5279.43    62.9  5279.5   64.86 5279.51   66.83 5279.44   68.79  5279.5
   70.76 5279.57   72.72 5279.66   74.69  5279.8   76.66 5279.96   78.62 5280.04
   80.59 5280.08   82.55 5280.15   84.52 5280.18   86.48  5280.2   88.45 5280.23
   90.41 5280.25   92.38 5280.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   24.74    .015   48.31     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         17.06   57.63            93.35   78.95   64.55             .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   68.62   92.38 5289.48       0   14.51 5290.36

CROSS SECTION


RIVER: Apartment_Split
REACH: 1                  RS: 20
```

```
INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5278.39    1.96 5278.35    3.92 5278.16    5.28 5278.22    5.88 5278.24
    7.84 5278.36     9.8 5278.43   11.76 5278.38   13.31  5278.1   13.72 5278.02
   14.34 5277.97   15.68 5277.85   17.64 5277.85    19.6 5277.92   21.56 5277.99
   23.52 5278.08   25.48 5278.12   27.44 5278.16    29.4 5278.17   31.36 5278.15
   33.32  5278.3   35.28  5278.6   35.96 5278.62   37.24 5278.67    39.2 5278.77
   41.16 5278.99   41.91 5279.05   43.12 5279.14   45.08 5279.42   47.04 5279.92
      49  5280.4   50.96 5280.49   52.92 5280.48   54.88 5280.41   56.84 5280.43

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    5.28     .06   14.34    .015   35.96     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         11.76   41.91           21.62   20.18   18.73             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   39.13   46.095288.768       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   46.09   56.84 5289.64

CROSS SECTION


RIVER: Bear_Bline_Split
REACH: 1                  RS: 723

INPUT
Description:
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5345.08    1.98    5345    3.96 5344.93    5.94 5344.82    7.92 5344.72
     9.9 5344.63   11.88 5344.53   13.86 5344.43   15.84 5344.31   17.82 5344.22
    19.8 5344.15   21.78 5344.08   23.76 5344.02   25.74 5343.92   27.71 5343.81
   29.69 5343.69   31.67 5343.59   33.25 5343.51   33.65 5343.49   35.63  5343.4
   37.61 5343.32   39.59 5343.23   41.57 5343.15   43.55 5343.04   45.53 5342.95
   47.51 5342.89   49.49 5342.82   51.47 5342.79   53.45 5342.77   55.43 5342.73
   57.41  5342.7   59.39 5342.67   61.37 5342.59   63.35 5342.56   65.33 5342.53
   67.31 5342.51   69.29 5342.52   71.27 5342.49   73.25 5342.44   75.23  5342.5
   77.21 5342.53   79.19  5342.5   81.17 5342.49   83.14 5342.52   85.12 5342.56
    87.1 5342.59   87.86 5342.63   89.08 5342.69   91.06 5342.78   93.04 5342.87
   95.02 5342.75      97 5342.68   98.98 5342.62  100.96 5342.53  102.94 5342.46

Manning's n Values        num=       1
     Sta   n Val
       0     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         33.25   91.06          141.03  136.81  129.23             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   90.98  102.945352.775

CROSS SECTION


RIVER: Bear_Bline_Split
REACH: 1                  RS: 586

INPUT
Description:
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5345.18    1.99 5345.09    3.98    5345    5.97 5344.93    7.95 5344.89
    9.94 5344.82   11.93 5344.73   13.92 5344.66   15.91 5344.62    17.9 5344.62
   19.89 5344.61   21.88 5344.59   23.86 5344.55   25.85 5344.48   27.84 5344.46
   29.83 5344.45   31.82 5344.44   33.81 5344.37    35.8  5344.3   37.79 5344.22
   39.77 5344.11   41.76 5344.06   43.75 5343.98   45.74 5343.71   47.73 5343.42
   49.72  5343.2   51.71 5343.07   53.69 5342.94   55.68 5342.79   57.67 5342.67
   58.04 5342.66   59.66 5342.61   61.65 5342.52   63.64 5342.39   65.63 5342.29
   67.62 5342.24    69.6 5342.15   71.59 5342.04   73.58 5341.94   75.57 5341.82
   77.56 5341.67   79.55 5341.56   81.54 5341.49   83.53 5341.45   85.51 5341.45
    87.5 5341.55   89.49 5341.65   91.48 5341.71   93.47 5341.82   95.46 5341.95
   97.45 5342.06   99.43 5342.19  101.42 5342.22  103.41 5342.36   105.4 5342.21
  107.39 5342.31  107.96 5342.31  109.38 5342.32  111.37  5342.4  113.36 5342.42
  115.34  5342.5  117.33 5342.59  119.32 5342.59  121.31 5342.61

Manning's n Values        num=       1
     Sta   n Val
       0     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         58.04  103.41          148.47  139.94  127.03             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   17.275355.176  108.05  121.315352.308

CROSS SECTION


RIVER: Bear_Bline_Split
REACH: 1                  RS: 446

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5342.02    1.98 5342.13    3.96 5342.03    5.94 5341.88    7.92 5341.81
   11.88 5341.75   15.84 5341.74   17.82  5341.7    19.8 5341.72   21.78 5341.69
   23.76 5341.69   25.74 5341.63   27.72  5341.6    29.7 5341.55   31.68 5341.54
   33.66 5341.77   35.64 5341.84   37.62 5342.09    39.6 5342.12   41.58 5341.87
   43.56 5341.74   45.54 5341.73   47.52 5341.69    49.5 5341.81   51.48 5341.62
   53.46 5341.42   55.44 5341.23   57.42 5341.18    59.4 5341.17   61.38 5341.13
   63.36 5341.11   65.34 5341.11    69.3 5341.02   71.28 5341.02   73.26    5341
    79.2 5340.99   79.99 5340.98   83.16 5340.93   85.14 5340.89   87.12 5340.83
    89.1 5340.81   91.08 5340.76   93.06 5340.77   97.02 5340.82  100.98 5340.77
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  102.96 5340.78  104.94 5340.76  106.92  5340.8   108.9 5340.81  110.88 5340.87
  112.86 5340.91  114.84 5340.89  116.82  5340.8  120.78 5340.83  122.76 5340.81
  124.74 5340.83  126.72 5340.82   128.7 5340.85  130.68 5340.86  132.66 5340.83
  134.64 5340.84   138.6 5340.95  140.58 5340.97  144.54 5340.97   148.5 5341.08
  150.48 5341.15  152.46 5341.15  156.42 5341.29  158.16 5341.39   158.4 5341.41
  160.38 5341.49  162.36 5341.54  164.34 5341.63  166.32 5341.67   168.3 5341.74
  170.28 5341.78  172.26 5341.78   174.2 5341.98  176.14 5342.26  178.09 5342.37
  180.03 5342.31  181.97 5342.08  183.91 5341.91   187.8 5341.96  189.74    5342
  191.69 5342.03  193.63 5342.03  197.52  5342.1  199.46 5342.14   201.4 5342.17
  203.34 5342.23  205.29 5342.33  207.23 5342.38  209.17 5342.54  211.12 5342.65
  216.94 5342.68  218.89 5342.68  224.72 5342.71  226.66 5342.71  234.43 5342.75

Manning's n Values        num=       1
     Sta   n Val
       0     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           49.5  158.16           166.01  183.79  192.35             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
     209  234.435352.531

CROSS SECTION


RIVER: Bear_Bline_Split
REACH: 1                  RS: 262

INPUT
Description:
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5339.73    1.96  5339.5    3.91 5339.13    5.87 5338.87    7.83 5338.85
    9.78 5338.86   11.74 5338.87    13.7 5338.85   15.66 5338.86   17.61 5338.85
   19.57 5338.81   21.53  5338.8   23.48 5338.77   25.44 5338.76    27.4 5338.71
   29.35 5338.65   31.31 5338.61   33.27 5338.57   35.23 5338.51   37.18 5338.42
   39.14 5338.36    41.1 5338.29   41.94 5338.24   43.05 5338.18   45.01  5338.3
   46.97 5338.58   48.92 5338.62   50.88 5338.64   52.84 5338.67   54.79  5338.8
   56.75 5338.81   58.71 5338.82   60.67 5338.84   62.62 5338.89   64.58 5338.96
   66.54 5339.21   66.73 5339.22   68.49 5339.26   70.45 5339.08   72.41 5339.07
   74.36 5339.06   76.32 5339.12   78.32 5339.13   80.31 5339.11   82.31 5339.08
   84.31 5339.04    86.3 5338.98    88.3 5338.95    90.3 5338.91   92.29 5338.92
   94.29 5338.87   96.29 5338.86   98.28 5338.83  100.28 5338.89  102.28 5338.97
  104.27 5339.01  106.27  5338.8  108.27 5338.75  110.26 5338.73  112.26  5338.7
  114.26 5338.62  116.25  5338.6  118.25 5338.62  120.25 5338.58  122.24 5338.58
  124.24 5338.58  126.24 5338.56  128.23 5338.52  130.23  5338.5  132.22 5338.49
  134.22 5338.46  136.22 5338.44  138.21  5338.4  140.21 5338.39  142.21 5338.37
   144.2 5338.35   146.2 5338.34   148.2 5338.29  150.19 5338.26  152.19 5338.25
  154.19 5338.24  156.18 5338.23  158.18 5338.24  160.18 5338.25  162.17 5338.19
  164.17 5338.08  166.17 5338.05  168.16 5338.14  169.13 5338.14  170.16 5338.14
  172.16 5338.18  174.15  5338.2  176.15 5338.33  178.15 5338.41  180.14 5338.41
  182.14 5338.41  184.14 5338.38  186.13 5338.37

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015   41.94     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        104.27  176.15           159.89  144.54  126.06             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  172.07  186.135348.174

CROSS SECTION


RIVER: Bear_Bline_Split
REACH: 1                  RS: 118

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5336.4       2 5336.53    3.99 5336.19    5.99 5336.15    7.99 5336.18
    9.98 5336.18   11.98 5336.18   13.98 5336.19   15.98 5336.21   17.97 5336.21
   19.97 5336.17   21.97 5336.16   23.96 5336.16   25.28 5336.15   25.96 5336.14
   27.96 5336.14   29.95  5336.1   31.95 5336.08   33.95 5336.04   35.95 5335.99
   37.94 5335.94   39.94 5335.89   41.94 5335.88   43.93 5335.82   45.93 5335.78
   47.93 5335.71   49.92 5335.71   50.83 5335.86   51.92 5336.05   53.92 5336.28
   55.92 5336.35   57.91 5336.34   59.91 5336.38   61.91 5336.43    63.9 5336.46
    65.9 5336.46    67.9  5336.5   69.89 5336.54   71.89 5336.56   73.89 5336.59
   75.89 5336.61   77.77 5336.64   77.88 5336.65   79.88 5336.65   81.88 5336.69
   83.87 5336.66   85.87 5336.72   87.87 5336.78   89.86 5336.86   91.86 5336.94
   93.86 5336.98   95.85 5336.98

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015   50.83     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
               2   81.88            43.67  117.77   66.52             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   85.84   95.855346.717

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 4014

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5368.8    5.99 5368.71    7.98 5368.74   11.97 5368.68   13.53 5368.53
   13.97 5368.49   15.81 5367.83   17.96  5367.2   19.95 5366.31   21.95 5364.97
   25.94 5361.43   27.93 5359.81   29.93 5358.62   31.92 5357.72   33.92 5356.67
   35.92 5355.89   37.91 5355.55   44.42 5355.59   47.89 5355.58   51.88 5355.51
   55.87 5355.37   57.86 5355.34   59.86 5355.37   61.85 5355.63   63.85 5355.76
   65.21 5356.27   65.85 5356.51   67.84 5357.76   69.84 5358.33   71.83 5358.61
```

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   73.83 5358.74   75.82 5358.53   77.82 5358.39   79.81 5358.42    85.8 5358.74
   89.79 5358.75   93.78 5358.96  101.76 5359.17  103.76 5359.12  111.74  5359.1
  115.73 5359.02  119.72 5359.09  123.71 5359.22   129.7 5359.23  131.69 5359.21
  135.68 5359.07  141.67    5359  145.66 5358.87  151.64 5358.79  155.63  5358.8
  157.63 5358.76  161.62 5358.78  165.61 5358.86   169.6 5359.05  173.59 5359.34
  175.59 5359.64  177.58 5360.22  179.58 5360.87  181.57 5361.31  183.57 5361.55
  185.56 5361.62  187.56 5361.36  189.55 5360.67  191.55 5360.26  193.55 5360.29
  195.54 5360.55  197.54 5360.58  201.53 5360.23  202.49 5360.21  203.52 5360.19
  205.52 5360.33  209.51 5360.53   211.5 5360.59  215.49 5360.65  219.48 5360.67
  225.47 5360.69  233.45 5360.49  237.44 5360.29  239.44 5360.22  241.43 5360.08
  243.43 5360.21  245.01 5360.41  249.41 5360.64  251.41  5361.1   255.4  5362.6
   257.4 5363.14  259.39  5363.6  260.96  5363.9  263.38 5364.27  265.38 5364.44
  267.37 5364.52  271.36 5364.49  273.36 5364.29  275.35 5364.16  277.35 5364.19
  279.34 5364.59  283.33  5365.1  287.33 5365.17  293.31 5365.63   297.3  5365.9

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   13.53     .08   44.42    .015   65.21     .06  202.49    .015
  245.01     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         27.93   71.83           192.11  190.25  178.04             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  283.53   297.3 5375.12

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 3824

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5366.15       4 5366.08       6 5366.14       8 5366.09   11.99 5366.08
   13.99 5366.04   19.99 5365.99   25.98 5365.92   29.98 5365.81   33.98 5365.75
   39.98 5365.63   41.97 5365.52   43.92 5364.85   44.18 5364.67   45.97 5363.23
   47.97  5362.1   49.97 5360.87   53.97 5358.66   55.97 5357.52   59.96 5355.12
   61.96 5355.03   64.81 5355.11   67.96 5355.16   71.96 5355.17   79.95 5355.15
   81.95 5355.11   85.69 5355.16   87.95 5355.19   89.95 5355.16   91.94 5355.19
   95.94 5355.19   99.94 5355.15  101.94 5355.24  103.94 5355.39  107.93 5355.37
  111.93 5355.42  117.93 5355.59  123.93  5355.7  127.92 5355.83  133.92 5355.95
  141.91 5356.21  143.91 5356.11  149.91 5356.28  153.91 5356.41   157.9  5356.6
   165.9 5356.84   169.9 5356.84  175.89 5356.97  177.89 5357.07  179.89 5357.07
  183.89 5357.14  187.89 5357.16  191.88 5357.29  193.88 5357.45  195.88 5357.45
  197.88 5357.34  199.88 5357.32  201.88 5357.47  203.88 5357.68  205.88  5357.8
  211.87  5357.8  213.87 5357.66  215.87 5357.44  216.78  5357.4  217.87 5357.37
  221.87 5357.51  229.86 5357.43  231.86  5357.5  235.86 5357.52  243.85 5357.48
  249.85 5357.34  253.85  5357.2  255.85 5357.21     257 5357.29  259.84 5357.47
  261.84 5357.65  265.84 5358.12  269.84 5358.44  271.84 5358.57  275.83  5358.9
   280.4  5359.2  285.83 5359.56  291.82  5359.8  293.82 5359.82  299.82 5360.02
  303.82 5360.21  305.82 5360.34  309.81 5360.42  311.81 5360.56  313.81 5360.58
  317.81 5360.81  321.81 5360.95   325.8 5361.06   329.8  5361.1   331.8 5361.19
   335.8 5361.27   337.8 5361.45   339.8 5361.69  343.79 5361.87  347.79 5361.94

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   44.18     .08   64.81    .015   85.69     .06  216.78    .015
     257     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         43.92   280.4           250.87  250.34  314.02             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  149.53   336.95366.272       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   336.9  347.795371.334

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 3574

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5363.64    1.99 5363.69    3.98  5361.6    5.97 5358.08    7.96 5357.43
   11.94 5357.42   13.93 5357.36   21.89  5357.3   27.86  5357.2   29.85 5357.15
   33.82 5357.16    37.8 5357.06   43.77 5356.99   47.75 5356.96   49.74 5356.98
   55.71 5356.86   59.69 5356.88   63.67 5356.85   65.77 5356.81   69.64 5356.74
   71.63 5356.75   73.62 5356.66   75.61 5356.39   76.88 5356.09   79.59 5355.46
   81.58 5354.93   83.57 5354.49   85.56 5354.22   89.54 5354.06   91.53 5354.05
   94.08 5354.11   95.51 5354.15    97.5 5354.28   99.48 5354.67  103.46 5355.73
  105.45 5356.31  107.44 5356.68  109.19 5356.79  111.42 5356.86  113.41 5356.98
  117.39 5357.16  119.38 5357.39  121.37 5357.57  125.35 5357.79  127.34 5357.95
  129.33 5358.07  133.31 5358.14   135.3 5358.22  139.28 5358.49  143.26 5358.58
  145.25 5358.59  147.24 5358.65  149.23 5358.83  153.21 5358.76   155.2  5358.8
  157.19 5358.77  161.17 5358.82  163.16 5358.81  169.12 5358.71  175.09 5358.87
  179.07 5358.87  189.02 5359.01  191.01 5359.05     193 5359.03  194.99 5358.78
  196.98 5358.69  198.97  5358.8  200.96 5358.86  204.94 5358.93  206.93 5358.92
  210.91 5358.96  214.89 5358.86  222.85 5358.75  224.84 5358.79  228.82 5358.78
   230.8 5358.71  232.79 5358.54  234.52 5358.47  236.77  5358.3  238.76 5358.11
  242.74 5358.42  244.73 5358.54   250.7 5358.78  256.67 5358.91  260.65 5358.94
  262.64  5358.9  266.62 5358.76  272.59 5358.43  276.57 5358.12  280.55 5358.36
  284.53 5358.95  285.16 5358.98  286.52 5359.05  294.47 5359.29  296.46 5359.38
  300.44  5359.5  304.42 5359.46   308.4 5359.49  314.37  5359.6  316.36 5359.61

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   65.77     .08   94.08     .13  234.52    .015  285.16     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         76.88  109.19           221.95   221.2  220.33             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  144.89  169.195368.588       F
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Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  312.33  316.365369.563  169.19  194.925368.708

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 3352

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    5357       2 5354.79       8 5354.75    9.99 5354.71   13.99 5354.74
   15.99 5354.74   19.99 5354.71   21.99 5354.74   23.99 5354.75   25.99 5354.67
   29.98 5354.59   31.98 5354.58   33.98 5354.51   35.98 5354.46   37.98 5354.45
   39.98 5354.41   41.98  5354.4   43.98 5354.32   45.97 5354.32   49.97 5354.24
   51.97 5354.24   53.97 5354.15   57.97 5354.14   59.58 5354.12   61.97 5354.07
   63.96 5354.06   65.67 5354.01   65.96 5354.01   67.96 5353.85   69.96  5353.6
   71.96 5353.29   73.96 5352.84   75.96 5352.34   77.96 5351.88   79.96 5351.38
   81.95 5351.12   83.95 5350.72   85.95 5350.71   87.95 5351.01   89.95  5351.4
   91.12 5351.66   91.95 5351.86   93.95  5352.6   95.95  5353.2   97.95 5354.56
   99.94 5355.42  101.94 5355.83  103.94 5356.16  105.94 5357.08  107.94 5357.71
  111.94 5358.61  112.39 5358.69  113.94 5358.93  115.94 5359.18  117.93 5359.49
  119.93  5359.7  121.93 5359.77  123.93  5359.8  125.93 5359.88  129.93 5360.07
  137.92  5360.5  141.92 5360.73  143.92 5360.91  149.92 5361.11  151.92  5361.2
  153.91 5361.27  155.91 5361.32  157.91 5361.39  159.91 5361.41  161.91 5361.35
  167.91  5361.3  169.91 5361.25   171.9 5361.23   173.9 5361.25   181.9 5361.21
   185.9  5361.2  189.89 5361.17  191.89 5361.19  199.89 5361.07  201.89 5361.05
  205.89 5360.96  207.88 5360.94  209.88 5360.82  211.88 5360.76  215.88 5360.71
  217.88 5360.67  219.88 5360.58  221.88 5360.45  225.87 5360.15  229.29 5359.84
  229.87 5359.79  231.87 5359.71  233.87 5359.76  235.87 5359.83  237.87 5359.94
  239.87 5360.03  243.86  5360.3  245.86 5360.35  247.86 5360.48  249.86 5360.48

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   59.58     .08   91.12     .13  229.29    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         65.67  112.39           133.58  178.63  209.71             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     147   190.65371.005       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  112.65     147 5368.74

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 3174

INPUT
Description:
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5355.35   90.91 5355.45  163.96 5355.79  201.71 5355.66  287.94 5355.96
  341.92 5355.93  393.91 5356.25   449.9 5356.35  493.89 5356.83  575.87 5357.08

Manning's n Values        num=       1
     Sta   n Val
       0    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         90.91  393.91           121.97  120.98  127.66             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0     160    5359

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 3053

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5348.58    7.97 5348.55    9.96 5348.51   13.95  5348.5   15.94 5348.52
   17.94 5348.49   25.91 5348.54    27.9 5348.45   29.89  5348.5   31.89 5348.45
   33.88 5348.62   35.87 5349.11   37.87 5349.32   41.85 5349.52   45.84 5349.78
   47.83 5349.74   49.82 5349.85   59.79 5349.78   63.77 5349.62   65.77  5349.5
   67.76 5349.49   69.75 5349.41   73.74 5349.33   77.72 5349.16   79.72 5349.03
   82.45 5348.45   85.69 5347.83   87.69 5347.35   89.68 5346.81   91.67 5346.49
   93.67 5346.38   97.65 5346.34   99.65 5346.27  103.63 5346.23  107.62 5346.13
  109.61 5346.03   113.6    5346  117.58 5345.91  119.57 5345.82  123.56 5345.75
  129.54 5345.67  131.53 5345.58  133.52 5345.54   141.5 5345.51  151.46 5345.36
  155.45 5345.33  157.44 5345.36  163.42 5345.21   169.4  5345.2  171.39 5345.15
  175.38 5345.11  179.36 5345.13  185.34 5345.11  189.33 5345.04  193.31 5345.04
  201.28 5344.98  205.27 5344.91  217.23 5344.82  219.22 5344.76  223.21 5344.73
  229.18 5344.64  231.18 5344.57  233.17 5344.77  235.16 5345.07  237.16  5345.2
  243.13 5345.25  245.13 5345.24  247.12 5345.12  249.11 5345.06  251.11 5344.86
   253.1 5344.71  255.09 5344.61  257.08 5344.63  259.08 5344.56  261.07 5344.65
  263.06 5344.68  265.06 5344.66  267.05 5344.71  271.04 5344.74  273.03 5344.73
  277.01 5344.78  279.01 5344.75  282.99 5344.78  284.99 5344.74  288.97 5344.75
  290.96  5344.7  292.96 5344.71  296.94 5344.77  300.93 5344.78  306.91 5344.77
  310.89 5344.79  312.89 5344.74  316.87 5344.81  320.86 5344.93   323.7 5344.92
  328.83 5344.91  330.82 5344.94  334.81 5344.95  340.79 5345.05  342.78 5345.03

Manning's n Values        num=       1
     Sta   n Val
       0     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         82.45   323.7            74.72   81.16   62.95             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  337.77  342.785354.988       F
```

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CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 2972

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5347.31       2 5347.25       4 5347.14       8 5346.86      10  5346.8
   13.99 5346.58   15.99 5346.56   21.99 5346.31   25.99 5346.19   29.99 5346.12
   31.99 5346.02   33.99 5346.03   37.99 5345.94   39.98 5345.94   43.98 5345.87
   45.98 5345.87   47.98 5345.82   49.98 5345.73   51.98 5345.71   55.98 5345.55
   57.98 5345.49   59.98 5345.48   63.98 5345.31   67.97 5345.57   69.97 5345.56
   71.97 5345.46    74.3 5345.39   77.97 5345.25   81.97 5345.16   83.97  5345.2
   85.97 5345.08   89.97 5345.01   93.96 5345.03   95.96 5344.97   97.96 5344.81
   99.96 5344.74  103.96 5344.56  105.96 5344.51  107.96 5344.39  111.96  5344.4
  113.96 5344.32  115.96 5344.11  117.95 5343.98  119.95 5343.98  121.95 5344.04
  123.95 5344.04  125.95 5344.14  127.95 5344.41  129.95 5344.62  133.95 5344.79
  135.95 5344.79  139.95 5344.31  141.95 5344.24  145.94 5344.07  147.94 5344.01
  149.94 5343.97  151.94 5343.91  153.94 5343.91  155.94 5343.87  157.94 5343.94
  163.94 5344.02  165.94 5344.01  169.93 5344.24  171.93 5344.15  173.93 5343.97
  175.93 5343.87  177.93 5343.83  185.93 5343.87  187.93 5343.87  193.93 5343.84
  195.92 5343.85  197.92 5343.83  199.92 5343.84  203.92 5343.82  205.92 5343.86
  211.92 5343.88  215.92 5343.93  217.92 5343.89  221.91 5343.88  223.91 5343.92
  225.91  5343.9  231.91 5343.96  233.91 5343.95  235.91 5344.03  237.91 5344.21
  243.91 5344.27   245.9 5344.35   247.9 5344.38   249.9 5344.37   251.9 5344.31
   253.9 5344.38   257.9 5344.44   261.9 5344.54  264.53 5344.74   265.9 5344.87
   267.9 5344.94   269.9 5344.96  273.89 5345.02  281.89 5345.12  287.89 5345.21

Manning's n Values        num=       1
     Sta   n Val
       0     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          74.3  264.53           207.91   184.1  163.06             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   10.22   10.265356.787       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   10.225357.311  264.64  287.895354.784

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 2787

INPUT
Description:
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5342.59    1.99 5342.56    3.99 5342.52    5.98  5342.5    7.97 5342.47
    9.96 5342.43   11.95 5342.36   13.95 5342.23   15.94 5342.05   16.71    5342
   17.93 5341.93   19.92  5341.9   21.92 5341.83   23.91 5341.72    25.9 5341.61
   27.89 5341.54   29.89 5341.52   31.88 5341.48   33.87 5341.42   35.86 5341.38
   37.86 5341.34   39.85 5341.29   41.84 5341.27   43.83 5341.27   45.83 5341.25
   47.82 5341.26   49.81  5341.3    51.8 5341.34    53.8 5341.43   55.79 5341.55
   57.78 5341.71   59.77 5341.92   61.77 5342.16   63.76  5342.4   65.75 5342.57
   67.74 5342.53   69.74 5342.43   71.73 5342.28   72.39 5342.21   73.72 5342.08
   75.71 5342.05   77.71 5342.12    79.7 5342.22   81.69  5342.3   83.68 5342.31
   85.68 5342.32   87.67 5342.31   89.66 5342.32   91.65 5342.35   93.65  5342.4
   95.64 5342.48   97.63 5342.55   99.62 5342.53  101.62 5342.52  103.61  5342.5
   105.6 5342.49  107.59 5342.48  109.59 5342.46  111.58 5342.45  113.57 5342.43
  115.56 5342.42  117.56  5342.4  119.55  5342.4  121.54 5342.41  123.53 5342.42
  125.53 5342.42  127.52 5342.42

Manning's n Values        num=       1
     Sta   n Val
       0     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         16.71   63.76           149.46  150.31  150.41             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   80.72   81.74 5352.29       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   16.325352.592   81.74  127.525352.305

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 2637

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5340.05    3.98 5340.05    5.97 5340.06    9.95 5340.06   11.93 5340.07
   13.92 5340.07   15.91 5340.08    17.9 5340.08   19.89 5340.09   23.87 5340.09
   25.86  5340.1   27.85  5340.1   29.84 5340.11   31.82 5340.11   33.81  5340.1
    35.8 5340.06   36.04 5340.06   37.79 5340.05   39.78 5339.99   43.76 5339.91
   45.75 5339.85   49.73 5339.75   51.72 5339.71    53.7 5339.68   55.69 5339.63
   57.68  5339.6   59.67 5339.57   61.66 5339.56   63.65 5339.51   65.64 5339.49
   67.63 5339.48   69.62 5339.48   71.61 5339.56    73.6 5339.59   75.58 5339.61
   77.57 5339.66   79.56 5339.72   81.55 5339.73   83.54 5339.78   85.53  5339.8
   87.52 5339.86   89.51 5339.88    91.5 5339.91   93.49 5339.97   95.47 5340.04
   97.46 5340.13   97.81 5340.13   99.45 5340.14  101.44 5340.24  103.43 5340.31
  105.42 5340.39  107.41 5340.44   109.4 5340.49  111.39 5340.56  113.38 5340.59
  115.36 5340.64  117.35 5340.69  119.34 5340.72  121.33 5340.75  123.32 5340.79
  125.31 5340.95   127.3 5340.98  129.29 5341.02  131.28 5341.07  133.27 5341.13
  135.26  5341.2  137.24  5341.2  139.23 5341.25  141.22 5341.31  143.21  5341.4
   145.2 5341.44  147.19 5341.47  149.18 5341.59  151.17 5342.04  153.16  5342.1
  155.15 5342.13  157.13 5342.18  159.12 5342.33  161.11 5342.37   163.1 5342.35
  165.09 5342.44  167.08 5342.63  169.07 5342.69  171.06 5342.71  173.05 5342.72
  175.04 5342.74  177.03 5342.76     181  5342.8  182.99 5342.81  184.98 5342.83
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  188.96 5342.85  190.95 5342.85  192.94 5342.86  194.93 5342.86  196.92 5342.87
  198.91 5342.87  202.88 5342.89  204.87 5342.89  206.86  5342.9  208.85  5342.9

Manning's n Values        num=       1
     Sta   n Val
       0     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          36.04   97.81          171.16  191.16  222.37             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  121.56  159.765350.751       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   36.045350.045  159.76  208.855352.348

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 2446

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5340.04    3.99 5340.06    7.98 5339.98   11.97 5339.95   15.96 5339.98
   19.95 5340.08   23.94 5340.04   27.93 5340.15   31.92 5340.14   33.91 5340.17
    37.9 5340.35    39.9 5340.39   45.88 5340.41   47.88 5340.33   51.87 5339.96
   53.86 5339.86   57.85 5339.81   61.84 5340.04   81.79 5340.26   87.77 5340.35
   91.76 5340.58   99.74 5340.49  101.74 5340.38  105.18 5339.65  107.72 5339.29
  109.72 5338.93   115.7 5337.75   117.7 5337.57  121.69 5337.49  123.09 5337.42
  125.68 5337.14  127.67  5337.1  129.67 5337.29  133.65 5337.59  135.65 5337.68
  137.64 5337.67  139.64 5337.59  145.62 5337.19  147.62 5337.13  149.61 5337.47
  151.61 5338.04   153.6 5338.35   155.6 5338.23  159.59 5337.33  161.58 5337.18
  163.58 5337.29  171.56 5337.55  177.54 5337.61  183.53 5337.49  189.52 5337.24
   193.5 5337.18   195.5 5337.38  197.49 5337.75  199.49 5338.05  201.48 5338.26
  203.47 5338.26  205.47  5338.1  207.46 5338.03  211.45 5337.96  215.44 5337.95
  217.44 5337.82  221.43 5337.23  223.42 5337.18  225.42 5337.22  241.38 5337.28
  247.36 5337.33  249.36  5337.3  251.35 5337.45  253.35 5337.76  255.34 5337.79
  263.32 5337.99   271.3 5338.05  279.28 5338.18  289.25 5338.28  295.24 5338.43
  297.23 5338.57  299.23 5338.93  303.22 5339.87  307.21 5340.63   311.2  5341.1
  315.19 5341.77  317.71 5342.11  321.17  5342.4  325.16 5342.32  331.15 5342.44
  333.14  5342.8  335.14 5343.41  337.13 5343.58  341.12 5343.64  345.11 5343.78
   349.1 5343.88  357.08 5343.94  365.06  5344.1  367.05 5344.08  371.04 5344.21
  375.03 5344.27  381.02 5344.45     387 5344.56  394.98 5344.51  396.98 5344.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  123.09    .015  189.52     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         105.18  317.71          169.94  170.19   173.6             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  201.48  396.98    5340       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0  105.265350.044   390.9  396.98 5354.53

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 2                  RS: 2276

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5342.41       4  5342.4    7.99 5341.89   15.99 5341.18   25.98 5340.41
   29.97 5340.21   33.97 5340.12   37.97 5339.98   39.97 5339.96   45.96  5339.8
   53.95 5339.49   63.95 5339.27   69.94 5339.09   77.93 5338.91   79.93 5338.84
   89.92 5338.64  101.91 5338.33  105.91 5338.26   117.9 5337.89   121.9 5337.74
  129.89  5337.6  137.88 5337.39  141.88 5337.26  147.87 5337.13  157.87 5336.96
  161.86 5336.95  167.86 5336.79  173.85 5336.67  179.85  5336.6  183.84  5336.6
  187.84  5336.5  191.84 5336.47   196.4 5336.36  203.83 5336.24  213.82 5335.95
     217  5335.7  219.81 5335.31  221.81 5335.28  225.81 5335.51   229.8 5335.64
   233.8 5335.57  241.79 5335.17  243.79 5335.31  245.79 5335.62  251.79 5335.76
  257.78 5335.66  261.78 5335.27  263.78 5335.21  271.77 5335.36  275.77 5335.34
  280.33  5335.2  283.76 5335.12  287.75 5335.62  291.75 5335.58  293.75 5335.62
  297.75 5335.46  299.74 5335.49  307.74 5335.75  313.73 5336.03  317.73 5335.99
  321.73 5336.08  325.72    5336  331.72 5336.15  335.71 5336.37  337.71 5336.54
  339.71 5336.61  341.71 5336.54  345.71 5336.58   351.7 5336.86  363.69 5336.81
  371.68  5336.9  377.68 5337.13  387.67 5337.32  391.67 5337.37  395.66 5337.25
  399.66 5337.57  401.66 5337.87  403.66 5338.38  411.65 5340.93  413.65 5341.43
  415.65 5341.83  417.64 5342.04  419.28 5342.08  425.64 5342.27  427.64 5342.85
  429.63  5343.6  433.63 5343.74  437.63 5343.71  447.62  5343.7  453.61  5343.8
  455.61 5343.79  459.61 5343.89   465.6 5343.96   471.6 5344.07   473.6 5344.15
  477.59  5344.2  485.59 5344.45  487.58 5344.46  491.58 5344.62  497.58 5344.64

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06     217    .015  280.33     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          196.4  339.71          248.46  229.36  205.24             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  465.95  489.075353.975       F
    7.81  150.095351.906       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    7.815352.413  489.07  497.585354.526

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 1                  RS: 2046
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INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5336.3       2 5336.13    9.98 5335.99   15.96 5335.81      19 5335.68
   23.94 5335.51   25.94 5335.37   27.93 5335.09   31.92 5335.16   35.91 5335.15
    39.9  5335.3   47.89 5335.35   51.88 5335.43   55.87 5335.45   59.86 5335.38
   63.85 5335.38   67.84 5335.31   71.83 5335.31   73.82 5335.25   79.81 5335.23
    83.8 5335.26   87.79 5335.21   93.78 5335.25  102.35 5335.11  105.75 5335.08
  111.73 5334.98  115.72 5334.87  117.72 5334.87  127.69 5334.67  131.68 5334.67
  135.67 5334.57  143.66 5334.46  147.65 5334.38  151.64 5334.26  153.63 5334.14
  155.63 5334.11  159.62 5333.92   167.6  5334.1  173.24 5334.14  175.58 5334.11
  181.57 5334.13  183.56 5334.19  185.56 5334.07  189.55 5334.08  193.54 5334.15
  197.53 5334.08  201.52 5334.11  203.51 5334.07   209.5 5334.16  213.49 5334.16
  219.47 5334.31  227.46 5334.11  233.44 5334.32  235.44 5334.35  239.43 5334.52
  241.42 5334.65  247.41 5334.63  255.39 5334.82  259.38 5334.81  267.36 5335.01
  269.35    5335  273.35 5334.78  277.34 5334.85  281.33 5335.06  283.32 5335.09
  287.31  5335.3  289.31 5335.36  297.29 5335.51  299.28 5335.62  307.26 5335.75
  313.25 5335.92  315.24 5336.23  317.24 5336.74  321.23 5338.12  325.22 5339.36
  327.22 5339.66  331.21 5339.76   333.2 5339.99   335.2 5340.73  337.19 5341.29
  339.19 5341.57  341.18  5341.7  343.18 5341.65  346.09 5342.25  347.17 5342.55
  349.16 5343.34  351.16 5343.57  363.13 5343.69  367.12 5343.69  371.11 5343.65
   377.1 5343.81  379.09 5343.77  383.08 5343.87  389.07 5343.83  395.05  5343.9
  401.04 5344.05  405.03  5344.2  409.02 5344.27  413.01 5344.26     417  5344.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06      19    .015  173.24     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        102.35  287.31           229.22  208.72  192.02             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  407.18  409.265354.214       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  409.26     4175354.277

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 1                  RS: 1838

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5335.35       2 5335.05    5.85 5334.06    7.99 5333.21    9.99 5332.52
   11.99 5332.32   13.99 5332.02   15.99 5331.96   17.99 5332.09   22.67  5332.3
   25.98 5332.39   27.98 5332.48   31.98 5332.53   33.97 5332.58   37.97 5332.57
   39.97 5332.65   41.97 5332.59   45.96 5332.57   49.96  5332.5   51.96 5332.42
   55.96 5332.32   57.96 5332.33   59.95 5332.24   63.95 5332.19   65.95 5332.86
   67.95 5333.06   69.95 5333.07   71.94 5332.82   73.94 5332.48   75.94 5332.23
   79.94 5332.26   81.94 5332.31   89.93 5332.31   91.93 5332.27   93.93  5332.3
   95.93 5332.24  101.92 5332.16  105.92    5332  107.92 5331.83  109.92 5331.74
  111.91 5331.59  113.91 5332.09  115.91 5332.14  119.91  5332.4  121.06 5332.41
  123.91 5332.45   125.9 5332.52   127.9 5332.54   131.9 5332.72   133.9 5332.75
   135.9 5332.91  139.89  5332.9  141.89 5332.86  145.89  5332.9  147.89 5332.95
  151.88 5332.99  153.88 5332.94  159.88 5332.99  161.88 5332.87  163.87 5332.88
  165.87 5332.94  167.87 5332.95  169.87 5333.01  171.87 5333.19  173.87 5333.65
  175.87 5334.38  179.86 5335.88  181.86 5336.66  183.86 5337.31  189.85 5339.47
  191.85 5340.11  194.71 5340.95  195.85  5341.3  197.85 5341.42  199.85  5341.6
  203.84 5341.87  205.84 5341.86  207.84 5341.72  209.84 5341.65  211.84 5341.63
  213.84  5342.6  215.83 5343.46  217.83 5343.57  219.83 5343.58  221.83 5343.68
  223.83 5343.69  225.83 5343.52  229.82 5343.65  231.82 5343.67  233.82  5343.8
  239.82 5343.89  243.81 5343.91  245.81 5344.02  247.81 5343.98  253.81 5344.33
   255.8 5344.38   259.8 5344.39  269.79 5344.58  283.78 5344.58  291.78 5344.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   22.67    .015  121.06     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         69.95   135.9           258.33   261.2   264.1             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   67.95    5335       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  254.09  291.785354.337

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 1                  RS: 1577

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5330.83    5.98 5330.97    7.58 5330.98   13.96 5331.15   17.95 5331.23
   19.95 5331.18   21.94 5331.23   25.93 5331.23   27.93 5331.38   29.92 5331.36
   33.91 5331.43   35.91 5331.42    39.9 5331.53   47.88 5331.56   51.87 5331.48
   59.85 5331.39   65.83 5331.27   67.83 5331.27    77.8 5331.06   85.78 5330.84
   93.76 5330.79  105.73 5330.65  111.72 5330.54   119.7 5330.24  121.69 5330.12
  125.68 5330.59  127.68  5330.5  128.97 5330.33  129.67 5330.25  133.66 5330.06
  137.65 5330.01  139.65 5329.86  141.64 5329.33  143.64 5329.08  147.62 5329.23
  151.61 5329.24  161.59 5329.39  163.58 5329.46  171.56 5329.62  173.56 5329.61
  181.54 5329.77  185.53 5329.76  189.52 5329.91  193.51 5329.94  199.49 5329.94
  203.48 5329.99  207.47 5330.09  209.47 5330.09  215.45 5330.17  219.44 5330.04
  221.44 5330.13  223.43 5330.12  225.43    5330  227.14    5330  227.42    5330
  229.42    5330  231.41    5330   235.4    5330  241.39    5330  249.37    5330
  257.35    5330  261.34    5330  263.33    5330  265.33    5330  269.32    5330
  273.31    5330  279.29    5330  285.28    5330  287.27    5330  305.22 5330.87
   313.2 5331.28   315.2 5331.35  317.19 5331.32  321.18 5331.15  325.17 5331.21
  331.16 5331.22  335.15 5331.12  345.12 5331.26  349.11 5331.52  351.11  5331.6
   355.1  5331.2  365.07 5331.63  371.06 5331.74  377.04 5331.75  381.03 5332.13
  387.02 5332.13     395 5332.23  396.99 5332.65  400.98 5334.53  402.98    5335
  404.97 5335.02  406.97 5335.16  408.96 5335.77  412.95 5337.72  416.94 5339.72
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  418.94 5340.65  420.93 5341.04  422.93 5341.05  424.92 5341.21  426.92 5341.85

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015  128.97     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        125.68  305.22           216.31  222.59  221.65             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  333.68  340.06 5341.14       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  263.02  333.685337.624

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 1                  RS: 1354

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5333.25    1.99  5333.2    7.77  5332.3    9.97 5332.03   15.96 5331.46
   21.94 5331.02   23.93 5330.98   27.12 5330.43   27.92 5330.25   29.92 5330.26
   31.91  5330.4   39.89 5330.61   45.87 5330.65   47.87 5330.61   57.84 5330.57
   65.82 5330.42   67.81 5330.48    71.8 5330.47   77.79 5330.31   79.78 5330.03
   83.77 5329.89   87.76 5329.94   91.75 5329.93   99.73 5329.79   109.7 5329.56
  117.68 5329.25  119.67 5329.65  122.03    5330  123.66 5330.09  127.65 5329.84
  129.64  5329.8  135.63 5329.86  137.62 5329.71  141.61 5328.81   143.6 5328.45
  147.59 5327.57  149.59 5327.47  155.57 5327.72  157.57 5327.69  161.55 5327.92
  167.54 5328.11  171.53 5328.33   181.5 5328.64  185.49 5328.81  187.48 5328.83
  195.46 5328.62  203.44 5328.36  207.43 5328.05  211.42 5328.44  215.41 5328.56
  223.38 5328.68  229.37 5328.72  233.36 5328.81  241.34 5328.82  245.32 5328.91
  249.31 5328.91   255.3 5329.01  259.29 5329.02  263.27 5329.16  265.27 5329.17
  269.26 5328.88  273.25 5329.02  279.23 5329.14  283.22 5329.12  287.21 5329.24
  293.19 5329.32  297.18 5329.42  303.16 5329.46  307.15 5329.57  313.14 5329.58
   325.1 5329.81   327.1 5329.81  331.09 5329.48  333.08 5329.53  335.08  5329.7
  341.06 5329.85  345.05 5329.84  353.03 5329.95  357.99 5330.13  361.01 5330.22
  370.98 5330.14  374.97 5330.01  378.96 5330.06  384.94 5330.21  386.93 5330.31
  392.92 5330.48  396.91 5330.52  406.88 5330.87  408.87 5331.12  410.87  5331.8
  412.86 5332.34  418.85 5332.43  432.81 5332.57   434.8 5332.77   436.8 5333.57
  438.79  5334.1  444.77 5334.23  452.75 5334.56  460.73 5334.92   470.7 5334.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   27.12    .015  122.03     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        135.63  357.99           207.12   218.8  223.58             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  397.03  456.245340.524       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  456.24   470.75344.719

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 1                  RS: 1135

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5330.49       2 5330.47    3.99  5330.3    6.06 5329.96    9.98 5329.51
   15.97 5329.07   21.95 5328.77   23.95 5328.61   25.94 5328.53   27.94 5327.99
   28.57 5327.92   29.93 5327.77   37.92 5328.08   41.91 5328.11    45.9 5328.17
   51.89 5328.21   57.87 5328.15   63.86 5328.11   65.86 5328.06   67.85 5328.41
   69.85 5328.65   73.84 5328.49   77.83 5328.16   79.83 5327.95   81.82 5327.55
   83.82 5327.36   87.81 5327.41   95.79 5327.45   97.79 5327.41  103.77 5327.37
  107.77 5327.25  113.75 5327.04  117.74 5326.83  119.74 5326.92  121.35 5327.27
  123.73 5327.74  125.73 5327.79  129.72  5327.4  131.71 5327.33   137.7 5327.46
  141.69 5327.42  145.68 5327.29  147.68 5327.32  153.67 5327.27  157.66 5327.13
  163.64 5327.07  167.64 5326.97  173.62 5327.04  189.59 5327.37  199.57  5327.4
  201.56 5327.43  213.54 5327.45  217.53 5327.48  223.51 5327.56   231.5 5327.57
  237.48  5327.7  241.48 5327.83  249.46 5328.03  261.43 5328.23  263.43 5328.22
  269.41 5328.29  273.41 5328.36  279.39  5328.4  285.38 5328.51  287.38 5328.51
  291.37 5328.57  299.35 5328.59  301.35 5328.63  307.33 5328.69  313.32 5328.71
  315.32 5328.74  319.31 5328.74  327.29 5328.83  335.27 5328.84  337.27 5328.86
  343.26 5328.85  347.25 5328.87  349.24 5328.79  353.23 5328.48  355.23 5328.44
  359.22  5328.5  363.21 5328.65   367.2 5328.58  377.18 5328.44  381.17 5328.74
  383.17 5328.86  389.16 5328.96  391.15 5329.05   396.8 5329.63  399.13 5329.82
  403.13 5330.05  409.11 5330.06   413.1 5330.27   415.1  5330.3  419.09 5330.48
  425.08 5330.61  427.07 5330.73  429.07 5330.78  431.06 5330.93  433.06 5331.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   28.57    .015  121.35     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         73.84  273.41           165.81  170.19  170.56             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   69.85 5328.65       F

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 1                  RS: 965

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5328.48       2 5328.59       4 5328.55       6 5328.29     7.1 5328.02
```

```
      10 5327.28      14 5326.48   14.86 5326.21      16 5325.86   23.99 5326.24
   27.99 5326.39   31.99 5326.34   39.99 5326.32   45.99 5326.25   51.99 5325.98
   53.99 5325.93   55.99 5326.01   59.99 5325.75   65.99 5325.92   67.99 5325.86
   71.98 5325.92   85.98 5325.62   91.98 5325.52  101.98 5325.14  103.98 5325.08
  106.02 5325.12  107.98 5325.55  109.98 5325.79  111.98 5325.79  115.97 5325.41
  119.97 5325.43  123.97 5325.49  125.97 5325.62  127.97 5326.11  129.97 5326.48
  131.97 5326.72  133.97 5326.77  135.97 5326.67  137.97 5326.48  139.97 5326.62
  143.97 5326.79  149.97 5326.98  153.97 5326.99  163.96 5326.84  167.96 5326.82
  175.96 5326.72  187.96 5327.08  191.96 5327.12  195.96 5327.03  197.96 5327.05
  199.96 5327.18  203.96  5327.3  213.95 5327.36  217.95 5327.36  225.95 5327.43
  233.95  5327.6  235.95 5327.58  239.95 5327.77  241.95 5327.75  247.95 5327.93
  251.94 5327.95  255.94 5328.03  257.94 5327.84  259.94  5327.8  261.94 5328.05
  263.94 5328.09  269.94 5328.03  273.94 5327.94  279.94  5327.9  281.94 5327.97
  289.94 5328.11  293.94 5328.24  297.93 5328.26  301.93 5328.32  305.93 5328.25
  309.93 5328.24  313.93 5328.29  317.93 5328.14  319.93 5327.64  321.93 5327.22
  323.93 5327.17  327.93 5327.24  329.93 5327.34  331.93 5327.32  335.93 5327.44
  339.92 5327.38  341.92 5327.31  343.92 5327.34  351.92 5327.53  357.92 5327.41
  361.92  5327.4  363.92 5327.54  365.92 5327.84  367.92 5327.84  369.92 5327.91
  371.92 5328.32  373.92  5329.9  375.83 5330.57  377.92 5330.86  383.92 5330.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   14.86    .015  106.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            7.1  131.97           224.38  224.79  225.22             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   27.99    5327       F

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 1                  RS: 740

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5325.55    3.98 5325.47    5.97 5325.48    9.95  5325.3   15.93 5325.13
    21.9 5324.92   25.88 5324.86   27.87 5324.76   35.43  5324.6   39.81 5324.53
   45.79 5324.63   47.78 5324.71   51.76 5324.78   57.73 5324.79    63.7 5324.73
   71.67 5324.55   75.65 5324.41   79.63 5324.42   83.61 5324.36   97.55 5324.31
  103.52 5324.21  111.48 5324.02  115.46  5323.9  119.44 5323.87  121.44 5323.79
  125.42 5323.79  131.39 5323.61  133.38  5323.5  137.36 5323.37  139.65 5323.25
  143.33 5323.14  145.32 5323.14   151.3 5323.36  159.26 5323.39  163.24 5323.51
  167.22 5323.91  169.21 5324.01  175.19  5324.5  181.16 5324.58  189.12 5324.56
   193.1 5324.74  197.08 5324.85  201.07  5324.7  205.05 5324.73  211.02 5324.98
  213.01 5324.88  216.99 5324.85  226.95 5324.96  230.93 5325.05  232.92 5324.99
  238.89 5325.09  244.86  5325.3  246.85 5325.22  256.81 5325.28  266.76 5325.48
  268.75 5325.41  270.74 5325.48  272.73 5325.47  276.71 5325.56   278.7 5325.65
   280.7 5325.62  282.69 5325.77  284.68 5325.77  288.66 5325.93  292.64 5325.96
  294.63  5325.9  296.62 5325.99   300.6 5326.09  304.58 5326.11  308.57 5326.26
  310.56 5326.28  312.55 5326.45  318.52 5326.49  326.48  5326.7  328.47 5326.67
  334.45 5326.86  338.43 5326.88  340.42 5326.68  342.41 5326.18   344.4 5325.87
  346.39 5325.34  348.38 5325.36  352.36 5325.48  354.35 5325.48  360.33 5325.58
  362.32 5325.58  364.31 5325.71   366.3 5325.75  372.27 5325.95  376.25 5326.04
  380.23 5326.05  382.22 5326.13   388.2 5326.13  394.17    5326  398.15 5325.95
  400.14 5325.99  402.69 5326.33  406.11  5326.5   408.1 5326.92  410.09 5326.95

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015  139.65     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           63.7  181.16           130.93  130.66  130.48             .1       .3

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 1                  RS: 610

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5325.5       2 5325.34    5.56 5324.92    9.99 5324.52   11.99 5324.45
   15.98 5324.11   19.98 5323.93   24.75 5323.91   25.97 5323.89   27.97 5323.17
   35.96 5323.34   39.96 5323.48   45.95 5323.56   47.95 5323.52   51.95 5323.54
   55.94 5323.47   59.94 5323.53   61.94 5323.47   63.94 5323.51   69.93 5323.24
   73.93 5323.03   75.92 5322.88   77.92 5323.15   81.92 5322.77   83.92 5322.71
   91.91 5322.69    97.9 5322.58    99.9 5322.59  107.89 5322.41  111.89 5322.27
  115.47  5322.2  117.88 5322.12  119.88 5322.47  121.88 5322.98  123.88 5323.21
  125.87  5323.2  127.87 5322.88  129.87 5322.73  135.86 5322.87  137.86 5322.85
  141.86 5323.69  143.86 5323.49  145.85 5322.97  147.85 5322.83  151.85 5322.99
  155.84 5323.05  163.83 5323.05  169.83 5323.12  171.83 5323.21  175.82 5323.27
  177.82 5323.25  181.82 5323.31  183.81 5323.27  185.81 5323.37  189.81 5323.36
   193.8 5323.46   195.8 5323.45   199.8 5323.58  203.79 5323.59  209.79 5323.55
  213.78 5323.63  219.78 5323.66  221.78 5323.76  223.77  5323.7  235.76 5323.77
  241.76 5323.81  247.75 5323.86  263.73 5324.07  267.73 5324.11  271.73 5324.07
  275.72 5324.13  277.72 5324.11  281.72 5324.23  285.71  5324.2  291.71 5324.29
   295.7 5324.31   297.7 5324.38   301.7 5324.32  307.69 5324.33  313.68 5324.44
  317.68 5324.47  319.68 5324.53  323.67 5324.51  329.67 5324.72  333.66 5324.66
  339.66 5324.74  345.65 5324.74  347.65 5324.79  351.65 5324.79  355.64 5324.85
  357.64 5324.94  363.63 5325.04  367.63 5325.27  369.63 5326.02  372.81 5329.07
  373.62 5329.85  375.62 5331.28  377.62 5331.65  379.62 5331.82  381.62 5331.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   24.75    .015  115.47     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         61.94   199.8           164.78  165.03  165.19             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   51.95    5325       F
  141.86  381.62    5325       F

CROSS SECTION
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```
RIVER: Bear_Creek_Split
REACH: 1                    RS: 444

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5322.25       4 5322.22    7.81  5322.1   15.98  5321.8   17.98 5321.89
   19.98 5322.66   21.98 5322.81   23.97 5323.04   25.97 5323.04   27.97 5322.79
   29.97 5322.31   31.97 5321.39   33.96 5321.37   35.96 5321.38   37.96 5321.35
   39.96 5321.37   45.95 5321.26   47.95 5321.27   49.95 5321.24   51.94 5321.25
   53.94 5321.15   57.94 5321.15   59.93 5321.03   64.71 5320.87   65.93 5320.81
   69.92 5320.67   71.92 5321.25   73.92 5321.56   75.92 5321.69   77.91 5321.55
   79.91 5321.37   81.91 5321.37   85.91 5321.42    89.9 5321.54    95.9 5321.67
   97.89 5321.75   99.89 5321.74  101.89 5321.78  103.89 5321.85  105.88 5322.05
  109.88 5322.55  113.88 5322.74  115.87 5322.78  119.87 5322.77  121.87  5322.8
  125.86 5322.78  127.86 5322.79  129.86 5322.77  131.86 5322.83  133.85 5322.76
  135.85  5322.8  139.85 5322.69  141.84 5322.67  143.84 5322.58  145.84 5322.55
  147.84 5322.61  151.83  5322.6  153.83 5322.55  155.83  5322.6  159.83 5322.62
  163.82 5322.69  165.82 5322.68  167.82 5322.72  171.81 5322.72  173.81 5322.74
  177.81 5322.72   179.8 5322.67   181.8 5322.59   183.8 5322.74   185.8 5322.77
  187.79 5322.69  189.79 5322.74  191.79 5322.66  195.79 5322.62  197.78 5322.67
  199.78 5322.66  201.78 5322.58  205.77 5322.68  207.77 5322.62  209.77 5322.61
  211.77 5322.57  213.77 5322.62  215.76 5322.53  217.76 5322.54  219.76 5322.52
  221.76 5322.57  223.76 5322.59  225.75 5322.57  231.75 5322.71  239.74  5322.8
  243.73 5322.91  247.73 5322.97  251.68 5322.97  253.72 5322.97  255.72 5322.94
  257.72 5322.97  259.72 5322.97  261.71    5323  263.71 5322.96  265.71 5323.01

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015   64.71     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          27.97  113.88           168.97  168.53  168.06             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   23.97 5323.04       F

CROSS SECTION


RIVER: Bear_Creek_Split
REACH: 1                    RS: 276

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5320.44    3.98 5320.45    5.96 5320.43    7.95 5320.39    9.94 5320.29
   13.91 5320.11    15.9    5320   17.89 5319.87   18.66 5319.91   19.87 5319.96
   21.86 5319.91   23.85 5319.78   25.84 5319.79   29.81 5319.84    31.8 5319.85
   35.77 5319.78   37.76 5319.77   41.74 5319.68   45.71 5319.62    47.7 5319.56
   53.66 5319.45   55.65 5319.45   57.64 5319.44   61.61 5319.35   65.59 5319.16
   69.56 5319.01   70.71 5319.02   71.55 5319.03   73.54 5319.35   75.52 5319.48
   77.51 5319.49    79.5 5319.54   83.47 5319.71   85.46 5319.76   87.45 5319.83
   89.44 5319.88   91.42 5319.88   93.41  5319.8    95.4 5319.69   97.39 5319.51
   99.37 5319.41  103.35 5319.46  105.34 5319.45  109.31 5319.48  113.29 5319.48
  115.27 5319.52  119.25 5319.53  123.22 5319.49  125.21  5319.4   127.2 5319.33
  129.19 5319.42  131.17 5319.52  133.16 5319.52  135.15 5319.58  137.14  5319.4
  139.12 5318.74  141.11 5317.99   143.1 5316.93  145.09 5315.78  147.07 5315.34
  149.06 5315.13  151.05 5314.96  153.04 5314.81  155.02 5315.08  157.01 5315.84
  160.99 5316.94  162.97 5317.65  164.96 5318.09  166.95 5318.29  167.26 5318.31
  168.94 5318.42  172.91 5318.54   174.9  5318.7  176.89 5318.91  178.87 5319.24
  180.86 5319.51  182.85  5319.8  184.84 5320.02  186.82 5320.25  188.81 5320.56
   190.8 5320.82  192.79 5321.05  194.77 5321.17  196.76 5321.27  198.75 5321.43
  201.19 5321.67  204.71 5321.98   206.7 5322.07  210.67 5322.14  212.66 5322.16
  214.65 5322.21  216.64  5322.4  218.62 5322.49  220.61 5322.44   222.6 5322.47
  226.57  5322.6  228.56 5322.69  232.54 5322.89  234.52 5322.91  236.51 5322.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   70.71     .08  201.19     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          18.66   85.46            35.95  275.95   41.95             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
      86  236.51    5325       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  221.81  236.515332.451

CROSS SECTION


RIVER: Bluebell
REACH: 1                    RS: 6245

INPUT
Description: Bluebell Trail Crossing (U/S)
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5779.38    1.99 5778.86    3.98 5778.38    5.97 5778.01    7.96 5777.61
    9.95 5777.32   11.94 5777.01   13.93 5776.83   15.92 5776.63   17.91 5776.13
    19.9 5775.77   21.89 5775.39   23.88 5774.77   25.87 5774.15   27.86 5773.78
   29.85 5773.46   31.84 5773.06   33.83 5772.71   35.82 5772.31   37.81 5771.92
    39.8 5771.43   41.79  5770.9   43.78 5770.45   45.77 5770.27   47.76 5770.02
   49.75 5770.02   51.74 5770.16   53.73 5770.27   55.72 5770.26   57.71 5769.98
    59.7 5769.68   61.69 5769.04   63.68  5768.4   65.67 5767.98   67.66 5767.77
   69.65 5767.49   70.54 5767.27   71.46 5767.04   71.64    5767   73.63 5766.04
   75.62 5764.98   77.61 5764.05    79.6 5762.96   81.75 5760.28   94.25 5760.28
   95.52 5763.28   97.51 5764.63    99.5 5765.86  101.49 5767.16  103.48 5768.42
  105.47 5769.56  107.46 5770.67  108.46 5771.12  109.45 5771.57  111.44 5771.75
  113.43 5771.97  115.26 5772.98  115.42 5773.07  117.41 5774.78   119.4 5776.69
  121.39 5777.76  123.38  5778.8  125.37 5779.77  127.36 5780.57  129.35 5781.34
  131.34 5782.17  133.33 5783.28  135.32 5784.42  137.31 5785.25   139.3 5786.52
  141.29 5787.44  143.28 5788.42  145.27 5788.95  147.26 5789.49

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   70.54    .115  115.26     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         71.46  108.46            49.97   49.52   49.23              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   71.75 5770.26       T
  104.25  147.26 5771.57       T
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   81.75   85.45  5766.6   90.55   94.25  5766.6

CULVERT


RIVER: Bluebell
REACH: 1                  RS: 6200

INPUT
Description: Bluebell Trail Crossing  (50% potenential debris block);
culvert
             size = 12.5'Wx6.25'H (semi circular)
modeled culvert size (for
             50% block) = 8.84'Wx4.42'H
Distance from Upstream XS =      10
Deck/Roadway Width        =      26
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      14 5774.71              36  5770.1           55.72 5770.26
      57 5769.86              58 5773.13              84 5773.13
     106 5773.13             107 5769.99             108    5771

Upstream Bridge Cross Section Data
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5779.38    1.99 5778.86    3.98 5778.38    5.97 5778.01    7.96 5777.61
    9.95 5777.32   11.94 5777.01   13.93 5776.83   15.92 5776.63   17.91 5776.13
    19.9 5775.77   21.89 5775.39   23.88 5774.77   25.87 5774.15   27.86 5773.78
   29.85 5773.46   31.84 5773.06   33.83 5772.71   35.82 5772.31   37.81 5771.92
    39.8 5771.43   41.79  5770.9   43.78 5770.45   45.77 5770.27   47.76 5770.02
   49.75 5770.02   51.74 5770.16   53.73 5770.27   55.72 5770.26   57.71 5769.98
    59.7 5769.68   61.69 5769.04   63.68  5768.4   65.67 5767.98   67.66 5767.77
   69.65 5767.49   70.54 5767.27   71.46 5767.04   71.64    5767   73.63 5766.04
   75.62 5764.98   77.61 5764.05    79.6 5762.96   81.75 5760.28   94.25 5760.28
   95.52 5763.28   97.51 5764.63    99.5 5765.86  101.49 5767.16  103.48 5768.42
  105.47 5769.56  107.46 5770.67  108.46 5771.12  109.45 5771.57  111.44 5771.75
  113.43 5771.97  115.26 5772.98  115.42 5773.07  117.41 5774.78   119.4 5776.69
  121.39 5777.76  123.38  5778.8  125.37 5779.77  127.36 5780.57  129.35 5781.34
  131.34 5782.17  133.33 5783.28  135.32 5784.42  137.31 5785.25   139.3 5786.52
  141.29 5787.44  143.28 5788.42  145.27 5788.95  147.26 5789.49

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   70.54    .115  115.26     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
         71.46  108.46              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   71.75 5770.26       T
  104.25  147.26 5771.57       T
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   81.75   85.45  5766.6   90.55   94.25  5766.6

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   61.85 5766.02              64 5768.27              65 5772.14
      89 5772.14             111 5772.14          113.72 5770.42

Downstream Bridge Cross Section Data
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5776.94       2 5776.24    3.99 5775.69    5.99 5775.15    7.98 5774.48
    9.98 5773.54   11.97 5772.67   13.97 5771.91   15.96 5771.05   17.96  5770.3
   19.95 5769.71   21.95 5769.26   23.94 5768.92   25.94 5768.62   27.93 5768.34
   29.93 5768.05   31.92 5768.05   33.92 5767.67   35.91  5767.5   37.91 5767.39
    39.9 5767.34    41.9  5767.5   43.89 5767.69   45.89 5767.86   47.88    5768
   49.88  5767.9   51.87 5767.38   53.87 5766.72   55.86 5766.25   57.86 5766.07
   59.85 5766.07   61.85 5766.02   63.84 5765.69   65.84 5765.29   67.83 5764.99
   69.83 5764.64   71.82 5764.43   73.82 5764.02   75.81 5763.63   77.81 5762.55
    79.8 5761.36   80.75 5759.62   83.79 5758.99   85.79 5758.65   87.78 5758.71
   89.78 5759.12   93.25 5759.62   95.76 5761.91   97.76  5762.8   99.75  5763.9
  101.75 5765.04  103.74  5765.9  105.74 5766.66  107.73 5767.52  109.73 5768.86
  111.72 5769.73  113.72 5770.42  115.71 5770.66  117.71 5770.67   119.7 5770.56
   121.7  5770.3  123.69  5770.3  125.69 5770.41  127.68  5770.5  129.68 5770.65
  131.67 5770.89  133.67 5771.07  135.66 5771.41  137.66 5772.01  139.65 5772.33
  141.65  5771.8  143.64 5771.56  145.64 5772.55  147.63 5773.59  149.63 5775.05
  151.62 5776.48  153.62 5777.88  155.61 5779.39  157.61 5780.51   159.6 5781.43
   161.6 5782.47  163.59  5783.7  165.59  5785.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   67.83    .115  111.72     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
         61.85  111.72              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      70 5770.26       F
     104  165.59 5771.57       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         = 5769.86
Energy head used in spillway design         =
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Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1   Semi-Circle    4.42
FHWA Chart # 41- Arch; Corrugated metal
FHWA Scale # 1 - 90 Degree headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 10      26     .013     .013        0                   .5                 1
Upstream   Elevation =  5760.28
           Centerline Station =  88
Downstream Elevation =  5759.62
           Centerline Station =  87

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 6196

INPUT
Description: Bluebell Trail Crossing (D/S)
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5776.94       2 5776.24    3.99 5775.69    5.99 5775.15    7.98 5774.48
    9.98 5773.54   11.97 5772.67   13.97 5771.91   15.96 5771.05   17.96  5770.3
   19.95 5769.71   21.95 5769.26   23.94 5768.92   25.94 5768.62   27.93 5768.34
   29.93 5768.05   31.92 5768.05   33.92 5767.67   35.91  5767.5   37.91 5767.39
    39.9 5767.34    41.9  5767.5   43.89 5767.69   45.89 5767.86   47.88    5768
   49.88  5767.9   51.87 5767.38   53.87 5766.72   55.86 5766.25   57.86 5766.07
   59.85 5766.07   61.85 5766.02   63.84 5765.69   65.84 5765.29   67.83 5764.99
   69.83 5764.64   71.82 5764.43   73.82 5764.02   75.81 5763.63   77.81 5762.55
    79.8 5761.36   80.75 5759.62   83.79 5758.99   85.79 5758.65   87.78 5758.71
   89.78 5759.12   93.25 5759.62   95.76 5761.91   97.76  5762.8   99.75  5763.9
  101.75 5765.04  103.74  5765.9  105.74 5766.66  107.73 5767.52  109.73 5768.86
  111.72 5769.73  113.72 5770.42  115.71 5770.66  117.71 5770.67   119.7 5770.56
   121.7  5770.3  123.69  5770.3  125.69 5770.41  127.68  5770.5  129.68 5770.65
  131.67 5770.89  133.67 5771.07  135.66 5771.41  137.66 5772.01  139.65 5772.33
  141.65  5771.8  143.64 5771.56  145.64 5772.55  147.63 5773.59  149.63 5775.05
  151.62 5776.48  153.62 5777.88  155.61 5779.39  157.61 5780.51   159.6 5781.43
   161.6 5782.47  163.59  5783.7  165.59  5785.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   67.83    .115  111.72     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         61.85  111.72            83.04   82.62   81.34              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      70 5770.26       F
     104  165.59 5771.57       F

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 6113

INPUT
Description:
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5765.7       2 5764.67       4 5764.03       6 5763.72    7.99 5763.24
    9.99 5763.07   11.99 5762.97   13.99 5762.61   15.99 5762.46   17.99 5762.65
   19.98 5763.19   21.98 5763.59   23.98  5763.3   25.98 5762.28   26.13  5762.2
   27.98 5761.16   29.98 5759.89   31.98 5758.72   33.97  5757.5   35.97 5756.19
   37.97 5754.95   39.97 5754.19   41.97 5753.62   43.97 5753.55   45.96 5753.71
   47.96 5754.17   49.96 5754.52   51.96 5754.66   53.96 5754.49   55.96 5754.15
   57.95 5753.96   59.95  5753.4   61.95 5752.91   63.95 5753.04   65.95  5753.8
   67.95 5754.58   69.95 5754.92   71.94 5755.21   73.94  5755.6   75.94 5756.48
   77.94 5757.16   79.94  5757.6   81.94 5757.93   83.93 5758.33   85.93  5758.7
   87.93 5759.03   88.86 5759.07   89.93 5759.11   91.93 5759.25   93.93 5759.29
   95.93 5759.32   97.92 5759.32   99.92 5759.25  101.92 5759.02  103.92 5758.66
  105.92  5758.8  107.92 5759.12  109.91  5759.3  111.91 5759.32  113.91 5759.33
  115.91 5759.65  117.91 5760.27  119.91 5761.54  121.91 5762.86   123.9 5763.54
   125.9 5764.09   127.9 5764.44   129.9 5764.74   131.9 5765.39   133.9 5766.06
  135.89 5766.79  137.89 5767.56  139.89 5768.49  141.89 5769.46  143.89 5770.31
  145.89 5771.39  147.88 5772.48  149.88 5773.45  151.88 5774.29  153.88 5774.91
  155.88 5775.41

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   26.13    .115   88.86     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         26.13   88.86           111.11  115.63  108.43              .3       .5

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 5998

INPUT
Description:
Station Elevation Data    num=      79
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5763.92    1.98  5762.4    2.71 5761.88    3.95 5760.99    5.93  5759.6
    7.91  5758.4    9.88  5757.6   11.86 5757.15   13.84 5756.94   15.82 5756.59
   17.79 5756.55   19.77 5756.59   21.75 5756.61   23.72 5756.63    25.7 5756.77
   27.68 5756.83   28.96 5756.27   29.66 5755.97   30.12 5755.63   31.63 5754.52
   33.61 5753.15   35.59 5751.76   37.56 5750.05   39.54 5748.49   41.52 5747.17
   43.49 5746.05   45.47 5745.25   47.45 5745.15   49.42 5744.89    51.4 5744.67
   53.38 5744.57   55.36 5744.55   57.33 5744.59   59.31 5744.62   61.29 5744.67
   63.26 5744.76   65.24 5744.85   67.22 5744.94   69.19 5744.88   71.17 5744.88
   73.15 5744.87   75.13 5744.89    77.1 5744.91   79.08 5744.92   81.06 5744.97
   83.03 5744.95   85.01 5744.88   86.99 5744.96   88.97 5745.37   90.94    5746
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   92.92 5746.73    94.9 5747.55   96.87 5748.39   98.85 5749.13  100.83 5749.83
  101.45    5750   102.8 5750.36  104.78 5750.66  106.76 5750.78  108.73 5750.94
  110.71  5751.5  112.69 5752.16  114.67 5752.72  116.64 5753.19  118.62 5753.71
   120.6 5754.33  122.57 5754.99  124.55 5755.61  126.53 5756.19   128.5 5756.78
  130.48 5757.38  132.46 5758.09  134.44 5758.78  136.41 5759.41  138.39  5760.1
  140.37 5760.93  142.34 5761.62  144.32 5762.41   146.3 5763.26

Manning's n Values         num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    2.71     .08   30.12    .115  101.45     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         28.96  101.45            124.84  131.67  125.65             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 5866

INPUT
Description:
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5751.13       2 5750.99    3.22 5750.48    3.99 5750.15    5.71 5748.81
    5.99  5748.6    7.99 5747.28    9.98 5746.25   11.98    5745   13.97 5743.81
   15.97 5743.04   17.97  5742.5   19.96 5741.91   21.96 5741.47   23.96 5741.12
   25.95 5740.75   27.95 5740.35   29.95 5739.95   31.94 5739.69   33.94  5739.4
   35.94 5739.18   37.93 5738.99   39.93 5738.75   41.92 5738.46   43.92 5738.15
   45.92 5737.85   47.91 5737.52   49.91 5737.08   51.91 5736.71    53.9 5736.54
    55.9 5736.37    57.9 5736.32   59.89 5736.18   61.89 5736.02   63.89 5735.75
   65.88 5735.51   67.88 5735.11   69.87 5734.68   71.87 5734.49   73.87 5734.51
   75.86 5734.84   77.86 5735.14   79.86 5735.07   81.85 5735.16   83.85 5735.15
   85.85 5735.32   87.84 5735.66   89.84 5736.07   91.83 5736.57   93.83    5737
   95.83 5737.48   97.82 5738.15   99.82 5738.68  101.82 5739.41  103.52 5740.02
  103.81 5740.13  105.17 5740.64  105.81 5740.88  107.81 5741.73   109.8 5742.77
   111.8 5743.92   113.8 5745.12  115.79 5746.34  117.79 5747.36  119.78 5748.32
  121.78  5749.5  123.78 5751.05  125.77 5751.97  127.77 5753.02  129.77 5754.24
  131.76 5755.81  133.76 5757.26  135.76 5757.44  137.75 5757.96  139.75 5758.98
  141.75 5760.42  143.74  5761.9

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    5.71    .115  103.52     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         41.92  105.17            193.34  194.43  181.62             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 5672

INPUT
Description:
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5740.01    1.76 5739.58    1.98 5739.52     2.5 5739.24    3.95 5738.47
    5.93  5737.1     7.9 5735.69    9.88 5734.49   11.86 5733.29   13.83 5732.41
   15.81 5731.05   17.78 5730.05   19.76 5729.48   21.74 5729.13   23.71 5728.61
   25.69 5728.25   27.66 5727.86   29.64  5727.4   31.62 5727.24   33.59 5726.77
   35.57 5726.13   37.54 5725.75   39.52 5725.59    41.5 5725.43   43.47 5725.04
   45.45 5724.65   47.42 5724.35    49.4 5723.97   51.38  5723.9   53.35 5724.08
   55.33 5724.24    57.3 5724.35   59.28 5725.26   61.26 5726.16   63.23 5726.49
   65.21 5726.33   67.18 5726.13   69.16 5726.12   71.14 5726.44   73.11 5726.64
   75.09 5726.84   77.06 5726.87   79.04 5726.81   81.02 5726.77   82.99 5726.63
   84.97 5726.96   86.94 5727.86   88.92 5728.17    90.9 5728.11   92.87 5727.98
   94.85 5727.72   96.82 5727.53    98.8  5727.7  100.78 5727.73  102.75 5727.91
  104.73 5727.42   106.7 5726.23  108.68 5724.61  110.66 5723.94  112.63 5723.68
  114.61 5723.62  116.58 5723.57  118.56  5723.6  120.54  5723.6  122.51 5723.31
  124.49 5722.82  126.46 5722.72  128.44 5723.03  130.42 5723.75  132.39 5724.61
  134.37 5725.77  136.34 5727.11  138.32 5728.52  138.96 5728.98  139.37 5729.27
   140.3 5729.93  142.27 5731.45  144.25 5733.34  146.22  5734.4   148.2 5735.53
  150.18 5736.14  152.15 5736.47  154.13 5737.71   156.1 5739.15  158.08 5740.67
  160.06 5742.27

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    1.76    .115  138.96     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        102.75  139.37            141.42  144.72  141.82             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   89.92 5728.17       F

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 5527

INPUT
Description:
Station Elevation Data    num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5729.77     .68 5729.27    1.98 5728.32     2.9  5727.7    3.96 5726.98
    5.94 5725.69    7.92 5724.43     9.9 5723.33   11.88 5722.22   13.86  5721.2
   15.84 5720.44   17.82 5719.65    19.8 5718.98   21.78 5718.42   23.76 5718.07
   25.75 5717.74   27.73 5717.38   29.71 5716.98   31.69 5716.67   33.67 5716.41
   35.65 5716.13   37.63 5715.78   39.61 5715.68   41.59  5715.7   43.57 5715.87
   45.55  5714.6   47.53 5713.29   49.51 5712.96   51.49 5712.71   53.47 5712.54
   55.45 5712.52   57.43 5712.58   59.41 5712.62   61.39 5712.21   63.37 5711.68
   65.35 5711.17   67.33 5710.79   69.31 5710.78   71.29 5710.53   73.27 5710.54
   75.26 5710.63   77.24 5710.81   79.22 5711.02    81.2 5711.11   83.18 5711.16
   85.16  5711.2   87.14 5711.19   89.12 5711.13    91.1 5711.16   93.08 5711.12
   95.06 5710.99   97.04 5710.81   99.02 5710.79     101 5710.85  102.98 5710.94
  104.96 5711.05  106.94 5711.14  108.92 5711.29   110.9  5711.6  112.88 5711.84
  114.86 5711.92  116.84 5712.28  118.82 5712.46   120.8 5712.26  122.79 5711.99
  124.77 5711.82  126.75 5711.54  128.73 5711.51  130.71 5711.62  132.69 5711.61
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  134.67  5711.7  136.65 5712.01  138.63 5712.68  140.61 5713.74  142.59 5714.67
  143.79 5715.09  144.57 5715.37  145.52 5715.56  146.55 5715.77  148.53 5716.04
  150.51 5717.08  152.49 5718.55  154.47 5719.54  156.45  5720.5  158.43 5721.76
  160.41 5722.78  162.39 5723.72  164.37 5725.02  166.35 5726.16  168.33 5727.31
  170.31 5728.54   172.3 5729.61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08     2.9    .115  145.52     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         59.41  143.79            31.59    45.4    39.2             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 5481

INPUT
Description:
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5726.53    1.99  5725.4    3.11 5724.65    3.97 5724.06    5.96  5722.8
    7.95 5721.68    9.94 5720.63   11.92  5719.6   13.91 5718.86    15.9 5717.87
   17.88 5717.11   19.87 5716.43   21.86 5715.76   23.84 5715.18   25.83 5714.64
   27.82 5714.24    29.8 5713.82   31.79 5713.35   33.78 5712.87   35.77 5712.54
   37.75 5712.16   39.74 5711.87   41.73 5711.53   43.71 5711.21    45.7 5710.82
   47.69 5710.59   49.67 5710.31   51.66  5710.1   53.65 5709.77   55.64 5709.36
   57.62 5709.07   59.61 5708.93    61.6 5708.78   63.58  5708.6   65.57 5708.35
   67.56 5708.33   69.54 5708.29   71.53 5708.22   73.52 5708.04   75.51 5707.92
   77.49 5707.88   79.48 5707.89   81.47 5707.88   83.45 5707.88   85.44 5707.89
   87.43 5707.99   89.42 5707.87    91.4 5707.81   93.39 5707.77   95.38 5707.33
   97.36 5706.77   99.35 5706.44  101.34 5706.42  103.32 5706.92  105.31 5707.61
   107.3 5707.96  109.28 5708.23  111.27 5708.83  113.26 5709.24  115.25 5709.58
  117.23 5709.88  119.22 5710.09  121.21 5710.13  123.19 5709.94  125.18 5709.85
  127.17 5709.98  129.15 5710.23  131.14 5710.51  133.05 5710.78  133.13 5710.79
  135.12 5711.18   137.1 5711.67  139.09 5712.32  141.08 5712.86  143.06 5713.31
  145.05 5714.09  147.04 5714.72  149.02 5715.53  151.01 5716.23     153  5716.9
  154.99 5717.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    3.11    .115  119.22     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         51.66  119.22            27.63   36.35   29.71             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 5445

INPUT
Description:
Station Elevation Data    num=      82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5726.79    1.99 5725.48    3.98 5724.16    5.97 5722.88    7.96 5721.59
    9.95 5720.44   10.23 5720.27   11.94 5719.22   13.94  5718.2   15.93 5717.25
   17.92  5716.5   19.91 5715.88    21.9 5714.96   23.89 5714.68   25.88 5714.17
   27.87 5713.61   29.86 5713.15   31.85 5712.66   33.84 5712.19   35.83 5711.75
   37.82 5711.45   39.81  5711.2   41.81 5710.85    43.8 5710.38   45.79 5710.02
   47.78 5709.43   49.77 5708.95   51.76 5708.47   53.75 5707.93   55.74 5707.43
   57.73 5706.89   59.72 5706.56   61.71 5706.47    63.7 5706.41   65.69 5705.89
   67.69 5705.73   69.68 5705.32   71.67 5705.04   73.66 5704.78   75.65 5704.15
   77.64 5703.92   79.63 5703.85   81.62 5704.07   83.61 5704.84    85.6 5705.27
   87.59 5705.65   89.58 5705.83   91.57 5706.05   93.57 5706.36   95.56 5706.45
   97.55 5706.58   99.54  5706.6  101.53 5706.68  103.52 5706.76  105.51 5706.75
   107.5 5706.76  109.49 5706.89  111.48  5706.9  113.47 5707.08  115.46 5707.25
  117.45 5707.29  119.44 5707.48  121.44 5707.74  123.43 5707.76  125.42 5707.71
  127.41 5707.35  128.67 5707.24   129.4 5707.17  131.39 5707.56  133.38 5707.77
  135.37 5708.09  137.36 5708.52  139.35 5709.02  141.34 5709.41  143.33 5709.77
  145.32 5710.44  147.31 5711.21  149.31 5711.82   151.3 5712.75  153.29 5713.52
  155.28 5714.37  157.27 5715.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   10.23    .115  121.44     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         55.74  121.44           128.84  123.57  124.57             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 5322

INPUT
Description:
Station Elevation Data    num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5704.98    1.99 5704.37    3.98 5703.65    5.97 5702.81    7.95 5701.85
    9.94 5701.07   11.93 5700.42   13.09 5699.98   13.35 5699.88   13.92 5699.66
   15.91 5698.98    17.9  5698.3   19.89 5697.73   21.88 5697.01   23.87 5696.45
   25.85 5695.72   27.84 5694.83   29.83 5693.95   31.82 5693.19   33.81 5692.78
    35.8 5692.58   37.79 5692.27   39.77 5691.96   41.76 5691.98   43.75 5692.13
   45.74 5692.65   47.73 5693.48   49.72 5694.46   51.71 5695.16    53.7  5695.8
   55.69 5696.53   57.67 5697.38   59.21 5697.76   59.66 5697.88   61.65 5698.53
   63.64  5698.9   65.63 5699.21   67.62 5699.54   69.61    5700   71.59 5700.42
   73.58 5700.77   75.57 5701.41   77.56 5701.82   79.55 5702.19   81.54 5702.42
   83.53 5702.55   85.52  5702.7    87.5 5702.82   89.49 5703.27   91.48 5703.62
   93.47 5703.97   95.46 5703.81   97.45 5703.22   99.44  5702.8  101.43 5702.52
  103.41 5702.25    105.4 5701.92  107.39 5701.74  109.38 5701.59  111.37 5701.49
  113.36 5701.53  115.35  5701.4  117.34 5701.38  119.33 5701.33  121.31 5701.34
   123.3 5701.28  125.29 5701.24  127.28 5701.26  129.27 5701.39  131.26 5701.62
  133.25 5702.22  135.23 5702.94  137.22 5703.89  139.21 5704.85   141.2 5705.87
  143.19 5706.68  145.18  5707.6  147.17 5708.72  149.16 5709.61  151.15 5710.52

Manning's n Values        num=       3
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     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   13.35    .115   59.21     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         13.09   59.21            126.69  127.51  130.01             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 5194

INPUT
Description:
Station Elevation Data    num=      82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5693.91       2 5692.85    3.99 5691.87    5.99 5691.21    7.98 5690.52
    9.98 5689.43   10.64 5689.16   11.98 5688.62   13.97 5687.96   15.97  5687.4
   17.96 5686.81   19.96 5686.26   21.95 5685.62   23.95 5685.13   25.95 5684.57
   27.94 5684.22   29.94 5684.17   31.93 5684.33   33.93 5685.03   35.93 5685.32
   37.92 5685.34   39.92  5685.2   41.91 5685.13   43.91 5684.99    45.9 5684.74
    47.9 5684.56    49.9 5684.81   51.89 5685.39   53.89 5685.62   55.88  5685.7
   57.88 5685.67   59.88 5685.64   61.87 5685.84   63.87 5685.88   65.86 5686.07
   67.86 5686.37   69.86 5686.65   71.85 5686.74   73.85 5687.08   75.84 5687.24
   77.84 5687.46   79.84 5687.74   81.83 5688.14   83.83 5688.41   85.82 5688.67
   87.82 5688.98   89.81 5689.16   91.81 5689.47   93.81 5689.91    95.8 5690.36
    97.8 5690.75   99.79    5691  100.37 5691.06  101.79 5691.19  103.79  5691.2
  105.78 5691.43  107.78 5691.69  109.77 5691.88  111.77 5691.88  113.77 5691.94
  115.76 5692.07  117.76  5692.2  119.75 5692.29  121.75 5692.47  123.74 5692.71
  125.74 5692.79  127.74 5692.81  129.73 5692.89  131.73 5693.08  133.72 5693.52
  135.72  5693.8  137.72 5693.73  139.71 5693.91  141.71 5694.24   143.7 5694.77
   145.7 5695.34  147.69 5695.93  149.69 5696.68  151.69 5697.11  153.68 5697.97
  155.68 5698.83  157.67 5699.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   10.64    .115  100.37     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         10.64  100.37            37.03   36.98   37.59             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 5157

INPUT
Description:
Station Elevation Data    num=      78
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5689.92    1.99 5688.97    3.99 5688.31    5.98 5687.68    7.97 5686.94
    9.36 5686.38    9.96 5686.13   11.96 5685.38   13.95 5684.78   15.94 5684.04
   17.93 5683.09   19.93 5682.11   21.92 5681.81   23.91 5681.81    25.9 5681.71
    27.9 5681.44   29.89 5681.34   31.88 5681.55   33.87 5681.82   35.87 5682.12
   37.86 5682.08   39.85 5682.13   41.84 5682.17   43.84  5682.2   45.83 5682.33
   47.82 5682.19   49.81 5681.77   51.81 5681.46    53.8 5681.05   55.79 5680.97
   57.78 5681.43   59.78 5681.83   61.77 5682.26   63.76 5682.63   65.75 5682.67
   67.75 5682.74   69.74 5683.16   71.73 5683.62   73.73 5683.97   75.72 5684.73
   77.71 5685.72    79.7 5686.68    81.7 5687.38   83.69 5687.62   85.68 5687.55
   87.67 5687.51   89.67 5687.59   91.66 5687.57   93.65 5687.54    94.4 5687.54
   95.64 5687.54   97.64 5687.68   99.63 5687.56  101.62 5687.49  103.61 5687.58
  105.61 5687.72   107.6 5687.88  109.59 5688.03  111.58  5688.1  113.58 5688.27
  115.57 5688.51  117.56 5688.75  119.55 5688.92  121.55 5689.15  123.54 5689.34
  125.53 5689.59  127.52 5689.99  129.52 5690.26  131.51 5690.36   133.5 5690.38
  135.49 5690.82  137.49  5691.1  139.48 5691.32  141.47 5691.42  143.47 5691.59
  145.46 5692.08  147.45  5692.6  149.44  5693.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    9.36    .115    81.7     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9.36    81.7             20.5   20.58    20.9             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 5136

INPUT
Description:
Station Elevation Data    num=      78
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5689.07    1.98 5688.11    3.97 5687.04    5.95 5686.31    7.93 5685.79
    9.91 5685.32    11.9    5685   12.64  5684.9   13.88 5684.74   15.86 5684.19
   17.84  5683.4   19.83 5682.73   21.81 5682.46   23.79 5681.65   25.77 5681.06
   27.76 5680.74   29.74 5680.31   31.72 5680.15    33.7 5680.24   35.69 5680.21
   37.67 5680.51   39.65 5680.84   41.63 5681.14   43.62 5681.43    45.6 5681.71
   47.58 5681.63   49.57 5681.43   51.55 5681.14   53.53 5680.84   55.51 5680.44
    57.5 5679.91   59.48 5679.68   61.46  5679.8   63.44 5680.32   65.43 5680.91
   67.41 5681.07   69.39 5681.22   71.37 5681.42   73.36 5681.64   75.34 5681.89
   77.32 5682.32    79.3 5683.17   81.29 5683.73   83.27 5684.51   85.25 5684.96
   87.23 5685.18   89.22 5685.34    91.2 5685.32   93.18 5685.32   95.06  5685.3
   95.16  5685.3   97.15 5685.21   99.13 5685.26  101.11 5685.33  103.09 5685.39
  105.08 5685.44  107.06 5685.54  109.04 5685.64  111.03 5685.96  113.01 5686.42
  114.99  5686.9  116.97  5686.8  118.96 5686.93  120.94 5687.27  122.92 5687.58
   124.9 5687.96  126.89 5688.28  128.87 5688.65  130.85 5688.96  132.83 5689.15
  134.82 5689.33   136.8  5689.7  138.78 5689.99  140.76 5690.42  142.75 5690.67
  144.73 5690.87  146.71 5691.21  148.69 5691.47

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   12.64    .115   85.25     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         12.64   85.25            55.31   56.75    60.4             .1       .3

CROSS SECTION
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RIVER: Bluebell
REACH: 1                  RS: 5080

INPUT
Description:
Station Elevation Data    num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5684.14    1.98 5684.03    3.97 5683.35    5.95 5682.72    7.93 5681.94
    9.92 5681.23    11.9 5680.57   13.32 5680.05   13.88 5679.84   15.87 5679.21
   17.85 5678.57   19.83 5677.93   21.82 5677.17    23.8 5676.24   25.79 5675.35
   27.77 5674.93   29.75    5675   31.74 5675.27   33.72 5676.23    35.7 5676.97
   37.69 5677.26   39.67 5677.26   41.65 5677.22   43.64  5677.4   45.62 5677.45
    47.6  5677.4   49.59 5677.31   51.57 5677.07   53.55 5676.84   55.54 5676.58
   57.52 5676.34    59.5 5676.36   61.49 5676.59   63.47    5677   65.45 5677.38
   67.44 5677.49   69.42 5677.58    71.4 5677.58   73.39 5677.67   75.37  5678.1
   77.36 5678.77   79.34 5679.34   81.32 5679.63   83.31 5679.99   85.29 5680.32
   87.27 5680.64   88.49 5680.76   89.26 5680.83   91.24 5680.87   93.22 5680.92
   95.21 5681.02   97.19 5680.98   99.17 5680.95  101.16 5680.97  103.14 5680.98
  105.12 5680.96  107.11 5681.08  109.09 5681.25  111.07 5681.22  113.06 5681.17
  115.04 5681.28  117.02 5681.38  119.01 5681.53  120.99 5681.67  122.97  5681.8
  124.96 5682.02  126.94 5682.21  128.93 5682.45  130.91 5682.67  132.89  5682.8
  134.88 5683.02  136.86 5683.21  138.84 5683.44  140.83 5683.83  142.81 5684.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   13.32    .115   88.49     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         13.32   88.49           160.77  169.22  162.64             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 4910

INPUT
Description:
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5669.11    1.99 5669.11    3.98 5668.99    5.96 5668.86    7.95 5668.83
    9.94 5668.62   11.93  5668.3   13.92 5668.04   15.91 5667.69   17.89 5667.37
   19.88  5667.1   21.87 5667.02   23.86 5667.03   25.85 5666.98   27.84 5666.89
   29.82 5666.84   31.81 5666.85    33.8 5666.81   35.79 5666.62   37.78 5666.56
   39.77 5666.54   41.75 5666.51   43.74  5666.3   45.73 5666.16   47.72 5666.08
   49.71 5666.09   51.61 5666.04    51.7 5666.04   53.68 5665.79   55.67  5665.4
   57.66 5665.33   59.65 5664.75   61.64 5664.04   63.63 5663.39   65.61 5662.92
    67.6 5662.77   69.59 5663.08   71.58 5663.92   73.57 5664.82   75.56 5665.34
   77.54 5665.48   79.53 5665.92   81.52 5666.69   83.51  5667.5   84.33 5667.66
    85.5 5667.89   86.02 5667.94   87.49 5668.07   89.47 5668.34   91.46 5668.58
   93.45 5668.72   95.44  5668.8   97.43 5668.97   99.42 5669.28   101.4 5669.84
  103.39 5670.26  105.38 5670.56  107.37 5671.05  109.36 5671.54  111.35 5671.94
  113.33 5672.42  115.32 5672.88  117.31 5673.39   119.3 5674.15  121.29 5674.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   51.61    .115   86.02     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         51.61   84.33           112.93  117.45  118.9              .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 4793

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5660.21    1.98  5659.9    3.96 5659.68    5.94 5659.29    7.92 5658.97
     9.9 5658.98   11.88 5658.79   13.86  5658.3   15.84 5657.86   17.83 5657.77
   19.81 5657.84   21.79 5657.93   23.77 5657.93   25.75 5658.07   27.73 5658.03
   29.71 5658.03   31.69 5657.92   32.17 5657.91   33.67 5657.87   35.24 5657.68
   35.65 5657.63   37.63 5657.39   39.61 5656.99   41.59  5656.6   43.57  5656.3
   45.55 5656.05   47.53 5655.86   49.51 5655.64   51.49 5655.46   53.48 5655.45
   55.46 5655.35   57.44 5655.26   59.42 5655.12    61.4 5655.09   63.38 5654.95
   65.36 5654.62   67.34 5653.59   69.32 5653.54    71.3 5654.38   73.28 5655.06
   75.26 5655.03   77.24 5655.21   79.22 5655.67    81.2 5656.48   83.18 5657.42
   85.16 5658.44   86.87 5659.21   86.88 5659.21   87.15 5659.33   89.13 5660.44
   91.11 5661.51   93.09  5662.1   95.07 5662.76   97.05 5663.36   99.03 5663.97
  101.01 5664.59  102.99 5665.52  104.97 5666.21  106.95 5667.02  108.93 5667.83
  110.91  5668.6  112.89 5669.46  114.87 5670.43

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   35.24    .115   86.87     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         32.17   86.88            38.24   48.09   51.45              .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 4745

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5657.45    1.98 5657.27    3.96 5657.04    5.93 5656.41    7.91  5655.8
    9.89 5655.36   11.87 5654.85   13.84 5654.57   14.04 5654.56   15.82 5654.41
    17.8 5654.06   19.78 5653.87   21.75 5653.53   23.73 5653.25   25.71 5652.99
   27.69 5652.66   29.67  5652.3   31.64 5652.02   33.62 5651.88    35.6 5651.73
   37.58  5651.6   39.55  5651.6   41.53 5651.53   43.51 5651.49   45.49 5651.38
   47.46 5651.11   49.44  5650.5   51.42 5650.35    53.4 5650.61   55.38 5651.08
   57.35  5651.3   59.33 5651.39   61.31 5651.48   63.29 5651.58   65.26 5651.74
   67.24 5651.85   69.05 5652.02   69.22 5652.04    71.2 5652.32   73.17 5652.53
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   75.15 5652.48   77.09  5652.6   79.04 5652.79   80.98 5653.38   82.92 5653.98
   84.86 5654.33   86.81  5654.6   88.75 5654.92   90.69 5655.22   92.63 5655.83
   94.58 5656.16   96.52 5656.65   98.46 5657.43   100.4 5658.09  102.35 5658.74
  104.29 5659.61  106.23  5660.5  108.17 5661.29  110.12 5661.95  112.06 5662.61
     114 5663.33  115.94 5664.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   14.04    .115   84.86     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         14.04   84.86             19.14   24.64   23.06             .3       .5

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 4720

INPUT
Description:
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5657.5    1.93 5657.35    3.86 5657.14     5.8 5657.07    7.73 5656.73
    9.66  5656.3   11.59 5655.94   13.52 5655.74   15.45  5655.5   17.39 5654.97
   19.02 5654.87   19.32 5654.85   21.25 5654.72   23.18 5654.41   25.11  5654.1
   27.05 5653.78   28.98 5653.49   30.91 5653.28   32.84 5653.11   34.77 5652.87
    36.7 5652.63    38.7 5652.31    40.7 5652.08    42.7    5652    44.7 5651.77
   46.69  5651.6   50.69 5651.15   52.69    5651   54.69  5650.9   56.68 5650.84
   58.68 5650.94   60.68 5650.83   62.68 5650.48   64.67 5650.11   66.67 5649.54
   68.67 5649.08   70.67  5649.2   72.45 5649.58   72.67 5649.63   74.66 5650.15
   76.66 5650.17   78.66 5650.19   80.66 5650.27   82.66  5650.5   84.65 5650.66
   86.65 5650.68   88.57 5650.52    90.5 5650.34   92.42 5650.26   94.35 5650.37
   96.27 5650.67   98.19 5651.05  100.12 5651.38  102.04 5651.75  103.96 5652.01
  105.89  5652.8  107.81 5653.43  109.74 5653.84  111.66 5654.13  113.58 5654.47
  115.51 5654.92  117.43 5655.45  119.35 5655.95  121.28 5656.67   123.2 5657.41
  125.13 5658.22  127.05 5658.85  128.97 5659.65   130.9 5660.59  132.82 5661.62
  134.74  5662.6  136.67 5663.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   19.02    .115  107.81     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         19.02  107.81             61.72   49.49   37.76             .3       .5

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 4671

INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    5655    1.98 5654.11    3.97 5653.16    5.95 5652.48    7.94 5652.31
    9.92 5652.23    11.9 5652.26   13.89  5652.3   15.87 5652.17   17.86 5652.16
   19.84 5651.98   21.82  5651.7   23.81  5651.5   25.79 5651.19   27.78    5651
   29.76 5650.85   31.74 5650.69   33.73 5650.55   35.71 5650.48   37.69 5650.33
   39.68 5650.22   41.66 5650.21   43.65 5650.03   45.63 5649.85   47.61 5649.71
    49.6 5649.57   51.58 5649.56   53.57 5649.43   55.55 5649.36   57.53 5649.31
   59.52 5649.25    61.5 5649.23   63.49  5649.1     64 5649.01   65.47 5648.74
   67.45 5648.32   69.44 5647.79   71.42 5646.99   73.41 5646.37   75.39 5645.75
   77.37 5645.27   79.36 5644.77   81.34 5644.25   83.33 5644.09   85.31 5644.02
   87.29 5643.85   89.28 5643.39   91.26 5643.33   93.25 5643.23   95.23 5643.05
   97.21 5643.03    99.2 5643.27  101.18 5643.92  103.16 5644.39  105.15 5644.86
  107.13 5645.52  109.12 5646.21   111.1 5646.81  112.34 5646.98  112.52 5647.01
  113.08 5647.08  115.07 5647.39  117.05 5647.49  119.04 5647.66  121.02 5647.72
     123 5647.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08      64    .115  112.34     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
             64  112.52             135.7  133.18  129.93             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 4538

INPUT
Description:
Station Elevation Data    num=      68
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5645.36    1.98 5644.74    3.97 5644.13    5.95 5643.53    7.93 5642.51
    9.92 5641.74    11.9 5640.93   13.89 5639.98   15.87 5639.34   17.85 5638.65
   19.84 5638.11   21.82 5637.59    23.8 5637.24   25.18 5636.96   25.21 5636.96
   25.79 5636.84   27.77 5636.47   29.76 5635.92   31.74 5635.46   33.72 5635.08
   35.71 5634.78   37.69 5634.01   39.67 5633.63   41.66 5632.99   43.64 5632.55
   45.62 5632.42   47.61 5632.53   49.59 5632.55   51.58 5632.48   53.56 5632.31
   55.54 5631.84   57.53 5631.55   59.51  5632.1   61.49 5632.93   63.48 5633.45
   65.46 5633.83   67.45 5634.21   69.43 5634.69   71.41 5635.16    73.4 5635.46
   75.38  5635.7   77.36 5635.89   79.35 5635.88   81.33 5636.15    81.8 5636.25
   83.31  5636.6    85.3 5636.58   87.28 5636.67   89.27 5636.82   91.25 5636.87
   93.23 5636.96   95.22 5636.88    97.2 5636.74   99.18  5636.7  101.17  5636.8
  103.15 5636.92  105.14 5637.04  107.12 5637.33   109.1 5637.69  111.09 5637.99
  113.07 5638.27  115.05 5638.35  117.04 5638.42  119.02  5638.4     121  5638.4
  122.99 5638.71  124.97  5639.1  126.96 5639.47

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   25.21    .115    81.8     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         25.18    81.8             122.3  115.59     106             .1       .3

CROSS SECTION
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RIVER: Bluebell
REACH: 1                  RS: 4422

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5641.36    1.97 5641.33    3.95 5641.31    5.92 5641.31     7.9  5641.3
    9.87 5641.31   11.85 5641.25   13.82 5641.24    15.8 5641.08   17.77 5640.79
   19.75 5640.45   21.72 5639.65    23.7 5639.02   25.67 5638.47   27.65 5637.77
   29.62 5636.99    31.6 5636.51   33.57 5636.12   35.55 5635.94   37.52 5635.85
    39.5 5635.76   41.47  5635.6   43.45 5635.29   45.42 5634.39    47.4 5632.62
   49.37 5631.13   51.35  5630.6   53.32 5629.99    55.3 5629.32   57.27 5628.86
   59.25  5628.3   61.22 5627.86    63.2 5627.55   65.17 5627.24    65.5 5627.17
   67.15 5626.85   69.12 5625.78    71.1 5623.98   73.07 5622.52   75.05 5621.94
   77.02 5621.77      79 5621.43   80.97 5621.14   82.95 5621.41   84.92 5621.58
    86.9 5621.79   88.87 5622.25   90.85 5623.07   92.82 5623.99   94.79 5624.81
   96.77 5625.67   98.74 5626.71  100.72 5627.84   101.5 5628.19  102.69 5628.74
  104.67 5630.18  106.64 5631.65  108.62 5633.07  110.59 5634.31  112.57 5635.02
  114.54 5635.71  116.52 5635.86  118.49 5635.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    63.2    .102   101.5     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          65.5   101.5           143.61  144.43  142.01             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 4278

INPUT
Description:
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5620.76    1.99 5621.25    3.97 5623.56    5.96  5626.2    7.94 5627.48
    9.93 5628.32   11.91 5627.63    13.9 5626.23   15.89 5625.78   17.87 5625.48
   19.86 5624.97   21.84 5624.07   23.83 5622.66   25.82 5621.21    27.8 5620.08
   29.79 5618.98   31.77 5617.94   33.76 5616.92   35.74 5615.97   37.73 5615.03
   38.55 5614.55   39.72 5613.86    41.7  5612.6   43.69 5611.49   45.67 5610.35
   47.66 5609.68   49.65 5608.97   51.63 5608.25   53.62 5607.72    55.6 5607.39
   57.59 5606.93   59.57 5606.73   61.56 5606.54   63.55 5606.71   65.53 5606.95
   67.52 5607.42    69.5 5608.18   71.49 5609.14   73.48 5610.03   75.46 5610.78
   77.45 5611.53   79.43 5612.64   81.42 5613.62    83.4  5614.6   85.39 5615.69
   87.38 5616.91   89.36 5617.68   90.69 5618.06   91.35 5618.25   93.33 5618.41
   95.32 5618.32   97.31 5618.27   99.29 5618.09  101.28 5617.98  103.26  5617.8
  105.25 5617.91  107.23 5618.09  109.22 5618.22  111.21 5618.47  113.19 5618.73
  115.18 5618.92  117.16    5619  119.15 5619.03  121.14 5619.15  123.12  5619.3
  125.11 5619.36  127.09 5619.36  129.08 5619.48  131.06 5619.61  133.05 5619.68
  135.04 5619.68  137.02 5619.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   38.55    .102   90.69     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          38.55   90.69           85.72   81.02   71.73             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   10.475630.757  123.03  137.025629.295

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 4197

INPUT
Description:
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    5620    1.99 5619.89    3.98 5619.56    5.96    5618    7.95 5616.12
    9.94 5615.48   11.93 5614.75   13.91 5614.17    15.9 5613.78   17.89 5613.38
   19.88 5612.87   21.86 5612.26   23.85 5611.62   25.84 5611.13   27.83 5610.53
   29.82 5610.03    31.8 5609.38   33.79  5608.7   35.78 5608.02   37.77 5607.36
   39.75 5606.74   41.44 5606.21   41.74 5606.12   43.73 5605.48   45.72 5604.73
    47.7 5603.92   49.69 5603.38   51.68 5603.05   53.67 5602.33   55.66 5601.58
   57.64 5600.94   59.63 5600.67   61.62 5600.58   63.61  5600.5   65.59 5600.57
   67.58 5600.74   69.57 5600.86   71.56 5600.93   73.55  5601.4   75.53  5602.6
   77.52 5604.15   79.51 5605.58    81.5 5606.97   83.48 5608.49   85.47 5609.76
    86.4 5610.09   87.46 5610.47   89.45 5610.81   91.43 5610.97   93.42 5610.97
   95.41 5611.03    97.4 5610.97   99.39 5611.02  101.37 5611.19  103.36 5611.41
  105.35 5611.65  107.34  5611.9  109.32 5612.08  111.31 5612.29   113.3 5612.52
  115.29 5613.05  117.27 5614.23  119.26 5615.43  121.25  5617.2  123.24 5618.14
  125.23 5618.46  127.21 5618.75   129.2 5618.94  131.19 5619.02  133.18 5619.06

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   41.44    .102    86.4     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          41.44    86.4           132.27  142.33  142.51             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 4054

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5605.05    1.97 5604.99    3.94 5604.93    5.91 5604.85    7.88 5604.82
    9.85  5604.8   11.82 5604.66   13.79 5604.25   15.76 5603.74   17.73  5603.3
    19.7 5602.71   21.67    5602   23.64 5601.27   25.61 5600.53   27.58 5599.78
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   29.55 5599.04   31.52 5598.29   33.49 5597.72   35.46 5597.41   37.43 5597.26
   37.98 5597.24    39.4 5597.18   40.36 5597.17   41.37 5597.17   43.34 5595.14
   45.31 5591.65   47.28 5590.34   49.25 5590.57   51.22 5590.86    53.2 5591.38
   55.17 5591.98   57.14 5592.53   59.11  5593.2   61.08 5594.08   63.05 5595.03
   65.02  5595.9   66.99 5596.93   68.96 5598.22   70.93 5599.73    72.9 5601.21
   74.55 5602.37   74.87 5602.59   76.84 5603.49   78.81 5603.31   80.78 5603.08
   82.75    5603   84.72 5603.11   86.69 5603.18   88.66 5603.19   90.63 5603.17
    92.6 5603.16   94.57 5603.17   96.54 5603.21   98.51  5603.2  100.48 5603.22
  102.45 5603.15  104.42 5603.21  106.39 5603.87  108.36 5604.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   37.98    .102   74.55     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          40.36   74.55           127.47  125.59  124.95              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   81.82  108.365613.007       0   38.055615.047

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 3929

INPUT
Description:
Station Elevation Data    num=      57
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5593.63    1.97 5593.57    3.93 5593.52     5.9 5593.47    7.87 5593.41
    9.83 5593.34    11.8 5593.22   13.77 5593.23   15.73 5593.29    17.7 5593.26
   19.67 5593.21   20.52  5593.1   21.64 5592.96   22.98 5592.42    23.6 5592.17
   25.57  5591.3   27.54 5590.48    29.5 5589.61   31.47 5588.87   33.44 5588.34
    35.4 5587.81   37.37 5587.16   39.34 5586.39    41.3  5585.8   43.27 5585.76
   45.24 5585.89    47.2  5585.8   49.17 5585.41   51.14 5585.24   53.11 5585.33
   55.07 5585.55   57.04 5585.64   59.01 5585.66   60.97 5585.59   62.94 5585.58
   64.91 5585.59   66.87 5585.43   68.84 5585.31   70.81  5585.4   72.77 5585.36
   74.74  5585.2   76.71 5585.28   78.67 5585.72   80.64  5586.5   82.61 5587.47
   84.58 5588.56   86.54 5589.57   88.51 5590.31   88.62 5590.34   90.48 5590.95
   92.44 5591.54   94.41 5591.96   96.38 5592.29   98.34 5592.57  100.31 5592.64
  102.28 5592.71  104.24  5592.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   22.98    .102   88.62     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          20.52   88.62           111.94  120.14  122.34              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    8.785603.628

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 3809

INPUT
Description:
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5588.41    1.99 5588.39    3.98 5588.39    5.98 5588.29    7.97 5588.36
    9.96 5588.35   11.96 5587.99   13.95 5587.37   15.94 5586.71   17.93  5586.3
   19.93  5586.1   21.92 5585.91   23.91 5585.67    25.9 5585.47    27.9 5585.32
   29.89 5585.15   31.88 5585.07   33.87 5584.93   35.87 5584.68   37.86 5584.49
   39.85 5584.33   41.84 5584.19   43.38 5584.04   43.84 5583.99   45.83 5583.73
   47.82 5583.39   49.81  5583.1   51.81 5582.76    53.8 5582.28   55.79 5581.89
   57.78 5581.41   59.78 5581.07   61.77 5580.69   63.76  5580.4   65.75 5580.19
   67.75 5579.96   69.74 5579.71   71.73 5579.54   73.72 5579.38   75.72 5579.29
   77.71 5579.14    79.7 5578.71   81.69 5578.21   83.69 5577.82   85.68  5577.5
   87.67 5577.21   89.66 5576.73   91.66 5576.79   93.65 5576.73   95.64 5576.59
   97.63 5577.04   99.63 5577.82  101.62 5578.09  103.61 5578.38   105.6 5578.53
   107.6 5578.81  109.59 5579.05  111.58  5579.1  111.82 5579.13  113.57 5579.32
  115.57 5579.43  117.56 5579.48  119.55 5579.47  121.54 5579.49  123.54 5579.49
  125.53  5579.5  127.52 5579.53  129.51  5579.6  131.51 5579.71   133.5  5579.8
  135.49 5579.85  137.48 5579.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   43.38    .102  111.82     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          77.71  111.82           98.04   99.81   94.55              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   12.495598.408       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  126.84  137.485589.515

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 3709

INPUT
Description:
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5578.7    1.98 5578.85    3.95 5578.84    5.93 5578.93    7.91 5579.03
    9.89 5579.02   11.86 5579.03   13.84 5579.09   15.82 5578.99   17.79 5579.13
   19.77 5579.29   21.75 5579.32   23.73 5579.31    25.7 5579.32   27.68 5579.22
   29.66 5579.11   31.63 5579.06   33.61    5579   35.59 5578.95   37.57  5578.9
   39.54 5578.84   41.52 5578.79    43.5 5578.77   45.48  5578.8   47.45 5578.84
   49.43 5578.68   51.41 5578.18   53.38 5577.72   55.36 5577.27   57.34  5577.1
   57.42  5577.1   59.32 5577.06   61.29 5577.05   63.27  5576.8   65.25 5576.46
   67.22 5576.12    69.2 5575.78   71.18 5575.44   73.16 5575.29   75.13 5575.32
   77.11 5575.25   79.09 5575.02   81.06 5574.73   83.04 5574.43   85.02 5574.14
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      87 5573.84   88.97 5573.57   90.95 5573.15   92.93 5572.91   94.91 5572.95
   96.88 5572.92   98.86 5572.87  100.84 5572.75  102.81 5572.37  104.79 5571.86
  106.77 5571.42  108.75 5571.36  110.72 5571.75   112.7 5572.16  114.68 5572.35
  116.65 5572.35  118.63 5572.35  120.61 5572.36  122.59 5572.43  122.65 5572.43
  124.56 5572.46  125.15 5572.46  126.54 5572.46  128.52 5572.43  130.49  5572.4
  132.47 5572.42  134.45 5572.42  136.43 5572.46   138.4 5572.62  140.38 5572.79
  142.36 5572.95  144.33 5573.12  146.31 5573.29  148.29 5573.48  150.27 5573.64
  152.24 5573.78  154.22 5573.99   156.2 5574.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   57.42    .102  125.15     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         88.97  122.65            101.82  109.63   110.9              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  128.49  135.165582.431       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   39.45  5588.7    61.7   89.545587.047  135.16   156.25582.423

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 3599

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5573.34    3.98 5573.34    5.98  5573.3    7.77 5573.26    7.97 5573.25
    9.96 5573.23   11.95  5573.2   15.93  5573.1   17.93    5573   19.92 5572.92
   21.91 5572.89    23.9 5572.85   27.89 5572.85   29.88 5572.82   31.87 5572.81
   33.86 5572.81   35.85 5572.76   37.84 5572.71   39.84 5572.67   41.83 5572.62
   43.82 5572.56   45.81 5572.55    47.8 5572.47   49.79 5572.46   51.79 5572.32
   53.78 5572.21   55.77 5572.12   57.76 5572.05   59.75 5571.97   61.75 5571.91
   63.74 5571.86   65.73 5571.78   67.72 5571.67   69.71 5571.59    71.7 5571.45
    73.7 5571.43   75.69 5571.33   77.68 5571.22   79.67 5571.21   81.66 5571.27
   83.66 5571.37   85.65 5571.42   87.64 5571.45   89.63 5571.65   91.62 5571.77
   93.61 5571.85   95.61 5571.86    97.6 5571.95   99.59 5571.98  101.58 5572.35
  103.57 5572.74  105.56 5572.84  107.56 5572.72  109.55 5572.57  111.54 5572.26
  113.06 5571.85  113.53 5571.72  115.52 5571.05  117.52 5570.14  119.51    5569
   121.5 5568.01  123.49 5566.99  125.48 5565.86  127.47 5565.19  129.47 5564.92
  131.46 5564.79  133.45 5564.78  135.44 5564.86  137.43 5564.43  139.43 5563.86
  141.42 5563.95  143.41 5564.64   145.4 5565.17  147.39 5565.43  148.73 5565.55
  149.38 5565.61  150.33 5565.66  151.38 5565.72  153.37 5565.69  155.36 5565.58
  157.35 5565.46  159.34 5565.23  161.33 5565.12  163.33 5565.02  165.32 5564.93
  167.31 5564.93   169.3 5565.02  171.29 5565.15  173.29 5565.61  175.28 5566.35
  177.27 5566.38  179.26 5566.42  181.25 5566.51  183.24 5566.63  185.24 5566.78
  187.23 5566.95  189.22  5567.1  191.21 5567.16   193.2 5567.12   195.2 5567.04

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015    7.77     .13  113.06    .102  148.73     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        113.06  150.33            119.95  119.09  108.97              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     .18   75.665583.335       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  179.81   195.25576.441

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 3480

INPUT
Description:
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5559.26    1.99 5559.28    3.98 5559.31    5.96 5559.35    7.95 5559.44
    9.94 5559.58   11.93 5559.61   13.91 5559.54    15.9 5559.49   17.89 5559.46
   19.88 5559.43   21.87 5559.43   23.85 5559.42   25.84 5559.43   27.83 5559.48
   29.82 5559.54   31.81 5559.59   33.79 5559.61   35.78 5559.63   37.77 5559.61
   39.76 5559.63   41.74 5559.64   43.73 5559.64   45.72 5559.69   47.71 5559.76
    49.7 5559.77   51.68 5559.73   53.67 5559.74   55.66 5559.76   57.65 5559.74
   59.63 5559.72   61.62 5559.69   63.61 5559.61    65.6 5559.52   67.59 5559.45
   69.57 5559.33   71.56  5559.1   73.55  5558.8   75.54 5558.55   77.53 5558.36
   79.51 5558.21    81.5 5558.14   83.49  5558.1   85.48 5558.07   87.46 5558.04
   87.61 5558.03   89.45 5557.95   91.44 5557.77   93.43 5557.63   95.42 5557.03
    97.4 5555.95   99.39 5555.72  101.38 5555.81  103.37 5555.81  105.36 5555.89
  107.34 5556.01  109.33 5555.86  111.32 5555.77  113.31 5555.91  115.29 5556.05
  117.28 5556.21  119.27 5556.51  121.26 5556.94  123.25 5557.39  125.23 5557.96
  125.73 5558.11  125.74 5558.11  127.22 5558.56  129.21 5558.79   131.2 5558.88
  133.18 5558.84  135.17 5558.92  137.16 5558.92  139.15  5558.9  141.14 5558.92
  143.12 5558.92  145.11 5558.92

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   87.61    .102  125.73     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         87.61  125.74            119.68  120.34  121.56              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   20.195569.255       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  133.68  145.115568.868

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 3360
```

```
INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5548.5    7.96 5548.27    9.95 5548.01   11.94 5547.89   15.93 5548.17
   17.92 5548.21   19.91  5548.8    21.9 5549.19   23.89 5549.33   25.88 5549.31
   27.87 5549.12   29.86 5548.53   31.85 5547.76   33.84 5547.66   35.83 5547.63
   41.81 5547.71   47.78 5547.74   51.76 5547.87   55.74 5547.96   57.73 5548.17
   59.72 5548.22   65.69 5548.31   77.64 5548.51   81.62 5548.41    85.6 5548.44
   91.97 5548.37   93.57 5548.39   96.91 5548.52   99.54 5548.42  101.53 5548.13
  105.51 5547.77   107.5 5547.45  109.49 5547.39  113.47 5548.06  114.86 5548.26
  114.96 5548.27  115.46 5548.34  117.45  5548.4  119.44  5548.3  121.44 5548.02
  123.43  5547.8  125.42 5547.39   129.4 5546.69  131.39 5546.18  133.38    5546
  135.37 5546.13  137.36 5546.44  141.34 5547.15  145.32 5547.93  147.32 5548.15
  149.31 5548.26  153.29 5548.54  155.28 5548.63  157.27 5548.47  159.26 5548.08
  163.24 5547.09  164.83 5546.86  167.22 5546.65  169.21 5546.59  175.19 5546.86
  177.18 5546.97  183.15 5547.23  187.13 5547.44  191.11 5547.56  197.08 5547.79
  201.07 5547.87  205.05 5547.98  207.04 5547.99   209.5 5548.09  213.01 5548.53
     215 5548.71  216.99 5548.79  220.97 5548.84  224.95 5548.99  226.94 5549.19
  230.93 5549.79  232.92 5549.98  234.91 5549.97   236.9 5550.08  238.89 5550.29
  240.88 5550.29  242.87 5550.22  244.86 5550.35  246.85 5550.62  248.84 5550.78
  252.82 5550.94  256.81 5551.19   258.8 5551.26  260.79 5551.06  262.78 5551.01
  264.77 5551.35  266.76 5551.49  268.75 5551.51  272.73 5551.61  274.72 5551.58
  276.71 5551.68   278.7    5552  280.69 5552.14  282.69 5552.02  284.68 5552.05

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   96.91    .102  114.96     .13  164.83    .015   209.5     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         91.97  114.86            73.74   76.18   98.67              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   96.91 5548.52       F
  155.28  284.68 5548.63       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   60.94   81.19 5558.24       0    9.79  5558.5  276.99  284.685561.726

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 3283

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5547.02    5.97 5546.82   13.94 5546.47   15.93 5546.41   19.91 5546.23
   23.89 5546.12   26.78    5546   33.85 5545.72   41.82 5545.45   49.78 5545.12
   51.77  5545.1   55.75 5544.95   59.74 5544.87   61.73 5544.79   69.69 5544.54
   73.68  5544.5   77.66 5544.34   85.62 5544.15   87.61 5544.13   95.58 5543.96
  101.55 5543.94  103.54 5543.86  107.53 5543.78  109.52 5543.67  111.51 5543.69
  117.48 5543.62  123.46 5543.59  127.44  5543.6  129.43 5543.57  131.42  5543.6
  141.38 5543.52  149.34 5543.51  153.33 5543.44  155.32 5543.45  161.29 5543.36
  165.27  5543.4  167.26 5543.35  171.25 5543.34  173.24  5543.3  175.23 5543.37
  179.21 5543.28  183.19 5543.33  185.19 5543.29  187.18 5543.35  193.15 5543.11
  195.14 5543.17  197.13 5543.15  199.12  5543.2  203.11  5543.1  209.08 5543.12
  213.06 5543.02  215.05 5543.06  219.04 5542.95  223.02 5543.19     227 5543.18
  230.98 5543.26  232.98 5543.21  234.97 5543.32  238.95 5543.42  242.93  5543.4
  246.91 5543.53   250.9 5543.51  256.87 5543.55  260.85 5543.52  262.84 5543.45
  264.84 5543.46   272.8  5543.4  276.78 5543.28  282.76 5543.21  286.74 5543.13
  290.72 5543.08   296.7 5543.11  306.65 5543.18  308.64 5543.22  312.63 5543.21
  318.54 5543.02  320.51 5542.98  324.43 5543.28  326.78 5543.42  330.32 5543.85
  332.28 5544.03  334.25  5544.4  336.21 5544.91  338.17 5545.17  340.14 5545.56
  344.06 5546.21  347.99 5546.68  348.84 5546.86  353.88 5547.98  355.84 5548.22
   357.8 5548.65  359.76 5548.93  363.69 5549.28  365.65 5549.56  367.62 5549.93
  369.58    5550  371.54 5550.27   373.5 5550.43  377.43 5550.82  383.32 5551.13

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015  326.78     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         26.78  348.84            97.56   68.73   65.09              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  368.93  383.325559.953       F

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 3215

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5541.6    1.99 5541.48    3.97  5541.4    5.96 5541.21    7.95 5541.37
    9.93 5541.64   11.92 5541.69   13.91  5541.5    15.9 5541.42   17.88 5541.57
   19.87  5541.7   21.86 5541.65   22.38  5541.6   23.84 5541.45   25.83 5541.28
   27.82 5541.16    29.8 5541.02   31.79 5540.88   33.78 5540.75   35.77 5540.55
   37.75 5540.33   39.74 5540.15   41.73 5539.79   42.27 5539.71   43.71 5539.49
    45.7 5539.51   47.69 5539.65   49.67 5539.77   51.66 5539.86   53.65 5539.92
   55.63 5539.93   57.62 5539.93   59.61 5539.93    61.6 5539.93   63.58 5539.94
   65.57 5539.91   67.56  5539.8   69.54 5539.67   71.53 5539.51   73.52 5539.47
   75.25  5539.6    75.5 5539.62   77.49 5539.76   79.48 5539.97   81.46 5540.05
   82.83 5540.09   83.45  5540.1   85.44 5540.11   87.43 5540.11   89.41 5540.17
    91.4 5540.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   42.27    .015   75.25     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          29.8   82.83           140.54  144.89  139.4              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
```

```
       0    7.295551.595

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 3070

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5530.93    1.99 5531.32    3.97 5531.89    5.96 5532.81    7.94 5533.24
    9.93  5533.3   11.91 5533.24    13.9 5532.89   15.89  5532.8   17.87  5532.8
   19.86 5532.78   21.84 5532.69   23.83 5532.44   25.81 5532.05   27.34 5531.83
    27.8 5531.76   29.79 5531.43   31.77  5531.1   33.76 5530.75   35.74  5530.3
   37.73 5529.73   39.08  5529.5   39.71  5529.4    41.7 5529.13   43.69 5529.15
   45.67 5529.29   47.66 5529.43   49.64 5529.55   51.63  5529.6   53.61 5529.68
    55.6 5529.71   57.59 5529.73   59.57 5529.75   61.56  5529.7   63.54 5529.65
   65.53 5529.54   67.51 5529.39    69.5 5529.24   71.49 5529.19   73.47 5529.28
   74.05 5529.31   75.46 5529.39   77.44 5529.45   78.56 5529.47   79.43 5529.48
   81.41 5529.51    83.4 5529.59   85.39 5529.64   87.37  5529.7   89.36 5529.79
   91.34 5529.86   93.33 5529.83   95.31 5529.81    97.3 5529.83   99.29 5529.83
  101.27  5529.9  103.26 5530.03  105.24 5530.11  107.23 5530.06  109.22 5529.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   39.08    .015   74.05     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         33.76   78.56            97.88   97.77   97.74              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    8.07 5540.93  103.71  109.225540.053

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 2972

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5523.05     .41 5523.03    1.97 5522.97    3.93 5522.53     5.9 5521.99
    7.02 5521.85    7.86 5521.75    9.82 5521.69   11.79 5521.71   13.75 5521.79
   15.72 5521.86   17.68 5521.93   19.64 5521.94   21.61 5521.98   23.57    5522
   25.54 5521.99    27.5 5521.99   29.46 5521.99   31.43 5521.96   33.39 5521.91
   35.36 5521.86   37.32 5521.77   39.29 5521.81   41.25 5522.08   43.21 5522.37
   43.38 5522.41   45.18 5522.84   47.14    5523   47.61 5523.03   49.11 5523.12
   51.07 5523.18   53.03 5523.26      55 5523.31   56.96 5523.41   58.93 5523.44
   60.89 5523.46   62.85 5523.47   64.82 5523.44   66.78 5523.41   68.75 5523.34
   70.71 5523.55   72.68 5523.73   74.64  5523.9    76.6 5524.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    7.02    .015   43.38     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            .41   47.61           108.53  108.41  108.38              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   69.35    76.65533.406  -25.53  -18.665533.358

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 2864

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5515.97    1.99 5516.08    3.99 5516.08    5.98 5516.05    7.98 5516.04
    9.97 5516.26   11.97 5516.18   13.96 5516.08   15.95 5515.67   17.95 5515.49
   19.94 5515.41   21.94  5515.5   23.93 5515.57   25.93 5515.56   27.92 5515.64
   29.91 5515.64   31.51 5515.55   31.91 5515.53    33.9 5515.42    35.9 5514.75
    36.6 5514.67   37.89 5514.52   39.89 5514.39   41.88 5514.25   43.88 5514.33
   45.87  5514.5   47.86 5514.63   49.86 5514.77   51.85 5514.81   53.85 5514.86
   55.84 5514.84   57.84 5514.81   59.83 5514.74   61.82 5514.68   63.82 5514.57
   65.81 5514.47   67.81 5514.37    69.8 5514.24    71.8 5514.42   72.55 5514.45
   73.79 5514.49   75.78 5516.33   77.78 5516.88   79.77 5517.08   79.79 5517.09
   81.77 5517.36   83.76  5517.6   85.76 5517.89   87.75  5518.1   89.74 5518.31
   91.74 5518.36   93.73 5518.41   95.73 5518.63   97.72 5518.72   99.72 5518.62
  101.71 5518.68  103.71 5518.81   105.7 5518.92  107.69 5518.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    36.6    .015   72.55     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         31.51   75.78            99.79    99.9   99.91              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    4.055525.972   99.17  107.695528.662

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 2764

INPUT
Description:
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5510.12    1.98 5510.13    3.97 5510.14    5.95 5510.05    7.93 5509.89
    9.92 5509.71    11.9 5509.52   13.88 5509.38   15.87 5509.37   17.85  5509.4
   19.84 5509.49   21.82 5509.64    23.8 5509.77   25.79 5509.81   27.77 5509.69
```

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   29.75 5509.46   31.74 5509.44   33.72 5509.31   34.72 5509.21    35.7 5509.12
   37.69 5508.84   39.67 5508.46   40.71 5508.21   41.65 5507.97   43.64 5507.61
   45.62 5507.45    47.6 5507.35   49.59 5507.53   51.57  5507.7   53.56 5507.83
   55.54 5507.97   57.52  5508.1   59.51 5508.17   61.49  5508.2   63.47 5508.16
   65.46 5508.05   67.44 5507.94   69.42 5507.79   71.41 5507.62   73.39 5507.44
   75.37 5507.39   77.36 5507.72   78.08 5507.77   79.34 5507.87   81.32 5509.06
   83.31 5509.61   85.29 5509.72   87.28 5509.78   89.26 5509.83   91.24  5510.4
   92.78 5511.43   93.23 5511.73   95.21 5511.87   97.19 5511.97   99.18 5512.07
  101.16 5512.22  103.14 5512.34  105.13 5512.41  107.11 5512.56  109.09 5512.58
  111.08 5512.69  113.06 5512.76  115.05  5512.8  117.03 5512.85  119.01 5512.85
     121 5512.84  122.98  5512.8  124.96 5512.84  126.95 5512.78  128.93  5512.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   40.71    .015   78.08     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          34.72   83.31           141.21  141.02  140.98             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.135520.123  120.66  128.93 5522.84

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 2623

INPUT
Description:
Station Elevation Data    num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5500.86    1.98 5501.11    3.96 5501.21    5.94 5501.13    7.92 5501.14
     9.9 5501.09   11.87 5501.04   13.85 5500.99   15.83 5500.94   17.81 5500.71
   19.79 5500.41   21.77 5500.16   23.75 5500.06   25.73 5500.13   27.71 5500.21
   29.69  5500.6   31.67    5501   33.64 5500.77   35.62 5500.52   36.16 5500.45
    37.6 5500.24   39.58 5499.65   39.86 5499.49   41.56 5498.52   43.54 5497.87
   45.52 5497.64    47.5 5497.68   49.48 5497.77   51.46  5497.9   53.44 5498.01
   55.41 5498.08   57.39 5498.11   59.37 5498.11   61.35 5498.11   63.33 5498.06
   65.31 5498.05   67.29 5497.99   69.27 5497.89   71.25 5497.76   73.23 5497.61
   75.21 5497.51   77.18 5497.66   79.16 5497.86   79.26 5497.93   81.14 5499.13
   83.12 5499.65    85.1 5499.77   85.87 5499.82   87.08  5499.9   89.06 5500.04
   91.04 5500.11   93.02 5500.14      95 5500.17   96.98 5500.15   98.95 5500.18
  100.93 5500.17  102.91 5500.12  104.89  5500.1  106.87 5500.13  108.85 5500.16
  110.83 5500.19  112.81 5500.22  114.79 5500.25  116.77 5500.34  118.75 5500.44
  120.72 5500.51   122.7 5500.62  124.68 5500.72  126.66 5500.78  128.64 5500.87
  130.62 5500.96   132.6 5501.22  134.58 5501.48  136.56 5501.54  138.54 5501.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   39.86    .015   79.26     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          36.16   85.87            90.28   90.17   90.14             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    5.795510.861

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 2533

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5494.71    1.98 5494.67    3.97  5494.6    5.95  5494.5    7.93 5494.46
    9.92 5494.34    11.9 5494.27   13.88 5494.19   15.87    5494   16.89 5493.96
   17.85 5493.93   19.84 5493.89   21.82 5493.96   22.07 5493.95    23.8 5493.83
   25.79 5493.69   27.77 5493.41   29.75 5493.42   31.74 5493.59   33.72  5493.7
    35.7 5493.79   37.69 5493.94   39.67    5494   41.65 5494.03   43.64 5494.03
   45.62 5493.97   47.61 5493.88   49.59 5493.81   51.57  5493.7   53.56 5493.55
   55.54 5493.34   57.52 5493.49   59.51  5493.6   61.49  5493.7   62.89 5493.86
   63.47 5493.92   65.46 5494.16   67.44 5494.33   67.55 5494.34   69.42 5494.52
   71.41 5494.72   73.39 5494.84   75.38 5494.91   77.36    5495

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   22.07    .015   62.89     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          16.89   67.55           117.51  117.62  117.64             .1       .3

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 2415

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5488.67    1.98 5488.48    3.96 5488.41    5.94 5488.31    7.91 5488.12
    9.89 5488.12   11.87 5488.21   13.85  5488.2   15.83 5488.13   17.81 5488.06
   19.78 5488.02   21.76 5487.94   23.74 5487.94   25.72 5487.94    27.7 5487.92
   29.68 5487.86   31.66 5487.76   33.63 5487.59   35.61 5487.53   37.59 5487.38
   38.78  5487.3   39.57 5487.24   41.55 5487.08   43.53 5486.93    45.5 5486.76
   45.91 5486.74   47.48 5486.65   49.46 5486.61   51.44 5486.47   53.42 5486.55
    55.4 5486.68   57.38 5486.82   59.35 5486.98   61.33 5487.05   63.31  5487.1
   65.29 5487.13   67.27 5487.08   69.25 5487.03   71.22 5486.94    73.2 5486.88
   75.18  5486.7   77.16 5486.51   79.14 5486.29   81.12 5486.38    83.1 5486.55
   85.07  5486.8   85.51 5486.86   87.05  5487.1   89.03 5487.38   89.75  5487.4
   91.01 5487.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   45.91    .015   85.51     .13
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         38.78   89.75           131.68  131.21  131.08             .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  130.94  136.515497.588       0    4.74 5498.67

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 2284

INPUT
Description:
Station Elevation Data    num=      56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5480.39    1.99 5480.44    3.98 5480.46    5.97 5480.47    7.96  5480.6
    9.95  5480.6   11.94 5480.58   13.93 5480.51   15.93 5480.46   17.92 5480.48
   19.91 5480.49    21.9 5480.56   23.89 5480.67   25.88 5481.37   27.87 5481.76
   29.86 5481.86   31.85 5481.61   33.84 5481.27   34.55 5481.05   35.83 5480.65
   37.82 5480.44   39.81 5479.86    41.8 5479.27    43.8 5478.77    43.9 5478.74
   45.79  5478.2   47.78  5478.1   49.77 5477.88   51.76    5478   53.75 5478.12
   55.74 5478.25   57.73 5478.38   59.72 5478.46   61.71 5478.47    63.7 5478.56
   65.69 5478.52   67.68 5478.48   69.68 5478.44   71.67 5478.29   73.66 5478.17
   75.65 5477.99   77.64 5477.85   79.63 5478.05   81.62 5478.63   82.14 5478.75
   83.61 5479.08    85.6 5479.28   87.59 5479.53   89.58  5479.6   91.57 5479.79
   93.56 5480.03   95.55 5480.32   96.26 5480.37   97.54 5480.47   99.54 5480.54
  101.53 5480.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    43.9    .015   82.14     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         34.55   96.26           101.7  102.01   102.1             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
       0   29.86 5481.86       F
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  116.65  125.41 5488.93       0    4.745490.387

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 2182

INPUT
Description:
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5473.89    1.99 5474.18    3.98 5473.94    5.98 5473.87    7.97 5473.87
    9.96 5473.74   11.95 5473.63   13.95 5473.63   15.94 5473.68   17.93 5473.77
   19.92 5473.87   21.92 5473.83   23.91 5473.82    25.9 5473.76   27.89 5473.85
   29.89  5473.8   30.22 5473.79   31.88 5473.71   33.87  5473.6   35.86 5473.45
   37.86 5473.34   39.85 5473.16   41.13 5472.99   41.84  5472.9   43.83 5472.79
   45.82 5472.74   47.82 5472.65   49.81  5472.8    51.8 5472.97   53.79 5473.11
   55.79 5473.24   57.78 5473.31   59.77 5473.39   61.76 5473.38   63.76 5473.36
   65.75 5473.31   67.74  5473.2   69.73 5473.07   71.73 5472.94   73.72 5472.71
   75.71 5472.66   77.12 5472.73    77.7 5472.76    79.7 5472.89   81.69 5473.17
   83.68 5473.45   85.67 5473.68   87.67  5473.9   89.66 5474.16   91.65 5474.37
   93.64 5474.56   95.63 5474.73   97.63  5474.9   99.62 5475.02   100.5 5475.08
  101.61 5475.16   103.6 5475.29   105.6 5475.43  107.59 5475.53  109.58 5475.65
  111.57 5475.79  113.57 5475.94  115.56 5476.09  117.55 5476.27  119.54 5476.42

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   41.13    .015   77.12     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         30.22   91.65           142.71  142.78   142.8             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
       0   19.92 5473.87       F
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    2.585483.888  118.33  119.545486.349

CROSS SECTION


RIVER: Bluebell
REACH: 1                   RS: 2039

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5466.91    1.99 5466.92    3.99 5466.82    5.98 5466.76    7.97 5466.69
    9.97 5466.64   11.96 5466.55   13.95 5466.43   15.94 5466.31   17.94 5466.26
   19.93 5466.28   21.92 5466.29   23.92 5466.26   25.91 5466.28    27.9 5466.35
    29.9 5466.47   31.23 5466.46   31.89 5466.46   33.88 5466.25   35.87 5466.07
   37.87 5465.98   39.86 5465.77   41.85 5465.59    43.6 5465.51   43.85  5465.5
   45.84 5465.26   47.83 5465.21   49.83 5465.25   51.82 5465.41   53.81 5465.63
   55.81 5465.73    57.8 5465.85   59.79 5465.93   61.78 5465.98   63.78    5466
   65.77 5465.95   67.76 5465.87   69.76 5465.78   71.75 5465.66   73.74 5465.44
   75.74 5465.23   77.73 5465.45   78.13 5465.47   79.72 5465.58   81.71 5465.79
   83.71 5466.07    85.7 5466.32   87.28 5466.51   87.69 5466.56   89.69 5466.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    43.6    .015   78.13     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         31.23   87.28           113.03  113.22  113.26             .1       .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
       0    29.9 5466.47       F
   89.69   89.69 5466.67       F
Blocked Obstructions     num=        1
```

```
   Sta L   Sta R    Elev
       0    4.745476.913

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 1926

INPUT
Description:
Station Elevation Data    num=      68
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    5461    1.98  5461.2    3.96 5461.03    5.95 5460.39    7.93 5460.18
    9.91 5460.18   11.89 5460.15   13.88 5460.17   15.86 5460.24   17.84  5460.4
   19.82 5460.52   21.81 5460.55   23.79 5460.56   25.77  5460.4   27.75  5460.3
   29.73 5460.35   31.72 5460.31    33.7 5460.39   34.57 5460.35   35.68 5460.29
   37.66 5460.25   39.65 5460.04   41.63 5459.99   43.61 5459.77   45.26 5459.58
   45.59 5459.54   47.57 5459.41   49.56 5459.35   51.54 5459.49   53.52 5459.56
    55.5 5459.69   57.49 5459.78   59.47 5459.85   61.45 5459.87   63.43 5459.91
   65.42 5459.88    67.4 5459.84   69.38 5459.76   71.36  5459.7   73.34 5459.56
   75.33 5459.31   77.31 5459.43   78.63 5459.49   79.29 5459.53   81.27 5459.73
   83.26 5459.94   85.24 5460.07   87.22 5460.05    89.2 5460.12   91.19 5460.28
   92.94 5460.42   93.17 5460.44   95.15 5460.57   97.13 5460.67   99.11 5460.79
   101.1 5460.81  103.08 5460.92  105.06 5461.04  107.04 5461.11  109.03 5461.18
  111.01 5461.27  112.99 5461.36  114.97 5461.45  116.95 5461.54  118.94 5461.62
  120.92 5461.71   122.9 5461.83  124.88 5461.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   45.26    .015   78.63     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          34.57   92.94            85.75   86.59   86.83              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    5.225470.995

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 1839

INPUT
Description:
Station Elevation Data    num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5457.07    1.97 5457.69    3.95 5457.75    5.92 5457.72    7.89 5457.64
    9.86 5457.52   11.84  5457.5   13.81 5457.46   15.78 5457.36   17.75 5457.29
   19.73  5457.3    21.7 5457.29   23.67 5457.31   25.65 5457.37   27.62 5457.47
   29.59 5457.53   31.56 5457.41   32.97  5457.2   33.54 5457.11   35.51 5456.61
   37.48 5456.07   39.45 5455.49   41.43    5455   42.77 5454.97    43.4 5454.96
   45.37 5454.74   47.35  5454.9   49.32 5455.08   51.29 5455.21   53.26 5455.34
   55.24 5455.52   57.21 5455.59   59.18 5455.67   61.15 5455.61   63.13 5455.57
    65.1 5455.42   67.07 5455.43   69.05 5455.22   71.02 5454.98   72.99 5454.74
   74.96 5454.86   75.23 5454.88   76.94    5455   78.91 5455.04   80.88 5455.12
   82.85 5455.17   83.35 5455.19   84.83 5455.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   42.77    .015   75.23     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          32.97   83.35            75.4   74.81   74.64              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  113.32  118.365465.484       0    5.26 5467.07

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 1764

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5452.08    1.97 5452.02    3.94    5452    5.91 5451.98    7.88 5452.01
    9.86 5451.97   11.83 5451.89    13.8 5451.79   15.77 5451.63   17.74 5451.66
   19.71  5451.6   21.68 5451.53   23.65 5451.51   25.62 5451.46    27.6 5451.31
   28.73 5451.28   29.57 5451.25   31.54 5451.25   33.51 5451.11   35.48 5451.02
   37.45 5450.88   39.42 5450.78   41.39 5450.69   41.69 5450.65   43.36 5450.44
   45.33 5450.58   47.31 5450.73   49.28 5450.91   51.25 5451.04   53.22 5451.14
   55.19 5451.26   57.16 5451.24   59.13 5451.24    61.1 5451.23   63.07 5451.19
   65.05 5451.07   67.02 5450.94   68.99 5450.82   70.96 5450.68   72.93 5450.61
   74.13 5450.61    74.9 5450.62   76.87 5450.76   78.84 5450.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   41.69    .015   74.13     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          28.73   78.84           114.26   113.7  113.53              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  105.74  116.295460.509       0   11.855462.076

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 1651

INPUT
Description:
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5446.69       2 5446.76       4 5446.82       6 5446.87       8 5446.82
    9.99 5446.62   11.99 5446.37   13.99 5446.18   15.99 5445.96   17.99 5445.88
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   19.99 5446.01   21.99 5446.21   23.99 5446.22   25.99 5446.03   27.98 5445.94
   29.98 5445.85   31.98 5445.72   33.98 5445.59   35.98 5445.52   37.98 5445.58
   39.44 5445.56   39.98 5445.56   41.98 5445.41   43.97 5445.37   45.97 5445.37
   47.97 5445.31   49.97 5445.03   51.97 5444.69   53.97 5444.55   55.53 5444.51
   55.97  5444.5   57.97  5444.6   59.97 5444.76   61.96 5444.87   63.96 5444.97
   65.96 5445.06   67.96 5445.13   69.96 5445.16   71.96 5445.14   73.96  5445.1
   75.96 5445.02   77.96 5444.91   79.95 5444.79   81.95 5444.64   83.95 5444.45
   85.95 5444.51   87.95 5444.67   89.95 5444.81   91.95 5444.91   93.95 5444.94
   95.94  5445.1   96.55 5445.15   97.94 5445.26   99.94 5445.33  101.94 5445.34

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   55.53    .015   87.95     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          39.44   96.55           114.41  114.74  114.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   99.94  101.94    5447       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  121.68  127.935454.605       0    6.945456.693

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 1536

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5442.47    1.19 5442.42    1.98 5442.39    3.32 5441.82    3.97 5441.53
    5.95 5441.37    7.93 5441.13    9.92 5441.22    11.9 5441.45   13.88  5441.6
   15.86 5441.73   17.85 5441.85   19.83 5441.91   21.81 5441.92    23.8  5441.9
   25.78  5441.9   27.76 5441.84   29.75 5441.79   31.73  5441.7   33.71 5441.58
   35.69 5441.41   37.68 5441.26   38.47 5441.31   39.66 5441.38   41.64 5441.49
   43.63 5441.49

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    3.32    .015   38.47     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           1.19   43.63           123.19  123.09  123.07             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0       0    5443       F
   43.63   43.63    5443       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   77.01   85.275449.493  -41.64  -35.445450.348

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 1413

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5435.68    1.98 5435.63    3.97  5435.5    5.95 5435.31    7.93 5435.19
    9.91 5435.14   11.89 5435.08   13.87 5435.08   15.86 5435.16   17.84 5435.27
   19.82 5435.39    21.8 5435.45   23.23 5435.37   23.78 5435.33   25.76 5435.08
   27.75 5434.89   29.73 5434.58   30.65 5434.44   31.71 5434.27   33.69 5434.14
   35.67 5434.07   37.65 5434.34   39.64 5434.53   41.62 5434.63    43.6 5434.68
   45.58 5434.76   47.56 5434.83   49.54 5434.82   51.53 5434.79   53.51 5434.79
   55.49 5434.72   57.47 5434.66   59.45 5434.55   61.43 5434.32   63.42 5434.08
   65.23 5434.15    65.4 5434.15   67.38 5434.31   69.36 5434.41   71.34 5434.62
   73.32 5434.75   75.31 5435.13   76.32 5435.18   77.29 5435.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   30.65    .015   65.23     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          23.23   76.32           133.28  133.14   133.1             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0    21.8 5435.45       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  -13.87   -8.385445.657  103.84  108.995444.368

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 1280

INPUT
Description:
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5430.72    1.99 5430.56    3.98 5430.47    5.96 5430.58    7.95 5430.63
    9.94 5430.68   11.93 5430.52   13.92 5430.48   15.91 5430.44   17.89 5430.29
   19.88 5430.15   21.87 5430.07   23.86 5430.01   25.85 5430.03   27.83 5430.02
   27.87 5430.02   29.82 5429.93   31.81 5429.83    33.8 5429.75   35.79  5429.5
   37.78 5429.18   39.76 5428.94   40.58 5428.91   41.75 5428.86   43.74 5428.68
   45.73 5428.78   47.72 5428.98   49.71 5429.13   51.69 5429.23   53.68 5429.25
   55.67 5429.26   57.66 5429.27   59.65 5429.24   61.63  5429.2   63.62 5429.16
   65.61 5429.11    67.6 5428.98   69.59 5428.85   71.58 5428.67   73.56 5428.76
   74.55  5428.8   75.55 5428.83   77.54 5428.82   79.53 5428.97   81.52 5429.19
   82.36 5429.24    83.5 5429.32   85.49 5429.46   87.48 5429.59   89.47 5429.69
   91.46 5429.72   93.45 5429.79   95.43 5429.89   97.42 5429.98   99.41 5430.05
   101.4 5430.08  103.39 5430.13  105.38 5430.16  107.36 5430.21  109.35 5430.46
  111.34 5430.68  113.33 5430.69  115.32 5430.63   117.3 5430.54
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Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   40.58    .015   74.55     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          27.87   89.47            85.63   85.76   85.79              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.745440.718  111.66   117.35440.692

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 1194

INPUT
Description:
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5427.71    1.99 5427.52    3.98 5427.37    5.97 5427.22    7.96 5427.14
    9.95 5426.97   11.94 5426.91   13.93 5427.01   15.92 5427.09   17.91 5427.09
    19.9 5427.16   21.89 5426.95   23.88 5426.67   25.87 5426.53   27.86 5426.56
   29.85 5426.62   31.41 5426.44   31.84 5426.39   33.83 5426.18   35.82 5425.95
   37.81 5425.71    39.8 5425.54   41.79 5425.15   43.78 5425.01   44.33 5424.99
   45.77 5424.92   47.76 5424.69   49.75 5424.91   51.73 5425.13   53.72 5425.26
   55.71 5425.32    57.7 5425.31   59.69  5425.3   61.68 5425.34   63.67  5425.3
   65.66 5425.32   67.65 5425.28   69.64  5425.2   71.63 5425.03   73.62 5424.97
   75.61 5424.81    77.6 5425.08   79.59 5425.11   80.91 5425.27   81.58 5425.35
   83.57  5425.5   85.56 5425.67   87.55 5425.77   89.54 5425.87   90.27  5425.9
   91.53 5425.96   93.52 5426.06   95.51 5426.17    97.5 5426.31   99.49 5426.44
  101.48 5426.51  103.47 5426.63  105.46 5426.77  107.45 5426.97  109.44 5427.14
  111.43 5427.15  113.42 5427.09  115.41 5427.24   117.4 5427.34  119.39 5427.42
  121.38 5427.49  123.37 5427.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   44.33    .015   80.91     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          31.41   90.27           140.75  140.86  140.89              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  115.12  123.375437.207       0    5.12 5437.71

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 1053

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5422.04    1.97  5421.5    2.56 5421.35    3.95    5421    5.92 5420.87
    7.89 5420.73    9.86 5420.43   11.83  5420.3   12.75 5420.19    13.8 5420.07
   15.77 5420.15   17.74 5420.39   19.71 5420.59   21.68 5420.64   23.66 5420.77
   25.63 5420.82    27.6  5420.8   29.57 5420.83   31.54 5420.77   33.51 5420.72
   35.48 5420.66   37.45 5420.49   39.42 5420.41   41.39 5420.19   43.37  5419.9
   45.34 5420.13   47.31 5420.25    48.2 5420.36   49.28 5420.48   51.25 5421.08
   53.22 5421.47   55.19 5421.29   57.05 5421.07   57.16 5421.06   59.13 5421.21
    61.1 5421.41   63.08 5421.57   65.05 5421.76   67.02 5421.87   68.99    5422
   70.96 5422.11   72.93 5422.24    74.9 5422.35   76.87 5422.37   78.84 5422.41
   80.81 5422.46   82.79 5422.48   84.76  5422.4   86.73 5422.31    88.7 5422.31

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   12.75    .015    48.2     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           2.56   53.22           138.03  138.03  138.03              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0       0 5422.04       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  -27.59  -21.265431.615   82.91    88.75432.482

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 915

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5418.25    1.97 5418.23    3.93 5418.18     5.9 5418.11    7.86 5417.84
    9.83 5417.57    11.8 5417.44   13.76 5417.51   15.73 5417.54    17.7 5417.58
   19.66  5417.6   21.63 5417.63   22.45 5417.62   23.59 5417.59   25.56 5417.63
   27.53 5417.32   29.49 5417.18   31.46 5417.01    31.8 5417.02   33.43 5417.08
   35.39 5417.33   37.36  5417.5   39.32  5417.6   41.29 5417.69   43.26 5417.76
   45.22 5417.75   47.19 5417.73   49.16 5417.73   51.12  5417.7   53.09 5417.64
   55.05 5417.54   57.02 5417.38   58.99 5417.21   60.95 5417.16   62.92 5417.24
   64.89 5417.41   66.13 5417.52   66.85 5417.59   68.82  5417.7   70.78  5417.6
   72.75 5417.76   74.72 5417.95   76.68 5418.17   76.91  5418.2   78.65 5418.39
   80.62 5418.68   82.58 5418.94   84.55  5419.2   86.51 5419.26   88.48 5419.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    31.8    .015   66.13     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          22.45   76.91           115.6  115.86  115.95              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   81.28   88.485428.762       0    5.895428.252

CROSS SECTION
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```
RIVER: Bluebell
REACH: 1                    RS: 799

INPUT
Description:
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5415.22    1.99 5415.26    3.98 5415.11    4.11 5415.09    5.98 5414.82
    7.97 5414.37    9.33 5414.07    9.96 5413.93   11.96 5413.77   13.95 5413.62
   15.95  5413.5   17.94  5413.6   19.93 5413.67   21.93 5413.74   23.92 5413.78
   25.92  5413.8   27.91 5413.79    29.9 5413.81    31.9 5413.77   33.89 5413.74
   35.89 5413.72   37.88 5413.69   39.87 5413.67   41.87 5413.59   43.86 5413.53
   45.85 5413.71   47.54 5413.79   47.85  5413.8   49.84 5413.92    51.5 5413.94
   51.84 5413.94   53.83  5413.9   55.82 5413.89   57.82 5413.85   59.81 5413.81
   61.81 5413.82    63.8 5413.69   65.79 5413.52   67.79 5413.36   69.78 5413.29
   71.78 5413.24   73.77 5413.17   75.76  5413.1   77.76 5412.91   79.75 5412.89
   81.74 5413.04   83.74 5413.25   85.73 5413.16   87.73 5413.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    9.33    .015   47.54     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          4.11    51.5             66.9   67.02   67.06             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0    1.99 5415.26       F
    51.5   87.73    5415       F

CROSS SECTION


RIVER: Bluebell
REACH: 1                    RS: 732

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5412.12    1.99 5412.15    3.97 5412.18    5.96 5412.04    7.94 5412.06
    9.93 5412.04   11.91    5412    13.9 5411.96   15.88 5411.84   17.87 5411.65
   19.85 5411.57   20.73 5411.52   21.84 5411.46   23.82 5411.45   25.81 5411.33
   27.79  5411.2   28.77 5411.16   29.78 5411.12   31.76 5411.02   33.75 5410.78
   35.73 5410.88   37.72 5410.93    39.7 5410.97   41.69    5411   43.67 5410.98
   45.66 5410.98   47.64 5411.02   49.63 5410.99   51.61 5410.97    53.6 5410.91
   55.58 5410.86   57.57 5410.75   59.56  5410.7   61.54 5410.71   63.53 5410.84
   65.51 5410.96   66.65 5411.06    67.5 5411.14   69.48 5411.42   71.47 5411.68
   73.45 5411.93   74.27 5411.97   75.44 5412.03   77.42 5412.09   79.41 5412.19
   81.39 5412.19   83.38 5412.22   85.36 5412.28   87.35 5412.36   89.33  5412.4
   91.32  5412.4    93.3 5412.14   95.29    5412   97.27 5412.24   99.26 5412.33
  101.24 5412.29  103.23 5412.34  105.21 5412.33   107.2 5412.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   28.77    .015   66.65     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         20.73   74.27           133.07  133.31  133.36             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  100.24   107.25422.283       0    8.985422.117

CROSS SECTION


RIVER: Bluebell
REACH: 1                    RS: 599

INPUT
Description:
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5406.76    1.98 5406.75    3.96 5406.71    5.94 5406.64    7.92 5406.53
     9.9  5406.4   11.87 5406.27   13.85 5406.22   15.83 5406.19   17.81 5406.18
   19.79 5406.19   20.41  5406.2   21.77 5406.22   23.74 5406.14   25.72 5405.86
   26.58 5405.81    27.7 5405.74   29.68 5405.62   31.66 5405.57   33.64 5405.67
   35.61 5405.72   37.59 5405.73   39.57 5405.74   41.55 5405.75   43.53 5405.78
   45.51 5405.76   47.48 5405.69   49.46  5405.6   51.44 5405.58   53.42 5405.51
    55.4 5405.44   57.38 5405.34   59.35 5405.29   61.33 5405.58   63.31  5405.7
    63.8 5405.76   65.29 5405.95   67.27 5406.68   68.17 5406.65   69.25 5406.62
   71.22 5406.37    73.2 5406.25   75.18 5406.23   77.16  5406.3   79.14 5406.49
   81.12 5406.59   83.09 5406.73   85.07  5406.7   87.05 5406.76   89.03 5406.75
   91.01 5406.83   92.99 5406.84   94.96 5406.84   96.94 5406.83   98.92 5406.82
   100.9 5406.81  102.88 5406.89  104.85  5406.9  106.83 5406.99  108.81 5407.11
  110.79 5407.13  112.77 5407.08  114.75    5407  116.72    5407

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   26.58    .015    63.8     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         20.41   68.17           117.94  117.43  117.31             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  103.05  111.93  5416.9       F
   67.27    87.2 5406.68       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  111.93  116.725417.108   -17.8  -13.625416.454

CROSS SECTION


RIVER: Bluebell
REACH: 1                    RS: 481

INPUT
Description:
Station Elevation Data    num=      69
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     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5402.56    1.99 5402.53    3.98  5402.5    5.97 5402.48    7.96 5402.48
    9.95 5402.43   11.94 5402.37   13.94 5402.28   15.93 5402.22   17.92 5402.11
   19.91 5402.06    21.9 5401.98   23.89 5401.88   25.88 5401.83   27.87 5401.79
   29.86 5401.73   31.85 5401.65   33.84 5401.61   35.83 5401.52   37.83 5401.48
   39.82 5401.53   41.38  5401.5   41.81  5401.5    43.8 5401.33   45.79 5401.16
   47.73 5401.05   47.78 5401.05   49.77 5400.88   51.76 5400.94   53.75 5401.06
   55.74 5401.11   57.73 5401.17   59.72 5401.23   61.72 5401.25   63.71 5401.24
    65.7 5401.24   67.69 5401.17   69.68 5401.14   71.67  5401.1   73.66 5401.03
   75.65 5400.95   77.64 5400.82   79.63 5400.88   81.62 5401.17   83.61 5401.27
   84.35 5401.33   85.61 5401.43    87.6 5401.62   89.59 5401.96    91.2 5402.12
   91.58 5402.16   93.57 5402.15   95.56  5401.9   97.55 5401.67   99.54 5401.56
  101.53 5401.34  103.52 5401.31  105.51 5401.33   107.5 5401.43   109.5 5401.53
  111.49  5401.6  113.48 5401.67  115.47  5401.8  117.46 5402.23  119.45 5402.36
  121.44 5402.31  123.43 5402.48  125.42 5402.54  127.41 5402.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   47.73    .015   84.35     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         41.38    91.2           114.39  114.73  114.81             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   91.58  127.41 5402.16       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   120.4  127.415412.333       0    6.245412.563

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 367

INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5398.19    1.97 5398.46    3.95 5398.61    5.92 5398.71    7.89 5398.74
    9.86 5398.71   11.84 5398.62   13.81 5398.53   15.78 5398.49   17.76 5398.39
   19.73 5398.32    21.7 5398.34   23.68 5398.33   25.65 5398.27   27.62  5398.2
   29.59 5398.11   31.57 5398.02   33.54 5397.92   35.51 5397.83   37.49 5397.77
   39.37 5397.73   39.46 5397.72   41.43 5397.63    43.4 5397.45   45.38  5397.3
   47.35 5397.11   47.53  5397.1   49.32 5397.02    51.3 5397.13   53.27 5397.19
   55.24 5397.22   57.22 5397.27   59.19 5397.26   61.16 5397.24   63.13 5397.25
   65.11 5397.23   67.08 5397.19   69.05 5397.15   71.03  5397.1      73 5397.03
   74.97 5396.95   76.95 5396.92   78.92 5397.09   80.89 5397.23   82.86 5397.34
   83.58 5397.41   84.84 5397.54   86.81 5397.67   88.78 5397.71   90.76 5397.79
   92.73 5397.93    94.3 5398.06    94.7  5398.1   96.67 5398.15   98.65 5398.17
  100.62 5398.25  102.59 5398.28  104.57 5398.39  106.54  5398.5  108.51 5398.57
  110.49 5398.61  112.46 5398.53  114.43 5398.37   116.4  5398.3  118.38 5398.36
  120.35 5398.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   47.53    .015   83.58     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         39.37    94.3            78.32   77.41    77.2             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  115.51  120.355408.331       0    7.425408.188

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 289

INPUT
Description:
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5395.49    1.99 5395.48    3.97 5395.41    5.21 5395.37    5.96 5395.35
    7.95 5395.34    9.93 5395.22   11.92 5394.67   13.91 5394.58   15.65 5394.37
   15.89 5394.34   17.88 5394.47   19.87 5394.56   21.85 5394.57   23.84 5394.55
   25.83 5394.61   27.81  5394.6    29.8 5394.58   31.79 5394.57   33.77 5394.46
   35.76 5394.46   37.75 5394.48   39.73 5394.42   41.72  5394.4   43.71 5394.27
   45.69 5394.41   47.68 5394.61   49.67 5394.64   51.31 5394.71   51.65 5394.72
   53.64 5394.85   55.63  5394.9   57.61 5394.96    59.6 5395.08   60.22 5395.11
   61.59 5395.18   63.57 5395.23   65.56  5395.3   67.54  5395.4   69.53 5395.51
   71.52 5395.57    73.5 5395.64   75.49 5395.68   77.48 5395.72   79.46 5395.86
   81.45 5396.11   83.44 5396.31   85.42 5396.43   87.41 5396.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   15.65    .015   51.31     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5.21   60.22            70.02   70.54   70.67             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   83.78   87.415406.346  -23.84  -15.345405.213

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 219

INPUT
Description:
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5392.33    1.99 5392.37    3.98 5392.57    5.98 5392.55    7.97 5392.67
    9.96 5392.73   11.95  5392.7   13.94  5392.7   15.93 5392.73   17.93  5392.7
   19.92 5392.67   21.91 5392.73    23.9 5392.74   25.89 5392.73   27.88  5392.7
   29.88 5392.68   31.87 5392.65   33.86 5392.69   34.96 5392.65   35.85 5392.61
   37.84 5392.59   39.83 5392.55   41.83 5392.33   43.82 5392.27   45.81 5392.04
   46.16 5392.06    47.8 5392.18   49.79 5392.19   51.78 5392.26   53.78  5392.3
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   55.77 5392.23   57.76 5392.23   59.75 5392.28   61.74 5392.21   63.73 5392.16
   65.73 5392.13   67.72 5392.19   69.71 5392.17    71.7 5392.05   73.69 5391.99
   75.69 5392.31   77.68 5392.56   79.67 5392.82   81.46 5392.93   81.66 5392.94
   83.12 5392.96   83.65 5392.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   46.16    .015   81.46     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         34.96   83.12            97.04   97.15   77.98             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    6.555402.333

CROSS SECTION


RIVER: Bluebell
REACH: 1                  RS: 122

INPUT
Description:
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5393.53    1.99 5393.41    3.97 5392.99    5.96 5392.92    7.94 5392.88
    9.93 5392.85   11.92 5392.78    13.9 5392.74   15.89 5392.75   17.88 5392.68
   19.86  5392.6   21.85 5392.62   23.83 5392.61   25.82 5392.54   27.81 5392.48
   29.79 5392.45   31.78  5392.5   33.77 5392.42   35.75 5392.35   37.74 5392.33
   39.72 5392.29   41.71 5392.21    43.7 5392.21   45.68  5392.5   47.67 5392.56
   49.66 5392.49   51.64 5392.47   52.77 5392.34   53.63 5392.25   55.61 5392.08
    57.6 5391.71   59.59 5391.22   61.57 5390.73   63.56 5390.47   65.55 5390.48
   67.53 5390.43   69.52 5390.37    71.5  5390.3   73.49 5390.27   75.48 5390.28
   77.46  5390.4   79.45 5390.67   81.43 5390.71   83.42 5390.67   85.41 5390.74
   87.39 5391.01   89.38 5391.05   91.37 5391.05   92.84    5391   93.35 5390.99
   95.34 5390.64   97.32 5390.52   99.31  5390.5   101.3 5390.52  103.28 5390.52
  105.27 5390.56  107.26 5390.57  109.24 5390.58  109.27 5390.58  111.23 5390.54
  113.21 5390.52   115.2  5390.5  117.19 5390.48  119.17 5390.48  121.16 5390.52
  123.15 5390.59  125.13 5390.74  127.12 5390.55   129.1 5390.35  131.09 5390.25
  133.08 5390.24  135.06 5390.25  137.05 5390.26

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0    .015   92.84     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         52.77  109.27            12.19  121.54   25.41             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  128.25  137.055400.432

CROSS SECTION


RIVER: Bluebell_Spur
REACH: 1                  RS: 314

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5542.56    1.71 5542.54    3.69 5542.48    5.67 5542.45    7.64 5542.44
    9.62  5542.4    11.6 5542.34   13.57  5542.3   15.55    5542   17.53 5541.14
    19.5 5540.11   21.48 5539.67   23.46  5540.2   25.44 5540.97   27.41 5541.42
   29.39  5541.8   31.37    5542   33.34 5542.02   35.32 5542.13    37.3 5542.36
   39.27 5542.51   41.25 5542.45   43.23 5542.31    45.2 5542.27   47.18 5542.55
   49.16 5542.75   51.13 5542.66   53.11 5542.64   55.09 5542.61   57.06 5542.64
   59.04 5542.64   61.02 5542.62   62.99 5542.52   64.97 5542.55   66.69 5542.75
   66.95 5542.78   68.92 5542.83    70.9 5542.82   72.88 5542.88   74.85 5542.91
   76.83 5542.91   78.81  5542.9   80.78 5542.96   82.76 5543.02   84.74 5543.14

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         13.57   31.37            56.24   57.27   59.54             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   65.04   84.745552.562        F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   -14.1   -6.315551.311

CROSS SECTION


RIVER: Bluebell_Spur
REACH: 1                  RS: 256

INPUT
Description:
Station Elevation Data    num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5538.56    1.99  5538.5    3.97  5538.4    5.96  5538.3    7.95 5538.18
    9.93 5538.16   11.92 5537.57   13.91 5537.13    15.9  5536.7   17.88 5536.63
   19.87  5536.6   21.86 5536.56   23.84 5536.52   25.83 5536.57   27.82 5536.78
    29.8 5537.33   31.79 5537.48   33.78 5537.32   35.77 5537.09   37.75 5536.95
   39.74  5536.6   40.08 5536.48   41.73 5535.91   43.71 5535.55    45.7 5535.54
   47.69  5535.5   49.67 5535.94   51.66 5536.19   53.65 5536.15   55.63 5536.18
   57.62 5536.26   59.61 5536.16    61.6 5536.14   63.58 5536.27   65.57 5536.44
   67.56  5536.5   69.54 5536.47   71.53 5536.36   73.52 5536.21    75.5 5536.11
   77.49 5536.09   79.48  5536.1   81.46 5536.12   83.45  5536.1   85.44 5536.16
   87.43 5536.19   89.41  5536.1    91.4 5536.02   93.39    5536   95.37 5536.03
   97.36 5536.06   99.35 5536.06  101.33 5536.07  103.32 5536.08  105.31 5536.08
  107.29 5536.15  109.28  5536.2  111.27 5536.25  113.26 5536.33  114.27 5536.36
  115.24 5536.38  117.23 5536.46  119.22 5536.61   121.2 5536.83  123.19 5537.07
  125.18  5537.4  127.16 5537.53  129.15 5537.55  131.14 5537.58

Manning's n Values        num=       1
     Sta   n Val
```

```
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         37.75  123.19            62.12   73.32   77.44             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    3.93    13.55548.402       F
    13.5   31.79 5537.48       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    3.935548.559   123.9  131.145547.207

CROSS SECTION


RIVER: Bluebell_Spur
REACH: 1                  RS: 183

INPUT
Description:
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5534.4    1.99 5534.29    3.97 5534.15    5.96 5534.05    7.95 5533.92
    9.94 5533.84   11.92 5533.78   13.91 5533.73    15.9 5533.72   16.17  5533.7
   17.89 5533.55   19.87 5533.21   21.86 5532.97   23.85 5532.55   25.84 5531.73
   27.82 5531.75   29.81 5532.16    31.8 5532.39   33.79 5532.58   35.77 5532.61
   37.76 5532.74   39.75  5532.5   41.74 5532.53   43.72  5532.5   45.71 5532.33
    47.7 5532.11   49.69 5532.01   51.67    5532   53.66 5531.96   55.65 5531.92
   57.64 5531.72   59.62  5531.5   61.61 5531.21    63.6 5531.02   65.59  5531.1
   67.57 5531.27   69.56 5531.37   71.55 5531.19   73.54 5531.11   75.52 5531.17
   77.51 5531.19    79.5 5531.11   81.49 5531.01   83.47 5530.94   85.46 5531.03
   87.45 5531.19   89.44 5531.31   91.42 5531.35   93.41 5531.35    95.4 5531.42
   97.39 5531.53   99.06 5531.64   99.37 5531.66  101.36 5531.85  103.35 5532.14
  105.34 5532.45  107.32 5532.62  109.31 5532.67   111.3 5533.06  113.29 5534.49
  115.27 5534.65  117.26 5534.17  119.25 5533.77  121.24 5533.83  123.22 5534.07

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         55.65  105.34            91.03   81.45   71.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   37.76 5532.74       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0       95544.404  114.42  123.225544.678

CROSS SECTION


RIVER: Bluebell_Spur
REACH: 1                  RS: 102

INPUT
Description:
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5527.52    1.99 5527.74    3.98 5527.81    5.97 5527.88    7.96 5527.88
    9.95 5527.86   11.94 5527.85   13.93 5527.79   15.92 5527.74   17.91 5527.67
    19.9 5527.57   21.89 5527.48   23.88 5527.38   25.58 5527.28   25.87 5527.26
   27.87 5527.12   29.86    5527   31.85 5526.88   33.84  5526.8   35.83 5526.69
   37.82 5526.58   39.81 5526.52    41.8 5526.48   43.79 5526.49   45.78 5526.48
   47.77  5526.4   49.76 5526.42   51.75 5526.41   53.74 5526.35   55.73  5526.3
   57.72  5526.3   59.71 5526.26    61.7 5526.19   63.69 5526.14   65.68 5526.16
   67.67  5526.1   69.66 5526.09   71.65 5526.07   73.64 5526.07   75.63 5526.02
   77.62 5525.97   79.61 5525.73    81.6 5525.46    83.6 5525.17   85.59 5525.18
   87.58 5525.51   89.57 5525.71   91.56 5525.61   93.55 5525.81   95.54 5526.05
   97.53 5526.12   99.52 5526.14  101.51 5526.44   103.5 5526.36  105.49 5526.48
  107.48  5526.7  109.47 5526.93  111.46 5527.11  113.45 5527.19  115.44 5527.21
  117.43 5527.26   117.9 5527.26  119.42 5527.27  121.41 5527.31   123.4 5527.33
  125.39 5527.32  127.38 5527.41  129.37 5527.42  131.36 5527.35  133.35 5527.44
  135.34 5527.52  137.33 5527.55

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         25.58  111.46            61.35   61.71   63.61             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    6.785537.521

CROSS SECTION


RIVER: Bluebell_Spur
REACH: 1                  RS: 40

INPUT
Description:
Station Elevation Data    num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5527.07    1.99 5527.19    3.98 5527.04    5.97 5526.67    7.96 5526.47
    9.95 5525.89   11.94  5525.4   13.93 5525.08   15.92 5524.83   17.91 5524.47
    19.9 5524.29   19.97 5524.28   21.89 5524.08   23.88 5523.98   25.87 5523.78
   27.86 5523.65   29.85  5523.5   31.84 5523.49   33.82 5523.42   35.81 5523.38
    37.8  5523.3   39.79 5523.17   41.78 5523.05   43.77 5522.92   45.76  5522.8
   47.75 5522.81   49.74 5523.14   51.73 5523.01   53.72 5522.62   55.71 5522.23
    57.7 5521.79   59.69 5521.24   61.68 5520.82   63.67 5520.55   65.66 5520.44
   65.67 5520.01   69.64 5519.42   71.63 5519.23   73.62 5519.59   75.61 5520.08
    77.6 5520.43   79.59 5520.79   81.58 5521.15   83.57 5521.51   85.56 5521.74
   87.55 5521.87   89.54 5522.05   91.53  5522.2   93.52 5522.18   95.51 5522.16
   96.89 5522.17    97.5 5522.17   99.49 5522.22  101.47 5522.31  103.46 5522.41
  105.45 5522.46  107.44 5522.49  109.43 5522.49  111.42 5522.51  113.41 5522.54
   115.4 5522.65  117.39 5522.78  119.38 5522.85  121.37 5522.95  123.36    5523
  125.35    5523  127.34 5523.06  129.33 5523.15  131.32 5523.23  133.31  5523.3
   135.3  5523.3  137.29 5523.33  139.28 5523.38  141.27 5523.36  143.26 5523.28
```

```
Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         49.74   91.53            38.61   39.97   36.47             .1       .3

CROSS SECTION


RIVER: Blue_Ave_Split
REACH: 1                  RS: 818

INPUT
Description:
Station Elevation Data    num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5407.53       2 5407.57    3.99  5407.6    5.99  5407.6    7.98 5407.58
    9.98  5407.6   11.97  5407.7   13.97 5407.65   15.96 5407.56   17.96 5407.52
   19.95 5407.46   21.95 5407.53   23.95 5407.61   25.94 5407.55   27.94 5407.53
   29.93 5407.32   30.84 5407.21   31.93 5407.08   33.92 5406.97   35.92 5406.92
   37.91 5406.87   39.91 5406.82   41.91 5406.63   42.26 5406.59    43.9 5406.42
    45.9 5406.16   47.89 5406.34   49.89  5406.5   51.88 5406.59   53.88 5406.64
   55.87  5406.7   57.87 5406.77   59.86  5406.8   61.86 5406.78   63.86 5406.75
   65.85 5406.69   67.85 5406.63   69.84 5406.58   71.84 5406.42   73.83 5406.24
   75.83 5406.29   76.77 5406.43   77.82 5406.59   79.82 5406.82   81.82 5407.26
   82.61 5407.31   83.81 5407.38   85.81 5407.46    87.8 5407.59    89.8 5407.82
   91.79 5408.03   93.79 5408.21   95.78 5408.38   97.78 5408.52   99.77 5408.62
  101.77 5408.79  103.77 5408.93  105.76 5409.12  107.76 5409.26  109.75 5409.39
  111.75 5409.54  113.74 5409.64  115.74 5409.73  117.73  5409.8  119.73 5409.94
  121.72 5410.08  123.72 5410.06  125.72 5410.14  127.71 5410.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   42.26    .015   76.77     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         30.84   82.61            69.19   69.53   69.49             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  121.44  127.71 5420.09       0    6.945417.534

CROSS SECTION


RIVER: Blue_Ave_Split
REACH: 1                  RS: 748

INPUT
Description:
Station Elevation Data    num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5406.31    1.99 5406.31    3.98 5406.32    5.97 5406.32    7.96 5406.26
    9.95 5406.11   11.94 5406.04   13.93 5405.99   15.92 5405.93    17.9 5405.88
   19.89 5405.89   21.88 5405.82   23.87 5405.71   25.86  5405.7   27.85 5405.62
   29.84 5405.55   31.83 5405.45   33.82 5405.33   34.53 5405.28   35.81 5405.21
    37.8 5405.07   39.79 5404.88   41.78 5404.75   43.77 5404.62   45.76 5404.52
   47.75 5404.35   48.33  5404.3   49.73 5404.18   51.72 5403.95   53.71 5404.09
    55.7 5404.15   57.69 5404.29   59.68 5404.38   61.67 5404.39   63.66  5404.5
   65.65  5404.5   67.64  5404.5   69.63 5404.45   71.62  5404.4   73.61 5404.27
    75.6 5404.22   77.59 5404.14   79.58 5403.92   81.57 5404.04   82.54 5404.14
   83.55 5404.24   85.54 5404.45   86.78 5404.48   87.53  5404.5   89.52 5404.58
   91.51 5404.68    93.5 5404.73   95.49 5404.78   97.48 5404.84   99.47 5404.97
  101.46 5404.99  103.45 5405.04  105.44 5405.07  107.43 5405.13  109.42 5405.25
  111.41 5405.27   113.4 5405.35  115.38 5405.35  117.37 5405.35  119.36 5405.51
  121.35 5405.67  123.34 5405.78  125.33 5405.77  127.32 5405.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   48.33    .015   82.54     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         34.53   86.78            93.28   93.15   93.13             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   118.3  127.325415.418       0   10.685416.314

CROSS SECTION


RIVER: Blue_Ave_Split
REACH: 1                  RS: 655

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5403.27    1.99 5403.24    3.97 5403.05    5.64 5402.81    5.95 5402.77
    7.94 5402.39    9.92 5402.08    11.9 5401.97   13.88 5401.98   15.87 5401.88
   17.85 5401.68   19.78 5401.58   19.83 5401.58   21.81 5401.36    23.8 5401.05
   25.78 5401.19   27.76 5401.25   29.75 5401.32   31.73 5401.39   33.71 5401.44
   35.69 5401.46   37.68  5401.5   39.66 5401.44   41.64 5401.42   43.63 5401.38
   45.61 5401.31   47.59 5401.25   49.57 5401.13   51.56    5401   53.54 5401.37
   53.58 5401.37   55.52 5401.41   57.51 5401.84   59.49 5402.29    59.6 5402.31
   61.47 5402.62   63.45 5402.68   65.44 5402.68   67.42 5402.71    69.4 5402.82
   71.38 5402.87   73.37 5402.85   75.35 5402.82   77.33 5402.68   79.32 5402.65
    81.3 5402.65   83.28 5402.67   85.26 5402.67   87.25 5402.77   89.23 5402.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   19.78    .015   53.58     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5.64   61.47            91.73   91.46   91.38             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   -45.6  -39.755411.576

CROSS SECTION
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```
RIVER: Blue_Ave_Split
REACH: 1                  RS: 564

INPUT
Description:
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5398.99    1.98 5399.05    3.97 5399.11    5.95 5399.16    7.93 5399.22
    9.92 5399.26    11.9 5399.43   13.89 5399.26   15.87 5399.08   17.85  5399.1
   19.84 5399.09   21.82 5399.09    23.8 5399.08   25.79 5399.06   27.77 5398.98
   29.76 5398.92   31.74 5398.92   33.72 5398.94   35.71  5398.9   37.69 5398.82
   39.67 5398.87   40.34 5398.86   41.66 5398.82   43.64  5398.8   45.62 5398.77
   47.61 5398.67   49.59 5398.53   50.02 5398.52   51.58 5398.45   53.56 5398.31
   55.54 5398.46   57.53 5398.52   59.51 5398.67   61.49 5398.74   63.48 5398.77
   65.46 5398.76   67.45 5398.82   69.43 5398.85   71.41 5398.79    73.4 5398.74
   75.38 5398.68   77.36 5398.55   79.35 5398.43   81.33 5398.27   83.31 5398.54
   83.41 5398.55    85.3 5398.74   87.28  5399.1   89.27 5399.55   91.25 5399.78
   92.85 5399.92   93.23 5399.96   95.22 5400.12    97.2 5400.14   99.18 5400.23
  101.17 5400.27  103.15 5400.33  105.14 5400.31  107.12 5400.33   109.1 5400.45
  111.09 5400.62  113.07  5400.7  115.05  5400.7  117.04  5400.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   50.02    .015   83.41     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          40.34   92.85            89.35   89.49   89.53              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   11.715408.991

CROSS SECTION


RIVER: Blue_Ave_Split
REACH: 1                  RS: 474

INPUT
Description:
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5397.41       2 5397.38    3.99 5397.33    5.99 5397.26    7.98 5397.22
    9.98 5397.18   11.98 5397.16   13.97 5397.14   15.97 5397.09   17.96 5397.05
   19.96 5397.03   21.96 5397.01   23.95 5396.98   25.95 5396.97   27.95 5396.92
   29.94 5396.91   31.94 5396.89   33.93 5396.85   35.93 5396.86   37.93 5396.82
   39.92 5396.74   41.92 5396.71   43.91 5396.68   45.15 5396.64   45.91 5396.62
   47.91 5396.48    48.5 5396.44    49.9 5396.33    51.9 5396.18   53.89  5396.2
   55.89 5396.29   57.89 5396.39   59.88 5396.47   61.88 5396.57   63.87 5396.59
   65.87  5396.6   67.87 5396.61   69.86 5396.58   71.86 5396.53   73.85 5396.49
   75.85 5396.36   77.85 5396.25   79.84 5396.22    81.5 5396.32   81.84 5396.34
   83.84 5396.57   85.83 5396.75   87.83 5396.91   89.82 5397.09   91.82 5397.25
   93.53 5397.41   93.82 5397.44   95.81 5397.64   97.81 5397.86    99.8 5398.06
   101.8 5398.26   103.8 5398.47  105.79 5398.64  107.79 5398.82  109.78 5399.01
  111.78 5399.21  113.78 5399.37  115.77 5399.54  117.77 5399.75  119.76 5399.93
  121.76 5400.05  123.76 5400.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    48.5    .015    81.5     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          45.15   93.53           110.15  110.08  110.06              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    5.97   11.575407.263       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  118.29  123.765409.803       0    5.975407.413

CROSS SECTION


RIVER: Blue_Ave_Split
REACH: 1                  RS: 364

INPUT
Description:
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5394.47    1.97 5394.52    3.94 5394.57    5.91 5394.61    7.88 5394.64
    9.85 5394.45   11.82 5394.42   13.79 5394.44   15.76 5394.37   17.73  5394.3
    19.7 5394.28   21.68 5394.31   23.65 5394.26   25.62 5394.22   27.59 5394.21
   29.56 5394.18   31.53 5394.17    33.5 5394.14   35.47 5394.08   37.44 5394.13
   38.54 5394.14   39.41 5394.14   41.38 5394.17   43.35 5394.03   45.32  5393.8
   47.29  5393.8   49.26 5393.88   51.23 5393.93    53.2 5393.99   55.17 5394.07
   57.14 5394.13   59.11 5394.17   61.08 5394.19   63.05 5394.19   65.03 5394.18
      67 5394.13   68.97 5394.05   70.94 5393.99   72.91  5393.9   74.88 5393.85
   75.86 5393.93   76.85    5394   78.82 5394.21   80.79 5394.35   82.76 5394.58
   84.73 5394.79    86.7 5394.97   86.92    5395   88.67 5395.23   90.64 5395.44
   92.61  5395.6   94.58 5395.72   96.55 5395.86   98.52 5396.02  100.49 5396.16
  102.46 5396.29  104.44 5396.44  106.41  5396.5  108.38 5396.58  110.35 5396.71
  112.32 5396.83  114.29 5396.87  116.26 5397.04  118.23  5397.2   120.2  5397.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   43.35    .015   75.86     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          38.54   86.92           112.43  113.05  113.17              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    8.875404.469

CROSS SECTION


RIVER: Blue_Ave_Split
REACH: 1                  RS: 251

INPUT
Description:
```

```
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5391.69    1.97 5391.71    3.94 5391.73    5.91 5391.79    7.88 5391.85
    9.85 5391.87   11.82 5391.92   13.79 5391.99   15.76 5392.04   17.73 5392.06
    19.7 5392.14   21.68 5392.24   23.65 5392.32   25.62 5392.51   27.59 5392.48
   29.56 5392.26   31.53 5392.26    33.5 5392.31   35.47 5392.35   37.44 5392.47
   39.41 5392.57   41.38 5392.58   43.28 5392.44   43.35 5392.44   45.32 5392.14
   47.29 5391.85   47.69 5391.81   49.26 5391.66   51.23 5391.32    53.2 5391.38
   55.17 5391.47   57.14 5391.57   59.11 5391.63   61.08  5391.7   63.05 5391.74
   65.02 5391.73      67 5391.74   68.97 5391.76   70.94 5391.69   72.91 5391.62
   74.88 5391.55   76.85 5391.42   78.82 5391.26   80.79 5391.56   80.85 5391.56
   82.76 5391.66   84.73 5391.93    86.7  5392.3   88.67 5392.76   90.64 5393.11
   92.61 5393.77   94.58 5394.27   96.55 5395.13   98.52  5396.1  100.49 5397.21
  102.46 5397.96  102.63    5398  104.43 5398.38   106.4 5398.67  108.37 5398.61
  110.34 5398.47  112.32 5398.49

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   47.69    .015   80.85     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         43.28   92.61             53.26   66.31   69.89              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    9.99   11.835401.875       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    9.995401.692

CROSS SECTION


RIVER: Blue_Ave_Split
REACH: 1                  RS: 185

INPUT
Description:
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5391.28    1.99 5391.32    3.99 5391.37    5.98 5391.28    7.97 5391.17
    9.96 5391.14   11.96 5391.04   13.95 5391.07   15.94 5391.08   17.94 5391.05
   19.93 5391.07   21.92 5391.08   23.91 5391.09   25.91 5391.05    27.9 5391.07
   29.89 5391.11   31.89 5391.26   33.88 5391.12   35.87 5391.15   37.86 5391.14
   39.72 5391.05   39.86 5391.04   41.85 5390.92   43.84 5390.93   45.84 5390.96
   47.83  5390.8   49.82 5390.69   51.59 5390.56   51.81 5390.54   53.81 5390.31
    55.8 5390.32   57.79 5390.37   59.79 5390.41   61.78 5390.51   63.77 5390.56
   65.76 5390.65   67.76 5390.69   69.75 5390.74   71.74  5390.8   73.74 5390.82
   75.73 5390.85   77.72 5390.89   79.71 5390.93   81.71 5390.95    83.7 5390.97
   85.69    5391   87.69 5391.01   89.68 5391.03   91.67 5391.04   93.66 5391.12
   95.66 5391.13   97.65 5391.21   99.64 5391.19  100.81 5391.18  101.64 5391.18
  103.63 5391.23  105.62 5391.22  107.61 5391.28  109.61  5391.2   111.6 5392.23
  113.59 5393.64  115.59 5394.36  117.58    5395  119.57 5395.58  121.56 5396.12
  123.56 5396.82  124.27 5397.05  125.55 5397.45  127.54 5397.94  129.54  5398.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   51.59    .015  100.81     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         39.72  113.59             72.39   97.02  130.28              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   10.885401.284

CROSS SECTION


RIVER: Blue_Ave_Split
REACH: 1                  RS: 88

INPUT
Description:
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5391.08       2 5391.07    3.99 5390.95    5.99 5390.87    7.98 5390.82
    9.98 5390.56   10.59 5390.42   11.97 5390.11   13.97 5389.67   15.96 5389.54
   17.96 5389.47   19.95 5389.38   21.95 5389.26   23.95 5389.16   25.94 5389.11
   27.94 5389.31   29.93 5389.38   31.93 5389.36   33.92 5389.43   35.92 5389.49
   37.91 5389.61   39.91 5389.84   41.91 5390.04    43.9  5390.3    45.9 5390.47
   47.89 5390.65   49.89 5390.81   51.08 5390.83   51.88 5390.85   53.88 5390.85
   55.87 5390.86   57.87 5390.88   59.86 5390.92   61.86 5391.23   63.86 5391.38
   65.85 5391.78   67.85    5392   69.84 5391.85   71.84 5391.91   73.83 5391.98
   75.66 5392.07   75.83 5392.08   77.82 5392.13   79.82 5392.17   81.81 5392.22
   83.81 5392.26   85.81 5392.28    87.8 5392.29    89.8 5392.33   91.79 5392.33
   93.79 5392.36   95.78  5392.4   97.78 5392.46   99.77 5392.52  101.77 5392.58

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0     .13   51.08    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         10.59   67.85             13.97   87.84    6.3              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    7.185401.077

CROSS SECTION


RIVER: Denton_Ave_Split
REACH: 1                  RS: 534

INPUT
Description:
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5301.74    1.99  5301.8    3.99 5301.84    5.98 5301.75    7.98 5301.74
    9.97 5301.77   11.97 5301.79   12.33 5301.78   13.96 5301.75   15.96 5301.72
   17.95 5301.64   19.95 5301.55   21.94  5301.5   23.94 5301.44   25.93 5301.37
   27.93 5301.28   29.92 5301.24   31.92  5301.1   32.68 5301.05   33.91 5300.98
   35.91 5300.92    37.9 5300.52    39.9 5300.63   41.89 5300.74   43.89 5300.79
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   45.88 5300.87   47.88 5300.92   49.87 5300.95   51.87 5300.94   53.86 5300.94
   55.86 5300.95   57.85 5300.92   59.85 5300.84   61.84 5300.79   63.84 5300.73
   65.83 5300.66   67.83 5300.53   69.82 5300.69   71.82 5300.86   73.81 5300.88
   74.01 5300.91   75.81 5301.14    77.8  5301.3    79.8 5301.31   81.79 5301.35
   83.79 5301.46   85.78 5301.58   87.78  5301.7   89.77  5301.8   91.77 5301.88
   93.76  5301.9   95.76 5301.92   97.75 5301.95   99.75 5301.93  101.12 5301.93
  101.74 5301.93  103.74 5302.11  105.73 5302.24  107.73 5302.16  109.72 5301.95
  111.72 5301.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   32.68    .015   74.01     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          12.33   89.77            121.32  120.54  120.47             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.595311.736  103.48  111.725312.079

CROSS SECTION


RIVER: Denton_Ave_Split
REACH: 1                  RS: 414

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5300.17    1.99 5300.29    3.99 5300.26    5.98 5300.18    7.97 5300.15
    9.97 5300.01   10.03    5300   11.96 5299.88   13.96 5299.83   15.95  5299.8
   17.94 5299.69   19.94 5299.57   21.93 5299.44   23.92 5299.37   25.92 5299.26
   27.91 5299.23    29.9 5299.21    31.9  5299.2   33.74 5299.04   33.89 5299.03
   35.88    5299   37.88 5298.69   39.87 5298.69   41.87 5298.86   43.86 5298.97
   45.85 5299.05   47.85 5299.13   49.84  5299.2   51.83 5299.21   53.83 5299.22
   55.82 5299.18   57.81 5299.17   59.81 5299.11    61.8 5299.03   63.79 5298.92
   65.79 5298.77   67.78 5298.57   69.77 5298.75   71.77 5298.91   73.29 5299.01
   73.76 5299.04   75.76 5299.11   77.75 5299.18   79.74 5299.25   81.74 5299.38
   83.73 5299.52   85.72 5299.62   87.72 5299.76   89.71 5299.89    91.7 5300.01
   92.17 5300.01    93.7 5300.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   33.74    .015   73.29     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          10.03   92.17            130.38  131.08  131.29             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    4.255310.172

CROSS SECTION


RIVER: Denton_Ave_Split
REACH: 1                  RS: 283

INPUT
Description:
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5298.17    1.97 5298.17    3.93 5298.18     5.9 5298.19    7.87 5298.13
    9.84 5298.05   10.65 5298.03    11.8    5298   13.77 5297.97   15.74 5297.92
   17.71 5297.83   19.67 5297.73   21.64 5297.63   23.61 5297.52   25.58 5297.41
   27.54 5297.28   29.51 5297.16   31.48 5297.04   33.45 5296.85   35.26 5296.63
   35.41 5296.61   37.38 5296.49   39.35 5296.59   41.32 5296.75   43.28 5296.82
   45.25 5296.94   47.22 5296.99   49.19 5297.01   51.15 5297.09   53.12 5297.13
   55.09 5297.12   57.06 5297.12   59.02 5297.04   60.99 5296.95   62.96 5296.88
   64.93 5296.82   66.89 5296.69   68.86 5296.53   70.83 5296.62   72.79  5296.9
   72.88 5296.91   74.76    5297   76.73 5297.23    78.7 5297.38   80.66 5297.67
   82.63 5297.85    84.6 5298.01   86.57 5298.17   88.53 5298.41    90.5 5298.54
   92.47 5298.65   94.44 5298.79    96.4 5298.88   98.37 5298.91   98.39 5298.91
  100.34 5298.92  102.31  5299.5  104.27 5299.83  106.24 5299.94  108.21 5299.91
  110.18 5299.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   35.26    .015   72.88     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          10.65   86.57            104.06  103.77  103.69             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0    5.125308.165       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  103.12  110.185309.712

CROSS SECTION


RIVER: Denton_Ave_Split
REACH: 1                  RS: 179

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5297.51    1.99 5297.55    3.99 5297.48    5.98 5297.32    7.97 5297.18
    9.97 5297.06   10.37 5297.03   11.96 5296.93   13.95 5296.83   15.94 5296.72
   17.94 5296.61   19.93 5296.48   21.92 5296.37   23.92 5296.31   25.91 5296.18
    27.9 5296.09    29.9    5296   31.89  5295.9   33.88 5295.75   35.87 5295.53
   36.57 5295.45   37.87  5295.3   39.86 5295.37   41.85 5295.54   43.85 5295.68
   45.84 5295.82   47.83 5295.94   49.83 5296.01   51.82 5296.01   53.81 5296.03
   55.81    5296    57.8 5295.94   59.79 5295.91   61.78 5295.87   63.78 5295.77
   65.77 5295.69   67.76 5295.53   69.76 5295.52   71.75 5295.77   72.66 5295.89
   73.74 5296.03   75.74 5296.33   77.73 5296.56   79.72  5296.8   81.71 5297.04
   83.71 5297.28    85.7 5297.52   87.69 5297.76   89.69 5298.06   91.68 5298.26
   93.67 5298.45   95.67 5298.67   96.67 5298.75   97.66 5298.84   99.65 5298.99
  101.65 5299.13  103.64 5299.19  105.63 5299.17  107.62 5299.16
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Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   36.57    .015   72.66     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         10.37   81.71            104.35   103.6  103.54             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    4.255307.514  102.36  107.62 5309.16

CROSS SECTION


RIVER: Denton_Ave_Split
REACH: 1                  RS: 75

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5296.08    1.98 5296.11    3.95 5296.08    5.93 5296.04     7.9 5296.12
    9.88 5296.04   10.73    5296   11.85 5295.95   13.83 5295.88    15.8 5295.79
   17.78 5295.73   19.75  5295.6   21.73 5295.47    23.7 5295.43   25.68 5295.23
   27.65 5295.17   29.63 5295.08    31.6 5295.08   33.58 5294.94   35.55 5294.71
   37.53 5294.55   37.87 5294.51   39.51 5294.34   41.48 5294.63   43.46 5294.77
   45.43 5294.85   47.41 5294.91   49.38 5295.03   51.36 5295.14   53.33 5295.17
   55.31 5295.24   57.28 5295.24   59.26 5295.19   61.23 5295.12   63.21 5295.04
   65.18 5294.95   67.16 5294.91   69.13 5294.68   71.11 5294.72   72.43 5294.87
   73.09 5294.94   75.06 5295.14   77.04 5295.36   79.01 5295.52   80.99 5295.63
   82.96 5295.75   84.94 5295.87   86.91 5295.99   88.89 5296.13   90.86 5296.22
   92.84 5296.35   94.81 5296.55   96.79 5296.73   98.76  5296.9  100.19 5297.06
  100.74 5297.11  102.71 5297.38  104.69 5297.71  106.66 5298.04  108.64 5298.22
  110.62 5298.22  112.59 5298.17  114.57 5298.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   37.87    .015   72.43     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         10.73   88.89             47.67   34.78   31.34             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.365306.076   107.4  114.575308.165

CROSS SECTION


RIVER: Denton_Ave_Split
REACH: 1                  RS: 41

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5295.23     .94  5295.2    1.99 5295.17    3.97 5295.09    5.95 5295.04
    7.93 5294.96    9.91 5294.95   11.89 5294.93   13.87 5294.89   15.85 5294.86
   17.83 5294.84   19.81 5294.76   21.79 5294.68   23.77 5294.67   25.75  5294.7
   27.73 5294.74   29.71 5294.74   31.69 5294.67   33.67 5294.65   35.65 5294.53
   37.63 5294.24   39.61 5294.39   39.85  5294.4   41.59 5294.47   43.57 5294.47
   45.55 5294.59   47.54 5294.66   49.52 5294.71    51.5 5294.78   53.48 5294.87
   55.46 5294.86   57.44 5294.86   59.42 5294.83    61.4 5294.79   63.38 5294.71
   65.36 5294.69   67.34 5294.56   69.32 5294.68    71.3 5294.93   73.28    5295
   75.26 5295.21   75.77 5295.26   77.24 5295.42   79.22 5295.57    81.2 5295.72
   83.18 5295.94   85.16 5296.18   87.14 5296.37   89.12 5296.54    91.1 5296.73
   93.09 5296.89   95.07    5297   96.36 5297.13   97.05  5297.2   99.03 5297.27
  101.01 5297.56  102.99 5297.79  104.97 5297.95  106.95 5298.11  108.93 5298.33
  110.91 5298.36  112.89 5298.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   39.85    .015   75.77     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            .94    81.2            24.45    40.7   19.08             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  106.17  112.89 5308.04

CROSS SECTION


RIVER: Echo_Pl_Split
REACH: 1                  RS: 289

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5443.07    1.97 5443.09    3.94  5443.1    5.91 5443.05    7.88 5443.03
    9.85 5442.98   11.82 5442.93   13.79 5442.99   15.76 5443.07   17.73 5443.24
    19.7 5443.48   21.67 5443.65   23.64 5443.58   25.61  5443.5   27.58 5443.49
   29.55  5443.3   31.52 5443.06   33.49 5442.91   35.46  5442.8   37.43 5442.64
    39.4 5442.56   41.37  5442.3   43.34 5441.59   45.31 5441.04   47.28 5440.87
   49.25 5440.79   51.22 5440.75   53.19 5440.73   55.16 5440.79   57.13 5440.65
    59.1 5440.58   61.07 5440.46   63.04 5440.41   65.01 5440.34   66.98 5440.27
   68.95 5440.24   69.77  5440.2   70.92 5440.15   72.89 5440.08   74.86    5440
   76.83 5439.91    78.8 5439.83   80.77 5439.81   82.74 5439.68   84.71  5439.5
   86.68 5439.51   88.65 5439.61   90.62 5439.71   92.59 5439.81   93.79 5439.88
   94.56 5439.93   96.53 5440.02    98.5 5439.88  100.47 5439.71  102.44 5439.54
  104.41 5439.46  106.38 5439.41  108.35 5439.38  110.32 5439.36  112.29 5439.33
  114.26  5439.3  116.23 5439.29

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         41.37   93.79            74.19    70.5   83.44             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   13.995453.068   93.79  116.235449.861
```

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CROSS SECTION


RIVER: Echo_Pl_Split
REACH: 1                  RS: 219

INPUT
Description:
Station Elevation Data    num=      79
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5440.07       2 5439.97       4 5439.86       6 5439.75       8 5439.64
      10 5439.52      12  5439.4      14  5439.3      16 5439.27      18 5439.37
      20 5439.47   21.61 5439.47      22 5439.47   23.99 5439.34   25.99 5439.26
   27.99 5439.28   29.99 5439.04   31.99 5438.85   33.99 5438.85   35.99 5438.76
   37.99 5438.71   39.99 5438.63   41.99 5438.53   43.99 5438.46   45.99 5438.32
   47.99 5438.28   49.99 5438.24   51.99 5438.18   53.99 5438.11   55.99 5438.06
   57.99 5438.07   59.99 5438.03   61.99 5438.03   63.99 5438.04   65.99 5437.99
   67.99 5437.91   69.98 5437.77   71.98 5437.65   73.98 5437.67   75.98 5437.71
   77.98 5437.69   79.98 5437.73   81.98 5437.75   83.98 5437.79   85.98 5437.88
   87.98 5438.03   89.98 5438.02   91.98 5438.02   93.98 5438.06   95.98 5438.11
   97.98 5438.15   99.98 5438.16  100.46 5438.16  101.98 5438.16  103.98 5438.22
  105.98  5438.3  107.98 5438.38  109.98 5438.52  111.98 5438.59  113.97 5438.61
  115.97  5438.6  117.97 5438.59  119.97 5438.64  121.97  5438.7  123.97 5438.79
  125.97 5438.85  127.97 5438.91  129.97 5438.97  131.97 5439.03  133.97 5439.01
  135.97    5439  137.97 5438.99  139.97 5438.98  141.97 5438.97  143.97 5438.96
  145.97 5438.94  147.97 5438.93  149.97 5438.92  151.97 5438.83

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         21.61  100.46            47.46   52.06   89.63              .1       .3
Ineffective Flow     num=        2
   Sta L   Sta R    Elev  Permanent
   49.31   77.295448.263       F
   18.25    19.65449.377       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   18.25 5450.07  128.99  151.975448.924

CROSS SECTION


RIVER: Echo_Pl_Split
REACH: 1                  RS: 167

INPUT
Description:
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5439.9    1.98 5439.83    3.96 5439.78    5.95 5439.77    7.93 5439.82
    9.91 5439.79   11.89 5439.57   13.87 5439.27   15.86 5439.03   17.84  5438.9
   19.82 5438.78    21.8 5438.63   23.78 5438.46   25.77 5438.26   26.13 5438.22
   27.75 5438.06   29.73 5437.82   31.71 5437.56   33.69 5437.33   35.68 5437.16
   37.66 5437.01   39.64 5436.84   41.62 5436.62   43.49 5436.39    43.6 5436.38
   45.59 5436.21   47.57 5436.06   49.55 5435.88   51.53 5435.91   53.52 5436.01
    55.5 5436.12   57.48 5436.24   59.46 5436.31   61.44 5436.39   63.43 5436.46
   65.41 5436.52   67.39 5436.58   69.37 5436.63   71.35 5436.63   73.34 5436.62
   75.32 5436.59    77.3 5436.53   79.28 5436.55   81.26 5436.52   83.25 5436.51
   85.23 5436.48   87.21 5436.42   89.19 5436.36   91.17 5436.28   93.16 5436.21
   95.14 5436.06   97.12 5435.95    99.1 5435.95  100.78 5435.99  101.08    5436
  103.07  5436.2  105.05 5436.24  107.03 5436.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   43.49    .015  100.78     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         37.66  107.03            89.43   90.19   96.85              .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
   11.47   16.715449.638       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   11.475449.896

CROSS SECTION


RIVER: Echo_Pl_Split
REACH: 1                  RS: 76

INPUT
Description:
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5437.14    1.97 5437.07    3.95 5437.02    5.92 5436.92     7.9  5436.8
    9.87 5436.74   11.85 5436.53   13.82 5436.46    15.8 5436.43   17.77 5436.34
   19.75 5436.14   21.72 5436.02    23.7 5435.91   23.96 5435.89   25.67  5435.8
   27.65 5435.74   29.62 5435.62    31.6 5435.48   33.57 5435.35   35.54 5435.21
   37.52 5435.15   39.49 5435.09   41.47 5434.98   43.44 5434.84   44.56  5434.7
   45.42  5434.6   47.39 5434.44   49.37 5434.26   51.34  5434.2   53.32  5434.3
   55.29 5434.37   57.27 5434.44   59.24 5434.48   61.22 5434.55   63.19 5434.56
   65.16 5434.55   67.14 5434.52   69.11 5434.45   71.09 5434.37   73.06 5434.28
   75.04 5434.17   75.52  5434.2   77.01 5434.29   78.99 5434.46   80.96 5434.53
   82.94 5434.62   84.91 5434.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   44.56    .015   75.52     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          33.57   84.91            17.23   76.47   14.25              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   14.665447.142

CROSS SECTION
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```
RIVER: Euclid_Ave_Split
REACH: 02                  RS: 1563

INPUT
Description:
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5305.53    1.99 5305.55    3.99 5305.61    5.98 5305.53    7.98 5305.41
    9.97 5305.31   11.96  5305.3   13.96 5305.26   15.95 5305.26   17.94 5305.25
   19.94 5305.21   21.93 5305.25   23.34 5305.31   23.92 5305.33   25.92 5305.24
   27.91 5304.45   29.91 5303.93    31.9 5303.85   33.89 5303.83   35.89 5303.47
   37.88  5303.3   39.87 5303.36   41.87 5303.39   43.06 5303.38   43.86 5303.37
   45.86  5303.4   47.85 5303.43   49.84 5303.44   51.84 5303.47   53.83 5303.49
   55.82 5303.52   57.82 5303.55   59.81 5303.62   61.81 5303.63    63.8 5303.65
   65.79 5303.69   67.79 5303.69   69.78 5303.75   71.77 5303.77   73.77 5303.71
   75.76 5303.65   77.76 5303.58   79.75 5303.51   81.74 5303.46   83.74 5303.39
   85.73 5303.32   87.72 5303.25   88.04 5303.24   89.72  5303.2   91.71 5303.15
   93.71 5303.09    95.7  5303.3   97.69 5303.52   99.69 5303.58  101.68 5303.77
  103.67 5304.04  105.67  5304.2  107.66 5304.43  109.66 5304.61  111.03  5304.6
  111.65 5304.59  113.64 5304.52  115.64 5304.56  117.63 5304.69  119.62 5304.76
  121.62 5304.75  123.61 5304.76  125.61 5304.79   127.6 5304.81  129.59 5304.82
  131.59 5304.89  133.58 5305.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   43.06    .015   88.04     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         25.92  109.66            118.2  117.88  117.83             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.725315.528  126.34  133.585314.793

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                  RS: 1445

INPUT
Description:
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5304.88    1.99 5304.87    3.98 5304.88    5.98 5304.88    7.97 5304.79
    9.96 5304.51   11.95 5304.21   13.94    5304   14.08 5303.99   15.93 5303.85
   17.93 5303.75   19.92 5303.55   21.91 5303.39    23.9 5303.34   25.89 5303.28
   27.88 5303.21   29.87 5303.01   31.87 5302.79   33.86  5302.7   35.85 5302.44
   37.84 5302.25   39.83  5302.3   39.91  5302.3   41.82 5302.33   43.82 5302.34
   45.81 5302.36    47.8 5302.34   49.79 5302.36   51.78 5302.39   53.77 5302.39
   55.77  5302.4   57.76 5302.44   59.75 5302.46   61.74 5302.49   63.73 5302.55
   65.72 5302.58   67.72 5302.61   69.71  5302.6    71.7 5302.54   73.69 5302.47
   75.68 5302.38   77.67 5302.29   79.67 5302.24   81.66 5302.16   83.65 5302.08
   85.64    5302   86.08 5301.98   87.63  5301.9   89.62 5301.84   91.62 5301.79
   93.61 5301.89    95.6 5302.15   97.59 5302.22   99.58  5302.2  101.57 5302.12
  103.57 5302.02  105.34 5301.96  105.56 5301.95  107.55  5301.9  109.54  5301.9
  111.53 5301.97  113.52 5301.96  115.52 5301.95  117.51 5301.89   119.5 5301.83
  121.49  5301.8  123.48 5301.92  125.47 5301.94  127.47 5301.95  129.46 5301.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   39.91    .015   86.08     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         27.88   97.59           133.31  133.46  133.56             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0     7.15314.881   124.1  129.465311.925

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                  RS: 1311

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5303.52    1.98 5303.53    3.96 5303.52    5.93 5303.44    7.91 5303.41
    9.89 5303.43   11.87 5303.49   13.84 5303.68   15.82 5303.91    17.8 5304.04
   19.78 5304.12   21.75  5304.2   23.73 5304.22   25.09 5304.14   25.71  5304.1
   27.69  5303.8   29.66 5303.39   31.64 5302.86   33.62 5302.38    35.6 5301.99
   37.58 5301.63   38.35 5301.57   39.55 5301.48   41.53 5301.33   43.51 5301.03
   45.49 5301.06   47.46 5301.06   49.44 5301.05   51.42 5301.06    53.4 5301.12
   55.37 5301.14   57.35 5301.15   59.33 5301.16   61.31 5301.16   63.28 5301.17
   65.26  5301.2   67.24 5301.25   69.22 5301.24   71.19 5301.19   73.17 5301.17
   75.15 5301.12   77.13 5301.04   79.11 5301.04   81.08 5300.96   83.06 5300.89
   85.04 5300.85   85.87 5300.83   87.02 5300.81   88.99  5300.8   90.97 5300.73
   92.95 5300.73   94.93 5301.18    96.9 5301.26   98.88 5301.51  100.86 5301.74
  102.84 5301.68  104.81 5301.64  106.79 5301.84  108.77 5301.88  110.75  5301.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   38.35    .015   85.87     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           35.6  100.86            117.9  117.82  117.89             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    6.445313.525

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                  RS: 1193

INPUT
Description:
Station Elevation Data    num=      54
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```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5301.75    1.97 5301.74    3.95 5301.71    5.92 5301.63     7.9 5301.54
    9.87 5301.56   11.84 5301.56   13.82 5301.54   15.79 5301.48   17.77  5301.4
   19.74 5301.32   21.71 5301.22   23.69  5301.1   25.15 5301.07   25.66 5301.07
   27.64 5301.05   29.61 5300.93   31.58 5300.73   33.56 5300.53   35.21 5300.38
   35.53 5300.35   37.51 5300.24   39.48  5300.1   41.45 5299.84   43.43 5299.75
    45.4 5299.73   47.38 5299.74   49.35  5299.7   51.32 5299.75    53.3 5299.74
   55.27  5299.8   57.25 5299.81   59.22 5299.81   61.19 5299.86   63.17 5299.88
   65.14 5299.92   67.12 5299.97   69.09 5299.91   71.06 5299.87   73.04 5299.77
   75.01 5299.73   76.99  5299.7   78.96  5299.6   80.94 5299.55   82.91 5299.49
   83.91 5299.46   84.88 5299.43   86.86 5299.42   88.83 5299.35   90.81  5299.3
   92.78  5299.7   94.75 5299.81   96.73 5300.09   98.83 5300.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   35.21    .015   83.91     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         33.56   98.83            89.06   69.04   54.87             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.895311.747  122.18  132.265310.236

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                 RS: 1124

INPUT
Description:
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5301.82       2 5301.81       4  5301.8       6 5301.76    7.99 5301.66
    9.99 5301.52   11.99 5301.49   13.99 5301.37   15.99 5301.29   17.99 5301.32
   19.99 5301.45   21.99 5301.64   23.98 5301.83   25.98  5301.9   27.98 5301.83
   29.98 5301.81   31.98 5301.77   33.98 5301.58   35.98  5301.3   37.98    5301
   39.97 5300.58   41.97 5300.21   43.74 5300.02   43.97 5299.99   45.97 5299.75
   47.97 5299.38   49.97 5299.26   51.97 5299.06   53.97 5299.01   55.96 5299.07
   57.96 5299.16   59.96 5299.19   61.94 5299.23   61.96 5299.23   63.96 5299.29
   65.96 5299.32   67.96 5299.33   69.96 5299.34   71.95 5299.39   73.95 5299.42
   75.95 5299.41   77.95 5299.44   79.95 5299.48   81.95 5299.49   83.95  5299.5
   85.94 5299.51   87.94 5299.53   89.94 5299.56   91.94 5299.56   93.94 5299.57
   95.94 5299.57   97.94 5299.49   99.94  5299.5  101.93 5299.46  103.93 5299.43
  105.93 5299.43  107.93  5299.4  109.93 5299.33  111.93 5299.29  113.93 5299.29
  115.93 5299.26  117.36 5299.22  117.92  5299.2  119.92 5299.16  121.92 5299.13
  123.92  5299.1  125.92 5299.08  127.92 5299.04  129.92 5299.01  131.92 5298.98
  133.91 5299.13  135.91 5299.35  137.91 5299.52  139.91 5299.69  141.91 5299.69
  143.91 5299.61  145.91 5299.75  147.91 5299.74   149.9  5299.6   151.9 5299.68
   153.9 5299.77   155.9 5299.82   157.9 5299.83   159.9 5299.82  161.77 5299.86
   161.9 5299.86  163.89 5300.09  165.89 5300.17  167.89 5300.22  169.89 5300.33
  171.89 5300.45  173.89 5300.26  175.89 5300.23  177.89 5300.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   43.74    .015  117.36     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         41.97  161.77            98.25   88.73    61.6             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.475311.818  167.76  177.89 5310.22

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                 RS: 1036

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5299.47    1.99 5299.61    3.98 5299.64    5.97 5299.64    7.96 5299.58
    9.95 5299.65   11.94 5299.58   13.93 5299.49   15.66 5299.35   15.92 5299.33
   17.91 5299.02    19.9  5298.9   21.89 5298.88   23.88 5298.82   25.87 5298.65
   27.86 5298.56   29.85 5298.48   31.79 5298.43   31.84 5298.42   33.83 5298.37
   35.82 5298.12   37.81 5298.01    39.8 5297.59   41.79 5297.59   43.78  5297.7
   45.77 5297.81   47.76  5297.9   49.75 5297.96   51.74 5297.99   53.73 5298.04
   55.72 5298.07   57.71 5298.05    59.7 5298.01   61.69 5297.96   63.68 5297.92
   65.67 5297.86   67.66 5297.77   69.65 5297.67   71.64 5297.62   72.26 5297.64
   73.63 5297.66   75.62 5297.75   77.61 5298.12    79.6 5298.39   81.59 5298.57
   83.58 5298.64   85.57 5298.68   87.56 5298.79   89.55 5298.95   91.54 5299.15
   92.36 5299.21   93.53  5299.3   95.52  5299.4   97.51 5299.55    99.5 5299.68
  101.49 5299.86  103.48 5299.95  105.47 5299.93  107.46 5299.91  109.45 5299.87
  111.44 5299.83  113.43 5299.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   31.79    .015   72.26     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         15.66   92.36           101.33  101.44  101.97             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.255309.472  107.21  113.435309.913

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                 RS: 934

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5297.97    1.97 5297.98    3.94 5298.05    5.91 5297.91    7.88 5297.75
    9.85 5297.75   11.82 5297.79    13.8 5297.84   15.66 5297.85   15.77 5297.85
   17.74 5297.84   19.71 5297.75   21.68 5297.67   23.65 5297.48   25.62 5297.33
   27.59 5297.22   29.56 5297.14   31.53 5297.04   32.27 5296.99    33.5 5296.92
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   35.47 5296.73   37.45 5296.63   39.42 5296.38   41.39 5296.31   43.36 5296.41
   45.33 5296.44    47.3 5296.43   49.27  5296.5   51.24 5296.56   53.21 5296.59
   55.18  5296.6   57.15 5296.56   59.12 5296.54    61.1 5296.55   63.07 5296.53
   65.04  5296.5   67.01 5296.46   68.98 5296.37   70.95 5296.42   72.41 5296.57
   72.92 5296.62   74.89 5296.74   76.86 5296.94   78.83 5297.12    80.8 5297.22
   82.77 5297.31   84.75  5297.4   86.72 5297.49   88.69  5297.6      90 5297.71
   90.66 5297.76   92.63 5297.85    94.6 5297.88   96.57 5297.88   98.54 5297.89
  100.51 5297.94  102.48 5298.01  104.45 5298.12  106.42 5298.09   108.4 5298.01
  110.37 5298.02  112.34 5298.08  114.31  5298.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   32.27    .015   72.41     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         15.66      90           133.01   133.1  133.53              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.265307.971   106.1  114.31  5308.1

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                 RS: 801

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5296.25       2 5296.28       4 5296.31    5.99 5296.27    7.99 5296.26
    9.99  5296.2   11.99 5296.15   13.99 5296.08   15.87 5295.97   15.98 5295.97
   17.98 5295.85   19.98 5295.76   21.98 5295.62   23.98 5295.58   25.98 5295.52
   27.97  5295.4   29.97 5295.32   31.97 5295.29   33.97 5295.25   35.56 5295.15
   35.97 5295.12   37.96 5294.94   39.96 5294.83   41.96 5294.54   43.96  5294.5
   45.96 5294.62   47.96 5294.69   49.95 5294.77   51.95 5294.79   53.95 5294.82
   55.95 5294.85   57.95 5294.86   59.94 5294.81   61.94 5294.76   63.94 5294.72
   65.94 5294.66   67.94 5294.59   69.93 5294.48   71.93 5294.37   73.93 5294.48
   75.26 5294.59   75.93 5294.65   77.93 5294.85   79.93 5295.06   81.92 5295.16
   83.92 5295.22   85.92  5295.3   87.92 5295.41   89.92 5295.53   91.91 5295.66
   93.91 5295.77   95.07 5295.83   95.91 5295.87   97.91 5295.94   99.91 5296.09
   101.9 5296.27   103.9 5296.35   105.9 5296.23   107.9 5296.28   109.9 5296.43
   111.9 5296.44  113.89 5296.38

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   35.56    .015   75.26     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         15.87   95.07           102.99   102.8  101.94              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0     6.75306.254  105.44  113.895306.284

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                 RS: 698

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5294.92    1.97 5294.93    3.95 5294.83    5.92 5294.65     7.9 5294.61
    9.87 5294.66   11.85 5294.68   12.87 5294.67   13.82 5294.66    15.8  5294.6
   17.77 5294.58   19.74 5294.58   21.72 5294.54   23.69 5294.53   25.67 5294.48
   27.64  5294.2   29.62 5293.99   31.59 5293.86   33.57 5293.76   34.27 5293.69
   35.54 5293.58   37.51 5293.36   39.49 5293.16   41.46 5293.01   43.44 5293.19
   45.41 5293.28   47.39 5293.31   49.36 5293.34   51.34 5293.41   53.31 5293.43
   55.28 5293.44   57.26 5293.43   59.23  5293.4   61.21 5293.36   63.18 5293.36
   65.16 5293.32   67.13 5293.24    69.1 5293.15   71.08 5293.05   73.05 5293.49
   73.62 5293.51   75.03 5293.54      77 5293.86   78.98 5293.88   80.95 5293.94
   82.93 5294.05    84.9 5294.14   86.87 5294.23   88.85 5294.32   90.82 5294.34
    92.8 5294.48   94.77  5294.5   95.41 5294.51   96.75 5294.53   98.72 5294.58
   100.7 5294.62  102.67 5294.69  104.64 5294.73  106.62 5294.86  108.59 5294.88
  110.57  5294.8  112.54 5294.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   34.27    .015   73.62     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         12.87   95.41           104.77   104.87  105.35              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.625304.922  106.07  112.545304.817

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                 RS: 593

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5293.52       2 5293.61       4 5293.57    5.99  5293.5    7.99 5293.35
    9.99 5293.21   11.99 5293.17    13.2 5293.19   13.99 5293.21   15.98 5293.05
   17.98 5293.02   19.98 5292.94   21.98 5292.77   23.97 5292.63   25.97 5292.56
   27.97 5292.45   29.97 5292.42   31.97 5292.25   33.89 5292.05   33.96 5292.04
   35.96 5291.97   37.96 5291.63   39.96 5291.53   41.96 5291.66   43.95 5291.83
   45.95 5291.89   47.95 5291.98   49.95 5291.98   51.95 5292.01   53.94 5292.04
   55.94 5292.02   57.94 5292.01   59.94 5291.91   61.93 5291.91   63.93 5291.86
   65.93 5291.74   67.93 5291.65   69.93 5291.41   71.92 5291.57   72.89 5291.68
   73.92 5291.81   75.92 5292.33   77.92 5292.52   79.92 5292.63   81.91 5292.71
   83.91 5292.84   85.91 5292.92   87.91 5293.08    89.9  5293.3    91.9 5293.43
    93.9  5293.5   94.27 5293.55    95.9 5293.75    97.9 5293.86   99.89 5293.89
  101.89    5294  103.89 5293.85  105.89 5293.92  107.89 5293.97  109.88 5294.06
```

```
Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   33.89    .015   72.89     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           13.2   94.27            91.05   90.92    90.3             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0     6.35303.522  104.11  109.885303.839

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                 RS: 502

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5292.28    1.99 5292.26    3.99 5292.39    5.98 5292.46    7.98 5292.41
    9.97 5292.35   11.97 5292.22   13.21 5292.15   13.96  5292.1   15.95 5292.01
   17.95 5291.89   19.94 5291.76   21.94 5291.66   23.93  5291.6   25.93 5291.57
   27.92 5291.63   29.91 5291.54   31.91 5291.44    33.9 5291.01   34.32 5290.97
    35.9 5290.84   37.89 5290.64   39.89 5290.71   41.88 5290.84   43.87 5290.98
   45.87 5291.12   47.86 5291.18   49.86 5291.24   51.85 5291.26   53.85 5291.29
   55.84  5291.3   57.83 5291.22   59.83 5291.16   61.82 5291.15   63.82 5291.02
   65.81 5290.93   67.81 5290.77    69.8 5290.87   71.79 5291.08   73.02 5291.18
   73.79 5291.24   75.78 5291.34   77.78 5291.56   79.77 5291.69   81.77 5291.83
   83.76 5291.87   85.76 5292.01   87.75 5292.18   89.74 5292.33   91.74 5292.44
   93.73 5292.63   95.73 5292.83   95.79 5292.83   97.72 5292.93   99.72 5292.99
  101.71 5293.04   103.7 5293.19   105.7 5293.34  107.69 5293.41

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   34.32    .015   73.02     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          13.21   95.79            80.16   80.21   80.45             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.045302.276  102.43  107.695303.075

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 02                 RS: 422

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5292.15    1.97 5292.15    3.93 5292.14     5.9 5292.03    7.86 5291.93
    9.83 5291.81    11.8 5291.71   12.65 5291.65   13.76 5291.56   15.73 5291.45
   17.69  5291.4   19.66 5291.33   21.63 5291.32   23.59 5291.33   25.56 5291.24
   27.52 5291.13   29.49 5290.98   31.45 5290.86   33.42 5290.69    34.7 5290.63
   35.39 5290.59   37.35 5290.26   39.32 5290.26   41.28 5290.38   43.25 5290.46
   45.22 5290.61   47.18 5290.74   49.15  5290.8   51.11 5290.86   53.08  5290.9
   55.05 5290.89   57.01 5290.84   58.98 5290.76   60.94 5290.67   62.91 5290.59
   64.88 5290.46   66.84  5290.3   68.81 5290.33   70.77 5290.59   72.74 5290.66
   73.13 5290.69   74.71 5290.81   76.67 5291.02   78.64 5291.15    80.6 5291.26
   82.57 5291.35   84.54 5291.45    86.5 5291.56   88.47 5291.63   90.43 5291.74
    92.4 5291.88   94.37 5292.03   94.88 5292.07   96.33 5292.18    98.3 5292.45
  100.26 5292.62  102.23 5292.66  104.19 5292.71  106.16 5292.79  108.13  5292.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    34.7    .015   73.13     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          12.65   94.88           113.87  113.87  113.87             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    4.695302.155  101.25  108.135302.638

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 01                 RS: 308

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5291.42       2  5291.5       4 5291.52    5.99  5291.5    7.99 5291.45
    9.99  5291.4   11.99 5291.32   13.99 5291.26   14.64 5291.25   15.98 5291.23
   17.98  5291.1   19.98 5290.82   21.98 5290.63   23.98 5290.57   25.97 5290.52
   27.97 5290.47   29.97 5290.38   31.97 5290.33   33.97 5290.35   35.96 5290.09
   37.89 5289.93   37.96 5289.93   39.96 5289.61   41.96 5289.63   43.96 5289.86
   45.96 5290.02   47.95 5290.15   49.95 5290.22   51.95 5290.26   53.95 5290.31
   55.94  5290.3   57.94 5290.27   59.94 5290.25   61.94 5290.17   63.94  5290.1
   65.94 5290.01   67.93  5289.9   69.93 5289.72   71.93 5289.88   73.93 5290.08
   75.93  5290.2   75.94  5290.2   77.92 5290.38   79.92 5290.55   81.92 5290.72
   83.92 5290.87   85.92 5291.02   87.91 5291.17   89.91 5291.32   91.91  5291.5
   93.91 5291.67   95.91 5291.86   96.59 5291.93    97.9 5292.06    99.9 5292.19
   101.9 5292.26   103.9 5292.38   105.9 5292.51  107.89 5292.59  109.89 5292.64

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   37.89    .015   75.94     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          14.64   96.59            84.78   84.75   84.75             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.465301.417  103.66  109.895302.358

CROSS SECTION
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```
RIVER: Euclid_Ave_Split
REACH: 01                  RS: 224

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5290.98    1.97 5291.04    3.93 5291.19     5.9 5291.14    7.87 5290.89
    9.83 5290.79    11.8 5290.76   13.77 5290.76   14.64 5290.72   15.73 5290.66
    17.7 5290.54   19.67 5290.39   21.63  5290.3    23.6 5290.14   25.57 5290.03
   27.53  5289.9    29.5  5289.9   31.47 5289.75   33.43 5289.72    35.4 5289.51
   37.37 5289.32   39.17 5289.14   39.33 5289.12    41.3 5289.02   43.27 5289.17
   45.23 5289.34    47.2 5289.47   49.17 5289.58   51.13 5289.67    53.1 5289.72
   55.07 5289.74   57.03 5289.73      59 5289.69   60.97 5289.63   62.93 5289.57
    64.9 5289.48   66.87 5289.36   68.83 5289.25    70.8 5289.15   72.77 5289.37
   74.73 5289.54    76.7 5289.69   76.94 5289.71   78.67 5289.87   80.63 5289.95
    82.6 5290.03   84.57 5290.12   86.53 5290.22    88.5 5290.28   90.47 5290.33
   92.43 5290.43    94.4 5290.52   94.99 5290.55   96.37 5290.62   98.33 5290.72
   100.3 5290.76  102.27 5290.83  104.23 5291.01   106.2 5291.12  108.16 5291.15
  110.13 5291.17   112.1 5291.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   39.17    .015   76.94     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         14.64   94.99            97.16   94.52   81.54             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.495300.976  105.35   112.15301.097

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 01                  RS: 129

INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5289.33    1.97 5289.62    3.94 5289.89    5.91 5290.16    7.88 5290.44
    9.86 5290.55   11.83 5290.42    13.8  5290.2   15.77 5290.18   17.74 5290.18
   19.01 5290.17   19.71 5290.16   21.68  5290.1   23.65 5290.01   25.63 5289.91
    27.6  5289.8   29.57 5289.73   31.54 5289.68   33.51 5289.61   35.48 5289.54
   37.45 5289.42   39.42 5289.31    41.4 5289.19   43.37 5289.08   43.41 5289.07
   45.34 5288.93   47.31 5288.65   49.28 5288.85   51.25 5288.96   53.22 5289.06
   55.19 5289.17   57.17 5289.25   59.14 5289.27   61.11 5289.28   63.08  5289.3
   65.05 5289.27   67.02 5289.19   68.99 5289.16   70.96 5289.11   72.82 5289.06
   72.94 5289.05   74.91 5288.92   76.88 5288.83   78.85 5289.04   80.82 5289.13
   82.79  5289.3   84.76 5289.34   86.73 5289.43    88.7 5289.45   90.68 5289.58
   92.65 5289.65   94.62 5289.75   96.59 5289.89   98.56 5289.95   99.73    5290
  100.53 5290.03   102.5  5290.1  104.47 5290.17  106.45 5290.26  108.42 5290.33
  110.39 5290.44  112.36 5290.45  114.33 5290.46   116.3 5290.49  118.27 5290.54
  120.24 5290.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   43.41    .015   72.82     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         19.01   99.73            57.54   53.06   37.51             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    9.835299.334  112.41  120.245300.445

CROSS SECTION


RIVER: Euclid_Ave_Split
REACH: 01                  RS: 76

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5289.16    1.99  5289.5    3.98 5289.63    5.97 5289.51    7.96 5289.51
    9.95  5289.5   11.94 5289.51   13.93 5289.43    14.8 5289.44   15.92 5289.44
   17.91 5289.58    19.9 5289.77   21.89 5289.58   23.88 5289.55   25.87  5289.5
   27.86 5289.39   29.85 5289.27   31.84 5289.26   33.83  5289.1   35.82 5288.92
   37.81 5288.81   38.84 5288.79    39.8 5288.76   41.79 5288.53   43.78 5288.32
   45.77 5288.55   47.76 5288.67   49.75 5288.79   51.74 5288.92   53.73 5289.03
   55.72 5289.09   57.71 5289.12    59.7 5289.13   61.69 5289.12   63.68  5289.1
   65.67 5289.08   67.66 5289.04   69.65 5288.92   71.64 5288.85   73.63 5288.71
   75.62 5288.87   75.81 5288.88   77.61 5288.94    79.6 5289.15   81.59 5289.25
   83.58 5289.32   85.57 5289.35   87.56 5289.41   89.54 5289.57   91.53 5289.79
   92.59 5289.83   93.52 5289.86   95.51 5290.07    97.5 5290.28   99.49 5290.41
  101.48 5290.55  103.47 5290.69  105.46  5290.8  107.45 5290.97  109.44  5291.1
  111.43 5291.06  113.42 5290.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   38.84    .015   75.81     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         25.87   92.59            25.81   76.07   17.23             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  107.06  113.425300.931       0    7.715299.157

CROSS SECTION


RIVER: Kings
REACH: 03                  RS: 3674

INPUT
Description:
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
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```
       0 5632.29    1.99 5631.61    3.98 5630.93    5.97  5630.2    7.96 5629.48
    9.95 5628.88   11.94 5628.12   13.94 5627.31   15.93 5626.71   17.92 5626.17
   19.91 5625.59    21.9 5624.85   23.89 5624.23   25.88 5623.37   27.87 5622.73
   29.86 5621.84   31.85 5620.98   33.84 5620.32   35.83 5619.36   37.83 5618.28
      39 5617.67   39.82 5617.25   41.81  5616.3    43.8 5615.53   45.79 5615.09
   47.78 5614.59   49.77 5614.25   51.76    5614   53.75 5614.31   55.74 5615.43
   57.73 5616.97   59.72 5617.79   61.72 5618.32   63.71 5618.93    65.7  5619.4
   67.64 5619.95   67.66 5619.95   67.69 5619.96   69.68 5620.69   71.67  5621.6
   73.66  5622.6   75.65 5624.07   77.64 5625.25   79.63 5626.27   81.62 5627.33
   83.61 5628.06    85.6 5628.96    87.6  5632.2   89.59 5636.61   91.58 5639.81
   93.57 5640.19   95.56  5640.2   97.55 5640.21   99.54 5640.36  101.53 5640.56
  103.52 5640.42  105.51 5640.26   107.5 5640.89  109.49 5641.33  111.49 5641.65
  113.48 5641.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08      39    .105   67.64      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            39   67.66           100.32   98.96   96.56             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   92.68  113.485650.181

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 3575

INPUT
Description:
Station Elevation Data    num=      79
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5640.27    1.98 5639.38    3.97 5638.77    5.95 5638.01    7.94 5637.25
    9.92 5636.57    11.9 5635.89   13.89 5635.03   15.87 5634.02   17.86 5633.12
   19.84 5632.27   21.82  5631.3   23.81 5630.43   25.79 5629.67   27.77 5628.91
   29.76 5628.04   31.74 5627.06   33.73    5626   35.71 5624.87   37.69 5624.11
   39.68 5623.26   41.66 5622.38   43.65 5621.56   45.63 5620.85   47.61  5619.9
    49.6 5618.96   51.58 5617.95   53.57 5616.87   55.37 5615.83   55.55 5615.73
   57.53 5614.65   59.52 5613.68    61.5 5612.76   63.49 5612.01   65.47 5611.39
   67.45 5610.79   69.44 5610.49   71.42 5610.34   73.41 5610.35   75.39 5610.49
   77.37 5610.48   79.36 5610.45   81.34 5610.52   83.33 5610.89   85.31 5611.22
   87.29  5611.8   89.28 5612.69   91.26 5613.79   93.25 5614.71   95.08 5615.62
   95.23  5615.7   97.21 5616.82    99.2 5618.06  101.18 5619.33  103.16 5620.63
  105.15 5621.95  107.13 5623.17  109.12 5624.46   111.1 5626.01  113.08 5627.32
  115.07 5628.27  117.05 5628.64  119.04 5628.73  121.02 5628.74     123 5628.66
  124.99 5628.74  126.97 5629.23  128.96 5630.33  130.94 5631.49  132.92 5632.68
  134.91 5633.95  136.89  5635.3  138.88  5636.4  140.86 5637.36  142.84 5638.19
  144.83 5638.38  146.81 5638.36  148.79 5638.41  150.78 5638.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   55.37    .105   95.08      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          55.37   95.08           117.12  116.23  114.02             .1       .3

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 3459

INPUT
Description: Bellevue Drive (U/S)
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5630.38    1.98 5629.59    3.97 5628.75    5.95 5627.67    7.93 5626.85
    9.92 5626.04    11.9 5625.36   13.88 5624.81   15.87 5624.21   17.85 5623.44
   19.84 5622.64   21.82 5621.79    23.8 5620.95   25.79 5620.27   27.77 5619.42
   29.75 5618.44   31.74 5617.66   33.72 5616.93    35.7 5616.25   37.69 5615.67
   39.67 5615.29   41.65 5614.89   43.64 5614.02   45.62 5612.92    47.6  5612.1
   49.59 5611.34   51.57 5610.56   52.44 5610.22   53.16 5609.94   53.55 5609.79
   55.54 5609.02   57.52 5608.35   59.51 5607.66   61.49 5606.91   63.47 5606.19
   65.46 5605.63   67.44 5605.21   69.42 5604.71   71.41 5604.26   73.39 5604.23
   75.37  5604.2   77.36 5604.27   79.34 5604.22   81.32 5603.92   83.31 5603.62
      84  5601.8      88  5601.8   89.26 5603.43   91.24 5604.32   93.22  5604.8
   95.21 5605.16   97.19 5605.53   99.18 5606.16  101.16 5606.89  103.14 5607.83
  105.13 5609.05  106.19 5609.77   106.2 5609.78  107.11  5610.4  109.09 5611.92
  111.08 5613.32  113.06  5614.9  115.04  5616.4  117.03  5617.9  119.01 5618.73
  120.99 5618.87  122.98 5618.53  124.96 5618.44  126.94 5618.41  128.93 5618.39
  129.31 5618.41  130.91 5618.48  132.89 5618.66  134.88 5618.72  136.86 5618.75
  138.85 5618.82  140.83 5618.88  142.81    5619   144.8 5619.07  146.78 5619.52
  148.08 5619.99  148.76 5620.24  150.75 5621.01  152.73 5621.91  154.71 5622.82
   156.7 5623.67  158.68 5624.27  160.66 5625.01  162.65 5625.87  164.63  5626.7
  166.61  5627.5   168.6 5628.22  170.58 5628.94  172.56 5629.63  174.55 5630.16
  176.53  5630.6

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   52.44    .105   106.2      .1  129.31    .015  148.08      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          53.16  106.19           178.73  191.62  180.85             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      81    5613        T
      91  176.53    5613        T
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
      84    85.2  5606.8    86.8      88  5606.8

CULVERT


RIVER: Kings
REACH: 03                 RS: 3400

INPUT
Description: Bellevue Drive (50% potential debris block);
```

```
culvert size = 48"
             Dia.
modeled culvert size (for 50% block) = 33.9" Dia.
Distance from Upstream XS =       4
Deck/Roadway Width        =     153
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=        4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      25    5614              62    5613              96    5613
     113    5612

Upstream Bridge Cross Section Data
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5630.38    1.98 5629.59    3.97 5628.75    5.95 5627.67    7.93 5626.85
    9.92 5626.04    11.9 5625.36   13.88 5624.81   15.87 5624.21   17.85 5623.44
   19.84 5622.64   21.82 5621.79    23.8 5620.95   25.79 5620.27   27.77 5619.42
   29.75 5618.44   31.74 5617.66   33.72 5616.93    35.7 5616.25   37.69 5615.67
   39.67 5615.29   41.65 5614.89   43.64 5614.02   45.62 5612.92    47.6  5612.1
   49.59 5611.34   51.57 5610.56   52.44 5610.22   53.16 5609.94   53.55 5609.79
   55.54 5609.02   57.52 5608.35   59.51 5607.66   61.49 5606.91   63.47 5606.19
   65.46 5605.63   67.44 5605.21   69.42 5604.71   71.41 5604.26   73.39 5604.23
   75.37  5604.2   77.36 5604.27   79.34 5604.22   81.32 5603.92   83.31 5603.62
      84  5601.8      88  5601.8   89.26 5603.43   91.24 5604.32   93.22  5604.8
   95.21 5605.16   97.19 5605.53   99.18 5606.16  101.16 5606.89  103.14 5607.83
  105.13 5609.05  106.19 5609.77   106.2 5609.78  107.11  5610.4  109.09 5611.92
  111.08 5613.32  113.06  5614.9  115.04  5616.4  117.03  5617.9  119.01 5618.73
  120.99 5618.87  122.98 5618.53  124.96 5618.44  126.94 5618.41  128.93 5618.39
  129.31 5618.41  130.91 5618.48  132.89 5618.66  134.88 5618.72  136.86 5618.75
  138.85 5618.82  140.83 5618.88  142.81    5619   144.8 5619.07  146.78 5619.52
  148.08 5619.99  148.76 5620.24  150.75 5621.01  152.73 5621.91  154.71 5622.82
   156.7 5623.67  158.68 5624.27  160.66 5625.01  162.65 5625.87  164.63  5626.7
  166.61  5627.5   168.6 5628.22  170.58 5628.94  172.56 5629.63  174.55 5630.16
  176.53  5630.6

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   52.44    .105   106.2      .1  129.31    .015  148.08      .1

Bank Sta: Left   Right    Coeff Contr.   Expan.
         53.16  106.19             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      81    5613       T
      91  176.53    5613       T
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
      84    85.2  5606.8    86.8      88  5606.8

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      45 5601.45             100 5601.45

Downstream Bridge Cross Section Data
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5617.56    1.99 5617.32    3.98 5617.18    4.86 5617.22    5.98 5617.26
    7.97 5617.29    9.96 5617.31   13.94 5617.25   15.93 5617.13   17.93 5616.98
   19.92 5616.57   21.91 5615.75    23.9 5614.74   25.89 5613.47   27.89 5612.44
   29.88 5611.11   31.87 5609.54   33.86 5608.49   35.85 5607.38   37.84 5606.35
   39.84 5605.38   41.83 5604.21   43.82 5603.13   45.81 5602.32    47.8 5601.61
    49.8 5601.07   51.79 5600.57   53.78 5600.19   55.77 5599.99   57.76 5599.88
   59.75 5599.71    61.4 5599.39   61.75 5599.33   63.74 5598.09   65.73 5595.59
   67.72 5595.05   69.71 5595.02   71.71 5595.77    73.7  5597.5   75.69 5598.49
   76.09 5598.51   77.68 5598.57   79.67 5598.42   81.66 5598.42   83.66 5598.39
   85.65 5598.31   87.64 5598.29   89.63 5598.28   91.62  5598.2   93.62 5598.18
   95.61 5598.32    97.6 5598.45   99.59 5598.57  107.56 5599.09  109.55 5599.21
  111.54 5599.34  113.53 5599.55  115.53 5599.92  117.52 5600.22  119.51 5600.18
   121.5 5600.56  123.49 5601.14  125.48 5601.59  127.48 5601.88  129.47 5602.12
  131.46 5602.54  133.45 5603.12  135.44 5603.58  139.43 5604.48  141.42 5604.98
  143.41 5605.61   145.4 5606.01  147.39 5606.03  149.39 5605.93  151.38 5605.88
  155.36 5605.76  157.35 5605.69  159.35 5605.65  161.34 5605.63  163.33 5605.59
  165.32 5605.52  167.31 5605.37  168.47  5605.3   169.3 5605.24   171.3 5605.25
  173.29 5605.43  175.28 5605.56  177.27 5605.75  181.26 5605.99  183.25 5606.13
  185.24 5606.23  187.23 5606.32  189.22 5606.38  191.21 5606.48  193.21 5606.55
   195.2 5606.59  197.19 5606.62  199.18 5606.69  201.17 5606.71  203.17 5606.69

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015    4.86      .1    61.4    .105   76.09      .1  168.47    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          61.4   76.09             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      63 5601.45       F
      73  203.17 5601.42       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   85.56  148.425608.312

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular    2.83
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 3 - Groove end entrance; pipe projecting from fill
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                   3     155     .013     .013        0                   .5                 1
Upstream   Elevation =  5601.8
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           Centerline Station =  86
Downstream Elevation =  5596.47
           Centerline Station =  68

CROSS SECTION


RIVER: Kings
REACH: 03                  RS: 3268

INPUT
Description: Bellevue Drive (D/S)
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5617.56    1.99 5617.32    3.98 5617.18    4.86 5617.22    5.98 5617.26
    7.97 5617.29    9.96 5617.31   13.94 5617.25   15.93 5617.13   17.93 5616.98
   19.92 5616.57   21.91 5615.75    23.9 5614.74   25.89 5613.47   27.89 5612.44
   29.88 5611.11   31.87 5609.54   33.86 5608.49   35.85 5607.38   37.84 5606.35
   39.84 5605.38   41.83 5604.21   43.82 5603.13   45.81 5602.32    47.8 5601.61
    49.8 5601.07   51.79 5600.57   53.78 5600.19   55.77 5599.99   57.76 5599.88
   59.75 5599.71    61.4 5599.39   61.75 5599.33   63.74 5598.09   65.73 5595.59
   67.72 5595.05   69.71 5595.02   71.71 5595.77    73.7  5597.5   75.69 5598.49
   76.09 5598.51   77.68 5598.57   79.67 5598.42   81.66 5598.42   83.66 5598.39
   85.65 5598.31   87.64 5598.29   89.63 5598.28   91.62  5598.2   93.62 5598.18
   95.61 5598.32    97.6 5598.45   99.59 5598.57  107.56 5599.09  109.55 5599.21
  111.54 5599.34  113.53 5599.55  115.53 5599.92  117.52 5600.22  119.51 5600.18
   121.5 5600.56  123.49 5601.14  125.48 5601.59  127.48 5601.88  129.47 5602.12
  131.46 5602.54  133.45 5603.12  135.44 5603.58  139.43 5604.48  141.42 5604.98
  143.41 5605.61   145.4 5606.01  147.39 5606.03  149.39 5605.93  151.38 5605.88
  155.36 5605.76  157.35 5605.69  159.35 5605.65  161.34 5605.63  163.33 5605.59
  165.32 5605.52  167.31 5605.37  168.47  5605.3   169.3 5605.24   171.3 5605.25
  173.29 5605.43  175.28 5605.56  177.27 5605.75  181.26 5605.99  183.25 5606.13
  185.24 5606.23  187.23 5606.32  189.22 5606.38  191.21 5606.48  193.21 5606.55
   195.2 5606.59  197.19 5606.62  199.18 5606.69  201.17 5606.71  203.17 5606.69

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015    4.86      .1    61.4    .105   76.09      .1  168.47    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          61.4   76.09            80.73   88.61   78.08             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      63 5601.45       F
      73  203.17 5601.42       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   85.56  148.425608.312

CROSS SECTION


RIVER: Kings
REACH: 03                  RS: 3179

INPUT
Description:
Station Elevation Data    num=      88
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5609.26    1.99 5608.28    3.98  5607.3    5.98 5606.55    7.97 5605.88
    9.96 5605.22   11.95 5604.57   13.94 5603.89   15.94  5603.2   17.93 5602.53
   19.92 5601.77   21.91 5601.19    23.9 5600.99    25.9 5600.84   27.89 5600.72
   29.88 5600.61   31.87  5600.5   33.86 5600.37   35.86 5600.18   37.85 5599.92
   39.84 5599.58   41.83 5599.32   43.82 5599.01   45.82 5598.87   47.81 5598.78
    49.8 5598.58   51.79 5598.42   53.78 5598.28   55.78 5598.24   57.77 5598.17
   59.76 5598.06   61.75 5597.74   63.58 5597.27   63.74 5597.22   65.74 5596.06
   67.73 5594.85   69.72 5593.67   71.71  5592.5    73.7 5591.36    75.7 5590.26
   77.69 5589.37   79.68 5588.48   81.67 5587.91   83.66 5587.19   85.66 5586.76
   87.65 5586.67   89.64 5586.57   91.63 5586.38   93.62 5586.01   95.62 5585.71
   97.61  5585.4    99.6 5585.23  101.59 5585.01  103.58 5584.79  105.58 5584.63
  107.57 5584.72  109.56 5584.83  111.55 5584.72  113.54 5584.75  115.54 5585.17
  117.53 5586.02  119.52 5586.94  121.51 5587.84  122.72  5588.5   123.5 5588.92
  125.35 5590.06   125.5 5590.14  127.49 5591.36  129.48 5592.53  131.47 5593.82
  133.46 5595.24  135.46 5596.44  137.45 5597.44  139.44 5598.27  141.43 5598.87
  143.42 5599.25  145.42 5599.61  147.41 5599.93   149.4 5600.23  151.39 5600.48
  151.64 5600.51  153.38 5600.74  155.38  5601.1  157.37  5601.3  159.36 5601.44
  161.35 5601.53  163.34 5601.57  165.34 5601.58

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   63.58    .105  122.72      .1  151.64    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          89.64  125.35           93.97   95.86   96.73             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    54.2   54.495608.251       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    54.25619.255

CROSS SECTION


RIVER: Kings
REACH: 03                  RS: 3083

INPUT
Description:
Station Elevation Data    num=      93
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5598.16    1.98 5597.51    3.96 5597.01    5.94 5596.81    7.92 5596.43
     9.9 5596.72   11.89 5596.79   13.87 5596.77   15.85 5596.98   17.83 5597.26
   19.81 5596.89   21.79 5596.24   23.77 5595.59   25.75 5594.85   27.73 5593.92
   29.71 5593.56    31.7 5593.45   33.68 5593.17   35.66  5592.8   37.64 5592.45
   39.62  5592.1    41.6  5591.8   43.58 5591.43   45.56 5590.97   47.54 5590.69
   49.52 5590.35   51.51 5589.96   53.49 5589.41   55.47 5588.84   57.45 5588.57
   59.43 5588.61   61.41 5588.21   63.39 5587.76   65.37 5587.36   67.35 5587.03
   68.53 5586.82   69.33 5586.68   71.31 5586.14    73.3 5585.55   75.28 5585.17
   77.26 5584.53   79.24  5583.4   81.22 5582.51    83.2 5581.96   85.18  5581.5
   87.16 5581.11   89.14 5580.87   91.12 5580.56   93.11 5580.23   95.09 5580.05
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   97.07 5579.87   99.05 5579.61  101.03 5579.25  103.01 5578.82  104.99 5578.32
  106.97 5577.83  108.95 5577.55  110.93 5577.49  112.91 5577.51   114.9 5577.65
  116.88 5577.79  118.86 5577.44  120.84 5577.45  122.82 5578.08   124.8 5579.18
  126.78 5580.47  128.76  5581.4  128.87 5581.44  130.74 5582.11  132.72 5582.91
  134.56 5583.43  134.71 5583.48  136.69 5583.98  138.67 5584.63  140.65 5586.05
  142.63 5587.64  144.61 5588.66  146.59 5589.18  148.57 5589.79  150.55 5590.41
  152.53 5590.88  154.52 5591.19   156.5 5591.32  158.48 5591.48  158.91 5591.51
  160.46 5591.62  162.44 5591.72  164.42 5591.95   166.4 5592.01  168.38 5592.12
  170.36 5592.25  172.34 5592.32  174.32 5592.35

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   68.53    .105  128.87      .1  158.91    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          77.26  134.56           93.51   93.01   91.73              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   16.39   20.355607.086       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   16.395608.163

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2990

INPUT
Description:
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5578.96    1.98 5578.69    3.95  5578.4    5.93 5578.11     7.9 5577.81
    9.88 5577.52   11.85 5577.17   13.83 5576.76    15.8 5576.36   17.78 5576.06
   19.75 5576.12   21.73 5576.41    23.7 5576.56   25.68 5576.59   27.65 5576.55
   29.63 5576.36   31.61 5576.23   33.58 5576.22   35.56 5576.17   37.53 5576.05
   39.51    5576   41.48 5576.02   43.46 5575.89   45.43 5575.76   47.41 5575.77
   49.38 5575.76   51.36  5575.7   53.33 5575.57   54.42 5575.45   55.31 5575.36
   57.28 5574.87   59.26 5574.17   61.24 5573.34   63.21 5573.09   65.19 5573.14
   67.16  5573.9   69.14 5575.03   71.11 5575.96   73.09  5576.7   75.06 5577.31
   77.04 5578.03   79.01 5578.82   80.99 5579.44   82.96 5580.11   84.94 5580.74
   86.27 5581.05   86.92  5581.2   88.89  5581.5   90.87  5581.7   92.84 5581.94
   94.82 5582.22   96.79 5582.42   98.77  5582.5  100.74 5582.74  102.72 5582.81
  104.69 5582.97  105.44 5583.06  106.67 5583.21  108.64 5583.03  110.62 5582.91
  112.59 5582.98  114.57 5583.11  116.55 5583.23  118.52 5583.32   120.5 5583.38
  122.47 5583.39  124.45 5583.42

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   54.42    .105   86.27      .1  105.44    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          54.42   77.04           50.22   51.56   50.47              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   45.165588.963

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2938

INPUT
Description: 260 Bellevue Dr - Dwy - (U/S)
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5581.61    1.98  5580.8    3.96 5580.27    5.94 5579.62    7.92 5578.91
     9.9 5578.09   11.87 5577.66   13.85 5577.28   15.83 5577.05   17.81 5576.85
   19.79 5576.67   21.77 5576.37   23.75 5576.06   25.73 5575.79   27.71 5575.63
   29.69 5575.53   31.67  5575.5   33.64 5575.44   35.62 5575.37    37.6 5575.29
   39.58 5575.21   41.56 5575.12   43.54 5575.08   45.52 5574.99    47.5 5574.86
   49.48 5574.83   51.46 5574.84   53.44 5574.81   55.41 5574.86   57.39 5574.85
   59.37 5574.93   61.35 5574.82   63.33 5574.82   65.31 5575.01   67.29 5575.29
   69.27 5575.28   70.28  5575.2   71.25 5575.13   73.23 5574.57    75.2 5573.86
   77.18 5573.17   79.16 5572.39   81.14 5570.29    85.1 5570.29   87.08 5572.44
   89.06 5573.25   91.04 5574.02   93.02    5575      95 5575.73   96.97  5576.2
   98.95 5576.77   99.37 5576.88  100.93 5577.25  102.91 5577.48  104.89 5577.61
  106.87 5577.83  107.72 5577.96  108.85 5578.13  110.83 5578.13  112.81 5577.72
  114.79 5577.89  116.77 5578.04  118.74 5578.11  120.72 5578.23   122.7 5578.28
  124.68 5578.32

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   70.28    .105   99.37      .1  107.72    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          70.28   99.37           40.72   38.41   38.6               .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0   39.57 5591.61       F
      70      78 5575.28       T
      88     100 5575.84       T
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
      81   81.75 5574.27   84.25      85 5574.27

CULVERT


RIVER: Kings
REACH: 03                 RS: 2920

INPUT
Description: 260 Bellevue Dr - Driveway (25% Potential Debris Block);
culvert
                size = 48"Dia.
modeled culvert size (for 25% block) = 41.6" Dia.
Distance from Upstream XS =       3
Deck/Roadway Width        =      33
```

```
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   70.28  5575.2            75.8  5575.8           81.5 5575.84
      84 5575.56            96.5 5576.96            107 5577.93

Upstream Bridge Cross Section Data
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5581.61    1.98  5580.8    3.96 5580.27    5.94 5579.62    7.92 5578.91
     9.9 5578.09   11.87 5577.66   13.85 5577.28   15.83 5577.05   17.81 5576.85
   19.79 5576.67   21.77 5576.37   23.75 5576.06   25.73 5575.79   27.71 5575.63
   29.69 5575.53   31.67  5575.5   33.64 5575.44   35.62 5575.37    37.6 5575.29
   39.58 5575.21   41.56 5575.12   43.54 5575.08   45.52 5574.99    47.5 5574.86
   49.48 5574.83   51.46 5574.84   53.44 5574.81   55.41 5574.86   57.39 5574.85
   59.37 5574.93   61.35 5574.82   63.33 5574.82   65.31 5575.01   67.29 5575.29
   69.27 5575.28   70.28  5575.2   71.25 5575.13   73.23 5574.57    75.2 5573.86
   77.18 5573.17   79.16 5572.39   81.14 5570.29    85.1 5570.29   87.08 5572.44
   89.06 5573.25   91.04 5574.02   93.02    5575      95 5575.73   96.97  5576.2
   98.95 5576.77   99.37 5576.88  100.93 5577.25  102.91 5577.48  104.89 5577.61
  106.87 5577.83  107.72 5577.96  108.85 5578.13  110.83 5578.13  112.81 5577.72
  114.79 5577.89  116.77 5578.04  118.74 5578.11  120.72 5578.23   122.7 5578.28
  124.68 5578.32

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   70.28    .105   99.37      .1  107.72    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         70.28   99.37             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0   39.57 5591.61       F
      70      78 5575.28       T
      88     100 5575.84       T
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
      81   81.75 5574.27   84.25      85 5574.27

Downstream  Deck/Roadway Coordinates
    num=       3
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      44 5573.94            48.5  5574.1           89.06 5573.72

Downstream Bridge Cross Section Data
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5579.15    1.98 5578.39    3.96 5577.64    5.94 5577.11    7.92 5576.68
     9.9 5576.16   11.87 5575.63   13.85 5575.37   15.83 5575.26   17.81 5575.25
   19.79 5575.11   21.77 5574.87   23.75 5574.81   25.73 5574.75   27.71 5574.68
   29.69  5574.6   31.67  5574.5   33.65 5574.45   35.63  5574.4    37.6 5574.31
   39.58 5574.21   41.56 5574.13   43.54 5574.06   45.52 5573.99    47.5 5573.92
   49.48 5573.72   51.46 5573.72   53.44 5573.76   55.42 5573.66    57.4 5573.31
   59.38  5572.8   59.61 5572.73   61.35 5572.16   63.33 5571.58   65.31 5571.29
   67.29  5570.3   69.27 5569.07   71.25 5568.26   73.23 5568.28   75.21 5569.08
   77.19 5570.27   79.17 5571.33   81.15 5572.26   83.13 5572.75    85.1 5573.15
    85.6 5573.23   85.64 5573.24   87.08 5573.47   88.03 5573.59   89.06 5573.72
   91.04 5573.82   93.02 5573.74      95  5573.9   96.98 5574.09   98.96 5574.19
  100.94 5574.27  102.92 5574.29   104.9 5574.37  106.88 5574.42  108.85 5574.41

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   59.61    .105   85.64      .1   88.03    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         59.61    85.6             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
    20.3   20.895585.034       F
      40      69     5574       F
      75     100 5573.72       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    20.3 5589.15

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular    3.47
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                   3      33     .024     .024        0                   .5                1
Upstream   Elevation =  5570.29
           Centerline Station =  83
Downstream Elevation =  5568.77
           Centerline Station =  72

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2900

INPUT
Description: 260 Bellevue Dr - Dwy - (D/S)
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5579.15    1.98 5578.39    3.96 5577.64    5.94 5577.11    7.92 5576.68
     9.9 5576.16   11.87 5575.63   13.85 5575.37   15.83 5575.26   17.81 5575.25
   19.79 5575.11   21.77 5574.87   23.75 5574.81   25.73 5574.75   27.71 5574.68
```

```
   29.69  5574.6   31.67  5574.5   33.65 5574.45   35.63  5574.4    37.6 5574.31
   39.58 5574.21   41.56 5574.13   43.54 5574.06   45.52 5573.99    47.5 5573.92
   49.48 5573.72   51.46 5573.72   53.44 5573.76   55.42 5573.66    57.4 5573.31
   59.38  5572.8   59.61 5572.73   61.35 5572.16   63.33 5571.58   65.31 5571.29
   67.29  5570.3   69.27 5569.07   71.25 5568.26   73.23 5568.28   75.21 5569.08
   77.19 5570.27   79.17 5571.33   81.15 5572.26   83.13 5572.75    85.1 5573.15
    85.6 5573.23   85.64 5573.24   87.08 5573.47   88.03 5573.59   89.06 5573.72
   91.04 5573.82   93.02 5573.74      95  5573.9   96.98 5574.09   98.96 5574.19
  100.94 5574.27  102.92 5574.29   104.9 5574.37  106.88 5574.42  108.85 5574.41

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   59.61    .105   85.64      .1   88.03    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         59.61    85.6           89.83   79.09   73.12              .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
    20.3   20.895585.034       F
      40      69    5574       F
      75     100 5573.72       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    20.3 5589.15

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2821

INPUT
Description:
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5571.84    1.98 5570.97    3.95 5569.95    5.93 5569.89    7.91 5569.93
    9.88 5569.67   11.86 5569.72   13.84 5569.92   15.81 5570.02   17.79 5570.08
   19.77 5570.06   21.75 5569.92   23.72 5569.95    25.7 5569.94   27.68 5569.92
   29.65 5569.92   31.63 5569.96   33.61 5569.94   35.58 5569.89   37.56 5569.89
   39.54 5569.88   41.51 5569.76   43.49 5569.75   45.47 5569.79   47.44 5569.75
   49.42 5569.78    51.4 5569.69   53.37 5569.61   55.35 5569.51   57.33 5569.37
   59.31 5569.21   60.53 5569.01   61.28 5568.89   63.26 5568.08   65.24 5567.27
   67.21  5566.3   69.19 5565.52   71.17 5564.99   73.14 5564.61   75.12 5564.12
    77.1 5563.78   79.07 5563.46   81.05 5563.15   83.03 5562.65      85  5562.2
   86.98 5561.74   88.96 5561.17   90.93 5560.87   92.91 5560.74   94.89 5560.51
   96.87 5560.37   98.84 5560.28  100.82 5560.52   102.8 5560.96  104.77 5561.57
  106.75 5562.35  108.73 5563.48   110.7 5564.62  111.67 5565.17  112.68 5565.75
  114.66  5566.9  116.56  5567.5  116.63 5567.52  118.61 5567.93  120.59 5568.07
  122.56 5568.19  124.54 5568.41  126.52 5568.63  128.49 5568.79  130.47 5568.86
  132.45 5568.94

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   60.53    .105  111.67    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         60.53  116.56           96.02   96.72   97.14              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   10.02   21.295579.657       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   10.025581.835

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2724

INPUT
Description:
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5568.36    1.97 5567.31    3.95 5566.25    5.92 5564.85    7.89 5563.57
    9.87 5561.75   11.84 5561.69   13.81 5561.62   15.79  5561.6   17.76 5561.59
   19.74 5561.54   21.71 5561.51   23.68 5561.45   25.66 5561.45   27.63 5561.43
    29.6 5561.32   31.58  5561.3   33.55 5561.36   35.52 5561.34    37.5 5561.29
   39.47 5561.24   41.44 5561.13   43.42 5560.94   45.39 5560.79   47.37 5560.56
   49.34 5560.18   49.83 5560.06   51.31 5559.71   53.29  5559.2   55.26 5558.52
   57.23 5557.83   59.21 5557.19   61.18 5556.74   63.15 5556.31   65.13 5556.01
    67.1 5555.75   69.07 5555.71   71.05 5555.52   73.02 5555.39      75 5555.21
   76.97 5554.88   78.94 5554.47   80.92 5554.04   82.89  5553.7   84.86 5553.77
   86.84 5554.06   88.81 5554.59   90.78 5555.63   92.76 5556.76   94.73 5557.78
    96.7 5558.71   98.68 5559.74  100.65 5560.22  102.62 5560.59   103.4 5560.72
  103.42 5560.73   104.6 5560.93  106.24 5561.09  106.57 5561.12  108.55  5561.3
  110.52 5561.36  112.49 5561.03  114.47 5560.83  116.44 5560.94  118.41 5561.02
  120.39 5561.08  122.36  5561.1  124.33 5561.09  126.31 5561.07  128.28 5561.07
  130.25 5561.04

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0      .1   49.83    .105  103.42      .1  106.24    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         49.83   98.68           96.25   95.78   90.17              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    7.78   16.145573.658       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    7.78 5578.36

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2628

INPUT
Description:
```

```
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5563.2       4 5562.96    5.99 5562.85    7.99 5562.67    9.99  5562.5
   11.99 5562.31   13.99 5562.05   15.99 5561.83   17.98 5561.57   19.98 5561.36
   20.51 5561.35   21.98 5561.34   23.98 5561.26   25.98 5561.11   27.98 5560.88
   29.97 5560.54   31.97 5560.17   33.97 5559.81   35.97  5559.4   37.97 5559.06
   39.97 5558.73   41.96 5558.47   43.96 5558.25   45.96 5558.06   47.96 5557.84
   49.96  5557.7   51.96  5557.6   53.95 5557.51   55.95 5557.47   57.95 5557.45
   59.95 5557.44   61.95 5557.31   65.94 5556.91   67.94 5556.77   69.94 5556.66
   71.94 5556.61   73.94 5556.62   75.94 5556.53   77.93 5556.27   79.93 5555.91
   81.93 5555.41   83.93 5554.75   89.92 5553.43   91.92 5552.97   93.92 5552.15
   95.92 5550.74   97.91 5550.42   99.91 5550.42  101.91 5550.33  103.91 5550.21
   105.9  5550.1  106.18 5550.05   107.9 5549.77   109.9 5548.59   111.9 5547.44
   113.9 5547.11  115.89 5547.33  117.89 5547.42  119.89 5547.44  121.89 5547.54
  123.88  5547.8  125.88 5548.19  127.88 5548.73  129.88 5549.29  131.88 5549.92
  133.87 5550.59  135.87 5551.17  136.91 5551.31  137.87 5551.43   138.7 5551.59
  139.87 5551.81  141.86 5552.08  145.86 5552.48  147.86  5552.8  149.86 5552.97
  151.85 5553.15  153.85 5553.36  155.85 5553.54  157.85 5553.71  159.85 5553.96
  161.84  5554.2  163.84  5554.5  165.84 5554.87  167.84 5555.11  169.83 5555.38
  171.83 5555.66  175.83 5556.28  177.83 5556.52  179.82 5556.62  180.56 5556.66
  181.82 5556.73  183.82 5556.75  185.82 5556.59  187.81 5556.24  189.81 5556.39
  191.81 5556.46  193.81  5556.6  195.81 5556.62   197.8 5556.69   201.8 5556.71

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   20.51      .1  106.18    .105   138.7      .1  180.56    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        106.18  136.91           116.67  124.77  129.49             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   97.94  103.135560.419       F
       0   60.185573.196       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   60.18   97.945567.435

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2504

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5552.09    5.98 5551.22    9.96 5551.02   11.95 5551.03   13.94 5551.55
   15.93 5552.16   17.93 5552.96   19.92 5553.25   21.91 5553.24   25.89 5553.04
   27.89 5552.92   29.88 5552.88   31.87 5552.61   33.86 5552.25   37.84 5551.91
   39.84 5551.84   41.83 5551.62   44.17 5551.15   45.81 5550.75    49.8 5550.19
   51.79 5550.01   59.75 5549.89   61.75 5549.84   63.74 5549.72   67.72 5549.56
   69.71 5549.45    73.7 5549.06   75.69 5548.81   77.68 5548.61   79.67 5548.37
   81.66 5548.09   82.78 5547.98   83.66 5547.88   85.65 5548.07   87.64 5547.98
    89.7 5547.59   91.62 5546.78   93.62 5545.87   95.61 5545.03    97.6 5544.25
   99.59 5543.62  101.58  5543.1  103.57 5541.81  105.57 5542.41  107.56 5543.98
  109.55    5545  113.53 5545.11  115.26 5545.13  117.52 5545.04  119.51 5545.02
   121.5 5545.13  123.49 5545.77  125.48 5546.55  126.77 5547.16  127.48 5547.49
  129.47 5547.77  131.46 5547.83  135.44 5547.82  139.43 5547.84  141.42 5547.83
  143.41 5547.85  147.37 5547.64  149.34 5547.58  151.31 5547.55  155.25 5547.54
  161.17 5547.51  163.14 5547.51  169.05 5547.48  171.02 5547.48  176.93 5547.45
  184.81 5547.43  190.72  5547.4  194.66 5547.39  196.63 5547.42   198.6 5547.42
  200.57 5547.51  202.54 5547.57  206.48 5547.28  208.45 5547.38  210.42 5547.53
  212.39  5547.6  214.37 5547.62  216.34 5547.83  218.31 5548.15  220.28 5548.54
  224.22 5549.14  226.19 5549.35  228.16 5549.78  230.13 5549.77   232.1 5549.79
  234.07 5550.14  236.04 5550.83  238.01 5551.18  241.95 5551.43  244.05 5551.38
  245.89  5551.3  247.86 5551.16  249.83 5551.14  259.68 5551.64  263.62 5551.74

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   44.17    .015   82.78      .1    89.7    .105  115.26      .1
  244.05    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          89.7  126.77                78      71      62             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  126.19  136.345556.986       F
    6.72   53.425561.168       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  136.34  202.585557.827       0    6.725562.085

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2444

INPUT
Description:
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5540.32    1.99 5540.33    3.98 5540.32    5.97  5540.3    7.96 5540.15
    9.96 5540.13   11.95 5540.43   13.94 5540.47   15.93 5540.41   17.92  5540.4
   19.91  5540.4    21.9 5540.46   23.89 5540.53   25.89 5540.53   27.88  5540.5
   29.87 5540.56   31.86 5540.62   33.85 5540.53   35.84 5540.54   37.83 5540.53
   38.58 5540.55   39.82 5540.58   41.81  5540.6   43.81 5540.41    45.8 5540.23
   47.79 5540.24   49.78 5540.04   50.35 5540.05   51.77 5540.09   53.76 5540.26
   55.75 5540.34   57.74 5540.43   59.73 5540.49   61.73  5540.6   63.72 5540.62
   65.71  5540.6    67.7 5540.61   69.69 5540.57   71.68  5540.5   73.67 5540.42
   75.66 5540.32   77.66  5540.2   79.65 5540.25   81.64 5540.46   83.63 5540.63
   85.62 5540.85   87.61 5541.05   88.12 5541.08    89.6 5541.15   91.59 5541.15
   93.58 5541.27   95.58 5541.46   97.57 5541.65   99.56 5541.87  101.55 5541.99
  103.54 5542.01  105.53 5542.01  107.52 5542.09  109.51 5542.17   111.5 5542.26
   113.5 5542.28  115.49  5542.3  115.54  5542.3  117.48 5542.36  119.47  5542.4
  121.46  5542.5  123.44 5542.63  123.45 5542.64  125.44 5542.68  127.43 5542.59
  129.43 5542.56  131.42 5542.69  133.41  5542.9   135.4 5543.15  137.39 5543.39
  139.38 5543.63  141.37 5543.78  143.36 5543.81  145.35 5543.82  147.35 5543.82
  149.34 5543.84  151.33 5543.86  153.32 5544.01
```

```
Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   50.35    .015   88.12    .105  115.54      .1

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         41.81   88.12               56      72      61              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   41.81    5542       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0     7.85550.322  123.43  153.325552.633

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2396

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5540.04       2 5539.98    3.99 5539.89    5.99 5539.78    7.98 5539.71
    9.98 5539.66   11.97 5539.61   13.97 5539.58   15.97 5539.53   17.96 5539.47
   21.95 5539.39   23.95 5539.37   25.94 5539.31   27.94 5539.28   29.94 5539.22
   31.93 5539.12   33.93 5539.08   35.92 5539.03   37.92 5538.97   39.92 5538.95
   41.91 5538.92   43.91  5538.9    47.9 5538.76   51.89 5538.66   53.89 5538.59
   55.88 5538.51   57.88 5538.49   59.87 5538.48   61.87 5538.45   63.86 5538.37
   65.86 5538.33   67.86 5538.27   69.85 5538.28   71.85 5538.26   73.84  5538.2
   79.83 5538.08   81.83 5538.07   83.82 5538.08   85.17 5538.07   85.82 5538.07
   87.81 5538.08   89.81 5538.05    93.8 5537.97    95.8 5537.96   99.79 5537.88
  101.78 5537.83  105.78 5537.75  107.77 5537.67  109.77 5537.58  111.76 5537.52
  113.76 5537.47  117.75 5537.35  119.75 5537.24  123.74 5537.18  125.73  5537.1
  129.73 5537.04  131.72 5537.03  133.72 5537.06  135.71 5537.04  137.71 5537.01
   139.7 5537.02   141.7 5536.96   143.7 5536.91  145.69 5536.89  147.69 5536.88
  153.67 5536.79  155.67 5536.74  157.67 5536.75  159.66 5536.77  161.66 5536.77
  165.65 5536.75  167.64 5536.76  169.64 5536.79  171.64 5536.79  173.63 5536.87
  177.62 5536.99  179.62 5537.03  181.61 5537.07  183.61 5537.15  185.61 5537.21
   187.6 5537.35  191.59 5537.51  193.59  5537.6  197.58  5537.8  199.58 5537.88
  201.57 5538.02  203.57 5538.13  205.56 5538.29  207.56  5538.4  209.56 5538.54
  211.55  5538.7  213.55 5538.86  215.54 5538.99  217.54 5539.15  218.11  5539.2
  219.53 5539.32  221.53 5539.49  223.53 5539.67  225.52 5539.85  227.52 5540.02

Manning's n Values        num=       1
     Sta   n Val
       0    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        105.78  197.58            66.74   66.17   59.48              .1       .3

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2330

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5534.28    1.97 5533.98    3.94 5533.23    5.91 5533.08    7.88 5533.15
    9.85 5533.08   11.83 5533.05    13.8 5532.99   14.34 5532.97   15.77 5532.94
   17.74 5532.87   19.71 5532.74   21.68 5532.72   23.65 5532.86   25.62 5533.08
   25.76  5533.1   27.59 5533.41   29.56 5531.43   31.53 5529.61   33.51 5529.24
   35.48  5529.2   37.45 5529.19   39.42 5529.19   41.39  5529.9   43.36 5532.76
   45.33 5535.57   46.66 5536.08    47.3 5536.33   49.27 5536.49   51.24 5536.46
   53.21  5536.6   55.18 5536.77   57.16    5537   59.13 5537.25    61.1 5537.43
   63.07 5537.62   65.04 5537.75   67.01  5537.9

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   14.34     .08   25.76    .056   46.66     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         27.59   45.33            61.36    61.5   61.72              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   27.59 5533.41       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    4.625544.283

CROSS SECTION


RIVER: Kings
REACH: 03                 RS: 2268

INPUT
Description:
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5531.24    1.92 5531.59     2.3 5531.64    3.83 5531.85    5.75 5528.72
    7.67 5528.09    9.58 5528.05    11.5 5528.09   13.42  5528.1   15.34 5528.46
   17.25 5531.69   19.17 5534.38   20.45 5534.85   20.68 5534.94   21.09 5535.09
      23 5535.41   24.92 5535.71   26.84 5535.89   28.75 5536.13   30.67 5536.51
   32.59 5536.89    34.5 5537.19   36.42 5537.55   38.34  5537.9   40.25 5538.33
   42.17  5538.7   44.09 5538.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08     2.3    .056   20.45     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          3.83   19.17            93.69   93.18   92.52              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0    3.83 5531.85       F

CROSS SECTION
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RIVER: Kings
REACH: 03                  RS: 2175

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5527.79    1.93 5527.96    3.37 5527.99    3.86    5528     5.8 5527.31
    7.73 5525.76    9.66 5525.19   11.59 5525.23   13.52 5525.24   15.46 5525.22
   17.39 5526.09   19.32    5530   21.25 5534.49    22.6 5536.12   22.76 5536.31
   23.18 5536.82   25.12 5538.02   27.05 5538.56   28.98 5539.59   30.91 5540.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    3.37    .056    22.6     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          3.37   21.25           156.48  156.43  156.58             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0    3.37 5527.99       F

CROSS SECTION


RIVER: Kings
REACH: 03                  RS: 2018

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5520.19    1.94  5520.2    3.88 5520.17    5.08 5520.17    5.82 5520.17
    7.76 5520.23     9.7 5520.32     9.8 5520.33   11.64 5520.56   13.58 5518.41
   15.52 5517.11   17.46 5516.96    19.4 5517.01   21.34 5517.05   23.28 5517.13
   25.22 5518.69   27.16 5521.59    29.1 5524.66   29.68  5525.3   31.04 5526.81
   32.98 5527.46   34.92  5528.2   36.86 5529.34    38.8 5530.46   40.74 5531.31
   42.69 5531.99

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    5.08     .08     9.8    .056   29.68     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         11.64   29.68           145.42   145.9  146.26             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   11.64 5520.56       F

CROSS SECTION


RIVER: Kings
REACH: 03                  RS: 1873

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5506.28    1.95 5506.24    3.89 5506.28    5.84 5506.33    7.79 5506.19
    9.73 5506.29   11.66 5506.49   11.68 5506.49   13.63 5506.37   14.35  5506.2
   15.57 5505.91   17.52  5505.5   19.47 5503.46   21.42 5502.31   23.36 5502.02
   25.31 5502.15   27.26 5501.99    29.2 5502.04   31.15 5502.72    33.1 5505.06
   35.04 5505.76   36.99  5506.6   37.67 5506.82   38.94 5507.23   40.88 5507.34
   42.83 5507.24   44.78 5507.32   46.72 5507.36   48.67 5507.36   50.62 5507.45
   52.56  5507.6   54.51 5507.77   56.46 5507.86    58.4  5507.9   60.35 5507.92
    62.3 5507.95   64.25 5508.07   66.19 5508.17

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   11.66     .08   14.35    .056   37.67     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         14.35   37.67           138.51   139.4  140.05             .1       .3

CROSS SECTION


RIVER: Kings
REACH: 03                  RS: 1733

INPUT
Description:
Station Elevation Data    num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5497.1       2 5497.02       4 5496.97    5.99 5497.03    7.99 5497.17
    9.99 5497.34   11.99 5497.44   13.98 5497.32   14.74 5497.12   15.85 5496.82
   15.98 5496.79   17.98 5495.91   19.98 5495.11   21.97 5494.62   23.97 5494.52
   25.97 5494.95   27.97 5495.24   29.96 5496.02   31.96 5497.25   33.96 5497.27
   35.96  5496.8   37.95 5496.26   39.95 5496.15   41.95 5496.28   43.95  5496.3
   45.95 5496.56   47.94 5496.71   49.94 5496.69   51.94 5496.71   52.08 5496.71
   52.18  5496.7   53.94 5496.66   55.93 5496.57   57.93 5496.19   59.93 5495.73
   61.93  5495.6   63.92  5495.5   65.92 5495.37   67.92 5495.28   69.92  5495.3
   71.91 5495.16   73.91 5495.14   75.91 5495.39   77.91 5496.08   79.91  5496.6
    81.9 5497.11    83.9 5497.27    85.9 5497.43    87.9 5497.46   89.89 5497.53
   91.89 5497.59   93.89  5497.6   95.89 5497.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   15.85    .056   52.08     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         14.74   31.96           113.12  112.58  111.43             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   11.99 5497.44       F
   33.96   95.89  5497.5       F

CROSS SECTION
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RIVER: Kings
REACH: 02                  RS: 1621

INPUT
Description:
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0    5489    1.97  5489.6    3.95 5490.37    5.92 5491.13    7.89 5491.86
    9.87 5492.26   11.84 5492.13   13.81 5491.88   15.78 5491.53   17.76 5491.14
   19.73 5490.79    21.7 5490.39   23.68 5490.29   25.65 5490.34   27.62 5490.36
   27.77 5490.35   29.59 5490.21   31.57 5489.96   32.11  5489.9   33.54 5489.73
   35.51 5489.54   37.49 5489.49   39.46 5489.54   41.43 5489.53   43.41 5489.56
   45.38 5489.53   47.35 5489.55   49.32 5489.51    51.3 5489.46   53.27 5489.39
   55.24 5489.32   57.22 5489.24   59.19 5489.15   61.16    5489   63.14 5488.84
   65.11 5488.71    65.8 5488.69   67.08 5488.64   69.05 5488.82   71.03 5489.26
   72.97 5489.85      73 5489.86   74.97 5490.18   76.95  5490.2   78.92 5490.06
   80.89 5489.99   82.87 5489.81   84.84 5489.67   86.81 5489.75   88.78 5489.78
   90.76  5489.9   92.73 5490.31    94.7 5490.91   96.68 5491.32   98.65 5491.67
  100.62 5491.89   102.6 5491.97  104.57 5492.05  106.54 5492.06  108.51 5492.08
  110.49 5492.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   32.11    .015    65.8     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         27.77   72.97           106.14  106.17  106.38             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   76.95  110.49  5490.2       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   11.435498.995

CROSS SECTION


RIVER: Kings
REACH: 02                  RS: 1514

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5485.61       2 5485.67    3.99 5485.72    5.99 5485.67    7.99 5485.78
    9.99 5486.02   11.98 5486.18   13.98 5486.06   15.98 5485.87   17.98 5485.97
   19.97 5485.98   21.97 5485.87   23.97  5485.8   25.97 5485.73   27.96 5485.68
   29.96 5485.66   31.96 5485.59   33.96 5485.48   35.95 5485.35   37.95  5485.2
   38.82 5485.11   39.95 5484.98   41.95 5484.77   43.94 5484.65   45.94 5484.34
   47.67 5484.18   47.94 5484.15   49.94 5483.96   51.93 5483.92   53.93 5484.04
   55.93 5484.16   57.93 5484.23   59.92 5484.32   61.92  5484.4   63.92 5484.43
   65.92 5484.42   67.91 5484.43   69.91 5484.41   71.91 5484.38   73.91 5484.35
    75.9 5484.28    77.9 5484.21    79.9 5484.09   80.93 5484.09    81.9 5484.09
   83.89 5484.25   85.89 5484.42   87.89 5485.09   89.89 5486.29   91.88 5486.79
   91.95 5486.79   93.88 5486.76   95.88 5486.74   97.88 5486.78   99.87 5486.77
  101.87 5486.68  103.87  5486.6  105.87 5486.55  107.86 5486.51  109.86 5486.44
  111.86 5486.34  113.85 5486.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   47.67    .015   80.93     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         38.82   89.89            95.86   95.85   95.83             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.555495.607   99.13  113.855496.796

CROSS SECTION


RIVER: Kings
REACH: 02                  RS: 1419

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5481.44    1.96 5481.14    3.93 5480.99    5.18 5480.91    5.89 5480.87
    7.86 5480.69    9.82 5480.73   11.79 5480.81   13.75 5480.86   15.72 5480.91
   17.69 5480.95   19.65 5480.98   21.62 5480.98   23.58 5480.99   25.55 5480.99
   27.51 5480.92   29.48 5480.83   31.44 5480.73   33.41 5480.55   35.37 5480.42
   37.34 5480.28   39.31 5480.29   41.27 5480.48   43.24 5480.63    45.2 5480.68
   47.17 5480.77   49.13 5480.81   50.63 5480.84    51.1 5480.85   53.06 5480.94
   55.03 5480.99   56.99 5481.01   58.96 5481.04

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0     .13    5.18    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
              0   50.63            98.38    98.4   98.52             .1       .3

CROSS SECTION


RIVER: Kings
REACH: 02                  RS: 1320

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5477.88    1.99 5477.88    3.98 5477.98    5.97 5478.03    7.95 5477.94
    9.83 5477.79    9.94 5477.78   11.93 5477.67   13.92 5477.61   15.91 5477.45
    17.9 5477.26   19.76 5477.12   19.88 5477.11   21.87 5476.93   23.86 5476.98
   25.85 5477.03   27.84 5477.12   29.83 5477.19   31.81 5477.21    33.8 5477.23
   35.79 5477.23   37.78 5477.25   39.77 5477.26   41.76 5477.23   43.74 5477.17
   45.73 5477.14   47.72 5477.13   49.71 5477.09    51.7 5476.97   53.69 5476.95
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   55.68 5477.09   57.17 5477.26   57.66 5477.31   59.65 5477.55   61.64 5477.79
   63.24 5477.99   63.63 5478.04   65.62 5478.24   67.61 5478.42   69.59 5478.62
   71.58  5478.8   73.57 5478.96   75.56 5479.05   77.55 5479.06   79.54 5479.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   19.76    .015   57.17     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9.83   63.24           99.56   99.47   99.08             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0    5.97 5478.03       F

CROSS SECTION


RIVER: Kings
REACH: 02                 RS: 1221

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5473.35    1.99 5473.32    3.98 5473.26    5.97 5473.22    7.96 5473.18
    9.95 5473.17   11.94 5473.11   13.93 5473.04   14.71 5473.02   15.92 5472.99
   17.91 5472.94    19.9  5472.9   21.89  5472.9   23.88 5472.84   25.87  5472.7
   27.86  5472.6   29.56 5472.45   29.85 5472.43   31.84 5472.31   33.83 5472.39
   35.82 5472.46   37.81 5472.55    39.8  5472.6   41.79 5472.62   43.78 5472.64
   45.77 5472.66   47.76 5472.69   49.75 5472.71   51.74  5472.7   53.73 5472.66
   55.72 5472.59   57.71  5472.5    59.7 5472.42   61.69 5472.46   63.68 5472.64
   65.67 5472.69   67.62 5472.77   67.66 5472.77   69.65 5472.87   71.64 5472.85
   73.63 5472.81   74.29 5472.81   75.62  5472.8   77.61 5472.83    79.6 5472.95
   81.59 5473.13   83.58 5473.31   85.57 5473.49   87.56 5473.67   89.55 5473.86

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   29.56    .015   67.62     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         21.89   69.65          140.95  141.16   142.1             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   77.31   89.555482.813

CROSS SECTION


RIVER: Kings
REACH: 02                 RS: 1079

INPUT
Description:
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5466.88    1.97 5466.83    3.95 5466.79    5.92 5466.71     7.9 5466.63
    8.59 5466.59    9.87  5466.5   11.85 5466.46   13.82  5466.3    15.8  5465.9
   17.77 5465.75   19.75 5465.53   20.19 5465.54   21.72 5465.58    23.7 5465.67
   25.67 5465.71   27.65  5465.8   29.62 5465.86    31.6 5465.87   33.57 5465.85
   35.55 5465.84   37.52 5465.84    39.5 5465.82   41.47  5465.8   43.45 5465.75
   45.42 5465.68    47.4 5465.63   49.37 5465.55   51.35 5465.62   53.32 5465.75
    55.3 5465.87   57.27 5466.06   58.93 5466.15   59.25 5466.16   61.22 5466.31
    63.2 5466.47   65.17 5466.49   66.42  5466.5   67.15  5466.5   69.12 5466.51
    71.1 5466.53   73.07 5466.53   75.05 5466.49   77.02 5466.48      79 5466.46
   80.97 5466.46   82.95 5466.61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   20.19    .015   58.93     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         11.85    63.2           98.64   98.26   96.43             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.285476.881   73.61   82.955476.517

CROSS SECTION


RIVER: Kings
REACH: 02                 RS: 981

INPUT
Description:
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5462.33    1.95 5462.32    3.91 5462.24    5.86 5462.16    6.52 5462.12
    7.81 5462.05    9.76 5461.73   11.72 5461.56   12.22 5461.54   13.67 5461.47
   15.62 5461.36   17.57 5461.52   19.53 5461.58   21.48 5461.59   23.43 5461.62
   25.38 5461.67   27.34  5461.7   29.29 5461.67   31.24 5461.69    33.2 5461.65
   35.15 5461.64    37.1 5461.59   39.05 5461.53   41.01  5461.5   42.96 5461.42
   44.91 5461.34   46.86 5461.18   48.82 5461.33   50.77 5461.48   52.72 5461.71
   54.68 5461.83   55.59 5461.85   56.63 5461.86   58.58 5461.95    59.3 5461.98
   60.53 5462.03   62.49 5462.07   64.44 5462.06   66.39 5461.95   68.34 5461.85
    70.3 5461.83

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   12.22    .015   55.59     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          6.52    59.3          108.46  108.65   109.6             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   62.42    70.3 5472.07

CROSS SECTION


RIVER: Kings
REACH: 02                 RS: 873
```

```
INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5456.35    1.98 5456.31    3.96 5456.26    5.94 5456.17    7.92 5456.16
     9.9 5456.13    9.97 5456.12   11.88 5456.03   13.86 5455.84   14.63 5455.75
   15.84 5455.62   17.82 5455.43    19.8 5455.52   21.78 5455.55   23.76 5455.57
   25.74  5455.6   27.72 5455.62    29.7 5455.61   31.68 5455.63   33.66 5455.65
   35.64 5455.65   37.62 5455.66    39.6 5455.63   41.58 5455.56   43.56  5455.5
   45.54 5455.45   47.52 5455.35    49.5 5455.25   51.48 5455.29   53.46 5455.42
   55.45 5455.56   57.43  5455.7   59.41 5455.85   61.39 5456.02   63.37 5456.19
   65.35  5456.3   67.33 5456.38   69.31 5456.44   70.84 5456.46   71.29 5456.46
   73.27 5456.48   75.25 5456.48   77.23 5456.47   79.21 5456.45   81.19 5456.45

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0     .13   14.63    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9.97   63.37            102.08  102.07  102.06             .1       .3

CROSS SECTION


RIVER: Kings
REACH: 02                 RS: 771

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5452.01     .97 5451.98    1.97 5451.95    3.93 5451.78     5.9 5451.49
    7.87 5451.21    9.08 5451.09    9.83 5451.01    11.8 5450.89   13.76 5450.76
   15.73 5450.84   17.69 5450.89   19.66 5450.95   21.63 5450.97   23.59    5451
   25.56 5451.03   27.52 5451.07   29.49 5451.07   31.46 5451.04   33.42 5451.03
   35.39    5451   37.35    5451   39.32    5451   41.29 5450.96   43.25 5450.86
   45.22 5451.19   47.18 5451.24   49.15  5451.5   51.12 5451.64   51.85 5451.64
   53.08 5451.64   55.05 5451.74   57.01  5451.9   58.98 5452.08   60.94 5452.32
   62.91 5452.59   64.88 5452.83   66.84 5453.07   68.81 5453.29   69.58 5453.39
   70.77 5453.55   72.74 5453.81   74.71 5454.01   76.67 5454.14   78.64 5454.35
    80.6 5454.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    9.08    .015   51.85     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1.97   51.12            105.95  105.93   105.8             .1       .3

CROSS SECTION


RIVER: Kings
REACH: 02                 RS: 665

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5448.62    1.98 5448.75    3.96 5448.96    5.94 5449.04    7.92 5448.94
     9.9 5448.85   11.88  5448.8   13.87 5448.69   15.85 5448.51   17.83 5448.41
   19.81 5448.33   20.16  5448.3   21.79 5448.16   23.77 5447.96   25.75 5447.77
   27.73 5447.51   29.71 5447.24   31.69  5447.1   33.67 5446.86   35.65 5446.83
   37.63 5446.93   39.62 5447.02    41.6 5447.14   43.58 5447.26   45.56 5447.36
   47.54 5447.46   49.52  5447.5    51.5 5447.52   53.48 5447.53   55.46 5447.54
   57.44 5447.54   59.42 5447.51    61.4 5447.48   63.38 5447.37   65.37 5447.31
   67.35 5447.43   69.33 5447.53   70.24 5447.64   71.31 5447.77   73.29 5448.11
   74.19 5448.13   75.27 5448.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   29.71    .015   70.24     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         20.16   74.19            103.39  103.35  103.13             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    7.435458.625

CROSS SECTION


RIVER: Kings
REACH: 02                 RS: 561

INPUT
Description:
Station Elevation Data    num=      56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5442.76    1.97 5442.66    3.94 5442.68    5.91 5442.76    7.88  5442.8
    9.85 5442.74   11.82 5442.71   13.79  5442.7   15.76  5442.7   17.73 5442.74
    19.7 5442.78   21.67 5442.81   23.65 5442.87   25.62 5442.89   26.42 5442.91
   27.59 5442.93   29.56 5442.96   30.81 5442.83   31.53 5442.75    33.5 5442.54
   35.47 5442.45   37.44 5442.58   39.41 5442.69   41.38 5442.84   43.35 5442.97
   45.32 5443.14   47.29  5443.2   49.26 5443.22   51.23 5443.25    53.2  5443.3
   55.17  5443.3   57.14 5443.26   59.11 5443.22   61.08 5443.19   63.05 5443.17
   65.02 5443.14   66.99 5443.11   68.96 5443.09   70.94 5443.07   72.91 5443.09
   74.88 5443.11   76.85 5443.12   78.82 5443.13   80.79 5443.13   82.76 5443.12
   83.51 5443.12   84.73 5443.12    86.7 5443.13   88.67 5443.12   90.64 5443.12
   92.61 5443.15   94.58 5443.21   96.55 5443.25   98.52 5443.29  100.49 5443.31
  102.46 5443.32

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0     .13   30.81    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         29.56    53.2            125.95  125.89  125.56             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
```

```
       0   29.56    5444       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    3.245452.761

CROSS SECTION


RIVER: Kings
REACH: 02                 RS: 435

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5439.19    1.96 5439.23    3.93 5439.42    5.89  5439.6    7.85 5439.57
    9.81 5439.41   11.78 5439.24   13.74 5439.07    15.7 5439.02   17.66 5439.04
   19.63 5438.89   21.59 5438.75   23.39 5438.69   23.55 5438.68   25.52 5438.63
   27.48 5438.55   29.44 5438.34    30.4 5438.24    31.4 5438.13   33.37 5437.95
   35.33 5437.88   37.29    5438   39.25 5438.07   41.22 5438.16   43.18 5438.24
   45.14 5438.31    47.1 5438.38   49.07 5438.45   51.03 5438.43   52.99 5438.41
   54.96 5438.41   56.92 5438.41   58.88 5438.41   60.84 5438.38   62.81 5438.39
   64.77 5438.34   66.73 5438.49   68.69 5438.66   70.02 5439.17   70.66 5439.42
   72.62 5441.02   74.58 5441.54   76.55 5441.95   76.82 5441.99   78.51 5442.24
   80.47 5442.83

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    30.4    .015   70.02     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         23.39   70.66           123.76  123.85  124.44              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    3.17 5449.19

CROSS SECTION


RIVER: Kings
REACH: 02                 RS: 311

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5434.33    1.97  5434.2    3.95 5433.81    5.23 5433.67    5.93 5433.59
    7.91 5433.38    9.89  5433.4   11.87 5433.55   13.85  5433.7   15.83 5433.83
   17.81 5433.94   19.79 5434.05   21.77 5434.14   23.74 5434.19   25.72 5434.18
    27.7 5434.16   29.68 5434.16   31.66 5434.14   33.64 5434.15   35.62 5434.13
    37.6 5433.99   39.58 5433.88   41.56 5433.97   43.54 5434.08   44.16 5434.16
   45.51 5434.31   47.49 5434.53   49.47 5434.52   51.08 5434.48   51.45 5434.48
   53.43 5434.56   55.41 5434.64   57.39 5434.67   59.37 5434.78   61.35 5434.89
   63.33 5434.91    65.3 5434.86   67.28 5434.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    5.23    .015   44.16     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          1.97   47.49            96.3   96.37   96.93              .1       .3

CROSS SECTION


RIVER: Kings
REACH: 01                 RS: 215

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5431.36       2 5431.25    3.99 5431.06    5.99 5430.87    7.98 5430.77
    9.98 5430.76   11.78 5430.69   11.97 5430.68   13.97 5430.59   15.96 5430.48
   17.96 5430.41   19.46 5430.42   19.95 5430.42   21.95 5430.19   23.94 5430.35
   25.94 5430.38   27.93 5430.45   29.93 5430.45   31.92 5430.45   33.92  5430.5
   35.91 5430.56   37.91 5430.55    39.9 5430.56    41.9  5430.6   43.89 5430.58
   45.89 5430.59   47.88  5430.6   49.88 5430.62   51.87 5430.53   53.87 5430.76
   54.82  5430.8   55.86 5430.84   57.86 5431.19   59.85 5431.77   61.85 5432.17
   62.08 5432.21   63.84 5432.47   65.84 5432.85   67.83 5433.25   69.83 5433.64
   71.82  5433.8   73.82 5433.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   19.46    .015   54.82     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         11.78   59.85           133.42  133.39  133.36              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  -17.95  -11.525441.138   67.46   73.825443.176

CROSS SECTION


RIVER: Kings
REACH: 01                 RS: 82

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5427.1    1.97 5427.02    3.94 5427.02    5.91 5427.07    7.87 5426.99
    9.84  5426.9   11.81 5426.86   13.78 5426.89   15.75 5426.98   17.72 5426.98
   19.68 5426.88   21.65 5426.74   23.62 5426.61   25.59 5426.46   26.69 5426.34
   27.56 5426.25   29.53 5425.94    31.5 5425.75   33.46 5425.69   35.43  5425.5
   36.23 5425.51    37.4 5425.51   39.37 5425.63   41.34 5425.72   43.31  5425.8
   45.28 5425.87   47.24 5425.95   49.21 5425.98   51.18 5426.01   53.15 5426.05
   55.12 5426.07   57.09 5426.06   59.06 5426.04   61.02 5426.06   62.99 5426.06
   64.96 5425.96   66.93 5426.01    68.9 5426.26   69.61  5426.3   70.87 5426.37
   72.83 5426.61   73.26  5426.7    74.8 5427.02   76.77 5427.26   78.74 5427.47
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   80.71 5427.76   82.68 5428.02   84.65 5428.27   86.61  5428.5   88.58 5428.62
   90.55 5428.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   36.23    .015   69.61     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          26.69   73.26            47.42   81.72   40.49             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    3.645437.101

CROSS SECTION


RIVER: Kings_Split
REACH: 1                  RS: 775

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5535.35    1.96  5535.3    3.93 5535.26    5.89 5535.26    7.85  5535.2
    9.81 5535.11   11.78 5535.06   13.74 5535.05    15.7 5535.07   17.66 5535.13
   19.63 5535.07   21.59 5534.91   23.55 5534.79   25.52 5534.68   27.48 5534.63
   29.44 5534.41    31.4 5534.33   33.37 5534.26   35.33 5534.09   37.29 5533.99
   39.25 5533.93   41.22 5533.85   43.18 5533.69   45.14  5533.6    47.1 5533.64
   49.07  5533.5   51.03 5533.17    51.4  5533.1   52.99 5532.79   54.96 5532.47
   56.92 5532.26   58.88  5532.1   60.84 5532.09   62.81  5532.2   64.77 5532.19
   66.73 5532.01   68.69 5531.73   70.66 5531.58   72.22 5531.62   72.62 5531.63
   74.58  5531.7   76.54 5531.71   78.51 5531.69   80.47 5531.65

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          51.4   72.22            74.04   74.27   73.66             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0    24.95545.345       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
      68   80.475541.589

CROSS SECTION


RIVER: Kings_Split
REACH: 1                  RS: 701

INPUT
Description:
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5530.55    1.99 5530.85    3.99 5531.07    5.98 5530.84    7.97 5530.58
    9.96 5530.53   11.95 5530.44   13.95 5530.29   15.94 5530.23   17.93 5530.19
   19.92 5530.07   21.92 5529.92   23.91 5529.77    25.9 5529.59   27.89 5529.44
   29.89 5529.25   31.88 5529.06   33.87  5528.9   35.86 5528.75   37.86 5528.64
   39.85 5528.52   41.84 5528.36   42.21 5528.33   43.83 5528.19   45.83 5528.02
   47.82 5527.91   49.81 5527.79    51.8 5527.64    53.8  5527.5   55.79 5527.36
   57.78 5527.21   59.77 5527.08   61.77 5526.97   63.76 5526.88   65.75 5526.89
   67.74 5526.97   69.74 5527.01   71.73 5527.05   73.72 5527.03   75.71 5526.93
   77.71 5526.87    79.7 5526.81   81.69 5526.93   83.68 5527.56   85.68 5528.41
   87.67 5529.03   89.66 5529.32   91.65 5529.51   93.65 5529.68   94.57 5529.89
   95.64 5530.12   97.63  5530.6   99.62 5530.55  101.62 5530.14  103.61 5530.03
   105.6 5530.15  107.59 5530.23  109.59 5530.31  111.58 5530.36  113.57  5530.4
  115.56 5530.55  117.56 5530.84  119.55 5530.79  121.54 5530.59  123.53  5530.5
  125.52 5530.46  127.52 5530.59  129.51 5530.72   131.5 5530.67  133.49 5529.98
  135.49 5529.95  137.48 5529.88  139.47 5529.81  141.46 5529.74  143.46 5529.78
  145.45 5529.83  147.44  5529.9  149.43 5529.99  151.43 5530.02  152.22 5530.04
  153.42 5530.06  155.41 5530.03   157.4 5530.07   159.4 5530.31  161.39 5530.65

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0     .13  152.22     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          42.21   94.57           120.85  103.58  121.11             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   23.76   39.655539.782       F
   98.85  133.695540.687       F

CROSS SECTION


RIVER: Kings_Split
REACH: 1                  RS: 597

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5526.79    1.99 5526.53    5.97 5526.09    7.96 5525.96    9.95 5525.86
   11.94 5525.83   13.93 5525.67   15.92 5525.43   17.91 5525.28   19.89 5525.26
   21.88  5525.3   23.87 5525.44   25.86 5525.29   27.85 5524.93   29.84 5524.39
   31.83 5523.93   33.82 5523.74    37.8 5523.53   39.79 5523.46   43.77 5523.36
   45.76 5523.35   47.75 5523.39   49.74 5523.47   51.73  5523.6   53.72  5523.9
   55.71 5523.85   57.69 5523.84   61.67 5523.67   63.66 5523.64   65.65 5523.54
   67.64 5523.38   69.63 5523.56   71.62 5523.48   73.61 5523.37    75.6 5523.38
   77.59 5523.32    80.5  5523.2   81.57 5523.16   83.56 5522.94   85.55 5522.89
   87.54  5522.8   89.53 5522.77   91.52 5522.77   93.51  5522.8   95.49 5522.91
   97.48 5522.86   99.47 5522.75  101.46 5522.85  103.45 5522.84  105.44  5522.7
  109.42 5522.51  111.41 5522.44   113.4  5522.4  117.38 5522.43  125.34 5522.47
  129.32 5522.53  131.31 5522.59  139.26 5522.71  141.25 5522.68  143.24 5522.61
  145.23 5522.57  147.22  5522.5  149.21 5522.51  153.19  5522.7  159.16 5522.61
  161.15 5522.68  163.14 5522.79  165.13 5522.48  167.12 5521.96  169.11 5521.86
  171.09 5522.09  175.07 5522.77  177.06 5522.83  179.05 5523.05  181.04 5523.24
  183.03 5523.37  187.01 5523.47  190.99  5523.4  194.97 5523.38  196.96 5523.41
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  202.93 5523.39  204.92 5523.37  206.91 5523.29   208.9 5523.25  210.88 5523.14
  212.87  5523.1  216.85 5523.17  218.84 5523.22  222.82 5523.28  224.81 5523.29
  228.79 5523.14  230.78 5524.88  232.77 5526.09  234.76 5526.43  236.75 5526.58
  238.74 5526.67  240.65 5526.79  242.65 5527.02  244.71 5527.23   246.7 5527.29

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0     .13  240.65     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          80.5  232.77             74.6   74.17   77.95             .1       .3
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
   52.74  104.545533.799       F
  147.85  165.31  5532.5       F
  191.62  208.845533.397       F
Blocked Obstructions     num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    28.3   52.745534.811  104.54  147.855532.765  177.18  191.625532.833
  208.84  232.185533.252

CROSS SECTION


RIVER: Kings_Split
REACH: 1                  RS: 523

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5519.92    3.98 5519.71    5.97 5519.69    7.95 5519.43    9.94 5519.59
   11.93 5519.57   15.91 5519.29    17.9  5519.2   19.89  5519.4   21.88 5519.31
   23.86 5519.37   25.85 5519.31   29.83 5519.27   31.82  5519.1    35.8 5519.22
   39.77 5518.85   41.76  5518.4   43.75 5518.28   49.72 5518.39   51.71 5518.28
   55.68 5518.34   57.67 5518.77   59.66 5519.69   61.65 5519.65   63.64  5519.5
   67.62 5519.36    69.6 5519.07   71.59 5519.33   75.57 5519.71   77.56  5519.7
   79.55 5519.79   81.54 5520.07   85.51 5520.19   91.48 5520.07   93.47 5519.99
   95.46 5520.03   99.44 5520.17  101.42  5520.2  103.41 5520.16  107.39 5519.99
  111.37 5519.88  117.33 5519.79  121.31 5519.98   123.3    5520  129.57 5519.77
  131.25 5519.75  133.24  5519.8  137.22 5519.58   141.2 5519.03  145.18 5518.73
  147.16 5518.63  149.15 5518.74  151.14 5518.99  153.13 5519.32  155.12 5519.46
  157.11  5519.3   159.1 5519.23  165.06 5519.29  173.02  5519.2     177 5519.35
  182.96 5519.43  186.94 5519.34  188.93  5519.6   192.9  5520.5  194.89 5521.08
  196.88 5521.36  198.87 5521.18  200.86 5520.79  202.85 5520.63  204.84 5520.77
  206.83 5520.69  208.81 5520.13   210.8 5519.42  212.79 5519.35  214.78 5519.71
  216.77 5519.77  220.75 5519.57  224.72 5519.21  226.71 5519.07   228.7 5519.11
  230.69 5519.24  240.63 5519.56  242.62  5519.6   246.6 5519.76  250.58 5519.96
  254.55 5520.11  258.53 5520.41  262.51 5520.57  266.49  5520.8  272.45 5521.08
  274.44 5521.32  276.43 5522.19  278.42 5523.49  280.41 5524.24   282.4 5524.68
  286.37 5525.27  289.78 5525.55   291.1 5525.62  292.34 5525.66  294.33 5525.95

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
       0     .13  289.78     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        129.57  258.53            87.79  107.31   95.37             .1       .3
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0  122.155529.979       F
  161.68   197.25529.279       F
   253.9  267.475530.067       F

CROSS SECTION


RIVER: Kings_Split
REACH: 1                  RS: 416

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5514.84    7.96 5516.73    9.95 5517.17   11.94 5517.48   13.93 5517.69
   15.92 5517.78   21.89 5517.61   25.87 5517.62   27.86 5517.35   29.85  5516.7
   33.82 5516.51    37.8 5516.46   41.78 5516.37   45.76 5515.82   47.75 5515.49
   51.73  5514.6   55.71 5514.62   59.69 5514.88   61.68 5515.06   63.67 5515.06
   65.66 5514.32   67.65  5513.1   69.64 5512.45   71.63 5512.34   73.62 5512.33
    77.6 5512.13   81.58 5512.14   87.55 5512.06   89.54  5512.2    95.5 5512.23
   99.48 5512.14  103.46 5512.21  105.45 5512.41  109.43  5514.9  111.42 5515.27
   115.4 5515.37  117.39 5515.55  121.37 5515.62  123.36  5515.6  125.35 5515.68
  129.33 5515.62  131.32 5515.49  133.31  5515.5  138.46 5515.05  139.28 5514.97
  141.27 5514.05  143.26 5512.83  145.25 5512.06  149.23 5511.76   153.2 5511.25
  155.19 5511.15  159.17 5511.13  163.15 5511.05  169.12    5511  171.11 5510.95
   173.1 5511.12  175.09 5511.54  177.08 5511.81  179.07 5511.99  183.05 5512.25
  187.03 5512.37  191.01 5512.29     193 5512.37  196.98 5512.43  200.96  5512.6
  202.95 5512.58  206.93 5512.66  208.92 5512.74  212.89 5512.82  214.88 5512.98
  216.87 5513.05  218.86 5513.28  220.85 5513.17  224.83 5512.68  226.82 5512.56
  228.81 5512.54  232.79 5512.36  236.77  5512.4  238.76 5512.47  242.74 5512.52
  246.72 5512.61  248.71 5512.95   250.7 5513.43  252.69 5514.15  254.68 5514.46
  256.67 5514.56  258.66 5514.38  260.65 5514.53  264.63 5514.94   270.6 5515.75
  272.59 5515.89  274.57 5516.13  276.56 5516.53  280.54  5517.5  282.53  5517.8
  286.51 5518.19   288.5 5518.32  291.05 5518.39  292.48 5518.39  296.46 5518.24

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        138.46  256.67            95.35  107.35   99.98             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   18.42   129.85525.713       F
  183.07  274.515522.252       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   18.425524.842

CROSS SECTION
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RIVER: Kings_Split
REACH: 1                    RS: 308

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5507.3    5.98 5507.02    7.97 5506.98    9.96 5507.05   11.95 5507.02
   15.94 5506.78   17.93 5506.73   19.92 5506.75   21.91 5506.65    25.9 5506.65
   29.88 5506.72   33.86 5506.75   35.86 5506.79   37.85 5507.02   39.84 5507.11
   41.83 5507.28   47.81 5507.21   51.79    5507   53.78 5506.78   55.77 5506.35
   59.76 5506.08   61.75 5506.04   63.74 5505.95   65.73 5505.93   69.72 5505.77
   71.71 5505.58   77.69  5505.2   79.68 5505.13   83.66 5505.26   85.65  5505.2
   87.65 5505.22   89.64 5505.19   91.63 5505.43   93.62 5505.44   95.61 5505.56
   97.61 5505.76    99.6 5505.82  101.59 5505.98  103.58 5506.02  105.57 5505.96
  107.57 5505.96  109.56 5506.15  113.54 5506.67  115.53 5506.61  119.45 5506.17
   123.5 5505.99  127.49 5506.03  129.48 5505.97  133.46 5506.19  137.45 5506.21
  139.44 5506.17  143.42 5506.17   149.4 5506.25  151.39  5506.3  155.37 5506.34
  157.36 5506.41  159.36 5506.59  161.35 5506.69  165.33 5506.84  167.32 5506.98
  171.31 5507.14  177.28 5507.16  181.27 5507.07  185.25  5507.1  193.22 5507.38
   197.2 5507.48  203.18 5507.56  207.16 5507.48  209.16 5507.51  213.14 5507.41
  215.13 5507.41  219.12 5507.32   223.1 5507.28  227.08 5507.16  231.07 5507.07
  235.05 5506.84  239.03 5506.86  241.03 5506.84  245.01 5506.88     247 5506.85
  248.99 5506.87  250.99 5506.95  254.97 5507.05  258.95 5507.23  260.95 5507.28
  264.93 5507.43  268.91 5507.44  270.91 5507.52  274.89 5507.55  278.87 5507.51
  282.86 5507.62  286.84 5507.68  288.83 5507.68  294.81 5507.85  298.79 5507.76
  300.79 5507.75  304.73 5507.93  306.76 5508.06  308.75 5508.13  310.75 5508.04

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        51.79  304.73           89.77   85.95   83.44             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   36.09  130.175516.812       F
  181.21  197.385517.076       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   36.095517.303

CROSS SECTION


RIVER: Kings_Split
REACH: 1                    RS: 222

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5504.58    1.99 5504.41    5.98 5504.33    9.96 5503.85   11.95 5503.66
   15.94 5503.47   17.93 5503.56   19.92 5503.72   21.91 5503.95    25.9 5504.16
   27.89 5504.32   29.88 5504.29   35.86 5503.95   37.85 5503.52   39.84 5502.74
   41.84 5502.26   43.83 5502.11   45.82 5502.04    51.8  5501.7   55.78 5501.68
   59.77 5501.58   63.75 5501.56   67.74  5501.4   71.72 5501.38   75.71 5501.47
   81.68 5501.48   85.67 5501.54   89.65 5501.71   91.64 5501.87   93.64 5501.92
   95.63 5501.62   97.62 5501.39   99.61 5501.35   103.6 5501.44  111.57 5501.43
  115.55 5501.38  119.53 5501.44  123.52 5501.44  125.51 5501.56   129.5 5501.52
  133.48 5501.57  135.47 5501.42  139.46 5500.61  141.45 5500.43  145.43 5500.36
  149.42  5500.4   153.4 5500.35  157.39 5500.35  163.36 5500.28  167.35 5500.32
  171.33 5500.11  177.31 5500.01  181.29 5500.15  185.28 5500.35  191.25 5500.42
  197.23 5500.39  201.22 5500.23  205.66 5500.55  207.19 5500.65  209.18 5500.63
  211.18 5500.44  213.17 5500.01  215.16 5499.96  219.15 5500.06  223.13 5500.12
  227.11 5500.26   231.1 5500.35  233.09 5500.33  243.05 5500.69  245.04 5500.71
     257 5500.65  260.98 5500.56  264.97 5500.57  270.94 5500.33  272.94 5500.46
  274.93 5501.12  278.91 5501.27  280.91 5501.72   282.9 5502.41  284.89 5503.02
  286.88 5503.18  288.87 5503.02  292.86 5502.87  294.85 5502.87  296.84 5503.08
  304.81 5503.38  310.79 5503.41  312.78 5503.35  318.76 5503.31  320.75 5503.23
  324.73 5503.15  326.73 5503.19  328.72 5503.12   332.7 5503.06   334.7 5503.07
  338.68 5502.98  341.94 5503.03  346.65 5503.12  350.63 5504.49  352.63 5504.63

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       133.48  280.91           76.52   72.53   74.78             .1       .3
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
   20.39   80.615513.764       F
  160.25     195 5511.32       F
  226.74  231.54 5510.26       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  136.26  160.255511.322  231.54  269.945510.334  286.11  315.02 5513.18

CROSS SECTION


RIVER: Kings_Split
REACH: 1                    RS: 150

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5498.11    1.99 5498.05    5.97 5498.14    9.94 5498.06   15.91 5497.98
   19.88 5497.89   21.87 5497.74   25.85 5497.53   29.83 5497.46   31.81 5497.53
   35.79 5497.47   37.78 5497.49   39.77 5497.42   43.75 5497.15   47.72 5497.11
   49.71 5497.03    51.7 5497.02   55.68 5496.86   61.64 5496.72   65.62 5496.65
   67.61 5496.75   71.58 5496.62   73.57  5496.5   77.55 5496.56   79.54 5496.44
   81.53 5496.52   89.48 5496.59   91.47 5496.69   97.43 5496.84  105.39 5496.95
  107.38  5496.9  113.34 5497.07  117.32 5497.08  123.28 5496.96  129.25 5496.98
  131.24 5497.08  135.21 5497.19   137.2  5497.2  139.19 5497.39  141.18 5497.29
  145.16 5496.77  149.13 5497.04  153.11 5497.13  157.09 5498.04  159.08 5498.61
  161.06 5498.92  165.04 5498.04  171.01 5497.57  172.99 5497.39  176.97 5497.29
  178.96 5497.39  182.94 5497.79   188.9 5497.69  192.88 5497.85  196.86 5497.57
  202.82  5497.3   206.8 5497.49  208.79 5497.63  212.76 5498.03  218.73 5498.24
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  222.71  5498.6     225 5498.39  226.68 5498.04  228.67 5497.71  230.66 5497.64
  236.62 5497.53   240.6 5497.61  244.58 5497.49  248.56 5497.56  252.53 5497.57
  256.51 5497.88   258.5 5497.92  262.47 5497.86  266.45 5497.85  270.43 5497.89
   274.4 5497.84  276.39 5497.87  278.38 5497.82  280.37 5497.54  282.36 5497.15
  284.35 5496.91  288.32 5496.73   292.3 5496.44  296.28 5495.95  298.27 5496.09
  300.25 5496.07  302.24 5495.67  304.23 5494.89  306.22 5494.25  308.21 5494.17
  312.18 5494.15  314.17 5494.42  316.16 5495.26  318.15 5496.19  320.14 5496.76
  322.32 5497.22  324.12 5497.67   326.1 5497.92  328.09 5497.83  332.07 5497.53

Manning's n Values        num=       1
     Sta   n Val
       0     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           225  322.32            55.69   45.12   52.15              .1       .3
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0   52.04 5507.48       F
   74.88   192.95506.531       F
  298.73  331.615506.116       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   52.04   74.885507.011

CROSS SECTION


RIVER: Kings_Split
REACH: 1                  RS: 105

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5496.87    1.97 5496.71    3.94 5496.62    5.92 5496.61    9.86 5496.51
   15.78 5496.06   21.69 5495.12   23.84 5494.94   27.61 5494.77   31.55 5494.43
    35.5 5494.57   39.44 5494.59   43.38 5494.53   45.36 5494.55   53.25 5494.41
   57.24 5494.42   61.23 5494.38   67.22 5494.45   69.22 5494.42   73.21 5494.43
   75.21  5494.4    77.2 5494.44    79.2  5494.4   85.19 5494.44   89.18 5494.42
   91.18 5494.37   99.16 5494.32  101.16 5494.37  103.16  5494.3  105.15 5494.34
  109.15 5494.26  111.14 5494.26  113.14 5494.18  115.14 5494.22  119.13 5494.23
  123.12 5494.17  125.12 5494.23  127.11 5494.14  131.11  5494.1   135.1 5494.13
  139.09 5494.02  143.09 5494.06  145.08 5494.01  149.07 5494.01  155.06 5493.97
  159.06 5493.99  165.05 5493.97  167.04 5493.92  169.04 5493.98  173.03 5493.99
  175.03 5493.95  181.02 5493.98  183.01 5493.94     189 5493.95     191 5493.92
  194.99 5493.96  200.98 5493.87  202.98 5493.88  210.96 5493.85  212.96 5493.82
  216.95 5493.84  224.94 5493.73  228.93  5493.7  230.93 5493.72  234.92 5493.63
  236.92 5493.64  238.91 5493.58  240.91 5493.61  244.65 5493.46   246.9 5493.42
   248.9 5493.47  250.89 5493.42  252.89 5493.49  256.88 5493.39  262.87 5493.43
  266.86  5493.4  276.85 5493.38  280.84 5493.35  286.83 5493.26  290.82 5493.22
  298.81 5493.11   300.8 5493.12  308.79    5493  312.78 5492.99  314.78 5492.95
  328.66 5492.85  332.45 5492.86  338.14 5492.82  341.94  5492.6  343.83 5492.76
  345.73 5493.07  347.63 5493.18  350.37 5494.65  351.42 5495.21  353.08 5495.85
  353.32 5495.95  355.22 5496.22  357.12 5496.41  359.01  5496.9  360.91 5497.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   23.84    .015  350.37     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        244.65  353.08            20.7  104.55   11.36              .1       .3

CROSS SECTION


RIVER: Madison_Split
REACH: 1                  RS: 346

INPUT
Description:
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5285.38    1.98  5285.4    3.95 5285.42    5.93 5285.36     7.9 5285.24
    9.88 5285.15   11.86 5285.04   13.83 5284.94   15.81 5284.63   17.78 5284.25
   19.76 5284.03   21.73 5283.86   23.71  5283.7   25.64 5283.48   25.69 5283.47
   27.66 5283.33   29.64 5283.33   31.61 5283.27   33.59 5283.23   35.57  5283.2
   37.54 5283.16   39.52 5283.12   39.61 5283.11   41.49 5283.09   43.47 5283.07
   45.44 5283.04   47.42 5283.07    49.4 5283.11   51.37  5283.1   53.35  5283.1
   55.32 5283.14    57.3 5283.18   59.28 5283.18   61.25  5283.2   61.56  5283.2
   63.23 5283.24    65.2 5283.34   65.64 5283.43   67.18 5283.73   69.16 5284.12
   71.13 5284.16   73.11 5284.06   75.08 5283.71   77.06 5283.77   79.03 5283.82
   81.01 5283.73   82.99 5283.75   84.96 5283.76   86.94 5283.74   88.91 5283.62
   90.89 5283.59   92.87  5283.7   94.84 5283.78   96.82 5283.76   98.79  5283.7
  100.77 5283.65  102.74 5283.59  104.72 5283.53   106.7 5283.49  108.67 5283.53
  110.65 5283.59  112.62  5283.5   114.6 5283.42  116.58 5283.41  118.55 5283.55
  120.53  5283.7   122.5 5283.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   39.61    .015   61.56     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         15.81   69.16            94.37   94.37   94.37              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.865295.382   94.97   122.5 5293.78

CROSS SECTION


RIVER: Madison_Split
REACH: 1                  RS: 252

INPUT
Description:
Station Elevation Data    num=      93
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5285.01    1.98  5284.9    3.96 5284.74    5.94 5284.82    7.92 5284.85
     9.9 5284.88   11.88 5284.88   13.86 5284.84   15.84 5284.83   17.82 5284.86
    19.8 5284.81   21.78 5284.67   23.76 5284.52   25.74 5284.36   27.72  5284.2
    29.7 5284.14   31.68 5284.04   33.66 5283.98   35.64 5283.89   37.62 5283.89
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    39.6 5283.89   41.58 5283.86   43.56 5283.81   45.54 5283.75   47.52 5283.64
    49.5 5283.62   51.48 5283.69   53.46 5283.73   55.44 5283.71   57.42 5283.69
    59.4 5283.63   61.38 5283.57   63.36 5283.52   65.34 5283.48   67.31 5283.45
   69.29 5283.26   71.27 5283.14   73.25 5282.97   74.81 5282.79   75.23 5282.75
   77.21 5282.64   79.19 5282.58   81.17 5282.51   83.15 5282.44   85.13 5282.36
   87.11 5282.25   87.73 5282.22   89.09 5282.16   91.07 5282.02   93.05 5281.77
   95.03 5281.86   97.01 5282.17   98.99 5282.21  100.97 5282.26  102.95 5282.35
  104.93  5282.4  106.91 5282.43  108.89 5282.47  109.44 5282.48  110.87 5282.51
  112.85 5282.52  114.81 5282.77  114.83 5282.77  116.81 5283.23  118.79 5283.39
  120.77 5283.31  122.75 5283.19  124.73 5283.08  126.71 5283.07  128.69 5283.07
  130.67 5283.01  132.65 5282.98  134.63 5283.03  136.61 5283.01  138.59 5282.92
  140.57 5282.88  142.55 5282.83  144.53 5282.71  146.51 5282.72  148.49 5282.86
  150.47 5282.85  152.45 5282.83  154.43 5282.85  156.41 5282.85  158.39 5282.87
  160.37 5282.88  162.35 5282.89  164.33  5282.9  166.31  5282.9  168.29 5282.87
  170.27 5282.76  172.25 5282.65  174.23 5282.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   87.73    .015  109.44     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         67.31  116.81            88.63   88.63   88.63             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    5.94   42.735294.817       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.945295.007  149.71  174.235292.861

CROSS SECTION


RIVER: Madison_Split
REACH: 1                  RS: 163

INPUT
Description:
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5284.53    1.99 5284.49    3.97 5284.45    5.96 5284.44    7.95 5284.53
    9.94 5284.57   11.92 5284.47   13.91 5284.27    15.9 5284.14   17.88 5283.98
   19.87  5283.8   21.86 5283.37   23.84 5283.16   25.83  5283.1   27.82 5283.08
    28.7 5283.08   29.81 5283.08   31.79 5283.07   33.78  5283.1   35.77 5283.13
   37.75 5283.08   39.74 5282.95   40.64 5282.85   41.73 5282.73   43.72 5282.38
    45.7 5282.27   47.69 5282.28   49.68  5282.3   51.66 5282.28   53.65 5282.32
   55.64 5282.31   57.62 5282.28   59.61 5282.26    61.6 5282.27   62.12 5282.27
   63.59 5282.26   65.57  5282.4   67.56 5282.64    68.7 5282.69   69.55 5282.72
   71.53 5282.72   73.52  5282.7   75.51 5282.67   77.49 5282.67   79.48 5282.66
   81.47 5282.64   83.46 5282.63   85.44  5282.6   87.43 5282.61   89.42 5282.58
    91.4 5282.54   93.39 5282.53   95.38 5282.48   97.37 5282.46   99.35 5282.46
  101.34 5282.44  103.33 5282.45  105.31 5282.44   107.3 5282.46  109.29  5282.5
  111.27 5282.48  113.26 5282.43  115.25 5282.42  117.24 5282.42  119.22 5282.42
  121.21 5282.42   123.2 5282.46  125.18 5282.56  127.17 5282.64  129.16 5282.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   40.64    .015   62.12     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         37.75    68.7           118.27  118.27  118.27             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   13.465294.526  102.82  129.16 5292.44

CROSS SECTION


RIVER: Madison_Split
REACH: 1                  RS: 45

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5284.93    1.98 5284.71    3.97 5284.23    5.95 5283.61    7.94 5283.25
    9.92 5283.09   11.91 5282.97   13.89  5282.9   15.88 5282.76   17.86 5282.59
   19.85 5282.44   21.83  5282.4   23.82 5282.36    25.8 5282.06   27.79 5281.89
   29.77 5281.87   30.95 5281.87   31.75 5281.87   33.74 5281.86   35.72 5281.79
   37.71 5281.75   39.69 5281.73   41.58 5281.72   41.68 5281.72   43.66 5281.72
   45.65 5281.76   47.63 5281.78   49.62 5281.78    51.6 5281.81   53.59 5281.85
   55.57  5281.9   57.56 5281.93   59.54 5281.93   61.52 5281.92   62.76 5281.92
   63.51 5281.93   65.49 5281.96   67.48 5282.08   69.46 5282.12   70.95 5281.94
   71.45 5281.88   73.43 5281.57   75.42  5281.3    77.4 5281.19   79.39 5281.24
   81.37 5281.45   83.36 5281.62   85.34  5281.6   87.33  5281.6   89.31 5281.64
    91.3 5281.79   93.28 5281.91   95.26 5281.87   97.25 5281.83   99.23 5281.79
  101.22 5281.75   103.2 5281.73  105.19 5281.78  107.17 5281.84  109.16 5281.77
  111.14 5281.48  113.13 5281.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   41.58    .015   62.76     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         23.82   69.46            45.05   45.07   45.08             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    9.78 5294.93   89.19  113.135291.638

CROSS SECTION


RIVER: Quinn_St_Split
REACH: 02                 RS: 488

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5300.16    1.98 5300.16    3.96 5300.07    5.95 5300.04    7.93 5300.07
    9.91 5299.99    11.6 5299.88   11.89 5299.86   13.88 5299.71   15.86 5299.52
   17.84 5299.27   19.82 5299.06    21.8 5298.86   23.79 5298.76   25.77 5298.67
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   27.75 5298.42   29.73 5298.24   31.71 5298.12   32.26 5298.03    33.7  5297.8
   35.68 5297.54   37.66 5297.25   39.64 5297.05   41.63 5297.22   43.61 5297.31
   45.59 5297.37   47.57 5297.43   49.55 5297.42   51.54 5297.44   53.52 5297.43
    55.5 5297.41   57.48 5297.42   59.47 5297.37   61.45 5297.29   63.43 5297.21
   65.41 5297.09   67.39 5296.96   69.38 5296.77   71.36 5296.78   73.34 5297.04
   75.32 5297.18   75.75 5297.25    77.3 5297.51   79.29 5297.64   81.27 5297.72
   83.25 5297.74   85.23 5297.68   87.22 5297.75   89.21 5297.88   90.45 5297.95
    91.2 5297.99   93.19 5298.11   95.18 5298.22   97.17 5298.17   99.16  5298.2
  101.15 5298.19  103.13 5298.38  105.12 5298.63  107.11 5298.67   109.1 5298.56
  111.09 5298.54  113.08 5298.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   32.26    .015   75.75     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         19.82   90.45           100.14   82.01   76.88             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    4.345310.159  102.91  113.085308.347

CROSS SECTION


RIVER: Quinn_St_Split
REACH: 02                 RS: 406

INPUT
Description:
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5298.27    1.97 5298.33    3.95 5298.44    5.93 5298.25     7.9 5298.09
    9.78 5297.86    9.88 5297.85   11.85 5297.58   13.83  5297.5    15.8 5297.35
   17.78 5297.07   19.75 5296.72   21.73 5296.21    23.7 5295.79   24.09 5295.74
   25.68 5295.56   27.65  5295.3   29.63 5294.91    31.6 5295.06   33.58 5295.12
   35.55 5295.19   37.53 5295.22    39.5 5295.29   41.48 5295.31   43.45 5295.32
   45.43 5295.32    47.4 5295.29   49.38 5295.25   51.35 5295.21   53.33 5295.17
    55.3 5295.05   57.28 5294.91   59.25 5294.79   61.23 5294.84    63.2 5295.24
   64.57 5295.28   65.18  5295.3   67.15 5295.45   69.13 5295.58    71.1 5295.72
   73.08 5295.84   75.05 5295.96   77.03 5296.13      79 5296.22   80.27 5296.25
   80.98 5296.27   82.95 5296.39   84.93 5296.49    86.9 5296.61   88.88 5296.67
   90.85  5296.7   92.83 5296.87    94.8 5297.01   96.78 5297.09   98.75 5297.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   24.09    .015   64.57     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         19.75   80.27           128.08  128.42  128.56             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    4.615308.273   94.48   98.755306.993

CROSS SECTION


RIVER: Quinn_St_Split
REACH: 01                 RS: 278

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5294.9    1.97 5294.96    3.95 5295.11    5.92  5295.1    7.89 5294.88
    9.86 5294.74   11.84 5294.59   13.81 5294.69   15.78  5294.7   17.76 5294.52
   19.73 5294.38    21.7 5294.25   22.17 5294.24   23.67 5294.21   25.65 5294.11
   27.62 5293.88    27.7 5293.87   29.59 5293.63   31.56  5293.3   33.54 5292.88
   35.51 5292.51   37.48 5292.29   39.46 5292.27   41.43 5292.47    43.4 5292.54
   45.37 5292.61   47.35 5292.77   49.32 5292.83   51.29 5292.85   53.27 5292.89
   55.24 5292.92   57.21 5292.88   59.18 5292.78   61.16 5292.69   63.13 5292.58
    65.1 5292.43   67.08  5292.3   69.05 5292.15   71.02 5292.24   71.95 5292.38
   72.99 5292.53   74.97 5292.62   76.94 5292.73   78.91 5292.86   80.88 5292.98
   82.86 5293.13   84.83 5293.26    86.8 5293.38   88.78 5293.49   90.75 5293.68
   92.72 5293.81   94.23 5293.92   94.69 5293.96   96.67 5294.14   98.64 5294.24
  100.61 5294.39  102.59 5294.74  104.56 5294.95  106.53 5295.02   108.5 5295.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    27.7    .015   71.95     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         22.17   94.23            82.11   82.56   82.7              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.235304.902  102.43   108.55304.711

CROSS SECTION


RIVER: Quinn_St_Split
REACH: 01                 RS: 195

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5293.73    1.99 5293.59    3.99 5293.66    5.98 5293.52    7.98 5293.29
    9.97 5293.14   11.97 5293.07   13.25 5293.05   13.96 5293.03   15.95 5292.96
   17.95 5292.85   19.94 5292.72   21.94 5292.72   23.93 5292.64   25.48 5292.53
   25.93  5292.5   27.92 5292.37   29.92 5292.28   31.91 5291.94    33.9 5291.73
    35.9 5291.53   37.89 5291.24   39.89 5291.51   41.88 5291.59   43.88 5291.71
   45.87 5291.83   47.86 5291.91   49.86 5291.94   51.85 5291.99   53.85 5291.96
   55.84 5291.89   57.84 5291.88   59.83 5291.79   61.83  5291.7   63.82 5291.59
   65.81 5291.47   67.81  5291.4   68.93 5291.57    69.8 5291.71    71.8 5291.78
   73.79  5291.9   75.79 5292.15   77.78 5292.31   79.77 5292.51   81.77 5292.62
   83.76 5292.69   85.76 5292.73   87.75 5292.76   89.75 5292.82   91.74  5292.9
   92.24 5292.92   93.74 5292.99   95.73 5293.09   97.72 5293.09   99.72 5293.25
  101.71 5293.39  103.71 5293.52   105.7 5293.54   107.7 5293.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
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       0     .13   25.48    .015   68.93     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         13.25   92.24             84.99   85.87   86.31              .1       .3
Blocked Obstructions     num=        1
   Sta L   Sta R    Elev
  100.07   107.75303.273

CROSS SECTION


RIVER: Quinn_St_Split
REACH: 01                  RS: 109

INPUT
Description:
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5292.71    1.98 5292.67    3.96 5292.67    5.95 5292.61    7.93 5292.53
    9.91  5292.5   11.89 5292.51   12.48 5292.48   13.87  5292.4   15.85 5292.31
   17.84 5292.18   19.82 5291.95   21.01 5291.79    21.8 5291.68   23.78 5291.52
   25.76 5291.45   27.74 5291.41   29.73 5291.31   31.71 5291.21   33.69  5290.9
   35.67 5291.03   37.65 5291.18   39.64 5291.27   41.62 5291.37    43.6 5291.41
   45.58 5291.46   47.56  5291.5   49.54 5291.51   51.53 5291.49   53.51 5291.43
   55.49 5291.36   57.47 5291.26   59.45 5291.13   61.43 5290.99   63.42  5290.9
    63.6 5290.92    65.4 5291.11   67.38  5291.3   69.36 5291.37   71.34 5291.44
   73.33 5291.46   75.31 5291.46   77.29 5291.47   79.27  5291.5   81.25 5291.58
   83.23 5291.67   85.22 5291.81    87.2 5291.86   89.18 5291.89   90.11  5291.9
   91.16 5291.91   93.14    5292   95.12 5292.14   97.11  5292.2   99.09 5292.05
  101.07 5291.95  103.05 5291.91  105.03 5291.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   21.01    .015    63.6     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         12.48   90.11             51.5   68.32   73.68              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   98.27  105.035302.129       0    5.655302.706

CROSS SECTION


RIVER: Quinn_St_Split
REACH: 01                  RS: 41

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5292.88       2 5292.85       4 5292.82    5.99 5292.79    7.99 5292.74
    9.99 5292.68   11.99 5292.61   13.98 5292.39   15.98 5292.13   17.59 5292.01
   17.98 5291.98   19.98 5291.87   21.97 5291.79   23.97 5291.66   25.97 5291.53
   27.97 5291.43   28.24 5291.42   29.96 5291.32   31.96 5291.22   33.96 5291.16
   35.96 5291.12   37.95 5291.05   39.95 5290.97   41.95 5290.85   43.95 5290.63
   45.94 5290.63   47.94  5290.8   49.94 5290.89   51.94    5291   53.93 5291.04
   55.93 5291.06   57.93  5291.1   59.93 5291.12   61.93 5291.07   63.92 5291.05
   65.92    5291   67.92 5290.94   69.92 5290.86   71.91 5290.75   73.91 5290.61
   74.44 5290.62   75.91 5290.67   77.91 5290.94    79.9  5291.1    81.9 5291.31
    83.9 5291.41    85.9 5291.54   87.89 5291.73   89.89 5291.89   91.89    5292
   93.89 5292.11   95.11 5292.17   95.88  5292.2   97.88 5292.26   99.88 5292.27
  101.88 5292.28  103.88 5292.42  105.87 5292.62  107.87 5292.74  109.87 5292.75
  111.87 5292.72  113.86 5292.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   28.24    .015   74.44     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         17.59   95.11             16.37   41.16    8.53              .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  109.14  113.865302.759       0    4.625302.879

CROSS SECTION


RIVER: Skunk
REACH: 06                  RS: 11882

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5449.56    3.98 5449.49    5.98 5449.27    9.96 5449.05   11.95 5449.01
   13.95 5449.03   15.94 5448.99   19.92 5448.97   21.91    5449    25.9 5448.98
   27.89    5449   29.88 5448.95   33.87 5448.91   37.85 5448.96   39.84 5448.95
   41.84 5448.84   43.83 5448.69   45.82 5448.67   47.81 5448.73    49.8 5448.76
    51.8 5448.84   53.79 5448.85   55.36 5448.77      56 5448.69   57.77 5448.18
   59.77 5446.73   61.76 5445.82   65.74 5446.07   67.73 5446.14   69.73 5446.59
   71.72 5447.15   73.71 5447.43    75.7 5447.98   77.69 5448.58   77.83  5448.6
   79.69 5448.88   81.68 5448.94   83.67 5448.92   87.66 5449.07   91.64 5449.11
   95.62  5449.2   97.62 5449.17   99.61 5449.21  103.59 5449.22  107.58 5449.12
  109.57 5449.24  111.56 5449.43  113.55 5449.43  117.54 5449.29  121.52 5449.27
  123.51 5449.29  125.51 5449.37   127.5 5449.34  129.49 5449.24  131.48 5449.22
  135.47 5449.42  137.46 5449.42  139.45  5449.5  141.44 5449.51  145.43 5449.55
  147.42 5449.52  149.41 5449.44   153.4 5449.36  157.38 5449.59  161.37 5449.71
  163.36 5449.81  165.35 5449.86  169.33 5449.92  171.33 5450.06   177.3  5450.3
   179.3 5450.32  181.29 5450.31  183.28 5450.28  185.27 5450.33  187.26 5450.47
  189.26 5450.64  191.25 5450.74  193.24  5450.8  197.22    5451  199.22 5451.09
  201.21 5451.24  205.19 5451.48  207.19 5451.67  209.18 5451.79  211.17 5451.95
  213.16 5452.07  215.15 5452.01  217.15    5452  219.14 5452.05  221.13 5452.15
  223.12 5452.31  225.12 5452.54  227.11 5452.59   229.1 5452.55  231.09 5452.59
  237.07 5452.84  239.06 5452.98  245.04 5453.17  247.03 5453.25  249.02 5453.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08      56    .102   77.83     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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         55.36   77.83           169.34  168.65  163.34             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 06                  RS: 11713

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5444.21    1.99 5444.25    5.97 5444.17    7.96 5444.15   11.94 5444.15
   13.93 5444.13   17.91 5444.04   21.89 5444.21   23.88 5444.24   27.86 5444.26
   31.83 5444.16   33.82 5444.15    37.8 5444.16   41.78 5444.27   47.75 5444.39
   51.73 5444.37   55.71 5444.44    57.7 5444.52   59.69 5444.65   61.68 5444.89
   63.67 5445.07   65.66 5445.08   67.65 5445.14   69.64 5445.05   75.61 5444.71
   79.59 5444.36   83.57 5444.38   85.56 5444.31   91.52 5444.36    95.5 5444.37
   97.49 5444.42   99.48 5444.42  101.47 5444.39  105.45 5444.46  109.41  5444.4
   111.4 5444.33   114.8 5444.12  117.34  5443.9  119.32  5443.3   121.3 5441.92
  123.28 5440.42  125.26 5440.18  127.24 5440.02  129.22 5440.13   131.2 5441.37
  133.18 5443.01  135.16 5443.75  137.15 5443.99   139.2 5444.04  143.09 5444.12
  145.07 5444.23  147.05 5444.37  151.01 5444.56  152.99 5444.59  154.97 5444.56
  156.95 5444.59  158.93 5444.57  160.92 5444.59  164.88 5444.76  166.86 5444.96
  168.84 5445.04  170.82 5445.17   172.8 5445.26  174.78 5445.39  178.75 5445.75
  184.72 5445.92  186.71 5446.01   188.7 5446.27  190.69 5446.36  192.68 5446.57
  194.67 5446.75  196.66 5446.81  200.64 5446.84  202.63 5446.79  204.63  5446.8
  206.62 5446.91  208.61 5447.07   210.6 5447.28  214.58 5447.78  216.57 5447.95
  218.56 5448.16  222.54  5448.3  224.53 5448.51  226.52 5448.67  228.51 5448.95
   230.5 5449.09  232.49 5449.19  234.48 5449.15  238.46 5449.42  240.45 5449.59
  244.43 5449.85  248.41    5450  252.39 5450.24  256.37 5450.31  258.36 5450.43
  260.35 5450.59  262.34 5450.66  264.33  5450.8  266.32 5450.89  268.31 5450.94

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   114.8    .102   139.2     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         114.8   139.2            38.41   40.13   42.43             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   65.66    5446       T

INLINE STRUCTURE


RIVER: Skunk
REACH: 06                  RS: 11700

INPUT
Description: Cemetery Road
Distance from Upstream XS =       6
Deck/Roadway Width        =      16
Weir Coefficient          =     2.6
 Weir Embankment Coordinates    num =        5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      90    5444     100    5444     134    5445     173    5446  196.66 5446.81

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Weir crest shape                            = Broad Crested


INLINE STRUCTURE OUTPUT  Profile #100-yr  Inl Struct:

  E.G. Elev (ft)               5445.28    Q Gates (cfs)
  W.S. Elev (ft)               5445.27    Q Gate Group (cfs)              0.00
  Q Total (cfs)                 113.00    Gate Open Ht (ft)            5441.32
  Q Weir (cfs)                  113.00    Gate #Open
  Weir Flow Area (sq ft)         50.01    Gate Area (sq ft)               1.00
  Weir Sta Lft (ft)              65.66    Gate Submerg                    0.00
  Weir Sta Rgt (ft)             144.93    Gate Invert (ft)                0.00
  Weir Max Depth (ft)             0.97    Gate Weir Coef                 0.000
  Weir Avg Depth (ft)             0.63
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5444.32    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               79.27


INLINE STRUCTURE OUTPUT  Profile #FW  Inl Struct:

  E.G. Elev (ft)               5445.70    Q Gates (cfs)
  W.S. Elev (ft)               5445.68    Q Gate Group (cfs)              0.00
  Q Total (cfs)                 113.00    Gate Open Ht (ft)
  Q Weir (cfs)                  113.00    Gate #Open
  Weir Flow Area (sq ft)         41.79    Gate Area (sq ft)
  Weir Sta Lft (ft)             100.00    Gate Submerg
  Weir Sta Rgt (ft)             140.00    Gate Invert (ft)
  Weir Max Depth (ft)             1.37    Gate Weir Coef
  Weir Avg Depth (ft)             1.04
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5444.34    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               40.00


INLINE STRUCTURE OUTPUT  Profile #10-yr  Inl Struct:

  E.G. Elev (ft)               5444.65    Q Gates (cfs)
  W.S. Elev (ft)               5444.65    Q Gate Group (cfs)              0.00
  Q Total (cfs)                  14.00    Gate Open Ht (ft)
  Q Weir (cfs)                   14.00    Gate #Open
  Weir Flow Area (sq ft)         10.57    Gate Area (sq ft)
  Weir Sta Lft (ft)              76.32    Gate Submerg
  Weir Sta Rgt (ft)             122.01    Gate Invert (ft)
  Weir Max Depth (ft)             0.34    Gate Weir Coef
  Weir Avg Depth (ft)             0.23
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
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  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5444.32    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               45.69


INLINE STRUCTURE OUTPUT  Profile #25-yr  Inl Struct:

  E.G. Elev (ft)               5445.02    Q Gates (cfs)
  W.S. Elev (ft)               5445.02    Q Gate Group (cfs)              0.00
  Q Total (cfs)                  59.00    Gate Open Ht (ft)
  Q Weir (cfs)                   59.00    Gate #Open
  Weir Flow Area (sq ft)         31.10    Gate Area (sq ft)
  Weir Sta Lft (ft)              70.15    Gate Submerg
  Weir Sta Rgt (ft)             134.82    Gate Invert (ft)
  Weir Max Depth (ft)             0.71    Gate Weir Coef
  Weir Avg Depth (ft)             0.48
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5444.32    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               64.67


INLINE STRUCTURE OUTPUT  Profile #50-yr  Inl Struct:

  E.G. Elev (ft)               5445.13    Q Gates (cfs)
  W.S. Elev (ft)               5445.13    Q Gate Group (cfs)              0.00
  Q Total (cfs)                  79.00    Gate Open Ht (ft)
  Q Weir (cfs)                   79.00    Gate #Open
  Weir Flow Area (sq ft)         38.85    Gate Area (sq ft)
  Weir Sta Lft (ft)              65.66    Gate Submerg
  Weir Sta Rgt (ft)             139.24    Gate Invert (ft)
  Weir Max Depth (ft)             0.82    Gate Weir Coef
  Weir Avg Depth (ft)             0.53
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5444.32    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               73.25


INLINE STRUCTURE OUTPUT  Profile #500-yr  Inl Struct:

  E.G. Elev (ft)               5445.53    Q Gates (cfs)
  W.S. Elev (ft)               5445.51    Q Gate Group (cfs)              0.00
  Q Total (cfs)                 177.00    Gate Open Ht (ft)
  Q Weir (cfs)                  177.00    Gate #Open
  Weir Flow Area (sq ft)         70.83    Gate Area (sq ft)
  Weir Sta Lft (ft)              65.66    Gate Submerg
  Weir Sta Rgt (ft)             154.59    Gate Invert (ft)
  Weir Max Depth (ft)             1.22    Gate Weir Coef
  Weir Avg Depth (ft)             0.80
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5444.32    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               88.93


CROSS SECTION


RIVER: Skunk
REACH: 06                 RS: 11673

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5443.25    1.99 5443.25    5.98 5443.21    7.97 5443.23   11.96 5443.23
   13.95 5443.25   15.95 5443.25   17.94 5443.23   19.93 5443.14   21.92 5443.08
   23.92 5442.92    27.9  5442.5    29.9 5442.41   31.89 5442.46   33.88 5442.52
   35.88 5442.62   37.87 5442.76   39.86 5442.96   41.86 5443.12   43.85 5443.23
   47.84 5443.54   49.83 5443.66   51.82  5443.8   53.82 5443.93   55.81 5444.04
    57.8 5444.05   59.79 5444.18   61.79 5444.14   63.78 5443.98   65.77 5443.77
   67.77 5443.59   69.76 5443.48   71.75 5443.46   73.45 5443.48   73.75 5443.48
   75.74 5443.29   77.73 5442.56   79.73 5441.11   81.72 5440.14   83.71 5439.38
   85.71 5439.08    87.7 5439.29   89.69 5440.39   91.69 5441.86   93.68 5442.54
   95.67    5443   96.77 5443.32   97.66 5443.58   99.66 5443.69  101.65 5443.72
  103.64 5443.83  105.64 5443.89  107.63 5443.96  109.62 5443.99  111.62 5444.06
  113.61 5444.11   115.6 5444.22  119.59 5444.38  121.58 5444.41  125.57 5444.54
  127.56 5444.54  129.56 5444.57  131.55 5444.64  133.54 5444.73  135.53 5444.75
  137.53 5444.81  139.52 5444.81  141.51 5444.79  143.51 5444.74   145.5 5444.78
  149.49 5444.97  151.48 5445.09  153.47 5445.13  155.47 5445.21  157.46 5445.33
  159.45 5445.37  161.45 5445.43  163.44 5445.45  167.43 5445.57  169.42 5445.61
  171.41 5445.69   173.4 5445.75   175.4  5445.8  177.39 5445.83  179.38 5445.89
  183.37 5445.93  185.36 5446.01  187.36    5446  191.34    5446  193.34 5445.97
  195.33 5445.96  197.32 5445.96  199.32 5445.93   203.3 5445.97   205.3 5446.01
  207.29 5446.06  209.28 5446.16  211.28 5446.24  215.26 5446.29  217.25  5446.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   73.45    .102   96.77     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         73.45   96.77             58.34    59.9   59.73             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   16.18 5453.25   47.36   73.425453.502

CROSS SECTION


RIVER: Skunk
REACH: 06                 RS: 11613

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5442.11       2 5442.06    3.99 5442.07    5.99 5442.12    7.99 5442.16
   11.98  5442.3   13.97 5442.36   15.97 5442.41   17.97 5442.34   19.96 5442.31
   21.96 5442.31   23.96 5442.19   25.95 5441.94   27.95 5441.76   31.94 5441.46
   33.94 5441.34   35.93 5441.17   37.93 5440.98   39.93 5440.87   41.92  5440.8
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   43.92 5440.84   45.92 5440.94   47.91 5441.01   49.91 5441.05    51.9 5441.03
    53.9 5440.98    55.9 5440.95   57.89 5440.89   59.89 5441.02   61.89 5441.29
   63.88 5441.33   65.88 5441.33   67.87 5441.23   69.87 5440.94   71.87 5440.74
   73.86 5440.62   75.86 5440.51   77.86 5440.34   79.85 5440.19   80.28 5440.12
   81.85 5439.87   83.85 5439.21   85.84 5438.47   87.84 5437.66   89.83 5437.08
   91.83  5436.4   93.83 5436.07   95.82 5436.05   97.82  5436.1   99.82  5436.5
  101.81 5437.24  103.81 5438.38   105.8 5439.47   107.8 5440.59   109.8 5441.66
  112.72 5441.96  112.74 5441.96  113.79 5442.06  115.79  5442.2  117.78  5442.4
  121.78  5442.5  123.77 5442.49  127.76 5442.57  129.76 5442.56  131.76 5442.62
  133.75 5442.65  137.75 5442.77  139.74 5442.84  141.74 5442.84  143.74 5442.88
  145.73 5442.88  147.73 5442.84  149.72 5442.78  151.72 5442.74  153.72 5442.76
  155.71 5442.69  157.71 5442.78  159.71 5442.89   161.7 5442.93   163.7 5442.96
  165.69    5443  169.69    5443  171.68 5443.03  175.68 5443.15  177.67 5443.17
  179.67  5443.2  181.67 5443.24  183.66 5443.34  185.66 5443.43  187.65 5443.45
  189.65 5443.51  191.65 5443.54  193.64  5443.6  195.64 5443.61  197.64 5443.61
  199.63 5443.63  201.63 5443.63  203.62 5443.66  205.62 5443.62  207.62 5443.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   80.28    .102  112.72     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         80.28  112.74            88.16   89.17   90.14             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   57.94   71.585450.893       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   23.475452.107

INLINE STRUCTURE


RIVER: Skunk
REACH: 06                 RS: 11583

INPUT
Description: Anderson Ditch Flume Structure
Distance from Upstream XS =      30
Deck/Roadway Width        =      12
Weir Coefficient          =     2.6
 Weir Embankment Coordinates    num =        2
     Sta    Elev     Sta    Elev
       0    5440     200    5440

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Weir crest shape                            = Broad Crested


INLINE STRUCTURE OUTPUT  Profile #100-yr  Inl Struct:

  E.G. Elev (ft)               5441.19    Q Gates (cfs)
  W.S. Elev (ft)               5441.17    Q Gate Group (cfs)              0.00
  Q Total (cfs)                 113.00    Gate Open Ht (ft)            5436.27
  Q Weir (cfs)                  113.00    Gate #Open
  Weir Flow Area (sq ft)         43.96    Gate Area (sq ft)               1.00
  Weir Sta Lft (ft)              35.74    Gate Submerg                    0.00
  Weir Sta Rgt (ft)             108.92    Gate Invert (ft)                0.00
  Weir Max Depth (ft)             1.19    Gate Weir Coef                 0.000
  Weir Avg Depth (ft)             0.74
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5440.01    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               59.54


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

INLINE STRUCTURE OUTPUT  Profile #FW  Inl Struct:

  E.G. Elev (ft)               5441.61    Q Gates (cfs)
  W.S. Elev (ft)               5441.59    Q Gate Group (cfs)              0.00
  Q Total (cfs)                 113.00    Gate Open Ht (ft)
  Q Weir (cfs)                  113.00    Gate #Open
  Weir Flow Area (sq ft)         34.19    Gate Area (sq ft)
  Weir Sta Lft (ft)              84.00    Gate Submerg
  Weir Sta Rgt (ft)             105.22    Gate Invert (ft)
  Weir Max Depth (ft)             1.61    Gate Weir Coef
  Weir Avg Depth (ft)             1.61
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5440.01    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               21.22


Warning: The encroachment was ignored because the encroachment was coded either outside of the cross section or inside of
         the channel.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

INLINE STRUCTURE OUTPUT  Profile #10-yr  Inl Struct:

  E.G. Elev (ft)               5440.34    Q Gates (cfs)
  W.S. Elev (ft)               5440.34    Q Gate Group (cfs)              0.00
  Q Total (cfs)                  14.00    Gate Open Ht (ft)
  Q Weir (cfs)                   14.00    Gate #Open
  Weir Flow Area (sq ft)          9.32    Gate Area (sq ft)
  Weir Sta Lft (ft)              77.84    Gate Submerg
  Weir Sta Rgt (ft)             107.36    Gate Invert (ft)
  Weir Max Depth (ft)             0.34    Gate Weir Coef
  Weir Avg Depth (ft)             0.32
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5440.01    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               29.51


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.
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INLINE STRUCTURE OUTPUT  Profile #25-yr  Inl Struct:

  E.G. Elev (ft)               5440.84    Q Gates (cfs)
  W.S. Elev (ft)               5440.83    Q Gate Group (cfs)             0.00
  Q Total (cfs)                  59.00    Gate Open Ht (ft)
  Q Weir (cfs)                   59.00    Gate #Open
  Weir Flow Area (sq ft)         25.87    Gate Area (sq ft)
  Weir Sta Lft (ft)              40.91    Gate Submerg
  Weir Sta Rgt (ft)             108.26    Gate Invert (ft)
  Weir Max Depth (ft)             0.84    Gate Weir Coef
  Weir Avg Depth (ft)             0.66
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5440.01    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               39.47


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

INLINE STRUCTURE OUTPUT  Profile #50-yr  Inl Struct:

  E.G. Elev (ft)               5440.99    Q Gates (cfs)
  W.S. Elev (ft)               5440.98    Q Gate Group (cfs)             0.00
  Q Total (cfs)                  79.00    Gate Open Ht (ft)
  Q Weir (cfs)                   79.00    Gate #Open
  Weir Flow Area (sq ft)         32.91    Gate Area (sq ft)
  Weir Sta Lft (ft)              37.79    Gate Submerg
  Weir Sta Rgt (ft)             108.55    Gate Invert (ft)
  Weir Max Depth (ft)             0.99    Gate Weir Coef
  Weir Avg Depth (ft)             0.64
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5440.01    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               51.23


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

INLINE STRUCTURE OUTPUT  Profile #500-yr  Inl Struct:

  E.G. Elev (ft)               5441.49    Q Gates (cfs)
  W.S. Elev (ft)               5441.46    Q Gate Group (cfs)             0.00
  Q Total (cfs)                 177.00    Gate Open Ht (ft)
  Q Weir (cfs)                  177.00    Gate #Open
  Weir Flow Area (sq ft)         62.91    Gate Area (sq ft)
  Weir Sta Lft (ft)              31.50    Gate Submerg
  Weir Sta Rgt (ft)             109.49    Gate Invert (ft)
  Weir Max Depth (ft)             1.49    Gate Weir Coef
  Weir Avg Depth (ft)             0.98
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5440.01    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               64.35


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

CROSS SECTION


RIVER: Skunk
REACH: 06                  RS: 11524

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5438.93    1.93 5438.77    3.86 5438.75    5.79 5438.99    7.73 5438.89
   11.59 5438.58   13.52 5438.62   19.32  5438.5   21.25 5438.56   23.18  5438.7
   25.11  5438.6   27.04 5438.39   28.97 5438.24   32.84  5438.1    36.7  5437.9
   38.63 5437.88   42.55 5437.94   46.54 5438.05   52.51 5438.08   56.49 5438.15
   58.49 5438.12   62.47 5438.19   64.46 5438.17   66.45 5438.27   70.43 5438.18
   72.43 5438.17   76.41 5438.22    78.4  5438.1   80.39 5438.49   82.38 5438.48
   84.71 5438.28   86.37 5438.07   88.36 5437.27   90.35 5435.73   92.34 5434.27
   94.33 5433.94   96.32 5433.94   98.32 5434.14  100.31 5435.05   102.3 5436.35
  104.29 5437.45  106.47 5438.43  106.49 5438.43  108.27 5438.85  110.27 5438.96
  112.26 5438.97  114.25 5438.85  118.23 5438.72  120.22 5438.59  122.21 5438.54
   126.2 5438.68  130.18 5438.69  132.17 5438.57  136.16 5438.46  138.15 5438.33
  142.13 5438.23  146.11 5438.08   148.1 5438.05  152.09  5438.1  156.07 5437.94
  158.06 5437.99  162.05 5438.18  168.02 5438.43  170.01 5438.47     174  5438.8
  175.99 5439.05  177.98 5439.41  181.96  5439.7  183.95 5439.77  185.94 5439.73
  187.94 5439.45  189.93 5438.97  193.91 5437.57   195.9 5436.91  197.89 5436.51
  199.89 5436.36  201.88 5436.33  203.87 5436.59  205.86 5437.36  207.85 5438.34
  209.84  5438.5  213.83 5438.72  215.82 5438.87  221.79 5439.18  223.78 5439.23
  227.77 5439.43  229.76 5439.58  233.74 5439.79  237.72 5439.85  239.72 5439.97
  241.71 5440.14   243.7 5440.23  245.69 5440.37  249.67 5441.08  251.67 5441.24
  253.66 5441.45  257.64 5441.77  259.63 5441.98  261.62 5442.06  263.61 5442.06

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   84.71    .102  106.49     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         84.71  106.47            68.13   66.63   65.04             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  183.95  263.61 5439.77       F

CROSS SECTION


RIVER: Skunk
REACH: 06                  RS: 11457

INPUT
Description:
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5436.45       2 5436.44       4 5436.41       6 5436.38       8 5436.31
    9.99 5436.26   11.99 5436.19   13.99 5436.19   15.99 5436.11   17.99 5435.93
   19.99 5434.55   21.99 5433.76   23.99 5433.69   25.99 5433.79   27.99 5434.79
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   29.98 5434.81   31.98 5434.74   33.98 5434.69   35.98 5434.49   37.98 5434.36
   39.98 5434.23   41.98 5434.13   43.98    5434   45.98 5433.82   47.98  5433.6
   48.59 5433.51   49.97 5433.31   51.97 5431.84   53.97 5430.95   55.97 5430.77
   57.97 5431.04   59.97 5431.62   61.97 5432.18   63.97 5433.06   65.97 5433.89
   67.97 5434.59   69.96 5435.37   71.96 5436.26   73.96 5437.09   74.88 5437.19
    74.9 5437.19   75.96 5437.31   77.96 5437.31   79.96 5437.36   81.96 5437.54
   83.96 5437.48   85.96 5437.44   87.96 5437.42   89.95 5437.65   91.95  5437.7
   93.95 5437.57   95.95  5437.4   97.95 5437.38   99.92 5437.39   101.9 5437.38
  103.87 5437.35  105.84 5437.25  107.81 5437.08  109.79 5437.07  111.76 5437.03
  113.73  5436.9   115.7  5436.8  117.68 5436.73  119.65 5436.65  121.62 5436.56
  123.59 5436.49  125.56 5436.46  127.54 5436.47  129.51  5436.5  131.48 5436.37
  133.45 5436.15  135.43  5436.1   137.4  5436.2  139.37 5435.53  141.35 5434.45
  143.32 5434.42  145.29 5434.41  147.26 5434.62  149.24 5435.16  151.21 5435.35
  153.18 5435.36  155.15 5435.41  157.13 5435.47   159.1 5435.54  161.07 5435.64
  163.04 5435.76  165.01  5435.9  166.99 5436.02  168.96 5436.13  170.93 5436.31
   172.9 5436.59  174.88  5436.7  176.85 5436.71  178.82 5436.84  180.79 5436.82
  182.77 5436.89  184.74 5436.92  186.71 5436.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   48.59    .102    74.9     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         48.59   74.88             84.36   92.71    98.1              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
     7.4   46.355446.332       F
   91.43  187.55 5440.53       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0     7.45446.445

CROSS SECTION


RIVER: Skunk
REACH: 06                 RS: 11364

INPUT
Description:
Station Elevation Data    num=      57
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5433.59    1.99 5433.58    3.97 5433.66    5.96 5433.69    7.95  5433.7
    9.93  5433.7   11.92 5433.63   13.91 5433.57   15.89  5433.5   17.88 5433.34
   19.87 5433.27   21.85 5433.22   23.84 5433.21   25.83 5433.01   27.81 5432.19
    29.8 5431.02   31.79 5430.14   33.77 5430.12   35.76 5430.09   37.75 5430.07
   39.73 5430.05   41.72 5430.02   43.71    5430   45.69 5429.98   47.68 5429.94
   49.67 5429.88   51.65 5429.83   53.64 5429.77   55.63 5429.75   57.61 5429.74
    59.6 5429.71   61.59 5429.76   63.08 5429.63   63.57 5429.59   65.56 5427.69
   67.55 5427.05   69.53 5428.64   71.52 5430.29   73.51 5431.17   75.49 5431.56
   76.39 5431.65   76.41 5431.65   77.48 5431.76   79.47 5431.93   81.45 5431.97
   82.93 5431.93   83.44 5431.91   85.43 5431.76   87.41 5431.77    89.4 5432.12
   91.39 5432.61   93.37  5433.1   95.36 5433.35   97.35 5433.38   99.33 5433.44
  101.32 5433.44  103.31 5433.47

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   63.08    .102   76.39     .13   82.93     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         63.08   76.41             90.83   91.88   93.27              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   54.965443.595

CROSS SECTION


RIVER: Skunk
REACH: 06                 RS: 11272

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5430.74    1.99 5430.65    3.97 5430.55    5.96 5430.45    7.94 5430.37
    9.93 5430.17   11.92 5430.06    13.9  5429.9   15.89 5429.75   17.87 5429.68
   19.86 5429.54   21.84 5429.46   23.83 5429.37   25.82 5429.28    27.8 5429.24
   29.79 5429.21   31.77 5429.15   33.76 5429.05   35.75 5428.92   37.73 5428.79
   39.72 5428.66    41.7 5428.58   43.69 5428.44   45.67 5428.18   47.66 5428.03
   49.65 5427.83   51.63 5427.55   53.62 5427.28    55.6 5427.08   57.59 5426.91
   59.58 5426.78   61.56 5426.66   63.55 5426.55   64.91  5426.4   65.53 5426.34
   65.93 5426.24   67.52 5425.85    69.5 5424.97   71.49 5424.23   73.48 5424.05
   75.46 5424.45   77.45  5425.5   79.43 5426.53   81.42 5427.46   82.97 5427.97
   83.41 5428.11   83.45 5428.12    84.6 5428.21   85.39 5428.27   87.38 5428.27
   89.36 5428.27   91.35 5428.39   93.34 5428.45   95.32 5428.56   97.31 5428.81
   99.29 5428.92  101.28 5428.95  103.26 5428.98  105.25    5429  107.24 5429.04
  109.22 5429.13  111.21 5429.25  113.19 5429.29

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   64.91    .102   82.97     .13    84.6     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         65.93   83.45             91.52    87.9   82.97              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   30.965440.743       F

CROSS SECTION


RIVER: Skunk
REACH: 06                 RS: 11185

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5427.59       2 5427.58    3.99 5427.61    5.99 5427.69    7.98 5427.64
    9.98 5427.64   11.97 5427.68   13.97 5427.68   15.96 5427.58   17.96 5427.43
```

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   19.95 5427.31   21.95 5427.21   22.91 5427.01   23.95  5426.8   25.94  5425.7
   27.94 5424.88   29.93 5423.88   31.93 5423.14   33.92 5422.93   35.92 5422.87
   37.91 5422.91   39.91 5423.18   41.91 5423.83    43.9 5424.54    45.9 5424.99
   47.89 5425.09   49.25 5425.14   49.28 5425.15   49.89 5425.17   51.88 5425.28
   53.88 5425.39   55.87 5425.51   57.87 5425.64   59.86 5425.75   61.86 5425.81
   63.86 5425.81   65.85    5426   67.85    5426   69.84 5426.02   71.84 5426.08
   73.83 5426.15   75.83 5426.22   77.82  5426.5   79.82 5426.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   22.91    .102   49.28     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         22.91   49.25            75.55   74.66   74.45              .1       .3
Blocked Obstructions     num=        1
   Sta L   Sta R    Elev
       0   27.745437.592

CROSS SECTION


RIVER: Skunk
REACH: 06                 RS: 11110

INPUT
Description: King Avenue (U/S)
Station Elevation Data    num=     116
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5424.46    1.99 5424.41    3.98 5424.37    5.97 5424.38    7.96 5424.33
    9.95 5424.21   11.94 5424.15   13.94 5424.19   15.93 5424.13   17.92 5424.03
   19.91 5423.96    21.9 5423.95   23.89 5423.93   25.88 5423.92   27.87 5423.91
   29.86  5423.9   31.85 5423.92   33.84  5423.9   35.83  5423.9   37.83 5423.95
   39.82 5423.95   41.81 5423.89    43.8  5423.9   45.79  5423.9   47.78 5423.87
   49.77 5423.86   51.76 5423.89   53.75 5423.89   55.74 5423.84   57.73 5423.75
   59.72 5423.72   61.71 5423.78   63.71 5423.79    65.7 5423.81   67.69 5423.89
   69.68 5423.93   71.67    5424   73.66 5424.08   75.65 5424.17   77.64 5424.24
   79.63  5424.3   81.62 5424.33   83.61 5424.38    85.6 5424.41   87.59 5424.47
   89.59 5424.41   91.58 5424.29   93.57 5424.08   95.56 5423.96   97.55 5423.79
   97.72 5423.76   99.54 5423.37  101.53 5423.11  103.52 5422.83  105.51 5422.51
   107.5 5422.32  109.49 5422.25  111.48 5422.31  113.47 5422.25  115.47 5422.27
  117.46  5422.3  119.45 5422.42  121.44  5422.4  123.43 5422.45  125.42 5422.42
  127.41 5422.38   129.4 5422.41  131.39 5422.48  133.38 5422.78  135.34 5422.81
  137.31  5422.9  138.36 5422.71   138.4  5422.7  139.27 5422.54  141.23 5421.27
  143.19    5420     145 5417.14     152 5417.14     153 5419.18  154.96 5420.54
  156.92 5421.45  157.54 5421.62  158.05 5421.75  158.89 5421.98  160.85 5422.35
  162.81 5422.62  164.77 5422.86  166.73 5423.08   168.7 5423.32  170.66 5423.49
  172.62 5423.49  174.58 5423.51  176.54 5423.52   178.5 5423.59  180.47 5423.72
  182.43 5423.72  184.39 5423.46  186.35 5423.31  188.31 5423.36  190.28 5423.38
  192.24 5423.43   194.2 5423.43  196.16 5423.47  198.12 5423.48  200.08  5423.5
  202.05 5423.54  204.01 5423.53  205.97  5423.5  207.93 5423.54  209.89 5423.58
  211.86 5423.58  213.82 5423.62  215.78 5423.65  217.74 5423.66   219.7 5423.68
  221.66 5423.67

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   97.72     .06  138.36    .102  157.54     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         138.4  158.05            57.55   60.58   63.54              .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   29.99   55.525433.901       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     145  146.75 5418.84  150.25     152 5418.84

CULVERT


RIVER: Skunk
REACH: 06                 RS: 11100

INPUT
Description: King Avenue (2.3' sediment. - 50% potential debris
             block);
culvert size = 7'Wx4'H
modeled culvert size (for 50%
             block) = 3.5'Wx4'H
Distance from Upstream XS =      10
Deck/Roadway Width        =      35
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     135    5422             143 5422.85             143  5424.5
     152 5424.49             152 5422.84             155    5422
     170    5422

Upstream Bridge Cross Section Data
Station Elevation Data    num=     116
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5424.46    1.99 5424.41    3.98 5424.37    5.97 5424.38    7.96 5424.33
    9.95 5424.21   11.94 5424.15   13.94 5424.19   15.93 5424.13   17.92 5424.03
   19.91 5423.96    21.9 5423.95   23.89 5423.93   25.88 5423.92   27.87 5423.91
   29.86  5423.9   31.85 5423.92   33.84  5423.9   35.83  5423.9   37.83 5423.95
   39.82 5423.95   41.81 5423.89    43.8  5423.9   45.79  5423.9   47.78 5423.87
   49.77 5423.86   51.76 5423.89   53.75 5423.89   55.74 5423.84   57.73 5423.75
   59.72 5423.72   61.71 5423.78   63.71 5423.79    65.7 5423.81   67.69 5423.89
   69.68 5423.93   71.67    5424   73.66 5424.08   75.65 5424.17   77.64 5424.24
   79.63  5424.3   81.62 5424.33   83.61 5424.38    85.6 5424.41   87.59 5424.47
   89.59 5424.41   91.58 5424.29   93.57 5424.08   95.56 5423.96   97.55 5423.79
   97.72 5423.76   99.54 5423.37  101.53 5423.11  103.52 5422.83  105.51 5422.51
   107.5 5422.32  109.49 5422.25  111.48 5422.31  113.47 5422.25  115.47 5422.27
  117.46  5422.3  119.45 5422.42  121.44  5422.4  123.43 5422.45  125.42 5422.42
  127.41 5422.38   129.4 5422.41  131.39 5422.48  133.38 5422.78  135.34 5422.81
  137.31  5422.9  138.36 5422.71   138.4  5422.7  139.27 5422.54  141.23 5421.27
  143.19    5420     145 5417.14     152 5417.14     153 5419.18  154.96 5420.54
  156.92 5421.45  157.54 5421.62  158.05 5421.75  158.89 5421.98  160.85 5422.35
  162.81 5422.62  164.77 5422.86  166.73 5423.08   168.7 5423.32  170.66 5423.49
  172.62 5423.49  174.58 5423.51  176.54 5423.52   178.5 5423.59  180.47 5423.72
  182.43 5423.72  184.39 5423.46  186.35 5423.31  188.31 5423.36  190.28 5423.38
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  192.24 5423.43   194.2 5423.43  196.16 5423.47  198.12 5423.48  200.08  5423.5
  202.05 5423.54  204.01 5423.53  205.97  5423.5  207.93 5423.54  209.89 5423.58
  211.86 5423.58  213.82 5423.62  215.78 5423.65  217.74 5423.66   219.7 5423.68
  221.66 5423.67

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   97.72     .06  138.36    .102  157.54     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
        138.4  158.05             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   29.99   55.525433.901       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     145  146.75 5418.84  150.25     152 5418.84

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     167 5421.29             175 5422.89             175 5424.54
     184 5424.52             184 5422.87             191 5421.36

Downstream Bridge Cross Section Data
Station Elevation Data    num=     108
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5425.43    1.99 5425.36    3.98  5425.3    5.96 5425.13    7.95 5425.19
    9.94 5425.19   11.93 5425.02   13.92  5425.1   15.91 5424.92   17.89 5424.76
   19.88 5424.77   21.87 5424.81   23.86 5424.61   25.85 5424.51   27.83 5424.28
   29.82 5424.07   31.81 5423.85    33.8 5423.74   35.79 5423.81   37.77 5423.76
   39.76  5423.9   41.75 5423.93   43.74 5423.73   45.73 5423.53   47.72 5423.16
    49.7 5422.74   51.69  5422.1   53.68 5421.78   55.67  5421.7   56.93 5421.53
   57.66 5421.43   59.64 5421.41   61.63 5421.46   63.62 5421.58   65.61  5421.6
    67.6 5421.66   69.59 5421.67   71.57  5421.6   73.56 5421.55   75.55 5421.47
   77.54 5421.43   79.53 5421.33   81.51 5421.22    83.5 5421.06   84.09 5421.02
   85.49 5420.92   87.48 5420.66   89.47 5420.68   91.45    5421   93.44 5421.08
   95.43 5421.02   97.42 5420.95   99.41 5420.92   101.4 5420.88  103.38 5420.84
  105.37 5420.81  107.36 5420.83  109.35 5420.82  111.34 5420.82  113.32 5420.87
  115.31 5420.89   117.3 5420.85  119.29 5420.77  121.28 5420.74  123.27 5420.78
  125.25 5420.82  127.24 5420.82  129.23 5420.79  131.22 5420.94  133.21 5421.04
  135.19 5421.05  137.18 5420.99  139.17 5420.88  141.16 5420.73  143.15 5420.74
  145.14 5420.86  147.12  5420.9  149.11 5420.96   151.1 5420.98  153.09 5420.96
  155.08 5420.94  157.06 5420.87  159.05 5420.71  161.04 5420.57  163.03 5420.46
  165.02 5420.32     167 5420.23  168.99 5420.18  170.47    5420  170.98 5419.93
  172.97    5419  174.96 5417.43  176.95 5416.14  178.93 5415.62  180.92 5415.76
  182.75 5416.71  182.91 5416.79   184.9 5418.75  186.89 5420.26  187.99 5420.54
  188.87 5420.77  190.86    5421  192.85 5421.07  194.84 5421.13  196.83 5421.27
  198.82 5421.38   200.8 5421.49  202.79 5421.57

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   56.93    .015   84.09     .13  170.47    .102  182.75     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
        170.47  187.99             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0     5.35435.432       F
     151   170.5    5421       F
   187.5     195    5421       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       4     3.5
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 2 - Wingwall flared 90 or 15 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  4      47     .013     .013      2.3                   .4                 1
Upstream   Elevation =  5414.84
           Centerline Station =  148.5
Downstream Elevation =  5414.87
           Centerline Station =  179

CROSS SECTION


RIVER: Skunk
REACH: 06                 RS: 11049

INPUT
Description: King Avenue (D/S)
Station Elevation Data    num=     108
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5425.43    1.99 5425.36    3.98  5425.3    5.96 5425.13    7.95 5425.19
    9.94 5425.19   11.93 5425.02   13.92  5425.1   15.91 5424.92   17.89 5424.76
   19.88 5424.77   21.87 5424.81   23.86 5424.61   25.85 5424.51   27.83 5424.28
   29.82 5424.07   31.81 5423.85    33.8 5423.74   35.79 5423.81   37.77 5423.76
   39.76  5423.9   41.75 5423.93   43.74 5423.73   45.73 5423.53   47.72 5423.16
    49.7 5422.74   51.69  5422.1   53.68 5421.78   55.67  5421.7   56.93 5421.53
   57.66 5421.43   59.64 5421.41   61.63 5421.46   63.62 5421.58   65.61  5421.6
    67.6 5421.66   69.59 5421.67   71.57  5421.6   73.56 5421.55   75.55 5421.47
   77.54 5421.43   79.53 5421.33   81.51 5421.22    83.5 5421.06   84.09 5421.02
   85.49 5420.92   87.48 5420.66   89.47 5420.68   91.45    5421   93.44 5421.08
   95.43 5421.02   97.42 5420.95   99.41 5420.92   101.4 5420.88  103.38 5420.84
  105.37 5420.81  107.36 5420.83  109.35 5420.82  111.34 5420.82  113.32 5420.87
  115.31 5420.89   117.3 5420.85  119.29 5420.77  121.28 5420.74  123.27 5420.78
  125.25 5420.82  127.24 5420.82  129.23 5420.79  131.22 5420.94  133.21 5421.04
  135.19 5421.05  137.18 5420.99  139.17 5420.88  141.16 5420.73  143.15 5420.74
  145.14 5420.86  147.12  5420.9  149.11 5420.96   151.1 5420.98  153.09 5420.96
  155.08 5420.94  157.06 5420.87  159.05 5420.71  161.04 5420.57  163.03 5420.46
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  165.02 5420.32     167 5420.23  168.99 5420.18  170.47    5420  170.98 5419.93
  172.97    5419  174.96 5417.43  176.95 5416.14  178.93 5415.62  180.92 5415.76
  182.75 5416.71  182.91 5416.79   184.9 5418.75  186.89 5420.26  187.99 5420.54
  188.87 5420.77  190.86    5421  192.85 5421.07  194.84 5421.13  196.83 5421.27
  198.82 5421.38   200.8 5421.49  202.79 5421.57

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   56.93    .015   84.09     .13  170.47    .102  182.75     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        170.47  187.99            68.05   68.57    69.3             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0     5.35435.432       F
     151   170.5    5421       F
   187.5     195    5421       F

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 10981

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5425.67    1.99 5425.61    3.99 5425.54    5.98 5425.38    7.97 5425.27
    9.97 5425.05   11.96 5424.83   13.95 5424.58   15.95 5424.33   17.94  5424.1
   19.93 5423.94   21.93 5423.71   23.92 5423.44   25.91 5423.16   27.91 5422.94
    29.9 5422.72   31.89 5422.46   33.89 5422.19   35.88 5421.98   37.87 5421.73
   39.87  5421.5   41.86  5421.3   43.85 5421.03   45.85  5420.8   47.84 5420.64
   49.83 5420.44   51.83 5420.32   52.62 5420.23   53.82 5420.11   55.81 5420.04
   57.81 5420.14    59.8 5420.22    61.8 5420.27   63.79 5420.27   65.78 5420.25
   67.78 5420.19   69.77 5420.14   71.76 5420.08   73.76 5420.01   75.75 5419.85
   77.74 5419.65   79.74  5419.5   81.73 5419.32   82.02 5419.29   83.72 5419.14
   85.72 5418.99   87.71 5419.03    89.7 5419.25    91.7 5419.25   93.69 5419.22
   95.68 5419.17   97.68  5419.2   99.67 5419.22  101.66  5419.2  103.66 5419.03
  105.65 5418.75  107.64 5418.56  109.64  5418.5  111.63 5418.53  113.62 5418.49
  117.61 5418.39   119.6 5418.36   121.6 5418.35  123.59 5418.39  125.58 5418.48
  127.58 5418.63  129.57 5418.62  131.56 5418.66  133.56 5418.69  135.55 5418.71
  137.54 5418.63  139.54 5418.69  141.53 5418.67  143.52 5418.69  145.52  5418.4
  147.51 5417.91   149.5 5417.09   151.5 5416.41  153.49 5415.97  155.48 5414.95
  157.48 5413.94  159.47 5413.49  161.46 5413.34  163.46 5413.37  165.45 5413.62
  167.44 5414.51  169.44 5416.11  171.43 5417.61  173.15 5418.37  173.35 5418.46
  173.43  5418.5  175.42  5418.9  177.41 5419.04  179.41 5419.04   181.4 5418.97
  181.96 5418.97  183.39 5418.96  185.39    5419  187.38 5419.07  189.37 5419.16

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   52.62    .015   82.02     .13  147.51    .102  173.35     .13
  181.96     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        147.51  173.15            72.5   70.48   60.78             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  182.68  189.37 5428.95       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    5.08 5435.67

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 10910

INPUT
Description: 322 22nd Ave - Driveway (U/S)
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5420.98    1.99 5420.86    3.99 5420.74    5.98 5420.62    7.98 5420.46
    9.97 5420.29   11.97 5420.21   13.96 5420.01   15.95 5419.82   17.95 5419.65
   19.94  5419.5   21.94  5419.3   23.93 5419.06   25.92 5418.85   27.92 5418.62
   29.91  5418.4   31.91 5418.13   33.04 5418.09    33.9 5418.05   35.89 5417.87
   37.89 5417.92   39.88 5418.02   41.88 5418.07   43.87 5418.08   45.87 5418.08
   47.86 5418.11   49.85 5418.08   51.85 5418.02   53.84 5417.94   55.84 5417.87
   57.83 5417.76   59.82 5417.63   61.82 5417.54   63.81 5417.36      65 5417.24
   65.81 5417.17    67.8  5417.1    69.8 5417.26   71.79 5417.33   73.78 5417.21
   75.78 5417.01   77.77 5416.85   79.77 5416.71   81.76 5416.57   83.75 5416.38
   85.75 5415.97   85.98 5415.88   87.74 5415.17   89.74 5414.21   91.73 5413.16
   93.73  5412.1   95.72  5410.8      98 5408.51   101.7 5408.31   103.7 5408.77
  105.69 5409.38  107.68 5409.77  109.68 5410.46  111.67 5411.31  113.67 5412.15
  115.66  5413.1  117.66 5414.17  118.45  5414.3  119.65 5414.51  121.64 5414.52
  123.55 5414.55  123.64 5414.55  125.63 5414.52  127.63 5414.42  129.62 5414.26
  131.61  5414.2  133.61  5414.2   135.6 5414.23   137.6 5414.23  139.59 5414.24
  141.59 5414.29  143.58  5414.3  145.57 5414.29  147.57 5414.34  149.56 5414.35
  151.56 5414.37

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   33.04    .015      65     .13   85.98    .102  123.55     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         85.98  118.45            39.1   37.38   35.54             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   137.4  151.565424.235       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
      91      98  5413.5     107     115    5413

BRIDGE


RIVER: Skunk
REACH: 05                 RS: 10890

INPUT
```

```
Description: 322 22nd Ave - Driveway (40% potential debris block)
Distance from Upstream XS =       6
Deck/Roadway Width        =      17
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      85 5415.88              87 5415.67              87 5418.78 5413.38
     116  5417.6 5412.33     116 5414.58             120  5414.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5420.98    1.99 5420.86    3.99 5420.74    5.98 5420.62    7.98 5420.46
    9.97 5420.29   11.97 5420.21   13.96 5420.01   15.95 5419.82   17.95 5419.65
   19.94  5419.5   21.94  5419.3   23.93 5419.06   25.92 5418.85   27.92 5418.62
   29.91  5418.4   31.91 5418.13   33.04 5418.09    33.9 5418.05   35.89 5417.87
   37.89 5417.92   39.88 5418.02   41.88 5418.07   43.87 5418.08   45.87 5418.08
   47.86 5418.11   49.85 5418.08   51.85 5418.02   53.84 5417.94   55.84 5417.87
   57.83 5417.76   59.82 5417.63   61.82 5417.54   63.81 5417.36      65 5417.24
   65.81 5417.17    67.8  5417.1    69.8 5417.26   71.79 5417.33   73.78 5417.21
   75.78 5417.01   77.77 5416.85   79.77 5416.71   81.76 5416.57   83.75 5416.38
   85.75 5415.97   85.98 5415.88   87.74 5415.17   89.74 5414.21   91.73 5413.16
   93.73  5412.1   95.72  5410.8      98 5408.51   101.7 5408.31   103.7 5408.77
  105.69 5409.38  107.68 5409.77  109.68 5410.46  111.67 5411.31  113.67 5412.15
  115.66  5413.1  117.66 5414.17  118.45  5414.3  119.65 5414.51  121.64 5414.52
  123.55 5414.55  123.64 5414.55  125.63 5414.52  127.63 5414.42  129.62 5414.26
  131.61  5414.2  133.61  5414.2   135.6 5414.23   137.6 5414.23  139.59 5414.24
  141.59 5414.29  143.58  5414.3  145.57 5414.29  147.57 5414.34  149.56 5414.35
  151.56 5414.37

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   33.04    .015      65     .13   85.98    .102  123.55     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
         85.98  118.45             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   137.4  151.565424.235       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
      91      98  5413.5     107     115    5413

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   81.46 5415.41              86 5415.67              86 5418.78 5413.38
     115  5417.6 5412.33     115 5414.58             119  5414.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5418.11    1.99 5417.94    3.97  5417.8    5.96 5417.74    7.95 5417.55
    9.93 5417.34   11.92 5417.12   13.91 5416.96   15.43 5416.74   15.89 5416.67
   17.88 5416.61   19.87 5416.42   21.86 5416.55   23.84 5416.65   25.83 5416.74
   27.82 5416.75    29.8 5416.72   31.79 5416.68   33.78 5416.64   35.76 5416.62
   37.75 5416.56   39.74 5416.44   41.72 5416.38   43.71 5416.25    45.7 5416.09
   47.68 5415.93   49.67 5415.78   51.04 5415.67   51.66 5415.62   53.64 5415.61
   55.63 5415.82   57.62 5415.84    59.6 5415.82   61.59 5415.84   63.58 5415.94
   65.57 5416.02   67.55 5416.03   69.54  5415.9   71.53 5415.77   73.51 5415.64
    75.5 5415.54   77.49 5415.41   79.47 5415.49   81.46 5415.41   83.45 5414.97
   85.43 5414.62   86.55 5414.35   87.01 5414.24   87.42 5414.14   89.41 5413.32
   91.39 5412.49   93.38 5411.48   95.37 5410.38   97.35 5409.08   99.34 5407.85
  101.33 5407.42  103.31 5407.42   105.3 5407.66  107.29 5408.37  109.28 5409.27
  111.26 5410.04  113.25 5410.64  115.24 5411.64  117.22 5412.66  118.96 5413.23
  119.21 5413.32   121.2 5413.45  123.18 5413.52  125.17 5413.76  127.16 5414.09
  129.14 5414.24  131.13 5414.26  133.12  5414.3   135.1 5414.34  137.09 5414.38
  139.08 5414.41  141.06 5414.46  143.05  5414.5  145.04 5414.54  147.03 5414.45

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   15.43    .015   51.04     .13   87.01    .102  118.96     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
         86.55  118.96             .3       .5
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  115.49  147.035421.767

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 10873

INPUT
```

```
Description: 322 22nd Ave - Driveway (D/S)
Station Elevation Data    num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5418.11    1.99 5417.94    3.97  5417.8    5.96 5417.74    7.95 5417.55
    9.93 5417.34   11.92 5417.12   13.91 5416.96   15.43 5416.74   15.89 5416.67
   17.88 5416.61   19.87 5416.42   21.86 5416.55   23.84 5416.65   25.83 5416.74
   27.82 5416.75    29.8 5416.72   31.79 5416.68   33.78 5416.64   35.76 5416.62
   37.75 5416.56   39.74 5416.44   41.72 5416.38   43.71 5416.25    45.7 5416.09
   47.68 5415.93   49.67 5415.78   51.04 5415.67   51.66 5415.62   53.64 5415.61
   55.63 5415.82   57.62 5415.84    59.6 5415.82   61.59 5415.84   63.58 5415.94
   65.57 5416.02   67.55 5416.03   69.54  5415.9   71.53 5415.77   73.51 5415.64
    75.5 5415.54   77.49 5415.41   79.47 5415.49   81.46 5415.41   83.45 5414.97
   85.43 5414.62   86.55 5414.35   87.01 5414.24   87.42 5414.14   89.41 5413.32
   91.39 5412.49   93.38 5411.48   95.37 5410.38   97.35 5409.08   99.34 5407.85
  101.33 5407.42  103.31 5407.42   105.3 5407.66  107.29 5408.37  109.28 5409.27
  111.26 5410.04  113.25 5410.64  115.24 5411.64  117.22 5412.66  118.96 5413.23
  119.21 5413.32   121.2 5413.45  123.18 5413.52  125.17 5413.76  127.16 5414.09
  129.14 5414.24  131.13 5414.26  133.12  5414.3   135.1 5414.34  137.09 5414.38
  139.08 5414.41  141.06 5414.46  143.05  5414.5  145.04 5414.54  147.03 5414.45

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   15.43    .015   51.04     .13   87.01    .102  118.96     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         86.55  118.96            47.85   47.27   46.56             .3       .5
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  115.49  147.035421.767

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 10826

INPUT
Description:
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5416.49    1.98 5416.32    3.96 5416.17    5.94    5416    7.91 5415.84
    9.89 5415.66   11.87 5415.42   11.95 5415.41   13.85 5415.09   15.83 5415.07
   17.81 5414.83   19.79 5414.98   21.76 5415.05   23.74 5415.12   25.72 5415.18
    27.7 5415.19   29.68 5415.18   31.66 5415.16   33.64 5415.12   35.61 5415.05
   37.59 5414.99   39.57 5414.92   41.55 5414.81   43.53  5414.7   45.51 5414.57
   47.49 5414.42   49.47 5414.24   50.78 5414.22   51.44 5414.21   53.42 5414.38
    55.4 5414.54   57.38 5414.46   59.36 5414.45   61.34 5414.45   63.32  5414.4
   65.29 5414.33   67.27 5414.46   69.25 5414.66   71.23 5414.64   73.21 5414.44
   75.19 5414.32   77.17 5414.22   79.14 5414.12   81.12 5413.98    83.1  5413.9
   85.08 5413.86   87.06 5413.84   89.04 5413.76   91.02 5413.67   92.99  5413.6
   94.97 5413.53   96.95 5413.52   98.93 5413.52  100.91 5413.47  102.89 5413.32
  104.87 5413.12  105.48 5413.01  106.58  5412.8  106.84 5412.75  108.82 5411.41
   110.8 5409.98  112.78 5408.41  114.76 5406.73  116.74 5405.73  118.72 5405.61
  120.69 5405.81  122.67 5406.43  124.65 5406.92  126.63 5407.36  128.61 5408.34
  130.59 5409.28  132.57 5410.26  134.52  5411.1  134.54 5411.11  136.52 5411.57
   138.5 5411.61  140.48 5411.56  142.46 5411.49  144.44 5411.48  146.42 5411.48
   148.4 5411.48  150.37 5411.47  152.35 5411.45  154.33 5411.41  156.31 5411.39
  158.29  5411.4  160.27  5411.4  162.25  5411.4  164.22  5411.4   166.2 5411.44
  168.18 5411.49  170.16 5411.46  172.14 5411.55  174.12 5411.57   176.1 5411.57
  178.07 5411.58

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   11.95    .015   50.78     .13  106.58    .102  134.52     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        105.48  134.52            46.64   47.32   48.01             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   132.4  178.075420.181       F

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 10778

INPUT
Description: 2200 Bluebell (U/S)
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5413.99    1.99 5414.01    3.98 5413.96    5.97 5413.89    7.96 5413.84
    9.95 5413.78   11.94 5413.67   13.93 5413.57   15.92 5413.46   17.91 5413.38
    19.9 5413.27   21.89 5413.06   22.85 5413.11   23.88 5413.17   25.87  5413.5
   27.86 5413.39   29.86 5413.25   31.85 5413.13   33.84 5413.15   35.83 5413.14
   37.82 5413.12   39.81 5413.08    41.8 5413.06   43.79 5413.04   45.78 5412.86
   47.77 5412.37   49.76 5411.99   51.75 5411.91   53.74 5411.86   55.73 5411.81
   57.72 5411.75   59.71 5411.69    61.7 5411.65   63.69 5411.58   65.68 5411.56
   67.67 5411.51   69.66  5411.4   71.65 5411.39   73.64 5411.39   75.63 5411.37
   77.62 5411.34   79.61  5411.3    81.6 5411.29   83.59 5411.29   85.58 5411.29
   87.58 5411.32   89.57 5411.27   91.56 5411.18   93.55 5411.15   95.54 5411.12
   97.24 5410.99   97.53 5410.97   99.52 5410.22  101.51 5408.91   103.5 5407.61
  105.49 5406.56  107.48 5405.52  109.47  5404.2  111.46    5404  113.45    5404
  115.44 5406.26  117.43 5408.41  119.42  5410.7  120.74 5410.72  121.41 5410.72
   123.4  5410.8  125.39 5410.87  127.38 5410.87  129.37 5410.88  131.36 5410.91
  133.35 5410.95  135.34    5411  137.33 5411.09  139.32 5411.17  141.31 5411.23
   143.3 5411.29  145.29 5411.35  147.29  5411.4  149.28 5411.46  151.27 5411.53
  153.26 5411.56  155.25 5411.56  157.24 5411.56  159.23 5411.56  161.22 5411.57
  163.21 5411.57

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   22.85     .13   97.24    .102  120.74     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         97.53  120.74            33.85   32.89   31.65             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  120.72  120.965420.717       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
```

```
     100     107 5409.36     114     119 5409.36  120.96  163.21 5420.72

BRIDGE


RIVER: Skunk
REACH: 05                  RS: 10760

INPUT
Description: 2200 Bluebell - Driveway (40% potential debris block)
Distance from Upstream XS =       3
Deck/Roadway Width        =      20
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    97.5 5410.97            101 5410.84             101 5413.92 5409.36
     113 5414.09 5409.17    119 5413.72  5409.1     119 5410.75
     125 5410.75

Upstream Bridge Cross Section Data
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5413.99    1.99 5414.01    3.98 5413.96    5.97 5413.89    7.96 5413.84
    9.95 5413.78   11.94 5413.67   13.93 5413.57   15.92 5413.46   17.91 5413.38
    19.9 5413.27   21.89 5413.06   22.85 5413.11   23.88 5413.17   25.87  5413.5
   27.86 5413.39   29.86 5413.25   31.85 5413.13   33.84 5413.15   35.83 5413.14
   37.82 5413.12   39.81 5413.08    41.8 5413.06   43.79 5413.04   45.78 5412.86
   47.77 5412.37   49.76 5411.99   51.75 5411.91   53.74 5411.86   55.73 5411.81
   57.72 5411.75   59.71 5411.69    61.7 5411.65   63.69 5411.58   65.68 5411.56
   67.67 5411.51   69.66  5411.4   71.65 5411.39   73.64 5411.39   75.63 5411.37
   77.62 5411.34   79.61  5411.3    81.6 5411.29   83.59 5411.29   85.58 5411.29
   87.58 5411.32   89.57 5411.27   91.56 5411.18   93.55 5411.15   95.54 5411.12
   97.24 5410.99   97.53 5410.97   99.52 5410.22  101.51 5408.91   103.5 5407.61
  105.49 5406.56  107.48 5405.52  109.47  5404.2  111.46    5404  113.45    5404
  115.44 5406.26  117.43 5408.41  119.42  5410.7  120.74 5410.72  121.41 5410.72
   123.4  5410.8  125.39 5410.87  127.38 5410.87  129.37 5410.88  131.36 5410.91
  133.35 5410.95  135.34    5411  137.33 5411.09  139.32 5411.17  141.31 5411.23
   143.3 5411.29  145.29 5411.35  147.29  5411.4  149.28 5411.46  151.27 5411.53
  153.26 5411.56  155.25 5411.56  157.24 5411.56  159.23 5411.56  161.22 5411.57
  163.21 5411.57

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   22.85     .13   97.24    .102  120.74     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
         97.53  120.74             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  120.72  120.965420.717       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     100     107 5409.36     114     119 5409.36  120.96  163.21 5420.72

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      90 5410.67            101 5410.67             101 5413.78 5409.16
     124 5413.67 5409.03    124 5410.64             130 5410.64

Downstream Bridge Cross Section Data
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5412.49    1.99  5412.4    3.98 5412.35    5.96 5412.29    7.95  5412.2
    9.94 5412.14   11.93    5412   13.92 5411.92    15.9 5411.84   17.89 5411.67
   19.88 5411.49   21.87 5411.39   23.86 5411.37   25.85 5411.33   27.83 5411.26
   29.82 5411.28   31.81 5411.29   32.54 5411.29    33.8 5411.28   35.79 5411.32
   37.77 5411.25   39.76 5411.17   41.75 5411.21   43.74 5411.16   45.73  5411.1
   47.71 5411.09    49.7 5411.09   51.69 5411.05   53.68 5411.04   55.67 5411.04
   57.66 5411.06   59.64  5411.1   61.63 5411.13   63.62 5411.06   65.61 5410.91
    67.6 5410.76   69.58 5410.68   71.57 5410.68   73.56  5410.7   75.55 5410.81
   77.54 5410.79   79.52 5410.75   81.51 5410.72    83.5 5410.77   85.49 5410.73
   87.48 5410.73   89.47 5410.71   91.45 5410.51   93.44 5410.44   95.43 5410.27
   96.07 5410.13   97.42 5409.84   99.41 5409.18  101.39 5408.38  103.38 5407.47
  105.37 5406.74  107.36 5405.89  109.35 5404.91  111.33  5403.9  113.32  5403.8
  115.31    5404   117.3 5404.61  119.29 5405.49  121.27 5407.83  123.26  5408.9
  125.25  5409.8  125.48 5409.88  127.24 5410.44  129.23 5410.74  131.22 5410.93
   133.2    5411  135.19 5411.08  137.18 5411.14  139.17 5411.27  141.16 5411.43
  143.14 5411.34  145.13 5411.32  147.12 5411.36  149.11 5411.37   151.1 5411.35
  153.08 5411.33  155.07 5411.32  157.06 5411.31  159.05  5411.3  161.04 5411.31
  163.03 5411.32

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   32.54     .13   96.07    .102  125.48     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
         96.07  125.48             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  131.07  135.315420.926       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  135.31  163.035421.086

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
```

```
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Skunk
REACH: 05                  RS: 10745

INPUT
Description: 2200 Bluebell (D/S)
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5412.49    1.99  5412.4    3.98 5412.35    5.96 5412.29    7.95  5412.2
    9.94 5412.14   11.93    5412   13.92 5411.92    15.9 5411.84   17.89 5411.67
   19.88 5411.49   21.87 5411.39   23.86 5411.37   25.85 5411.33   27.83 5411.26
   29.82 5411.28   31.81 5411.29   32.54 5411.29    33.8 5411.28   35.79 5411.32
   37.77 5411.25   39.76 5411.17   41.75 5411.21   43.74 5411.16   45.73  5411.1
   47.71 5411.09    49.7 5411.09   51.69 5411.05   53.68 5411.04   55.67 5411.04
   57.66 5411.06   59.64  5411.1   61.63 5411.13   63.62 5411.06   65.61 5410.91
    67.6 5410.76   69.58 5410.68   71.57 5410.68   73.56  5410.7   75.55 5410.81
   77.54 5410.79   79.52 5410.75   81.51 5410.72    83.5 5410.77   85.49 5410.73
   87.48 5410.73   89.47 5410.71   91.45 5410.51   93.44 5410.44   95.43 5410.27
   96.07 5410.13   97.42 5409.84   99.41 5409.18  101.39 5408.38  103.38 5407.47
  105.37 5406.74  107.36 5405.89  109.35 5404.91  111.33  5403.9  113.32  5403.8
  115.31    5404   117.3 5404.61  119.29 5405.49  121.27 5407.83  123.26  5408.9
  125.25  5409.8  125.48 5409.88  127.24 5410.44  129.23 5410.74  131.22 5410.93
   133.2    5411  135.19 5411.08  137.18 5411.14  139.17 5411.27  141.16 5411.43
  143.14 5411.34  145.13 5411.32  147.12 5411.36  149.11 5411.37   151.1 5411.35
  153.08 5411.33  155.07 5411.32  157.06 5411.31  159.05  5411.3  161.04 5411.31
  163.03 5411.32

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   32.54     .13   96.07    .102  125.48     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         96.07  125.48              23    23.2   22.96              .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  131.07  135.315420.926       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  135.31  163.035421.086

CROSS SECTION


RIVER: Skunk
REACH: 05                  RS: 10722

INPUT
Description: Bluebell Ave (U/S)
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5411.12    1.98 5411.12    3.96 5411.12    5.94 5411.08    7.92 5411.04
     9.9 5411.01   11.88 5410.97   13.86 5410.91   15.84 5410.87   17.82  5410.8
    19.8 5410.76   21.78 5410.71   23.76 5410.67   25.74 5410.61   27.72 5410.56
    29.7  5410.5   31.68  5410.4   33.66 5410.34   35.64 5410.27   37.62 5410.19
    39.6 5410.06   41.58 5409.93   43.56 5409.99   45.54 5410.09   47.52  5410.1
    49.5 5410.08   51.48 5410.09   51.55 5410.09   53.46 5410.13   55.44 5410.16
   57.42 5410.17    59.4 5410.08   61.38 5410.01   63.36 5410.01   65.34 5409.97
   67.32 5409.91    69.3 5409.82   71.28 5409.74   73.26  5409.6   75.22 5409.38
   75.23 5409.38   77.21 5408.88   79.19 5407.81   81.17 5406.53   83.15 5405.22
   85.13 5404.18   87.11 5403.68   89.09  5403.7   91.07 5403.93   93.05 5405.29
   95.03 5407.29   97.01 5408.79   98.99 5409.43   99.23 5409.49  100.97 5409.89
  102.95 5410.11  104.93  5410.2  106.91 5410.32  108.89 5410.39  110.87 5410.46
  112.85  5410.5  114.83 5410.55  116.81 5410.64  118.79 5410.75  120.77 5410.84
  122.75 5410.83  124.73 5410.96  126.71 5411.02  128.69 5410.99  130.67    5411
  132.65 5410.96  134.63 5410.93  136.61 5410.93

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   51.55     .13   75.22    .102   99.23     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         75.22   99.23             61.07   66.82   69.85              .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  112.09  136.615420.497       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
      85    85.9 5406.88    90.1      91 5406.88

CULVERT


RIVER: Skunk
REACH: 05                  RS: 10700

INPUT
Description: Bluebell Avenue - 3.92' sediment  (30% potential debris
             block);
culvert size = 6'Wx6'H
modeled culvert size (for 30%
             block) = 4.2'Wx6'H
Distance from Upstream XS =      17
Deck/Roadway Width        =      40
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  5411.2              58 5409.93              82 5409.17
      82 5412.59              94 5412.22              94 5408.77
     100 5408.77
```

```
Upstream Bridge Cross Section Data
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5411.12    1.98 5411.12    3.96 5411.12    5.94 5411.08    7.92 5411.04
     9.9 5411.01   11.88 5410.97   13.86 5410.91   15.84 5410.87   17.82  5410.8
    19.8 5410.76   21.78 5410.71   23.76 5410.67   25.74 5410.61   27.72 5410.56
    29.7  5410.5   31.68  5410.4   33.66 5410.34   35.64 5410.27   37.62 5410.19
    39.6 5410.06   41.58 5409.93   43.56 5409.99   45.54 5410.09   47.52  5410.1
    49.5 5410.08   51.48 5410.09   51.55 5410.09   53.46 5410.13   55.44 5410.16
   57.42 5410.17    59.4 5410.08   61.38 5410.01   63.36 5410.01   65.34 5409.97
   67.32 5409.91    69.3 5409.82   71.28 5409.74   73.26  5409.6   75.22 5409.38
   75.23 5409.38   77.21 5408.88   79.19 5407.81   81.17 5406.53   83.15 5405.22
   85.13 5404.18   87.11 5403.68   89.09  5403.7   91.07 5403.93   93.05 5405.29
   95.03 5407.29   97.01 5408.79   98.99 5409.43   99.23 5409.49  100.97 5409.89
  102.95 5410.11  104.93  5410.2  106.91 5410.32  108.89 5410.39  110.87 5410.46
  112.85  5410.5  114.83 5410.55  116.81 5410.64  118.79 5410.75  120.77 5410.84
  122.75 5410.83  124.73 5410.96  126.71 5411.02  128.69 5410.99  130.67    5411
  132.65 5410.96  134.63 5410.93  136.61 5410.93

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   51.55     .13   75.22    .102   99.23     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
         75.22   99.23            .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  112.09  136.615420.497       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
      85    85.9 5406.88    90.1      91 5406.88

Downstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      81 5409.42              88 5409.18              95  5409.1
      95  5412.6             108 5412.29             108 5408.84
     118 5408.46

Downstream Bridge Cross Section Data
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5412.31       2 5412.35       4 5412.42    5.99 5412.54    7.99 5412.64
    9.99 5412.84   11.99 5413.06   13.99 5413.06   15.99 5412.85   17.98  5412.4
   19.98 5412.08   21.98 5411.81   23.98  5411.6   25.98 5411.53   27.97 5411.55
   29.97 5411.61   31.97 5411.78   33.97 5412.04   35.97 5412.21   37.96 5411.94
   39.96 5411.68   41.96 5411.52   43.96 5411.47   45.96 5411.47   47.96 5411.47
   49.95 5411.49   51.95 5411.46   53.95 5411.35   55.95 5411.23   57.95 5411.19
   59.94 5410.91   61.94 5410.57   63.94  5410.4   65.94 5410.05   67.94 5409.92
   69.93 5409.77   71.93  5409.5   73.93 5409.55   75.93 5409.64   77.93 5409.59
   79.93 5409.58   81.92 5409.42   83.92  5408.9   85.92 5408.53   87.92 5408.27
   89.06 5407.98   89.35  5407.9   89.92 5407.76   91.91 5406.94   93.91 5405.67
   95.91 5404.31   97.91 5403.46   99.91 5403.42   101.9  5403.7   103.9 5404.21
   105.9 5404.67   107.9 5405.35   109.9 5406.28   111.9 5407.19  113.89 5408.04
     114 5408.06  114.03 5408.06  115.89 5408.34  117.89 5408.46  119.89 5408.51
  121.89 5408.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   89.06    .102  114.03     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
         89.35     114            .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0   70.755422.314       F
      80    92.5  5409.1       F
   110.5     120  5408.5       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1          Box       6     4.2
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 2 - Wingwall flared 90 or 15 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 17      40     .013     .013     3.92                   .5                 1
Upstream   Elevation =  5400.88
           Centerline Station =  88
Downstream Elevation =  5399.88
           Centerline Station =  101.5

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 10655

INPUT
Description: Bluebell Ave (D/S)
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5412.31       2 5412.35       4 5412.42    5.99 5412.54    7.99 5412.64
    9.99 5412.84   11.99 5413.06   13.99 5413.06   15.99 5412.85   17.98  5412.4
   19.98 5412.08   21.98 5411.81   23.98  5411.6   25.98 5411.53   27.97 5411.55
   29.97 5411.61   31.97 5411.78   33.97 5412.04   35.97 5412.21   37.96 5411.94
   39.96 5411.68   41.96 5411.52   43.96 5411.47   45.96 5411.47   47.96 5411.47
   49.95 5411.49   51.95 5411.46   53.95 5411.35   55.95 5411.23   57.95 5411.19
   59.94 5410.91   61.94 5410.57   63.94  5410.4   65.94 5410.05   67.94 5409.92
   69.93 5409.77   71.93  5409.5   73.93 5409.55   75.93 5409.64   77.93 5409.59
   79.93 5409.58   81.92 5409.42   83.92  5408.9   85.92 5408.53   87.92 5408.27
```

```
   89.06 5407.98   89.35  5407.9   89.92 5407.76   91.91 5406.94   93.91 5405.67
   95.91 5404.31   97.91 5403.46   99.91 5403.42   101.9  5403.7   103.9 5404.21
   105.9 5404.67   107.9 5405.35   109.9 5406.28   111.9 5407.19  113.89 5408.04
     114 5408.06  114.03 5408.06  115.89 5408.34  117.89 5408.46  119.89 5408.51
  121.89 5408.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   89.06    .102  114.03     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         89.35     114            40.07   39.15   37.84             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0   70.755422.314       F
      80    92.5  5409.1       F
   110.5     120  5408.5       F

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 10616

INPUT
Description:
Station Elevation Data    num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5412.85    1.97 5412.44    3.95 5411.97    5.92 5411.51     7.9 5411.04
    9.87 5410.57   11.85  5410.1   13.82 5409.64    15.8 5409.17   17.77  5408.7
   19.75 5408.23   21.72 5407.77    23.7 5407.21   25.67 5406.73   27.65 5406.66
   29.62 5406.67    31.6 5406.78   33.57 5406.88   35.55  5406.9   37.52 5406.84
   38.05 5406.64   38.29 5406.55    39.5 5406.09   41.47  5404.8   43.45  5403.5
   45.42  5403.1    47.4 5403.32   49.37 5403.75   51.35 5403.93   53.32    5404
    55.3 5404.12   57.27 5404.13   59.25 5404.17   61.22 5404.39    63.2 5404.95
   65.17 5405.39   67.15 5405.97   69.12 5406.51    71.1 5406.94    72.3 5407.15
   73.07 5407.29   75.05 5407.56   77.02 5407.61      79 5407.66   80.97 5407.62
   82.95 5407.61   84.92 5407.67    86.9 5407.72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   38.29    .102    72.3     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         38.05    72.3            60.81   56.68   47.13             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  101.24  114.555417.347       0   30.195422.854

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 10560

INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5411.81       2 5411.44    3.99 5411.08    5.99 5410.71    7.99 5410.34
    9.98 5410.01   11.98 5409.83   13.98 5409.26   15.97 5408.15   17.97 5407.36
   19.97 5407.33   21.96 5408.08   23.96 5408.13   25.96 5407.97   27.95 5407.83
   29.95 5407.71   31.95 5407.56   33.94 5407.48   35.94 5407.44   37.94 5407.34
   39.93 5407.28   41.93 5407.26   43.93 5407.19   45.92 5407.13   47.92 5407.06
   49.92 5406.99   51.92 5406.96   53.91 5407.09   55.91 5407.08   57.91 5407.02
    59.9 5406.96    61.9 5406.85    63.9 5406.57   64.54 5406.45   65.89  5406.2
    66.6 5406.03   67.89  5405.7   69.89 5405.22   71.88 5404.67   73.88 5403.97
   75.88 5403.45   77.87 5403.07   79.87 5402.83   81.87 5402.84   83.86 5402.89
   85.86 5402.92   87.86 5403.01   89.85  5403.5   91.85 5404.48   93.85 5405.73
   95.79 5406.05   95.84 5406.06   97.84 5406.12   99.84 5406.11  101.83 5406.06
  103.83 5406.01  105.83 5406.01  107.82    5406  109.82 5405.99  111.82    5406
  113.81 5406.19  115.81 5406.27  117.81 5406.36   119.8 5406.45   121.8 5406.56
   123.8 5406.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   64.54    .102   95.84     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         66.6   95.79            76.13   71.27   63.55             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   93.99   123.85415.758       0   24.785421.806

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 10488

INPUT
Description:
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5407.34       2 5407.32    3.99 5407.31    5.99 5407.33    7.99 5407.28
    9.98 5407.23   11.98 5407.19   13.98 5407.14   15.98 5407.01   17.97 5406.91
   19.97 5406.73   21.97 5406.52   23.96 5406.28   25.96  5406.1   27.96 5405.95
   29.95 5405.78   31.95 5405.62   33.95 5405.48   35.94 5405.41   37.94 5405.33
   39.94 5405.29   41.93 5405.24   43.93 5405.21   45.93 5405.53   47.92 5405.69
   49.92 5405.55   51.92 5405.39   53.92 5405.27   55.91 5405.07   57.91 5404.93
   59.91  5404.6    61.9 5404.34   62.07 5404.29    63.9 5403.74    65.9 5402.79
   67.89 5401.72   69.89 5400.92   71.89 5400.42   73.88 5399.86   75.88 5398.77
   77.88 5398.46   79.87 5398.48   81.87 5398.62   83.87 5399.38   85.87  5400.5
   87.86 5401.81   89.86  5403.1   91.86 5404.31   93.69 5405.58    93.7 5405.59
   93.85 5405.69   95.85  5406.8   97.85 5406.97   99.84 5407.01  101.84 5407.01
  103.84    5407  105.83 5406.99  107.83 5406.98  109.83 5406.97  111.83 5406.97
  113.82 5407.06  115.82 5407.05

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   62.07    .102   93.69     .13
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         62.07    93.7            68.83    67.7   64.94             .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   17.895417.339   97.52  115.825416.963

CROSS SECTION


RIVER: Skunk
REACH: 05                  RS: 10421

INPUT
Description:
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5403.65    1.99 5403.55    3.99 5403.48    5.98  5403.5    7.97  5403.5
    9.96 5403.48   11.96 5403.44   13.95 5403.47   15.94 5403.45   17.93 5403.41
   19.93 5403.33   21.92 5403.28   23.91 5403.25    25.9 5403.18    27.9 5403.07
   29.89 5403.12   31.88 5403.11   33.87 5403.06   35.87 5403.11   37.86    5403
   39.85 5402.81   41.84 5402.77   43.84 5402.73   45.83 5402.72   47.82  5402.6
   49.81 5402.59   51.81 5402.54    53.8 5402.38   55.79 5402.34   57.78 5402.31
   59.78  5402.1   60.25 5402.01   61.77 5401.72   63.76 5401.19   65.75 5400.54
   67.75 5399.37   69.74 5398.67   71.73 5397.19   73.72 5397.22   75.72 5397.62
   77.71 5398.05    79.7 5398.39   81.69 5398.96   83.69 5399.53   85.68 5400.11
   87.67 5400.51   89.66 5400.82   91.66 5401.82   93.65 5402.79   95.41 5403.14
   95.64 5403.18   97.63 5403.19   99.63 5403.35  101.62 5403.59  103.61 5403.69
   105.6 5403.79   107.6 5403.83  109.59 5403.94  111.58 5403.97  113.57 5404.05
  115.57  5404.1  117.56 5404.11  119.55 5404.14  121.55 5404.15  123.54 5404.16
  125.53 5404.16  127.52 5404.22  129.52 5404.38  131.51 5404.57   133.5 5404.77
  135.49 5404.76  137.49  5404.8  139.48 5404.88  141.47 5404.99  143.46 5405.11
  145.46 5405.22  147.45 5405.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   60.25    .102   95.41     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         60.25   95.41           103.85  103.84  102.05             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    8.93   19.945413.501       F
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    8.935413.648  133.85  147.455414.791

CROSS SECTION


RIVER: Skunk
REACH: 05                  RS: 10317

INPUT
Description:
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5401.57    1.97 5401.61    3.94 5401.65    5.91 5401.68    7.88 5401.72
    9.85 5400.55   11.81 5400.47   13.78 5400.55   15.75 5400.54   17.72  5400.5
   19.69 5400.76   21.66 5400.92   23.63 5400.51    25.6 5400.84   27.57 5401.29
   29.54 5401.25   31.51  5400.9   33.48 5400.41   35.44  5399.9   36.01 5399.67
   37.41 5399.12   39.38 5398.58   41.35 5398.49   43.32 5398.31   45.29  5397.3
   47.26 5395.43   49.23 5394.44    51.2 5394.35   53.17 5394.34   55.14 5394.72
   57.11 5395.93   59.07 5397.03   61.04 5397.38   63.01 5397.69   64.98 5398.07
   66.95 5398.47   68.92 5398.79   70.89 5399.12   72.86 5399.48   74.83 5399.87
   75.68 5400.04    76.8 5400.28   78.77 5400.55   80.74 5400.58    82.7 5400.64
   84.67 5400.82   86.64 5400.93   88.61 5401.07   90.58 5401.15   92.55 5401.26
   94.52 5401.33   96.49 5401.37   98.46  5401.5  100.43 5401.51   102.4 5401.53
  104.37 5401.54  106.33 5401.54   108.3 5401.55  110.27 5401.55  112.24 5401.55
  114.21 5401.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   36.01    .102   75.68     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         36.01   75.68            78.94   78.42   73.46             .1       .3
Blocked Obstructions     num=        2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   10.955411.569   99.47  114.215411.507

CROSS SECTION


RIVER: Skunk
REACH: 05                  RS: 10238

INPUT
Description:
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5398.05    1.96 5398.01    3.93 5398.08    5.89 5398.15    7.85 5398.15
    9.81 5398.14   11.78 5398.12   13.74 5398.08    15.7 5398.08   17.67 5398.15
   19.63 5398.21   21.59 5398.11   23.55 5397.98   25.52 5397.94   27.48 5397.97
   29.44 5397.94   31.41 5397.87   33.37 5397.83   35.33 5397.81    37.3 5397.77
   39.26 5397.76   41.22 5397.69   43.18 5397.61   45.15 5397.56   47.11 5397.52
   49.07 5397.41   51.04 5397.34      53 5397.11   54.96 5396.95   56.92 5396.89
   58.89 5396.88   60.85 5397.36   62.81 5397.44   64.78 5397.55   66.74  5397.2
    68.7 5396.85   70.66 5396.77   72.63 5396.66    74.6 5396.33   76.57  5396.1
   78.54 5395.99   80.52 5395.82    82.4  5395.4   82.49 5395.38   84.46  5394.6
   86.43 5393.44   88.41  5392.1   90.38 5390.84   92.35 5389.41   94.32 5388.21
    96.3 5387.88   98.27 5387.85  100.24 5387.93  102.21 5388.59  104.19 5390.21
  106.16 5391.75  108.13  5393.7   110.1 5395.19  112.08 5396.47  113.57 5397.04
  114.05 5397.23  116.02 5397.41  117.99  5397.5  119.96 5397.52  121.94 5397.59
  123.91 5397.67  125.88 5397.76  127.85 5397.84  129.83 5397.92   131.8    5398
  133.77  5398.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    82.4    .102  113.57     .13
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          82.4  113.57            66.77   70.01   74.42             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     5.9   19.775408.149       F
Blocked Obstructions      num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0     5.95408.052   113.4  133.775407.024

CROSS SECTION


RIVER: Skunk
REACH: 05                  RS: 10168

INPUT
Description:
Station Elevation Data    num=      84
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5398.1       2 5398.19       4 5398.14    5.99 5398.09    7.99 5398.13
    9.99 5398.13   11.99 5398.03   13.98 5397.95   15.98 5397.89   17.98 5397.78
   19.98 5397.72   21.98 5397.69   23.97  5397.7   25.97 5397.69   27.97 5397.65
   29.97 5397.58   31.96 5397.51   33.96 5397.46   35.96 5397.48   37.96 5397.45
   39.96 5397.31   41.95 5397.15   43.95 5397.04   45.95 5396.86   47.95 5396.68
   49.94 5396.48   51.94 5396.17   53.94 5396.01   55.94 5395.75   57.94 5395.59
   59.93 5395.59   61.93 5395.83   63.93 5395.93   65.93 5396.03   67.93 5396.21
   69.92 5396.08   71.92 5395.95   73.92 5395.89   75.92 5395.72   77.91  5395.4
   79.91  5395.3   81.91 5394.97   83.91 5394.68   85.91 5394.56    87.9 5394.37
    89.9 5394.14    91.9 5393.92   93.21 5393.69   93.86 5393.58    93.9 5393.57
   95.89 5392.79   97.89  5391.7   99.89 5390.47  101.89 5389.28  103.89 5388.15
  105.88 5387.13  107.88 5386.62  109.88 5386.58  111.88 5386.58  113.87 5387.03
  115.87 5388.55  117.87 5390.81  119.87  5392.7  121.87 5393.85  123.86 5394.68
  125.86 5395.56  126.42 5395.77  127.86 5396.32  129.86 5396.76  131.86  5396.8
  133.85 5396.79  135.85 5396.75  137.85  5396.8  139.85 5396.82  141.84 5396.82
  143.84 5396.86  145.84 5396.92  147.84 5396.98  149.84 5397.19  151.83 5397.28
  153.83 5397.29  155.83 5397.31  157.83 5397.32  159.82 5397.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   93.21    .102  126.42     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         93.86  126.42            95.17   94.82   93.84             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    6.78   15.755408.108       F
  133.78  141.725406.789       F
Blocked Obstructions      num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.785408.103  141.57  159.825406.823

CROSS SECTION


RIVER: Skunk
REACH: 05                  RS: 10073

INPUT
Description:
Station Elevation Data    num=      84
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5391.69    1.98 5391.54    3.96 5391.56    5.94 5391.59    7.92 5391.74
    9.89 5391.85   11.87 5391.96   13.85    5392   15.83 5391.98   17.81 5391.96
   19.79 5391.93   21.77 5391.92   23.75 5391.94   25.73 5391.99    27.7 5392.08
   29.68 5392.16   31.66 5392.22   33.64 5392.18   35.62 5392.17    37.6 5392.21
   39.58 5392.19   41.56 5392.13   43.54 5392.09   45.52 5392.01   47.49    5392
   49.47    5392   51.45 5391.92   53.43 5391.84   55.41 5391.81   57.39 5391.82
   59.37 5391.85   61.35 5391.95   63.33 5392.05    65.3 5392.03   66.21 5391.88
   66.24 5391.87   67.28  5391.7   69.26    5391   71.24 5389.99   73.22 5388.66
    75.2 5387.39   77.18 5386.48   79.16 5385.82   81.14 5385.24   83.11 5384.78
   85.09 5384.67   87.07 5384.85   89.05 5385.47   91.03 5386.43   93.01  5387.2
   94.99 5388.29   96.97 5389.21   98.95 5389.94  100.83 5390.43  100.92 5390.46
   102.9 5390.91  104.88 5391.17  106.86 5391.52  108.84 5391.49  110.82 5391.53
   112.8 5391.66  114.78 5391.81  116.76 5391.82  118.73 5391.85  120.71 5391.89
  122.69 5392.03  124.67 5392.02  126.65 5392.03  128.63 5392.11  130.61 5392.22
  132.59 5392.31  134.57 5392.43  136.55  5392.6  138.52 5392.78   140.5 5393.02
  142.48  5393.2  144.46 5393.56  146.44 5393.84  148.42 5393.86   150.4 5394.12
  152.38  5394.3  154.36 5394.46  156.33  5394.7  158.31 5394.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   66.24    .102  100.83     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         66.21  100.83            73.12   76.33   79.94             .1       .3
Blocked Obstructions      num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   38.055401.686  151.15  158.315404.232

CROSS SECTION


RIVER: Skunk
REACH: 05                  RS: 9997

INPUT
Description:
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5390.47    1.98 5390.52    3.96 5390.55    5.94 5390.55    7.92 5390.54
     9.9 5390.51   11.88 5390.42   13.86 5390.34   15.84 5390.25   17.81 5390.17
   19.79 5390.08   21.77    5390   23.75 5389.92   25.73 5389.88   27.71 5389.84
   29.69 5389.81   31.67 5389.82   33.65 5389.92   35.63 5389.93   37.61 5389.95
   39.59 5389.87   41.57  5389.8   43.55 5389.81   45.53  5389.8   47.51 5389.78
   49.49 5389.77   51.47 5389.77   53.45 5389.77   55.42 5389.78    57.4 5389.78
   59.38 5389.77   61.36 5389.76   63.34 5389.76   65.32 5389.71   66.92  5389.7
   66.94  5389.7    67.3  5389.7   69.28 5388.23   71.26 5386.72   73.24 5385.78
   75.22 5385.13    77.2 5384.35   79.18 5383.76   81.16 5383.74   83.14 5383.95
   85.12 5384.66    87.1 5385.31   89.07 5385.32   91.05 5385.36   93.03 5385.59
   95.01 5385.96   96.99 5386.33   98.97 5386.59  100.95 5386.89  102.93 5387.19
  104.91 5387.45  106.89 5387.75  108.87  5387.9  110.85 5387.91  112.72 5388.14
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  112.83 5388.15  114.81 5388.36  116.79 5388.46  118.77 5388.54  120.75 5388.62
  122.73 5388.72   124.7  5388.9  126.68 5388.94  128.66 5388.79  130.64 5388.72
  132.62 5388.69   134.6 5388.62  136.58 5388.57  138.56 5388.56  140.54 5388.57
  142.52 5388.55   144.5 5388.51  146.48 5388.48  148.46 5388.48  150.44 5388.53
  152.42 5388.57   154.4 5388.66  156.38 5388.68  158.36 5388.73  160.33 5388.74
  162.31 5388.82  164.29 5388.84  166.27 5388.88  168.25 5388.94  170.23 5389.01
  172.21 5389.08  174.19 5389.15  176.17 5389.29  178.15 5389.35  180.13 5389.33
  182.11 5389.31  184.09 5389.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   66.94    .102  112.72     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          66.92  112.72             54.03   54.36   50.32              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  154.44  157.14 5398.66       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   66.735400.471  157.14  184.095398.708

CROSS SECTION


RIVER: Skunk
REACH: 05                 RS: 9943

INPUT
Description:
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5390.33    1.96 5390.37    3.91 5390.41    5.87 5390.44    7.83 5390.51
    9.79 5390.52   11.74 5390.44    13.7 5390.39   15.66 5390.32   17.61 5389.99
   19.57 5389.65   21.53 5389.58   23.49 5389.41   25.44 5389.44    27.4  5389.5
   29.36 5389.57   31.31 5389.72   33.27 5389.71   35.23 5389.64   37.18 5389.59
   39.14  5389.6    41.1 5389.62   43.06 5389.71   45.01 5389.75   46.97 5389.68
   48.93 5389.62   50.88 5389.53   52.84 5389.56    54.8 5389.53   56.76 5389.52
   58.71 5389.53   60.67 5389.44   62.63 5389.32   64.58  5389.2   66.54 5389.14
    68.5  5389.1   70.48 5389.02   72.46 5389.01   74.44 5388.96   76.42 5388.77
    78.4 5388.74   79.55 5388.54   80.38 5388.39   82.36 5387.05   84.34 5385.39
   86.33 5383.97   88.31 5383.17   90.29  5382.9   92.27 5382.88   94.25 5382.82
   96.23 5382.77   98.21 5382.94  100.19 5383.69  102.17 5385.58  104.15 5386.35
  106.13 5386.98  108.11 5387.42   110.1  5387.8  112.08 5388.18   112.8 5388.34
  114.06  5388.6  116.04 5388.97  118.02 5389.17     120  5389.3  121.98 5389.62
  123.96 5390.14  125.94  5390.4  127.92 5390.37   129.9 5390.24  131.88 5390.17
  133.87 5390.13  135.85 5390.23  137.83 5390.17  139.81 5389.98  141.79 5389.88
  143.77 5389.82  145.75 5389.78  147.73 5389.75  149.71 5389.78  151.69 5389.92
  153.67 5390.03  155.65 5390.06  157.63 5390.07  159.62 5390.08   161.6 5390.06
  163.58 5390.17

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   79.55    .102   112.8     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          79.55   112.8             47.17   48.62   53.06              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   13.29   35.715400.402       F
   41.92   57.355399.655       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  137.72  163.585400.174       0   13.295400.333   35.71   41.925399.618

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 9894

INPUT
Description: Broadway (U/S)
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5390.08       2 5390.07       4 5390.01       6 5389.98      10 5389.96
      12 5389.92   15.99 5389.94   21.99 5390.01   25.99 5390.09   29.99 5390.07
   33.99 5390.21   37.99 5390.31   39.98 5390.33   45.98 5390.55   47.98 5390.67
   49.98 5390.69   51.98 5390.76   53.98 5390.87   55.98 5390.93   57.98 5390.79
   59.98 5390.76   63.98 5391.05   67.97 5391.22   69.97 5391.27   71.97 5391.51
   73.97  5391.6   77.97 5391.74   79.97 5391.76   81.97 5392.01   83.97 5392.21
   85.97 5392.22   87.97 5392.13   91.96 5392.61   93.96 5392.32   95.96  5392.8
   97.96 5393.18   99.96 5392.82  101.96 5392.12  103.38 5389.53  103.96 5388.47
  104.77 5387.37  105.96 5385.77  107.96 5384.81  109.96 5384.26  111.96 5383.61
  113.96    5383  115.96 5382.67     116 5382.59     138 5382.59  139.95 5383.08
  141.95 5383.38  143.95 5383.75  145.94 5384.15  147.94  5384.5  149.94 5384.91
  151.94 5385.54  153.94 5386.03  155.94 5386.62  157.94 5389.69   159.9  5391.8
  161.94 5393.05  163.04 5393.09  163.94 5393.12  165.94 5393.03  167.94 5392.79
  169.94 5392.22  173.93 5391.78  175.93 5391.93  177.93 5391.92  179.93 5392.03
  181.93  5392.3  183.93 5391.92  185.93 5391.42  187.93 5391.41  189.93  5391.5
  191.93 5391.35  195.93 5391.19  197.92 5391.19  199.92 5391.15  202.94 5391.04
  205.92 5390.94  207.92 5390.98  215.92 5390.78  217.92 5390.76  219.92 5390.71
  221.92 5390.75  223.91 5390.68  227.91 5390.68  229.91 5390.65  231.91 5390.65
  235.91 5390.71  239.91 5390.73  245.91 5390.73   249.9 5390.78

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015      10     .13  104.77    .102  163.04     .13  202.94    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         103.38   159.9            100.68  100.14  100.49              .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
       0   70.035400.085       F
   70.03   115.5 5393.05       T
   138.5  203.59  5392.9       T
  203.59  248.945401.039       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     116  116.55 5390.59  137.45     138 5390.59
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CULVERT


RIVER: Skunk
REACH: 04                 RS: 9850

INPUT
Description: Broadway (5% potential debris block);
culvert size =
             22'Wx8'H
modeled culvert size (for 5% block) = 20.9'Wx8'H
Distance from Upstream XS =      .5
Deck/Roadway Width        =      98
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    5393              48 5393.11              84 5393.05
      84 5393.43             113 5396.77             140 5396.74
     170 5393.48             170  5392.9             200 5392.93
   249.9 5392.21

Upstream Bridge Cross Section Data
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5390.08       2 5390.07       4 5390.01       6 5389.98      10 5389.96
      12 5389.92   15.99 5389.94   21.99 5390.01   25.99 5390.09   29.99 5390.07
   33.99 5390.21   37.99 5390.31   39.98 5390.33   45.98 5390.55   47.98 5390.67
   49.98 5390.69   51.98 5390.76   53.98 5390.87   55.98 5390.93   57.98 5390.79
   59.98 5390.76   63.98 5391.05   67.97 5391.22   69.97 5391.27   71.97 5391.51
   73.97  5391.6   77.97 5391.74   79.97 5391.76   81.97 5392.01   83.97 5392.21
   85.97 5392.22   87.97 5392.13   91.96 5392.61   93.96 5392.32   95.96  5392.8
   97.96 5393.18   99.96 5392.82  101.96 5392.12  103.38 5389.53  103.96 5388.47
  104.77 5387.37  105.96 5385.77  107.96 5384.81  109.96 5384.26  111.96 5383.61
  113.96    5383  115.96 5382.67     116 5382.59     138 5382.59  139.95 5383.08
  141.95 5383.38  143.95 5383.75  145.94 5384.15  147.94  5384.5  149.94 5384.91
  151.94 5385.54  153.94 5386.03  155.94 5386.62  157.94 5389.69   159.9  5391.8
  161.94 5393.05  163.04 5393.09  163.94 5393.12  165.94 5393.03  167.94 5392.79
  169.94 5392.22  173.93 5391.78  175.93 5391.93  177.93 5391.92  179.93 5392.03
  181.93  5392.3  183.93 5391.92  185.93 5391.42  187.93 5391.41  189.93  5391.5
  191.93 5391.35  195.93 5391.19  197.92 5391.19  199.92 5391.15  202.94 5391.04
  205.92 5390.94  207.92 5390.98  215.92 5390.78  217.92 5390.76  219.92 5390.71
  221.92 5390.75  223.91 5390.68  227.91 5390.68  229.91 5390.65  231.91 5390.65
  235.91 5390.71  239.91 5390.73  245.91 5390.73   249.9 5390.78

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015      10     .13  104.77    .102  163.04     .13  202.94    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        103.38   159.9             .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
       0   70.035400.085       F
   70.03   115.5 5393.05       T
   138.5  203.59  5392.9       T
  203.59  248.945401.039       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     116  116.55 5390.59  137.45     138 5390.59

Downstream  Deck/Roadway Coordinates
    num=       11
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0 5393.19              23 5393.19              55 5393.03
      56 5393.03              56 5393.23              80 5396.02
   107.5 5396.03             126 5394.54             126 5392.69
     185 5393.05          343.19  5394.6

Downstream Bridge Cross Section Data
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5385.13       2 5384.84    3.99 5385.14    5.99    5386    7.98 5385.53
   11.97 5385.44   13.97 5385.74   17.96 5385.14   19.95  5384.7   21.95 5384.64
   23.94 5384.99   25.94 5384.96   27.93 5385.24   31.92 5384.43   37.91 5384.55
   39.91 5384.51    41.9  5384.2    43.9 5384.32   45.89 5384.11   49.88 5383.94
   51.88    5384   54.78 5383.68    56.2 5383.62   57.86 5383.29   61.85 5383.26
   65.84 5382.84   67.84 5382.89   71.83 5382.49   73.83  5380.6   75.82 5379.44
   77.82 5379.51   81.81 5378.95    83.8 5378.87   87.79 5379.09  101.76 5379.22
  105.75 5379.49  109.74 5381.07  111.74 5381.61  115.73 5382.37  119.72 5382.93
  121.71 5382.95  122.85 5383.21   125.1 5383.37   125.7 5383.35   127.7 5384.29
  131.69 5384.77  133.68 5384.65  135.68 5384.88  137.67 5384.63  141.66 5384.74
  145.66 5385.24  147.65 5385.77  151.64 5385.71  153.64  5385.5  157.63 5385.84
  159.62 5385.45  161.62 5385.76  163.61 5385.64  165.61 5385.98   167.6 5385.63
  171.59 5385.49  173.59  5385.6  175.58  5385.4  177.58 5385.64  179.58 5385.62
  181.57 5385.28  185.56 5384.91  193.54 5384.71  199.53 5384.74  205.51 5384.55
  213.49 5384.61  221.48 5384.92  223.47 5384.82  229.46    5385  235.44 5384.83
  243.42 5384.96  245.42 5385.12  247.41 5385.01  249.41  5385.2   253.4  5385.1
   255.4 5385.21  261.38 5385.16  267.37 5385.37  273.35 5385.37  279.34 5385.61
  281.33 5385.48  283.33 5385.64  287.32  5385.6   297.3 5385.68  299.29 5385.85
  303.28 5385.86  305.28 5386.01  321.24 5386.31  323.23 5386.27  325.23 5386.49
  331.22 5386.59  333.21 5386.79   339.2 5386.96  343.19 5387.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    56.2    .102   125.1     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         54.78  122.85             .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
       0   12.795395.128       F
   12.79      79 5393.03       F
     103  192.41 5392.69       F
  192.41  343.195394.733       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
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Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1          Box       8    20.9
FHWA Chart # 10- 90 degree headwall; Chamfered or beveled inlet
FHWA Scale # 2 - Inlet edges beveled 1/2 inch at 45 degrees (1:1)
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 .5      98     .013     .013        0                   .5                1
Upstream   Elevation =  5382.59
           Centerline Station =  127
Downstream Elevation =  5379.26
           Centerline Station =  91

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 9794

INPUT
Description: Broadway (D/S)
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5385.13       2 5384.84    3.99 5385.14    5.99    5386    7.98 5385.53
   11.97 5385.44   13.97 5385.74   17.96 5385.14   19.95  5384.7   21.95 5384.64
   23.94 5384.99   25.94 5384.96   27.93 5385.24   31.92 5384.43   37.91 5384.55
   39.91 5384.51    41.9  5384.2    43.9 5384.32   45.89 5384.11   49.88 5383.94
   51.88    5384   54.78 5383.68    56.2 5383.62   57.86 5383.29   61.85 5383.26
   65.84 5382.84   67.84 5382.89   71.83 5382.49   73.83  5380.6   75.82 5379.44
   77.82 5379.51   81.81 5378.95    83.8 5378.87   87.79 5379.09  101.76 5379.22
  105.75 5379.49  109.74 5381.07  111.74 5381.61  115.73 5382.37  119.72 5382.93
  121.71 5382.95  122.85 5383.21   125.1 5383.37   125.7 5383.35   127.7 5384.29
  131.69 5384.77  133.68 5384.65  135.68 5384.88  137.67 5384.63  141.66 5384.74
  145.66 5385.24  147.65 5385.77  151.64 5385.71  153.64  5385.5  157.63 5385.84
  159.62 5385.45  161.62 5385.76  163.61 5385.64  165.61 5385.98   167.6 5385.63
  171.59 5385.49  173.59  5385.6  175.58  5385.4  177.58 5385.64  179.58 5385.62
  181.57 5385.28  185.56 5384.91  193.54 5384.71  199.53 5384.74  205.51 5384.55
  213.49 5384.61  221.48 5384.92  223.47 5384.82  229.46    5385  235.44 5384.83
  243.42 5384.96  245.42 5385.12  247.41 5385.01  249.41  5385.2   253.4  5385.1
   255.4 5385.21  261.38 5385.16  267.37 5385.37  273.35 5385.37  279.34 5385.61
  281.33 5385.48  283.33 5385.64  287.32  5385.6   297.3 5385.68  299.29 5385.85
  303.28 5385.86  305.28 5386.01  321.24 5386.31  323.23 5386.27  325.23 5386.49
  331.22 5386.59  333.21 5386.79   339.2 5386.96  343.19 5387.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    56.2    .102   125.1     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          54.78  122.85           14.17   14.17   14.17             .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
       0   12.795395.128       F
   12.79      79 5393.03       F
     103  192.41 5392.69       F
  192.41  343.195394.733       F

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 9780

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5381.84       2 5381.88       4 5381.82    5.99 5381.85    9.99 5381.81
   11.99 5381.73   15.98 5381.62   19.98 5381.56   21.97 5381.49   27.97 5381.36
   29.97 5381.28   33.96 5381.16   35.96 5381.14   41.95 5381.04   47.94 5380.88
   49.94 5380.75   52.43 5380.64   52.78 5380.62   55.94 5380.44   61.93  5379.9
   63.93 5379.85   65.92 5379.71   71.92 5379.59   75.91 5379.45   79.91 5379.39
   81.91 5379.33    83.9 5379.35   91.89  5379.3   93.89 5379.33   97.89 5379.29
   99.89  5379.3  105.88 5379.65  107.88 5379.73  111.87 5379.96  113.87 5380.12
  117.86 5380.33  119.86 5380.52  122.96 5380.58  127.85 5380.83  133.85 5381.22
  139.84 5381.54  141.84  5381.7  145.83 5381.94  149.83 5382.17  155.82 5382.56
  157.82 5382.71  161.81 5382.93  163.81 5383.07  167.81 5383.24   169.8 5383.36
   173.8 5383.46   175.8 5383.55   177.8 5383.59  179.79 5383.68  181.79 5383.73
  185.79 5383.77  189.78 5383.73  191.78 5383.78  193.78 5383.74  195.77 5383.65
  197.77 5383.61  199.77 5383.73  201.77 5383.66  205.76 5383.61  207.76 5383.63
  209.76 5383.56  211.76 5383.69  213.75 5383.55  215.75 5383.65  217.75 5383.67
  219.75 5383.64  225.74 5383.68  227.74 5383.61  229.74 5383.67  235.73  5383.7
  237.73 5383.86  239.72 5383.83  241.72 5383.73  243.72  5383.7  245.72 5383.77
  247.72 5383.72  249.71 5383.76  251.71 5383.73  255.71 5383.86   257.7 5383.88
   259.7 5383.77   261.7 5383.79  265.69 5383.87  269.69 5383.88  271.69 5383.93
  273.69 5383.91  275.68    5384  277.68 5383.92  279.68 5384.01  281.68 5384.23
  283.67  5384.4  287.67 5384.62  291.66 5384.88  293.66 5384.94  295.66 5385.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   52.78    .102  122.96     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          52.43  122.96           68.9   70.04   68.66             .1       .3
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
       0    8.325391.842       F
     8.32      66    5393       F
     104  183.22    5393       F
  183.22  295.66 5393.74       F

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 9710
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INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5380.76    1.99 5380.59    5.96    5380    7.94 5379.61   11.91 5379.07
    13.9 5378.83   15.88 5378.67   19.85 5378.29   21.84 5378.26   25.81 5378.29
   27.79 5378.39   29.78 5378.44   31.76 5378.42   33.75 5378.42   35.73  5378.4
   37.72 5378.82    39.7 5380.75   41.69 5380.78   43.67  5380.7   45.66 5380.65
   47.65 5380.54   49.63 5380.41    53.6 5380.26   55.59 5380.17   57.57 5380.17
   59.56 5380.15   61.54 5380.11   63.53 5380.13   65.51 5380.11    67.5  5380.1
   71.47 5380.05   73.45 5380.05   79.41 5380.08   81.39 5380.05   83.38    5380
   85.36 5379.85   87.35 5379.77   88.66 5379.73   89.33 5379.71   91.32 5379.71
    93.3 5379.69   95.29 5379.65   95.81  5379.5   97.28 5379.07   99.26 5376.54
  101.25 5374.75  103.23 5374.26  105.22 5373.94   107.2 5374.02  109.19 5374.33
  111.17 5374.57  113.16 5374.74  115.14 5374.85  117.13 5375.14  119.11 5375.54
   121.1 5376.67  123.08 5377.72  125.07 5379.24     126 5379.82  127.05 5380.48
  128.77  5380.9  129.04 5380.97  131.02 5381.03  133.01  5380.9  134.99 5380.66
  138.96 5380.64  140.95 5380.67  142.93 5380.72  144.92 5380.81  146.91 5380.92
  148.89 5380.93  150.88 5381.01  154.85    5381  156.83 5380.89   160.8 5380.63
  162.79 5380.53  164.77 5380.51  170.73 5380.63  172.71 5380.55   174.7 5380.55
  176.68 5380.49  180.65 5380.35  182.64 5380.36  184.62 5380.48  186.61 5380.47
  188.59 5380.58  190.58 5380.77  192.57 5380.75  194.55 5380.52  196.54 5380.44
  198.52 5380.24  200.51 5379.86  202.49 5379.64  204.48 5379.59  206.46 5379.63
  210.43 5379.49  212.42 5379.41   214.4 5379.37  216.39 5379.39  220.36 5379.37

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   88.66    .102     126     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         95.81  128.77           122.63  123.49  124.83              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   15.86   40.53 5381.96       F
  174.14  220.365390.551       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   18.575390.761

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 9586

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5380.46    1.99 5380.51    3.99 5380.64    7.98 5380.76   11.97 5381.02
   13.96 5381.09   15.96  5380.9   17.95 5380.62   21.94 5380.63   27.93 5380.59
   29.92 5380.62   31.92 5380.58   33.91 5380.58    39.9 5380.52   41.89 5380.53
   43.89 5380.45   45.88 5380.44   49.87 5380.33   51.87 5380.24   55.86 5380.17
   61.84 5379.88   63.84 5379.81   67.83 5379.62   69.82 5379.57   71.82 5379.45
   73.81 5379.39   75.81 5379.36   81.79 5379.16   85.78 5379.01   87.78  5378.9
   89.77 5378.85   93.76 5378.68   95.75 5378.66   97.75 5378.54   99.74 5378.55
  101.74 5378.67  103.73 5378.61  105.73  5378.5  107.72 5378.35  111.71 5378.18
   115.7 5378.12   117.7 5378.06  118.86 5378.06  119.69 5378.05  121.62 5377.73
  121.69 5377.72  123.68 5376.67  125.68 5375.32  127.67  5374.2  129.67 5373.11
  131.66 5372.33  133.66 5371.58  135.65 5370.95  137.65 5370.82  141.64 5371.63
  143.63 5371.88  145.63 5371.77  147.62 5371.77  149.62  5372.1  151.61 5372.33
  153.61 5373.04   155.6 5374.08   157.6 5375.17  159.59 5375.96  159.91 5376.02
  161.59 5376.29  163.58  5376.3  165.58 5376.24  167.57 5376.33  169.57 5376.49
  171.56 5376.56  173.56 5376.61  175.55 5376.73  177.55 5376.79  179.54 5376.79
  181.54 5376.83  183.53 5376.89  185.52 5376.97  191.51 5377.34   193.5 5377.35
  197.49  5377.5  201.48 5377.56  203.48 5377.69  205.47 5377.73  207.47 5377.75
  211.46 5377.95  213.45 5378.01  215.45 5378.04  219.44 5378.05  221.43 5378.18
  223.43 5378.14  227.42 5378.11  229.41 5378.13   233.4 5378.15   235.4 5378.12
  237.39 5378.07  241.38 5378.02  245.37 5377.93  247.37 5377.93  251.36 5377.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  118.86    .102  159.91     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        121.62  159.91           141.41  141.97  142.01              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   17.48   34.255390.662       F
  174.51  226.825386.671       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   17.485390.461  226.02  251.365388.129

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 9444

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5378.87    7.95 5378.78    9.94 5378.77   25.84 5378.61   27.83  5378.6
   35.78 5378.52   37.77 5378.52   39.76 5378.45   41.75 5378.25   43.74  5377.9
   45.72 5377.75    49.7 5377.56   51.69 5377.49   53.68 5377.35   55.66 5377.15
   57.65 5377.12   59.64 5377.26   61.63 5377.58   63.62 5377.95    65.6 5378.09
   67.59 5378.07   69.58 5377.54   71.57 5377.12   73.56 5376.99   77.53 5376.86
   81.51 5376.67   85.48 5376.39   95.42 5375.93   97.41 5375.88    99.4 5375.98
  101.39 5375.88  103.38 5375.64  105.36 5375.52  107.35 5375.53  109.34 5375.39
  113.32 5375.25  118.59 5375.16  121.27 5375.17  123.26 5375.01  125.24 5374.72
  125.74 5374.58  127.23 5374.14  129.22 5373.17  131.21 5371.86   133.2 5370.86
  135.19 5370.05  137.17 5369.56  139.16 5369.49  141.15 5369.51  143.14 5369.89
  145.13 5369.86  147.11 5369.54   149.1 5369.75  151.09 5370.38  153.08 5371.34
  155.07 5372.53  157.05  5373.3  157.65 5373.38  157.75  5373.4  159.04 5373.58
  161.03 5373.61  166.99 5373.52  168.98 5373.59  170.97  5373.6  174.95 5373.69
  178.92 5373.62   182.9 5373.65  186.87 5373.52  188.86 5373.62  190.85 5373.58
  192.84 5373.61  196.81 5373.61  202.78 5373.71  208.74 5373.89  212.72 5373.87
  214.71  5373.8  216.69 5373.78  218.68 5373.87  220.67 5374.01  226.63 5374.17
  228.62 5374.06  230.61    5374  234.59 5373.96  236.57 5373.91  238.56 5374.05
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  242.54 5374.47  244.53 5374.37  246.51 5374.18   248.5 5374.03  250.49 5374.08
  252.48 5374.06  254.47 5374.08  256.45 5374.21  258.44 5374.25  260.43 5374.16
  262.42 5374.25  264.41 5374.17  268.38 5374.27  270.37 5374.28  274.35 5374.44

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  118.59    .102  157.75     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        125.74  157.65           134.85  140.05  147.98             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  180.02  260.575383.622       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   60.075388.875  261.26  274.355384.201

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 9304

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5378.2    3.97 5378.25    7.93 5378.15    9.92 5378.14   13.88 5378.03
   15.87 5377.94   17.85 5377.81   21.82 5377.64    23.8 5377.47   25.78 5377.41
   27.76 5377.46   31.73 5377.44    35.7 5377.48   37.68 5377.48   45.61  5377.4
   49.58 5377.41   51.56 5377.36   55.53 5377.28   61.48 5377.31   63.46  5377.3
   67.43 5377.31   73.38 5377.23   75.36 5377.18   77.35 5377.16   81.31 5376.94
   83.29 5376.73   85.28 5376.54   87.26 5376.42   91.23 5376.28   93.21 5376.14
   99.16 5375.56  101.14 5375.33  103.13 5375.24  105.11 5375.12  107.09 5374.92
  109.08 5374.92  111.06 5375.02  111.41 5374.92  112.12 5374.73  113.04 5374.47
  115.03 5371.74  117.01 5369.76  118.99 5369.82  120.98 5369.85  124.94 5369.73
  126.93 5369.69  128.91 5369.56  130.89 5367.66  132.88  5366.7  134.86 5366.48
  136.41 5366.78  136.84 5366.86  138.83 5367.82  140.81 5368.97  142.79 5370.03
  144.77 5370.54  146.76 5370.93  147.79 5371.09  148.74 5371.24   152.7 5371.44
  156.64  5371.5  158.62 5371.43  160.59 5371.46  166.51 5371.59  172.43 5371.77
   174.4  5371.8  178.35 5371.91  180.32 5371.92  186.24 5372.02  188.22 5372.04
  196.11 5372.16  198.08 5372.21     204 5372.29  207.95 5372.28  213.87 5372.38
  215.84 5372.43  221.76 5372.54  223.73 5372.61  225.71 5372.65  229.65 5372.68
   233.6 5372.78  235.57 5372.81  237.55 5372.79  241.49 5372.87  243.47 5372.89
  245.44 5372.94  249.39 5373.01  251.36 5373.13   255.3 5373.28  257.28 5373.37
  259.25  5373.5  261.22 5373.82   263.2 5373.94  267.14 5374.26  271.09 5374.24
  273.06 5374.21  278.98 5374.15  282.93 5374.15   284.9 5374.16   292.8 5374.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  111.41    .102  136.41     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        112.12  147.79           34.97    34.1   34.16             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   30.62   78.045387.447       F
  232.66  265.735382.747       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   30.625388.202  265.73   292.85384.146

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 9270

INPUT
Description: Ped. Bridge U/S of 27th Way
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5376.73    1.98 5376.66    3.97 5376.73    7.93 5376.75   13.88 5376.67
   17.85 5376.65   21.82 5376.46    23.8 5376.55   27.77 5376.57   31.73 5376.55
   33.72  5376.5    35.7  5376.4   39.67 5376.47   41.65 5376.48   43.63 5376.41
   51.56 5376.33   55.53 5376.21   61.48 5376.08   65.45 5376.02   67.43 5375.95
   77.35 5375.74    83.3 5375.71   91.23 5375.54    95.2 5375.49   97.18 5375.53
  101.15 5375.51  103.13 5375.47   107.1 5375.35  111.06 5375.01  113.05  5374.8
  115.03 5374.64  117.01 5374.56  120.98 5374.35  122.96 5374.32  124.95 5374.52
  125.55 5374.65  125.56 5374.65  126.93 5374.95  128.91 5369.63   130.9 5367.03
  136.84 5366.98  140.81 5366.92  142.79 5366.55  144.78 5364.63     146 5361.22
     158 5361.22  158.44 5364.64  158.66 5364.91  160.64 5368.22  162.63  5369.5
  164.61 5369.83  165.73 5369.95  166.59 5370.05  168.58 5370.58  170.56 5370.76
  180.47 5371.15  184.44 5371.22   188.4  5371.4  192.37 5371.34  194.35 5371.36
  202.28 5371.54  204.26 5371.56   212.2 5371.72  214.18 5371.73  224.09 5371.89
  226.07 5371.88  228.06 5371.93     234 5372.04  237.97 5372.09  239.95 5372.14
   245.9 5372.25  247.88 5372.25  249.86 5372.31  251.85 5372.33  255.81 5372.42
  257.79 5372.44  261.76  5372.6  265.72 5372.65  267.71 5372.62  273.66 5372.74
  275.64 5372.74  281.59  5372.8  285.55 5372.89  287.53 5372.88   291.5 5372.92
  293.48 5372.99  297.45 5373.04  301.41 5373.13  305.38  5373.3  307.36 5373.73
  313.31 5373.99  315.29 5374.15  317.27 5374.17  321.24  5374.1   325.2 5374.11
  341.06 5374.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  125.55    .102  158.44     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        125.56  165.73           24.01   24.08   24.27             .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
    8.79   95.88 5386.75       F
     140     146 5366.92       T
     158     170  5367.7       T
  260.62   312.65382.559       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0     8.5 5386.73   312.6  341.065383.959

CULVERT
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RIVER: Skunk
REACH: 04                  RS: 9260

INPUT
Description: Ped. Bridge U/S of 27th Way (100% potential debris block)
Distance from Upstream XS =      .1
Deck/Roadway Width        =      23
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       3
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     127 5366.37             137 5366.17             195 5369.97

Upstream Bridge Cross Section Data
Station Elevation Data     num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5376.73    1.98 5376.66    3.97 5376.73    7.93 5376.75   13.88 5376.67
   17.85 5376.65   21.82 5376.46   23.8 5376.55   27.77 5376.57   31.73 5376.55
   33.72  5376.5    35.7  5376.4   39.67 5376.47   41.65 5376.48   43.63 5376.41
   51.56 5376.33   55.53 5376.21   61.48 5376.08   65.45 5376.02   67.43 5375.95
   77.35 5375.74    83.3 5375.71   91.23 5375.54    95.2 5375.49   97.18 5375.53
  101.15 5375.51  103.13 5375.47   107.1 5375.35  111.06 5375.01  113.05  5374.8
  115.03 5374.64  117.01 5374.56  120.98 5374.35  122.96 5374.32  124.95 5374.52
  125.55 5374.65  125.56 5374.65  126.93 5374.95  128.91 5369.63   130.9 5367.03
  136.84 5366.98  140.81 5366.92  142.79 5366.55  144.78 5364.63     146 5361.22
     158 5361.22  158.44 5364.64  158.66 5364.91  160.64 5368.22  162.63  5369.5
  164.61 5369.83  165.73 5369.95  166.59 5370.05  168.58 5370.58  170.56 5370.76
  180.47 5371.15  184.44 5371.22   188.4  5371.4  192.37 5371.34  194.35 5371.36
  202.28 5371.54  204.26 5371.56   212.2 5371.72  214.18 5371.73  224.09 5371.89
  226.07 5371.88  228.06 5371.93     234 5372.04  237.97 5372.09  239.95 5372.14
   245.9 5372.25  247.88 5372.25  249.86 5372.31  251.85 5372.33  255.81 5372.42
  257.79 5372.44  261.76  5372.6  265.72 5372.65  267.71 5372.62  273.66 5372.74
  275.64 5372.74  281.59  5372.8  285.55 5372.89  287.53 5372.88   291.5 5372.92
  293.48 5372.99  297.45 5373.04  301.41 5373.13  305.38  5373.3  307.36 5373.73
  313.31 5373.99  315.29 5374.15  317.27 5374.17  321.24  5374.1   325.2 5374.11
  341.06 5374.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  125.55    .102  158.44     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
        125.56  165.73            .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
    8.79   95.88 5386.75       F
     140     146 5366.92       T
     158     170  5367.7       T
  260.62   312.65382.559       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0     8.5 5386.73   312.6  341.065383.959

Downstream  Deck/Roadway Coordinates
    num=       3
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      98 5366.37             108 5366.17             166 5369.97

Downstream Bridge Cross Section Data
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5376.69    5.99 5376.69   13.98 5376.37   17.97 5376.25   21.97 5376.08
   23.96 5375.97   25.96    5376   31.95 5376.49   33.95 5376.55   37.94 5376.24
   39.94 5376.16   41.94 5376.03   45.93 5375.84   47.93 5375.64   49.92 5375.29
   51.92 5375.06   53.92 5374.98   59.91 5374.84   61.91 5374.82    63.9 5374.75
    65.9 5374.75    69.9 5374.64   73.89 5374.48   79.88 5374.28   83.87 5374.07
   89.86 5373.72   91.86 5373.66   95.32 5373.99   95.86 5374.04   97.85 5372.27
   98.64  5370.3   99.85 5367.25  101.85 5366.06  103.84 5366.08  107.84 5366.05
  109.83 5365.99  111.83    5366  113.83 5365.59  115.83 5364.11   116.6 5361.01
   128.6 5361.01   129.8 5363.38   133.8 5367.68   135.8 5367.77  137.34 5368.01
  139.14 5368.17  141.79 5368.38  147.78 5368.73  149.77 5368.78  151.77 5369.09
  153.77 5370.19  155.77  5370.7  157.75 5370.99  159.73 5371.16  161.71 5371.21
  165.67 5371.19  167.65 5371.24  169.63 5371.16  171.62 5371.03   173.6    5371
  177.56    5371   183.5 5371.07  187.47 5371.08  189.45 5371.18  195.39 5371.34
  207.28 5371.55  215.21 5371.61  219.17 5371.71  231.06 5371.76  233.04 5371.83
  235.02 5371.78  238.98 5371.81  240.96 5371.87  242.94 5371.81  244.92 5371.82
  254.83 5372.07  256.81 5372.07  260.78 5372.12  262.76 5372.18  264.74 5372.15
   268.7 5372.17  274.64 5372.27  278.61 5372.32  280.59 5372.32  284.55 5372.39
  286.53  5372.4  296.44 5372.54  302.38 5372.69  304.36 5372.77  308.33 5372.81
  314.27 5372.82  318.23 5372.76   322.2 5372.75  326.16 5372.66   332.1 5372.66
  336.07 5372.74  338.05 5372.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   98.64    .102  137.34     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         95.32  139.14            .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
   12.08   66.695386.456       F
      90   116.6 5366.17       F
   128.6     135 5367.48       F
  236.27  338.055381.787       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   11.655386.686

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       4      12
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FHWA Chart # 8 - flared wingwalls
FHWA Scale # 3 - Wingwall flared 0 deg. (sides extended straight)
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  0      24     .013     .013     3.99                   .5                 1
Upstream   Elevation =  5361.22
           Centerline Station =  152
Downstream Elevation =  5361.01
           Centerline Station =  122.6

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 9246

INPUT
Description: Ped. Bridge U/S of 27th Way
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5376.69    5.99 5376.69   13.98 5376.37   17.97 5376.25   21.97 5376.08
   23.96 5375.97   25.96    5376   31.95 5376.49   33.95 5376.55   37.94 5376.24
   39.94 5376.16   41.94 5376.03   45.93 5375.84   47.93 5375.64   49.92 5375.29
   51.92 5375.06   53.92 5374.98   59.91 5374.84   61.91 5374.82    63.9 5374.75
    65.9 5374.75    69.9 5374.64   73.89 5374.48   79.88 5374.28   83.87 5374.07
   89.86 5373.72   91.86 5373.66   95.32 5373.99   95.86 5374.04   97.85 5372.27
   98.64  5370.3   99.85 5367.25  101.85 5366.06  103.84 5366.08  107.84 5366.05
  109.83 5365.99  111.83    5366  113.83 5365.59  115.83 5364.11   116.6 5361.01
   128.6 5361.01   129.8 5363.38   133.8 5367.68   135.8 5367.77  137.34 5368.01
  139.14 5368.17  141.79 5368.38  147.78 5368.73  149.77 5368.78  151.77 5369.09
  153.77 5370.19  155.77  5370.7  157.75 5370.99  159.73 5371.16  161.71 5371.21
  165.67 5371.19  167.65 5371.24  169.63 5371.16  171.62 5371.03   173.6    5371
  177.56    5371   183.5 5371.07  187.47 5371.08  189.45 5371.18  195.39 5371.34
  207.28 5371.55  215.21 5371.61  219.17 5371.71  231.06 5371.76  233.04 5371.83
  235.02 5371.78  238.98 5371.81  240.96 5371.87  242.94 5371.81  244.92 5371.82
  254.83 5372.07  256.81 5372.07  260.78 5372.12  262.76 5372.18  264.74 5372.15
   268.7 5372.17  274.64 5372.27  278.61 5372.32  280.59 5372.32  284.55 5372.39
  286.53  5372.4  296.44 5372.54  302.38 5372.69  304.36 5372.77  308.33 5372.81
  314.27 5372.82  318.23 5372.76   322.2 5372.75  326.16 5372.66   332.1 5372.66
  336.07 5372.74  338.05 5372.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   98.64    .102  137.34     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         95.32  139.14             11.4   11.67   12.52             .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
   12.08   66.695386.456       F
      90   116.6 5366.17       F
   128.6     135 5367.48       F
  236.27  338.055381.787       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   11.655386.686

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 9234

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5376.54    1.99 5376.55    5.97 5376.64    9.94 5376.32   11.93 5376.19
   15.91 5376.12    17.9 5376.03   19.89 5375.78   27.84 5375.52   29.83 5375.49
    35.8 5375.32   41.76 5375.08   45.74 5374.98   49.72 5374.79   53.69 5374.57
   57.67 5374.45   61.65 5374.29   67.61 5374.01   71.59 5373.87   77.56 5373.59
   81.53 5373.43   83.52 5373.31   85.51 5373.36   88.96 5373.56   89.49 5373.59
   91.48 5371.36   92.15 5369.45   93.47 5365.75   95.45 5365.33   97.44 5365.33
  103.41 5365.12   105.4 5364.95  107.39 5363.87  109.37  5362.4  111.36 5362.72
  113.35 5362.54  115.34 5361.12  117.33  5360.7  119.32    5361  121.31 5363.11
  123.29 5364.76  125.28 5365.39  127.27 5365.44  129.26 5365.81  131.25 5367.96
  133.02  5368.6  133.15 5368.65  137.22 5369.03  143.18 5369.39  147.16  5369.5
  149.15 5369.49  151.14 5369.35  153.13 5369.76  155.12 5370.41  157.11 5370.84
  163.07 5371.27  165.06 5371.22  169.04 5371.26  171.03 5371.03  173.02 5371.12
     177 5371.06  180.98 5371.18  184.96 5370.95  188.94 5370.95  190.93    5371
  198.89 5371.13  200.88 5371.12  210.82 5371.26   214.8 5371.29  216.79 5371.38
  220.77 5371.42  224.75  5371.5  228.73 5371.48  232.71 5371.54  236.69 5371.55
  238.68  5371.6  240.66 5371.57  244.64 5371.58  248.62 5371.71  250.61 5371.68
  254.59 5371.74  260.56  5371.8  262.55 5371.87  264.54 5371.84  268.52 5371.97
   272.5 5371.89  276.48 5371.88  280.46 5371.95  284.43 5371.96  288.41 5372.16
  292.39 5372.03  296.37 5372.09  300.35 5372.11  306.32 5372.06  312.29 5372.14
  314.28 5372.12  318.26 5372.19  322.23 5372.19  334.17 5372.24  340.14 5372.21

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   92.15    .102  133.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         88.96  133.15            52.17   40.03   25.52             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   15.19   59.075386.143       F
   232.2  340.145381.536       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0   15.165386.543

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 9194

INPUT
Description: 27th Way (U/S)
Station Elevation Data    num=      98
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5373.15    5.83    5373    9.72 5372.68   15.56 5372.51    17.5 5372.48
   21.39  5372.2   23.34 5372.17   29.17 5371.94   31.12 5371.79   33.06 5371.54
   36.95 5371.25   40.84 5371.01   46.68 5370.83   50.57  5370.8   54.46 5370.87
   58.03 5371.26   60.29 5371.31   64.18 5371.28   66.13 5371.16    70.1 5370.99
   72.09 5371.01    73.2 5370.46   74.08 5370.03   76.06 5366.82   78.05 5364.37
   80.04 5363.77   82.03 5362.21      84 5360.07    97.9 5360.07   97.92 5359.79
   99.91 5359.18   101.9 5359.38     104 5360.07  105.87 5362.05  107.86 5362.54
  111.84 5363.27  113.82 5364.19  115.81 5366.98   117.8 5368.29  120.12  5368.8
  122.56 5369.23  123.76 5369.41  127.73 5369.65  131.71 5369.71   133.7 5369.77
  137.67 5369.75  139.66 5369.69  141.65 5369.84  143.63  5370.3  147.61 5370.84
   149.6 5370.97  153.57 5371.15  155.56 5370.94  157.54 5370.89  159.53 5371.04
  161.52 5371.11  163.51 5371.02  165.49    5371  167.48 5371.05  171.46 5370.94
  173.44 5370.97  177.42 5370.84  179.41 5370.88  185.37 5370.84  189.34 5370.92
   195.3 5370.98  199.28 5370.95  205.24 5370.94  209.22 5370.98  213.19 5371.16
  215.18 5371.12  217.17 5371.17  219.15 5371.15  221.14 5371.22  233.06 5371.26
  237.04 5371.32  241.01 5371.31  246.98 5371.44  250.95 5371.37  254.93 5371.52
  256.91 5371.51  260.89 5371.42  262.87 5371.52  270.82 5371.41   274.8 5371.48
  284.74 5371.54  292.69  5371.5  294.67 5371.44  300.63 5371.39  302.62 5371.43
   307.3 5371.41  310.57 5371.49  314.55 5371.46  318.52 5371.56   322.5 5371.55
  326.47 5371.48  332.43 5371.54  334.42 5371.52

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   58.03    .102  122.56     .06   307.3    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          73.2  120.12           84.55   85.29   85.93             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
      60      79 5370.02       T
     109     150 5370.02       T
  218.46  334.425381.163       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   16.675383.154      84    84.5 5367.57   103.5     104 5367.57

CULVERT


RIVER: Skunk
REACH: 04                 RS: 9150

INPUT
Description: 27th Way  (5% Potential Debris Block);
culvert size =
             20'Wx8'H
modeled culvert size (for 5% block) = 19'Wx8'H
Distance from Upstream XS =       5
Deck/Roadway Width        =   78.03
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      70  5370.5              77 5370.02              77 5374.52
     117 5374.52             117 5370.02             131    5370
     150    5370

Upstream Bridge Cross Section Data
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5373.15    5.83    5373    9.72 5372.68   15.56 5372.51    17.5 5372.48
   21.39  5372.2   23.34 5372.17   29.17 5371.94   31.12 5371.79   33.06 5371.54
   36.95 5371.25   40.84 5371.01   46.68 5370.83   50.57  5370.8   54.46 5370.87
   58.03 5371.26   60.29 5371.31   64.18 5371.28   66.13 5371.16    70.1 5370.99
   72.09 5371.01    73.2 5370.46   74.08 5370.03   76.06 5366.82   78.05 5364.37
   80.04 5363.77   82.03 5362.21      84 5360.07    97.9 5360.07   97.92 5359.79
   99.91 5359.18   101.9 5359.38     104 5360.07  105.87 5362.05  107.86 5362.54
  111.84 5363.27  113.82 5364.19  115.81 5366.98   117.8 5368.29  120.12  5368.8
  122.56 5369.23  123.76 5369.41  127.73 5369.65  131.71 5369.71   133.7 5369.77
  137.67 5369.75  139.66 5369.69  141.65 5369.84  143.63  5370.3  147.61 5370.84
   149.6 5370.97  153.57 5371.15  155.56 5370.94  157.54 5370.89  159.53 5371.04
  161.52 5371.11  163.51 5371.02  165.49    5371  167.48 5371.05  171.46 5370.94
  173.44 5370.97  177.42 5370.84  179.41 5370.88  185.37 5370.84  189.34 5370.92
   195.3 5370.98  199.28 5370.95  205.24 5370.94  209.22 5370.98  213.19 5371.16
  215.18 5371.12  217.17 5371.17  219.15 5371.15  221.14 5371.22  233.06 5371.26
  237.04 5371.32  241.01 5371.31  246.98 5371.44  250.95 5371.37  254.93 5371.52
  256.91 5371.51  260.89 5371.42  262.87 5371.52  270.82 5371.41   274.8 5371.48
  284.74 5371.54  292.69  5371.5  294.67 5371.44  300.63 5371.39  302.62 5371.43
   307.3 5371.41  310.57 5371.49  314.55 5371.46  318.52 5371.56   322.5 5371.55
  326.47 5371.48  332.43 5371.54  334.42 5371.52

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   58.03    .102  122.56     .06   307.3    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          73.2  120.12             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
      60      79 5370.02       T
     109     150 5370.02       T
  218.46  334.425381.163       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   16.675383.154      84    84.5 5367.57   103.5     104 5367.57

Downstream  Deck/Roadway Coordinates
    num=       9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    5369              29 5369.66              42 5369.66
      42 5373.66              64 5373.66              68 5369.66
      68 5369.66             103    5370             150    5370

Downstream Bridge Cross Section Data
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5368.24    1.99 5368.29    3.98 5368.26    9.94 5368.39   11.93 5368.47
   15.91 5368.49   19.89 5368.46   21.88 5368.53   25.85 5368.54   27.84  5368.6
   31.82 5368.64   33.81 5368.75    35.8 5368.94    37.5 5369.07   40.02 5369.24
   41.76 5369.32   43.75  5367.4   45.74 5362.67      47 5359.64    59.6 5359.64
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   59.66 5359.44   61.65 5358.95   63.64 5358.84      67 5359.64   67.62 5362.84
   69.61 5366.93   71.59 5369.06   73.63 5369.33   75.57 5369.35   81.54 5369.47
   85.51 5369.44   89.49 5369.34   95.46 5369.59   97.45 5369.65  101.42 5369.66
   105.4  5369.8  107.39 5369.79  109.38 5369.83  113.36 5369.83  117.33 5369.86
  119.32 5369.94   123.3    5370  125.29 5370.14  127.28 5370.25  129.27 5370.25
  133.24 5370.07  135.23 5370.02  137.22 5370.07   141.2 5370.13  145.18 5370.15
  147.17 5370.12  149.15 5370.05  151.14 5370.02  153.13 5370.05  155.12 5370.12
  157.11 5370.15  161.09 5370.13  165.06 5370.22  169.04 5370.25  171.03 5370.23
  173.02 5370.11  175.01 5370.03  178.98 5370.08  182.96 5370.18  186.94 5370.25
  188.93 5370.23  190.92 5370.15  194.89 5370.05  196.88  5370.1  200.86 5370.15
  202.85  5370.2  204.84 5370.36  206.83 5370.47  208.82 5370.47   210.8 5370.51
  214.78 5370.42  216.77 5370.39  220.75  5370.3  222.74 5370.37  224.73 5370.35
  226.71 5370.27  230.69 5370.28  232.68 5370.25  234.67 5370.32  238.65 5370.39
  240.63 5370.36  244.61 5370.53   246.6 5370.52  248.59 5370.56  250.58 5370.54
  254.56 5370.39  258.53 5370.47  260.52 5370.44  262.51 5370.48   264.5 5370.42
  266.49 5370.31  272.45 5370.37  280.41 5370.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015    37.5    .102   73.63     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         40.02   73.63             .3       .5
Ineffective Flow      num=       3
   Sta L   Sta R    Elev  Permanent
       0      44 5369.66       F
      70     130 5369.66       F
  130.37  280.41  5380.2       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box     7.5      19
FHWA Chart # 9 - flared wingwalls and Inlet top edge bevel
FHWA Scale # 2 - Wingwall flared 18 to 33.7 deg.; inlet top edge bevel=0.083D
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  5   78.03     .013     .013        0                   .5                1
Upstream   Elevation =  5360.07
           Centerline Station =  94
Downstream Elevation =  5359.64
           Centerline Station =  57

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 9109

INPUT
Description: 27th Way (D/S)
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5368.24    1.99 5368.29    3.98 5368.26    9.94 5368.39   11.93 5368.47
   15.91 5368.49   19.89 5368.46   21.88 5368.53   25.85 5368.54   27.84  5368.6
   31.82 5368.64   33.81 5368.75    35.8 5368.94    37.5 5369.07   40.02 5369.24
   41.76 5369.32   43.75  5367.4   45.74 5362.67      47 5359.64    59.6 5359.64
   59.66 5359.44   61.65 5358.95   63.64 5358.84      67 5359.64   67.62 5362.84
   69.61 5366.93   71.59 5369.06   73.63 5369.33   75.57 5369.35   81.54 5369.47
   85.51 5369.44   89.49 5369.34   95.46 5369.59   97.45 5369.65  101.42 5369.66
   105.4  5369.8  107.39 5369.79  109.38 5369.83  113.36 5369.83  117.33 5369.86
  119.32 5369.94   123.3    5370  125.29 5370.14  127.28 5370.25  129.27 5370.25
  133.24 5370.07  135.23 5370.02  137.22 5370.07   141.2 5370.13  145.18 5370.15
  147.17 5370.12  149.15 5370.05  151.14 5370.02  153.13 5370.05  155.12 5370.12
  157.11 5370.15  161.09 5370.13  165.06 5370.22  169.04 5370.25  171.03 5370.23
  173.02 5370.11  175.01 5370.03  178.98 5370.08  182.96 5370.18  186.94 5370.25
  188.93 5370.23  190.92 5370.15  194.89 5370.05  196.88  5370.1  200.86 5370.15
  202.85  5370.2  204.84 5370.36  206.83 5370.47  208.82 5370.47   210.8 5370.51
  214.78 5370.42  216.77 5370.39  220.75  5370.3  222.74 5370.37  224.73 5370.35
  226.71 5370.27  230.69 5370.28  232.68 5370.25  234.67 5370.32  238.65 5370.39
  240.63 5370.36  244.61 5370.53   246.6 5370.52  248.59 5370.56  250.58 5370.54
  254.56 5370.39  258.53 5370.47  260.52 5370.44  262.51 5370.48   264.5 5370.42
  266.49 5370.31  272.45 5370.37  280.41 5370.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015    37.5    .102   73.63     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         40.02   73.63            33.04      33   32.69              .3       .5
Ineffective Flow      num=       3
   Sta L   Sta R    Elev  Permanent
       0      44 5369.66       F
      70     130 5369.66       F
  130.37  280.41  5380.2       F

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 9076

INPUT
Description:
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5368.98    1.99  5368.7    3.99 5368.29    5.98 5368.17    7.97 5368.24
    9.97 5368.29   11.96 5368.33   13.96 5368.36   15.95 5368.37   17.94 5368.34
   19.94 5368.32   21.93 5368.26   23.92 5368.18   25.92 5368.44   27.91 5368.63
    29.8  5368.7    29.9  5368.7    31.9 5368.75   33.89 5368.82   34.57 5368.22
   35.89 5367.06   37.88 5363.93   39.87  5362.7   41.87 5362.64   43.86 5362.43
   45.85 5362.33   47.85 5362.33   49.84 5362.29   51.83  5362.2   53.83 5362.16
   55.82 5362.09   57.82 5360.57   59.81 5358.99    61.8 5358.61    63.8 5358.74
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   65.79 5360.52   67.78 5362.18   69.78 5362.56   71.77 5362.64   73.76 5362.74
   75.76 5363.11   77.75 5363.99   79.75 5364.94   81.74 5365.49   83.73    5366
   85.73 5366.48   87.72 5366.96   89.71 5367.44   91.71 5367.98   92.07 5368.09
    93.7 5368.61   95.69 5369.02   97.69 5369.17   99.68  5369.2  101.68 5369.21
  103.67 5369.12  105.66 5368.95  107.66 5368.88  109.65 5368.82  111.64 5368.83
  113.64 5368.92  115.63 5368.95  117.62 5368.98  119.62 5369.06  121.61 5369.15
  123.61  5369.2   125.6 5369.21  127.59 5369.17  129.59  5369.1  131.58 5369.02
  133.57 5369.01  135.57 5369.18  137.56 5369.41  139.55 5369.54  141.55 5369.79
  143.54 5370.02  145.54 5370.03  147.53    5370  149.52 5370.06  151.52 5370.15
  153.51 5370.21   155.5 5370.23   157.5 5370.27  159.49 5370.33  161.48 5370.36
  163.48 5370.35  165.47  5370.4  167.47  5370.5  169.46 5370.55  171.45 5370.63
  173.45 5370.68  175.44 5370.66  177.43  5370.6  179.43 5370.55  181.42 5370.58
  183.41  5370.6  185.41 5370.62   187.4 5370.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015    29.8    .102   92.07     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         34.57   92.07            35.23   35.25   35.29              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
      30      43 5367.46       T
  110.45  170.41 5378.77       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  170.41   187.45380.589

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 9041

INPUT
Description:
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5368.07    1.97 5368.03    3.94 5368.04     5.9 5368.05    7.87  5368.1
    9.84 5368.08   11.81 5368.06   13.78 5368.05   15.74 5368.08   17.71 5368.03
   19.68 5367.96   21.65 5367.88   23.62 5367.77   25.58 5367.95   27.55 5368.21
   29.52 5368.25   29.59 5368.25   31.49 5368.27   33.46 5368.33   33.72  5368.2
   35.42 5367.37   37.39 5365.72   39.36 5365.25   41.33 5365.23    43.3 5365.17
   45.26 5365.11   47.23 5365.08    49.2 5365.04   51.17 5364.95   53.13 5363.47
    55.1 5359.78   57.07 5359.24   59.04 5358.81   61.01 5358.45   62.97 5358.56
   64.94 5359.45   66.91 5360.83   68.88 5361.18   70.85 5361.56   72.81 5361.94
   74.78 5362.24   76.75 5362.59   78.72 5363.22   80.69 5363.94   82.65 5364.94
   84.62 5366.02   86.59 5366.98   88.56 5368.23   89.23 5368.41   90.53 5368.78
   92.49 5369.15   94.46  5369.4   96.43 5369.42    98.4 5369.51  100.37 5369.53
  102.33 5369.37   104.3 5369.36  106.27 5369.39  108.24 5369.15  110.21 5369.12
  112.17 5369.16  114.14 5369.21  116.11 5369.27  118.08 5369.32

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015    29.59    .102   89.23     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         33.72   89.23            39.96   39.92   39.93              .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   34.68      45 5367.46       T
   93.65  102.795379.295       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  102.79  118.085379.353

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 9001

INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5367.92    1.97 5367.78    3.95 5367.76    5.92  5367.8    7.89 5367.79
    9.87 5367.76   11.84 5367.71   13.81 5367.72   15.79 5367.69   17.76  5367.6
   19.74 5367.51   21.71 5367.39   23.68 5367.27   25.66 5367.24   27.63 5367.35
   29.35 5367.49    29.6 5367.51   31.58 5367.64   33.55 5367.71   35.52  5367.7
    37.5 5367.65   39.47  5367.6   41.44 5367.56   43.42 5367.53   45.39 5367.53
   47.36  5367.5   49.06 5367.47   49.34 5367.46   51.31  5364.6   53.29 5360.47
   55.26 5359.98   57.23 5359.04   59.21  5358.3   61.18 5358.09   63.15 5358.33
   65.13 5359.07    67.1 5359.79   69.07 5360.31   71.05  5360.8   73.02 5361.34
   74.99 5361.89   76.97 5362.39   78.94 5363.27   80.91 5364.37   82.89 5365.42
   84.86 5366.54   86.83 5367.79   88.81 5368.66   89.48 5368.76   89.67 5368.79
   90.78 5368.95   92.76 5369.11   94.73 5369.19    96.7 5369.23   98.68 5369.44
  100.65 5369.21  102.62  5369.4   104.6 5369.43  106.57 5369.46  108.54 5369.49
  110.52 5369.52  112.49 5369.56  114.46 5369.59  116.44 5369.62  118.41  5369.7
  120.38 5369.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   29.35    .102   89.48     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         49.06   89.67            64.39   63.49   63.45              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   91.11  120.385378.976

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 8937

INPUT
Description:
Station Elevation Data    num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
       0 5367.43    1.98 5367.37    3.95 5367.33    5.93 5367.34     7.9  5367.2
    9.88 5367.14   11.86 5367.11   13.83 5367.07   15.81 5367.02   17.78 5366.93
   19.76 5366.83   21.74 5366.72   23.71 5366.57   25.69 5366.94   27.66 5366.96
   28.19 5366.96   29.08 5366.97   29.64 5366.97   31.62 5363.77   33.59 5363.42
   35.57 5363.05   37.54 5362.63   39.52 5361.99    41.5 5361.22   43.47 5360.62
   45.45 5360.31   47.42 5359.85    49.4 5359.34   51.38 5358.94   53.35 5358.95
   55.33 5359.35    57.3 5358.82   59.28 5358.08   61.26 5357.97   63.23 5358.63
   65.21  5359.3   67.18 5359.73   69.16 5360.09   71.14 5360.57   73.11 5361.06
   75.09 5361.56   77.06 5362.01   79.04  5362.7   81.02 5363.67   82.99 5364.73
   84.97  5365.9   86.95    5367   88.92 5367.91   89.15 5367.98    89.9 5368.23
    90.9 5368.55   92.87 5368.84   94.85 5368.91   96.83 5368.96    98.8 5368.99
  100.78 5369.09  102.75 5369.19  104.73 5369.25  106.71  5369.3  108.68 5369.36
  110.66 5369.42  112.63 5369.48  114.61 5369.54  116.59 5369.59  118.56 5369.65
  120.54  5369.7  122.51 5369.75  124.49 5369.81  126.47 5369.86  128.44 5369.91
  130.42 5369.96  132.39 5370.01  134.37 5370.05  136.35 5370.11  138.32 5370.18
   140.3 5370.17  142.27 5370.04  144.25 5369.96  146.23 5369.92   148.2 5369.85
  150.18 5369.75  152.15 5369.66  154.13 5369.58  156.11  5369.5  158.08 5369.41
  160.06 5369.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   28.19    .102   89.15     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          29.08    89.9             64.47   64.46   64.52              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   97.91  160.065378.992

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 8873

INPUT
Description: Moorhead Avenue (U/S)
Station Elevation Data    num=     106
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5366.77    1.99 5366.67    3.99 5366.65    5.98 5366.56    7.98 5366.46
    9.97 5366.42   11.96 5366.38   13.96  5366.3   15.95 5366.24   17.94 5366.16
   19.94 5366.01   21.93 5365.85   23.93 5365.81   25.92 5365.89   27.08 5365.91
   27.91 5365.92   29.91  5364.8   30.07 5364.72    31.9 5363.76   33.89 5363.32
   35.89 5362.85   37.88 5361.69   39.88 5360.42   41.87 5359.76   43.86 5359.23
      44 5358.21      54 5358.21   55.83  5357.7   57.82 5357.48   59.81 5357.34
   61.81 5357.27    63.8  5357.6   65.79  5358.3   67.79 5359.09   69.78 5359.73
   71.78 5361.52   73.77 5363.48   75.76 5364.22   77.76 5364.87   79.75 5365.46
   80.05  5365.5   81.75 5365.78   83.74 5365.74   85.73 5365.47   87.73 5365.27
   89.72 5365.32   91.71 5365.39   93.71 5365.46    95.7 5365.51    97.7 5365.56
   99.69 5365.62  101.68 5365.68  103.68 5365.73  105.67 5365.79  107.66 5365.86
  109.66 5365.89  111.65 5365.91  113.65 5365.97  115.64 5365.99  117.63 5366.04
  119.63 5366.05  121.62 5366.09  123.61 5366.15  125.61 5366.17   127.6 5366.24
   129.6 5366.33  131.59 5366.33  133.58  5366.3  135.58 5366.33  137.57 5366.34
  139.57 5366.38  141.56 5366.44  143.55 5366.49  145.55 5366.54  147.54  5366.6
  149.53 5366.65  151.53 5366.68  153.52 5366.73  155.52 5366.79  157.51 5366.84
   159.5  5366.9   161.5 5366.91  163.49 5366.94  165.48 5367.08  167.48 5367.56
  169.47 5368.16  171.47 5368.37  173.46 5368.17  175.45  5367.7  177.45 5367.52
  179.44 5367.47  181.43 5367.47  183.43 5367.49  185.42 5367.51  187.42 5367.56
  189.41 5367.61   191.4 5367.69   193.4 5367.84  195.39 5367.97  197.38 5368.11
  199.38 5368.31  201.37 5368.46  203.37 5368.62  205.36 5368.74  207.35 5368.86
  209.35 5368.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   27.08    .102   80.05     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          30.07   80.05            144.54  160.07  174.67              .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
      15      38 5366.24       T
      71   94.27 5365.78       T
   94.27  199.495375.474       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
      44    45.5 5362.91    63.5      65 5362.91  199.49  209.355378.321

CULVERT


RIVER: Skunk
REACH: 04                 RS: 8800

INPUT
Description: Moorhead Avenue (1.1' existing sediment.  15% potential debris
             block);
culvert size = 10'Wx5.8'H
modeled culvert size (for 15%
             block) = 8.5'Wx5.8'H
Distance from Upstream XS =       7
Deck/Roadway Width        =     125
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    5366              35  5366.6            39.1  5366.6
    39.1  5366.6              47  5370.1              69 5369.11
      76 5365.64              76 5365.22              84 5365.22

Upstream Bridge Cross Section Data
Station Elevation Data    num=     106
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5366.77    1.99 5366.67    3.99 5366.65    5.98 5366.56    7.98 5366.46
    9.97 5366.42   11.96 5366.38   13.96  5366.3   15.95 5366.24   17.94 5366.16
   19.94 5366.01   21.93 5365.85   23.93 5365.81   25.92 5365.89   27.08 5365.91
   27.91 5365.92   29.91  5364.8   30.07 5364.72    31.9 5363.76   33.89 5363.32
   35.89 5362.85   37.88 5361.69   39.88 5360.42   41.87 5359.76   43.86 5359.23
      44 5358.21      54 5358.21   55.83  5357.7   57.82 5357.48   59.81 5357.34
   61.81 5357.27    63.8  5357.6   65.79  5358.3   67.79 5359.09   69.78 5359.73
   71.78 5361.52   73.77 5363.48   75.76 5364.22   77.76 5364.87   79.75 5365.46
   80.05  5365.5   81.75 5365.78   83.74 5365.74   85.73 5365.47   87.73 5365.27
```

```
   89.72 5365.32   91.71 5365.39   93.71 5365.46    95.7 5365.51    97.7 5365.56
   99.69 5365.62  101.68 5365.68  103.68 5365.73  105.67 5365.79  107.66 5365.86
  109.66 5365.89  111.65 5365.91  113.65 5365.97  115.64 5365.99  117.63 5366.04
  119.63 5366.05  121.62 5366.09  123.61 5366.15  125.61 5366.17   127.6 5366.24
   129.6 5366.33  131.59 5366.33  133.58  5366.3  135.58 5366.33  137.57 5366.34
  139.57 5366.38  141.56 5366.44  143.55 5366.49  145.55 5366.54  147.54  5366.6
  149.53 5366.65  151.53 5366.68  153.52 5366.73  155.52 5366.79  157.51 5366.84
   159.5  5366.9   161.5 5366.91  163.49 5366.94  165.48 5367.08  167.48 5367.56
  169.47 5368.16  171.47 5368.37  173.46 5368.17  175.45  5367.7  177.45 5367.52
  179.44 5367.47  181.43 5367.47  183.43 5367.49  185.42 5367.51  187.42 5367.56
  189.41 5367.61   191.4 5367.69   193.4 5367.84  195.39 5367.97  197.38 5368.11
  199.38 5368.31  201.37 5368.46  203.37 5368.62  205.36 5368.74  207.35 5368.86
  209.35 5368.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   27.08    .102   80.05     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         30.07   80.05             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
      15      38 5366.24       T
      71   94.27 5365.78       T
   94.27  199.495375.474       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev

Downstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  5366.4              65    5366              98 5365.27
     115 5365.27             115 5367.79             140 5367.79
     141    5364             166    5364

Downstream Bridge Cross Section Data
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5367.01    1.99  5366.4    3.98 5365.64    5.96 5365.15    7.95    5365
    9.94 5364.87   11.93  5364.9   13.92 5364.92    15.9 5364.91   17.89 5364.93
   19.88  5364.9   21.87 5364.89   23.85 5364.88   25.84 5364.97   27.83    5365
   29.82 5364.98   31.81 5364.87   33.79  5364.8   35.78 5364.76   37.77 5364.76
   39.76 5364.73   41.75 5364.72   43.73 5364.69   45.72  5364.7   47.71 5364.65
    49.7 5364.57   51.69 5364.56   53.67 5364.41   55.66 5364.36   57.65 5364.32
   59.64 5364.29   61.63 5364.22   63.61 5364.17    65.6 5364.17   67.59 5364.19
   69.58 5364.14   71.56 5364.12   73.55 5364.11   75.54 5364.08   77.53 5364.06
   79.52 5364.03    81.5 5364.02   83.49    5364   85.48 5363.94   87.47 5363.89
   89.46 5363.84   91.44 5363.78   93.43 5363.72   95.42 5363.66   97.41  5363.6
    99.4 5363.62  101.38 5363.59  103.37 5363.47  105.36 5363.33  107.35 5363.16
  108.04 5363.15  109.33 5363.14  111.32 5363.17  113.29 5363.04  115.25 5362.52
  117.21 5361.63  119.17 5360.52  121.14 5359.88   123.1 5358.85  125.06 5356.82
  127.03 5355.62  128.99 5355.91  130.95 5356.68  132.91  5356.8  134.88 5356.89
  136.84 5356.88   138.8 5356.66  140.77 5356.57  142.73  5356.5  144.69 5356.34
  146.65 5356.69  148.62 5357.95  150.58 5359.16  152.54 5360.18   154.5 5361.56
  156.47 5362.92  156.66 5362.96  158.43 5363.37  160.39 5363.54  161.92 5363.64
  162.36 5363.68  164.32 5363.82  166.28 5363.89  168.24 5363.88  170.21 5363.95
  172.17 5364.03  174.13 5364.09   176.1 5364.13  178.06 5364.17  180.02 5364.17
  181.98 5364.18  183.95 5364.21

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  108.04    .102  161.92     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
        115.25  156.66             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0   39.385377.014       F
   39.38     114 5365.27       F
     155     170    5364       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box     5.8     8.5
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  6     137     .013     .013      1.1                    .4                 1
Number of Barrels =  2
Upstream   Elevation =  5357.11
Centerline Stations
    Sta.    Sta.
   49.75   59.25
Downstream Elevation =  5356.39
Centerline Stations
    Sta.    Sta.
  129.75  139.25

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 8713

INPUT
Description: Moorhead Avenue (D/S)
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5367.01    1.99  5366.4    3.98 5365.64    5.96 5365.15    7.95    5365
    9.94 5364.87   11.93  5364.9   13.92 5364.92    15.9 5364.91   17.89 5364.93
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```
   19.88  5364.9   21.87 5364.89   23.85 5364.88   25.84 5364.97   27.83    5365
   29.82 5364.98   31.81 5364.87   33.79  5364.8   35.78 5364.76   37.77 5364.76
   39.76 5364.73   41.75 5364.72   43.73 5364.69   45.72  5364.7   47.71 5364.65
    49.7 5364.57   51.69 5364.56   53.67 5364.41   55.66 5364.36   57.65 5364.32
   59.64 5364.29   61.63 5364.22   63.61 5364.17    65.6 5364.17   67.59 5364.19
   69.58 5364.14   71.56 5364.12   73.55 5364.11   75.54 5364.08   77.53 5364.06
   79.52 5364.03    81.5 5364.02   83.49    5364   85.48 5363.94   87.47 5363.89
   89.46 5363.84   91.44 5363.78   93.43 5363.72   95.42 5363.66   97.41  5363.6
    99.4 5363.62  101.38 5363.59  103.37 5363.47  105.36 5363.33  107.35 5363.16
  108.04 5363.15  109.33 5363.14  111.32 5363.17  113.29 5363.04  115.25 5362.52
  117.21 5361.63  119.17 5360.52  121.14 5359.88   123.1 5358.85  125.06 5356.82
  127.03 5355.62  128.99 5355.91  130.95 5356.68  132.91  5356.8  134.88 5356.89
  136.84 5356.88   138.8 5356.66  140.77 5356.57  142.73  5356.5  144.69 5356.34
  146.65 5356.69  148.62 5357.95  150.58 5359.16  152.54 5360.18   154.5 5361.56
  156.47 5362.92  156.66 5362.96  158.43 5363.37  160.39 5363.54  161.92 5363.64
  162.36 5363.68  164.32 5363.82  166.28 5363.89  168.24 5363.88  170.21 5363.95
  172.17 5364.03  174.13 5364.09   176.1 5364.13  178.06 5364.17  180.02 5364.17
  181.98 5364.18  183.95 5364.21

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  108.04    .102  161.92     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        115.25  156.66             62.21   59.31   55.27              .3       .5
Ineffective Flow     num=        3
   Sta L   Sta R    Elev  Permanent
       0   39.385377.014       F
   39.38     114 5365.27       F
     155     170    5364       F

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 8654

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5360.78    5.96 5360.81    7.95 5360.82    9.93 5360.83   13.91 5360.85
    15.9 5360.86   17.88 5360.87   19.87 5360.88   23.84  5360.9   27.82  5360.9
    29.8 5360.89   33.78 5360.81   35.76 5360.81   37.75 5360.83   39.74 5360.81
   41.73 5360.73   43.71 5360.57    45.7 5360.45   47.69 5360.37   49.67 5360.35
   51.66 5360.34   53.65 5360.31   55.63 5360.28   57.62 5360.26   59.61  5360.2
   61.59 5360.16   63.58  5360.1   65.57 5360.06   67.55 5359.98   69.54 5359.94
   71.53 5359.86   73.52  5359.8   77.49 5359.74   79.48 5359.73   81.46 5359.69
   83.45 5359.67   85.44 5359.59   87.42 5359.53   89.41 5359.48    91.4 5359.44
   93.38 5359.43   95.37 5359.39   97.36 5359.34   99.35  5359.3  101.33 5359.27
  103.32 5359.23  105.31 5359.16  107.29 5359.11  109.28 5359.07  111.27 5359.01
  115.24 5359.01  117.23 5358.98  119.21 5358.94   121.2 5358.91  123.19  5358.9
  125.18 5358.88  127.16 5358.87  129.15 5358.87  133.12 5358.85  135.11 5358.83
   137.1  5358.8  139.08 5358.74  141.07 5358.72  143.06 5358.71  145.04 5358.66
  147.03  5358.6  149.02 5358.57     151 5358.49  152.99 5358.39  154.98 5358.28
  156.97 5358.14  158.95 5358.07  160.94 5358.13  162.93 5358.33  164.91 5358.67
  165.25 5358.72   166.9 5358.96  168.89 5359.02  170.87 5358.83  171.69 5358.39
  172.86 5357.76  174.85 5355.25  176.83  5352.8  178.82 5352.38  180.81 5352.02
   182.8  5352.4  184.78 5352.41  186.77 5352.44  188.76 5352.41  190.74 5352.62
  192.73 5353.33  194.72 5354.16   196.7 5354.71  198.69 5356.08  200.68 5358.05
  202.66 5359.75  204.29 5360.14  204.65 5360.22  206.64 5360.28  210.61 5360.34

Manning's n Values         num=       2
     Sta   n Val     Sta   n Val
       0     .06  165.25    .102

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        171.69  204.29             78.21    77.8   78.74              .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
   45.63   72.515370.453       F
Blocked Obstructions      num=       1
   Sta L   Sta R    Elev
       0   45.635370.777

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 8576

INPUT
Description: US 36 Culvert (U/S)
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5362.39    1.99 5362.58    3.99 5362.61   13.95 5362.46   17.93  5362.3
   21.92 5362.27   29.89 5362.15   35.87 5362.01   39.85    5362   43.84 5361.93
   47.83 5361.92    53.8  5361.7    55.8 5361.74   59.78 5361.61   65.76 5361.54
   69.74 5361.39   73.73 5361.41   77.72 5361.35    81.7  5361.4   85.69 5361.28
   87.68 5361.28   93.66 5361.06   97.64 5360.64  100.85 5360.44  103.62 5360.35
  105.61 5360.08  107.61 5360.08  111.59 5359.95  117.57 5359.89  119.56 5359.94
  129.53 5359.54  133.52 5359.45   139.5  5359.4  143.49 5359.29  151.47 5359.63
  157.45 5359.12  169.41    5359  179.38 5358.93  181.38 5358.98  189.46 5359.56
  195.34 5359.54  197.33 5359.58  199.33 5359.46  201.32 5359.51  205.31 5359.39
  211.29 5359.42  215.28 5359.57  219.27 5359.34  221.26  5359.4  223.25 5359.58
  227.24 5359.65  229.24 5359.77  233.22  5359.8  239.21 5359.48  243.19 5359.15
  245.19 5358.89  247.18 5358.75  251.17 5358.58  253.17  5358.8  255.16  5358.9
  259.15 5358.56  261.14 5358.69  263.14 5358.71  265.13 5358.59   275.1 5358.31
  279.09 5358.25  283.08 5358.33  287.06 5358.07  289.06 5357.77  291.05 5357.62
  299.03 5357.48  305.01  5357.3  314.98 5357.08  318.97 5356.93  324.95 5357.05
  326.95 5357.13  334.92 5356.84  338.91 5356.85  344.89  5356.8  346.89  5356.9
  348.88 5356.83   351.6 5357.16  352.87  5357.4  356.86 5357.92  358.85 5358.71
  360.84 5359.78  361.83 5359.26  362.84 5358.72  364.83 5356.16  366.83 5352.44
  368.82 5350.02  370.81 5349.92     372 5348.69     385 5348.69  386.77 5351.52
  388.76 5355.96  390.75 5360.67  391.45 5360.65  392.75 5360.61

Manning's n Values         num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  100.85    .015  189.46     .06   351.6    .102

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

```
        361.83  391.45          576.51  579.79  576.09             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0  248.595372.392       F
  248.59     369 5359.89       T
     388     392  5360.5       T

Internal Rating Curve

    Flow      Elev
     (cfs)      (ft)

        0   5348.69
      263   5354.66
      509   5357.63
      696   5359.93
      890   5361.27
     1455   5362.93


CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7996

INPUT
Description: US 36 Culvert (D/S)
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5346.02    1.99 5346.02    3.97 5346.03    5.96 5346.04    7.95 5346.02
    9.93 5346.03   11.92 5346.04    13.9 5346.07   15.89 5346.05   17.88 5346.09
   19.86 5346.13   21.85 5346.15   23.83  5346.2   25.82 5346.21   27.81 5346.23
    29.5 5346.22   29.79 5346.22   31.78 5346.25   33.77 5346.23   35.75 5346.57
   37.74 5346.92   39.73  5347.2   41.71 5347.62    43.7 5347.82   45.68 5347.55
   47.67 5346.96   49.66 5346.76   51.64 5345.92   53.63 5344.78   55.62 5344.09
    57.6 5343.75   59.59  5343.8   61.57 5343.95   63.56 5344.03   65.55 5344.11
   67.53 5344.22   69.52 5344.31   71.51  5344.4   73.49  5344.5   75.48 5344.62
   77.46 5344.73   79.45 5344.85   81.44 5344.77   83.42 5344.69   85.41 5344.77
   85.83 5344.54    87.4 5343.65   89.38  5342.9   91.37 5342.73   93.35 5342.56
   95.34 5342.36   97.33  5342.3   99.31 5342.06  100.61 5340.82   101.3 5340.16
  103.29  5339.9  105.27  5340.1  107.26 5339.69     108  5336.7     121  5336.7
  121.16 5337.53  123.15 5338.09  125.13 5338.15  127.12 5338.15  129.11 5338.16
  131.09 5338.14  133.08 5338.17  135.07 5338.05  137.05 5337.93  139.04  5337.8
  141.02 5337.66  143.01 5338.82   144.3 5341.17     145 5342.46  146.98 5346.43
  148.97 5347.36  150.29 5347.24  150.96 5347.19  152.94 5346.61  154.93 5346.01
  156.91 5345.86

Manning's n Values         num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015    29.5     .06  100.61    .102   144.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          85.83  146.98            7.48    6.82    6.62             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0   30.765356.021       F
    43.7     100 5347.45       F
     129   150.3 5347.24       F

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7989

INPUT
Description:
Station Elevation Data    num=      84
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5346.19    1.98 5346.17    3.97 5346.17    5.95 5346.24    7.93 5346.24
    9.92 5346.16    11.9 5346.16   13.88 5346.19   15.86 5346.22   17.85 5346.25
   19.24 5346.27   19.83 5346.27   21.81 5346.34    23.8 5346.43   25.78 5346.58
   27.76 5346.79   29.75 5346.69   31.73 5346.65   33.71 5346.83    35.7  5347.3
   37.68 5347.58   39.66 5347.16   41.65 5345.97   43.63 5344.79   45.61 5343.62
   47.59 5343.24   49.58 5343.15   51.56 5343.27   53.54 5343.37   55.53 5343.42
   57.51 5343.53   59.49 5343.55   61.48 5343.63   63.46 5343.72   65.44 5343.84
   67.43 5343.94   69.41 5344.05   71.39  5344.1   73.37 5344.25   75.36 5344.31
   77.34 5344.23   79.32 5344.14   81.31 5344.02   83.29 5343.57   84.92 5343.02
   85.27  5342.9   87.26 5342.47   89.24 5342.33   91.22 5342.21   93.21 5341.95
   95.19 5340.81   97.17 5339.96   99.16 5339.79  101.14  5340.2  103.12 5340.21
   105.1 5339.48  107.09 5337.15  109.07 5336.89  111.05 5336.97  113.04 5336.93
  115.02 5336.95     117 5337.76  118.99 5338.72  120.97 5338.76  122.95 5338.67
  124.94 5338.67  126.92 5338.67   128.9 5338.61  130.88 5338.58  132.87 5338.51
  134.85 5338.43  136.83 5338.33  138.82  5338.2   140.8 5338.09  141.51 5340.31
  142.78 5344.35  144.77 5346.28  146.75 5346.46  148.51  5346.3  148.73 5346.28
  150.72 5346.07   152.7 5345.92  154.68 5345.93  156.67 5345.89

Manning's n Values         num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   19.24     .06   97.17    .102  141.51     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          84.92  144.77            4.98    5.02    5.16             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      955356.185       F
     130     160    5356       F

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7984

INPUT
Description: Multi-use path (U/S)
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5346.3    1.99  5346.3    3.97 5346.32    5.96  5346.3    7.95 5346.31
    9.93 5346.29   11.92 5346.33   12.93 5346.37   13.91  5346.4    15.9  5346.5
```

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   17.88 5346.58   19.87 5346.67   21.86 5346.67   23.84 5346.57   25.83 5346.64
   27.82  5346.5    29.8 5346.08   31.79  5345.7   33.78 5345.27   35.76 5344.86
   37.75 5344.48   39.74 5343.57   41.73 5342.77   43.71  5342.7    45.7  5342.8
   47.69 5342.92   49.67 5343.01   51.66 5343.06   53.65 5343.13   55.63 5343.23
   57.62 5343.26   59.61 5343.31   61.59 5343.43   63.58 5343.52   65.57 5343.62
   67.55 5343.78   69.54 5343.87   71.53 5343.85   73.52 5343.83    75.5 5343.84
   77.49 5343.74   79.48 5343.54   81.46 5343.25   83.45 5342.74   84.85 5342.32
   85.44 5342.15   87.42 5342.26   89.41 5342.16    91.4 5341.16   93.38 5339.79
   95.24 5339.44   95.37 5339.41   97.36 5339.63   99.35 5340.02  101.33 5340.13
  103.32 5339.48  105.31    5338  107.29 5337.25  109.28 5337.17  111.27 5336.85
  113.25  5337.9  115.24 5338.88  117.23 5339.25  119.21 5339.15   121.2 5339.08
  123.19 5339.02  125.18 5338.96  127.16 5338.94  129.15 5338.92  131.14 5338.88
  133.12 5338.77  135.11  5338.7   137.1 5338.61  139.08 5338.63  139.92 5339.63
  141.07    5341  143.06 5345.75  145.04 5346.35  147.03 5346.09  147.71 5346.03
  149.02 5345.93  151.01 5345.92  152.99  5345.9  154.98 5345.88  156.97 5345.95

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   12.93     .06   95.24    .102  139.92     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         84.85  143.06            53.96   49.91   50.32             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      935356.297       F
     130     160    5356       F

INLINE STRUCTURE


RIVER: Skunk
REACH: 04                 RS: 7960

INPUT
Description: Multi-use path.  North of US 36
Distance from Upstream XS =      10
Deck/Roadway Width        =      18
Weir Coefficient          =     2.6
 Weir Embankment Coordinates    num =        5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   64.66 5342.91   72.02 5342.55   98.44 5341.55  118.33  5341.2   169.2  5341.2

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Weir crest shape                            = Broad Crested


INLINE STRUCTURE OUTPUT  Profile #100-yr  Inl Struct:

  E.G. Elev (ft)               5345.77    Q Gates (cfs)
  W.S. Elev (ft)               5345.57    Q Gate Group (cfs)              0.00
  Q Total (cfs)                 890.00    Gate Open Ht (ft)            5343.10
  Q Weir (cfs)                  890.00    Gate #Open
  Weir Flow Area (sq ft)        162.95    Gate Area (sq ft)               1.00
  Weir Sta Lft (ft)              93.00    Gate Submerg                    0.00
  Weir Sta Rgt (ft)             130.00    Gate Invert (ft)                0.00
  Weir Max Depth (ft)             4.56    Gate Weir Coef                 0.000
  Weir Avg Depth (ft)             4.40
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.39    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5341.21    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               37.00


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

INLINE STRUCTURE OUTPUT  Profile #FW  Inl Struct:

  E.G. Elev (ft)               5345.91    Q Gates (cfs)
  W.S. Elev (ft)               5345.70    Q Gate Group (cfs)              0.00
  Q Total (cfs)                 890.00    Gate Open Ht (ft)
  Q Weir (cfs)                  890.00    Gate #Open
  Weir Flow Area (sq ft)        160.03    Gate Area (sq ft)
  Weir Sta Lft (ft)              95.00    Gate Submerg
  Weir Sta Rgt (ft)             130.00    Gate Invert (ft)
  Weir Max Depth (ft)             4.71    Gate Weir Coef
  Weir Avg Depth (ft)             4.57
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.41    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5341.21    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               35.00


Warning: The encroachment was ignored because the encroachment was coded either outside of the cross section or inside of
         the channel.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

INLINE STRUCTURE OUTPUT  Profile #10-yr  Inl Struct:

  E.G. Elev (ft)               5343.31    Q Gates (cfs)
  W.S. Elev (ft)               5343.27    Q Gate Group (cfs)              0.00
  Q Total (cfs)                 263.00    Gate Open Ht (ft)
  Q Weir (cfs)                  263.00    Gate #Open
  Weir Flow Area (sq ft)         72.18    Gate Area (sq ft)
  Weir Sta Lft (ft)              93.00    Gate Submerg
  Weir Sta Rgt (ft)             130.00    Gate Invert (ft)
  Weir Max Depth (ft)             2.11    Gate Weir Coef
  Weir Avg Depth (ft)             1.95
  Weir Coef (ft^1/2)             2.600    Q Breach (cfs)
  Weir Submerg                    0.00    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)        5341.21    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)               37.00


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

INLINE STRUCTURE OUTPUT  Profile #25-yr  Inl Struct:

  E.G. Elev (ft)               5344.39    Q Gates (cfs)
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  W.S. Elev (ft)              5344.29    Q Gate Group (cfs)             0.00
  Q Total (cfs)                509.00    Gate Open Ht (ft)
  Q Weir (cfs)                 509.00    Gate #Open
  Weir Flow Area (sq ft)       112.16    Gate Area (sq ft)
  Weir Sta Lft (ft)             93.00    Gate Submerg
  Weir Sta Rgt (ft)            130.00    Gate Invert (ft)
  Weir Max Depth (ft)            3.19    Gate Weir Coef
  Weir Avg Depth (ft)            3.03
  Weir Coef (ft^1/2)            2.600    Q Breach (cfs)
  Weir Submerg                   0.32    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)       5341.21    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)              37.00


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

INLINE STRUCTURE OUTPUT  Profile #50-yr  Inl Struct:

  E.G. Elev (ft)              5345.10    Q Gates (cfs)
  W.S. Elev (ft)              5344.95    Q Gate Group (cfs)             0.00
  Q Total (cfs)                696.00    Gate Open Ht (ft)
  Q Weir (cfs)                 696.00    Gate #Open
  Weir Flow Area (sq ft)       138.21    Gate Area (sq ft)
  Weir Sta Lft (ft)             93.00    Gate Submerg
  Weir Sta Rgt (ft)            130.00    Gate Invert (ft)
  Weir Max Depth (ft)            3.90    Gate Weir Coef
  Weir Avg Depth (ft)            3.74
  Weir Coef (ft^1/2)            2.600    Q Breach (cfs)
  Weir Submerg                   0.44    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)       5341.21    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)              37.00


Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

INLINE STRUCTURE OUTPUT  Profile #500-yr  Inl Struct:

  E.G. Elev (ft)              5347.66    Q Gates (cfs)
  W.S. Elev (ft)              5347.33    Q Gate Group (cfs)             0.00
  Q Total (cfs)               1455.00    Gate Open Ht (ft)
  Q Weir (cfs)                1455.00    Gate #Open
  Weir Flow Area (sq ft)       233.19    Gate Area (sq ft)
  Weir Sta Lft (ft)             93.00    Gate Submerg
  Weir Sta Rgt (ft)            130.00    Gate Invert (ft)
  Weir Max Depth (ft)            6.46    Gate Weir Coef
  Weir Avg Depth (ft)            6.30
  Weir Coef (ft^1/2)            2.600    Q Breach (cfs)
  Weir Submerg                   0.38    Breach Avg Velocity (ft/s)
  Min El Weir Flow (ft)       5341.21    Breach Flow Area (sq ft)
  Wr Top Wdth (ft)              37.00


Warning: The inline structure solution failed to converge.  The program used the solution with the least error.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest, valid, energy was used.

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7934

INPUT
Description: Multi-use path (D/S)
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5345.21       2 5345.19    5.99 5345.25   13.97 5345.08   17.96 5344.67
   19.95 5344.32   23.95 5344.05   31.93 5343.82   35.92 5343.74   37.91 5343.75
    43.9 5343.54   53.88 5343.42   57.87 5343.33   59.86 5343.24   65.85 5343.17
   71.83 5343.13   77.82 5343.12   81.81 5343.05    85.8 5343.08    87.8 5343.27
   91.79 5344.04   93.78 5344.21   97.78 5344.25   99.77 5344.16  103.76 5344.16
  105.76 5344.35  107.75 5344.45  109.75 5344.41  111.74 5343.66  113.74 5343.09
  115.73 5342.91  119.72 5342.96  125.71 5342.88   129.7  5342.9  135.69 5342.86
  139.68 5342.78  147.66 5342.73  149.66 5342.67  157.64 5342.58  171.61 5342.57
   173.6 5342.62  177.59 5342.59  181.58 5342.64  183.58 5342.58  191.56 5342.64
  195.55 5343.06  203.53 5343.18  205.53 5343.12  209.52 5343.13  213.51 5343.08
   219.5 5343.21  223.49 5343.09  229.47 5343.15  245.44 5343.07  249.43 5342.98
   261.4 5342.66  263.39 5342.64  267.35 5342.71  269.33  5342.7  271.31 5342.59
  273.29 5342.39  275.27 5341.99  277.05 5340.86  279.23 5339.58  281.21 5339.15
  283.19 5338.84  285.17 5339.06  287.15 5339.49  289.13 5340.45  291.11 5341.26
  295.07 5342.08  297.05 5342.18  299.03 5342.16  301.01 5341.96  304.97 5341.86
  306.46 5341.54  306.48 5341.53  306.94 5341.43  308.92 5340.42   310.9 5338.56
  312.88 5336.97  314.86 5336.47  316.84 5336.33   320.8 5336.36  322.78 5336.48
  324.19 5339.58  324.76 5340.85  326.74 5343.04  328.72 5343.34  334.66 5344.44
  336.64 5344.89  339.28 5345.33   340.6 5345.59  342.58 5345.73  346.54 5345.84
  348.52 5345.76  358.41 5345.84  366.33 5345.84  368.31 5346.24  370.29 5346.28

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  277.05     .08  306.46    .102  324.19     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        306.48  339.28           46.32   43.91   44.06             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  351.07  366.115355.779       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  189.07  263.395352.617  366.11  370.29 5355.84

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7890

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5343.64    2.87 5343.16    5.96 5342.51    9.94  5342.5   13.91 5342.33
    15.9 5342.31   29.33 5341.83    31.8 5341.69   35.78 5341.64   41.74  5341.4
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   45.71 5341.34    47.7 5341.26   51.68 5341.18   57.64 5341.11   61.61 5340.92
   65.59 5340.93   69.56 5340.98   75.53 5340.91   77.51 5340.85    79.5 5340.88
   83.48 5340.87   89.44 5340.91   93.41 5340.97   97.39 5341.07  101.36 5341.07
  105.34 5341.13  107.33 5341.21  109.31 5341.53   111.3 5342.14  115.28 5342.68
  117.26 5342.67  121.24 5342.83  123.23 5342.87  131.18 5342.77  139.13 5342.59
  153.04 5342.25  157.01  5342.2  162.98 5342.25  166.95 5342.25  170.93 5342.39
  176.89 5342.42  184.83  5342.3   188.8 5342.22  190.78 5342.22  192.77 5342.02
  194.75  5341.6  196.73 5341.02  198.72 5339.94   200.7 5339.05  202.69  5338.9
  204.67 5338.65  206.66 5338.63  208.64 5339.13  212.61 5340.63  214.59 5341.07
  217.07 5341.47  220.55 5341.83  222.53  5341.9  228.48 5342.04  230.47 5342.04
  234.44  5341.9  236.42 5341.78  240.39 5341.24  244.36 5340.57  246.15 5340.39
  247.48 5340.23  248.33 5340.12  250.31 5339.27   252.3 5337.37  254.28  5336.1
  256.27 5335.92  260.23 5335.88  262.22 5336.06   264.2 5337.68   265.4 5339.09
  266.19 5340.02  268.17 5341.32  270.16 5342.19  272.14 5342.93  276.11 5344.58
  278.18 5345.12  280.08 5345.41  284.05 5345.74  286.03 5345.82     290 5345.85
  291.98 5345.81  293.97 5345.91  295.95 5345.85  297.94 5345.86  301.91    5346
  305.87 5346.03  311.83 5345.83  313.81 5345.84  321.75 5346.02  331.67 5346.18
  333.66 5346.27  337.62 5346.27  343.58 5346.45  347.55 5346.49  349.53 5346.31

Manning's n Values         num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    2.87    .015   29.33     .06  217.07     .08  246.15    .102
   265.4     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        247.48  278.18            60.94   51.65    52.2             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  303.72  340.125356.032       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   107.9  200.415351.291  340.12  349.535356.336

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7839

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5341.67    1.98 5342.06    3.95 5341.97    5.93 5340.84    6.38  5340.8
     7.9 5340.67    9.88 5340.08   11.85 5340.26   13.83 5340.19   17.78 5340.21
   19.75 5340.15   21.73 5340.17    23.7 5340.09   27.65 5340.08   30.84 5339.94
   33.58 5339.84   35.55 5340.17   37.53 5340.32    39.5 5340.09   41.48 5339.52
   43.45 5339.34    47.4 5339.29    55.3 5339.41   61.23 5339.42    63.2 5339.48
   73.08 5339.58   75.05 5339.53   80.98 5339.54   88.88 5339.69    94.8  5339.9
  100.73 5339.97   102.7 5340.21  104.68 5340.71  106.65 5340.99  116.53 5341.34
  118.53 5341.34  122.52 5341.45  124.52 5341.46  128.51  5341.4  132.51 5341.48
   136.5 5341.73  140.49 5341.69  142.49 5341.56  144.49 5341.35  148.48 5340.72
  150.48 5340.47  152.48 5340.12  156.47 5339.29  158.38 5338.79  160.47 5338.16
  162.46 5337.39  164.46 5336.99  166.46 5336.72  168.45 5336.68  170.45 5336.53
  172.45 5336.12  174.44 5335.93  176.44 5335.92  180.44 5336.12  184.43 5336.55
  188.42 5337.07  189.86  5337.3  189.87 5337.31  190.42 5337.39  192.42 5336.91
  194.42 5335.98  196.41 5335.73  198.41 5335.69   202.4 5335.75   204.4 5336.22
   206.4 5338.51  208.11 5339.59  208.39 5339.77  210.39 5340.22  212.39 5340.29
  218.38 5340.27  224.37 5340.32  230.36  5340.4  232.36 5340.46  236.35 5340.47
  240.35 5340.53  246.34 5340.55  248.34  5340.6  250.33 5340.58  252.33 5340.63
  256.32 5340.67  258.32 5340.63  262.32 5340.62  266.31 5340.75   270.3 5340.97
   272.3 5341.36   274.3 5342.35  276.29 5343.16  280.31 5343.29  284.28 5343.64
  286.28 5343.65  288.28  5343.6  290.27 5343.41  292.27 5343.37  294.27 5343.39

Manning's n Values         num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    6.38    .015   30.84     .06  158.38     .08  189.86    .102
  208.11     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        148.48  212.39           145.84  133.95  115.27             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  105.85  132.335350.947

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7705

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5339.07    1.99 5339.08    3.99 5338.97    5.98 5338.82    9.86  5338.3
   11.96 5338.04   13.95 5337.82   15.95 5337.67   17.94 5337.64   19.93 5337.66
   21.92 5337.63   23.92 5337.62   25.91 5337.56    27.9 5337.54   31.89 5337.58
   33.88 5337.55   35.88 5337.58   39.42 5337.52   39.86 5337.52   43.85 5338.69
   45.84 5339.33   47.84 5339.87   49.83 5340.16   51.82 5340.11   53.81 5339.73
   55.81 5339.26    57.8 5338.84   59.79 5338.47   61.79 5338.29   63.78  5338.2
   65.77 5338.09   67.77    5338   69.76 5337.84   71.75 5337.66   73.75 5337.56
   77.73 5337.44   79.14 5337.33   79.73 5337.28   81.72 5336.87   83.71 5336.02
    85.7 5335.57    87.7 5335.67   89.69 5335.54   91.68 5335.52   95.67 5335.51
  105.64 5335.51  109.62 5335.53  111.62 5335.53  117.59 5335.56  119.59 5335.56
  125.57 5335.59  127.56 5335.59  133.54 5335.62  135.53 5335.62  141.51 5335.65
  143.51 5335.65  147.49 5335.67  151.48  5335.6  153.47 5335.54  155.46 5335.46
  157.46 5335.23  159.43 5335.21   161.4 5335.38  161.87 5335.39  163.38 5335.44
  165.35 5335.55  167.32    5336   169.3 5336.58  171.27 5337.39  173.24 5337.71
  175.21 5337.57  177.19 5337.52  179.16 5337.76  181.13 5338.05  183.11 5338.23
  185.08 5338.51  187.05 5338.73  189.02  5338.9     191 5339.05  194.94 5339.29
  196.92 5339.32  198.89  5339.2  200.86 5339.15  202.84 5339.21  206.78 5339.41
  210.73  5339.6  214.67 5339.71  216.65 5339.84  218.62 5340.18  220.59 5340.66
  222.56 5341.03  223.21 5341.12  224.54  5341.3  226.51 5341.44  228.48 5341.55
  230.46 5341.72  232.43 5342.04   234.4 5342.34  236.37 5342.43  238.35 5342.39

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    9.86    .015   39.42     .08   79.14    .102  161.87     .06

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

```
         79.14     191            48.72   53.95    69.7             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   93.27   98.145345.516       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
   98.14  162.075345.512

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7651

INPUT
Description: Obstruction is diversion weir
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5340.3    3.97 5340.28    5.96 5340.13   11.92  5339.4   13.91 5339.18
   19.87 5338.21   21.86 5337.91   27.82 5337.25   28.73 5337.06   31.79 5336.38
   39.74 5336.39   49.68 5336.26   53.65 5336.17   54.61 5336.19   55.64  5336.2
   57.63 5336.64    61.6 5337.07   63.59  5337.4   65.58 5337.63   69.55 5338.49
   71.54 5338.86   73.53  5339.1   75.51 5339.19    77.5 5339.02   81.47 5338.41
   82.82 5338.01   85.45 5337.22   87.44 5336.54   89.42 5336.04   91.41 5335.23
    93.4 5333.95   95.39 5333.22   97.37 5332.73  101.35 5332.26  105.32  5331.9
  107.31 5331.61   109.3 5331.49  113.27 5331.41  115.26 5331.54  117.24 5331.44
  119.23 5331.56  125.19 5332.34  129.17 5332.95  131.15 5333.48  133.14 5334.99
  135.13 5336.17  135.79 5336.22  137.12 5336.31   139.1 5336.14  141.09 5336.15
  145.07 5336.48  147.88 5336.76  149.04 5336.84  153.02 5336.81  161.02 5336.97
  165.01 5337.02  167.01 5337.12     173 5337.24     175  5337.2     177 5337.32
     181 5337.28  184.99 5337.34  186.99 5337.46  190.98  5337.5  194.98 5337.72
  195.94 5337.72  196.98 5337.72  200.97 5337.46  204.97 5337.32  208.97 5337.41
  212.96 5337.39  216.96 5337.25  220.95 5337.38  222.95 5337.52  226.95 5337.63
  228.94  5337.8  230.94  5337.8  232.94 5337.86  236.94 5338.07  238.93 5338.11
  240.93 5338.24  244.93 5338.37  248.92 5338.57  250.92 5338.61  256.91 5338.85
  258.91 5338.87  260.91 5338.99  264.91 5339.06   266.9 5339.18   268.9 5339.23
   270.9 5339.38   272.9 5339.47   274.9  5339.5  278.89 5339.71  280.89 5339.75
  284.88 5339.89  290.88 5340.26  294.87 5340.46  296.87 5340.46  298.87 5340.58

Manning's n Values         num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   28.73    .015   54.61     .08   82.82    .102  147.88     .06
  195.94    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         82.82  135.79           16.19   11.57     9.8             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  122.63  150.895342.002       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
      88     134 5334.43

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7639

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5337.34    1.99 5337.22    3.97 5337.23    5.96 5337.13    9.93 5337.01
   13.91    5337   15.89 5337.05   23.84 5336.94   27.81 5337.01   31.79 5337.02
   35.76 5336.97   43.71 5336.58   47.68 5336.44   51.66 5336.34   55.63 5336.11
   57.98  5335.9    59.6  5335.7   61.59 5335.38   63.58 5335.44   69.54 5335.38
   71.52  5335.4    75.5 5335.32   79.47 5335.38   83.44 5335.27   85.43  5335.3
   86.23 5335.42   87.42  5335.6   93.38 5336.24   97.35 5336.43  103.31 5336.56
   105.3 5336.49  107.28 5336.49  113.24 5336.39  115.23 5336.29  116.12 5336.18
  116.28 5336.16  117.22 5336.04   119.2 5335.42  121.19 5334.55  123.18 5332.88
  125.16  5331.5  127.15 5330.93  129.14 5330.76  131.12 5330.67   135.1 5329.99
  137.08 5330.13  143.04 5330.96  145.03 5331.93  147.02 5333.42  149.01 5334.64
  150.99 5335.35  153.19 5335.83  154.97  5336.3  156.95 5336.63  158.94 5336.73
  162.91 5336.53  168.99 5336.66  172.85 5336.69  174.82 5336.76  178.77 5336.79
  182.72 5336.79  186.67 5336.95  192.59 5337.09  196.54 5337.14  200.49 5337.29
  206.42 5337.39  208.39 5337.39  210.37 5337.19  212.34 5337.49  214.32 5337.46
  216.29 5337.23  218.27 5337.46  220.24 5336.87  222.22 5336.61  226.17 5336.77
  230.12 5336.83  234.07 5337.06  239.99 5337.14  243.94 5337.41  247.89 5337.56
  249.87 5337.67  257.77 5337.91  261.72 5338.05  269.62 5338.28  271.59 5338.38
  275.54 5338.47  277.52 5338.61  279.49 5338.81  281.47 5338.92  287.39 5339.03
  289.36 5339.15  295.29 5339.65  301.21 5339.95  305.16 5340.08  307.14 5340.11
  311.09 5340.02  313.06 5340.09  317.01 5340.34  320.96 5340.45  322.94 5340.54

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   57.98    .015   86.23     .08  116.12    .102  168.99    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         116.28  153.19           21.34   17.69   14.42             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  147.72  170.53 5343.86       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    5.925347.344

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7622

INPUT
Description: 29th Street (U/S)
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5333.77    1.99  5333.8    3.97 5333.87    9.93 5333.83   11.37 5333.78
   15.89 5333.54   19.86 5333.64   21.85 5333.62   25.82 5333.62   27.81 5333.66
   31.78 5333.67   37.74 5333.72   39.72 5333.72   41.71 5333.85   45.68 5334.24
   49.65 5334.61   51.64 5334.68   53.63 5334.56   55.61 5334.52   59.59 5334.51
```

```
   61.57 5334.52   63.56 5334.48   67.53 5334.57   69.22 5334.48   69.27 5334.48
   69.52 5334.47    71.5 5332.61    72.5 5329.21    87.5 5329.21   87.63 5331.13
   89.54 5333.42   91.45 5334.48   93.37 5334.61   96.07 5334.72   97.19 5334.78
  101.01 5335.24  104.83 5335.54  106.75 5335.93  108.66 5336.05  110.57 5336.25
  112.48 5336.38  114.39 5336.35   116.3  5336.2  120.13 5335.67  122.04  5335.5
  128.02 5335.72  130.01 5335.74  132.01  5335.8     134  5335.9  135.99 5335.95
  139.98 5336.08  143.97 5336.06  145.96 5336.09  147.95  5336.2  149.95 5336.08
  151.94 5336.09  153.93 5336.13  155.93 5336.05  157.92    5336  159.91 5336.04
   163.9 5336.16  165.89 5336.26  169.88 5336.41  173.87 5336.68  177.86 5336.82
  179.85 5336.87  181.84 5336.97  185.83 5337.11  187.82 5337.24  189.82 5337.32
   193.8 5337.53   195.8 5337.59  199.78 5337.63  205.77 5337.85  209.75 5337.92
  211.75 5338.01  215.73 5338.09  219.72 5338.29  221.71 5338.43  223.71 5338.63
   225.7 5338.79  227.69 5338.88  231.68 5338.99  235.67 5339.15  237.66 5339.28
  239.66 5339.37  243.64 5339.65  249.62 5339.97  253.61 5340.13   255.6 5340.19
   257.6 5340.19  261.58 5340.05  265.57 5340.22  267.56 5340.28  271.55  5340.5

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   11.37    .015   69.27     .09   96.07    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         69.22   96.07            55.66   55.27    54.8             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      72  5334.6       F
    96.2  114.46 5344.69       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    72.5    73.9 5333.21    86.1    87.5 5333.21

CULVERT


RIVER: Skunk
REACH: 04                 RS: 7600

INPUT
Description: 29th Street (20% potential debris block);
culvert size =
             7'Wx4'H
modeled culvert size (for 20% block) = 5.6'Wx4'H
Distance from Upstream XS =      .1
Deck/Roadway Width        =    47.3
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    5333            65.5 5334.13            72.5 5334.55
    72.5 5337.55            89.3 5337.55            89.3 5334.65
   92.96  5334.6

Upstream Bridge Cross Section Data
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5333.77    1.99  5333.8    3.97 5333.87    9.93 5333.83   11.37 5333.78
   15.89 5333.54   19.86 5333.64   21.85 5333.62   25.82 5333.62   27.81 5333.66
   31.78 5333.67   37.74 5333.72   39.72 5333.72   41.71 5333.85   45.68 5334.24
   49.65 5334.61   51.64 5334.68   53.63 5334.56   55.61 5334.52   59.59 5334.51
   61.57 5334.52   63.56 5334.48   67.53 5334.57   69.22 5334.48   69.27 5334.48
   69.52 5334.47    71.5 5332.61    72.5 5329.21    87.5 5329.21   87.63 5331.13
   89.54 5333.42   91.45 5334.48   93.37 5334.61   96.07 5334.72   97.19 5334.78
  101.01 5335.24  104.83 5335.54  106.75 5335.93  108.66 5336.05  110.57 5336.25
  112.48 5336.38  114.39 5336.35   116.3  5336.2  120.13 5335.67  122.04  5335.5
  128.02 5335.72  130.01 5335.74  132.01  5335.8     134  5335.9  135.99 5335.95
  139.98 5336.08  143.97 5336.06  145.96 5336.09  147.95  5336.2  149.95 5336.08
  151.94 5336.09  153.93 5336.13  155.93 5336.05  157.92    5336  159.91 5336.04
   163.9 5336.16  165.89 5336.26  169.88 5336.41  173.87 5336.68  177.86 5336.82
  179.85 5336.87  181.84 5336.97  185.83 5337.11  187.82 5337.24  189.82 5337.32
   193.8 5337.53   195.8 5337.59  199.78 5337.63  205.77 5337.85  209.75 5337.92
  211.75 5338.01  215.73 5338.09  219.72 5338.29  221.71 5338.43  223.71 5338.63
   225.7 5338.79  227.69 5338.88  231.68 5338.99  235.67 5339.15  237.66 5339.28
  239.66 5339.37  243.64 5339.65  249.62 5339.97  253.61 5340.13   255.6 5340.19
   257.6 5340.19  261.58 5340.05  265.57 5340.22  267.56 5340.28  271.55  5340.5

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   11.37    .015   69.27     .09   96.07    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         69.22   96.07             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      72  5334.6       F
    96.2  114.46 5344.69       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    72.5    73.9 5333.21    86.1    87.5 5333.21

Downstream  Deck/Roadway Coordinates
    num=       9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  5332.3            27.3 5332.48           52.96  5333.2
    81.5 5333.51            81.5 5336.51             102 5336.51
     102  5333.7           114.89  5334.5          142.46 5333.87

Downstream Bridge Cross Section Data
Station Elevation Data    num=      76
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5332.47    1.92 5332.54    3.84 5332.66    5.76 5332.67    7.68 5332.68
     9.6 5332.71   11.52  5332.7   13.44 5332.78   15.36 5332.81   17.28 5332.82
    19.2 5332.85   21.12 5332.89   23.04  5332.9   24.96 5332.85   26.88 5332.83
    28.8 5332.82   30.72 5332.74   32.64 5332.53   34.56 5332.42   36.48 5332.34
    38.4 5332.29   40.32  5332.2   42.24 5332.11   44.23 5332.09   46.22 5332.07
   48.22 5332.02   50.21 5332.01   52.21 5332.05    54.2 5332.15   56.19 5332.31
   58.19 5332.47   60.18 5332.64   62.18 5332.74   64.17 5332.84   66.16 5332.83
   68.16 5332.75   70.15  5332.8   72.15 5332.74   73.88  5332.4   74.14 5332.35
   76.13 5331.08   78.13 5328.73   80.12 5327.22   82.12 5326.77   84.11  5326.4
    86.1 5326.33    88.1 5326.33   90.09 5326.35   92.09 5326.34   94.08 5326.36
   95.38 5326.38   96.07 5326.39   98.07 5326.68  100.06 5327.83  102.06 5329.62
  104.05 5330.94  104.39  5331.1  106.04 5331.85  108.04 5332.35  110.03 5332.64
  112.03  5332.9  114.02    5333  116.01 5332.91  118.01 5332.76     120 5332.65
```

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  121.99 5332.69  123.99  5332.7  125.98 5332.61  127.98 5332.61  129.97 5332.58
  131.96 5332.64  133.96 5332.75  135.95 5332.86  137.95 5332.98  139.94 5333.17
  141.93 5333.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   73.88    .077   95.38     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         73.88  104.39             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0    76.5 5332.88       F
    93.8  130.795336.361       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       4     5.6
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 3 - Wingwall flared 0 deg. (sides extended straight)
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 .1    47.3     .013     .013        0                   .5                 1
Number of Barrels =  2
Upstream   Elevation =  5329.21
Centerline Stations
    Sta.    Sta.
    76.7    83.3
Downstream Elevation =  5328.1
Centerline Stations
    Sta.    Sta.
    85.7    92.3

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7566

INPUT
Description: 29th Street (D/S)
Station Elevation Data    num=      76
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5332.47    1.92 5332.54    3.84 5332.66    5.76 5332.67    7.68 5332.68
     9.6 5332.71   11.52  5332.7   13.44 5332.78   15.36 5332.81   17.28 5332.82
    19.2 5332.85   21.12 5332.89   23.04  5332.9   24.96 5332.85   26.88 5332.83
    28.8 5332.82   30.72 5332.74   32.64 5332.53   34.56 5332.42   36.48 5332.34
    38.4 5332.29   40.32  5332.2   42.24 5332.11   44.23 5332.09   46.22 5332.07
   48.22 5332.02   50.21 5332.01   52.21 5332.05    54.2 5332.15   56.19 5332.31
   58.19 5332.47   60.18 5332.64   62.18 5332.74   64.17 5332.84   66.16 5332.83
   68.16 5332.75   70.15  5332.8   72.15 5332.74   73.88  5332.4   74.14 5332.35
   76.13 5331.08   78.13 5328.73   80.12 5327.22   82.12 5326.77   84.11  5326.4
    86.1 5326.33    88.1 5326.33   90.09 5326.35   92.09 5326.34   94.08 5326.36
   95.38 5326.38   96.07 5326.39   98.07 5326.68  100.06 5327.83  102.06 5329.62
  104.05 5330.94  104.39  5331.1  106.04 5331.85  108.04 5332.35  110.03 5332.64
  112.03  5332.9  114.02    5333  116.01 5332.91  118.01 5332.76     120 5332.65
  121.99 5332.69  123.99  5332.7  125.98 5332.61  127.98 5332.61  129.97 5332.58
  131.96 5332.64  133.96 5332.75  135.95 5332.86  137.95 5332.98  139.94 5333.17
  141.93 5333.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   73.88    .077   95.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         73.88  104.39            60.28   88.72   98.67             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0    76.5 5332.88       F
    93.8  130.795336.361       F

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 7478

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5331.77    1.97  5331.8    3.95 5331.85    5.92 5331.89     7.9 5331.94
    9.87 5331.95   11.85 5331.95   13.82    5332    15.8 5332.05   17.77 5332.08
   21.72 5332.08   23.69 5332.13   25.67 5332.14   27.64 5332.17   29.62 5332.22
   31.59 5332.24   33.57 5332.23   35.54 5332.23   37.52 5332.24   39.49 5332.24
   41.47 5332.25   43.44 5332.27   45.41 5332.29   47.39  5332.3   49.36 5332.33
   51.34 5332.38   52.56  5332.4   53.31 5332.41   55.29 5332.43   57.26 5332.46
   59.24 5332.49   61.21 5332.52   63.19 5332.51   65.16 5332.55   67.13 5332.58
   69.11 5332.58   71.08 5332.57   73.06 5332.55   75.03 5332.56   77.01 5332.59
   78.98 5332.66   80.96  5332.7   82.93 5332.74   84.91 5332.75   86.88 5332.79
   88.86 5332.83   90.84  5332.6   92.82 5332.22    94.8 5331.91   96.78 5331.59
   98.76  5331.4  100.74  5331.2  102.72    5331   104.7 5330.91  106.68  5330.7
  108.66 5330.72  110.64 5330.65  112.62 5330.63   114.6 5330.57  116.58 5330.43
  118.56 5330.38  120.54 5330.31  122.53 5329.96  124.51 5329.71  126.49 5329.51
  128.31 5329.57  128.47 5329.57  130.45 5329.32  132.43 5328.73  134.41 5328.12
  136.39 5327.59  138.37 5327.16  140.35 5326.78  142.33 5326.56  144.31 5326.46
  146.29 5326.45  148.27  5326.5  150.25 5326.54  152.23 5326.56  154.17  5326.5
  156.11 5326.22  158.05 5325.73  159.99 5325.17  161.93 5325.02  163.87 5325.09
  165.81 5325.46  167.75 5325.76  169.69 5325.81  170.75 5325.91  171.63    5326
  173.57 5326.47  175.51  5326.9  177.45  5327.3  181.33 5328.08  183.27 5328.48
  185.21 5328.83  187.15 5328.93  189.08 5328.94  191.02 5328.95  192.96 5328.96
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```
Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   52.56     .08  128.31    .077  170.75     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        128.31  170.75            64.15   61.14   46.47              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  168.64  192.965335.783

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 7416

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5330.19    2.01 5330.08       4 5329.79    5.97 5329.29    7.95 5328.41
    9.92 5327.34    11.9 5326.37   13.87 5325.66   17.82 5325.29    19.8 5324.08
   21.78 5323.57   23.75 5323.52   25.73 5323.61    27.7 5324.03   29.68  5324.4
   33.63 5324.76    35.6 5325.04   37.58  5325.7   39.55 5326.77   41.53 5327.75
   43.51 5328.42   45.48 5329.11   45.58 5329.12   47.46 5329.42   49.43 5329.45
   51.41  5329.2   53.38    5329   54.97 5328.77   57.33  5328.5   59.31 5328.24
   61.29 5327.95   63.26 5327.86   65.24 5327.82   67.21 5327.74   69.19 5327.73
   71.16 5327.64   73.14 5327.64   77.09 5327.67   79.07 5327.71   83.02  5327.7
   86.97 5327.71   88.94 5327.76   96.85 5328.14   98.82 5328.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .077   45.58     .08   54.97     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
               0   45.58            99.46   98.14   93.52              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   65.89   78.055337.791       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 -142.57 -131.475338.437   78.05   98.825337.691

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 7318

INPUT
Description:
Station Elevation Data    num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5329.28    1.98 5329.17    3.97 5329.07    5.96 5328.91    7.94 5328.61
    9.93 5328.55   11.91 5328.48    13.9 5328.36   15.89 5328.27   17.87 5328.18
   19.86 5328.08   21.85 5327.97   23.83  5327.9   25.82 5327.81    27.8 5327.68
   29.79  5327.5   31.78 5327.38   33.76 5327.34   35.75 5327.32   37.73 5327.29
   39.72 5327.28   41.71 5327.28   43.69 5327.31   45.68 5327.27   47.67 5327.25
   49.65 5327.25   51.64 5327.37   52.09 5327.38   53.62  5327.4   55.61 5327.46
    57.6 5327.49   59.58 5327.36   60.84 5327.04   61.57 5326.85   63.55 5326.04
   65.54 5325.19   67.53 5324.33   69.51 5323.73    71.5 5322.95   73.49 5322.33
   75.47 5321.97   77.46 5321.89   79.44 5321.84   81.43 5321.93   83.42 5322.53
    85.4 5323.26   87.39  5323.5   89.37 5323.92   91.36 5324.37   93.35 5324.72
   95.33 5325.07   97.32 5325.35   99.31 5325.47  101.29 5325.49  103.28 5325.66
  105.26 5325.92  107.25 5326.12  109.24 5326.39  111.22 5326.66  113.21 5327.16
  113.23 5327.17  114.87 5327.55  115.19 5327.63  117.18 5327.98  119.17  5328.3
  121.15 5328.57  123.14 5328.73  125.13  5328.9  127.11 5329.05   129.1 5329.11
  131.08 5329.01  133.07 5328.88  135.06 5328.71  137.04 5328.67  139.03 5328.63

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   52.09     .08   60.84    .077  113.23     .08  114.87     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         60.84  113.21            57.63   58.89   60.73              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  118.14  129.135338.138       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  -47.67  -30.675337.711   129.1  139.035339.114

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 7259

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5330.39    3.98 5330.34    7.96 5330.24   11.95 5330.26    21.9 5330.21
   25.88 5330.28   27.88 5330.28   31.86 5330.21   35.84 5330.21   37.83  5330.1
   39.82 5329.94   41.81 5329.89    43.8 5329.81    45.8 5329.63   49.78 5329.22
   51.77 5329.06   55.75 5328.57   57.74 5328.39   59.73 5328.29   63.72 5328.16
   65.71 5328.06   69.69 5327.97   71.68 5327.84   75.66 5327.63   77.65 5327.68
   81.64 5327.56   83.63 5327.48    89.6  5327.1   95.57  5326.9   99.56 5326.66
  101.55 5326.57  105.53 5326.32  109.51 5326.23   111.5 5326.13  113.49    5326
  115.49 5325.91  119.47 5325.81  121.46 5325.81  125.44 5325.76  127.43 5325.79
  129.42 5325.76  131.76 5325.82  133.41 5325.87   135.4 5325.96  137.39 5325.77
  138.87 5325.36  139.38 5325.22  141.37 5324.19  143.36 5323.29  145.35 5322.69
  147.34 5322.29  149.33 5322.06  151.33 5321.75  153.32  5321.1  155.31 5320.63
   157.3 5320.42  159.29 5320.74  161.28  5321.3  163.27 5321.82  165.26 5322.26
  169.25 5322.91  173.23  5323.7  175.22 5324.06  177.21 5324.33  181.19 5324.57
  183.18 5324.72  185.22 5324.95  186.02 5325.07  187.17 5325.26   188.3 5325.33
  189.16 5325.38  191.15 5325.58  193.14 5325.75  195.13 5325.79  197.12 5325.78
  199.11 5325.73   201.1 5325.41   203.1  5325.3  205.09 5325.31  207.08 5325.25
  211.06  5325.1  213.05 5325.05  215.04 5324.97  219.02 5324.89  221.02 5324.81
     225 5324.75  226.99 5324.67  232.96 5324.51  234.95 5324.47  238.94  5324.3
  242.92 5324.21  248.89 5324.17  250.88 5324.18  252.87 5324.15  254.87 5324.18
```

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  258.85 5324.27  260.84  5324.3  262.83 5324.28  264.82 5324.31  270.79 5324.32

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  131.76     .08  138.87    .077  186.02     .08   188.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        138.87  185.22           19.38   19.52   20.21             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    36.8   66.575340.191       F
  213.06  270.795335.045       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    36.85340.392

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 7240

INPUT
Description: Ped. Bridge (U/S)
Station Elevation Data     num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5330.03    1.99 5330.05    7.97 5330.18   11.96  5330.2   15.95 5330.25
   19.94 5330.19   21.93 5329.99   23.92 5329.93   27.91 5329.92    29.9 5329.84
   33.89 5329.64   35.89 5329.48   39.87 5329.11   41.87 5329.01   45.85 5328.86
   49.84 5328.74   51.83 5328.61   57.82  5328.3   59.81 5328.28    61.8 5328.32
   65.79 5328.12   67.78 5328.01   69.78 5327.87   71.77 5327.57   73.76 5327.41
   75.76 5327.36   77.75 5327.27   81.74 5327.12   83.73    5327   85.73 5326.96
   87.72 5326.95   89.71 5326.89    93.7 5326.72   95.69 5326.67  101.68 5326.39
  105.66 5326.17  111.64 5325.95  113.64 5325.85  117.62 5325.69  121.61 5325.44
   125.6  5325.4  127.59 5325.41  131.58 5325.33  133.57 5325.27  135.57 5325.16
  136.14 5325.19  137.56 5325.27  141.55  5325.4  142.69 5325.18  143.54 5325.02
  145.54 5324.09  147.53 5323.27  149.52 5322.52  153.51 5321.48   155.5 5320.99
   157.5 5320.15  159.49 5319.57     164 5320.11  165.47 5321.44  167.47 5321.93
  169.46 5322.34  173.45 5323.32  175.44 5323.77  178.28 5324.21  179.52 5324.39
  181.42 5324.75  183.41 5324.73  185.41 5324.54   187.4 5324.48   189.4 5324.56
  191.39 5324.73  193.38 5324.81  195.38 5324.82  197.37 5324.89  199.36 5325.07
  201.52 5325.15  203.35 5325.18  205.35 5325.06  207.34 5324.82  209.33 5324.63
  211.33 5324.49  215.31 5324.29  221.29 5324.02  225.28 5323.88  227.28 5323.84
  231.26 5323.72  235.25 5323.63  237.24 5323.57  241.23  5323.5  243.22 5323.43
  245.22 5323.47  247.21 5323.45   251.2  5323.5  255.19 5323.46  257.18 5323.49
  259.17 5323.55  265.15 5323.62  271.14 5323.67  273.13 5323.64

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  136.14     .08  142.69    .077  179.52     .08  201.52     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        142.69  181.42           24.01    23.9   24.25             .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
   18.18   22.06 5340.23       F
    22.4   70.195339.957       F
  220.35  244.635334.062       F
  244.63  273.135333.459       F
Blocked Obstructions     num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   18.195340.028   22.06    22.45339.983     154     156    5324
   163.5   165.5    5324

BRIDGE


RIVER: Skunk
REACH: 04                 RS: 7230

INPUT
Description: Ped. Bridge - Parking Lot  (30% potential debris block)
Distance from Upstream XS =       9
Deck/Roadway Width        =       5
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     146 5324.58             146 5327.55             154 5327.63  5323.9
   165.5 5327.73 5324.01     172 5327.81           175.5 5327.49
   175.5 5324.52             179 5324.23

Upstream Bridge Cross Section Data
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5330.03    1.99 5330.05    7.97 5330.18   11.96  5330.2   15.95 5330.25
   19.94 5330.19   21.93 5329.99   23.92 5329.93   27.91 5329.92    29.9 5329.84
   33.89 5329.64   35.89 5329.48   39.87 5329.11   41.87 5329.01   45.85 5328.86
   49.84 5328.74   51.83 5328.61   57.82  5328.3   59.81 5328.28    61.8 5328.32
   65.79 5328.12   67.78 5328.01   69.78 5327.87   71.77 5327.57   73.76 5327.41
   75.76 5327.36   77.75 5327.27   81.74 5327.12   83.73    5327   85.73 5326.96
   87.72 5326.95   89.71 5326.89    93.7 5326.72   95.69 5326.67  101.68 5326.39
  105.66 5326.17  111.64 5325.95  113.64 5325.85  117.62 5325.69  121.61 5325.44
   125.6  5325.4  127.59 5325.41  131.58 5325.33  133.57 5325.27  135.57 5325.16
  136.14 5325.19  137.56 5325.27  141.55  5325.4  142.69 5325.18  143.54 5325.02
  145.54 5324.09  147.53 5323.27  149.52 5322.52  153.51 5321.48   155.5 5320.99
   157.5 5320.15  159.49 5319.57     164 5320.11  165.47 5321.44  167.47 5321.93
  169.46 5322.34  173.45 5323.32  175.44 5323.77  178.28 5324.21  179.52 5324.39
  181.42 5324.75  183.41 5324.73  185.41 5324.54   187.4 5324.48   189.4 5324.56
  191.39 5324.73  193.38 5324.81  195.38 5324.82  197.37 5324.89  199.36 5325.07
  201.52 5325.15  203.35 5325.18  205.35 5325.06  207.34 5324.82  209.33 5324.63
  211.33 5324.49  215.31 5324.29  221.29 5324.02  225.28 5323.88  227.28 5323.84
  231.26 5323.72  235.25 5323.63  237.24 5323.57  241.23  5323.5  243.22 5323.43
  245.22 5323.47  247.21 5323.45   251.2  5323.5  255.19 5323.46  257.18 5323.49
  259.17 5323.55  265.15 5323.62  271.14 5323.67  273.13 5323.64

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  136.14     .08  142.69    .077  179.52     .08  201.52     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
```

```
        142.69  181.42             .3       .5
Ineffective Flow     num=       4
   Sta L   Sta R    Elev  Permanent
   18.18   22.06 5340.23       F
    22.4   70.195339.957       F
  220.35  244.635334.062       F
  244.63  273.135333.459       F
Blocked Obstructions     num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   18.195340.028   22.06    22.45339.983     154     156    5324
   163.5   165.5    5324

Downstream  Deck/Roadway Coordinates
    num=       9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     158 5324.58             158 5327.55             166 5327.63  5323.9
   177.5 5327.73 5324.01     184 5327.81           187.5 5327.49
   187.5 5324.52             191 5324.23          195.45 5323.62

Downstream Bridge Cross Section Data
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5330.08    1.99 5330.06    5.98 5329.92    9.97 5329.86   13.96 5329.74
   17.95 5329.65   21.94 5329.37   27.92 5329.24    33.9  5329.1    35.9 5329.02
   39.89 5328.94   41.88 5328.83   43.88 5328.84   45.87    5329   49.86 5328.98
   53.85 5328.84   55.84 5328.73   57.84 5328.72   61.83 5328.64   63.82 5328.69
   65.82 5328.94   67.81 5328.94    69.8 5328.54    71.8 5328.27   75.79 5327.83
   79.78 5327.48   83.77 5327.11   85.76 5326.87   87.75 5326.75   91.74 5326.64
   95.73 5326.45   97.73 5326.38   99.72 5326.26   105.7 5326.06   107.7 5326.03
  109.69 5325.92  111.69  5325.9  113.68 5325.84  119.66  5325.6  123.65 5325.48
  129.64 5325.27  133.62 5325.11  139.61 5324.93   141.6 5324.96  147.59 5324.73
  149.56 5324.76  151.57 5324.76  155.56 5325.01     156 5324.95  157.56 5324.74
  159.55 5324.02  161.55 5322.88   166.5 5320.11  169.52 5319.52   172.5 5320.11
  173.51 5320.54  175.51 5321.28   177.5 5321.67   179.5 5321.94  183.48 5322.61
  185.15 5322.84  187.47 5323.08  189.47 5323.18  191.46 5323.34  195.45 5323.62
  197.45 5323.66  201.43 5323.82  203.43 5323.85  205.42 5323.93  207.42 5323.97
  209.41 5323.96   213.4 5323.74  217.39 5323.73  221.38 5323.63  223.37 5323.66
  225.37  5323.8  227.36 5323.65  231.35 5323.25  231.81 5323.17  233.34 5322.91
  235.34 5322.75  239.33  5322.8  241.32 5322.89  243.32 5322.91  247.31 5323.04
   249.3 5323.15  253.29 5323.24  255.28 5323.31  259.27 5323.19  261.27  5323.2
  263.26 5323.26  265.26 5323.26  267.25 5323.35  271.24 5323.36  273.23 5323.23
  275.23  5323.4  277.22 5323.47  279.22  5323.6   285.2 5324.19

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  149.56     .08     156    .077  185.15     .08  231.81     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
           156  185.15             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  228.81  271.615333.497       F
    5.75    82.75339.921       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.835340.082  271.61   285.25333.336

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 7216

INPUT
Description: Ped. Bridge (D/S)
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5330.08    1.99 5330.06    5.98 5329.92    9.97 5329.86   13.96 5329.74
   17.95 5329.65   21.94 5329.37   27.92 5329.24    33.9  5329.1    35.9 5329.02
   39.89 5328.94   41.88 5328.83   43.88 5328.84   45.87    5329   49.86 5328.98
   53.85 5328.84   55.84 5328.73   57.84 5328.72   61.83 5328.64   63.82 5328.69
   65.82 5328.94   67.81 5328.94    69.8 5328.54    71.8 5328.27   75.79 5327.83
   79.78 5327.48   83.77 5327.11   85.76 5326.87   87.75 5326.75   91.74 5326.64
   95.73 5326.45   97.73 5326.38   99.72 5326.26   105.7 5326.06   107.7 5326.03
  109.69 5325.92  111.69  5325.9  113.68 5325.84  119.66  5325.6  123.65 5325.48
  129.64 5325.27  133.62 5325.11  139.61 5324.93   141.6 5324.96  147.59 5324.73
  149.56 5324.76  151.57 5324.76  155.56 5325.01     156 5324.95  157.56 5324.74
  159.55 5324.02  161.55 5322.88   166.5 5320.11  169.52 5319.52   172.5 5320.11
  173.51 5320.54  175.51 5321.28   177.5 5321.67   179.5 5321.94  183.48 5322.61
  185.15 5322.84  187.47 5323.08  189.47 5323.18  191.46 5323.34  195.45 5323.62
  197.45 5323.66  201.43 5323.82  203.43 5323.85  205.42 5323.93  207.42 5323.97
  209.41 5323.96   213.4 5323.74  217.39 5323.73  221.38 5323.63  223.37 5323.66
  225.37  5323.8  227.36 5323.65  231.35 5323.25  231.81 5323.17  233.34 5322.91
  235.34 5322.75  239.33  5322.8  241.32 5322.89  243.32 5322.91  247.31 5323.04
   249.3 5323.15  253.29 5323.24  255.28 5323.31  259.27 5323.19  261.27  5323.2
  263.26 5323.26  265.26 5323.26  267.25 5323.35  271.24 5323.36  273.23 5323.23
  275.23  5323.4  277.22 5323.47  279.22  5323.6   285.2 5324.19
```

```
Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  149.56     .08     156    .077  185.15     .08  231.81     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            156  185.15             27.3   27.21   28.73              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  228.81  271.615333.497       F
    5.75    82.75339.921       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.835340.082  271.61   285.25333.336

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 7189

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5328.97    5.96 5328.79    9.93 5328.76    13.9 5328.58   15.88 5328.47
   19.85 5328.31   23.82 5328.18    25.8    5328   29.77 5327.68   31.76 5327.56
   35.72 5327.51   37.71 5327.41   43.66    5327   47.63 5326.65    51.6 5326.35
   53.58 5326.13   55.57 5325.97   59.54 5325.84   61.52  5325.8   65.49  5325.6
   71.45 5325.38   73.43 5325.28   81.37 5325.05   83.35 5325.03   89.31 5324.76
   91.29 5324.74   93.27 5324.67   97.24 5324.62  101.21 5324.48  111.13 5324.22
  113.12 5324.19   115.1 5324.05  117.17 5324.07  121.06 5324.21  123.04 5324.18
  124.31 5324.02  125.03 5323.94  127.01 5323.35     129 5322.58  132.96 5320.72
  134.95 5320.08  138.92 5320.28   140.9 5320.54  142.89 5320.62  144.87 5320.81
  148.84 5321.39  150.82 5321.65     153 5322.02  154.79 5322.33  156.78 5322.63
  158.76 5322.87  164.72 5323.28   166.7 5323.38  170.67 5323.44  172.65 5323.33
  174.64 5323.27  176.62 5323.12  178.61 5322.82  180.59 5322.61  182.58 5322.47
  186.55 5322.47  188.53 5322.44  190.51 5322.35   192.5 5322.46  194.48 5322.69
  196.55 5323.02  198.45  5323.2  200.44 5323.22  204.41 5323.33  208.37 5323.33
  212.34 5323.46  216.31 5323.46  226.24 5324.58   230.2 5324.96

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  117.17     .08  124.31    .077     153     .08  196.55     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        124.31  158.76            75.38   70.79   55.73              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   190.8     2195332.359       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  -69.68  -34.275334.001     219   230.25333.768

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 7118

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5324.6    1.99 5324.44    3.97  5323.9    5.96 5323.71    7.95 5323.79
   13.91 5323.97   17.89 5324.02   19.87 5323.87   23.85 5323.77   29.81  5323.6
    31.8  5323.6   33.79 5323.52   37.76 5323.43   39.75 5323.33   41.74  5323.3
   43.73 5323.23   45.71 5323.11   49.69 5322.79   51.68 5322.73   55.65 5322.54
   57.64 5322.47    63.6 5322.31   69.57 5322.25    83.7 5322.42   85.47 5322.55
   87.46  5322.6   89.44 5322.58   93.42 5322.35   95.41  5322.3   97.39 5322.31
   99.38 5322.21  102.87 5321.94  103.32 5321.91  105.29  5321.6  107.26 5320.23
  109.23 5318.63   111.2 5317.83  113.17 5317.72  115.15 5317.77  117.12 5318.06
  119.09 5318.68  121.06 5319.25  123.03 5319.66     125 5320.35  126.97 5321.23
  127.33 5321.33  128.94 5321.77  132.88 5322.29  134.85 5322.58  136.82 5322.78
  139.32 5322.86  140.76 5322.92  142.73  5323.2   144.7 5323.32  148.64 5323.43
  152.58 5323.46  156.53 5323.37   158.5 5323.48  164.41 5324.02

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    83.7     .08  102.87    .077  127.33     .08  139.32     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        102.87  127.33           108.32   78.24   75.98              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  144.17   144.65333.305       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 -103.36  -91.675333.791   144.6  164.415333.319

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 7040

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5322.14   11.95 5322.26   13.94 5322.25   15.93 5322.11   17.92 5321.94
   19.91 5321.86    21.9 5321.68   23.89 5321.59   25.88 5321.41   27.87  5321.2
   29.87 5321.14   31.86 5321.13   33.85 5320.87   35.84 5320.46   39.82 5320.34
   41.81 5320.29    43.8 5320.31   45.79 5320.26   47.79 5320.18   49.78 5320.15
   53.76  5320.1   55.75 5320.11   57.74 5320.06   59.73 5320.06   61.72 5319.98
    65.7  5319.9    67.7 5319.84   71.68 5319.75   75.66  5319.7   77.65 5319.69
   79.64 5319.58   81.63 5319.55   85.61 5319.46   87.61 5319.49    89.6 5319.48
   91.59  5319.4   93.58 5319.36   99.55 5319.48  103.53 5319.62  105.53 5319.67
  109.51 5319.78   111.5 5319.81  113.49  5319.9  115.48 5319.92  117.47    5320
  121.45 5320.03  123.45 5320.09  125.44 5320.08  129.42 5320.21   133.4 5320.26
  135.39 5320.33  137.38 5320.33  139.37 5320.39  143.36  5320.4  147.34 5320.45
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  149.33 5320.51  151.32 5320.61   155.3 5320.61  157.29 5320.65  159.28 5320.67
  161.27 5320.62  163.27 5320.53   164.2 5320.51  167.25 5320.47  169.24 5320.43
  171.23 5320.64  173.22 5320.58  175.21 5320.72   177.2 5320.71  179.19  5320.6
  179.32 5320.57  181.19  5320.1  183.18 5318.26  185.17 5317.27  187.16 5317.17
  191.14 5317.27  193.13 5318.12  195.12  5319.4  197.11 5320.33   199.1 5321.07
   201.1 5321.57  201.64 5321.68  202.26 5321.81  203.09 5321.98  205.08 5322.24
  207.07 5322.42  209.06 5322.62  211.05  5322.9  213.04 5323.25  215.03 5323.69
  217.02  5324.2  221.01 5325.06     223 5325.39  224.99 5325.65  226.98 5325.81
  228.97 5325.89  230.96 5325.71  232.95 5325.42  234.94 5325.26  236.93 5325.18

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   164.2     .08  179.32    .077  201.64     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        179.32  202.26           16.47   81.51   97.64              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  223.85   226.15335.497       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   17.645332.137   226.1  236.935335.759

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6958

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5322.13   13.83 5322.17    15.8 5322.14   17.78 5321.96   23.71 5321.51
   27.66 5321.11   29.63 5321.11   31.61 5321.06   37.54 5320.75   39.51 5320.68
   43.46  5320.6   49.39 5320.42   53.34 5320.15   55.32 5320.12   57.29 5320.06
   59.27 5319.97   63.22 5319.76   67.17 5319.64   69.15 5319.61    73.1 5319.52
   75.07 5319.45   77.05 5319.35   82.97 5319.19   84.95 5319.23    88.9 5319.21
    96.8 5319.37   98.78 5319.38  100.75 5319.44  102.73 5319.47  106.68 5319.56
  112.61 5319.75  116.56 5319.85  118.54 5319.87  122.49 5319.97  126.44    5320
  128.41 5319.97  132.37 5319.98  134.35 5320.04  138.31 5320.09  140.29 5320.15
  142.27 5320.18  144.25 5320.17  148.22 5320.25   150.2 5320.25  152.18 5320.44
  153.72 5320.68  154.16 5320.74  156.14 5320.58  158.12 5320.66   160.1 5320.64
  162.08 5320.56  164.06 5320.43  167.92    5320     170 5319.67  171.98 5319.41
  175.95 5318.76  179.91 5317.95  181.89 5317.67  185.85 5317.16  189.81 5316.81
  191.79  5316.6  193.77 5316.15  195.75 5315.66  197.73 5315.11  199.71 5314.74
  203.68 5313.94  205.66 5313.32  207.64 5312.66  209.62 5312.54   211.6 5312.56
  213.58 5313.18  215.56 5314.11  217.54 5314.96  219.52 5316.07   221.5  5317.1
  223.48 5317.86  225.58 5318.19  231.41 5318.26  233.39 5318.31  241.31 5318.66
  243.29 5318.84  247.25 5319.01  249.23 5319.12  251.21 5319.18  253.19 5319.19
  257.15 5319.32  259.14 5319.34  261.12 5319.46   263.1 5319.61  267.06 5319.87
  267.93 5319.91  269.04 5319.96     273 5320.08  274.98 5320.09  278.94  5320.2
   282.9 5320.38  284.88 5320.54  286.87 5320.74  290.83 5320.97  292.81 5321.12

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06  153.72     .08  167.92    .077  225.58     .08  267.93     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         167.92  225.58           78.81   69.65   61.48              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  248.92  277.745329.114       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  278.41  292.815330.182       0   14.465332.128

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6889

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5321.77    3.99 5321.82    9.98 5321.91   11.98 5321.91   13.97 5321.86
   15.97 5321.97   17.96    5322   19.96 5321.97   21.96 5322.02   23.95 5321.94
   25.95 5321.88   27.94 5321.75   29.94  5321.6   31.94 5321.41   33.93 5321.18
   35.93 5321.02   37.92 5320.79   39.92 5320.59   41.91  5320.3   43.91  5320.3
   45.91 5320.25    47.9 5320.31   51.89 5320.24   53.89 5320.27   55.89 5320.23
   59.88 5320.17   61.87 5320.15   63.87 5320.16   69.86 5320.11   73.85  5320.1
   75.85 5320.11   77.84 5320.15   79.84 5320.15   81.84 5320.09   85.83  5320.1
   87.83 5320.05   88.75 5319.95   89.83 5319.83   91.83 5319.57   92.19 5319.54
   93.82 5319.42   95.82 5319.18   97.82 5318.29   99.82 5317.44  101.81 5316.47
  103.81 5315.58  105.81 5314.84  107.81 5314.37   109.8 5314.33   111.8 5314.26
   113.8 5314.14   115.8 5314.04  117.79 5313.64  119.79 5313.19  121.79 5312.79
  123.79 5312.47  125.79 5312.18  127.78 5311.96  131.78 5311.34  133.78 5311.12
  135.77 5311.09  137.77 5311.35  139.77 5312.04  141.77 5312.61  143.76 5313.41
  145.76 5314.43  147.76 5315.53  149.76 5316.68  151.75 5317.39  153.75 5317.92
  155.16  5318.1  155.75 5318.17  157.75 5318.35  159.74  5318.4  163.74 5318.68
  167.73 5318.76  168.88 5318.73  169.73 5318.71  171.73 5318.71  175.72 5318.82
  177.72 5318.98  179.72 5319.23  181.72 5319.45  183.71 5319.68  185.71 5320.18
  189.71 5321.43   191.7 5321.44   193.7 5321.38   195.7 5321.58  199.69 5322.22
  201.69 5322.35  203.69 5322.24  205.69 5322.18  211.68 5322.05  213.68 5322.05
  215.68 5322.16  217.67 5322.31  219.67 5322.43  221.67 5322.58  225.66 5322.89

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   92.19    .077  155.16     .08  168.88     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          88.75  155.16          113.77  107.19  105.2              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  179.57  180.285329.202       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  180.26  225.665329.309       0   13.755331.768
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CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 6781

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5321.69    5.81 5321.98    7.75 5322.07    9.69 5322.17   11.62 5322.09
   13.56 5322.09    15.5 5322.05   17.43 5321.92   21.31 5321.84   23.25 5321.79
   25.18 5321.69   27.12 5321.57   29.06 5321.44   31.05 5321.29   33.05 5321.13
   35.05 5321.08   37.04  5320.8   38.98 5320.64   43.03 5320.23   45.03 5320.02
   47.03 5319.95   49.02 5319.71   51.02 5319.37   53.02 5319.11   55.01 5318.77
   55.86  5318.5   57.01 5318.13   59.01 5317.24      61    5316      63 5314.33
   64.99 5312.92   66.99 5311.62   68.99 5310.26   70.98  5309.3   72.98 5308.91
   74.98  5308.8   76.97 5308.68   78.97 5308.67   80.97 5308.87   82.96 5309.32
   83.88 5309.71   84.96 5310.18   86.96 5311.69   88.95 5313.38   90.95 5314.93
   92.94  5316.1   94.56 5316.56   94.94 5316.67   96.94 5316.65   98.93 5316.41
  100.93 5316.33  102.93 5316.26  104.92 5316.21  106.92 5316.27  108.92 5316.28
  110.91 5316.35  112.91 5316.45  114.91 5316.53   116.9 5316.57   118.9 5316.64
   120.9  5316.7  124.89 5316.88  126.88 5316.94  128.88 5316.98  130.88 5317.03
  132.87 5317.09  134.87 5317.11  136.87 5317.21  140.86 5317.43  142.86 5317.57
  144.85 5317.68  146.85 5317.83  148.85 5317.92  152.84 5318.13  154.83 5318.21
  156.83 5318.35  160.82 5318.52  162.82 5318.62  164.82  5318.7  168.81 5318.84
   172.8 5318.99   174.8 5319.08   176.8 5319.22  180.79  5319.6  182.79 5319.74
  186.78 5319.94  188.77 5320.15  190.77 5320.38  192.77 5320.39  194.76 5320.48
  196.76 5320.61  198.76 5321.04  202.75 5321.62  204.75 5322.12  206.74 5322.42
  208.74 5322.93  210.74 5323.13  212.73  5323.2  214.73 5323.22  218.72 5323.22

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   38.98     .08   55.86    .077   83.88     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         55.86   94.56            59.78   62.38   61.57             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  141.39  206.095327.468       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   11.825331.695  206.09  218.725332.322

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 6719

INPUT
Description:
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5318.07    1.98 5318.19    3.96 5318.04    5.94 5317.74    7.91 5317.53
    9.89 5317.33   11.87 5317.11   13.85 5317.35   15.83 5317.56   17.81 5317.69
   19.78 5317.63   21.76 5317.57   23.74 5317.52   25.72 5317.58    27.7 5317.62
   29.68 5317.57   31.66 5317.53   33.63 5317.52   35.61 5317.44   37.59  5317.4
   39.57 5317.32   41.55 5317.25   42.94  5317.2   43.53 5317.18   45.51 5317.03
   47.48 5316.72   49.46 5316.38   51.44 5315.91   53.42 5315.48    55.4 5314.96
   55.47 5314.95   57.38  5314.5   59.35 5313.77   61.33 5312.87   63.31 5311.74
   65.29 5310.74   67.27 5309.81   69.25 5309.17   71.23 5308.73    73.2 5308.23
   75.18 5307.82   77.16 5307.43   79.14 5307.24   81.12 5307.24    83.1 5307.24
   85.07 5307.24   87.05 5307.75   89.03 5308.79   91.01 5310.17   92.99 5312.21
   94.97 5314.79   96.95 5315.73   98.92 5315.69   99.02  5315.7   100.9 5316.05
  102.88 5316.37  104.86 5316.47  106.84 5316.41  108.82 5316.37   110.8 5316.43
  112.77 5316.47  114.75  5316.5  115.28 5316.51  116.73 5316.53  118.71 5316.61
  120.69 5317.06  122.67 5317.18  124.64 5317.21  126.62 5317.28   128.6 5317.45
  130.58 5317.62  132.56  5317.8  134.54 5317.99  136.52 5318.18  138.49 5318.37
  140.47 5318.55  142.45  5318.7

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   42.94     .08   55.47    .077   99.02     .08  115.28     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         55.47   99.02            17.02   15.47   13.57             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    8.96   29.575327.427       F
   112.6  112.665326.467       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    8.965328.069  112.66  142.455326.467

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 6704

INPUT
Description: Private Ped. Bridge (U/S)
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5316.86       2 5316.88    3.99 5316.83    5.99 5316.69    7.98 5316.63
    9.98 5316.69   11.97 5316.23   13.97 5315.67   15.96 5315.07   17.96  5314.7
   19.95 5314.32   21.95 5313.91   23.94 5313.79   25.94 5313.69   27.93 5313.64
   29.93 5313.63   31.92 5313.59    33.6 5313.54   33.92 5313.53   35.92 5313.51
   37.91 5313.48   39.72 5313.51   39.91 5313.51    41.9 5312.12    43.9 5311.23
   45.89  5310.3   47.89  5309.2   49.88 5308.49   51.88 5308.12   53.87 5307.95
   55.87  5307.7   57.86 5306.53   61.85 5305.91   65.84 5306.55   67.84 5308.36
   69.84 5309.08   71.83 5309.87   73.83  5310.6   75.82 5311.38   77.82 5312.27
   79.81 5313.87   81.81 5315.55   81.89 5315.57    83.8 5316.01    85.8 5315.98
   87.79    5316   89.79 5316.07   91.78 5316.14   93.78 5316.22   95.77  5316.3
   97.77 5316.32   99.76 5316.38  101.76 5316.41  103.76 5316.45  105.75 5316.48
  107.75 5316.48  107.83 5316.49  109.74 5316.53  111.74  5316.7  113.73  5316.9
  115.73 5317.11  117.72 5317.31  119.72 5317.52  121.71 5317.71  123.71 5317.85
   125.7 5317.96

Manning's n Values        num=       5
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     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    33.6     .08   39.72    .077   81.89     .08  107.83     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         39.72   81.89            19.26   18.85   17.61              .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   23.225326.863       F
  100.83  105.855326.399       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  105.85   125.75326.484      40      52  5312.5      69      80    5314

BRIDGE


RIVER: Skunk
REACH: 04                  RS: 6690

INPUT
Description: Private Ped. Bridge (west of 30th Street)  (30% potential debris
             block)
Distance from Upstream XS =       9
Deck/Roadway Width        =     5.6
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      39  5313.5              41  5313.5              41 5317.86 5311.32
      80 5320.58 5313.59      80 5315.58              82  5315.6

Upstream Bridge Cross Section Data
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5316.86       2 5316.88    3.99 5316.83    5.99 5316.69    7.98 5316.63
    9.98 5316.69   11.97 5316.23   13.97 5315.67   15.96 5315.07   17.96  5314.7
   19.95 5314.32   21.95 5313.91   23.94 5313.79   25.94 5313.69   27.93 5313.64
   29.93 5313.63   31.92 5313.59    33.6 5313.54   33.92 5313.53   35.92 5313.51
   37.91 5313.48   39.72 5313.51   39.91 5313.51    41.9 5312.12    43.9 5311.23
   45.89  5310.3   47.89  5309.2   49.88 5308.49   51.88 5308.12   53.87 5307.95
   55.87  5307.7   57.86 5306.53   61.85 5305.91   65.84 5306.55   67.84 5308.36
   69.84 5309.08   71.83 5309.87   73.83  5310.6   75.82 5311.38   77.82 5312.27
   79.81 5313.87   81.81 5315.55   81.89 5315.57    83.8 5316.01    85.8 5315.98
   87.79    5316   89.79 5316.07   91.78 5316.14   93.78 5316.22   95.77  5316.3
   97.77 5316.32   99.76 5316.38  101.76 5316.41  103.76 5316.45  105.75 5316.48
  107.75 5316.48  107.83 5316.49  109.74 5316.53  111.74  5316.7  113.73  5316.9
  115.73 5317.11  117.72 5317.31  119.72 5317.52  121.71 5317.71  123.71 5317.85
   125.7 5317.96

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    33.6     .08   39.72    .077   81.89     .08  107.83     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         39.72   81.89             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   23.225326.863       F
  100.83  105.855326.399       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  105.85   125.75326.484      40      52  5312.5      69      80    5314

Downstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      34 5312.86              34 5317.86 5311.32      71 5320.58 5313.59
      71 5315.58

Downstream Bridge Cross Section Data
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5313.77       2  5313.7       4 5313.73    5.99 5313.68    7.99  5313.6
    9.99 5313.54   11.99 5313.48   13.99 5313.45   15.99 5313.47   17.98  5313.5
   19.98 5313.57   21.98 5313.54   23.98 5313.49   25.98 5313.36   27.98 5313.49
   29.97 5313.51   30.26 5313.48   31.97 5313.31   32.48 5313.22   32.58 5313.21
   33.97 5312.97   35.97 5311.76   37.97 5309.42   39.96 5307.58    41.5 5306.43
   45.96 5305.99    48.8 5306.52   49.96 5306.78   51.95 5307.56   53.95 5308.39
   55.95 5309.33   57.95 5310.34   59.95 5312.02   61.95 5313.15   63.94 5313.94
   65.94 5314.46   67.94 5314.94   69.94 5315.22   71.89  5315.4   71.94 5315.41
   73.93 5315.47   75.93 5315.56   77.93 5315.68   79.93 5315.78   81.93 5315.84
   83.93  5315.9   85.92 5316.01   87.92 5316.12   89.92 5316.18   91.92 5316.22
   93.92 5316.29   95.92 5316.37   97.91 5316.43   99.91 5316.46  101.91 5316.49
  103.91 5316.53  105.91 5316.56   107.9 5316.56  108.19 5316.57   109.9 5316.63
   111.9 5316.91   113.9 5317.18   115.9 5317.45   117.9 5317.69

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    30.26     .08   32.48    .077   71.89     .08  108.19     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         32.58   71.89             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   21.13 5323.77       F
   95.12  106.85 5326.34       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  106.85   117.95326.562

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins        =
Energy head used in spillway design        =
Spillway height used in design             =
Weir crest shape                           = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
```

```
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 6685

INPUT
Description: Private Ped. Bridge (D/S)
Station Elevation Data     num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5313.77       2  5313.7       4 5313.73    5.99 5313.68    7.99  5313.6
    9.99 5313.54   11.99 5313.48   13.99 5313.45   15.99 5313.47   17.98  5313.5
   19.98 5313.57   21.98 5313.54   23.98 5313.49   25.98 5313.36   27.98 5313.49
   29.97 5313.51   30.26 5313.48   31.97 5313.31   32.48 5313.22   32.58 5313.21
   33.97 5312.97   35.97 5311.76   37.97 5309.42   39.96 5307.58    41.5 5306.43
   45.96 5305.99    48.8 5306.52   49.96 5306.78   51.95 5307.56   53.95 5308.39
   55.95 5309.33   57.95 5310.34   59.95 5312.02   61.95 5313.15   63.94 5313.94
   65.94 5314.46   67.94 5314.94   69.94 5315.22   71.89  5315.4   71.94 5315.41
   73.93 5315.47   75.93 5315.56   77.93 5315.68   79.93 5315.78   81.93 5315.84
   83.93  5315.9   85.92 5316.01   87.92 5316.12   89.92 5316.18   91.92 5316.22
   93.92 5316.29   95.92 5316.37   97.91 5316.43   99.91 5316.46  101.91 5316.49
  103.91 5316.53  105.91 5316.56   107.9 5316.56  108.19 5316.57   109.9 5316.63
   111.9 5316.91   113.9 5317.18   115.9 5317.45   117.9 5317.69

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   30.26     .08   32.48    .077   71.89     .08  108.19     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          32.58   71.89            20.6   18.75   15.94             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   21.13 5323.77       F
   95.12  106.85 5326.34       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
  106.85   117.95326.562

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 6666

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5313.37    1.98 5313.44    3.96 5313.53    5.94 5313.49    7.93 5313.37
    9.91 5313.19   11.89 5313.29   13.87 5313.39   15.85 5313.38   17.83 5313.32
   19.81 5312.99   21.47  5312.5   21.73 5312.43   21.79 5312.41   23.78 5311.45
   25.76 5310.76   27.74 5309.86   29.72  5308.2    31.7 5306.47   33.68 5305.99
   35.66 5306.01   37.64 5306.15   39.63 5306.57   41.61 5307.18   43.59 5307.74
   45.57 5308.24   47.55 5308.64   49.53 5309.32   51.51 5310.31   53.49 5311.57
   55.48 5313.08   57.46 5313.93    59.2 5314.57   59.44 5314.66   61.42 5315.23
    63.4 5315.23   65.38 5315.18   67.36 5315.27   69.34 5315.44   71.33 5315.67
   73.31 5315.84   75.29 5315.91   77.27 5315.96   79.25 5316.02   81.23  5316.1
   83.21 5316.22    85.2 5316.25   87.18 5316.28   89.16 5316.35   91.14 5316.46
   93.12 5316.51    95.1 5316.52   97.08 5316.54   99.06 5316.56  100.38 5316.62
  101.05 5316.65  103.03 5316.85  105.01 5317.15  106.99 5317.45

Manning's n Values         num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   21.47    .077    59.2     .08  100.38     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          21.73    59.2           31.64   30.08   23.62             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
    8.87   16.665323.242       F
   84.63   99.395326.243       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    8.875323.373   99.39  106.995326.563

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 6636

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5313.12       2 5313.12    3.99 5313.26    5.99 5313.34    7.98 5313.23
    9.98 5313.05   11.98 5312.99   13.97 5312.65   15.97 5312.31   17.44 5312.17
   17.96 5312.11   18.01 5312.11   19.96 5312.04   21.96 5307.13   23.95 5305.45
   25.95 5305.59   27.94 5306.03   29.94 5306.41   31.94 5307.02   33.93  5307.7
   35.93 5308.13   37.92 5308.47   39.92 5308.94   41.92 5309.56   43.91 5310.43
   45.91 5311.35   47.91 5312.53    49.9  5313.5    51.9 5314.09   52.89 5314.23
   53.65 5314.34   53.89 5314.37   55.89 5314.79   57.89 5314.87   59.88  5314.8
   61.88 5314.79   63.87 5314.82   65.87 5314.87   67.87 5314.99   69.86 5315.13
   71.86 5315.39   73.85 5315.61   75.85 5315.78   77.85 5315.96   79.84 5316.23
   81.84 5316.97   83.83 5317.92   85.83 5318.27   87.83 5318.31   89.82 5317.59
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   91.82 5316.82   93.81 5316.56   95.81 5316.57   97.81 5316.67    99.8  5316.6
  100.62 5316.66   101.8 5316.74  103.79 5317.14  105.79  5317.6

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   18.01    .077   52.89     .08  100.62     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          17.44   53.65            29.21   30.54   33.65             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   15.44   16.455322.395       F
    80.8    99.95326.484       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   15.445323.121    99.9  105.795326.596

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6605

INPUT
Description: 30th Street (U/S)
Station Elevation Data    num=      79
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5312.16    1.97 5312.11    3.94 5312.12     5.9 5312.14    7.87 5312.14
    9.84 5312.15   11.81 5312.09   13.77 5311.97   15.74 5311.91   17.71 5311.94
   19.68    5312   21.64 5312.01   23.61 5312.01   25.58  5312.2   27.55 5312.49
   29.52 5312.66   31.51 5312.34   32.46 5312.14   33.04 5312.02    33.5 5311.93
   35.49 5309.53   37.48 5305.39   39.12 5304.89   47.12 5304.89   47.43 5307.06
   49.42 5308.15   51.41 5310.37    53.4 5312.35   55.39 5313.01    56.9 5312.93
   57.35  5312.9   57.39  5312.9   59.38 5312.87   61.37 5313.26   63.36 5313.54
   65.35 5313.72   67.34 5313.66   69.33 5313.72   71.32 5313.77   73.31 5313.79
    75.3 5313.84   77.29 5313.92   79.28 5314.14   81.27 5314.41   83.26 5314.54
   85.26  5314.7   87.25  5314.8   89.24 5314.88   91.23 5315.05   93.22 5315.21
    93.8 5315.24   95.21 5315.32    97.2 5315.43   99.19 5315.53  101.18 5315.62
  103.17 5315.71  105.16  5315.8  107.15 5315.95  109.14  5316.1  111.13 5316.22
  113.13 5316.35  115.12 5316.48  117.11 5316.61   119.1 5316.69  121.09 5316.72
  123.08 5316.78  125.07 5316.84  127.06 5316.85  129.05 5316.93  131.04  5317.1
  132.96 5317.23   134.8 5317.36  136.64 5317.48  138.49 5317.59  140.33 5317.72
  142.17 5317.81  144.01 5317.94  145.85 5318.06   147.7 5318.18

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   33.04    .077   57.35     .08    93.8    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          32.46   55.39            73.82   73.27    73.2             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0   36.12 5312.32       T
   50.12      65 5312.35       T
   83.91   147.75324.568       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   39.12   40.32 5309.09   45.92   47.12 5309.09

CULVERT


RIVER: Skunk
REACH: 04                 RS: 6570

INPUT
Description: 30th Street  (30% potential debris block);
culvert size =
             8'Wx6'H
modeled culvert size (for 30% block) = 5.6'Wx6'H
Distance from Upstream XS =       3
Deck/Roadway Width        =      62
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      30  5312.3              37 5312.32              37  5316.2
      50  5316.2              52  5316.2              52 5312.26
      68 5313.09

Upstream Bridge Cross Section Data
Station Elevation Data    num=      79
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5312.16    1.97 5312.11    3.94 5312.12     5.9 5312.14    7.87 5312.14
    9.84 5312.15   11.81 5312.09   13.77 5311.97   15.74 5311.91   17.71 5311.94
   19.68    5312   21.64 5312.01   23.61 5312.01   25.58  5312.2   27.55 5312.49
   29.52 5312.66   31.51 5312.34   32.46 5312.14   33.04 5312.02    33.5 5311.93
   35.49 5309.53   37.48 5305.39   39.12 5304.89   47.12 5304.89   47.43 5307.06
   49.42 5308.15   51.41 5310.37    53.4 5312.35   55.39 5313.01    56.9 5312.93
   57.35  5312.9   57.39  5312.9   59.38 5312.87   61.37 5313.26   63.36 5313.54
   65.35 5313.72   67.34 5313.66   69.33 5313.72   71.32 5313.77   73.31 5313.79
    75.3 5313.84   77.29 5313.92   79.28 5314.14   81.27 5314.41   83.26 5314.54
   85.26  5314.7   87.25  5314.8   89.24 5314.88   91.23 5315.05   93.22 5315.21
    93.8 5315.24   95.21 5315.32    97.2 5315.43   99.19 5315.53  101.18 5315.62
  103.17 5315.71  105.16  5315.8  107.15 5315.95  109.14  5316.1  111.13 5316.22
  113.13 5316.35  115.12 5316.48  117.11 5316.61   119.1 5316.69  121.09 5316.72
  123.08 5316.78  125.07 5316.84  127.06 5316.85  129.05 5316.93  131.04  5317.1
  132.96 5317.23   134.8 5317.36  136.64 5317.48  138.49 5317.59  140.33 5317.72
  142.17 5317.81  144.01 5317.94  145.85 5318.06   147.7 5318.18

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   33.04    .077   57.35     .08    93.8    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
          32.46   55.39             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
       0   36.12 5312.32       T
   50.12      65 5312.35       T
   83.91   147.75324.568       F
```

```
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   39.12   40.32 5309.09   45.92   47.12 5309.09

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    5311           17.95 5312.58           17.95 5316.45
   26.83 5316.77           26.83 5312.84            50.8    5313

Downstream Bridge Cross Section Data
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5311.39    1.99 5311.55    3.99 5311.62    5.98 5311.69    7.98 5311.68
    9.97 5311.66    10.2 5311.61   11.97 5311.22   13.96 5309.56   15.96 5306.79
   17.95  5305.6   18.39 5304.12   26.39 5304.12   26.44 5305.78   28.14  5306.9
   30.12 5309.59    32.1  5311.5   33.52 5311.88   34.08 5312.03   35.54  5312.4
   36.05 5312.53   38.03 5312.82   40.01 5312.52   41.99  5312.5   43.97 5312.54
   45.95 5312.65   47.93 5312.78    49.9 5312.94   51.88  5313.1   53.86 5313.25
   55.84 5314.25   57.82 5315.39    59.8 5315.72   61.78 5315.86   63.75 5315.98
   65.73 5315.23   67.71 5314.79   69.69 5315.24   71.67 5315.84   73.65  5316.2
   75.63 5316.41    77.6 5316.54   79.58 5316.61   81.56 5316.64   83.54 5316.22
   85.52 5315.82    87.5 5315.74   89.48 5315.77   91.45 5315.81   93.43 5315.89
   95.41 5315.96   97.39 5316.03   99.37 5316.13  101.35 5316.26  103.33 5316.36
   105.3 5316.45  107.28 5316.58  109.26 5317.31

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    10.2    .102   33.52     .08   35.54     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
          10.2   33.52             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
      10   15.39 5311.61       F
   31.39      50 5312.84       F
   54.35  109.265323.326       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box     4.2     5.6
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 2 - Wingwall flared 90 or 15 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                   3      62     .013     .013        0                   .5                1
Upstream   Elevation =  5304.89
           Centerline Station =  43.12
Downstream Elevation =  5304.12
           Centerline Station =  22.39

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6532

INPUT
Description: 30th Street (D/S)
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5311.39    1.99 5311.55    3.99 5311.62    5.98 5311.69    7.98 5311.68
    9.97 5311.66    10.2 5311.61   11.97 5311.22   13.96 5309.56   15.96 5306.79
   17.95  5305.6   18.39 5304.12   26.39 5304.12   26.44 5305.78   28.14  5306.9
   30.12 5309.59    32.1  5311.5   33.52 5311.88   34.08 5312.03   35.54  5312.4
   36.05 5312.53   38.03 5312.82   40.01 5312.52   41.99  5312.5   43.97 5312.54
   45.95 5312.65   47.93 5312.78    49.9 5312.94   51.88  5313.1   53.86 5313.25
   55.84 5314.25   57.82 5315.39    59.8 5315.72   61.78 5315.86   63.75 5315.98
   65.73 5315.23   67.71 5314.79   69.69 5315.24   71.67 5315.84   73.65  5316.2
   75.63 5316.41    77.6 5316.54   79.58 5316.61   81.56 5316.64   83.54 5316.22
   85.52 5315.82    87.5 5315.74   89.48 5315.77   91.45 5315.81   93.43 5315.89
   95.41 5315.96   97.39 5316.03   99.37 5316.13  101.35 5316.26  103.33 5316.36
   105.3 5316.45  107.28 5316.58  109.26 5317.31

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    10.2    .102   33.52     .08   35.54     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          10.2   33.52             50.7   52.72   53.81             .3       .5
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
      10   15.39 5311.61       F
   31.39      50 5312.84       F
   54.35  109.265323.326       F

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6479

INPUT
Description:
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5311.15    1.99 5311.19    3.98 5311.23    5.97 5311.26    7.96 5311.28
    9.95 5311.18   11.94 5311.05   13.93    5311   15.92 5310.95    16.9 5310.98
   17.91 5311.01    19.9 5311.07   21.89 5311.08   23.88 5311.05   25.87 5311.05
   27.86 5311.01   29.85 5310.94   31.84 5310.84   33.83 5310.53   35.82 5309.67
   37.81 5308.65    39.8 5307.37   41.79 5305.82   43.78 5304.63   45.77  5303.9
   47.76 5303.53   49.75  5303.6   51.74 5304.01   53.73 5305.04   55.72 5306.29
```

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   57.71 5307.37    59.7 5308.61   61.69    5310   63.68 5311.36    64.8 5311.67
   65.67 5311.91   66.61  5312.1   67.66 5312.32   69.65 5312.35   71.64 5312.41
   73.63 5312.49   75.62 5312.55   77.61 5312.66    79.6 5312.75   81.59 5312.82
   83.58 5312.81   85.57  5312.9   87.56 5312.98   89.55 5312.96   91.54    5313
   93.53 5313.34   95.52 5314.14   97.51 5314.81    99.5 5315.31  101.49  5315.5

Manning's n Values         num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    16.9     .08   33.83    .102    64.8     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         33.83   63.68            56.07   56.31   55.72             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    9.45    17.25321.231       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    9.455321.154   89.99  101.495322.959

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6423

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5310.46    1.99 5310.44    3.98  5310.4    5.97 5310.38    7.96  5310.3
    9.95 5310.26   11.94 5310.22   13.93 5310.25   15.92 5310.31   17.91 5310.41
    19.9 5310.33   21.89 5310.12   23.88 5310.03   25.87 5309.96   26.73 5309.76
   27.11 5309.67   27.86  5309.5   29.85 5308.63   31.84 5307.25   33.83 5305.49
   35.82 5303.97   37.81 5303.19    39.8 5302.85   41.79 5302.77   43.78 5302.94
   45.77 5303.81   47.76 5305.36   49.75 5305.48   51.74 5305.73   53.73  5306.2
   55.72 5306.86   57.71 5307.61   59.63 5308.71    59.7 5308.75   61.69    5310
   63.68 5311.15   65.67  5312.1   66.64 5312.37   67.66 5312.66   69.65 5313.09
   71.64 5313.52   73.63 5313.71   75.62  5313.9   77.62 5314.08   79.61 5314.26
    81.6  5314.4   83.59 5314.56   85.58 5314.76   87.57 5314.92   89.56 5315.16
   91.55 5315.26   93.54 5315.44   95.53 5315.63   97.52 5315.72   99.51 5315.82
   101.5  5315.9  103.49 5315.99  105.48 5316.15  107.47 5316.32

Manning's n Values         num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    19.9     .08   26.73    .102   59.63     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         27.11   66.64            72.06   93.08  103.03             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   91.83  107.475325.283       F
       0    2.725320.464       F

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6330

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5310.93    1.98 5310.95    3.95 5310.87    5.93 5310.73     7.9 5310.67
    9.88 5310.67   13.83 5310.48   15.81 5310.46   17.78 5310.41   19.76 5310.34
   25.69 5310.34   27.66 5310.44   29.64 5310.48   31.61 5310.55   33.59  5310.6
   35.57 5310.53   37.54 5310.43   39.52 5310.19   41.49 5310.06   45.44 5309.99
   47.42  5309.9   51.37 5309.81   53.35 5309.72    57.3 5309.49   59.28 5309.34
   61.25 5309.25   63.23 5309.11   65.49 5308.97   67.18 5308.93   71.13 5308.75
   73.11 5308.74   75.08 5308.62   77.06 5308.42   79.03 5308.39   81.01 5308.52
   82.99 5308.24   84.96 5308.02   86.94 5307.77   88.91 5307.79   90.89 5307.75
   92.88 5307.75   93.86 5307.44   94.87 5307.12   96.87 5305.31   98.86  5303.1
  100.85 5301.08  102.84 5299.87  104.83 5299.81  106.83 5299.99  108.82 5301.86
  110.81 5303.51   112.8 5305.04   114.8 5306.04  116.79 5306.96  118.11 5307.47
  118.12 5307.47  118.78 5307.72  120.77 5308.08  122.77 5308.21  124.76 5308.23
  126.75 5308.29  128.74 5308.46  130.73 5308.66  132.73 5308.93  134.72  5309.1
  136.71 5309.23   140.7 5309.42  142.69 5309.54  144.68 5309.55  150.64 5309.83
  152.63 5309.97  156.59 5310.31  158.58 5310.45  162.55 5310.66  166.52 5310.96
   168.5 5311.13  172.47 5311.49  174.45 5311.66  176.44 5311.89  180.41 5312.52
  184.38 5313.34  188.35 5314.19  190.33 5314.58  192.31 5314.91   194.3  5315.2
  196.28 5315.56  198.27 5315.94  200.25 5316.15  202.24 5316.29     204 5316.35
  206.21 5316.46  208.19 5316.53  212.16 5316.73  214.14 5316.84  216.13 5316.88
  218.11  5317.1   220.1 5317.11  222.08 5317.32  226.05 5317.42  228.03 5317.48

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   65.49     .08   93.86    .102  118.12     .08     204     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         93.86  118.11            77.04   76.28   74.26             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  204.69  218.425326.381       F
    4.27   71.525320.848       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    4.275320.929  218.42  228.035327.098

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6254

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5307.74    3.97 5307.76    7.95 5307.61   11.92 5307.62   13.91 5307.58
   17.88 5307.75   21.86 5307.59   23.84 5307.41   27.82 5307.26   31.79 5307.19
   33.78 5307.01   35.77 5306.96   41.73 5306.98   43.71 5306.93    45.7 5307.01
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   53.65 5306.91   55.64 5306.94    61.6 5306.87   65.57  5306.8   69.55 5306.69
   73.52 5306.53   75.51 5306.49   79.48 5306.51   80.99 5306.45   83.45 5306.39
   87.43 5306.39    91.4 5306.29   95.38 5306.09   99.35 5305.97  103.32 5305.75
  109.29 5305.59  117.23 5305.71  121.21 5305.75  125.18  5305.9  129.16 5305.95
   137.1 5306.15  141.08 5306.33  143.06 5306.34  145.05 5305.82  147.04 5303.94
  149.03 5301.82  151.01 5300.17     153 5299.58  158.96  5299.5  160.95 5299.68
  162.93  5300.7  164.92 5302.15  166.91 5302.82   168.9 5302.87  170.88 5303.11
  172.87 5303.61  176.84 5305.25  178.83 5305.85  180.86 5306.14   182.8 5306.26
  184.79 5306.52  186.78 5306.71  190.75 5306.71  192.74 5306.86  196.71 5306.86
  200.69  5306.9  202.67 5306.84  206.65 5306.84  210.62 5306.95  212.61 5306.93
  216.58 5306.98  218.57  5307.1  220.56 5307.15  224.55 5307.18  228.53  5307.3
  232.51 5307.38  236.49 5307.52  242.46 5307.64  248.44 5307.89  250.43 5307.95
   256.4 5308.24  260.38 5308.28  264.36 5308.43  266.35 5308.54  272.33 5308.78
   278.3 5309.17  282.28 5309.55  290.24 5310.34  292.23 5310.62  296.22 5311.32
  298.21 5311.71   300.2 5312.17  302.19 5312.36  304.18 5312.68  306.17 5313.24
  308.16 5313.67  310.15 5313.91  312.14 5314.02  314.23 5313.95  316.12 5313.88
  318.11 5313.67   320.1  5313.7   322.1 5313.86  328.07 5314.04  332.05 5314.05

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   80.99     .08  143.06    .102  180.86     .08  314.23    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        143.06  180.86            100.02   95.85   87.36              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    2.44  139.16 5317.78       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    2.445317.744

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6158

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5303.04    5.99 5302.93    9.98 5302.93   13.97 5302.89   17.96 5303.05
   19.95 5303.04   23.94  5302.8   25.94 5302.81   29.93 5302.94   35.91 5302.85
    39.9  5302.6    41.9 5302.57   45.89 5302.43   49.88 5302.56   53.87 5302.44
   57.86 5302.36   59.85 5302.26   63.84 5302.21   65.84 5302.15   69.83 5302.21
   73.82 5302.15   77.81 5302.16    79.8 5302.21    81.8 5302.47   85.18 5302.64
   87.78 5302.74   91.77 5302.72   93.77 5302.91   97.76 5303.38   99.75 5303.69
  101.75 5303.91  103.74 5304.02  107.73 5304.04  115.71  5304.2  117.71 5304.27
  129.68 5304.41  131.67 5304.49  141.65 5304.67  145.64  5304.7  147.63 5304.81
  151.62 5304.87  155.61 5305.11   159.6  5305.2  163.59 5305.24  167.59 5305.34
  169.58 5305.18  170.14 5305.04  171.57 5304.67  173.57 5303.28  175.57 5302.12
  177.56 5300.38  179.56 5299.05  181.55 5298.39  183.55 5298.24  185.54 5298.25
  187.54  5298.5  189.53 5299.06  191.53 5300.28  193.52 5302.24  195.52 5303.55
  197.51 5304.43  199.51 5305.04  200.38 5305.17  201.52 5305.34  205.49 5305.57
  207.49 5305.77  211.48 5306.48  215.47 5307.02  219.46 5307.43  223.45 5307.71
  225.44 5307.71  227.44 5307.62  237.41 5307.54  239.41 5307.58   241.4 5307.52
  245.39 5307.48  247.39  5307.5  253.37 5307.45  257.36 5307.37  265.34 5307.32
  279.31 5307.52   283.3 5307.51  285.29 5307.73  287.29 5307.85  293.27 5308.51
  297.26 5308.91  299.26 5309.17  303.25 5309.89  307.24 5310.56  309.23 5310.83
  313.22 5311.57  317.21 5312.28   321.2 5313.05   323.2 5313.26  326.06 5313.36
  329.18 5313.31  331.18  5313.1  335.17 5313.38  341.15 5313.59  345.14 5313.57

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   85.18     .08  170.14    .102  201.52     .08  326.06    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        170.14  200.38             69.05   70.54   71.03              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    9.65  164.925312.949       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    9.655313.042

CROSS SECTION


RIVER: Skunk
REACH: 04                 RS: 6087

INPUT
Description: Arrowwood Park Ped Bridge (U/S)
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5302.82    5.96 5302.47    7.95 5302.45   11.93 5302.34    15.9 5302.26
   19.88 5302.11   21.87 5302.08   25.84 5301.96   31.81    5302    33.8 5301.98
   39.76 5301.86   45.72 5301.79    49.7  5301.7   53.68 5301.66   57.65 5301.49
   61.63 5301.35    65.6  5301.4   69.58 5301.38   75.54 5301.45    83.5 5301.45
   85.48 5301.42   86.54 5301.48   89.46 5301.65   91.45 5301.68    99.4 5302.39
  103.38 5302.83  105.36 5303.08  107.35 5303.26  111.33 5303.54  117.29 5303.73
  121.27 5303.72  123.26 5303.85  129.22 5304.04   133.2 5304.08  137.17 5304.21
  139.16 5304.16  141.15 5304.22  143.14 5304.38  145.12 5304.38   145.5 5304.04
   146.8 5302.41  151.89 5301.18  155.96 5300.09  158.91 5299.32  159.95 5298.35
  163.02 5297.39  167.92 5297.39  170.97 5298.86  172.96 5299.68  174.94  5300.9
     178 5302.27   182.9 5304.97  183.36 5305.04  184.88 5305.28  186.87 5305.41
  190.85 5305.58  194.82 5305.86  196.81 5306.15   198.8 5306.36  202.78 5306.68
  206.75 5306.83  210.73 5307.07  212.72 5307.06  216.69 5307.16  222.66 5307.36
  224.64 5307.52  228.62  5307.5  234.58 5307.65  236.57 5307.73  240.55 5307.97
  242.54  5308.2  246.51 5308.59  250.49 5308.95  254.46 5309.08  256.45 5309.23
  260.43 5309.45   264.4 5309.73  266.39 5309.83  268.38 5310.03  272.36 5310.34
  278.32 5310.64   282.3 5310.75  286.27 5310.72  288.26 5310.76  292.24 5310.94
  294.22 5311.15  296.21 5311.42   298.2  5311.6  302.18 5312.03  304.16 5312.12
  306.77 5312.11  308.14 5312.06  310.13 5311.73   314.1 5311.99  320.07 5312.25
  324.04 5312.29

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   86.54     .08   145.5    .102  183.36     .08  306.77    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
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         145.5  183.36             27.6   27.28   26.77             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    4.83  139.61 5312.53       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    4.835312.818     143     156    5305     173     184    5305

BRIDGE


RIVER: Skunk
REACH: 04                  RS: 6070

INPUT
Description: Arrowwood Park Ped. Bridge. (30% potential debris block)
Distance from Upstream XS =      10
Deck/Roadway Width        =       9
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      15
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    97.7 5301.51             113 5302.95             128 5305.14
     140 5305.43             144 5305.51             144 5308.52
     145    5309           146.8    5309 5304.54   162.5 5309.04 5304.54
     178 5308.97 5304.49     1795308.454             179 5305.49
     184 5305.62             199 5306.23             215 5306.93

Upstream Bridge Cross Section Data
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5302.82    5.96 5302.47    7.95 5302.45   11.93 5302.34    15.9 5302.26
   19.88 5302.11   21.87 5302.08   25.84 5301.96   31.81    5302    33.8 5301.98
   39.76 5301.86   45.72 5301.79    49.7  5301.7   53.68 5301.66   57.65 5301.49
   61.63 5301.35    65.6  5301.4   69.58 5301.38   75.54 5301.45    83.5 5301.45
   85.48 5301.42   86.54 5301.48   89.46 5301.65   91.45 5301.68    99.4 5302.39
  103.38 5302.83  105.36 5303.08  107.35 5303.26  111.33 5303.54  117.29 5303.73
  121.27 5303.72  123.26 5303.85  129.22 5304.04   133.2 5304.08  137.17 5304.21
  139.16 5304.16  141.15 5304.22  143.14 5304.38  145.12 5304.38   145.5 5304.04
   146.8 5302.41  151.89 5301.18  155.96 5300.09  158.91 5299.32  159.95 5298.35
  163.02 5297.39  167.92 5297.39  170.97 5298.86  172.96 5299.68  174.94  5300.9
     178 5302.27   182.9 5304.97  183.36 5305.04  184.88 5305.28  186.87 5305.41
  190.85 5305.58  194.82 5305.86  196.81 5306.15   198.8 5306.36  202.78 5306.68
  206.75 5306.83  210.73 5307.07  212.72 5307.06  216.69 5307.16  222.66 5307.36
  224.64 5307.52  228.62  5307.5  234.58 5307.65  236.57 5307.73  240.55 5307.97
  242.54  5308.2  246.51 5308.59  250.49 5308.95  254.46 5309.08  256.45 5309.23
  260.43 5309.45   264.4 5309.73  266.39 5309.83  268.38 5310.03  272.36 5310.34
  278.32 5310.64   282.3 5310.75  286.27 5310.72  288.26 5310.76  292.24 5310.94
  294.22 5311.15  296.21 5311.42   298.2  5311.6  302.18 5312.03  304.16 5312.12
  306.77 5312.11  308.14 5312.06  310.13 5311.73   314.1 5311.99  320.07 5312.25
  324.04 5312.29

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   86.54     .08   145.5    .102  183.36     .08  306.77    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         145.5  183.36             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    4.83  139.61 5312.53       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    4.835312.818     143     156    5305     173     184    5305

Downstream  Deck/Roadway Coordinates
    num=      16
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    82.7 5301.51              98 5302.95             113 5305.14
     125 5305.43             129 5305.51             129 5308.52
     130    5309           131.8    5309 5304.48   147.5 5309.04 5304.49
     163 5308.97 5304.41     1645308.454             164 5305.49
     169 5305.62             184 5306.23             200 5306.93
     233 5307.66

Downstream Bridge Cross Section Data
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5302.64    7.96 5302.53   11.93  5302.4   13.92 5302.57   19.89  5302.2
   21.88 5302.17   23.87 5302.23   25.86 5302.44   27.84 5302.42   29.83 5302.33
   31.82 5302.14   33.81 5302.11    35.8 5301.98   39.78 5301.79   43.76 5301.66
   47.73  5301.6   49.72  5301.6    53.7 5301.45   55.69 5301.41   59.67 5301.38
   65.63 5301.26   69.61 5301.24   73.59 5301.31   77.57 5301.25   81.55 5301.49
   85.52 5301.19   87.51 5301.15      90 5301.26   93.48 5301.55   97.46 5301.74
   99.45 5302.06  103.42 5302.99  109.39 5304.03  111.38 5304.43  113.37 5304.64
  115.36 5304.77  117.35 5304.77  121.32 5304.84   125.3  5305.1  127.29 5304.97
  129.28 5304.68   130.9 5304.22   131.8 5301.93  139.23 5301.14   143.2  5299.5
  145.19 5298.59  147.18 5297.51  149.17 5297.01  152.95 5297.26     154 5297.59
  157.13 5299.14  159.11 5300.43   161.1 5301.93     163 5302.65  165.08 5303.92
  167.35  5304.1  169.06 5304.41  171.05  5304.5  175.03 5304.79  180.99 5305.13
  184.97 5305.18  188.95  5305.2  192.93 5305.45  194.92 5305.54  200.88 5305.97
  204.86 5306.22  208.84 5306.65  212.82 5306.82  216.79 5306.96  220.77 5307.22
  226.74 5307.48   232.7 5307.66  238.67 5308.11  240.66 5308.32  244.64 5308.58
  246.63 5308.74  250.61 5308.96  252.59 5309.11  260.55 5309.47  264.53  5309.6
  268.51 5309.94  270.49 5310.07  276.46 5310.62  280.44 5310.87  282.43 5311.02
   288.4 5311.38  292.37 5311.69  294.36  5311.8  297.03 5311.83  298.34 5311.79
  300.33  5311.6  302.32 5311.61  304.31 5311.73  308.28 5311.88  310.27 5311.99
  312.26 5312.05  314.25 5312.03

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13      90     .08   130.9    .102  167.35     .08  297.03    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         130.9  167.35             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    3.34   124.45312.595       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    3.345312.638
```

```
Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 6060

INPUT
Description: Arrowwood Park Ped Bridge (D/S)
Station Elevation Data     num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5302.64    7.96 5302.53   11.93  5302.4   13.92 5302.57   19.89  5302.2
   21.88 5302.17   23.87 5302.23   25.86 5302.44   27.84 5302.42   29.83 5302.33
   31.82 5302.14   33.81 5302.11    35.8 5301.98   39.78 5301.79   43.76 5301.66
   47.73  5301.6   49.72  5301.6    53.7 5301.45   55.69 5301.41   59.67 5301.38
   65.63 5301.26   69.61 5301.24   73.59 5301.31   77.57 5301.25   81.55 5301.49
   85.52 5301.19   87.51 5301.15      90 5301.26   93.48 5301.55   97.46 5301.74
   99.45 5302.06  103.42 5302.99  109.39 5304.03  111.38 5304.43  113.37 5304.64
  115.36 5304.77  117.35 5304.77  121.32 5304.84   125.3  5305.1  127.29 5304.97
  129.28 5304.68   130.9 5304.22   131.8 5301.93  139.23 5301.14   143.2  5299.5
  145.19 5298.59  147.18 5297.51  149.17 5297.01  152.95 5297.26     154 5297.59
  157.13 5299.14  159.11 5300.43   161.1 5301.93     163 5302.65  165.08 5303.92
  167.35  5304.1  169.06 5304.41  171.05  5304.5  175.03 5304.79  180.99 5305.13
  184.97 5305.18  188.95  5305.2  192.93 5305.45  194.92 5305.54  200.88 5305.97
  204.86 5306.22  208.84 5306.65  212.82 5306.82  216.79 5306.96  220.77 5307.22
  226.74 5307.48   232.7 5307.66  238.67 5308.11  240.66 5308.32  244.64 5308.58
  246.63 5308.74  250.61 5308.96  252.59 5309.11  260.55 5309.47  264.53  5309.6
  268.51 5309.94  270.49 5310.07  276.46 5310.62  280.44 5310.87  282.43 5311.02
   288.4 5311.38  292.37 5311.69  294.36  5311.8  297.03 5311.83  298.34 5311.79
  300.33  5311.6  302.32 5311.61  304.31 5311.73  308.28 5311.88  310.27 5311.99
  312.26 5312.05  314.25 5312.03

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13      90     .08   130.9    .102  167.35     .08  297.03    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        130.9  167.35           40.15   36.69    31.6             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    3.34   124.45312.595       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    3.345312.638

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 6023

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5302.08    3.95 5302.17     7.9 5302.06   11.86    5302   13.83 5301.92
   15.81 5301.37   17.79 5301.18   19.76 5301.15   25.69 5301.15   27.67 5301.19
   29.64 5301.18    33.6 5301.21   37.55 5301.06   39.52 5301.05    41.5 5301.26
   43.48 5301.32   45.45 5301.31   49.41 5301.13   57.31  5301.2   59.29 5301.19
   67.19 5301.04   69.17 5300.97   73.12 5300.96    75.1  5300.9   77.07 5300.78
   79.05 5300.75   81.02 5301.14    83.5 5301.98   84.98 5302.42   86.95 5302.77
   88.93    5303   90.91 5303.09   98.81 5303.14  100.79  5303.2  102.76  5303.2
  106.72 5303.14  108.69 5303.15  112.99 5303.25   116.6 5303.35  118.57 5303.36
  120.55 5303.28  121.26 5303.06  122.53 5302.67   124.5 5301.67  126.48 5300.56
  128.45 5299.11  130.43 5297.49  132.41 5296.97  136.36 5296.78  138.33 5296.85
  140.31 5297.85  142.29 5298.79  144.26 5299.24  146.24 5299.77  148.22 5301.03
  150.19 5302.09  152.17    5303  153.47 5303.46  153.72 5303.55  154.14  5303.7
  156.12 5303.99   158.1 5304.15  164.02  5304.3  167.97 5304.48  175.87 5304.94
  177.85    5305  181.79 5305.28  183.77 5305.48  185.74 5305.63  189.69 5305.86
  191.67 5305.93  193.64 5305.92  195.62 5305.98  201.54 5306.21  205.49 5306.26
  209.44 5306.39  211.41 5306.51  215.36  5306.7  223.26 5306.98  225.23 5307.08
  229.18 5307.39  235.11 5308.07  237.08 5308.25  241.03 5308.98     243 5309.37
  244.98 5309.72  246.95 5310.02  248.93 5310.25   250.9 5310.37  252.88 5310.54
  254.85 5310.63  256.83 5310.67  264.72 5311.16  268.67 5311.35  272.62 5311.39
  274.18 5311.28  276.57 5311.14  286.44 5311.68  290.39 5311.81  294.34 5311.76

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    83.5     .08  112.99    .102  153.72     .08  274.18    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         121.26  153.47           81.45   88.01   92.04             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     6.71  113.155312.104       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
```

```
       0    6.715312.079   44.04   71.98 5311.31

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 5935

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5301.18    1.97 5301.19    3.95 5301.23    5.92 5301.25    7.89 5301.15
    9.87 5300.79   11.84 5300.75   13.81 5300.75   15.79 5300.72   17.76 5300.68
   19.73  5300.7    21.7 5300.74   23.68 5300.71   25.65 5300.74   27.62 5300.73
    29.6 5300.73   31.57 5300.75   33.54 5300.73   37.49 5300.75   39.46 5300.75
   43.41 5300.77   45.38 5300.72   47.36 5300.73   49.33 5300.73    51.3 5300.74
   53.27 5300.73   55.25 5300.75   57.22 5300.79   59.19 5300.87   61.17 5301.13
   63.14 5301.54   65.11 5301.37   67.09 5300.91   68.41 5300.91   69.06 5300.91
   71.03 5301.16   73.01 5301.34   74.98 5301.43   78.93 5301.43    80.9 5301.44
   82.86 5301.39    86.8 5301.27   90.73 5301.09    92.7 5301.07   94.66 5301.09
   95.85 5301.05   96.63 5301.02   98.36 5300.75   98.59 5300.72  100.56 5300.16
  102.53 5298.96  104.49  5297.5  106.46 5296.32  108.42 5295.73  110.39  5295.7
  112.36 5295.77  114.32 5295.77  116.29 5295.86  118.25 5296.22  120.22 5297.22
  122.19 5298.02  124.15 5298.83  126.12  5300.1  128.09 5301.31  130.05 5302.63
  132.02  5304.2  133.03 5304.64  133.98 5305.05  135.95 5305.84  136.22 5305.93
  137.92 5306.54  139.88 5306.88  141.85 5307.05  143.81 5307.14  145.78 5307.25
  147.75 5307.46  149.71 5307.72  151.68 5308.05  153.65 5308.33  155.61 5308.71
  157.58 5309.01  159.54 5309.29  161.51 5309.66  163.48 5309.96  165.44 5310.24
  167.41 5310.45  169.37 5310.64  171.34 5310.79  173.31 5310.93  177.24 5311.01
   179.2 5311.06  181.17 5311.11  183.14 5311.17   185.1 5311.12  187.07 5311.06
  189.04 5311.01     191 5311.05  192.97 5311.23  194.93 5311.24   196.9 5311.18

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   68.41     .08   95.85    .102  133.03     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         98.36  136.22            86.97    90.7   92.88             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    7.37   87.075311.244       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    7.375311.181  190.88   196.95321.041

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 5845

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5301.06    3.98 5301.06    5.97 5301.03    7.95 5301.04    9.94 5300.88
   13.92  5301.1   15.18    5301   15.91 5300.93    17.9 5300.59   19.89  5300.6
   21.87 5300.54   23.86  5300.5   27.84 5300.48   31.82 5300.44   37.78 5300.63
   39.77 5300.72   41.76 5300.76   43.75 5300.77   45.74  5300.8   49.71 5300.73
    51.7 5300.74   53.69 5300.73   55.68 5300.68   59.66 5300.61   61.65 5300.61
   65.62 5300.64   67.61 5300.64    69.6 5300.61   71.59 5300.48    72.8 5300.15
   72.84 5300.14   73.58 5299.94   75.57  5298.8   77.56 5297.28   79.54 5295.88
   81.53 5294.54   83.52  5293.6   85.51 5293.37   89.49 5293.33   91.48 5293.34
   93.46 5293.74   95.45 5294.35   97.44  5295.2   99.43 5296.42  101.42 5297.51
  103.41 5298.19   105.4 5298.92  107.38 5299.61  109.37 5300.27  111.36 5301.25
  113.35 5302.78  115.34 5303.69  116.98 5304.09  117.33 5304.17  119.32 5304.37
  125.28 5304.63  127.27 5304.61  129.26 5304.48  131.25 5304.53   137.8 5304.66
  141.19 5304.75  143.18 5304.66  145.17 5304.54  147.16 5304.48  149.14 5304.49
  151.13 5304.67  153.12 5304.64  155.11 5304.66   157.1 5304.87  159.06 5305.01
  161.02 5305.19  162.97 5305.58  164.93 5306.04  166.89 5306.44  168.85 5306.81
  170.81 5307.21  172.77 5307.58  174.72  5307.9  176.68 5308.19  178.64 5308.41
   180.6 5308.57  182.56 5308.81  186.47 5309.06  188.43 5309.15  190.39 5309.33
  192.35 5309.49  196.27  5309.6  198.23 5309.72  200.18 5309.78  202.14 5309.78
   204.1  5309.7  206.06 5309.68  208.02 5309.78  209.98 5309.93  211.93 5310.13
  213.89 5310.43  215.85 5310.65  217.81 5310.63  219.77 5310.73  223.68 5310.74

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   15.18     .08   72.84    .102  116.98     .08   137.8     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          72.8  116.98            54.8   56.36   58.66             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
  187.84  216.955319.126       F
    7.67    9.325311.055       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    7.675311.059  216.95  223.685320.622  129.32  140.635314.485

CROSS SECTION


RIVER: Skunk
REACH: 04                  RS: 5788

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5300.8    1.99 5300.67    3.98 5300.63    5.96 5300.66    7.95 5301.12
    9.94 5301.33   11.93 5300.78    12.1 5300.76   13.91 5300.52    15.9 5300.44
   17.89 5300.34   19.88 5300.21   21.86 5300.14   23.85  5300.1   25.84    5300
   27.83 5299.98   29.81 5299.95    31.8 5299.88   33.79 5299.85   35.78 5299.79
   37.76 5299.71   39.75 5299.67   41.74 5299.68   43.73 5299.71   45.72 5299.76
    47.7 5299.78   49.69 5299.85   51.68 5299.96   53.67 5300.04   55.65 5300.09
   57.64 5300.12   59.63 5300.11   63.63 5300.01   67.62 5299.93   69.62 5299.92
   71.62 5300.04   73.62 5300.05   75.62 5300.05   77.61 5300.04   79.61 5299.96
   83.61 5299.86   85.61 5299.83   87.61 5299.71   87.91 5299.67   88.43 5299.61
    89.6 5299.47    91.6 5298.56    93.6 5296.98    95.6 5295.54    97.6 5294.15
```

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    99.6 5293.46  101.59 5292.93  103.59 5292.39  105.59 5292.04  107.59 5291.96
  109.59 5292.07  111.59 5292.55  113.59 5293.92  115.58 5295.21  117.58 5296.69
  119.58 5298.61  121.58 5299.83  123.58 5300.89   124.9 5301.54  125.58 5301.87
  127.57 5302.34  129.57 5302.59  131.57 5302.75  133.57 5302.88  135.57 5302.89
  137.57 5302.91  139.56 5303.03  141.56 5303.09  143.56 5303.11  145.56 5303.11
  147.56 5303.13  151.55 5303.19  153.55 5303.29  154.23 5303.32  155.55 5303.37
  159.55 5303.55  161.55 5303.55  163.54 5303.54  165.54 5303.62  167.54 5303.69
  169.54 5303.77  173.54 5304.13  175.54 5304.35  177.53 5304.56  179.53 5304.76
  181.53 5304.89  183.53 5305.05  185.53 5305.17  187.53 5305.28  191.52 5305.46
  193.52 5305.52  195.52 5305.56  197.52 5305.71  199.52 5305.72  201.51 5305.72

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13    12.1     .08   88.43    .102   124.9     .08  154.23     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          87.91   124.9            50.62   51.28   52.31             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    4.56   14.775310.633       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    4.565310.803  194.06  201.515315.534

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5737

INPUT
Description: Aurora Ave (U/S)
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5299.3    3.95 5299.34    5.92 5299.32     7.9 5299.31    9.87 5299.28
   11.85 5299.21   13.82 5299.24    15.8 5299.19   17.77 5299.19   21.72 5299.15
   23.69  5299.1   25.67 5299.06   29.62 5299.02   31.59 5298.97   33.56  5298.9
   35.54 5298.88   37.51 5298.85   39.49 5298.76   41.46 5298.71   43.44 5298.65
   45.41  5298.6   47.39 5298.54   51.33  5298.4   53.31 5298.35   55.28  5298.3
   57.26 5298.24   59.23 5298.17   61.21  5298.1   63.18 5298.03   65.16 5297.96
   67.13 5298.02    69.1 5298.04   71.08 5298.21   73.05 5298.34   75.03 5298.38
   78.98 5298.36   80.95 5298.37   82.93 5298.41   83.56 5298.43    84.9 5298.46
   86.87 5298.49   90.82 5298.47    92.8 5298.51   94.77 5298.49   96.75 5298.38
   98.72 5298.18  100.09 5297.97  100.69 5297.87  102.67 5296.76  104.64 5295.19
  106.62 5293.37  108.59 5292.08     109  5290.8     117  5290.8  118.46 5293.39
  120.44 5295.67  122.41 5297.21  124.39 5298.56  126.07 5299.35  126.36 5299.49
  127.12  5299.7  128.34 5300.05  130.31  5300.4  132.29 5300.69  134.26 5300.75
  136.23 5300.83  138.21 5300.94  140.18 5301.09  142.16 5301.45  144.13 5301.87
  146.11 5302.14  148.08  5302.3   149.9 5302.39  150.05 5302.39  152.03 5302.51
  155.97 5302.57  157.95 5302.65  159.92 5302.69  161.89 5302.75  163.87 5302.84
  165.84 5302.93  167.81  5302.9  169.79 5302.97  171.76 5303.07  175.71 5303.09
  177.68 5303.13  179.65 5303.25  181.63  5303.2   183.6 5303.26  185.57  5303.3
  187.55 5303.31  189.52 5303.25  191.49 5303.27  193.47 5303.37  195.44 5303.57
  197.41 5303.51  199.39 5303.38  201.36 5303.32

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   83.56     .08  100.09    .102  127.12     .08   149.9     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        100.69  126.07            82.49   80.52   78.57             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0    92.8 5298.51       F
     125  201.36  5298.1       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     109   109.8  5296.8   116.2     117  5296.8  192.39  201.365313.311

CULVERT


RIVER: Skunk
REACH: 03                 RS: 5700

INPUT
Description: E. Aurora Avenue (20% potential debris block);
culvert size =
             8'Wx6'H
modeled culvert size (for 20% block) = 6.4'Wx6'H
Distance from Upstream XS =       8
Deck/Roadway Width        =      54
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      29    5299              90  5298.1             108  5298.1
     108  5301.6             117  5301.6             117  5298.1
     130  5298.1

Upstream Bridge Cross Section Data
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5299.3    3.95 5299.34    5.92 5299.32     7.9 5299.31    9.87 5299.28
   11.85 5299.21   13.82 5299.24    15.8 5299.19   17.77 5299.19   21.72 5299.15
   23.69  5299.1   25.67 5299.06   29.62 5299.02   31.59 5298.97   33.56  5298.9
   35.54 5298.88   37.51 5298.85   39.49 5298.76   41.46 5298.71   43.44 5298.65
   45.41  5298.6   47.39 5298.54   51.33  5298.4   53.31 5298.35   55.28  5298.3
   57.26 5298.24   59.23 5298.17   61.21  5298.1   63.18 5298.03   65.16 5297.96
   67.13 5298.02    69.1 5298.04   71.08 5298.21   73.05 5298.34   75.03 5298.38
   78.98 5298.36   80.95 5298.37   82.93 5298.41   83.56 5298.43    84.9 5298.46
   86.87 5298.49   90.82 5298.47    92.8 5298.51   94.77 5298.49   96.75 5298.38
   98.72 5298.18  100.09 5297.97  100.69 5297.87  102.67 5296.76  104.64 5295.19
  106.62 5293.37  108.59 5292.08     109  5290.8     117  5290.8  118.46 5293.39
  120.44 5295.67  122.41 5297.21  124.39 5298.56  126.07 5299.35  126.36 5299.49
  127.12  5299.7  128.34 5300.05  130.31  5300.4  132.29 5300.69  134.26 5300.75
  136.23 5300.83  138.21 5300.94  140.18 5301.09  142.16 5301.45  144.13 5301.87
  146.11 5302.14  148.08  5302.3   149.9 5302.39  150.05 5302.39  152.03 5302.51
  155.97 5302.57  157.95 5302.65  159.92 5302.69  161.89 5302.75  163.87 5302.84
  165.84 5302.93  167.81  5302.9  169.79 5302.97  171.76 5303.07  175.71 5303.09
  177.68 5303.13  179.65 5303.25  181.63  5303.2   183.6 5303.26  185.57  5303.3
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  187.55 5303.31  189.52 5303.25  191.49 5303.27  193.47 5303.37  195.44 5303.57
  197.41 5303.51  199.39 5303.38  201.36 5303.32

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   83.56     .08  100.09    .102  127.12     .08   149.9     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
        100.69  126.07            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0    92.8 5298.51       F
     125  201.36  5298.1       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
     109   109.8  5296.8   116.2     117  5296.8  192.39  201.365313.311

Downstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    5298              47 5297.86              68  5297.7
      68  5301.2              77  5301.2              77 5297.67
      95    5298

Downstream Bridge Cross Section Data
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5298.07    1.97 5298.06    3.95 5298.05    5.92 5298.04     7.9 5297.97
    9.87 5298.01   11.84    5298   13.82 5297.94   15.79 5297.92   17.77 5297.89
   19.74 5297.85   21.71 5297.74   23.69 5297.66   25.66 5297.58   27.63 5297.45
   29.61 5297.38   31.58 5297.35   33.56  5297.3    37.5 5297.12   39.48 5297.09
   41.45 5297.16   43.43 5297.12    45.4 5297.06   47.37 5297.02   49.35 5296.95
   51.32 5296.88   53.29 5296.77   55.27 5296.67   57.24 5296.59   59.22 5296.38
   61.19 5296.12   62.05 5295.81   63.16 5295.41   65.14 5294.45   67.11 5292.95
      69 5290.35      77 5290.35   78.96 5292.96   80.93 5294.87    82.9  5296.2
   83.96 5296.61   84.88 5296.97   86.85 5297.55   88.82 5298.04    90.8  5298.2
   92.77 5298.16   96.72 5297.86   96.99 5297.86   98.69 5297.85  100.67 5297.85
  102.64 5297.72  104.62 5297.56  106.59 5297.62  108.56 5297.62  110.54 5297.75
  112.51 5297.89  114.48    5298  116.46 5298.08  118.43 5298.18  120.41 5298.24
  122.38 5298.29  124.35 5298.36  126.33 5298.46  130.28 5298.64  132.25 5298.69
  134.22 5298.78   136.2 5298.82  138.17 5298.82  142.12 5298.96  144.09 5298.95
  146.07 5298.98  148.04 5298.99  150.01 5299.03  151.99 5299.02  153.97 5298.97
  155.95 5298.92  157.93 5298.88  159.91 5298.78  161.89 5298.69  163.86 5298.58
  165.84  5298.5  167.82 5298.93   169.8 5299.07  171.78 5300.21  172.05 5300.32
  173.76 5301.01  175.73  5301.5  177.71  5302.1  179.69 5302.46  181.67 5302.59
  183.65 5302.76  185.63 5302.99   187.6 5303.12  189.58 5303.23  191.56 5303.39
  193.54 5303.43  195.52 5303.49

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   62.05    .102   83.96     .13   96.99    .015  172.05     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
         62.05   83.96            .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      60  5297.7       F
      86  195.52  5297.7       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    8.665308.066  189.79  195.525313.237

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       6     6.4
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 2 - Wingwall flared 90 or 15 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  8      54     .013     .013        0                   .5                1
Upstream   Elevation =  5290.8
           Centerline Station =  113
Downstream Elevation =  5290.35
           Centerline Station =  73

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5656

INPUT
Description: Aurora Ave (D/S)
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5298.07    1.97 5298.06    3.95 5298.05    5.92 5298.04     7.9 5297.97
    9.87 5298.01   11.84    5298   13.82 5297.94   15.79 5297.92   17.77 5297.89
   19.74 5297.85   21.71 5297.74   23.69 5297.66   25.66 5297.58   27.63 5297.45
   29.61 5297.38   31.58 5297.35   33.56  5297.3    37.5 5297.12   39.48 5297.09
   41.45 5297.16   43.43 5297.12    45.4 5297.06   47.37 5297.02   49.35 5296.95
   51.32 5296.88   53.29 5296.77   55.27 5296.67   57.24 5296.59   59.22 5296.38
   61.19 5296.12   62.05 5295.81   63.16 5295.41   65.14 5294.45   67.11 5292.95
      69 5290.35      77 5290.35   78.96 5292.96   80.93 5294.87    82.9  5296.2
   83.96 5296.61   84.88 5296.97   86.85 5297.55   88.82 5298.04    90.8  5298.2
   92.77 5298.16   96.72 5297.86   96.99 5297.86   98.69 5297.85  100.67 5297.85
  102.64 5297.72  104.62 5297.56  106.59 5297.62  108.56 5297.62  110.54 5297.75
  112.51 5297.89  114.48    5298  116.46 5298.08  118.43 5298.18  120.41 5298.24
  122.38 5298.29  124.35 5298.36  126.33 5298.46  130.28 5298.64  132.25 5298.69
  134.22 5298.78   136.2 5298.82  138.17 5298.82  142.12 5298.96  144.09 5298.95
  146.07 5298.98  148.04 5298.99  150.01 5299.03  151.99 5299.02  153.97 5298.97
  155.95 5298.92  157.93 5298.88  159.91 5298.78  161.89 5298.69  163.86 5298.58
  165.84  5298.5  167.82 5298.93   169.8 5299.07  171.78 5300.21  172.05 5300.32
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  173.76 5301.01  175.73  5301.5  177.71  5302.1  179.69 5302.46  181.67 5302.59
  183.65 5302.76  185.63 5302.99   187.6 5303.12  189.58 5303.23  191.56 5303.39
  193.54 5303.43  195.52 5303.49

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   62.05    .102   83.96     .13   96.99    .015  172.05     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         62.05   83.96            54.41   54.11    53.5             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      60  5297.7       F
      86  195.52  5297.7       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    8.665308.066  189.79  195.525313.237

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5602

INPUT
Description:
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5297.27    1.98 5297.29    3.97  5297.3    5.95  5297.3    7.94 5297.28
    9.92 5297.27   11.91 5297.26   13.89 5297.25   15.87 5297.26   17.86  5297.3
   19.84 5297.29   21.83 5297.26   23.81 5297.28    25.8  5297.3   27.78 5297.31
   29.76 5297.29   31.75 5297.24   33.73 5297.11   35.72    5297    37.7  5296.8
   39.69 5296.64   41.67 5296.54   43.65 5296.51   45.64 5296.52   47.62 5296.56
   49.61 5296.56   51.59 5296.52   53.58 5296.51   55.56 5296.46   57.54  5296.4
   59.53 5296.31   61.51 5296.06    63.5 5295.86   65.48 5295.75   67.47  5295.7
   69.45 5295.59   71.43 5295.59   73.42 5295.64    75.4 5295.51   77.17 5295.16
   77.39 5295.12   79.37 5294.17   81.36 5292.49   83.34 5291.08   85.32 5290.02
   87.31 5289.29   89.29  5289.1   91.28 5289.11   93.26    5290   95.25 5291.18
   97.23 5292.15   99.22 5293.01   101.2 5294.42  103.18 5295.39  105.17 5296.45
  107.15 5297.32  107.86 5297.57  109.14 5298.01  111.12 5298.67  113.11 5298.95
  115.09 5299.04  117.07 5299.17  119.06  5299.3  121.04 5299.33  123.03 5299.35
  125.01 5299.34     127 5299.36  128.98 5299.36  130.96 5299.36  132.95 5299.36

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   77.17    .102  107.86     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         77.17  107.86            66.87   65.84   65.01             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   17.27 5307.27   31.77   64.625307.243

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5536

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5295.59       2 5295.52    3.99 5295.42    5.99 5295.34    7.99 5295.34
    9.98 5295.29   11.98  5295.4   13.98 5295.56   15.97 5295.72   17.97 5295.86
   19.97 5295.91   21.96 5295.94   23.96 5295.78   25.95  5295.4   27.95 5295.01
   29.95 5294.93   31.94 5294.92   33.94 5294.91   35.94  5294.8   37.93 5294.66
   39.93 5294.58   41.93 5294.52   43.92 5294.44   45.92 5294.27   47.92 5294.14
   49.91 5294.07   51.91 5294.12   53.91 5294.11    55.9 5294.04    57.9 5294.04
    59.9 5294.07   61.89 5294.08   63.89 5294.04   65.36 5293.76   65.89 5293.66
   67.88 5292.88   69.88 5291.65   71.87 5290.14   73.87 5289.33   75.87 5289.06
   77.86 5288.95   79.86 5289.23   81.86 5289.97   83.85  5290.9   85.85 5291.89
   87.85 5293.82   89.84 5294.49   91.84 5295.02   92.87 5295.42   93.84  5295.8
   95.83 5296.39   97.83 5296.92   99.83 5296.98  101.82 5296.85  103.82 5297.05
  105.82 5297.35  107.81 5297.07  109.81 5296.38   111.8 5295.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   65.36    .102   92.87     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         65.36   87.85            64.06    67.6   67.43             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   22.475305.591   97.67   111.85306.896

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5469

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5295.01    1.98 5295.05    3.97 5295.03    5.95 5295.05    7.94 5295.03
    9.92 5295.04    11.9 5295.01   13.89 5294.82   15.87 5294.78   17.86 5294.81
   19.84 5294.76   21.82 5294.73   23.81 5294.39   25.79 5294.23   27.78 5294.17
   29.76  5294.1   31.74 5294.07   33.73 5293.99   35.71 5293.91    37.7 5293.85
   39.68 5293.79   41.66 5293.69   43.65 5293.62   45.63  5293.6   47.62 5293.55
    49.6 5293.47   51.58 5293.42   53.57 5293.39   55.55 5293.31   57.54 5293.27
   59.52 5293.17    61.5 5293.13   65.47 5293.09   67.46 5293.11   69.44 5293.05
   71.42    5293   73.41  5292.9   75.39 5292.84   77.38 5292.75   79.36 5292.65
   81.34  5292.6   83.33 5292.49   85.31 5292.48    87.3 5292.51   89.28 5292.45
   91.26  5292.3   91.65 5292.26   93.25 5292.05   95.23 5291.63   97.22 5291.06
    99.2 5290.52  101.18 5290.13  103.17 5289.88  105.15 5289.32  107.14 5288.88
  109.12 5288.74   111.1 5288.86  113.09 5289.03  115.07  5289.7  117.06 5290.57
  119.04 5291.28  121.02 5291.82  122.84 5292.18  123.01 5292.22  124.99 5292.42
  126.96 5292.46  128.92 5292.52  130.89  5292.6  132.85 5292.61  134.82 5292.98
  136.78 5293.59  138.74 5294.44  140.71 5295.21  142.67 5295.56  144.64 5295.53
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   146.6 5295.55  148.57 5295.79  150.53 5296.49  152.49 5297.47  154.46 5298.01
  156.42  5298.4  158.39 5298.43  160.35 5298.42  162.32 5299.27  164.28 5299.77
  166.25 5299.83  168.21 5299.87  170.17 5299.89  172.14  5299.9   174.1  5299.9
  176.07 5299.89  178.03 5299.73     180 5299.44  181.96 5299.37  183.93 5299.55
  185.89 5299.73  187.85 5299.95  189.82 5300.12  191.78 5300.15  193.75 5300.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   91.65    .102  122.84     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         91.65  122.84            82.55   88.64    83.3             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   188.8  193.755310.046       0    13.15305.013

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5380

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5293.63    1.99 5293.55    3.98 5293.39    5.98  5293.4    7.97 5293.32
    9.96 5293.19   13.94    5293   17.93 5292.97   19.92 5292.92   23.91 5292.65
    25.9 5292.83   29.88 5292.88   31.87 5292.78   33.87 5292.43   35.86 5292.31
   37.85 5292.25   39.84 5292.23   41.83 5292.25   55.78 5292.18   57.77 5292.12
   59.76 5291.99   61.75 5292.03   63.75  5291.9   65.74 5291.66   66.89 5291.47
   67.73 5291.34   69.72 5290.88   71.72 5290.27   73.71 5290.25    75.7 5290.05
   77.69 5289.22   79.68 5288.18   81.68 5287.57   83.67 5287.34   87.65 5287.35
   89.64 5287.68   91.64 5289.44   93.63 5291.46   95.62 5292.42   95.93 5292.44
   97.61 5292.59    99.6 5292.72   101.6 5292.54  103.59 5292.15  105.58 5291.89
  107.57 5291.89  111.56 5291.85  115.54 5291.75  117.53 5291.68  121.52 5291.68
  123.51 5291.62  127.49 5291.64  129.49 5291.62  133.47 5291.39  135.46 5291.34
  141.44 5291.33  145.42 5291.25  147.41 5291.15  149.41 5291.16  153.39 5291.22
  155.38 5291.31  157.38 5291.32  161.36  5291.5  163.35 5291.69  167.34 5292.19
  169.33 5292.37  171.32 5292.63   175.3 5292.73   177.3 5292.88  179.29 5292.97
  183.27 5293.27  187.26  5293.5  191.18 5293.53  199.02 5293.34  200.98 5293.39
  202.95 5293.51  204.91 5293.47  206.87 5293.27  208.83 5292.92  210.79 5292.77
  214.71 5292.74  218.64 5292.78   220.6 5292.84  222.56 5292.85  224.52 5292.76
  226.48 5292.73   230.4 5293.03  232.36 5293.31  234.32 5294.09  236.29 5295.07
  238.25 5295.91  240.21  5296.6  242.17 5297.09  244.13 5297.64  246.09  5298.1
  248.05 5298.41  250.01 5298.62  251.98 5298.75  257.86 5299.05  261.78 5299.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   66.89    .102   95.93     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         66.89   95.93            89.35   95.23   95.86             .1       .3
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    5.96 5303.63  169.75   201.85302.418

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5285

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5291.97    7.88    5292    9.86 5291.95   11.83    5292   15.77 5291.83
   19.71 5291.73   21.68 5291.72    27.6 5291.59   31.54 5291.43   35.48 5291.34
   37.45 5291.23   43.37 5290.79   45.34 5290.62   47.31 5290.62   49.28 5290.52
   49.75 5290.36   51.25 5289.84   53.22 5288.04   55.19 5287.04   57.16 5286.86
   59.13 5286.91   61.11 5287.05   63.08 5287.33   65.05  5288.3   67.02  5289.4
   68.99 5289.76   71.53 5290.06    74.9 5290.38   76.87 5290.63   82.48 5290.89
   84.76 5290.91    88.7 5291.16   90.67 5291.21   92.64 5291.03   94.62 5290.92
   96.59 5290.75  100.53 5290.66   102.5 5290.67  106.44  5290.5  110.38 5290.12
  112.36 5290.15  118.55    5290  120.24 5289.94  124.18  5289.9  126.15 5289.91
  130.12 5289.87   138.1 5290.03  142.09 5290.15  146.08 5290.33  150.07 5290.36
  154.06 5290.48  156.06 5290.48  160.05 5290.58  166.04 5290.86  168.03 5290.87
  174.02 5290.71  176.01 5290.78  183.99 5291.32  187.99 5291.31  189.98 5291.15
  193.97 5291.16  195.97 5291.25  199.96  5291.5  201.95 5291.56  207.94 5291.98
  211.93 5291.89  213.93 5292.05  215.92  5292.1  219.91 5292.13  223.91 5292.05
  225.91 5292.09  227.91 5292.05  231.91 5292.37  235.91 5292.48   239.9 5292.48
   241.9 5292.44   247.9 5292.15   251.9 5292.46   253.9 5292.46   255.9 5292.58
  257.89 5292.83  259.89  5293.3  263.89 5293.41  269.89 5293.61  281.88  5293.9
  285.88 5293.98  293.88 5294.21  297.87 5294.44  299.87 5294.46  303.87 5294.43
  305.87 5294.28  309.87 5294.09  311.87 5294.18  315.86 5294.08  317.86 5295.06
  319.86 5296.98  321.86 5297.41  327.86 5297.71  331.86 5297.74  335.85 5297.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   49.75    .102   71.53     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         49.75   71.53            95.24   94.71   90.39             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  180.36  189.515301.078       F
Blocked Obstructions     num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    9.285301.969  326.37  335.855307.636   269.3  310.655303.596
  206.03  248.665301.829

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5190

INPUT
Description:
Station Elevation Data    num=     100
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5291.37    7.82 5291.42    9.77 5291.38   13.68 5291.23   15.64 5291.21
   19.55 5291.06   27.36 5290.85   31.27 5290.77   33.23 5290.69   37.14 5290.62
   41.05 5290.61   44.99 5290.55   48.98 5290.41   50.97 5290.43   54.96 5290.55
   58.94  5290.6   60.93 5290.44   62.93 5290.18   63.68 5289.93   64.92 5289.52
    68.9 5288.75    70.9 5287.89   74.88  5285.4   76.87 5285.15   78.87 5285.21
   80.86 5285.71   82.85 5286.83   84.84 5287.77   86.84 5288.43   90.82 5289.91
   91.55 5290.06   92.81 5290.32   94.81 5290.18    96.8 5290.16   98.79 5290.25
  100.78 5290.41  102.78 5290.73  106.76 5290.99  108.75 5290.78  110.75 5290.48
  116.72 5290.41  136.65 5290.57  138.64 5290.57  154.58 5290.64  158.57 5290.73
  164.92 5290.74  166.51 5290.75  170.48 5290.56  176.43 5290.47  182.39 5290.83
  184.37 5291.06  186.35 5291.22  192.31  5291.4  194.29 5291.48  198.26 5291.58
   206.2 5291.63  212.15 5291.82  216.12  5291.7  224.06 5291.63  226.04 5291.55
  228.02  5291.3  233.98 5291.42   237.1 5291.35  237.95 5291.31  241.91 5291.83
   243.9 5291.98  245.88 5291.93  249.85 5292.05  257.79 5292.14  259.77 5292.12
  269.69 5292.22  271.68 5292.33  283.58 5292.35  287.55 5292.48  291.52 5292.57
   293.5 5292.57  295.49 5292.86  297.47 5293.25  299.46 5293.27  305.41 5293.42
  307.39 5293.61  311.36 5293.61  323.27 5293.92  329.22 5294.09  333.19 5294.26
  335.17 5294.38  337.16  5294.4   345.1 5294.35  347.08 5294.29  349.06 5294.39
  351.05 5294.42  353.03 5294.37  355.02 5295.52     357 5297.29  358.98 5297.88
  360.97 5297.97  366.92 5298.16  368.91 5298.17  370.89 5298.25  372.87 5298.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   63.68    .102   91.55     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         63.68   91.55           111.75   91.45   76.96             .1       .3
Blocked Obstructions     num=       6
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   184.7  225.325301.103   94.99  168.465300.153       0    9.625301.368
  369.69  372.875308.169  307.07  348.415303.575  244.46  285.995301.962

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5099

INPUT
Description:
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5290.67       4 5290.76       6 5290.97       8 5291.09      10 5290.86
      14 5290.73      16 5290.72      18 5290.61      22 5290.07      24 5289.91
   29.99 5289.62   31.99 5289.62   33.99 5289.52   37.99 5289.24   39.99 5289.19
   43.99  5289.2   45.99 5289.12   47.99 5289.19   49.99 5289.18   51.99 5289.03
   55.99 5288.59   57.99 5288.16   58.75 5287.84   59.99 5287.32   61.99 5286.21
    63.5  5283.5    76.5  5283.5   77.99  5284.9   81.99 5288.13   83.92 5289.24
   85.99 5289.87   87.99 5290.02   91.99 5289.62   93.99 5289.48  101.99 5289.43
  109.99 5289.42  111.99 5289.49  115.99 5289.97  117.99 5289.86  123.99 5289.62
  125.99 5289.66  129.99 5289.89  135.98 5289.89  139.98 5289.95  143.98 5289.95
  147.98 5289.88  151.98 5289.96  155.98 5290.11   161.9 5290.09  163.98 5290.13
  167.98  5290.1  173.98  5290.1  179.98 5290.03  185.98 5290.13  189.98 5290.04
  193.98 5290.16  195.98 5290.11  199.98  5290.1  205.98  5290.3  207.98 5290.31
  209.98 5290.24  213.98 5290.34  215.98 5290.29  219.98 5290.43  221.98 5290.44
  225.98 5290.33  229.98 5290.45  231.38 5290.44  233.98 5290.42  237.98 5290.58
  239.98 5290.61  243.98 5290.57  251.98 5290.76  255.98 5290.77  265.98 5290.94
  269.98 5290.88  275.98 5291.06  279.98 5291.43  287.98 5291.68  289.98 5291.82
  295.97 5292.43  297.97 5292.48  301.97 5292.25  303.97 5292.25  307.97 5292.46
  311.97  5292.6  313.97 5292.62  321.97 5292.84  325.97 5292.93  327.97 5293.02
  333.97 5293.18  335.97 5293.38  337.97 5293.79  341.97 5294.69  343.97 5294.94

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   58.75    .102   83.92     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         58.75   83.92             51.3   59.91   65.19             .1       .3
Ineffective Flow     num=       5
   Sta L   Sta R    Elev  Permanent
   99.52  143.195299.453       F
  177.21  191.615300.047       F
  238.17  250.075300.579       F
      50    58.5 5288.82       F
    81.5      90 5288.82       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.145300.669    63.5    64.7    5287    75.3    76.5    5287

CULVERT


RIVER: Skunk
REACH: 03                 RS: 5075

INPUT
Description: 34th Street (20% potential debris block);
culvert size = double
             6'Wx3.5'H
modeled culvert size (for 20% block) = 4.8'Wx3.5'H
Distance from Upstream XS =       3
Deck/Roadway Width        =      45
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      46  5288.8            63.9 5288.82              64  5291.7
      77  5291.7            77.1 5288.82              95 5288.76

Upstream Bridge Cross Section Data
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5290.67       4 5290.76       6 5290.97       8 5291.09      10 5290.86
      14 5290.73      16 5290.72      18 5290.61      22 5290.07      24 5289.91
   29.99 5289.62   31.99 5289.62   33.99 5289.52   37.99 5289.24   39.99 5289.19
   43.99  5289.2   45.99 5289.12   47.99 5289.19   49.99 5289.18   51.99 5289.03
   55.99 5288.59   57.99 5288.16   58.75 5287.84   59.99 5287.32   61.99 5286.21
    63.5  5283.5    76.5  5283.5   77.99  5284.9   81.99 5288.13   83.92 5289.24
   85.99 5289.87   87.99 5290.02   91.99 5289.62   93.99 5289.48  101.99 5289.43
  109.99 5289.42  111.99 5289.49  115.99 5289.97  117.99 5289.86  123.99 5289.62
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  125.99 5289.66  129.99 5289.89  135.98 5289.89  139.98 5289.95  143.98 5289.95
  147.98 5289.88  151.98 5289.96  155.98 5290.11   161.9 5290.09  163.98 5290.13
  167.98  5290.1  173.98  5290.1  179.98 5290.03  185.98 5290.13  189.98 5290.04
  193.98 5290.16  195.98 5290.11  199.98  5290.1  205.98  5290.3  207.98 5290.31
  209.98 5290.24  213.98 5290.34  215.98 5290.29  219.98 5290.43  221.98 5290.44
  225.98 5290.33  229.98 5290.45  231.38 5290.44  233.98 5290.42  237.98 5290.58
  239.98 5290.61  243.98 5290.57  251.98 5290.76  255.98 5290.77  265.98 5290.94
  269.98 5290.88  275.98 5291.06  279.98 5291.43  287.98 5291.68  289.98 5291.82
  295.97 5292.43  297.97 5292.48  301.97 5292.25  303.97 5292.25  307.97 5292.46
  311.97  5292.6  313.97 5292.62  321.97 5292.84  325.97 5292.93  327.97 5293.02
  333.97 5293.18  335.97 5293.38  337.97 5293.79  341.97 5294.69  343.97 5294.94

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   58.75    .102   83.92     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
          58.75   83.92            .1       .3
Ineffective Flow     num=       5
   Sta L   Sta R    Elev  Permanent
   99.52  143.195299.453       F
  177.21  191.615300.047       F
  238.17  250.075300.579       F
      50    58.5 5288.82       F
    81.5      90 5288.82       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.145300.669    63.5    64.7    5287    75.3    76.5    5287

Downstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    73.5 5288.57              85 5288.55              86 5288.55
    86.1 5291.44              98 5291.55            98.1 5288.65
     113 5288.66

Downstream Bridge Cross Section Data
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5290.35    1.99  5290.3    5.96 5289.87    7.94 5289.78   11.91 5289.32
   17.87 5289.27   19.85 5289.33   25.81 5289.19   27.79 5289.29   31.76 5289.24
   33.75 5289.12   35.73  5288.9   37.72 5288.83   41.69 5288.82   43.67 5288.89
   49.63 5288.89   57.57 5288.55   61.54  5288.6   67.49 5288.78   71.46 5288.77
   75.45 5288.67   77.45 5288.67   78.88 5288.54   79.44 5288.49   81.44 5287.14
   83.44 5285.15   85.44  5283.7   87.43 5283.63   89.43 5283.46   93.43  5283.4
   95.42 5283.44    98.5  5283.7   99.42 5285.86  101.42 5287.72  103.84 5288.78
  105.41 5289.21  109.41 5289.72   113.4 5289.95  119.39 5290.06  125.39 5290.21
  127.39 5290.62  129.38 5290.86  133.38 5291.05  135.38 5291.03  139.37 5290.79
  145.36 5290.55  149.35 5290.52  153.34 5290.73  155.33  5290.9  157.33 5290.92
  161.31 5290.33   165.3 5290.47  171.28 5290.47  173.28 5290.42  177.27 5290.56
  181.25 5290.63  183.23 5290.72  187.24 5290.51  189.23 5290.53  191.22  5290.7
  195.21 5290.93   199.2 5291.25  205.18 5291.13  209.17 5290.94  213.16 5290.96
  217.14 5290.89  219.14 5290.92  221.13 5290.85  229.11 5290.85  233.09  5291.2
  235.09 5291.29  237.08 5291.21   241.2 5290.91  243.06 5290.84  249.05 5290.88
  253.03 5290.73  257.02 5290.76  259.01  5290.9     263 5291.42  266.99 5291.71
  272.97    5292  276.96 5292.07  282.94 5292.06  284.94  5292.1  288.92 5291.97
  290.92 5291.97   296.9 5292.07  300.89 5292.01  306.87 5292.01  308.86 5291.97
  312.85 5291.68  316.84 5291.49  320.82 5291.41  322.82 5291.48   328.8 5291.97
  330.79 5292.22  336.78 5293.27  338.77 5293.46  342.76 5293.73  344.75 5293.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   78.88    .102  103.84     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
          78.88  103.84            .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   15.58   40.815299.287       F
  120.38  128.095300.085       F
Blocked Obstructions     num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  199.79  241.365301.275  128.09  183.275300.746  339.08  344.755303.484
  269.16  310.415301.813

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box     3.5     4.8
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 2 - Wingwall flared 90 or 15 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  3      45     .013     .013        0                   .5                1
Number of Barrels =  2
Upstream   Elevation =  5283.5
Centerline Stations
    Sta.    Sta.
    67.1    72.9
Downstream Elevation =  5283.7
Centerline Stations
    Sta.    Sta.
    89.1    94.9

CROSS SECTION


RIVER: Skunk
REACH: 03                 RS: 5039

INPUT
Description:
Station Elevation Data    num=     100
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5290.35    1.99  5290.3    5.96 5289.87    7.94 5289.78   11.91 5289.32
   17.87 5289.27   19.85 5289.33   25.81 5289.19   27.79 5289.29   31.76 5289.24
   33.75 5289.12   35.73  5288.9   37.72 5288.83   41.69 5288.82   43.67 5288.89
   49.63 5288.89   57.57 5288.55   61.54  5288.6   67.49 5288.78   71.46 5288.77
   75.45 5288.67   77.45 5288.67   78.88 5288.54   79.44 5288.49   81.44 5287.14
   83.44 5285.15   85.44  5283.7   87.43 5283.63   89.43 5283.46   93.43  5283.4
   95.42 5283.44    98.5  5283.7   99.42 5285.86  101.42 5287.72  103.84 5288.78
  105.41 5289.21  109.41 5289.72   113.4 5289.95  119.39 5290.06  125.39 5290.21
  127.39 5290.62  129.38 5290.86  133.38 5291.05  135.38 5291.03  139.37 5290.79
  145.36 5290.55  149.35 5290.52  153.34 5290.73  155.33  5290.9  157.33 5290.92
  161.31 5290.33   165.3 5290.47  171.28 5290.47  173.28 5290.42  177.27 5290.56
  181.25 5290.63  183.23 5290.72  187.24 5290.51  189.23 5290.53  191.22  5290.7
  195.21 5290.93   199.2 5291.25  205.18 5291.13  209.17 5290.94  213.16 5290.96
  217.14 5290.89  219.14 5290.92  221.13 5290.85  229.11 5290.85  233.09  5291.2
  235.09 5291.29  237.08 5291.21   241.2 5290.91  243.06 5290.84  249.05 5290.88
  253.03 5290.73  257.02 5290.76  259.01  5290.9     263 5291.42  266.99 5291.71
  272.97    5292  276.96 5292.07  282.94 5292.06  284.94  5292.1  288.92 5291.97
  290.92 5291.97   296.9 5292.07  300.89 5292.01  306.87 5292.01  308.86 5291.97
  312.85 5291.68  316.84 5291.49  320.82 5291.41  322.82 5291.48   328.8 5291.97
  330.79 5292.22  336.78 5293.27  338.77 5293.46  342.76 5293.73  344.75 5293.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   78.88    .102  103.84     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         78.88  103.84            46.24   39.79   32.95             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
   15.58   40.815299.287       F
  120.38  128.095300.085       F
Blocked Obstructions     num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  199.79  241.365301.275  128.09  183.275300.746  339.08  344.755303.484
  269.16  310.415301.813

CROSS SECTION


RIVER: Skunk
REACH: 02                 RS: 4999

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5288.03    3.99 5288.16    9.98 5288.47   11.98 5288.54   19.97 5288.74
   21.96 5288.73   23.96 5288.78   25.96 5288.77   27.95 5288.67   29.95 5288.43
   31.95 5287.97   33.94 5287.58   35.94 5287.27   37.48 5286.94   39.93 5286.37
   41.93 5285.36   43.93 5284.06   45.92 5283.14   47.92 5282.58   49.92 5282.58
   51.91 5282.77   53.91 5283.42    57.9 5285.38    59.9 5286.01    61.9    5287
   63.89 5288.05   65.89 5288.87   66.63 5289.12   67.89 5289.53   69.88 5289.79
   71.88 5289.83   73.88 5289.99   77.87  5290.1   81.86 5290.33   83.86 5290.39
   87.85 5290.45   89.85 5290.58   91.85  5290.6   99.83 5290.78  103.83 5290.79
  105.86 5290.71   109.8 5290.49  115.77 5290.51  117.76 5290.57  121.74 5290.79
  123.72 5290.79  131.68 5290.52  137.65 5290.61  143.62 5290.58  147.59 5290.66
  149.58 5290.92  151.57 5290.66  153.56 5290.31  155.55 5290.54  157.54 5290.71
  159.53    5291  161.52 5291.15  167.49 5291.44  169.47 5291.44  173.45 5291.28
  175.44 5291.23  179.42 5291.21  181.41 5291.17   183.4 5291.24  187.38 5291.24
   188.2 5291.29  189.37 5291.35  191.35 5291.58  193.34  5291.6  199.31 5291.47
   201.3 5291.38  205.28 5290.97  209.26 5291.03  213.24 5290.85  215.22  5290.8
   219.2 5291.05  221.19 5291.12  225.17 5291.11  227.16 5291.26  231.14 5291.85
  235.12 5292.14  239.09 5292.09  245.06 5292.16  251.03 5292.06  253.02 5291.97
  255.01 5291.96  260.97 5292.05  262.96  5292.1  272.91 5291.97  276.89  5291.8
  280.87 5291.43  282.85 5291.32  286.83 5291.39  288.82 5291.48   292.8 5291.79
  298.77 5292.62  300.76 5292.99  302.75 5293.22  308.71 5293.63   310.7 5293.71

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   37.48    .102   66.63     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         37.48   66.63            45.37    88.5  101.78             .1       .3
Blocked Obstructions     num=       5
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  165.53   207.15301.327   87.45  148.665300.419       0   21.015298.034
   304.8   310.75303.361  234.74  275.98 5302.12

CROSS SECTION


RIVER: Skunk
REACH: 02                 RS: 4911

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5287.14    1.98 5287.05    3.96 5286.82    5.94 5286.72    9.89 5286.38
   17.81 5286.19   21.77 5286.03   23.74 5286.06   29.68 5285.88   31.66 5285.59
   35.62 5285.53   37.59 5285.57   43.53 5285.57   45.51 5285.62   51.44 5285.49
   52.95 5285.14   53.42 5285.04    55.4 5284.17   59.36 5282.66   61.34 5281.73
   63.32 5281.22   65.29  5281.1   67.27 5281.17   69.25 5281.83   71.23 5283.52
   73.21 5285.81   75.15 5286.73   79.15 5286.95   81.12  5286.9   89.04 5287.04
   96.95 5286.98  100.91 5287.01  106.85 5287.18   110.8 5287.75  118.72 5287.77
  124.65 5287.75  128.61 5287.66  138.57 5287.73  142.56 5287.65  148.53 5287.75
  154.51 5287.62  158.49 5287.29  160.48 5287.22  164.47 5287.32  166.46 5287.49
  170.44 5287.42  175.21 5287.61  178.41 5287.75  184.39 5287.84  188.37 5287.85
  192.36 5287.99  196.34 5288.07  204.31 5287.95   206.3 5287.86  210.28 5287.85
  216.26  5287.9  218.25 5287.95  224.23  5287.9   230.2 5287.71   232.2 5287.69
  238.17    5288  242.16 5288.06  248.67 5288.01  254.11    5288  268.05 5288.27
  278.01 5288.29     282 5288.34  285.98 5288.25  289.96 5288.26  291.96 5288.35
  293.95  5288.6  301.92 5288.73  303.91  5288.7  309.88 5288.77  311.88 5288.72
  313.87 5288.79  317.85 5289.41  323.83 5289.38   329.8 5289.23  333.79 5289.29
  341.76 5289.25  343.75 5289.21  347.73  5288.9  351.72 5289.01   355.7  5289.2
  357.69 5289.42  361.68 5289.47  367.65 5289.42  371.64 5289.53  375.62  5289.5
  383.59 5289.65  397.53 5289.71   405.5 5289.58  407.49 5289.66  413.47 5290.15
  417.45 5290.22  423.43 5290.41  425.42 5290.54  427.41 5290.53  437.37 5290.69

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   52.95    .102   75.15     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         52.95   75.15             63.62   62.95   64.23             .1       .3
Blocked Obstructions     num=        7
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  419.75  437.375300.298  299.64  343.535298.704  239.49  283.625298.017
   179.9  223.585297.754  121.69  158.645297.754       0    4.87 5297.14
  359.22  403.075299.444

CROSS SECTION


RIVER: Skunk
REACH: 02                  RS: 4848

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5286.24    1.99 5285.76    3.98 5285.69    5.97 5285.89    7.96 5286.44
    9.94 5286.52   13.92 5286.12    17.9 5286.18   21.88 5285.84   27.84 5285.51
   33.81 5285.57    35.8 5285.74   39.78 5285.52   43.75 5285.45   49.72  5285.1
    53.7 5285.11   61.65 5284.74    71.6 5284.37   75.58 5284.18   78.36 5283.95
   81.54  5283.5   83.53 5282.84    89.5 5280.23   91.49 5279.86   95.47 5279.93
   97.45 5280.55  103.42  5283.5   107.4 5285.29  109.84 5286.13  111.38  5286.4
  115.35  5286.6  121.32 5286.74  127.29 5286.76  135.24 5286.94  139.22 5286.97
   143.2 5287.16  149.16 5287.12  167.06 5287.27  177.05 5287.42  185.04 5287.42
  193.02 5287.29  203.01 5287.18     209 5287.25  212.99 5287.06  218.98 5287.24
  224.97 5287.19  228.97 5287.23  236.95  5287.4  238.95  5287.5  246.94 5287.46
  252.93 5287.53  264.91 5287.22   268.9 5287.03  273.18 5287.29  274.89  5287.3
  282.88 5287.75  286.87 5287.89  288.87 5288.09  302.85 5288.19  306.84  5288.1
  316.83 5288.06  320.82 5288.11  324.81 5288.01  328.81 5287.71   334.8 5287.72
  338.79 5287.77  344.78 5288.16  350.77 5288.05  356.76 5288.04  364.75 5287.92
  370.74 5288.06  372.74 5288.19  382.96 5288.14   394.7 5288.16   398.7 5288.65
  408.68 5288.67  414.67  5288.8  420.66 5288.78  422.66 5288.92  432.64 5288.78
  438.63  5288.9  446.62 5288.98  450.61 5288.72  454.61 5288.84   458.6 5289.38
   460.6 5289.47  466.59 5289.51  470.58  5289.4  474.58 5289.51  486.56 5289.54
  494.54 5289.48  504.53 5289.45  508.52 5289.31  510.52 5289.37  514.51 5289.75
  516.51 5290.04   520.5  5290.2   524.5 5290.65  536.48 5290.85  542.47 5290.81

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13   78.36    .102  109.84     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         78.36  109.84            100.67   99.24    99.2             .3       .5
Blocked Obstructions     num=        8
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
  523.05  542.475300.449  402.83  446.725298.646  342.58  386.715297.974
  282.97  326.655297.751  217.39  263.275297.193  144.94  197.675297.205
       0    5.83 5296.24  462.83  506.685299.462

CROSS SECTION


RIVER: Skunk
REACH: 02                  RS: 4748

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5292.49       4 5292.29   13.98 5292.28   19.98 5292.37   23.97 5292.24
   29.97 5291.74   31.96  5291.8   47.95 5291.74   53.94 5291.47   59.93 5291.45
   63.93 5291.72   67.92 5291.49   77.91 5291.22    85.9 5291.24    93.9 5291.46
   95.89 5291.12  105.88 5291.01  129.86 5291.26  131.85 5291.18  137.85 5291.43
  145.84 5291.28  149.83 5291.62  155.83 5290.84  159.82 5290.64  165.82 5289.82
   177.8 5289.29   181.8  5289.5  189.79 5289.29  193.78 5288.85  195.78 5288.97
  203.77 5288.89  209.77  5288.7  219.75 5288.03  227.75 5287.97  231.74 5287.68
  241.73 5287.32  247.72 5287.64  261.71 5287.32   269.7 5287.71   273.7 5287.48
  275.69 5287.75  283.68 5287.66  285.68 5287.37  291.67 5287.02  299.67 5286.82
  317.65 5286.74  339.62    5287  345.62 5286.93  347.61 5286.71   355.6 5286.86
   357.6 5286.63  365.59 5286.34  371.59 5286.28  397.56 5285.77  399.55  5285.6
  403.55 5285.77  413.54 5285.72  425.53 5285.28  435.51 5285.11   447.5 5285.06
  455.49 5284.67  467.48 5284.43  473.47 5284.07  491.45 5283.39  499.44 5283.68
  503.44 5283.44  509.43 5283.45  517.42 5283.24  519.42 5283.01  531.41 5283.01
   535.4 5283.21  538.96    5283  540.08 5282.83  547.39 5280.82  551.39 5279.26
  555.38 5279.56  559.38 5281.72  563.37 5283.19  565.37 5284.82  567.12 5285.28
  573.36 5285.61  587.34 5285.79  593.34 5286.12  601.33 5286.32  613.32 5286.36
   623.3 5286.23  633.29 5285.75  643.28 5285.14  659.26 5284.05  665.49 5283.79
  671.25  5283.5  677.24  5283.8  691.23 5284.04  703.21 5283.85  709.12 5283.48
   717.2 5284.11  729.19 5284.59  737.18 5284.54  751.16  5284.9  771.14 5284.98

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13  538.96    .102  567.12     .13  665.49    .015  709.12     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        540.08  567.12             108.2   86.44   86.09             .1       .3
Ineffective Flow     num=        7
   Sta L   Sta R    Elev  Permanent
       0   15.145302.488       F
   67.34   80.125301.524       F
  130.37  142.985301.245       F
   182.4  207.595299.492       F
  240.82  265.645297.347       F
  301.99  327.145296.869       F
  629.39  752.65 5295.29       F
Blocked Obstructions     num=        5
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   46.76   67.345301.746  108.82  130.375301.134  164.56   182.4 5299.99
  581.25  632.385295.755  749.81  771.14 5294.88

CROSS SECTION


RIVER: Skunk
REACH: 02                  RS: 4662
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```
INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5292.24    5.99 5292.19   13.98 5291.85   17.97  5290.8   19.97 5290.71
   27.96 5290.81   55.91 5290.72   75.88 5290.23   79.87 5290.06   125.8  5289.6
  131.79 5289.63  137.78 5289.03  145.77 5288.55  175.72 5288.57  181.71 5288.47
   187.7 5288.21  207.67 5287.66  221.65 5287.89  225.65 5288.08   253.6 5287.92
  263.59  5287.7  271.57  5287.7  273.57 5287.56  279.56 5287.69  283.55 5288.06
  295.54 5288.22  297.53 5288.36  305.52 5288.27  325.49 5287.92  329.48 5287.63
  333.48  5287.6  343.46 5287.87  345.46 5287.64  349.45 5286.72  359.43 5286.78
  369.42 5286.99   379.4 5286.85  385.39 5286.91  405.36 5286.73  415.35 5286.27
  421.34 5285.64  433.32 5285.54  451.29 5285.65  459.28 5285.51  467.26  5285.7
  481.24 5285.54  487.23 5285.57  497.22 5285.27   505.2 5285.44  519.18  5285.4
  527.17 5285.62  531.16 5285.62  535.16 5285.15  541.15 5285.08  543.15 5285.22
  548.65 5284.91  548.69  5284.9  551.13 5284.54  553.13 5283.55  557.12 5280.84
  559.12 5279.11  561.12 5278.55  563.11  5278.6  565.11 5279.26   569.1 5281.51
   571.1    5283   573.1 5284.06  575.79 5284.98  576.15 5285.11  579.09 5285.78
  581.09 5285.62  583.08 5284.73  587.08 5284.95  589.07 5285.79  597.06 5285.92
  603.05 5285.78  611.04 5284.98  617.03 5285.19     633 5285.11  640.99 5284.88
  644.99 5284.99  658.96 5284.15  662.96 5284.19  666.95  5283.7  672.94 5283.52
  676.22  5283.2  682.93 5282.66  686.92 5282.97   700.9  5283.3  714.88    5283
  720.74 5282.71  722.86 5283.01  730.85  5283.5  736.84 5283.45  738.84 5283.72
  742.83 5283.72  750.82 5283.94   762.8 5283.96   766.8 5284.19  776.78 5284.25

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13  548.69    .102  576.15     .13  676.22    .015  720.74     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        548.65  575.79            68.51   67.76   67.41             .1       .3
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
  434.22  484.655295.552       F
  495.71  522.215295.359       F
  638.37  763.27 5295.95       F
Blocked Obstructions     num=      10
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    9.225302.245   21.36   59.115300.726   95.47  134.525299.907
  149.12     1835298.483  227.28  261.295298.062  294.95  331.065298.173
  356.11  404.945296.806  484.66  495.715295.517  599.05  641.955295.829
  761.42  776.785293.955

CROSS SECTION


RIVER: Skunk
REACH: 02                 RS: 4594

INPUT
Description: Madison Ave (U/S)
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5290.1       4 5290.24   17.99 5289.83   19.99 5289.92   27.99 5289.49
   35.99 5288.91   45.98 5288.65   61.98 5289.18   69.97 5289.28   77.97 5288.95
   81.97  5289.2   89.97 5289.05   95.96 5288.52  105.96 5287.93  113.96 5288.49
  119.95  5288.3  127.95 5288.29  135.95 5288.14  141.95 5288.29  145.95 5288.12
  147.94  5287.8  155.94 5287.26  159.94 5287.19  169.94 5286.76  175.93 5286.98
  187.93  5287.6  191.93 5287.72  199.92 5287.63  205.92 5287.75  219.92 5287.64
  225.92 5287.06  233.91  5286.6  241.91 5286.42  245.91 5286.89   259.9 5286.94
   263.9 5287.04   273.9 5287.01  281.89 5286.63  289.89 5286.48  295.89 5286.55
  307.88 5286.25  311.88  5285.9  319.88 5285.94  327.88 5286.57  331.88 5287.29
  333.87  5287.3  341.87 5286.21  349.87 5286.43  357.87 5286.37  369.86 5285.67
  375.86 5285.47  381.86 5284.94  389.85 5284.79  401.85 5285.09  411.85 5285.06
  415.84 5284.95  419.84 5285.08  427.84 5284.88  441.83    5285  455.83 5284.67
  467.82  5284.9  475.82 5284.81  481.82 5284.92  491.82 5284.55  501.81 5284.35
  507.06 5284.52  507.81 5284.55  509.81 5281.11  511.81 5278.31   513.5 5276.78
   526.5 5276.78   527.8 5278.41   531.8 5280.73  538.56  5283.3   541.8 5284.02
   545.8 5284.22  549.79 5283.93  567.79 5283.88  575.78 5283.93  585.78 5284.26
  599.77 5284.26  621.77 5283.74  623.77 5283.78  633.76 5283.22   639.5 5282.69
  645.76  5282.2  653.75  5282.6  665.75 5282.63  673.75 5282.55  684.71 5282.27
  691.74 5282.92  705.73 5283.17  717.42 5283.92   726.9 5284.37  732.59  5284.3
  736.38 5284.53  742.07 5284.46  747.76 5284.08

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13  507.06    .102  538.56     .13   639.5    .015  684.71     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        507.06  538.56           101.61   83.12   62.04             .3       .5
Ineffective Flow     num=       8
   Sta L   Sta R    Elev  Permanent
       0   17.335300.101       F
   66.95   92.885299.235       F
  120.69  137.395298.285       F
  199.05  215.765297.637       F
  268.61  284.155296.946       F
  329.16  357.575296.714       F
  404.02  480.935295.104       F
   550.2  727.35 5291.22       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   513.5   515.3 5280.78   524.7   526.5 5280.78  727.96  747.765294.367

CULVERT


RIVER: Skunk
REACH: 02                 RS: 4550

INPUT
Description: Madison Ave (30% potential debris block)'
culvert size = double
              6'Wx4'H
modeled culvert size (for 30% block) = 4.2'Wx4'H
Distance from Upstream XS =      10
Deck/Roadway Width        =      60
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
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     485    5284             504    5284             504 5285.38
   504.1  5287.1           523.5  5287.1           523.5 5283.35
     540 5283.35             637    5283

Upstream Bridge Cross Section Data
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5290.1       4 5290.24   17.99 5289.83   19.99 5289.92   27.99 5289.49
   35.99 5288.91   45.98 5288.65   61.98 5289.18   69.97 5289.28   77.97 5288.95
   81.97  5289.2   89.97 5289.05   95.96 5288.52  105.96 5287.93  113.96 5288.49
  119.95  5288.3  127.95 5288.29  135.95 5288.14  141.95 5288.29  145.95 5288.12
  147.94  5287.8  155.94 5287.26  159.94 5287.19  169.94 5286.76  175.93 5286.98
  187.93  5287.6  191.93 5287.72  199.92 5287.63  205.92 5287.75  219.92 5287.64
  225.92 5287.06  233.91  5286.6  241.91 5286.42  245.91 5286.89   259.9 5286.94
   263.9 5287.04   273.9 5287.01  281.89 5286.63  289.89 5286.48  295.89 5286.55
  307.88 5286.25  311.88  5285.9  319.88 5285.94  327.88 5286.57  331.88 5287.29
  333.87  5287.3  341.87 5286.21  349.87 5286.43  357.87 5286.37  369.86 5285.67
  375.86 5285.47  381.86 5284.94  389.85 5284.79  401.85 5285.09  411.85 5285.06
  415.84 5284.95  419.84 5285.08  427.84 5284.88  441.83    5285  455.83 5284.67
  467.82  5284.9  475.82 5284.81  481.82 5284.92  491.82 5284.55  501.81 5284.35
  507.06 5284.52  507.81 5284.55  509.81 5281.11  511.81 5278.31   513.5 5276.78
   526.5 5276.78   527.8 5278.41   531.8 5280.73  538.56  5283.3   541.8 5284.02
   545.8 5284.22  549.79 5283.93  567.79 5283.88  575.78 5283.93  585.78 5284.26
  599.77 5284.26  621.77 5283.74  623.77 5283.78  633.76 5283.22   639.5 5282.69
  645.76  5282.2  653.75  5282.6  665.75 5282.63  673.75 5282.55  684.71 5282.27
  691.74 5282.92  705.73 5283.17  717.42 5283.92   726.9 5284.37  732.59  5284.3
  736.38 5284.53  742.07 5284.46  747.76 5284.08

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .13  507.06    .102  538.56     .13   639.5    .015  684.71     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
        507.06  538.56             .3       .5
Ineffective Flow     num=       8
   Sta L   Sta R    Elev  Permanent
       0   17.335300.101       F
   66.95   92.885299.235       F
  120.69  137.395298.285       F
  199.05  215.765297.637       F
  268.61  284.155296.946       F
  329.16  357.575296.714       F
  404.02  480.935295.104       F
   550.2  727.35 5291.22       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
   513.5   515.3 5280.78   524.7   526.5 5280.78  727.96  747.765294.367

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
     140  5282.9           159.9  5282.9             160  5286.2
     175  5286.2           175.1  5282.9             195  5282.9

Downstream Bridge Cross Section Data
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5285.07    5.98 5285.29    9.97 5285.18   15.95 5284.83   19.93 5284.27
   21.93 5284.07   25.91 5283.89    29.9 5283.62   33.89 5283.59   40.24 5283.38
   47.84  5283.3   51.82  5283.4    57.8 5283.49   62.27  5283.6   65.78 5283.73
   69.76 5284.28   71.76 5284.33   75.74 5283.89   79.73 5283.83   83.72  5283.7
   85.71 5283.75    89.7 5283.72   93.68 5283.58   99.66 5283.55   105.6 5283.45
  113.48 5283.43  115.45 5283.53  117.42 5283.79  119.39 5283.94  123.33 5284.12
  127.28 5284.12  131.22 5283.92  135.16 5283.61  137.13  5283.5  141.07 5283.51
  143.04 5283.63  148.95 5284.23  150.92 5284.29  153.19 5284.23  154.87 5283.97
  156.84 5283.41  157.49 5283.14  158.81 5282.57   161.5  5276.1   174.5  5276.1
  176.54 5282.11  177.31 5282.46  178.52 5283.01  180.68 5282.93  182.46 5282.61
  184.43 5282.65  188.37 5282.87  194.28 5282.97  200.19 5282.87  204.14 5282.66
  210.05 5282.39  212.02 5282.19  213.63 5282.48   219.9  5283.2  223.84 5283.54
  227.78 5283.64   233.7 5283.99  235.68 5284.01  239.64 5283.89  243.61 5283.83
  247.58 5283.91  251.54 5283.74  255.51 5283.68  257.49 5283.74  259.47 5283.71
  261.45 5283.57   267.4 5283.05  271.37 5282.85  273.38  5282.7  277.31 5282.25
   279.3 5282.12  283.26 5282.41  287.23 5282.55  293.18 5282.61  301.11 5282.58
  309.04 5282.48     313 5282.37  318.63 5282.17   324.9  5282.8  328.86 5282.96
  334.81 5283.04  338.78 5283.05  342.74 5283.22  346.71 5283.33  356.66    5284
  358.65 5284.04  362.63 5284.23   368.6 5284.19  370.59 5284.22  374.57  5284.5
  382.54 5284.29

Manning's n Values        num=       8
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   40.24    .015   62.27     .06  153.19    .102  180.68    .015
  213.63     .13  273.38    .015  318.63     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
        157.49  177.31             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  234.69  382.54 5288.14       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.425295.073  367.27  382.545294.176

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       4     4.2
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 2 - Wingwall flared 90 or 15 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  6      69     .013     .013        0                    .5                 1
Number of Barrels =  2
Upstream   Elevation =  5276.78
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Centerline Stations
    Sta.    Sta.
   517.4   522.6
Downstream Elevation =  5276.1
Centerline Stations
    Sta.    Sta.
   165.4   170.6

CROSS SECTION


RIVER: Skunk
REACH: 02                  RS: 4511

INPUT
Description: Madison Ave (D/S)
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5285.07    5.98 5285.29    9.97 5285.18   15.95 5284.83   19.93 5284.27
   21.93 5284.07   25.91 5283.89    29.9 5283.62   33.89 5283.59   40.24 5283.38
   47.84  5283.3   51.82  5283.4    57.8 5283.49   62.27  5283.6   65.78 5283.73
   69.76 5284.28   71.76 5284.33   75.74 5283.89   79.73 5283.83   83.72  5283.7
   85.71 5283.75    89.7 5283.72   93.68 5283.58   99.66 5283.55   105.6 5283.45
  113.48 5283.43  115.45 5283.53  117.42 5283.79  119.39 5283.94  123.33 5284.12
  127.28 5284.12  131.22 5283.92  135.16 5283.61  137.13  5283.5  141.07 5283.51
  143.04 5283.63  148.95 5284.23  150.92 5284.29  153.19 5284.23  154.87 5283.97
  156.84 5283.41  157.49 5283.14  158.81 5282.57   161.5  5276.1   174.5  5276.1
  176.54 5282.11  177.31 5282.46  178.52 5283.01  180.68 5282.93  182.46 5282.61
  184.43 5282.65  188.37 5282.87  194.28 5282.97  200.19 5282.87  204.14 5282.66
  210.05 5282.39  212.02 5282.19  213.63 5282.48   219.9  5283.2  223.84 5283.54
  227.78 5283.64   233.7 5283.99  235.68 5284.01  239.64 5283.89  243.61 5283.83
  247.58 5283.91  251.54 5283.74  255.51 5283.68  257.49 5283.74  259.47 5283.71
  261.45 5283.57   267.4 5283.05  271.37 5282.85  273.38  5282.7  277.31 5282.25
   279.3 5282.12  283.26 5282.41  287.23 5282.55  293.18 5282.61  301.11 5282.58
  309.04 5282.48     313 5282.37  318.63 5282.17   324.9  5282.8  328.86 5282.96
  334.81 5283.04  338.78 5283.05  342.74 5283.22  346.71 5283.33  356.66    5284
  358.65 5284.04  362.63 5284.23   368.6 5284.19  370.59 5284.22  374.57  5284.5
  382.54 5284.29

Manning's n Values        num=       8
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   40.24    .015   62.27     .06  153.19    .102  180.68    .015
  213.63     .13  273.38    .015  318.63     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        157.49  177.31            21.88   22.11   22.41             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  234.69  382.54 5288.14       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    6.425295.073  367.27  382.545294.176

CROSS SECTION


RIVER: Skunk
REACH: 02                  RS: 4489

INPUT
Description:
Station Elevation Data    num=      99
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5283.77   11.99 5283.81   13.99 5283.79   15.99 5283.73   17.99 5283.75
   19.98 5283.82   23.98 5283.85   27.98 5283.82   33.97 5283.68   37.97 5283.66
   39.97 5283.59   41.97  5283.6   43.97 5283.59   49.95 5283.33   51.94 5283.33
   53.93 5283.48   55.92 5283.71    59.9 5283.82   61.89 5283.84   62.61 5283.77
   63.89 5283.64   64.37  5283.5   65.88 5283.04   67.87 5281.56   69.86  5280.2
   71.85 5278.89   73.84 5277.13   75.83 5275.61   79.82  5275.8   81.81 5277.28
    83.8 5279.35   85.79 5280.16   88.83 5281.44   89.77 5281.85   91.77 5282.36
   93.76 5282.63   95.75 5282.73   97.74 5282.77   99.73 5282.74  101.14 5282.46
  101.72 5282.34   105.7 5282.41  113.67 5282.64  115.66 5282.56  119.64 5282.52
  123.63 5282.39  127.61 5282.29   129.6 5282.15  131.59 5282.12  133.58 5282.46
  134.23 5282.53  139.56 5283.11  141.55 5283.24  149.38 5283.15   153.3 5282.98
  155.26 5282.85  156.44 5282.81  159.18 5282.68  161.13 5282.48  163.09 5282.23
  165.05 5282.03  167.01 5282.01  168.97 5282.22  172.89 5282.36  174.84 5282.46
  178.76 5282.51  180.72 5282.51  182.68 5282.54  184.64 5282.52   186.6 5282.54
  188.55  5282.5  192.47 5282.45  194.43 5282.41  198.35 5282.39  204.22 5282.16
  206.18 5282.06  206.87 5282.08  208.14 5282.13   210.1 5282.32  212.06 5282.62
  214.02 5282.82  215.97 5282.85  223.81 5282.85  229.68 5282.99  231.64 5283.06
   233.6 5283.09  235.56 5283.14  239.48 5283.41  241.45 5283.49  245.37 5283.78
  247.33  5283.9  249.29 5283.96  253.22 5284.21  255.18 5284.24   259.1 5284.11
  261.07 5284.18  264.99  5284.4  266.95 5284.41  272.84 5284.23

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   62.61    .102  101.14    .015  134.23     .13  156.44    .015
  206.87     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         64.37   88.83            39.2   40.74   41.75             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  141.12  272.84 5287.63       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0      135293.772  261.03  272.845294.174

CROSS SECTION


RIVER: Skunk
REACH: 02                  RS: 4448

INPUT
Description: 35th Street (U/S)
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5283.71    3.93 5283.73    5.89 5283.75    7.85  5283.8   11.78 5283.65
   13.74 5283.67   15.71  5283.8   19.63 5283.71   21.6 5283.56   25.52 5283.43
   27.49 5283.39   29.45 5283.29   31.41 5283.23   35.34 5283.03   37.31 5282.92
```

```
   39.27 5282.83   41.23 5282.68    43.2 5282.58   45.16  5282.7   47.12 5282.95
   49.09 5283.16   51.05 5283.23   52.29  5283.3   53.01 5283.34   54.98 5283.33
   56.62 5283.05   56.94    5283    58.9 5282.34   60.87 5281.32   62.83 5280.11
   64.79 5278.73   66.76 5277.57    67.5 5275.61    80.5 5275.61   82.46 5276.35
   84.43 5278.01   86.39 5280.92   87.42 5281.33   88.35 5281.71   90.32 5281.84
   92.28 5281.84   94.24 5281.82   94.42 5281.83   96.21 5281.93   98.17 5281.81
  100.15 5281.53  102.13  5281.5  108.08 5281.79  110.06 5281.87     116 5282.07
  119.96 5282.17  121.94 5282.19  123.93 5282.25  127.89 5282.35  129.87 5282.32
  133.83  5282.3  135.81 5282.26  139.77 5282.25  145.72 5282.09  149.68 5282.04
  151.66 5281.97  153.64 5281.86   157.6 5281.75  163.55 5281.47  165.53  5281.5
  166.95 5281.62  167.51 5281.66  169.49 5281.91  171.47 5282.07  173.45 5282.12
  175.43 5282.22  177.41 5282.29   179.4 5282.29  181.38 5282.36  183.36 5282.47
  187.32 5282.71   189.3 5282.81  193.26 5283.06  195.25 5283.25  197.23 5283.37
  199.21 5283.46  201.19  5283.6  203.17 5283.67  205.15  5283.8  207.13 5283.91
  209.11 5283.96  211.09 5284.03  213.07 5284.07  215.06 5284.07  217.04  5284.1
  219.02  5284.2     221 5284.36  222.98 5284.37  224.96 5284.33  228.92  5284.2

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   52.29    .102   94.42    .015  166.95     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         56.62   87.42            84.75   83.98    83.7             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0    62.5    5282       T
  132.91  228.92 5286.58       T
Blocked Obstructions     num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   16.215293.708    67.5    69.3 5279.61    78.7    80.5 5279.61
   220.1  228.925294.298

CULVERT


RIVER: Skunk
REACH: 02                 RS: 4430

INPUT
Description: 35th Street (30% potential debris block);
culvert size = double
             6'Wx4'H
modeled culvert size (for 30% block) = 4.2'Wx4'H
Distance from Upstream XS =      11
Deck/Roadway Width        =      55
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      11
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    5283               45    5284              49    5285
      55    5285             56.5    5284              61    5282
      66 5281.87             66.1 5285.95            81.9 5285.95
      82 5281.69              114    5282

Upstream Bridge Cross Section Data
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5283.71    3.93 5283.73    5.89 5283.75    7.85  5283.8   11.78 5283.65
   13.74 5283.67   15.71  5283.8   19.63 5283.71    21.6 5283.56   25.52 5283.43
   27.49 5283.39   29.45 5283.29   31.41 5283.23   35.34 5283.03   37.31 5282.92
   39.27 5282.83   41.23 5282.68    43.2 5282.58   45.16  5282.7   47.12 5282.95
   49.09 5283.16   51.05 5283.23   52.29  5283.3   53.01 5283.34   54.98 5283.33
   56.62 5283.05   56.94    5283    58.9 5282.34   60.87 5281.32   62.83 5280.11
   64.79 5278.73   66.76 5277.57    67.5 5275.61    80.5 5275.61   82.46 5276.35
   84.43 5278.01   86.39 5280.92   87.42 5281.33   88.35 5281.71   90.32 5281.84
   92.28 5281.84   94.24 5281.82   94.42 5281.83   96.21 5281.93   98.17 5281.81
  100.15 5281.53  102.13  5281.5  108.08 5281.79  110.06 5281.87     116 5282.07
  119.96 5282.17  121.94 5282.19  123.93 5282.25  127.89 5282.35  129.87 5282.32
  133.83  5282.3  135.81 5282.26  139.77 5282.25  145.72 5282.09  149.68 5282.04
  151.66 5281.97  153.64 5281.86   157.6 5281.75  163.55 5281.47  165.53  5281.5
  166.95 5281.62  167.51 5281.66  169.49 5281.91  171.47 5282.07  173.45 5282.12
  175.43 5282.22  177.41 5282.29   179.4 5282.29  181.38 5282.36  183.36 5282.47
  187.32 5282.71   189.3 5282.81  193.26 5283.06  195.25 5283.25  197.23 5283.37
  199.21 5283.46  201.19  5283.6  203.17 5283.67  205.15  5283.8  207.13 5283.91
  209.11 5283.96  211.09 5284.03  213.07 5284.07  215.06 5284.07  217.04  5284.1
  219.02  5284.2     221 5284.36  222.98 5284.37  224.96 5284.33  228.92  5284.2

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   52.29    .102   94.42    .015  166.95     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
         56.62   87.42             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0    62.5    5282       T
  132.91  228.92 5286.58       T
Blocked Obstructions     num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   16.215293.708    67.5    69.3 5279.61    78.7    80.5 5279.61
   220.1  228.925294.298

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
   17.85 5281.53              26 5281.71            26.1 5285.85
    41.9 5285.85              42 5281.66              55    5282

Downstream Bridge Cross Section Data
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5281.29   10.41 5281.58   17.85 5281.53   20.65 5281.11   21.82 5280.75
    23.8 5279.27   25.79 5277.55    26.5  5275.4    39.5  5275.4   39.67 5278.18
   41.65 5279.47   43.64 5280.02    47.6 5280.28   51.77  5281.4   53.55 5281.96
   55.54 5282.22    59.5 5283.21   65.46 5283.38   69.42 5284.48   71.41 5284.89
   77.39 5284.89   81.38 5284.27   83.38 5284.08   85.38  5283.4   87.38 5283.05
   90.56 5282.16   93.37 5281.47   95.37 5281.32   97.37 5281.41  101.36 5281.82
  105.36 5281.87  109.36 5281.53  117.35 5281.31  121.35 5281.27  127.34 5281.07
  133.34 5281.01  137.33 5280.78  149.32 5280.76  153.32 5281.01  157.31 5281.03
   169.3 5280.97   173.3 5280.78   177.3 5280.86  187.29  5280.8  191.28 5280.84
  197.28 5280.66  201.27 5280.74  205.27 5280.71  211.26 5280.88  215.26 5280.91
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   227.3 5280.82  235.24 5280.71  239.24 5280.49  243.24 5280.43  245.23  5280.5
  251.23 5280.49  259.22 5280.65  265.22 5281.07  271.21 5281.02  275.21 5281.12
   277.2 5281.05   287.2 5281.11  291.19 5280.91  295.19 5280.99  303.18 5281.26
  315.17 5281.36  325.16 5281.39  337.15 5281.31  339.15 5281.13  343.15 5281.08
  349.14 5281.23  365.13 5281.24  369.12 5281.21  379.11 5281.39  387.11 5281.37
   391.1 5281.28  407.09 5281.54  413.08  5281.5  419.08 5281.62  429.07 5281.64
  449.05 5281.81  453.05 5281.78  465.03 5281.52  469.03 5281.37  479.02 5281.43
  485.02 5281.37  497.01 5281.54     503 5281.53  508.31 5281.71  512.99 5282.09
  514.99 5282.13  522.98 5282.67  528.98  5282.7  536.97 5283.12  540.97 5283.02
  544.96 5283.02  546.96 5283.12

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   10.41     .08   20.65      .1   51.77     .08   90.56     .13
   227.3     .06  508.31     .13

Bank Sta: Left   Right    Coeff Contr.   Expan.
          20.65   51.77            .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   71.41  546.96 5284.89       T

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       4     4.2
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                  5      63     .013     .013        0                    .5                 1
Number of Barrels =  2
Upstream   Elevation =  5275.61
Centerline Stations
    Sta.    Sta.
    71.4    76.6
Downstream Elevation =  5275.4
Centerline Stations
    Sta.    Sta.
    30.4    35.6

CROSS SECTION


RIVER: Skunk
REACH: 02                 RS: 4364

INPUT
Description: 35th Street (D/S)
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5281.29   10.41 5281.58   17.85 5281.53   20.65 5281.11   21.82 5280.75
    23.8 5279.27   25.79 5277.55    26.5  5275.4    39.5  5275.4   39.67 5278.18
   41.65 5279.47   43.64 5280.02    47.6 5280.28   51.77  5281.4   53.55 5281.96
   55.54 5282.22    59.5 5283.21   65.46 5283.38   69.42 5284.48   71.41 5284.89
   77.39 5284.89   81.38 5284.27   83.38 5284.08   85.38  5283.4   87.38 5283.05
   90.56 5282.16   93.37 5281.47   95.37 5281.32   97.37 5281.41  101.36 5281.82
  105.36 5281.87  109.36 5281.53  117.35 5281.31  121.35 5281.27  127.34 5281.07
  133.34 5281.01  137.33 5280.78  149.32 5280.76  153.32 5281.01  157.31 5281.03
   169.3 5280.97   173.3 5280.78   177.3 5280.86  187.29  5280.8  191.28 5280.84
  197.28 5280.66  201.27 5280.74  205.27 5280.71  211.26 5280.88  215.26 5280.91
   227.3 5280.82  235.24 5280.71  239.24 5280.49  243.24 5280.43  245.23  5280.5
  251.23 5280.49  259.22 5280.65  265.22 5281.07  271.21 5281.02  275.21 5281.12
   277.2 5281.05   287.2 5281.11  291.19 5280.91  295.19 5280.99  303.18 5281.26
  315.17 5281.36  325.16 5281.39  337.15 5281.31  339.15 5281.13  343.15 5281.08
  349.14 5281.23  365.13 5281.24  369.12 5281.21  379.11 5281.39  387.11 5281.37
   391.1 5281.28  407.09 5281.54  413.08  5281.5  419.08 5281.62  429.07 5281.64
  449.05 5281.81  453.05 5281.78  465.03 5281.52  469.03 5281.37  479.02 5281.43
  485.02 5281.37  497.01 5281.54     503 5281.53  508.31 5281.71  512.99 5282.09
  514.99 5282.13  522.98 5282.67  528.98  5282.7  536.97 5283.12  540.97 5283.02
  544.96 5283.02  546.96 5283.12

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   10.41     .08   20.65      .1   51.77     .08   90.56     .13
   227.3     .06  508.31     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          20.65   51.77           111.92  111.81  109.69             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   71.41  546.96 5284.89       T

CROSS SECTION


RIVER: Skunk
REACH: 02                 RS: 4252

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5281.46    5.93  5281.5    9.88 5281.37   15.81 5281.36   23.71 5281.21
   31.62 5281.14   37.55 5281.01   42.44 5280.82   45.45 5280.63   47.43 5280.26
   57.31 5280.19   63.45 5280.07   65.21 5280.01   67.19 5280.16   69.17 5280.01
   71.14 5279.72   73.12  5279.6   75.38 5279.22   77.07 5278.43   81.02  5275.8
      83 5275.51   86.95 5275.69   88.93 5276.58    90.9 5277.69   92.88 5278.15
   98.81 5278.63  100.78 5278.96  104.74  5280.2  107.09 5280.69  107.83 5280.79
  109.66 5280.97  114.62 5281.42  118.57 5281.66  122.52 5281.81  128.45 5281.91
   132.4 5282.12  136.35 5282.58  138.33 5282.71  146.24 5282.86  150.19 5282.78
  158.11 5282.77  174.07 5282.64  192.02 5282.32  196.01 5282.33     200 5282.19
  205.99  5281.7  209.23 5281.37  215.96 5280.75  217.96 5280.67  223.94 5280.69
```

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  231.92 5280.88  237.91 5280.93   241.9 5281.01  245.89 5281.22  247.88 5281.42
  255.86    5282  263.84  5282.7  265.83 5282.84  269.82 5282.95  275.81 5283.05
  289.77 5283.04  305.73    5283  309.72 5282.81  313.71 5282.77   317.7 5282.63
  321.69 5282.72  327.68 5282.61  335.65 5282.37  339.64 5282.35  347.62 5282.17
  351.61 5282.01  359.59 5281.88  365.58 5281.69  373.56 5281.91  377.55 5281.92
  381.54 5281.81   397.5 5281.69  405.48 5281.57  409.47 5281.44  411.46 5281.45
  427.42 5281.21   433.4 5281.19   435.4 5281.11  441.38 5281.01  445.37 5280.89
  453.35 5280.76  459.34  5280.5   473.3 5280.44  483.28 5280.29  485.27 5280.29
  495.24    5280  501.47  5279.8  503.22 5279.91  507.21 5282.17   513.2 5282.61
  515.19 5281.72  517.19 5280.41  521.18 5281.05  529.16 5282.77  531.15 5283.02

Manning's n Values        num=       8
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   42.44    .015   63.45     .08   75.38      .1  107.09     .08
  107.83     .13  209.23     .06  501.47     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          75.38  109.66           113.37  113.32  112.34              .1       .3
Ineffective Flow     num=       6
   Sta L   Sta R    Elev  Permanent
    12.6   16.415291.386       F
  131.19  143.955292.068       F
  194.46  261.74 5282.45       F
  262.34   272.15292.578       F
  306.83  337.935292.973       F
  352.07  528.55 5282.48       F
Blocked Obstructions     num=       4
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    12.65291.464  143.95  191.325292.798   272.1  306.83 5292.98
  517.83  531.155290.504

CROSS SECTION


RIVER: Skunk
REACH: 02                 RS: 4139

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5281.84       2 5281.86    7.98 5282.26    9.98 5282.21   13.97 5281.24
   15.96 5280.99   17.96 5280.36   21.95 5279.71   23.94 5279.63   27.94 5279.18
   33.92 5279.17   35.92 5279.12   45.67 5279.03   47.89 5279.04   55.87 5278.95
   59.86 5278.97    66.1 5278.83   67.84 5278.78   71.83 5279.07   77.82  5278.9
   81.81 5278.59   84.02 5278.22    85.8 5277.82   89.79 5277.34   91.79 5276.96
   93.78 5276.12   95.78 5275.13   97.77 5274.97   99.77 5274.96  101.76 5276.08
  103.76 5277.37  106.22 5278.33  107.75 5278.59  108.79 5278.58  111.74 5278.55
  113.74 5278.64  117.73 5278.62  121.72 5278.68  124.39 5278.81   127.7 5279.03
   131.7 5279.56  133.69 5279.67  139.68 5279.32  145.66 5279.35  151.65 5279.46
  157.63  5279.5   171.6 5279.79  177.59 5280.02  183.57  5280.4  187.57 5280.77
  193.55 5280.98  197.54  5281.4  201.53 5281.71  209.49 5281.93  215.46 5282.26
  217.45 5282.24  235.35 5281.85  239.33 5281.83  243.31 5281.68  249.28 5281.71
  255.25  5281.8  267.18  5282.2  271.16  5282.5  291.05 5283.15  295.03 5283.14
     301 5283.02  308.96 5283.57  314.93 5283.56  322.88 5283.21  326.86 5282.77
  328.85 5282.66  334.82 5282.52   338.8 5282.66  342.78 5282.51  346.76 5282.19
   356.7 5281.65  362.67  5281.4  368.64 5281.22  372.62 5281.05   376.6 5280.78
  384.56  5280.4  386.54 5280.22  392.51 5279.87  398.48 5280.03  402.46 5280.24
  406.44 5280.26  410.42 5279.41  412.41 5279.26  420.36 5279.19  424.34 5279.19
  440.26  5279.1  446.23 5279.02  449.44 5278.93  452.19 5278.87  454.18  5279.4
  456.17 5280.24  460.15 5280.41  462.14 5280.77  468.11 5281.06   470.1 5281.06

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   45.67    .015    66.1     .08   84.02      .1  108.79     .08
  124.39     .06  449.44     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          84.02  106.22           133.73  129.85  128.85              .1       .3
Ineffective Flow     num=       3
   Sta L   Sta R    Elev  Permanent
   13.07    26.35291.415       F
  177.54     1785290.018       F
  376.21  470.48 5281.68       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   13.075291.838     178  325.635290.044

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 4009

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5278.2    3.98 5278.24    7.96 5277.97    9.96 5278.11   13.94 5278.25
   15.93 5277.99   18.61 5277.75    21.9 5277.59   23.89 5277.62   37.83 5277.55
   41.81 5277.59   49.78 5277.58   53.76 5277.52   65.71 5277.41   75.66 5277.38
    89.6  5277.2   91.59 5277.24   97.56  5277.2  101.54 5277.25  105.53 5277.35
  109.51 5277.54  113.49 5277.49  117.47 5277.13  123.45  5277.2  127.43 5277.21
  131.41 5277.13  140.98 5277.03  145.35 5276.98  149.33 5277.19  151.32  5277.2
  153.31 5277.11   155.3 5277.15  159.29 5277.54  163.27 5277.53   165.6 5277.23
  167.25 5276.87  169.24 5276.65  173.22 5275.39  175.21  5275.2   179.2 5275.17
  181.19 5275.58  183.18 5276.28  185.17  5277.4  187.16 5277.78  188.71 5277.84
  191.14 5277.94  197.12 5278.03  207.07  5278.1  215.04  5278.1  221.01 5278.14
  224.99 5277.99  228.97 5278.04  234.95 5277.94  238.93 5278.09  248.88 5278.35
  256.85  5278.5  258.84 5278.49   266.8 5278.76   268.8 5278.88  272.78 5279.45
  274.77 5279.58  276.21 5279.56  282.73 5279.39  288.71 5279.37  292.69 5279.52
  300.65 5279.73  304.63 5279.97  308.62 5280.16  316.58 5280.36  324.55 5280.48
  328.53 5280.65  330.51 5280.59  338.43 5280.47   342.4 5280.51  348.34  5280.5
  350.32 5280.64  364.19 5280.25  380.04 5279.99  389.95 5279.81  395.89 5279.66
  397.88 5279.66  403.82  5279.5  407.78 5279.47  413.73 5279.36  421.65 5279.25
  423.63 5279.19  429.58 5279.19  451.37 5278.88  457.32 5278.72  465.24 5278.72
   469.2 5278.79  474.67  5278.7  477.13 5278.69  479.11 5278.85  481.09 5279.63
  483.07 5279.89  485.06 5280.02  489.02 5280.56  492.98 5280.65  494.96 5280.64

Manning's n Values        num=       7
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
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       0     .08   18.61    .015  140.98     .08   165.6      .1  188.71     .08
  276.21     .06  474.67     .13

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         165.6  188.71            62.12   69.72   73.43              .1       .3
Ineffective Flow      num=       2
   Sta L   Sta R    Elev  Permanent
       0   71.695288.198       F
  350.32  494.96 5280.64       F

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 3940

INPUT
Description: Wellman Canal Berm (24" Culvert 100% Blocked)
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5277.56       2 5277.58    3.99 5277.63    5.99 5277.73    9.98 5277.67
   11.97 5277.78   13.97 5277.78   17.96 5277.86   19.95 5277.92   23.94 5277.99
   25.94 5278.01   29.93 5278.08   31.92 5278.06   35.91 5278.15    37.9 5278.21
    39.9 5278.21   45.88 5278.31   49.88 5278.36   51.87 5278.41   57.86 5278.42
   61.85 5278.48   63.84 5278.46   65.84  5278.5   69.83 5278.51   75.81 5278.46
    79.8 5278.38    81.8  5278.3   83.79 5278.17   85.79 5278.09   87.78 5277.96
   89.78 5277.88   91.77 5277.73   95.76 5277.52   99.75 5277.25  101.75 5277.18
  103.74 5277.08  107.73 5276.91  111.72  5276.7  115.71 5276.44  117.71 5276.38
   121.7 5276.12  123.97    5276  125.69  5275.9  129.68 5275.72  135.66 5275.39
  137.66 5275.25  141.65 5275.04  143.64 5274.96  145.62 5274.84  149.59 5274.73
  151.57 5274.73  153.55 5274.67  157.51 5274.58   159.5 5274.58  163.46 5274.52
  171.39 5274.61  175.35 5274.63   181.3 5274.75  183.28 5274.98  189.23 5275.04
  193.19    5275  199.13 5275.06  201.12 5275.13   203.1 5275.25  205.08 5275.31
  207.06 5275.45  211.03 5275.52  214.99 5275.63  218.95 5275.43  220.94 5275.37
  222.92  5275.5   224.9 5275.66  226.88 5275.77  228.86 5275.78  232.83 5275.98
  234.81 5276.05  236.79 5276.15  242.74 5276.34  244.72 5276.48  248.68  5276.8
  252.65 5277.21  254.63 5277.37  256.61 5277.67  258.59 5277.84  260.24 5277.87
  264.54 5277.92  266.52 5277.91   268.5 5277.94  270.48 5278.07  272.47 5278.33
  274.45 5278.55  276.43 5278.72  278.41 5278.81  280.39 5279.01  282.38  5279.1
  284.36 5279.22  288.32 5279.21   290.3 5279.32  292.29 5279.37  296.25  5279.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08  123.97      .1  260.24     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        123.97  260.24            59.23   57.33   55.53              .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
  269.96  296.255288.008       F

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 3882

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5278.34    7.95 5278.35    9.93  5278.3   11.92 5278.29   17.88  5278.1
   19.86 5278.02   23.84    5278   27.81 5277.87   31.78 5277.81   35.75 5277.67
   39.73 5277.59   41.71 5277.48    43.7 5277.43   45.68 5277.34   47.67  5277.2
   51.64 5277.08   55.62 5276.88   59.59 5276.63   61.58 5276.48   63.56 5276.26
   64.09 5276.13   65.55 5275.77   67.53  5275.2   69.52 5274.69   71.51 5274.04
   73.49 5273.32   75.48 5272.81   77.47 5272.56   83.42 5272.36    87.4 5272.27
   89.38 5272.21   91.37 5272.02   93.36 5271.87   95.34 5271.78   97.33 5271.61
   99.31 5271.61   101.3 5271.26  103.29 5270.44  105.27 5270.25  107.26  5270.3
  109.25 5270.41  111.23 5270.46   115.2 5270.26  119.18 5270.26  121.16  5270.3
  123.15  5270.2  127.12 5270.33  129.11 5270.37  133.08 5270.37  135.07 5270.46
  137.05 5270.59  139.04  5270.6  141.03 5270.69  143.01 5270.73     145 5270.67
  146.99 5270.56  148.97 5270.52  152.94 5270.55  156.92 5270.47   158.9 5270.56
  162.88 5270.85  164.86 5270.79  168.83 5270.62  172.81 5270.65  174.79 5270.72
  176.78 5271.09  180.75 5272.34  182.74 5272.79  184.72 5273.04  186.71 5273.22
   188.7 5273.64  190.68 5274.14  192.67 5274.56  194.66 5274.91  198.63 5275.72
  200.62 5276.08  204.59 5276.94  207.24 5277.41  208.56 5277.65  210.55 5277.92
  211.76 5278.01  214.52 5278.16  216.51 5278.32  218.49 5278.75  220.48 5279.28
  222.46 5279.28  224.45 5279.18  228.42 5279.42   232.4 5279.49  236.37 5279.33
  240.34 5279.48  244.31 5279.49  248.29 5279.41  250.27  5279.4  252.26 5279.45
  254.24 5279.43  256.23 5279.25  258.22 5279.24   260.2 5279.33  262.19 5279.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   64.09      .1  207.24     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         64.09  211.76            66.35   69.77   71.05              .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
  223.61  255.385289.166       F
Blocked Obstructions      num=       1
   Sta L   Sta R    Elev
  255.38  262.195289.334

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 3812

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5275.66    1.99 5275.58    5.97 5275.39    7.96 5275.26    9.95 5275.19
   11.94 5275.15   13.93 5275.14   17.91 5274.99   21.89 5274.82   23.88 5274.68
   29.85 5274.37   33.83 5274.19   35.82 5274.07   37.81 5273.81    39.8  5273.6
   43.78 5273.36   45.77 5273.19   49.75 5272.67   53.73 5272.41   57.71 5272.23
    59.7 5272.12   62.65 5271.76   65.67 5271.39   67.66  5271.1   69.65 5270.73
   71.64 5270.28   75.62 5269.47    77.6    5269   79.59  5268.6   81.58 5268.28
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   83.57 5268.04   85.56  5267.9   87.55 5267.55   91.53 5267.08   93.52 5266.79
   95.51 5266.59    97.5 5266.61   99.49  5266.6  101.48 5266.54  103.47 5266.41
  105.46 5266.35  107.45 5266.36  109.44 5266.42  111.43  5266.4  113.42 5266.25
  115.41 5266.06   117.4 5265.97  119.39 5265.95  121.38 5266.09  123.37 5266.08
  125.36 5266.12  129.34 5266.13  131.33 5266.23  133.32 5266.15  135.31 5266.17
   137.3 5266.23  139.29 5266.37  141.28 5266.46  143.27 5266.58  145.26 5266.48
  147.25 5265.73  149.24 5264.78  151.23 5264.45  153.22 5265.26  155.21 5265.63
   157.2 5265.68  159.19 5265.64  161.18 5265.55  163.17 5265.58  165.16 5265.65
  167.15 5265.92  169.14 5266.71  171.13 5267.47  173.12  5267.9  175.11 5268.86
   177.1 5269.96  179.09 5270.86  181.08 5271.79  183.07 5272.82  185.06 5273.57
  189.04 5274.15  191.03 5274.52  193.02 5275.01  195.01 5275.46     197 5275.99
  198.99 5276.47  200.98 5276.92   202.9 5277.24  204.96 5277.54  206.95 5277.75
   209.6 5277.94  210.93 5278.01  214.91 5278.07   216.9  5278.3  218.89 5278.45
  220.88 5278.54  222.87 5278.72  224.85 5278.78  228.83 5278.69   234.8 5278.58

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   62.65      .1   202.9     .08   209.6     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         62.65  185.06            88.89   90.82   91.94             .1       .3
Blocked Obstructions     num=        1
   Sta L   Sta R    Elev
  222.69   234.8  5288.7

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 3722

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5273.71       2 5273.68    3.99  5273.7    7.99 5273.56    9.99 5273.46
   11.98  5273.3   13.98 5273.06   15.98 5272.91   17.97 5272.69   21.97 5272.33
   24.75 5271.98   24.76 5271.98   25.96  5271.8   27.96 5271.64   31.95 5271.28
   33.95 5270.99   35.95 5270.81   37.95  5270.7   39.94 5270.54   43.94 5269.96
   45.93 5269.73   49.93  5269.3   53.92 5268.71   55.92  5268.5   57.92 5268.15
   59.91  5267.9   61.91 5267.75   63.91 5267.72    67.9 5267.45    69.9 5267.38
   75.89 5267.02   77.89 5266.92   79.89 5266.85   81.88 5266.67   83.88 5266.44
   85.88 5265.89   87.87 5265.54   89.87 5265.57   91.87 5265.84   93.87 5265.81
   95.86 5265.15   97.86 5264.62   99.86 5264.22  101.85 5264.16  105.85 5264.27
  107.85  5263.8  109.84 5262.78  111.84 5262.95  113.83 5263.59  115.82 5264.79
  117.81 5264.71   119.8  5264.4  121.79  5264.4  123.78 5264.98  125.77  5265.8
  127.76 5266.45  129.75 5267.26  131.74 5268.27  135.72 5269.88  137.71 5270.49
   139.7 5271.17  141.69 5271.79  143.68 5272.45  144.54  5272.7  145.67 5273.03
  147.66 5273.13  149.65 5272.85  151.64 5272.22  153.63 5271.39  155.63 5270.47
  157.62 5269.79  159.61  5268.8   161.6 5267.68  163.59 5267.24  165.58 5267.09
  167.57 5267.11  173.54 5267.67  175.53 5267.75  177.52 5267.73  179.51 5267.81
   181.5 5267.96  183.49 5268.17  185.48 5268.62  189.46 5270.65  191.45 5271.37
  193.44 5271.85  195.43 5272.59  197.42 5273.17   201.4 5274.23  203.39 5274.66
  205.38 5275.04  207.37 5275.27  209.36 5275.64  211.35 5276.14  213.34 5276.48
  215.33 5276.74  219.31 5276.91   221.3 5276.94  225.28 5276.83  227.27 5276.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   24.76      .1  144.54     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         24.75  144.54            95.17   92.61   92.33             .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
  147.66  227.27 5273.13       T

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 3629

INPUT
Description: Colorado Ave. (U/S)
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5272.46    1.99 5272.37    3.98 5272.33    5.96 5272.25    7.95 5272.14
    9.94  5272.1   11.93 5272.04   13.92    5272   17.89 5271.86   19.88 5271.81
   21.87 5271.74   23.86 5271.69   25.85 5271.65   27.83 5271.55   29.82 5271.47
   31.81 5271.42    33.8 5271.33   37.77  5271.2   41.75 5270.96   43.74 5270.85
   45.44 5270.73   45.73 5270.71   47.71 5270.76    49.7 5271.09   53.68 5271.08
   55.67 5271.15   57.66 5271.19   59.64 5271.29   61.63 5271.27   63.62 5271.28
   65.61 5271.31    67.6 5271.38   69.58 5271.32   71.42 5271.19   71.57 5271.18
   73.56 5270.67   75.55 5265.74   77.54 5261.87    79.6 5260.75   89.47 5260.75
    90.5 5260.03   100.4 5260.03  101.39 5260.77  105.37 5260.84  107.36 5263.76
  109.35 5267.03  111.34 5267.43  113.32 5267.78  115.31  5268.4   117.3 5269.06
  119.29 5269.51  121.28 5270.03  123.26 5270.81  125.25 5271.68  127.24 5272.34
  129.23 5272.95  131.22 5273.52   133.2  5273.8  135.38 5274.12  137.18 5274.29
  139.17 5274.41  141.13 5274.38  143.08 5274.33  145.04 5274.19  148.96 5273.83
  150.92  5273.6  152.88 5273.33  154.83 5272.99  156.79 5272.55  157.27 5272.48
  158.75 5272.27  160.71 5272.33  164.62 5272.42  166.58 5272.45  168.54 5272.44
   170.5 5272.49  174.42 5272.46  176.37 5272.37  178.33 5272.32  182.33 5272.25
  184.21 5272.09  186.16 5272.47  188.12 5272.88  190.08 5273.42  192.04  5273.9
     194  5274.3  195.96  5274.6  199.87 5274.76  201.83 5275.48  203.79 5276.34
  205.75    5277   207.7 5277.34  209.66 5277.45  213.58 5277.51

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   45.44     .08   71.42      .1  135.38     .08  157.27    .015
  182.33     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         71.42  135.38           196.36  201.13  198.77             .3       .5
Ineffective Flow     num=        3
   Sta L   Sta R    Elev  Permanent
       0      76 5271.38       T
     105     150    5271       T
  193.52  205.265284.207       F
Blocked Obstructions     num=        3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    79.6    80.1 5268.05    99.9   100.4 5268.23  205.26  213.585286.854
```

```
CULVERT


RIVER: Skunk
REACH: 01                 RS: 3540

INPUT
Description: Colorado Ave (5% potential debris block);
culvert size =
             9.9'Wx8.2'H and 9.9'Wx7.3'H
modeled culvert size (for 5% block) =
             9.4'Wx8.2'H and 9.4'Wx7.3'H
Distance from Upstream XS =      55
Deck/Roadway Width        =     110
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  5272.3              72    5271            75.5  5272.6
      77  5272.6            77.1  5274.6             103  5274.6
   103.1  5272.2             108    5271          135.38 5274.12

Upstream Bridge Cross Section Data
Station Elevation Data     num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5272.46    1.99 5272.37    3.98 5272.33    5.96 5272.25    7.95 5272.14
    9.94  5272.1   11.93 5272.04   13.92    5272   17.89 5271.86   19.88 5271.81
   21.87 5271.74   23.86 5271.69   25.85 5271.65   27.83 5271.55   29.82 5271.47
   31.81 5271.42    33.8 5271.33   37.77  5271.2   41.75 5270.96   43.74 5270.85
   45.44 5270.73   45.73 5270.71   47.71 5270.76    49.7 5271.09   53.68 5271.08
   55.67 5271.15   57.66 5271.19   59.64 5271.29   61.63 5271.27   63.62 5271.28
   65.61 5271.31    67.6 5271.38   69.58 5271.32   71.42 5271.19   71.57 5271.18
   73.56 5270.67   75.55 5265.74   77.54 5261.87    79.6 5260.75   89.47 5260.75
    90.5 5260.03   100.4 5260.03  101.39 5260.77  105.37 5260.84  107.36 5263.76
  109.35 5267.03  111.34 5267.43  113.32 5267.78  115.31  5268.4   117.3 5269.06
  119.29 5269.51  121.28 5270.03  123.26 5270.81  125.25 5271.68  127.24 5272.34
  129.23 5272.95  131.22 5273.52   133.2  5273.8  135.38 5274.12  137.18 5274.29
  139.17 5274.41  141.13 5274.38  143.08 5274.33  145.04 5274.19  148.96 5273.83
  150.92  5273.6  152.88 5273.33  154.83 5272.99  156.79 5272.55  157.27 5272.48
  158.75 5272.27  160.71 5272.33  164.62 5272.42  166.58 5272.45  168.54 5272.44
   170.5 5272.49  174.42 5272.46  176.37 5272.37  178.33 5272.32  182.33 5272.25
  184.21 5272.09  186.16 5272.47  188.12 5272.88  190.08 5273.42  192.04  5273.9
     194  5274.3  195.96  5274.6  199.87 5274.76  201.83 5275.48  203.79 5276.34
  205.75    5277   207.7 5277.34  209.66 5277.45  213.58 5277.51

Manning's n Values         num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   45.44     .08   71.42      .1  135.38     .08  157.27    .015
  182.33     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
         71.42  135.38           .3       .5
Ineffective Flow     num=        3
   Sta L   Sta R    Elev  Permanent
       0      76 5271.38       T
     105     150    5271       T
  193.52  205.265284.207       F
Blocked Obstructions     num=       3
   Sta L   Sta R    Elev   Sta L   Sta R    Elev   Sta L   Sta R    Elev
    79.6    80.1 5268.05    99.9   100.4 5268.23  205.26  213.585286.854

Downstream  Deck/Roadway Coordinates
    num=       9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      34    5269              81    5269             140    5269
     141    5270           141.1  5272.2             174  5272.2
   174.1    5270             175    5269             208    5268

Downstream Bridge Cross Section Data
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5274.32    3.96 5273.84    5.94 5273.52    7.92 5273.14    9.91 5272.94
   11.89 5272.64   15.85 5272.12   17.83 5271.74   19.81 5271.39   21.79 5271.01
   23.77 5270.54   25.75 5270.13   27.73 5269.88   33.68 5269.07   37.64 5268.62
   39.62 5268.43    41.6 5268.34   43.58 5268.34   45.56 5268.31    46.7 5268.26
   47.55 5268.23   49.53 5267.99   51.51 5267.66   53.49 5267.66   57.45 5267.84
   59.43 5267.91   63.39    5268   65.37 5268.02   69.34 5268.11    73.3 5268.08
   75.28 5268.02   79.24 5267.94    83.2 5267.83   87.17 5267.67   89.15 5267.54
   89.42 5267.57   91.13 5267.82   93.11 5268.21   95.09 5268.29   97.07 5268.33
   99.05 5268.32  101.05 5268.28  103.04 5268.21  107.03 5268.25  109.03 5268.24
  115.01 5268.44     117 5268.41     119 5268.28  122.99 5267.98  126.98 5267.56
  131.31 5266.83  132.96 5266.55  134.95 5266.14  136.95 5265.69  138.94 5265.14
  140.94  5264.5  142.93 5262.58  144.93 5259.71  146.92 5259.14   147.6  5258.3
   157.5  5258.3   158.5 5256.94   168.4 5256.94  168.86  5258.1  170.85 5257.92
  172.85 5257.87  174.84 5258.79  176.84 5262.26  178.83 5266.68  180.83 5268.72
  181.05 5268.72  181.07 5268.72  184.82 5268.75  192.79 5268.88  194.79 5268.95
  198.78  5268.9  202.77 5268.72  204.76 5268.49  206.75 5268.18  207.74 5267.91
  208.75 5267.63  210.74 5267.68  212.74 5267.77  214.73 5267.83  216.73 5267.86
  220.72 5267.88   224.7 5267.87   226.7 5267.91  228.69 5267.92  230.69 5267.96
  232.68 5268.03  242.66 5268.12  244.65 5268.19  246.64 5268.21  252.63 5268.16
  254.62 5268.19

Manning's n Values         num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    46.7    .015   89.42     .08  131.31     .07  181.07     .08
  207.74    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        131.31  181.05           .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     145    5269       F
     173  254.62    5269       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
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Weir crest shape                          = Broad Crested

Number of Culverts =  2

Culvert Name     Shape      Rise    Span
Culvert #1           Box     7.3     9.4
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 25     159     .013     .013        0                   .5                1
Upstream   Elevation =  5260.75
           Centerline Station =  84.8
Downstream Elevation =  5258.3
           Centerline Station =  152.8

Culvert Name     Shape      Rise    Span
Culvert #2           Box     8.2     9.4
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 25     159     .013     .013        0                   .5                1
Upstream   Elevation =  5260.03
           Centerline Station =  95.2
Downstream Elevation =  5256.94
           Centerline Station =  163.2

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 3428

INPUT
Description: Colorado Ave. (D/S)
Station Elevation Data    num=      96
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5274.32    3.96 5273.84    5.94 5273.52    7.92 5273.14    9.91 5272.94
   11.89 5272.64   15.85 5272.12   17.83 5271.74   19.81 5271.39   21.79 5271.01
   23.77 5270.54   25.75 5270.13   27.73 5269.88   33.68 5269.07   37.64 5268.62
   39.62 5268.43    41.6 5268.34   43.58 5268.34   45.56 5268.31    46.7 5268.26
   47.55 5268.23   49.53 5267.99   51.51 5267.66   53.49 5267.66   57.45 5267.84
   59.43 5267.91   63.39    5268   65.37 5268.02   69.34 5268.11    73.3 5268.08
   75.28 5268.02   79.24 5267.94    83.2 5267.83   87.17 5267.67   89.15 5267.54
   89.42 5267.57   91.13 5267.82   93.11 5268.21   95.09 5268.29   97.07 5268.33
   99.05 5268.32  101.05 5268.28  103.04 5268.21  107.03 5268.25  109.03 5268.24
  115.01 5268.44     117 5268.41     119 5268.28  122.99 5267.98  126.98 5267.56
  131.31 5266.83  132.96 5266.55  134.95 5266.14  136.95 5265.69  138.94 5265.14
  140.94  5264.5  142.93 5262.58  144.93 5259.71  146.92 5259.14   147.6  5258.3
   157.5  5258.3   158.5 5256.94   168.4 5256.94  168.86  5258.1  170.85 5257.92
  172.85 5257.87  174.84 5258.79  176.84 5262.26  178.83 5266.68  180.83 5268.72
  181.05 5268.72  181.07 5268.72  184.82 5268.75  192.79 5268.88  194.79 5268.95
  198.78  5268.9  202.77 5268.72  204.76 5268.49  206.75 5268.18  207.74 5267.91
  208.75 5267.63  210.74 5267.68  212.74 5267.77  214.73 5267.83  216.73 5267.86
  220.72 5267.88   224.7 5267.87   226.7 5267.91  228.69 5267.92  230.69 5267.96
  232.68 5268.03  242.66 5268.12  244.65 5268.19  246.64 5268.21  252.63 5268.16
  254.62 5268.19

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    46.7    .015   89.42     .08  131.31     .07  181.07     .08
  207.74    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        131.31  181.05            37.99   43.31   45.27             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0     145    5269       F
     173  254.62    5269       F

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 3385

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5275.37    3.98 5275.13    7.95 5274.82   11.93 5274.71   13.92 5274.55
   17.89 5274.12   19.88 5273.86   21.87 5273.44   25.85 5272.52   27.83 5271.99
    33.8 5270.54   37.77 5269.74   39.76 5269.27   41.75 5268.69   43.74 5268.27
   45.73 5268.04    49.7 5267.79   53.68 5267.72   56.21 5267.47   59.64 5266.89
   61.63 5266.85    67.6 5267.17   73.56 5267.34   79.52 5267.39    83.5 5267.28
   89.47 5267.17   95.19 5266.94   97.42 5266.79   99.41 5266.85  101.39 5267.25
  103.38 5267.24  107.35 5267.35  113.28  5267.7  119.21 5267.69  121.19 5267.64
  127.12 5267.61  131.08 5268.08  133.06 5268.16  135.03 5268.07  138.99 5267.74
  144.92 5267.41  148.49 5267.01  152.83  5266.3  156.79 5265.47  160.74 5264.26
   164.7 5262.88  166.68 5262.33  170.63 5261.85  172.61 5261.22  174.59 5260.72
  176.56 5260.33   182.5 5260.07  186.45 5259.98  190.41 5259.78  192.38 5259.53
  194.36 5259.36  196.34 5258.55  198.32 5258.16  202.27 5257.92  206.23  5257.9
  210.18    5258  212.16 5257.78  216.12  5257.9  218.09  5257.9  220.07 5258.06
  222.05 5258.34  224.03  5258.2     226 5258.53  227.98 5259.88  229.96 5262.18
  231.94 5263.63  233.91 5264.43  236.67 5265.04  241.82 5265.98   243.8 5266.39
  247.76 5266.93  251.71 5267.17  255.67 5267.23  257.64 5267.47   261.6 5267.84
  263.58 5267.92  267.53 5268.16  269.51 5268.19  271.49 5268.13   279.4 5268.23
  281.38 5268.22  285.32 5268.29  287.29 5268.22  289.26     5268  291.23  5267.5
  293.23 5267.15  295.17 5267.17  299.11 5267.35  303.05 5267.41  305.02 5267.51
  310.93  5267.6  314.87 5267.61  322.75 5267.74   326.7 5267.75  332.61  5267.9

Manning's n Values        num=       6
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   56.21    .015   95.19     .08  148.49     .07  236.67     .08
  293.23    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        148.49  236.67            45.93   48.45   52.13             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
```

```
    8.43    14.35284.781       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    8.435285.373

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 3336

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5271.28    3.96 5272.64    5.94 5273.17    9.91 5273.79   11.89 5273.85
   13.87 5273.73   17.83 5273.24    21.8 5272.64   25.76 5271.86   29.72 5270.95
   31.71 5270.54   35.67 5269.59   39.63 5268.79   45.58  5267.7   47.56 5267.42
   51.52 5267.08   55.48 5267.09    57.3  5266.9   59.45 5266.63   61.43 5266.25
   63.41 5266.42   69.35 5266.67    75.3 5266.79   81.24  5266.8   83.23 5266.72
   91.15 5266.58   94.44 5266.41    97.1 5266.31   99.08 5266.11  101.06 5266.51
  103.04 5266.57  108.99 5266.33  110.97  5266.3  118.93 5266.33  122.91 5266.41
  130.87 5266.68  134.85 5266.57  138.83  5266.5   144.8 5266.48  146.79 5266.51
  150.77 5266.81  154.75 5266.93  160.72 5266.74   164.7 5266.34  167.08    5266
  170.67 5265.52  174.65 5265.24  178.63 5264.12  180.62 5263.68  188.58 5263.11
  190.57 5262.92  192.56 5262.58  194.55 5262.15  198.54  5261.4  202.52 5260.53
   206.5 5259.87  210.48 5258.92  212.47 5258.53  214.46 5258.28  216.45  5258.2
  220.43 5258.19  222.42 5258.24  224.41 5258.05   226.4 5257.69  228.39 5257.62
  230.38 5257.83  234.36 5258.01  236.35 5258.39  240.33 5258.47  244.31 5258.92
   246.3 5258.89  250.28 5258.63  254.26 5258.76  256.25 5258.72  258.24 5258.81
  260.23 5259.27  262.22 5259.48  264.21 5259.79   266.2 5260.37  268.19 5260.83
  270.17 5261.59  274.15 5262.51  278.12 5264.24  280.11 5264.89  281.24 5265.14
   282.1 5265.32  286.07 5265.79  290.04 5265.91  296.01 5266.31  301.97 5266.64
   311.9 5266.81  315.88 5266.83  319.85 5266.98  321.84  5267.1  325.81 5267.19
  329.79 5267.35  333.76 5267.59  339.72 5267.85  345.69 5267.92  349.66    5268

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06    57.3    .015   94.44     .08  167.08     .07  281.24     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        167.08  281.24            89.34  101.91  119.33              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    10.7   25.965283.834       F
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
       0    10.75281.282

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 3234

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5267.95    5.98 5267.94   15.95  5267.6   21.93  5267.3   25.91 5266.97
    29.9 5266.92   33.89 5266.52   37.42 5266.25   39.87 5266.12   41.86 5265.66
   45.85 5265.94   51.83  5266.2   57.81 5266.32    59.8 5266.41   65.78 5266.31
   73.87 5266.06   77.74 5265.89   79.73 5265.71   81.73 5266.11    89.7 5265.99
   91.69  5265.9   95.68 5265.89  101.66 5265.78  103.65 5265.65  111.63 5265.43
  115.61 5265.52  121.59 5265.44  131.56 5265.09  133.55  5265.1  139.53  5264.8
  143.52 5264.71  145.51 5264.76  147.51 5264.64  151.34 5264.04  157.47 5262.36
  161.46 5261.38  165.45 5260.58  171.43 5259.66  173.42 5259.23  177.41 5258.82
  181.39 5258.59  189.37 5258.49  193.35 5258.37  199.34 5257.91  203.32  5257.8
  205.31 5257.85  211.29  5257.7  215.28 5257.53  219.27 5257.65  221.26  5257.5
  223.26 5256.96  225.25 5256.63  227.24 5257.01  229.24 5257.22  231.23 5257.61
  233.22  5257.7  235.22 5257.52  237.21 5257.77   239.2 5258.17   241.2 5258.38
  245.18 5258.29  255.15 5258.49  259.14 5258.71  263.12 5259.17  265.12 5259.57
   269.1  5260.6  275.08 5262.36  277.08 5262.75  279.77 5263.09  281.06 5263.21
  287.04  5263.5  291.03  5263.6  293.02 5263.94  295.02 5264.45  297.01 5264.55
     301 5263.99  302.99     5264  308.97 5264.33  316.94 5264.46  326.91 5264.41
   328.9 5264.44  334.88 5264.68  344.85 5264.91  346.84  5265.2  348.84 5265.33
  350.83  5265.1  354.82 5264.89  356.81 5264.94   358.8 5265.29  362.79 5266.56
  364.78 5266.48  366.78 5265.95  368.77 5265.76  372.76 5266.42  376.74 5266.36
  380.73 5265.89  382.72 5266.27  384.72 5266.39   388.7 5265.84   390.7 5265.83

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   37.42    .015   73.87     .08  151.34     .07  279.77     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        151.34  279.77            88.56  108.29  123.17              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
       0   17.015277.952       F

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 3126

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5268.35    7.96 5268.32   11.94 5267.93   15.92 5267.19   23.85 5265.87
   27.86 5265.08   29.85 5265.21   35.83 5265.43   39.81 5265.45   43.79 5265.57
   51.75 5265.51   59.32 5265.31   65.68 5265.12   69.66 5265.49   75.63 5265.45
   83.59 5265.13   89.56 5264.94   93.54 5264.87   99.51 5264.85  103.49 5264.95
  111.47 5264.92  115.46 5264.96  123.43 5264.78  129.26 5264.14  131.41 5263.76
   133.4 5263.18  137.39 5261.85  141.38 5260.38  145.37 5259.19  147.36 5258.71
  149.36 5258.56  155.34 5258.38  157.33 5258.38  171.29 5258.11  175.28  5257.9
  181.26 5257.82  185.25 5257.61  189.24 5257.13  191.23  5257.2  199.21  5256.7
   203.2 5256.49  205.19 5256.22  207.18 5256.19  209.18 5256.53  213.17 5256.12
  215.16 5256.07  217.16 5256.36  219.15 5256.86  221.14 5256.97  223.14  5257.6
  229.12    5258   235.1 5258.14  239.09 5258.34  243.08 5258.89  247.07 5259.83
```

```
  253.05 5261.54  257.04 5262.43  261.94 5263.03  265.01 5263.28  272.99 5263.73
  276.98 5263.82  278.97 5264.18  280.97 5265.14  282.96 5265.53  286.95 5264.02
  290.94 5263.96  292.93 5264.02  300.91 5263.94   304.9 5264.02  310.88 5263.96
  318.85    5264  326.83 5264.22   336.8 5264.35  340.79 5264.49  344.78 5264.47
  352.75 5264.58  362.73 5264.47  368.71 5264.52  380.67 5264.83  388.65 5264.86
  394.63 5264.81   404.6 5264.96   406.6 5264.92  412.58  5265.1  424.54 5265.27
  428.53 5265.19  432.52 5265.22  442.49 5265.08  454.45 5265.24  460.44 5265.21
  468.41 5264.99   474.4 5264.92  482.37 5264.92  486.36 5264.82  490.35 5264.85
  498.33 5264.77  504.31 5264.85  510.29 5264.71  514.28 5264.89  520.26 5264.82

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   23.85    .015   59.32     .08  129.26     .07  261.94     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        129.26  261.94           96.15   104.2   104.9              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  491.02  511.955274.843       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0    9.725278.348  511.95  520.265274.765

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 3022

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5268.28    3.97 5268.41    7.95 5268.25   11.92  5267.8   15.89 5266.88
   19.87  5266.1   23.93 5265.19   25.83 5264.64   27.81  5264.3   31.79 5264.44
   39.73 5264.58   43.71 5264.61   51.65 5264.58   57.61 5264.37   64.38 5264.18
   69.53 5263.98    73.5 5263.77   79.46 5263.94   83.44 5263.97    89.4  5263.8
   93.37 5263.85   103.3 5263.75  106.53 5263.27  109.26 5262.57  115.22 5260.67
   119.2 5259.12  121.18 5258.42  123.17 5257.91  127.14 5257.54   133.1 5257.32
  135.09 5257.29  139.06 5257.08  143.04 5256.73  147.01 5256.13  150.98 5255.73
  152.97 5255.63  156.94 5255.72  158.93 5255.96   162.9 5256.27  164.89 5256.62
  170.85 5256.98  174.82 5257.08  180.78 5257.14  184.76 5257.24  190.71 5257.66
  194.69 5257.74  198.66 5257.89  200.65 5258.08  206.61 5258.85  212.57 5260.44
  216.54 5261.43  220.51 5261.99  222.19 5262.09  224.49 5262.21  234.42 5262.98
  236.41 5263.21  238.39  5263.1  240.38 5263.26  246.35  5263.2  260.28 5263.43
  262.27  5263.5  266.25  5263.5  278.18 5263.73  282.16 5263.75  298.08 5264.16
  302.06 5264.15  306.04 5264.28     314 5264.38  319.97 5264.54  321.96 5264.47
  331.91 5264.58  335.88 5264.57  345.83 5264.65   351.8 5264.78  355.78 5264.75
  359.76 5264.86  365.73 5264.89   371.7 5264.98  373.69 5264.96  377.67 5264.79
  381.65 5264.78  389.61 5264.89  393.58 5264.85  401.54 5264.97   409.5 5264.99
  417.46 5265.08  419.45 5265.03  427.41 5265.16  435.37 5265.05  443.33 5265.08
  453.27 5265.01  459.24 5265.04  465.21 5264.92  481.13 5264.72  489.09 5264.78
  495.06 5264.73  501.03 5264.88  505.01 5264.82  508.99 5264.95  510.98 5264.91

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   23.93    .015   64.38     .08  106.53     .07  222.19     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        106.53  222.19          127.98  116.14   81.49              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  494.11  499.635274.743       F
Blocked Obstructions     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
       0   10.115278.279  499.63  510.985274.855

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2906

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5260.33    5.99 5260.33    7.99 5260.42    9.99 5260.07   11.98 5259.41
   13.98    5259   15.98 5258.81   17.97 5258.96   19.97 5259.35   21.97  5259.4
   27.27 5259.24   27.96 5259.22   29.96 5258.27   31.96  5257.6   33.95 5257.43
   37.95 5257.61   39.94 5257.61   43.94 5256.81   45.94 5257.02   49.93 5256.24
   53.92 5256.46   57.92 5255.81   59.92 5255.71   61.91 5255.44   65.91 5254.51
    67.9 5254.62    71.9 5254.31    73.9 5254.38   75.89 5254.67   77.89 5255.13
   83.88 5255.38   87.88 5255.18   89.87 5255.34   97.86 5256.41   99.86 5256.57
  103.85 5256.49  109.85 5256.53  113.84 5256.73  115.84 5256.93  121.83 5257.32
  125.82 5257.29  133.81 5257.45   139.8 5257.69   145.8  5257.8  151.79 5257.99
  155.78 5258.33  157.78 5258.68  161.77  5259.6  167.76 5260.83  171.76  5261.4
  177.52 5262.03  179.75 5262.15  185.74 5262.28  193.73 5262.95  195.72 5262.99
  207.67 5262.97  213.63    5263  217.61 5263.14  225.55 5263.13  229.53 5263.32
  231.52 5263.21  243.44 5263.34  247.41 5263.53  251.39 5263.52  253.38 5263.64
  263.31 5263.74  269.28 5263.67  273.25 5263.77  283.19 5263.77  287.16 5263.91
  293.12 5264.04  299.09 5264.08  303.06 5264.05  307.03 5264.25  314.98 5264.24
  318.96 5264.04  322.93 5264.03  324.92 5264.13  328.89 5264.15  330.88 5264.01
  338.83 5264.11  348.77 5264.33  350.76 5264.31   358.7 5264.75  362.68  5264.8
  366.65 5264.73  376.59 5264.72  380.56 5264.64  384.54 5264.65  388.51  5264.5
  402.43 5264.72  408.39  5264.7  414.35 5264.77  418.32 5264.75  432.24 5264.85
   438.2 5264.84  450.12 5264.71  452.11 5264.64  460.06 5264.58  466.02  5264.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   27.27     .07  177.52     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         27.27  177.52          112.52  111.84   99.56              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  465.27  466.025274.417       F

CROSS SECTION
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RIVER: Skunk
REACH: 01                  RS: 2794

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5262.78    9.97 5262.53   15.94 5262.45   19.93 5262.25   25.91 5262.21
   31.89 5262.07   37.87 5261.72   41.86 5261.73   45.84 5262.02   61.79 5261.83
   65.77 5261.83   75.74 5261.62   79.73 5261.71    87.7 5261.29   99.66 5260.58
  103.64 5260.22  105.64 5260.16  109.62 5259.78   115.6 5259.82  117.59 5259.74
  123.57 5260.11  127.56 5260.11  133.54 5260.35  141.51 5260.21  145.07 5259.85
  149.48 5259.44  153.47 5258.47  157.46 5257.74  161.44 5257.64  165.43 5257.29
  167.42 5257.26   173.4 5256.94  177.39 5256.53  183.37 5256.19  187.35 5255.88
  195.33 5255.64  201.31 5254.86   203.3 5254.95  209.28  5254.4  213.26 5254.23
  219.24  5254.7  223.23 5255.93  225.22  5256.3   231.2 5256.23  235.19 5256.09
  245.15 5256.18  247.15 5256.31  255.12 5256.42  259.11 5256.62  263.09 5257.06
  271.06 5258.74  275.05 5259.79  281.03 5261.16  283.92 5261.51     289 5261.54
  292.99 5261.72  298.97  5262.3  302.95 5262.47  304.94 5262.45  308.92 5262.75
  316.87 5262.99  318.86 5262.83  322.84 5262.85   328.8    5263  336.76 5263.39
  340.73 5263.49  344.71 5263.45  350.68  5263.6  362.61 5263.73  366.59 5263.82
   382.5 5263.71  384.48 5263.82  390.45 5263.77  396.42 5263.61  404.37  5263.9
  408.35  5263.8  410.34 5263.87  420.28 5263.81  422.27 5263.94  432.21 5263.86
  436.19 5263.78  442.16 5264.22  458.06 5264.27  475.96 5264.38  477.95 5264.28
  485.91 5264.32  489.88 5264.16  493.86 5264.39  499.83 5264.35   503.8 5264.42
  507.78 5264.31  515.74 5264.52  519.71 5264.45  533.63 5264.71  541.59 5264.76
  547.55 5264.64  561.47 5264.79  571.42 5264.61  579.37 5264.53  581.36 5264.44

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08  145.07     .07  283.92     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        145.07  283.92            56.06   53.29   50.59              .1       .3
Ineffective Flow     num=        1
   Sta L   Sta R    Elev  Permanent
  581.24  581.365274.445       F

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 2740

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5263.4    5.99 5263.29    7.99 5263.33   11.99 5263.05   13.99 5263.04
   17.98 5262.89   21.98 5262.53   27.97 5261.64   31.97 5261.55   37.96 5261.93
   41.96 5261.95   45.95 5262.07   51.95 5261.91   53.94  5261.8   55.94 5261.99
   57.94 5262.01   63.93 5261.78   67.93 5261.51   73.92 5261.35   77.92 5261.38
   83.91 5261.19    91.9 5260.87    95.9 5260.86    99.9 5260.95  105.89 5261.16
  111.88 5261.06  115.88 5260.75  119.88 5260.69  123.87 5260.48  127.87 5260.79
  135.86 5260.67  142.02 5260.23  142.15 5260.22  143.85 5260.09  145.85 5259.62
  147.85 5258.93  149.84 5258.54  151.84 5258.32  153.84 5257.92  157.84 5256.89
  159.83 5256.46  161.83  5256.3  167.83 5255.97  173.82 5255.44  175.82 5255.34
  177.81  5255.1  179.81 5254.58  181.81 5254.23  183.81  5254.4  215.78 5254.17
  223.77 5254.17  225.76 5254.44  229.76 5255.32  231.76  5255.5  233.76 5255.53
  235.75 5255.74  239.75  5255.8  247.74 5256.07  251.74 5256.48  255.73 5257.27
  257.73 5257.73  261.73 5258.91  265.72 5259.92  269.72 5260.76  271.72 5260.97
   276.5 5261.18  279.71 5261.35   283.7 5261.35   287.7 5261.58  295.69 5262.18
  299.69 5262.52  305.68 5262.84  311.67 5262.94  313.67 5263.02  317.67 5263.33
  321.66 5263.49  325.66 5263.46  329.66 5263.54  333.65 5263.55  339.65 5263.71
  343.64 5263.69  351.63 5263.87  355.63 5263.86  357.63 5263.94  361.62 5263.83
  369.61    5264  371.61  5263.8  375.61 5263.73   379.6 5263.87   381.6 5263.83
   385.6    5264  389.59 5263.93  395.59 5263.98  399.58 5263.93  405.58 5263.79
  411.57 5263.81  421.56 5263.75  427.55 5263.79  433.55 5263.96  435.55 5263.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08  142.15     .07   276.5     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         142.02   276.5            55.37   52.94   50.45              .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 2688

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5263.26    1.99  5263.3    9.97 5263.34   15.95 5263.47   21.93 5263.45
   23.93 5263.53   27.91 5263.56   29.91 5263.43    31.9 5263.41    33.9 5263.28
   39.88  5263.2   43.87 5263.31   45.86 5263.26   49.85 5263.02   55.83 5262.98
   57.82 5262.89   61.81 5262.93   67.79 5262.61   71.78 5262.35   75.77 5262.04
   79.76 5261.87   85.74 5261.34   87.73 5261.28   91.72 5260.95   93.71 5260.91
    97.7 5260.66    99.7 5260.64  103.68 5260.72  107.67 5260.65  111.66 5260.67
  113.65 5260.56  117.26 5260.19  119.63 5259.92  123.62  5259.2  127.61  5258.4
   129.6 5257.91   131.6 5257.29  133.59 5256.76  137.58 5255.93  139.57 5255.71
  141.57 5255.63  143.56 5255.31  145.56 5254.63  147.55  5254.3  175.46  5254.3
  183.44 5254.29  189.42 5254.31  213.35 5254.34  217.34 5254.38  219.33 5254.71
  221.32 5255.43  223.32 5255.99  225.31 5256.36   229.3 5256.97  233.29 5257.96
  237.28  5259.1  239.27 5259.55  241.26 5259.78  243.26 5259.93   245.8 5260.32
  246.93 5260.46  249.24 5260.65  253.23 5260.82  255.22 5260.84  257.21  5261.1
   261.2 5261.44  265.19 5261.55  267.18 5261.66  269.18 5261.64  271.17 5261.85
  273.17 5261.76  275.16 5261.84  277.15 5262.03  279.15  5262.3  281.14 5262.12
  285.13 5262.33  291.11 5262.69   295.1 5262.73  299.09 5262.95  303.07 5263.27
  305.07  5263.3  309.06 5263.46  315.04 5263.61  323.01 5263.62  325.01 5263.72
     327 5263.67  330.99  5263.7  338.96 5263.67  340.96 5263.72  344.95 5263.73
  350.93 5263.82  356.91 5263.84  362.89 5263.89  368.87 5263.84  372.86  5263.9
  374.85 5263.88  378.84 5263.95  382.83 5263.93  384.82 5263.97  390.81 5264.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08  117.26     .07  246.93     .08
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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        117.26   245.8             52.6   49.09   46.12             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2638

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5263.02    1.99  5263.1    3.99 5263.01    9.97 5262.94   11.97 5262.84
   15.95 5262.71   17.95 5262.55   21.94 5262.17   23.93 5261.94   25.93  5261.6
   27.92 5261.18   29.92 5260.96   31.91 5260.88    33.9 5260.96    35.9  5260.9
   37.89 5260.99   39.89 5261.22   41.88 5261.19   43.88 5261.32   45.87 5261.25
   47.86 5261.06   51.85 5260.94   53.85 5260.84   57.84 5260.51   59.83  5260.4
   65.81 5260.23   67.81 5260.13    69.8 5259.96    71.8 5259.66   73.79 5259.43
    75.9 5259.38   77.78 5259.14   79.77  5258.6   81.77 5257.87   83.76 5257.29
   85.76 5256.31   87.75 5255.25   89.75 5254.67   91.74 5254.43   93.73 5254.35
  103.71 5254.37  129.63 5254.39  135.62 5254.43   141.6 5254.35  147.58 5254.38
  149.58  5254.6  151.57 5255.14  155.56 5255.82  157.55 5255.95  161.54 5256.96
  163.54 5257.59  167.53 5258.34  169.52  5258.9  171.51 5259.32  173.51 5259.61
  175.32 5259.78  179.49 5260.07  181.49 5260.17  183.48 5260.34  185.48 5260.59
  191.46 5260.79  195.45 5260.88  199.44 5261.17  205.42  5261.4   211.4 5261.57
  217.38 5261.64  221.37 5261.95  225.36 5262.13  227.36 5262.27  231.35 5262.43
  237.33 5262.84  239.32 5262.88  241.32 5262.83  245.31 5262.98  249.29 5263.03
  253.28  5263.2  255.28 5263.12  257.27 5263.15  261.26 5263.35  265.25 5263.91
  267.24 5263.87  271.23 5263.48  273.23 5263.39   281.2 5263.41   283.2 5263.37
  289.18 5263.34  291.18 5263.41  295.16 5263.38  303.14 5263.47  307.13 5263.57
  311.12 5263.51  313.11 5263.57   317.1 5263.57   319.1 5263.63  323.09 5263.57
  329.07 5263.66  331.06 5263.56  335.05 5263.61  337.05 5263.56  339.04 5263.64

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    75.9     .07  175.32     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          75.9  175.32            48.12   47.06   46.73             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2591

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5265.25    3.98 5265.15    9.96 5264.87   15.93 5264.46   17.92 5264.28
   19.91 5264.21   23.89 5263.91   29.87 5263.54   33.85  5263.2   37.83 5263.04
   39.82 5262.91   41.82 5262.88    45.8 5262.89   47.79 5262.81   51.77 5262.49
   53.76 5262.39   57.75 5262.37   61.73 5262.41   63.72 5262.28    67.7 5262.38
   69.69 5262.21   71.68 5262.16   73.68 5261.98   77.66 5261.47   81.64 5260.83
   83.63 5260.58   88.73 5259.83    91.6 5259.46   93.59 5259.37   95.58 5259.01
   97.57 5258.59   99.56 5258.07  101.55 5257.69  103.54 5257.49  105.54 5257.35
  111.51  5257.1  117.48  5256.6  119.47 5256.29  123.46 5255.27  125.45 5254.65
  127.44 5254.19  131.42 5254.27  133.41 5254.34   135.4  5254.5  137.39 5254.58
  141.38 5254.23  143.37 5254.16  145.36 5254.27  147.35 5254.44  149.34 5254.52
  151.33  5254.4  153.32 5254.51  155.32  5254.9  157.31 5255.19   159.3 5255.42
  161.29 5255.53  163.28 5255.56  165.27 5255.71  167.26  5256.2  169.25 5256.58
  173.24 5256.93  177.22 5257.44   181.2 5257.81  183.19 5258.09  185.18 5258.21
  189.17 5258.37  195.14 5258.82   203.1  5259.5   205.1 5259.64  206.81 5259.88
  213.06 5260.51  217.04 5260.74  219.03 5260.99  221.03 5261.18     227 5261.52
  230.98 5261.72  234.96 5261.82  240.94 5262.04  244.92 5262.19  250.89 5262.23
  254.88  5262.3  256.87 5262.28  258.86 5262.37  260.85 5262.41  262.84 5262.39
  264.83 5262.47  268.82 5262.45  274.79 5262.52  278.77 5262.66  280.76 5262.66
  282.75 5262.75  284.74 5262.71  288.73 5262.91  290.72 5263.12  292.71 5263.61
   294.7 5264.16  296.69 5263.84  298.68 5263.34  300.67 5263.21  304.66 5263.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   88.73     .07  206.81     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         88.73  206.81            31.17   31.31   31.85             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2560

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5265.86    1.99 5265.85    3.97 5265.81    5.96 5265.81    9.94 5265.63
   11.92 5265.61   13.91 5265.56    15.9 5265.55   17.88 5265.51   21.86 5265.34
   23.85  5265.3   25.83  5265.3   27.82 5265.27   29.81 5265.21   33.78 5264.98
   35.77 5264.96   37.76 5264.91   39.74  5264.7   41.73 5264.58   43.72 5264.59
    45.7 5264.49   49.68 5263.98   51.66 5263.79   53.65 5263.56   55.64 5263.29
   57.63 5263.11   59.61  5262.9    61.6 5262.71   63.59 5262.39   65.57 5262.29
   66.19 5262.23   67.56  5262.1   69.55 5261.75   71.54 5260.54   73.52 5258.97
   75.51 5257.27    77.5 5256.44   79.48 5255.93   81.47 5255.38   83.46 5254.94
   85.45  5254.8   93.39 5254.71   95.38 5254.71   97.37 5254.66   99.36 5254.46
  101.34 5254.14  103.33 5254.01  105.32 5254.05   107.3 5254.16  109.29 5254.01
  111.28 5253.63  113.27 5253.72  115.25 5253.89  117.24  5253.8  119.23 5253.81
  121.21 5254.05   123.2 5254.41  125.19 5254.59  127.17  5254.7  129.16 5254.75
  131.15 5254.86  133.14 5255.09  135.12 5255.35  137.11 5255.51   139.1 5255.74
  141.08 5256.03  143.07 5256.48  145.06 5257.52  147.05 5258.74  149.03 5259.32
  151.02  5259.2  153.01  5259.5  157.74  5260.3  158.97 5260.52  160.96  5260.8
  162.94 5261.02  166.92 5261.33   168.9 5261.51  170.89 5261.76  172.88 5262.06
  176.85 5262.39  178.84 5262.61  180.83 5262.85  182.81 5262.94   184.8 5262.68
  186.79 5262.48  188.78 5262.48  190.76 5262.43  192.75 5262.46  194.74 5262.54
  196.72 5262.57   200.7 5262.58  204.67 5262.63  206.66 5262.67  208.65 5262.67
  212.62 5262.73  216.59 5262.71  218.58 5262.76  222.56 5262.72  224.54 5262.73

Manning's n Values        num=       3
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```
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   66.19     .07  157.74     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         66.19  157.74             19.63   19.19   18.84             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 2541

INPUT
Description: Discovery Dr. U/S
Station Elevation Data    num=      78
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5265.19    1.99  5265.2    3.97 5265.21    5.96 5265.21    7.95 5265.21
    9.93  5265.2   11.92 5265.23   13.91 5265.21   15.89 5265.21   17.88 5265.21
   19.86  5265.2   21.85 5265.33   23.84 5265.41   25.82 5265.43   27.81 5265.55
    29.8 5265.79   31.78 5266.15   33.77 5266.41   35.76 5266.23   36.55 5266.17
   37.74 5266.06   39.73 5265.84   41.72  5265.8    43.7 5265.69   45.69 5265.58
   47.68 5265.46   49.66 5265.48   51.65 5265.48   53.64 5265.54   55.62 5265.59
   57.61 5265.72   59.59 5265.78   61.58 5265.74   63.57 5265.69   65.55 5265.71
   67.54 5265.74   69.53 5265.65   71.51 5265.56    73.5 5265.53   75.49 5265.41
   77.47 5265.37   79.46 5265.42   81.45 5265.36   83.43 5265.36   85.42 5265.43
   86.34 5265.24   87.41 5265.01   89.39 5262.67   91.38 5259.32    94.1  5253.2
     106  5253.1  107.58  5252.6     111  5251.8     117  5251.1     128  5251.9
   140.2  5252.9  141.04 5256.92  143.03 5261.81  145.01 5263.65  146.46  5264.2
  146.56 5264.24     147  5264.4  148.99 5264.32  150.97 5264.08  152.96  5264.1
  154.95  5264.1  156.93 5264.06  158.92 5264.18  160.91 5264.22  162.89  5264.4
  164.88 5264.46  166.87 5264.79  168.85 5264.94  170.84 5264.95  172.83 5265.06
  174.81 5265.07   176.8    5265  178.78 5264.96

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   36.55     .08   86.34     .07  107.58    .078  146.56    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         86.34  146.46             96.5   96.14   97.34             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      93  5266.6       T
     141  178.78  5266.5       T

BRIDGE


RIVER: Skunk
REACH: 01                  RS: 2490

INPUT
Description: Discovery Drive
Distance from Upstream XS =       1
Deck/Roadway Width        =      95
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=      20
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    5267               57  5266.3              70  5266.6
    71.3  5266.6             71.4 5269.25            81.8 5269.24
   81.81  5273.3            85.29  5273.3            85.3 5269.27
    94.1  5269.2 5261.86   117.2 5268.85 5261.52   140.2  5268.6 5261.22
   147.3  5268.5           147.31  5272.5           150.69  5272.5
   150.7  5268.5            161.2  5268.3           161.3  5265.5
     162  5265.5              178    5265

Upstream Bridge Cross Section Data
Station Elevation Data    num=      78
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5265.19    1.99  5265.2    3.97 5265.21    5.96 5265.21    7.95 5265.21
    9.93  5265.2   11.92 5265.23   13.91 5265.21   15.89 5265.21   17.88 5265.21
   19.86  5265.2   21.85 5265.33   23.84 5265.41   25.82 5265.43   27.81 5265.55
    29.8 5265.79   31.78 5266.15   33.77 5266.41   35.76 5266.23   36.55 5266.17
   37.74 5266.06   39.73 5265.84   41.72  5265.8    43.7 5265.69   45.69 5265.58
   47.68 5265.46   49.66 5265.48   51.65 5265.48   53.64 5265.54   55.62 5265.59
   57.61 5265.72   59.59 5265.78   61.58 5265.74   63.57 5265.69   65.55 5265.71
   67.54 5265.74   69.53 5265.65   71.51 5265.56    73.5 5265.53   75.49 5265.41
   77.47 5265.37   79.46 5265.42   81.45 5265.36   83.43 5265.36   85.42 5265.43
   86.34 5265.24   87.41 5265.01   89.39 5262.67   91.38 5259.32    94.1  5253.2
     106  5253.1  107.58  5252.6     111  5251.8     117  5251.1     128  5251.9
   140.2  5252.9  141.04 5256.92  143.03 5261.81  145.01 5263.65  146.46  5264.2
  146.56 5264.24     147  5264.4  148.99 5264.32  150.97 5264.08  152.96  5264.1
  154.95  5264.1  156.93 5264.06  158.92 5264.18  160.91 5264.22  162.89  5264.4
  164.88 5264.46  166.87 5264.79  168.85 5264.94  170.84 5264.95  172.83 5265.06
  174.81 5265.07   176.8    5265  178.78 5264.96

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   36.55     .08   86.34     .07  107.58    .078  146.56    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
         86.34  146.46             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      93  5266.6       T
     141  178.78  5266.5       T

Downstream  Deck/Roadway Coordinates
    num=      18
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0    5265               44  5264.6           61.09  5264.4
    61.1  5268.7             71.4 5268.74           71.41 5272.74
   75.09 5272.74             75.1 5268.77            83.5 5268.67 5261.23
   106.5 5268.41 5261.04   129.3 5268.29 5260.91   135.7  5268.2
  135.71  5272.2           139.39  5272.2           139.4  5268.2
   149.5 5267.97           149.51  5264.3             182    5264

Downstream Bridge Cross Section Data
Station Elevation Data    num=      87
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5265.64    1.98 5265.84    3.97 5266.08    5.95 5265.86    7.93  5265.7
```

```
    9.92 5265.62    11.9 5265.67   13.88 5265.61   15.87 5265.48   17.85 5265.44
   21.82 5265.56    23.8 5265.56   25.78 5265.49   27.77 5265.36   29.75  5265.2
   31.73    5265   33.72 5264.83    35.7 5264.75   37.68 5264.71   39.67 5264.69
   41.65 5264.65   43.63 5264.67   45.62 5264.63   49.58 5264.81   51.57 5264.84
   53.55 5265.01   55.53 5264.92   57.52 5264.75    59.5  5264.5   60.49 5264.43
   61.48 5264.36   65.45 5264.18   69.42 5264.05    71.4 5264.05   73.38 5264.12
   75.37 5263.94   77.35  5263.5   78.39 5262.76   78.51 5262.67   79.33 5262.08
   81.32  5257.6    83.5  5252.9    95.8  5252.9   102.4  5252.1  109.46  5250.7
   119.8    5252   129.3  5252.4   130.9 5255.52  132.88 5259.51  134.87 5262.28
  136.85 5263.66  138.26 5263.86  138.83 5263.95   142.8 5263.95  144.78  5263.7
  146.77 5263.79  148.75 5263.81  150.73 5263.79  152.72 5264.09   154.7 5264.24
  158.67 5264.19  160.65 5264.14  162.63 5264.12   166.6 5264.15  168.58 5264.13
  172.55 5264.12  174.53 5264.15   178.5  5264.1  182.47 5264.03  184.45 5264.01
  186.43 5264.03  188.42    5264  192.38 5263.89  194.37 5263.86  196.35 5263.85
  198.33 5263.78   202.3  5263.7  204.28 5263.69  208.25 5263.59  210.23 5263.57
  216.18 5263.32  218.17 5263.29  220.15 5263.16  224.12 5262.61   226.1 5262.58
  228.08 5262.59  230.07 5262.57

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   60.49    .015   78.51    .078  109.46     .07  138.26     .08

Bank Sta: Left   Right    Coeff Contr.   Expan.
         78.39  138.26             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      81  5264.4       F
   131.8  230.07  5264.4       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2445

INPUT
Description: Discovery Dr. D/S
Station Elevation Data    num=      87
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5265.64    1.98 5265.84    3.97 5266.08    5.95 5265.86    7.93  5265.7
    9.92 5265.62    11.9 5265.67   13.88 5265.61   15.87 5265.48   17.85 5265.44
   21.82 5265.56    23.8 5265.56   25.78 5265.49   27.77 5265.36   29.75  5265.2
   31.73    5265   33.72 5264.83    35.7 5264.75   37.68 5264.71   39.67 5264.69
   41.65 5264.65   43.63 5264.67   45.62 5264.63   49.58 5264.81   51.57 5264.84
   53.55 5265.01   55.53 5264.92   57.52 5264.75    59.5  5264.5   60.49 5264.43
   61.48 5264.36   65.45 5264.18   69.42 5264.05    71.4 5264.05   73.38 5264.12
   75.37 5263.94   77.35  5263.5   78.39 5262.76   78.51 5262.67   79.33 5262.08
   81.32  5257.6    83.5  5252.9    95.8  5252.9   102.4  5252.1  109.46  5250.7
   119.8    5252   129.3  5252.4   130.9 5255.52  132.88 5259.51  134.87 5262.28
  136.85 5263.66  138.26 5263.86  138.83 5263.95   142.8 5263.95  144.78  5263.7
  146.77 5263.79  148.75 5263.81  150.73 5263.79  152.72 5264.09   154.7 5264.24
  158.67 5264.19  160.65 5264.14  162.63 5264.12   166.6 5264.15  168.58 5264.13
  172.55 5264.12  174.53 5264.15   178.5  5264.1  182.47 5264.03  184.45 5264.01
  186.43 5264.03  188.42    5264  192.38 5263.89  194.37 5263.86  196.35 5263.85
  198.33 5263.78   202.3  5263.7  204.28 5263.69  208.25 5263.59  210.23 5263.57
  216.18 5263.32  218.17 5263.29  220.15 5263.16  224.12 5262.61   226.1 5262.58
  228.08 5262.59  230.07 5262.57

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   60.49    .015   78.51    .078  109.46     .07  138.26     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         78.39  138.26             62.7   57.24   50.91             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0      81  5264.4       F
   131.8  230.07  5264.4       F

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2388

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5262.27    1.99 5262.22    3.98 5262.14    5.98    5262    7.97  5261.8
    9.96 5261.73   13.94 5261.69   15.94 5261.71   17.93 5261.61   19.92 5261.49
   21.91 5261.36    23.9 5261.22    25.9 5261.15   27.89 5261.19   29.88 5261.13
   31.87 5261.08   33.87 5261.01   35.86  5260.9   37.85 5260.62   41.83  5259.8
   43.83  5259.4   47.81 5258.56    49.8 5258.11   51.79  5257.8   53.79  5257.6
   55.78 5257.42   57.77 5257.22   59.76 5256.95   61.75 5256.89   63.75 5256.75
   65.74 5256.66   67.73 5256.59   69.72 5256.53   71.71 5256.46   72.61 5256.29
   73.36 5256.15    75.7 5255.76   77.69 5255.52   79.68 5255.14   81.68 5254.56
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   83.67 5253.95   85.66 5253.32   87.65 5252.86   89.64 5252.74   91.64  5252.8
   93.63 5252.81   95.62 5252.79    99.6 5252.73   101.6 5252.71  103.59 5252.68
  105.58 5252.71  107.57 5252.69  109.56 5252.64  117.53 5252.64  119.52 5252.66
  121.52 5252.65  123.51 5252.66  127.49 5252.66  129.49 5252.68  131.48 5252.81
  133.47 5253.29  135.46 5253.76  137.45 5254.01  139.45  5254.3  141.44 5254.56
  143.43 5254.91  145.42 5255.05  147.41 5255.34  149.41  5255.6   151.4 5255.89
  153.39 5256.23  155.38 5256.63  157.37 5256.96  159.37 5257.41  161.36 5257.98
  163.35 5258.62  165.34 5259.28  167.33 5259.77  169.33 5260.27  171.32 5260.59
  173.31 5260.86  174.61 5260.97   177.3 5261.19  179.29 5261.29  181.28 5261.37
  183.27 5261.43  185.26  5261.6  187.26 5261.73  189.25 5261.99  191.24 5262.18
  193.23 5262.22  195.22 5262.18  197.22 5262.08  199.21 5262.09   201.2 5262.06
  203.19 5262.11  205.18 5262.12  207.18 5262.12  209.17 5262.15  211.16 5262.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   72.61     .07  174.61     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         73.36  165.34            44.52   45.72   48.41             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2342

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5261.27       2 5261.26       4  5261.2       6 5261.07       8  5260.9
    9.99 5260.76   11.99 5260.66   13.99 5260.66   15.99 5260.59   17.99  5260.5
   19.99 5260.36   23.99 5259.99   25.99 5259.62   27.99 5259.44   29.98 5259.11
   31.98 5258.84   33.98 5258.74   37.98 5258.59   41.98 5258.41   43.98 5258.31
   45.98 5258.16   47.98 5257.97   49.97 5257.75   51.97  5257.6   53.97 5257.51
   55.97 5257.48   57.97 5257.43   61.97 5257.35   63.97 5257.28   65.97 5257.18
   67.88  5257.1   69.11 5256.97   69.96 5256.88   71.96 5256.57   73.96 5255.99
   75.96 5255.59   79.96 5254.42   81.96 5253.92   83.96 5253.45   85.96 5253.08
   87.95 5253.09   89.95  5253.3   91.95 5253.12   93.95 5252.77   95.95 5252.64
   97.95 5252.63   99.95 5252.74  101.95 5252.83  103.95 5252.75  105.95 5252.96
  107.94 5253.12  109.94 5253.04  111.94 5252.88  113.94 5252.87  115.94 5252.97
  117.94 5252.87  119.94 5252.93  121.94 5253.06  123.94 5252.95  125.94  5252.9
  127.93 5252.93  131.93 5252.81  133.93 5252.67  135.93 5252.71  137.93    5253
  139.93 5253.34  141.93 5253.49  143.93  5253.5  147.92 5253.57  149.92 5253.57
  153.92 5253.74  155.92  5253.9  157.92    5254  159.92 5254.06  161.92 5254.19
  163.92 5254.37  167.91  5255.1  169.91 5255.59  171.91 5256.14  173.91 5256.86
  175.91 5257.38  177.91 5258.04  179.91  5258.8  181.91 5259.32  183.33 5259.52
     184  5259.6   185.9 5259.74   187.9 5259.85   189.9  5259.9   191.9 5260.01
   193.9 5260.09   195.9 5260.37   197.9 5261.08   199.9    5262   201.9 5262.88
   203.9 5263.58  205.89 5263.78  207.89 5264.08  209.89  5264.8  211.89 5264.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   67.88     .07  183.33     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         69.11     184            59.19   61.72   60.15             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2280

INPUT
Description:
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5259.69    1.99 5259.64    3.97 5259.52    5.96 5259.31    7.95 5259.16
    9.93 5259.02   11.92 5258.75   13.91 5258.61    15.9 5258.49   17.88 5258.33
   19.87 5258.13   21.86 5257.97   23.84 5257.93   25.83 5257.81   27.82 5257.61
    29.8 5257.48   31.79 5257.43   33.78 5257.35   35.77 5257.25   37.75 5257.32
   39.74 5257.33   41.73 5257.31   43.71 5257.29    45.7 5257.29   47.69 5257.35
    48.6 5257.31   49.67 5257.26   50.69 5257.12   51.66 5256.98   53.65 5256.52
   55.63 5255.97   57.62 5255.47   59.61 5254.91    61.6 5254.49   63.58  5253.9
   65.57 5253.44   67.56 5253.03   69.54 5252.65   71.53 5252.42   73.52 5252.37
    75.5 5252.47   77.49 5252.44   79.48 5252.81   81.47 5253.02   83.45 5253.14
   85.44 5253.19   87.43 5253.14   89.41 5253.23    91.4 5253.19   93.39 5253.05
   95.37 5252.84   97.36 5252.47   99.35 5252.24  101.34 5252.07  103.32 5252.14
  105.31 5252.11   107.3  5252.1  109.28 5252.14  111.27 5252.21  113.26  5252.3
  115.24 5252.12  117.23 5252.64  119.22 5253.05   121.2 5253.17  123.19 5253.18
  125.18 5253.19  127.17  5253.3  129.15 5253.28  131.14 5253.25  133.13 5253.24
  135.11 5253.29   137.1 5253.39  139.09 5253.51  141.07 5253.55  143.06 5253.56
  145.05 5253.68  147.04  5253.8  149.02 5254.02  151.01 5254.29     153  5254.7
  154.98 5255.17  156.97 5255.68  158.96 5256.21  160.94  5256.8  162.93 5257.27
  163.88 5257.45  164.62 5257.59  164.92 5257.64  166.91 5257.89  168.89 5257.96
  170.88    5258  172.87 5258.29  174.85 5258.97  176.84 5259.74  178.83 5260.55
  180.81 5261.29   182.8 5261.44  184.79 5261.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    48.6     .07  163.88     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         50.69  164.62            94.12   96.33   97.06             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2184

INPUT
Description:
Station Elevation Data    num=      95
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5258.39    1.99 5258.39    3.99 5258.37    5.98  5258.3    7.98 5258.26
    9.97 5258.15   11.97 5258.01   13.96 5257.92   15.96 5257.81   17.95 5257.69
   19.95 5257.55   21.94 5257.38   23.93 5257.26   25.93 5257.13   27.92 5257.15
   29.92 5257.12   31.91 5257.08   33.91 5257.02    35.9 5256.95    37.9 5256.82
   39.89 5256.86   41.88 5256.88    43.4 5256.54   43.88 5256.44   45.87 5255.88
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   47.87 5255.28   49.86 5254.58   51.86 5254.05   53.85 5253.55   55.85 5253.06
   57.84 5252.68   59.83 5252.42   61.83 5252.19   63.82 5252.15   65.82 5252.22
   67.81 5252.55   69.81 5252.98    71.8 5253.08    73.8 5253.14   75.79 5253.09
   77.79 5253.04   79.78 5253.04   81.77 5253.07   83.77 5253.01   85.76 5253.03
   87.76 5253.11   89.75 5253.02   91.75 5253.01   93.74 5252.96   95.74  5252.9
   97.73 5252.81   99.73 5252.59  101.72 5252.18  103.71  5251.8  105.71 5251.62
   107.7 5251.62   109.7 5251.65  111.69 5251.68  113.69 5251.62  115.68 5251.63
  117.68 5251.98  119.67 5252.49  121.66 5252.76  123.66 5252.92  125.65 5253.08
  127.65 5253.21  129.64 5253.21  131.64 5253.16  133.63 5253.23  135.63 5253.19
  137.62 5253.17  139.61 5253.16  141.61  5253.3   143.6 5253.56   145.6 5253.92
  147.59  5254.4  149.59 5254.82  151.58 5255.42  153.58 5256.04  155.57 5256.57
  157.57 5256.89  159.56 5257.21  159.73 5257.23  161.55 5257.42  163.55 5257.77
  165.54 5257.79  167.54 5257.75  169.53 5257.71  171.53 5257.76  173.52 5257.97
  175.52 5258.22  177.51 5258.38   179.5 5258.53   181.5  5258.7  183.49 5259.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    43.4     .07  159.73     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          43.4  159.73             88.25   99.95  107.76             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2084

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5258.09    3.98 5258.04    5.97 5257.97    9.94 5257.55   11.93 5257.38
   13.92 5257.23   15.91  5257.1   19.89 5256.76   21.88 5256.61   23.87  5256.5
   25.85 5256.52   27.84 5256.52   29.83  5256.5   33.81 5256.49    35.8 5256.44
   37.79 5256.44   39.78  5256.4   40.73 5256.19   41.77 5255.96   43.75 5255.32
   45.74 5254.75   47.73 5254.21   49.72 5253.64    53.7 5252.78   55.69 5252.29
   57.68  5252.1   59.66 5252.14   61.65 5252.25   65.63 5253.02   67.62 5253.07
   69.61 5253.18    71.6 5253.23   73.59 5253.23   75.58 5253.07   77.56 5252.88
   79.55 5252.78   81.54  5252.7   85.52 5252.61   87.51  5252.6    89.5 5252.61
   91.49 5252.56   93.47 5252.56   95.46 5252.54   97.45 5252.32   99.44 5252.12
  101.43 5251.57  103.42 5250.94  105.41 5250.83   107.4 5251.03  109.39 5251.03
  111.37 5250.91  113.36 5251.26  115.35 5251.95  117.34 5252.07  121.32 5252.21
  123.31 5252.18   125.3 5252.27  127.28 5252.24  129.27 5252.28  131.26 5252.29
  133.25  5252.4  135.24 5252.53  137.23 5252.58  141.21 5252.81   143.2 5252.83
  145.18 5252.89  147.17 5252.98  149.16 5253.09  153.14 5253.26  155.13 5253.41
  157.12 5253.58  159.11 5253.78   161.1  5254.2  163.08 5254.58  165.07 5255.11
  167.06 5255.77  169.05 5256.21  171.04 5256.53  173.03  5256.7  177.01 5257.09
  180.98 5256.99  182.97 5256.91  184.96 5256.93  186.95 5257.02  190.93 5257.07
  192.92 5257.18  194.91 5257.49  196.89 5257.77  198.88 5258.12  200.87 5258.75
  202.86 5259.35  204.85    5260  206.84 5261.03  208.83 5261.69  210.82 5263.16
   212.8 5264.04  213.58  5264.2  214.79 5264.43  216.78 5264.49  220.76 5264.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   40.73     .07  213.58     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         40.73  171.04             46.3   49.95   52.84             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 2034

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5257.31    1.99 5257.27    3.98 5257.17    5.96 5257.13    7.95    5257
   13.92 5256.53   15.91 5256.35   17.89  5256.2   21.87 5255.96   23.86 5255.77
   25.85 5255.69   27.84 5255.75    33.8 5255.73   37.78 5255.62   39.77 5255.49
   41.19 5255.42   41.75  5255.4   43.74 5255.14   45.73 5254.59   47.72 5253.94
   49.71 5253.25    51.7  5252.6   53.68 5252.17   55.67 5252.01   57.66 5252.23
   59.65 5252.69   61.64 5253.02   63.63 5253.26   65.61 5253.52   69.59 5253.87
   71.58 5253.85   75.56 5253.28   77.54 5252.91   81.52  5252.5   83.51 5252.33
    85.5 5252.25   87.49 5252.24   89.47  5252.2   91.46 5252.11   95.44 5252.12
   97.43 5251.92   99.42 5251.75   101.4 5251.55  103.39 5251.08  105.38 5250.82
  107.37 5250.94  109.36 5250.84  111.35 5250.67  113.33 5250.58  115.32 5250.66
  117.31 5250.77   119.3 5251.16  121.29 5251.84  123.28 5252.13  125.26 5252.25
  127.25 5252.27  129.24 5252.23  133.22 5252.09  137.19 5252.08  139.18 5252.09
  141.17 5252.05  143.16 5252.11  147.14  5252.2  149.12  5252.3   153.1 5252.35
  155.09 5252.45  157.08 5252.44  159.07 5252.51  161.05 5252.76  163.04 5253.08
  165.03 5253.53  167.02 5254.04     171 5255.16  172.98 5255.61  174.97 5255.85
  176.96 5256.03  178.95 5256.23  180.94 5256.32  182.93 5256.35   186.9 5256.29
  188.89 5256.51  190.88 5256.67  192.87  5256.9  194.86  5257.1  196.84 5257.35
  198.83 5257.76  200.82 5258.31  202.81 5259.19   204.8 5259.91  206.79 5260.84
  208.77 5261.94  210.76 5262.84  212.75 5263.61  214.74 5264.28  216.12 5264.99
  216.73 5265.31  217.65 5265.66  218.72 5266.07   220.7 5266.24  222.69 5266.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   41.19     .07  217.65     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         71.58  174.97               46   52.01   55.84             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1982

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5256.67    3.99 5256.57    7.98 5256.42   11.98 5256.19   15.97 5255.85
   17.96 5255.62   21.96 5255.28   25.95 5254.92   27.94 5254.72   29.94 5254.62
   31.94 5254.59   37.92 5254.43   39.48 5254.42   41.92 5254.46   43.91 5254.04
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   45.91 5253.45   47.91 5252.76    49.9 5252.24    51.9 5252.12   53.89 5252.14
   57.89 5253.55   59.88    5254   63.87 5254.67   65.87 5254.88   67.87 5255.02
   69.86 5255.25   71.86 5255.12   73.85 5254.96   75.85  5254.6   77.85 5254.15
   79.84 5253.43   81.84 5252.78   83.83 5252.06   85.83 5251.85   87.83 5251.71
   89.82 5251.72   91.82 5251.55   93.81  5251.5   95.81  5251.5    99.8 5251.73
   101.8    5252  103.79 5251.71  105.79 5251.52  107.79 5251.39  109.78 5251.12
  111.78 5250.91  113.77 5250.63  115.77  5250.3  117.77 5250.17  119.76 5250.14
  121.76 5250.23  123.75 5250.45  127.75 5251.16  131.74  5251.5  133.73 5251.59
  135.73 5251.59  137.73 5251.54  141.72 5251.67  143.71 5251.69  147.71  5251.6
   151.7 5251.67   153.7 5251.64  157.69 5251.76  161.68 5252.05  163.68 5252.17
  165.67 5252.47  167.67 5252.98  169.66 5253.67  171.66 5254.28  173.66 5254.74
  175.65 5255.27  177.65 5255.77  179.64  5256.2  181.64  5256.3  183.64 5256.15
  185.63 5256.08  187.63 5256.08  189.62 5256.12  191.62 5256.21  193.62 5256.25
  195.61 5256.37  197.61 5256.55   199.6 5256.85   201.6 5257.28   203.6 5257.82
  205.59 5258.51  207.59 5259.44  209.58 5260.47  211.58  5261.6  213.58 5262.57
  215.57 5263.48  217.57 5264.26  219.56 5265.09  221.56 5266.12  223.56 5267.42
  225.22 5267.89  225.23 5267.89  227.55 5268.38  229.54 5268.51  231.54 5268.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   39.48     .07  225.23     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         71.86  177.65            54.83   64.06   69.46              .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1918

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5256.16    1.99 5256.29    3.99 5256.29    7.97 5255.94   11.96 5255.63
   13.95 5255.35   15.95 5255.22   17.94 5255.06   19.93 5254.84   21.92 5254.58
   25.91 5254.14    29.9  5254.1   32.28  5254.1   33.88 5254.08   35.88 5253.99
   37.87 5253.69   39.86 5253.34   41.86 5252.29   43.85 5252.04   45.84 5252.08
   47.84 5252.22   49.83 5252.87   51.82 5253.33   53.82 5253.61   55.81  5253.8
    59.8 5253.44   61.79 5253.38   65.77 5253.34   67.77 5253.28   69.76 5253.09
   71.75 5252.96   73.75 5252.92   75.74  5252.8   77.73 5252.95   79.73 5252.91
   81.72 5252.48   83.71  5252.1   85.71 5251.67    87.7 5251.48   89.69 5251.43
   91.69 5251.22   95.67 5250.99   99.66 5251.06  105.64 5250.89  107.63 5250.96
  109.62 5250.96  111.62 5250.78  113.61 5250.64   115.6 5250.35   117.6 5249.98
  119.59 5249.82  121.58 5249.54  123.58 5249.61  125.57 5249.73  127.56 5249.79
  129.56 5249.71  131.55 5249.73  135.54 5249.81  137.53 5250.66  139.52 5250.89
  141.52 5250.95  143.51 5250.89  147.49 5250.96  149.49 5251.06  153.47 5251.03
  155.47 5251.24  157.46  5251.3  159.45 5251.27  161.45  5251.5  163.44 5251.66
  167.43 5251.86  169.42 5252.03  171.41 5252.43  173.41  5252.8   175.4 5253.26
  177.39 5253.56  181.38 5254.51  183.37 5255.04  185.36 5255.33  187.36 5255.54
  189.35 5255.84  191.34 5256.07  195.33 5256.46  197.32 5256.58  199.32  5256.6
  201.31 5256.75   203.3 5256.98   205.3 5257.26  209.28 5257.92  211.28 5258.31
  213.27 5258.99  215.26 5259.93  217.26 5261.04  219.25 5262.27  223.23 5264.47
  227.22 5266.45  228.38 5267.13  229.21 5267.63  231.21  5268.4   233.2 5268.37

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   32.28     .07  228.38     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         55.81  191.34           103.35  116.22  133.63              .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1802

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5255.21    7.99 5255.25   11.99 5255.19   15.99 5255.06   17.99 5254.92
   19.98 5254.66   21.98 5254.45   23.98 5254.41   25.98 5254.26   27.98 5254.25
   29.98  5254.2   31.97 5254.08   35.97 5254.01   37.97 5254.11   41.97 5254.43
   47.96 5254.93   51.96 5255.21   53.96 5255.27   55.95  5255.2   57.95  5254.9
   59.95 5254.72   61.95 5254.67   63.95 5254.75   65.95 5254.85   66.34 5254.84
   67.94 5254.78   69.94 5254.34   71.94 5253.76   73.94 5253.06   75.94 5252.24
   77.94 5251.45   79.93 5250.97   81.93 5250.75   85.93 5250.51   89.93 5250.34
   91.92 5249.76   93.92 5249.05   95.92    5249   97.92 5248.97   99.92 5249.14
  101.92 5249.05  103.91 5248.91  105.91 5249.01  107.91 5248.88  109.91 5248.92
  111.91 5249.12  113.91  5249.3  115.91 5249.53   119.9 5249.94   121.9 5250.24
   123.9 5250.47   125.9 5250.58   127.9 5250.61  129.89 5250.69  131.89 5250.74
  133.89 5250.73  135.89 5250.63  139.89 5250.75  141.88 5250.76  143.88 5250.81
  145.88 5250.81  147.88 5250.73  149.88 5250.73  153.87 5250.69  155.87 5250.83
  157.87 5251.18  159.87  5251.7  161.87 5252.04  163.87 5251.69  165.86 5251.38
  169.86 5251.41  171.86 5251.54  173.83 5251.63   175.8 5251.62  177.76 5251.64
  179.73 5251.79   181.7 5252.57  183.67 5253.16  185.64 5253.57   187.6 5254.04
  189.57 5254.58  191.54 5254.96  193.51 5255.47  195.48 5256.19  197.44 5256.96
  199.41 5257.99  201.38 5258.85  203.35 5259.75  205.32  5260.3  207.28 5260.75
  209.25 5261.74  211.22 5262.67  213.19 5264.24  215.16 5265.23  217.12 5265.86
  218.81 5266.29  221.06 5266.85  223.03    5267     225 5267.08  226.97 5266.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   66.34     .07  218.81     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         66.34  189.57           138.61  126.39  105.18              .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1675

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
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```
       0 5254.31       2 5254.29       4 5254.31       6 5254.31       8 5254.33
   11.99 5254.23   13.99 5254.24   15.99 5254.18   17.99 5254.06   19.99 5253.99
   21.99 5253.86   23.99 5253.67   25.98 5253.47   27.98 5253.31   29.98 5253.35
   31.98 5253.31   32.83  5253.2   33.98 5253.05   35.98 5252.65   37.98 5252.13
   39.98 5251.79   41.97 5251.26   43.97 5250.84   45.97  5250.6   49.97 5250.27
   51.97 5250.12   53.97 5250.01   55.97 5249.95   57.97 5249.97   61.96 5249.93
   63.96 5249.86   65.96 5249.76   67.96 5249.72   71.96 5249.51   73.96 5249.26
   75.95 5248.77   77.95 5248.83   79.95 5248.95   81.95 5248.69   83.95  5248.5
   85.95  5248.5   87.95 5248.54   89.95 5248.51   91.95 5248.44   93.94 5248.41
   95.94 5248.43   99.94 5248.41  101.94 5248.47  103.94 5248.59  105.94  5248.8
  107.94 5249.11  109.93 5249.46  111.93 5249.74  113.93 5249.89  115.93 5249.92
  117.93 5249.88  119.93 5249.73  121.93 5249.69  123.93 5249.75  125.93 5249.76
  127.92 5249.79  129.92 5249.93  133.92 5250.24  135.92 5250.35  137.92 5250.48
  139.92 5250.76  141.92 5251.21  143.91  5251.8  145.91 5252.38  147.91  5252.6
  149.91 5252.52  151.91  5252.6  153.91 5252.67  155.91 5252.63  157.91 5252.18
  159.91 5251.67   161.9 5251.49   163.9 5251.67   165.9 5251.87   167.9 5252.04
   169.9 5252.02   171.9 5251.94   173.9 5251.97   175.9 5251.97  177.89    5252
  179.89 5252.01  181.89 5252.06  183.89 5252.42  185.89    5253  187.89 5253.16
  189.89 5253.62  191.89 5254.38  193.88 5255.64  195.88 5256.61  197.88 5257.22
  199.88 5257.87  201.81 5258.89  203.88 5260.27  205.88 5261.54  207.88 5262.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   32.83     .07  201.81     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         32.83  145.91           115.18  103.14   88.28             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1572

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5253.7    1.98 5253.69    5.95 5253.59    7.93 5253.55    9.91 5253.56
   11.89 5253.55   13.87  5253.5   15.86 5253.47   17.84 5253.37   19.82 5253.28
    21.8 5253.18   23.78 5253.12   25.76 5253.08   27.75 5253.01   29.73  5252.9
   31.71 5252.84   33.69 5252.85   35.67 5252.73   37.66 5252.67   39.64 5252.91
   41.62 5253.05    43.6 5252.92   45.58 5252.82   46.43 5252.68   46.73 5252.62
   47.57 5252.48   49.55 5251.94   51.53 5251.27   53.51 5250.72   55.49 5250.47
   57.47 5250.25   59.46 5250.19   61.44  5250.2   63.42 5250.09    65.4 5249.96
   67.38 5249.86   71.35 5249.78   73.33 5249.73   75.31 5249.73   77.29 5249.68
   79.28 5249.54   81.26 5249.41   83.24 5249.47   85.22 5249.45    87.2 5249.32
   89.18 5249.08   91.17  5248.5   93.15 5248.19   95.13 5248.32   97.11 5248.29
   99.09 5248.36  101.08 5248.24  103.06 5248.45  105.04 5248.42  107.02 5248.49
     109 5248.37  110.99 5248.17  112.97 5248.02  114.95  5248.2  116.93 5248.51
  118.91  5248.8   120.9 5248.88  122.88    5249  124.86 5249.11  126.84 5249.09
  128.82 5249.05   130.8 5249.06  132.79 5249.05  134.77 5249.05  136.75 5249.17
  138.73 5249.31   142.7 5249.35  144.68  5249.4  146.66 5249.55  150.62 5249.73
  152.61 5249.81  154.59 5249.85  156.57 5250.01  158.55 5250.31  160.53 5250.61
  162.51 5250.82   164.5 5251.13  166.48 5251.43  168.46 5251.39  170.44 5251.85
  172.42 5252.28  174.41 5252.78  176.39 5253.25  178.37 5253.97  180.35 5254.69
  182.33 5255.41  184.32  5256.3   186.3 5257.38  188.28 5258.44  190.26 5259.56
  190.47 5259.66  192.24 5260.54  194.23 5261.92  196.21 5262.92  198.19  5263.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   46.43     .07  190.47     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         46.73  178.37           112.34   98.92   82.48             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1473

INPUT
Description:
Station Elevation Data    num=      90
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5252.05       2    5252    3.99 5251.87    5.99 5251.69    7.98 5251.56
    9.98 5251.38   11.98 5251.26   13.97 5251.15   15.97 5251.29   17.96 5251.38
   19.96 5251.48   21.96 5251.52   23.46 5251.47   23.95 5251.45   25.95 5251.29
   27.94 5250.93   29.94 5250.49   31.94 5249.88   33.93 5249.56   35.93 5249.38
   37.92 5249.33   39.92 5249.29   41.92 5249.18   43.91 5249.01   45.91  5248.9
    47.9 5248.87    49.9 5248.68    51.9  5248.6   53.89 5248.94   55.89 5248.93
   57.88 5248.83   59.88 5248.83   61.88 5248.79   63.87 5248.73   65.87 5248.66
   67.86 5248.72   69.86 5248.41   71.86 5247.86   73.85 5247.87   75.85 5247.84
   77.84 5247.72   79.84 5247.66   81.84 5247.73   83.83 5247.81   85.83 5247.83
   87.82 5247.88   89.82 5247.99   91.82 5248.03   93.81 5248.35   95.81 5248.65
    97.8 5248.81    99.8 5248.85   101.8 5248.95  103.79 5249.04  105.79  5249.1
  107.78 5249.05  109.78 5249.06  111.78 5249.13  113.77 5249.24  115.77 5249.33
  117.76 5249.38  119.76 5249.35  121.76  5249.4  123.75 5249.39  125.75 5249.36
  127.74 5249.35  129.74 5249.44  131.74 5249.72  133.73 5250.11  135.73 5250.39
  137.72 5250.57  139.72 5250.87  141.72 5251.28  143.71 5251.68  145.71 5252.04
   147.7  5252.5   149.7    5253   151.7 5253.56  153.69 5253.97  154.56 5254.07
  155.69  5254.2  157.68 5254.29  159.68 5254.26  161.68 5254.23  163.67 5254.37
  165.67 5254.84  167.66 5255.44  169.66  5256.1  171.66 5256.74  173.65 5257.63

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   23.46     .07  154.56     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         23.46  154.56           111.41  100.56   88.74             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1373

INPUT
Description:
Station Elevation Data    num=      97
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5251.35       2 5251.32    3.99 5251.35    5.99 5251.33    7.98 5251.27
    9.98 5251.16   11.98 5251.06   13.97 5251.04   15.97 5250.95   17.96  5250.9
   19.96 5250.94   21.96 5250.94   23.95  5250.8   25.95 5250.74   27.95 5250.74
   29.94 5250.61   31.94 5250.56   33.93 5250.52   35.93 5250.41   37.93  5250.3
   39.44 5250.21   39.92 5250.19   41.92 5250.08   43.91  5249.8   45.91 5249.63
   47.91 5249.27    49.9 5249.05    51.9 5248.98   53.89 5248.95   55.89 5248.89
   57.89 5248.78   59.88 5248.88   61.88 5248.91   63.87 5248.84   65.87 5248.77
   67.87 5248.72   69.86 5248.64   71.86 5248.65   73.86 5248.59   75.85 5248.51
   77.85 5248.48   79.84 5248.45   81.84 5248.34   83.84  5248.2   85.83 5247.98
   87.83 5247.77   89.82 5247.65   91.82 5247.71   93.82 5247.82   95.81  5247.7
   97.81 5247.61    99.8 5247.75   101.8 5247.78   103.8 5247.72  105.79  5247.5
  107.79 5247.45  109.78 5247.53  111.78 5247.82  113.78  5248.1  115.77 5248.29
  117.77 5248.38  119.77 5248.43  121.76 5248.44  123.76 5248.46  125.75 5248.51
  127.75 5248.54  129.75  5248.6  131.74 5248.76  133.74 5248.73  135.73 5248.74
  137.73 5248.78  139.73 5248.73  141.72 5248.76  143.72 5248.75  145.71 5248.86
  147.71 5249.06  149.71 5249.26   151.7 5249.54   153.7 5249.87  155.69  5250.4
  157.69 5250.82  159.69 5251.27  161.68 5251.75  163.26 5252.03  163.68  5252.1
  165.68 5252.34  167.67 5252.53  169.67 5252.56  171.66 5252.53  173.66 5252.45
  175.66 5252.39  177.65 5252.42  179.65 5252.66  181.64  5252.9  183.64 5253.12
  185.64 5253.39  187.63  5253.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   39.44     .07  163.26     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         39.44  163.26            105.1   99.28   93.69             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  187.23  187.635263.485       F

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1273

INPUT
Description:
Station Elevation Data    num=      75
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5249.97    1.98 5249.94    3.64 5249.91    3.85  5249.9    3.95  5249.9
    5.93 5249.88     7.9 5249.73    9.88 5249.35   11.86  5248.9   13.83 5248.61
   15.81 5248.25   17.79 5248.06   19.76 5248.09   21.74 5248.07   23.71    5248
   25.69  5247.9   27.67 5247.68   29.64 5247.77   31.62 5247.81    33.6 5247.74
   35.57 5247.58   37.55 5247.51   39.52 5247.44    41.5 5247.05   43.48 5246.34
   45.45 5246.08   47.43 5245.77   49.41  5245.6   51.38 5245.48   53.36 5245.47
   55.33  5245.3   57.31 5245.24   59.29 5245.19   61.26  5245.1   63.24 5245.21
   65.22 5245.79   67.19 5246.39   69.17 5246.78   71.14 5247.06   73.12 5247.34
    75.1 5247.42   77.07 5247.55   79.05 5247.47   81.03 5247.52      83 5247.63
   84.98 5247.66   86.95 5247.63   88.93 5247.72   90.91 5247.85   92.88 5247.95
   94.86 5247.94   96.84 5248.17   98.81 5248.33  100.79 5248.54  102.76 5248.83
  104.74 5249.14  106.72 5249.44  108.69 5249.46  110.67 5249.46  112.65 5249.24
  114.62  5248.9   116.6 5248.64  118.57  5248.4  120.55  5248.3  122.53 5248.54
   124.5 5249.01  126.48  5249.6  128.46 5250.37  130.43 5251.16  132.41 5251.72
  133.16 5251.89  134.38 5252.18  136.36 5252.51  138.34 5253.04  140.31 5253.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    3.64     .07  133.16     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          3.85  133.16           102.52  100.12   96.99             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  110.45  140.315259.471       F

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1173

INPUT
Description:
Station Elevation Data    num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5248.54    1.99 5248.56    3.99 5248.48    5.98 5248.28    7.97 5248.08
    8.21 5248.07    9.37 5248.04    9.97 5248.02   11.96 5247.56   13.95 5246.94
   15.94 5246.45   17.94 5246.15   19.93 5245.76   21.92 5245.34   23.92 5245.09
   25.91 5244.95    27.9 5244.87    29.9 5244.83   31.89  5244.8   33.88 5244.78
   35.88  5244.7   37.87  5244.7   39.86 5244.64   41.85 5244.55   43.85 5244.53
   45.84 5244.51   47.83 5244.48   49.83  5244.4   51.82 5244.37   53.81 5244.36
   55.81 5244.29    57.8 5244.31   59.79 5244.31   61.79 5244.27   63.78 5244.31
   65.77 5244.35   67.77 5244.34   69.76 5244.34   71.75 5244.37   73.74 5244.38
   75.74 5244.41   77.73 5244.33   79.72 5244.38   81.72 5244.43   83.71 5244.46
    85.7 5244.55    87.7 5244.59   89.69 5244.65   91.68 5244.72   93.68 5244.82
   95.67 5244.96   97.66  5245.1   99.65 5245.38  101.65 5245.68  103.64 5246.02
  105.63 5246.34  107.63 5246.69  109.62 5247.03  111.61 5247.46  113.61 5247.96
   115.6 5248.39  117.59 5248.74  119.59 5249.11  121.58 5249.44  123.57 5249.79
  124.19 5249.93  125.56 5250.23  127.56 5250.44  129.55 5250.49  131.54 5250.52
  133.54  5250.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    9.37     .07  124.19     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          8.21  124.19            100.7  100.24   99.76             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 1073

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
       0 5247.05    1.99 5247.09    3.97 5247.08    5.28 5247.03    5.96    5247
    7.94 5246.83    9.93 5246.38   11.91 5245.79    13.9 5245.34   15.89 5244.85
   17.87 5244.51   19.86 5244.37   21.84  5244.3   23.83 5244.24   25.81 5244.19
    27.8 5244.14   29.79 5244.09   31.77 5244.04   33.76 5244.03   35.74 5244.03
   37.73 5243.98   39.71 5244.04    41.7    5244   43.69 5243.96   45.67 5243.89
   47.66 5243.85   49.64 5243.84   51.63 5243.83   53.61 5243.79    55.6 5243.79
   57.59 5243.85   59.57 5243.95   61.56 5243.99   63.54 5244.14   65.53 5244.15
   67.51 5244.14    69.5 5244.16   71.49 5244.16   73.47 5244.18   75.46 5244.21
   77.44 5244.16   79.43  5244.1   81.41 5244.07    83.4 5244.16   85.39 5244.23
   87.37 5244.25   89.36 5244.42   91.34 5244.53   93.33 5244.76   95.31 5245.06
    97.3 5245.39   99.29 5245.89  101.27 5246.25  103.26 5246.79  105.24 5247.22
  107.23 5247.64  109.21 5248.14   111.2 5248.54  113.19 5248.95  114.97 5249.27
  115.17  5249.3  117.16 5249.54  119.14 5249.73  121.13 5249.88  123.11 5250.02
   125.1 5250.11  127.09 5250.24  129.07 5250.32  131.06 5250.38  133.04 5250.43
  135.03 5250.51  137.01 5250.54     139 5250.51  140.99 5250.46

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    5.28     .07  114.97     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          5.28  114.97           113.16   98.28   83.71             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 975

INPUT
Description:
Station Elevation Data    num=      78
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5247.13    1.98 5247.15    3.96 5247.19    5.95 5247.16    7.93 5247.04
    8.22    5247    8.23    5247    9.91 5246.77   11.89 5246.37   13.88 5245.93
   15.86 5245.34   17.84 5244.76   19.83 5244.33   21.81 5244.07   23.79 5243.91
   25.77  5243.8   27.76 5243.77   29.74 5243.69   31.72 5243.56    33.7  5243.5
   35.69 5243.47   37.67 5243.42   39.65 5243.41   41.63 5243.35   43.62 5243.28
    45.6 5243.24   47.58 5243.21   49.56 5243.21   51.55 5243.23   53.53 5243.17
   55.51 5243.15   57.49 5243.18   59.48 5243.21   61.46 5243.21   63.44 5243.35
   65.42 5243.34   67.41  5243.3   69.39 5243.29   71.37 5243.33   73.35  5243.4
   75.34 5243.46   77.32 5243.45    79.3 5243.44   81.28 5243.46   83.27 5243.51
   85.25 5243.51   87.23 5243.54   89.21 5243.48    91.2  5243.6   93.18  5243.7
   95.16 5243.73   97.14 5244.13   99.13 5244.61  101.11 5245.12  103.09 5245.64
  105.07 5246.39  107.06 5246.81  109.04 5247.32  111.02 5247.72     113  5248.2
  114.99 5248.55  116.71 5248.78  116.97 5248.82  118.95 5249.08  120.93 5249.33
  122.92 5249.43   124.9 5249.51  126.88 5249.57  128.86 5249.58  130.85 5249.63
  132.83 5249.77  134.81 5249.74  136.79 5249.69  138.78 5249.73  140.76 5249.79
  142.74 5249.87  144.72 5249.94  146.71 5249.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    8.23     .07  116.71     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          8.22  116.71           117.21   99.29   79.98             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 875

INPUT
Description:
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0  5246.1    1.97 5246.07    3.95 5246.02    5.92 5245.94    7.11 5245.82
     7.9 5245.75    9.87 5245.48   11.84 5245.19   13.82 5244.81   15.79  5244.4
   17.76 5243.93   19.74 5243.57   21.71 5243.33   23.69 5243.26   25.66 5243.16
   27.63 5243.04   29.61 5242.97   31.58 5242.93   33.56 5242.89   35.53 5242.85
    37.5 5242.87   39.48 5242.83   41.45 5242.79   43.43  5242.8    45.4  5242.8
   47.37 5242.81   49.35 5242.85   51.32 5242.94   53.29    5243   55.27 5242.96
   57.24 5242.93   59.22 5242.96   61.19 5242.95   63.16 5242.95   65.14 5242.93
   67.11 5242.85   69.09  5242.8   71.06 5242.72   73.03 5242.69   75.01 5242.67
   76.98 5242.69   78.95  5242.7   80.93 5242.73    82.9 5242.79   84.88 5242.87
   86.85  5242.9   88.82    5243    90.8 5243.12   92.77  5243.2   94.75 5243.35
   96.72 5243.54   98.69 5243.86  100.67  5244.3  102.64 5244.77  104.62 5245.22
  106.59 5245.59  108.56  5245.9  110.54 5246.16  112.51 5246.73  114.48 5247.26
  116.46 5247.58  118.43 5247.79  120.41 5248.01  122.38  5248.2  122.79 5248.26
  124.35 5248.45  126.33 5248.57   128.3 5248.59  130.28 5248.62  132.25 5248.66
  134.22 5248.71   136.2 5248.76  138.17 5248.86  140.14 5248.87  142.12 5248.89
     150    5249     160  5249.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    7.11     .07  122.79     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          7.11  122.79           114.31   96.64   78.12             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 779

INPUT
Description:
Station Elevation Data    num=      76
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5245.06    1.99 5245.06    3.98 5245.07    5.97 5245.12    6.42 5245.11
    7.95 5245.06    9.94  5244.9   11.93 5244.77   13.92 5244.42   15.91 5243.95
    17.9  5243.6   19.88 5243.29   21.87 5243.19   23.86 5243.07   25.85 5242.85
   27.84 5242.77   29.83 5242.77   31.81 5242.74    33.8 5242.63   35.79 5242.55
   37.78 5242.43   39.77 5242.48   41.76  5242.4   43.74 5242.26   45.73 5242.22
   47.72 5242.28   49.71 5242.37    51.7 5242.38   53.69  5242.4   55.67 5242.39
   57.66 5242.37   59.65 5242.31   61.64 5242.45   63.63 5242.57   65.62 5242.58
    67.6 5242.53   69.59 5242.51   71.58 5242.63   73.57 5242.71   75.56  5242.7
   77.55 5242.66   79.53 5242.59   81.52 5242.53   83.51 5242.56    85.5  5242.5
   87.49 5242.62   89.48 5242.56   91.47 5242.78   93.45 5242.71   95.44 5242.96
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   97.43 5243.32   99.42 5243.74  101.41 5244.23   103.4 5244.91  105.38 5245.31
  107.37 5245.65  109.36 5245.86  111.35 5246.19  113.34 5246.48  115.33 5246.87
  117.31 5247.17   119.3 5247.52  121.29 5247.84  123.28 5248.05  123.84  5248.1
  125.27 5248.22  127.26 5248.31  129.24 5248.34  131.23 5248.38  133.22 5248.56
  135.21 5248.62   137.2 5248.61  139.19 5248.68  141.17 5248.72  143.16 5248.76
     160    5249

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    6.42     .07  123.84     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           6.42  123.84            102.45   98.81   95.54             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 680

INPUT
Description:
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5244.87    1.98 5244.96    3.96 5244.97    5.94 5244.89    7.92 5244.86
     9.9 5244.91   11.88 5244.84   13.87 5244.84   15.85  5244.9   17.83 5244.84
   19.41 5244.67   19.81 5244.63   21.79 5244.36   23.77    5244   25.75 5243.62
   27.73 5243.23   29.71 5242.96   31.69 5242.86   33.67  5242.7   35.65 5242.52
   37.63 5242.44   39.61 5242.42    41.6 5242.39   43.58 5242.38   45.56 5242.33
   47.54  5242.4   49.52 5242.36    51.5 5242.41   53.48 5242.43   55.46 5242.36
   57.44 5242.28   59.42 5242.21    61.4 5242.22   63.38 5242.18   65.36 5242.12
   67.35 5242.09   69.33 5242.09   71.31 5242.07   73.29 5242.11   75.27 5242.07
   77.25 5242.08   79.23 5242.01   81.21 5242.03   83.19 5242.05   85.17  5242.1
   87.15 5242.17   89.13 5242.14   91.11  5242.2   93.09 5242.32   95.08 5242.45
   97.06 5242.53   99.04 5242.62  101.02  5242.7     103 5242.81  104.98 5242.81
  106.96 5242.94  108.94 5243.35  110.92 5243.65   112.9  5244.2  114.88 5244.84
  116.86 5245.35  118.84 5245.63  120.83 5246.03  122.81  5246.4  124.79 5246.84
  126.77 5247.34  128.75 5247.81  130.73 5248.14  132.71  5248.5  134.69 5248.66
  136.33 5248.91  136.67 5248.97  138.65  5249.2  140.63 5249.36  142.61 5249.48
  144.59 5249.64  146.57 5249.62  148.56 5249.62  150.54  5249.6  152.52 5249.62
   154.5 5249.67

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   19.41     .07  136.33     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          19.41  136.33            91.15  101.19  111.36             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 579

INPUT
Description:
Station Elevation Data    num=      79
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5245.01    1.97 5245.01    3.95 5244.88    5.53 5244.69    5.92 5244.65
     7.9 5244.28    9.87 5243.83   11.85 5243.44   13.82 5242.98    15.8 5242.54
   17.77  5242.3   19.74 5242.12   21.72 5242.02   23.69 5242.01   25.67 5241.96
   27.64 5241.91   29.62 5241.88   31.59 5241.82   33.56  5241.8   35.54  5241.8
   37.51  5241.8   39.49 5241.72   41.46 5241.74   43.44 5241.79   45.41 5241.82
   47.38  5241.8   49.36 5241.79   51.33 5241.82   53.31 5241.73   55.28 5241.64
   57.26 5241.63   59.23 5241.75    61.2 5241.79   63.18 5241.84   65.15 5241.93
   67.13 5241.98    69.1 5241.94   71.08 5242.01   73.05 5241.99   75.03 5241.93
      77 5242.05   78.97 5242.12   80.95 5242.07   82.92 5242.23    84.9 5242.45
   86.87 5242.51   88.85 5242.59   90.82 5242.62    92.8  5242.7   94.77 5242.91
   96.74 5243.25   98.72 5243.76  100.69 5244.11  102.67 5244.46  104.64 5244.99
  106.62 5245.58  108.59 5245.98  110.56 5246.46  112.54 5246.99  114.51 5247.52
  116.49 5248.03  118.46 5248.44  120.44 5248.83  122.41 5249.16  122.53 5249.18
  123.18 5249.26  124.38 5249.41  126.36 5249.68  128.33  5249.5  130.31 5249.38
  132.28 5249.51  134.26 5249.53  136.23 5249.49  138.21 5249.51  140.18  5249.5
  142.15 5249.51  144.13 5249.45   146.1 5249.42  148.08 5249.42

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    5.53     .07  122.53     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           5.53  123.18             81.2   98.97  121.01             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                  RS: 480

INPUT
Description:
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5245.03       2 5245.18       4 5245.25    5.99 5245.21    7.99 5245.16
    9.99 5245.13   11.99 5245.09   13.99 5245.13   15.99 5245.23   17.98 5245.17
   18.99 5245.04   19.98  5244.9   21.98 5244.43   23.98 5243.98   25.98 5243.58
   27.98 5243.06   29.97 5242.65   31.97 5242.09   33.97 5241.73   35.97 5241.27
   37.97 5241.29   39.97 5241.33   41.96 5241.47   43.96 5241.36   45.96 5241.37
   47.96 5241.34   49.96 5241.29   51.95  5241.3   53.95 5241.35   55.95 5241.39
   57.95  5241.3   59.95 5241.25   61.95 5241.28   63.94 5241.25   65.94 5241.26
   67.94 5241.26   69.94  5241.2   71.94 5241.27   73.94 5241.33   75.93 5241.34
   77.93 5241.21   79.93 5241.14   81.93  5241.2   83.93 5241.22   85.93 5241.18
   87.92 5241.28   89.92 5241.39   91.92 5241.46   93.92 5241.45   95.92  5241.5
   97.91 5241.57   99.91  5241.7  101.91 5241.73  103.91 5241.79  105.91 5241.89
  107.91    5242   109.9 5242.18   111.9 5242.44   113.9 5242.82   115.9 5243.24
   117.9 5243.61   119.9 5244.04  121.89 5244.61  123.89  5245.2  125.89 5245.65
  127.89    5246  129.89 5246.33  131.89 5246.66  133.88 5246.96  135.88 5247.16
  137.88 5247.48   138.9 5247.68  139.88 5247.87  141.31 5248.09  141.88 5248.18
  143.87 5248.39  145.87 5248.54  147.87 5248.62  149.87 5248.68  151.87  5248.7
  153.87  5248.6  155.86 5248.57  157.86 5248.63  159.86 5248.66  160.87 5248.68
  161.86 5248.71  163.86 5248.76  165.86 5248.88  167.85 5248.99  169.85 5249.06
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  171.85 5249.04  173.85 5248.99  175.85    5249  177.85 5249.03

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08   18.99     .07   138.9     .08  160.87     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         18.99  141.31            81.41  101.26  123.22             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 378

INPUT
Description:
Station Elevation Data    num=      90
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5242.23       2 5242.15       4 5242.09       6 5241.95       8 5241.87
      10 5241.72      12 5241.19      14 5241.19      16 5241.17      18 5241.17
      20 5241.48   21.99 5241.67    23.8 5241.49   23.99 5241.47   25.39 5241.47
   25.99 5241.46   27.99 5241.32   29.99 5241.17   31.99 5240.95   33.99  5240.8
   35.99 5240.66   37.99 5240.62   39.99 5240.56   41.99  5240.5   43.99 5240.46
   45.99 5240.48   47.99 5240.46   49.99 5240.45   51.99 5240.54   53.99 5240.55
   55.99 5240.54   57.99  5240.5   59.99 5240.51   61.99 5240.66   63.98 5240.73
   65.98 5240.67   67.98 5240.64   69.98 5240.68   71.98 5240.84   73.98 5240.88
   75.98 5240.83   77.98  5240.9   79.98 5240.86   81.98 5240.95   83.98 5240.96
   85.98 5241.04   87.98 5241.11   89.98 5241.02   91.98 5241.03   93.98 5241.06
   95.98 5241.11   97.98 5241.22   99.98 5241.38  101.98 5241.43  103.98 5241.58
  105.97 5241.84  107.97  5242.1  109.97 5242.26  111.97 5242.35  113.97 5242.54
  115.97 5242.83  117.97 5243.11  119.97 5243.33  121.97 5243.66  123.97    5244
  125.97 5244.29  127.97 5244.54  129.97 5244.77  131.97 5245.07  133.97 5245.25
  135.97  5245.4  137.03 5245.53  137.97 5245.65  139.97 5245.88  141.97 5245.98
  143.97 5245.88  145.97 5245.74  147.96 5245.62  149.96 5245.62  151.96 5245.64
  153.96 5245.75  155.96 5245.82  157.96 5245.73  159.96  5245.8  161.96 5245.94
  163.96 5246.06  165.96 5245.98  167.96 5245.99  169.96 5246.11  171.96 5246.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .08    23.8     .07  137.03     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         25.39  137.03            95.13   92.23   92.04             .1       .3

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 286

INPUT
Description: Foothills Pkwy, U/S
Station Elevation Data    num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5247.72    1.99 5247.82    9.97 5247.74   15.96 5247.85   19.95  5247.8
   27.93 5247.36   35.91 5247.31    39.9 5247.25   47.88 5247.28   57.85 5247.24
   61.84 5247.18   69.82 5247.18   71.82 5247.23   75.81 5247.13    79.8 5247.21
   83.79 5247.15   87.78 5247.16  105.73 5247.12  109.72 5247.18  113.71 5247.14
   117.7 5247.18  123.69 5247.17  131.67 5247.04  137.65 5246.78  141.64 5246.51
  143.64 5246.29  147.84 5246.02  149.62 5245.88  155.61 5245.66   159.6 5245.47
  163.59 5245.36  171.57 5245.29  173.56 5245.16  175.53 5245.19  179.48 5244.91
  181.45 5244.84  185.26 5244.32  185.31 5244.31  189.34 5243.73  191.31 5243.23
  193.28 5242.88  195.26 5239.42     196  5237.2     229  5237.2  230.76  5239.4
  232.73 5239.99   234.7 5241.57  236.67  5242.6  238.65 5243.13  240.62 5243.14
  244.56    5243  246.54 5243.08  250.48 5243.06   256.4 5243.43  258.37  5243.7
  262.31    5244  264.29 5244.27  268.23 5244.35  274.15 5244.68  278.51    5245
  278.54    5245  282.04 5245.14  285.98 5245.12  293.87 5245.22  297.81 5245.05
  301.76 5245.07  303.73    5245  309.71 5245.25   311.7 5245.38  317.68 5245.95
  319.68 5246.24  322.53 5246.43  325.66 5246.81  329.64 5247.45  333.63 5247.96
  337.62 5248.07   341.6 5248.25  349.58 5248.39  355.56 5248.39  365.52 5248.45
  375.49 5248.57  381.47  5248.6  383.46 5248.66  397.41  5248.7  405.39 5248.85
  413.36 5248.91  421.33 5249.05  423.33 5249.13  425.32 5249.48  427.31 5249.63
  435.29 5249.69  437.28 5249.75

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015  147.84     .08  185.31      .1  278.54     .08  322.53    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         185.26  278.51           167.24  177.51  191.45             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   195.5    5248       T
   234.5  437.28  5248.5       T

CULVERT


RIVER: Skunk
REACH: 01                 RS: 210

INPUT
Description: Foothills Parkway
Distance from Upstream XS =      27
Deck/Roadway Width        =      99
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
       0  5247.5              35    5248             161 5248.32
     193 5248.42             240 5248.56             270    5249
     437  5249.7

Upstream Bridge Cross Section Data
Station Elevation Data    num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5247.72    1.99 5247.82    9.97 5247.74   15.96 5247.85   19.95  5247.8
   27.93 5247.36   35.91 5247.31    39.9 5247.25   47.88 5247.28   57.85 5247.24
   61.84 5247.18   69.82 5247.18   71.82 5247.23   75.81 5247.13    79.8 5247.21
   83.79 5247.15   87.78 5247.16  105.73 5247.12  109.72 5247.18  113.71 5247.14
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   117.7 5247.18  123.69 5247.17  131.67 5247.04  137.65 5246.78  141.64 5246.51
  143.64 5246.29  147.84 5246.02  149.62 5245.88  155.61 5245.66   159.6 5245.47
  163.59 5245.36  171.57 5245.29  173.56 5245.16  175.53 5245.19  179.48 5244.91
  181.45 5244.84  185.26 5244.32  185.31 5244.31  189.34 5243.73  191.31 5243.23
  193.28 5242.88  195.26 5239.42     196  5237.2     229  5237.2  230.76  5239.4
  232.73 5239.99   234.7 5241.57  236.67  5242.6  238.65 5243.13  240.62 5243.14
  244.56    5243  246.54 5243.08  250.48 5243.06   256.4 5243.43  258.37  5243.7
  262.31    5244  264.29 5244.27  268.23 5244.35  274.15 5244.68  278.51    5245
  278.54    5245  282.04 5245.14  285.98 5245.12  293.87 5245.22  297.81 5245.05
  301.76 5245.07  303.73    5245  309.71 5245.25   311.7 5245.38  317.68 5245.95
  319.68 5246.24  322.53 5246.43  325.66 5246.81  329.64 5247.45  333.63 5247.96
  337.62 5248.07   341.6 5248.25  349.58 5248.39  355.56 5248.39  365.52 5248.45
  375.49 5248.57  381.47  5248.6  383.46 5248.66  397.41  5248.7  405.39 5248.85
  413.36 5248.91  421.33 5249.05  423.33 5249.13  425.32 5249.48  427.31 5249.63
  435.29 5249.69  437.28 5249.75

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015  147.84     .08  185.31      .1  278.54     .08  322.53    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        185.26  278.51             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   195.5    5248       T
   234.5  437.28  5248.5       T

Downstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
      52 5247.57           114.5 5247.57           119.3 5248.06
     146 5248.01             152 5247.57             242 5247.57
     330    5248             458  5248.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5247.26   15.87 5247.37   19.84 5247.49   35.72 5247.59   41.67 5247.67
   47.62 5247.63   57.36 5247.65   59.53 5247.67    63.5 5247.55   69.45 5247.52
    75.4 5247.15   79.37 5246.69   83.34 5246.08   87.31 5245.15   93.26 5244.47
   97.23 5244.35  103.18 5244.34   113.1 5244.44  113.78 5244.37  115.09 5244.24
  117.07 5241.46  119.05 5239.29   119.1  5236.3     147  5236.3   150.8  5243.1
  153.98 5244.07  154.63 5244.26  160.72 5244.66  166.68 5244.79  170.64 5244.49
  174.61  5243.6   176.6 5243.39  180.56 5243.43  184.53 5243.85  192.46 5244.05
  200.39 5244.11  206.34 5244.21  216.25  5244.2  220.22 5244.31  226.16 5244.35
  238.06 5244.66  240.04 5244.76  247.97 5244.79  251.94 5244.93  259.87 5244.99
  265.82 5244.93  269.78 5245.05  273.75 5244.98  277.71 5245.01  283.66 5245.18
  287.63 5245.17  291.59 5245.33  293.58 5245.32  301.51 5245.49  309.44 5245.45
   313.4 5245.58  315.38 5245.52  323.31  5245.7   325.3 5245.64  337.19 5245.74
  339.18 5245.84  349.09 5245.98  353.05 5245.95  359.04 5245.77  361.04 5245.55
  363.03 5245.14  365.03 5245.08  369.02  5245.6     375 5245.75  378.99 5245.57
  382.98 5245.54  386.97 5245.63  390.96  5245.9  392.96 5246.12  398.94 5246.55
  400.94 5246.55  406.93  5246.2  408.92 5245.95  410.92 5245.96   416.9 5246.37
  424.88 5247.06  426.88 5247.18  430.87 5247.59  434.86 5247.83  438.85 5248.31
  442.84  5248.3   446.3 5248.38   460.8 5248.69  474.76 5248.93  482.74 5249.01
  484.74 5249.18  486.73 5249.54

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   57.36     .08  113.78      .1  153.98     .08   446.3    .015

Bank Sta: Left   Right    Coeff Contr.   Expan.
        113.78  154.63             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   110.2  5247.6       F
   153.8  486.73  5247.6       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .98
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       6      12
FHWA Chart # 9 - flared wingwalls and Inlet top edge bevel
FHWA Scale # 2 - Wingwall flared 18 to 33.7 deg.; inlet top edge bevel=0.083D
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 7.2     156     .013     .013        0                   .5                 1
Number of Barrels =  2
Upstream   Elevation =  5237.23
Centerline Stations
    Sta.    Sta.
   208.5   221.5
Downstream Elevation =  5236.38
Centerline Stations
    Sta.    Sta.
   125.5   138.5

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 109

INPUT
Description: Foothills Pkwy, D/S
Station Elevation Data    num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5247.26   15.87 5247.37   19.84 5247.49   35.72 5247.59   41.67 5247.67
   47.62 5247.63   57.36 5247.65   59.53 5247.67    63.5 5247.55   69.45 5247.52
    75.4 5247.15   79.37 5246.69   83.34 5246.08   87.31 5245.15   93.26 5244.47
   97.23 5244.35  103.18 5244.34   113.1 5244.44  113.78 5244.37  115.09 5244.24
  117.07 5241.46  119.05 5239.29   119.1  5236.3     147  5236.3   150.8  5243.1
  153.98 5244.07  154.63 5244.26  160.72 5244.66  166.68 5244.79  170.64 5244.49
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  174.61  5243.6   176.6 5243.39  180.56 5243.43  184.53 5243.85  192.46 5244.05
  200.39 5244.11  206.34 5244.21  216.25  5244.2  220.22 5244.31  226.16 5244.35
  238.06 5244.66  240.04 5244.76  247.97 5244.79  251.94 5244.93  259.87 5244.99
  265.82 5244.93  269.78 5245.05  273.75 5244.98  277.71 5245.01  283.66 5245.18
  287.63 5245.17  291.59 5245.33  293.58 5245.32  301.51 5245.49  309.44 5245.45
   313.4 5245.58  315.38 5245.52  323.31  5245.7   325.3 5245.64  337.19 5245.74
  339.18 5245.84  349.09 5245.98  353.05 5245.95  359.04 5245.77  361.04 5245.55
  363.03 5245.14  365.03 5245.08  369.02  5245.6     375 5245.75  378.99 5245.57
  382.98 5245.54  386.97 5245.63  390.96  5245.9  392.96 5246.12  398.94 5246.55
  400.94 5246.55  406.93  5246.2  408.92 5245.95  410.92 5245.96   416.9 5246.37
  424.88 5247.06  426.88 5247.18  430.87 5247.59  434.86 5247.83  438.85 5248.31
  442.84  5248.3   446.3 5248.38   460.8 5248.69  474.76 5248.93  482.74 5249.01
  484.74 5249.18  486.73 5249.54

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   57.36     .08  113.78      .1  153.98     .08   446.3    .015

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        113.78  154.63            75.79   84.06   91.92             .3       .5
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
       0   110.2  5247.6       F
   153.8  486.73  5247.6       F

CROSS SECTION


RIVER: Skunk
REACH: 01                 RS: 25

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
       0 5247.21    3.97 5247.33   11.91 5247.39   23.81 5247.54   33.03 5247.55
    37.7 5247.52   43.65 5246.98   47.62 5246.44   51.59 5245.67   59.53 5243.94
    63.5 5242.65   65.48 5242.39   67.47  5242.3   73.42 5242.25   77.39 5242.34
   83.34 5242.67   85.33  5242.6   91.28 5242.63   96.95 5242.47   99.84  5242.2
   101.2 5241.92  103.18 5241.06  107.15 5238.96  111.12 5238.75  117.07 5238.95
  119.06 5239.42  123.03 5241.02  125.01 5241.43     127 5241.59  128.98 5242.07
  131.18 5242.88  132.83 5243.31  136.92 5243.64   140.9 5243.65  148.86 5243.77
  152.84 5244.02  156.82 5244.36  162.79 5244.67  166.77 5244.78  174.73 5244.79
   180.7 5244.44  184.68 5244.45  190.65 5244.62  192.64 5244.89  194.63 5244.77
  196.62 5244.83   200.6 5244.73  204.58  5244.5  212.54 5244.72   220.5 5244.76
  226.47 5244.62  228.46 5244.76   240.4 5244.79  244.38 5244.92  248.36 5244.87
  250.35 5244.93  256.32 5244.95  264.28 5245.07  272.24 5245.21   280.2 5245.17
  284.18 5245.29  288.16 5245.27  290.15 5245.36  294.13 5245.23  308.06 5245.55
  312.04 5245.68  316.02 5245.68  321.99 5245.52  325.97 5245.73  327.96 5245.66
  331.94 5245.69  335.92 5245.85  343.88 5245.96  347.86 5246.24  349.85 5246.25
  353.83 5245.96  355.82 5245.91   359.8 5245.59  365.77 5245.57  371.74 5246.04
  375.72 5246.18  377.71 5246.33  383.68 5246.24  387.66 5246.31  389.65 5246.45
  395.62  5246.4  403.58 5246.78  407.56 5246.89  417.51 5246.92  421.49 5247.12
  425.47 5247.22  429.45 5246.84  433.43 5246.87  437.41 5246.45  441.39 5246.42
  445.37  5246.6  447.36 5246.83  451.34 5247.04  453.33 5247.05  457.31  5247.3

Manning's n Values        num=       4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0    .015   33.03     .08   96.95      .1  131.18     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         99.84  132.83            18.81   24.68   17.46             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
     200  457.31    5248       T


SUMMARY OF MANNING'S N VALUES

River:29th_St_Split

      Reach          River Sta.       n1        n2        n3

 1                    1539               .06      .015       .08
 1                    1456               .06      .015       .06
 1                    1304               .06      .015       .06
 1                    1197               .06      .015       .06
 1                    1070               .06      .015       .06
 1                    964                .06      .015       .06
 1                    897                .06      .015       .06
 1                    744                .06
 1                    585                .06
 1                    529                .06      .015       .06
 1                    397                .06      .015       .06
 1                    245                .06      .015       .06
 1                    94                 .13      .015       .06


River:30th_St_Split

      Reach          River Sta.       n1        n2        n3

 1                    875                .06      .015       .13
 1                    758                .06      .015       .13
 1                    643                .06      .015       .13
 1                    556                .06      .015       .13
 1                    471                .13      .015       .13
 1                    373                .13      .015       .13
 1                    226                .13      .015       .13
 1                    68                 .13      .015       .13


River:35th_St_Split

      Reach          River Sta.       n1        n2        n3

 1                    346                .06      .015
 1                    240                .06      .015       .06
 1                    165                .06      .015       .06
 1                    43                 .06      .015       .06
```

River:Apartment_Split

Reach	River Sta.	n1	n2	n3	n4
1	237	.06	.015	.06	
1	99	.06	.015	.06	
1	20	.08	.06	.015	.06

River:Bear_Bline_Split

Reach	River Sta.	n1	n2
1	723	.06	
1	586	.06	
1	446	.06	
1	262	.015	.06
1	118	.015	.06

River:Bear_Creek_Split

Reach	River Sta.	n1	n2	n3	n4	n5	n6
2	4014	.015	.08	.015	.06	.015	.06
2	3824	.015	.08	.015	.06	.015	.06
2	3574	.015	.08	.13	.015	.13	
2	3352	.015	.08	.13	.015		
2	3174	.015					
2	3053	.06					
2	2972	.06					
2	2787	.06					
2	2637	.06					
2	2446	.06	.015	.06			
2	2276	.06	.015	.06			
1	2046	.06	.015	.06			
1	1838	.13	.015	.06			
1	1577	.015	.06				
1	1354	.08	.015	.06			
1	1135	.08	.015	.06			
1	965	.08	.015	.06			
1	740	.015	.06				
1	610	.08	.015	.06			
1	444	.015	.06				
1	276	.015	.08	.06			

River:Bluebell

Reach	River Sta.	n1	n2	n3	n4	n5
1	6245	.08	.115	.08		
1	6200	Culvert				
1	6196	.08	.115	.08		
1	6113	.08	.115	.08		
1	5998	.13	.08	.115	.08	
1	5866	.08	.115	.08		
1	5672	.08	.115	.08		
1	5527	.08	.115	.08		
1	5481	.08	.115	.08		
1	5445	.08	.115	.08		
1	5322	.08	.115	.08		
1	5194	.08	.115	.08		
1	5157	.08	.115	.08		
1	5136	.08	.115	.08		
1	5080	.08	.115	.08		
1	4910	.08	.115	.08		
1	4793	.08	.115	.08		
1	4745	.08	.115	.08		
1	4720	.08	.115	.08		
1	4671	.08	.115	.08		
1	4538	.08	.115	.08		
1	4422	.13	.102	.13		
1	4278	.13	.102	.13		
1	4197	.13	.102	.13		
1	4054	.13	.102	.13		
1	3929	.13	.102	.13		
1	3809	.13	.102	.13		
1	3709	.13	.102	.13		
1	3599	.015	.13	.102	.13	
1	3480	.13	.102	.13		
1	3360	.13	.102	.13	.015	.13
1	3283	.015	.13			
1	3215	.13	.015	.13		
1	3070	.13	.015	.13		
1	2972	.13	.015	.13		
1	2864	.13	.015	.13		
1	2764	.13	.015	.13		
1	2623	.13	.015	.13		
1	2533	.13	.015	.13		
1	2415	.13	.015	.13		
1	2284	.13	.015	.13		
1	2182	.13	.015	.13		
1	2039	.13	.015	.13		
1	1926	.13	.015	.13		
1	1839	.13	.015	.13		
1	1764	.13	.015	.13		
1	1651	.13	.015	.13		
1	1536	.13	.015	.13		
1	1413	.13	.015	.13		
1	1280	.13	.015	.13		
1	1194	.13	.015	.13		
1	1053	.13	.015	.13		
1	915	.13	.015	.13		
1	799	.13	.015	.13		
1	732	.13	.015	.13		
1	599	.13	.015	.13		
1	481	.13	.015	.13		
1	367	.13	.015	.13		

1	289	.13	.015	.13
1	219	.13	.015	.13
1	122	.015	.13	

River:Bluebell_Spur

Reach	River Sta.	n1
1	314	.13
1	256	.13
1	183	.13
1	102	.13
1	40	.13

River:Blue_Ave_Split

Reach	River Sta.	n1	n2	n3
1	818	.13	.015	.13
1	748	.13	.015	.13
1	655	.13	.015	.13
1	564	.13	.015	.13
1	474	.13	.015	.13
1	364	.13	.015	.13
1	251	.13	.015	.06
1	185	.13	.015	.06
1	88	.13	.015	

River:Denton_Ave_Split

Reach	River Sta.	n1	n2	n3
1	534	.13	.015	.13
1	414	.13	.015	.13
1	283	.13	.015	.13
1	179	.13	.015	.13
1	75	.13	.015	.13
1	41	.13	.015	.13

River:Echo_Pl_Split

Reach	River Sta.	n1	n2	n3
1	289	.13		
1	219	.13		
1	167	.13	.015	.13
1	76	.13	.015	.13

River:Euclid_Ave_Split

Reach	River Sta.	n1	n2	n3
02	1563	.13	.015	.13
02	1445	.13	.015	.13
02	1311	.13	.015	.13
02	1193	.13	.015	.13
02	1124	.06	.015	.13
02	1036	.13	.015	.13
02	934	.13	.015	.13
02	801	.13	.015	.13
02	698	.13	.015	.13
02	593	.13	.015	.13
02	502	.13	.015	.13
02	422	.13	.015	.13
01	308	.13	.015	.13
01	224	.13	.015	.13
01	129	.13	.015	.13
01	76	.13	.015	.13

River:Kings

Reach	River Sta.	n1	n2	n3	n4	n5	n6
03	3674	.08	.105	.1			
03	3575	.08	.105	.1			
03	3459	.08	.105	.1	.015	.1	
03	3400	Culvert					
03	3268	.015	.1	.105	.1	.015	
03	3179	.1	.105	.1	.015		
03	3083	.1	.105	.1	.015		
03	2990	.1	.105	.1	.015		
03	2938	.1	.105	.1	.015		
03	2920	Culvert					
03	2900	.1	.105	.1	.015		
03	2821	.1	.105	.015			
03	2724	.1	.105	.1	.015		
03	2628	.015	.1	.105	.1	.015	
03	2504	.13	.015	.1	.105	.1	.015
03	2444	.13	.015	.105	.1		
03	2396	.015					
03	2330	.13	.08	.056	.08		
03	2268	.08	.056	.08			
03	2175	.08	.056	.08			
03	2018	.13	.08	.056	.08		
03	1873	.13	.08	.056	.08		
03	1733	.13	.056	.08			
02	1621	.13	.015	.08			
02	1514	.13	.015	.13			
02	1419	.13	.015				
02	1320	.13	.015	.13			
02	1221	.13	.015	.13			
02	1079	.13	.015	.13			
02	981	.13	.015	.13			
02	873	.13	.015				
02	771	.13	.015	.13			

02	665	.13	.015	.13
02	561	.13	.015	
02	435	.13	.015	.13
02	311	.13	.015	.13
01	215	.13	.015	.13
01	82	.13	.015	.13

River:Kings_Split

Reach	River Sta.	n1	n2	n3
1	775	.13		
1	701	.13	.08	
1	597	.13	.08	
1	523	.13	.08	
1	416	.13		
1	308	.13		
1	222	.13		
1	150	.13		
1	105	.13	.015	.13

River:Madison_Split

Reach	River Sta.	n1	n2	n3
1	346	.06	.015	.06
1	252	.06	.015	.06
1	163	.06	.015	.06
1	45	.06	.015	.06

River:Quinn_St_Split

Reach	River Sta.	n1	n2	n3
02	488	.13	.015	.13
02	406	.13	.015	.13
01	278	.13	.015	.13
01	195	.13	.015	.13
01	109	.13	.015	.13
01	41	.13	.015	.13

River:Skunk

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8
06	11882	.08	.102	.08					
06	11713	.08	.102	.08					
06	11700	Inl Struct							
06	11673	.08	.102	.08					
06	11613	.08	.102	.08					
06	11583	Inl Struct							
06	11524	.08	.102	.08					
06	11457	.13	.102	.08					
06	11364	.13	.102	.13	.06				
06	11272	.13	.102	.13	.06				
06	11185	.13	.102	.06					
06	11110	.13	.06	.102	.06				
06	11100	Culvert							
06	11049	.13	.015	.13	.102	.08			
05	10981	.13	.015	.13	.102	.13	.08		
05	10910	.13	.015	.13	.102	.13			
05	10890	Bridge							
05	10873	.13	.015	.13	.102	.13			
05	10826	.13	.015	.13	.102	.13			
05	10778	.015	.13	.102	.13				
05	10760	Bridge							
05	10745	.015	.13	.102	.13				
05	10722	.015	.13	.102	.13				
05	10700	Culvert							
05	10655	.13	.102	.13					
05	10616	.13	.102	.13					
05	10560	.13	.102	.13					
05	10488	.13	.102	.13					
05	10421	.13	.102	.13					
05	10317	.13	.102	.13					
05	10238	.13	.102	.13					
05	10168	.13	.102	.13					
05	10073	.13	.102	.13					
05	9997	.13	.102	.13					
05	9943	.13	.102	.13					
04	9894	.015	.13	.102	.13	.015			
04	9850	Culvert							
04	9794	.06	.102	.06					
04	9780	.06	.102	.06					
04	9710	.06	.102	.06					
04	9586	.06	.102	.06					
04	9444	.06	.102	.06					
04	9304	.06	.102	.06					
04	9270	.06	.102	.06					
04	9260	Culvert							
04	9246	.06	.102	.06					
04	9234	.06	.102	.06					
04	9194	.06	.102	.06	.015				
04	9150	Culvert							
04	9109	.015	.102	.06					
04	9076	.015	.102	.06					
04	9041	.015	.102	.06					
04	9001	.015	.102	.06					
04	8937	.015	.102	.06					
04	8873	.015	.102	.06					
04	8800	Culvert							
04	8713	.06	.102	.06					
04	8654	.06	.102						
04	8576	.06	.015	.06	.102				
04	7996	.015	.06	.102	.06				
04	7989	.015	.06	.102	.06				
04	7984	.015	.06	.102	.06				

04	7960	Inl Struct								
04	7934	.06	.08	.102	.06					
04	7890	.06	.015	.06	.08	.102	.06			
04	7839	.06	.015	.06	.08	.102	.06			
04	7705	.06	.015	.08	.102	.06				
04	7651	.06	.015	.08	.102	.06	.015			
04	7639	.06	.015	.08	.102	.015				
04	7622	.06	.015	.09	.015					
04	7600	Culvert								
04	7566	.08	.077	.06						
04	7478	.06	.08	.077	.06					
04	7416	.077	.08	.06						
04	7318	.06	.08	.077	.08	.06				
04	7259	.06	.08	.077	.08	.06				
04	7240	.06	.08	.077	.08	.06				
04	7230	Bridge								
04	7216	.06	.08	.077	.08	.06				
04	7189	.06	.08	.077	.08	.06				
04	7118	.06	.08	.077	.08	.06				
04	7040	.06	.08	.077	.06					
04	6958	.06	.08	.077	.08	.06				
04	6889	.06	.077	.08	.06					
04	6781	.06	.08	.077	.06					
04	6719	.06	.08	.077	.08	.06				
04	6704	.06	.08	.077	.08	.06				
04	6690	Bridge								
04	6685	.06	.08	.077	.08	.06				
04	6666	.06	.077	.08	.06					
04	6636	.06	.077	.08	.06					
04	6605	.06	.077	.08	.015					
04	6570	Culvert								
04	6532	.08	.102	.08	.13					
04	6479	.13	.08	.102	.13					
04	6423	.13	.08	.102	.13					
04	6330	.13	.08	.102	.08	.13				
04	6254	.13	.08	.102	.08	.015				
04	6158	.13	.08	.102	.08	.015				
04	6087	.13	.08	.102	.08	.015				
04	6070	Bridge								
04	6060	.13	.08	.102	.08	.015				
04	6023	.13	.08	.102	.08	.015				
04	5935	.13	.08	.102	.13					
04	5845	.13	.08	.102	.08	.13				
04	5788	.13	.08	.102	.08	.13				
03	5737	.015	.08	.102	.08	.13				
03	5700	Culvert								
03	5656	.13	.102	.13	.015	.13				
03	5602	.13	.102	.13						
03	5536	.13	.102	.13						
03	5469	.13	.102	.13						
03	5380	.13	.102	.13						
03	5285	.13	.102	.13						
03	5190	.13	.102	.13						
03	5099	.13	.102	.13						
03	5075	Culvert								
03	5039	.13	.102	.13						
02	4999	.13	.102	.13						
02	4911	.13	.102	.13						
02	4848	.13	.102	.13						
02	4748	.13	.102	.13	.015	.13				
02	4662	.13	.102	.13	.015	.13				
02	4594	.13	.102	.13	.015	.13				
02	4550	Culvert								
02	4511	.06	.015	.06	.102	.015	.13	.015	.13	
02	4489	.06	.102	.015	.13	.015	.13			
02	4448	.06	.102	.015	.13					
02	4430	Culvert								
02	4364	.015	.08	.1	.08	.13	.06	.13		
02	4252	.06	.015	.08	.1	.08	.13	.06	.13	
02	4139	.06	.015	.08	.1	.08	.06	.13		
01	4009	.08	.015	.08	.1	.08	.06	.13		
01	3940	.08	.1	.08						
01	3882	.08	.1	.06						
01	3812	.08	.1	.08	.06					
01	3722	.08	.1	.08						
01	3629	.015	.08	.1	.08	.015	.06			
01	3540	Culvert								
01	3428	.06	.015	.08	.07	.08	.015			
01	3385	.06	.015	.08	.07	.08	.015			
01	3336	.06	.015	.08	.07	.08				
01	3234	.06	.015	.08	.07	.08				
01	3126	.06	.015	.08	.07	.08				
01	3022	.06	.015	.08	.07	.08				
01	2906	.015	.07	.08						
01	2794	.08	.07	.08						
01	2740	.08	.07	.08						
01	2688	.08	.07	.08						
01	2638	.08	.07	.08						
01	2591	.08	.07	.08						
01	2560	.08	.07	.08						
01	2541	.015	.08	.07	.078	.015				
01	2490	Bridge								
01	2445	.08	.015	.078	.07	.08				
01	2388	.08	.07	.08						
01	2342	.08	.07	.08						
01	2280	.08	.07	.08						
01	2184	.08	.07	.08						
01	2084	.08	.07	.08						
01	2034	.08	.07	.08						
01	1982	.08	.07	.08						
01	1918	.08	.07	.08						
01	1802	.08	.07	.08						
01	1675	.08	.07	.08						
01	1572	.08	.07	.08						
01	1473	.08	.07	.08						
01	1373	.08	.07	.08						
01	1273	.08	.07	.08						
01	1173	.08	.07	.08						
01	1073	.08	.07	.08						
01	975	.08	.07	.08						
01	875	.08	.07	.08						

01	779	.08	.07	.08		
01	680	.08	.07	.08		
01	579	.08	.07	.06		
01	480	.08	.07	.08	.06	
01	378	.08	.07	.08		
01	286	.015	.08	.1	.08	.015
01	210	Culvert				
01	109	.015	.08	.1	.08	.015
01	25	.015	.08	.1	.08	

SUMMARY OF REACH LENGTHS

River: 29th_St_Split

Reach	River Sta.	Left	Channel	Right
1	1539	83.52	83.63	83.71
1	1456	152.42	152.28	152.89
1	1304	106.51	106.66	107.1
1	1197	138.87	126.58	115.37
1	1070	119.59	106.2	89.19
1	964	61.38	66.82	82.18
1	897	127.87	152.89	168.12
1	744	159.38	159.24	159.05
1	585	76.02	55.7	36.35
1	529	144.68	132.29	122.94
1	397	152.41	152.47	152.43
1	245	145.83	150.32	146.03
1	94	34.16	94.33	22.26

River: 30th_St_Split

Reach	River Sta.	Left	Channel	Right
1	875	117.2	117.01	117.03
1	758	114.17	114.17	114.15
1	643	88.22	87.48	87.4
1	556	140.63	84.64	58.04
1	471	99.04	98.69	98.68
1	373	146.33	146.7	146.8
1	226	158.14	158.47	158.55
1	68	33.14	67.51	54.26

River: 35th_St_Split

Reach	River Sta.	Left	Channel	Right
1	346	106.72	106.63	106.54
1	240	74.87	74.95	75.03
1	165	121.13	121.23	121.33
1	43	43.36	43.31	43.27

River: Apartment_Split

Reach	River Sta.	Left	Channel	Right
1	237	130.88	138.11	145.34
1	99	93.35	78.95	64.55
1	20	21.62	20.18	18.73

River: Bear_Bline_Split

Reach	River Sta.	Left	Channel	Right
1	723	141.03	136.81	129.23
1	586	148.47	139.94	127.03
1	446	166.01	183.79	192.35
1	262	159.89	144.54	126.06
1	118	43.67	117.77	66.52

River: Bear_Creek_Split

Reach	River Sta.	Left	Channel	Right
2	4014	192.11	190.25	178.04
2	3824	250.87	250.34	314.02
2	3574	221.95	221.2	220.33
2	3352	133.58	178.63	209.71
2	3174	121.97	120.98	127.66
2	3053	74.72	81.16	62.95
2	2972	207.91	184.1	163.06
2	2787	149.46	150.31	150.41
2	2637	171.16	191.16	222.37
2	2446	169.94	170.19	173.6
2	2276	248.46	229.36	205.24
1	2046	229.22	208.72	192.02
1	1838	258.33	261.2	264.1
1	1577	216.31	222.59	221.65
1	1354	207.12	218.8	223.58
1	1135	165.81	170.19	170.56
1	965	224.38	224.79	225.22
1	740	130.93	130.66	130.48
1	610	164.78	165.03	165.19
1	444	168.97	168.53	168.06
1	276	35.95	275.95	41.95

River: Bluebell

Reach	River Sta.	Left	Channel	Right
1	6245	49.97	49.52	49.23
1	6200	Culvert		

1	6196	83.04	82.62	81.34
1	6113	111.11	115.63	108.43
1	5998	124.84	131.67	125.65
1	5866	193.34	194.43	181.62
1	5672	141.42	144.72	141.82
1	5527	31.59	45.4	39.2
1	5481	27.63	36.35	29.71
1	5445	128.84	123.57	124.57
1	5322	126.69	127.51	130.01
1	5194	37.03	36.98	37.59
1	5157	20.5	20.58	20.9
1	5136	55.31	56.75	60.4
1	5080	160.77	169.22	162.64
1	4910	112.93	117.45	118.9
1	4793	38.24	48.09	51.45
1	4745	19.14	24.64	23.06
1	4720	61.72	49.49	37.76
1	4671	135.7	133.18	129.93
1	4538	122.3	115.59	106
1	4422	143.61	144.43	142.01
1	4278	85.72	81.02	71.73
1	4197	132.27	142.33	142.51
1	4054	127.47	125.59	124.95
1	3929	111.94	120.14	122.34
1	3809	98.04	99.81	94.55
1	3709	101.82	109.63	110.9
1	3599	119.95	119.09	108.97
1	3480	119.68	120.34	121.56
1	3360	73.74	76.18	98.67
1	3283	97.56	68.73	65.09
1	3215	140.54	144.89	139.4
1	3070	97.88	97.77	97.74
1	2972	108.53	108.41	108.38
1	2864	99.79	99.9	99.91
1	2764	141.21	141.02	140.98
1	2623	90.28	90.17	90.14
1	2533	117.51	117.62	117.64
1	2415	131.68	131.21	131.08
1	2284	101.7	102.01	102.1
1	2182	142.71	142.78	142.8
1	2039	113.03	113.22	113.26
1	1926	85.75	86.59	86.83
1	1839	75.4	74.81	74.64
1	1764	114.26	113.7	113.53
1	1651	114.41	114.74	114.83
1	1536	123.19	123.09	123.07
1	1413	133.28	133.14	133.1
1	1280	85.63	85.76	85.79
1	1194	140.75	140.86	140.89
1	1053	138.03	138.03	138.03
1	915	115.6	115.86	115.95
1	799	66.9	67.02	67.06
1	732	133.07	133.31	133.36
1	599	117.94	117.43	117.31
1	481	114.39	114.73	114.81
1	367	78.32	77.41	77.2
1	289	70.02	70.54	70.67
1	219	97.04	97.15	77.98
1	122	12.19	121.54	25.41

River: Bluebell_Spur

	Reach	River Sta.	Left	Channel	Right
1		314	56.24	57.27	59.54
1		256	62.12	73.32	77.44
1		183	91.03	81.45	71.83
1		102	61.35	61.71	63.61
1		40	38.61	39.97	36.47

River: Blue_Ave_Split

	Reach	River Sta.	Left	Channel	Right
1		818	69.19	69.53	69.49
1		748	93.28	93.15	93.13
1		655	91.73	91.46	91.38
1		564	89.35	89.49	89.53
1		474	110.15	110.08	110.06
1		364	112.43	113.05	113.17
1		251	53.26	66.31	69.89
1		185	72.39	97.02	130.28
1		88	13.97	87.84	6.3

River: Denton_Ave_Split

	Reach	River Sta.	Left	Channel	Right
1		534	121.32	120.54	120.47
1		414	130.38	131.08	131.29
1		283	104.06	103.77	103.69
1		179	104.35	103.6	103.54
1		75	47.67	34.78	31.34
1		41	24.45	40.7	19.08

River: Echo_Pl_Split

	Reach	River Sta.	Left	Channel	Right
1		289	74.19	70.5	83.44
1		219	47.46	52.06	89.63
1		167	89.43	90.19	96.85
1		76	17.23	76.47	14.25

River: Euclid_Ave_Split

Reach	River Sta.	Left	Channel	Right
02	1563	118.2	117.88	117.83
02	1445	133.31	133.46	133.56
02	1311	117.9	117.82	117.89
02	1193	89.06	69.04	54.87
02	1124	98.25	88.73	61.6
02	1036	101.33	101.44	101.97
02	934	133.01	133.1	133.53
02	801	102.99	102.8	101.94
02	698	104.77	104.87	105.35
02	593	91.05	90.92	90.3
02	502	80.16	80.21	80.45
02	422	113.87	113.87	113.87
01	308	84.78	84.75	84.75
01	224	97.16	94.52	81.54
01	129	57.54	53.06	37.51
01	76	25.81	76.07	17.23

River: Kings

Reach	River Sta.	Left	Channel	Right
03	3674	100.32	98.96	96.56
03	3575	117.12	116.23	114.02
03	3459	178.73	191.62	180.85
03	3400	Culvert		
03	3268	80.73	88.61	78.08
03	3179	93.97	95.86	96.73
03	3083	93.51	93.01	91.73
03	2990	50.22	51.56	50.47
03	2938	40.72	38.41	38.6
03	2920	Culvert		
03	2900	89.83	79.09	73.12
03	2821	96.02	96.72	97.14
03	2724	96.25	95.78	90.17
03	2628	116.67	124.77	129.49
03	2504	78	71	62
03	2444	56	72	61
03	2396	66.74	66.17	59.48
03	2330	61.36	61.5	61.72
03	2268	93.69	93.18	92.52
03	2175	156.48	156.43	156.58
03	2018	145.42	145.9	146.26
03	1873	138.51	139.4	140.05
03	1733	113.12	112.58	111.43
02	1621	106.14	106.17	106.38
02	1514	95.86	95.85	95.83
02	1419	98.38	98.4	98.52
02	1320	99.56	99.47	99.08
02	1221	140.95	141.16	142.1
02	1079	98.64	98.26	96.43
02	981	108.46	108.65	109.6
02	873	102.08	102.07	102.06
02	771	105.95	105.93	105.8
02	665	103.39	103.35	103.13
02	561	125.95	125.89	125.56
02	435	123.76	123.85	124.44
02	311	96.3	96.37	96.93
01	215	133.42	133.39	133.36
01	82	47.42	81.72	40.49

River: Kings_Split

Reach	River Sta.	Left	Channel	Right
1	775	74.04	74.27	73.66
1	701	120.85	103.58	121.11
1	597	74.6	74.17	77.95
1	523	87.79	107.31	95.37
1	416	95.35	107.35	99.98
1	308	89.77	85.95	83.44
1	222	76.52	72.53	74.78
1	150	55.69	45.12	52.15
1	105	20.7	104.55	11.36

River: Madison_Split

Reach	River Sta.	Left	Channel	Right
1	346	94.37	94.37	94.37
1	252	88.63	88.63	88.63
1	163	118.27	118.27	118.27
1	45	45.05	45.07	45.08

River: Quinn_St_Split

Reach	River Sta.	Left	Channel	Right
02	488	100.14	82.01	76.88
02	406	128.08	128.42	128.56
01	278	82.11	82.56	82.7
01	195	84.99	85.87	86.31
01	109	51.5	68.32	73.68
01	41	16.37	41.16	8.53

River: Skunk

Reach	River Sta.	Left	Channel	Right
06	11882	169.34	168.65	163.34
06	11713	38.41	40.13	42.43
06	11700	Inl Struct		
06	11673	58.34	59.9	59.73
06	11613	88.16	89.17	90.14
06	11583	Inl Struct		

06	11524	68.13	66.63	65.04
06	11457	84.36	92.71	98.1
06	11364	90.83	91.88	93.27
06	11272	91.52	87.9	82.97
06	11185	75.55	74.66	74.45
06	11110	57.55	60.58	63.54
06	11100	Culvert		
06	11049	68.05	68.57	69.3
05	10981	72.5	70.48	60.78
05	10910	39.1	37.38	35.54
05	10890	Bridge		
05	10873	47.85	47.27	46.56
05	10826	46.64	47.32	48.01
05	10778	33.85	32.89	31.65
05	10760	Bridge		
05	10745	23	23.2	22.96
05	10722	61.07	66.82	69.85
05	10700	Culvert		
05	10655	40.07	39.15	37.84
05	10616	60.81	56.68	47.13
05	10560	76.13	71.27	63.55
05	10488	68.83	67.7	64.94
05	10421	103.85	103.84	102.05
05	10317	78.94	78.42	73.46
05	10238	66.77	70.01	74.42
05	10168	95.17	94.82	93.84
05	10073	73.12	76.33	79.94
05	9997	54.03	54.36	50.32
05	9943	47.17	48.62	53.06
04	9894	100.68	100.14	100.49
04	9850	Culvert		
04	9794	14.17	14.17	14.17
04	9780	68.9	70.04	68.66
04	9710	122.63	123.49	124.83
04	9586	141.41	141.97	142.01
04	9444	134.85	140.05	147.98
04	9304	34.97	34.1	34.16
04	9270	24.01	24.08	24.27
04	9260	Culvert		
04	9246	11.4	11.67	12.52
04	9234	52.17	40.03	25.52
04	9194	84.55	85.29	85.93
04	9150	Culvert		
04	9109	33.04	33	32.69
04	9076	35.23	35.25	35.29
04	9041	39.96	39.92	39.93
04	9001	64.39	63.49	63.45
04	8937	64.47	64.46	64.52
04	8873	144.54	160.07	174.67
04	8800	Culvert		
04	8713	62.21	59.31	55.27
04	8654	78.21	77.8	78.74
04	8576	576.51	579.79	576.09
04	7996	7.48	6.82	6.62
04	7989	4.98	5.02	5.16
04	7984	53.96	49.91	50.32
04	7960	Inl Struct		
04	7934	46.32	43.91	44.06
04	7890	60.94	51.65	52.2
04	7839	145.84	133.95	115.27
04	7705	48.72	53.95	69.7
04	7651	16.19	11.57	9.8
04	7639	21.34	17.69	14.42
04	7622	55.66	55.27	54.8
04	7600	Culvert		
04	7566	60.28	88.72	98.67
04	7478	64.15	61.14	46.47
04	7416	99.46	98.14	93.52
04	7318	57.63	58.89	60.73
04	7259	19.38	19.52	20.21
04	7240	24.01	23.9	24.25
04	7230	Bridge		
04	7216	27.3	27.21	28.73
04	7189	75.38	70.79	55.73
04	7118	108.32	78.24	75.98
04	7040	16.47	81.51	97.64
04	6958	78.81	69.65	61.48
04	6889	113.77	107.19	105.2
04	6781	59.78	62.38	61.57
04	6719	17.02	15.47	13.57
04	6704	19.26	18.85	17.61
04	6690	Bridge		
04	6685	20.6	18.75	15.94
04	6666	31.64	30.08	23.62
04	6636	29.21	30.54	33.65
04	6605	73.82	73.27	73.2
04	6570	Culvert		
04	6532	50.7	52.72	53.81
04	6479	56.07	56.31	55.72
04	6423	72.06	93.08	103.03
04	6330	77.04	76.28	74.26
04	6254	100.02	95.85	87.36
04	6158	69.05	70.54	71.03
04	6087	27.6	27.28	26.77
04	6070	Bridge		
04	6060	40.15	36.69	31.6
04	6023	81.45	88.01	92.04
04	5935	86.97	90.7	92.88
04	5845	54.8	56.36	58.66
04	5788	50.62	51.28	52.31
03	5737	82.49	80.52	78.57
03	5700	Culvert		
03	5656	54.41	54.11	53.5
03	5602	66.87	65.84	65.01
03	5536	64.06	67.6	67.43
03	5469	82.55	88.64	83.3
03	5380	89.35	95.23	95.86
03	5285	95.24	94.71	90.39
03	5190	111.75	91.45	76.96
03	5099	51.3	59.91	65.19
03	5075	Culvert		

03	5039	46.24	39.79	32.95
02	4999	45.37	88.5	101.78
02	4911	63.62	62.95	64.23
02	4848	100.67	99.24	99.2
02	4748	108.2	86.44	86.09
02	4662	68.51	67.76	67.41
02	4594	101.61	83.12	62.04
02	4550	Culvert		
02	4511	21.88	22.11	22.41
02	4489	39.2	40.74	41.75
02	4448	84.75	83.98	83.7
02	4430	Culvert		
02	4364	111.92	111.81	109.69
02	4252	113.37	113.32	112.34
02	4139	133.73	129.85	128.85
01	4009	62.12	69.72	73.43
01	3940	59.23	57.33	55.53
01	3882	66.35	69.77	71.05
01	3812	88.89	90.82	91.94
01	3722	95.17	92.61	92.33
01	3629	196.36	201.13	198.77
01	3540	Culvert		
01	3428	37.99	43.31	45.27
01	3385	45.93	48.45	52.13
01	3336	89.34	101.91	119.33
01	3234	88.56	108.29	123.17
01	3126	96.15	104.2	104.9
01	3022	127.98	116.14	81.49
01	2906	112.52	111.84	99.56
01	2794	56.06	53.29	50.59
01	2740	55.37	52.94	50.45
01	2688	52.6	49.09	46.12
01	2638	48.12	47.06	46.73
01	2591	31.17	31.31	31.85
01	2560	19.63	19.19	18.84
01	2541	96.5	96.14	97.34
01	2490	Bridge		
01	2445	62.7	57.24	50.91
01	2388	44.52	45.72	48.41
01	2342	59.19	61.72	60.15
01	2280	94.12	96.33	97.06
01	2184	88.25	99.95	107.76
01	2084	46.3	49.95	52.84
01	2034	46	52.01	55.84
01	1982	54.83	64.06	69.46
01	1918	103.35	116.22	133.63
01	1802	138.61	126.39	105.18
01	1675	115.18	103.14	88.28
01	1572	112.34	98.92	82.48
01	1473	111.41	100.56	88.74
01	1373	105.1	99.28	93.69
01	1273	102.52	100.12	96.99
01	1173	100.7	100.24	99.76
01	1073	113.16	98.28	83.71
01	975	117.21	99.29	79.98
01	875	114.31	96.64	78.12
01	779	102.45	98.81	95.54
01	680	91.15	101.19	111.36
01	579	81.2	98.97	121.01
01	480	81.41	101.26	123.22
01	378	95.13	92.23	92.04
01	286	167.24	177.51	191.45
01	210	Culvert		
01	109	75.79	84.06	91.92
01	25	18.81	24.68	17.46

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 29th_St_Split

Reach	River Sta.	Contr.	Expan.
1	1539	.1	.3
1	1456	.1	.3
1	1304	.1	.3
1	1197	.1	.3
1	1070	.1	.3
1	964	.1	.3
1	897	.1	.3
1	744	.1	.3
1	585	.1	.3
1	529	.1	.3
1	397	.1	.3
1	245	.1	.3
1	94	.1	.3

River: 30th_St_Split

Reach	River Sta.	Contr.	Expan.
1	875	.1	.3
1	758	.1	.3
1	643	.1	.3
1	556	.1	.3
1	471	.1	.3
1	373	.1	.3
1	226	.1	.3
1	68	.1	.3

River: 35th_St_Split

Reach	River Sta.	Contr.	Expan.
1	346	.1	.3
1	240	.1	.3
1	165	.1	.3

1	43	.1	.3

River: Apartment_Split

Reach	River Sta.	Contr.	Expan.
1	237	.1	.3
1	99	.1	.3
1	20	.1	.3

River: Bear_Bline_Split

Reach	River Sta.	Contr.	Expan.
1	723	.1	.3
1	586	.1	.3
1	446	.1	.3
1	262	.1	.3
1	118	.1	.3

River: Bear_Creek_Split

Reach	River Sta.	Contr.	Expan.
2	4014	.1	.3
2	3824	.1	.3
2	3574	.1	.3
2	3352	.1	.3
2	3174	.1	.3
2	3053	.1	.3
2	2972	.1	.3
2	2787	.1	.3
2	2637	.1	.3
2	2446	.1	.3
2	2276	.1	.3
1	2046	.1	.3
1	1838	.1	.3
1	1577	.1	.3
1	1354	.1	.3
1	1135	.1	.3
1	965	.1	.3
1	740	.1	.3
1	610	.1	.3
1	444	.1	.3
1	276	.1	.3

River: Bluebell

Reach	River Sta.	Contr.	Expan.
1	6245	.3	.5
1	6200	Culvert	
1	6196	.1	.3
1	6113	.3	.5
1	5998	.1	.3
1	5866	.1	.3
1	5672	.1	.3
1	5527	.1	.3
1	5481	.1	.3
1	5445	.1	.3
1	5322	.1	.3
1	5194	.1	.3
1	5157	.1	.3
1	5136	.1	.3
1	5080	.1	.3
1	4910	.1	.3
1	4793	.1	.3
1	4745	.3	.5
1	4720	.3	.5
1	4671	.1	.3
1	4538	.1	.3
1	4422	.1	.3
1	4278	.1	.3
1	4197	.1	.3
1	4054	.1	.3
1	3929	.1	.3
1	3809	.1	.3
1	3709	.1	.3
1	3599	.1	.3
1	3480	.1	.3
1	3360	.1	.3
1	3283	.1	.3
1	3215	.1	.3
1	3070	.1	.3
1	2972	.1	.3
1	2864	.1	.3
1	2764	.1	.3
1	2623	.1	.3
1	2533	.1	.3
1	2415	.1	.3
1	2284	.1	.3
1	2182	.1	.3
1	2039	.1	.3
1	1926	.1	.3
1	1839	.1	.3
1	1764	.1	.3
1	1651	.1	.3
1	1536	.1	.3
1	1413	.1	.3
1	1280	.1	.3
1	1194	.1	.3
1	1053	.1	.3
1	915	.1	.3
1	799	.1	.3
1	732	.1	.3
1	599	.1	.3
1	481	.1	.3

1	367	.1	.3
1	289	.1	.3
1	219	.1	.3
1	122	.1	.3

River: Bluebell_Spur

Reach	River Sta.	Contr.	Expan.
1	314	.1	.3
1	256	.1	.3
1	183	.1	.3
1	102	.1	.3
1	40	.1	.3

River: Blue_Ave_Split

Reach	River Sta.	Contr.	Expan.
1	818	.1	.3
1	748	.1	.3
1	655	.1	.3
1	564	.1	.3
1	474	.1	.3
1	364	.1	.3
1	251	.1	.3
1	185	.1	.3
1	88	.1	.3

River: Denton_Ave_Split

Reach	River Sta.	Contr.	Expan.
1	534	.1	.3
1	414	.1	.3
1	283	.1	.3
1	179	.1	.3
1	75	.1	.3
1	41	.1	.3

River: Echo_Pl_Split

Reach	River Sta.	Contr.	Expan.
1	289	.1	.3
1	219	.1	.3
1	167	.1	.3
1	76	.1	.3

River: Euclid_Ave_Split

Reach	River Sta.	Contr.	Expan.
02	1563	.1	.3
02	1445	.1	.3
02	1311	.1	.3
02	1193	.1	.3
02	1124	.1	.3
02	1036	.1	.3
02	934	.1	.3
02	801	.1	.3
02	698	.1	.3
02	593	.1	.3
02	502	.1	.3
02	422	.1	.3
01	308	.1	.3
01	224	.1	.3
01	129	.1	.3
01	76	.1	.3

River: Kings

Reach	River Sta.	Contr.	Expan.
03	3674	.1	.3
03	3575	.1	.3
03	3459	.3	.5
03	3400	Culvert	
03	3268	.3	.5
03	3179	.1	.3
03	3083	.1	.3
03	2990	.1	.3
03	2938	.3	.5
03	2920	Culvert	
03	2900	.3	.5
03	2821	.1	.3
03	2724	.1	.3
03	2628	.1	.3
03	2504	.1	.3
03	2444	.1	.3
03	2396	.1	.3
03	2330	.1	.3
03	2268	.1	.3
03	2175	.1	.3
03	2018	.1	.3
03	1873	.1	.3
03	1733	.1	.3
02	1621	.1	.3
02	1514	.1	.3
02	1419	.1	.3
02	1320	.1	.3
02	1221	.1	.3
02	1079	.1	.3
02	981	.1	.3
02	873	.1	.3

02	771	.1	.3
02	665	.1	.3
02	561	.1	.3
02	435	.1	.3
02	311	.1	.3
01	215	.1	.3
01	82	.1	.3

River: Kings_Split

Reach	River Sta.	Contr.	Expan.
1	775	.1	.3
1	701	.1	.3
1	597	.1	.3
1	523	.1	.3
1	416	.1	.3
1	308	.1	.3
1	222	.1	.3
1	150	.1	.3
1	105	.1	.3

River: Madison_Split

Reach	River Sta.	Contr.	Expan.
1	346	.1	.3
1	252	.1	.3
1	163	.1	.3
1	45	.1	.3

River: Quinn_St_Split

Reach	River Sta.	Contr.	Expan.
02	488	.1	.3
02	406	.1	.3
01	278	.1	.3
01	195	.1	.3
01	109	.1	.3
01	41	.1	.3

River: Skunk

Reach	River Sta.	Contr.	Expan.
06	11882	.1	.3
06	11713	.1	.3
06	11700	Inl Struct	
06	11673	.1	.3
06	11613	.1	.3
06	11583	Inl Struct	
06	11524	.1	.3
06	11457	.1	.3
06	11364	.1	.3
06	11272	.1	.3
06	11185	.1	.3
06	11110	.3	.5
06	11100	Culvert	
06	11049	.3	.5
05	10981	.1	.3
05	10910	.3	.5
05	10890	Bridge	
05	10873	.3	.5
05	10826	.1	.3
05	10778	.3	.5
05	10760	Bridge	
05	10745	.3	.5
05	10722	.3	.5
05	10700	Culvert	
05	10655	.3	.5
05	10616	.1	.3
05	10560	.1	.3
05	10488	.1	.3
05	10421	.1	.3
05	10317	.1	.3
05	10238	.1	.3
05	10168	.1	.3
05	10073	.1	.3
05	9997	.1	.3
05	9943	.1	.3
04	9894	.3	.5
04	9850	Culvert	
04	9794	.3	.5
04	9780	.1	.3
04	9710	.1	.3
04	9586	.1	.3
04	9444	.1	.3
04	9304	.1	.3
04	9270	.3	.5
04	9260	Culvert	
04	9246	.3	.5
04	9234	.1	.3
04	9194	.3	.5
04	9150	Culvert	
04	9109	.3	.5
04	9076	.1	.3
04	9041	.1	.3
04	9001	.1	.3
04	8937	.1	.3
04	8873	.3	.5
04	8800	Culvert	
04	8713	.3	.5
04	8654	.1	.3
04	8576	.3	.5
04	7996	.3	.5
04	7989	.1	.3

04	7984		.3	.5
04	7960	Inl Struct		
04	7934		.3	.5
04	7890		.1	.3
04	7839		.1	.3
04	7705		.1	.3
04	7651		.3	.5
04	7639		.3	.5
04	7622		.3	.5
04	7600	Culvert		
04	7566		.3	.5
04	7478		.1	.3
04	7416		.1	.3
04	7318		.1	.3
04	7259		.1	.3
04	7240		.3	.5
04	7230	Bridge		
04	7216		.3	.5
04	7189		.1	.3
04	7118		.1	.3
04	7040		.1	.3
04	6958		.1	.3
04	6889		.1	.3
04	6781		.1	.3
04	6719		.1	.3
04	6704		.3	.5
04	6690	Bridge		
04	6685		.3	.5
04	6666		.1	.3
04	6636		.1	.3
04	6605		.3	.5
04	6570	Culvert		
04	6532		.3	.5
04	6479		.1	.3
04	6423		.1	.3
04	6330		.1	.3
04	6254		.1	.3
04	6158		.1	.3
04	6087		.3	.5
04	6070	Bridge		
04	6060		.3	.5
04	6023		.1	.3
04	5935		.1	.3
04	5845		.1	.3
04	5788		.1	.3
03	5737		.3	.5
03	5700	Culvert		
03	5656		.3	.5
03	5602		.1	.3
03	5536		.1	.3
03	5469		.1	.3
03	5380		.1	.3
03	5285		.1	.3
03	5190		.1	.3
03	5099		.1	.3
03	5075	Culvert		
03	5039		.1	.3
02	4999		.1	.3
02	4911		.1	.3
02	4848		.3	.5
02	4748		.1	.3
02	4662		.1	.3
02	4594		.3	.5
02	4550	Culvert		
02	4511		.3	.5
02	4489		.1	.3
02	4448		.3	.5
02	4430	Culvert		
02	4364		.3	.5
02	4252		.1	.3
02	4139		.1	.3
01	4009		.1	.3
01	3940		.1	.3
01	3882		.1	.3
01	3812		.1	.3
01	3722		.1	.3
01	3629		.3	.5
01	3540	Culvert		
01	3428		.3	.5
01	3385		.1	.3
01	3336		.1	.3
01	3234		.1	.3
01	3126		.1	.3
01	3022		.1	.3
01	2906		.1	.3
01	2794		.1	.3
01	2740		.1	.3
01	2688		.1	.3
01	2638		.1	.3
01	2591		.1	.3
01	2560		.1	.3
01	2541		.3	.5
01	2490	Bridge		
01	2445		.3	.5
01	2388		.1	.3
01	2342		.1	.3
01	2280		.1	.3
01	2184		.1	.3
01	2084		.1	.3
01	2034		.1	.3
01	1982		.1	.3
01	1918		.1	.3
01	1802		.1	.3
01	1675		.1	.3
01	1572		.1	.3
01	1473		.1	.3
01	1373		.1	.3
01	1273		.1	.3
01	1173		.1	.3
01	1073		.1	.3
01	975		.1	.3

01	875	.1	.3
01	779	.1	.3
01	680	.1	.3
01	579	.1	.3
01	480	.1	.3
01	378	.1	.3
01	286	.3	.5
01	210	Culvert	
01	109	.3	.5
01	25	.1	.3

Profile Output Table - Standard Table 1

River	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
29th_St_Split	1	94	100-yr	97.00	5303.93	5305.01	5305.01	5305.25	0.005093	3.90	24.87	55.58	1.03
29th_St_Split	1	94	FW	97.00	5303.93	5305.13	5305.13	5305.44	0.004507	4.44	21.85	38.00	1.03
29th_St_Split	1	94	10-yr	4.00	5303.93	5304.33	5304.33	5304.42	0.005757	2.48	1.62	8.47	1.00
29th_St_Split	1	94	25-yr	28.00	5303.93	5304.71	5304.71	5304.84	0.005398	2.87	9.76	38.60	1.01
29th_St_Split	1	94	50-yr	60.00	5303.93	5304.89	5304.89	5305.06	0.005418	3.32	18.08	54.24	1.01
29th_St_Split	1	94	500-yr	210.00	5303.93	5305.33	5305.33	5305.70	0.004174	4.87	43.15	59.19	1.00
29th_St_Split	1	245	100-yr	97.00	5306.29	5307.33	5307.33	5307.54	0.005099	3.67	26.60	67.09	0.99
29th_St_Split	1	245	FW	97.00	5306.29	5307.48	5307.48	5307.78	0.004473	4.43	21.88	38.00	1.03
29th_St_Split	1	245	10-yr	4.00	5306.29	5306.69	5306.69	5306.78	0.005663	2.51	1.59	8.09	1.00
29th_St_Split	1	245	25-yr	28.00	5306.29	5307.03	5307.03	5307.15	0.005447	2.82	9.93	39.18	0.99
29th_St_Split	1	245	50-yr	60.00	5306.29	5307.21	5307.21	5307.37	0.005800	3.24	18.51	59.07	1.02
29th_St_Split	1	245	500-yr	210.00	5306.29	5307.62	5307.62	5307.96	0.004738	4.71	47.91	82.18	0.99
29th_St_Split	1	397	100-yr	97.00	5309.31	5310.16	5310.16	5310.35	0.009525	3.87	32.54	105.75	1.17
29th_St_Split	1	397	FW	97.00	5309.31	5310.46	5310.46	5310.75	0.004117	4.32	22.46	38.00	0.99
29th_St_Split	1	397	10-yr	4.00	5309.31	5309.59	5309.59	5309.65	0.007531	2.23	2.80	41.32	1.08
29th_St_Split	1	397	25-yr	28.00	5309.31	5309.90	5309.90	5310.00	0.005443	2.81	14.79	81.84	1.02
29th_St_Split	1	397	50-yr	60.00	5309.31	5310.04	5310.04	5310.19	0.007800	3.41	24.04	93.35	1.09
29th_St_Split	1	397	500-yr	210.00	5309.31	5310.43	5310.43	5310.75	0.007076	4.89	55.05	107.48	1.11
29th_St_Split	1	529	100-yr	97.00	5312.61	5313.72	5313.72	5313.92	0.011618	3.60	27.19	79.55	0.99
29th_St_Split	1	529	FW	97.00	5312.61	5313.96	5313.96	5314.50	0.011595	5.86	16.54	15.00	0.98
29th_St_Split	1	529	10-yr	4.00	5312.61	5312.96	5312.96	5313.03	0.006574	2.15	1.86	11.95	0.96
29th_St_Split	1	529	25-yr	28.00	5312.61	5313.30	5313.30	5313.47	0.011383	3.34	8.39	26.41	1.04
29th_St_Split	1	529	50-yr	60.00	5312.61	5313.56	5313.56	5313.73	0.010873	3.39	17.85	56.85	0.99
29th_St_Split	1	529	500-yr	210.00	5312.61	5313.99	5313.99	5314.30	0.014115	4.45	47.55	106.37	1.02
29th_St_Split	1	585	100-yr	97.00	5313.57	5314.62	5314.38	5314.73	0.019254	2.71	36.93	53.57	0.57
29th_St_Split	1	585	FW	97.00	5313.57	5315.04		5315.17	0.011226	2.96	32.78	25.00	0.46
29th_St_Split	1	585	10-yr	4.00	5313.57	5313.82	5313.79	5313.86	0.057647	1.54	2.59	20.68	0.75
29th_St_Split	1	585	25-yr	28.00	5313.57	5314.21	5314.07	5314.25	0.017838	1.78	16.53	45.91	0.50
29th_St_Split	1	585	50-yr	60.00	5313.57	5314.43	5314.23	5314.50	0.018410	2.32	26.93	49.04	0.54
29th_St_Split	1	585	500-yr	210.00	5313.57	5315.05	5314.73	5315.23	0.020883	3.41	62.36	66.04	0.62
29th_St_Split	1	744	100-yr	97.00	5314.15	5315.70		5315.74	0.003058	1.49	65.84	57.49	0.25
29th_St_Split	1	744	FW	97.00	5314.15	5316.11		5316.18	0.004056	2.15	45.09	25.00	0.28
29th_St_Split	1	744	10-yr	4.00	5314.15	5314.57		5314.57	0.001514	0.40	10.23	39.97	0.14
29th_St_Split	1	744	25-yr	28.00	5314.15	5315.05		5315.06	0.002380	0.91	31.24	48.02	0.20
29th_St_Split	1	744	50-yr	60.00	5314.15	5315.41		5315.43	0.002746	1.23	49.51	53.61	0.23
29th_St_Split	1	744	500-yr	210.00	5314.15	5316.34		5316.40	0.003657	2.02	105.25	66.40	0.28
29th_St_Split	1	897	100-yr	97.00	5321.14	5321.86	5321.86	5322.05	0.005505	3.48	27.85	103.70	0.98
29th_St_Split	1	897	FW	97.00	5321.15	5321.97	5321.97	5322.23	0.004105	4.07	23.85	45.00	0.98
29th_St_Split	1	897	10-yr	4.00	5321.14	5321.40	5321.40	5321.45	0.007133	1.83	2.19	31.77	0.98
29th_St_Split	1	897	25-yr	28.00	5321.14	5321.62	5321.62	5321.71	0.007006	2.45	11.42	94.15	1.03
29th_St_Split	1	897	50-yr	60.00	5321.14	5321.75	5321.75	5321.89	0.005627	2.97	20.22	100.80	0.96
29th_St_Split	1	897	500-yr	210.00	5321.14	5322.11	5322.11	5322.44	0.005533	4.56	46.04	109.80	1.02
29th_St_Split	1	964	100-yr	97.00	5322.95	5324.03	5324.03	5324.29	0.009803	4.03	24.09	55.66	1.06
29th_St_Split	1	964	FW	97.00	5322.95	5324.27	5324.27	5324.82	0.005007	5.93	16.35	15.00	1.00
29th_St_Split	1	964	10-yr	4.00	5322.95	5323.24	5323.24	5323.31	0.011259	2.13	1.88	14.18	1.03
29th_St_Split	1	964	25-yr	28.00	5322.95	5323.58	5323.58	5323.75	0.010070	3.33	8.41	23.31	0.98
29th_St_Split	1	964	50-yr	60.00	5322.95	5323.85	5323.85	5324.07	0.008991	3.77	15.91	33.82	0.97
29th_St_Split	1	964	500-yr	210.00	5322.95	5324.38	5324.38	5324.75	0.006332	4.88	43.06	69.28	1.01
29th_St_Split	1	1070	100-yr	97.00	5326.70	5327.63	5327.63	5327.81	0.008336	3.41	28.46	80.07	1.01
29th_St_Split	1	1070	FW	97.00	5326.70	5327.98	5327.98	5328.42	0.003988	5.27	18.42	22.00	1.01
29th_St_Split	1	1070	10-yr	4.00	5326.70	5327.04	5327.04	5327.12	0.007616	2.24	1.79	11.53	1.00
29th_St_Split	1	1070	25-yr	28.00	5326.70	5327.35	5327.35	5327.47	0.011766	2.81	9.96	42.73	1.03
29th_St_Split	1	1070	50-yr	60.00	5326.70	5327.53	5327.53	5327.66	0.009082	2.88	20.84	74.86	0.96
29th_St_Split	1	1070	500-yr	210.00	5326.70	5327.87	5327.87	5328.16	0.007116	4.35	48.31	85.54	1.02
29th_St_Split	1	1197	100-yr	97.00	5328.50	5329.63	5329.63	5329.87	0.011993	3.92	24.76	53.84	1.02
29th_St_Split	1	1197	FW	97.00	5328.50	5329.77	5329.77	5330.22	0.007729	5.40	17.95	20.00	1.01
29th_St_Split	1	1197	10-yr	4.00	5328.50	5328.88	5328.88	5328.97	0.007162	2.35	1.70	10.72	1.04
29th_St_Split	1	1197	25-yr	28.00	5328.50	5329.27	5329.27	5329.41	0.008178	2.93	9.57	32.85	0.96
29th_St_Split	1	1197	50-yr	60.00	5328.50	5329.47	5329.47	5329.66	0.010908	3.54	16.95	43.03	0.99
29th_St_Split	1	1197	500-yr	210.00	5328.50	5329.96	5329.96	5330.26	0.010445	4.40	47.70	83.03	1.02
29th_St_Split	1	1304	100-yr	97.00	5329.62	5330.63	5330.59	5330.81	0.006778	3.42	29.43	73.18	0.89
29th_St_Split	1	1304	FW	97.00	5329.62	5330.66	5330.63	5330.98	0.006208	4.51	21.50	30.00	0.94
29th_St_Split	1	1304	10-yr	4.00	5329.62	5329.92	5329.92	5329.99	0.006359	2.17	1.85	12.98	1.01
29th_St_Split	1	1304	25-yr	28.00	5329.62	5330.23	5330.23	5330.39	0.008296	3.17	8.83	31.60	1.06
29th_St_Split	1	1304	50-yr	60.00	5329.62	5330.44	5330.44	5330.62	0.007467	3.41	17.60	49.43	1.01
29th_St_Split	1	1304	500-yr	210.00	5329.62	5330.90	5330.88	5331.20	0.007486	4.39	51.16	83.19	0.96
29th_St_Split	1	1456	100-yr	97.00	5331.08	5332.33	5332.33	5332.59	0.006131	4.21	24.72	45.80	1.02
29th_St_Split	1	1456	FW	97.00	5331.08	5332.34	5332.34	5332.81	0.005156	5.49	17.68	20.00	1.03
29th_St_Split	1	1456	10-yr	4.00	5331.08	5331.43	5331.43	5331.52	0.007412	2.36	1.69	9.67	1.00
29th_St_Split	1	1456	25-yr	28.00	5331.08	5331.82	5331.82	5332.01	0.007064	3.51	8.58	23.64	0.99
29th_St_Split	1	1456	50-yr	60.00	5331.08	5332.09	5332.09	5332.34	0.006372	4.08	15.91	31.49	1.01
29th_St_Split	1	1456	500-yr	210.00	5331.08	5332.68	5332.68	5333.11	0.004861	5.33	42.08	50.39	1.04
29th_St_Split	1	1539	100-yr	97.00	5332.21	5333.42	5333.42	5333.70	0.006486	4.21	23.04	44.76	1.03
29th_St_Split	1	1539	FW	97.00	5332.26	5333.78	5333.78	5334.31	0.003723	5.85	16.57	15.00	0.98
29th_St_Split	1	1539	10-yr	4.00	5332.21	5332.54	5332.54	5332.63	0.011874	2.38	1.68	9.81	1.01
29th_St_Split	1	1539	25-yr	28.00	5332.21	5332.98	5332.98	5333.16	0.008814	3.42	8.18	22.74	1.01
29th_St_Split	1	1539	50-yr	60.00	5332.21	5333.26	5333.26	5333.48	0.006700	3.73	16.08	35.99	0.98
29th_St_Split	1	1539	500-yr	210.00	5332.21	5333.80	5333.80	5334.22	0.004349	5.15	40.75	49.48	1.00
30th_St_Split	1	68	100-yr	355.00	5298.69	5300.38	5300.38	5300.82	0.004957	5.31	67.59	88.96	1.02
30th_St_Split	1	68	FW	355.00	5298.72	5300.81	5300.81	5301.53	0.003429	6.81	52.16	37.00	1.01
30th_St_Split	1	68	10-yr	7.00	5298.69	5299.70		5299.70	0.000068	0.37	18.98	57.28	0.11

30th_St_Split	1	68	25-yr	138.00	5298.69	5299.94	5299.94	5300.20	0.004757	4.06	33.95	66.83	1.00
30th_St_Split	1	68	50-yr	245.00	5298.69	5300.19	5300.19	5300.54	0.004810	4.76	51.45	76.38	1.02
30th_St_Split	1	68	500-yr	633.00	5298.69	5300.79	5300.79	5301.40	0.005071	6.26	105.53	97.01	1.01
30th_St_Split	1	226	100-yr	355.00	5300.17	5301.72	5301.72	5302.14	0.004991	5.19	68.38	85.17	1.01
30th_St_Split	1	226	FW	355.00	5300.19	5302.08	5302.08	5302.79	0.003379	6.74	52.71	38.00	1.01
30th_St_Split	1	226	10-yr	7.00	5300.17	5300.60	5300.60	5300.69	0.005712	2.34	3.00	17.78	1.00
30th_St_Split	1	226	25-yr	138.00	5300.17	5301.26	5301.26	5301.52	0.005124	4.06	33.99	66.66	1.00
30th_St_Split	1	226	50-yr	245.00	5300.17	5301.52	5301.52	5301.86	0.004866	4.71	52.02	76.94	1.01
30th_St_Split	1	226	500-yr	633.00	5300.17	5302.12	5302.12	5302.70	0.005270	6.12	105.74	103.24	1.01
30th_St_Split	1	373	100-yr	355.00	5301.62	5303.14	5303.14	5303.56	0.004635	5.19	68.36	83.68	1.01
30th_St_Split	1	373	FW	355.00	5301.62	5303.48	5303.48	5304.19	0.003372	6.73	52.76	38.00	1.01
30th_St_Split	1	373	10-yr	7.00	5301.62	5301.97	5301.97	5302.06	0.005649	2.37	2.96	16.66	0.99
30th_St_Split	1	373	25-yr	138.00	5301.62	5302.68	5302.68	5302.94	0.004691	4.13	33.45	63.72	1.00
30th_St_Split	1	373	50-yr	245.00	5301.62	5302.94	5302.94	5303.29	0.004436	4.70	52.12	76.96	1.01
30th_St_Split	1	373	500-yr	633.00	5301.62	5303.53	5303.53	5304.13	0.005134	6.21	104.46	100.18	1.01
30th_St_Split	1	471	100-yr	355.00	5302.51	5304.06	5304.06	5304.53	0.004376	5.50	64.56	69.83	1.01
30th_St_Split	1	471	FW	355.00	5302.51	5304.40	5304.40	5305.12	0.003354	6.78	52.35	37.00	1.00
30th_St_Split	1	471	10-yr	7.00	5302.51	5302.88	5302.88	5302.96	0.005871	2.30	3.04	18.53	1.00
30th_St_Split	1	471	25-yr	138.00	5302.51	5303.56	5303.56	5303.84	0.005030	4.30	32.07	57.91	1.02
30th_St_Split	1	471	50-yr	245.00	5302.51	5303.83	5303.83	5304.22	0.004608	5.02	48.79	64.73	1.02
30th_St_Split	1	471	500-yr	633.00	5302.51	5304.56	5304.56	5305.15	0.004057	6.19	102.32	85.77	1.00
30th_St_Split	1	556	100-yr	545.00	5304.09	5305.67	5305.67	5306.20	0.004980	5.82	95.46	95.16	1.01
30th_St_Split	1	556	FW	545.00	5304.09	5306.14	5306.14	5306.94	0.003175	7.21	75.64	48.00	1.01
30th_St_Split	1	556	10-yr	7.00	5304.09	5304.44	5304.44	5304.52	0.005668	2.31	3.03	18.23	1.00
30th_St_Split	1	556	25-yr	192.00	5304.09	5305.13	5305.13	5305.41	0.005945	4.23	45.37	85.37	1.02
30th_St_Split	1	556	50-yr	362.00	5304.09	5305.42	5305.42	5305.83	0.005289	5.10	71.66	94.01	1.01
30th_St_Split	1	556	500-yr	1032.00	5304.09	5306.23	5306.23	5307.02	0.004533	7.15	148.47	97.35	1.01
30th_St_Split	1	643	100-yr	545.00	5305.53	5307.07	5307.07	5307.59	0.005157	5.79	97.82	98.63	1.00
30th_St_Split	1	643	FW	545.00	5305.53	5307.50	5307.50	5308.29	0.003159	7.14	76.28	49.00	1.01
30th_St_Split	1	643	10-yr	7.00	5305.53	5305.85	5305.85	5305.94	0.005679	2.42	2.89	15.88	1.00
30th_St_Split	1	643	25-yr	192.00	5305.53	5306.53	5306.53	5306.80	0.006029	4.18	46.12	89.93	1.01
30th_St_Split	1	643	50-yr	362.00	5305.53	5306.81	5306.81	5307.22	0.005560	5.11	72.60	97.73	1.02
30th_St_Split	1	643	500-yr	1032.00	5305.53	5307.62	5307.62	5308.40	0.004716	7.10	152.86	101.29	1.01
30th_St_Split	1	758	100-yr	545.00	5307.63	5309.17	5309.17	5309.71	0.005333	5.91	95.84	92.11	1.00
30th_St_Split	1	758	FW	545.00	5307.63	5309.65	5309.65	5310.48	0.003124	7.34	74.25	45.00	1.01
30th_St_Split	1	758	10-yr	7.00	5307.63	5307.96	5307.96	5308.05	0.005897	2.39	2.93	16.59	1.00
30th_St_Split	1	758	25-yr	192.00	5307.63	5308.60	5308.60	5308.89	0.006470	4.29	45.27	83.76	1.01
30th_St_Split	1	758	50-yr	362.00	5307.63	5308.90	5308.90	5309.32	0.005945	5.23	71.04	89.58	1.01
30th_St_Split	1	758	500-yr	1032.00	5307.63	5309.75	5309.75	5310.56	0.004800	7.25	149.66	95.06	1.01
30th_St_Split	1	875	100-yr	545.00	5309.80	5311.40	5311.40	5311.92	0.004031	5.80	94.94	97.47	1.01
30th_St_Split	1	875	FW	545.00	5309.81	5311.77	5311.77	5312.58	0.003145	7.24	75.31	47.00	1.01
30th_St_Split	1	875	10-yr	7.00	5309.80	5310.12	5310.12	5310.20	0.006139	2.23	3.14	20.27	1.00
30th_St_Split	1	875	25-yr	192.00	5309.80	5310.82	5310.82	5311.12	0.004308	4.41	43.54	74.42	1.02
30th_St_Split	1	875	50-yr	362.00	5309.80	5311.14	5311.14	5311.55	0.004033	5.16	70.11	89.05	1.02
30th_St_Split	1	875	500-yr	1032.00	5309.80	5311.97	5311.97	5312.71	0.003925	6.93	152.76	105.76	1.00
35th_St_Split	1	43	100-yr	134.00	5279.56	5280.57	5280.43	5280.71	0.006010	3.33	50.60	89.13	0.84
35th_St_Split	1	43	FW	134.00	5279.62	5280.81	5280.81	5281.18	0.004442	4.89	27.42	38.00	1.01
35th_St_Split	1	43	10-yr	16.00	5279.56	5279.93	5279.93	5280.04	0.071557	2.88	6.24	32.60	1.30
35th_St_Split	1	43	25-yr	55.00	5279.56	5280.35	5280.20	5280.41	0.006000	2.17	31.21	85.23	0.71
35th_St_Split	1	43	50-yr	86.00	5279.56	5280.45	5280.29	5280.54	0.006001	2.72	39.62	87.10	0.78
35th_St_Split	1	43	500-yr	305.00	5279.56	5280.91	5280.78	5281.20	0.006003	4.68	81.42	94.38	0.94
35th_St_Split	1	165	100-yr	264.00	5280.29	5281.52	5281.52	5281.86	0.007772	4.68	60.00	94.69	1.02
35th_St_Split	1	165	FW	264.00	5280.29	5281.75	5281.75	5282.28	0.004839	5.83	45.29	44.00	1.01
35th_St_Split	1	165	10-yr	59.00	5280.29	5281.10	5281.06	5281.21	0.007056	2.66	22.55	79.49	0.84
35th_St_Split	1	165	25-yr	134.00	5280.29	5281.27	5281.27	5281.49	0.008532	3.81	36.89	86.62	0.99
35th_St_Split	1	165	50-yr	186.00	5280.29	5281.38	5281.38	5281.65	0.008279	4.24	46.36	90.32	1.02
35th_St_Split	1	165	500-yr	501.00	5280.29	5281.88	5281.88	5282.36	0.007244	5.63	95.58	105.77	1.01
35th_St_Split	1	240	100-yr	264.00	5280.74	5282.05		5282.22	0.003138	3.41	84.21	96.98	0.65
35th_St_Split	1	240	FW	264.00	5280.74	5282.25	5282.25	5282.83	0.003585	6.08	43.44	38.00	1.00
35th_St_Split	1	240	10-yr	59.00	5280.74	5281.49		5281.55	0.003187	1.95	33.09	86.42	0.56
35th_St_Split	1	240	25-yr	134.00	5280.74	5281.75		5281.85	0.002922	2.60	56.16	91.40	0.59
35th_St_Split	1	240	50-yr	186.00	5280.74	5281.89		5282.02	0.002954	2.95	68.72	93.53	0.61
35th_St_Split	1	240	500-yr	501.00	5280.74	5282.45		5282.74	0.003414	4.42	125.03	108.03	0.70
35th_St_Split	1	346	100-yr	264.00	5281.22	5282.45	5282.45	5282.96	0.004255	4.94	47.92	50.68	0.92
35th_St_Split	1	346	FW	264.00	5281.23	5282.66	5282.62	5283.19	0.003053	5.80	45.20	38.00	0.96
35th_St_Split	1	346	10-yr	59.00	5281.22	5281.85	5281.85	5282.02	0.003255	2.69	18.71	47.04	0.83
35th_St_Split	1	346	25-yr	134.00	5281.22	5282.09	5282.09	5282.41	0.003881	3.98	30.39	48.30	0.94
35th_St_Split	1	346	50-yr	186.00	5281.22	5282.24	5282.24	5282.65	0.004123	4.47	37.58	48.85	0.94
35th_St_Split	1	346	500-yr	501.00	5281.22	5282.99	5282.99	5283.75	0.004461	5.83	78.53	61.84	0.88
Apartment_Split	1	20	100-yr	204.00	5277.85	5279.48	5279.31	5279.88	0.002483	5.30	49.16	45.29	0.82
Apartment_Split	1	20	FW	204.00	5277.85	5279.79	5279.61	5280.43	0.002769	6.44	31.69	18.00	0.86
Apartment_Split	1	20	10-yr	43.00	5277.85	5279.13	5278.56	5279.17	0.000293	1.52	35.80	43.03	0.27
Apartment_Split	1	20	25-yr	104.00	5277.85	5279.32	5278.90	5279.46	0.000974	3.08	43.06	44.37	0.51
Apartment_Split	1	20	50-yr	147.00	5277.85	5279.42	5279.10	5279.65	0.001479	3.99	47.04	45.08	0.63
Apartment_Split	1	20	500-yr	342.00	5277.85	5279.73	5279.73	5280.52	0.003871	7.38	59.32	46.09	1.04
Apartment_Split	1	99	100-yr	204.00	5278.04	5279.77		5280.07	0.002131	4.44	50.36	54.11	0.74
Apartment_Split	1	99	FW	204.00	5278.04	5280.06		5280.63	0.002025	6.05	33.74	19.00	0.80
Apartment_Split	1	99	10-yr	43.00	5278.04	5279.15		5279.21	0.000763	2.11	20.46	38.85	0.50
Apartment_Split	1	99	25-yr	104.00	5278.04	5279.38		5279.57	0.001765	3.52	30.19	43.23	0.73
Apartment_Split	1	99	50-yr	147.00	5278.04	5279.54		5279.80	0.002092	4.06	38.08	54.11	0.76
Apartment_Split	1	99	500-yr	342.00	5278.04	5280.43		5280.74	0.001497	4.58	86.03	54.11	0.61
Apartment_Split	1	237	100-yr	204.00	5279.31	5280.33		5280.55	0.006287	3.76	55.87	76.49	0.75
Apartment_Split	1	237	FW	204.00	5279.31	5280.58	5280.58	5281.19	0.007156	6.27	32.56	27.00	1.01
Apartment_Split	1	237	10-yr	43.00	5279.31	5279.72	5279.72	5279.86	0.012760	2.96	14.55	53.72	1.00
Apartment_Split	1	237	25-yr	104.00	5279.31	5279.94	5279.94	5280.16	0.011809	3.77	27.66	64.96	1.01
Apartment_Split	1	237	50-yr	147.00	5279.31	5280.10	5280.06	5280.33	0.009368	3.87	38.43	70.94	0.90
Apartment_Split	1	237	500-yr	342.00	5279.31	5280.85		5281.06	0.003574	3.75	96.02	80.25	0.58
Bear_Bline_Split	1	118	100-yr	99.00	5335.71	5336.55	5336.55	5336.75	0.004369	3.60	27.62	70.96	1.01
Bear_Bline_Split	1	118	FW	99.00	5335.71	5336.97	5336.97	5337.51	0.003673	5.90	16.77	15.00	0.98
Bear_Bline_Split	1	118	10-yr	0.10	5335.71	5335.78		5335.78	0.001441	0.49	0.20	4.24	0.40
Bear_Bline_Split	1	118	25-yr	1.00	5335.71	5335.86		5335.89	0.004164	1.30	0.77	8.34	0.76
Bear_Bline_Split	1	118	50-yr	32.00	5335.71	5336.29	5336.29	5336.40	0.005662	2.72	11.75	50.69	1.00
Bear_Bline_Split	1	118	500-yr	230.00	5335.71	5336.85	5336.85	5337.16	0.004450	4.49	52.01	85.84	1.00
Bear_Bline_Split	1	262	100-yr	99.00	5338.05	5338.80	5338.80	5338.98	0.033091	2.40	33.96	99.06	0.67
Bear_Bline_Split	1	262	FW	99.00	5338.26	5339.21	5339.21	5339.60	0.061817	5.04	19.66	25.00	1.00

Bear_Bline_Split	1	262	10-yr	0.10	5338.05	5338.10	5338.10	5338.12	0.131804	0.89	0.11	3.59	0.89
Bear_Bline_Split	1	262	25-yr	1.00	5338.05	5338.19	5338.19	5338.22	0.134532	1.51	0.66	10.01	1.02
Bear_Bline_Split	1	262	50-yr	32.00	5338.05	5338.54	5338.54	5338.66	0.047111	2.08	13.25	57.54	0.74
Bear_Bline_Split	1	262	500-yr	230.00	5338.05	5339.04	5339.04	5339.28	0.024687	2.79	65.22	148.31	0.63
Bear_Bline_Split	1	446	100-yr	99.00	5340.76	5341.55		5341.59	0.008054	1.57	63.28	112.35	0.36
Bear_Bline_Split	1	446	FW	99.00	5340.76	5342.04		5342.10	0.005693	2.04	48.41	40.00	0.33
Bear_Bline_Split	1	446	10-yr	0.10	5340.76	5340.86		5340.86	0.000234	0.05	2.02	42.72	0.04
Bear_Bline_Split	1	446	25-yr	1.00	5340.76	5340.90		5340.90	0.003319	0.26	3.85	49.59	0.16
Bear_Bline_Split	1	446	50-yr	32.00	5340.76	5341.26		5341.28	0.006830	0.97	32.91	100.45	0.30
Bear_Bline_Split	1	446	500-yr	230.00	5340.76	5341.87		5341.95	0.009801	2.28	106.90	161.27	0.42
Bear_Bline_Split	1	586	100-yr	99.00	5341.45	5342.84		5342.92	0.011174	2.39	42.47	52.98	0.45
Bear_Bline_Split	1	586	FW	99.00	5341.45	5343.27		5343.55	0.021108	4.27	23.21	15.00	0.60
Bear_Bline_Split	1	586	10-yr	0.10	5341.45	5341.50	5341.50	5341.51	0.035785	0.51	0.19	5.34	0.48
Bear_Bline_Split	1	586	25-yr	1.00	5341.45	5341.66	5341.57	5341.66	0.010660	0.65	1.53	11.82	0.32
Bear_Bline_Split	1	586	50-yr	32.00	5341.45	5342.39		5342.43	0.010013	1.57	20.65	44.36	0.39
Bear_Bline_Split	1	586	500-yr	230.00	5341.45	5343.34		5343.51	0.012404	3.41	70.86	59.58	0.51
Bear_Bline_Split	1	723	100-yr	99.00	5342.44	5343.79		5343.83	0.004321	1.65	60.61	62.90	0.29
Bear_Bline_Split	1	723	FW	99.00	5342.44	5344.28		5344.32	0.002448	1.62	61.05	37.00	0.22
Bear_Bline_Split	1	723	10-yr	0.10	5342.44	5342.50	5342.50	5342.51	0.219357	0.88	0.11	5.44	1.07
Bear_Bline_Split	1	723	25-yr	1.00	5342.44	5342.62		5342.62	0.004996	0.37	2.68	27.12	0.21
Bear_Bline_Split	1	723	50-yr	32.00	5342.44	5343.25		5343.27	0.004142	1.09	29.44	51.77	0.25
Bear_Bline_Split	1	723	500-yr	230.00	5342.44	5344.41		5344.49	0.004624	2.32	104.09	76.80	0.32
Bear_Creek_Split	1	276	100-yr	235.00	5319.01	5320.30	5320.30	5320.63	0.005324	4.66	51.47	177.36	0.96
Bear_Creek_Split	1	276	FW	235.00	5319.01	5320.60	5320.60	5321.20	0.004165	6.25	37.60	30.00	0.98
Bear_Creek_Split	1	276	10-yr	7.00	5319.01	5319.38	5319.38	5319.48	0.008596	2.53	2.76	58.69	0.99
Bear_Creek_Split	1	276	25-yr	18.00	5319.01	5319.56	5319.56	5319.67	0.008249	2.62	6.86	115.69	1.00
Bear_Creek_Split	1	276	50-yr	97.00	5319.01	5319.96	5319.96	5320.16	0.007722	3.62	26.96	167.81	1.01
Bear_Creek_Split	1	276	500-yr	412.00	5319.01	5320.63	5320.63	5321.07	0.004312	5.44	78.81	189.34	0.93
Bear_Creek_Split	1	444	100-yr	235.00	5320.67	5322.03	5322.03	5322.37	0.007885	4.67	50.28	83.58	1.01
Bear_Creek_Split	1	444	FW	235.00	5320.67	5322.35	5322.35	5322.96	0.006257	6.27	37.51	30.00	0.99
Bear_Creek_Split	1	444	10-yr	7.00	5320.67	5321.17	5321.08	5321.22	0.012697	1.83	3.83	18.08	0.70
Bear_Creek_Split	1	444	25-yr	18.00	5320.67	5321.31	5321.29	5321.41	0.013277	2.54	7.09	29.32	0.91
Bear_Creek_Split	1	444	50-yr	97.00	5320.67	5321.70	5321.70	5321.90	0.008220	3.63	26.71	65.32	1.00
Bear_Creek_Split	1	444	500-yr	412.00	5320.67	5322.34	5322.34	5322.82	0.007766	5.57	74.02	97.44	1.01
Bear_Creek_Split	1	610	100-yr	235.00	5322.12	5323.43	5323.43	5323.77	0.006131	4.66	50.40	134.48	1.00
Bear_Creek_Split	1	610	FW	235.00	5322.12	5323.54	5323.54	5324.06	0.004461	5.77	40.75	40.00	1.01
Bear_Creek_Split	1	610	10-yr	7.00	5322.12	5322.55	5322.48	5322.60	0.005983	1.81	3.86	18.51	0.70
Bear_Creek_Split	1	610	25-yr	18.00	5322.12	5322.73	5322.67	5322.80	0.005671	2.10	8.58	37.57	0.77
Bear_Creek_Split	1	610	50-yr	97.00	5322.12	5323.08	5323.08	5323.29	0.006400	3.67	26.41	81.91	0.98
Bear_Creek_Split	1	610	500-yr	412.00	5322.12	5323.77	5323.77	5324.19	0.004903	5.23	80.03	209.37	0.94
Bear_Creek_Split	1	740	100-yr	235.00	5323.14	5324.50		5324.71	0.008390	3.68	63.92	102.15	0.82
Bear_Creek_Split	1	740	FW	235.00	5323.14	5324.71	5324.71	5325.33	0.007839	6.35	37.03	30.00	1.01
Bear_Creek_Split	1	740	10-yr	7.00	5323.14	5323.54		5323.56	0.009111	1.11	6.30	30.76	0.43
Bear_Creek_Split	1	740	25-yr	18.00	5323.14	5323.68		5323.72	0.009235	1.61	11.20	36.02	0.51
Bear_Creek_Split	1	740	50-yr	97.00	5323.14	5324.13		5324.26	0.008638	2.88	33.72	63.83	0.70
Bear_Creek_Split	1	740	500-yr	412.00	5323.14	5324.72	5324.71	5325.05	0.009002	4.62	91.54	149.71	0.94
Bear_Creek_Split	1	965	100-yr	235.00	5325.08	5326.44	5326.33	5326.64	0.008743	3.60	65.25	115.58	0.79
Bear_Creek_Split	1	965	FW	235.00	5325.08	5326.79	5326.79	5327.49	0.009978	6.72	34.98	25.00	1.00
Bear_Creek_Split	1	965	10-yr	7.00	5325.08	5325.56	5325.44	5325.58	0.008906	1.24	5.66	28.86	0.49
Bear_Creek_Split	1	965	25-yr	18.00	5325.08	5325.72	5325.60	5325.76	0.008887	1.59	11.31	41.45	0.54
Bear_Creek_Split	1	965	50-yr	97.00	5325.08	5326.10	5325.99	5326.22	0.008842	2.69	36.12	84.66	0.70
Bear_Creek_Split	1	965	500-yr	412.00	5325.08	5326.72	5326.59	5327.01	0.008519	4.36	95.22	126.45	0.81
Bear_Creek_Split	1	1135	100-yr	235.00	5326.83	5327.89	5327.75	5328.01	0.007373	2.69	87.41	168.21	0.65
Bear_Creek_Split	1	1135	FW	235.00	5326.83	5328.30	5327.83	5328.39	0.002928	2.48	94.93	90.00	0.42
Bear_Creek_Split	1	1135	10-yr	7.00	5326.83	5327.17	5327.15	5327.21	0.010167	1.68	4.16	33.63	0.84
Bear_Creek_Split	1	1135	25-yr	18.00	5326.83	5327.30	5327.25	5327.35	0.009974	1.86	9.67	51.85	0.76
Bear_Creek_Split	1	1135	50-yr	97.00	5326.83	5327.63	5327.54	5327.70	0.008641	2.11	45.97	148.60	0.67
Bear_Creek_Split	1	1135	500-yr	412.00	5326.83	5328.16	5327.94	5328.31	0.006753	3.12	132.10	205.75	0.64
Bear_Creek_Split	1	1354	100-yr	235.00	5327.47	5329.49	5328.98	5329.54	0.006547	1.74	135.30	173.94	0.34
Bear_Creek_Split	1	1354	FW	235.00	5327.69	5329.50	5329.14	5329.66	0.015701	3.24	72.43	65.00	0.54
Bear_Creek_Split	1	1354	10-yr	7.00	5327.47	5328.23	5327.84	5328.23	0.002698	0.66	10.67	29.17	0.19
Bear_Creek_Split	1	1354	25-yr	18.00	5327.47	5328.52	5328.04	5328.53	0.003371	0.82	21.86	50.27	0.22
Bear_Creek_Split	1	1354	50-yr	97.00	5327.47	5329.12	5328.60	5329.15	0.005255	1.24	78.10	135.46	0.29
Bear_Creek_Split	1	1354	500-yr	412.00	5327.47	5329.80	5329.23	5329.87	0.007536	2.08	195.22	221.03	0.38
Bear_Creek_Split	1	1577	100-yr	235.00	5329.08	5330.76	5330.30	5330.81	0.005123	1.70	133.71	166.97	0.31
Bear_Creek_Split	1	1577	FW	235.00	5329.08	5331.25	5330.38	5331.33	0.004301	2.29	102.82	64.00	0.32
Bear_Creek_Split	1	1577	10-yr	7.00	5329.08	5329.51	5329.41	5329.54	0.021165	1.29	5.42	25.25	0.49
Bear_Creek_Split	1	1577	25-yr	18.00	5329.08	5329.78	5329.56	5329.80	0.011573	1.23	14.58	46.13	0.39
Bear_Creek_Split	1	1577	50-yr	97.00	5329.08	5330.38	5330.04	5330.40	0.006132	1.30	74.45	142.15	0.31
Bear_Creek_Split	1	1577	500-yr	412.00	5329.08	5331.08	5330.48	5331.16	0.004596	1.97	191.14	197.18	0.31
Bear_Creek_Split	1	1838	100-yr	235.00	5331.59	5333.06	5333.06	5333.40	0.003565	4.67	54.56	160.92	0.94
Bear_Creek_Split	1	1838	FW	235.00	5331.59	5333.46	5333.46	5334.16	0.003325	6.73	34.93	25.00	1.00
Bear_Creek_Split	1	1838	10-yr	7.00	5331.59	5332.10	5332.10	5332.22	0.005732	2.81	2.49	15.43	1.03
Bear_Creek_Split	1	1838	25-yr	18.00	5331.59	5332.33	5332.33	5332.42	0.006262	2.41	7.46	63.12	1.03
Bear_Creek_Split	1	1838	50-yr	97.00	5331.59	5332.69	5332.69	5332.90	0.003839	3.68	26.36	114.55	0.97
Bear_Creek_Split	1	1838	500-yr	412.00	5331.59	5333.39	5333.39	5333.85	0.003457	5.58	87.84	165.17	0.95
Bear_Creek_Split	1	2046	100-yr	235.00	5333.92	5334.76	5334.76	5334.99	0.016899	3.83	61.31	129.61	0.98
Bear_Creek_Split	1	2046	FW	235.00	5333.92	5335.26	5335.26	5335.76	0.003558	5.71	41.19	40.00	0.99
Bear_Creek_Split	1	2046	10-yr	7.00	5333.92	5334.17	5334.17	5334.21	0.013377	1.54	4.56	63.86	1.01
Bear_Creek_Split	1	2046	25-yr	18.00	5333.92	5334.24	5334.23	5334.30	0.013883	1.86	9.67	74.06	0.91
Bear_Creek_Split	1	2046	50-yr	97.00	5333.92	5334.48	5334.48	5334.64	0.020373	3.23	30.07	96.24	1.02
Bear_Creek_Split	1	2046	500-yr	412.00	5333.92	5334.99	5334.99	5335.28	0.015389	4.32	95.30	165.47	1.00
Bear_Creek_Split	2	2276	100-yr	180.00	5335.12	5336.15	5335.97	5336.26	0.002279	2.68	67.28	124.63	0.64
Bear_Creek_Split	2	2276	FW	180.00	5335.17	5336.32	5336.32	5336.73	0.003475	5.17	34.83	40.00	0.98
Bear_Creek_Split	2	2276	10-yr	0.10	5335.12	5335.35	5335.18	5335.35	0.000006	0.04	2.83	32.64	0.02
Bear_Creek_Split	2	2276	25-yr	5.00	5335.12	5335.46	5335.36	5335.47	0.000882	0.72	6.95	41.93	0.31
Bear_Creek_Split	2	2276	50-yr	60.00	5335.12	5335.84	5335.68	5335.89	0.001702	1.72	34.79	94.57	0.50
Bear_Creek_Split	2	2276	500-yr	374.00	5335.12	5336.44	5336.27	5336.63	0.002914	3.53	106.05	143.31	0.72
Bear_Creek_Split	2	2446	100-yr	180.00	5337.10	5337.98	5337.98	5338.27	0.006175	4.32	41.63	131.27	1.05
Bear_Creek_Split	2	2446	FW	180.00	5337.13	5338.41	5338.41	5338.84	0.003714	5.27	34.14	40.00	1.01
Bear_Creek_Split	2	2446	10-yr	0.10	5337.10	5337.16	5337.16	5337.17	0.013416	1.02	0.10	3.68	1.10
Bear_Creek_Split	2	2446	25-yr	5.00	5337.10	5337.34	5337.34	5337.39	0.010274	1.85	2.70	54.38	1.00
Bear_Creek_Split	2	2446	50-yr	60.00	5337.10	5337.69	5337.69	5337.83	0.007090	2.99	20.10	107.90	1.00
Bear_Creek_Split	2	2446	500-yr	374.00	5337.10	5338.35	5338.35	5338.76	0.004818	5.11	73.25	179.54	0.99
Bear_Creek_Split	2	2637	100-yr	180.00	5339.48	5340.47	5340.41	5340.71	0.040377	3.98	46.36	72.57	0.83

Bear_Creek_Split	2	2637	FW	180.00	5339.48	5340.90	5340.90	5341.59	0.056453	6.65	27.08	20.00	1.01
Bear_Creek_Split	2	2637	10-yr	0.10	5339.48	5339.51	5339.51	5339.52	0.306676	0.93	0.11	6.09	1.23
Bear_Creek_Split	2	2637	25-yr	5.00	5339.48	5339.77	5339.67	5339.78	0.015430	0.91	5.50	34.29	0.40
Bear_Creek_Split	2	2637	50-yr	60.00	5339.48	5340.17	5340.06	5340.25	0.028417	2.33	25.83	63.94	0.64
Bear_Creek_Split	2	2637	500-yr	374.00	5339.48	5340.83	5340.83	5341.25	0.041575	5.28	75.24	87.80	0.89
Bear_Creek_Split	2	2787	100-yr	180.00	5341.25	5342.89	5342.35	5342.99	0.007769	2.63	72.79	65.42	0.40
Bear_Creek_Split	2	2787	FW	180.00	5341.25	5343.38	5342.37	5343.49	0.005206	2.63	68.34	35.00	0.33
Bear_Creek_Split	2	2787	10-yr	0.10	5341.25	5341.32	5341.28	5341.32	0.003673	0.19	0.53	12.15	0.16
Bear_Creek_Split	2	2787	25-yr	5.00	5341.25	5341.58	5341.44	5341.59	0.009658	0.84	5.95	29.26	0.33
Bear_Creek_Split	2	2787	50-yr	60.00	5341.25	5342.27	5341.88	5342.31	0.008006	1.78	34.48	55.30	0.37
Bear_Creek_Split	2	2787	500-yr	374.00	5341.25	5343.50	5342.82	5343.68	0.008404	3.52	112.10	65.42	0.45
Bear_Creek_Split	2	2972	100-yr	284.00	5343.82	5344.86	5344.54	5344.95	0.013424	2.33	122.14	167.35	0.48
Bear_Creek_Split	2	2972	FW	284.00	5343.83	5345.27	5344.95	5345.55	0.021299	4.24	67.00	50.00	0.65
Bear_Creek_Split	2	2972	10-yr	0.10	5343.82	5343.85	5343.85	5343.85	0.428497	0.73	0.14	14.28	1.32
Bear_Creek_Split	2	2972	25-yr	7.00	5343.82	5344.01	5343.95	5344.02	0.017065	0.76	9.21	80.80	0.40
Bear_Creek_Split	2	2972	50-yr	98.00	5343.82	5344.45	5344.24	5344.49	0.015805	1.71	57.30	140.61	0.47
Bear_Creek_Split	2	2972	500-yr	608.00	5343.82	5345.38	5344.88	5345.51	0.011125	2.83	214.84	192.88	0.47
Bear_Creek_Split	2	3053	100-yr	284.00	5344.56	5345.73	5345.32	5345.78	0.008056	1.81	156.62	217.58	0.37
Bear_Creek_Split	2	3053	FW	284.00	5344.56	5346.23	5345.53	5346.29	0.004925	2.05	138.25	105.00	0.32
Bear_Creek_Split	2	3053	10-yr	0.10	5344.56	5344.67	5344.62	5344.67	0.002914	0.16	0.61	14.09	0.14
Bear_Creek_Split	2	3053	25-yr	7.00	5344.56	5344.88	5344.79	5344.88	0.007312	0.56	12.52	92.19	0.27
Bear_Creek_Split	2	3053	50-yr	98.00	5344.56	5345.33	5345.07	5345.36	0.007847	1.26	78.00	184.97	0.34
Bear_Creek_Split	2	3053	500-yr	608.00	5344.56	5346.18	5345.62	5346.27	0.007894	2.35	257.70	237.20	0.39
Bear_Creek_Split	2	3174	100-yr	284.00	5355.66	5356.24	5356.24	5356.43	0.004892	3.46	82.11	232.32	1.03
Bear_Creek_Split	2	3174	FW	284.00	5355.66	5356.37	5356.37	5356.68	0.003900	4.43	64.17	105.00	1.00
Bear_Creek_Split	2	3174	10-yr	0.10	5355.66	5355.68	5355.68	5355.69	0.019044	0.69	0.15	12.99	1.14
Bear_Creek_Split	2	3174	25-yr	7.00	5355.66	5355.79	5355.79	5355.82	0.009651	1.51	4.65	76.36	1.08
Bear_Creek_Split	2	3174	50-yr	98.00	5355.66	5356.04	5356.04	5356.14	0.005630	2.50	39.15	200.02	1.00
Bear_Creek_Split	2	3174	500-yr	608.00	5355.66	5356.49	5356.49	5356.75	0.003471	4.16	152.86	302.97	0.94
Bear_Creek_Split	2	3352	100-yr	284.00	5350.71	5356.48	5353.41	5356.51	0.000157	0.43	269.81	104.15	0.04
Bear_Creek_Split	2	3352	FW	284.00	5350.71	5356.74	5353.42	5356.79	0.000200	0.55	245.53	75.00	0.05
Bear_Creek_Split	2	3352	10-yr	0.10	5350.71	5355.69	5350.75	5355.69	0.000000	0.00	189.35	100.07	0.00
Bear_Creek_Split	2	3352	25-yr	7.00	5350.71	5355.83	5351.20	5355.83	0.000000	0.02	202.94	100.86	0.00
Bear_Creek_Split	2	3352	50-yr	98.00	5350.71	5356.16	5352.36	5356.17	0.000031	0.19	237.01	103.18	0.02
Bear_Creek_Split	2	3352	500-yr	608.00	5350.71	5356.79	5354.63	5356.93	0.000464	0.77	302.67	105.12	0.07
Bear_Creek_Split	2	3574	100-yr	284.00	5354.05	5356.17	5356.17	5356.90	0.105246	6.83	41.61	28.45	0.99
Bear_Creek_Split	2	3574	FW	284.00	5354.05	5356.64	5356.17	5357.05	0.043839	5.20	54.74	28.45	0.66
Bear_Creek_Split	2	3574	10-yr	0.10	5354.05	5355.69	5354.09	5355.69	0.000000	0.00	28.77	24.71	0.00
Bear_Creek_Split	2	3574	25-yr	7.00	5354.05	5355.83	5354.35	5355.83	0.000133	0.22	32.17	25.77	0.03
Bear_Creek_Split	2	3574	50-yr	98.00	5354.05	5356.13	5355.26	5356.22	0.013896	2.44	40.24	28.08	0.36
Bear_Creek_Split	2	3574	500-yr	608.00	5354.05	5357.34	5357.34	5357.92	0.042000	5.94	102.10	101.81	0.68
Bear_Creek_Split	2	3824	100-yr	284.00	5355.03	5357.71	5356.12	5357.74	0.000919	1.39	204.93	197.79	0.17
Bear_Creek_Split	2	3824	FW	284.00	5355.03	5357.99	5356.18	5358.05	0.001319	2.03	140.01	50.00	0.21
Bear_Creek_Split	2	3824	10-yr	0.10	5355.03	5355.69	5355.09	5355.69	0.000000	0.00	27.41	64.39	0.00
Bear_Creek_Split	2	3824	25-yr	7.00	5355.03	5355.85	5355.25	5355.85	0.000089	0.18	38.35	70.32	0.04
Bear_Creek_Split	2	3824	50-yr	98.00	5355.03	5356.71	5355.69	5356.73	0.000767	0.87	112.57	104.39	0.14
Bear_Creek_Split	2	3824	500-yr	608.00	5355.03	5358.77	5356.61	5358.83	0.001171	1.99	305.63	220.47	0.20
Bear_Creek_Split	2	4014	100-yr	284.00	5355.34	5357.93		5358.14	0.005473	3.69	77.02	36.99	0.45
Bear_Creek_Split	2	4014	FW	284.00	5355.34	5358.30		5358.46	0.003315	3.13	90.76	36.99	0.35
Bear_Creek_Split	2	4014	10-yr	0.10	5355.34	5355.69		5355.69	0.000003	0.02	4.53	25.69	0.01
Bear_Creek_Split	2	4014	25-yr	7.00	5355.34	5355.89		5355.90	0.001436	0.70	10.02	28.29	0.21
Bear_Creek_Split	2	4014	50-yr	98.00	5355.34	5356.94		5357.02	0.003536	2.32	42.28	33.11	0.36
Bear_Creek_Split	2	4014	500-yr	608.00	5355.34	5359.01		5359.38	0.007488	4.96	132.84	93.90	0.52
Bluebell	1	122	100-yr	151.00	5390.27	5391.98		5392.04	0.000626	2.05	96.40	72.11	0.32
Bluebell	1	122	FW	151.00	5390.27	5392.44		5392.68	0.000792	3.89	38.80	20.00	0.49
Bluebell	1	122	10-yr	16.00	5390.27	5390.66	5390.66	5390.76	0.007165	2.55	8.30	48.34	1.02
Bluebell	1	122	25-yr	65.00	5390.27	5391.12	5390.93	5391.20	0.003163	2.42	35.72	68.23	0.60
Bluebell	1	122	50-yr	100.00	5390.27	5391.47		5391.54	0.001301	2.19	60.10	69.67	0.42
Bluebell	1	122	500-yr	254.00	5390.27	5393.07		5393.11	0.000193	1.69	202.34	124.63	0.20
Bluebell	1	219	100-yr	151.00	5391.99	5392.99	5392.99	5393.31	0.004865	4.58	40.71	77.10	0.99
Bluebell	1	219	FW	151.00	5391.99	5393.14	5393.14	5393.63	0.003637	5.62	26.86	28.00	1.01
Bluebell	1	219	10-yr	16.00	5391.99	5392.38	5392.38	5392.47	0.006893	2.46	6.51	34.86	1.00
Bluebell	1	219	25-yr	65.00	5391.99	5392.67	5392.67	5392.88	0.005315	3.67	17.82	48.26	1.01
Bluebell	1	219	50-yr	100.00	5391.99	5392.82	5392.82	5393.08	0.005088	4.12	27.49	73.09	0.99
Bluebell	1	219	500-yr	254.00	5391.99	5393.26	5393.26	5393.70	0.004769	5.46	61.01	77.10	1.00
Bluebell	1	289	100-yr	151.00	5394.27	5395.27	5395.27	5395.58	0.004444	4.51	33.79	55.39	0.98
Bluebell	1	289	FW	151.00	5394.27	5395.46	5395.46	5395.95	0.003795	5.63	26.83	28.00	1.01
Bluebell	1	289	10-yr	16.00	5394.27	5394.68	5394.68	5394.77	0.006799	2.41	6.65	38.74	1.02
Bluebell	1	289	25-yr	65.00	5394.27	5394.96	5394.96	5395.15	0.004747	3.54	18.34	46.65	1.00
Bluebell	1	289	50-yr	100.00	5394.27	5395.09	5395.09	5395.35	0.004808	4.07	24.55	49.33	1.02
Bluebell	1	289	500-yr	254.00	5394.27	5395.53	5395.53	5395.97	0.004528	5.29	50.55	70.26	1.00
Bluebell	1	367	100-yr	151.00	5396.92	5397.91	5397.91	5398.23	0.004341	4.54	33.84	58.82	1.01
Bluebell	1	367	FW	151.00	5396.92	5398.12	5398.12	5398.60	0.003750	5.61	26.92	28.00	1.01
Bluebell	1	367	10-yr	16.00	5396.92	5397.33	5397.33	5397.42	0.006233	2.40	6.66	37.70	1.01
Bluebell	1	367	25-yr	65.00	5396.92	5397.61	5397.61	5397.81	0.004623	3.62	17.95	44.15	1.00
Bluebell	1	367	50-yr	100.00	5396.92	5397.76	5397.76	5398.00	0.004164	3.99	25.10	51.83	1.00
Bluebell	1	367	500-yr	254.00	5396.92	5398.18	5398.18	5398.62	0.004367	5.28	51.00	70.98	1.00
Bluebell	1	481	100-yr	151.00	5400.82	5401.84	5401.84	5402.17	0.004417	4.66	35.50	82.74	1.00
Bluebell	1	481	FW	151.00	5400.82	5402.01	5402.01	5402.48	0.003762	5.48	27.56	30.00	1.01
Bluebell	1	481	10-yr	16.00	5400.82	5401.27	5401.27	5401.35	0.006072	2.34	6.84	38.97	0.98
Bluebell	1	481	25-yr	65.00	5400.82	5401.53	5401.53	5401.73	0.004754	3.58	18.29	60.97	1.00
Bluebell	1	481	50-yr	100.00	5400.82	5401.68	5401.68	5401.93	0.004246	3.99	26.29	73.11	0.96
Bluebell	1	481	500-yr	254.00	5400.82	5402.14	5402.14	5402.58	0.003907	5.33	56.31	97.39	0.97
Bluebell	1	599	100-yr	151.00	5405.29	5406.41	5406.41	5406.74	0.036056	4.61	34.37	64.20	0.97
Bluebell	1	599	FW	151.00	5405.30	5406.60	5406.60	5407.08	0.003609	5.54	27.25	28.00	0.99
Bluebell	1	599	10-yr	16.00	5405.29	5405.81	5405.81	5405.89	0.007292	2.36	6.79	37.49	0.98
Bluebell	1	599	25-yr	65.00	5405.29	5406.06	5406.06	5406.29	0.025475	3.83	16.97	41.29	1.05
Bluebell	1	599	50-yr	100.00	5405.29	5406.24	5406.24	5406.50	0.038191	4.07	24.86	53.91	0.98
Bluebell	1	599	500-yr	254.00	5405.29	5406.71	5406.71	5407.12	0.035140	5.24	56.61	80.06	0.94
Bluebell	1	732	100-yr	151.00	5410.70	5411.68	5411.68	5412.01	0.003953	4.59	33.15	53.87	1.00
Bluebell	1	732	FW	151.00	5410.70	5411.87	5411.87	5412.35	0.003750	5.61	26.89	28.00	1.01
Bluebell	1	732	10-yr	16.00	5410.70	5411.09	5411.09	5411.18	0.005645	2.40	6.67	36.62	0.99
Bluebell	1	732	25-yr	65.00	5410.70	5411.36	5411.36	5411.57	0.004435	3.68	17.64	43.78	1.02
Bluebell	1	732	50-yr	100.00	5410.70	5411.51	5411.51	5411.77	0.003950	4.06	24.63	49.32	1.01
Bluebell	1	732	500-yr	254.00	5410.70	5411.95	5411.95	5412.40	0.003933	5.37	48.75	59.93	1.01

Bluebell	1	799	100-yr	151.00	5413.50	5414.47	5414.47	5414.82	0.003931	4.77	31.67	80.19	0.99
Bluebell	1	799	FW	151.00	5413.50	5414.69	5414.69	5415.16	0.003506	5.49	27.49	28.00	0.98
Bluebell	1	799	10-yr	16.00	5413.50	5413.87	5413.87	5413.97	0.006460	2.46	6.50	69.48	1.05
Bluebell	1	799	25-yr	65.00	5413.50	5414.15	5414.15	5414.35	0.004423	3.61	17.98	78.76	0.98
Bluebell	1	799	50-yr	100.00	5413.50	5414.28	5414.28	5414.56	0.004328	4.22	23.71	79.37	1.00
Bluebell	1	799	500-yr	254.00	5413.50	5414.77	5414.77	5415.26	0.003596	5.61	45.27	81.54	0.99
Bluebell	1	915	100-yr	220.00	5417.01	5418.29	5418.29	5418.68	0.007327	5.09	52.71	71.83	1.03
Bluebell	1	915	FW	220.00	5417.01	5418.68	5418.68	5419.29	0.003740	6.24	35.26	30.00	1.01
Bluebell	1	915	10-yr	25.00	5417.01	5417.64	5417.64	5417.76	0.008280	2.88	9.69	46.34	1.00
Bluebell	1	915	25-yr	90.00	5417.01	5417.94	5417.94	5418.16	0.008685	3.85	27.98	67.40	1.03
Bluebell	1	915	50-yr	144.00	5417.01	5418.09	5418.09	5418.40	0.008030	4.48	38.89	69.99	1.04
Bluebell	1	915	500-yr	401.00	5417.01	5418.67	5418.67	5419.24	0.006612	6.18	80.42	74.64	1.02
Bluebell	1	1053	100-yr	220.00	5419.90	5421.40	5421.40	5421.81	0.058642	5.19	43.42	57.47	1.00
Bluebell	1	1053	FW	220.00	5419.95	5421.72	5421.72	5422.32	0.003644	6.22	35.40	30.00	1.01
Bluebell	1	1053	10-yr	25.00	5419.90	5420.62	5420.62	5420.76	0.054010	3.08	8.11	25.81	0.97
Bluebell	1	1053	25-yr	90.00	5419.90	5421.00	5421.00	5421.24	0.055905	3.92	22.95	47.06	0.99
Bluebell	1	1053	50-yr	144.00	5419.90	5421.18	5421.18	5421.51	0.057913	4.58	31.60	51.16	1.00
Bluebell	1	1053	500-yr	401.00	5419.90	5421.83	5421.83	5422.40	0.048582	6.14	69.99	65.50	0.96
Bluebell	1	1194	100-yr	220.00	5424.69	5426.06	5426.06	5426.46	0.004433	5.04	43.88	58.74	1.00
Bluebell	1	1194	FW	220.00	5424.72	5426.41	5426.41	5427.04	0.003632	6.37	34.51	28.00	1.01
Bluebell	1	1194	10-yr	25.00	5424.69	5425.36	5425.36	5425.47	0.006238	2.68	9.31	40.96	0.99
Bluebell	1	1194	25-yr	90.00	5424.69	5425.66	5425.66	5425.91	0.004871	3.97	22.65	47.11	1.01
Bluebell	1	1194	50-yr	144.00	5424.69	5425.85	5425.85	5426.17	0.004530	4.49	32.05	52.52	1.01
Bluebell	1	1194	500-yr	401.00	5424.69	5426.46	5426.46	5427.02	0.004475	6.05	68.95	68.72	1.01
Bluebell	1	1280	100-yr	143.00	5428.67	5429.68	5429.68	5429.99	0.006799	4.45	32.11	54.95	1.03
Bluebell	1	1280	FW	143.00	5428.67	5430.01	5430.01	5430.48	0.003834	5.50	26.02	28.00	1.00
Bluebell	1	1280	10-yr	18.00	5428.67	5429.12	5429.12	5429.24	0.008267	2.78	6.47	26.89	1.00
Bluebell	1	1280	25-yr	63.00	5428.67	5429.41	5429.41	5429.60	0.007893	3.49	18.07	48.39	1.01
Bluebell	1	1280	50-yr	96.00	5428.67	5429.54	5429.54	5429.78	0.007019	3.93	24.45	51.17	1.00
Bluebell	1	1280	500-yr	251.00	5428.67	5429.97	5429.97	5430.38	0.006039	5.12	50.26	68.40	1.00
Bluebell	1	1413	100-yr	143.00	5434.07	5435.21	5435.21	5435.51	0.005709	4.39	32.60	61.18	0.97
Bluebell	1	1413	FW	143.00	5434.12	5435.58	5435.58	5436.05	0.003773	5.52	25.90	27.00	0.99
Bluebell	1	1413	10-yr	18.00	5434.07	5434.58	5434.58	5434.71	0.006715	2.88	6.24	22.88	0.97
Bluebell	1	1413	25-yr	63.00	5434.07	5434.92	5434.92	5435.10	0.006968	3.44	18.29	46.71	0.97
Bluebell	1	1413	50-yr	96.00	5434.07	5435.04	5435.04	5435.28	0.006653	3.99	24.06	48.61	1.00
Bluebell	1	1413	500-yr	251.00	5434.07	5435.50	5435.50	5435.92	0.005352	5.22	52.80	73.27	0.97
Bluebell	1	1536	100-yr	143.00	5441.13	5442.34	5442.34	5442.69	0.033075	4.75	30.11	41.53	0.98
Bluebell	1	1536	FW	143.00	5441.13	5442.59	5442.59	5443.04	0.003821	5.41	26.42	29.00	1.00
Bluebell	1	1536	10-yr	18.00	5441.13	5441.68	5441.68	5441.82	0.069747	3.00	6.00	22.91	1.03
Bluebell	1	1536	25-yr	63.00	5441.13	5442.02	5442.02	5442.23	0.034792	3.67	17.16	40.79	1.00
Bluebell	1	1536	50-yr	96.00	5441.13	5442.17	5442.17	5442.44	0.032575	4.15	23.14	41.13	0.97
Bluebell	1	1536	500-yr	251.00	5441.13	5442.67	5442.67	5443.17	0.034061	5.68	44.39	43.63	0.98
Bluebell	1	1651	100-yr	159.00	5444.45	5445.56	5445.56	5445.87	0.006867	4.44	36.83	65.31	0.99
Bluebell	1	1651	FW	159.00	5444.45	5445.92	5445.92	5446.40	0.003575	5.60	28.41	28.00	0.98
Bluebell	1	1651	10-yr	20.00	5444.45	5444.95	5444.95	5445.07	0.008911	2.83	7.08	29.75	1.02
Bluebell	1	1651	25-yr	73.00	5444.45	5445.26	5445.26	5445.47	0.009012	3.68	19.89	49.68	1.01
Bluebell	1	1651	50-yr	111.00	5444.45	5445.40	5445.40	5445.67	0.007890	4.12	27.37	59.60	1.03
Bluebell	1	1651	500-yr	250.00	5444.45	5445.79	5445.79	5446.19	0.006541	5.09	52.26	71.07	0.97
Bluebell	1	1764	100-yr	159.00	5450.44	5451.61	5451.61	5451.95	0.008294	4.73	34.83	59.32	1.02
Bluebell	1	1764	FW	159.00	5450.44	5451.91	5451.91	5452.40	0.003855	5.59	28.43	30.00	1.01
Bluebell	1	1764	10-yr	20.00	5450.44	5450.99	5450.99	5451.12	0.009532	2.88	6.95	27.35	1.01
Bluebell	1	1764	25-yr	73.00	5450.44	5451.33	5451.33	5451.54	0.010125	3.68	19.87	51.53	1.03
Bluebell	1	1764	50-yr	111.00	5450.44	5451.47	5451.47	5451.74	0.008623	4.15	27.12	53.63	1.00
Bluebell	1	1764	500-yr	250.00	5450.44	5451.85	5451.85	5452.30	0.007262	5.43	50.25	66.17	1.00
Bluebell	1	1839	100-yr	159.00	5454.74	5455.93	5455.93	5456.29	0.060813	4.85	33.44	46.86	1.01
Bluebell	1	1839	FW	159.00	5454.74	5456.29	5456.29	5456.80	0.003880	5.72	27.80	28.00	1.01
Bluebell	1	1839	10-yr	20.00	5454.74	5455.26	5455.26	5455.39	0.126716	2.93	6.89	27.72	1.01
Bluebell	1	1839	25-yr	73.00	5454.74	5455.62	5455.62	5455.85	0.070685	3.85	19.35	43.02	1.01
Bluebell	1	1839	50-yr	111.00	5454.74	5455.76	5455.76	5456.06	0.066566	4.39	25.80	46.31	1.04
Bluebell	1	1839	500-yr	250.00	5454.74	5456.18	5456.18	5456.67	0.058701	5.61	45.48	47.76	1.01
Bluebell	1	1926	100-yr	191.00	5459.31	5460.50	5460.50	5460.83	0.005193	4.66	45.60	83.41	0.98
Bluebell	1	1926	FW	191.00	5459.35	5460.94	5460.94	5461.55	0.003642	6.29	30.38	25.00	1.00
Bluebell	1	1926	10-yr	21.00	5459.31	5459.83	5459.83	5459.95	0.006216	2.86	7.35	30.07	1.02
Bluebell	1	1926	25-yr	84.00	5459.31	5460.17	5460.17	5460.39	0.005484	3.82	21.99	53.79	1.03
Bluebell	1	1926	50-yr	133.00	5459.31	5460.34	5460.34	5460.62	0.005037	4.19	33.26	73.26	0.99
Bluebell	1	1926	500-yr	329.00	5459.31	5460.80	5460.80	5461.27	0.005454	5.56	72.37	94.38	0.98
Bluebell	1	2039	100-yr	191.00	5465.21	5466.48	5466.48	5466.82	0.004917	4.68	43.38	73.90	0.97
Bluebell	1	2039	FW	191.00	5465.21	5466.82	5466.82	5467.39	0.003714	6.07	31.47	28.00	1.01
Bluebell	1	2039	10-yr	21.00	5465.21	5465.74	5465.74	5465.87	0.005246	2.92	7.20	26.51	0.99
Bluebell	1	2039	25-yr	84.00	5465.21	5466.11	5466.11	5466.35	0.006412	3.93	21.38	48.59	1.04
Bluebell	1	2039	50-yr	133.00	5465.21	5466.30	5466.30	5466.59	0.005297	4.29	30.97	62.26	0.98
Bluebell	1	2039	500-yr	329.00	5465.21	5466.79	5466.79	5467.27	0.004985	5.59	68.13	84.77	0.97
Bluebell	1	2182	100-yr	191.00	5472.65	5473.88	5473.88	5474.20	0.004658	4.59	44.03	81.70	0.95
Bluebell	1	2182	FW	191.00	5472.66	5474.24	5474.24	5474.80	0.003593	6.01	31.77	28.00	0.99
Bluebell	1	2182	10-yr	21.00	5472.65	5473.13	5473.13	5473.26	0.005793	2.85	7.37	26.79	0.96
Bluebell	1	2182	25-yr	84.00	5472.65	5473.52	5473.52	5473.74	0.005573	3.75	22.43	49.39	0.98
Bluebell	1	2182	50-yr	133.00	5472.65	5473.69	5473.69	5473.98	0.005288	4.29	30.98	58.71	0.99
Bluebell	1	2182	500-yr	329.00	5472.65	5474.17	5474.17	5474.64	0.004953	5.53	69.06	87.19	0.98
Bluebell	1	2284	100-yr	191.00	5477.85	5479.20	5479.20	5479.62	0.018869	5.20	36.70	42.71	0.99
Bluebell	1	2284	FW	191.00	5477.85	5479.42	5479.42	5479.98	0.003585	6.01	31.76	28.00	1.00
Bluebell	1	2284	10-yr	21.00	5477.85	5478.41	5478.41	5478.55	0.005076	3.05	6.89	24.13	1.01
Bluebell	1	2284	25-yr	84.00	5477.85	5478.79	5478.79	5479.06	0.005615	4.21	19.97	38.56	1.03
Bluebell	1	2284	50-yr	133.00	5477.85	5479.00	5479.00	5479.34	0.011054	4.68	28.39	40.36	0.98
Bluebell	1	2284	500-yr	329.00	5477.85	5479.61	5479.61	5480.16	0.036888	5.92	55.55	49.09	0.98
Bluebell	1	2415	100-yr	191.00	5486.29	5487.58	5487.58	5487.97	0.004435	4.98	39.07	57.11	1.01
Bluebell	1	2415	FW	191.00	5486.31	5487.96	5487.96	5488.54	0.003724	6.08	31.43	28.00	1.01
Bluebell	1	2415	10-yr	21.00	5486.29	5486.88	5486.88	5487.02	0.005085	2.98	7.04	26.30	1.02
Bluebell	1	2415	25-yr	84.00	5486.29	5487.26	5487.26	5487.49	0.004684	3.84	21.86	48.79	1.01
Bluebell	1	2415	50-yr	133.00	5486.29	5487.42	5487.42	5487.72	0.004533	4.44	30.09	53.13	1.02
Bluebell	1	2415	500-yr	329.00	5486.29	5487.91	5487.91	5488.46	0.004220	5.95	58.66	63.00	1.01
Bluebell	1	2533	100-yr	177.00	5493.34	5494.50	5494.50	5494.87	0.004381	4.85	39.03	63.37	1.01
Bluebell	1	2533	FW	177.00	5493.40	5494.88	5494.88	5495.43	0.003679	5.97	29.67	27.00	1.00
Bluebell	1	2533	10-yr	18.00	5493.34	5493.85	5493.85	5493.97	0.005710	2.83	6.36	27.27	1.03
Bluebell	1	2533	25-yr	90.00	5493.34	5494.24	5494.24	5494.48	0.004607	3.89	23.67	53.76	1.01
Bluebell	1	2533	50-yr	121.00	5493.34	5494.34	5494.34	5494.63	0.004471	4.27	29.44	57.74	1.01
Bluebell	1	2533	500-yr	313.00	5493.34	5494.84	5494.84	5495.36	0.003978	5.78	62.46	73.49	0.99

Bluebell	1	2623	100-yr	177.00	5497.51	5498.77	5498.77	5499.20	0.008747	5.27	33.57	39.45	1.01
Bluebell	1	2623	FW	177.00	5497.52	5498.96	5498.96	5499.50	0.003729	5.85	30.25	29.00	1.01
Bluebell	1	2623	10-yr	18.00	5497.51	5498.04	5498.04	5498.16	0.006656	2.86	6.29	24.87	1.00
Bluebell	1	2623	25-yr	90.00	5497.51	5498.45	5498.45	5498.73	0.007765	4.25	21.18	38.30	1.01
Bluebell	1	2623	50-yr	121.00	5497.51	5498.57	5498.57	5498.91	0.008176	4.68	25.85	38.80	1.01
Bluebell	1	2623	500-yr	313.00	5497.51	5499.17	5499.17	5499.79	0.010255	6.28	49.83	40.90	1.00
Bluebell	1	2764	100-yr	177.00	5507.35	5508.65	5508.65	5509.07	0.021970	5.20	34.05	41.96	1.02
Bluebell	1	2764	FW	177.00	5507.39	5508.95	5508.95	5509.51	0.003811	6.01	29.43	27.00	1.02
Bluebell	1	2764	10-yr	18.00	5507.35	5507.87	5507.87	5508.01	0.016298	2.96	6.09	22.88	1.01
Bluebell	1	2764	25-yr	90.00	5507.35	5508.34	5508.34	5508.62	0.015489	4.20	21.42	39.97	1.01
Bluebell	1	2764	50-yr	121.00	5507.35	5508.46	5508.46	5508.79	0.017880	4.64	26.10	40.64	1.02
Bluebell	1	2764	500-yr	313.00	5507.35	5509.05	5509.05	5509.63	0.030593	6.11	51.22	45.07	1.01
Bluebell	1	2864	100-yr	177.00	5514.24	5515.44	5515.44	5515.86	0.025909	5.21	34.01	42.39	1.01
Bluebell	1	2864	FW	177.00	5514.24	5515.69	5515.69	5516.23	0.003694	5.90	29.99	28.00	1.01
Bluebell	1	2864	10-yr	18.00	5514.24	5514.71	5514.71	5514.83	0.021015	2.85	6.33	25.70	1.01
Bluebell	1	2864	25-yr	90.00	5514.24	5515.12	5515.12	5515.40	0.022001	4.21	21.37	39.69	1.01
Bluebell	1	2864	50-yr	121.00	5514.24	5515.25	5515.25	5515.58	0.022767	4.60	26.29	40.19	1.00
Bluebell	1	2864	500-yr	313.00	5514.24	5515.85	5515.85	5516.39	0.029835	5.97	56.47	60.17	0.97
Bluebell	1	2972	100-yr	177.00	5521.69	5522.78	5522.78	5523.20	0.003703	5.16	34.33	42.14	1.01
Bluebell	1	2972	FW	177.00	5521.69	5522.96	5522.96	5523.51	0.003679	5.93	29.85	28.00	1.01
Bluebell	1	2972	10-yr	18.00	5521.69	5522.08	5522.08	5522.19	0.006448	2.61	6.90	35.69	1.05
Bluebell	1	2972	25-yr	90.00	5521.69	5522.46	5522.46	5522.74	0.004391	4.24	21.23	39.42	1.02
Bluebell	1	2972	50-yr	121.00	5521.69	5522.59	5522.59	5522.92	0.004024	4.61	26.24	40.45	1.01
Bluebell	1	2972	500-yr	313.00	5521.69	5523.18	5523.18	5523.74	0.003351	6.01	52.35	50.96	1.01
Bluebell	1	3070	100-yr	177.00	5529.13	5530.25	5530.25	5530.60	0.034779	4.95	44.95	67.80	1.00
Bluebell	1	3070	FW	177.00	5529.13	5530.56	5530.56	5531.09	0.003722	5.85	30.27	29.00	1.01
Bluebell	1	3070	10-yr	18.00	5529.13	5529.60	5529.60	5529.71	0.050507	2.73	6.93	32.20	0.98
Bluebell	1	3070	25-yr	90.00	5529.13	5529.99	5529.99	5530.22	0.034378	4.00	27.24	65.76	0.99
Bluebell	1	3070	50-yr	121.00	5529.13	5530.09	5530.09	5530.37	0.033634	4.36	34.37	67.25	0.98
Bluebell	1	3070	500-yr	313.00	5529.13	5530.58	5530.58	5531.05	0.036851	5.89	67.22	69.18	1.01
Bluebell	1	3215	100-yr	177.00	5539.47	5540.59	5540.59	5540.97	0.005056	4.94	39.45	56.06	1.01
Bluebell	1	3215	FW	177.00	5539.47	5540.80	5540.80	5541.32	0.003725	5.79	30.57	30.00	1.01
Bluebell	1	3215	10-yr	18.00	5539.47	5539.95	5539.95	5540.05	0.007921	2.54	7.10	38.42	1.04
Bluebell	1	3215	25-yr	90.00	5539.47	5540.31	5540.31	5540.56	0.005512	4.04	23.71	53.37	1.01
Bluebell	1	3215	50-yr	121.00	5539.47	5540.41	5540.41	5540.72	0.005366	4.43	29.58	54.41	1.01
Bluebell	1	3215	500-yr	313.00	5539.47	5540.96	5540.96	5541.47	0.004656	5.77	60.49	60.67	1.00
Bluebell	1	3283	100-yr	226.00	5542.95	5543.65	5543.65	5543.81	0.004708	3.23	69.91	213.37	1.00
Bluebell	1	3283	FW	226.00	5542.95	5544.08	5544.08	5544.51	0.003517	5.23	43.23	50.00	0.99
Bluebell	1	3283	10-yr	23.00	5542.95	5543.26	5543.26	5543.33	0.007079	2.07	11.13	90.20	1.04
Bluebell	1	3283	25-yr	99.00	5542.95	5543.47	5543.47	5543.58	0.005035	2.67	37.08	158.59	0.97
Bluebell	1	3283	50-yr	151.00	5542.95	5543.56	5543.56	5543.69	0.004977	2.93	51.62	191.02	0.99
Bluebell	1	3283	500-yr	404.00	5542.95	5543.80	5543.80	5544.04	0.004258	3.88	104.04	223.46	1.00
Bluebell	1	3360	100-yr	226.00	5547.39	5548.37	5548.37	5548.78	0.194510	4.25	44.19	142.71	1.02
Bluebell	1	3360	FW	226.00	5547.39	5548.70	5548.70	5549.29	0.225487	6.45	36.71	30.00	1.14
Bluebell	1	3360	10-yr	23.00	5547.39	5546.88	5546.88	5547.12	0.293185		5.86	22.22	0.00
Bluebell	1	3360	25-yr	99.00	5547.39	5547.70	5547.70	5548.09	0.216710	2.26	20.14	68.05	0.90
Bluebell	1	3360	50-yr	151.00	5547.39	5548.02	5548.02	5548.44	0.204618	3.19	29.81	112.93	0.96
Bluebell	1	3360	500-yr	404.00	5547.39	5548.59	5548.59	5548.95	0.192151	4.58	86.14	171.54	1.09
Bluebell	1	3480	100-yr	203.00	5555.72	5557.98	5557.32	5558.20	0.039140	3.72	54.55	36.55	0.54
Bluebell	1	3480	FW	203.00	5555.72	5558.34	5557.43	5558.63	0.036101	4.35	46.64	19.00	0.49
Bluebell	1	3480	10-yr	19.00	5555.72	5556.45	5556.20	5556.50	0.030647	1.64	11.62	22.42	0.40
Bluebell	1	3480	25-yr	90.00	5555.72	5557.21	5556.75	5557.35	0.036426	2.94	30.59	27.65	0.49
Bluebell	1	3480	50-yr	137.00	5555.72	5557.55	5556.99	5557.73	0.037580	3.39	40.37	30.12	0.52
Bluebell	1	3480	500-yr	354.00	5555.72	5558.52	5557.92	5558.85	0.042141	4.65	79.38	51.26	0.58
Bluebell	1	3599	100-yr	203.00	5563.86	5565.95	5565.95	5566.36	0.128641	5.60	43.32	48.90	0.94
Bluebell	1	3599	FW	203.00	5563.86	5566.32	5566.32	5567.19	0.155313	7.52	26.98	15.00	0.99
Bluebell	1	3599	10-yr	19.00	5563.86	5564.86	5564.86	5565.06	0.235025	3.65	5.20	13.73	1.04
Bluebell	1	3599	25-yr	90.00	5563.86	5565.49	5565.49	5565.79	0.146323	4.62	22.55	37.49	0.93
Bluebell	1	3599	50-yr	137.00	5563.86	5565.69	5565.69	5566.06	0.153649	5.30	30.50	44.86	1.01
Bluebell	1	3599	500-yr	354.00	5563.86	5566.35	5566.34	5566.91	0.127467	6.63	63.05	50.66	0.97
Bluebell	1	3709	100-yr	203.00	5571.36	5573.80	5573.34	5574.02	0.043389	3.78	54.81	45.62	0.56
Bluebell	1	3709	FW	203.00	5571.36	5574.28	5573.50	5574.56	0.036807	4.24	47.85	22.00	0.51
Bluebell	1	3709	10-yr	19.00	5571.36	5572.58	5572.22	5572.63	0.032357	1.69	11.75	33.46	0.41
Bluebell	1	3709	25-yr	90.00	5571.36	5573.27	5572.90	5573.38	0.039926	2.71	34.03	44.76	0.50
Bluebell	1	3709	50-yr	137.00	5571.36	5573.54	5573.13	5573.69	0.039241	3.15	44.49	45.62	0.52
Bluebell	1	3709	500-yr	354.00	5571.36	5574.35	5573.77	5574.69	0.044706	4.72	76.28	45.62	0.59
Bluebell	1	3809	100-yr	203.00	5576.59	5579.14	5578.74	5579.47	0.070595	4.57	44.43	34.26	0.71
Bluebell	1	3809	FW	203.00	5576.59	5579.53	5579.02	5580.26	0.094483	6.84	29.68	11.00	0.73
Bluebell	1	3809	10-yr	19.00	5576.59	5577.44	5577.30	5577.56	0.083959	2.78	6.83	12.56	0.66
Bluebell	1	3809	25-yr	90.00	5576.59	5578.38	5578.09	5578.62	0.071211	3.90	23.09	22.59	0.68
Bluebell	1	3809	50-yr	137.00	5576.59	5578.71	5578.41	5579.01	0.075547	4.36	31.43	27.20	0.71
Bluebell	1	3809	500-yr	354.00	5576.59	5579.66	5579.36	5580.14	0.067623	5.59	67.46	56.52	0.73
Bluebell	1	3929	100-yr	203.00	5585.20	5586.82	5586.47	5587.06	0.056700	3.90	52.02	43.06	0.63
Bluebell	1	3929	FW	203.00	5585.24	5587.30		5587.56	0.041861	4.06	50.01	28.00	0.54
Bluebell	1	3929	10-yr	19.00	5585.20	5585.82		5585.86	0.057645	1.66	11.47	35.06	0.51
Bluebell	1	3929	25-yr	90.00	5585.20	5586.31	5586.08	5586.45	0.059642	2.94	30.65	40.56	0.60
Bluebell	1	3929	50-yr	137.00	5585.20	5586.56	5586.26	5586.73	0.055238	3.35	40.90	41.86	0.60
Bluebell	1	3929	500-yr	354.00	5585.20	5587.31		5587.67	0.058065	4.80	73.75	45.39	0.66
Bluebell	1	4054	100-yr	203.00	5590.34	5593.95		5594.43	0.059616	5.52	36.81	16.79	0.66
Bluebell	1	4054	FW	203.00	5590.34	5594.13		5594.81	0.081206	6.60	30.75	10.00	0.66
Bluebell	1	4054	10-yr	19.00	5590.34	5591.76	5591.36	5591.86	0.040120	2.47	7.68	9.21	0.48
Bluebell	1	4054	25-yr	90.00	5590.34	5593.00	5592.39	5593.26	0.049108	4.08	22.03	13.96	0.57
Bluebell	1	4054	50-yr	137.00	5590.34	5593.43		5593.79	0.056186	4.83	28.38	15.31	0.62
Bluebell	1	4054	500-yr	354.00	5590.34	5594.85		5595.55	0.065938	6.68	52.97	19.18	0.71
Bluebell	1	4197	100-yr	203.00	5600.50	5602.82	5602.40	5603.23	0.064132	5.11	39.70	23.50	0.69
Bluebell	1	4197	FW	203.00	5600.50	5603.19		5603.58	0.048088	5.00	40.59	17.00	0.57
Bluebell	1	4197	10-yr	19.00	5600.50	5601.15		5601.28	0.130221	2.93	6.48	15.48	0.80
Bluebell	1	4197	25-yr	90.00	5600.50	5601.95	5601.73	5602.24	0.083989	4.31	20.86	19.78	0.74
Bluebell	1	4197	50-yr	137.00	5600.50	5602.36	5602.04	5602.70	0.070288	4.66	29.39	21.56	0.70
Bluebell	1	4197	500-yr	354.00	5600.50	5603.70		5604.20	0.055989	5.66	62.49	28.43	0.67
Bluebell	1	4278	100-yr	203.00	5606.54	5609.00	5608.79	5609.55	0.095540	5.96	34.05	21.64	0.84
Bluebell	1	4278	FW	203.00	5606.54	5609.23	5609.13	5610.32	0.161744	8.37	24.25	10.00	0.95
Bluebell	1	4278	10-yr	19.00	5606.54	5607.54	5607.29	5607.63	0.052115	2.37	8.02	13.16	0.53
Bluebell	1	4278	25-yr	90.00	5606.54	5608.36	5608.07	5608.64	0.074470	4.27	21.09	18.53	0.70
Bluebell	1	4278	50-yr	137.00	5606.54	5608.65	5608.41	5609.06	0.087295	5.13	26.69	19.93	0.78

Bluebell	1	4278	500-yr	354.00	5606.54	5609.62	5609.50	5610.45	0.109147	7.33	48.26	24.71	0.92
Bluebell	1	4422	100-yr	203.00	5621.14	5623.54	5623.39	5624.16	0.106894	6.32	32.12	20.17	0.88
Bluebell	1	4422	FW	203.00	5621.14	5623.83		5624.28	0.063758	5.36	37.91	20.17	0.69
Bluebell	1	4422	10-yr	19.00	5621.14	5621.96	5621.96	5622.17	0.222279	3.73	5.10	12.63	1.03
Bluebell	1	4422	25-yr	90.00	5621.14	5622.73	5622.69	5623.17	0.142289	5.34	16.87	17.24	0.95
Bluebell	1	4422	50-yr	137.00	5621.14	5623.12	5623.01	5623.63	0.117512	5.75	23.83	18.68	0.90
Bluebell	1	4422	500-yr	354.00	5621.14	5624.34	5624.10	5625.14	0.094857	7.20	49.20	22.94	0.87
Bluebell	1	4538	100-yr	203.00	5631.55	5634.25	5633.82	5634.57	0.076441	4.54	44.75	30.56	0.66
Bluebell	1	4538	FW	203.00	5631.55	5634.36		5635.08	0.147506	6.82	29.74	14.00	0.83
Bluebell	1	4538	10-yr	19.00	5631.55	5632.83		5632.89	0.050473	1.89	10.07	18.89	0.46
Bluebell	1	4538	25-yr	90.00	5631.55	5633.59	5633.19	5633.77	0.063790	3.39	26.52	24.45	0.57
Bluebell	1	4538	50-yr	137.00	5631.55	5633.90	5633.48	5634.15	0.072257	3.97	34.49	27.57	0.63
Bluebell	1	4538	500-yr	354.00	5631.55	5634.87	5634.40	5635.33	0.081539	5.47	64.76	35.03	0.71
Bluebell	1	4671	100-yr	203.00	5643.03	5645.32		5645.69	0.091250	4.87	41.68	29.38	0.72
Bluebell	1	4671	FW	203.00	5643.03	5645.61	5644.99	5645.86	0.050678	4.05	50.09	29.37	0.55
Bluebell	1	4671	10-yr	19.00	5643.03	5643.75	5643.68	5643.90	0.158134	3.10	6.13	12.93	0.79
Bluebell	1	4671	25-yr	90.00	5643.03	5644.59	5644.40	5644.85	0.112385	4.07	22.11	23.96	0.75
Bluebell	1	4671	50-yr	137.00	5643.03	5644.94	5644.67	5645.25	0.096959	4.41	31.10	26.74	0.72
Bluebell	1	4671	500-yr	354.00	5643.03	5645.99		5646.48	0.085923	5.64	62.78	33.85	0.73
Bluebell	1	4720	100-yr	215.00	5649.08	5651.29	5651.20	5651.65	0.162343	4.80	44.78	50.11	0.90
Bluebell	1	4720	FW	215.00	5649.08	5651.63	5651.63	5652.40	0.200090	7.06	30.44	20.00	1.01
Bluebell	1	4720	10-yr	20.00	5649.08	5650.25	5649.98	5650.35	0.109703	2.59	7.73	16.20	0.66
Bluebell	1	4720	25-yr	94.00	5649.08	5650.88	5650.75	5651.09	0.141122	3.62	25.95	39.83	0.79
Bluebell	1	4720	50-yr	145.00	5649.08	5651.08	5650.99	5651.35	0.158528	4.19	34.62	46.70	0.86
Bluebell	1	4720	500-yr	375.00	5649.08	5651.68	5651.61	5652.19	0.159271	5.71	65.73	55.97	0.93
Bluebell	1	4745	100-yr	215.00	5650.35	5653.12		5653.24	0.032476	2.85	75.47	55.35	0.43
Bluebell	1	4745	FW	215.00	5650.35	5653.60		5653.74	0.020264	2.98	72.06	31.00	0.34
Bluebell	1	4745	10-yr	20.00	5650.35	5651.72		5651.75	0.033955	1.44	13.86	29.14	0.37
Bluebell	1	4745	25-yr	94.00	5650.35	5652.47		5652.55	0.031236	2.22	42.35	43.88	0.40
Bluebell	1	4745	50-yr	145.00	5650.35	5652.80		5652.90	0.031820	2.48	58.55	52.22	0.41
Bluebell	1	4745	500-yr	375.00	5650.35	5653.67		5653.86	0.034326	3.48	107.79	60.97	0.46
Bluebell	1	4793	100-yr	215.00	5653.54	5656.12	5656.12	5656.64	0.196411	5.82	36.94	35.30	1.00
Bluebell	1	4793	FW	215.00	5653.54	5656.50	5656.50	5657.59	0.214862	8.39	25.64	12.00	1.01
Bluebell	1	4793	10-yr	20.00	5653.54	5654.69		5654.94	0.172508	4.00	5.00	7.27	0.85
Bluebell	1	4793	25-yr	94.00	5653.54	5655.59	5655.59	5655.93	0.225957	4.73	19.87	28.75	1.00
Bluebell	1	4793	50-yr	145.00	5653.54	5655.83	5655.83	5656.27	0.210154	5.28	27.44	31.86	1.00
Bluebell	1	4793	500-yr	375.00	5653.54	5656.62	5656.62	5657.32	0.178885	6.72	55.78	39.98	1.00
Bluebell	1	4910	100-yr	215.00	5662.77	5666.37	5665.62	5666.62	0.046979	4.05	54.31	37.63	0.53
Bluebell	1	4910	FW	215.00	5662.77	5666.61		5666.92	0.040419	4.44	48.43	18.00	0.48
Bluebell	1	4910	10-yr	20.00	5662.77	5664.09		5664.17	0.044631	2.33	8.57	10.44	0.45
Bluebell	1	4910	25-yr	94.00	5662.77	5665.54		5665.69	0.042645	3.13	30.04	22.80	0.48
Bluebell	1	4910	50-yr	145.00	5662.77	5665.98	5665.10	5666.18	0.044988	3.51	41.30	27.55	0.51
Bluebell	1	4910	500-yr	375.00	5662.77	5666.98	5666.37	5667.33	0.049506	4.90	82.49	56.49	0.57
Bluebell	1	5080	100-yr	215.00	5674.93	5677.76	5677.53	5678.02	0.104621	4.08	52.72	53.56	0.72
Bluebell	1	5080	FW	215.00	5674.93	5677.93	5677.69	5678.81	0.145125	7.51	28.62	12.00	0.86
Bluebell	1	5080	10-yr	20.00	5674.93	5675.92		5676.10	0.126650	3.45	5.79	8.56	0.74
Bluebell	1	5080	25-yr	94.00	5674.93	5677.02	5676.82	5677.28	0.126851	4.16	22.58	25.37	0.78
Bluebell	1	5080	50-yr	145.00	5674.93	5677.48		5677.70	0.114853	3.80	38.17	46.18	0.74
Bluebell	1	5080	500-yr	375.00	5674.93	5678.22	5677.94	5678.58	0.094197	4.82	77.79	56.78	0.73
Bluebell	1	5136	100-yr	215.00	5679.68	5682.06		5682.24	0.055254	3.38	63.56	53.31	0.55
Bluebell	1	5136	FW	215.00	5679.68	5682.52		5682.70	0.038639	3.40	63.26	37.00	0.46
Bluebell	1	5136	10-yr	20.00	5679.68	5680.71		5680.76	0.057092	1.90	10.52	21.45	0.48
Bluebell	1	5136	25-yr	94.00	5679.68	5681.52		5681.62	0.050774	2.57	36.60	43.59	0.49
Bluebell	1	5136	50-yr	145.00	5679.68	5681.80		5681.93	0.052219	2.89	50.21	51.23	0.51
Bluebell	1	5136	500-yr	375.00	5679.68	5682.51		5682.79	0.059913	4.23	88.63	56.36	0.59
Bluebell	1	5157	100-yr	215.00	5680.97	5683.18		5683.36	0.053700	3.39	63.47	52.06	0.54
Bluebell	1	5157	FW	215.00	5680.97	5683.36		5683.55	0.044707	3.53	60.82	38.00	0.49
Bluebell	1	5157	10-yr	20.00	5680.97	5681.97		5682.02	0.065115	1.85	10.83	25.56	0.50
Bluebell	1	5157	25-yr	94.00	5680.97	5682.62		5682.73	0.057016	2.63	35.71	44.82	0.52
Bluebell	1	5157	50-yr	145.00	5680.97	5682.90		5683.03	0.054349	2.95	49.17	50.17	0.52
Bluebell	1	5157	500-yr	375.00	5680.97	5683.69		5683.95	0.053467	4.12	91.09	55.46	0.57
Bluebell	1	5194	100-yr	215.00	5684.17	5686.15	5686.04	5686.51	0.148856	4.83	44.49	46.04	0.87
Bluebell	1	5194	FW	215.00	5684.17	5686.31	5686.31	5687.06	0.206498	6.96	30.89	21.00	1.01
Bluebell	1	5194	10-yr	20.00	5684.17	5685.06		5685.16	0.114285	2.52	7.92	17.73	0.67
Bluebell	1	5194	25-yr	94.00	5684.17	5685.71		5685.91	0.141137	3.66	25.71	38.85	0.79
Bluebell	1	5194	50-yr	145.00	5684.17	5685.92	5685.80	5686.19	0.148792	4.23	34.25	43.22	0.84
Bluebell	1	5194	500-yr	375.00	5684.17	5686.57	5686.46	5687.09	0.144471	5.77	65.04	50.47	0.90
Bluebell	1	5322	100-yr	215.00	5691.96	5695.20	5694.25	5695.47	0.040757	4.14	51.90	24.84	0.50
Bluebell	1	5322	FW	215.00	5691.96	5695.36	5694.25	5695.59	0.032375	3.85	55.90	24.85	0.45
Bluebell	1	5322	10-yr	20.00	5691.96	5693.08		5693.14	0.039344	1.99	10.04	14.40	0.42
Bluebell	1	5322	25-yr	94.00	5691.96	5694.19		5694.35	0.038250	3.20	29.36	19.89	0.46
Bluebell	1	5322	50-yr	145.00	5691.96	5694.68		5694.89	0.038962	3.66	39.64	22.17	0.48
Bluebell	1	5322	500-yr	375.00	5691.96	5696.09		5696.47	0.044302	4.94	75.95	29.63	0.54
Bluebell	1	5445	100-yr	215.00	5703.85	5706.27	5706.27	5706.88	0.189719	6.26	34.32	28.71	1.01
Bluebell	1	5445	FW	215.00	5703.85	5706.70	5706.70	5707.62	0.213312	7.67	28.03	15.75	1.01
Bluebell	1	5445	10-yr	20.00	5703.85	5704.63	5704.63	5704.90	0.248203	4.18	4.79	8.95	1.01
Bluebell	1	5445	25-yr	94.00	5703.85	5705.54	5705.54	5706.02	0.207756	5.51	17.06	18.45	1.01
Bluebell	1	5445	50-yr	145.00	5703.85	5705.93	5705.93	5706.44	0.199882	5.75	25.20	24.91	1.01
Bluebell	1	5445	500-yr	375.00	5703.85	5706.94	5706.94	5707.52	0.191886	6.10	61.50	54.41	1.01
Bluebell	1	5481	100-yr	215.00	5706.42	5709.28		5709.40	0.034646	2.86	75.10	57.25	0.44
Bluebell	1	5481	FW	215.00	5706.42	5709.46		5709.56	0.022507	2.51	85.70	57.25	0.36
Bluebell	1	5481	10-yr	20.00	5706.42	5707.73		5707.80	0.038239	2.09	9.58	12.40	0.42
Bluebell	1	5481	25-yr	94.00	5706.42	5708.64		5708.72	0.036920	2.26	41.61	47.47	0.43
Bluebell	1	5481	50-yr	145.00	5706.42	5708.94		5709.04	0.035599	2.55	56.76	52.38	0.43
Bluebell	1	5481	500-yr	375.00	5706.42	5709.85		5710.03	0.034480	3.42	109.71	63.83	0.46
Bluebell	1	5527	100-yr	215.00	5710.53	5711.99	5711.87	5712.25	0.139043	4.09	52.52	66.76	0.81
Bluebell	1	5527	FW	215.00	5710.53	5711.87	5711.87	5712.23	0.221130	4.84	44.45	62.31	1.01
Bluebell	1	5527	10-yr	20.00	5710.53	5711.13		5711.22	0.209564	2.46	8.12	30.09	0.84
Bluebell	1	5527	25-yr	94.00	5710.53	5711.58		5711.75	0.151903	3.38	27.80	50.35	0.80
Bluebell	1	5527	50-yr	145.00	5710.53	5711.77	5711.67	5711.99	0.148793	3.74	38.74	59.29	0.82
Bluebell	1	5527	500-yr	375.00	5710.53	5712.39	5712.20	5712.72	0.119486	4.64	80.77	75.74	0.79
Bluebell	1	5672	100-yr	215.00	5722.72	5725.40	5724.90	5725.75	0.066713	4.72	45.55	43.99	0.63
Bluebell	1	5672	FW	215.00	5722.72	5725.55	5724.90	5725.84	0.051721	4.35	49.37	26.03	0.56
Bluebell	1	5672	10-yr	20.00	5722.72	5723.92	5723.67	5723.98	0.048228	1.86	10.76	20.90	0.45
Bluebell	1	5672	25-yr	94.00	5722.72	5724.68	5724.29	5724.86	0.060024	3.42	27.50	36.64	0.56

Bluebell	1	5672	50-yr	145.00	5722.72	5725.03	5724.56	5725.28	0.062191	4.03	35.99	40.18	0.59
Bluebell	1	5672	500-yr	375.00	5722.72	5726.04	5725.53	5726.59	0.077821	5.99	62.65	52.77	0.70
Bluebell	1	5866	100-yr	215.00	5734.49	5737.00		5737.20	0.052292	3.62	59.45	43.48	0.55
Bluebell	1	5866	FW	215.00	5734.49	5736.90		5737.13	0.065515	3.91	55.02	42.44	0.60
Bluebell	1	5866	10-yr	20.00	5734.49	5735.43		5735.50	0.074555	2.12	9.45	20.19	0.55
Bluebell	1	5866	25-yr	94.00	5734.49	5736.26	5735.84	5736.41	0.058656	3.04	30.88	31.89	0.55
Bluebell	1	5866	50-yr	145.00	5734.49	5736.63		5736.80	0.056441	3.30	44.01	39.22	0.55
Bluebell	1	5866	500-yr	375.00	5734.49	5737.69	5736.95	5737.95	0.045258	4.10	91.39	49.53	0.53
Bluebell	1	5998	100-yr	215.00	5744.55	5746.00	5745.76	5746.27	0.094464	4.18	51.45	47.33	0.71
Bluebell	1	5998	FW	215.00	5744.55	5746.08	5745.76	5746.32	0.074356	3.88	55.36	47.33	0.63
Bluebell	1	5998	10-yr	20.00	5744.55	5745.13	5745.03	5745.17	0.072333	1.60	12.53	40.22	0.50
Bluebell	1	5998	25-yr	94.00	5744.55	5745.57	5745.37	5745.71	0.086850	2.99	31.41	44.90	0.63
Bluebell	1	5998	50-yr	145.00	5744.55	5745.78	5745.55	5745.97	0.088153	3.54	41.01	46.08	0.66
Bluebell	1	5998	500-yr	375.00	5744.55	5746.38	5746.16	5746.83	0.109580	5.37	69.79	49.07	0.79
Bluebell	1	6113	100-yr	215.00	5752.91	5755.52	5755.10	5755.80	0.072376	4.25	50.63	36.48	0.64
Bluebell	1	6113	FW	215.00	5752.91	5755.43	5755.10	5755.75	0.088827	4.55	47.28	35.85	0.70
Bluebell	1	6113	10-yr	20.00	5752.91	5754.06	5753.84	5754.14	0.083001	2.34	8.56	16.75	0.58
Bluebell	1	6113	25-yr	94.00	5752.91	5754.88	5754.56	5755.05	0.074972	3.27	28.75	31.55	0.60
Bluebell	1	6113	50-yr	145.00	5752.91	5755.17	5754.82	5755.40	0.075429	3.78	38.39	34.07	0.63
Bluebell	1	6113	500-yr	375.00	5752.91	5756.16	5755.61	5756.55	0.066206	5.01	74.90	39.19	0.64
Bluebell	1	6196	100-yr	215.00	5758.65	5761.72	5761.17	5762.26	0.082515	5.86	36.68	16.36	0.69
Bluebell	1	6196	FW	215.00	5758.65	5761.84	5761.17	5762.32	0.070725	5.57	38.61	16.36	0.64
Bluebell	1	6196	10-yr	20.00	5758.65	5759.76	5759.50	5759.85	0.058456	2.35	8.51	12.73	0.51
Bluebell	1	6196	25-yr	94.00	5758.65	5760.76	5760.30	5761.04	0.069446	4.27	22.00	14.37	0.61
Bluebell	1	6196	50-yr	145.00	5758.65	5761.22	5760.71	5761.62	0.074046	5.03	28.85	15.13	0.64
Bluebell	1	6196	500-yr	375.00	5758.65	5762.56	5762.09	5763.38	0.101465	7.27	51.60	19.43	0.79
Bluebell	1	6200		Culvert									
Bluebell	1	6245	100-yr	215.00	5760.28	5764.63	5763.65	5765.18	0.202816	5.93	36.27	13.75	0.64
Bluebell	1	6245	FW	215.00	5760.28	5764.63	5763.65	5765.18	0.202910	5.93	36.26	13.75	0.64
Bluebell	1	6245	10-yr	20.00	5760.28	5761.03	5761.03	5761.39	0.427603	4.77	4.20	6.02	1.01
Bluebell	1	6245	25-yr	94.00	5760.28	5762.29	5762.29	5763.14	0.515479	7.39	12.72	7.56	1.00
Bluebell	1	6245	50-yr	145.00	5760.28	5762.89	5762.89	5763.96	0.548531	8.28	17.50	8.30	1.01
Bluebell	1	6245	500-yr	375.00	5760.28	5768.82	5764.89	5768.93	0.015740	2.72	137.97	41.79	0.23
Bluebell_Spur	1	40	100-yr	54.00	5519.23	5520.96	5520.69	5521.13	0.109967	3.32	16.28	19.55	0.64
Bluebell_Spur	1	40	FW	54.00	5519.23	5520.96	5520.69	5521.13	0.109970	3.32	16.28	19.55	0.64
Bluebell_Spur	1	40	10-yr	7.00	5519.23	5519.98	5519.81	5520.05	0.110088	2.15	3.25	7.43	0.57
Bluebell_Spur	1	40	25-yr	26.00	5519.23	5520.57	5520.28	5520.68	0.110060	2.77	9.39	14.79	0.61
Bluebell_Spur	1	40	50-yr	38.00	5519.23	5520.76	5520.50	5520.90	0.110145	3.02	12.56	17.33	0.63
Bluebell_Spur	1	40	500-yr	94.00	5519.23	5521.34	5521.03	5521.57	0.110112	3.86	24.35	23.30	0.67
Bluebell_Spur	1	102	100-yr	54.00	5525.17	5526.53		5526.58	0.072018	1.80	29.99	66.54	0.47
Bluebell_Spur	1	102	FW	54.00	5525.17	5526.56		5526.69	0.074917	2.88	18.74	20.00	0.52
Bluebell_Spur	1	102	10-yr	7.00	5525.17	5525.82		5525.85	0.081342	1.50	4.65	14.74	0.47
Bluebell_Spur	1	102	25-yr	26.00	5525.17	5526.26		5526.30	0.076480	1.67	15.59	40.55	0.47
Bluebell_Spur	1	102	50-yr	38.00	5525.17	5526.39		5526.44	0.074349	1.77	21.43	49.78	0.48
Bluebell_Spur	1	102	500-yr	94.00	5525.17	5526.74		5526.81	0.067030	2.12	44.30	72.80	0.48
Bluebell_Spur	1	183	100-yr	54.00	5530.94	5531.88	5531.59	5531.94	0.060218	1.99	27.20	48.57	0.45
Bluebell_Spur	1	183	FW	54.00	5531.02	5532.18	5531.79	5532.30	0.063600	2.71	19.94	20.00	0.48
Bluebell_Spur	1	183	10-yr	7.00	5530.94	5531.39	5531.25	5531.40	0.057772	0.97	7.19	34.07	0.37
Bluebell_Spur	1	183	25-yr	26.00	5530.94	5531.65	5531.45	5531.69	0.057509	1.53	17.03	40.90	0.42
Bluebell_Spur	1	183	50-yr	38.00	5530.94	5531.76	5531.52	5531.81	0.058940	1.75	21.69	45.25	0.44
Bluebell_Spur	1	183	500-yr	94.00	5530.94	5532.10	5531.78	5532.20	0.065256	2.49	38.36	59.89	0.49
Bluebell_Spur	1	256	100-yr	54.00	5535.50	5536.55	5536.35	5536.59	0.067003	1.65	32.76	81.20	0.45
Bluebell_Spur	1	256	FW	54.00	5536.00	5536.98	5536.66	5537.08	0.067213	2.55	21.17	25.00	0.49
Bluebell_Spur	1	256	10-yr	7.00	5535.50	5536.18	5535.91	5536.19	0.074284	0.90	7.78	50.03	0.40
Bluebell_Spur	1	256	25-yr	26.00	5535.50	5536.23	5536.23	5536.32	0.433639	2.43	10.70	58.21	1.00
Bluebell_Spur	1	256	50-yr	38.00	5535.50	5536.46	5536.29	5536.49	0.069200	1.49	25.56	73.29	0.44
Bluebell_Spur	1	256	500-yr	94.00	5535.50	5536.74	5536.49	5536.80	0.060151	1.96	47.88	93.14	0.45
Bluebell_Spur	1	314	100-yr	54.00	5539.67	5541.71	5541.43	5541.97	0.136236	4.14	13.03	12.67	0.72
Bluebell_Spur	1	314	FW	54.00	5539.67	5541.77	5541.43	5542.01	0.111989	3.90	13.85	12.61	0.66
Bluebell_Spur	1	314	10-yr	7.00	5539.67	5540.62	5540.39	5540.69	0.082633	2.12	3.30	6.03	0.51
Bluebell_Spur	1	314	25-yr	26.00	5539.67	5541.61	5540.94	5541.69	0.039769	2.19	11.89	11.97	0.39
Bluebell_Spur	1	314	50-yr	38.00	5539.67	5541.48	5541.19	5541.69	0.120798	3.68	10.33	10.95	0.67
Bluebell_Spur	1	314	500-yr	94.00	5539.67	5542.07	5541.91	5542.48	0.184316	5.14	18.42	19.11	0.85
Blue_Ave_Split	1	88	100-yr	303.00	5389.11	5392.42		5392.50	0.003372	2.17	143.10	89.33	0.25
Blue_Ave_Split	1	88	FW	303.00	5389.11	5392.78		5392.85	0.003319	2.15	141.71	50.00	0.23
Blue_Ave_Split	1	88	10-yr	1.00	5389.11	5389.86		5389.86	0.000165	0.08	11.82	26.96	0.02
Blue_Ave_Split	1	88	25-yr	69.00	5389.11	5391.11		5391.13	0.006277	1.18	59.20	53.88	0.19
Blue_Ave_Split	1	88	50-yr	160.00	5389.11	5391.75		5391.80	0.004683	1.71	95.71	58.53	0.23
Blue_Ave_Split	1	88	500-yr	610.00	5389.11	5393.42		5393.56	0.001632	2.27	236.91	94.59	0.22
Blue_Ave_Split	1	185	100-yr	303.00	5390.31	5392.52		5392.61	0.000532	2.48	157.64	101.12	0.34
Blue_Ave_Split	1	185	FW	303.00	5390.31	5392.84		5392.97	0.000516	2.89	104.70	50.00	0.35
Blue_Ave_Split	1	185	10-yr	1.00	5390.31	5390.44	5390.44	5390.48	0.008696	1.69	0.59	7.61	1.06
Blue_Ave_Split	1	185	25-yr	69.00	5390.31	5391.34		5391.40	0.001544	2.08	39.49	98.99	0.54
Blue_Ave_Split	1	185	50-yr	160.00	5390.31	5391.88		5391.95	0.000727	2.17	93.57	100.04	0.38
Blue_Ave_Split	1	185	500-yr	610.00	5390.31	5393.50		5393.64	0.000460	3.08	258.27	102.52	0.34
Blue_Ave_Split	1	251	100-yr	303.00	5391.26	5392.82	5392.82	5393.34	0.003727	5.86	66.91	79.02	0.98
Blue_Ave_Split	1	251	FW	303.00	5391.26	5393.06	5393.06	5393.78	0.003228	6.83	44.37	30.00	0.99
Blue_Ave_Split	1	251	10-yr	1.00	5391.26	5391.45	5391.45	5391.49	0.007750	1.61	0.62	7.79	1.01
Blue_Ave_Split	1	251	25-yr	69.00	5391.26	5392.07	5392.07	5392.30	0.004607	3.83	18.37	47.73	1.00
Blue_Ave_Split	1	251	50-yr	160.00	5391.26	5392.42	5392.42	5392.79	0.003994	4.87	37.35	66.96	0.99
Blue_Ave_Split	1	251	500-yr	610.00	5391.26	5393.46	5393.46	5394.23	0.003551	7.23	117.12	81.69	0.99
Blue_Ave_Split	1	364	100-yr	303.00	5393.80	5395.14	5395.14	5395.63	0.005011	5.81	74.87	79.10	1.02
Blue_Ave_Split	1	364	FW	303.00	5393.80	5395.49	5395.49	5396.23	0.003368	6.91	43.86	30.00	1.01
Blue_Ave_Split	1	364	10-yr	1.00	5393.80	5393.93	5393.93	5393.96	0.008536	1.48	0.67	10.32	1.02
Blue_Ave_Split	1	364	25-yr	69.00	5393.80	5394.48	5394.48	5394.68	0.005623	3.67	24.52	72.28	1.00
Blue_Ave_Split	1	364	50-yr	160.00	5393.80	5394.78	5394.78	5395.12	0.005161	4.75	47.33	75.79	1.01
Blue_Ave_Split	1	364	500-yr	610.00	5393.80	5395.72	5395.72	5396.50	0.004866	7.35	122.51	85.69	1.03
Blue_Ave_Split	1	474	100-yr	303.00	5396.18	5397.59	5397.59	5398.08	0.004441	5.75	72.86	89.29	0.99
Blue_Ave_Split	1	474	FW	303.00	5396.18	5397.90	5397.90	5398.63	0.003292	6.86	44.15	30.00	1.00
Blue_Ave_Split	1	474	10-yr	1.00	5396.18	5396.30	5396.30	5396.34	0.009727	1.56	0.64	10.10	1.09
Blue_Ave_Split	1	474	25-yr	69.00	5396.18	5396.90	5396.90	5397.11	0.005016	3.69	20.09	56.13	0.98
Blue_Ave_Split	1	474	50-yr	160.00	5396.18	5397.22	5397.22	5397.56	0.004570	4.74	42.97	83.44	0.99
Blue_Ave_Split	1	474	500-yr	610.00	5396.18	5398.16	5398.16	5398.94	0.004467	7.30	122.74	94.85	1.01
Blue_Ave_Split	1	564	100-yr	303.00	5398.27	5399.71	5399.71	5400.20	0.005264	5.75	70.04	78.92	1.01

Blue_Ave_Split	1	564	FW	303.00	5398.30	5400.18	5400.18	5400.95	0.003425	7.08	42.81	28.00	1.01
Blue_Ave_Split	1	564	10-yr	1.00	5398.27	5398.46	5398.46	5398.50	0.007488	1.60	0.63	7.76	0.99
Blue_Ave_Split	1	564	25-yr	69.00	5398.27	5399.05	5399.05	5399.26	0.006412	3.67	20.57	60.90	1.02
Blue_Ave_Split	1	564	50-yr	160.00	5398.27	5399.36	5399.36	5399.69	0.005550	4.69	42.75	75.65	0.99
Blue_Ave_Split	1	564	500-yr	610.00	5398.27	5400.29	5400.29	5401.04	0.004969	7.14	118.12	90.07	1.01
Blue_Ave_Split	1	655	100-yr	303.00	5401.00	5402.53	5402.53	5403.03	0.004137	5.69	53.22	53.71	1.01
Blue_Ave_Split	1	655	FW	303.00	5401.04	5402.85	5402.85	5403.63	0.003371	7.06	42.90	28.00	1.01
Blue_Ave_Split	1	655	10-yr	1.00	5401.00	5401.19	5401.19	5401.24	0.007439	1.65	0.61	7.14	0.99
Blue_Ave_Split	1	655	25-yr	69.00	5401.00	5401.80	5401.80	5402.03	0.004774	3.87	17.84	40.64	1.03
Blue_Ave_Split	1	655	50-yr	160.00	5401.00	5402.15	5402.15	5402.50	0.004128	4.76	33.58	49.37	1.02
Blue_Ave_Split	1	655	500-yr	610.00	5401.00	5403.13	5403.13	5403.89	0.004176	6.98	98.31	86.14	0.99
Blue_Ave_Split	1	748	100-yr	303.00	5403.92	5405.43	5405.43	5405.90	0.004378	5.60	66.78	86.05	0.98
Blue_Ave_Split	1	748	FW	303.00	5403.92	5405.83	5405.83	5406.61	0.003447	7.09	42.75	28.00	1.01
Blue_Ave_Split	1	748	10-yr	1.00	5403.92	5404.11	5404.11	5404.14	0.005182	1.40	0.72	8.24	0.83
Blue_Ave_Split	1	748	25-yr	69.00	5403.92	5404.72	5404.72	5404.94	0.005422	3.74	19.15	50.77	1.02
Blue_Ave_Split	1	748	50-yr	160.00	5403.92	5405.05	5405.05	5405.39	0.004684	4.69	38.24	65.83	0.99
Blue_Ave_Split	1	748	500-yr	610.00	5403.92	5405.99	5405.99	5406.74	0.004438	7.07	119.98	104.43	0.99
Blue_Ave_Split	1	818	100-yr	303.00	5406.16	5407.69	5407.69	5408.19	0.004725	5.67	57.99	81.29	0.99
Blue_Ave_Split	1	818	FW	303.00	5406.17	5408.13	5408.13	5408.91	0.003458	7.09	42.76	28.00	1.01
Blue_Ave_Split	1	818	10-yr	1.00	5406.16	5406.35	5406.35	5406.40	0.007362	1.62	0.62	7.35	0.99
Blue_Ave_Split	1	818	25-yr	69.00	5406.16	5407.03	5407.03	5407.23	0.004757	3.58	19.25	47.86	1.00
Blue_Ave_Split	1	818	50-yr	160.00	5406.16	5407.32	5407.32	5407.67	0.004978	4.69	34.19	52.94	1.02
Blue_Ave_Split	1	818	500-yr	610.00	5406.16	5408.28	5408.28	5409.05	0.004540	7.12	107.69	87.67	0.99
Denton_Ave_Split	1	41	100-yr	151.00	5294.24	5295.37		5295.54	0.006937	3.32	45.59	76.80	0.76
Denton_Ave_Split	1	41	FW	151.00	5294.24	5295.59	5295.59	5296.05	0.004835	5.47	27.60	30.00	1.01
Denton_Ave_Split	1	41	10-yr	2.00	5294.24	5294.53	5294.53	5294.59	0.071714	1.93	1.04	8.86	0.99
Denton_Ave_Split	1	41	25-yr	51.00	5294.24	5294.98	5294.98	5295.12	0.016275	2.97	17.16	65.28	1.02
Denton_Ave_Split	1	41	50-yr	98.00	5294.24	5295.13	5295.13	5295.33	0.014269	3.59	27.32	71.47	1.02
Denton_Ave_Split	1	41	500-yr	315.00	5294.24	5295.59	5295.59	5295.99	0.010951	5.04	62.83	79.52	1.00
Denton_Ave_Split	1	75	100-yr	151.00	5294.34	5295.60	5295.60	5295.90	0.006737	4.36	34.63	60.80	1.02
Denton_Ave_Split	1	75	FW	151.00	5294.41	5295.93	5295.93	5296.41	0.003815	5.53	27.32	29.00	1.00
Denton_Ave_Split	1	75	10-yr	2.00	5294.34	5294.77		5294.79	0.001949	1.07	1.86	11.79	0.48
Denton_Ave_Split	1	75	25-yr	51.00	5294.34	5295.30	5295.25	5295.43	0.005712	2.87	17.74	51.51	0.86
Denton_Ave_Split	1	75	50-yr	98.00	5294.34	5295.44	5295.44	5295.68	0.007013	3.86	25.37	55.05	1.00
Denton_Ave_Split	1	75	500-yr	315.00	5294.34	5295.99	5295.99	5296.41	0.006422	5.20	60.61	75.77	1.02
Denton_Ave_Split	1	179	100-yr	151.00	5295.30	5296.47	5296.47	5296.78	0.005396	4.48	33.69	56.81	1.03
Denton_Ave_Split	1	179	FW	151.00	5295.30	5296.66	5296.66	5297.11	0.003898	5.39	28.04	32.00	1.01
Denton_Ave_Split	1	179	10-yr	2.00	5295.30	5295.56	5295.56	5295.62	0.006954	1.91	1.05	9.30	1.00
Denton_Ave_Split	1	179	25-yr	51.00	5295.30	5296.12	5296.12	5296.29	0.006046	3.27	15.58	47.08	1.00
Denton_Ave_Split	1	179	50-yr	98.00	5295.30	5296.30	5296.30	5296.55	0.005662	3.99	24.53	51.47	1.02
Denton_Ave_Split	1	179	500-yr	315.00	5295.30	5296.88	5296.88	5297.32	0.005047	5.34	58.94	67.33	1.01
Denton_Ave_Split	1	283	100-yr	151.00	5296.49	5297.55	5297.55	5297.87	0.005480	4.55	33.15	56.70	1.05
Denton_Ave_Split	1	283	FW	151.00	5296.49	5297.76	5297.76	5298.22	0.004046	5.45	27.73	32.00	1.03
Denton_Ave_Split	1	283	10-yr	2.00	5296.49	5296.70	5296.70	5296.75	0.006091	1.76	1.14	10.56	0.95
Denton_Ave_Split	1	283	25-yr	51.00	5296.49	5297.21	5297.21	5297.38	0.006051	3.31	15.42	47.83	1.03
Denton_Ave_Split	1	283	50-yr	98.00	5296.49	5297.40	5297.40	5297.64	0.005053	3.87	25.29	53.19	0.99
Denton_Ave_Split	1	283	500-yr	315.00	5296.49	5297.98	5297.98	5298.40	0.004623	5.22	60.30	70.99	1.00
Denton_Ave_Split	1	414	100-yr	151.00	5298.57	5299.64	5299.64	5299.92	0.005438	4.23	35.72	67.25	1.02
Denton_Ave_Split	1	414	FW	151.00	5298.57	5299.92	5299.92	5300.39	0.003866	5.50	27.48	30.00	1.01
Denton_Ave_Split	1	414	10-yr	2.00	5298.57	5298.83	5298.83	5298.88	0.004966	1.65	1.21	10.45	0.86
Denton_Ave_Split	1	414	25-yr	51.00	5298.57	5299.33	5299.33	5299.48	0.005387	3.14	16.22	56.16	1.03
Denton_Ave_Split	1	414	50-yr	98.00	5298.57	5299.49	5299.49	5299.71	0.005364	3.75	26.12	62.21	1.02
Denton_Ave_Split	1	414	500-yr	315.00	5298.57	5300.00	5300.00	5300.40	0.005514	5.06	62.29	81.46	1.02
Denton_Ave_Split	1	534	100-yr	151.00	5300.52	5301.55	5301.55	5301.82	0.003780	4.23	35.68	65.05	1.01
Denton_Ave_Split	1	534	FW	151.00	5300.53	5301.73	5301.73	5302.20	0.003838	5.50	27.47	30.00	1.01
Denton_Ave_Split	1	534	10-yr	2.00	5300.52	5300.73	5300.73	5300.78	0.007412	1.80	1.11	11.37	1.02
Denton_Ave_Split	1	534	25-yr	51.00	5300.52	5301.18	5301.18	5301.35	0.004562	3.32	15.38	45.40	1.00
Denton_Ave_Split	1	534	50-yr	98.00	5300.52	5301.38	5301.38	5301.61	0.003791	3.83	25.60	56.63	1.00
Denton_Ave_Split	1	534	500-yr	315.00	5300.52	5301.90	5301.90	5302.31	0.004265	5.12	62.46	87.27	1.01
Echo_Pl_Split	1	76	100-yr	115.00	5434.17	5435.06	5435.06	5435.36	0.005763	4.42	26.04	44.83	1.02
Echo_Pl_Split	1	76	FW	115.00	5434.17	5435.28	5435.28	5435.72	0.003874	5.31	21.68	25.00	1.00
Echo_Pl_Split	1	76	10-yr	10.00	5434.17	5434.52	5434.52	5434.60	0.008074	2.25	4.45	27.85	0.99
Echo_Pl_Split	1	76	25-yr	46.00	5434.17	5434.77	5434.77	5434.94	0.006518	3.31	13.91	40.93	1.00
Echo_Pl_Split	1	76	50-yr	75.00	5434.17	5434.91	5434.91	5435.14	0.005919	3.84	19.55	42.43	1.00
Echo_Pl_Split	1	76	500-yr	205.00	5434.17	5435.35	5435.35	5435.75	0.005167	5.08	40.34	51.36	1.01
Echo_Pl_Split	1	167	100-yr	115.00	5435.88	5436.78	5436.78	5437.00	0.005288	3.76	30.61	66.83	0.98
Echo_Pl_Split	1	167	FW	115.00	5435.88	5436.78	5436.78	5437.01	0.005193	3.81	30.20	63.22	0.97
Echo_Pl_Split	1	167	10-yr	10.00	5435.88	5436.21	5436.21	5436.32	0.007580	2.62	3.81	21.60	1.10
Echo_Pl_Split	1	167	25-yr	46.00	5435.88	5436.53	5436.53	5436.67	0.006037	3.04	15.13	49.74	0.97
Echo_Pl_Split	1	167	50-yr	75.00	5435.88	5436.64	5436.64	5436.83	0.007195	3.47	21.62	65.60	1.07
Echo_Pl_Split	1	167	500-yr	205.00	5435.88	5436.98	5436.98	5437.31	0.004971	4.62	44.39	69.03	1.01
Echo_Pl_Split	1	219	100-yr	115.00	5437.65	5438.80	5438.80	5439.03	0.239167	4.11	30.74	88.92	0.91
Echo_Pl_Split	1	219	FW	115.00	5437.65	5439.21	5439.21	5439.67	0.270462	5.49	20.95	49.79	0.99
Echo_Pl_Split	1	219	10-yr	10.00	5437.65	5438.11	5438.11	5438.21	0.429070	2.62	3.82	41.64	1.01
Echo_Pl_Split	1	219	25-yr	46.00	5437.65	5438.43	5438.43	5438.63	0.321299	3.64	13.29	64.38	0.99
Echo_Pl_Split	1	219	50-yr	75.00	5437.65	5438.65	5438.65	5438.84	0.225348	3.68	22.37	80.69	0.87
Echo_Pl_Split	1	219	500-yr	205.00	5437.65	5439.04	5439.04	5439.35	0.238907	4.75	47.00	98.95	0.95
Echo_Pl_Split	1	289	100-yr	115.00	5439.50	5441.63	5440.68	5441.67	0.014168	1.65	69.84	50.56	0.25
Echo_Pl_Split	1	289	FW	115.00	5439.50	5441.88		5441.92	0.011366	1.71	67.10	37.00	0.22
Echo_Pl_Split	1	289	10-yr	10.00	5439.50	5440.38		5440.39	0.010226	0.70	14.30	29.86	0.18
Echo_Pl_Split	1	289	25-yr	46.00	5439.50	5441.06	5440.30	5441.07	0.012193	1.11	41.28	48.53	0.21
Echo_Pl_Split	1	289	50-yr	75.00	5439.50	5441.32	5440.49	5441.35	0.013533	1.38	54.18	49.48	0.23
Echo_Pl_Split	1	289	500-yr	205.00	5439.50	5442.17	5441.02	5442.24	0.015702	2.11	97.32	52.05	0.27
Euclid_Ave_Split	01	76	100-yr	500.00	5288.32	5291.36		5291.50	0.000732	3.12	200.98	99.35	0.36
Euclid_Ave_Split	01	76	FW	500.00	5288.32	5291.63		5291.95	0.000700	4.55	109.95	40.00	0.48
Euclid_Ave_Split	01	76	10-yr	65.00	5288.32	5289.52		5289.58	0.001316	2.02	32.57	72.91	0.50
Euclid_Ave_Split	01	76	25-yr	275.00	5288.32	5290.32		5290.47	0.001427	3.16	100.84	90.40	0.49
Euclid_Ave_Split	01	76	50-yr	450.00	5288.32	5290.78		5290.99	0.001487	3.79	143.51	97.30	0.51
Euclid_Ave_Split	01	76	500-yr	500.00	5288.32	5292.73		5292.79	0.000162	1.93	337.54	99.35	0.18
Euclid_Ave_Split	01	129	100-yr	500.00	5288.65	5291.42		5291.55	0.001306	2.96	190.83	102.58	0.36
Euclid_Ave_Split	01	129	FW	500.00	5288.65	5291.64		5292.01	0.001226	4.87	102.64	40.00	0.54
Euclid_Ave_Split	01	129	10-yr	65.00	5288.65	5289.60		5289.71	0.004505	2.67	24.31	57.46	0.72
Euclid_Ave_Split	01	129	25-yr	275.00	5288.65	5290.42		5290.58	0.002906	3.25	88.05	98.12	0.56
Euclid_Ave_Split	01	129	50-yr	450.00	5288.65	5290.90		5291.10	0.002598	3.61	137.04	102.58	0.52
Euclid_Ave_Split	01	129	500-yr	500.00	5288.65	5292.75		5292.80	0.000273	1.77	327.07	102.58	0.17

Euclid_Ave_Split	01	224	100-yr	500.00	5289.02	5291.50		5291.70	0.001426	3.58	151.34	98.86	0.48
Euclid_Ave_Split	01	224	FW	500.00	5289.02	5291.69		5292.17	0.001384	5.58	89.53	40.00	0.66
Euclid_Ave_Split	01	224	10-yr	65.00	5289.02	5289.95		5290.08	0.003331	2.91	22.33	53.82	0.80
Euclid_Ave_Split	01	224	25-yr	275.00	5289.02	5290.63		5290.89	0.002987	4.02	68.50	80.49	0.76
Euclid_Ave_Split	01	224	50-yr	450.00	5289.02	5291.08		5291.37	0.002599	4.30	109.54	98.86	0.67
Euclid_Ave_Split	01	224	500-yr	500.00	5289.02	5292.76		5292.83	0.000270	2.05	275.79	98.86	0.21
Euclid_Ave_Split	01	308	100-yr	500.00	5289.61	5291.48	5291.45	5292.01	0.004828	5.84	86.49	84.84	0.98
Euclid_Ave_Split	01	308	FW	500.00	5289.61	5291.65	5291.65	5292.44	0.003521	7.14	70.02	44.00	1.00
Euclid_Ave_Split	01	308	10-yr	65.00	5289.61	5290.47	5290.47	5290.66	0.004987	3.49	18.61	50.98	1.02
Euclid_Ave_Split	01	308	25-yr	275.00	5289.61	5291.04	5291.04	5291.45	0.005049	5.14	53.51	67.79	1.02
Euclid_Ave_Split	01	308	50-yr	450.00	5289.61	5291.37	5291.37	5291.90	0.005166	5.84	77.32	79.63	1.02
Euclid_Ave_Split	01	308	500-yr	500.00	5289.61	5292.77		5292.87	0.000529	2.61	205.60	97.20	0.30
Euclid_Ave_Split	02	422	100-yr	109.00	5290.26	5292.21		5292.22	0.000152	1.08	103.93	91.83	0.17
Euclid_Ave_Split	02	422	FW	109.00	5290.26	5292.60		5292.63	0.000088	1.37	79.65	40.00	0.17
Euclid_Ave_Split	02	422	10-yr	10.00	5290.26	5290.94		5290.94	0.000254	0.71	14.07	45.65	0.23
Euclid_Ave_Split	02	422	25-yr	35.00	5290.26	5291.65		5291.66	0.000068	0.62	56.68	76.16	0.13
Euclid_Ave_Split	02	422	50-yr	69.00	5290.26	5292.10		5292.10	0.000078	0.75	93.82	90.46	0.12
Euclid_Ave_Split	02	422	500-yr	209.00	5290.26	5292.89		5292.92	0.000163	1.32	168.89	96.56	0.17
Euclid_Ave_Split	02	502	100-yr	109.00	5290.64	5292.21		5292.25	0.000450	1.69	64.42	75.89	0.32
Euclid_Ave_Split	02	502	FW	109.00	5290.64	5292.57		5292.66	0.000414	2.44	44.76	30.00	0.35
Euclid_Ave_Split	02	502	10-yr	10.00	5290.64	5291.06	5291.06	5291.17	0.005697	2.55	3.93	19.91	1.01
Euclid_Ave_Split	02	502	25-yr	35.00	5290.64	5291.65		5291.67	0.000419	1.29	27.06	56.73	0.33
Euclid_Ave_Split	02	502	50-yr	69.00	5290.64	5292.10		5292.12	0.000254	1.23	56.12	72.67	0.25
Euclid_Ave_Split	02	502	500-yr	209.00	5290.64	5292.90		5292.94	0.000336	1.75	123.60	92.01	0.26
Euclid_Ave_Split	02	593	100-yr	109.00	5291.41	5292.44	5292.44	5292.71	0.004130	4.19	26.00	48.20	1.01
Euclid_Ave_Split	02	593	FW	109.00	5291.41	5292.60	5292.60	5292.98	0.004109	4.93	22.10	30.00	1.01
Euclid_Ave_Split	02	593	10-yr	10.00	5291.41	5291.87	5291.87	5291.97	0.005712	2.53	3.95	19.69	0.99
Euclid_Ave_Split	02	593	25-yr	35.00	5291.41	5292.12	5292.12	5292.25	0.005018	2.94	11.92	41.88	0.97
Euclid_Ave_Split	02	593	50-yr	69.00	5291.41	5292.27	5292.27	5292.49	0.004813	3.75	18.41	43.96	1.02
Euclid_Ave_Split	02	593	500-yr	209.00	5291.41	5292.76	5292.75	5293.12	0.003676	4.81	43.43	60.46	1.00
Euclid_Ave_Split	02	698	100-yr	109.00	5293.01	5293.94	5293.94	5294.21	0.003745	4.14	26.31	50.63	1.01
Euclid_Ave_Split	02	698	FW	109.00	5293.01	5294.05	5294.05	5294.42	0.004013	4.91	22.18	30.00	1.01
Euclid_Ave_Split	02	698	10-yr	10.00	5293.01	5293.42	5293.42	5293.50	0.006465	2.25	4.45	29.53	1.02
Euclid_Ave_Split	02	698	25-yr	35.00	5293.01	5293.61	5293.61	5293.75	0.004917	3.05	11.48	40.18	1.00
Euclid_Ave_Split	02	698	50-yr	69.00	5293.01	5293.77	5293.77	5293.99	0.004353	3.75	18.41	43.12	1.01
Euclid_Ave_Split	02	698	500-yr	209.00	5293.01	5294.24	5294.24	5294.61	0.003702	4.89	42.75	59.72	1.02
Euclid_Ave_Split	02	801	100-yr	109.00	5294.37	5295.31	5295.31	5295.56	0.004045	4.00	27.28	55.36	1.00
Euclid_Ave_Split	02	801	FW	109.00	5294.37	5295.48	5295.48	5295.87	0.003991	5.03	21.68	28.00	1.01
Euclid_Ave_Split	02	801	10-yr	10.00	5294.37	5294.77	5294.77	5294.86	0.006203	2.35	4.26	25.17	1.01
Euclid_Ave_Split	02	801	25-yr	35.00	5294.37	5294.98	5294.98	5295.11	0.005358	2.99	11.71	41.55	0.99
Euclid_Ave_Split	02	801	50-yr	69.00	5294.37	5295.14	5295.14	5295.35	0.004725	3.63	18.99	45.91	1.00
Euclid_Ave_Split	02	801	500-yr	209.00	5294.37	5295.59	5295.59	5295.93	0.004088	4.69	44.58	67.38	1.02
Euclid_Ave_Split	02	934	100-yr	109.00	5296.31	5297.13	5297.13	5297.40	0.004075	4.17	26.16	49.15	1.01
Euclid_Ave_Split	02	934	FW	109.00	5296.31	5297.28	5297.28	5297.67	0.003881	5.00	21.79	28.00	1.00
Euclid_Ave_Split	02	934	10-yr	10.00	5296.31	5296.62	5296.62	5296.69	0.006129	2.07	4.84	35.49	0.99
Euclid_Ave_Split	02	934	25-yr	35.00	5296.31	5296.80	5296.80	5296.94	0.004978	3.02	11.57	40.72	1.00
Euclid_Ave_Split	02	934	50-yr	69.00	5296.31	5296.97	5296.97	5297.18	0.004589	3.71	18.62	44.43	1.01
Euclid_Ave_Split	02	934	500-yr	209.00	5296.31	5297.44	5297.44	5297.80	0.003734	4.83	43.23	61.26	1.01
Euclid_Ave_Split	02	1036	100-yr	109.00	5297.59	5298.47	5298.47	5298.73	0.005265	4.13	26.36	50.01	1.00
Euclid_Ave_Split	02	1036	FW	109.00	5297.59	5298.57	5298.57	5298.94	0.004116	4.84	22.54	32.00	1.02
Euclid_Ave_Split	02	1036	10-yr	10.00	5297.59	5297.92	5297.92	5298.01	0.009241	2.44	4.10	22.74	1.01
Euclid_Ave_Split	02	1036	25-yr	35.00	5297.59	5298.15	5298.15	5298.28	0.006718	2.92	11.97	42.19	0.97
Euclid_Ave_Split	02	1036	50-yr	69.00	5297.59	5298.30	5298.30	5298.51	0.006083	3.70	18.64	44.54	1.01
Euclid_Ave_Split	02	1036	500-yr	209.00	5297.59	5298.77	5298.77	5299.13	0.004506	4.82	43.38	62.63	1.02
Euclid_Ave_Split	02	1124	100-yr	109.00	5298.98	5299.68	5299.68	5299.85	0.011147	3.31	32.92	98.88	1.01
Euclid_Ave_Split	02	1124	FW	109.00	5298.98	5299.72	5299.72	5299.92	0.010148	3.58	30.47	78.00	1.01
Euclid_Ave_Split	02	1124	10-yr	10.00	5298.98	5299.28	5299.26	5299.34	0.028131	1.90	5.25	34.52	0.86
Euclid_Ave_Split	02	1124	25-yr	35.00	5298.98	5299.44	5299.44	5299.55	0.022198	2.62	13.35	64.52	1.02
Euclid_Ave_Split	02	1124	50-yr	69.00	5298.98	5299.58	5299.58	5299.71	0.015013	2.92	23.65	91.68	1.01
Euclid_Ave_Split	02	1124	500-yr	209.00	5298.98	5299.87	5299.87	5300.10	0.008202	3.86	54.16	117.04	1.00
Euclid_Ave_Split	02	1193	100-yr	96.00	5299.30	5300.24	5300.17	5300.40	0.005843	3.26	29.45	60.68	0.82
Euclid_Ave_Split	02	1193	FW	96.00	5299.30	5300.26	5300.22	5300.48	0.006099	3.79	25.32	46.00	0.90
Euclid_Ave_Split	02	1193	10-yr	2.00	5299.30	5299.81		5299.81	0.000560	0.30	6.63	39.83	0.13
Euclid_Ave_Split	02	1193	25-yr	24.00	5299.30	5300.02		5300.05	0.002717	1.43	16.79	56.11	0.46
Euclid_Ave_Split	02	1193	50-yr	57.00	5299.30	5300.14		5300.23	0.004149	2.37	24.02	58.44	0.65
Euclid_Ave_Split	02	1193	500-yr	217.00	5299.30	5300.48	5300.48	5300.84	0.007184	4.83	44.93	64.73	1.02
Euclid_Ave_Split	02	1311	100-yr	96.00	5300.73	5301.51	5301.51	5301.73	0.008484	3.74	25.68	59.82	1.01
Euclid_Ave_Split	02	1311	FW	96.00	5300.73	5301.54	5301.54	5301.79	0.007810	4.04	23.76	49.00	1.02
Euclid_Ave_Split	02	1311	10-yr	2.00	5300.73	5300.91	5300.91	5300.96	0.213642	1.78	1.12	11.11	0.99
Euclid_Ave_Split	02	1311	25-yr	24.00	5300.73	5301.23	5301.23	5301.33	0.017180	2.47	9.72	51.17	1.00
Euclid_Ave_Split	02	1311	50-yr	57.00	5300.73	5301.38	5301.38	5301.54	0.011228	3.25	17.56	56.88	1.03
Euclid_Ave_Split	02	1311	500-yr	217.00	5300.73	5301.82	5301.82	5302.18	0.006512	4.83	45.64	70.09	1.02
Euclid_Ave_Split	02	1445	100-yr	256.00	5301.79	5302.97	5302.97	5303.34	0.012383	5.25	69.05	93.83	1.16
Euclid_Ave_Split	02	1445	FW	256.00	5301.79	5303.20	5303.20	5303.66	0.005716	5.39	47.49	54.00	1.01
Euclid_Ave_Split	02	1445	10-yr	4.00	5301.79	5301.99	5301.99	5302.03	0.464109	1.87	2.51	27.94	0.97
Euclid_Ave_Split	02	1445	25-yr	76.00	5301.79	5302.66	5302.48	5302.75	0.009323	2.65	41.20	89.96	0.78
Euclid_Ave_Split	02	1445	50-yr	161.00	5301.79	5302.83	5302.75	5303.05	0.011119	4.09	56.22	92.57	1.02
Euclid_Ave_Split	02	1445	500-yr	536.00	5301.79	5303.43	5303.43	5304.03	0.008393	6.47	114.63	102.74	1.10
Euclid_Ave_Split	02	1563	100-yr	256.00	5303.09	5304.24	5304.24	5304.59	0.009182	4.74	54.03	77.34	1.00
Euclid_Ave_Split	02	1563	FW	256.00	5303.09	5304.34	5304.34	5304.78	0.006398	5.34	47.96	56.00	1.02
Euclid_Ave_Split	02	1563	10-yr	4.00	5303.09	5303.52	5303.38	5303.53	0.003774	0.65	6.17	38.63	0.29
Euclid_Ave_Split	02	1563	25-yr	76.00	5303.09	5303.85	5303.82	5304.00	0.011814	3.07	24.77	70.37	0.91
Euclid_Ave_Split	02	1563	50-yr	161.00	5303.09	5304.05	5304.04	5304.31	0.010246	4.06	39.61	74.41	0.98
Euclid_Ave_Split	02	1563	500-yr	536.00	5303.09	5304.68	5304.68	5305.24	0.007991	6.00	90.10	90.21	1.02
Kings	01	82	100-yr	134.00	5425.50	5426.58	5426.58	5426.91	0.006486	4.58	29.54	48.67	1.01
Kings	01	82	FW	134.00	5425.50	5426.93	5426.93	5427.50	0.004081	6.03	22.21	20.00	1.01
Kings	01	82	10-yr	7.00	5425.50	5426.04		5426.06	0.002487	1.13	6.21	27.40	0.42
Kings	01	82	25-yr	55.00	5425.50	5426.28	5426.28	5426.47	0.009025	3.53	15.59	41.93	1.02
Kings	01	82	50-yr	85.00	5425.50	5426.41	5426.41	5426.66	0.007366	3.97	21.42	45.17	1.01
Kings	01	82	500-yr	243.00	5425.50	5426.90	5426.90	5427.37	0.005656	5.52	45.94	59.04	1.00
Kings	01	215	100-yr	134.00	5430.19	5431.17	5431.17	5431.49	0.005386	4.56	31.96	54.95	1.01
Kings	01	215	FW	134.00	5430.19	5431.57	5431.57	5432.14	0.003769	6.05	22.17	20.00	1.01
Kings	01	215	10-yr	7.00	5430.19	5430.58	5430.58	5430.64	0.008295	1.96	3.58	28.25	0.97
Kings	01	215	25-yr	55.00	5430.19	5430.89	5430.89	5431.06	0.005648	3.31	17.29	50.43	0.95
Kings	01	215	50-yr	85.00	5430.19	5431.00	5431.00	5431.24	0.005902	3.96	22.80	52.18	1.01
Kings	01	215	500-yr	243.00	5430.19	5431.49	5431.49	5431.95	0.004782	5.47	50.04	58.88	1.00

Kings	02	311	100-yr	90.00	5433.38	5434.44	5434.44	5434.70	0.005041	4.10	22.31	46.70	1.03
Kings	02	311	FW	90.00	5433.38	5434.82	5434.82	5435.34	0.003921	5.81	15.50	15.00	1.01
Kings	02	311	10-yr	3.00	5433.38	5433.65	5433.65	5433.74	0.006457	2.37	1.27	7.77	1.03
Kings	02	311	25-yr	33.00	5433.38	5434.19	5434.19	5434.33	0.006475	2.99	11.03	42.43	1.03
Kings	02	311	50-yr	58.00	5433.38	5434.31	5434.31	5434.51	0.005619	3.58	16.30	45.25	1.03
Kings	02	311	500-yr	139.00	5433.38	5434.62	5434.62	5434.95	0.004530	4.66	31.09	54.78	1.02
Kings	02	435	100-yr	90.00	5437.88	5438.82	5438.82	5439.07	0.034452	4.03	22.55	48.44	1.01
Kings	02	435	FW	90.00	5437.88	5439.27	5439.27	5439.81	0.003805	5.88	15.31	14.00	0.99
Kings	02	435	10-yr	3.00	5437.88	5438.15	5438.15	5438.22	0.006245	2.14	1.40	9.84	1.00
Kings	02	435	25-yr	33.00	5437.88	5438.55	5438.55	5438.70	0.022657	3.08	10.70	40.04	1.05
Kings	02	435	50-yr	58.00	5437.88	5438.69	5438.69	5438.88	0.037297	3.46	16.76	45.52	1.00
Kings	02	435	500-yr	139.00	5437.88	5438.97	5438.97	5439.31	0.032226	4.69	30.36	50.98	1.03
Kings	02	561	100-yr	90.00	5442.45	5443.47	5443.47	5443.65	0.003586	3.87	27.93	99.22	0.91
Kings	02	561	FW	90.00	5442.45	5443.92	5443.92	5444.52	0.003818	6.21	14.48	12.00	1.00
Kings	02	561	10-yr	3.00	5442.45	5442.74	5442.74	5442.82	0.005603	2.19	1.37	19.02	0.96
Kings	02	561	25-yr	33.00	5442.45	5443.28	5443.28	5443.38	0.003052	2.81	14.45	90.69	0.79
Kings	02	561	50-yr	58.00	5442.45	5443.39	5443.39	5443.51	0.003002	3.21	22.24	99.22	0.81
Kings	02	561	500-yr	139.00	5442.45	5443.58	5443.58	5443.82	0.003704	4.45	36.37	99.22	0.95
Kings	02	665	100-yr	90.00	5446.83	5447.84	5447.84	5448.08	0.004257	3.95	22.77	46.62	1.00
Kings	02	665	FW	90.00	5446.83	5448.31	5448.31	5448.95	0.004017	6.44	13.97	11.00	1.01
Kings	02	665	10-yr	3.00	5446.83	5447.09	5447.09	5447.16	0.006215	2.22	1.35	8.90	1.00
Kings	02	665	25-yr	33.00	5446.83	5447.57	5447.57	5447.71	0.005750	3.00	11.01	42.41	1.04
Kings	02	665	50-yr	58.00	5446.83	5447.70	5447.70	5447.89	0.004961	3.53	16.42	44.38	1.02
Kings	02	665	500-yr	139.00	5446.83	5448.00	5448.00	5448.32	0.004091	4.54	30.64	49.27	1.01
Kings	02	771	100-yr	113.00	5450.76	5451.62	5451.62	5451.91	0.004175	4.34	26.05	45.85	1.01
Kings	02	771	FW	113.00	5450.76	5451.73	5451.73	5452.12	0.003940	4.97	22.73	30.00	1.01
Kings	02	771	10-yr	7.00	5450.76	5451.07	5451.07	5451.13	0.007410	1.89	3.70	35.28	1.03
Kings	02	771	25-yr	55.00	5450.76	5451.38	5451.38	5451.58	0.004624	3.51	15.67	41.61	1.01
Kings	02	771	50-yr	79.00	5450.76	5451.49	5451.49	5451.73	0.004390	3.93	20.12	43.15	1.01
Kings	02	771	500-yr	168.00	5450.76	5451.81	5451.81	5452.17	0.003753	4.84	35.23	52.22	1.00
Kings	02	873	100-yr	113.00	5455.25	5456.13	5456.13	5456.40	0.004127	4.16	27.16	52.71	1.02
Kings	02	873	FW	113.00	5455.25	5456.28	5456.28	5456.65	0.003972	4.86	23.25	32.00	1.00
Kings	02	873	10-yr	7.00	5455.25	5455.60	5455.60	5455.67	0.006471	2.09	3.36	25.03	1.00
Kings	02	873	25-yr	55.00	5455.25	5455.91	5455.91	5456.08	0.004692	3.38	16.27	46.91	1.01
Kings	02	873	50-yr	79.00	5455.25	5456.00	5456.00	5456.23	0.004459	3.78	20.88	49.03	1.02
Kings	02	873	500-yr	168.00	5455.25	5456.29	5456.29	5456.63	0.003872	4.69	36.61	62.35	1.01
Kings	02	981	100-yr	113.00	5461.18	5462.12	5462.12	5462.39	0.004398	4.13	27.60	55.91	1.01
Kings	02	981	FW	113.00	5461.18	5462.30	5462.30	5462.68	0.004041	4.93	22.91	31.00	1.01
Kings	02	981	10-yr	7.00	5461.18	5461.58	5461.58	5461.65	0.006027	2.12	3.30	23.10	0.99
Kings	02	981	25-yr	55.00	5461.18	5461.90	5461.90	5462.08	0.005159	3.39	16.22	48.86	1.04
Kings	02	981	50-yr	79.00	5461.18	5462.00	5462.00	5462.22	0.004667	3.73	21.21	51.76	1.02
Kings	02	981	500-yr	168.00	5461.18	5462.28	5462.28	5462.62	0.004290	4.71	36.65	59.44	1.01
Kings	02	1079	100-yr	133.00	5465.53	5466.43	5466.43	5466.73	0.004562	4.40	30.24	50.57	1.00
Kings	02	1079	FW	133.00	5465.54	5466.62	5466.62	5467.06	0.003748	5.32	25.02	29.00	1.01
Kings	02	1079	10-yr	9.00	5465.53	5465.85	5465.85	5465.91	0.009314	2.11	4.27	32.87	1.03
Kings	02	1079	25-yr	63.00	5465.53	5466.17	5466.17	5466.37	0.005542	3.56	17.69	44.91	1.00
Kings	02	1079	50-yr	92.00	5465.53	5466.29	5466.29	5466.53	0.005086	4.00	22.98	46.99	1.01
Kings	02	1079	500-yr	208.00	5465.53	5466.65	5466.65	5467.04	0.004352	5.04	43.17	66.15	0.99
Kings	02	1221	100-yr	133.00	5472.31	5473.22	5473.22	5473.52	0.004899	4.44	35.27	71.44	1.00
Kings	02	1221	FW	133.00	5472.32	5473.47	5473.47	5473.91	0.003837	5.37	24.75	28.00	1.01
Kings	02	1221	10-yr	9.00	5472.31	5472.67	5472.67	5472.74	0.006996	2.10	4.28	31.40	1.00
Kings	02	1221	25-yr	63.00	5472.31	5472.98	5472.98	5473.17	0.005269	3.48	19.51	61.06	1.00
Kings	02	1221	50-yr	92.00	5472.31	5473.08	5473.08	5473.33	0.005297	3.99	25.91	64.62	1.02
Kings	02	1221	500-yr	208.00	5472.31	5473.44	5473.44	5473.83	0.004533	5.11	51.41	77.31	0.99
Kings	02	1320	100-yr	133.00	5476.93	5477.81	5477.81	5478.11	0.004399	4.41	30.16	52.26	1.02
Kings	02	1320	FW	133.00	5476.93	5477.96	5477.96	5478.35	0.003681	5.06	26.28	32.00	0.98
Kings	02	1320	10-yr	9.00	5476.93	5477.24	5477.24	5477.30	0.006990	2.09	4.30	33.65	1.03
Kings	02	1320	25-yr	63.00	5476.93	5477.55	5477.55	5477.75	0.004947	3.62	17.39	44.98	1.03
Kings	02	1320	50-yr	92.00	5476.93	5477.68	5477.68	5477.92	0.004246	3.90	23.60	49.05	0.99
Kings	02	1320	500-yr	208.00	5476.93	5478.04	5478.04	5478.42	0.004089	4.93	43.24	63.63	0.98
Kings	02	1419	100-yr	145.00	5480.28	5481.38	5481.38	5481.67	0.003930	4.40	33.77	58.59	1.00
Kings	02	1419	FW	145.00	5480.28	5481.69	5481.69	5482.15	0.003873	5.42	26.75	30.00	1.01
Kings	02	1419	10-yr	9.00	5480.28	5480.73	5480.73	5480.83	0.005600	2.57	3.50	17.11	1.00
Kings	02	1419	25-yr	62.00	5480.28	5481.12	5481.12	5481.30	0.004663	3.44	18.58	56.73	1.01
Kings	02	1419	50-yr	102.00	5480.28	5481.27	5481.27	5481.49	0.003729	3.82	27.46	57.88	0.95
Kings	02	1419	500-yr	245.00	5480.28	5481.62	5481.62	5482.03	0.003714	5.21	47.89	58.96	1.00
Kings	02	1514	100-yr	145.00	5483.92	5484.97	5484.97	5485.31	0.066672	4.66	31.13	47.50	1.01
Kings	02	1514	FW	145.00	5483.92	5485.23	5485.23	5485.70	0.003837	5.54	26.15	28.00	1.01
Kings	02	1514	10-yr	9.00	5483.92	5484.31	5484.31	5484.39	0.070047	2.34	3.85	22.64	1.00
Kings	02	1514	25-yr	62.00	5483.92	5484.67	5484.67	5484.87	0.054812	3.59	17.25	42.95	1.00
Kings	02	1514	50-yr	102.00	5483.92	5484.83	5484.83	5485.10	0.063602	4.20	24.30	45.67	1.01
Kings	02	1514	500-yr	245.00	5483.92	5485.26	5485.26	5485.72	0.064319	5.43	45.25	51.00	1.00
Kings	02	1621	100-yr	145.00	5488.64	5490.03	5490.03	5490.41	0.006685	4.96	29.34	54.45	1.05
Kings	02	1621	FW	145.00	5488.64	5490.21	5490.21	5490.65	0.003988	5.33	27.21	30.00	0.99
Kings	02	1621	10-yr	9.00	5488.64	5489.12	5489.12	5489.26	0.016689	2.96	3.04	10.85	0.99
Kings	02	1621	25-yr	62.00	5488.64	5489.72	5489.72	5489.93	0.008438	3.69	16.80	40.77	0.99
Kings	02	1621	50-yr	102.00	5488.64	5489.89	5489.89	5490.18	0.007233	4.36	23.42	49.38	1.01
Kings	02	1621	500-yr	245.00	5488.64	5490.38	5490.38	5490.81	0.004450	5.37	53.37	70.99	0.95
Kings	03	1733	100-yr	119.00	5494.52	5496.55	5496.55	5497.20	0.045084	6.46	18.42	46.91	1.00
Kings	03	1733	FW	119.00	5494.52	5496.55	5496.55	5497.20	0.045084	6.46	18.42	14.29	1.00
Kings	03	1733	10-yr	6.00	5494.52	5495.03	5495.03	5495.19	0.071137	3.16	1.90	6.26	1.01
Kings	03	1733	25-yr	43.00	5494.52	5495.78	5495.78	5496.17	0.050829	4.97	8.65	28.39	0.99
Kings	03	1733	50-yr	74.00	5494.52	5496.14	5496.14	5496.65	0.047938	5.73	12.92	32.69	1.00
Kings	03	1733	500-yr	224.00	5494.52	5497.31	5497.31	5498.14	0.047018	7.34	30.64	79.87	0.97
Kings	03	1873	100-yr	119.00	5501.99	5503.75	5503.75	5504.44	0.046079	6.71	17.73	12.81	1.00
Kings	03	1873	FW	119.00	5501.99	5503.75	5503.75	5504.44	0.046069	6.71	17.73	12.80	1.00
Kings	03	1873	10-yr	6.00	5501.99	5502.39		5502.48	0.040583	2.32	2.59	8.93	0.76
Kings	03	1873	25-yr	43.00	5501.99	5502.98	5502.98	5503.37	0.052623	5.00	8.60	11.09	1.00
Kings	03	1873	50-yr	74.00	5501.99	5503.33	5503.33	5503.87	0.049525	5.88	12.59	11.97	1.01
Kings	03	1873	500-yr	224.00	5501.99	5504.50	5504.50	5505.50	0.043466	8.04	27.85	14.15	1.01
Kings	03	2018	100-yr	119.00	5516.96	5518.80	5518.80	5519.52	0.045084	6.79	17.53	12.07	0.99
Kings	03	2018	FW	119.00	5516.96	5518.80	5518.80	5519.52	0.045211	6.80	17.51	12.06	0.99
Kings	03	2018	10-yr	6.00	5516.96	5517.31	5517.31	5517.43	0.065748	2.76	2.17	8.28	0.95
Kings	03	2018	25-yr	43.00	5516.96	5517.99	5517.99	5518.39	0.050133	5.08	8.47	10.15	0.98
Kings	03	2018	50-yr	74.00	5516.96	5518.37	5518.37	5518.91	0.046804	5.90	12.54	11.19	0.98

Kings	03	2018	500-yr	224.00	5516.96	5519.61	5519.61	5520.62	0.041727	8.06	27.78	13.34	0.98
Kings	03	2175	100-yr	119.00	5525.19	5527.03	5527.03	5527.76	0.045425	6.85	17.36	11.71	0.99
Kings	03	2175	FW	119.00	5525.19	5527.03	5527.03	5527.76	0.045688	6.87	17.33	11.70	0.99
Kings	03	2175	10-yr	6.00	5525.19	5525.58	5525.52	5525.67	0.043075	2.48	2.42	7.89	0.79
Kings	03	2175	25-yr	43.00	5525.19	5526.22	5526.22	5526.62	0.050875	5.08	8.46	10.30	0.99
Kings	03	2175	50-yr	74.00	5525.19	5526.59	5526.59	5527.15	0.048398	6.01	12.32	10.93	1.00
Kings	03	2175	500-yr	224.00	5525.19	5527.89	5527.89	5528.86	0.042241	7.93	28.26	15.18	0.99
Kings	03	2268	100-yr	119.00	5528.05	5530.26	5529.86	5530.73	0.023241	5.50	21.62	11.60	0.71
Kings	03	2268	FW	119.00	5528.05	5530.26	5529.85	5530.73	0.023179	5.50	21.64	11.59	0.71
Kings	03	2268	10-yr	6.00	5528.05	5528.49	5528.39	5528.55	0.023353	1.97	3.05	8.92	0.59
Kings	03	2268	25-yr	43.00	5528.05	5529.33	5529.04	5529.55	0.021049	3.81	11.28	10.47	0.65
Kings	03	2268	50-yr	74.00	5528.05	5529.76	5529.42	5530.10	0.021954	4.64	15.96	11.00	0.68
Kings	03	2268	500-yr	224.00	5528.05	5531.16	5530.71	5531.90	0.025568	6.89	32.52	12.68	0.76
Kings	03	2330	100-yr	119.00	5529.19	5531.56	5530.96	5531.91	0.015759	4.72	25.19	13.11	0.60
Kings	03	2330	FW	119.00	5529.19	5531.56	5530.95	5531.91	0.015758	4.72	25.19	13.11	0.60
Kings	03	2330	10-yr	6.00	5529.19	5529.66	5529.50	5529.71	0.015432	1.71	3.51	9.26	0.49
Kings	03	2330	25-yr	43.00	5529.19	5530.51	5530.17	5530.70	0.016727	3.48	12.35	11.25	0.59
Kings	03	2330	50-yr	74.00	5529.19	5530.99	5530.53	5531.26	0.016210	4.11	17.99	12.11	0.59
Kings	03	2330	500-yr	224.00	5529.19	5532.62	5531.75	5533.11	0.015036	5.60	39.97	14.89	0.60
Kings	03	2396	100-yr	170.00	5536.74	5537.54	5537.54	5537.80	0.004156	4.09	41.58	81.14	1.01
Kings	03	2396	FW	170.00	5536.74	5537.81	5537.81	5538.32	0.003590	5.70	29.85	30.00	1.01
Kings	03	2396	10-yr	3.00	5536.74	5536.86	5536.86	5536.90	0.007828	1.60	1.88	24.13	1.01
Kings	03	2396	25-yr	59.00	5536.74	5537.23	5537.23	5537.38	0.004927	3.07	19.23	65.58	1.00
Kings	03	2396	50-yr	106.00	5536.74	5537.37	5537.37	5537.58	0.004624	3.68	28.77	71.07	1.02
Kings	03	2396	500-yr	315.00	5536.74	5537.81	5537.81	5538.17	0.003679	4.80	65.70	95.39	1.00
Kings	03	2444	100-yr	170.00	5540.04	5541.18	5541.18	5541.56	0.006102	4.95	34.54	84.34	1.01
Kings	03	2444	FW	170.00	5540.20	5541.63	5541.63	5542.18	0.003372	5.96	28.51	25.00	0.98
Kings	03	2444	10-yr	3.00	5540.04	5540.31	5540.31	5540.36	0.019682	1.91	1.57	17.68	1.02
Kings	03	2444	25-yr	59.00	5540.04	5540.80	5540.80	5540.99	0.007723	3.45	17.08	77.37	0.97
Kings	03	2444	50-yr	106.00	5540.04	5540.98	5540.98	5541.26	0.007013	4.26	24.90	79.09	1.01
Kings	03	2444	500-yr	315.00	5540.04	5541.58	5541.58	5542.13	0.004768	5.96	55.46	89.02	0.98
Kings	03	2504	100-yr	170.00	5541.81	5545.32	5545.32	5545.85	0.135392	5.83	29.17	27.17	0.99
Kings	03	2504	FW	170.00	5541.81	5545.50	5545.50	5546.96	0.261334	9.67	17.59	6.00	0.99
Kings	03	2504	10-yr	3.00	5541.81	5542.62	5542.44	5542.68	0.063809	1.93	1.55	3.52	0.51
Kings	03	2504	25-yr	59.00	5541.81	5544.01	5544.01	5544.55	0.182107	5.89	10.01	9.24	1.00
Kings	03	2504	50-yr	106.00	5541.81	5544.59	5544.59	5545.25	0.164625	6.53	16.24	12.02	0.99
Kings	03	2504	500-yr	315.00	5541.81	5545.88	5545.88	5546.63	0.136244	6.97	45.22	30.17	1.00
Kings	03	2628	100-yr	170.00	5547.11	5550.40	5549.11	5550.53	0.017122	2.97	57.84	32.83	0.36
Kings	03	2628	FW	170.00	5547.11	5550.85	5549.08	5550.97	0.011391	2.78	61.05	20.00	0.28
Kings	03	2628	10-yr	3.00	5547.11	5547.66	5547.49	5547.67	0.027428	0.98	3.07	11.25	0.33
Kings	03	2628	25-yr	59.00	5547.11	5549.17	5548.31	5549.24	0.015594	2.12	27.87	20.55	0.32
Kings	03	2628	50-yr	106.00	5547.11	5549.81	5548.70	5549.91	0.015825	2.53	41.97	23.88	0.34
Kings	03	2628	500-yr	315.00	5547.11	5551.34	5549.80	5551.54	0.018128	3.64	87.92	39.22	0.39
Kings	03	2724	100-yr	170.00	5553.70	5555.95	5555.95	5556.50	0.158323	5.94	28.60	25.76	0.99
Kings	03	2724	FW	170.00	5553.70	5556.04	5556.04	5557.03	0.182617	7.99	21.27	11.00	1.01
Kings	03	2724	10-yr	3.00	5553.70	5554.04	5554.04	5554.14	0.284835	2.59	1.16	5.73	1.01
Kings	03	2724	25-yr	59.00	5553.70	5555.07	5555.07	5555.48	0.175859	5.14	11.48	13.89	1.00
Kings	03	2724	50-yr	106.00	5553.70	5555.54	5555.54	5556.01	0.163594	5.52	19.20	19.78	0.99
Kings	03	2724	500-yr	315.00	5553.70	5556.55	5556.55	5557.29	0.145627	6.94	45.38	30.31	1.00
Kings	03	2821	100-yr	170.00	5560.28	5562.95	5562.24	5563.19	0.038259	3.86	44.02	25.98	0.52
Kings	03	2821	FW	170.00	5560.28	5563.42	5562.31	5563.71	0.035522	4.36	38.98	14.00	0.46
Kings	03	2821	10-yr	3.00	5560.28	5560.78	5560.59	5560.80	0.030162	1.07	2.81	9.71	0.35
Kings	03	2821	25-yr	59.00	5560.28	5561.96	5561.46	5562.08	0.035818	2.78	21.25	19.75	0.47
Kings	03	2821	50-yr	106.00	5560.28	5562.46	5561.84	5562.63	0.037091	3.33	31.85	23.07	0.50
Kings	03	2821	500-yr	315.00	5560.28	5563.78	5562.93	5564.12	0.041146	4.63	68.03	32.18	0.56
Kings	03	2900	100-yr	170.00	5568.26	5571.46	5571.46	5572.93	0.122018	9.72	17.49	15.33	1.00
Kings	03	2900	FW	170.00	5568.26	5571.46	5571.46	5572.93	0.255335	9.72	17.49	6.00	1.00
Kings	03	2900	10-yr	3.00	5568.26	5568.63	5568.63	5568.76	0.241514	2.88	1.04	3.76	0.97
Kings	03	2900	25-yr	59.00	5568.26	5569.99	5569.99	5570.71	0.152267	6.80	8.67	8.95	1.00
Kings	03	2900	50-yr	106.00	5568.26	5570.70	5570.70	5571.75	0.131556	8.23	12.88	11.49	0.99
Kings	03	2900	500-yr	315.00	5568.26	5572.98	5572.98	5575.16	0.103407	11.83	26.62	25.62	0.99
Kings	03	2920		Culvert									
Kings	03	2938	100-yr	170.00	5570.29	5575.82	5573.66	5575.91	0.025204	2.59	70.42	69.81	0.29
Kings	03	2938	FW	170.00	5570.29	5576.17	5573.68	5576.26	0.022484	2.52	68.69	33.00	0.26
Kings	03	2938	10-yr	3.00	5570.29	5571.05	5570.63	5571.08	0.033551	1.24	2.43	3.88	0.28
Kings	03	2938	25-yr	59.00	5570.29	5574.26	5572.32	5574.35	0.030854	2.39	24.68	15.93	0.25
Kings	03	2938	50-yr	106.00	5570.29	5575.32	5573.03	5575.41	0.033379	2.57	46.33	56.97	0.32
Kings	03	2938	500-yr	315.00	5570.29	5576.56	5575.55	5576.68	0.022467	2.61	112.73	77.68	0.30
Kings	03	2990	100-yr	170.00	5573.09	5576.86		5577.02	0.018312	3.26	56.08	28.46	0.37
Kings	03	2990	FW	170.00	5573.09	5577.19		5577.39	0.020260	3.62	46.92	15.00	0.36
Kings	03	2990	10-yr	3.00	5573.09	5573.53		5573.58	0.075454	1.76	1.70	5.43	0.56
Kings	03	2990	25-yr	59.00	5573.09	5575.58		5575.68	0.021857	2.57	23.01	17.15	0.38
Kings	03	2990	50-yr	106.00	5573.09	5576.40		5576.50	0.014546	2.65	43.17	27.13	0.33
Kings	03	2990	500-yr	315.00	5573.09	5577.65		5577.90	0.023786	4.21	79.31	30.83	0.44
Kings	03	3083	100-yr	170.00	5577.44	5579.55	5579.09	5579.85	0.057742	4.37	38.93	26.00	0.63
Kings	03	3083	FW	170.00	5577.44	5580.00	5579.26	5580.39	0.056119	5.01	33.95	14.00	0.57
Kings	03	3083	10-yr	3.00	5577.44	5577.81	5577.66	5577.82	0.030324	0.90	3.32	14.82	0.34
Kings	03	3083	25-yr	59.00	5577.44	5578.67	5578.37	5578.83	0.058046	3.17	18.58	20.27	0.58
Kings	03	3083	50-yr	106.00	5577.44	5578.95	5578.71	5579.24	0.082363	4.31	24.60	21.99	0.72
Kings	03	3083	500-yr	315.00	5577.44	5580.54	5579.75	5580.86	0.043969	4.53	69.47	35.68	0.57
Kings	03	3179	100-yr	170.00	5584.63	5586.48	5586.27	5586.86	0.094748	4.94	34.39	27.99	0.79
Kings	03	3179	FW	170.00	5584.63	5586.82	5586.48	5587.38	0.096673	6.02	28.24	14.00	0.75
Kings	03	3179	10-yr	3.00	5584.63	5584.87	5584.87	5584.94	0.391462	2.18	1.37	11.20	1.10
Kings	03	3179	25-yr	59.00	5584.63	5585.75	5585.60	5585.95	0.097973	3.64	16.20	21.51	0.74
Kings	03	3179	50-yr	106.00	5584.63	5586.22	5585.92	5586.45	0.068751	3.86	27.45	25.49	0.66
Kings	03	3179	500-yr	315.00	5584.63	5586.91	5586.87	5587.60	0.124801	6.68	47.91	34.50	0.94
Kings	03	3268	100-yr	170.00	5595.02	5597.93	5597.93	5599.02	0.152681	8.37	20.30	10.71	0.99
Kings	03	3268	FW	170.00	5595.02	5597.94	5597.94	5599.02	0.151683	8.36	20.35	10.72	0.99
Kings	03	3268	10-yr	3.00	5595.02	5595.54	5595.38	5595.58	0.057353	1.65	1.82	5.20	0.49
Kings	03	3268	25-yr	59.00	5595.02	5596.71	5596.67	5597.28	0.167480	6.07	9.71	7.95	0.97
Kings	03	3268	50-yr	106.00	5595.02	5597.27	5597.27	5598.11	0.167597	7.36	14.39	9.04	1.00
Kings	03	3268	500-yr	315.00	5595.02	5599.08	5599.08	5600.64	0.137518	10.00	31.49	23.41	0.99
Kings	03	3400		Culvert									

Kings	03	3459	100-yr	170.00	5601.80	5613.54	5605.57	5613.57	0.005453	1.39	125.61	66.84	0.16
Kings	03	3459	FW	170.00	5601.80	5614.01	5605.56	5614.04	0.005362	1.54	110.35	20.00	0.12
Kings	03	3459	10-yr	3.00	5601.80	5602.58	5602.25	5602.63	0.116762	1.89	1.59	2.49	0.42
Kings	03	3459	25-yr	59.00	5601.80	5606.58	5604.30	5606.65	0.027813	2.23	26.51	35.49	0.21
Kings	03	3459	50-yr	106.00	5601.80	5612.68	5604.90	5612.71	0.001970	1.22	87.05	63.98	0.07
Kings	03	3459	500-yr	315.00	5601.80	5614.05	5607.10	5614.11	0.008807	2.02	160.01	68.41	0.22
Kings	03	3575	100-yr	170.00	5610.34	5614.12		5614.17	0.004893	1.88	90.59	33.35	0.20
Kings	03	3575	FW	170.00	5610.34	5614.60		5614.67	0.005296	2.13	79.70	20.00	0.19
Kings	03	3575	10-yr	3.00	5610.34	5610.66	5610.56	5610.68	0.045796	1.05	2.84	13.80	0.41
Kings	03	3575	25-yr	59.00	5610.34	5611.48	5611.25	5611.66	0.074583	3.38	17.43	21.03	0.66
Kings	03	3575	50-yr	106.00	5610.34	5613.06		5613.11	0.007136	1.85	57.42	29.07	0.23
Kings	03	3575	500-yr	315.00	5610.34	5614.96		5615.07	0.007550	2.62	120.07	36.79	0.26
Kings	03	3674	100-yr	170.00	5614.00	5616.47	5616.47	5617.25	0.154901	7.10	23.95	15.64	1.01
Kings	03	3674	FW	170.00	5614.00	5616.77	5616.77	5617.98	0.213980	8.85	19.20	8.00	1.01
Kings	03	3674	10-yr	3.00	5614.00	5614.61	5614.40	5614.63	0.035247	1.30	2.30	6.56	0.39
Kings	03	3674	25-yr	59.00	5614.00	5616.19		5616.33	0.032418	2.99	19.72	14.64	0.45
Kings	03	3674	50-yr	106.00	5614.00	5615.98	5615.98	5616.61	0.165936	6.33	16.76	13.83	1.01
Kings	03	3674	500-yr	315.00	5614.00	5617.33	5617.33	5618.36	0.141396	8.15	38.64	18.93	1.01
Kings_Split	1	105	100-yr	79.00	5492.60	5493.34	5493.34	5493.53	0.005198	3.48	22.70	66.64	1.05
Kings_Split	1	105	FW	79.00	5492.60	5493.36	5493.36	5493.53	0.004379	3.31	23.90	66.64	0.97
Kings_Split	1	105	10-yr	3.00	5492.60	5492.90	5492.90	5492.94	0.007630	1.62	1.85	22.72	1.00
Kings_Split	1	105	25-yr	27.00	5492.60	5493.13	5493.13	5493.24	0.005472	2.59	10.44	49.80	0.99
Kings_Split	1	105	50-yr	49.00	5492.60	5493.24	5493.24	5493.38	0.005075	2.99	16.37	59.24	1.00
Kings_Split	1	105	500-yr	152.00	5492.60	5493.56	5493.56	5493.76	0.004402	3.60	42.27	106.05	1.00
Kings_Split	1	150	100-yr	79.00	5494.15	5497.63	5497.63	5497.83	0.270806	3.71	22.43	199.46	0.93
Kings_Split	1	150	FW	79.00	5497.49	5498.12	5498.12	5498.37	0.325313	4.12	19.59	39.01	1.01
Kings_Split	1	150	10-yr	3.00	5494.15	5496.30	5496.30	5496.41	0.407820	2.62	1.14	25.08	0.99
Kings_Split	1	150	25-yr	27.00	5494.15	5496.94	5496.94	5497.17	0.304195	3.86	7.00	72.47	0.98
Kings_Split	1	150	50-yr	49.00	5494.15	5497.18	5497.18	5497.50	0.272193	4.50	10.89	120.20	0.98
Kings_Split	1	150	500-yr	152.00	5494.15	5497.90	5497.90	5498.13	0.306902	3.91	40.20	260.36	0.99
Kings_Split	1	222	100-yr	79.00	5499.96	5501.53	5500.81	5501.57	0.020940	1.67	49.72	134.04	0.29
Kings_Split	1	222	FW	79.00	5499.96	5501.72	5500.88	5501.77	0.017542	1.82	43.41	30.00	0.27
Kings_Split	1	222	10-yr	3.00	5499.96	5500.39	5500.17	5500.39	0.020571	0.59	5.06	56.09	0.22
Kings_Split	1	222	25-yr	27.00	5499.96	5500.93	5500.53	5500.95	0.020539	1.19	22.74	75.69	0.26
Kings_Split	1	222	50-yr	49.00	5499.96	5501.22	5500.68	5501.25	0.020944	1.46	33.52	78.85	0.28
Kings_Split	1	222	500-yr	152.00	5499.96	5501.93	5501.13	5501.99	0.020942	2.02	87.27	171.44	0.30
Kings_Split	1	308	100-yr	79.00	5505.13	5506.90	5506.90	5507.12	0.358403	3.75	21.05	130.01	1.04
Kings_Split	1	308	FW	79.00	5506.19	5507.24	5507.24	5507.54	0.308311	4.40	17.97	30.00	1.00
Kings_Split	1	308	10-yr	3.00	5505.13	5506.27	5506.27	5506.32	0.602673	1.74	1.73	85.03	1.04
Kings_Split	1	308	25-yr	27.00	5505.13	5506.54	5506.54	5506.69	0.368964	3.13	8.64	100.15	1.00
Kings_Split	1	308	50-yr	49.00	5505.13	5506.70	5506.70	5506.90	0.305134	3.61	13.59	107.50	0.97
Kings_Split	1	308	500-yr	152.00	5505.13	5507.19	5507.19	5507.42	0.308434	3.86	39.36	176.00	0.99
Kings_Split	1	416	100-yr	79.00	5510.95	5512.59	5511.85	5512.64	0.019508	1.75	45.19	114.80	0.29
Kings_Split	1	416	FW	79.00	5510.95	5512.78	5511.89	5512.84	0.019172	1.95	40.60	33.00	0.29
Kings_Split	1	416	10-yr	3.00	5510.95	5511.34	5511.17	5511.34	0.015765	0.56	5.32	21.58	0.20
Kings_Split	1	416	25-yr	27.00	5510.95	5511.98	5511.46	5512.01	0.018497	1.20	22.42	32.74	0.26
Kings_Split	1	416	50-yr	49.00	5510.95	5512.29	5511.64	5512.32	0.019787	1.46	33.49	69.63	0.28
Kings_Split	1	416	500-yr	152.00	5510.95	5513.11	5512.20	5513.19	0.021451	2.31	65.82	141.57	0.32
Kings_Split	1	523	100-yr	79.00	5518.63	5519.66	5519.66	5519.86	0.350584	3.63	21.76	149.70	1.02
Kings_Split	1	523	FW	79.00	5519.07	5520.09	5520.09	5520.41	0.288169	4.57	17.30	26.07	0.99
Kings_Split	1	523	10-yr	3.00	5518.63	5518.92	5518.92	5519.00	0.469432	2.34	1.28	26.78	1.02
Kings_Split	1	523	25-yr	27.00	5518.63	5519.38	5519.38	5519.51	0.380005	2.95	9.16	101.51	1.00
Kings_Split	1	523	50-yr	49.00	5518.63	5519.52	5519.52	5519.69	0.350243	3.24	15.14	131.18	0.99
Kings_Split	1	523	500-yr	152.00	5518.63	5519.89	5519.89	5520.15	0.307746	4.08	37.43	192.15	1.00
Kings_Split	1	597	100-yr	79.00	5521.86	5524.58	5523.42	5524.71	0.026460	2.92	27.05	98.35	0.34
Kings_Split	1	597	FW	79.00	5521.86	5525.02	5523.48	5525.15	0.027126	2.83	27.88	10.00	0.30
Kings_Split	1	597	10-yr	3.00	5521.86	5522.54	5522.20	5522.55	0.016923	0.84	3.59	10.99	0.23
Kings_Split	1	597	25-yr	27.00	5521.86	5523.54	5522.83	5523.59	0.020883	1.83	14.78	84.86	0.29
Kings_Split	1	597	50-yr	49.00	5521.86	5524.04	5523.12	5524.12	0.023751	2.37	20.64	98.35	0.32
Kings_Split	1	597	500-yr	152.00	5521.86	5525.51	5524.02	5525.74	0.033250	3.94	40.94	111.35	0.39
Kings_Split	1	701	100-yr	79.00	5526.81	5528.13	5527.64	5528.20	0.044005	2.20	35.85	40.43	0.41
Kings_Split	1	701	FW	79.00	5526.81	5528.42	5527.75	5528.53	0.040015	2.69	29.34	20.00	0.39
Kings_Split	1	701	10-yr	3.00	5526.81	5527.05	5527.02	5527.08	0.282861	1.35	2.22	21.25	0.73
Kings_Split	1	701	25-yr	27.00	5526.81	5527.48	5527.30	5527.54	0.090608	2.03	13.32	29.34	0.53
Kings_Split	1	701	50-yr	49.00	5526.81	5527.78	5527.46	5527.85	0.060622	2.14	22.87	34.25	0.46
Kings_Split	1	701	500-yr	152.00	5526.81	5528.77	5527.99	5528.86	0.027059	2.37	64.63	51.26	0.35
Kings_Split	1	775	100-yr	79.00	5531.83	5533.39	5533.19	5533.67	0.142667	4.32	18.48	18.25	0.73
Kings_Split	1	775	FW	79.00	5532.09	5533.67	5533.44	5534.12	0.179811	5.35	14.76	10.00	0.78
Kings_Split	1	775	10-yr	3.00	5531.83	5532.25	5532.25	5532.31	0.542838	2.11	1.42	10.91	1.03
Kings_Split	1	775	25-yr	27.00	5531.83	5533.01	5532.68	5533.09	0.062476	2.24	12.07	16.15	0.46
Kings_Split	1	775	50-yr	49.00	5531.83	5533.23	5532.92	5533.38	0.092550	3.15	15.61	17.29	0.57
Kings_Split	1	775	500-yr	152.00	5531.83	5533.76	5533.76	5534.32	0.197863	6.09	26.33	25.63	0.88
Madison_Split	1	45	100-yr	154.00	5281.72	5282.49	5282.35	5282.70	0.007998	4.09	47.21	69.98	0.92
Madison_Split	1	45	FW	154.00	5281.72	5282.92	5282.92	5283.48	0.004961	6.01	25.62	23.00	1.00
Madison_Split	1	45	10-yr	4.00	5281.72	5281.51	5281.51	5281.60	0.090359		1.60	8.14	0.00
Madison_Split	1	45	25-yr	59.00	5281.72	5282.18	5282.05	5282.27	0.007987	2.76	26.66	64.17	0.87
Madison_Split	1	45	50-yr	96.00	5281.72	5282.31	5282.19	5282.46	0.008001	3.38	35.49	65.07	0.89
Madison_Split	1	45	500-yr	302.00	5281.72	5282.83	5282.71	5283.20	0.008002	5.37	71.98	74.33	0.97
Madison_Split	1	163	100-yr	228.00	5282.26	5283.43	5283.43	5283.85	0.004793	5.82	64.66	81.23	1.02
Madison_Split	1	163	FW	228.00	5282.26	5283.71	5283.71	5284.41	0.003773	6.68	34.14	25.00	1.01
Madison_Split	1	163	10-yr	4.00	5282.26	5282.44	5282.38	5282.47	0.002461	1.22	3.28	23.11	0.56
Madison_Split	1	163	25-yr	84.00	5282.26	5282.97	5282.97	5283.21	0.004930	4.25	29.86	63.34	0.98
Madison_Split	1	163	50-yr	143.00	5282.26	5283.19	5283.19	5283.51	0.004787	4.99	45.20	79.22	1.01
Madison_Split	1	163	500-yr	448.00	5282.26	5283.91	5283.91	5284.56	0.004833	7.35	104.46	84.17	1.06
Madison_Split	1	252	100-yr	228.00	5281.77	5283.94	5283.33	5284.05	0.000998	2.82	109.87	115.17	0.41
Madison_Split	1	252	FW	228.00	5281.77	5284.30	5283.59	5284.59	0.000898	4.36	52.25	25.00	0.53
Madison_Split	1	252	10-yr	4.00	5281.77	5282.50	5282.15	5282.50	0.000165	0.53	7.54	28.77	0.18
Madison_Split	1	252	25-yr	84.00	5281.77	5283.31	5282.86	5283.37	0.000766	1.97	51.08	78.07	0.38
Madison_Split	1	252	50-yr	143.00	5281.77	5283.61	5283.11	5283.69	0.000903	2.39	75.81	89.55	0.40
Madison_Split	1	252	500-yr	448.00	5281.77	5284.62	5283.81	5284.78	0.001056	3.52	182.69	127.28	0.42
Madison_Split	1	346	100-yr	228.00	5283.04	5284.15	5284.15	5284.55	0.006579	5.14	51.61	75.70	0.99
Madison_Split	1	346	FW	228.00	5283.04	5284.50	5284.50	5285.19	0.003960	6.68	34.13	25.00	1.01
Madison_Split	1	346	10-yr	4.00	5283.04	5283.23	5283.23	5283.26	0.004684	1.43	2.79	28.84	0.81
Madison_Split	1	346	25-yr	84.00	5283.04	5283.70	5283.70	5283.94	0.007029	3.97	21.49	48.54	1.00
Madison_Split	1	346	50-yr	143.00	5283.04	5283.93	5283.93	5284.23	0.006326	4.46	35.64	68.33	0.96
Madison_Split	1	346	500-yr	448.00	5283.04	5284.60	5284.60	5285.17	0.006654	6.28	86.48	79.00	0.99

Quinn_St_Split	01	41	100-yr	600.00	5290.61	5292.44	5292.44	5293.05	0.004560	6.29	97.69	90.49	1.00
Quinn_St_Split	01	41	FW	600.00	5290.61	5292.82	5292.82	5293.77	0.003542	7.81	76.79	40.00	0.99
Quinn_St_Split	01	41	10-yr	39.00	5290.61	5291.21	5291.21	5291.35	0.007456	3.01	12.97	48.46	1.02
Quinn_St_Split	01	41	25-yr	234.00	5290.61	5291.81	5291.81	5292.18	0.004621	4.84	48.30	67.44	1.01
Quinn_St_Split	01	41	50-yr	404.00	5290.61	5292.15	5292.15	5292.63	0.004412	5.55	72.89	78.77	1.01
Quinn_St_Split	01	41	500-yr	700.00	5290.61	5292.56	5292.56	5293.25	0.004659	6.64	109.37	92.91	1.01
Quinn_St_Split	01	109	100-yr	600.00	5290.90	5292.90	5292.71	5293.35	0.003786	5.39	119.73	92.62	0.80
Quinn_St_Split	01	109	FW	600.00	5290.90	5293.35	5293.05	5293.99	0.002362	6.42	93.44	45.00	0.79
Quinn_St_Split	01	109	10-yr	39.00	5290.90	5291.62		5291.70	0.003741	2.21	17.66	59.72	0.72
Quinn_St_Split	01	109	25-yr	234.00	5290.90	5292.23	5292.09	5292.47	0.003826	4.00	59.79	81.12	0.79
Quinn_St_Split	01	109	50-yr	404.00	5290.90	5292.57	5292.42	5292.92	0.003834	4.76	88.96	91.31	0.80
Quinn_St_Split	01	109	500-yr	700.00	5290.90	5293.06	5292.83	5293.55	0.003750	5.67	134.06	92.62	0.80
Quinn_St_Split	01	195	100-yr	600.00	5291.24	5293.34	5293.34	5293.95	0.004350	6.29	98.31	92.49	1.01
Quinn_St_Split	01	195	FW	600.00	5291.24	5293.61	5293.61	5294.58	0.003487	7.90	75.98	40.00	1.01
Quinn_St_Split	01	195	10-yr	39.00	5291.24	5292.02	5292.02	5292.17	0.005739	3.07	12.68	43.29	1.00
Quinn_St_Split	01	195	25-yr	234.00	5291.24	5292.71	5292.71	5293.08	0.003950	4.91	47.66	62.46	0.99
Quinn_St_Split	01	195	50-yr	404.00	5291.24	5293.05	5293.05	5293.53	0.003972	5.54	73.05	81.97	1.02
Quinn_St_Split	01	195	500-yr	700.00	5291.24	5293.47	5293.47	5294.15	0.004422	6.59	110.95	93.67	1.00
Quinn_St_Split	01	278	100-yr	600.00	5292.15	5294.24	5294.24	5294.88	0.004231	6.46	93.39	76.10	1.00
Quinn_St_Split	01	278	FW	600.00	5292.15	5294.48	5294.48	5295.45	0.003168	7.88	76.11	40.00	1.01
Quinn_St_Split	01	278	10-yr	39.00	5292.15	5292.86	5292.86	5293.02	0.005923	3.21	12.16	39.61	1.02
Quinn_St_Split	01	278	25-yr	234.00	5292.15	5293.52	5293.52	5293.92	0.004748	5.09	46.00	58.80	1.01
Quinn_St_Split	01	278	50-yr	404.00	5292.15	5293.89	5293.89	5294.42	0.004540	5.84	69.18	66.28	1.01
Quinn_St_Split	01	278	500-yr	700.00	5292.15	5294.37	5294.37	5295.09	0.004290	6.80	104.33	80.58	1.00
Quinn_St_Split	02	406	100-yr	449.00	5294.79	5296.60	5296.60	5297.20	0.058754	6.23	73.02	66.47	1.00
Quinn_St_Split	02	406	FW	449.00	5294.79	5296.96	5296.96	5297.83	0.003026	7.51	59.76	33.00	0.98
Quinn_St_Split	02	406	10-yr	37.00	5294.79	5295.47	5295.47	5295.61	0.017127	2.99	12.36	41.05	0.96
Quinn_St_Split	02	406	25-yr	183.00	5294.79	5296.01	5296.01	5296.37	0.048226	4.85	37.75	52.91	1.01
Quinn_St_Split	02	406	50-yr	306.00	5294.79	5296.32	5296.32	5296.80	0.061403	5.54	55.26	60.45	1.01
Quinn_St_Split	02	406	500-yr	385.00	5294.79	5296.48	5296.48	5297.03	0.059125	5.93	65.40	64.07	1.00
Quinn_St_Split	02	488	100-yr	449.00	5296.77	5298.61	5298.61	5299.18	0.003923	6.07	79.12	76.67	1.00
Quinn_St_Split	02	488	FW	449.00	5296.77	5299.06	5299.06	5299.94	0.003050	7.51	59.79	33.00	0.98
Quinn_St_Split	02	488	10-yr	37.00	5296.77	5297.53	5297.53	5297.67	0.004802	3.02	12.26	41.88	0.98
Quinn_St_Split	02	488	25-yr	183.00	5296.77	5298.04	5298.04	5298.39	0.004292	4.75	38.62	59.84	1.03
Quinn_St_Split	02	488	50-yr	306.00	5296.77	5298.34	5298.34	5298.79	0.003966	5.42	58.50	74.03	1.00
Quinn_St_Split	02	488	500-yr	385.00	5296.77	5298.49	5298.49	5299.02	0.003943	5.81	70.19	75.74	1.00
Skunk	01	25	100-yr	1430.00	5238.75	5245.56	5244.02	5245.82	0.010998	4.57	380.08	258.53	0.35
Skunk	01	25	FW	1430.00	5238.75	5245.96	5244.14	5246.27	0.011001	4.80	327.49	80.00	0.36
Skunk	01	25	10-yr	438.00	5238.75	5243.60	5241.96	5243.75	0.011009	3.32	149.03	75.85	0.33
Skunk	01	25	25-yr	821.00	5238.75	5244.57	5243.22	5244.78	0.011008	3.97	241.23	118.80	0.34
Skunk	01	25	50-yr	1076.00	5238.75	5245.06	5243.54	5245.28	0.011004	4.27	305.92	208.86	0.35
Skunk	01	25	500-yr	2211.00	5238.75	5246.46	5244.77	5246.78	0.011014	5.09	515.89	354.63	0.36
Skunk	01	109	100-yr	1430.00	5236.30	5246.24	5240.63	5246.52	0.006536	4.27	338.05	321.12	0.26
Skunk	01	109	FW	1430.00	5236.30	5246.69	5240.63	5246.95	0.005952	4.09	353.54	42.00	0.24
Skunk	01	109	10-yr	438.00	5236.30	5244.02	5238.25	5244.07	0.001687	1.80	243.04	57.09	0.13
Skunk	01	109	25-yr	821.00	5236.30	5245.15	5239.29	5245.28	0.003500	2.84	290.49	197.88	0.19
Skunk	01	109	50-yr	1076.00	5236.30	5245.68	5239.89	5245.87	0.004703	3.46	313.78	268.11	0.22
Skunk	01	109	500-yr	2211.00	5236.30	5247.25	5242.05	5247.78	0.010478	5.84	382.25	353.88	0.34
Skunk	01	210		Culvert									
Skunk	01	286	100-yr	1430.00	5237.20	5248.42	5240.98	5248.55	0.002471	2.92	506.47	360.66	0.17
Skunk	01	286	FW	1430.00	5237.20	5248.90	5240.98	5249.03	0.005033	2.97	501.18	135.00	0.23
Skunk	01	286	10-yr	438.00	5237.20	5244.24	5238.94	5244.28	0.001108	1.68	260.93	78.20	0.11
Skunk	01	286	25-yr	821.00	5237.20	5245.96	5239.85	5246.06	0.001809	2.50	328.34	169.21	0.15
Skunk	01	286	50-yr	1076.00	5237.20	5247.12	5240.36	5247.25	0.002024	2.88	373.42	200.77	0.16
Skunk	01	286	500-yr	2211.00	5237.20	5249.30	5242.17	5249.46	0.001848	1.90	849.14	424.28	0.14
Skunk	01	378	100-yr	1430.00	5240.45	5248.60		5248.63	0.000375	1.50	1050.37	171.96	0.10
Skunk	01	378	FW	1430.00	5240.45	5249.09		5249.12	0.000324	1.46	1050.84	148.00	0.09
Skunk	01	378	10-yr	438.00	5240.45	5244.34		5244.36	0.000733	1.21	377.96	126.38	0.12
Skunk	01	378	25-yr	821.00	5240.45	5246.13		5246.15	0.000573	1.38	625.71	170.18	0.11
Skunk	01	378	50-yr	1076.00	5240.45	5247.31		5247.33	0.000437	1.41	828.28	171.96	0.10
Skunk	01	378	500-yr	2211.00	5240.45	5249.50		5249.56	0.000585	2.03	1205.62	171.96	0.13
Skunk	01	480	100-yr	1430.00	5241.14	5248.63		5248.68	0.000700	1.86	800.33	153.07	0.13
Skunk	01	480	FW	1430.00	5241.14	5249.12		5249.17	0.000629	1.82	786.52	120.00	0.13
Skunk	01	480	10-yr	438.00	5241.14	5244.43		5244.48	0.001741	1.68	260.89	99.31	0.18
Skunk	01	480	25-yr	821.00	5241.14	5246.19		5246.24	0.001148	1.82	464.85	129.03	0.16
Skunk	01	480	50-yr	1076.00	5241.14	5247.35		5247.40	0.000877	1.80	619.22	137.07	0.14
Skunk	01	480	500-yr	2211.00	5241.14	5249.55		5249.64	0.001017	2.46	958.55	177.85	0.16
Skunk	01	579	100-yr	1430.00	5241.63	5248.70		5248.77	0.001012	2.15	675.99	119.79	0.16
Skunk	01	579	FW	1430.00	5241.63	5249.18		5249.24	0.000784	2.03	707.30	110.00	0.14
Skunk	01	579	10-yr	438.00	5241.63	5244.64		5244.70	0.002751	1.94	225.47	97.34	0.22
Skunk	01	579	25-yr	821.00	5241.63	5246.31		5246.38	0.001624	2.07	402.15	109.95	0.19
Skunk	01	579	50-yr	1076.00	5241.63	5247.44		5247.51	0.001202	2.07	528.66	114.21	0.17
Skunk	01	579	500-yr	2211.00	5241.63	5249.65		5249.77	0.001482	2.84	795.78	147.50	0.20
Skunk	01	680	100-yr	1430.00	5242.01	5248.81		5248.88	0.001053	2.11	705.28	135.67	0.16
Skunk	01	680	FW	1430.00	5242.01	5249.26		5249.33	0.000963	2.12	674.20	110.00	0.15
Skunk	01	680	10-yr	438.00	5242.01	5244.92		5244.98	0.002938	1.99	220.52	111.23	0.23
Skunk	01	680	25-yr	821.00	5242.01	5246.48		5246.55	0.001786	2.10	406.16	123.18	0.20
Skunk	01	680	50-yr	1076.00	5242.01	5247.57		5247.63	0.001283	2.07	542.20	127.73	0.17
Skunk	01	680	500-yr	2211.00	5242.01	5249.81		5249.92	0.001421	2.74	847.18	154.50	0.19
Skunk	01	779	100-yr	1430.00	5242.22	5248.91		5248.99	0.001191	2.23	661.12	153.98	0.17
Skunk	01	779	FW	1430.00	5242.22	5249.36		5249.43	0.001044	2.17	658.61	110.00	0.16
Skunk	01	779	10-yr	438.00	5242.22	5245.22		5245.28	0.002964	1.98	222.38	104.92	0.23
Skunk	01	779	25-yr	821.00	5242.22	5246.67		5246.74	0.002054	2.18	381.44	114.29	0.21
Skunk	01	779	50-yr	1076.00	5242.22	5247.70		5247.77	0.001536	2.18	502.53	120.42	0.19
Skunk	01	779	500-yr	2211.00	5242.22	5249.95		5250.07	0.001528	2.84	826.09	160.00	0.20
Skunk	01	875	100-yr	1430.00	5242.67	5249.03		5249.12	0.001372	2.34	627.98	151.61	0.18
Skunk	01	875	FW	1430.00	5242.67	5249.45		5249.57	0.001664	2.76	518.72	80.00	0.19
Skunk	01	875	10-yr	438.00	5242.67	5245.51		5245.57	0.003096	2.02	216.81	96.47	0.24
Skunk	01	875	25-yr	821.00	5242.67	5246.87		5246.95	0.002315	2.29	363.12	113.04	0.22
Skunk	01	875	50-yr	1076.00	5242.67	5247.85		5247.93	0.001772	2.29	476.29	119.00	0.20
Skunk	01	875	500-yr	2211.00	5242.67	5250.10		5250.23	0.001693	2.95	797.43	160.00	0.21
Skunk	01	975	100-yr	1430.00	5243.15	5249.18		5249.28	0.001919	2.66	547.48	119.70	0.21
Skunk	01	975	FW	1430.00	5243.15	5249.62		5249.76	0.001984	2.92	489.85	80.00	0.21
Skunk	01	975	10-yr	438.00	5243.15	5245.85		5245.92	0.004030	2.25	194.46	89.47	0.27

Skunk	01	975	25-yr	821.00	5243.15	5247.13		5247.23	0.003281	2.60	315.73	101.80	0.26
Skunk	01	975	50-yr	1076.00	5243.15	5248.04		5248.15	0.002479	2.62	416.47	112.35	0.23
Skunk	01	975	500-yr	2211.00	5243.15	5250.26		5250.43	0.002295	3.33	694.08	146.71	0.24
Skunk	01	1073	100-yr	1430.00	5243.79	5249.38		5249.50	0.002471	2.86	506.19	115.81	0.24
Skunk	01	1073	FW	1430.00	5243.79	5249.83		5249.98	0.002589	3.17	450.57	80.00	0.24
Skunk	01	1073	10-yr	438.00	5243.79	5246.29		5246.39	0.005408	2.44	179.32	91.20	0.31
Skunk	01	1073	25-yr	821.00	5243.79	5247.48		5247.60	0.004197	2.79	296.12	106.47	0.29
Skunk	01	1073	50-yr	1076.00	5243.79	5248.31		5248.43	0.003207	2.82	385.59	110.04	0.26
Skunk	01	1073	500-yr	2211.00	5243.79	5250.50		5250.69	0.002790	3.53	644.03	136.20	0.26
Skunk	01	1173	100-yr	1430.00	5244.27	5249.64		5249.77	0.002832	2.94	492.81	122.70	0.25
Skunk	01	1173	FW	1430.00	5244.27	5250.09		5250.26	0.002812	3.26	438.91	80.00	0.25
Skunk	01	1173	10-yr	438.00	5244.27	5246.82		5246.91	0.004955	2.35	186.22	93.96	0.29
Skunk	01	1173	25-yr	821.00	5244.27	5247.91		5248.03	0.004337	2.80	293.33	102.94	0.29
Skunk	01	1173	50-yr	1076.00	5244.27	5248.64		5248.77	0.003608	2.89	373.68	117.03	0.28
Skunk	01	1173	500-yr	2211.00	5244.27	5250.79		5250.98	0.003019	3.54	639.06	133.54	0.27
Skunk	01	1273	100-yr	1430.00	5245.10	5250.01	5249.17	5250.46	0.019001	5.36	266.82	127.53	0.60
Skunk	01	1273	FW	1430.00	5245.10	5250.40	5249.21	5250.91	0.014938	5.75	248.77	70.00	0.54
Skunk	01	1273	10-yr	438.00	5245.10	5247.91	5247.91	5248.44	0.066519	5.88	74.49	66.41	0.98
Skunk	01	1273	25-yr	821.00	5245.10	5248.61	5248.51	5249.22	0.051333	6.27	130.97	93.37	0.90
Skunk	01	1273	50-yr	1076.00	5245.10	5249.17	5248.80	5249.71	0.032680	5.92	181.81	106.19	0.75
Skunk	01	1273	500-yr	2211.00	5245.10	5251.12	5249.89	5251.63	0.013195	5.71	389.83	130.33	0.53
Skunk	01	1373	100-yr	1430.00	5247.45	5251.50	5250.27	5251.75	0.009314	4.08	366.50	160.64	0.43
Skunk	01	1373	FW	1430.00	5247.45	5251.82	5250.43	5252.21	0.011397	5.03	284.54	80.00	0.47
Skunk	01	1373	10-yr	438.00	5247.45	5250.09	5249.24	5250.18	0.007651	2.49	175.74	112.70	0.35
Skunk	01	1373	25-yr	821.00	5247.45	5250.77	5249.67	5250.93	0.008233	3.21	258.24	132.41	0.39
Skunk	01	1373	50-yr	1076.00	5247.45	5251.08	5249.95	5251.29	0.009041	3.66	301.72	147.27	0.41
Skunk	01	1373	500-yr	2211.00	5247.45	5252.37	5250.88	5252.69	0.008565	4.63	508.65	166.02	0.43
Skunk	01	1473	100-yr	1430.00	5247.66	5252.33		5252.53	0.006389	3.63	406.66	146.96	0.36
Skunk	01	1473	FW	1430.00	5247.66	5252.78		5253.01	0.005705	3.90	367.13	90.00	0.34
Skunk	01	1473	10-yr	438.00	5247.66	5250.72		5250.80	0.004959	2.21	198.24	109.84	0.29
Skunk	01	1473	25-yr	821.00	5247.66	5251.49		5251.62	0.005744	2.87	287.69	131.44	0.33
Skunk	01	1473	50-yr	1076.00	5247.66	5251.87		5252.03	0.006080	3.22	339.98	140.76	0.34
Skunk	01	1473	500-yr	2211.00	5247.66	5253.18		5253.46	0.006775	4.31	533.29	150.35	0.38
Skunk	01	1572	100-yr	1430.00	5248.02	5252.93		5253.11	0.005295	3.40	422.61	142.24	0.33
Skunk	01	1572	FW	1430.00	5248.02	5253.33		5253.59	0.005885	4.10	348.96	80.00	0.35
Skunk	01	1572	10-yr	438.00	5248.02	5251.19		5251.26	0.004345	2.10	208.63	113.06	0.27
Skunk	01	1572	25-yr	821.00	5248.02	5252.02		5252.13	0.004683	2.68	306.73	121.95	0.30
Skunk	01	1572	50-yr	1076.00	5248.02	5252.44		5252.58	0.004975	3.00	358.23	125.30	0.31
Skunk	01	1572	500-yr	2211.00	5248.02	5253.82		5254.08	0.005638	4.06	566.77	177.97	0.35
Skunk	01	1675	100-yr	1430.00	5248.41	5253.44		5253.61	0.004423	3.30	460.70	162.81	0.31
Skunk	01	1675	FW	1430.00	5248.41	5253.91		5254.10	0.004106	3.53	405.35	90.00	0.29
Skunk	01	1675	10-yr	438.00	5248.41	5251.61		5251.68	0.003891	2.11	207.65	105.23	0.26
Skunk	01	1675	25-yr	821.00	5248.41	5252.48		5252.59	0.004239	2.70	314.24	137.63	0.29
Skunk	01	1675	50-yr	1076.00	5248.41	5252.92		5253.05	0.004354	2.98	379.17	150.98	0.30
Skunk	01	1675	500-yr	2211.00	5248.41	5254.38		5254.59	0.004478	3.87	620.73	191.88	0.32
Skunk	01	1802	100-yr	1430.00	5248.88	5254.07		5254.28	0.006338	3.71	385.23	121.29	0.36
Skunk	01	1802	FW	1430.00	5248.88	5254.49		5254.78	0.006607	4.35	328.74	75.00	0.37
Skunk	01	1802	10-yr	438.00	5248.88	5252.21		5252.30	0.006397	2.43	180.49	104.79	0.33
Skunk	01	1802	25-yr	821.00	5248.88	5253.09		5253.23	0.005938	2.99	274.20	109.57	0.33
Skunk	01	1802	50-yr	1076.00	5248.88	5253.54		5253.71	0.006074	3.32	324.31	112.92	0.35
Skunk	01	1802	500-yr	2211.00	5248.88	5255.00		5255.30	0.006790	4.40	519.42	166.66	0.39
Skunk	01	1918	100-yr	1430.00	5249.54	5254.79		5254.95	0.005159	3.30	451.80	162.09	0.32
Skunk	01	1918	FW	1430.00	5249.54	5255.22		5255.42	0.004477	3.56	401.27	95.00	0.31
Skunk	01	1918	10-yr	438.00	5249.54	5252.90		5252.99	0.005401	2.37	188.15	106.35	0.30
Skunk	01	1918	25-yr	821.00	5249.54	5253.79		5253.91	0.005834	2.82	299.36	141.02	0.33
Skunk	01	1918	50-yr	1076.00	5249.54	5254.24		5254.38	0.005496	3.05	365.49	155.29	0.33
Skunk	01	1918	500-yr	2211.00	5249.54	5255.77		5255.98	0.004964	3.76	618.78	178.72	0.33
Skunk	01	1982	100-yr	1430.00	5250.14	5255.13		5255.37	0.007615	3.99	381.53	148.65	0.39
Skunk	01	1982	FW	1430.00	5250.14	5255.50		5255.87	0.009127	4.90	291.69	70.00	0.42
Skunk	01	1982	10-yr	438.00	5250.14	5253.29		5253.40	0.007706	2.72	164.89	99.09	0.36
Skunk	01	1982	25-yr	821.00	5250.14	5254.17		5254.34	0.007123	3.30	257.03	111.16	0.37
Skunk	01	1982	50-yr	1076.00	5250.14	5254.61		5254.81	0.007399	3.65	308.36	129.87	0.38
Skunk	01	1982	500-yr	2211.00	5250.14	5256.08		5256.37	0.007060	4.51	532.19	167.95	0.39
Skunk	01	2034	100-yr	1430.00	5250.58	5255.52		5255.73	0.006570	3.78	395.32	133.30	0.37
Skunk	01	2034	FW	1430.00	5250.58	5256.02		5256.25	0.005493	3.85	373.12	95.00	0.34
Skunk	01	2034	10-yr	438.00	5250.58	5253.71		5253.81	0.008033	2.65	171.09	112.45	0.36
Skunk	01	2034	25-yr	821.00	5250.58	5254.55		5254.70	0.006827	3.14	272.13	122.99	0.36
Skunk	01	2034	50-yr	1076.00	5250.58	5255.00		5255.17	0.006596	3.42	327.41	126.15	0.36
Skunk	01	2034	500-yr	2211.00	5250.58	5256.45		5256.72	0.006500	4.38	537.40	173.44	0.38
Skunk	01	2084	100-yr	1430.00	5250.83	5255.85		5256.06	0.006819	3.69	387.17	125.33	0.37
Skunk	01	2084	FW	1430.00	5250.83	5256.30		5256.56	0.006797	4.12	346.80	90.00	0.37
Skunk	01	2084	10-yr	438.00	5250.83	5254.10		5254.19	0.007340	2.46	178.12	112.52	0.34
Skunk	01	2084	25-yr	821.00	5250.83	5254.90		5255.04	0.006939	3.04	270.25	119.03	0.36
Skunk	01	2084	50-yr	1076.00	5250.83	5255.33		5255.50	0.006847	3.34	322.40	122.00	0.36
Skunk	01	2084	500-yr	2211.00	5250.83	5256.77		5257.06	0.007073	4.37	510.66	153.90	0.39
Skunk	01	2184	100-yr	1430.00	5251.62	5256.51		5256.73	0.006461	3.80	376.07	111.77	0.37
Skunk	01	2184	FW	1430.00	5251.62	5256.95		5257.22	0.006318	4.16	343.50	80.00	0.35
Skunk	01	2184	10-yr	438.00	5251.62	5254.73		5254.81	0.005216	2.33	188.06	99.69	0.30
Skunk	01	2184	25-yr	821.00	5251.62	5255.53		5255.68	0.005848	3.03	270.60	104.91	0.33
Skunk	01	2184	50-yr	1076.00	5251.62	5255.97		5256.15	0.006133	3.39	317.34	107.81	0.35
Skunk	01	2184	500-yr	2211.00	5251.62	5257.45		5257.77	0.006961	4.55	493.66	140.62	0.39
Skunk	01	2280	100-yr	1430.00	5252.07	5257.10		5257.29	0.005282	3.59	398.78	111.32	0.33
Skunk	01	2280	FW	1430.00	5252.07	5257.52		5257.76	0.004959	3.87	369.34	80.00	0.32
Skunk	01	2280	10-yr	438.00	5252.07	5255.18		5255.25	0.004050	2.19	200.13	96.35	0.27
Skunk	01	2280	25-yr	821.00	5252.07	5256.05		5256.18	0.004673	2.86	287.30	103.03	0.30
Skunk	01	2280	50-yr	1076.00	5252.07	5256.52		5256.68	0.004947	3.20	336.59	106.37	0.32
Skunk	01	2280	500-yr	2211.00	5252.07	5258.09		5258.37	0.005550	4.29	531.33	151.10	0.36
Skunk	01	2342	100-yr	1430.00	5252.63	5257.42		5257.63	0.005347	3.66	392.35	117.42	0.34
Skunk	01	2342	FW	1430.00	5252.63	5257.82		5258.11	0.005953	4.29	333.53	70.00	0.35
Skunk	01	2342	10-yr	438.00	5252.63	5255.44		5255.52	0.004449	2.29	191.58	92.79	0.28
Skunk	01	2342	25-yr	821.00	5252.63	5256.34		5256.48	0.004921	2.94	279.15	99.73	0.31
Skunk	01	2342	50-yr	1076.00	5252.63	5256.83		5257.00	0.005172	3.28	328.49	103.54	0.32
Skunk	01	2342	500-yr	2211.00	5252.63	5258.43		5258.72	0.005683	4.36	522.56	137.34	0.36
Skunk	01	2388	100-yr	1430.00	5252.64	5257.64		5257.93	0.006971	4.28	344.79	106.84	0.39
Skunk	01	2388	FW	1430.00	5252.64	5258.10		5258.36	0.005197	4.08	350.11	75.00	0.33

Skunk	01	2388	10-yr	438.00	5252.64	5255.64		5255.75	0.005299	2.65	165.26	72.95	0.31
Skunk	01	2388	25-yr	821.00	5252.64	5256.56		5256.75	0.006436	3.45	238.38	86.45	0.36
Skunk	01	2388	50-yr	1076.00	5252.64	5257.06		5257.28	0.006758	3.84	284.28	98.80	0.37
Skunk	01	2388	500-yr	2211.00	5252.64	5258.66		5259.05	0.007481	5.08	458.38	116.12	0.41
Skunk	01	2445	100-yr	1430.00	5250.70	5258.00	5255.22	5258.40	0.007568	5.04	283.55	50.99	0.38
Skunk	01	2445	FW	1430.00	5250.70	5258.39	5255.29	5258.79	0.007430	5.06	282.75	45.00	0.36
Skunk	01	2445	10-yr	438.00	5250.70	5255.88	5253.53	5255.98	0.003064	2.47	177.67	48.96	0.23
Skunk	01	2445	25-yr	821.00	5250.70	5256.88	5254.26	5257.08	0.005025	3.62	226.92	49.92	0.30
Skunk	01	2445	50-yr	1076.00	5250.70	5257.40	5254.70	5257.68	0.006164	4.25	252.98	50.42	0.33
Skunk	01	2445	500-yr	2211.00	5250.70	5259.02	5256.28	5259.69	0.010461	6.60	335.07	51.95	0.45
Skunk	01	2490		Bridge									
Skunk	01	2541	100-yr	1430.00	5251.10	5258.84	5255.34	5259.17	0.005142	4.59	311.50	50.23	0.32
Skunk	01	2541	FW	1430.00	5251.10	5258.99	5255.40	5259.34	0.006143	4.70	304.14	45.00	0.32
Skunk	01	2541	10-yr	438.00	5251.10	5256.19	5253.65	5256.28	0.002730	2.38	184.38	48.12	0.21
Skunk	01	2541	25-yr	821.00	5251.10	5257.40	5254.38	5257.58	0.003910	3.39	242.40	49.00	0.27
Skunk	01	2541	50-yr	1076.00	5251.10	5258.05	5254.81	5258.29	0.004483	3.93	273.67	49.56	0.29
Skunk	01	2541	500-yr	2211.00	5251.10	5260.28	5256.36	5260.81	0.006286	5.80	380.92	51.60	0.36
Skunk	01	2560	100-yr	1430.00	5253.63	5258.93		5259.31	0.009095	4.94	289.58	74.13	0.44
Skunk	01	2560	FW	1430.00	5253.63	5258.98		5259.58	0.013683	6.22	229.90	50.00	0.51
Skunk	01	2560	10-yr	438.00	5253.63	5256.15		5256.47	0.026433	4.56	96.11	62.94	0.65
Skunk	01	2560	25-yr	821.00	5253.63	5257.43		5257.74	0.012808	4.52	181.74	69.55	0.49
Skunk	01	2560	50-yr	1076.00	5253.63	5258.11		5258.45	0.010541	4.69	229.65	71.48	0.46
Skunk	01	2560	500-yr	2211.00	5253.63	5260.52		5260.95	0.007839	5.28	418.54	87.38	0.42
Skunk	01	2591	100-yr	1000.00	5254.16	5259.40		5259.56	0.005366	3.15	317.26	109.06	0.33
Skunk	01	2591	FW	1000.00	5254.16	5259.63		5259.90	0.005864	4.21	237.45	50.00	0.34
Skunk	01	2591	10-yr	383.00	5254.16	5256.88		5257.10	0.015037	3.75	102.19	58.60	0.50
Skunk	01	2591	25-yr	631.00	5254.16	5257.92		5258.12	0.010353	3.59	176.00	81.64	0.43
Skunk	01	2591	50-yr	794.00	5254.16	5258.57		5258.75	0.007789	3.41	232.97	94.19	0.38
Skunk	01	2591	500-yr	1600.00	5254.16	5260.99		5261.14	0.003264	3.17	513.72	138.32	0.27
Skunk	01	2638	100-yr	1000.00	5254.35	5259.62		5259.71	0.002075	2.47	405.39	101.39	0.21
Skunk	01	2638	FW	1000.00	5254.35	5259.93		5260.13	0.003828	3.61	277.04	50.00	0.27
Skunk	01	2638	10-yr	383.00	5254.35	5257.29		5257.35	0.002366	1.91	200.56	78.83	0.21
Skunk	01	2638	25-yr	631.00	5254.35	5258.26		5258.34	0.002382	2.25	280.36	86.39	0.22
Skunk	01	2638	50-yr	794.00	5254.35	5258.85		5258.94	0.002267	2.38	332.92	90.51	0.22
Skunk	01	2638	500-yr	1600.00	5254.35	5261.13		5261.26	0.001836	2.84	594.55	162.65	0.21
Skunk	01	2688	100-yr	1000.00	5254.29	5259.73		5259.79	0.001217	1.94	515.26	120.17	0.17
Skunk	01	2688	FW	1000.00	5254.29	5260.16		5260.26	0.001538	2.45	408.75	70.00	0.18
Skunk	01	2688	10-yr	383.00	5254.29	5257.40		5257.44	0.001335	1.47	261.26	99.80	0.16
Skunk	01	2688	25-yr	631.00	5254.29	5258.38		5258.43	0.001341	1.74	362.27	107.06	0.17
Skunk	01	2688	50-yr	794.00	5254.29	5258.97		5259.03	0.001302	1.86	427.43	112.08	0.17
Skunk	01	2688	500-yr	1600.00	5254.29	5261.25		5261.33	0.001163	2.24	730.71	170.98	0.17
Skunk	01	2740	100-yr	1000.00	5254.17	5259.80		5259.86	0.001434	2.04	490.21	120.14	0.18
Skunk	01	2740	FW	1000.00	5254.17	5260.24		5260.34	0.001722	2.56	391.29	70.00	0.19
Skunk	01	2740	10-yr	383.00	5254.17	5257.48		5257.52	0.001977	1.64	233.24	101.10	0.19
Skunk	01	2740	25-yr	631.00	5254.17	5258.45		5258.51	0.001782	1.88	335.52	109.56	0.19
Skunk	01	2740	50-yr	794.00	5254.17	5259.05		5259.11	0.001645	1.98	401.96	114.75	0.19
Skunk	01	2740	500-yr	1600.00	5254.17	5261.32		5261.40	0.001388	2.32	712.16	199.23	0.18
Skunk	01	2794	100-yr	1000.00	5254.23	5259.88	5257.43	5259.96	0.002361	2.29	436.65	142.02	0.22
Skunk	01	2794	FW	1000.00	5254.23	5260.34	5257.48	5260.46	0.002635	2.84	352.14	76.00	0.23
Skunk	01	2794	10-yr	383.00	5254.23	5257.63	5256.60	5257.71	0.006109	2.28	168.21	104.15	0.32
Skunk	01	2794	25-yr	631.00	5254.23	5258.57	5256.97	5258.65	0.003811	2.30	274.21	117.18	0.27
Skunk	01	2794	50-yr	794.00	5254.23	5259.15	5257.14	5259.23	0.003015	2.31	343.18	121.91	0.24
Skunk	01	2794	500-yr	1600.00	5254.23	5261.40	5258.00	5261.48	0.001708	2.42	703.36	197.29	0.20
Skunk	01	2906	100-yr	1000.00	5254.31	5260.12	5257.69	5260.20	0.001840	2.04	477.55	154.64	0.20
Skunk	01	2906	FW	1000.00	5254.31	5260.62	5257.70	5260.70	0.001632	2.19	456.21	105.00	0.19
Skunk	01	2906	10-yr	383.00	5254.31	5258.19	5256.69	5258.24	0.003818	1.84	207.69	123.90	0.25
Skunk	01	2906	25-yr	631.00	5254.31	5258.97	5257.15	5259.03	0.003022	2.05	307.32	134.17	0.24
Skunk	01	2906	50-yr	794.00	5254.31	5259.47	5257.44	5259.54	0.002515	2.10	378.15	149.40	0.22
Skunk	01	2906	500-yr	1600.00	5254.31	5261.53	5258.23	5261.65	0.001220	2.02	712.67	172.98	0.17
Skunk	01	3022	100-yr	1000.00	5255.63	5260.40	5258.71	5260.58	0.005927	3.41	293.39	96.52	0.34
Skunk	01	3022	FW	1000.00	5255.63	5260.85	5258.72	5261.00	0.003930	3.12	320.97	85.00	0.28
Skunk	01	3022	10-yr	383.00	5255.63	5258.77	5257.85	5258.88	0.007930	2.66	143.90	85.75	0.36
Skunk	01	3022	25-yr	631.00	5255.63	5259.43	5258.22	5259.58	0.007413	3.12	202.49	90.38	0.37
Skunk	01	3022	50-yr	794.00	5255.63	5259.85	5258.44	5260.02	0.006820	3.29	241.23	93.05	0.36
Skunk	01	3022	500-yr	1600.00	5255.63	5261.72	5259.34	5261.94	0.004986	3.75	426.84	106.68	0.33
Skunk	01	3126	100-yr	1000.00	5256.07	5260.98	5259.08	5261.11	0.004272	2.92	342.63	111.32	0.29
Skunk	01	3126	FW	1000.00	5256.07	5261.29	5259.21	5261.51	0.005726	3.81	262.46	65.00	0.33
Skunk	01	3126	10-yr	383.00	5256.07	5259.44	5258.27	5259.51	0.004753	2.14	179.11	100.87	0.28
Skunk	01	3126	25-yr	631.00	5256.07	5260.10	5258.69	5260.20	0.004710	2.55	247.01	105.66	0.29
Skunk	01	3126	50-yr	794.00	5256.07	5260.49	5258.88	5260.60	0.004586	2.75	288.70	108.26	0.30
Skunk	01	3126	500-yr	1600.00	5256.07	5262.23	5259.67	5262.39	0.003757	3.29	486.76	119.86	0.29
Skunk	01	3234	100-yr	1000.00	5256.63	5261.46	5259.69	5261.61	0.004924	3.05	327.73	110.92	0.31
Skunk	01	3234	FW	1000.00	5256.63	5261.90	5259.77	5262.10	0.005093	3.58	279.55	70.00	0.32
Skunk	01	3234	10-yr	383.00	5256.63	5259.97	5258.90	5260.05	0.005219	2.23	171.63	97.25	0.30
Skunk	01	3234	25-yr	631.00	5256.63	5260.63	5259.26	5260.74	0.005231	2.65	237.78	103.98	0.31
Skunk	01	3234	50-yr	794.00	5256.63	5261.00	5259.46	5261.13	0.005148	2.86	277.62	107.14	0.31
Skunk	01	3234	500-yr	1600.00	5256.63	5262.65	5260.25	5262.84	0.004383	3.44	464.94	120.18	0.31
Skunk	01	3336	100-yr	1000.00	5257.62	5262.06	5260.70	5262.37	0.010703	4.44	224.98	77.20	0.46
Skunk	01	3336	FW	1000.00	5257.62	5262.48	5260.74	5262.85	0.009766	4.91	203.78	50.00	0.43
Skunk	01	3336	10-yr	383.00	5257.62	5260.62	5259.63	5260.77	0.009457	3.13	122.50	65.16	0.40
Skunk	01	3336	25-yr	631.00	5257.62	5261.27	5260.11	5261.49	0.010160	3.78	166.80	70.21	0.43
Skunk	01	3336	50-yr	794.00	5257.62	5261.63	5260.37	5261.90	0.010487	4.12	192.77	73.07	0.45
Skunk	01	3336	500-yr	1600.00	5257.62	5263.16	5261.46	5263.56	0.010584	5.07	315.31	87.81	0.47
Skunk	01	3385	100-yr	1000.00	5257.78	5262.56	5261.08	5262.91	0.011137	4.79	208.78	64.61	0.47
Skunk	01	3385	FW	1000.00	5257.78	5262.94	5261.11	5263.36	0.010520	5.18	193.09	45.00	0.44
Skunk	01	3385	10-yr	383.00	5257.78	5261.05	5259.77	5261.21	0.008653	3.22	118.88	55.70	0.39
Skunk	01	3385	25-yr	631.00	5257.78	5261.74	5260.47	5261.98	0.009773	3.99	158.18	58.59	0.43
Skunk	01	3385	50-yr	794.00	5257.78	5262.12	5260.76	5262.42	0.010542	4.38	181.09	61.50	0.45
Skunk	01	3385	500-yr	1600.00	5257.78	5263.63	5261.89	5264.13	0.011762	5.70	280.75	69.39	0.50
Skunk	01	3428	100-yr	824.00	5256.94	5262.92	5260.83	5263.44	0.009207	5.77	142.86	34.56	0.45
Skunk	01	3428	FW	824.00	5256.94	5263.37	5260.83	5263.81	0.009876	5.30	155.56	28.00	0.40
Skunk	01	3428	10-yr	365.00	5256.94	5261.34	5259.56	5261.55	0.006203	3.70	98.67	32.52	0.35
Skunk	01	3428	25-yr	558.00	5256.94	5262.07	5260.15	5262.41	0.007758	4.69	119.03	33.44	0.40
Skunk	01	3428	50-yr	673.00	5256.94	5262.47	5260.44	5262.89	0.008345	5.16	130.31	33.93	0.42
Skunk	01	3428	500-yr	1207.00	5256.94	5263.99	5261.72	5264.75	0.010483	6.99	172.77	36.15	0.50

Skunk	01	3540		Culvert									
Skunk	01	3629	100-yr	824.00	5260.03	5266.87	5263.64	5267.22	0.022861	4.75	173.59	33.16	0.34
Skunk	01	3629	FW	824.00	5260.03	5266.87	5263.64	5267.22	0.027313	4.75	173.56	28.00	0.34
Skunk	01	3629	10-yr	365.00	5260.03	5264.13	5262.35	5264.35	0.022978	3.77	96.81	30.20	0.35
Skunk	01	3629	25-yr	558.00	5260.03	5265.37	5262.94	5265.65	0.022807	4.25	131.42	31.60	0.35
Skunk	01	3629	50-yr	673.00	5260.03	5266.05	5263.27	5266.36	0.022651	4.47	150.50	32.33	0.34
Skunk	01	3629	500-yr	1207.00	5260.03	5268.77	5264.56	5269.21	0.022894	5.31	227.25	42.09	0.33
Skunk	01	3722	100-yr	824.00	5262.78	5268.78		5268.99	0.015964	3.68	223.98	105.74	0.39
Skunk	01	3722	FW	824.00	5262.78	5268.92		5269.27	0.018336	4.76	172.95	40.00	0.40
Skunk	01	3722	10-yr	365.00	5262.78	5266.71		5266.98	0.035671	4.16	87.67	47.00	0.54
Skunk	01	3722	25-yr	558.00	5262.78	5267.67		5267.91	0.026159	3.94	141.80	77.84	0.47
Skunk	01	3722	50-yr	673.00	5262.78	5268.17		5268.39	0.021099	3.80	176.92	96.44	0.43
Skunk	01	3722	500-yr	1207.00	5262.78	5270.33		5270.50	0.009087	3.36	359.08	128.55	0.31
Skunk	01	3812	100-yr	824.00	5264.45	5269.77		5269.87	0.006343	2.53	325.85	102.63	0.25
Skunk	01	3812	FW	824.00	5264.45	5270.21		5270.37	0.008346	3.24	254.40	60.00	0.28
Skunk	01	3812	10-yr	365.00	5264.45	5268.27		5268.33	0.007940	2.04	178.78	92.20	0.26
Skunk	01	3812	25-yr	558.00	5264.45	5268.96		5269.04	0.007086	2.29	244.16	97.47	0.25
Skunk	01	3812	50-yr	673.00	5264.45	5269.32		5269.41	0.006761	2.41	279.68	99.67	0.25
Skunk	01	3812	500-yr	1207.00	5264.45	5271.00		5271.10	0.004935	2.64	456.53	111.16	0.23
Skunk	01	3882	100-yr	824.00	5270.20	5272.09	5272.09	5272.77	0.129472	6.64	124.13	89.26	0.99
Skunk	01	3882	FW	824.00	5270.20	5272.28	5272.28	5273.17	0.127204	7.58	108.70	60.00	0.99
Skunk	01	3882	10-yr	365.00	5270.20	5271.43	5271.43	5271.86	0.148259	5.28	69.07	77.48	0.99
Skunk	01	3882	25-yr	558.00	5270.20	5271.72	5271.72	5272.28	0.141114	6.01	92.88	82.80	1.00
Skunk	01	3882	50-yr	673.00	5270.20	5271.90	5271.90	5272.51	0.131568	6.23	107.99	86.43	0.98
Skunk	01	3882	500-yr	1207.00	5270.20	5272.54	5272.54	5273.35	0.123854	7.19	167.95	103.72	1.00
Skunk	01	3940	100-yr	824.00	5274.52	5276.79	5276.37	5277.08	0.048222	4.30	194.29	138.59	0.62
Skunk	01	3940	FW	824.00	5274.52	5277.05	5276.50	5277.50	0.049029	5.37	153.38	70.00	0.64
Skunk	01	3940	10-yr	365.00	5274.52	5276.16	5275.81	5276.32	0.047395	3.23	113.20	116.05	0.57
Skunk	01	3940	25-yr	558.00	5274.52	5276.47	5276.08	5276.68	0.047352	3.72	151.03	129.28	0.59
Skunk	01	3940	50-yr	673.00	5274.52	5276.61	5276.18	5276.86	0.048534	4.01	169.49	133.20	0.61
Skunk	01	3940	500-yr	1207.00	5274.52	5277.19	5276.70	5277.55	0.047770	4.91	251.51	150.87	0.63
Skunk	01	4009	100-yr	824.00	5275.17	5278.41	5278.41	5279.00	0.005930	1.89	179.71	251.92	0.23
Skunk	01	4009	FW	824.00	5275.17	5278.55	5278.55	5279.31	0.008105	2.31	147.76	95.00	0.27
Skunk	01	4009	10-yr	365.00	5275.17	5277.76	5277.76	5278.18	0.013894	2.41	83.97	168.59	0.33
Skunk	01	4009	25-yr	558.00	5275.17	5278.08	5278.08	5278.57	0.007881	1.96	123.60	208.37	0.25
Skunk	01	4009	50-yr	673.00	5275.17	5278.22	5278.22	5278.77	0.006960	1.93	147.23	241.02	0.24
Skunk	01	4009	500-yr	1207.00	5275.17	5278.76	5278.76	5279.50	0.005246	1.96	246.36	285.39	0.22
Skunk	02	4139	100-yr	693.00	5274.96	5279.83	5279.56	5280.21	0.018329	4.22	161.05	198.35	0.41
Skunk	02	4139	FW	693.00	5274.96	5280.11	5279.46	5280.57	0.011686	3.56	158.19	85.00	0.34
Skunk	02	4139	10-yr	318.00	5274.96	5279.54	5278.47	5279.67	0.008977	2.77	120.29	175.33	0.29
Skunk	02	4139	25-yr	464.00	5274.96	5279.66	5279.32	5279.88	0.013404	3.47	136.17	187.42	0.35
Skunk	02	4139	50-yr	562.00	5274.96	5279.75	5279.42	5280.03	0.015143	3.77	149.14	194.30	0.37
Skunk	02	4139	500-yr	1007.00	5274.96	5280.09	5279.92	5280.65	0.020346	4.67	198.64	217.62	0.44
Skunk	02	4252	100-yr	693.00	5275.51	5281.39	5280.52	5281.76	0.010487	3.40	163.92	232.61	0.33
Skunk	02	4252	FW	693.00	5275.51	5281.77	5280.49	5282.16	0.016954	4.73	140.09	40.00	0.39
Skunk	02	4252	10-yr	318.00	5275.51	5280.63	5278.99	5280.77	0.010485	2.94	105.82	110.29	0.31
Skunk	02	4252	25-yr	464.00	5275.51	5280.99	5279.54	5281.22	0.010429	3.15	129.85	163.95	0.32
Skunk	02	4252	50-yr	562.00	5275.51	5281.17	5279.87	5281.47	0.010656	3.29	143.30	189.69	0.33
Skunk	02	4252	500-yr	1007.00	5275.51	5281.77	5280.79	5282.32	0.011259	3.75	202.23	283.75	0.34
Skunk	02	4364	100-yr	693.00	5275.40	5282.63		5282.93	0.010048	3.70	172.44	490.59	0.30
Skunk	02	4364	FW	693.00	5275.40	5283.03		5283.29	0.006419	3.13	194.16	55.00	0.24
Skunk	02	4364	10-yr	318.00	5275.40	5281.64		5281.76	0.007380	2.71	118.54	427.67	0.25
Skunk	02	4364	25-yr	464.00	5275.40	5282.12		5282.29	0.008441	3.14	144.05	478.52	0.27
Skunk	02	4364	50-yr	562.00	5275.40	5282.37		5282.59	0.009008	3.38	157.94	484.86	0.28
Skunk	02	4364	500-yr	1007.00	5275.40	5283.11		5283.65	0.012462	4.40	200.37	517.87	0.34
Skunk	02	4430		Culvert									
Skunk	02	4448	100-yr	957.00	5275.61	5284.07	5280.98	5284.55	0.002306	1.57	307.29	199.04	0.12
Skunk	02	4448	FW	957.00	5275.61	5284.52	5280.98	5285.07	0.002429	1.70	278.68	65.00	0.12
Skunk	02	4448	10-yr	377.00	5275.61	5282.83	5278.79	5282.97	0.003010	1.54	178.14	139.20	0.13
Skunk	02	4448	25-yr	598.00	5275.61	5283.44	5279.91	5283.72	0.002380	1.48	235.36	173.67	0.12
Skunk	02	4448	50-yr	748.00	5275.61	5283.75	5280.39	5284.11	0.002250	1.49	269.99	186.67	0.11
Skunk	02	4448	500-yr	1508.00	5275.61	5284.66	5282.19	5285.48	0.002744	1.83	375.73	203.89	0.13
Skunk	02	4489	100-yr	957.00	5275.61	5284.21	5282.85	5284.68	0.004196	2.57	246.50	245.53	0.20
Skunk	02	4489	FW	957.00	5275.61	5284.66	5282.96	5285.24	0.007658	3.59	196.34	50.00	0.26
Skunk	02	4489	10-yr	377.00	5275.61	5282.99	5280.08	5283.15	0.006166	2.73	125.77	149.22	0.23
Skunk	02	4489	25-yr	598.00	5275.61	5283.57	5281.18	5283.86	0.004948	2.56	171.03	188.74	0.21
Skunk	02	4489	50-yr	748.00	5275.61	5283.87	5281.75	5284.24	0.004526	2.55	202.71	233.88	0.20
Skunk	02	4489	500-yr	1508.00	5275.61	5284.97	5284.13	5285.63	0.003651	2.62	343.72	248.03	0.19
Skunk	02	4511	100-yr	1185.00	5276.10	5284.38	5283.10	5284.80	0.005025	2.91	306.68	348.10	0.20
Skunk	02	4511	FW	1185.00	5276.10	5284.53	5282.09	5285.94	0.021543	6.12	163.13	35.00	0.41
Skunk	02	4511	10-yr	381.00	5276.10	5283.15	5279.01	5283.29	0.006316	2.86	127.90	136.60	0.21
Skunk	02	4511	25-yr	682.00	5276.10	5283.68	5280.35	5284.02	0.007180	3.24	175.91	234.59	0.23
Skunk	02	4511	50-yr	891.00	5276.10	5283.98	5281.13	5284.38	0.006425	3.16	225.25	303.17	0.22
Skunk	02	4511	500-yr	1956.00	5276.10	5285.41	5284.58	5285.78	0.002627	2.31	534.35	360.85	0.15
Skunk	02	4550		Culvert									
Skunk	02	4594	100-yr	1185.00	5276.78	5286.58	5282.90	5286.80	0.012208	4.16	376.71	440.49	0.28
Skunk	02	4594	FW	1185.00	5276.78	5286.79	5282.90	5286.99	0.010803	3.99	376.06	180.00	0.26
Skunk	02	4594	10-yr	381.00	5276.78	5284.83	5280.09	5284.91	0.005118	2.23	184.09	266.87	0.17
Skunk	02	4594	25-yr	682.00	5276.78	5285.72	5281.51	5285.86	0.008085	3.10	267.55	358.99	0.22
Skunk	02	4594	50-yr	891.00	5276.78	5286.14	5282.13	5286.31	0.009875	3.58	314.94	379.34	0.25
Skunk	02	4594	500-yr	1956.00	5276.78	5287.30	5285.37	5287.66	0.019216	5.57	520.45	531.34	0.35
Skunk	02	4662	100-yr	1185.00	5278.55	5287.44	5286.24	5287.81	0.016794	5.58	304.82	312.30	0.41
Skunk	02	4662	FW	1185.00	5278.55	5287.56	5286.14	5287.99	0.017893	5.84	269.93	160.95	0.43
Skunk	02	4662	10-yr	381.00	5278.55	5285.28	5282.73	5285.52	0.015444	3.90	101.76	169.20	0.36
Skunk	02	4662	25-yr	682.00	5278.55	5286.35	5284.11	5286.67	0.016383	4.79	185.38	293.86	0.39
Skunk	02	4662	50-yr	891.00	5278.55	5286.87	5285.00	5287.21	0.016438	5.15	239.59	309.83	0.40
Skunk	02	4662	500-yr	1956.00	5278.55	5288.51	5287.26	5288.94	0.017775	6.44	488.76	405.52	0.44
Skunk	02	4748	100-yr	1185.00	5279.26	5288.24	5284.96	5288.28	0.002104	2.27	947.71	482.10	0.15
Skunk	02	4748	FW	1185.00	5279.26	5288.48	5284.94	5288.53	0.002520	2.39	663.86	130.00	0.16
Skunk	02	4748	10-yr	381.00	5279.26	5285.93	5283.18	5285.96	0.002230	1.77	356.01	309.30	0.15
Skunk	02	4748	25-yr	682.00	5279.26	5287.09	5284.21	5287.12	0.002101	2.01	613.29	408.16	0.15
Skunk	02	4748	50-yr	891.00	5279.26	5287.62	5284.44	5287.66	0.002002	2.08	758.93	451.75	0.15
Skunk	02	4748	500-yr	1956.00	5279.26	5289.40	5285.72	5289.44	0.002173	2.57	1317.93	512.86	0.16

Skunk	02	4848	100-yr	1185.00	5279.86	5288.52		5288.63	0.005069	3.38	553.77	205.35	0.24
Skunk	02	4848	FW	1185.00	5279.86	5288.80		5289.00	0.006975	4.08	358.52	70.00	0.28
Skunk	02	4848	10-yr	381.00	5279.86	5286.23		5286.32	0.005463	2.59	191.76	98.98	0.23
Skunk	02	4848	25-yr	682.00	5279.86	5287.37		5287.47	0.005129	2.97	334.65	171.60	0.23
Skunk	02	4848	50-yr	891.00	5279.86	5287.89		5288.00	0.005149	3.17	428.67	192.48	0.24
Skunk	02	4848	500-yr	1956.00	5279.86	5289.67		5289.82	0.005473	3.93	808.84	233.71	0.25
Skunk	02	4911	100-yr	1185.00	5281.10	5288.91		5289.13	0.011515	4.73	410.26	170.42	0.34
Skunk	02	4911	FW	1185.00	5281.10	5289.31		5289.61	0.012703	5.19	312.56	77.00	0.36
Skunk	02	4911	10-yr	381.00	5281.10	5286.68		5286.91	0.016004	4.08	119.33	68.67	0.37
Skunk	02	4911	25-yr	682.00	5281.10	5287.77		5288.01	0.013702	4.48	228.80	143.58	0.36
Skunk	02	4911	50-yr	891.00	5281.10	5288.29		5288.52	0.012614	4.60	308.00	160.58	0.35
Skunk	02	4911	500-yr	1956.00	5281.10	5290.09		5290.32	0.010905	5.20	628.96	195.32	0.34
Skunk	02	4999	100-yr	1185.00	5282.58	5290.00		5290.84	0.035850	7.60	175.43	53.31	0.60
Skunk	02	4999	FW	1185.00	5282.58	5290.49		5291.34	0.031688	7.48	163.66	30.00	0.55
Skunk	02	4999	10-yr	381.00	5282.58	5288.11		5288.38	0.017916	4.18	93.76	32.67	0.40
Skunk	02	4999	25-yr	682.00	5282.58	5289.10		5289.57	0.025286	5.59	132.22	45.57	0.49
Skunk	02	4999	50-yr	891.00	5282.58	5289.53		5290.15	0.029679	6.47	151.95	46.88	0.54
Skunk	02	4999	500-yr	1956.00	5282.58	5290.92	5290.36	5292.32	0.049502	10.01	236.74	82.37	0.73
Skunk	03	5039	100-yr	364.00	5283.40	5291.26	5286.29	5291.30	0.001397	1.67	316.78	165.05	0.12
Skunk	03	5039	FW	364.00	5283.40	5291.73	5286.25	5291.76	0.001283	1.68	272.45	60.00	0.11
Skunk	03	5039	10-yr	261.00	5283.40	5288.76	5285.75	5288.88	0.007780	2.80	95.29	45.65	0.25
Skunk	03	5039	25-yr	305.00	5283.40	5289.97	5285.99	5290.03	0.003261	2.18	178.63	109.15	0.17
Skunk	03	5039	50-yr	325.00	5283.40	5290.55	5286.09	5290.60	0.002132	1.90	232.98	130.12	0.14
Skunk	03	5039	500-yr	478.00	5283.40	5292.77	5286.80	5292.79	0.000705	1.37	547.55	195.91	0.09
Skunk	03	5075		Culvert									
Skunk	03	5099	100-yr	364.00	5283.50	5291.28	5286.59	5291.31	0.002213	1.58	357.42	272.23	0.11
Skunk	03	5099	FW	364.00	5283.50	5291.78	5286.58	5291.81	0.002200	1.66	263.37	66.00	0.11
Skunk	03	5099	10-yr	261.00	5283.50	5289.64	5286.00	5289.71	0.007236	2.30	125.35	77.98	0.19
Skunk	03	5099	25-yr	305.00	5283.50	5290.23	5286.26	5290.29	0.005488	2.18	175.71	182.96	0.17
Skunk	03	5099	50-yr	325.00	5283.50	5290.59	5286.39	5290.64	0.004111	1.98	228.20	222.27	0.15
Skunk	03	5099	500-yr	478.00	5283.50	5292.78	5287.24	5292.79	0.000767	1.08	685.21	313.61	0.07
Skunk	03	5190	100-yr	364.00	5285.15	5291.55		5291.66	0.006377	2.80	176.95	115.35	0.25
Skunk	03	5190	FW	364.00	5285.15	5292.04		5292.17	0.006407	2.91	125.89	28.18	0.24
Skunk	03	5190	10-yr	261.00	5285.15	5290.45		5290.61	0.012907	3.22	82.36	37.77	0.33
Skunk	03	5190	25-yr	305.00	5285.15	5290.86		5291.01	0.010757	3.21	108.82	82.00	0.31
Skunk	03	5190	50-yr	325.00	5285.15	5291.07		5291.21	0.009322	3.11	127.49	91.76	0.29
Skunk	03	5190	500-yr	478.00	5285.15	5292.87		5292.92	0.002514	2.13	337.92	130.30	0.16
Skunk	03	5285	100-yr	364.00	5286.86	5292.08	5290.61	5292.12	0.003868	2.11	297.59	196.75	0.19
Skunk	03	5285	FW	364.00	5286.86	5292.57	5290.51	5292.62	0.003636	2.09	242.52	90.00	0.18
Skunk	03	5285	10-yr	261.00	5286.86	5291.41	5289.75	5291.47	0.006685	2.44	180.16	165.85	0.24
Skunk	03	5285	25-yr	305.00	5286.86	5291.67	5290.33	5291.73	0.005533	2.34	223.46	179.61	0.22
Skunk	03	5285	50-yr	325.00	5286.86	5291.80	5290.33	5291.85	0.005017	2.29	245.68	188.30	0.21
Skunk	03	5285	500-yr	478.00	5286.86	5293.09	5290.97	5293.11	0.001626	1.60	492.58	207.08	0.13
Skunk	03	5380	100-yr	364.00	5287.34	5292.58		5292.69	0.009457	2.96	176.88	133.08	0.29
Skunk	03	5380	FW	364.00	5287.34	5293.04		5293.20	0.010166	3.29	126.33	50.00	0.29
Skunk	03	5380	10-yr	261.00	5287.34	5292.14		5292.25	0.009753	2.79	122.35	101.09	0.29
Skunk	03	5380	25-yr	305.00	5287.34	5292.32		5292.44	0.010019	2.92	143.37	125.83	0.29
Skunk	03	5380	50-yr	325.00	5287.34	5292.41		5292.52	0.009952	2.95	154.12	128.65	0.29
Skunk	03	5380	500-yr	478.00	5287.34	5293.31		5293.38	0.005360	2.55	298.05	187.55	0.22
Skunk	03	5469	100-yr	364.00	5288.74	5293.48		5293.64	0.012052	3.37	133.09	86.96	0.33
Skunk	03	5469	FW	364.00	5288.74	5293.95		5294.11	0.010451	3.22	113.07	31.19	0.30
Skunk	03	5469	10-yr	261.00	5288.74	5293.04		5293.18	0.011277	2.96	99.52	65.37	0.32
Skunk	03	5469	25-yr	305.00	5288.74	5293.25		5293.39	0.011605	3.15	114.26	77.67	0.32
Skunk	03	5469	50-yr	325.00	5288.74	5293.33		5293.48	0.011751	3.22	120.76	80.85	0.33
Skunk	03	5469	500-yr	478.00	5288.74	5293.90		5294.08	0.011853	3.64	173.48	101.57	0.34
Skunk	03	5536	100-yr	364.00	5288.95	5294.39		5294.69	0.019113	4.42	88.02	45.05	0.41
Skunk	03	5536	FW	364.00	5288.95	5294.81		5295.17	0.022565	4.85	75.04	15.00	0.38
Skunk	03	5536	10-yr	261.00	5288.95	5293.90		5294.11	0.016443	3.71	70.31	23.45	0.37
Skunk	03	5536	25-yr	305.00	5288.95	5294.13		5294.38	0.017680	4.04	76.71	40.50	0.39
Skunk	03	5536	50-yr	325.00	5288.95	5294.22		5294.49	0.018208	4.17	80.58	42.37	0.40
Skunk	03	5536	500-yr	478.00	5288.95	5294.81		5295.19	0.021355	5.03	109.35	55.38	0.44
Skunk	03	5602	100-yr	364.00	5289.10	5295.50		5295.70	0.012419	3.65	99.90	27.90	0.33
Skunk	03	5602	FW	364.00	5289.10	5295.94		5296.14	0.009955	3.54	102.82	20.00	0.28
Skunk	03	5602	10-yr	261.00	5289.10	5294.82		5294.98	0.010621	3.16	82.66	24.02	0.30
Skunk	03	5602	25-yr	305.00	5289.10	5295.14		5295.32	0.011535	3.37	90.50	25.40	0.31
Skunk	03	5602	50-yr	325.00	5289.10	5295.27		5295.46	0.011835	3.46	93.84	26.33	0.32
Skunk	03	5602	500-yr	478.00	5289.10	5296.06		5296.32	0.013858	4.13	120.47	39.81	0.35
Skunk	03	5656	100-yr	364.00	5290.35	5296.30	5293.98	5296.62	0.021178	4.53	80.75	23.35	0.41
Skunk	03	5656	FW	364.00	5290.35	5296.61	5293.98	5296.95	0.020034	4.64	78.53	15.00	0.36
Skunk	03	5656	10-yr	261.00	5290.35	5295.54	5293.30	5295.79	0.019677	4.02	64.87	19.12	0.38
Skunk	03	5656	25-yr	305.00	5290.35	5295.91	5293.60	5296.18	0.020433	4.23	72.14	20.68	0.40
Skunk	03	5656	50-yr	325.00	5290.35	5296.05	5293.73	5296.34	0.020595	4.33	75.13	21.28	0.40
Skunk	03	5656	500-yr	478.00	5290.35	5296.93	5294.61	5297.33	0.022364	5.06	95.86	34.91	0.43
Skunk	03	5700		Culvert									
Skunk	03	5737	100-yr	364.00	5290.80	5298.39	5294.88	5298.59	0.025494	3.56	102.84	58.01	0.30
Skunk	03	5737	FW	364.00	5290.80	5298.50	5294.89	5298.68	0.023551	3.47	105.67	27.62	0.29
Skunk	03	5737	10-yr	261.00	5290.80	5297.02	5294.19	5297.22	0.038276	3.64	71.66	19.95	0.34
Skunk	03	5737	25-yr	305.00	5290.80	5297.71	5294.50	5297.90	0.030238	3.54	86.20	22.16	0.32
Skunk	03	5737	50-yr	325.00	5290.80	5297.99	5294.59	5298.19	0.027541	3.51	92.73	25.72	0.31
Skunk	03	5737	500-yr	478.00	5290.80	5298.89	5295.54	5299.13	0.011981	2.59	147.09	90.47	0.21
Skunk	04	5788	100-yr	364.00	5291.96	5299.00	5295.26	5299.11	0.005337	2.69	135.29	29.59	0.22
Skunk	04	5788	FW	364.00	5291.96	5299.07	5295.27	5299.18	0.005109	2.65	137.29	29.59	0.22
Skunk	04	5788	10-yr	261.00	5291.96	5297.76	5294.73	5297.87	0.006029	2.58	101.12	26.09	0.23
Skunk	04	5788	25-yr	305.00	5291.96	5298.36	5294.98	5298.46	0.005477	2.61	117.06	27.46	0.22
Skunk	04	5788	50-yr	325.00	5291.96	5298.61	5295.07	5298.72	0.005298	2.62	124.10	28.10	0.22
Skunk	04	5788	500-yr	478.00	5291.96	5299.45	5295.75	5299.61	0.007192	3.21	148.99	31.31	0.26
Skunk	04	5845	100-yr	364.00	5293.33	5299.34	5296.31	5299.48	0.007881	2.98	122.23	32.00	0.27
Skunk	04	5845	FW	364.00	5293.33	5299.40	5296.31	5299.53	0.007554	2.94	123.95	32.00	0.26
Skunk	04	5845	10-yr	261.00	5293.33	5298.17	5295.80	5298.30	0.009740	2.98	87.59	26.94	0.29
Skunk	04	5845	25-yr	305.00	5293.33	5298.72	5296.04	5298.86	0.008612	2.96	103.14	29.18	0.28
Skunk	04	5845	50-yr	325.00	5293.33	5298.96	5296.11	5299.10	0.008206	2.95	110.27	30.22	0.27
Skunk	04	5845	500-yr	478.00	5293.33	5299.90	5296.77	5300.08	0.009436	3.40	140.69	34.60	0.30
Skunk	04	5935	100-yr	364.00	5295.70	5300.35	5298.69	5300.64	0.021664	4.35	83.63	26.62	0.43

Skunk	04	5935	FW	364.00	5295.70	5300.36	5298.69	5300.66	0.021310	4.33	84.08	26.62	0.43
Skunk	04	5935	10-yr	261.00	5295.70	5299.43	5298.18	5299.72	0.026542	4.28	60.93	23.33	0.47
Skunk	04	5935	25-yr	305.00	5295.70	5299.84	5298.42	5300.13	0.023989	4.32	70.60	24.62	0.45
Skunk	04	5935	50-yr	325.00	5295.70	5300.02	5298.51	5300.31	0.022979	4.33	75.04	25.19	0.44
Skunk	04	5935	500-yr	478.00	5295.70	5301.03	5299.15	5301.36	0.021303	4.65	103.06	86.39	0.44
Skunk	04	6023	100-yr	364.00	5296.78	5302.14	5300.21	5302.41	0.018436	4.12	88.45	76.13	0.40
Skunk	04	6023	FW	364.00	5296.78	5302.14	5300.21	5302.40	0.018439	4.12	88.41	26.69	0.40
Skunk	04	6023	10-yr	261.00	5296.78	5301.41	5299.71	5301.63	0.017901	3.74	69.87	62.15	0.39
Skunk	04	6023	25-yr	305.00	5296.78	5301.73	5299.94	5301.97	0.018315	3.92	77.72	65.42	0.39
Skunk	04	6023	50-yr	325.00	5296.78	5301.87	5300.04	5302.12	0.018436	4.00	81.28	66.88	0.40
Skunk	04	6023	500-yr	478.00	5296.78	5302.83	5300.70	5303.13	0.019000	4.44	107.76	82.56	0.41
Skunk	04	6060	100-yr	364.00	5297.01	5302.83	5300.70	5303.04	0.015570	3.66	99.51	131.26	0.36
Skunk	04	6060	FW	364.00	5297.01	5302.83	5300.70	5303.04	0.015588	3.66	99.47	31.84	0.36
Skunk	04	6060	10-yr	261.00	5297.01	5302.10	5300.15	5302.28	0.017067	3.40	76.78	95.41	0.37
Skunk	04	6060	25-yr	305.00	5297.01	5302.42	5300.38	5302.62	0.016392	3.52	86.66	114.70	0.37
Skunk	04	6060	50-yr	325.00	5297.01	5302.57	5300.51	5302.76	0.016133	3.57	91.05	127.27	0.37
Skunk	04	6060	500-yr	478.00	5297.01	5303.52	5301.24	5303.76	0.014693	3.92	122.02	136.41	0.36
Skunk	04	6070		Bridge									
Skunk	04	6087	100-yr	364.00	5297.39	5303.28	5300.76	5303.57	0.017280	4.32	84.30	119.76	0.34
Skunk	04	6087	FW	364.00	5297.39	5303.28	5300.76	5303.57	0.017285	4.32	84.29	17.00	0.34
Skunk	04	6087	10-yr	261.00	5297.39	5302.53	5300.28	5302.74	0.014103	3.65	71.59	112.70	0.31
Skunk	04	6087	25-yr	305.00	5297.39	5302.86	5300.49	5303.11	0.015504	3.95	77.27	115.81	0.33
Skunk	04	6087	50-yr	325.00	5297.39	5303.01	5300.58	5303.27	0.016124	4.08	79.71	116.95	0.33
Skunk	04	6087	500-yr	478.00	5297.39	5303.98	5301.25	5304.37	0.020565	4.96	96.33	139.64	0.37
Skunk	04	6158	100-yr	364.00	5298.24	5304.40	5301.65	5304.61	0.012701	3.70	98.44	144.68	0.33
Skunk	04	6158	FW	364.00	5298.24	5304.40	5301.65	5304.61	0.012699	3.70	98.44	25.48	0.33
Skunk	04	6158	10-yr	261.00	5298.24	5303.49	5301.10	5303.67	0.012397	3.40	76.80	110.99	0.32
Skunk	04	6158	25-yr	305.00	5298.24	5303.90	5301.33	5304.09	0.012593	3.54	86.12	115.62	0.33
Skunk	04	6158	50-yr	325.00	5298.24	5304.07	5301.46	5304.28	0.012648	3.60	90.31	124.04	0.33
Skunk	04	6158	500-yr	478.00	5298.24	5305.28	5302.18	5305.51	0.012863	3.88	123.22	188.25	0.34
Skunk	04	6254	100-yr	364.00	5299.50	5305.50	5302.71	5305.65	0.009267	3.10	117.51	32.30	0.29
Skunk	04	6254	FW	364.00	5299.50	5305.50	5302.68	5305.65	0.009267	3.10	117.51	32.30	0.29
Skunk	04	6254	10-yr	261.00	5299.50	5304.60	5302.14	5304.73	0.009940	2.90	90.02	28.94	0.29
Skunk	04	6254	25-yr	305.00	5299.50	5305.01	5302.41	5305.15	0.009574	2.99	101.99	30.34	0.29
Skunk	04	6254	50-yr	325.00	5299.50	5305.18	5302.51	5305.32	0.009441	3.03	107.28	30.94	0.29
Skunk	04	6254	500-yr	478.00	5299.50	5306.38	5303.29	5306.54	0.008972	3.22	148.97	95.95	0.29
Skunk	04	6330	100-yr	364.00	5299.81	5306.43	5304.15	5306.79	0.023780	4.76	76.49	20.02	0.43
Skunk	04	6330	FW	364.00	5299.81	5306.43	5304.15	5306.79	0.023778	4.76	76.49	20.02	0.43
Skunk	04	6330	10-yr	261.00	5299.81	5305.58	5303.48	5305.87	0.022097	4.31	60.56	17.31	0.41
Skunk	04	6330	25-yr	305.00	5299.81	5305.96	5303.79	5306.28	0.023006	4.53	67.39	18.49	0.42
Skunk	04	6330	50-yr	325.00	5299.81	5306.13	5303.91	5306.46	0.023330	4.61	70.47	19.01	0.42
Skunk	04	6330	500-yr	478.00	5299.81	5307.28	5304.80	5307.67	0.024313	5.06	94.55	23.23	0.44
Skunk	04	6423	100-yr	364.00	5302.77	5308.38	5306.43	5308.61	0.016242	3.84	94.71	28.85	0.37
Skunk	04	6423	FW	364.00	5302.77	5308.38	5306.43	5308.61	0.016242	3.84	94.71	28.85	0.37
Skunk	04	6423	10-yr	261.00	5302.77	5307.54	5305.93	5307.75	0.018384	3.64	71.63	26.11	0.39
Skunk	04	6423	25-yr	305.00	5302.77	5307.92	5306.12	5308.14	0.017295	3.73	81.73	27.37	0.38
Skunk	04	6423	50-yr	325.00	5302.77	5308.08	5306.25	5308.30	0.016892	3.77	86.20	27.89	0.38
Skunk	04	6423	500-yr	478.00	5302.77	5309.20	5306.89	5309.45	0.015047	4.00	119.45	31.86	0.36
Skunk	04	6479	100-yr	364.00	5303.53	5309.33	5307.25	5309.61	0.018854	4.27	85.22	24.24	0.40
Skunk	04	6479	FW	364.00	5303.53	5309.33	5307.25	5309.61	0.018853	4.27	85.22	24.24	0.40
Skunk	04	6479	10-yr	261.00	5303.53	5308.55	5306.68	5308.78	0.018109	3.87	67.40	21.64	0.39
Skunk	04	6479	25-yr	305.00	5303.53	5308.90	5306.93	5309.15	0.018504	4.06	75.13	22.79	0.39
Skunk	04	6479	50-yr	325.00	5303.53	5309.05	5307.03	5309.31	0.018652	4.14	78.57	23.29	0.40
Skunk	04	6479	500-yr	478.00	5303.53	5310.09	5307.75	5310.42	0.018903	4.56	104.75	26.98	0.41
Skunk	04	6532	100-yr	898.00	5304.12	5311.12	5310.29	5312.81	0.081338	10.43	86.08	19.62	0.79
Skunk	04	6532	FW	898.00	5304.12	5311.41	5310.30	5313.09	0.099181	10.41	86.30	14.00	0.74
Skunk	04	6532	10-yr	274.00	5304.12	5309.53	5307.35	5309.84	0.020598	4.45	61.54	16.10	0.38
Skunk	04	6532	25-yr	518.00	5304.12	5310.27	5308.69	5311.06	0.045436	7.13	72.61	17.71	0.58
Skunk	04	6532	50-yr	706.00	5304.12	5310.69	5309.47	5311.92	0.065704	8.92	79.17	18.65	0.70
Skunk	04	6532	500-yr	1431.00	5304.12	5312.48	5312.48	5314.52	0.093934	11.62	128.37	35.86	0.86
Skunk	04	6570		Culvert									
Skunk	04	6605	100-yr	898.00	5304.89	5314.91	5313.02	5315.11	0.008042	3.57	259.13	89.59	0.25
Skunk	04	6605	FW	898.00	5304.89	5315.24	5311.47	5315.45	0.007199	3.50	255.79	65.00	0.24
Skunk	04	6605	10-yr	274.00	5304.89	5312.54	5308.44	5312.68	0.010902	3.08	93.38	51.81	0.27
Skunk	04	6605	25-yr	518.00	5304.89	5313.88	5309.94	5314.02	0.008004	3.15	175.05	76.16	0.25
Skunk	04	6605	50-yr	706.00	5304.89	5314.44	5310.74	5314.61	0.007972	3.37	219.87	81.73	0.25
Skunk	04	6605	500-yr	1431.00	5304.89	5316.05	5313.71	5316.32	0.007753	3.93	354.43	108.41	0.26
Skunk	04	6636	100-yr	898.00	5305.45	5315.06	5311.22	5315.34	0.005597	4.26	214.34	53.38	0.31
Skunk	04	6636	FW	898.00	5305.45	5315.38	5311.22	5315.67	0.005862	4.36	205.85	30.00	0.29
Skunk	04	6636	10-yr	274.00	5305.45	5312.75	5308.92	5312.82	0.002158	2.11	129.93	32.92	0.18
Skunk	04	6636	25-yr	518.00	5305.45	5314.03	5309.98	5314.17	0.003440	3.01	172.77	36.26	0.24
Skunk	04	6636	50-yr	706.00	5305.45	5314.60	5310.64	5314.80	0.004587	3.66	193.64	39.53	0.28
Skunk	04	6636	500-yr	1431.00	5305.45	5316.15	5312.64	5316.61	0.007527	5.53	277.19	63.79	0.37
Skunk	04	6666	100-yr	898.00	5305.99	5315.26	5311.21	5315.49	0.003979	3.81	240.26	58.35	0.27
Skunk	04	6666	FW	898.00	5305.99	5315.53	5311.17	5315.86	0.006304	4.60	195.22	25.00	0.29
Skunk	04	6666	10-yr	274.00	5305.99	5312.82	5308.96	5312.88	0.001721	1.96	140.34	34.73	0.17
Skunk	04	6666	25-yr	518.00	5305.99	5314.15	5310.00	5314.26	0.002584	2.74	192.01	49.18	0.21
Skunk	04	6666	50-yr	706.00	5305.99	5314.76	5310.65	5314.93	0.003339	3.29	217.79	50.91	0.25
Skunk	04	6666	500-yr	1431.00	5305.99	5316.44	5312.48	5316.81	0.005239	4.92	309.94	81.95	0.32
Skunk	04	6685	100-yr	898.00	5305.99	5315.33	5311.50	5315.60	0.006312	4.23	219.47	71.17	0.33
Skunk	04	6685	FW	898.00	5305.99	5315.70	5311.51	5315.98	0.005181	4.27	213.14	35.00	0.30
Skunk	04	6685	10-yr	274.00	5305.99	5312.84	5309.07	5312.93	0.002513	2.33	117.51	27.23	0.20
Skunk	04	6685	25-yr	518.00	5305.99	5314.19	5310.21	5314.35	0.003982	3.22	166.37	64.89	0.26
Skunk	04	6685	50-yr	706.00	5305.99	5314.81	5310.89	5315.03	0.005070	3.77	194.49	67.41	0.29
Skunk	04	6685	500-yr	1431.00	5305.99	5316.54	5312.96	5316.94	0.007186	5.15	295.85	104.78	0.36
Skunk	04	6690		Bridge									
Skunk	04	6704	100-yr	898.00	5305.91	5316.36	5311.45	5316.53	0.004074	3.28	284.11	87.73	0.25
Skunk	04	6704	FW	898.00	5305.91	5316.80	5311.46	5316.95	0.003427	3.16	293.76	55.00	0.23
Skunk	04	6704	10-yr	274.00	5305.91	5312.98	5309.03	5313.08	0.004538	2.57	106.53	28.33	0.23
Skunk	04	6704	25-yr	518.00	5305.91	5314.64	5310.10	5314.78	0.005411	3.02	179.39	62.46	0.27
Skunk	04	6704	50-yr	706.00	5305.91	5315.56	5310.75	5315.71	0.004593	3.14	232.74	67.52	0.25
Skunk	04	6704	500-yr	1431.00	5305.91	5318.08	5314.27	5318.28	0.003423	3.60	417.84	105.85	0.24
Skunk	04	6719	100-yr	898.00	5307.24	5316.40	5311.66	5316.58	0.003266	3.41	267.61	57.00	0.25

Skunk	04	6719	FW	898.00	5307.24	5316.83	5311.69	5317.00	0.002761	3.23	278.22	41.48	0.22
Skunk	04	6719	10-yr	274.00	5307.24	5313.06	5309.66	5313.13	0.001980	2.06	133.11	32.74	0.18
Skunk	04	6719	25-yr	518.00	5307.24	5314.72	5310.57	5314.84	0.002645	2.70	191.83	38.49	0.21
Skunk	04	6719	50-yr	706.00	5307.24	5315.62	5311.17	5315.77	0.003034	3.10	228.57	43.91	0.23
Skunk	04	6719	500-yr	1431.00	5307.24	5318.11	5312.90	5318.34	0.003237	4.01	392.09	103.70	0.25
Skunk	04	6781	100-yr	898.00	5308.67	5316.55	5313.55	5316.96	0.008342	5.14	177.87	52.73	0.40
Skunk	04	6781	FW	898.00	5308.67	5316.95	5313.52	5317.31	0.006632	4.79	187.63	33.75	0.36
Skunk	04	6781	10-yr	274.00	5308.67	5313.19	5311.21	5313.38	0.007291	3.53	77.53	24.11	0.35
Skunk	04	6781	25-yr	518.00	5308.67	5314.86	5312.30	5315.14	0.007312	4.26	121.67	28.50	0.36
Skunk	04	6781	50-yr	706.00	5308.67	5315.76	5312.93	5316.11	0.007839	4.76	148.45	31.08	0.38
Skunk	04	6781	500-yr	1431.00	5308.67	5318.29	5314.90	5318.66	0.006550	5.20	310.72	99.40	0.37
Skunk	04	6889	100-yr	898.00	5311.09	5317.59	5315.36	5317.88	0.008476	4.31	208.52	53.02	0.38
Skunk	04	6889	FW	898.00	5311.09	5317.79	5315.39	5318.05	0.007058	4.13	217.48	50.00	0.35
Skunk	04	6889	10-yr	274.00	5311.09	5314.44	5313.63	5314.72	0.024776	4.24	64.59	38.26	0.58
Skunk	04	6889	25-yr	518.00	5311.09	5315.88	5314.55	5316.15	0.012345	4.14	125.23	45.24	0.44
Skunk	04	6889	50-yr	706.00	5311.09	5316.78	5314.99	5317.06	0.009734	4.22	167.40	48.86	0.40
Skunk	04	6889	500-yr	1431.00	5311.09	5319.07	5316.29	5319.43	0.007914	4.85	302.97	82.38	0.38
Skunk	04	6958	100-yr	898.00	5312.54	5318.33	5317.63	5319.05	0.033188	6.78	133.00	55.80	0.72
Skunk	04	6958	FW	898.00	5312.54	5318.35	5317.62	5319.11	0.032233	7.00	128.29	41.00	0.70
Skunk	04	6958	10-yr	274.00	5312.54	5316.19	5315.48	5316.59	0.028174	5.09	53.88	26.14	0.62
Skunk	04	6958	25-yr	518.00	5312.54	5317.02	5316.49	5317.70	0.040666	6.60	78.43	33.94	0.77
Skunk	04	6958	50-yr	706.00	5312.54	5317.67	5317.15	5318.40	0.039376	6.87	102.77	41.08	0.77
Skunk	04	6958	500-yr	1431.00	5312.54	5319.74	5318.75	5320.35	0.020757	6.45	247.96	144.05	0.59
Skunk	04	7040	100-yr	898.00	5317.17	5320.97	5320.97	5321.42	0.040722	6.59	174.31	165.70	0.75
Skunk	04	7040	FW	898.00	5317.17	5321.40	5321.40	5322.04	0.043086	7.47	145.28	98.82	0.78
Skunk	04	7040	10-yr	274.00	5317.17	5320.28	5320.28	5320.57	0.029388	5.06	74.45	105.53	0.62
Skunk	04	7040	25-yr	518.00	5317.17	5320.60	5320.60	5320.98	0.039683	6.06	115.72	145.24	0.72
Skunk	04	7040	50-yr	706.00	5317.17	5320.83	5320.83	5321.21	0.037798	6.18	151.42	164.39	0.72
Skunk	04	7040	500-yr	1431.00	5317.17	5321.39	5321.28	5321.93	0.037772	6.76	246.13	174.29	0.73
Skunk	04	7118	100-yr	898.00	5317.72	5323.44	5323.24	5324.01	0.020613	6.77	174.70	107.44	0.59
Skunk	04	7118	FW	898.00	5317.72	5323.85	5323.08	5324.57	0.020291	7.15	143.42	45.00	0.59
Skunk	04	7118	10-yr	274.00	5317.72	5321.98	5320.65	5322.26	0.014767	4.26	65.01	28.16	0.46
Skunk	04	7118	25-yr	518.00	5317.72	5322.79	5321.74	5323.25	0.017987	5.63	111.25	87.54	0.54
Skunk	04	7118	50-yr	706.00	5317.72	5323.13	5322.93	5323.66	0.020109	6.33	142.36	96.78	0.57
Skunk	04	7118	500-yr	1431.00	5317.72	5324.04	5323.96	5324.76	0.024018	8.00	248.08	141.16	0.65
Skunk	04	7189	100-yr	898.00	5320.08	5324.91	5324.15	5325.29	0.016110	5.43	198.11	133.01	0.52
Skunk	04	7189	FW	898.00	5320.08	5325.35	5324.33	5325.75	0.013800	5.45	188.65	65.00	0.49
Skunk	04	7189	10-yr	274.00	5320.08	5323.20	5322.67	5323.48	0.020923	4.36	68.56	59.37	0.56
Skunk	04	7189	25-yr	518.00	5320.08	5324.15	5323.39	5324.44	0.016089	4.61	129.04	101.60	0.50
Skunk	04	7189	50-yr	706.00	5320.08	5324.57	5323.88	5324.91	0.015900	5.04	164.68	120.46	0.51
Skunk	04	7189	500-yr	1431.00	5320.08	5325.66	5324.91	5326.12	0.015854	6.14	285.71	154.75	0.53
Skunk	04	7216	100-yr	898.00	5319.52	5325.36	5324.79	5325.78	0.018085	5.86	190.48	144.51	0.55
Skunk	04	7216	FW	898.00	5319.52	5325.76	5324.82	5326.14	0.013658	5.46	195.28	70.00	0.48
Skunk	04	7216	10-yr	274.00	5319.52	5323.72	5322.82	5324.02	0.018037	4.46	65.52	90.69	0.51
Skunk	04	7216	25-yr	518.00	5319.52	5324.58	5323.94	5324.93	0.017426	5.13	123.10	113.61	0.52
Skunk	04	7216	50-yr	706.00	5319.52	5325.02	5324.48	5325.40	0.018107	5.49	157.39	134.93	0.54
Skunk	04	7216	500-yr	1431.00	5319.52	5326.10	5325.49	5326.62	0.017926	6.62	274.25	167.18	0.56
Skunk	04	7230		Bridge									
Skunk	04	7240	100-yr	898.00	5319.57	5327.27	5325.39	5327.37	0.004078	2.80	357.30	195.30	0.23
Skunk	04	7240	FW	898.00	5319.57	5327.72	5325.48	5327.85	0.004136	3.00	322.42	85.00	0.23
Skunk	04	7240	10-yr	274.00	5319.57	5325.65	5323.19	5325.70	0.003318	1.91	161.61	154.91	0.19
Skunk	04	7240	25-yr	518.00	5319.57	5326.45	5324.36	5326.52	0.003636	2.33	250.59	172.77	0.21
Skunk	04	7240	50-yr	706.00	5319.57	5326.89	5324.96	5326.98	0.003876	2.58	305.66	183.47	0.22
Skunk	04	7240	500-yr	1431.00	5319.57	5328.13	5326.02	5328.27	0.004157	3.17	485.41	207.54	0.24
Skunk	04	7259	100-yr	898.00	5320.42	5327.32	5325.09	5327.46	0.004047	3.29	317.92	184.66	0.27
Skunk	04	7259	FW	898.00	5320.42	5327.77	5325.08	5327.94	0.003961	3.46	279.12	70.00	0.27
Skunk	04	7259	10-yr	274.00	5320.42	5325.70	5323.30	5325.77	0.002735	2.01	142.16	126.48	0.21
Skunk	04	7259	25-yr	518.00	5320.42	5326.50	5324.10	5326.60	0.003481	2.67	220.73	168.15	0.24
Skunk	04	7259	50-yr	706.00	5320.42	5326.94	5324.70	5327.07	0.003801	3.01	271.30	176.52	0.26
Skunk	04	7259	500-yr	1431.00	5320.42	5328.18	5326.25	5328.37	0.004397	3.85	436.26	207.66	0.29
Skunk	04	7318	100-yr	898.00	5321.84	5327.54	5326.33	5328.00	0.017848	5.42	170.93	85.51	0.54
Skunk	04	7318	FW	898.00	5321.84	5328.00	5326.32	5328.39	0.012872	5.03	179.72	50.00	0.46
Skunk	04	7318	10-yr	274.00	5321.84	5325.92	5324.48	5326.08	0.011032	3.22	85.16	41.45	0.40
Skunk	04	7318	25-yr	518.00	5321.84	5326.75	5325.42	5327.03	0.014674	4.20	123.24	49.77	0.47
Skunk	04	7318	50-yr	706.00	5321.84	5327.19	5325.95	5327.55	0.016771	4.85	145.58	53.03	0.51
Skunk	04	7318	500-yr	1431.00	5321.84	5328.37	5327.31	5328.95	0.018027	6.37	248.73	105.83	0.56
Skunk	04	7416	100-yr	898.00	5323.52	5329.29	5328.07	5329.83	0.019024	6.01	155.13	67.96	0.56
Skunk	04	7416	FW	898.00	5323.52	5329.37	5328.01	5329.99	0.019269	6.34	141.60	35.00	0.56
Skunk	04	7416	10-yr	274.00	5323.52	5327.14	5326.15	5327.40	0.015966	4.07	67.39	29.99	0.48
Skunk	04	7416	25-yr	518.00	5323.52	5328.23	5327.00	5328.62	0.017238	5.04	104.17	53.29	0.52
Skunk	04	7416	50-yr	706.00	5323.52	5328.83	5327.50	5329.29	0.018134	5.55	131.14	61.12	0.54
Skunk	04	7416	500-yr	1431.00	5323.52	5330.23	5329.27	5330.95	0.022364	7.01	213.24	78.05	0.62
Skunk	04	7478	100-yr	898.00	5325.02	5330.44		5330.97	0.018604	5.87	157.06	52.23	0.53
Skunk	04	7478	FW	898.00	5325.02	5330.60		5331.13	0.017861	5.87	153.09	38.00	0.51
Skunk	04	7478	10-yr	274.00	5325.02	5328.24		5328.50	0.020277	4.06	67.42	34.62	0.51
Skunk	04	7478	25-yr	518.00	5325.02	5329.34		5329.70	0.018084	4.82	107.49	38.35	0.51
Skunk	04	7478	50-yr	706.00	5325.02	5329.96		5330.40	0.018077	5.32	134.10	46.13	0.52
Skunk	04	7478	500-yr	1431.00	5325.02	5331.49		5332.21	0.019595	6.99	223.72	70.81	0.56
Skunk	04	7566	100-yr	890.00	5326.33	5332.10	5331.30	5333.65	0.033674	9.99	89.04	42.20	0.78
Skunk	04	7566	FW	890.00	5326.33	5332.52	5331.30	5333.84	0.041735	9.25	96.27	17.30	0.69
Skunk	04	7566	10-yr	263.00	5326.33	5329.85	5328.75	5330.27	0.018100	5.21	50.46	25.23	0.53
Skunk	04	7566	25-yr	509.00	5326.33	5330.98	5329.92	5331.81	0.025020	7.31	69.62	27.90	0.64
Skunk	04	7566	50-yr	696.00	5326.33	5331.60	5330.66	5332.76	0.028941	8.66	80.40	30.17	0.71
Skunk	04	7566	500-yr	1455.00	5326.33	5333.85	5333.85	5334.84	0.021098	8.93	231.21	141.93	0.63
Skunk	04	7600		Culvert									
Skunk	04	7622	100-yr	890.00	5329.21	5335.00	5335.00	5335.96	0.012193	2.78	161.64	99.04	0.26
Skunk	04	7622	FW	890.00	5329.21	5335.13	5335.13	5336.12	0.009080	2.44	167.61	91.07	0.23
Skunk	04	7622	10-yr	263.00	5329.21	5333.37	5331.64	5333.72	0.049437	4.75	55.37	18.81	0.47
Skunk	04	7622	25-yr	509.00	5329.21	5333.91	5332.94	5334.86	0.112369	7.83	65.05	62.62	0.73
Skunk	04	7622	50-yr	696.00	5329.21	5334.69	5334.69	5335.48	0.019445	3.32	131.26	95.26	0.33
Skunk	04	7622	500-yr	1455.00	5329.21	5335.91	5335.91	5336.99	0.004972	2.07	251.86	122.46	0.18
Skunk	04	7639	100-yr	890.00	5329.99	5335.59	5334.53	5336.41	0.042868	7.25	122.68	60.51	0.64
Skunk	04	7639	FW	890.00	5329.99	5335.76	5334.53	5336.50	0.035768	6.47	132.42	58.24	0.56
Skunk	04	7639	10-yr	263.00	5329.99	5334.03	5332.45	5334.23	0.015836	3.53	74.43	26.21	0.37

Skunk	04	7639	25-yr	509.00	5329.99	5335.37	5333.41	5335.70	0.017997	4.60	111.09	43.67	0.41
Skunk	04	7639	50-yr	696.00	5329.99	5335.40	5334.00	5336.00	0.032698	6.22	112.55	51.82	0.55
Skunk	04	7639	500-yr	1455.00	5329.99	5335.76	5335.76	5337.70	0.089895	10.66	132.31	64.48	0.93
Skunk	04	7651	100-yr	890.00	5334.43	5336.58	5336.58	5338.92	0.241812	11.12	75.93	85.26	1.40
Skunk	04	7651	FW	890.00	5334.43	5336.56	5336.56	5338.96	0.280848	11.44	74.31	61.48	1.45
Skunk	04	7651	10-yr	263.00	5334.43	5335.75	5335.75	5336.39	0.144085	6.41	41.01	44.29	1.01
Skunk	04	7651	25-yr	509.00	5334.43	5336.50	5336.50	5337.31	0.102620	7.07	70.73	83.35	0.91
Skunk	04	7651	50-yr	696.00	5334.43	5336.55	5336.55	5338.00	0.163438	9.05	73.95	84.56	1.15
Skunk	04	7651	500-yr	1455.00	5334.43	5338.49	5338.49	5339.14	0.005497	2.49	324.10	217.93	0.23
Skunk	04	7705	100-yr	890.00	5335.40	5339.46	5339.13	5339.91	0.005131	2.46	209.59	135.11	0.28
Skunk	04	7705	FW	890.00	5335.52	5339.46	5339.46	5340.34	0.007768	2.46	144.67	76.66	0.23
Skunk	04	7705	10-yr	263.00	5335.40	5338.09	5337.80	5338.35	0.016181	3.08	71.19	81.90	0.43
Skunk	04	7705	25-yr	509.00	5335.40	5338.48	5338.32	5339.04	0.015681	3.39	104.57	95.81	0.45
Skunk	04	7705	50-yr	696.00	5335.40	5338.87	5338.73	5339.48	0.010516	3.03	141.47	106.01	0.38
Skunk	04	7705	500-yr	1455.00	5335.40	5339.73	5339.73	5340.62	0.008584	3.42	247.01	144.63	0.36
Skunk	04	7839	100-yr	890.00	5335.69	5340.61		5340.77	0.006854	3.36	294.64	198.40	0.33
Skunk	04	7839	FW	890.00	5335.69	5341.10		5341.21	0.004338	2.89	337.93	134.77	0.26
Skunk	04	7839	10-yr	263.00	5335.69	5339.28		5339.34	0.003977	2.00	131.38	51.10	0.22
Skunk	04	7839	25-yr	509.00	5335.69	5340.11		5340.21	0.005030	2.66	211.12	132.33	0.27
Skunk	04	7839	50-yr	696.00	5335.69	5340.44		5340.56	0.005593	2.96	263.09	176.09	0.29
Skunk	04	7839	500-yr	1455.00	5335.69	5341.42		5341.58	0.004764	3.17	473.36	229.48	0.28
Skunk	04	7890	100-yr	890.00	5335.88	5341.52	5341.52	5342.13	0.041505	7.01	149.72	116.43	0.63
Skunk	04	7890	FW	890.00	5335.88	5341.52	5341.52	5342.13	0.041324	7.00	150.01	116.47	0.63
Skunk	04	7890	10-yr	263.00	5335.88	5339.49	5338.85	5339.97	0.049138	5.68	48.17	25.12	0.61
Skunk	04	7890	25-yr	509.00	5335.88	5340.26	5340.01	5341.10	0.071464	7.43	69.45	30.59	0.76
Skunk	04	7890	50-yr	696.00	5335.88	5340.63	5340.63	5341.76	0.084457	8.66	81.42	35.29	0.85
Skunk	04	7890	500-yr	1455.00	5335.88	5342.11	5342.11	5342.78	0.040592	7.50	229.40	155.98	0.65
Skunk	04	7934	100-yr	890.00	5336.33	5343.10	5341.57	5343.43	0.019238	5.30	203.74	145.83	0.42
Skunk	04	7934	FW	890.00	5336.33	5343.23	5342.18	5344.27	0.045860	8.32	111.18	27.12	0.66
Skunk	04	7934	10-yr	263.00	5336.33	5340.97	5339.27	5341.16	0.015032	3.61	77.47	30.58	0.34
Skunk	04	7934	25-yr	509.00	5336.33	5342.33	5340.46	5342.59	0.016190	4.43	130.03	52.50	0.38
Skunk	04	7934	50-yr	696.00	5336.33	5343.01	5341.07	5343.24	0.013237	4.37	192.07	137.80	0.35
Skunk	04	7934	500-yr	1455.00	5336.33	5343.75	5343.31	5344.10	0.019210	5.53	319.42	198.96	0.45
Skunk	04	7960		Inl Struct									
Skunk	04	7984	100-yr	890.00	5336.85	5345.57	5341.43	5345.77	0.004721	3.56	249.71	110.58	0.24
Skunk	04	7984	FW	890.00	5336.85	5345.70	5341.51	5345.91	0.006860	3.67	242.73	35.00	0.25
Skunk	04	7984	10-yr	263.00	5336.85	5343.27	5339.94	5343.31	0.001648	1.60	164.78	78.33	0.13
Skunk	04	7984	25-yr	509.00	5336.85	5344.29	5340.62	5344.39	0.003100	2.51	202.59	104.29	0.19
Skunk	04	7984	50-yr	696.00	5336.85	5344.95	5341.06	5345.10	0.003975	3.07	226.88	107.40	0.22
Skunk	04	7984	500-yr	1455.00	5336.85	5347.33	5342.46	5347.66	0.005818	4.62	315.00	156.97	0.28
Skunk	04	7989	100-yr	890.00	5336.89	5345.59	5341.30	5345.79	0.004710	3.63	245.51	101.76	0.24
Skunk	04	7989	FW	890.00	5336.89	5345.75	5341.30	5345.95	0.005949	3.54	251.27	35.00	0.23
Skunk	04	7989	10-yr	263.00	5336.89	5343.28	5339.48	5343.32	0.001554	1.60	164.78	62.66	0.13
Skunk	04	7989	25-yr	509.00	5336.89	5344.31	5340.44	5344.41	0.003011	2.54	200.78	98.24	0.19
Skunk	04	7989	50-yr	696.00	5336.89	5344.97	5340.90	5345.12	0.003920	3.11	223.82	100.08	0.22
Skunk	04	7989	500-yr	1455.00	5336.89	5347.35	5342.37	5347.70	0.005961	4.74	307.22	153.96	0.28
Skunk	04	7996	100-yr	890.00	5336.70	5345.60	5341.04	5345.85	0.005824	4.02	221.42	94.36	0.26
Skunk	04	7996	FW	890.00	5336.70	5345.77	5341.04	5346.01	0.007641	3.93	226.52	29.00	0.25
Skunk	04	7996	10-yr	263.00	5336.70	5343.29	5338.81	5343.33	0.001691	1.70	154.41	57.06	0.13
Skunk	04	7996	25-yr	509.00	5336.70	5344.32	5339.84	5344.44	0.003507	2.76	184.38	74.53	0.19
Skunk	04	7996	50-yr	696.00	5336.70	5344.98	5340.56	5345.16	0.004719	3.42	203.49	92.98	0.23
Skunk	04	7996	500-yr	1455.00	5336.70	5347.71	5342.27	5347.80	0.001489	2.38	649.17	155.09	0.15
Skunk	04	8576	100-yr	890.00	5348.69	5361.27		5361.36	0.003188	2.62	397.83	304.80	0.16
Skunk	04	8576	FW	890.00	5348.69	5361.27		5361.48	0.006358	3.69	242.84	30.75	0.23
Skunk	04	8576	10-yr	263.00	5348.69	5354.66		5354.76	0.004168	2.56	102.72	22.54	0.19
Skunk	04	8576	25-yr	509.00	5348.69	5357.63		5357.79	0.003628	3.20	159.15	89.49	0.19
Skunk	04	8576	50-yr	696.00	5348.69	5359.93		5360.11	0.005248	3.42	207.67	276.22	0.22
Skunk	04	8576	500-yr	1455.00	5348.69	5362.93		5363.01	0.002015	2.35	637.16	392.75	0.13
Skunk	04	8654	100-yr	1003.00	5352.02	5361.49	5356.99	5361.55	0.002035	2.20	484.56	164.98	0.15
Skunk	04	8654	FW	1003.00	5352.02	5361.71	5356.99	5361.84	0.003370	2.89	353.76	70.00	0.19
Skunk	04	8654	10-yr	169.00	5352.02	5355.14	5353.99	5355.32	0.021930	3.46	48.89	22.37	0.41
Skunk	04	8654	25-yr	451.00	5352.02	5358.03	5355.29	5358.24	0.010919	3.69	122.37	28.31	0.31
Skunk	04	8654	50-yr	705.00	5352.02	5360.36	5356.15	5360.44	0.003237	2.47	329.13	161.86	0.18
Skunk	04	8654	500-yr	1510.00	5352.02	5363.07	5358.51	5363.14	0.001364	2.06	703.04	164.98	0.12
Skunk	04	8713	100-yr	1003.00	5355.62	5361.45	5360.38	5362.25	0.046293	7.19	139.58	36.82	0.65
Skunk	04	8713	FW	1003.00	5355.62	5361.92	5360.38	5362.55	0.032495	6.40	156.62	36.80	0.55
Skunk	04	8713	10-yr	169.00	5355.62	5357.75	5357.75	5358.31	0.148899	6.01	28.11	24.15	0.98
Skunk	04	8713	25-yr	451.00	5355.62	5359.16	5358.82	5359.91	0.083254	6.97	64.68	28.06	0.81
Skunk	04	8713	50-yr	705.00	5355.62	5360.56	5359.60	5361.22	0.048067	6.54	107.85	33.97	0.65
Skunk	04	8713	500-yr	1510.00	5355.62	5362.87	5361.42	5363.81	0.038523	7.76	194.80	42.47	0.62
Skunk	04	8800		Culvert									
Skunk	04	8873	100-yr	1003.00	5357.27	5366.38	5361.85	5366.61	0.014097	3.91	261.62	127.43	0.31
Skunk	04	8873	FW	1003.00	5357.27	5366.38	5361.82	5366.61	0.014111	3.91	261.66	82.25	0.31
Skunk	04	8873	10-yr	169.00	5357.27	5360.55	5359.24	5360.68	0.021611	2.81	60.18	28.03	0.34
Skunk	04	8873	25-yr	451.00	5357.27	5362.76	5360.41	5362.96	0.018522	3.60	125.35	33.98	0.31
Skunk	04	8873	50-yr	705.00	5357.27	5364.72	5361.14	5364.94	0.012439	3.72	189.77	47.24	0.27
Skunk	04	8873	500-yr	1510.00	5357.27	5367.68	5363.02	5368.12	0.007662	3.36	382.43	183.42	0.24
Skunk	04	8937	100-yr	1003.00	5357.97	5366.96		5367.10	0.004655	3.04	330.81	68.35	0.22
Skunk	04	8937	FW	1003.00	5357.97	5366.96		5367.11	0.004678	3.05	329.30	57.23	0.22
Skunk	04	8937	10-yr	169.00	5357.97	5361.61		5361.71	0.012343	2.48	68.11	34.81	0.31
Skunk	04	8937	25-yr	451.00	5357.97	5363.65		5363.79	0.009333	2.95	152.93	48.69	0.29
Skunk	04	8937	50-yr	705.00	5357.97	5365.34		5365.48	0.005913	2.94	239.86	53.38	0.24
Skunk	04	8937	500-yr	1510.00	5357.97	5368.25		5368.49	0.004047	3.14	440.52	89.96	0.21
Skunk	04	9001	100-yr	1003.00	5358.09	5367.27		5367.63	0.012792	4.76	210.59	39.20	0.35
Skunk	04	9001	FW	1003.00	5358.09	5367.28		5367.63	0.012771	4.76	210.67	36.55	0.35
Skunk	04	9001	10-yr	169.00	5358.09	5362.38		5362.50	0.012455	2.80	60.43	24.55	0.31
Skunk	04	9001	25-yr	451.00	5358.09	5364.31		5364.56	0.014841	4.00	112.66	29.35	0.36
Skunk	04	9001	50-yr	705.00	5358.09	5365.77		5366.08	0.013979	4.45	158.32	33.01	0.36
Skunk	04	9001	500-yr	1510.00	5358.09	5368.53		5368.93	0.010600	4.73	304.31	88.52	0.33
Skunk	04	9041	100-yr	1003.00	5358.45	5367.88	5364.34	5368.15	0.013120	4.21	238.07	56.65	0.35
Skunk	04	9041	FW	1003.00	5358.45	5367.88	5364.33	5368.15	0.013107	4.21	238.02	53.61	0.35
Skunk	04	9041	10-yr	169.00	5358.45	5362.90	5361.06	5363.03	0.013914	2.88	58.77	24.29	0.33
Skunk	04	9041	25-yr	451.00	5358.45	5364.92	5362.66	5365.16	0.015077	3.92	115.09	31.39	0.36
Skunk	04	9041	50-yr	705.00	5358.45	5366.37	5363.52	5366.63	0.013484	4.13	170.80	48.72	0.35

Skunk	04	9041	500-yr	1510.00	5358.45	5368.94	5365.61	5369.36	0.010381	4.24	326.52	91.37	0.32
Skunk	04	9076	100-yr	1003.00	5358.61	5368.33	5364.62	5368.55	0.009343	3.71	271.32	73.15	0.30
Skunk	04	9076	FW	1003.00	5358.61	5368.33	5364.62	5368.55	0.009369	3.71	270.33	58.39	0.30
Skunk	04	9076	10-yr	169.00	5358.61	5363.44	5361.70	5363.55	0.015668	2.66	63.53	37.85	0.34
Skunk	04	9076	25-yr	451.00	5358.61	5365.44	5363.32	5365.61	0.010942	3.34	134.87	44.63	0.32
Skunk	04	9076	50-yr	705.00	5358.61	5366.83	5363.97	5367.04	0.009728	3.66	192.49	51.16	0.31
Skunk	04	9076	500-yr	1510.00	5358.61	5369.35	5365.57	5369.68	0.007705	3.83	367.08	137.00	0.28
Skunk	04	9109	100-yr	1003.00	5358.84	5368.59	5363.69	5368.94	0.010215	4.75	211.19	56.02	0.29
Skunk	04	9109	FW	1003.00	5358.84	5368.60	5363.69	5368.95	0.011288	4.74	211.66	26.00	0.29
Skunk	04	9109	10-yr	169.00	5358.84	5363.73	5360.77	5363.79	0.003562	1.86	90.80	22.76	0.16
Skunk	04	9109	25-yr	451.00	5358.84	5365.75	5361.95	5365.91	0.007510	3.26	138.47	24.59	0.24
Skunk	04	9109	50-yr	705.00	5358.84	5367.13	5362.82	5367.39	0.009647	4.07	173.30	25.93	0.28
Skunk	04	9109	500-yr	1510.00	5358.84	5369.55	5364.93	5370.19	0.015929	6.39	236.26	94.53	0.37
Skunk	04	9150		Culvert									
Skunk	04	9194	100-yr	1003.00	5359.18	5369.59	5364.01	5369.82	0.010575	3.85	260.25	52.31	0.23
Skunk	04	9194	FW	1003.00	5359.18	5369.60	5364.02	5369.83	0.013331	3.85	260.82	30.00	0.23
Skunk	04	9194	10-yr	169.00	5359.18	5363.81	5361.23	5363.86	0.006612	1.86	90.76	32.07	0.18
Skunk	04	9194	25-yr	451.00	5359.18	5366.00	5362.44	5366.13	0.010374	2.92	154.28	37.39	0.22
Skunk	04	9194	50-yr	705.00	5359.18	5367.55	5363.26	5367.75	0.012432	3.54	199.28	40.07	0.24
Skunk	04	9194	500-yr	1510.00	5359.18	5371.22	5365.09	5371.49	0.014325	4.29	384.92	176.73	0.29
Skunk	04	9234	100-yr	1003.00	5360.70	5369.97	5366.80	5370.25	0.010401	4.23	244.49	61.82	0.32
Skunk	04	9234	FW	1003.00	5360.70	5370.04	5366.83	5370.32	0.010493	4.28	235.31	42.96	0.32
Skunk	04	9234	10-yr	169.00	5360.70	5364.13	5363.67	5364.61	0.072061	5.55	30.46	15.63	0.70
Skunk	04	9234	25-yr	451.00	5360.70	5366.54	5365.55	5366.89	0.033989	4.74	95.19	36.75	0.52
Skunk	04	9234	50-yr	705.00	5360.70	5368.07	5366.19	5368.40	0.019299	4.61	152.98	38.91	0.41
Skunk	04	9234	500-yr	1510.00	5360.70	5371.63	5367.72	5371.91	0.008363	4.47	384.13	154.96	0.29
Skunk	04	9246	100-yr	1003.00	5361.01	5370.10	5367.15	5370.37	0.010848	4.22	242.72	54.89	0.32
Skunk	04	9246	FW	1003.00	5361.01	5370.15	5367.15	5370.49	0.013519	4.66	215.45	36.21	0.34
Skunk	04	9246	10-yr	169.00	5361.01	5364.74	5362.85	5364.96	0.011582	3.77	44.79	16.09	0.34
Skunk	04	9246	25-yr	451.00	5361.01	5366.89	5364.55	5367.28	0.029959	5.06	89.09	32.60	0.50
Skunk	04	9246	50-yr	705.00	5361.01	5368.30	5366.38	5368.64	0.021345	4.69	150.57	41.36	0.42
Skunk	04	9246	500-yr	1510.00	5361.01	5371.72	5368.02	5372.03	0.009521	4.64	364.06	124.36	0.31
Skunk	04	9260		Culvert									
Skunk	04	9270	100-yr	1003.00	5361.22	5371.68	5368.00	5371.95	0.011268	4.29	246.93	81.80	0.31
Skunk	04	9270	FW	1003.00	5361.22	5371.96	5368.04	5372.24	0.011045	4.27	235.11	36.84	0.30
Skunk	04	9270	10-yr	169.00	5361.22	5368.73	5363.04	5368.76	0.002187	1.40	120.80	31.84	0.13
Skunk	04	9270	25-yr	451.00	5361.22	5370.11	5364.72	5370.22	0.006301	2.69	167.75	38.08	0.22
Skunk	04	9270	50-yr	705.00	5361.22	5370.98	5366.00	5371.17	0.008688	3.51	203.36	47.71	0.27
Skunk	04	9270	500-yr	1510.00	5361.22	5372.43	5369.11	5372.81	0.014398	5.19	327.85	129.34	0.35
Skunk	04	9304	100-yr	1003.00	5366.48	5372.61	5372.61	5373.29	0.039616	7.13	164.35	109.24	0.68
Skunk	04	9304	FW	1003.00	5366.48	5372.64	5372.64	5373.29	0.037655	6.99	167.65	109.23	0.66
Skunk	04	9304	10-yr	169.00	5366.48	5369.33	5369.33	5370.22	0.102253	7.58	22.31	12.32	0.99
Skunk	04	9304	25-yr	451.00	5366.48	5370.84	5370.84	5371.79	0.104608	7.84	57.54	30.35	1.00
Skunk	04	9304	50-yr	705.00	5366.48	5371.68	5371.68	5372.71	0.075010	8.20	89.22	54.42	0.90
Skunk	04	9304	500-yr	1510.00	5366.48	5373.10	5373.10	5373.89	0.041504	7.87	221.80	136.77	0.70
Skunk	04	9444	100-yr	1003.00	5369.49	5375.94	5374.37	5376.27	0.012706	4.59	228.02	164.73	0.36
Skunk	04	9444	FW	1003.00	5369.49	5375.96	5374.34	5376.29	0.013347	4.71	222.44	74.00	0.37
Skunk	04	9444	10-yr	169.00	5369.49	5373.07	5371.21	5373.16	0.008454	2.42	69.78	27.07	0.27
Skunk	04	9444	25-yr	451.00	5369.49	5374.75	5372.45	5374.90	0.008988	3.21	146.31	136.21	0.29
Skunk	04	9444	50-yr	705.00	5369.49	5375.52	5373.28	5375.73	0.009589	3.75	194.56	153.72	0.31
Skunk	04	9444	500-yr	1510.00	5369.49	5376.71	5375.02	5377.15	0.014204	5.33	299.30	180.55	0.39
Skunk	04	9586	100-yr	1003.00	5370.82	5377.88	5375.54	5378.25	0.015158	4.92	207.90	89.36	0.39
Skunk	04	9586	FW	1003.00	5370.82	5377.93	5375.56	5378.29	0.014690	4.88	210.60	53.80	0.39
Skunk	04	9586	10-yr	169.00	5370.82	5374.41	5372.94	5374.51	0.010827	2.55	66.15	28.91	0.30
Skunk	04	9586	25-yr	451.00	5370.82	5376.21	5374.06	5376.42	0.012650	3.63	124.42	36.75	0.34
Skunk	04	9586	50-yr	705.00	5370.82	5377.10	5374.79	5377.39	0.014153	4.34	167.12	64.81	0.37
Skunk	04	9586	500-yr	1510.00	5370.82	5378.83	5376.88	5379.34	0.016433	5.77	271.23	135.67	0.42
Skunk	04	9710	100-yr	1003.00	5373.94	5380.35	5378.86	5381.09	0.035370	7.00	154.16	120.34	0.58
Skunk	04	9710	FW	1003.00	5373.94	5380.35	5378.86	5381.09	0.035504	7.01	153.86	75.63	0.58
Skunk	04	9710	10-yr	169.00	5373.94	5376.62	5375.97	5376.90	0.040986	4.25	39.78	21.81	0.55
Skunk	04	9710	25-yr	451.00	5373.94	5378.43	5377.21	5378.88	0.033271	5.40	83.52	41.96	0.53
Skunk	04	9710	50-yr	705.00	5373.94	5379.50	5378.05	5380.11	0.035359	6.23	113.18	59.87	0.56
Skunk	04	9710	500-yr	1510.00	5373.94	5381.31	5381.08	5381.93	0.027026	6.87	260.35	201.79	0.53
Skunk	04	9780	100-yr	1003.00	5379.29	5383.06	5382.21	5383.87	0.044191	7.25	138.39	163.63	0.67
Skunk	04	9780	FW	1003.00	5379.29	5383.14	5382.21	5383.92	0.046020	7.09	141.53	44.00	0.65
Skunk	04	9780	10-yr	169.00	5379.29	5380.47	5380.26	5380.75	0.077879	4.21	40.11	63.94	0.72
Skunk	04	9780	25-yr	451.00	5379.29	5381.46	5381.07	5381.98	0.060952	5.80	77.79	115.14	0.71
Skunk	04	9780	50-yr	705.00	5379.29	5382.31	5381.62	5382.95	0.046826	6.40	110.08	152.01	0.66
Skunk	04	9780	500-yr	1510.00	5379.29	5383.55	5383.11	5384.98	0.065823	9.62	156.97	175.71	0.83
Skunk	04	9794	100-yr	1003.00	5378.87	5383.48	5382.90	5384.90	0.060325	9.56	104.94	69.09	0.81
Skunk	04	9794	FW	1003.00	5378.87	5383.65	5382.89	5384.97	0.066432	9.21	108.89	35.00	0.76
Skunk	04	9794	10-yr	169.00	5378.87	5381.13	5380.26	5381.31	0.022668	3.50	48.35	36.67	0.43
Skunk	04	9794	25-yr	451.00	5378.87	5382.13	5381.33	5382.73	0.041743	6.22	72.55	42.28	0.63
Skunk	04	9794	50-yr	705.00	5378.87	5382.84	5382.09	5383.80	0.050692	7.88	89.49	50.72	0.72
Skunk	04	9794	500-yr	1510.00	5378.87	5384.12	5384.12	5386.57	0.087049	12.57	120.17	81.51	0.99
Skunk	04	9850		Culvert									
Skunk	04	9894	100-yr	1003.00	5382.59	5389.08	5386.65	5389.85	0.055211	7.06	142.03	52.82	0.49
Skunk	04	9894	FW	1003.00	5382.59	5389.08	5386.65	5389.85	0.075529	7.06	142.03	21.90	0.49
Skunk	04	9894	10-yr	169.00	5382.59	5384.57	5383.83	5384.81	0.043978	3.91	43.24	38.33	0.49
Skunk	04	9894	25-yr	451.00	5382.59	5386.40	5384.97	5386.85	0.047136	5.41	83.31	48.59	0.49
Skunk	04	9894	50-yr	705.00	5382.59	5387.72	5385.80	5388.33	0.050899	6.28	112.25	51.04	0.49
Skunk	04	9894	500-yr	1510.00	5382.59	5391.13	5387.92	5392.13	0.059451	8.04	187.79	171.88	0.50
Skunk	05	9943	100-yr	242.00	5382.77	5390.42	5385.18	5390.44	0.000958	1.29	220.14	118.22	0.10
Skunk	05	9943	FW	242.00	5382.77	5390.58	5385.18	5390.61	0.001233	1.41	172.14	30.00	0.10
Skunk	05	9943	10-yr	68.00	5382.77	5385.67	5383.96	5385.72	0.005196	1.68	40.52	18.41	0.20
Skunk	05	9943	25-yr	164.00	5382.77	5387.71	5384.69	5387.77	0.004244	1.89	86.80	28.24	0.19
Skunk	05	9943	50-yr	201.00	5382.77	5389.05	5384.94	5389.09	0.002062	1.55	132.45	47.17	0.14
Skunk	05	9943	500-yr	324.00	5382.77	5392.54	5385.60	5392.56	0.000398	1.04	390.61	118.22	0.07
Skunk	05	9997	100-yr	242.00	5383.74	5390.48	5386.45	5390.49	0.000752	1.03	276.79	90.41	0.09
Skunk	05	9997	FW	242.00	5383.74	5390.65	5386.43	5390.68	0.001552	1.50	161.17	30.00	0.11
Skunk	05	9997	10-yr	68.00	5383.74	5386.14	5385.39	5386.23	0.020357	2.34	29.02	23.52	0.37
Skunk	05	9997	25-yr	164.00	5383.74	5387.99	5386.06	5388.05	0.006546	1.88	87.27	41.93	0.23
Skunk	05	9997	50-yr	201.00	5383.74	5389.18	5386.25	5389.20	0.002092	1.38	163.14	89.13	0.14

Skunk	05	9997	500-yr	324.00	5383.74	5392.56	5386.79	5392.57	0.000287	0.83	459.96	90.41	0.06
Skunk	05	10073	100-yr	242.00	5384.67	5390.55		5390.63	0.005157	2.27	106.43	31.18	0.22
Skunk	05	10073	FW	242.00	5384.67	5390.81		5390.88	0.004117	2.12	114.33	31.18	0.19
Skunk	05	10073	10-yr	68.00	5384.67	5387.37		5387.44	0.012873	2.25	30.21	18.06	0.31
Skunk	05	10073	25-yr	164.00	5384.67	5388.63		5388.76	0.013329	2.94	55.73	22.45	0.33
Skunk	05	10073	50-yr	201.00	5384.67	5389.41		5389.52	0.009112	2.70	74.35	25.40	0.28
Skunk	05	10073	500-yr	324.00	5384.67	5392.58		5392.63	0.001884	1.76	219.00	98.32	0.14
Skunk	05	10168	100-yr	242.00	5386.58	5391.28	5389.43	5391.51	0.018340	3.87	62.50	19.79	0.38
Skunk	05	10168	FW	242.00	5386.58	5391.40	5389.43	5391.61	0.016482	3.73	64.80	19.80	0.36
Skunk	05	10168	10-yr	68.00	5386.58	5388.92	5388.01	5389.06	0.023020	2.95	23.03	13.67	0.40
Skunk	05	10168	25-yr	164.00	5386.58	5390.21	5388.90	5390.44	0.023653	3.83	42.85	17.02	0.43
Skunk	05	10168	50-yr	201.00	5386.58	5390.62	5389.16	5390.87	0.023256	4.02	49.98	18.05	0.43
Skunk	05	10168	500-yr	324.00	5386.58	5392.85	5389.91	5393.02	0.010216	3.34	96.89	24.37	0.30
Skunk	05	10238	100-yr	242.00	5387.85	5392.60	5390.78	5392.84	0.019585	3.98	60.77	19.34	0.40
Skunk	05	10238	FW	242.00	5387.85	5392.62	5390.78	5392.86	0.019150	3.95	61.23	19.34	0.39
Skunk	05	10238	10-yr	68.00	5387.85	5390.38	5389.32	5390.50	0.018847	2.79	24.40	13.40	0.36
Skunk	05	10238	25-yr	164.00	5387.85	5391.76	5390.22	5391.96	0.019982	3.61	45.40	17.22	0.39
Skunk	05	10238	50-yr	201.00	5387.85	5392.16	5390.49	5392.38	0.020169	3.83	52.49	18.24	0.40
Skunk	05	10238	500-yr	324.00	5387.85	5393.66	5391.28	5393.90	0.015175	3.91	82.80	22.04	0.36
Skunk	05	10317	100-yr	242.00	5394.34	5397.39	5397.39	5398.36	0.141281	7.89	30.66	16.02	1.01
Skunk	05	10317	FW	242.00	5394.34	5397.39	5397.39	5398.36	0.142415	7.92	30.54	15.95	1.01
Skunk	05	10317	10-yr	68.00	5394.34	5395.84	5395.84	5396.41	0.163144	6.02	11.29	10.14	1.01
Skunk	05	10317	25-yr	164.00	5394.34	5396.77	5396.77	5397.64	0.146735	7.48	21.93	12.76	1.01
Skunk	05	10317	50-yr	201.00	5394.34	5397.06	5397.06	5398.01	0.144002	7.83	25.67	13.67	1.01
Skunk	05	10317	500-yr	324.00	5394.34	5397.92	5397.92	5398.93	0.137648	8.08	40.11	20.08	1.01
Skunk	05	10421	100-yr	242.00	5397.19	5401.88	5400.19	5402.04	0.015276	3.17	76.30	30.85	0.36
Skunk	05	10421	FW	242.00	5397.19	5401.88	5400.19	5402.04	0.015279	3.17	76.27	30.82	0.36
Skunk	05	10421	10-yr	68.00	5397.19	5399.99	5398.89	5400.08	0.014803	2.31	29.40	18.60	0.32
Skunk	05	10421	25-yr	164.00	5397.19	5401.21	5399.72	5401.34	0.015266	2.87	57.08	26.76	0.35
Skunk	05	10421	50-yr	201.00	5397.19	5401.54	5399.95	5401.69	0.015257	3.03	66.32	28.68	0.35
Skunk	05	10421	500-yr	324.00	5397.19	5402.40	5400.62	5402.59	0.015283	3.48	93.68	39.28	0.36
Skunk	05	10488	100-yr	242.00	5398.46	5402.95		5403.15	0.017507	3.61	67.02	24.07	0.38
Skunk	05	10488	FW	242.00	5398.46	5402.95		5403.15	0.017507	3.61	67.02	24.07	0.38
Skunk	05	10488	10-yr	68.00	5398.46	5401.04		5401.14	0.016553	2.47	27.52	17.12	0.34
Skunk	05	10488	25-yr	164.00	5398.46	5402.27		5402.43	0.016805	3.19	51.39	21.70	0.37
Skunk	05	10488	50-yr	201.00	5398.46	5402.61		5402.79	0.017173	3.41	59.00	22.86	0.37
Skunk	05	10488	500-yr	324.00	5398.46	5403.50		5403.75	0.018836	4.01	80.82	26.12	0.40
Skunk	05	10560	100-yr	242.00	5402.83	5405.16	5404.99	5405.79	0.103683	6.41	37.73	22.81	0.88
Skunk	05	10560	FW	242.00	5402.83	5405.16	5404.99	5405.79	0.103754	6.42	37.71	22.80	0.88
Skunk	05	10560	10-yr	68.00	5402.83	5403.92	5403.92	5404.32	0.167591	5.10	13.34	16.62	1.00
Skunk	05	10560	25-yr	164.00	5402.83	5404.59	5404.58	5405.22	0.141183	6.37	25.73	19.93	0.99
Skunk	05	10560	50-yr	201.00	5402.83	5404.87	5404.78	5405.51	0.120150	6.40	31.38	21.31	0.93
Skunk	05	10560	500-yr	324.00	5402.83	5405.69	5405.37	5406.32	0.082338	6.39	50.73	25.85	0.80
Skunk	05	10616	100-yr	242.00	5403.10	5407.20		5407.32	0.011590	2.81	88.43	42.37	0.31
Skunk	05	10616	FW	242.00	5403.10	5407.23		5407.38	0.012211	3.10	78.12	25.00	0.31
Skunk	05	10616	10-yr	68.00	5403.10	5405.64		5405.69	0.008950	1.76	38.63	25.84	0.25
Skunk	05	10616	25-yr	164.00	5403.10	5406.67		5406.76	0.010570	2.41	67.93	31.85	0.29
Skunk	05	10616	50-yr	201.00	5403.10	5406.93		5407.04	0.011132	2.62	77.46	40.88	0.30
Skunk	05	10616	500-yr	324.00	5403.10	5407.63		5407.79	0.011855	3.16	107.61	51.03	0.33
Skunk	05	10655	100-yr	327.00	5403.42	5407.81	5406.77	5408.30	0.034985	5.65	57.85	23.60	0.56
Skunk	05	10655	FW	327.00	5403.42	5407.91	5406.76	5408.38	0.037409	5.47	59.74	18.00	0.53
Skunk	05	10655	10-yr	49.00	5403.42	5406.00	5404.79	5406.05	0.009559	1.89	25.94	15.90	0.26
Skunk	05	10655	25-yr	158.00	5403.42	5407.14	5405.80	5407.33	0.017644	3.44	45.92	20.37	0.38
Skunk	05	10655	50-yr	222.00	5403.42	5407.47	5406.23	5407.75	0.023364	4.29	51.76	21.91	0.45
Skunk	05	10655	500-yr	556.00	5403.42	5408.29	5407.71	5409.37	0.063070	8.34	66.66	27.85	0.76
Skunk	05	10700		Culvert									
Skunk	05	10722	100-yr	327.00	5403.68	5411.02	5407.71	5411.08	0.003993	1.83	168.67	126.50	0.15
Skunk	05	10722	FW	327.00	5403.68	5411.46	5407.71	5411.55	0.006240	2.44	151.44	45.00	0.19
Skunk	05	10722	10-yr	49.00	5403.68	5407.64	5405.23	5407.66	0.006530	1.34	36.49	16.03	0.16
Skunk	05	10722	25-yr	158.00	5403.68	5410.31	5406.51	5410.34	0.003784	1.59	106.18	72.02	0.14
Skunk	05	10722	50-yr	222.00	5403.68	5410.64	5407.07	5410.69	0.004005	1.73	133.01	91.99	0.15
Skunk	05	10722	500-yr	556.00	5403.68	5411.46	5408.81	5411.60	0.004166	1.99	217.45	136.61	0.16
Skunk	05	10745	100-yr	327.00	5403.80	5411.10	5407.39	5411.19	0.004507	2.46	146.58	86.61	0.21
Skunk	05	10745	FW	327.00	5403.80	5411.58	5407.39	5411.67	0.004092	2.42	135.34	25.00	0.18
Skunk	05	10745	10-yr	49.00	5403.80	5407.73	5405.19	5407.74	0.001979	1.09	44.87	18.36	0.12
Skunk	05	10745	25-yr	158.00	5403.80	5410.37	5406.29	5410.41	0.001996	1.45	109.17	32.81	0.13
Skunk	05	10745	50-yr	222.00	5403.80	5410.71	5406.76	5410.77	0.002920	1.86	121.70	45.04	0.16
Skunk	05	10745	500-yr	556.00	5403.80	5411.57	5408.44	5411.75	0.008094	3.53	194.32	116.32	0.28
Skunk	05	10760		Bridge									
Skunk	05	10778	100-yr	327.00	5404.00	5412.65	5408.50	5412.73	0.006563	2.54	163.46	74.32	0.21
Skunk	05	10778	FW	327.00	5404.00	5413.15	5408.50	5413.22	0.005346	2.35	159.68	45.72	0.18
Skunk	05	10778	10-yr	49.00	5404.00	5407.82	5405.54	5407.89	0.008826	2.05	23.87	7.00	0.20
Skunk	05	10778	25-yr	158.00	5404.00	5411.14	5406.94	5411.21	0.008786	2.25	70.46	26.46	0.23
Skunk	05	10778	50-yr	222.00	5404.00	5412.13	5407.56	5412.19	0.005531	2.15	125.56	71.92	0.19
Skunk	05	10778	500-yr	556.00	5404.00	5413.38	5410.64	5413.52	0.009407	3.36	223.70	100.06	0.26
Skunk	05	10826	100-yr	327.00	5405.61	5412.89	5409.06	5412.99	0.004436	2.59	126.31	71.95	0.21
Skunk	05	10826	FW	327.00	5405.61	5413.35	5409.06	5413.44	0.003845	2.39	136.95	24.40	0.18
Skunk	05	10826	10-yr	49.00	5405.61	5408.26	5407.02	5408.32	0.009322	1.89	25.97	15.49	0.26
Skunk	05	10826	25-yr	158.00	5405.61	5411.39	5408.05	5411.44	0.002884	1.77	89.33	26.90	0.16
Skunk	05	10826	50-yr	222.00	5405.61	5412.32	5408.45	5412.38	0.002919	1.98	111.85	70.59	0.17
Skunk	05	10826	500-yr	556.00	5405.61	5413.72	5410.08	5413.94	0.007541	3.73	152.39	88.14	0.28
Skunk	05	10873	100-yr	327.00	5407.42	5413.17		5413.37	0.012485	3.51	93.15	25.73	0.33
Skunk	05	10873	FW	327.00	5407.42	5413.59		5413.74	0.009176	3.18	102.67	25.00	0.28
Skunk	05	10873	10-yr	49.00	5407.42	5409.08		5409.30	0.059010	3.72	13.17	11.52	0.61
Skunk	05	10873	25-yr	158.00	5407.42	5411.60		5411.73	0.012439	2.85	55.48	22.02	0.32
Skunk	05	10873	50-yr	222.00	5407.42	5412.52		5412.65	0.009819	2.89	76.75	24.16	0.29
Skunk	05	10873	500-yr	556.00	5407.42	5414.19		5414.52	0.017971	4.62	120.47	28.26	0.39
Skunk	05	10890		Bridge									
Skunk	05	10910	100-yr	327.00	5408.31	5415.95	5412.21	5416.04	0.006712	2.39	149.64	65.77	0.22
Skunk	05	10910	FW	327.00	5408.31	5416.27	5412.19	5416.38	0.006926	2.59	127.70	30.00	0.22
Skunk	05	10910	10-yr	49.00	5408.31	5410.50	5409.73	5410.65	0.031475	3.10	15.81	9.00	0.41
Skunk	05	10910	25-yr	158.00	5408.31	5412.38	5410.89	5412.74	0.041742	4.84	32.68	9.00	0.45
Skunk	05	10910	50-yr	222.00	5408.31	5413.77	5411.43	5414.03	0.044682	4.09	54.23	26.33	0.50

Skunk	05	10910	500-yr	556.00	5408.31	5417.44	5414.16	5417.53	0.005181	2.63	237.24	88.59	0.20
Skunk	05	10981	100-yr	327.00	5413.34	5416.61	5416.61	5417.64	0.130165	8.16	40.08	19.17	0.99
Skunk	05	10981	FW	327.00	5413.34	5416.99	5416.61	5417.73	0.078273	6.90	47.37	19.17	0.77
Skunk	05	10981	10-yr	49.00	5413.34	5414.54	5414.52	5414.94	0.154429	5.07	9.67	11.20	0.96
Skunk	05	10981	25-yr	158.00	5413.34	5416.00	5415.54	5416.45	0.067077	5.39	29.34	15.93	0.70
Skunk	05	10981	50-yr	222.00	5413.34	5416.83	5415.98	5417.22	0.045080	4.98	44.58	20.15	0.59
Skunk	05	10981	500-yr	556.00	5413.34	5417.59	5417.55	5418.88	0.121015	9.13	60.88	23.10	0.99
Skunk	06	11049	100-yr	138.00	5415.62	5420.54	5418.29	5420.66	0.009461	2.79	49.49	26.30	0.29
Skunk	06	11049	FW	138.00	5415.62	5420.62	5418.24	5420.82	0.016202	3.54	38.95	9.00	0.30
Skunk	06	11049	10-yr	39.00	5415.62	5418.00	5417.03	5418.10	0.017856	2.50	15.60	9.90	0.35
Skunk	06	11049	25-yr	84.00	5415.62	5419.02	5417.69	5419.17	0.018154	3.12	26.93	12.34	0.37
Skunk	06	11049	50-yr	104.00	5415.62	5419.36	5417.93	5419.53	0.018916	3.33	31.27	13.50	0.39
Skunk	06	11049	500-yr	202.00	5415.62	5421.38	5418.78	5421.47	0.005975	2.60	118.17	120.32	0.24
Skunk	06	11100		Culvert									
Skunk	06	11110	100-yr	138.00	5417.14	5423.08	5420.07	5423.11	0.003786	1.63	93.96	64.93	0.15
Skunk	06	11110	FW	138.00	5417.14	5423.48	5420.07	5423.52	0.003132	1.59	89.99	35.00	0.14
Skunk	06	11110	10-yr	39.00	5417.14	5420.04	5418.65	5420.11	0.020116	2.10	18.57	11.11	0.29
Skunk	06	11110	25-yr	84.00	5417.14	5422.59	5419.52	5422.62	0.003244	1.38	65.35	50.62	0.14
Skunk	06	11110	50-yr	104.00	5417.14	5422.83	5419.74	5422.86	0.003378	1.46	78.41	59.03	0.14
Skunk	06	11110	500-yr	202.00	5417.14	5423.43	5420.61	5423.48	0.004311	1.85	118.44	80.21	0.17
Skunk	06	11185	100-yr	138.00	5422.87	5424.76	5424.76	5425.41	0.148470	6.45	21.38	16.72	1.01
Skunk	06	11185	FW	138.00	5422.87	5424.76	5424.76	5425.41	0.150143	6.48	21.29	16.68	1.01
Skunk	06	11185	10-yr	39.00	5422.87	5423.84	5423.84	5424.18	0.175468	4.72	8.26	11.89	1.00
Skunk	06	11185	25-yr	84.00	5422.87	5424.32	5424.32	5424.84	0.159833	5.79	14.52	14.21	1.01
Skunk	06	11185	50-yr	104.00	5422.87	5424.49	5424.49	5425.07	0.153641	6.08	17.11	15.06	1.00
Skunk	06	11185	500-yr	202.00	5422.87	5425.22	5425.22	5425.92	0.144354	6.72	30.11	23.08	1.00
Skunk	06	11272	100-yr	138.00	5424.05	5427.96	5426.56	5428.07	0.012219	2.80	58.17	34.63	0.31
Skunk	06	11272	FW	138.00	5424.05	5428.40	5426.50	5428.57	0.015421	3.27	42.20	12.00	0.31
Skunk	06	11272	10-yr	39.00	5424.05	5426.56	5425.41	5426.61	0.010575	1.89	20.88	16.02	0.27
Skunk	06	11272	25-yr	84.00	5424.05	5427.34	5426.02	5427.42	0.011639	2.45	38.64	27.95	0.30
Skunk	06	11272	50-yr	104.00	5424.05	5427.59	5426.22	5427.69	0.011936	2.61	46.01	30.46	0.31
Skunk	06	11272	500-yr	202.00	5424.05	5428.49	5427.09	5428.62	0.012491	3.15	79.80	50.96	0.33
Skunk	06	11364	100-yr	138.00	5427.05	5430.46	5430.46	5431.12	0.119496	6.89	23.37	16.95	0.86
Skunk	06	11364	FW	138.00	5427.05	5430.87		5431.50	0.085015	6.43	22.30	9.91	0.73
Skunk	06	11364	10-yr	39.00	5427.05	5428.99	5428.99	5429.56	0.196532	6.07	6.42	5.74	1.01
Skunk	06	11364	25-yr	84.00	5427.05	5429.97	5429.97	5430.53	0.120675	6.12	15.18	16.17	0.84
Skunk	06	11364	50-yr	104.00	5427.05	5430.18	5430.18	5430.77	0.116638	6.40	18.65	16.43	0.84
Skunk	06	11364	500-yr	202.00	5427.05	5430.86	5430.86	5431.67	0.132744	7.78	30.23	17.84	0.93
Skunk	06	11457	100-yr	138.00	5430.77	5434.43	5433.10	5434.59	0.017748	3.19	44.34	40.46	0.37
Skunk	06	11457	FW	138.00	5430.77	5434.45	5433.09	5434.60	0.017420	3.17	44.69	21.17	0.37
Skunk	06	11457	10-yr	39.00	5430.77	5432.96	5432.05	5433.03	0.015059	2.12	18.38	13.30	0.32
Skunk	06	11457	25-yr	84.00	5430.77	5433.79	5432.61	5433.90	0.017017	2.70	31.37	23.56	0.35
Skunk	06	11457	50-yr	104.00	5430.77	5434.04	5432.79	5434.17	0.017498	2.91	36.32	28.28	0.36
Skunk	06	11457	500-yr	202.00	5430.77	5435.05	5433.60	5435.24	0.017841	3.58	57.92	58.45	0.39
Skunk	06	11524	100-yr	113.00	5433.94	5436.27	5435.95	5436.74	0.082811	5.48	20.62	12.53	0.75
Skunk	06	11524	FW	113.00	5433.94	5436.27	5435.95	5436.74	0.083775	5.50	20.53	12.51	0.76
Skunk	06	11524	10-yr	14.00	5433.94	5434.57	5434.57	5434.82	0.206354	3.97	3.52	7.34	1.01
Skunk	06	11524	25-yr	59.00	5433.94	5435.57	5435.34	5435.92	0.091613	4.71	12.53	10.54	0.76
Skunk	06	11524	50-yr	79.00	5433.94	5435.87	5435.59	5436.26	0.085956	5.01	15.75	11.38	0.75
Skunk	06	11524	500-yr	177.00	5433.94	5436.88	5436.51	5437.47	0.081484	6.15	28.80	22.96	0.77
Skunk	06	11583		Inl Struct									
Skunk	06	11613	100-yr	113.00	5436.05	5441.17	5437.82	5441.19	0.001370	1.15	105.29	65.58	0.11
Skunk	06	11613	FW	113.00	5436.05	5441.59	5437.82	5441.61	0.001285	1.20	94.50	21.22	0.10
Skunk	06	11613	10-yr	14.00	5436.05	5440.34	5436.64	5440.34	0.000053	0.20	71.83	29.51	0.02
Skunk	06	11613	25-yr	59.00	5436.05	5440.83	5437.31	5440.84	0.000546	0.69	88.10	39.47	0.07
Skunk	06	11613	50-yr	79.00	5436.05	5440.98	5437.53	5440.99	0.000826	0.87	94.86	53.69	0.09
Skunk	06	11613	500-yr	177.00	5436.05	5441.46	5438.28	5441.49	0.002425	1.60	123.06	77.41	0.15
Skunk	06	11673	100-yr	113.00	5439.08	5441.32	5441.32	5442.05	0.154740	6.86	16.47	11.51	1.01
Skunk	06	11673	FW	113.00	5439.08	5441.41	5441.31	5442.06	0.129583	6.47	17.46	11.51	0.93
Skunk	06	11673	10-yr	14.00	5439.08	5440.30		5440.38	0.033685	2.19	6.39	8.14	0.44
Skunk	06	11673	25-yr	59.00	5439.08	5440.72	5440.72	5441.25	0.166034	5.85	10.08	9.60	1.01
Skunk	06	11673	50-yr	79.00	5439.08	5440.97	5440.97	5441.58	0.159673	6.26	12.61	10.46	1.01
Skunk	06	11673	500-yr	177.00	5439.08	5441.88	5441.88	5442.77	0.143368	7.58	23.35	13.08	1.00
Skunk	06	11700		Inl Struct									
Skunk	06	11713	100-yr	113.00	5440.02	5445.27	5442.09	5445.28	0.001365	1.07	134.67	172.90	0.11
Skunk	06	11713	FW	113.00	5440.02	5445.68	5442.09	5445.70	0.001341	1.15	105.19	40.00	0.11
Skunk	06	11713	10-yr	14.00	5440.02	5444.65	5440.70	5444.65	0.000078	0.22	74.81	145.57	0.02
Skunk	06	11713	25-yr	59.00	5440.02	5445.02	5441.48	5445.02	0.000621	0.68	108.67	161.04	0.07
Skunk	06	11713	50-yr	79.00	5440.02	5445.13	5441.72	5445.13	0.000887	0.83	119.75	169.33	0.09
Skunk	06	11713	500-yr	177.00	5440.02	5445.51	5442.65	5445.53	0.002089	1.39	160.63	176.05	0.14
Skunk	06	11882	100-yr	113.00	5445.82	5447.67	5447.67	5448.25	0.158112	6.15	18.36	16.08	1.01
Skunk	06	11882	FW	113.00	5445.82	5447.67	5447.67	5448.25	0.157013	6.14	18.40	16.08	1.01
Skunk	06	11882	10-yr	14.00	5445.82	5446.50	5446.50	5446.71	0.214435	3.71	3.77	9.04	1.01
Skunk	06	11882	25-yr	59.00	5445.82	5447.17	5447.17	5447.61	0.167868	5.32	11.08	12.67	1.00
Skunk	06	11882	50-yr	79.00	5445.82	5447.39	5447.39	5447.88	0.163229	5.61	14.07	14.54	1.01
Skunk	06	11882	500-yr	177.00	5445.82	5448.10	5448.10	5448.83	0.147176	6.84	25.89	18.24	1.01

Profile Output Table - Encroachment 3

River	Reach	River Sta	Profile	Top Wdth Act (ft)	Area (sq ft)	Vel Total (ft/s)	W.S. Elev (ft)	Base WS (ft)	Prof Delta WS (ft)
29th_St_Split	1	94	100-yr	55.58	24.87	3.90	5305.01	5305.01	
29th_St_Split	1	94	FW	38.00	21.85	4.44	5305.13	5305.01	0.12
29th_St_Split	1	94	10-yr	8.47	1.62	2.48	5304.33	5305.01	-0.68
29th_St_Split	1	94	25-yr	38.60	9.76	2.87	5304.71	5305.01	-0.30
29th_St_Split	1	94	50-yr	54.24	18.08	3.32	5304.89	5305.01	-0.12
29th_St_Split	1	94	500-yr	59.19	43.15	4.87	5305.33	5305.01	0.32
29th_St_Split	1	245	100-yr	67.09	26.60	3.65	5307.33	5307.33	
29th_St_Split	1	245	FW	38.00	21.88	4.43	5307.48	5307.33	0.14
29th_St_Split	1	245	10-yr	8.09	1.59	2.51	5306.69	5307.33	-0.65
29th_St_Split	1	245	25-yr	39.18	9.93	2.82	5307.03	5307.33	-0.30
29th_St_Split	1	245	50-yr	59.07	18.51	3.24	5307.21	5307.33	-0.13
29th_St_Split	1	245	500-yr	82.18	47.91	4.38	5307.62	5307.33	0.28

29th_St_Split	1	397	100-yr	81.75	49.01	2.98	5310.16	5310.16	
29th_St_Split	1	397	FW	38.00	22.46	4.32	5310.46	5310.16	0.30
29th_St_Split	1	397	10-yr	20.50	5.68	1.43	5309.59	5310.16	-0.57
29th_St_Split	1	397	25-yr	57.84	25.01	1.89	5309.90	5310.16	-0.26
29th_St_Split	1	397	50-yr	69.35	37.80	2.50	5310.04	5310.16	-0.11
29th_St_Split	1	397	500-yr	83.48	78.04	3.81	5310.43	5310.16	0.27
29th_St_Split	1	529	100-yr	66.38	29.66	3.57	5313.72	5313.72	
29th_St_Split	1	529	FW	15.00	16.54	5.86	5313.96	5313.72	0.24
29th_St_Split	1	529	10-yr	11.95	1.86	2.15	5312.96	5313.72	-0.76
29th_St_Split	1	529	25-yr	26.41	8.39	3.34	5313.30	5313.72	-0.42
29th_St_Split	1	529	50-yr	49.26	18.63	3.36	5313.56	5313.72	-0.16
29th_St_Split	1	529	500-yr	79.99	55.50	4.42	5313.99	5313.72	0.27
29th_St_Split	1	585	100-yr	53.57	38.03	2.63	5314.62	5314.62	
29th_St_Split	1	585	FW	25.00	32.78	2.96	5315.04	5314.62	0.41
29th_St_Split	1	585	10-yr	19.57	3.19	1.54	5313.82	5314.62	-0.80
29th_St_Split	1	585	25-yr	45.91	17.63	1.69	5314.21	5314.62	-0.42
29th_St_Split	1	585	50-yr	49.04	28.04	2.23	5314.43	5314.62	-0.20
29th_St_Split	1	585	500-yr	66.04	63.47	3.37	5315.05	5314.62	0.43
29th_St_Split	1	744	100-yr	57.49	66.23	1.47	5315.70	5315.70	
29th_St_Split	1	744	FW	25.00	45.09	2.15	5316.11	5315.70	0.41
29th_St_Split	1	744	10-yr	39.97	10.61	0.39	5314.57	5315.70	-1.13
29th_St_Split	1	744	25-yr	48.02	31.62	0.90	5315.05	5315.70	-0.65
29th_St_Split	1	744	50-yr	53.61	49.90	1.21	5315.41	5315.70	-0.29
29th_St_Split	1	744	500-yr	66.40	105.63	2.00	5316.34	5315.70	0.64
29th_St_Split	1	897	100-yr	70.77	41.34	3.48	5321.86	5321.86	
29th_St_Split	1	897	FW	45.00	23.85	4.07	5321.97	5321.86	0.11
29th_St_Split	1	897	10-yr	20.25	3.70	1.83	5321.40	5321.86	-0.46
29th_St_Split	1	897	25-yr	65.03	17.34	2.45	5321.62	5321.86	-0.24
29th_St_Split	1	897	50-yr	68.73	30.16	2.97	5321.75	5321.86	-0.11
29th_St_Split	1	897	500-yr	74.80	68.02	4.56	5322.11	5321.86	0.25
29th_St_Split	1	964	100-yr	53.32	24.16	4.03	5324.03	5324.03	
29th_St_Split	1	964	FW	15.00	16.35	5.93	5324.27	5324.03	0.24
29th_St_Split	1	964	10-yr	14.18	1.88	2.13	5323.24	5324.03	-0.79
29th_St_Split	1	964	25-yr	23.31	8.41	3.33	5323.58	5324.03	-0.46
29th_St_Split	1	964	50-yr	33.82	15.91	3.77	5323.85	5324.03	-0.19
29th_St_Split	1	964	500-yr	59.87	45.23	4.88	5324.38	5324.03	0.34
29th_St_Split	1	1070	100-yr	80.07	28.46	3.41	5327.63	5327.63	
29th_St_Split	1	1070	FW	22.00	18.42	5.27	5327.98	5327.63	0.35
29th_St_Split	1	1070	10-yr	11.53	1.79	2.24	5327.04	5327.63	-0.59
29th_St_Split	1	1070	25-yr	42.73	9.96	2.81	5327.35	5327.63	-0.28
29th_St_Split	1	1070	50-yr	74.86	20.84	2.88	5327.53	5327.63	-0.10
29th_St_Split	1	1070	500-yr	85.54	48.31	4.35	5327.87	5327.63	0.24
29th_St_Split	1	1197	100-yr	53.84	24.76	3.92	5329.63	5329.63	
29th_St_Split	1	1197	FW	20.00	17.95	5.40	5329.77	5329.63	0.14
29th_St_Split	1	1197	10-yr	10.72	1.70	2.35	5328.88	5329.63	-0.75
29th_St_Split	1	1197	25-yr	32.85	9.57	2.93	5329.27	5329.63	-0.36
29th_St_Split	1	1197	50-yr	43.03	16.95	3.54	5329.47	5329.63	-0.16
29th_St_Split	1	1197	500-yr	83.03	47.70	4.40	5329.96	5329.63	0.33
29th_St_Split	1	1304	100-yr	73.18	29.43	3.30	5330.63	5330.63	
29th_St_Split	1	1304	FW	30.00	21.50	4.51	5330.66	5330.63	0.03
29th_St_Split	1	1304	10-yr	12.98	1.85	2.17	5329.92	5330.63	-0.71
29th_St_Split	1	1304	25-yr	31.60	8.83	3.17	5330.23	5330.63	-0.40
29th_St_Split	1	1304	50-yr	49.43	17.60	3.41	5330.44	5330.63	-0.19
29th_St_Split	1	1304	500-yr	83.19	51.16	4.11	5330.90	5330.63	0.27
29th_St_Split	1	1456	100-yr	45.80	24.72	3.92	5332.33	5332.33	
29th_St_Split	1	1456	FW	20.00	17.68	5.49	5332.34	5332.33	0.01
29th_St_Split	1	1456	10-yr	9.67	1.69	2.36	5331.43	5332.33	-0.90
29th_St_Split	1	1456	25-yr	23.64	8.58	3.26	5331.82	5332.33	-0.50
29th_St_Split	1	1456	50-yr	31.49	15.91	3.77	5332.09	5332.33	-0.24
29th_St_Split	1	1456	500-yr	50.39	42.08	4.99	5332.68	5332.33	0.35
29th_St_Split	1	1539	100-yr	44.76	23.04	4.21	5333.42	5333.42	
29th_St_Split	1	1539	FW	15.00	16.57	5.85	5333.78	5333.42	0.35
29th_St_Split	1	1539	10-yr	9.81	1.68	2.38	5332.54	5333.42	-0.88
29th_St_Split	1	1539	25-yr	22.74	8.18	3.42	5332.98	5333.42	-0.45
29th_St_Split	1	1539	50-yr	35.99	16.08	3.73	5333.26	5333.42	-0.16
29th_St_Split	1	1539	500-yr	49.48	40.75	5.15	5333.80	5333.42	0.38
30th_St_Split	1	68	100-yr	88.96	67.59	5.25	5300.38	5300.38	
30th_St_Split	1	68	FW	37.00	52.16	6.81	5300.81	5300.38	0.43
30th_St_Split	1	68	10-yr	57.28	18.98	0.37	5299.70	5300.38	-0.68
30th_St_Split	1	68	25-yr	66.83	33.95	4.06	5299.94	5300.38	-0.44
30th_St_Split	1	68	50-yr	76.38	51.45	4.76	5300.19	5300.38	-0.20
30th_St_Split	1	68	500-yr	97.01	105.53	6.00	5300.79	5300.38	0.41
30th_St_Split	1	226	100-yr	85.17	68.38	5.19	5301.72	5301.72	
30th_St_Split	1	226	FW	38.00	52.71	6.74	5302.08	5301.72	0.37
30th_St_Split	1	226	10-yr	17.78	3.00	2.34	5300.60	5301.72	-1.11
30th_St_Split	1	226	25-yr	66.66	33.99	4.06	5301.26	5301.72	-0.46
30th_St_Split	1	226	50-yr	76.94	52.02	4.71	5301.52	5301.72	-0.20
30th_St_Split	1	226	500-yr	103.24	105.74	5.99	5302.12	5301.72	0.40
30th_St_Split	1	373	100-yr	83.68	68.36	5.19	5303.14	5303.14	
30th_St_Split	1	373	FW	38.00	52.76	6.73	5303.48	5303.14	0.34
30th_St_Split	1	373	10-yr	16.66	2.96	2.37	5301.97	5303.14	-1.17
30th_St_Split	1	373	25-yr	63.72	33.45	4.13	5302.68	5303.14	-0.47
30th_St_Split	1	373	50-yr	76.96	52.12	4.70	5302.94	5303.14	-0.20
30th_St_Split	1	373	500-yr	100.18	104.46	6.06	5303.53	5303.14	0.39
30th_St_Split	1	471	100-yr	69.83	64.56	5.50	5304.06	5304.06	
30th_St_Split	1	471	FW	37.00	52.35	6.78	5304.40	5304.06	0.34
30th_St_Split	1	471	10-yr	18.53	3.04	2.30	5302.88	5304.06	-1.18
30th_St_Split	1	471	25-yr	57.91	32.07	4.30	5303.56	5304.06	-0.51
30th_St_Split	1	471	50-yr	64.73	48.79	5.02	5303.83	5304.06	-0.23
30th_St_Split	1	471	500-yr	85.77	102.32	6.19	5304.56	5304.06	0.49
30th_St_Split	1	556	100-yr	95.16	95.46	5.71	5305.67	5305.67	
30th_St_Split	1	556	FW	48.00	75.64	7.21	5306.14	5305.67	0.46
30th_St_Split	1	556	10-yr	18.23	3.03	2.31	5304.44	5305.67	-1.24
30th_St_Split	1	556	25-yr	85.37	45.37	4.23	5305.13	5305.67	-0.54
30th_St_Split	1	556	50-yr	94.01	71.66	5.05	5305.42	5305.67	-0.25

30th_St_Split	1	556	500-yr	97.35	148.47	6.95	5306.23	5305.67	0.55
30th_St_Split	1	643	100-yr	98.63	97.82	5.57	5307.07	5307.07	
30th_St_Split	1	643	FW	49.00	76.28	7.14	5307.50	5307.07	0.43
30th_St_Split	1	643	10-yr	15.88	2.89	2.42	5305.85	5307.07	-1.22
30th_St_Split	1	643	25-yr	89.93	46.12	4.16	5306.53	5307.07	-0.54
30th_St_Split	1	643	50-yr	97.73	72.60	4.99	5306.81	5307.07	-0.26
30th_St_Split	1	643	500-yr	101.29	152.86	6.75	5307.62	5307.07	0.55
30th_St_Split	1	758	100-yr	92.11	95.84	5.69	5309.17	5309.17	
30th_St_Split	1	758	FW	45.00	74.25	7.34	5309.65	5309.17	0.47
30th_St_Split	1	758	10-yr	16.59	2.93	2.39	5307.96	5309.17	-1.21
30th_St_Split	1	758	25-yr	83.76	45.27	4.24	5308.60	5309.17	-0.57
30th_St_Split	1	758	50-yr	89.58	71.04	5.10	5308.90	5309.17	-0.27
30th_St_Split	1	758	500-yr	95.06	149.66	6.90	5309.75	5309.17	0.57
30th_St_Split	1	875	100-yr	97.47	94.94	5.74	5311.40	5311.40	
30th_St_Split	1	875	FW	47.00	75.31	7.24	5311.77	5311.40	0.37
30th_St_Split	1	875	10-yr	20.27	3.14	2.23	5310.12	5311.40	-1.27
30th_St_Split	1	875	25-yr	74.42	43.54	4.41	5310.82	5311.40	-0.58
30th_St_Split	1	875	50-yr	89.05	70.11	5.16	5311.14	5311.40	-0.26
30th_St_Split	1	875	500-yr	105.76	152.76	6.76	5311.97	5311.40	0.57
35th_St_Split	1	43	100-yr	89.13	50.60	2.65	5280.57	5280.57	
35th_St_Split	1	43	FW	38.00	27.42	4.89	5280.81	5280.57	0.24
35th_St_Split	1	43	10-yr	32.60	6.24	2.57	5279.93	5280.57	-0.64
35th_St_Split	1	43	25-yr	85.23	31.21	1.76	5280.35	5280.57	-0.22
35th_St_Split	1	43	50-yr	87.10	39.62	2.17	5280.45	5280.57	-0.12
35th_St_Split	1	43	500-yr	94.38	81.42	3.75	5280.91	5280.57	0.34
35th_St_Split	1	165	100-yr	94.69	60.00	4.40	5281.52	5281.52	
35th_St_Split	1	165	FW	44.00	45.29	5.83	5281.75	5281.52	0.23
35th_St_Split	1	165	10-yr	79.49	22.55	2.62	5281.10	5281.52	-0.42
35th_St_Split	1	165	25-yr	86.62	36.89	3.63	5281.27	5281.52	-0.25
35th_St_Split	1	165	50-yr	90.32	46.36	4.01	5281.38	5281.52	-0.15
35th_St_Split	1	165	500-yr	105.77	95.58	5.24	5281.88	5281.52	0.35
35th_St_Split	1	240	100-yr	96.98	84.21	3.14	5282.05	5282.05	
35th_St_Split	1	240	FW	38.00	43.44	6.08	5282.25	5282.05	0.20
35th_St_Split	1	240	10-yr	86.42	33.09	1.78	5281.49	5282.05	-0.56
35th_St_Split	1	240	25-yr	91.40	56.16	2.39	5281.75	5282.05	-0.30
35th_St_Split	1	240	50-yr	93.53	68.72	2.71	5281.89	5282.05	-0.16
35th_St_Split	1	240	500-yr	108.03	125.03	4.01	5282.45	5282.05	0.40
35th_St_Split	1	346	100-yr	50.68	47.92	5.51	5282.45	5282.45	
35th_St_Split	1	346	FW	38.00	45.20	5.84	5282.66	5282.45	0.21
35th_St_Split	1	346	10-yr	47.04	18.71	3.15	5281.85	5282.45	-0.60
35th_St_Split	1	346	25-yr	48.30	30.39	4.41	5282.09	5282.45	-0.36
35th_St_Split	1	346	50-yr	48.85	37.58	4.95	5282.24	5282.45	-0.21
35th_St_Split	1	346	500-yr	61.84	78.53	6.38	5282.99	5282.45	0.54
Apartment_Split	1	20	100-yr	39.13	51.56	4.15	5279.48	5279.48	
Apartment_Split	1	20	FW	18.00	31.69	6.44	5279.79	5279.48	0.32
Apartment_Split	1	20	10-yr	39.13	36.46	1.20	5279.13	5279.48	-0.34
Apartment_Split	1	20	25-yr	39.13	44.57	2.41	5279.32	5279.48	-0.16
Apartment_Split	1	20	50-yr	39.13	49.11	3.13	5279.42	5279.48	-0.05
Apartment_Split	1	20	500-yr	39.13	63.45	5.76	5279.73	5279.48	0.26
Apartment_Split	1	99	100-yr	54.11	50.36	4.05	5279.77	5279.77	
Apartment_Split	1	99	FW	19.00	33.74	6.05	5280.06	5279.77	0.29
Apartment_Split	1	99	10-yr	38.85	20.46	2.10	5279.15	5279.77	-0.63
Apartment_Split	1	99	25-yr	43.23	30.19	3.44	5279.38	5279.77	-0.39
Apartment_Split	1	99	50-yr	54.11	38.08	3.86	5279.54	5279.77	-0.23
Apartment_Split	1	99	500-yr	54.11	86.03	3.98	5280.43	5279.77	0.66
Apartment_Split	1	237	100-yr	76.49	55.87	3.65	5280.33	5280.33	
Apartment_Split	1	237	FW	27.00	32.56	6.27	5280.58	5280.33	0.25
Apartment_Split	1	237	10-yr	53.72	14.55	2.96	5279.72	5280.33	-0.61
Apartment_Split	1	237	25-yr	64.96	27.66	3.76	5279.94	5280.33	-0.39
Apartment_Split	1	237	50-yr	70.94	38.43	3.83	5280.10	5280.33	-0.23
Apartment_Split	1	237	500-yr	80.25	96.02	3.56	5280.85	5280.33	0.51
Bear_Bline_Split	1	118	100-yr	70.96	27.62	3.58	5336.55	5336.55	
Bear_Bline_Split	1	118	FW	15.00	16.77	5.90	5336.97	5336.55	0.42
Bear_Bline_Split	1	118	10-yr	4.24	0.20	0.49	5335.78	5336.55	-0.78
Bear_Bline_Split	1	118	25-yr	8.34	0.77	1.30	5335.86	5336.55	-0.69
Bear_Bline_Split	1	118	50-yr	50.69	11.75	2.72	5336.29	5336.55	-0.26
Bear_Bline_Split	1	118	500-yr	85.84	52.01	4.42	5336.85	5336.55	0.30
Bear_Bline_Split	1	262	100-yr	99.06	33.96	2.91	5338.80	5338.80	
Bear_Bline_Split	1	262	FW	25.00	19.66	5.04	5339.21	5338.80	0.41
Bear_Bline_Split	1	262	10-yr	3.59	0.11	0.89	5338.10	5338.80	-0.70
Bear_Bline_Split	1	262	25-yr	10.01	0.66	1.51	5338.19	5338.80	-0.61
Bear_Bline_Split	1	262	50-yr	57.54	13.25	2.41	5338.54	5338.80	-0.26
Bear_Bline_Split	1	262	500-yr	148.31	65.22	3.53	5339.04	5338.80	0.24
Bear_Bline_Split	1	446	100-yr	112.35	63.28	1.56	5341.55	5341.55	
Bear_Bline_Split	1	446	FW	40.00	48.41	2.04	5342.04	5341.55	0.49
Bear_Bline_Split	1	446	10-yr	42.72	2.02	0.05	5340.86	5341.55	-0.69
Bear_Bline_Split	1	446	25-yr	49.59	3.85	0.26	5340.90	5341.55	-0.65
Bear_Bline_Split	1	446	50-yr	100.45	32.91	0.97	5341.26	5341.55	-0.29
Bear_Bline_Split	1	446	500-yr	161.27	106.90	2.15	5341.87	5341.55	0.32
Bear_Bline_Split	1	586	100-yr	52.98	42.47	2.33	5342.84	5342.84	
Bear_Bline_Split	1	586	FW	15.00	23.21	4.27	5343.27	5342.84	0.43
Bear_Bline_Split	1	586	10-yr	5.34	0.19	0.51	5341.50	5342.84	-1.33
Bear_Bline_Split	1	586	25-yr	11.82	1.53	0.65	5341.66	5342.84	-1.18
Bear_Bline_Split	1	586	50-yr	44.36	20.65	1.55	5342.39	5342.84	-0.45
Bear_Bline_Split	1	586	500-yr	59.58	70.86	3.25	5343.34	5342.84	0.50
Bear_Bline_Split	1	723	100-yr	62.90	60.61	1.63	5343.79	5343.79	
Bear_Bline_Split	1	723	FW	37.00	61.05	1.62	5344.28	5343.79	0.49
Bear_Bline_Split	1	723	10-yr	5.44	0.11	0.88	5342.50	5343.79	-1.29
Bear_Bline_Split	1	723	25-yr	27.12	2.68	0.37	5342.62	5343.79	-1.17
Bear_Bline_Split	1	723	50-yr	51.77	29.44	1.09	5343.25	5343.79	-0.54
Bear_Bline_Split	1	723	500-yr	76.80	104.09	2.21	5344.41	5343.79	0.62
Bear_Creek_Split	1	276	100-yr	76.23	225.37	4.57	5320.30	5320.30	
Bear_Creek_Split	1	276	FW	30.00	37.60	6.25	5320.60	5320.30	0.30
Bear_Creek_Split	1	276	10-yr	13.58	95.52	2.53	5319.38	5320.30	-0.92
Bear_Creek_Split	1	276	25-yr	32.23	110.91	2.62	5319.56	5320.30	-0.74

Bear_Creek_Split	1	276	50-yr	69.50	167.19	3.60	5319.96	5320.30	-0.34
Bear_Creek_Split	1	276	500-yr	86.00	286.60	5.23	5320.63	5320.30	0.33
Bear_Creek_Split	1	444	100-yr	75.06	51.37	4.67	5322.03	5322.03	
Bear_Creek_Split	1	444	FW	30.00	37.51	6.27	5322.35	5322.03	0.32
Bear_Creek_Split	1	444	10-yr	18.08	3.83	1.83	5321.17	5322.03	-0.86
Bear_Creek_Split	1	444	25-yr	29.32	7.09	2.54	5321.31	5322.03	-0.71
Bear_Creek_Split	1	444	50-yr	65.32	26.71	3.63	5321.70	5322.03	-0.33
Bear_Creek_Split	1	444	500-yr	78.31	79.49	5.57	5322.34	5322.03	0.31
Bear_Creek_Split	1	610	100-yr	74.85	65.25	4.66	5323.43	5323.43	
Bear_Creek_Split	1	610	FW	40.00	40.75	5.77	5323.54	5323.43	0.11
Bear_Creek_Split	1	610	10-yr	18.51	3.86	1.81	5322.55	5323.43	-0.88
Bear_Creek_Split	1	610	25-yr	37.57	8.58	2.10	5322.73	5323.43	-0.70
Bear_Creek_Split	1	610	50-yr	60.89	28.00	3.67	5323.08	5323.43	-0.35
Bear_Creek_Split	1	610	500-yr	89.91	125.31	5.15	5323.77	5323.43	0.34
Bear_Creek_Split	1	740	100-yr	102.15	63.92	3.68	5324.50	5324.50	
Bear_Creek_Split	1	740	FW	30.00	37.03	6.35	5324.71	5324.50	0.20
Bear_Creek_Split	1	740	10-yr	30.76	6.30	1.11	5323.54	5324.50	-0.96
Bear_Creek_Split	1	740	25-yr	36.02	11.20	1.61	5323.68	5324.50	-0.82
Bear_Creek_Split	1	740	50-yr	63.83	33.72	2.88	5324.13	5324.50	-0.37
Bear_Creek_Split	1	740	500-yr	149.71	91.54	4.50	5324.72	5324.50	0.22
Bear_Creek_Split	1	965	100-yr	101.73	69.33	3.60	5326.44	5326.44	
Bear_Creek_Split	1	965	FW	25.00	34.98	6.72	5326.79	5326.44	0.36
Bear_Creek_Split	1	965	10-yr	28.86	5.66	1.24	5325.56	5326.44	-0.88
Bear_Creek_Split	1	965	25-yr	41.45	11.31	1.59	5325.72	5326.44	-0.72
Bear_Creek_Split	1	965	50-yr	78.72	36.85	2.69	5326.10	5326.44	-0.33
Bear_Creek_Split	1	965	500-yr	111.27	103.42	4.33	5326.72	5326.44	0.28
Bear_Creek_Split	1	1135	100-yr	163.90	87.67	2.69	5327.89	5327.89	
Bear_Creek_Split	1	1135	FW	90.00	94.93	2.48	5328.30	5327.89	0.40
Bear_Creek_Split	1	1135	10-yr	33.63	4.16	1.68	5327.17	5327.89	-0.73
Bear_Creek_Split	1	1135	25-yr	51.85	9.67	1.86	5327.30	5327.89	-0.60
Bear_Creek_Split	1	1135	50-yr	148.60	45.97	2.11	5327.63	5327.89	-0.26
Bear_Creek_Split	1	1135	500-yr	179.09	135.16	3.12	5328.16	5327.89	0.26
Bear_Creek_Split	1	1354	100-yr	173.94	135.30	1.74	5329.49	5329.49	
Bear_Creek_Split	1	1354	FW	65.00	72.43	3.24	5329.50	5329.49	0.01
Bear_Creek_Split	1	1354	10-yr	29.17	10.67	0.66	5328.23	5329.49	-1.27
Bear_Creek_Split	1	1354	25-yr	50.27	21.86	0.82	5328.52	5329.49	-0.97
Bear_Creek_Split	1	1354	50-yr	135.46	78.10	1.24	5329.12	5329.49	-0.37
Bear_Creek_Split	1	1354	500-yr	221.03	195.22	2.11	5329.80	5329.49	0.30
Bear_Creek_Split	1	1577	100-yr	166.97	133.71	1.76	5330.76	5330.76	
Bear_Creek_Split	1	1577	FW	64.00	102.82	2.29	5331.25	5330.76	0.48
Bear_Creek_Split	1	1577	10-yr	25.25	5.42	1.29	5329.51	5330.76	-1.25
Bear_Creek_Split	1	1577	25-yr	46.13	14.58	1.23	5329.78	5330.76	-0.98
Bear_Creek_Split	1	1577	50-yr	142.15	74.45	1.30	5330.38	5330.76	-0.39
Bear_Creek_Split	1	1577	500-yr	197.18	191.14	2.16	5331.08	5330.76	0.31
Bear_Creek_Split	1	1838	100-yr	101.38	92.77	4.31	5333.06	5333.06	
Bear_Creek_Split	1	1838	FW	25.00	34.93	6.73	5333.46	5333.06	0.39
Bear_Creek_Split	1	1838	10-yr	10.74	2.87	2.81	5332.10	5333.06	-0.97
Bear_Creek_Split	1	1838	25-yr	43.60	10.23	2.41	5332.33	5333.06	-0.74
Bear_Creek_Split	1	1838	50-yr	58.59	43.20	3.68	5332.69	5333.06	-0.37
Bear_Creek_Split	1	1838	500-yr	104.77	145.26	4.69	5333.39	5333.06	0.32
Bear_Creek_Split	1	2046	100-yr	129.61	61.31	3.83	5334.76	5334.76	
Bear_Creek_Split	1	2046	FW	40.00	41.19	5.71	5335.26	5334.76	0.50
Bear_Creek_Split	1	2046	10-yr	63.86	4.56	1.54	5334.17	5334.76	-0.59
Bear_Creek_Split	1	2046	25-yr	74.06	9.67	1.86	5334.24	5334.76	-0.52
Bear_Creek_Split	1	2046	50-yr	96.24	30.07	3.23	5334.48	5334.76	-0.28
Bear_Creek_Split	1	2046	500-yr	165.47	95.30	4.32	5334.99	5334.76	0.23
Bear_Creek_Split	2	2276	100-yr	124.63	67.28	2.68	5336.15	5336.15	
Bear_Creek_Split	2	2276	FW	40.00	34.83	5.17	5336.32	5336.15	0.17
Bear_Creek_Split	2	2276	10-yr	32.64	2.83	0.04	5335.35	5336.15	-0.79
Bear_Creek_Split	2	2276	25-yr	41.93	6.95	0.72	5335.46	5336.15	-0.69
Bear_Creek_Split	2	2276	50-yr	94.57	34.79	1.72	5335.84	5336.15	-0.30
Bear_Creek_Split	2	2276	500-yr	143.31	106.05	3.53	5336.44	5336.15	0.29
Bear_Creek_Split	2	2446	100-yr	79.09	66.72	4.32	5337.98	5337.98	
Bear_Creek_Split	2	2446	FW	40.00	34.14	5.27	5338.41	5337.98	0.43
Bear_Creek_Split	2	2446	10-yr	3.68	0.10	1.02	5337.16	5337.98	-0.82
Bear_Creek_Split	2	2446	25-yr	25.22	4.92	1.85	5337.34	5337.98	-0.64
Bear_Creek_Split	2	2446	50-yr	73.27	33.76	2.99	5337.69	5337.98	-0.28
Bear_Creek_Split	2	2446	500-yr	88.84	126.37	5.11	5338.35	5337.98	0.38
Bear_Creek_Split	2	2637	100-yr	72.57	46.36	3.88	5340.47	5340.47	
Bear_Creek_Split	2	2637	FW	20.00	27.08	6.65	5340.90	5340.47	0.43
Bear_Creek_Split	2	2637	10-yr	6.09	0.11	0.93	5339.51	5340.47	-0.97
Bear_Creek_Split	2	2637	25-yr	34.29	5.50	0.91	5339.77	5340.47	-0.70
Bear_Creek_Split	2	2637	50-yr	63.94	25.83	2.32	5340.17	5340.47	-0.30
Bear_Creek_Split	2	2637	500-yr	85.52	75.36	4.97	5340.83	5340.47	0.36
Bear_Creek_Split	2	2787	100-yr	64.40	73.41	2.47	5342.89	5342.89	
Bear_Creek_Split	2	2787	FW	35.00	68.34	2.63	5343.38	5342.89	0.49
Bear_Creek_Split	2	2787	10-yr	12.15	0.53	0.19	5341.32	5342.89	-1.57
Bear_Creek_Split	2	2787	25-yr	29.26	5.95	0.84	5341.58	5342.89	-1.31
Bear_Creek_Split	2	2787	50-yr	55.18	34.48	1.74	5342.27	5342.89	-0.62
Bear_Creek_Split	2	2787	500-yr	64.40	113.34	3.34	5343.50	5342.89	0.61
Bear_Creek_Split	2	2972	100-yr	167.35	122.14	2.33	5344.86	5344.86	
Bear_Creek_Split	2	2972	FW	50.00	67.00	4.24	5345.27	5344.86	0.41
Bear_Creek_Split	2	2972	10-yr	14.28	0.14	0.73	5343.85	5344.86	-1.02
Bear_Creek_Split	2	2972	25-yr	80.80	9.21	0.76	5344.01	5344.86	-0.85
Bear_Creek_Split	2	2972	50-yr	140.61	57.30	1.71	5344.45	5344.86	-0.42
Bear_Creek_Split	2	2972	500-yr	192.88	214.84	2.83	5345.38	5344.86	0.52
Bear_Creek_Split	2	3053	100-yr	212.57	160.12	1.81	5345.73	5345.73	
Bear_Creek_Split	2	3053	FW	105.00	138.25	2.05	5346.23	5345.73	0.50
Bear_Creek_Split	2	3053	10-yr	14.09	0.61	0.16	5344.67	5345.73	-1.06
Bear_Creek_Split	2	3053	25-yr	92.19	12.52	0.56	5344.88	5345.73	-0.85
Bear_Creek_Split	2	3053	50-yr	179.96	79.51	1.26	5345.33	5345.73	-0.39
Bear_Creek_Split	2	3053	500-yr	232.19	263.46	2.36	5346.18	5345.73	0.45
Bear_Creek_Split	2	3174	100-yr	232.32	82.11	3.46	5356.24	5356.24	
Bear_Creek_Split	2	3174	FW	105.00	64.17	4.43	5356.37	5356.24	0.13
Bear_Creek_Split	2	3174	10-yr	12.99	0.15	0.69	5355.68	5356.24	-0.56

Bear_Creek_Split	2	3174	25-yr	76.36	4.65	1.51	5355.79	5356.24	-0.45
Bear_Creek_Split	2	3174	50-yr	200.02	39.15	2.50	5356.04	5356.24	-0.20
Bear_Creek_Split	2	3174	500-yr	302.97	152.86	3.98	5356.49	5356.24	0.25
Bear_Creek_Split	2	3352	100-yr	104.15	269.81	1.05	5356.48	5356.48	
Bear_Creek_Split	2	3352	FW	75.00	245.53	1.16	5356.74	5356.48	0.26
Bear_Creek_Split	2	3352	10-yr	100.07	189.35	0.00	5355.69	5356.48	-0.79
Bear_Creek_Split	2	3352	25-yr	100.86	202.94	0.03	5355.83	5356.48	-0.65
Bear_Creek_Split	2	3352	50-yr	103.18	237.01	0.41	5356.16	5356.48	-0.32
Bear_Creek_Split	2	3352	500-yr	105.12	302.67	2.01	5356.79	5356.48	0.31
Bear_Creek_Split	2	3574	100-yr	28.45	41.61	6.83	5356.17	5356.17	
Bear_Creek_Split	2	3574	FW	28.45	54.74	5.19	5356.64	5356.17	0.46
Bear_Creek_Split	2	3574	10-yr	24.71	28.77	0.00	5355.69	5356.17	-0.48
Bear_Creek_Split	2	3574	25-yr	25.77	32.17	0.22	5355.83	5356.17	-0.35
Bear_Creek_Split	2	3574	50-yr	28.08	40.24	2.44	5356.13	5356.17	-0.05
Bear_Creek_Split	2	3574	500-yr	101.81	102.10	5.95	5357.34	5356.17	1.16
Bear_Creek_Split	2	3824	100-yr	93.89	257.63	1.39	5357.71	5357.71	
Bear_Creek_Split	2	3824	FW	50.00	140.01	2.03	5357.99	5357.71	0.28
Bear_Creek_Split	2	3824	10-yr	64.39	27.41	0.00	5355.69	5357.71	-2.02
Bear_Creek_Split	2	3824	25-yr	70.32	38.35	0.18	5355.85	5357.71	-1.85
Bear_Creek_Split	2	3824	50-yr	92.22	115.26	0.87	5356.71	5357.71	-0.99
Bear_Creek_Split	2	3824	500-yr	95.76	483.15	1.99	5358.77	5357.71	1.06
Bear_Creek_Split	2	4014	100-yr	36.99	77.02	3.69	5357.93	5357.93	
Bear_Creek_Split	2	4014	FW	36.99	90.76	3.13	5358.30	5357.93	0.37
Bear_Creek_Split	2	4014	10-yr	25.69	4.53	0.02	5355.69	5357.93	-2.24
Bear_Creek_Split	2	4014	25-yr	28.29	10.02	0.70	5355.89	5357.93	-2.04
Bear_Creek_Split	2	4014	50-yr	33.11	42.28	2.32	5356.94	5357.93	-1.00
Bear_Creek_Split	2	4014	500-yr	93.90	132.84	4.58	5359.01	5357.93	1.08
Bluebell	1	122	100-yr	72.11	96.40	1.57	5391.98	5391.98	
Bluebell	1	122	FW	20.00	38.80	3.89	5392.44	5391.98	0.46
Bluebell	1	122	10-yr	48.34	8.30	1.93	5390.66	5391.98	-1.32
Bluebell	1	122	25-yr	68.23	35.72	1.82	5391.12	5391.98	-0.87
Bluebell	1	122	50-yr	69.67	60.10	1.66	5391.47	5391.98	-0.51
Bluebell	1	122	500-yr	124.63	202.34	1.26	5393.07	5391.98	1.08
Bluebell	1	219	100-yr	77.10	40.71	3.71	5392.99	5392.99	
Bluebell	1	219	FW	28.00	26.86	5.62	5393.14	5392.99	0.15
Bluebell	1	219	10-yr	34.86	6.51	2.46	5392.38	5392.99	-0.61
Bluebell	1	219	25-yr	48.26	17.82	3.65	5392.67	5392.99	-0.32
Bluebell	1	219	50-yr	73.09	27.49	3.64	5392.82	5392.99	-0.18
Bluebell	1	219	500-yr	77.10	61.01	4.16	5393.26	5392.99	0.26
Bluebell	1	289	100-yr	55.39	33.79	4.47	5395.27	5395.27	
Bluebell	1	289	FW	28.00	26.83	5.63	5395.46	5395.27	0.19
Bluebell	1	289	10-yr	38.74	6.65	2.41	5394.68	5395.27	-0.58
Bluebell	1	289	25-yr	46.65	18.34	3.54	5394.96	5395.27	-0.31
Bluebell	1	289	50-yr	49.33	24.55	4.07	5395.09	5395.27	-0.18
Bluebell	1	289	500-yr	70.26	50.55	5.02	5395.53	5395.27	0.27
Bluebell	1	367	100-yr	58.82	33.84	4.46	5397.91	5397.91	
Bluebell	1	367	FW	28.00	26.92	5.61	5398.12	5397.91	0.20
Bluebell	1	367	10-yr	37.70	6.66	2.40	5397.33	5397.91	-0.58
Bluebell	1	367	25-yr	44.15	17.95	3.62	5397.61	5397.91	-0.31
Bluebell	1	367	50-yr	51.83	25.10	3.98	5397.76	5397.91	-0.16
Bluebell	1	367	500-yr	70.98	51.00	4.98	5398.18	5397.91	0.27
Bluebell	1	481	100-yr	63.22	41.63	4.25	5401.84	5401.84	
Bluebell	1	481	FW	30.00	27.56	5.48	5402.01	5401.84	0.18
Bluebell	1	481	10-yr	38.97	6.84	2.34	5401.27	5401.84	-0.57
Bluebell	1	481	25-yr	51.15	19.71	3.55	5401.53	5401.84	-0.30
Bluebell	1	481	50-yr	56.90	29.64	3.80	5401.68	5401.84	-0.15
Bluebell	1	481	500-yr	74.00	68.96	4.51	5402.14	5401.84	0.30
Bluebell	1	599	100-yr	56.79	35.26	4.39	5406.41	5406.41	
Bluebell	1	599	FW	28.00	27.25	5.54	5406.60	5406.41	0.19
Bluebell	1	599	10-yr	37.49	6.79	2.36	5405.81	5406.41	-0.61
Bluebell	1	599	25-yr	41.29	16.97	3.83	5406.06	5406.41	-0.35
Bluebell	1	599	50-yr	52.92	24.87	4.02	5406.24	5406.41	-0.17
Bluebell	1	599	500-yr	80.06	56.61	4.49	5406.71	5406.41	0.30
Bluebell	1	732	100-yr	53.87	33.15	4.56	5411.68	5411.68	
Bluebell	1	732	FW	28.00	26.89	5.61	5411.87	5411.68	0.19
Bluebell	1	732	10-yr	36.62	6.67	2.40	5411.09	5411.68	-0.59
Bluebell	1	732	25-yr	43.78	17.64	3.68	5411.36	5411.68	-0.32
Bluebell	1	732	50-yr	49.32	24.63	4.06	5411.51	5411.68	-0.17
Bluebell	1	732	500-yr	59.93	48.75	5.21	5411.95	5411.68	0.28
Bluebell	1	799	100-yr	43.96	69.73	4.77	5414.47	5414.47	
Bluebell	1	799	FW	28.00	27.49	5.49	5414.69	5414.47	0.22
Bluebell	1	799	10-yr	38.40	23.23	2.46	5413.87	5414.47	-0.59
Bluebell	1	799	25-yr	42.53	44.58	3.61	5414.15	5414.47	-0.32
Bluebell	1	799	50-yr	43.14	55.16	4.22	5414.28	5414.47	-0.18
Bluebell	1	799	500-yr	45.31	94.36	5.61	5414.77	5414.47	0.30
Bluebell	1	915	100-yr	71.83	52.71	4.17	5418.29	5418.29	
Bluebell	1	915	FW	30.00	35.26	6.24	5418.68	5418.29	0.39
Bluebell	1	915	10-yr	46.34	9.69	2.58	5417.64	5418.29	-0.65
Bluebell	1	915	25-yr	67.40	27.98	3.22	5417.94	5418.29	-0.35
Bluebell	1	915	50-yr	69.99	38.89	3.70	5418.09	5418.29	-0.19
Bluebell	1	915	500-yr	74.64	80.42	4.99	5418.67	5418.29	0.38
Bluebell	1	1053	100-yr	57.47	43.42	5.07	5421.40	5421.40	
Bluebell	1	1053	FW	30.00	35.40	6.22	5421.72	5421.40	0.33
Bluebell	1	1053	10-yr	25.81	8.11	3.08	5420.62	5421.40	-0.78
Bluebell	1	1053	25-yr	47.06	22.95	3.92	5421.00	5421.40	-0.40
Bluebell	1	1053	50-yr	51.16	31.60	4.56	5421.18	5421.40	-0.22
Bluebell	1	1053	500-yr	65.50	69.99	5.73	5421.83	5421.40	0.43
Bluebell	1	1194	100-yr	58.74	43.88	5.01	5426.06	5426.06	
Bluebell	1	1194	FW	28.00	34.51	6.37	5426.41	5426.06	0.34
Bluebell	1	1194	10-yr	40.96	9.31	2.68	5425.36	5426.06	-0.71
Bluebell	1	1194	25-yr	47.11	22.65	3.97	5425.66	5426.06	-0.40
Bluebell	1	1194	50-yr	52.52	32.05	4.49	5425.85	5426.06	-0.21
Bluebell	1	1194	500-yr	68.72	68.95	5.82	5426.46	5426.06	0.39
Bluebell	1	1280	100-yr	54.95	32.11	4.45	5429.68	5429.68	
Bluebell	1	1280	FW	28.00	26.02	5.50	5430.01	5429.68	0.33

Bluebell	1	1280	10-yr	26.89	6.47	2.78	5429.12	5429.68	-0.56
Bluebell	1	1280	25-yr	48.39	18.07	3.49	5429.41	5429.68	-0.27
Bluebell	1	1280	50-yr	51.17	24.45	3.93	5429.54	5429.68	-0.14
Bluebell	1	1280	500-yr	68.40	50.26	4.99	5429.97	5429.68	0.29
Bluebell	1	1413	100-yr	52.10	33.33	4.39	5435.21	5435.21	
Bluebell	1	1413	FW	27.00	25.90	5.52	5435.58	5435.21	0.37
Bluebell	1	1413	10-yr	22.88	6.24	2.88	5434.58	5435.21	-0.63
Bluebell	1	1413	25-yr	46.71	18.29	3.44	5434.92	5435.21	-0.29
Bluebell	1	1413	50-yr	48.61	24.06	3.99	5435.04	5435.21	-0.17
Bluebell	1	1413	500-yr	73.27	52.80	4.75	5435.50	5435.21	0.29
Bluebell	1	1536	100-yr	41.53	30.11	4.75	5442.34	5442.34	
Bluebell	1	1536	FW	29.00	26.42	5.41	5442.59	5442.34	0.25
Bluebell	1	1536	10-yr	22.91	6.00	3.00	5441.68	5442.34	-0.66
Bluebell	1	1536	25-yr	40.79	17.16	3.67	5442.02	5442.34	-0.31
Bluebell	1	1536	50-yr	41.13	23.14	4.15	5442.17	5442.34	-0.17
Bluebell	1	1536	500-yr	43.63	44.39	5.65	5442.67	5442.34	0.33
Bluebell	1	1651	100-yr	63.31	37.29	4.32	5445.56	5445.56	
Bluebell	1	1651	FW	28.00	28.41	5.60	5445.92	5445.56	0.35
Bluebell	1	1651	10-yr	29.75	7.08	2.83	5444.95	5445.56	-0.62
Bluebell	1	1651	25-yr	49.68	19.89	3.67	5445.26	5445.56	-0.30
Bluebell	1	1651	50-yr	57.60	27.50	4.06	5445.40	5445.56	-0.16
Bluebell	1	1651	500-yr	69.07	53.17	4.78	5445.79	5445.56	0.23
Bluebell	1	1764	100-yr	59.32	34.83	4.56	5451.61	5451.61	
Bluebell	1	1764	FW	30.00	28.43	5.59	5451.91	5451.61	0.31
Bluebell	1	1764	10-yr	27.35	6.95	2.88	5450.99	5451.61	-0.61
Bluebell	1	1764	25-yr	51.53	19.87	3.67	5451.33	5451.61	-0.27
Bluebell	1	1764	50-yr	53.63	27.12	4.09	5451.47	5451.61	-0.14
Bluebell	1	1764	500-yr	66.17	50.25	4.97	5451.85	5451.61	0.24
Bluebell	1	1839	100-yr	46.86	33.44	4.75	5455.93	5455.93	
Bluebell	1	1839	FW	28.00	27.80	5.72	5456.29	5455.93	0.36
Bluebell	1	1839	10-yr	27.72	6.89	2.90	5455.26	5455.93	-0.67
Bluebell	1	1839	25-yr	43.02	19.35	3.77	5455.62	5455.93	-0.31
Bluebell	1	1839	50-yr	46.31	25.80	4.30	5455.76	5455.93	-0.16
Bluebell	1	1839	500-yr	47.76	45.48	5.50	5456.18	5455.93	0.25
Bluebell	1	1926	100-yr	83.41	45.60	4.19	5460.50	5460.50	
Bluebell	1	1926	FW	25.00	30.38	6.29	5460.94	5460.50	0.44
Bluebell	1	1926	10-yr	30.07	7.35	2.86	5459.83	5460.50	-0.67
Bluebell	1	1926	25-yr	53.79	21.99	3.82	5460.17	5460.50	-0.33
Bluebell	1	1926	50-yr	73.26	33.26	4.00	5460.34	5460.50	-0.16
Bluebell	1	1926	500-yr	94.38	72.37	4.55	5460.80	5460.50	0.30
Bluebell	1	2039	100-yr	73.90	43.38	4.40	5466.48	5466.48	
Bluebell	1	2039	FW	28.00	31.47	6.07	5466.82	5466.48	0.34
Bluebell	1	2039	10-yr	26.51	7.20	2.92	5465.74	5466.48	-0.74
Bluebell	1	2039	25-yr	48.59	21.38	3.93	5466.11	5466.48	-0.37
Bluebell	1	2039	50-yr	52.13	31.21	4.29	5466.30	5466.48	-0.18
Bluebell	1	2039	500-yr	84.77	68.13	4.83	5466.79	5466.48	0.31
Bluebell	1	2182	100-yr	81.70	44.03	4.34	5473.88	5473.88	
Bluebell	1	2182	FW	28.00	31.77	6.01	5474.24	5473.88	0.36
Bluebell	1	2182	10-yr	26.79	7.37	2.85	5473.13	5473.88	-0.74
Bluebell	1	2182	25-yr	49.39	22.43	3.75	5473.52	5473.88	-0.36
Bluebell	1	2182	50-yr	53.48	31.19	4.29	5473.69	5473.88	-0.19
Bluebell	1	2182	500-yr	87.19	69.06	4.76	5474.17	5473.88	0.29
Bluebell	1	2284	100-yr	42.71	36.70	5.20	5479.20	5479.20	
Bluebell	1	2284	FW	28.00	31.76	6.01	5479.42	5479.20	0.22
Bluebell	1	2284	10-yr	24.13	6.89	3.05	5478.41	5479.20	-0.79
Bluebell	1	2284	25-yr	38.56	19.97	4.21	5478.79	5479.20	-0.41
Bluebell	1	2284	50-yr	40.36	28.39	4.68	5479.00	5479.20	-0.20
Bluebell	1	2284	500-yr	49.09	55.55	5.92	5479.61	5479.20	0.42
Bluebell	1	2415	100-yr	57.11	39.07	4.89	5487.58	5487.58	
Bluebell	1	2415	FW	28.00	31.43	6.08	5487.96	5487.58	0.38
Bluebell	1	2415	10-yr	26.30	7.04	2.98	5486.88	5487.58	-0.71
Bluebell	1	2415	25-yr	48.79	21.86	3.84	5487.26	5487.58	-0.33
Bluebell	1	2415	50-yr	53.13	30.09	4.42	5487.42	5487.58	-0.16
Bluebell	1	2415	500-yr	63.00	58.66	5.61	5487.91	5487.58	0.33
Bluebell	1	2533	100-yr	63.37	39.03	4.54	5494.50	5494.50	
Bluebell	1	2533	FW	27.00	29.67	5.97	5494.88	5494.50	0.38
Bluebell	1	2533	10-yr	27.27	6.36	2.83	5493.85	5494.50	-0.65
Bluebell	1	2533	25-yr	53.76	23.67	3.80	5494.24	5494.50	-0.26
Bluebell	1	2533	50-yr	57.74	29.44	4.11	5494.34	5494.50	-0.16
Bluebell	1	2533	500-yr	73.49	62.46	5.01	5494.84	5494.50	0.34
Bluebell	1	2623	100-yr	39.45	33.57	5.27	5498.77	5498.77	
Bluebell	1	2623	FW	29.00	30.25	5.85	5498.96	5498.77	0.19
Bluebell	1	2623	10-yr	24.87	6.29	2.86	5498.04	5498.77	-0.73
Bluebell	1	2623	25-yr	38.30	21.18	4.25	5498.45	5498.77	-0.32
Bluebell	1	2623	50-yr	38.80	25.85	4.68	5498.57	5498.77	-0.20
Bluebell	1	2623	500-yr	40.90	49.83	6.28	5499.17	5498.77	0.41
Bluebell	1	2764	100-yr	41.96	34.05	5.20	5508.65	5508.65	
Bluebell	1	2764	FW	27.00	29.43	6.01	5508.95	5508.65	0.30
Bluebell	1	2764	10-yr	22.88	6.09	2.96	5507.87	5508.65	-0.78
Bluebell	1	2764	25-yr	39.97	21.42	4.20	5508.34	5508.65	-0.31
Bluebell	1	2764	50-yr	40.64	26.10	4.64	5508.46	5508.65	-0.19
Bluebell	1	2764	500-yr	45.07	51.22	6.11	5509.05	5508.65	0.40
Bluebell	1	2864	100-yr	42.39	34.01	5.20	5515.44	5515.44	
Bluebell	1	2864	FW	28.00	29.99	5.90	5515.69	5515.44	0.25
Bluebell	1	2864	10-yr	25.70	6.33	2.85	5514.71	5515.44	-0.73
Bluebell	1	2864	25-yr	39.69	21.37	4.21	5515.12	5515.44	-0.31
Bluebell	1	2864	50-yr	40.19	26.29	4.60	5515.25	5515.44	-0.19
Bluebell	1	2864	500-yr	60.17	56.47	5.54	5515.85	5515.44	0.41
Bluebell	1	2972	100-yr	42.14	34.33	5.16	5522.78	5522.78	
Bluebell	1	2972	FW	28.00	29.85	5.93	5522.96	5522.78	0.18
Bluebell	1	2972	10-yr	35.69	6.90	2.61	5522.08	5522.78	-0.70
Bluebell	1	2972	25-yr	39.42	21.23	4.24	5522.46	5522.78	-0.32
Bluebell	1	2972	50-yr	40.45	26.24	4.61	5522.59	5522.78	-0.20
Bluebell	1	2972	500-yr	50.96	52.35	5.98	5523.18	5522.78	0.39
Bluebell	1	3070	100-yr	67.80	44.95	3.94	5530.25	5530.25	

Bluebell	1	3070	FW	29.00	30.27	5.85	5530.56	5530.25	0.31
Bluebell	1	3070	10-yr	32.20	6.93	2.60	5529.60	5530.25	-0.65
Bluebell	1	3070	25-yr	65.76	27.24	3.30	5529.99	5530.25	-0.26
Bluebell	1	3070	50-yr	67.25	34.37	3.52	5530.09	5530.25	-0.16
Bluebell	1	3070	500-yr	69.18	67.22	4.66	5530.58	5530.25	0.33
Bluebell	1	3215	100-yr	56.06	39.45	4.49	5540.59	5540.59	
Bluebell	1	3215	FW	30.00	30.57	5.79	5540.80	5540.59	0.21
Bluebell	1	3215	10-yr	38.42	7.10	2.54	5539.95	5540.59	-0.64
Bluebell	1	3215	25-yr	53.37	23.71	3.80	5540.31	5540.59	-0.29
Bluebell	1	3215	50-yr	54.41	29.58	4.09	5540.41	5540.59	-0.18
Bluebell	1	3215	500-yr	60.67	60.49	5.17	5540.96	5540.59	0.36
Bluebell	1	3283	100-yr	213.37	69.91	3.23	5543.65	5543.65	
Bluebell	1	3283	FW	50.00	43.23	5.23	5544.08	5543.65	0.44
Bluebell	1	3283	10-yr	90.20	11.13	2.07	5543.26	5543.65	-0.39
Bluebell	1	3283	25-yr	158.59	37.08	2.67	5543.47	5543.65	-0.17
Bluebell	1	3283	50-yr	191.02	51.62	2.93	5543.56	5543.65	-0.09
Bluebell	1	3283	500-yr	223.46	104.04	3.88	5543.80	5543.65	0.16
Bluebell	1	3360	100-yr	49.42	114.07	5.11	5548.37	5548.37	
Bluebell	1	3360	FW	30.00	36.71	6.16	5548.70	5548.37	0.33
Bluebell	1	3360	10-yr	11.46	7.57	3.92	5546.88	5548.37	-1.49
Bluebell	1	3360	25-yr	25.69	40.37	4.92	5547.70	5548.37	-0.67
Bluebell	1	3360	50-yr	35.33	69.73	5.06	5548.02	5548.37	-0.35
Bluebell	1	3360	500-yr	113.76	148.86	4.69	5548.59	5548.37	0.21
Bluebell	1	3480	100-yr	36.55	54.55	3.72	5557.98	5557.98	
Bluebell	1	3480	FW	19.00	46.64	4.35	5558.34	5557.98	0.36
Bluebell	1	3480	10-yr	22.42	11.62	1.64	5556.45	5557.98	-1.53
Bluebell	1	3480	25-yr	27.65	30.59	2.94	5557.21	5557.98	-0.77
Bluebell	1	3480	50-yr	30.12	40.37	3.39	5557.55	5557.98	-0.43
Bluebell	1	3480	500-yr	51.26	79.38	4.46	5558.52	5557.98	0.54
Bluebell	1	3599	100-yr	48.90	43.32	4.69	5565.95	5565.95	
Bluebell	1	3599	FW	15.00	26.98	7.52	5566.32	5565.95	0.36
Bluebell	1	3599	10-yr	13.73	5.20	3.65	5564.86	5565.95	-1.10
Bluebell	1	3599	25-yr	37.49	22.55	3.99	5565.49	5565.95	-0.46
Bluebell	1	3599	50-yr	44.86	30.50	4.49	5565.69	5565.95	-0.27
Bluebell	1	3599	500-yr	50.66	63.05	5.61	5566.35	5565.95	0.40
Bluebell	1	3709	100-yr	38.95	64.06	3.70	5573.80	5573.80	
Bluebell	1	3709	FW	22.00	47.85	4.24	5574.28	5573.80	0.47
Bluebell	1	3709	10-yr	26.79	12.86	1.62	5572.58	5573.80	-1.22
Bluebell	1	3709	25-yr	38.09	39.70	2.64	5573.27	5573.80	-0.54
Bluebell	1	3709	50-yr	38.95	51.96	3.08	5573.54	5573.80	-0.27
Bluebell	1	3709	500-yr	38.95	89.21	4.64	5574.35	5573.80	0.55
Bluebell	1	3809	100-yr	34.26	44.43	4.57	5579.14	5579.14	
Bluebell	1	3809	FW	11.00	29.68	6.84	5579.53	5579.14	0.39
Bluebell	1	3809	10-yr	12.56	6.83	2.78	5577.44	5579.14	-1.70
Bluebell	1	3809	25-yr	22.59	23.09	3.90	5578.38	5579.14	-0.76
Bluebell	1	3809	50-yr	27.20	31.43	4.36	5578.71	5579.14	-0.43
Bluebell	1	3809	500-yr	56.52	67.46	5.25	5579.66	5579.14	0.52
Bluebell	1	3929	100-yr	43.06	52.02	3.90	5586.82	5586.82	
Bluebell	1	3929	FW	28.00	50.01	4.06	5587.30	5586.82	0.48
Bluebell	1	3929	10-yr	35.06	11.47	1.66	5585.82	5586.82	-1.00
Bluebell	1	3929	25-yr	40.56	30.65	2.94	5586.31	5586.82	-0.51
Bluebell	1	3929	50-yr	41.86	40.90	3.35	5586.56	5586.82	-0.26
Bluebell	1	3929	500-yr	45.39	73.75	4.80	5587.31	5586.82	0.49
Bluebell	1	4054	100-yr	16.79	36.81	5.52	5593.95	5593.95	
Bluebell	1	4054	FW	10.00	30.75	6.60	5594.13	5593.95	0.18
Bluebell	1	4054	10-yr	9.21	7.68	2.47	5591.76	5593.95	-2.19
Bluebell	1	4054	25-yr	13.96	22.03	4.08	5593.00	5593.95	-0.96
Bluebell	1	4054	50-yr	15.31	28.38	4.83	5593.43	5593.95	-0.52
Bluebell	1	4054	500-yr	19.18	52.97	6.68	5594.85	5593.95	0.90
Bluebell	1	4197	100-yr	23.50	39.70	5.11	5602.82	5602.82	
Bluebell	1	4197	FW	17.00	40.59	5.00	5603.19	5602.82	0.37
Bluebell	1	4197	10-yr	15.48	6.48	2.93	5601.15	5602.82	-1.67
Bluebell	1	4197	25-yr	19.78	20.86	4.31	5601.95	5602.82	-0.87
Bluebell	1	4197	50-yr	21.56	29.39	4.66	5602.36	5602.82	-0.46
Bluebell	1	4197	500-yr	28.43	62.49	5.66	5603.70	5602.82	0.88
Bluebell	1	4278	100-yr	21.64	34.05	5.96	5609.00	5609.00	
Bluebell	1	4278	FW	10.00	24.25	8.37	5609.23	5609.00	0.23
Bluebell	1	4278	10-yr	13.16	8.02	2.37	5607.54	5609.00	-1.46
Bluebell	1	4278	25-yr	18.53	21.09	4.27	5608.36	5609.00	-0.65
Bluebell	1	4278	50-yr	19.93	26.69	5.13	5608.65	5609.00	-0.35
Bluebell	1	4278	500-yr	24.71	48.26	7.33	5609.62	5609.00	0.61
Bluebell	1	4422	100-yr	20.17	32.12	6.32	5623.54	5623.54	
Bluebell	1	4422	FW	20.17	37.91	5.36	5623.83	5623.54	0.29
Bluebell	1	4422	10-yr	12.63	5.10	3.73	5621.96	5623.54	-1.59
Bluebell	1	4422	25-yr	17.24	16.87	5.34	5622.73	5623.54	-0.81
Bluebell	1	4422	50-yr	18.68	23.83	5.75	5623.12	5623.54	-0.43
Bluebell	1	4422	500-yr	22.94	49.20	7.20	5624.34	5623.54	0.79
Bluebell	1	4538	100-yr	30.56	44.75	4.54	5634.25	5634.25	
Bluebell	1	4538	FW	14.00	29.74	6.82	5634.36	5634.25	0.11
Bluebell	1	4538	10-yr	18.89	10.07	1.89	5632.83	5634.25	-1.42
Bluebell	1	4538	25-yr	24.45	26.52	3.39	5633.59	5634.25	-0.66
Bluebell	1	4538	50-yr	27.57	34.49	3.97	5633.90	5634.25	-0.35
Bluebell	1	4538	500-yr	35.03	64.76	5.47	5634.87	5634.25	0.61
Bluebell	1	4671	100-yr	29.38	41.68	4.87	5645.32	5645.32	
Bluebell	1	4671	FW	29.37	50.09	4.05	5645.61	5645.32	0.29
Bluebell	1	4671	10-yr	12.93	6.13	3.10	5643.75	5645.32	-1.57
Bluebell	1	4671	25-yr	23.96	22.11	4.07	5644.59	5645.32	-0.73
Bluebell	1	4671	50-yr	26.74	31.10	4.41	5644.94	5645.32	-0.38
Bluebell	1	4671	500-yr	33.85	62.78	5.64	5645.99	5645.32	0.67
Bluebell	1	4720	100-yr	50.11	44.78	4.80	5651.29	5651.29	
Bluebell	1	4720	FW	20.00	30.44	7.06	5651.63	5651.29	0.34
Bluebell	1	4720	10-yr	16.20	7.73	2.59	5650.25	5651.29	-1.04
Bluebell	1	4720	25-yr	39.83	25.95	3.62	5650.88	5651.29	-0.41
Bluebell	1	4720	50-yr	46.70	34.62	4.19	5651.08	5651.29	-0.21
Bluebell	1	4720	500-yr	55.97	65.73	5.71	5651.68	5651.29	0.40

Bluebell	1	4745	100-yr	55.35	75.47	2.85	5653.12	5653.12	
Bluebell	1	4745	FW	31.00	72.06	2.98	5653.60	5653.12	0.49
Bluebell	1	4745	10-yr	29.14	13.86	1.44	5651.72	5653.12	-1.40
Bluebell	1	4745	25-yr	43.88	42.35	2.22	5652.47	5653.12	-0.64
Bluebell	1	4745	50-yr	52.22	58.55	2.48	5652.80	5653.12	-0.31
Bluebell	1	4745	500-yr	60.97	107.79	3.48	5653.67	5653.12	0.55
Bluebell	1	4793	100-yr	35.30	36.94	5.82	5656.12	5656.12	
Bluebell	1	4793	FW	12.00	25.64	8.39	5656.50	5656.12	0.38
Bluebell	1	4793	10-yr	7.27	5.00	4.00	5654.69	5656.12	-1.43
Bluebell	1	4793	25-yr	28.75	19.87	4.73	5655.59	5656.12	-0.53
Bluebell	1	4793	50-yr	31.86	27.44	5.28	5655.83	5656.12	-0.28
Bluebell	1	4793	500-yr	39.98	55.78	6.72	5656.62	5656.12	0.50
Bluebell	1	4910	100-yr	37.63	54.31	3.96	5666.37	5666.37	
Bluebell	1	4910	FW	18.00	48.43	4.44	5666.61	5666.37	0.24
Bluebell	1	4910	10-yr	10.44	8.57	2.33	5664.09	5666.37	-2.28
Bluebell	1	4910	25-yr	22.80	30.04	3.13	5665.54	5666.37	-0.84
Bluebell	1	4910	50-yr	27.55	41.30	3.51	5665.98	5666.37	-0.39
Bluebell	1	4910	500-yr	56.49	82.49	4.55	5666.98	5666.37	0.61
Bluebell	1	5080	100-yr	53.56	52.72	4.08	5677.76	5677.76	
Bluebell	1	5080	FW	12.00	28.62	7.51	5677.93	5677.76	0.17
Bluebell	1	5080	10-yr	8.56	5.79	3.45	5675.92	5677.76	-1.84
Bluebell	1	5080	25-yr	25.37	22.58	4.16	5677.02	5677.76	-0.75
Bluebell	1	5080	50-yr	46.18	38.17	3.80	5677.48	5677.76	-0.29
Bluebell	1	5080	500-yr	56.78	77.79	4.82	5678.22	5677.76	0.45
Bluebell	1	5136	100-yr	53.31	63.56	3.38	5682.06	5682.06	
Bluebell	1	5136	FW	37.00	63.26	3.40	5682.52	5682.06	0.46
Bluebell	1	5136	10-yr	21.45	10.52	1.90	5680.71	5682.06	-1.35
Bluebell	1	5136	25-yr	43.59	36.60	2.57	5681.52	5682.06	-0.54
Bluebell	1	5136	50-yr	51.23	50.21	2.89	5681.80	5682.06	-0.25
Bluebell	1	5136	500-yr	56.36	88.63	4.23	5682.51	5682.06	0.46
Bluebell	1	5157	100-yr	52.06	63.47	3.39	5683.18	5683.18	
Bluebell	1	5157	FW	38.00	60.82	3.53	5683.36	5683.18	0.18
Bluebell	1	5157	10-yr	25.56	10.83	1.85	5681.97	5683.18	-1.21
Bluebell	1	5157	25-yr	44.82	35.71	2.63	5682.62	5683.18	-0.56
Bluebell	1	5157	50-yr	50.17	49.17	2.95	5682.90	5683.18	-0.28
Bluebell	1	5157	500-yr	55.46	91.09	4.12	5683.69	5683.18	0.51
Bluebell	1	5194	100-yr	46.04	44.49	4.83	5686.15	5686.15	
Bluebell	1	5194	FW	21.00	30.89	6.96	5686.31	5686.15	0.17
Bluebell	1	5194	10-yr	17.73	7.92	2.52	5685.06	5686.15	-1.09
Bluebell	1	5194	25-yr	38.85	25.71	3.66	5685.71	5686.15	-0.44
Bluebell	1	5194	50-yr	43.22	34.25	4.23	5685.92	5686.15	-0.23
Bluebell	1	5194	500-yr	50.47	65.04	5.77	5686.57	5686.15	0.43
Bluebell	1	5322	100-yr	24.84	51.90	4.14	5695.20	5695.20	
Bluebell	1	5322	FW	24.85	55.90	3.85	5695.36	5695.20	0.16
Bluebell	1	5322	10-yr	14.40	10.04	1.99	5693.08	5695.20	-2.13
Bluebell	1	5322	25-yr	19.89	29.36	3.20	5694.19	5695.20	-1.01
Bluebell	1	5322	50-yr	22.17	39.64	3.66	5694.68	5695.20	-0.52
Bluebell	1	5322	500-yr	29.63	75.95	4.94	5696.09	5695.20	0.88
Bluebell	1	5445	100-yr	28.71	34.32	6.26	5706.27	5706.27	
Bluebell	1	5445	FW	15.75	28.03	7.67	5706.70	5706.27	0.44
Bluebell	1	5445	10-yr	8.95	4.79	4.18	5704.63	5706.27	-1.63
Bluebell	1	5445	25-yr	18.45	17.06	5.51	5705.54	5706.27	-0.72
Bluebell	1	5445	50-yr	24.91	25.20	5.75	5705.93	5706.27	-0.34
Bluebell	1	5445	500-yr	54.41	61.50	6.10	5706.94	5706.27	0.68
Bluebell	1	5481	100-yr	57.25	75.10	2.86	5709.28	5709.28	
Bluebell	1	5481	FW	57.25	85.70	2.51	5709.46	5709.28	0.19
Bluebell	1	5481	10-yr	12.40	9.58	2.09	5707.73	5709.28	-1.55
Bluebell	1	5481	25-yr	47.47	41.61	2.26	5708.64	5709.28	-0.64
Bluebell	1	5481	50-yr	52.38	56.76	2.55	5708.94	5709.28	-0.33
Bluebell	1	5481	500-yr	63.83	109.71	3.42	5709.85	5709.28	0.57
Bluebell	1	5527	100-yr	66.76	52.52	4.09	5711.99	5711.99	
Bluebell	1	5527	FW	62.31	44.45	4.84	5711.87	5711.99	-0.12
Bluebell	1	5527	10-yr	30.09	8.12	2.46	5711.13	5711.99	-0.86
Bluebell	1	5527	25-yr	50.35	27.80	3.38	5711.58	5711.99	-0.42
Bluebell	1	5527	50-yr	59.29	38.74	3.74	5711.77	5711.99	-0.22
Bluebell	1	5527	500-yr	75.74	80.77	4.64	5712.39	5711.99	0.40
Bluebell	1	5672	100-yr	26.03	62.76	4.72	5725.40	5725.40	
Bluebell	1	5672	FW	26.03	49.37	4.35	5725.55	5725.40	0.15
Bluebell	1	5672	10-yr	20.02	10.77	1.86	5723.92	5725.40	-1.48
Bluebell	1	5672	25-yr	23.92	33.63	3.42	5724.68	5725.40	-0.72
Bluebell	1	5672	50-yr	24.93	46.98	4.03	5725.03	5725.40	-0.38
Bluebell	1	5672	500-yr	27.83	93.78	5.99	5726.04	5725.40	0.63
Bluebell	1	5866	100-yr	43.48	59.45	3.62	5737.00	5737.00	
Bluebell	1	5866	FW	42.44	55.02	3.91	5736.90	5737.00	-0.10
Bluebell	1	5866	10-yr	20.19	9.45	2.12	5735.43	5737.00	-1.57
Bluebell	1	5866	25-yr	31.89	30.88	3.04	5736.26	5737.00	-0.74
Bluebell	1	5866	50-yr	39.22	44.01	3.30	5736.63	5737.00	-0.37
Bluebell	1	5866	500-yr	49.53	91.39	4.10	5737.69	5737.00	0.69
Bluebell	1	5998	100-yr	47.33	51.45	4.18	5746.00	5746.00	
Bluebell	1	5998	FW	47.33	55.36	3.88	5746.08	5746.00	0.08
Bluebell	1	5998	10-yr	40.22	12.53	1.60	5745.13	5746.00	-0.87
Bluebell	1	5998	25-yr	44.90	31.41	2.99	5745.57	5746.00	-0.43
Bluebell	1	5998	50-yr	46.08	41.01	3.54	5745.78	5746.00	-0.22
Bluebell	1	5998	500-yr	49.07	69.79	5.37	5746.38	5746.00	0.38
Bluebell	1	6113	100-yr	36.48	50.63	4.25	5755.52	5755.52	
Bluebell	1	6113	FW	35.85	47.28	4.55	5755.43	5755.52	-0.09
Bluebell	1	6113	10-yr	16.75	8.56	2.34	5754.06	5755.52	-1.46
Bluebell	1	6113	25-yr	31.55	28.75	3.27	5754.88	5755.52	-0.64
Bluebell	1	6113	50-yr	34.07	38.39	3.78	5755.17	5755.52	-0.35
Bluebell	1	6113	500-yr	39.19	74.90	5.01	5756.16	5755.52	0.64
Bluebell	1	6196	100-yr	16.36	36.68	5.86	5761.72	5761.72	
Bluebell	1	6196	FW	16.36	38.61	5.57	5761.84	5761.72	0.12
Bluebell	1	6196	10-yr	12.73	8.51	2.35	5759.76	5761.72	-1.96
Bluebell	1	6196	25-yr	14.37	22.00	4.27	5760.76	5761.72	-0.96
Bluebell	1	6196	50-yr	15.13	28.85	5.03	5761.22	5761.72	-0.50
Bluebell	1	6196	500-yr	19.43	51.60	7.27	5762.56	5761.72	0.84

Bluebell	1	6200		Culvert					
Bluebell	1	6245	100-yr	13.75	36.27	5.93	5764.63	5764.63	
Bluebell	1	6245	FW	13.75	36.26	5.93	5764.63	5764.63	0.00
Bluebell	1	6245	10-yr	6.02	4.20	4.77	5761.03	5764.63	-3.60
Bluebell	1	6245	25-yr	7.56	12.72	7.39	5762.29	5764.63	-2.34
Bluebell	1	6245	50-yr	8.30	17.50	8.28	5762.89	5764.63	-1.74
Bluebell	1	6245	500-yr	32.42	147.06	2.72	5768.82	5764.63	4.18
Bluebell_Spur	1	40	100-yr	19.55	16.28	3.32	5520.96	5520.96	
Bluebell_Spur	1	40	FW	19.55	16.28	3.32	5520.96	5520.96	0.00
Bluebell_Spur	1	40	10-yr	7.43	3.25	2.15	5519.98	5520.96	-0.99
Bluebell_Spur	1	40	25-yr	14.79	9.39	2.77	5520.57	5520.96	-0.40
Bluebell_Spur	1	40	50-yr	17.33	12.56	3.02	5520.76	5520.96	-0.20
Bluebell_Spur	1	40	500-yr	23.30	24.35	3.86	5521.34	5520.96	0.38
Bluebell_Spur	1	102	100-yr	66.54	29.99	1.80	5526.53	5526.53	
Bluebell_Spur	1	102	FW	20.00	18.74	2.88	5526.56	5526.53	0.03
Bluebell_Spur	1	102	10-yr	14.74	4.65	1.50	5525.82	5526.53	-0.71
Bluebell_Spur	1	102	25-yr	40.55	15.59	1.67	5526.26	5526.53	-0.27
Bluebell_Spur	1	102	50-yr	49.78	21.43	1.77	5526.39	5526.53	-0.14
Bluebell_Spur	1	102	500-yr	72.80	44.30	2.12	5526.74	5526.53	0.20
Bluebell_Spur	1	183	100-yr	45.57	27.56	1.99	5531.88	5531.88	
Bluebell_Spur	1	183	FW	20.00	19.94	2.71	5532.18	5531.88	0.30
Bluebell_Spur	1	183	10-yr	34.07	7.19	0.97	5531.39	5531.88	-0.50
Bluebell_Spur	1	183	25-yr	40.90	17.03	1.53	5531.65	5531.88	-0.23
Bluebell_Spur	1	183	50-yr	43.16	21.73	1.75	5531.76	5531.88	-0.12
Bluebell_Spur	1	183	500-yr	55.29	39.55	2.45	5532.10	5531.88	0.22
Bluebell_Spur	1	256	100-yr	78.54	32.80	1.65	5536.55	5536.55	
Bluebell_Spur	1	256	FW	25.00	21.17	2.55	5536.98	5536.55	0.43
Bluebell_Spur	1	256	10-yr	50.03	7.78	0.90	5536.18	5536.55	-0.37
Bluebell_Spur	1	256	25-yr	58.21	10.70	2.43	5536.23	5536.55	-0.32
Bluebell_Spur	1	256	50-yr	73.29	25.56	1.49	5536.46	5536.55	-0.09
Bluebell_Spur	1	256	500-yr	81.43	49.51	1.96	5536.74	5536.55	0.19
Bluebell_Spur	1	314	100-yr	12.67	13.03	4.14	5541.71	5541.71	
Bluebell_Spur	1	314	FW	12.61	13.85	3.90	5541.77	5541.71	0.07
Bluebell_Spur	1	314	10-yr	6.03	3.30	2.12	5540.62	5541.71	-1.08
Bluebell_Spur	1	314	25-yr	11.97	11.89	2.19	5541.61	5541.71	-0.09
Bluebell_Spur	1	314	50-yr	10.95	10.33	3.68	5541.48	5541.71	-0.23
Bluebell_Spur	1	314	500-yr	19.11	18.42	5.10	5542.07	5541.71	0.36
Blue_Ave_Split	1	88	100-yr	89.33	143.10	2.12	5392.42	5392.42	
Blue_Ave_Split	1	88	FW	50.00	141.71	2.14	5392.78	5392.42	0.36
Blue_Ave_Split	1	88	10-yr	26.96	11.82	0.08	5389.86	5392.42	-2.56
Blue_Ave_Split	1	88	25-yr	53.88	59.20	1.17	5391.11	5392.42	-1.32
Blue_Ave_Split	1	88	50-yr	58.53	95.71	1.67	5391.75	5392.42	-0.67
Blue_Ave_Split	1	88	500-yr	94.59	236.91	2.57	5393.42	5392.42	1.00
Blue_Ave_Split	1	185	100-yr	101.12	157.64	1.92	5392.52	5392.52	
Blue_Ave_Split	1	185	FW	50.00	104.70	2.89	5392.84	5392.52	0.33
Blue_Ave_Split	1	185	10-yr	7.61	0.59	1.69	5390.44	5392.52	-2.08
Blue_Ave_Split	1	185	25-yr	98.99	39.49	1.75	5391.34	5392.52	-1.18
Blue_Ave_Split	1	185	50-yr	100.04	93.57	1.71	5391.88	5392.52	-0.64
Blue_Ave_Split	1	185	500-yr	102.52	258.27	2.36	5393.50	5392.52	0.99
Blue_Ave_Split	1	251	100-yr	77.18	68.61	4.53	5392.82	5392.82	
Blue_Ave_Split	1	251	FW	30.00	44.37	6.83	5393.06	5392.82	0.23
Blue_Ave_Split	1	251	10-yr	7.79	0.62	1.61	5391.45	5392.82	-1.37
Blue_Ave_Split	1	251	25-yr	45.89	18.69	3.76	5392.07	5392.82	-0.75
Blue_Ave_Split	1	251	50-yr	65.12	38.32	4.28	5392.42	5392.82	-0.40
Blue_Ave_Split	1	251	500-yr	79.85	119.99	5.21	5393.46	5392.82	0.64
Blue_Ave_Split	1	364	100-yr	79.10	74.87	4.05	5395.14	5395.14	
Blue_Ave_Split	1	364	FW	30.00	43.86	6.91	5395.49	5395.14	0.35
Blue_Ave_Split	1	364	10-yr	10.32	0.67	1.48	5393.93	5395.14	-1.21
Blue_Ave_Split	1	364	25-yr	72.28	24.52	2.81	5394.48	5395.14	-0.66
Blue_Ave_Split	1	364	50-yr	75.79	47.33	3.38	5394.78	5395.14	-0.35
Blue_Ave_Split	1	364	500-yr	85.69	122.51	4.98	5395.72	5395.14	0.58
Blue_Ave_Split	1	474	100-yr	83.69	74.98	4.16	5397.59	5397.59	
Blue_Ave_Split	1	474	FW	30.00	44.15	6.86	5397.90	5397.59	0.31
Blue_Ave_Split	1	474	10-yr	10.10	0.64	1.56	5396.30	5397.59	-1.28
Blue_Ave_Split	1	474	25-yr	56.13	20.09	3.43	5396.90	5397.59	-0.69
Blue_Ave_Split	1	474	50-yr	79.87	43.09	3.72	5397.22	5397.59	-0.37
Blue_Ave_Split	1	474	500-yr	89.25	128.10	4.97	5398.16	5397.59	0.58
Blue_Ave_Split	1	564	100-yr	78.92	70.04	4.33	5399.71	5399.71	
Blue_Ave_Split	1	564	FW	28.00	42.81	7.08	5400.18	5399.71	0.47
Blue_Ave_Split	1	564	10-yr	7.76	0.63	1.60	5398.46	5399.71	-1.25
Blue_Ave_Split	1	564	25-yr	60.90	20.57	3.35	5399.05	5399.71	-0.66
Blue_Ave_Split	1	564	50-yr	75.65	42.75	3.74	5399.36	5399.71	-0.35
Blue_Ave_Split	1	564	500-yr	90.07	118.12	5.16	5400.29	5399.71	0.58
Blue_Ave_Split	1	655	100-yr	53.71	53.22	5.69	5402.53	5402.53	
Blue_Ave_Split	1	655	FW	28.00	42.90	7.06	5402.85	5402.53	0.33
Blue_Ave_Split	1	655	10-yr	7.14	0.61	1.65	5401.19	5402.53	-1.33
Blue_Ave_Split	1	655	25-yr	40.64	17.84	3.87	5401.80	5402.53	-0.73
Blue_Ave_Split	1	655	50-yr	49.37	33.58	4.76	5402.15	5402.53	-0.38
Blue_Ave_Split	1	655	500-yr	86.14	98.31	6.20	5403.13	5402.53	0.61
Blue_Ave_Split	1	748	100-yr	86.05	66.78	4.54	5405.43	5405.43	
Blue_Ave_Split	1	748	FW	28.00	42.75	7.09	5405.83	5405.43	0.40
Blue_Ave_Split	1	748	10-yr	8.24	0.72	1.40	5404.11	5405.43	-1.32
Blue_Ave_Split	1	748	25-yr	50.77	19.15	3.60	5404.72	5405.43	-0.71
Blue_Ave_Split	1	748	50-yr	65.83	38.24	4.18	5405.05	5405.43	-0.38
Blue_Ave_Split	1	748	500-yr	104.43	119.98	5.08	5405.99	5405.43	0.57
Blue_Ave_Split	1	818	100-yr	81.29	57.99	5.22	5407.69	5407.69	
Blue_Ave_Split	1	818	FW	28.00	42.76	7.09	5408.13	5407.69	0.43
Blue_Ave_Split	1	818	10-yr	7.35	0.62	1.62	5406.35	5407.69	-1.34
Blue_Ave_Split	1	818	25-yr	47.86	19.25	3.58	5407.03	5407.69	-0.67
Blue_Ave_Split	1	818	50-yr	52.94	34.19	4.68	5407.32	5407.69	-0.37
Blue_Ave_Split	1	818	500-yr	87.67	107.69	5.66	5408.28	5407.69	0.59
Denton_Ave_Split	1	41	100-yr	76.80	45.59	3.31	5295.37	5295.37	
Denton_Ave_Split	1	41	FW	30.00	27.60	5.47	5295.59	5295.37	0.21
Denton_Ave_Split	1	41	10-yr	8.86	1.04	1.93	5294.53	5295.37	-0.84

Denton_Ave_Split	1	41	25-yr	65.28	17.16	2.97	5294.98	5295.37	-0.39
Denton_Ave_Split	1	41	50-yr	71.47	27.32	3.59	5295.13	5295.37	-0.24
Denton_Ave_Split	1	41	500-yr	79.52	62.83	5.01	5295.59	5295.37	0.22
Denton_Ave_Split	1	75	100-yr	60.80	34.63	4.36	5295.60	5295.60	
Denton_Ave_Split	1	75	FW	29.00	27.32	5.53	5295.93	5295.60	0.33
Denton_Ave_Split	1	75	10-yr	11.79	1.86	1.07	5294.77	5295.60	-0.83
Denton_Ave_Split	1	75	25-yr	51.51	17.74	2.87	5295.30	5295.60	-0.30
Denton_Ave_Split	1	75	50-yr	55.05	25.37	3.86	5295.44	5295.60	-0.16
Denton_Ave_Split	1	75	500-yr	75.77	60.61	5.20	5295.99	5295.60	0.38
Denton_Ave_Split	1	179	100-yr	56.81	33.69	4.48	5296.47	5296.47	
Denton_Ave_Split	1	179	FW	32.00	28.04	5.39	5296.66	5296.47	0.19
Denton_Ave_Split	1	179	10-yr	9.30	1.05	1.91	5295.56	5296.47	-0.91
Denton_Ave_Split	1	179	25-yr	47.08	15.58	3.27	5296.12	5296.47	-0.35
Denton_Ave_Split	1	179	50-yr	51.47	24.53	3.99	5296.30	5296.47	-0.17
Denton_Ave_Split	1	179	500-yr	67.33	58.94	5.34	5296.88	5296.47	0.41
Denton_Ave_Split	1	283	100-yr	56.70	33.15	4.55	5297.55	5297.55	
Denton_Ave_Split	1	283	FW	32.00	27.73	5.45	5297.76	5297.55	0.22
Denton_Ave_Split	1	283	10-yr	10.56	1.14	1.76	5296.70	5297.55	-0.85
Denton_Ave_Split	1	283	25-yr	47.83	15.42	3.31	5297.21	5297.55	-0.34
Denton_Ave_Split	1	283	50-yr	53.19	25.29	3.87	5297.40	5297.55	-0.14
Denton_Ave_Split	1	283	500-yr	70.99	60.30	5.22	5297.98	5297.55	0.43
Denton_Ave_Split	1	414	100-yr	67.25	35.72	4.23	5299.64	5299.64	
Denton_Ave_Split	1	414	FW	30.00	27.48	5.50	5299.92	5299.64	0.28
Denton_Ave_Split	1	414	10-yr	10.45	1.21	1.65	5298.83	5299.64	-0.81
Denton_Ave_Split	1	414	25-yr	56.16	16.22	3.14	5299.33	5299.64	-0.32
Denton_Ave_Split	1	414	50-yr	62.21	26.12	3.75	5299.49	5299.64	-0.15
Denton_Ave_Split	1	414	500-yr	81.46	62.29	5.06	5300.00	5299.64	0.36
Denton_Ave_Split	1	534	100-yr	65.05	35.68	4.23	5301.55	5301.55	
Denton_Ave_Split	1	534	FW	30.00	27.47	5.50	5301.73	5301.55	0.18
Denton_Ave_Split	1	534	10-yr	11.37	1.11	1.80	5300.73	5301.55	-0.81
Denton_Ave_Split	1	534	25-yr	45.40	15.38	3.32	5301.18	5301.55	-0.37
Denton_Ave_Split	1	534	50-yr	56.63	25.60	3.83	5301.38	5301.55	-0.17
Denton_Ave_Split	1	534	500-yr	87.27	62.46	5.04	5301.90	5301.55	0.36
Echo_Pl_Split	1	76	100-yr	44.83	26.04	4.42	5435.06	5435.06	
Echo_Pl_Split	1	76	FW	25.00	21.68	5.31	5435.28	5435.06	0.22
Echo_Pl_Split	1	76	10-yr	27.85	4.45	2.25	5434.52	5435.06	-0.53
Echo_Pl_Split	1	76	25-yr	40.93	13.91	3.31	5434.77	5435.06	-0.28
Echo_Pl_Split	1	76	50-yr	42.43	19.55	3.84	5434.91	5435.06	-0.15
Echo_Pl_Split	1	76	500-yr	51.36	40.34	5.08	5435.35	5435.06	0.29
Echo_Pl_Split	1	167	100-yr	66.83	30.61	3.76	5436.78	5436.78	
Echo_Pl_Split	1	167	FW	63.22	30.20	3.81	5436.78	5436.78	0.01
Echo_Pl_Split	1	167	10-yr	21.60	3.81	2.62	5436.21	5436.78	-0.57
Echo_Pl_Split	1	167	25-yr	49.74	15.13	3.04	5436.53	5436.78	-0.25
Echo_Pl_Split	1	167	50-yr	65.60	21.62	3.47	5436.64	5436.78	-0.14
Echo_Pl_Split	1	167	500-yr	69.03	44.39	4.62	5436.98	5436.78	0.20
Echo_Pl_Split	1	219	100-yr	60.94	54.23	3.74	5438.80	5438.80	
Echo_Pl_Split	1	219	FW	21.81	55.92	5.49	5439.21	5438.80	0.41
Echo_Pl_Split	1	219	10-yr	18.51	8.41	2.62	5438.11	5438.80	-0.69
Echo_Pl_Split	1	219	25-yr	36.40	26.67	3.46	5438.43	5438.80	-0.36
Echo_Pl_Split	1	219	50-yr	52.71	41.74	3.35	5438.65	5438.80	-0.15
Echo_Pl_Split	1	219	500-yr	70.97	77.21	4.36	5439.04	5438.80	0.24
Echo_Pl_Split	1	289	100-yr	50.56	69.84	1.65	5441.63	5441.63	
Echo_Pl_Split	1	289	FW	37.00	67.10	1.71	5441.88	5441.63	0.24
Echo_Pl_Split	1	289	10-yr	29.86	14.30	0.70	5440.38	5441.63	-1.25
Echo_Pl_Split	1	289	25-yr	48.53	41.28	1.11	5441.06	5441.63	-0.58
Echo_Pl_Split	1	289	50-yr	49.48	54.18	1.38	5441.32	5441.63	-0.31
Echo_Pl_Split	1	289	500-yr	52.05	97.32	2.11	5442.17	5441.63	0.54
Euclid_Ave_Split	01	76	100-yr	99.35	200.98	2.49	5291.36	5291.36	
Euclid_Ave_Split	01	76	FW	40.00	109.95	4.55	5291.63	5291.36	0.27
Euclid_Ave_Split	01	76	10-yr	72.91	32.57	2.00	5289.52	5291.36	-1.84
Euclid_Ave_Split	01	76	25-yr	90.40	100.84	2.73	5290.32	5291.36	-1.04
Euclid_Ave_Split	01	76	50-yr	97.30	143.51	3.14	5290.78	5291.36	-0.58
Euclid_Ave_Split	01	76	500-yr	99.35	337.54	1.48	5292.73	5291.36	1.37
Euclid_Ave_Split	01	129	100-yr	102.58	190.83	2.62	5291.42	5291.42	
Euclid_Ave_Split	01	129	FW	40.00	102.64	4.87	5291.64	5291.42	0.22
Euclid_Ave_Split	01	129	10-yr	57.46	24.31	2.67	5289.60	5291.42	-1.82
Euclid_Ave_Split	01	129	25-yr	98.12	88.05	3.12	5290.42	5291.42	-1.00
Euclid_Ave_Split	01	129	50-yr	102.58	137.04	3.28	5290.90	5291.42	-0.52
Euclid_Ave_Split	01	129	500-yr	102.58	327.07	1.53	5292.75	5291.42	1.33
Euclid_Ave_Split	01	224	100-yr	98.86	151.34	3.30	5291.50	5291.50	
Euclid_Ave_Split	01	224	FW	40.00	89.53	5.58	5291.69	5291.50	0.18
Euclid_Ave_Split	01	224	10-yr	53.82	22.33	2.91	5289.95	5291.50	-1.56
Euclid_Ave_Split	01	224	25-yr	80.49	68.50	4.01	5290.63	5291.50	-0.87
Euclid_Ave_Split	01	224	50-yr	98.86	109.54	4.11	5291.08	5291.50	-0.42
Euclid_Ave_Split	01	224	500-yr	98.86	275.79	1.81	5292.76	5291.50	1.26
Euclid_Ave_Split	01	308	100-yr	84.84	86.49	5.78	5291.48	5291.48	
Euclid_Ave_Split	01	308	FW	44.00	70.02	7.14	5291.65	5291.48	0.17
Euclid_Ave_Split	01	308	10-yr	50.98	18.61	3.49	5290.47	5291.48	-1.01
Euclid_Ave_Split	01	308	25-yr	67.79	53.51	5.14	5291.04	5291.48	-0.44
Euclid_Ave_Split	01	308	50-yr	79.63	77.32	5.82	5291.37	5291.48	-0.11
Euclid_Ave_Split	01	308	500-yr	97.20	205.60	2.43	5292.77	5291.48	1.29
Euclid_Ave_Split	02	422	100-yr	91.83	103.93	1.05	5292.21	5292.21	
Euclid_Ave_Split	02	422	FW	40.00	79.65	1.37	5292.60	5292.21	0.39
Euclid_Ave_Split	02	422	10-yr	45.65	14.07	0.71	5290.94	5292.21	-1.27
Euclid_Ave_Split	02	422	25-yr	76.16	56.68	0.62	5291.65	5292.21	-0.56
Euclid_Ave_Split	02	422	50-yr	90.46	93.82	0.74	5292.10	5292.21	-0.11
Euclid_Ave_Split	02	422	500-yr	96.56	168.89	1.24	5292.89	5292.21	0.69
Euclid_Ave_Split	02	502	100-yr	75.89	64.42	1.69	5292.21	5292.21	
Euclid_Ave_Split	02	502	FW	30.00	44.76	2.44	5292.57	5292.21	0.36
Euclid_Ave_Split	02	502	10-yr	19.91	3.93	2.55	5291.06	5292.21	-1.14
Euclid_Ave_Split	02	502	25-yr	56.73	27.06	1.29	5291.65	5292.21	-0.56
Euclid_Ave_Split	02	502	50-yr	72.67	56.12	1.23	5292.10	5292.21	-0.11
Euclid_Ave_Split	02	502	500-yr	92.01	123.60	1.69	5292.90	5292.21	0.69
Euclid_Ave_Split	02	593	100-yr	48.20	26.00	4.19	5292.44	5292.44	
Euclid_Ave_Split	02	593	FW	30.00	22.10	4.93	5292.60	5292.44	0.16

Euclid_Ave_Split	02	593	10-yr	19.69	3.95	2.53	5291.87	5292.44	-0.56
Euclid_Ave_Split	02	593	25-yr	41.88	11.92	2.94	5292.12	5292.44	-0.32
Euclid_Ave_Split	02	593	50-yr	43.96	18.41	3.75	5292.27	5292.44	-0.17
Euclid_Ave_Split	02	593	500-yr	60.46	43.43	4.81	5292.76	5292.44	0.32
Euclid_Ave_Split	02	698	100-yr	50.63	26.31	4.14	5293.94	5293.94	
Euclid_Ave_Split	02	698	FW	30.00	22.18	4.91	5294.05	5293.94	0.11
Euclid_Ave_Split	02	698	10-yr	29.53	4.45	2.25	5293.42	5293.94	-0.53
Euclid_Ave_Split	02	698	25-yr	40.18	11.48	3.05	5293.61	5293.94	-0.34
Euclid_Ave_Split	02	698	50-yr	43.12	18.41	3.75	5293.77	5293.94	-0.17
Euclid_Ave_Split	02	698	500-yr	59.72	42.75	4.89	5294.24	5293.94	0.30
Euclid_Ave_Split	02	801	100-yr	55.36	27.28	4.00	5295.31	5295.31	
Euclid_Ave_Split	02	801	FW	28.00	21.68	5.03	5295.48	5295.31	0.17
Euclid_Ave_Split	02	801	10-yr	25.17	4.26	2.35	5294.77	5295.31	-0.54
Euclid_Ave_Split	02	801	25-yr	41.55	11.71	2.99	5294.98	5295.31	-0.33
Euclid_Ave_Split	02	801	50-yr	45.91	18.99	3.63	5295.14	5295.31	-0.17
Euclid_Ave_Split	02	801	500-yr	67.38	44.58	4.69	5295.59	5295.31	0.28
Euclid_Ave_Split	02	934	100-yr	49.15	26.16	4.17	5297.13	5297.13	
Euclid_Ave_Split	02	934	FW	28.00	21.79	5.00	5297.28	5297.13	0.15
Euclid_Ave_Split	02	934	10-yr	35.49	4.84	2.07	5296.62	5297.13	-0.50
Euclid_Ave_Split	02	934	25-yr	40.72	11.57	3.02	5296.80	5297.13	-0.33
Euclid_Ave_Split	02	934	50-yr	44.43	18.62	3.71	5296.97	5297.13	-0.16
Euclid_Ave_Split	02	934	500-yr	61.26	43.23	4.83	5297.44	5297.13	0.31
Euclid_Ave_Split	02	1036	100-yr	50.01	26.36	4.13	5298.47	5298.47	
Euclid_Ave_Split	02	1036	FW	32.00	22.54	4.84	5298.57	5298.47	0.11
Euclid_Ave_Split	02	1036	10-yr	22.74	4.10	2.44	5297.92	5298.47	-0.55
Euclid_Ave_Split	02	1036	25-yr	42.19	11.97	2.92	5298.15	5298.47	-0.32
Euclid_Ave_Split	02	1036	50-yr	44.54	18.64	3.70	5298.30	5298.47	-0.17
Euclid_Ave_Split	02	1036	500-yr	62.63	43.38	4.82	5298.77	5298.47	0.30
Euclid_Ave_Split	02	1124	100-yr	98.88	32.92	3.31	5299.68	5299.68	
Euclid_Ave_Split	02	1124	FW	78.00	30.47	3.58	5299.72	5299.68	0.05
Euclid_Ave_Split	02	1124	10-yr	34.52	5.25	1.90	5299.28	5299.68	-0.40
Euclid_Ave_Split	02	1124	25-yr	64.52	13.35	2.62	5299.44	5299.68	-0.23
Euclid_Ave_Split	02	1124	50-yr	91.68	23.65	2.92	5299.58	5299.68	-0.10
Euclid_Ave_Split	02	1124	500-yr	117.04	54.16	3.86	5299.87	5299.68	0.20
Euclid_Ave_Split	02	1193	100-yr	60.68	29.45	3.26	5300.24	5300.24	
Euclid_Ave_Split	02	1193	FW	46.00	25.32	3.79	5300.26	5300.24	0.02
Euclid_Ave_Split	02	1193	10-yr	39.83	6.63	0.30	5299.81	5300.24	-0.42
Euclid_Ave_Split	02	1193	25-yr	56.11	16.79	1.43	5300.02	5300.24	-0.22
Euclid_Ave_Split	02	1193	50-yr	58.44	24.02	2.37	5300.14	5300.24	-0.09
Euclid_Ave_Split	02	1193	500-yr	64.73	44.93	4.83	5300.48	5300.24	0.25
Euclid_Ave_Split	02	1311	100-yr	59.82	25.68	3.74	5301.51	5301.51	
Euclid_Ave_Split	02	1311	FW	49.00	23.76	4.04	5301.54	5301.51	0.02
Euclid_Ave_Split	02	1311	10-yr	11.11	1.12	1.78	5300.91	5301.51	-0.61
Euclid_Ave_Split	02	1311	25-yr	51.17	9.72	2.47	5301.23	5301.51	-0.28
Euclid_Ave_Split	02	1311	50-yr	56.88	17.56	3.25	5301.38	5301.51	-0.14
Euclid_Ave_Split	02	1311	500-yr	70.09	45.64	4.75	5301.82	5301.51	0.31
Euclid_Ave_Split	02	1445	100-yr	93.83	69.05	3.71	5302.97	5302.97	
Euclid_Ave_Split	02	1445	FW	54.00	47.49	5.39	5303.20	5302.97	0.24
Euclid_Ave_Split	02	1445	10-yr	27.94	2.51	1.60	5301.99	5302.97	-0.98
Euclid_Ave_Split	02	1445	25-yr	89.96	41.20	1.84	5302.66	5302.97	-0.30
Euclid_Ave_Split	02	1445	50-yr	92.57	56.22	2.86	5302.83	5302.97	-0.14
Euclid_Ave_Split	02	1445	500-yr	102.74	114.63	4.68	5303.43	5302.97	0.47
Euclid_Ave_Split	02	1563	100-yr	77.34	54.03	4.74	5304.24	5304.24	
Euclid_Ave_Split	02	1563	FW	56.00	47.96	5.34	5304.34	5304.24	0.10
Euclid_Ave_Split	02	1563	10-yr	38.63	6.17	0.65	5303.52	5304.24	-0.72
Euclid_Ave_Split	02	1563	25-yr	70.37	24.77	3.07	5303.85	5304.24	-0.39
Euclid_Ave_Split	02	1563	50-yr	74.41	39.61	4.06	5304.05	5304.24	-0.19
Euclid_Ave_Split	02	1563	500-yr	90.21	90.10	5.95	5304.68	5304.24	0.44
Kings	01	82	100-yr	48.67	29.54	4.54	5426.58	5426.58	
Kings	01	82	FW	20.00	22.21	6.03	5426.93	5426.58	0.35
Kings	01	82	10-yr	27.40	6.21	1.13	5426.04	5426.58	-0.55
Kings	01	82	25-yr	41.93	15.59	3.53	5426.28	5426.58	-0.31
Kings	01	82	50-yr	45.17	21.42	3.97	5426.41	5426.58	-0.17
Kings	01	82	500-yr	59.04	45.94	5.29	5426.90	5426.58	0.31
Kings	01	215	100-yr	54.95	31.96	4.19	5431.17	5431.17	
Kings	01	215	FW	20.00	22.17	6.05	5431.57	5431.17	0.40
Kings	01	215	10-yr	28.25	3.58	1.96	5430.58	5431.17	-0.59
Kings	01	215	25-yr	50.43	17.29	3.18	5430.89	5431.17	-0.28
Kings	01	215	50-yr	52.18	22.80	3.73	5431.00	5431.17	-0.17
Kings	01	215	500-yr	58.88	50.04	4.86	5431.49	5431.17	0.31
Kings	02	311	100-yr	46.70	22.31	4.03	5434.44	5434.44	
Kings	02	311	FW	15.00	15.50	5.81	5434.82	5434.44	0.37
Kings	02	311	10-yr	7.77	1.27	2.37	5433.65	5434.44	-0.79
Kings	02	311	25-yr	42.43	11.03	2.99	5434.19	5434.44	-0.25
Kings	02	311	50-yr	45.25	16.30	3.56	5434.31	5434.44	-0.13
Kings	02	311	500-yr	54.78	31.09	4.47	5434.62	5434.44	0.17
Kings	02	435	100-yr	48.44	22.55	3.99	5438.82	5438.82	
Kings	02	435	FW	14.00	15.31	5.88	5439.27	5438.82	0.46
Kings	02	435	10-yr	9.84	1.40	2.14	5438.15	5438.82	-0.67
Kings	02	435	25-yr	40.04	10.70	3.08	5438.55	5438.82	-0.26
Kings	02	435	50-yr	45.52	16.76	3.46	5438.69	5438.82	-0.12
Kings	02	435	500-yr	50.98	30.36	4.58	5438.97	5438.82	0.16
Kings	02	561	100-yr	72.90	45.81	3.22	5443.47	5443.47	
Kings	02	561	FW	12.00	14.48	6.21	5443.92	5443.47	0.45
Kings	02	561	10-yr	8.54	1.72	2.19	5442.74	5443.47	-0.72
Kings	02	561	25-yr	64.37	27.39	2.28	5443.28	5443.47	-0.19
Kings	02	561	50-yr	72.90	38.06	2.61	5443.39	5443.47	-0.08
Kings	02	561	500-yr	72.90	57.29	3.82	5443.58	5443.47	0.12
Kings	02	665	100-yr	46.62	22.77	3.95	5447.84	5447.84	
Kings	02	665	FW	11.00	13.97	6.44	5448.31	5447.84	0.47
Kings	02	665	10-yr	8.90	1.35	2.22	5447.09	5447.84	-0.75
Kings	02	665	25-yr	42.41	11.01	3.00	5447.57	5447.84	-0.26
Kings	02	665	50-yr	44.38	16.42	3.53	5447.70	5447.84	-0.14
Kings	02	665	500-yr	49.27	30.64	4.54	5448.00	5447.84	0.16
Kings	02	771	100-yr	45.85	26.05	4.34	5451.62	5451.62	

Kings	02	771	FW	30.00	22.73	4.97	5451.73	5451.62	0.11
Kings	02	771	10-yr	35.28	3.70	1.89	5451.07	5451.62	-0.55
Kings	02	771	25-yr	41.61	15.67	3.51	5451.38	5451.62	-0.24
Kings	02	771	50-yr	43.15	20.12	3.93	5451.49	5451.62	-0.13
Kings	02	771	500-yr	52.22	35.23	4.77	5451.81	5451.62	0.18
Kings	02	873	100-yr	52.71	27.16	4.16	5456.13	5456.13	
Kings	02	873	FW	32.00	23.25	4.86	5456.28	5456.13	0.15
Kings	02	873	10-yr	25.03	3.36	2.09	5455.60	5456.13	-0.53
Kings	02	873	25-yr	46.91	16.27	3.38	5455.91	5456.13	-0.22
Kings	02	873	50-yr	49.03	20.88	3.78	5456.00	5456.13	-0.12
Kings	02	873	500-yr	62.35	36.61	4.59	5456.29	5456.13	0.16
Kings	02	981	100-yr	55.91	27.60	4.09	5462.12	5462.12	
Kings	02	981	FW	31.00	22.91	4.93	5462.30	5462.12	0.18
Kings	02	981	10-yr	23.10	3.30	2.12	5461.58	5462.12	-0.54
Kings	02	981	25-yr	48.86	16.22	3.39	5461.90	5462.12	-0.22
Kings	02	981	50-yr	51.76	21.21	3.73	5462.00	5462.12	-0.12
Kings	02	981	500-yr	59.44	36.65	4.58	5462.28	5462.12	0.16
Kings	02	1079	100-yr	50.57	30.24	4.40	5466.43	5466.43	
Kings	02	1079	FW	29.00	25.02	5.32	5466.62	5466.43	0.18
Kings	02	1079	10-yr	32.87	4.27	2.11	5465.85	5466.43	-0.59
Kings	02	1079	25-yr	44.91	17.69	3.56	5466.17	5466.43	-0.26
Kings	02	1079	50-yr	46.99	22.98	4.00	5466.29	5466.43	-0.15
Kings	02	1079	500-yr	66.15	43.17	4.82	5466.65	5466.43	0.21
Kings	02	1221	100-yr	71.44	35.27	3.77	5473.22	5473.22	
Kings	02	1221	FW	28.00	24.75	5.37	5473.47	5473.22	0.24
Kings	02	1221	10-yr	31.40	4.28	2.10	5472.67	5473.22	-0.55
Kings	02	1221	25-yr	61.06	19.51	3.23	5472.98	5473.22	-0.24
Kings	02	1221	50-yr	64.62	25.91	3.55	5473.08	5473.22	-0.14
Kings	02	1221	500-yr	77.31	51.41	4.05	5473.44	5473.22	0.21
Kings	02	1320	100-yr	52.26	30.16	4.41	5477.81	5477.81	
Kings	02	1320	FW	32.00	26.28	5.06	5477.96	5477.81	0.14
Kings	02	1320	10-yr	33.65	4.30	2.09	5477.24	5477.81	-0.58
Kings	02	1320	25-yr	44.98	17.39	3.62	5477.55	5477.81	-0.26
Kings	02	1320	50-yr	49.05	23.60	3.90	5477.68	5477.81	-0.13
Kings	02	1320	500-yr	63.63	43.24	4.81	5478.04	5477.81	0.23
Kings	02	1419	100-yr	58.59	33.77	4.29	5481.38	5481.38	
Kings	02	1419	FW	30.00	26.75	5.42	5481.69	5481.38	0.31
Kings	02	1419	10-yr	17.11	3.50	2.57	5480.73	5481.38	-0.65
Kings	02	1419	25-yr	56.73	18.58	3.34	5481.12	5481.38	-0.26
Kings	02	1419	50-yr	57.88	27.46	3.71	5481.27	5481.38	-0.11
Kings	02	1419	500-yr	58.96	47.89	5.12	5481.62	5481.38	0.24
Kings	02	1514	100-yr	47.50	31.13	4.66	5484.97	5484.97	
Kings	02	1514	FW	28.00	26.15	5.54	5485.23	5484.97	0.25
Kings	02	1514	10-yr	22.64	3.85	2.34	5484.31	5484.97	-0.67
Kings	02	1514	25-yr	42.95	17.25	3.59	5484.67	5484.97	-0.31
Kings	02	1514	50-yr	45.67	24.30	4.20	5484.83	5484.97	-0.15
Kings	02	1514	500-yr	51.00	45.25	5.41	5485.26	5484.97	0.29
Kings	02	1621	100-yr	42.97	31.72	4.94	5490.03	5490.03	
Kings	02	1621	FW	30.00	27.21	5.33	5490.21	5490.03	0.18
Kings	02	1621	10-yr	10.85	3.04	2.96	5489.12	5490.03	-0.90
Kings	02	1621	25-yr	38.88	16.85	3.69	5489.72	5490.03	-0.31
Kings	02	1621	50-yr	40.92	24.41	4.35	5489.89	5490.03	-0.14
Kings	02	1621	500-yr	70.99	53.37	4.59	5490.38	5490.03	0.35
Kings	03	1733	100-yr	14.29	43.14	6.46	5496.55	5496.55	
Kings	03	1733	FW	14.29	18.42	6.46	5496.55	5496.55	0.00
Kings	03	1733	10-yr	6.26	1.90	3.16	5495.03	5496.55	-1.51
Kings	03	1733	25-yr	11.05	15.55	4.97	5495.78	5496.55	-0.77
Kings	03	1733	50-yr	12.70	26.51	5.73	5496.14	5496.55	-0.41
Kings	03	1733	500-yr	19.92	91.24	7.31	5497.31	5496.55	0.76
Kings	03	1873	100-yr	12.81	17.73	6.71	5503.75	5503.75	
Kings	03	1873	FW	12.80	17.73	6.71	5503.75	5503.75	0.00
Kings	03	1873	10-yr	8.93	2.59	2.32	5502.39	5503.75	-1.35
Kings	03	1873	25-yr	11.09	8.60	5.00	5502.98	5503.75	-0.76
Kings	03	1873	50-yr	11.97	12.59	5.88	5503.33	5503.75	-0.41
Kings	03	1873	500-yr	14.15	27.85	8.04	5504.50	5503.75	0.75
Kings	03	2018	100-yr	12.07	17.53	6.79	5518.80	5518.80	
Kings	03	2018	FW	12.06	17.51	6.80	5518.80	5518.80	0.00
Kings	03	2018	10-yr	8.28	2.17	2.76	5517.31	5518.80	-1.49
Kings	03	2018	25-yr	10.15	8.47	5.08	5517.99	5518.80	-0.81
Kings	03	2018	50-yr	11.19	12.54	5.90	5518.37	5518.80	-0.43
Kings	03	2018	500-yr	13.34	27.78	8.06	5519.61	5518.80	0.81
Kings	03	2175	100-yr	11.71	17.36	6.85	5527.03	5527.03	
Kings	03	2175	FW	11.70	17.33	6.87	5527.03	5527.03	0.00
Kings	03	2175	10-yr	7.89	2.42	2.48	5525.58	5527.03	-1.46
Kings	03	2175	25-yr	10.30	8.46	5.08	5526.22	5527.03	-0.81
Kings	03	2175	50-yr	10.93	12.32	6.01	5526.59	5527.03	-0.45
Kings	03	2175	500-yr	14.10	28.31	7.93	5527.89	5527.03	0.85
Kings	03	2268	100-yr	11.60	21.62	5.50	5530.26	5530.26	
Kings	03	2268	FW	11.59	21.64	5.50	5530.26	5530.26	0.00
Kings	03	2268	10-yr	8.92	3.05	1.97	5528.49	5530.26	-1.77
Kings	03	2268	25-yr	10.47	11.28	3.81	5529.33	5530.26	-0.94
Kings	03	2268	50-yr	11.00	15.96	4.64	5529.76	5530.26	-0.50
Kings	03	2268	500-yr	12.68	32.52	6.89	5531.16	5530.26	0.90
Kings	03	2330	100-yr	13.11	25.19	4.72	5531.56	5531.56	
Kings	03	2330	FW	13.11	25.19	4.72	5531.56	5531.56	0.00
Kings	03	2330	10-yr	9.26	3.51	1.71	5529.66	5531.56	-1.90
Kings	03	2330	25-yr	11.25	12.35	3.48	5530.51	5531.56	-1.05
Kings	03	2330	50-yr	12.11	17.99	4.11	5530.99	5531.56	-0.57
Kings	03	2330	500-yr	14.89	39.97	5.60	5532.62	5531.56	1.06
Kings	03	2396	100-yr	81.14	41.58	4.09	5537.54	5537.54	
Kings	03	2396	FW	30.00	29.85	5.70	5537.81	5537.54	0.27
Kings	03	2396	10-yr	24.13	1.88	1.60	5536.86	5537.54	-0.68
Kings	03	2396	25-yr	65.58	19.23	3.07	5537.23	5537.54	-0.31
Kings	03	2396	50-yr	71.07	28.77	3.68	5537.37	5537.54	-0.17
Kings	03	2396	500-yr	95.39	65.70	4.79	5537.81	5537.54	0.27

Kings	03	2444	100-yr	50.33	58.84	4.92	5541.18	5541.18	
Kings	03	2444	FW	25.00	28.51	5.96	5541.63	5541.18	0.45
Kings	03	2444	10-yr	14.34	2.03	1.91	5540.31	5541.18	-0.88
Kings	03	2444	25-yr	43.36	28.36	3.45	5540.80	5541.18	-0.38
Kings	03	2444	50-yr	45.08	42.18	4.26	5540.98	5541.18	-0.21
Kings	03	2444	500-yr	55.01	93.20	5.68	5541.58	5541.18	0.40
Kings	03	2504	100-yr	27.17	29.17	5.83	5545.32	5545.32	
Kings	03	2504	FW	6.00	17.59	9.67	5545.50	5545.32	0.18
Kings	03	2504	10-yr	3.52	1.55	1.93	5542.62	5545.32	-2.70
Kings	03	2504	25-yr	9.24	10.01	5.89	5544.01	5545.32	-1.31
Kings	03	2504	50-yr	12.02	16.24	6.53	5544.59	5545.32	-0.73
Kings	03	2504	500-yr	30.17	45.22	6.97	5545.88	5545.32	0.56
Kings	03	2628	100-yr	30.16	58.01	2.94	5550.40	5550.40	
Kings	03	2628	FW	20.00	61.05	2.78	5550.85	5550.40	0.46
Kings	03	2628	10-yr	11.25	3.07	0.98	5547.66	5550.40	-2.74
Kings	03	2628	25-yr	20.55	27.87	2.12	5549.17	5550.40	-1.22
Kings	03	2628	50-yr	23.88	41.97	2.53	5549.81	5550.40	-0.58
Kings	03	2628	500-yr	34.03	92.95	3.58	5551.34	5550.40	0.95
Kings	03	2724	100-yr	25.76	28.60	5.94	5555.95	5555.95	
Kings	03	2724	FW	11.00	21.27	7.99	5556.04	5555.95	0.08
Kings	03	2724	10-yr	5.73	1.16	2.59	5554.04	5555.95	-1.91
Kings	03	2724	25-yr	13.89	11.48	5.14	5555.07	5555.95	-0.88
Kings	03	2724	50-yr	19.78	19.20	5.52	5555.54	5555.95	-0.41
Kings	03	2724	500-yr	30.31	45.38	6.94	5556.55	5555.95	0.59
Kings	03	2821	100-yr	25.98	44.02	3.86	5562.95	5562.95	
Kings	03	2821	FW	14.00	38.98	4.36	5563.42	5562.95	0.46
Kings	03	2821	10-yr	9.71	2.81	1.07	5560.78	5562.95	-2.17
Kings	03	2821	25-yr	19.75	21.25	2.78	5561.96	5562.95	-0.99
Kings	03	2821	50-yr	23.07	31.85	3.33	5562.46	5562.95	-0.50
Kings	03	2821	500-yr	32.18	68.03	4.63	5563.78	5562.95	0.83
Kings	03	2900	100-yr	6.00	27.20	9.72	5571.46	5571.46	
Kings	03	2900	FW	6.00	17.49	9.72	5571.46	5571.46	0.00
Kings	03	2900	10-yr	3.76	1.04	2.88	5568.63	5571.46	-2.83
Kings	03	2900	25-yr	6.00	10.03	6.80	5569.99	5571.46	-1.47
Kings	03	2900	50-yr	6.00	17.16	8.23	5570.70	5571.46	-0.77
Kings	03	2900	500-yr	6.00	57.93	11.83	5572.98	5571.46	1.52
Kings	03	2920		Culvert					
Kings	03	2938	100-yr	48.43	94.46	2.41	5575.82	5575.82	
Kings	03	2938	FW	33.00	77.13	2.47	5576.17	5575.82	0.35
Kings	03	2938	10-yr	3.88	2.43	1.24	5571.05	5575.82	-4.76
Kings	03	2938	25-yr	8.50	29.99	2.39	5574.26	5575.82	-1.56
Kings	03	2938	50-yr	48.43	62.40	2.29	5575.32	5575.82	-0.50
Kings	03	2938	500-yr	58.64	149.25	2.79	5576.56	5575.82	0.74
Kings	03	2990	100-yr	28.46	56.08	3.03	5576.86	5576.86	
Kings	03	2990	FW	15.00	46.92	3.62	5577.19	5576.86	0.32
Kings	03	2990	10-yr	5.43	1.70	1.76	5573.53	5576.86	-3.33
Kings	03	2990	25-yr	17.15	23.01	2.56	5575.58	5576.86	-1.28
Kings	03	2990	50-yr	27.13	43.17	2.46	5576.40	5576.86	-0.46
Kings	03	2990	500-yr	30.83	79.31	3.97	5577.65	5576.86	0.78
Kings	03	3083	100-yr	26.00	38.93	4.37	5579.55	5579.55	
Kings	03	3083	FW	14.00	33.95	5.01	5580.00	5579.55	0.45
Kings	03	3083	10-yr	14.82	3.32	0.90	5577.81	5579.55	-1.75
Kings	03	3083	25-yr	20.27	18.58	3.17	5578.67	5579.55	-0.88
Kings	03	3083	50-yr	21.99	24.60	4.31	5578.95	5579.55	-0.60
Kings	03	3083	500-yr	35.68	69.47	4.53	5580.54	5579.55	0.99
Kings	03	3179	100-yr	27.99	34.39	4.94	5586.48	5586.48	
Kings	03	3179	FW	14.00	28.24	6.02	5586.82	5586.48	0.33
Kings	03	3179	10-yr	11.20	1.37	2.18	5584.87	5586.48	-1.62
Kings	03	3179	25-yr	21.51	16.20	3.64	5585.75	5586.48	-0.74
Kings	03	3179	50-yr	25.49	27.45	3.86	5586.22	5586.48	-0.26
Kings	03	3179	500-yr	34.50	47.91	6.57	5586.91	5586.48	0.43
Kings	03	3268	100-yr	9.14	21.01	8.37	5597.93	5597.93	
Kings	03	3268	FW	9.14	21.06	8.36	5597.94	5597.93	0.00
Kings	03	3268	10-yr	5.20	1.82	1.65	5595.54	5597.93	-2.39
Kings	03	3268	25-yr	7.95	9.71	6.07	5596.71	5597.93	-1.23
Kings	03	3268	50-yr	8.61	14.47	7.36	5597.27	5597.93	-0.67
Kings	03	3268	500-yr	10.00	41.52	10.00	5599.08	5597.93	1.15
Kings	03	3400		Culvert					
Kings	03	3459	100-yr	66.84	442.97	1.35	5613.54	5613.54	
Kings	03	3459	FW	20.00	195.28	1.54	5614.01	5613.54	0.47
Kings	03	3459	10-yr	2.49	1.59	1.89	5602.58	5613.54	-10.96
Kings	03	3459	25-yr	7.60	72.19	2.23	5606.58	5613.54	-6.96
Kings	03	3459	50-yr	10.00	387.11	1.22	5612.68	5613.54	-0.85
Kings	03	3459	500-yr	68.41	477.37	1.97	5614.05	5613.54	0.51
Kings	03	3575	100-yr	33.35	90.59	1.88	5614.12	5614.12	
Kings	03	3575	FW	20.00	79.70	2.13	5614.60	5614.12	0.48
Kings	03	3575	10-yr	13.80	2.84	1.05	5610.66	5614.12	-3.46
Kings	03	3575	25-yr	21.03	17.43	3.38	5611.48	5614.12	-2.64
Kings	03	3575	50-yr	29.07	57.42	1.85	5613.06	5614.12	-1.06
Kings	03	3575	500-yr	36.79	120.07	2.62	5614.96	5614.12	0.84
Kings	03	3674	100-yr	15.64	23.95	7.10	5616.47	5616.47	
Kings	03	3674	FW	8.00	19.20	8.85	5616.77	5616.47	0.30
Kings	03	3674	10-yr	6.56	2.30	1.30	5614.61	5616.47	-1.87
Kings	03	3674	25-yr	14.64	19.72	2.99	5616.19	5616.47	-0.28
Kings	03	3674	50-yr	13.83	16.76	6.33	5615.98	5616.47	-0.49
Kings	03	3674	500-yr	18.93	38.64	8.15	5617.33	5616.47	0.86
Kings_Split	1	105	100-yr	66.64	22.70	3.48	5493.34	5493.34	
Kings_Split	1	105	FW	66.64	23.90	3.31	5493.36	5493.34	0.02
Kings_Split	1	105	10-yr	22.72	1.85	1.62	5492.90	5493.34	-0.44
Kings_Split	1	105	25-yr	49.80	10.44	2.59	5493.13	5493.34	-0.21
Kings_Split	1	105	50-yr	59.24	16.37	2.99	5493.24	5493.34	-0.10
Kings_Split	1	105	500-yr	106.05	42.27	3.60	5493.56	5493.34	0.21
Kings_Split	1	150	100-yr	53.98	146.72	3.52	5497.63	5497.63	
Kings_Split	1	150	FW	39.01	19.59	4.03	5498.12	5497.63	0.49

Kings_Split	1	150	10-yr	5.28	28.51	2.62	5496.30	5497.63	-1.33
Kings_Split	1	150	25-yr	14.58	55.80	3.86	5496.94	5497.63	-0.69
Kings_Split	1	150	50-yr	16.54	80.48	4.50	5497.18	5497.63	-0.44
Kings_Split	1	150	500-yr	87.85	208.02	3.78	5497.90	5497.63	0.27
Kings_Split	1	222	100-yr	78.42	101.65	1.59	5501.53	5501.53	
Kings_Split	1	222	FW	30.00	43.41	1.82	5501.72	5501.53	0.19
Kings_Split	1	222	10-yr	23.21	10.51	0.59	5500.39	5501.53	-1.14
Kings_Split	1	222	25-yr	36.14	49.38	1.19	5500.93	5501.53	-0.60
Kings_Split	1	222	50-yr	39.30	71.69	1.46	5501.22	5501.53	-0.31
Kings_Split	1	222	500-yr	98.98	166.15	1.74	5501.93	5501.53	0.41
Kings_Split	1	308	100-yr	51.79	102.43	3.75	5506.90	5506.90	
Kings_Split	1	308	FW	30.00	17.97	4.40	5507.24	5506.90	0.34
Kings_Split	1	308	10-yr	19.95	37.19	1.74	5506.27	5506.90	-0.63
Kings_Split	1	308	25-yr	28.58	62.43	3.13	5506.54	5506.90	-0.37
Kings_Split	1	308	50-yr	31.48	79.64	3.61	5506.70	5506.90	-0.20
Kings_Split	1	308	500-yr	82.88	144.74	3.86	5507.19	5506.90	0.29
Kings_Split	1	416	100-yr	39.19	65.41	1.75	5512.59	5512.59	
Kings_Split	1	416	FW	28.07	42.87	1.95	5512.78	5512.59	0.19
Kings_Split	1	416	10-yr	21.58	5.32	0.56	5511.34	5512.59	-1.26
Kings_Split	1	416	25-yr	32.74	22.42	1.20	5511.98	5512.59	-0.61
Kings_Split	1	416	50-yr	38.42	37.21	1.46	5512.29	5512.59	-0.30
Kings_Split	1	416	500-yr	40.27	133.36	2.31	5513.11	5512.59	0.52
Kings_Split	1	523	100-yr	55.17	69.62	3.63	5519.66	5519.66	
Kings_Split	1	523	FW	26.07	17.30	4.57	5520.09	5519.66	0.43
Kings_Split	1	523	10-yr	7.85	10.82	2.34	5518.92	5519.66	-0.74
Kings_Split	1	523	25-yr	33.76	33.46	2.95	5519.38	5519.66	-0.28
Kings_Split	1	523	50-yr	45.58	51.06	3.24	5519.52	5519.66	-0.13
Kings_Split	1	523	500-yr	75.24	110.23	4.06	5519.89	5519.66	0.24
Kings_Split	1	597	100-yr	11.87	150.99	2.92	5524.58	5524.58	
Kings_Split	1	597	FW	10.00	27.88	2.83	5525.02	5524.58	0.45
Kings_Split	1	597	10-yr	8.42	3.68	0.84	5522.54	5524.58	-2.04
Kings_Split	1	597	25-yr	11.87	52.04	1.83	5523.54	5524.58	-1.03
Kings_Split	1	597	50-yr	11.87	97.93	2.37	5524.04	5524.58	-0.54
Kings_Split	1	597	500-yr	24.87	245.24	3.71	5525.51	5524.58	0.93
Kings_Split	1	701	100-yr	40.43	35.85	2.20	5528.13	5528.13	
Kings_Split	1	701	FW	20.00	29.34	2.69	5528.42	5528.13	0.29
Kings_Split	1	701	10-yr	21.25	2.22	1.35	5527.05	5528.13	-1.08
Kings_Split	1	701	25-yr	29.34	13.32	2.03	5527.48	5528.13	-0.65
Kings_Split	1	701	50-yr	34.25	22.87	2.14	5527.78	5528.13	-0.35
Kings_Split	1	701	500-yr	47.19	65.11	2.35	5528.77	5528.13	0.65
Kings_Split	1	775	100-yr	18.25	18.48	4.28	5533.39	5533.39	
Kings_Split	1	775	FW	10.00	14.76	5.35	5533.67	5533.39	0.29
Kings_Split	1	775	10-yr	10.91	1.42	2.11	5532.25	5533.39	-1.14
Kings_Split	1	775	25-yr	16.15	12.07	2.24	5533.01	5533.39	-0.37
Kings_Split	1	775	50-yr	17.29	15.61	3.14	5533.23	5533.39	-0.16
Kings_Split	1	775	500-yr	25.63	26.33	5.77	5533.76	5533.39	0.37
Madison_Split	1	45	100-yr	69.98	47.21	3.26	5282.49	5282.49	
Madison_Split	1	45	FW	23.00	25.62	6.01	5282.92	5282.49	0.43
Madison_Split	1	45	10-yr	8.14	1.60	2.51	5281.51	5282.49	-0.98
Madison_Split	1	45	25-yr	64.17	26.66	2.21	5282.18	5282.49	-0.31
Madison_Split	1	45	50-yr	65.07	35.49	2.70	5282.31	5282.49	-0.17
Madison_Split	1	45	500-yr	74.33	71.98	4.20	5282.83	5282.49	0.34
Madison_Split	1	163	100-yr	81.23	64.66	3.53	5283.43	5283.43	
Madison_Split	1	163	FW	25.00	34.14	6.68	5283.71	5283.43	0.29
Madison_Split	1	163	10-yr	23.11	3.28	1.22	5282.44	5283.43	-0.99
Madison_Split	1	163	25-yr	63.34	29.86	2.81	5282.97	5283.43	-0.46
Madison_Split	1	163	50-yr	79.22	45.20	3.16	5283.19	5283.43	-0.24
Madison_Split	1	163	500-yr	84.17	104.46	4.29	5283.91	5283.43	0.48
Madison_Split	1	252	100-yr	106.98	110.33	2.08	5283.94	5283.94	
Madison_Split	1	252	FW	25.00	52.25	4.36	5284.30	5283.94	0.35
Madison_Split	1	252	10-yr	28.77	7.54	0.53	5282.50	5283.94	-1.44
Madison_Split	1	252	25-yr	78.07	51.08	1.64	5283.31	5283.94	-0.63
Madison_Split	1	252	50-yr	89.55	75.81	1.89	5283.61	5283.94	-0.33
Madison_Split	1	252	500-yr	106.98	193.56	2.45	5284.62	5283.94	0.68
Madison_Split	1	346	100-yr	75.70	51.61	4.42	5284.15	5284.15	
Madison_Split	1	346	FW	25.00	34.13	6.68	5284.50	5284.15	0.35
Madison_Split	1	346	10-yr	28.84	2.79	1.43	5283.23	5284.15	-0.92
Madison_Split	1	346	25-yr	48.54	21.49	3.91	5283.70	5284.15	-0.45
Madison_Split	1	346	50-yr	68.33	35.64	4.01	5283.93	5284.15	-0.22
Madison_Split	1	346	500-yr	79.00	86.48	5.18	5284.60	5284.15	0.45
Quinn_St_Split	01	41	100-yr	90.49	97.69	6.14	5292.44	5292.44	
Quinn_St_Split	01	41	FW	40.00	76.79	7.81	5292.82	5292.44	0.38
Quinn_St_Split	01	41	10-yr	48.46	12.97	3.01	5291.21	5292.44	-1.23
Quinn_St_Split	01	41	25-yr	67.44	48.30	4.84	5291.81	5292.44	-0.63
Quinn_St_Split	01	41	50-yr	78.77	72.89	5.54	5292.15	5292.44	-0.29
Quinn_St_Split	01	41	500-yr	92.91	109.37	6.40	5292.56	5292.44	0.13
Quinn_St_Split	01	109	100-yr	92.62	119.73	5.01	5292.90	5292.90	
Quinn_St_Split	01	109	FW	45.00	93.44	6.42	5293.35	5292.90	0.45
Quinn_St_Split	01	109	10-yr	59.72	17.66	2.21	5291.62	5292.90	-1.28
Quinn_St_Split	01	109	25-yr	81.12	59.79	3.91	5292.23	5292.90	-0.68
Quinn_St_Split	01	109	50-yr	91.31	88.96	4.54	5292.57	5292.90	-0.33
Quinn_St_Split	01	109	500-yr	92.62	134.06	5.22	5293.06	5292.90	0.15
Quinn_St_Split	01	195	100-yr	92.49	98.31	6.10	5293.34	5293.34	
Quinn_St_Split	01	195	FW	40.00	75.98	7.90	5293.61	5293.34	0.27
Quinn_St_Split	01	195	10-yr	43.29	12.68	3.07	5292.02	5293.34	-1.32
Quinn_St_Split	01	195	25-yr	62.46	47.66	4.91	5292.71	5293.34	-0.63
Quinn_St_Split	01	195	50-yr	81.97	73.05	5.53	5293.05	5293.34	-0.28
Quinn_St_Split	01	195	500-yr	93.67	110.95	6.31	5293.47	5293.34	0.14
Quinn_St_Split	01	278	100-yr	76.10	93.39	6.42	5294.24	5294.24	
Quinn_St_Split	01	278	FW	40.00	76.11	7.88	5294.48	5294.24	0.25
Quinn_St_Split	01	278	10-yr	39.61	12.16	3.21	5292.86	5294.24	-1.37
Quinn_St_Split	01	278	25-yr	58.80	46.00	5.09	5293.52	5294.24	-0.72
Quinn_St_Split	01	278	50-yr	66.28	69.18	5.84	5293.89	5294.24	-0.35
Quinn_St_Split	01	278	500-yr	80.58	104.33	6.71	5294.37	5294.24	0.14
Quinn_St_Split	02	406	100-yr	66.47	73.02	6.15	5296.60	5296.60	

Quinn_St_Split	02	406	FW	33.00	59.76	7.51	5296.96	5296.60	0.36
Quinn_St_Split	02	406	10-yr	41.05	12.36	2.99	5295.47	5296.60	-1.13
Quinn_St_Split	02	406	25-yr	52.91	37.75	4.85	5296.01	5296.60	-0.59
Quinn_St_Split	02	406	50-yr	60.45	55.26	5.54	5296.32	5296.60	-0.28
Quinn_St_Split	02	406	500-yr	64.07	65.40	5.89	5296.48	5296.60	-0.12
Quinn_St_Split	02	488	100-yr	76.67	79.12	5.68	5298.61	5298.61	
Quinn_St_Split	02	488	FW	33.00	59.79	7.51	5299.06	5298.61	0.45
Quinn_St_Split	02	488	10-yr	41.88	12.26	3.02	5297.53	5298.61	-1.08
Quinn_St_Split	02	488	25-yr	59.84	38.62	4.74	5298.04	5298.61	-0.57
Quinn_St_Split	02	488	50-yr	74.03	58.50	5.23	5298.34	5298.61	-0.27
Quinn_St_Split	02	488	500-yr	75.74	70.19	5.49	5298.49	5298.61	-0.12
Skunk	01	25	100-yr	147.91	442.25	3.76	5245.56	5245.56	
Skunk	01	25	FW	80.00	327.49	4.37	5245.96	5245.56	0.40
Skunk	01	25	10-yr	75.85	149.03	2.94	5243.60	5245.56	-1.96
Skunk	01	25	25-yr	114.88	241.37	3.40	5244.57	5245.56	-0.99
Skunk	01	25	50-yr	145.59	322.94	3.52	5245.06	5245.56	-0.51
Skunk	01	25	500-yr	152.56	723.29	4.29	5246.46	5245.56	0.90
Skunk	01	109	100-yr	43.60	682.66	4.23	5246.24	5246.24	
Skunk	01	109	FW	42.00	353.54	4.04	5246.69	5246.24	0.45
Skunk	01	109	10-yr	38.55	248.97	1.80	5244.02	5246.24	-2.22
Skunk	01	109	25-yr	43.60	395.04	2.83	5245.15	5246.24	-1.09
Skunk	01	109	50-yr	43.60	514.95	3.43	5245.68	5246.24	-0.56
Skunk	01	109	500-yr	43.60	1027.94	5.78	5247.25	5246.24	1.01
Skunk	01	210		Culvert					
Skunk	01	286	100-yr	234.50	1134.67	2.82	5248.42	5248.42	
Skunk	01	286	FW	135.00	888.57	2.85	5248.90	5248.42	0.48
Skunk	01	286	10-yr	39.00	303.08	1.68	5244.24	5248.42	-4.19
Skunk	01	286	25-yr	39.00	513.21	2.50	5245.96	5248.42	-2.46
Skunk	01	286	50-yr	39.00	724.45	2.88	5247.12	5248.42	-1.30
Skunk	01	286	500-yr	424.28	1487.73	2.60	5249.30	5248.42	0.88
Skunk	01	378	100-yr	171.96	1050.37	1.36	5248.60	5248.60	
Skunk	01	378	FW	148.00	1050.84	1.36	5249.09	5248.60	0.49
Skunk	01	378	10-yr	126.38	377.96	1.16	5244.34	5248.60	-4.25
Skunk	01	378	25-yr	170.18	625.71	1.31	5246.13	5248.60	-2.47
Skunk	01	378	50-yr	171.96	828.28	1.30	5247.31	5248.60	-1.29
Skunk	01	378	500-yr	171.96	1205.62	1.83	5249.50	5248.60	0.90
Skunk	01	480	100-yr	153.07	800.33	1.79	5248.63	5248.63	
Skunk	01	480	FW	120.00	786.52	1.82	5249.12	5248.63	0.49
Skunk	01	480	10-yr	99.31	260.89	1.68	5244.43	5248.63	-4.20
Skunk	01	480	25-yr	129.03	464.85	1.77	5246.19	5248.63	-2.44
Skunk	01	480	50-yr	137.07	619.22	1.74	5247.35	5248.63	-1.28
Skunk	01	480	500-yr	177.85	958.55	2.31	5249.55	5248.63	0.92
Skunk	01	579	100-yr	119.79	675.99	2.12	5248.70	5248.70	
Skunk	01	579	FW	110.00	707.30	2.02	5249.18	5248.70	0.48
Skunk	01	579	10-yr	97.34	225.47	1.94	5244.64	5248.70	-4.06
Skunk	01	579	25-yr	109.95	402.15	2.04	5246.31	5248.70	-2.39
Skunk	01	579	50-yr	114.21	528.66	2.04	5247.44	5248.70	-1.26
Skunk	01	579	500-yr	147.50	795.78	2.78	5249.65	5248.70	0.95
Skunk	01	680	100-yr	135.67	705.28	2.03	5248.81	5248.81	
Skunk	01	680	FW	110.00	674.20	2.12	5249.26	5248.81	0.45
Skunk	01	680	10-yr	111.23	220.52	1.99	5244.92	5248.81	-3.89
Skunk	01	680	25-yr	123.18	406.16	2.02	5246.48	5248.81	-2.33
Skunk	01	680	50-yr	127.73	542.20	1.98	5247.57	5248.81	-1.24
Skunk	01	680	500-yr	154.50	847.18	2.61	5249.81	5248.81	1.00
Skunk	01	779	100-yr	153.98	661.12	2.16	5248.91	5248.91	
Skunk	01	779	FW	110.00	658.61	2.17	5249.36	5248.91	0.44
Skunk	01	779	10-yr	104.92	222.38	1.97	5245.22	5248.91	-3.70
Skunk	01	779	25-yr	114.29	381.44	2.15	5246.67	5248.91	-2.25
Skunk	01	779	50-yr	120.42	502.53	2.14	5247.70	5248.91	-1.21
Skunk	01	779	500-yr	160.00	826.09	2.68	5249.95	5248.91	1.03
Skunk	01	875	100-yr	151.61	627.98	2.28	5249.03	5249.03	
Skunk	01	875	FW	80.00	518.72	2.76	5249.45	5249.03	0.42
Skunk	01	875	10-yr	96.47	216.81	2.02	5245.51	5249.03	-3.53
Skunk	01	875	25-yr	113.04	363.12	2.26	5246.87	5249.03	-2.16
Skunk	01	875	50-yr	119.00	476.29	2.26	5247.85	5249.03	-1.18
Skunk	01	875	500-yr	160.00	797.43	2.77	5250.10	5249.03	1.06
Skunk	01	975	100-yr	119.70	547.48	2.61	5249.18	5249.18	
Skunk	01	975	FW	80.00	489.85	2.92	5249.62	5249.18	0.45
Skunk	01	975	10-yr	89.47	194.46	2.25	5245.85	5249.18	-3.33
Skunk	01	975	25-yr	101.80	315.73	2.60	5247.13	5249.18	-2.05
Skunk	01	975	50-yr	112.35	416.47	2.58	5248.04	5249.18	-1.13
Skunk	01	975	500-yr	146.71	694.08	3.19	5250.26	5249.18	1.09
Skunk	01	1073	100-yr	115.81	506.19	2.83	5249.38	5249.38	
Skunk	01	1073	FW	80.00	450.57	3.17	5249.83	5249.38	0.45
Skunk	01	1073	10-yr	91.20	179.32	2.44	5246.29	5249.38	-3.08
Skunk	01	1073	25-yr	106.47	296.12	2.77	5247.48	5249.38	-1.90
Skunk	01	1073	50-yr	110.04	385.59	2.79	5248.31	5249.38	-1.07
Skunk	01	1073	500-yr	136.20	644.03	3.43	5250.50	5249.38	1.12
Skunk	01	1173	100-yr	122.70	492.81	2.90	5249.64	5249.64	
Skunk	01	1173	FW	80.00	438.91	3.26	5250.09	5249.64	0.46
Skunk	01	1173	10-yr	93.96	186.22	2.35	5246.82	5249.64	-2.82
Skunk	01	1173	25-yr	102.94	293.33	2.80	5247.91	5249.64	-1.73
Skunk	01	1173	50-yr	117.03	373.68	2.88	5248.64	5249.64	-0.99
Skunk	01	1173	500-yr	133.54	639.06	3.46	5250.79	5249.64	1.15
Skunk	01	1273	100-yr	110.45	285.93	5.36	5250.01	5250.01	
Skunk	01	1273	FW	70.00	248.77	5.75	5250.40	5250.01	0.39
Skunk	01	1273	10-yr	66.41	74.49	5.88	5247.91	5250.01	-2.10
Skunk	01	1273	25-yr	87.42	132.05	6.27	5248.61	5250.01	-1.40
Skunk	01	1273	50-yr	94.23	187.99	5.92	5249.17	5250.01	-0.84
Skunk	01	1273	500-yr	110.45	429.54	5.67	5251.12	5250.01	1.11
Skunk	01	1373	100-yr	160.64	366.50	3.90	5251.50	5251.50	
Skunk	01	1373	FW	80.00	284.54	5.03	5251.82	5251.50	0.32
Skunk	01	1373	10-yr	112.70	175.74	2.49	5250.09	5251.50	-1.41
Skunk	01	1373	25-yr	132.41	258.24	3.18	5250.77	5251.50	-0.73
Skunk	01	1373	50-yr	147.27	301.72	3.57	5251.08	5251.50	-0.42

Skunk	01	1373		500-yr	166.02	508.65	4.35	5252.37	5251.50	0.87
Skunk	01	1473		100-yr	146.96	406.66	3.52	5252.33	5252.33	
Skunk	01	1473		FW	90.00	367.13	3.90	5252.78	5252.33	0.45
Skunk	01	1473		10-yr	109.84	198.24	2.21	5250.72	5252.33	-1.61
Skunk	01	1473		25-yr	131.44	287.69	2.85	5251.49	5252.33	-0.84
Skunk	01	1473		50-yr	140.76	339.98	3.16	5251.87	5252.33	-0.46
Skunk	01	1473		500-yr	150.35	533.29	4.15	5253.18	5252.33	0.85
Skunk	01	1572		100-yr	142.24	422.61	3.38	5252.93	5252.93	
Skunk	01	1572		FW	80.00	348.96	4.10	5253.33	5252.93	0.41
Skunk	01	1572		10-yr	113.06	208.63	2.10	5251.19	5252.93	-1.74
Skunk	01	1572		25-yr	121.95	306.73	2.68	5252.02	5252.93	-0.91
Skunk	01	1572		50-yr	125.30	358.23	3.00	5252.44	5252.93	-0.49
Skunk	01	1572		500-yr	177.97	566.77	3.90	5253.82	5252.93	0.90
Skunk	01	1675		100-yr	162.81	460.70	3.10	5253.44	5253.44	
Skunk	01	1675		FW	90.00	405.35	3.53	5253.91	5253.44	0.47
Skunk	01	1675		10-yr	105.23	207.65	2.11	5251.61	5253.44	-1.83
Skunk	01	1675		25-yr	137.63	314.24	2.61	5252.48	5253.44	-0.97
Skunk	01	1675		50-yr	150.98	379.17	2.84	5252.92	5253.44	-0.52
Skunk	01	1675		500-yr	191.88	620.73	3.56	5254.38	5253.44	0.93
Skunk	01	1802		100-yr	121.29	385.23	3.71	5254.07	5254.07	
Skunk	01	1802		FW	75.00	328.74	4.35	5254.49	5254.07	0.42
Skunk	01	1802		10-yr	104.79	180.49	2.43	5252.21	5254.07	-1.85
Skunk	01	1802		25-yr	109.57	274.20	2.99	5253.09	5254.07	-0.98
Skunk	01	1802		50-yr	112.92	324.31	3.32	5253.54	5254.07	-0.53
Skunk	01	1802		500-yr	166.66	519.42	4.26	5255.00	5254.07	0.94
Skunk	01	1918		100-yr	162.09	451.80	3.17	5254.79	5254.79	
Skunk	01	1918		FW	95.00	401.27	3.56	5255.22	5254.79	0.43
Skunk	01	1918		10-yr	106.35	188.15	2.33	5252.90	5254.79	-1.89
Skunk	01	1918		25-yr	141.02	299.36	2.74	5253.79	5254.79	-0.99
Skunk	01	1918		50-yr	155.29	365.49	2.94	5254.24	5254.79	-0.54
Skunk	01	1918		500-yr	178.72	618.78	3.57	5255.77	5254.79	0.98
Skunk	01	1982		100-yr	148.65	381.53	3.75	5255.13	5255.13	
Skunk	01	1982		FW	70.00	291.69	4.90	5255.50	5255.13	0.36
Skunk	01	1982		10-yr	99.09	164.89	2.66	5253.29	5255.13	-1.84
Skunk	01	1982		25-yr	111.16	257.03	3.19	5254.17	5255.13	-0.96
Skunk	01	1982		50-yr	129.87	308.36	3.49	5254.61	5255.13	-0.52
Skunk	01	1982		500-yr	167.95	532.19	4.15	5256.08	5255.13	0.95
Skunk	01	2034		100-yr	133.30	395.32	3.62	5255.52	5255.52	
Skunk	01	2034		FW	95.00	373.12	3.83	5256.02	5255.52	0.49
Skunk	01	2034		10-yr	112.45	171.09	2.56	5253.71	5255.52	-1.82
Skunk	01	2034		25-yr	122.99	272.13	3.02	5254.55	5255.52	-0.97
Skunk	01	2034		50-yr	126.15	327.41	3.29	5255.00	5255.52	-0.53
Skunk	01	2034		500-yr	173.44	537.40	4.11	5256.45	5255.52	0.92
Skunk	01	2084		100-yr	125.33	387.17	3.69	5255.85	5255.85	
Skunk	01	2084		FW	90.00	346.80	4.12	5256.30	5255.85	0.44
Skunk	01	2084		10-yr	112.52	178.12	2.46	5254.10	5255.85	-1.75
Skunk	01	2084		25-yr	119.03	270.25	3.04	5254.90	5255.85	-0.96
Skunk	01	2084		50-yr	122.00	322.40	3.34	5255.33	5255.85	-0.52
Skunk	01	2084		500-yr	153.90	510.66	4.33	5256.77	5255.85	0.91
Skunk	01	2184		100-yr	111.77	376.07	3.80	5256.51	5256.51	
Skunk	01	2184		FW	80.00	343.50	4.16	5256.95	5256.51	0.44
Skunk	01	2184		10-yr	99.69	188.06	2.33	5254.73	5256.51	-1.78
Skunk	01	2184		25-yr	104.91	270.60	3.03	5255.53	5256.51	-0.97
Skunk	01	2184		50-yr	107.81	317.34	3.39	5255.97	5256.51	-0.54
Skunk	01	2184		500-yr	140.62	493.66	4.48	5257.45	5256.51	0.94
Skunk	01	2280		100-yr	111.32	398.78	3.59	5257.10	5257.10	
Skunk	01	2280		FW	80.00	369.34	3.87	5257.52	5257.10	0.43
Skunk	01	2280		10-yr	96.35	200.13	2.19	5255.18	5257.10	-1.92
Skunk	01	2280		25-yr	103.03	287.30	2.86	5256.05	5257.10	-1.04
Skunk	01	2280		50-yr	106.37	336.59	3.20	5256.52	5257.10	-0.57
Skunk	01	2280		500-yr	151.10	531.33	4.16	5258.09	5257.10	0.99
Skunk	01	2342		100-yr	117.42	392.35	3.64	5257.42	5257.42	
Skunk	01	2342		FW	70.00	333.53	4.29	5257.82	5257.42	0.40
Skunk	01	2342		10-yr	92.79	191.58	2.29	5255.44	5257.42	-1.98
Skunk	01	2342		25-yr	99.73	279.15	2.94	5256.34	5257.42	-1.07
Skunk	01	2342		50-yr	103.54	328.49	3.28	5256.83	5257.42	-0.59
Skunk	01	2342		500-yr	137.34	522.56	4.23	5258.43	5257.42	1.01
Skunk	01	2388		100-yr	106.84	344.79	4.15	5257.64	5257.64	
Skunk	01	2388		FW	75.00	350.11	4.08	5258.10	5257.64	0.46
Skunk	01	2388		10-yr	72.95	165.26	2.65	5255.64	5257.64	-2.01
Skunk	01	2388		25-yr	86.45	238.38	3.44	5256.56	5257.64	-1.08
Skunk	01	2388		50-yr	98.80	284.28	3.78	5257.06	5257.64	-0.59
Skunk	01	2388		500-yr	116.12	458.38	4.82	5258.66	5257.64	1.01
Skunk	01	2445		100-yr	50.66	283.66	5.04	5258.00	5258.00	
Skunk	01	2445		FW	45.00	282.75	5.06	5258.39	5258.00	0.39
Skunk	01	2445		10-yr	48.96	177.67	2.47	5255.88	5258.00	-2.12
Skunk	01	2445		25-yr	49.92	226.92	3.62	5256.88	5258.00	-1.12
Skunk	01	2445		50-yr	50.39	252.98	4.25	5257.40	5258.00	-0.60
Skunk	01	2445		500-yr	50.80	335.88	6.60	5259.02	5258.00	1.01
Skunk	01	2490	BR D	100-yr	45.81	268.75	5.32	5257.98	5257.98	
Skunk	01	2490	BR D	FW	44.30	278.87	5.13	5258.38	5257.98	0.40
Skunk	01	2490	BR D	10-yr	45.81	172.44	2.54	5255.88	5257.98	-2.10
Skunk	01	2490	BR D	25-yr	45.81	217.82	3.77	5256.87	5257.98	-1.11
Skunk	01	2490	BR D	50-yr	45.81	241.40	4.46	5257.39	5257.98	-0.60
Skunk	01	2490	BR D	500-yr	45.81	314.11	7.04	5258.97	5257.98	0.99
Skunk	01	2490	BR U	100-yr	46.11	302.05	4.73	5258.81	5258.81	
Skunk	01	2490	BR U	FW	45.00	303.87	4.71	5258.99	5258.81	0.18
Skunk	01	2490	BR U	10-yr	46.11	181.06	2.42	5256.18	5258.81	-2.62
Skunk	01	2490	BR U	25-yr	46.11	236.40	3.47	5257.38	5258.81	-1.42
Skunk	01	2490	BR U	50-yr	46.11	266.17	4.04	5258.03	5258.81	-0.78
Skunk	01	2490	BR U	500-yr	46.10	367.54	6.02	5260.23	5258.81	1.42
Skunk	01	2541		100-yr	48.00	314.55	4.59	5258.84	5258.84	
Skunk	01	2541		FW	45.00	304.14	4.70	5258.99	5258.84	0.15
Skunk	01	2541		10-yr	47.89	184.44	2.38	5256.19	5258.84	-2.65
Skunk	01	2541		25-yr	48.00	243.13	3.39	5257.40	5258.84	-1.44

Skunk	01	2541	50-yr	48.00	275.23	3.93	5258.05	5258.84	-0.79
Skunk	01	2541	500-yr	48.00	388.15	5.80	5260.28	5258.84	1.45
Skunk	01	2560	100-yr	74.13	289.58	4.94	5258.93	5258.93	
Skunk	01	2560	FW	50.00	229.90	6.22	5258.98	5258.93	0.05
Skunk	01	2560	10-yr	62.94	96.11	4.56	5256.15	5258.93	-2.79
Skunk	01	2560	25-yr	69.55	181.74	4.52	5257.43	5258.93	-1.50
Skunk	01	2560	50-yr	71.48	229.65	4.69	5258.11	5258.93	-0.82
Skunk	01	2560	500-yr	87.38	418.54	5.28	5260.52	5258.93	1.59
Skunk	01	2591	100-yr	109.06	317.26	3.15	5259.40	5259.40	
Skunk	01	2591	FW	50.00	237.45	4.21	5259.63	5259.40	0.23
Skunk	01	2591	10-yr	58.60	102.19	3.75	5256.88	5259.40	-2.52
Skunk	01	2591	25-yr	81.64	176.00	3.59	5257.92	5259.40	-1.48
Skunk	01	2591	50-yr	94.19	232.97	3.41	5258.57	5259.40	-0.83
Skunk	01	2591	500-yr	138.32	513.72	3.11	5260.99	5259.40	1.58
Skunk	01	2638	100-yr	101.39	405.39	2.47	5259.62	5259.62	
Skunk	01	2638	FW	50.00	277.04	3.61	5259.93	5259.62	0.31
Skunk	01	2638	10-yr	78.83	200.56	1.91	5257.29	5259.62	-2.33
Skunk	01	2638	25-yr	86.39	280.36	2.25	5258.26	5259.62	-1.36
Skunk	01	2638	50-yr	90.51	332.92	2.38	5258.85	5259.62	-0.76
Skunk	01	2638	500-yr	162.65	594.55	2.69	5261.13	5259.62	1.52
Skunk	01	2688	100-yr	120.17	515.26	1.94	5259.73	5259.73	
Skunk	01	2688	FW	70.00	408.75	2.45	5260.16	5259.73	0.43
Skunk	01	2688	10-yr	99.80	261.26	1.47	5257.40	5259.73	-2.33
Skunk	01	2688	25-yr	107.06	362.27	1.74	5258.38	5259.73	-1.35
Skunk	01	2688	50-yr	112.08	427.43	1.86	5258.97	5259.73	-0.76
Skunk	01	2688	500-yr	170.98	730.71	2.19	5261.25	5259.73	1.52
Skunk	01	2740	100-yr	120.14	490.21	2.04	5259.80	5259.80	
Skunk	01	2740	FW	70.00	391.29	2.56	5260.24	5259.80	0.45
Skunk	01	2740	10-yr	101.10	233.24	1.64	5257.48	5259.80	-2.32
Skunk	01	2740	25-yr	109.56	335.52	1.88	5258.45	5259.80	-1.34
Skunk	01	2740	50-yr	114.75	401.96	1.98	5259.05	5259.80	-0.75
Skunk	01	2740	500-yr	199.23	712.16	2.25	5261.32	5259.80	1.52
Skunk	01	2794	100-yr	142.02	436.65	2.29	5259.88	5259.88	
Skunk	01	2794	FW	76.00	352.14	2.84	5260.34	5259.88	0.46
Skunk	01	2794	10-yr	104.15	168.21	2.28	5257.63	5259.88	-2.26
Skunk	01	2794	25-yr	117.18	274.21	2.30	5258.57	5259.88	-1.31
Skunk	01	2794	50-yr	121.91	343.18	2.31	5259.15	5259.88	-0.74
Skunk	01	2794	500-yr	197.29	703.36	2.27	5261.40	5259.88	1.51
Skunk	01	2906	100-yr	154.64	477.55	2.09	5260.12	5260.12	
Skunk	01	2906	FW	105.00	456.21	2.19	5260.62	5260.12	0.50
Skunk	01	2906	10-yr	123.90	207.69	1.84	5258.19	5260.12	-1.94
Skunk	01	2906	25-yr	134.17	307.32	2.05	5258.97	5260.12	-1.16
Skunk	01	2906	50-yr	149.40	378.15	2.10	5259.47	5260.12	-0.65
Skunk	01	2906	500-yr	172.98	712.67	2.25	5261.53	5260.12	1.41
Skunk	01	3022	100-yr	96.52	293.39	3.41	5260.40	5260.40	
Skunk	01	3022	FW	85.00	320.97	3.12	5260.85	5260.40	0.45
Skunk	01	3022	10-yr	85.75	143.90	2.66	5258.77	5260.40	-1.64
Skunk	01	3022	25-yr	90.38	202.49	3.12	5259.43	5260.40	-0.97
Skunk	01	3022	50-yr	93.05	241.23	3.29	5259.85	5260.40	-0.55
Skunk	01	3022	500-yr	106.68	426.84	3.75	5261.72	5260.40	1.32
Skunk	01	3126	100-yr	111.32	342.63	2.92	5260.98	5260.98	
Skunk	01	3126	FW	65.00	262.46	3.81	5261.29	5260.98	0.31
Skunk	01	3126	10-yr	100.87	179.11	2.14	5259.44	5260.98	-1.54
Skunk	01	3126	25-yr	105.66	247.01	2.55	5260.10	5260.98	-0.88
Skunk	01	3126	50-yr	108.26	288.70	2.75	5260.49	5260.98	-0.49
Skunk	01	3126	500-yr	119.86	486.76	3.29	5262.23	5260.98	1.25
Skunk	01	3234	100-yr	110.92	327.73	3.05	5261.46	5261.46	
Skunk	01	3234	FW	70.00	279.55	3.58	5261.90	5261.46	0.44
Skunk	01	3234	10-yr	97.25	171.63	2.23	5259.97	5261.46	-1.49
Skunk	01	3234	25-yr	103.98	237.78	2.65	5260.63	5261.46	-0.84
Skunk	01	3234	50-yr	107.14	277.62	2.86	5261.00	5261.46	-0.46
Skunk	01	3234	500-yr	120.18	464.94	3.44	5262.65	5261.46	1.19
Skunk	01	3336	100-yr	77.20	224.98	4.44	5262.06	5262.06	
Skunk	01	3336	FW	50.00	203.78	4.91	5262.48	5262.06	0.42
Skunk	01	3336	10-yr	65.16	122.50	3.13	5260.62	5262.06	-1.44
Skunk	01	3336	25-yr	70.21	166.80	3.78	5261.27	5262.06	-0.79
Skunk	01	3336	50-yr	73.07	192.77	4.12	5261.63	5262.06	-0.43
Skunk	01	3336	500-yr	87.81	315.31	5.07	5263.16	5262.06	1.10
Skunk	01	3385	100-yr	64.61	208.78	4.79	5262.56	5262.56	
Skunk	01	3385	FW	45.00	193.09	5.18	5262.94	5262.56	0.38
Skunk	01	3385	10-yr	55.70	118.88	3.22	5261.05	5262.56	-1.51
Skunk	01	3385	25-yr	58.59	158.18	3.99	5261.74	5262.56	-0.82
Skunk	01	3385	50-yr	61.50	181.09	4.38	5262.12	5262.56	-0.44
Skunk	01	3385	500-yr	69.39	280.75	5.70	5263.63	5262.56	1.07
Skunk	01	3428	100-yr	28.00	159.95	5.77	5262.92	5262.92	
Skunk	01	3428	FW	28.00	155.56	5.30	5263.37	5262.92	0.45
Skunk	01	3428	10-yr	28.00	107.06	3.70	5261.34	5262.92	-1.58
Skunk	01	3428	25-yr	28.00	131.04	4.69	5262.07	5262.92	-0.85
Skunk	01	3428	50-yr	28.00	144.61	5.16	5262.47	5262.92	-0.45
Skunk	01	3428	500-yr	28.00	197.72	6.99	5263.99	5262.92	1.07
Skunk	01	3540		Culvert					
Skunk	01	3629	100-yr	28.00	188.84	4.75	5266.87	5266.87	
Skunk	01	3629	FW	28.00	173.56	4.75	5266.87	5266.87	0.00
Skunk	01	3629	10-yr	27.62	101.71	3.77	5264.13	5266.87	-2.75
Skunk	01	3629	25-yr	28.00	140.06	4.25	5265.37	5266.87	-1.51
Skunk	01	3629	50-yr	28.00	161.84	4.47	5266.05	5266.87	-0.82
Skunk	01	3629	500-yr	29.00	260.10	5.31	5268.77	5266.87	1.89
Skunk	01	3722	100-yr	79.58	252.81	3.68	5268.78	5268.78	
Skunk	01	3722	FW	40.00	172.95	4.76	5268.92	5268.78	0.13
Skunk	01	3722	10-yr	47.00	87.67	4.16	5266.71	5268.78	-2.07
Skunk	01	3722	25-yr	65.92	146.04	3.94	5267.67	5268.78	-1.11
Skunk	01	3722	50-yr	73.71	190.61	3.80	5268.17	5268.78	-0.62
Skunk	01	3722	500-yr	95.77	433.17	3.36	5270.33	5268.78	1.54
Skunk	01	3812	100-yr	102.63	325.85	2.53	5269.77	5269.77	

Skunk	01	3812	FW	60.00	254.40	3.24	5270.21	5269.77	0.44
Skunk	01	3812	10-yr	92.20	178.78	2.04	5268.27	5269.77	-1.51
Skunk	01	3812	25-yr	97.47	244.16	2.29	5268.96	5269.77	-0.82
Skunk	01	3812	50-yr	99.67	279.68	2.41	5269.32	5269.77	-0.46
Skunk	01	3812	500-yr	111.16	456.53	2.64	5271.00	5269.77	1.22
Skunk	01	3882	100-yr	89.26	124.13	6.64	5272.09	5272.09	
Skunk	01	3882	FW	60.00	108.70	7.58	5272.28	5272.09	0.19
Skunk	01	3882	10-yr	77.48	69.07	5.28	5271.43	5272.09	-0.66
Skunk	01	3882	25-yr	82.80	92.88	6.01	5271.72	5272.09	-0.36
Skunk	01	3882	50-yr	86.43	107.99	6.23	5271.90	5272.09	-0.18
Skunk	01	3882	500-yr	103.72	167.95	7.19	5272.54	5272.09	0.46
Skunk	01	3940	100-yr	138.59	194.29	4.24	5276.79	5276.79	
Skunk	01	3940	FW	70.00	153.38	5.37	5277.05	5276.79	0.26
Skunk	01	3940	10-yr	116.05	113.20	3.22	5276.16	5276.79	-0.63
Skunk	01	3940	25-yr	129.28	151.03	3.69	5276.47	5276.79	-0.32
Skunk	01	3940	50-yr	133.20	169.49	3.97	5276.61	5276.79	-0.18
Skunk	01	3940	500-yr	150.87	251.51	4.80	5277.19	5276.79	0.40
Skunk	01	4009	100-yr	180.23	231.36	4.59	5278.41	5278.41	
Skunk	01	4009	FW	95.00	147.76	5.58	5278.55	5278.41	0.14
Skunk	01	4009	10-yr	115.38	95.76	4.35	5277.76	5278.41	-0.65
Skunk	01	4009	25-yr	148.71	153.09	4.51	5278.08	5278.41	-0.33
Skunk	01	4009	50-yr	172.32	185.68	4.57	5278.22	5278.41	-0.18
Skunk	01	4009	500-yr	195.11	323.97	4.90	5278.76	5278.41	0.35
Skunk	02	4139	100-yr	146.46	193.59	4.30	5279.83	5279.83	
Skunk	02	4139	FW	85.00	158.19	4.38	5280.11	5279.83	0.28
Skunk	02	4139	10-yr	129.04	138.42	2.64	5279.54	5279.83	-0.29
Skunk	02	4139	25-yr	138.74	159.91	3.41	5279.66	5279.83	-0.17
Skunk	02	4139	50-yr	143.49	177.47	3.77	5279.75	5279.83	-0.08
Skunk	02	4139	500-yr	151.24	245.91	5.07	5280.09	5279.83	0.25
Skunk	02	4252	100-yr	97.87	250.72	4.23	5281.39	5281.39	
Skunk	02	4252	FW	40.00	140.09	4.95	5281.77	5281.39	0.38
Skunk	02	4252	10-yr	61.30	122.67	3.01	5280.63	5281.39	-0.76
Skunk	02	4252	25-yr	71.81	172.15	3.57	5280.99	5281.39	-0.40
Skunk	02	4252	50-yr	83.07	203.19	3.92	5281.17	5281.39	-0.22
Skunk	02	4252	500-yr	105.00	346.88	4.98	5281.77	5281.39	0.38
Skunk	02	4364	100-yr	57.16	775.46	4.02	5282.63	5282.63	
Skunk	02	4364	FW	55.00	194.16	3.57	5283.03	5282.63	0.41
Skunk	02	4364	10-yr	52.54	308.72	2.68	5281.64	5282.63	-0.98
Skunk	02	4364	25-yr	54.77	530.18	3.22	5282.12	5282.63	-0.51
Skunk	02	4364	50-yr	56.14	650.68	3.56	5282.37	5282.63	-0.26
Skunk	02	4364	500-yr	59.08	1017.01	5.03	5283.11	5282.63	0.48
Skunk	02	4430		Culvert					
Skunk	02	4448	100-yr	116.70	434.73	3.11	5284.07	5284.07	
Skunk	02	4448	FW	65.00	281.05	3.43	5284.52	5284.07	0.44
Skunk	02	4448	10-yr	82.45	222.98	2.12	5282.83	5284.07	-1.24
Skunk	02	4448	25-yr	107.76	317.49	2.54	5283.44	5284.07	-0.63
Skunk	02	4448	50-yr	115.15	373.44	2.77	5283.75	5284.07	-0.32
Skunk	02	4448	500-yr	116.70	553.93	4.01	5284.66	5284.07	0.59
Skunk	02	4489	100-yr	128.12	405.89	3.88	5284.21	5284.21	
Skunk	02	4489	FW	50.00	196.34	4.87	5284.66	5284.21	0.45
Skunk	02	4489	10-yr	72.53	162.65	3.00	5282.99	5284.21	-1.22
Skunk	02	4489	25-yr	87.32	261.64	3.50	5283.57	5284.21	-0.64
Skunk	02	4489	50-yr	128.12	324.45	3.69	5283.87	5284.21	-0.34
Skunk	02	4489	500-yr	128.12	594.06	4.39	5284.97	5284.21	0.76
Skunk	02	4511	100-yr	215.52	473.81	3.86	5284.38	5284.38	
Skunk	02	4511	FW	35.00	163.13	7.26	5284.53	5284.38	0.16
Skunk	02	4511	10-yr	61.94	167.03	2.98	5283.15	5284.38	-1.23
Skunk	02	4511	25-yr	142.65	259.82	3.88	5283.68	5284.38	-0.70
Skunk	02	4511	50-yr	183.68	341.05	3.96	5283.98	5284.38	-0.40
Skunk	02	4511	500-yr	228.27	838.08	3.66	5285.41	5284.38	1.03
Skunk	02	4550		Culvert					
Skunk	02	4594	100-yr	168.03	1070.19	3.15	5286.58	5286.58	
Skunk	02	4594	FW	103.09	520.61	3.15	5286.79	5286.58	0.21
Skunk	02	4594	10-yr	70.77	437.33	2.07	5284.83	5286.58	-1.74
Skunk	02	4594	25-yr	104.93	739.50	2.55	5285.72	5286.58	-0.86
Skunk	02	4594	50-yr	125.28	892.46	2.83	5286.14	5286.58	-0.44
Skunk	02	4594	500-yr	233.33	1420.21	3.76	5287.30	5286.58	0.72
Skunk	02	4662	100-yr	115.90	913.41	3.89	5287.44	5287.44	
Skunk	02	4662	FW	84.02	425.77	4.39	5287.56	5287.44	0.12
Skunk	02	4662	10-yr	48.87	305.85	3.74	5285.28	5287.44	-2.16
Skunk	02	4662	25-yr	97.46	580.40	3.68	5286.35	5287.44	-1.09
Skunk	02	4662	50-yr	113.43	736.46	3.72	5286.87	5287.44	-0.57
Skunk	02	4662	500-yr	209.12	1307.75	4.00	5288.51	5287.44	1.07
Skunk	02	4748	100-yr	314.70	1468.87	1.25	5288.24	5288.24	
Skunk	02	4748	FW	130.00	663.86	1.79	5288.48	5288.24	0.23
Skunk	02	4748	10-yr	191.87	549.64	1.07	5285.93	5288.24	-2.31
Skunk	02	4748	25-yr	265.58	950.42	1.11	5287.09	5288.24	-1.16
Skunk	02	4748	50-yr	285.44	1176.29	1.17	5287.62	5288.24	-0.62
Skunk	02	4748	500-yr	323.69	2040.24	1.48	5289.40	5288.24	1.15
Skunk	02	4848	100-yr	205.35	553.77	2.14	5288.52	5288.52	
Skunk	02	4848	FW	70.00	358.52	3.31	5288.80	5288.52	0.28
Skunk	02	4848	10-yr	98.98	191.76	1.99	5286.23	5288.52	-2.28
Skunk	02	4848	25-yr	171.60	334.65	2.04	5287.37	5288.52	-1.15
Skunk	02	4848	50-yr	192.48	428.67	2.08	5287.89	5288.52	-0.63
Skunk	02	4848	500-yr	233.71	808.84	2.42	5289.67	5288.52	1.16
Skunk	02	4911	100-yr	170.42	410.26	2.89	5288.91	5288.91	
Skunk	02	4911	FW	77.00	312.56	3.79	5289.31	5288.91	0.40
Skunk	02	4911	10-yr	68.67	119.33	3.19	5286.68	5288.91	-2.23
Skunk	02	4911	25-yr	143.58	228.80	2.98	5287.77	5288.91	-1.14
Skunk	02	4911	50-yr	160.58	308.00	2.89	5288.29	5288.91	-0.62
Skunk	02	4911	500-yr	195.32	628.96	3.11	5290.09	5288.91	1.18
Skunk	02	4999	100-yr	53.31	175.43	6.75	5290.00	5290.00	
Skunk	02	4999	FW	30.00	163.66	7.24	5290.49	5290.00	0.49
Skunk	02	4999	10-yr	32.67	93.76	4.06	5288.11	5290.00	-1.90

Skunk	02	4999	25-yr	45.57	132.22	5.16	5289.10	5290.00	-0.90
Skunk	02	4999	50-yr	46.88	151.95	5.86	5289.53	5290.00	-0.47
Skunk	02	4999	500-yr	82.37	236.74	8.26	5290.92	5290.00	0.92
Skunk	03	5039	100-yr	132.11	377.72	1.15	5291.26	5291.26	
Skunk	03	5039	FW	60.00	272.45	1.34	5291.73	5291.26	0.46
Skunk	03	5039	10-yr	45.65	95.29	2.74	5288.76	5291.26	-2.51
Skunk	03	5039	25-yr	83.92	199.11	1.71	5289.97	5291.26	-1.30
Skunk	03	5039	50-yr	98.21	270.57	1.39	5290.55	5291.26	-0.71
Skunk	03	5039	500-yr	162.97	658.01	0.87	5292.77	5291.26	1.50
Skunk	03	5075		Culvert					
Skunk	03	5099	100-yr	202.26	451.31	1.02	5291.28	5291.28	
Skunk	03	5099	FW	66.00	263.37	1.38	5291.78	5291.28	0.50
Skunk	03	5099	10-yr	63.21	127.97	2.08	5289.64	5291.28	-1.65
Skunk	03	5099	25-yr	124.89	200.49	1.74	5290.23	5291.28	-1.05
Skunk	03	5099	50-yr	161.92	273.78	1.42	5290.59	5291.28	-0.70
Skunk	03	5099	500-yr	243.64	883.89	0.70	5292.78	5291.28	1.50
Skunk	03	5190	100-yr	115.35	176.95	2.06	5291.55	5291.55	
Skunk	03	5190	FW	28.18	125.89	2.89	5292.04	5291.55	0.49
Skunk	03	5190	10-yr	37.77	82.36	3.17	5290.45	5291.55	-1.10
Skunk	03	5190	25-yr	82.00	108.82	2.80	5290.86	5291.55	-0.69
Skunk	03	5190	50-yr	91.76	127.49	2.55	5291.07	5291.55	-0.48
Skunk	03	5190	500-yr	130.30	337.92	1.41	5292.87	5291.55	1.32
Skunk	03	5285	100-yr	187.60	305.12	1.22	5292.08	5292.08	
Skunk	03	5285	FW	90.00	242.52	1.50	5292.57	5292.08	0.49
Skunk	03	5285	10-yr	156.70	181.52	1.45	5291.41	5292.08	-0.67
Skunk	03	5285	25-yr	170.46	227.24	1.36	5291.67	5292.08	-0.41
Skunk	03	5285	50-yr	179.15	250.62	1.32	5291.80	5292.08	-0.28
Skunk	03	5285	500-yr	197.93	509.34	0.97	5293.09	5292.08	1.01
Skunk	03	5380	100-yr	133.08	176.88	2.06	5292.58	5292.58	
Skunk	03	5380	FW	50.00	126.33	2.88	5293.04	5292.58	0.46
Skunk	03	5380	10-yr	101.09	122.35	2.13	5292.14	5292.58	-0.44
Skunk	03	5380	25-yr	125.83	143.37	2.13	5292.32	5292.58	-0.26
Skunk	03	5380	50-yr	128.65	154.12	2.11	5292.41	5292.58	-0.17
Skunk	03	5380	500-yr	187.55	298.05	1.60	5293.31	5292.58	0.73
Skunk	03	5469	100-yr	86.96	133.09	2.73	5293.48	5293.48	
Skunk	03	5469	FW	31.19	113.07	3.22	5293.95	5293.48	0.47
Skunk	03	5469	10-yr	65.37	99.52	2.62	5293.04	5293.48	-0.43
Skunk	03	5469	25-yr	77.67	114.26	2.67	5293.25	5293.48	-0.23
Skunk	03	5469	50-yr	80.85	120.76	2.69	5293.33	5293.48	-0.15
Skunk	03	5469	500-yr	101.57	173.48	2.76	5293.90	5293.48	0.43
Skunk	03	5536	100-yr	45.05	88.02	4.14	5294.39	5294.39	
Skunk	03	5536	FW	15.00	75.04	4.85	5294.81	5294.39	0.42
Skunk	03	5536	10-yr	23.45	70.31	3.71	5293.90	5294.39	-0.49
Skunk	03	5536	25-yr	40.50	76.71	3.98	5294.13	5294.39	-0.26
Skunk	03	5536	50-yr	42.37	80.58	4.03	5294.22	5294.39	-0.17
Skunk	03	5536	500-yr	55.38	109.35	4.37	5294.81	5294.39	0.42
Skunk	03	5602	100-yr	27.90	99.90	3.64	5295.50	5295.50	
Skunk	03	5602	FW	20.00	102.82	3.54	5295.94	5295.50	0.45
Skunk	03	5602	10-yr	24.02	82.66	3.16	5294.82	5295.50	-0.67
Skunk	03	5602	25-yr	25.40	90.50	3.37	5295.14	5295.50	-0.35
Skunk	03	5602	50-yr	26.33	93.84	3.46	5295.27	5295.50	-0.22
Skunk	03	5602	500-yr	39.81	120.47	3.97	5296.06	5295.50	0.56
Skunk	03	5656	100-yr	23.16	80.75	4.51	5296.30	5296.30	
Skunk	03	5656	FW	15.00	78.53	4.64	5296.61	5296.30	0.31
Skunk	03	5656	10-yr	19.12	64.87	4.02	5295.54	5296.30	-0.76
Skunk	03	5656	25-yr	20.68	72.14	4.23	5295.91	5296.30	-0.40
Skunk	03	5656	50-yr	21.28	75.13	4.33	5296.05	5296.30	-0.25
Skunk	03	5656	500-yr	24.78	98.48	4.99	5296.93	5296.30	0.63
Skunk	03	5700		Culvert					
Skunk	03	5737	100-yr	27.61	108.04	3.54	5298.39	5298.39	
Skunk	03	5737	FW	27.62	105.67	3.44	5298.50	5298.39	0.10
Skunk	03	5737	10-yr	19.95	71.66	3.64	5297.02	5298.39	-1.38
Skunk	03	5737	25-yr	22.16	86.20	3.54	5297.71	5298.39	-0.69
Skunk	03	5737	50-yr	23.63	92.77	3.50	5297.99	5298.39	-0.40
Skunk	03	5737	500-yr	90.47	147.09	3.25	5298.89	5298.39	0.50
Skunk	04	5788	100-yr	29.59	135.29	2.69	5299.00	5299.00	
Skunk	04	5788	FW	29.59	137.29	2.65	5299.07	5299.00	0.07
Skunk	04	5788	10-yr	26.09	101.12	2.58	5297.76	5299.00	-1.24
Skunk	04	5788	25-yr	27.46	117.06	2.61	5298.36	5299.00	-0.64
Skunk	04	5788	50-yr	28.10	124.10	2.62	5298.61	5299.00	-0.39
Skunk	04	5788	500-yr	31.31	148.99	3.21	5299.45	5299.00	0.45
Skunk	04	5845	100-yr	32.00	122.23	2.98	5299.34	5299.34	
Skunk	04	5845	FW	32.00	123.95	2.94	5299.40	5299.34	0.05
Skunk	04	5845	10-yr	26.94	87.59	2.98	5298.17	5299.34	-1.18
Skunk	04	5845	25-yr	29.18	103.14	2.96	5298.72	5299.34	-0.62
Skunk	04	5845	50-yr	30.22	110.27	2.95	5298.96	5299.34	-0.38
Skunk	04	5845	500-yr	34.60	140.69	3.40	5299.90	5299.34	0.55
Skunk	04	5935	100-yr	26.62	83.63	4.35	5300.35	5300.35	
Skunk	04	5935	FW	26.62	84.08	4.33	5300.36	5300.35	0.02
Skunk	04	5935	10-yr	23.33	60.93	4.28	5299.43	5300.35	-0.91
Skunk	04	5935	25-yr	24.62	70.60	4.32	5299.84	5300.35	-0.51
Skunk	04	5935	50-yr	25.19	75.04	4.33	5300.02	5300.35	-0.33
Skunk	04	5935	500-yr	31.18	117.73	4.64	5301.03	5300.35	0.68
Skunk	04	6023	100-yr	26.73	130.49	4.12	5302.14	5302.14	
Skunk	04	6023	FW	26.69	88.41	4.12	5302.14	5302.14	0.00
Skunk	04	6023	10-yr	23.95	81.32	3.74	5301.41	5302.14	-0.73
Skunk	04	6023	25-yr	25.13	101.71	3.92	5301.73	5302.14	-0.41
Skunk	04	6023	50-yr	25.67	110.98	4.00	5301.87	5302.14	-0.27
Skunk	04	6023	500-yr	29.77	184.61	4.44	5302.83	5302.14	0.69
Skunk	04	6060	100-yr	31.85	203.79	3.66	5302.83	5302.83	
Skunk	04	6060	FW	31.84	99.47	3.66	5302.83	5302.83	0.00
Skunk	04	6060	10-yr	29.81	117.55	3.40	5302.10	5302.83	-0.74
Skunk	04	6060	25-yr	30.80	151.69	3.52	5302.42	5302.83	-0.41
Skunk	04	6060	50-yr	31.23	168.86	3.57	5302.57	5302.83	-0.27

Skunk	04	6060		500-yr	33.26	296.26	3.92	5303.52	5302.83	0.69
Skunk	04	6070	BR D	100-yr	31.20	103.74	3.51	5302.98	5302.98	
Skunk	04	6070	BR D	FW	31.20	103.71	3.51	5302.97	5302.98	0.00
Skunk	04	6070	BR D	10-yr	30.15	81.42	3.21	5302.25	5302.98	-0.72
Skunk	04	6070	BR D	25-yr	31.00	91.21	3.34	5302.57	5302.98	-0.40
Skunk	04	6070	BR D	50-yr	31.20	95.56	3.40	5302.71	5302.98	-0.26
Skunk	04	6070	BR D	500-yr	31.20	124.97	3.83	5303.66	5302.98	0.68
Skunk	04	6070	BR U	100-yr	17.00	80.57	4.52	5303.06	5303.06	
Skunk	04	6070	BR U	FW	17.00	80.56	4.52	5303.06	5303.06	0.00
Skunk	04	6070	BR U	10-yr	17.00	68.66	3.80	5302.36	5303.06	-0.70
Skunk	04	6070	BR U	25-yr	17.00	73.98	4.12	5302.67	5303.06	-0.39
Skunk	04	6070	BR U	50-yr	17.00	76.28	4.26	5302.81	5303.06	-0.25
Skunk	04	6070	BR U	500-yr	17.00	91.71	5.21	5303.71	5303.06	0.66
Skunk	04	6087		100-yr	17.00	227.38	4.32	5303.28	5303.28	
Skunk	04	6087		FW	17.00	84.29	4.32	5303.28	5303.28	0.00
Skunk	04	6087		10-yr	17.00	140.56	3.65	5302.53	5303.28	-0.75
Skunk	04	6087		25-yr	17.00	178.75	3.95	5302.86	5303.28	-0.41
Skunk	04	6087		50-yr	17.00	195.45	4.08	5303.01	5303.28	-0.27
Skunk	04	6087		500-yr	17.00	318.06	4.96	5303.98	5303.28	0.71
Skunk	04	6158		100-yr	25.48	265.06	3.70	5304.40	5304.40	
Skunk	04	6158		FW	25.48	98.44	3.70	5304.40	5304.40	0.00
Skunk	04	6158		10-yr	22.16	154.79	3.40	5303.49	5304.40	-0.91
Skunk	04	6158		25-yr	23.63	200.87	3.54	5303.90	5304.40	-0.50
Skunk	04	6158		50-yr	24.28	221.63	3.60	5304.07	5304.40	-0.33
Skunk	04	6158		500-yr	32.98	410.96	3.88	5305.28	5304.40	0.88
Skunk	04	6254		100-yr	32.30	117.51	3.10	5305.50	5305.50	
Skunk	04	6254		FW	32.30	117.51	3.10	5305.50	5305.50	0.00
Skunk	04	6254		10-yr	28.94	90.02	2.90	5304.60	5305.50	-0.90
Skunk	04	6254		25-yr	30.34	101.99	2.99	5305.01	5305.50	-0.50
Skunk	04	6254		50-yr	30.94	107.28	3.03	5305.18	5305.50	-0.32
Skunk	04	6254		500-yr	44.57	173.04	3.21	5306.38	5305.50	0.88
Skunk	04	6330		100-yr	20.02	76.49	4.76	5306.43	5306.43	
Skunk	04	6330		FW	20.02	76.49	4.76	5306.43	5306.43	0.00
Skunk	04	6330		10-yr	17.31	60.56	4.31	5305.58	5306.43	-0.85
Skunk	04	6330		25-yr	18.49	67.39	4.53	5305.96	5306.43	-0.47
Skunk	04	6330		50-yr	19.01	70.47	4.61	5306.13	5306.43	-0.31
Skunk	04	6330		500-yr	23.23	94.55	5.06	5307.28	5306.43	0.84
Skunk	04	6423		100-yr	28.85	94.71	3.84	5308.38	5308.38	
Skunk	04	6423		FW	28.85	94.71	3.84	5308.38	5308.38	0.00
Skunk	04	6423		10-yr	26.11	71.63	3.64	5307.54	5308.38	-0.84
Skunk	04	6423		25-yr	27.37	81.73	3.73	5307.92	5308.38	-0.46
Skunk	04	6423		50-yr	27.89	86.20	3.77	5308.08	5308.38	-0.30
Skunk	04	6423		500-yr	31.86	119.45	4.00	5309.20	5308.38	0.82
Skunk	04	6479		100-yr	24.24	85.22	4.27	5309.33	5309.33	
Skunk	04	6479		FW	24.24	85.22	4.27	5309.33	5309.33	0.00
Skunk	04	6479		10-yr	21.64	67.40	3.87	5308.55	5309.33	-0.78
Skunk	04	6479		25-yr	22.79	75.13	4.06	5308.90	5309.33	-0.43
Skunk	04	6479		50-yr	23.29	78.57	4.14	5309.05	5309.33	-0.28
Skunk	04	6479		500-yr	26.98	104.75	4.56	5310.09	5309.33	0.76
Skunk	04	6532		100-yr	16.00	91.24	10.43	5311.12	5311.12	
Skunk	04	6532		FW	14.00	86.30	10.41	5311.41	5311.12	0.29
Skunk	04	6532		10-yr	14.69	62.91	4.45	5309.53	5311.12	-1.59
Skunk	04	6532		25-yr	15.43	75.33	7.13	5310.27	5311.12	-0.85
Skunk	04	6532		50-yr	15.87	82.96	8.92	5310.69	5311.12	-0.43
Skunk	04	6532		500-yr	31.39	131.13	11.15	5312.48	5311.12	1.36
Skunk	04	6570			Culvert					
Skunk	04	6605		100-yr	83.91	277.90	3.47	5314.91	5314.91	
Skunk	04	6605		FW	65.00	272.77	3.51	5315.24	5314.91	0.33
Skunk	04	6605		10-yr	51.81	111.34	2.93	5312.54	5314.91	-2.37
Skunk	04	6605		25-yr	76.16	193.00	2.96	5313.88	5314.91	-1.04
Skunk	04	6605		50-yr	81.73	237.83	3.21	5314.44	5314.91	-0.47
Skunk	04	6605		500-yr	83.91	389.91	4.04	5316.05	5314.91	1.14
Skunk	04	6636		100-yr	52.37	217.11	4.19	5315.06	5315.06	
Skunk	04	6636		FW	30.00	205.85	4.36	5315.38	5315.06	0.32
Skunk	04	6636		10-yr	31.91	130.36	2.11	5312.75	5315.06	-2.31
Skunk	04	6636		25-yr	35.25	174.50	3.00	5314.03	5315.06	-1.03
Skunk	04	6636		50-yr	38.52	195.94	3.65	5314.60	5315.06	-0.46
Skunk	04	6636		500-yr	62.78	281.06	5.16	5316.15	5315.06	1.09
Skunk	04	6666		100-yr	50.56	255.44	3.74	5315.26	5315.26	
Skunk	04	6666		FW	25.00	195.22	4.60	5315.53	5315.26	0.27
Skunk	04	6666		10-yr	34.73	140.34	1.95	5312.82	5315.26	-2.45
Skunk	04	6666		25-yr	41.39	198.50	2.70	5314.15	5315.26	-1.12
Skunk	04	6666		50-yr	43.12	229.03	3.24	5314.76	5315.26	-0.50
Skunk	04	6666		500-yr	67.97	335.09	4.62	5316.44	5315.26	1.18
Skunk	04	6685		100-yr	50.04	256.51	4.09	5315.33	5315.33	
Skunk	04	6685		FW	35.00	213.14	4.21	5315.70	5315.33	0.37
Skunk	04	6685		10-yr	27.23	117.51	2.33	5312.84	5315.33	-2.49
Skunk	04	6685		25-yr	43.76	179.18	3.11	5314.19	5315.33	-1.15
Skunk	04	6685		50-yr	46.28	220.51	3.63	5314.81	5315.33	-0.52
Skunk	04	6685		500-yr	73.99	359.28	4.84	5316.54	5315.33	1.21
Skunk	04	6690	BR D	100-yr	26.82	187.83	5.74	5315.96	5315.96	
Skunk	04	6690	BR D	FW	4.00	114.90	0.00	5316.80	5315.96	0.84
Skunk	04	6690	BR D	10-yr	2.55	100.58	2.72	5312.85	5315.96	-3.11
Skunk	04	6690	BR D	25-yr	12.87	127.30	0.00	5314.30	5315.96	-1.66
Skunk	04	6690	BR D	50-yr	12.87	151.07	5.36	5315.00	5315.96	-0.96
Skunk	04	6690	BR D	500-yr	36.99	291.17	6.43	5317.55	5315.96	1.60
Skunk	04	6690	BR U	100-yr	36.91	164.58	5.85	5316.36	5316.36	
Skunk	04	6690	BR U	FW	16.00	140.16	6.30	5316.80	5316.36	0.43
Skunk	04	6690	BR U	10-yr	1.20	92.34	2.97	5312.88	5316.36	-3.48
Skunk	04	6690	BR U	25-yr	17.78	113.32	0.00	5314.64	5316.36	-1.72
Skunk	04	6690	BR U	50-yr	17.78	136.24	5.42	5315.56	5316.36	-0.80
Skunk	04	6690	BR U	500-yr	41.83	275.50	6.43	5318.08	5316.36	1.72
Skunk	04	6704		100-yr	75.91	301.22	3.16	5316.36	5316.36	
Skunk	04	6704		FW	55.00	293.76	3.06	5316.80	5316.36	0.43

Skunk	04	6704		10-yr	28.33	106.53	2.57	5312.98	5316.36	-3.38
Skunk	04	6704		25-yr	57.51	181.69	2.89	5314.64	5316.36	-1.72
Skunk	04	6704		50-yr	58.63	241.62	3.03	5315.56	5316.36	-0.80
Skunk	04	6704		500-yr	77.61	479.01	3.42	5318.08	5316.36	1.72
Skunk	04	6719		100-yr	57.00	267.61	3.36	5316.40	5316.40	
Skunk	04	6719		FW	41.48	278.22	3.23	5316.83	5316.40	0.43
Skunk	04	6719		10-yr	32.74	133.11	2.06	5313.06	5316.40	-3.34
Skunk	04	6719		25-yr	38.49	191.83	2.70	5314.72	5316.40	-1.68
Skunk	04	6719		50-yr	43.91	228.57	3.09	5315.62	5316.40	-0.79
Skunk	04	6719		500-yr	83.03	404.63	3.65	5318.11	5316.40	1.70
Skunk	04	6781		100-yr	52.73	177.87	5.05	5316.55	5316.55	
Skunk	04	6781		FW	33.75	187.63	4.79	5316.95	5316.55	0.40
Skunk	04	6781		10-yr	24.11	77.53	3.53	5313.19	5316.55	-3.37
Skunk	04	6781		25-yr	28.50	121.67	4.26	5314.86	5316.55	-1.69
Skunk	04	6781		50-yr	31.08	148.45	4.76	5315.76	5316.55	-0.79
Skunk	04	6781		500-yr	84.87	316.37	4.61	5318.29	5316.55	1.73
Skunk	04	6889		100-yr	53.02	208.52	4.31	5317.59	5317.59	
Skunk	04	6889		FW	50.00	217.48	4.13	5317.79	5317.59	0.20
Skunk	04	6889		10-yr	38.26	64.59	4.24	5314.44	5317.59	-3.15
Skunk	04	6889		25-yr	45.24	125.23	4.14	5315.88	5317.59	-1.71
Skunk	04	6889		50-yr	48.86	167.40	4.22	5316.78	5317.59	-0.81
Skunk	04	6889		500-yr	82.38	302.97	4.72	5319.07	5317.59	1.48
Skunk	04	6958		100-yr	55.80	133.00	6.75	5318.33	5318.33	
Skunk	04	6958		FW	41.00	128.29	7.00	5318.35	5318.33	0.02
Skunk	04	6958		10-yr	26.14	53.88	5.09	5316.19	5318.33	-2.14
Skunk	04	6958		25-yr	33.94	78.43	6.60	5317.02	5318.33	-1.31
Skunk	04	6958		50-yr	41.08	102.77	6.87	5317.67	5318.33	-0.66
Skunk	04	6958		500-yr	127.87	254.39	5.77	5319.74	5318.33	1.41
Skunk	04	7040		100-yr	165.70	174.31	5.15	5320.97	5320.97	
Skunk	04	7040		FW	98.82	145.28	6.18	5321.40	5320.97	0.44
Skunk	04	7040		10-yr	105.53	74.45	3.68	5320.28	5320.97	-0.69
Skunk	04	7040		25-yr	145.24	115.72	4.48	5320.60	5320.97	-0.36
Skunk	04	7040		50-yr	164.39	151.42	4.66	5320.83	5320.97	-0.14
Skunk	04	7040		500-yr	174.29	246.13	5.81	5321.39	5320.97	0.42
Skunk	04	7118		100-yr	107.01	174.76	5.14	5323.44	5323.44	
Skunk	04	7118		FW	45.00	143.42	6.26	5323.85	5323.44	0.41
Skunk	04	7118		10-yr	28.16	65.01	4.21	5321.98	5323.44	-1.46
Skunk	04	7118		25-yr	87.54	111.25	4.66	5322.79	5323.44	-0.65
Skunk	04	7118		50-yr	96.78	142.36	4.96	5323.13	5323.44	-0.32
Skunk	04	7118		500-yr	140.73	248.40	5.77	5324.04	5323.44	0.60
Skunk	04	7189		100-yr	104.81	246.05	4.53	5324.91	5324.91	
Skunk	04	7189		FW	65.00	188.65	4.76	5325.35	5324.91	0.44
Skunk	04	7189		10-yr	51.48	72.04	4.00	5323.20	5324.91	-1.71
Skunk	04	7189		25-yr	73.40	155.64	4.01	5324.15	5324.91	-0.76
Skunk	04	7189		50-yr	92.26	203.15	4.29	5324.57	5324.91	-0.34
Skunk	04	7189		500-yr	126.55	354.87	5.01	5325.66	5324.91	0.75
Skunk	04	7216		100-yr	101.71	286.14	4.71	5325.36	5325.36	
Skunk	04	7216		FW	70.00	195.28	4.60	5325.76	5325.36	0.40
Skunk	04	7216		10-yr	47.89	91.13	4.18	5323.72	5325.36	-1.64
Skunk	04	7216		25-yr	70.81	185.47	4.21	5324.58	5325.36	-0.78
Skunk	04	7216		50-yr	92.13	238.46	4.49	5325.02	5325.36	-0.34
Skunk	04	7216		500-yr	124.38	401.74	5.22	5326.10	5325.36	0.74
Skunk	04	7230	BR D	100-yr	76.45	229.30	7.05	5325.50	5325.50	
Skunk	04	7230	BR D	FW	40.50	106.89	8.40	5325.69	5325.50	0.18
Skunk	04	7230	BR D	10-yr	32.04	68.23	6.71	5323.77	5325.50	-1.74
Skunk	04	7230	BR D	25-yr	46.68	149.76	6.50	5324.76	5325.50	-0.74
Skunk	04	7230	BR D	50-yr	67.50	192.48	6.76	5325.18	5325.50	-0.32
Skunk	04	7230	BR D	500-yr	98.51	322.87	7.52	5326.22	5325.50	0.72
Skunk	04	7230	BR U	100-yr	86.98	274.39	6.67	5326.27	5326.27	
Skunk	04	7230	BR U	FW	55.50	111.10	8.08	5326.39	5326.27	0.12
Skunk	04	7230	BR U	10-yr	7.50	29.28	9.36	5323.86	5326.27	-2.41
Skunk	04	7230	BR U	25-yr	72.63	192.63	6.06	5325.65	5326.27	-0.62
Skunk	04	7230	BR U	50-yr	79.62	232.96	6.46	5325.97	5326.27	-0.30
Skunk	04	7230	BR U	500-yr	101.38	366.43	7.39	5326.90	5326.27	0.63
Skunk	04	7240		100-yr	142.52	549.70	2.51	5327.27	5327.27	
Skunk	04	7240		FW	85.00	322.42	2.79	5327.72	5327.27	0.45
Skunk	04	7240		10-yr	102.13	268.78	1.70	5325.65	5327.27	-1.61
Skunk	04	7240		25-yr	119.99	399.96	2.07	5326.45	5327.27	-0.82
Skunk	04	7240		50-yr	130.69	478.24	2.31	5326.89	5327.27	-0.38
Skunk	04	7240		500-yr	150.16	723.98	2.95	5328.13	5327.27	0.86
Skunk	04	7259		100-yr	126.93	484.01	2.82	5327.32	5327.32	
Skunk	04	7259		FW	70.00	279.12	3.22	5327.77	5327.32	0.45
Skunk	04	7259		10-yr	68.75	214.89	1.93	5325.70	5327.32	-1.62
Skunk	04	7259		25-yr	110.42	339.53	2.35	5326.50	5327.32	-0.82
Skunk	04	7259		50-yr	118.79	415.61	2.60	5326.94	5327.32	-0.38
Skunk	04	7259		500-yr	146.49	652.17	3.28	5328.18	5327.32	0.86
Skunk	04	7318		100-yr	85.51	170.93	5.25	5327.54	5327.54	
Skunk	04	7318		FW	50.00	179.72	5.00	5328.00	5327.54	0.46
Skunk	04	7318		10-yr	41.45	85.16	3.22	5325.92	5327.54	-1.62
Skunk	04	7318		25-yr	49.77	123.24	4.20	5326.75	5327.54	-0.79
Skunk	04	7318		50-yr	53.03	145.58	4.85	5327.19	5327.54	-0.36
Skunk	04	7318		500-yr	104.32	248.90	5.75	5328.37	5327.54	0.82
Skunk	04	7416		100-yr	55.80	174.60	5.79	5329.29	5329.29	
Skunk	04	7416		FW	35.00	141.60	6.34	5329.37	5329.29	0.08
Skunk	04	7416		10-yr	29.99	67.39	4.07	5327.14	5329.29	-2.14
Skunk	04	7416		25-yr	41.13	110.75	4.97	5328.23	5329.29	-1.06
Skunk	04	7416		50-yr	48.96	145.02	5.38	5328.83	5329.29	-0.46
Skunk	04	7416		500-yr	65.89	244.16	6.71	5330.23	5329.29	0.94
Skunk	04	7478		100-yr	52.23	157.06	5.72	5330.44	5330.44	
Skunk	04	7478		FW	38.00	153.09	5.87	5330.60	5330.44	0.16
Skunk	04	7478		10-yr	34.62	67.42	4.06	5328.24	5330.44	-2.20
Skunk	04	7478		25-yr	38.35	107.49	4.82	5329.34	5330.44	-1.10
Skunk	04	7478		50-yr	46.13	134.10	5.26	5329.96	5330.44	-0.48
Skunk	04	7478		500-yr	70.81	223.72	6.40	5331.49	5330.44	1.05
Skunk	04	7566		100-yr	17.30	136.41	9.99	5332.10	5332.10	

Skunk	04	7566	FW	17.30	96.27	9.25	5332.52	5332.10	0.42
Skunk	04	7566	10-yr	16.62	72.44	5.21	5329.85	5332.10	-2.25
Skunk	04	7566	25-yr	17.30	102.27	7.31	5330.98	5332.10	-1.12
Skunk	04	7566	50-yr	17.30	120.35	8.66	5331.60	5332.10	-0.50
Skunk	04	7566	500-yr	104.94	327.38	6.29	5333.85	5332.10	1.75
Skunk	04	7600		Culvert					
Skunk	04	7622	100-yr	96.20	162.09	5.51	5335.00	5335.00	
Skunk	04	7622	FW	91.07	167.61	5.31	5335.13	5335.00	0.13
Skunk	04	7622	10-yr	17.50	56.48	4.75	5333.37	5335.00	-1.63
Skunk	04	7622	25-yr	18.42	75.45	7.83	5333.91	5335.00	-1.09
Skunk	04	7622	50-yr	95.26	131.26	5.30	5334.69	5335.00	-0.32
Skunk	04	7622	500-yr	112.03	258.73	5.78	5335.91	5335.00	0.90
Skunk	04	7639	100-yr	56.14	125.72	7.25	5335.59	5335.59	
Skunk	04	7639	FW	58.24	132.42	6.72	5335.76	5335.59	0.17
Skunk	04	7639	10-yr	25.91	74.46	3.53	5334.03	5335.59	-1.56
Skunk	04	7639	25-yr	40.31	113.28	4.58	5335.37	5335.59	-0.22
Skunk	04	7639	50-yr	48.31	114.86	6.18	5335.40	5335.59	-0.19
Skunk	04	7639	500-yr	59.34	136.15	11.00	5335.76	5335.59	0.17
Skunk	04	7651	100-yr	61.80	103.71	11.72	5336.58	5336.58	
Skunk	04	7651	FW	61.48	74.31	11.98	5336.56	5336.58	-0.03
Skunk	04	7651	10-yr	32.50	55.15	6.41	5335.75	5336.58	-0.83
Skunk	04	7651	25-yr	60.74	96.54	7.20	5336.50	5336.58	-0.08
Skunk	04	7651	50-yr	61.41	100.97	9.41	5336.55	5336.58	-0.03
Skunk	04	7651	500-yr	189.67	405.03	4.49	5338.49	5336.58	1.91
Skunk	04	7705	100-yr	130.24	228.79	4.25	5339.46	5339.46	
Skunk	04	7705	FW	76.66	144.67	6.15	5339.46	5339.46	0.01
Skunk	04	7705	10-yr	77.03	83.72	3.69	5338.09	5339.46	-1.37
Skunk	04	7705	25-yr	90.94	119.02	4.87	5338.48	5339.46	-0.98
Skunk	04	7705	50-yr	101.14	157.81	4.92	5338.87	5339.46	-0.59
Skunk	04	7705	500-yr	139.76	267.57	5.89	5339.73	5339.46	0.28
Skunk	04	7839	100-yr	198.40	294.64	3.02	5340.61	5340.61	
Skunk	04	7839	FW	134.77	337.93	2.63	5341.10	5340.61	0.49
Skunk	04	7839	10-yr	51.10	131.38	2.00	5339.28	5340.61	-1.33
Skunk	04	7839	25-yr	132.33	211.12	2.41	5340.11	5340.61	-0.50
Skunk	04	7839	50-yr	176.09	263.09	2.65	5340.44	5340.61	-0.17
Skunk	04	7839	500-yr	229.48	473.36	3.07	5341.42	5340.61	0.81
Skunk	04	7890	100-yr	116.43	149.72	5.94	5341.52	5341.52	
Skunk	04	7890	FW	116.47	150.01	5.93	5341.52	5341.52	0.00
Skunk	04	7890	10-yr	25.12	48.17	5.46	5339.49	5341.52	-2.03
Skunk	04	7890	25-yr	30.59	69.45	7.33	5340.26	5341.52	-1.25
Skunk	04	7890	50-yr	35.29	81.42	8.55	5340.63	5341.52	-0.89
Skunk	04	7890	500-yr	155.98	229.40	6.34	5342.11	5341.52	0.59
Skunk	04	7934	100-yr	145.83	203.74	4.37	5343.10	5343.10	
Skunk	04	7934	FW	27.12	111.18	8.00	5343.23	5343.10	0.13
Skunk	04	7934	10-yr	30.58	77.47	3.40	5340.97	5343.10	-2.12
Skunk	04	7934	25-yr	52.50	130.03	3.91	5342.33	5343.10	-0.77
Skunk	04	7934	50-yr	137.80	192.07	3.62	5343.01	5343.10	-0.08
Skunk	04	7934	500-yr	198.96	319.42	4.56	5343.75	5343.10	0.65
Skunk	04	7960		Inl Struct					
Skunk	04	7984	100-yr	37.00	466.01	3.56	5345.57	5345.57	
Skunk	04	7984	FW	35.00	242.73	3.67	5345.70	5345.57	0.14
Skunk	04	7984	10-yr	37.00	232.78	1.60	5343.27	5345.57	-2.30
Skunk	04	7984	25-yr	37.00	329.39	2.51	5344.29	5345.57	-1.27
Skunk	04	7984	50-yr	37.00	398.73	3.07	5344.95	5345.57	-0.62
Skunk	04	7984	500-yr	37.00	710.52	4.62	5347.33	5345.57	1.76
Skunk	04	7989	100-yr	35.00	442.77	3.63	5345.59	5345.59	
Skunk	04	7989	FW	35.00	251.27	3.54	5345.75	5345.59	0.16
Skunk	04	7989	10-yr	35.00	233.12	1.60	5343.28	5345.59	-2.31
Skunk	04	7989	25-yr	35.00	314.95	2.54	5344.31	5345.59	-1.28
Skunk	04	7989	50-yr	35.00	380.24	3.11	5344.97	5345.59	-0.62
Skunk	04	7989	500-yr	35.00	674.50	4.74	5347.35	5345.59	1.76
Skunk	04	7996	100-yr	29.00	420.92	4.02	5345.60	5345.60	
Skunk	04	7996	FW	29.00	226.52	3.93	5345.77	5345.60	0.18
Skunk	04	7996	10-yr	29.00	242.69	1.70	5343.29	5345.60	-2.31
Skunk	04	7996	25-yr	29.00	307.55	2.76	5344.32	5345.60	-1.28
Skunk	04	7996	50-yr	29.00	363.02	3.42	5344.98	5345.60	-0.62
Skunk	04	7996	500-yr	124.33	698.84	2.24	5347.71	5345.60	2.12
Skunk	04	8576	100-yr	144.16	960.86	2.24	5361.27	5361.27	
Skunk	04	8576	FW	30.75	287.91	3.66	5361.27	5361.27	0.00
Skunk	04	8576	10-yr	19.00	111.74	2.56	5354.66	5361.27	-6.61
Skunk	04	8576	25-yr	19.00	215.65	3.20	5357.63	5361.27	-3.64
Skunk	04	8576	50-yr	139.41	569.20	3.35	5359.93	5361.27	-1.34
Skunk	04	8576	500-yr	144.16	1556.10	2.28	5362.93	5361.27	1.66
Skunk	04	8654	100-yr	138.10	519.62	2.07	5361.49	5361.49	
Skunk	04	8654	FW	70.00	353.76	2.84	5361.71	5361.49	0.22
Skunk	04	8654	10-yr	22.37	48.89	3.46	5355.14	5361.49	-6.35
Skunk	04	8654	25-yr	28.31	122.37	3.69	5358.03	5361.49	-3.45
Skunk	04	8654	50-yr	138.10	334.05	2.14	5360.36	5361.49	-1.13
Skunk	04	8654	500-yr	138.10	780.62	2.15	5363.07	5361.49	1.58
Skunk	04	8713	100-yr	36.82	139.58	7.19	5361.45	5361.45	
Skunk	04	8713	FW	36.80	156.62	6.40	5361.92	5361.45	0.46
Skunk	04	8713	10-yr	24.15	28.11	6.01	5357.75	5361.45	-3.70
Skunk	04	8713	25-yr	28.06	64.68	6.97	5359.16	5361.45	-2.29
Skunk	04	8713	50-yr	33.97	107.85	6.54	5360.56	5361.45	-0.90
Skunk	04	8713	500-yr	41.00	195.48	7.75	5362.87	5361.45	1.42
Skunk	04	8800		Culvert					
Skunk	04	8873	100-yr	82.25	329.76	3.83	5366.38	5366.38	
Skunk	04	8873	FW	82.25	312.60	3.83	5366.38	5366.38	0.00
Skunk	04	8873	10-yr	28.03	60.18	2.81	5360.55	5366.38	-5.82
Skunk	04	8873	25-yr	30.00	128.46	3.60	5362.76	5366.38	-3.62
Skunk	04	8873	50-yr	33.00	210.84	3.72	5364.72	5366.38	-1.66
Skunk	04	8873	500-yr	94.27	537.80	3.95	5367.68	5366.38	1.30
Skunk	04	8937	100-yr	68.35	330.81	3.03	5366.96	5366.96	

Skunk	04	8937	FW	57.23	329.30	3.05	5366.96	5366.96	0.00
Skunk	04	8937	10-yr	34.81	68.11	2.48	5361.61	5366.96	-5.35
Skunk	04	8937	25-yr	48.69	152.93	2.95	5363.65	5366.96	-3.31
Skunk	04	8937	50-yr	53.38	239.86	2.94	5365.34	5366.96	-1.62
Skunk	04	8937	500-yr	89.96	440.52	3.43	5368.25	5366.96	1.29
Skunk	04	9001	100-yr	39.20	210.59	4.76	5367.27	5367.27	
Skunk	04	9001	FW	36.55	210.67	4.76	5367.28	5367.27	0.00
Skunk	04	9001	10-yr	24.55	60.43	2.80	5362.38	5367.27	-4.89
Skunk	04	9001	25-yr	29.35	112.66	4.00	5364.31	5367.27	-2.96
Skunk	04	9001	50-yr	33.01	158.32	4.45	5365.77	5367.27	-1.50
Skunk	04	9001	500-yr	88.52	304.31	4.96	5368.53	5367.27	1.26
Skunk	04	9041	100-yr	56.65	256.54	4.21	5367.88	5367.88	
Skunk	04	9041	FW	53.61	256.48	4.21	5367.88	5367.88	0.00
Skunk	04	9041	10-yr	24.29	58.77	2.88	5362.90	5367.88	-4.97
Skunk	04	9041	25-yr	31.39	115.09	3.92	5364.92	5367.88	-2.96
Skunk	04	9041	50-yr	40.34	179.41	4.13	5366.37	5367.88	-1.51
Skunk	04	9041	500-yr	91.37	344.98	4.62	5368.94	5367.88	1.06
Skunk	04	9076	100-yr	73.15	298.66	3.70	5368.33	5368.33	
Skunk	04	9076	FW	58.39	297.67	3.71	5368.33	5368.33	0.00
Skunk	04	9076	10-yr	33.52	66.50	2.66	5363.44	5368.33	-4.89
Skunk	04	9076	25-yr	38.55	148.58	3.34	5365.44	5368.33	-2.89
Skunk	04	9076	50-yr	44.19	215.30	3.66	5366.83	5368.33	-1.50
Skunk	04	9076	500-yr	110.45	401.87	4.11	5369.35	5368.33	1.01
Skunk	04	9109	100-yr	26.00	217.42	4.75	5368.59	5368.59	
Skunk	04	9109	FW	26.00	211.66	4.74	5368.60	5368.59	0.02
Skunk	04	9109	10-yr	22.76	90.80	1.86	5363.73	5368.59	-4.85
Skunk	04	9109	25-yr	24.59	138.47	3.26	5365.75	5368.59	-2.84
Skunk	04	9109	50-yr	25.79	173.33	4.07	5367.13	5368.59	-1.46
Skunk	04	9109	500-yr	26.00	285.38	6.39	5369.55	5368.59	0.96
Skunk	04	9150		Culvert					
Skunk	04	9194	100-yr	30.00	322.13	3.85	5369.59	5369.59	
Skunk	04	9194	FW	30.00	260.82	3.85	5369.60	5369.59	0.02
Skunk	04	9194	10-yr	28.08	93.33	1.86	5363.81	5369.59	-5.78
Skunk	04	9194	25-yr	29.00	171.21	2.92	5366.00	5369.59	-3.58
Skunk	04	9194	50-yr	29.00	231.14	3.54	5367.55	5369.59	-2.03
Skunk	04	9194	500-yr	173.61	461.22	3.92	5371.22	5369.59	1.64
Skunk	04	9234	100-yr	61.82	244.49	4.10	5369.97	5369.97	
Skunk	04	9234	FW	42.96	235.31	4.26	5370.04	5369.97	0.06
Skunk	04	9234	10-yr	15.63	30.46	5.55	5364.13	5369.97	-5.84
Skunk	04	9234	25-yr	36.75	95.19	4.74	5366.54	5369.97	-3.43
Skunk	04	9234	50-yr	38.91	152.98	4.61	5368.07	5369.97	-1.90
Skunk	04	9234	500-yr	140.96	384.99	3.93	5371.63	5369.97	1.66
Skunk	04	9246	100-yr	54.89	242.72	4.13	5370.10	5370.10	
Skunk	04	9246	FW	36.21	215.45	4.66	5370.15	5370.10	0.05
Skunk	04	9246	10-yr	12.00	50.67	3.77	5364.74	5370.10	-5.36
Skunk	04	9246	25-yr	28.14	100.44	5.06	5366.89	5370.10	-3.22
Skunk	04	9246	50-yr	41.36	150.57	4.68	5368.30	5370.10	-1.80
Skunk	04	9246	500-yr	124.36	364.06	4.15	5371.72	5370.10	1.62
Skunk	04	9260		Culvert					
Skunk	04	9270	100-yr	81.80	259.88	4.06	5371.68	5371.68	
Skunk	04	9270	FW	36.84	248.07	4.27	5371.96	5371.68	0.28
Skunk	04	9270	10-yr	31.84	133.76	1.40	5368.73	5371.68	-2.94
Skunk	04	9270	25-yr	38.08	180.70	2.69	5370.11	5371.68	-1.57
Skunk	04	9270	50-yr	47.71	216.32	3.47	5370.98	5371.68	-0.70
Skunk	04	9270	500-yr	129.34	340.81	4.61	5372.43	5371.68	0.76
Skunk	04	9304	100-yr	109.24	164.35	6.10	5372.61	5372.61	
Skunk	04	9304	FW	109.23	167.65	5.98	5372.64	5372.61	0.03
Skunk	04	9304	10-yr	12.32	22.31	7.58	5369.33	5372.61	-3.28
Skunk	04	9304	25-yr	30.35	57.54	7.84	5370.84	5372.61	-1.77
Skunk	04	9304	50-yr	54.42	89.22	7.90	5371.68	5372.61	-0.93
Skunk	04	9304	500-yr	118.62	225.67	6.81	5373.10	5372.61	0.49
Skunk	04	9444	100-yr	84.18	391.48	4.40	5375.94	5375.94	
Skunk	04	9444	FW	74.00	222.44	4.51	5375.96	5375.94	0.01
Skunk	04	9444	10-yr	27.07	69.78	2.42	5373.07	5375.94	-2.88
Skunk	04	9444	25-yr	55.66	213.41	3.08	5374.75	5375.94	-1.20
Skunk	04	9444	50-yr	73.17	323.56	3.62	5375.52	5375.94	-0.43
Skunk	04	9444	500-yr	100.00	524.27	5.05	5376.71	5375.94	0.76
Skunk	04	9586	100-yr	53.80	229.52	4.82	5377.88	5377.88	
Skunk	04	9586	FW	53.80	210.60	4.76	5377.93	5377.88	0.05
Skunk	04	9586	10-yr	28.91	66.15	2.55	5374.41	5377.88	-3.47
Skunk	04	9586	25-yr	36.75	124.42	3.62	5376.21	5377.88	-1.67
Skunk	04	9586	50-yr	51.65	170.41	4.22	5377.10	5377.88	-0.78
Skunk	04	9586	500-yr	84.16	338.66	5.57	5378.83	5377.88	0.94
Skunk	04	9710	100-yr	75.74	210.62	6.51	5380.35	5380.35	
Skunk	04	9710	FW	75.63	153.86	6.52	5380.35	5380.35	0.00
Skunk	04	9710	10-yr	21.81	39.78	4.25	5376.62	5380.35	-3.74
Skunk	04	9710	25-yr	26.23	84.80	5.40	5378.43	5380.35	-1.93
Skunk	04	9710	50-yr	29.70	136.00	6.23	5379.50	5380.35	-0.85
Skunk	04	9710	500-yr	133.61	377.87	5.80	5381.31	5380.35	0.96
Skunk	04	9780	100-yr	38.00	373.99	7.25	5383.06	5383.06	
Skunk	04	9780	FW	38.00	162.19	7.09	5383.14	5383.06	0.08
Skunk	04	9780	10-yr	38.00	52.20	4.21	5380.47	5383.06	-2.59
Skunk	04	9780	25-yr	38.00	139.07	5.80	5381.46	5383.06	-1.59
Skunk	04	9780	50-yr	38.00	256.45	6.40	5382.31	5383.06	-0.75
Skunk	04	9780	500-yr	38.00	456.73	9.62	5383.55	5383.06	0.49
Skunk	04	9794	100-yr	24.00	175.21	9.56	5383.48	5383.48	
Skunk	04	9794	FW	24.00	142.75	9.21	5383.65	5383.48	0.16
Skunk	04	9794	10-yr	24.00	64.13	3.50	5381.13	5383.48	-2.36
Skunk	04	9794	25-yr	24.00	103.74	6.22	5382.13	5383.48	-1.35
Skunk	04	9794	50-yr	24.00	135.89	7.88	5382.84	5383.48	-0.64
Skunk	04	9794	500-yr	24.00	221.98	12.57	5384.12	5383.48	0.63
Skunk	04	9850		Culvert					
Skunk	04	9894	100-yr	21.90	276.04	7.06	5389.08	5389.08	

Skunk	04	9894		FW	21.90	142.03	7.06	5389.08	5389.08	0.00
Skunk	04	9894		10-yr	21.90	58.66	3.91	5384.57	5389.08	-4.51
Skunk	04	9894		25-yr	21.90	139.22	5.41	5386.40	5389.08	-2.68
Skunk	04	9894		50-yr	21.90	205.38	6.28	5387.72	5389.08	-1.36
Skunk	04	9894		500-yr	23.96	457.27	8.04	5391.13	5389.08	2.05
Skunk	05	9943		100-yr	80.37	248.05	1.10	5390.42	5390.42	
Skunk	05	9943		FW	30.00	172.14	1.41	5390.58	5390.42	0.16
Skunk	05	9943		10-yr	18.41	40.52	1.68	5385.67	5390.42	-4.75
Skunk	05	9943		25-yr	28.24	86.80	1.89	5387.71	5390.42	-2.71
Skunk	05	9943		50-yr	47.17	132.45	1.52	5389.05	5390.42	-1.37
Skunk	05	9943		500-yr	80.37	498.80	0.83	5392.54	5390.42	2.12
Skunk	05	9997		100-yr	87.71	281.65	0.87	5390.48	5390.48	
Skunk	05	9997		FW	30.00	161.17	1.50	5390.65	5390.48	0.17
Skunk	05	9997		10-yr	23.52	29.02	2.34	5386.14	5390.48	-4.33
Skunk	05	9997		25-yr	41.93	87.27	1.88	5387.99	5390.48	-2.48
Skunk	05	9997		50-yr	86.43	164.49	1.23	5389.18	5390.48	-1.30
Skunk	05	9997		500-yr	87.71	470.46	0.70	5392.56	5390.48	2.09
Skunk	05	10073		100-yr	31.18	106.43	2.27	5390.55	5390.55	
Skunk	05	10073		FW	31.18	114.33	2.12	5390.81	5390.55	0.25
Skunk	05	10073		10-yr	18.06	30.21	2.25	5387.37	5390.55	-3.19
Skunk	05	10073		25-yr	22.45	55.73	2.94	5388.63	5390.55	-1.92
Skunk	05	10073		50-yr	25.40	74.35	2.70	5389.41	5390.55	-1.14
Skunk	05	10073		500-yr	98.32	219.00	1.48	5392.58	5390.55	2.03
Skunk	05	10168		100-yr	19.79	62.50	3.87	5391.28	5391.28	
Skunk	05	10168		FW	19.80	64.80	3.73	5391.40	5391.28	0.12
Skunk	05	10168		10-yr	13.67	23.03	2.95	5388.92	5391.28	-2.36
Skunk	05	10168		25-yr	17.02	42.85	3.83	5390.21	5391.28	-1.07
Skunk	05	10168		50-yr	18.05	49.98	4.02	5390.62	5391.28	-0.66
Skunk	05	10168		500-yr	24.37	96.89	3.34	5392.85	5391.28	1.56
Skunk	05	10238		100-yr	19.34	60.77	3.98	5392.60	5392.60	
Skunk	05	10238		FW	19.34	61.23	3.95	5392.62	5392.60	0.02
Skunk	05	10238		10-yr	13.40	24.40	2.79	5390.38	5392.60	-2.21
Skunk	05	10238		25-yr	17.22	45.40	3.61	5391.76	5392.60	-0.84
Skunk	05	10238		50-yr	18.24	52.49	3.83	5392.16	5392.60	-0.44
Skunk	05	10238		500-yr	22.04	82.80	3.91	5393.66	5392.60	1.07
Skunk	05	10317		100-yr	16.02	30.66	7.89	5397.39	5397.39	
Skunk	05	10317		FW	15.95	30.54	7.92	5397.39	5397.39	-0.01
Skunk	05	10317		10-yr	10.14	11.29	6.02	5395.84	5397.39	-1.55
Skunk	05	10317		25-yr	12.76	21.93	7.48	5396.77	5397.39	-0.62
Skunk	05	10317		50-yr	13.67	25.67	7.83	5397.06	5397.39	-0.34
Skunk	05	10317		500-yr	20.08	40.11	8.08	5397.92	5397.39	0.52
Skunk	05	10421		100-yr	30.85	76.30	3.17	5401.88	5401.88	
Skunk	05	10421		FW	30.82	76.27	3.17	5401.88	5401.88	0.00
Skunk	05	10421		10-yr	18.60	29.40	2.31	5399.99	5401.88	-1.89
Skunk	05	10421		25-yr	26.76	57.08	2.87	5401.21	5401.88	-0.67
Skunk	05	10421		50-yr	28.68	66.32	3.03	5401.54	5401.88	-0.34
Skunk	05	10421		500-yr	39.28	93.68	3.46	5402.40	5401.88	0.52
Skunk	05	10488		100-yr	24.07	67.02	3.61	5402.95	5402.95	
Skunk	05	10488		FW	24.07	67.02	3.61	5402.95	5402.95	0.00
Skunk	05	10488		10-yr	17.12	27.52	2.47	5401.04	5402.95	-1.91
Skunk	05	10488		25-yr	21.70	51.39	3.19	5402.27	5402.95	-0.68
Skunk	05	10488		50-yr	22.86	59.00	3.41	5402.61	5402.95	-0.34
Skunk	05	10488		500-yr	26.12	80.82	4.01	5403.50	5402.95	0.55
Skunk	05	10560		100-yr	22.81	37.73	6.41	5405.16	5405.16	
Skunk	05	10560		FW	22.80	37.71	6.42	5405.16	5405.16	0.00
Skunk	05	10560		10-yr	16.62	13.34	5.10	5403.92	5405.16	-1.24
Skunk	05	10560		25-yr	19.93	25.73	6.37	5404.59	5405.16	-0.56
Skunk	05	10560		50-yr	21.31	31.38	6.40	5404.87	5405.16	-0.29
Skunk	05	10560		500-yr	25.85	50.73	6.39	5405.69	5405.16	0.53
Skunk	05	10616		100-yr	42.37	88.43	2.74	5407.20	5407.20	
Skunk	05	10616		FW	25.00	78.12	3.10	5407.23	5407.20	0.03
Skunk	05	10616		10-yr	25.84	38.63	1.76	5405.64	5407.20	-1.56
Skunk	05	10616		25-yr	31.85	67.93	2.41	5406.67	5407.20	-0.53
Skunk	05	10616		50-yr	40.88	77.46	2.59	5406.93	5407.20	-0.26
Skunk	05	10616		500-yr	51.03	107.61	3.01	5407.63	5407.20	0.43
Skunk	05	10655		100-yr	18.00	61.13	5.65	5407.81	5407.81	
Skunk	05	10655		FW	18.00	59.74	5.47	5407.91	5407.81	0.10
Skunk	05	10655		10-yr	15.90	25.94	1.89	5406.00	5407.81	-1.81
Skunk	05	10655		25-yr	18.00	46.58	3.44	5407.14	5407.81	-0.66
Skunk	05	10655		50-yr	18.00	53.44	4.29	5407.47	5407.81	-0.34
Skunk	05	10655		500-yr	18.00	73.57	8.34	5408.29	5407.81	0.49
Skunk	05	10700			Culvert					
Skunk	05	10722		100-yr	102.51	173.01	1.94	5411.02	5411.02	
Skunk	05	10722		FW	45.00	151.44	2.16	5411.46	5411.02	0.45
Skunk	05	10722		10-yr	16.03	36.49	1.34	5407.64	5411.02	-3.38
Skunk	05	10722		25-yr	72.02	106.18	1.49	5410.31	5411.02	-0.71
Skunk	05	10722		50-yr	87.30	133.44	1.67	5410.64	5411.02	-0.38
Skunk	05	10722		500-yr	112.09	232.61	2.56	5411.46	5411.02	0.44
Skunk	05	10745		100-yr	82.37	147.00	2.23	5411.10	5411.10	
Skunk	05	10745		FW	25.00	135.34	2.42	5411.58	5411.10	0.48
Skunk	05	10745		10-yr	18.36	44.87	1.09	5407.73	5411.10	-3.38
Skunk	05	10745		25-yr	32.81	109.17	1.45	5410.37	5411.10	-0.73
Skunk	05	10745		50-yr	45.04	121.70	1.82	5410.71	5411.10	-0.39
Skunk	05	10745		500-yr	112.08	196.73	2.86	5411.57	5411.10	0.47
Skunk	05	10760	BR D	100-yr	63.39	92.93	3.54	5411.13	5411.13	
Skunk	05	10760	BR D	FW	2.00	75.24	4.35	5411.57	5411.13	0.44
Skunk	05	10760	BR D	10-yr	18.42	45.24	1.08	5407.75	5411.13	-3.39
Skunk	05	10760	BR D	25-yr		73.40	2.15	5410.40	5411.13	-0.74
Skunk	05	10760	BR D	50-yr	28.98	74.97	2.96	5410.74	5411.13	-0.39
Skunk	05	10760	BR D	500-yr	90.50	141.65	4.01	5411.70	5411.13	0.57
Skunk	05	10760	BR U	100-yr	54.84	84.81	3.87	5412.35	5412.35	
Skunk	05	10760	BR U	FW	27.21	77.46	4.22	5412.84	5412.35	0.49
Skunk	05	10760	BR U	10-yr	7.00	23.68	2.07	5407.79	5412.35	-4.56
Skunk	05	10760	BR U	25-yr		33.60	4.70	5410.74	5412.35	-1.61
Skunk	05	10760	BR U	50-yr	38.45	46.13	4.83	5411.57	5412.35	-0.77

Skunk	05	10760	BR U	500-yr	63.98	126.85	4.40	5413.09	5412.35	0.74
Skunk	05	10778		100-yr	74.08	163.92	2.00	5412.65	5412.65	
Skunk	05	10778		FW	45.72	159.68	2.05	5413.15	5412.65	0.50
Skunk	05	10778		10-yr	7.00	23.87	2.05	5407.82	5412.65	-4.83
Skunk	05	10778		25-yr	26.22	70.56	2.24	5411.14	5412.65	-1.51
Skunk	05	10778		50-yr	71.68	125.89	1.77	5412.13	5412.65	-0.52
Skunk	05	10778		500-yr	99.82	224.34	2.49	5413.38	5412.65	0.73
Skunk	05	10826		100-yr	26.28	192.69	2.59	5412.89	5412.89	
Skunk	05	10826		FW	24.40	136.95	2.39	5413.35	5412.89	0.46
Skunk	05	10826		10-yr	15.49	25.97	1.89	5408.26	5412.89	-4.63
Skunk	05	10826		25-yr	23.55	91.09	1.77	5411.39	5412.89	-1.50
Skunk	05	10826		50-yr	24.92	152.26	1.98	5412.32	5412.89	-0.57
Skunk	05	10826		500-yr	42.47	256.73	3.65	5413.72	5412.89	0.83
Skunk	05	10873		100-yr	25.73	93.15	3.51	5413.17	5413.17	
Skunk	05	10873		FW	25.00	102.67	3.18	5413.59	5413.17	0.41
Skunk	05	10873		10-yr	11.52	13.17	3.72	5409.08	5413.17	-4.09
Skunk	05	10873		25-yr	22.02	55.48	2.85	5411.60	5413.17	-1.57
Skunk	05	10873		50-yr	24.16	76.75	2.89	5412.52	5413.17	-0.66
Skunk	05	10873		500-yr	28.26	120.47	4.62	5414.19	5413.17	1.01
Skunk	05	10890	BR D	100-yr		82.64	3.96	5413.45	5413.45	
Skunk	05	10890	BR D	FW		82.61	3.96	5413.79	5413.45	0.34
Skunk	05	10890	BR D	10-yr	13.85	20.58	2.38	5409.67	5413.45	-3.78
Skunk	05	10890	BR D	25-yr	22.21	59.45	2.66	5411.78	5413.45	-1.67
Skunk	05	10890	BR D	50-yr	14.14	78.68	2.82	5412.69	5413.45	-0.76
Skunk	05	10890	BR D	500-yr		82.64	6.73	5414.54	5413.45	1.09
Skunk	05	10890	BR U	100-yr	9.01	38.63	8.65	5414.36	5414.36	
Skunk	05	10890	BR U	FW	4.00	37.39	8.75	5414.72	5414.36	0.37
Skunk	05	10890	BR U	10-yr	9.00	12.24	4.00	5410.11	5414.36	-4.25
Skunk	05	10890	BR U	25-yr	9.00	28.78	5.49	5411.94	5414.36	-2.42
Skunk	05	10890	BR U	50-yr	0.27	36.65	6.06	5412.97	5414.36	-1.39
Skunk	05	10890	BR U	500-yr	27.00	118.33	6.48	5416.60	5414.36	2.24
Skunk	05	10910		100-yr	51.61	173.06	2.19	5415.95	5415.95	
Skunk	05	10910		FW	30.00	127.70	2.56	5416.27	5415.95	0.32
Skunk	05	10910		10-yr	9.00	15.81	3.10	5410.50	5415.95	-5.45
Skunk	05	10910		25-yr	9.00	32.68	4.84	5412.38	5415.95	-3.58
Skunk	05	10910		50-yr	26.33	54.23	4.09	5413.77	5415.95	-2.19
Skunk	05	10910		500-yr	74.43	281.64	2.34	5417.44	5415.95	1.48
Skunk	05	10981		100-yr	19.17	40.08	8.16	5416.61	5416.61	
Skunk	05	10981		FW	19.17	47.37	6.90	5416.99	5416.61	0.38
Skunk	05	10981		10-yr	11.20	9.67	5.07	5414.54	5416.61	-2.06
Skunk	05	10981		25-yr	15.93	29.34	5.39	5416.00	5416.61	-0.61
Skunk	05	10981		50-yr	20.15	44.58	4.98	5416.83	5416.61	0.23
Skunk	05	10981		500-yr	23.10	60.88	9.13	5417.59	5416.61	0.98
Skunk	06	11049		100-yr	17.00	51.71	2.79	5420.54	5420.54	
Skunk	06	11049		FW	9.00	38.95	3.54	5420.62	5420.54	0.09
Skunk	06	11049		10-yr	9.90	15.60	2.50	5418.00	5420.54	-2.53
Skunk	06	11049		25-yr	12.34	26.93	3.12	5419.02	5420.54	-1.51
Skunk	06	11049		50-yr	13.50	31.27	3.33	5419.36	5420.54	-1.18
Skunk	06	11049		500-yr	120.32	118.17	1.71	5421.38	5420.54	0.85
Skunk	06	11100			Culvert					
Skunk	06	11110		100-yr	64.93	93.96	1.47	5423.08	5423.08	
Skunk	06	11110		FW	35.00	89.99	1.53	5423.48	5423.08	0.40
Skunk	06	11110		10-yr	11.11	18.57	2.10	5420.04	5423.08	-3.04
Skunk	06	11110		25-yr	50.62	65.35	1.29	5422.59	5423.08	-0.49
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Skunk	06	11110		500-yr	80.21	118.44	1.71	5423.43	5423.08	0.35
Skunk	06	11185		100-yr	16.72	21.38	6.45	5424.76	5424.76	
Skunk	06	11185		FW	16.68	21.29	6.48	5424.76	5424.76	-0.01
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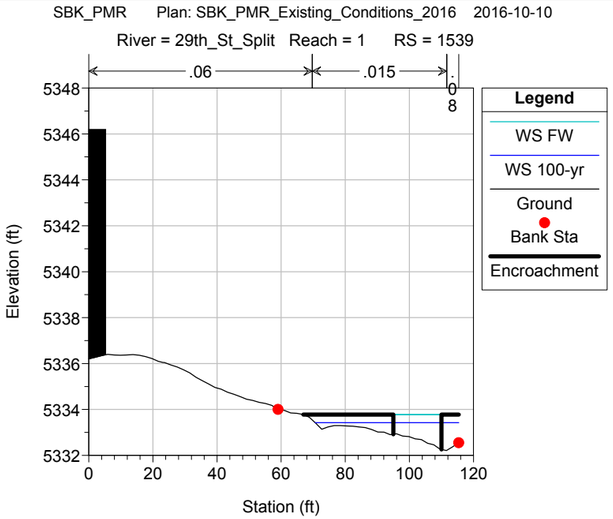
Skunk	06	11185		50-yr	15.06	17.11	6.08	5424.49	5424.76	-0.27
Skunk	06	11185		500-yr	23.08	30.11	6.71	5425.22	5424.76	0.46
Skunk	06	11272		100-yr	34.63	58.17	2.37	5427.96	5427.96	
Skunk	06	11272		FW	12.00	42.20	3.27	5428.40	5427.96	0.44
Skunk	06	11272		10-yr	16.02	20.88	1.87	5426.56	5427.96	-1.41
Skunk	06	11272		25-yr	27.95	38.64	2.17	5427.34	5427.96	-0.63
Skunk	06	11272		50-yr	30.46	46.01	2.26	5427.59	5427.96	-0.38
Skunk	06	11272		500-yr	50.96	79.80	2.53	5428.49	5427.96	0.52
Skunk	06	11364		100-yr	16.95	23.37	5.91	5430.46	5430.46	
Skunk	06	11364		FW	9.91	22.30	6.19	5430.87	5430.46	0.41
Skunk	06	11364		10-yr	5.74	6.42	6.07	5428.99	5430.46	-1.48
Skunk	06	11364		25-yr	16.17	15.18	5.54	5429.97	5430.46	-0.50
Skunk	06	11364		50-yr	16.43	18.65	5.58	5430.18	5430.46	-0.28
Skunk	06	11364		500-yr	17.84	30.23	6.68	5430.86	5430.46	0.39
Skunk	06	11457		100-yr	21.17	50.97	3.11	5434.43	5434.43	
Skunk	06	11457		FW	21.17	44.69	3.09	5434.45	5434.43	0.02
Skunk	06	11457		10-yr	13.30	18.38	2.12	5432.96	5434.43	-1.47
Skunk	06	11457		25-yr	19.38	31.61	2.68	5433.79	5434.43	-0.64
Skunk	06	11457		50-yr	20.05	38.08	2.86	5434.04	5434.43	-0.39
Skunk	06	11457		500-yr	22.79	82.66	3.49	5435.05	5434.43	0.62
Skunk	06	11524		100-yr	12.53	20.62	5.48	5436.27	5436.27	
Skunk	06	11524		FW	12.51	20.53	5.50	5436.27	5436.27	-0.01
Skunk	06	11524		10-yr	7.34	3.52	3.97	5434.57	5436.27	-1.70
Skunk	06	11524		25-yr	10.54	12.53	4.71	5435.57	5436.27	-0.70
Skunk	06	11524		50-yr	11.38	15.75	5.01	5435.87	5436.27	-0.41
Skunk	06	11524		500-yr	14.39	32.04	6.15	5436.88	5436.27	0.61
Skunk	06	11583			Inl Struct					
Skunk	06	11613		100-yr	59.27	106.49	1.07	5441.17	5441.17	
Skunk	06	11613		FW	21.22	94.50	1.20	5441.59	5441.17	0.42
Skunk	06	11613		10-yr	29.51	71.83	0.19	5440.34	5441.17	-0.83
Skunk	06	11613		25-yr	38.88	88.12	0.67	5440.83	5441.17	-0.34
Skunk	06	11613		50-yr	50.32	95.14	0.83	5440.98	5441.17	-0.18
Skunk	06	11613		500-yr	63.77	127.30	1.44	5441.46	5441.17	0.29

Skunk	06	11673	100-yr	11.51	16.47	6.86	5441.32	5441.32	
Skunk	06	11673	FW	11.51	17.46	6.47	5441.41	5441.32	0.09
Skunk	06	11673	10-yr	8.14	6.39	2.19	5440.30	5441.32	-1.02
Skunk	06	11673	25-yr	9.60	10.08	5.85	5440.72	5441.32	-0.60
Skunk	06	11673	50-yr	10.46	12.61	6.26	5440.97	5441.32	-0.35
Skunk	06	11673	500-yr	13.08	23.35	7.58	5441.88	5441.32	0.56
Skunk	06	11700		Inl Struct					
Skunk	06	11713	100-yr	107.24	197.62	0.84	5445.27	5445.27	
Skunk	06	11713	FW	40.00	105.19	1.07	5445.68	5445.27	0.42
Skunk	06	11713	10-yr	85.93	98.83	0.19	5444.65	5445.27	-0.62
Skunk	06	11713	25-yr	97.98	155.24	0.54	5445.02	5445.27	-0.25
Skunk	06	11713	50-yr	103.67	173.43	0.66	5445.13	5445.27	-0.14
Skunk	06	11713	500-yr	110.39	239.22	1.10	5445.51	5445.27	0.24
Skunk	06	11882	100-yr	16.08	18.36	6.15	5447.67	5447.67	
Skunk	06	11882	FW	16.08	18.40	6.14	5447.67	5447.67	0.00
Skunk	06	11882	10-yr	9.04	3.77	3.71	5446.50	5447.67	-1.17
Skunk	06	11882	25-yr	12.67	11.08	5.32	5447.17	5447.67	-0.50
Skunk	06	11882	50-yr	14.54	14.07	5.61	5447.39	5447.67	-0.28
Skunk	06	11882	500-yr	18.24	25.89	6.84	5448.10	5447.67	0.44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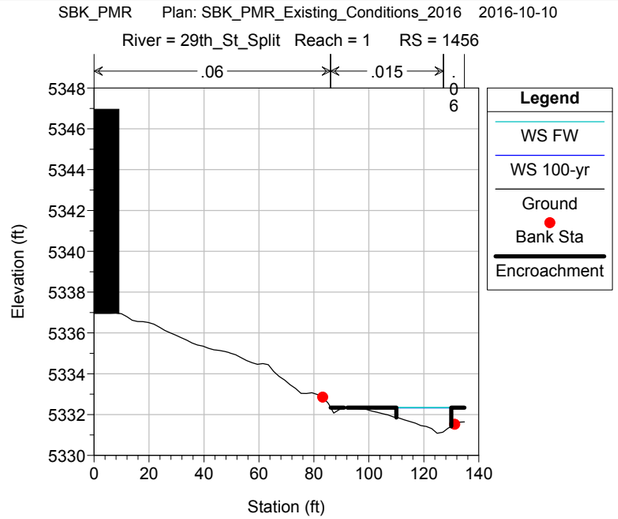
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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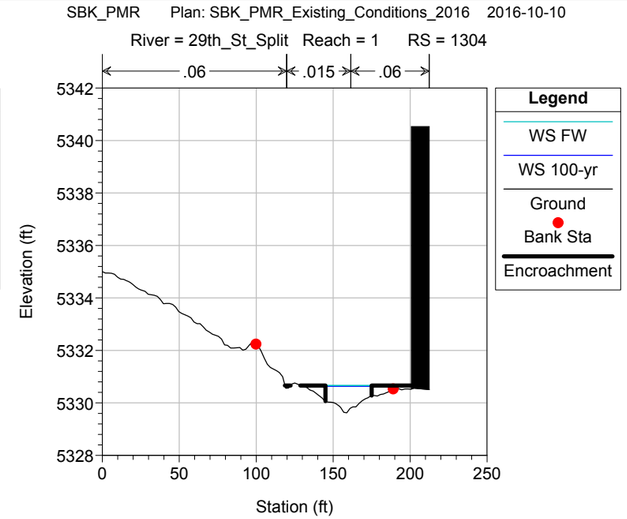
Encroachment
Elevation (ft)
Station (ft)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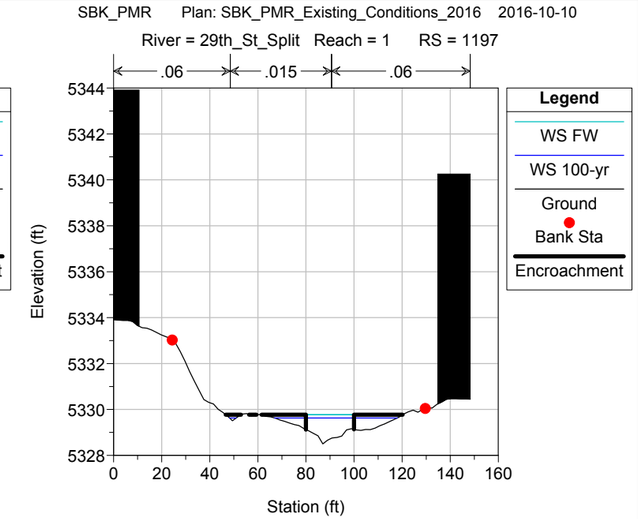
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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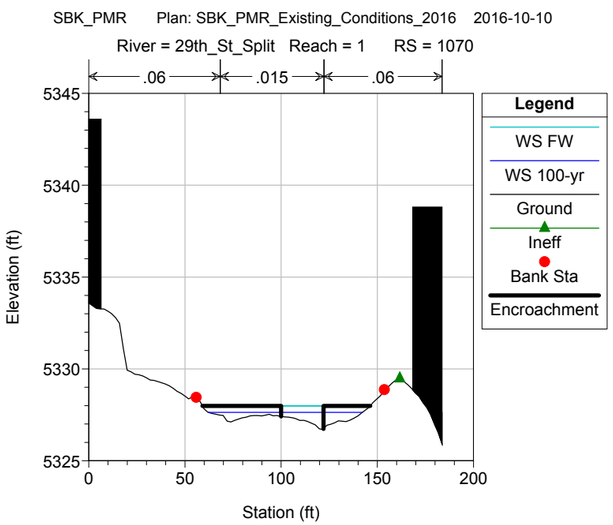
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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Legend
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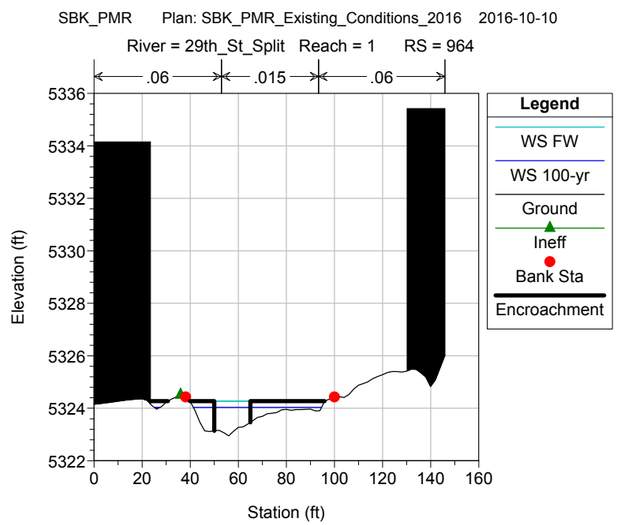
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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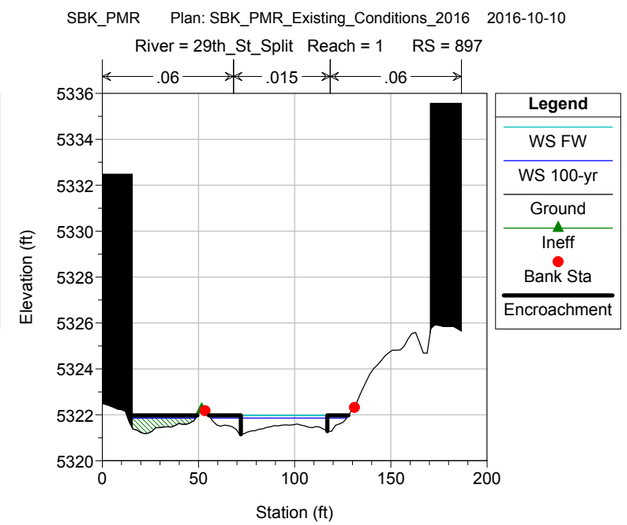
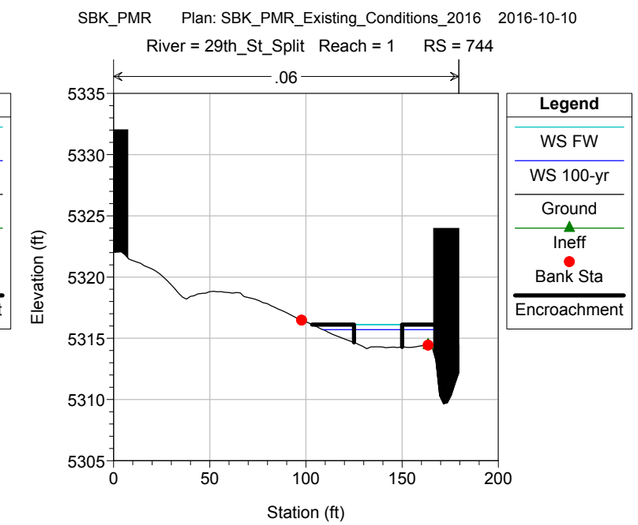
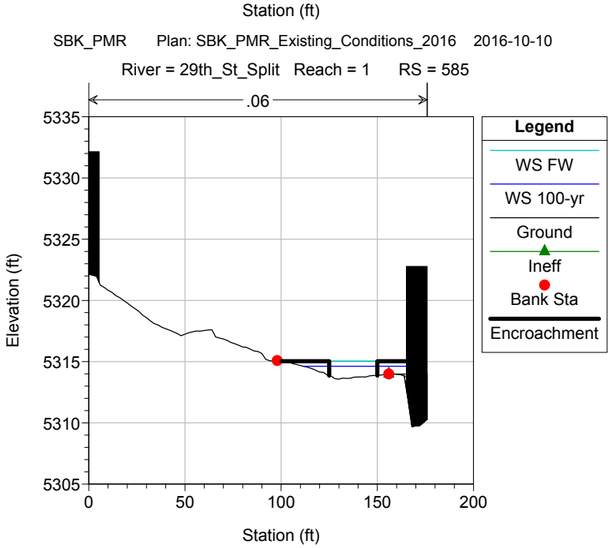
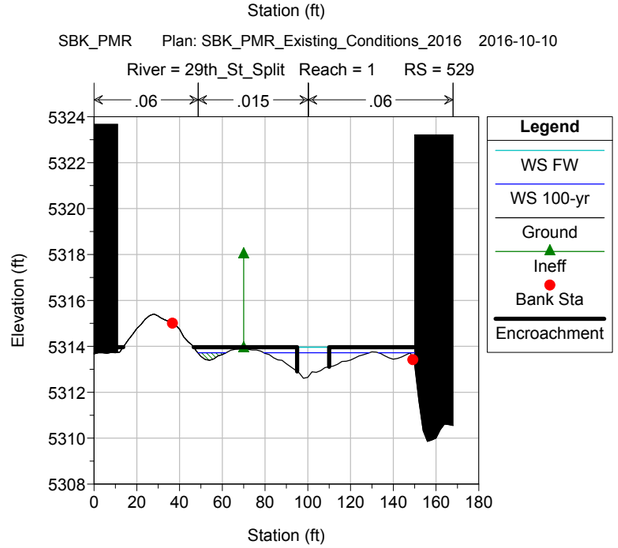
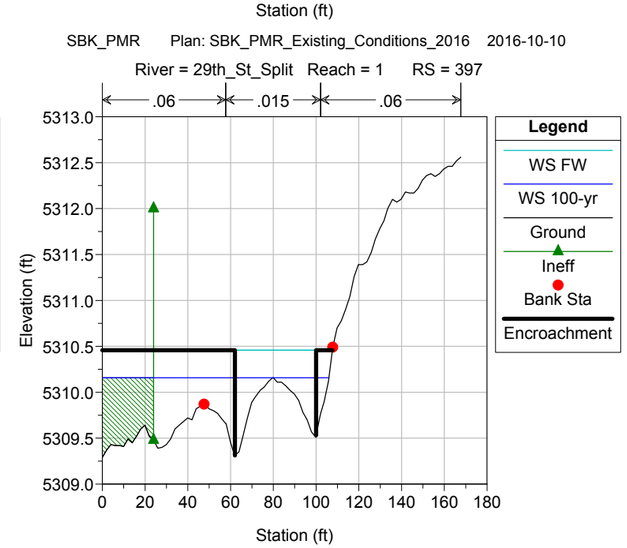
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

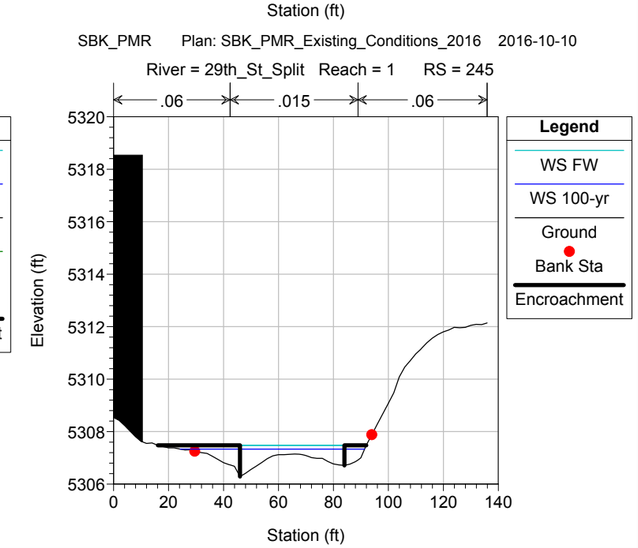

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 29th_St_Split Reach = 1 RS = 897
.06
.015
.06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 29th_St_Split Reach = 1 RS = 744
.06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 29th_St_Split Reach = 1 RS = 585
.06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 29th_St_Split Reach = 1 RS = 529
.06
.015
.06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 29th_St_Split Reach = 1 RS = 397
.06
.015
.06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 29th_St_Split Reach = 1 RS = 245
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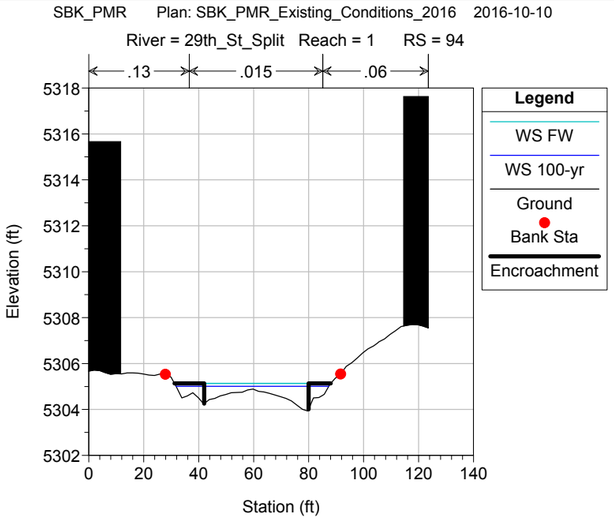
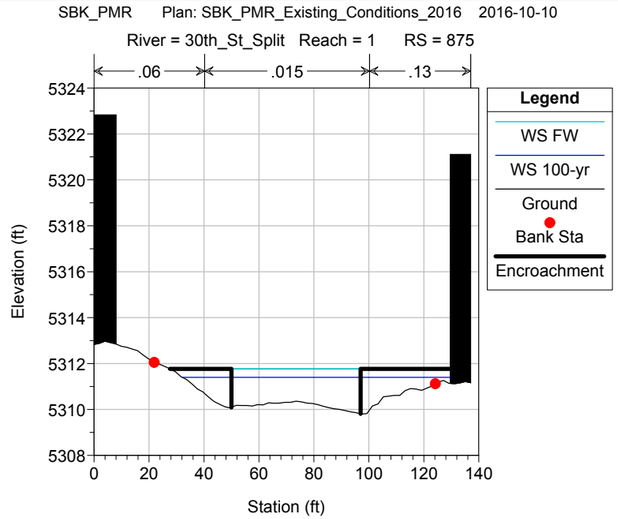
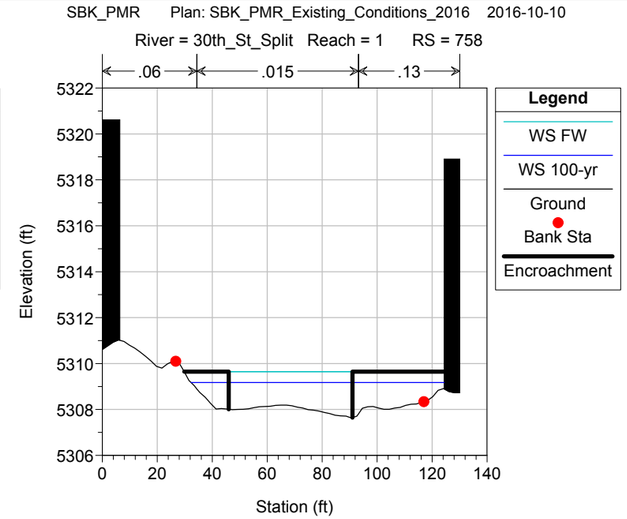
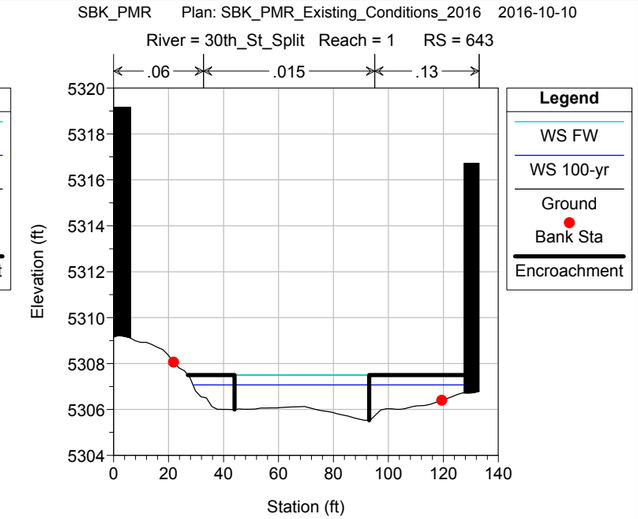
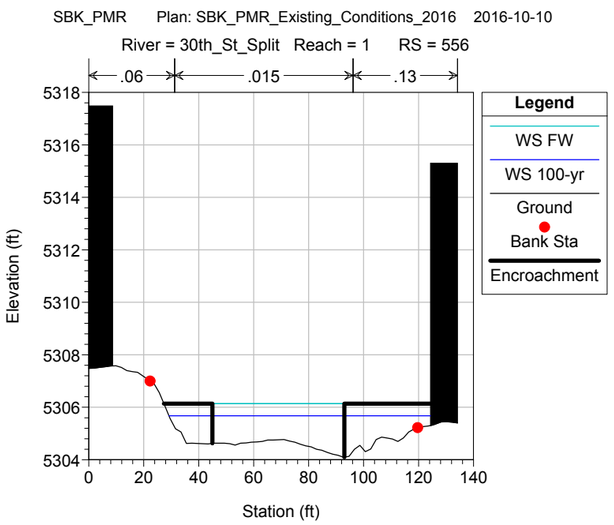
.015
.06
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

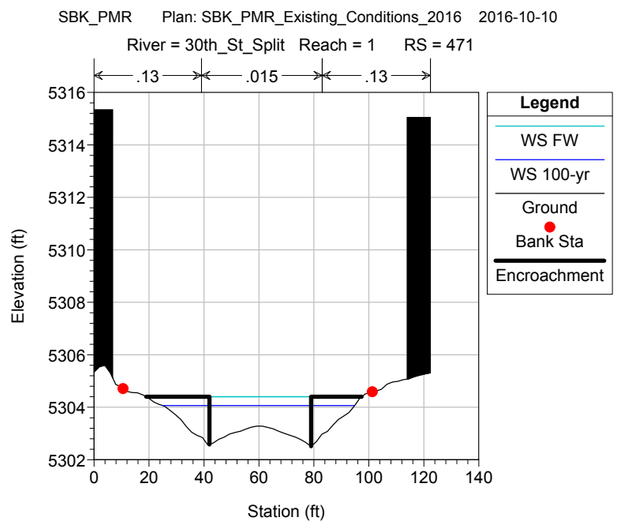

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 29th_St_Split Reach = 1 RS = 94
.13 .015 .06
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

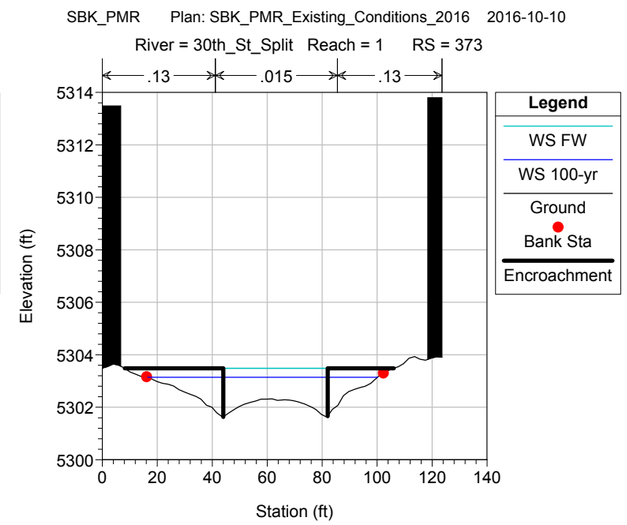

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 30th_St_Split Reach = 1 RS = 875
.06 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

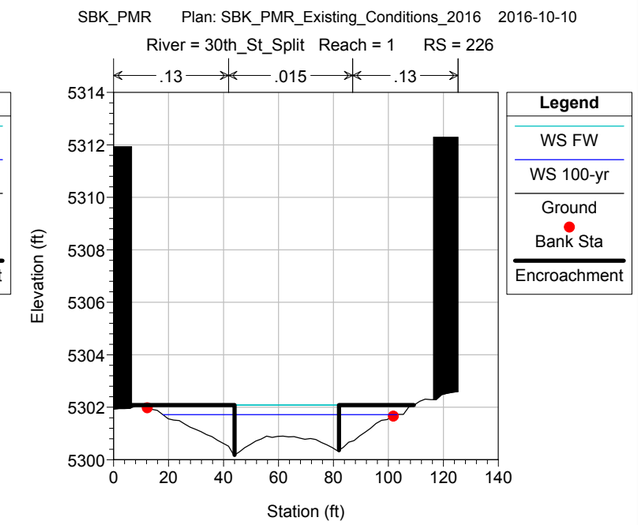

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 30th_St_Split Reach = 1 RS = 758
.06 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

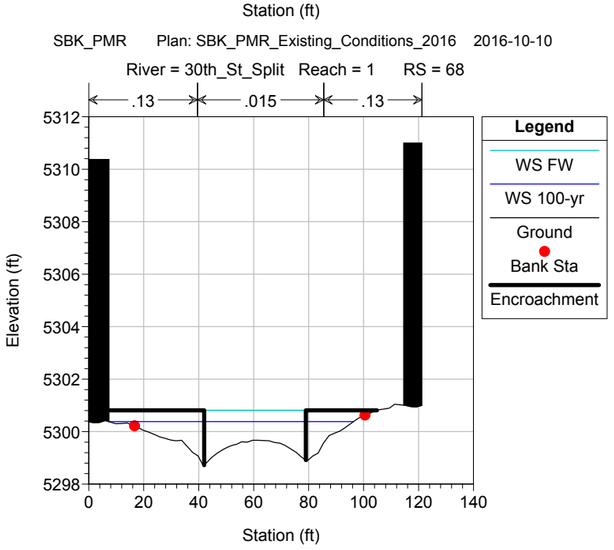

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 30th_St_Split Reach = 1 RS = 643
.06 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

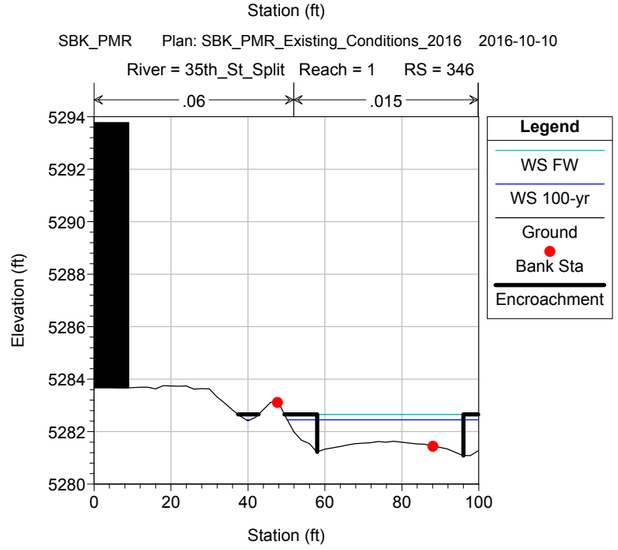

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 30th_St_Split Reach = 1 RS = 556
.06 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

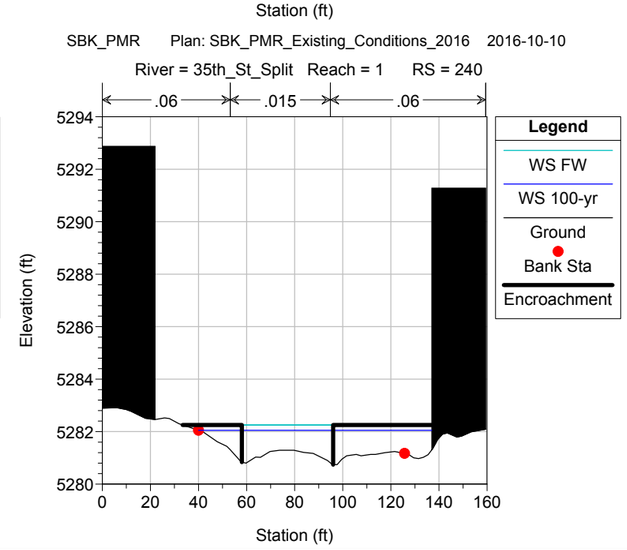

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 30th_St_Split Reach = 1 RS = 471
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

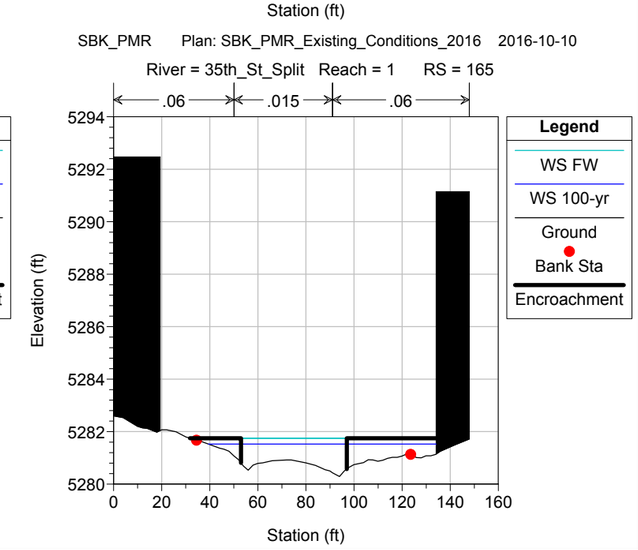

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 30th_St_Split Reach = 1 RS = 373
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 30th_St_Split Reach = 1 RS = 226
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 30th_St_Split Reach = 1 RS = 68
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

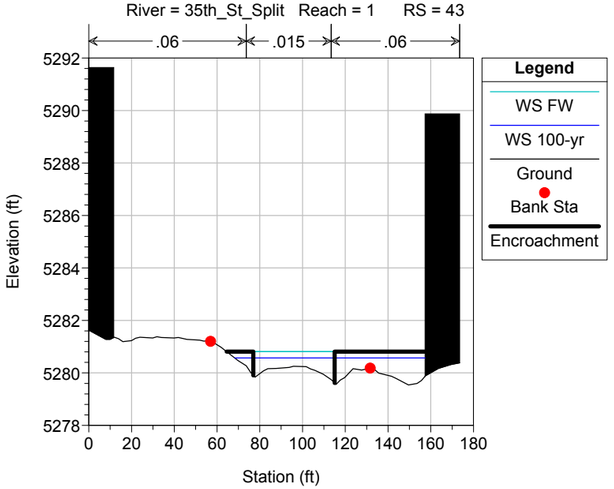

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 35th_St_Split Reach = 1 RS = 346
.06 .015
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 35th_St_Split Reach = 1 RS = 240
.06 .015 .06
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = 35th_St_Split Reach = 1 RS = 165
.06 .015 .06
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

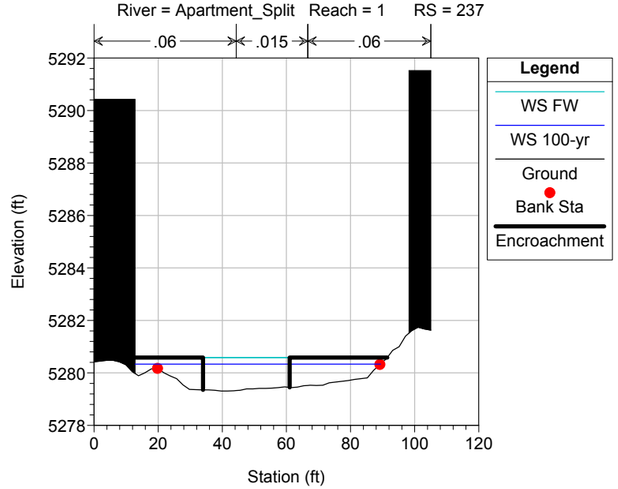
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = 35th_St_Split Reach = 1 RS = 43



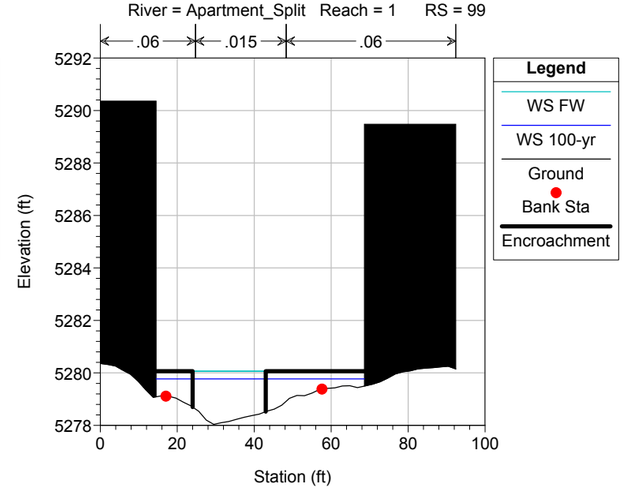
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Apartment_Split Reach = 1 RS = 237



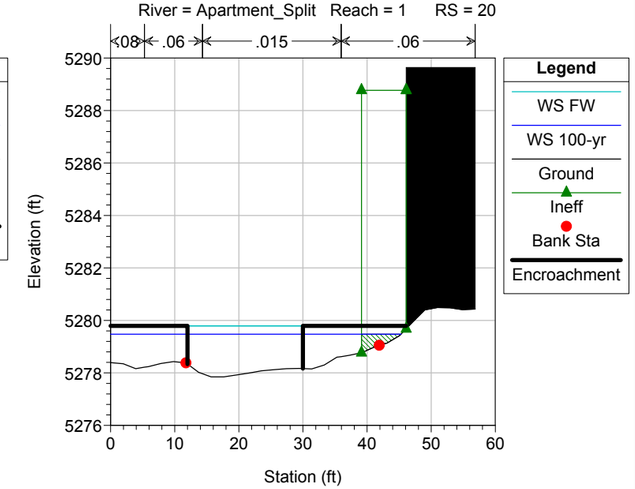
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Apartment_Split Reach = 1 RS = 99



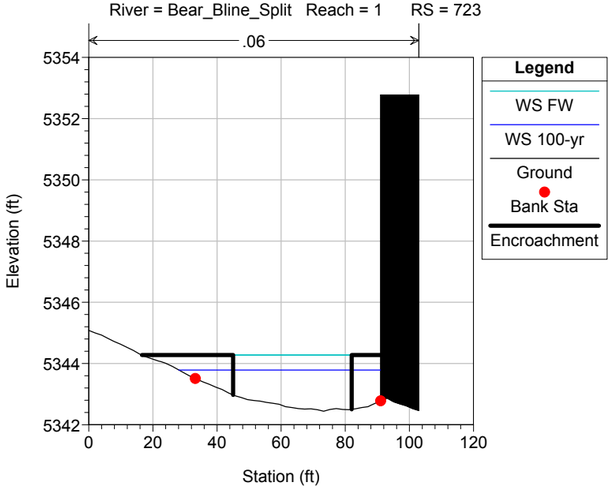
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Apartment_Split Reach = 1 RS = 20



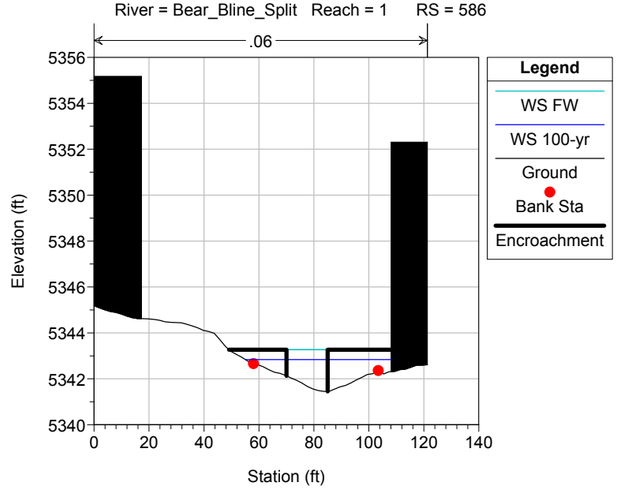
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Bline_Split Reach = 1 RS = 723



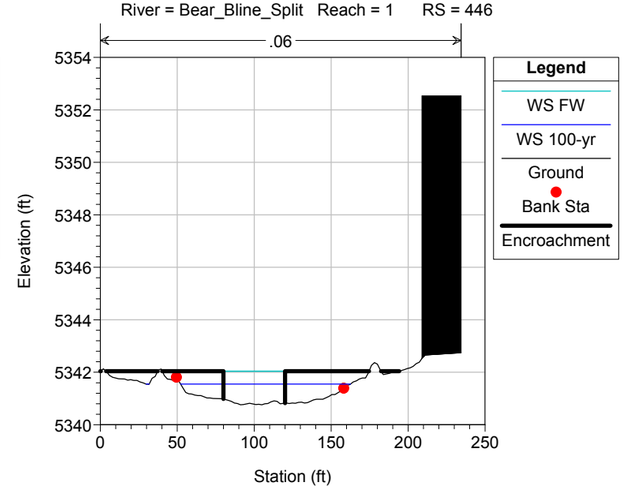
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Bline_Split Reach = 1 RS = 586



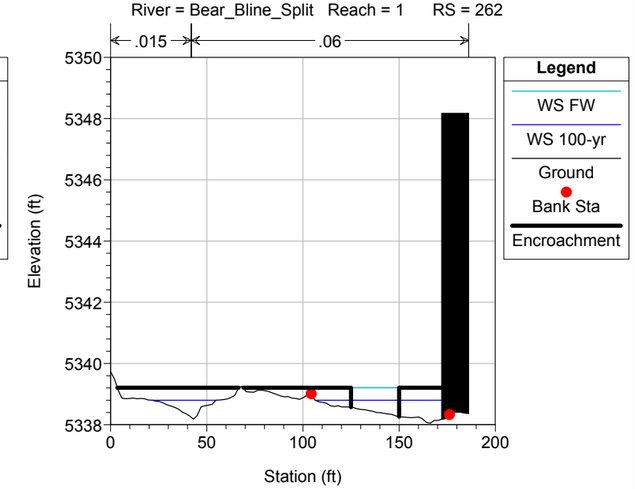
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Bline_Split Reach = 1 RS = 446



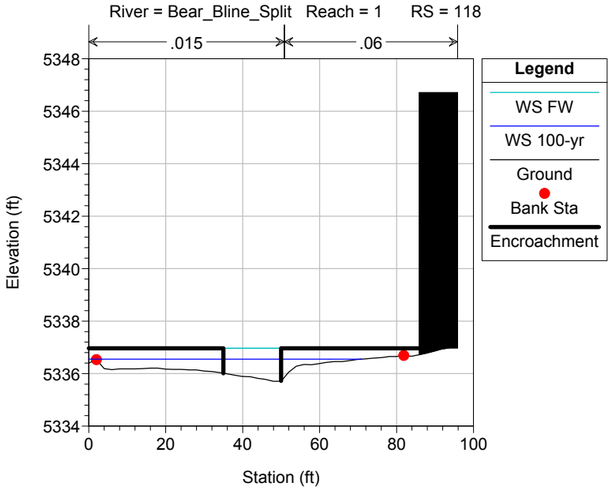
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Bline_Split Reach = 1 RS = 262



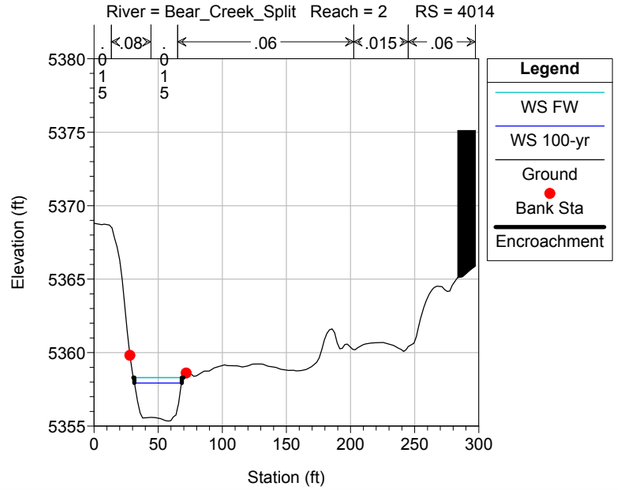
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Bline_Split Reach = 1 RS = 118



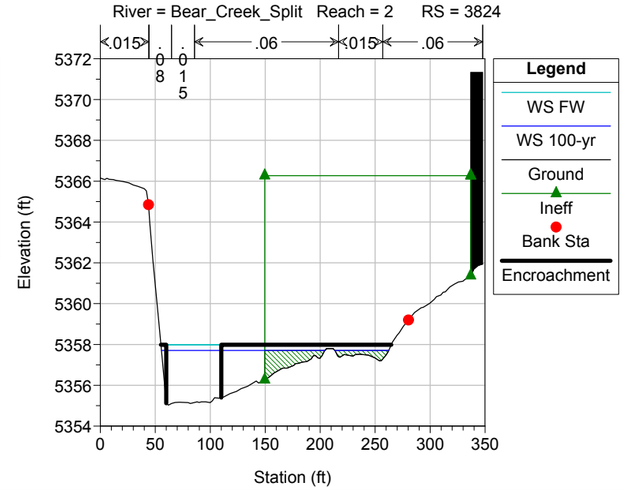
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Creek_Split Reach = 2 RS = 4014



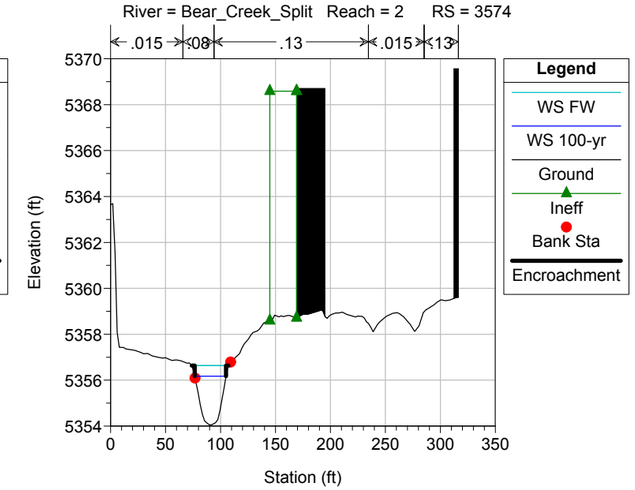
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Creek_Split Reach = 2 RS = 3824

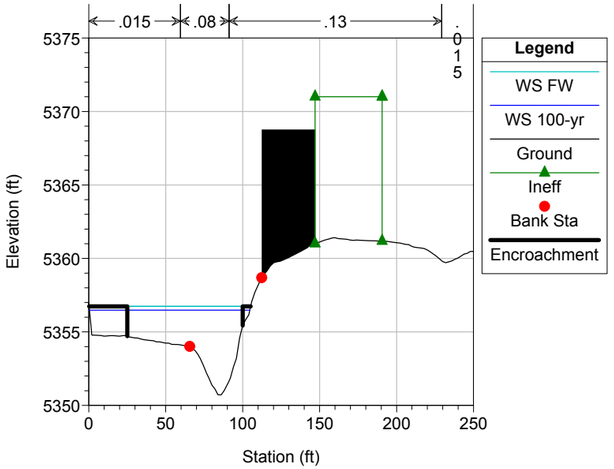


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

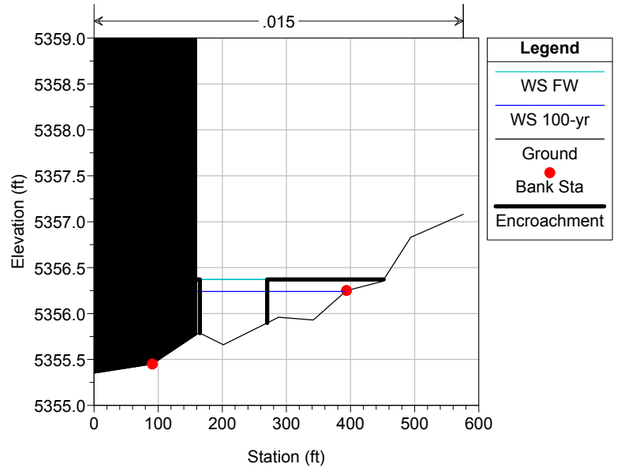
River = Bear_Creek_Split Reach = 2 RS = 3574



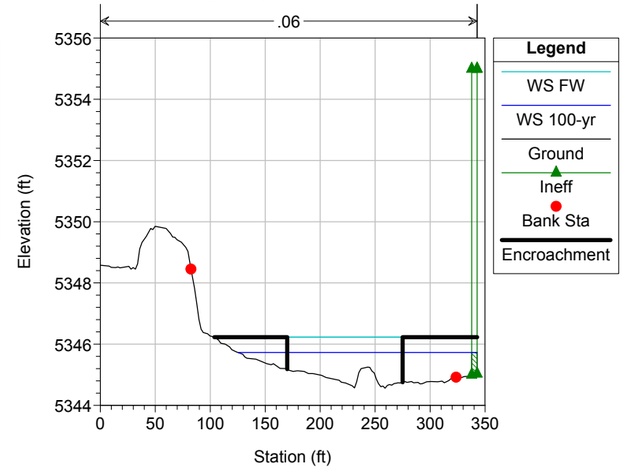
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 2 RS = 3352



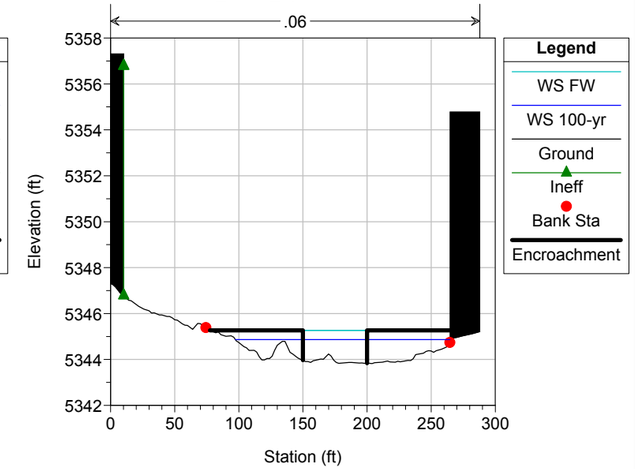
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 2 RS = 3174



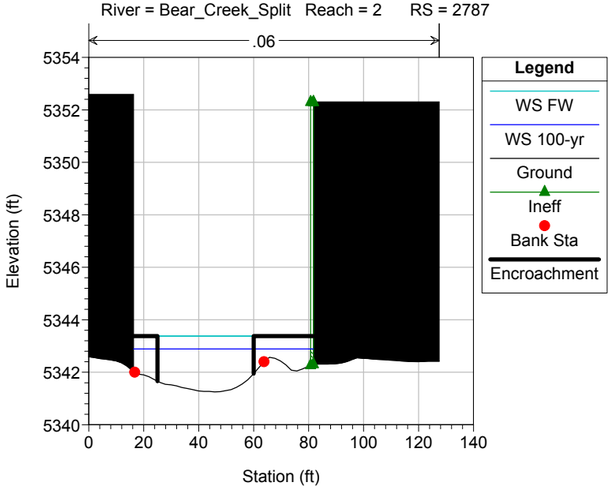
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 2 RS = 3053



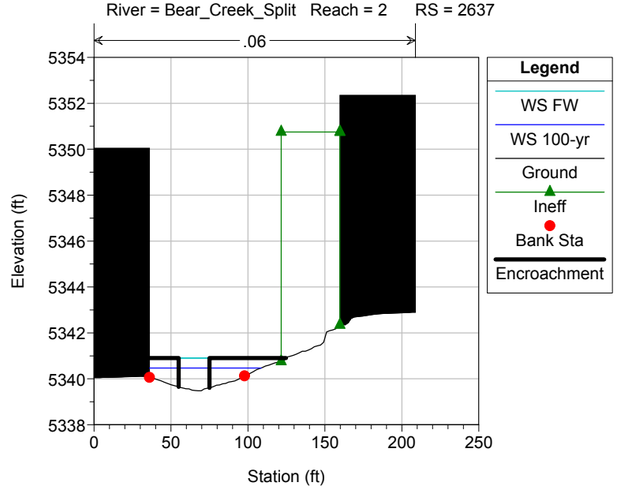
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 2 RS = 2972



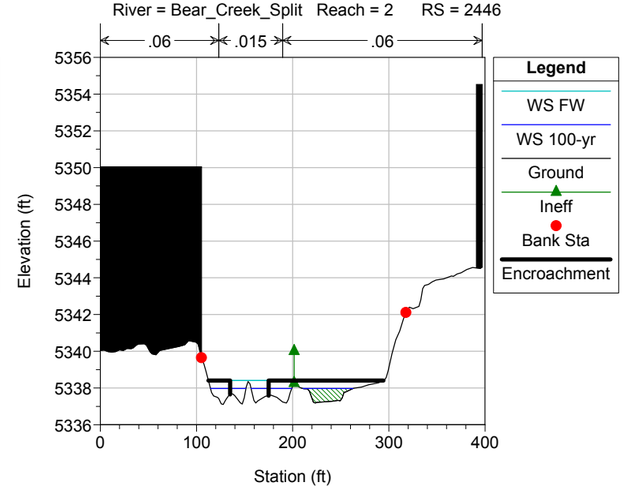
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 2 RS = 2787



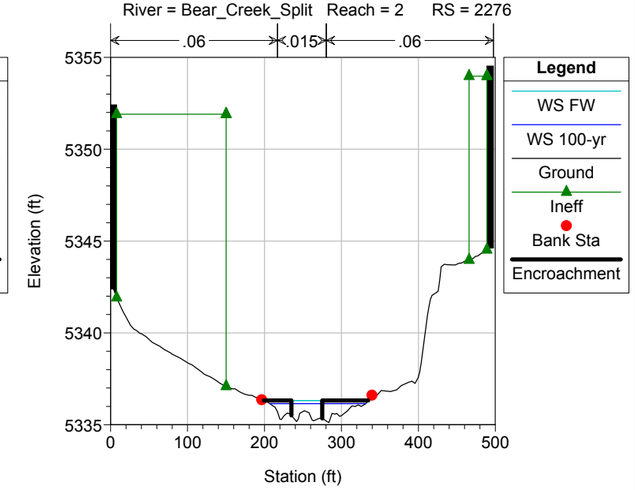
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 2 RS = 2637



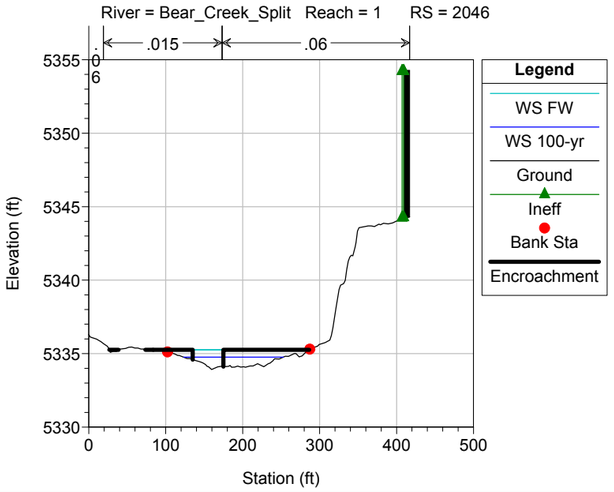
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 2 RS = 2446



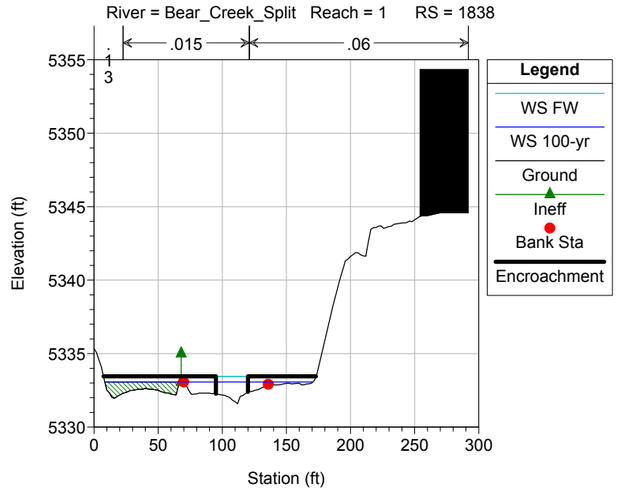
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 2 RS = 2276



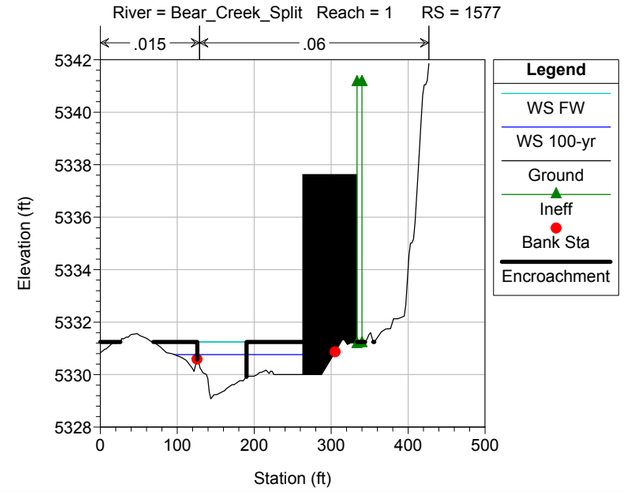
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 1 RS = 2046



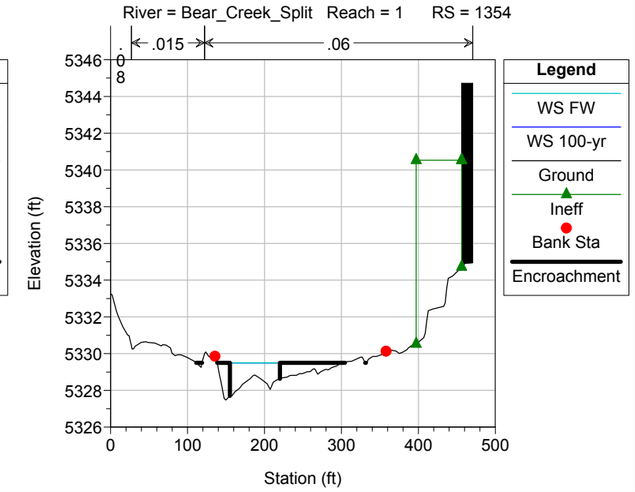
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 1 RS = 1838



SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 1 RS = 1577

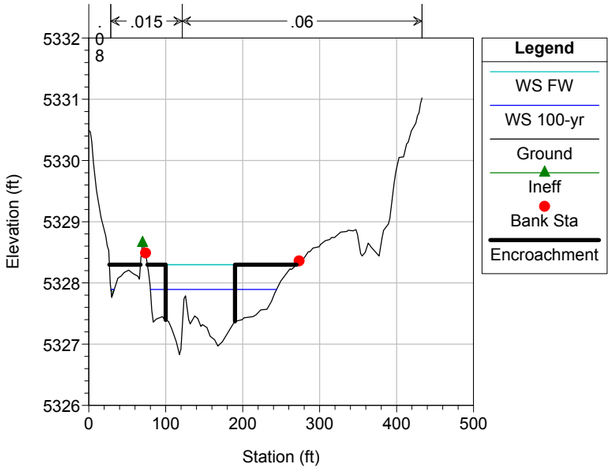


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bear_Creek_Split Reach = 1 RS = 1354



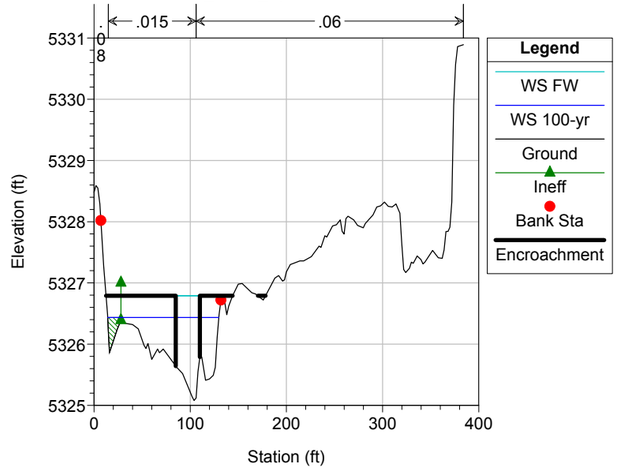
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Creek_Split Reach = 1 RS = 1135



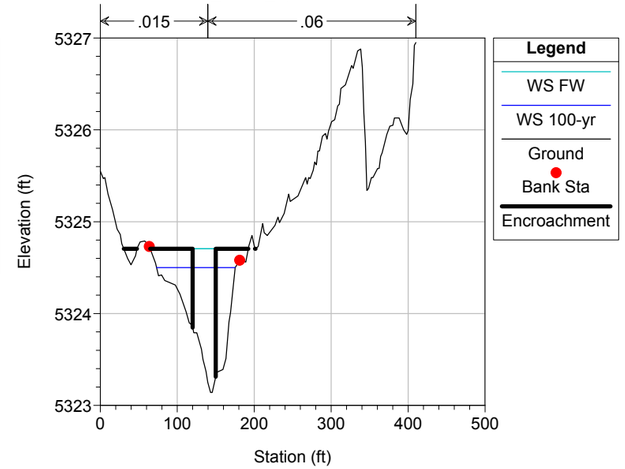
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Creek_Split Reach = 1 RS = 965



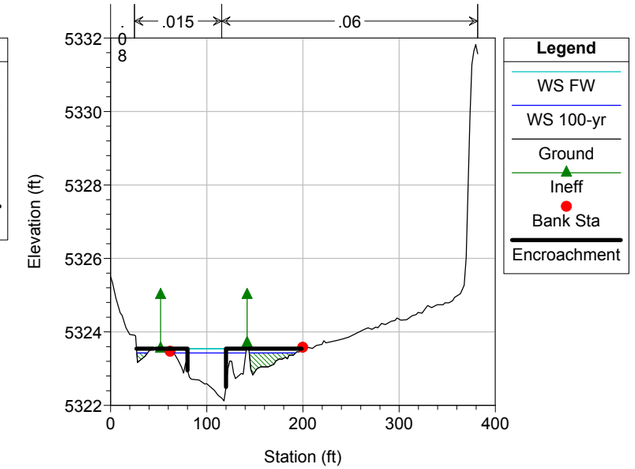
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Creek_Split Reach = 1 RS = 740



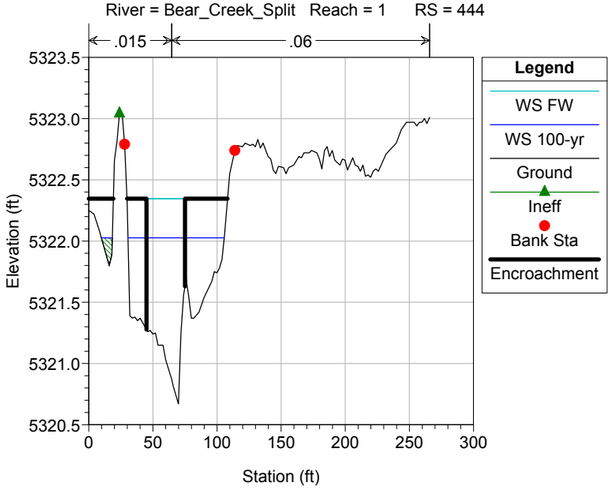
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Creek_Split Reach = 1 RS = 610



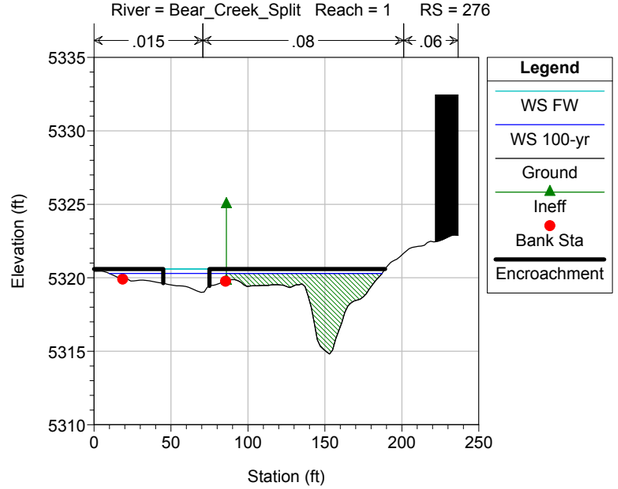
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Creek_Split Reach = 1 RS = 444



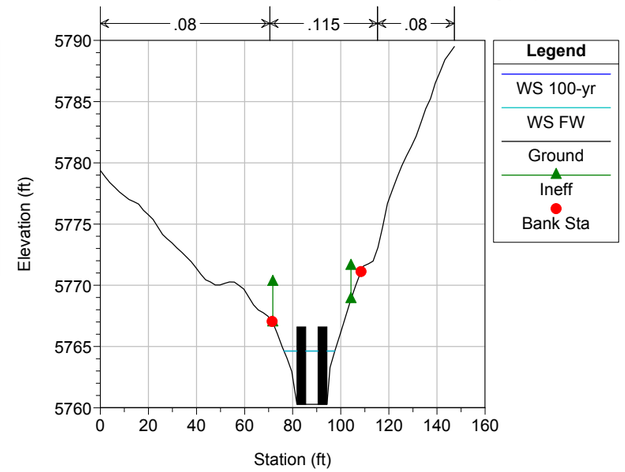
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bear_Creek_Split Reach = 1 RS = 276



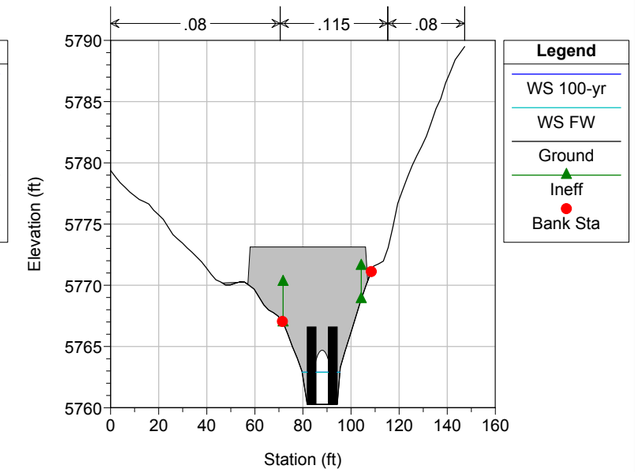
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 6245 Bluebell Trail Crossing (U/S)



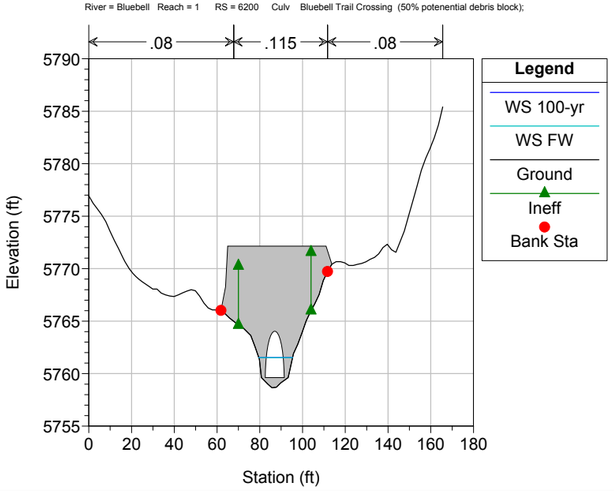
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 6200 Culv Bluebell Trail Crossing (50% potenential debris block);



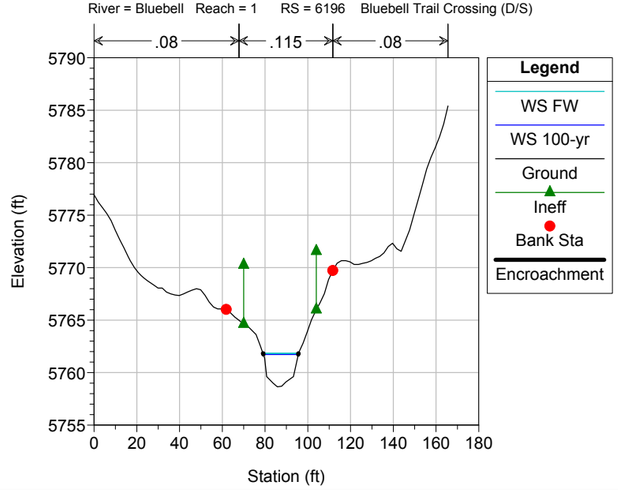
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 6200 Culv Bluebell Trail Crossing (50% potenential debris block);



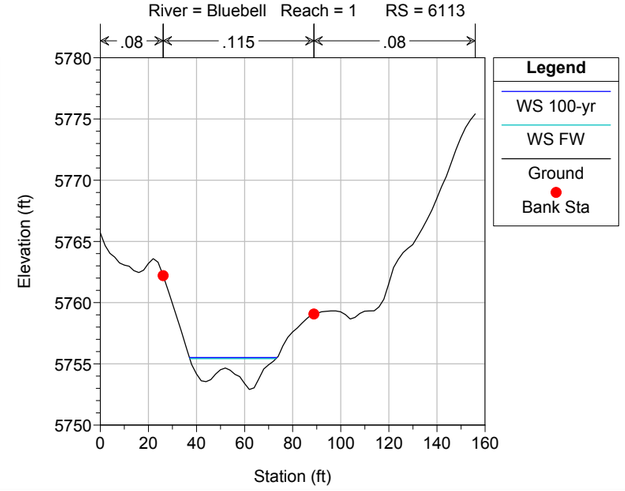
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 6196 Bluebell Trail Crossing (D/S)



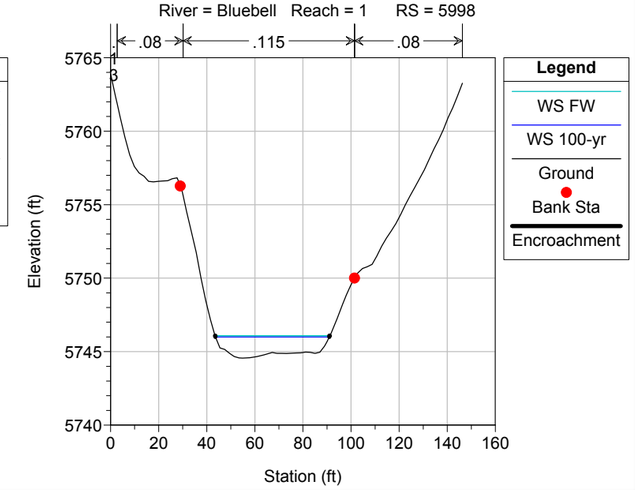
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 6113

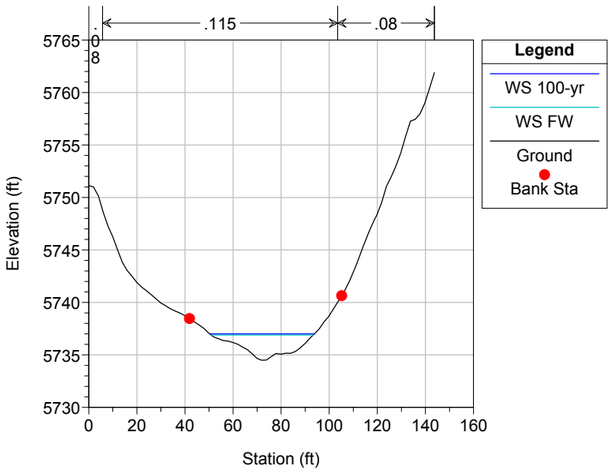


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

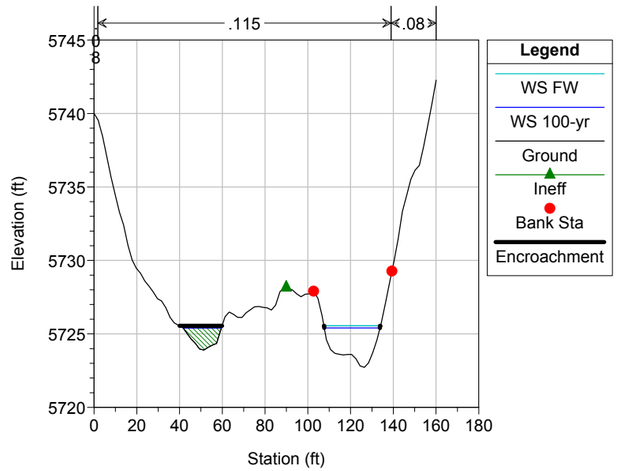
River = Bluebell Reach = 1 RS = 5998



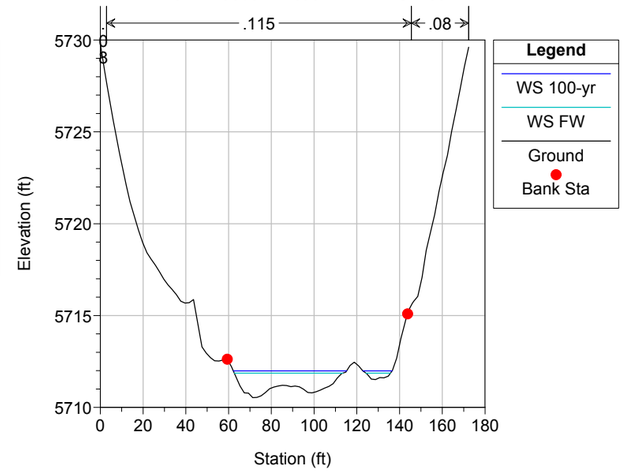
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5866



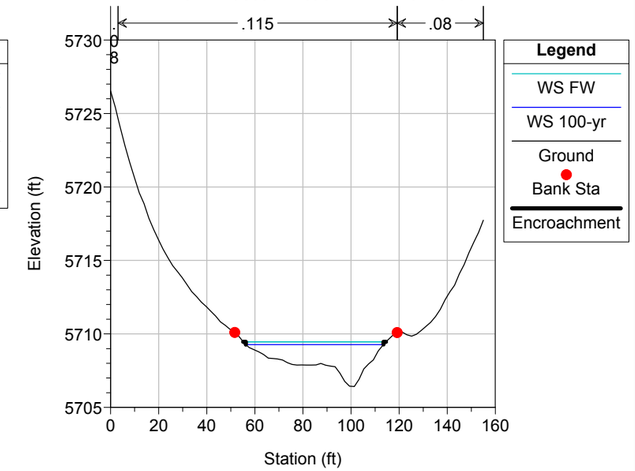
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5672



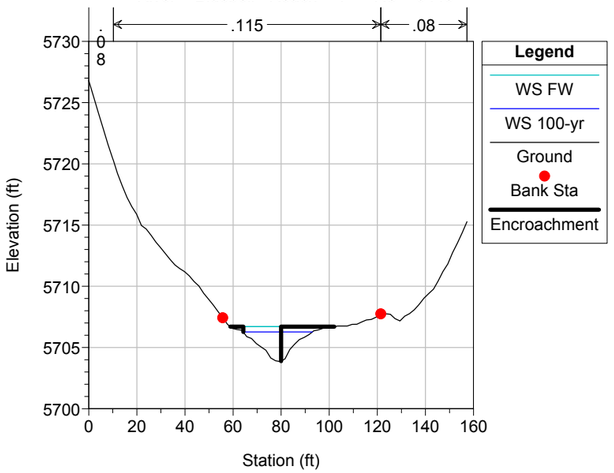
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5527



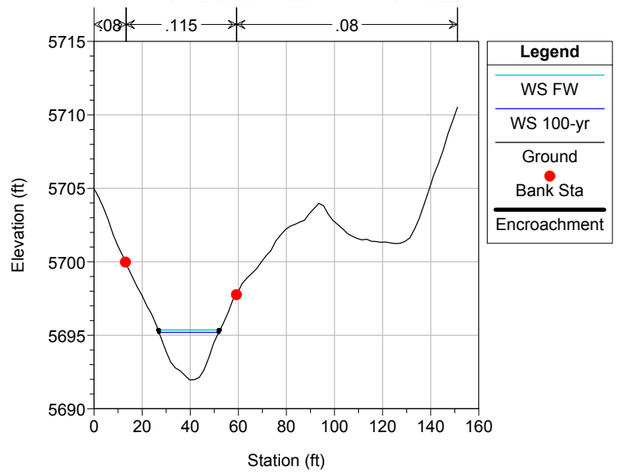
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5481



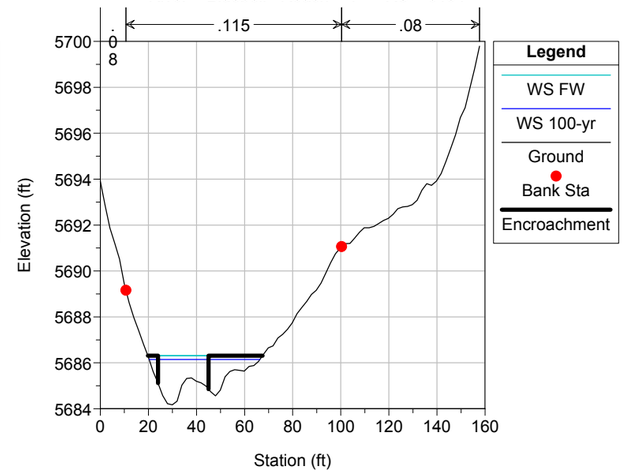
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5445



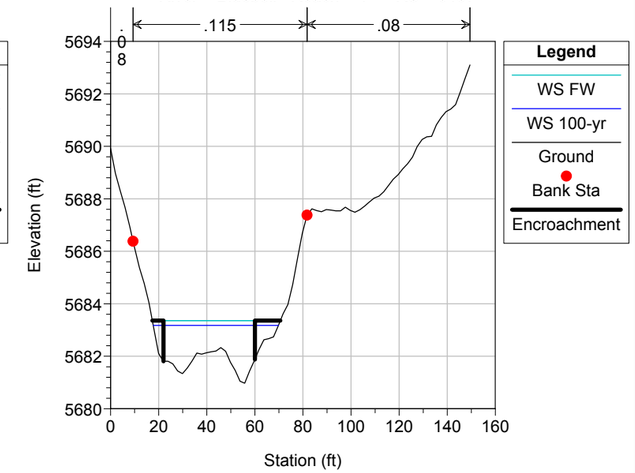
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5322



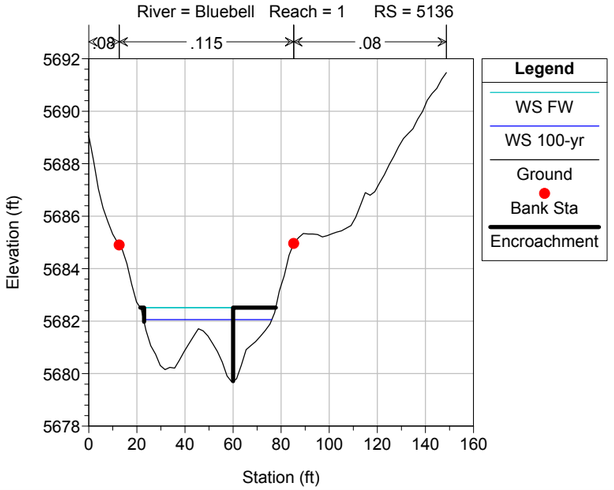
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5194



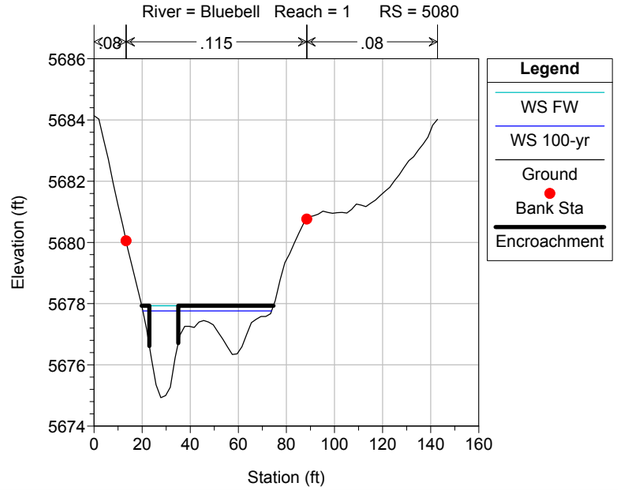
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5157



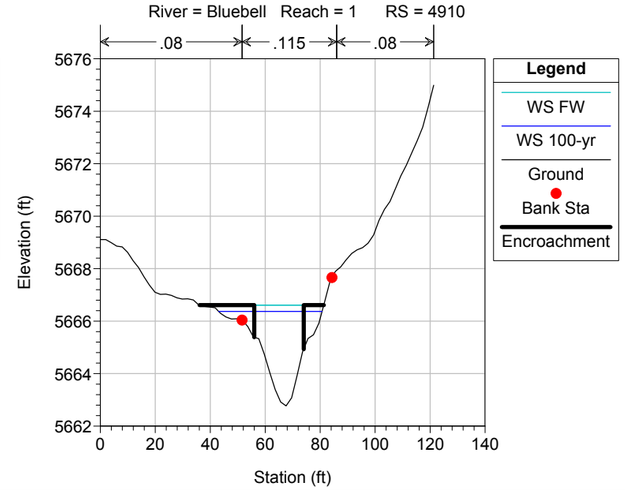
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5136



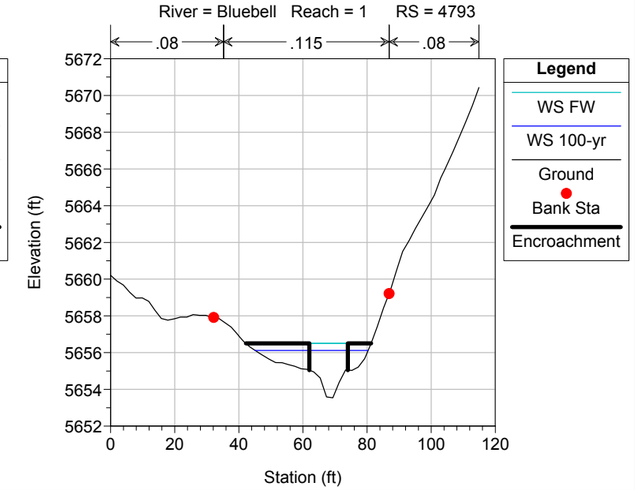
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 5080

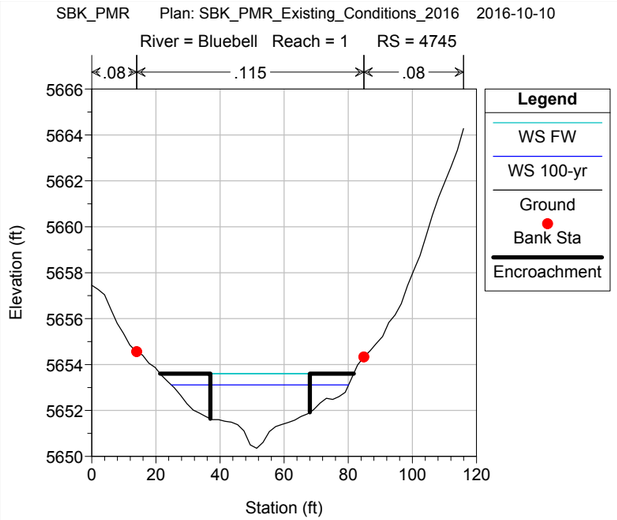


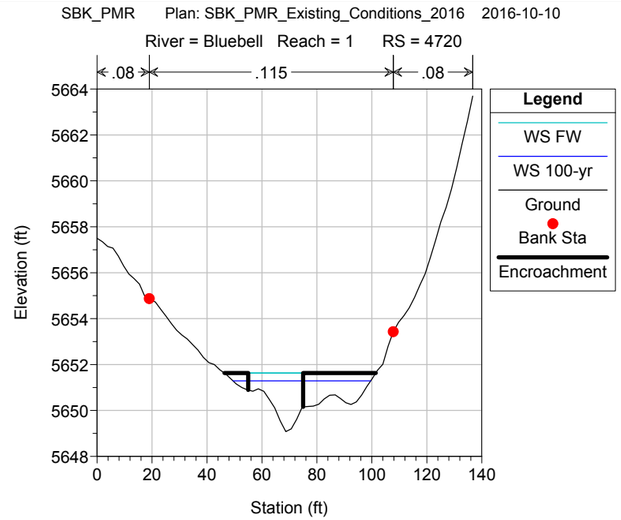
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4910

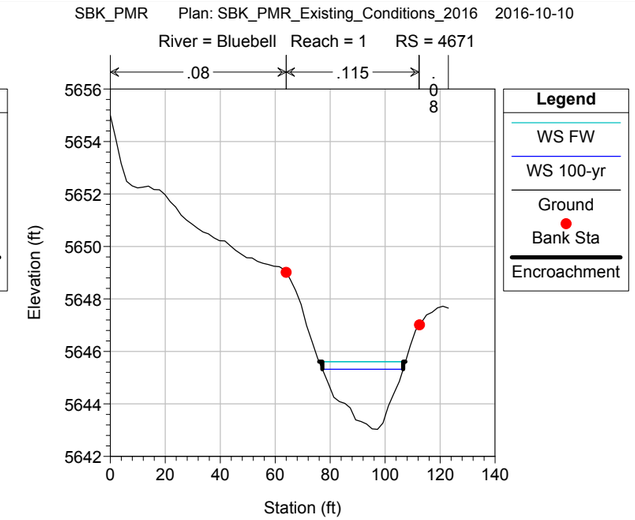


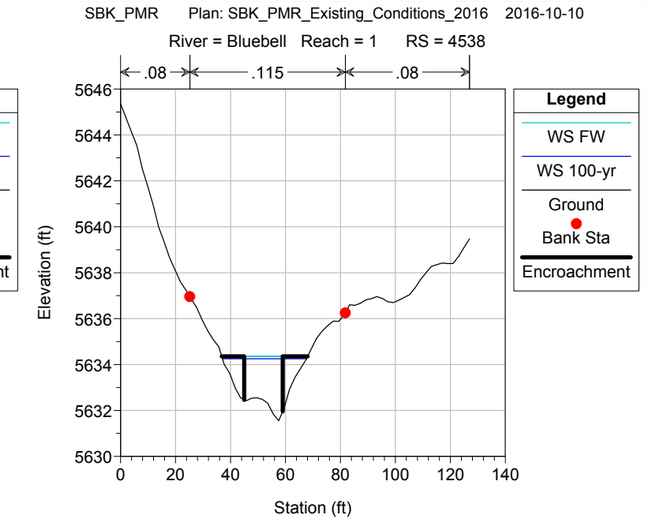
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4793

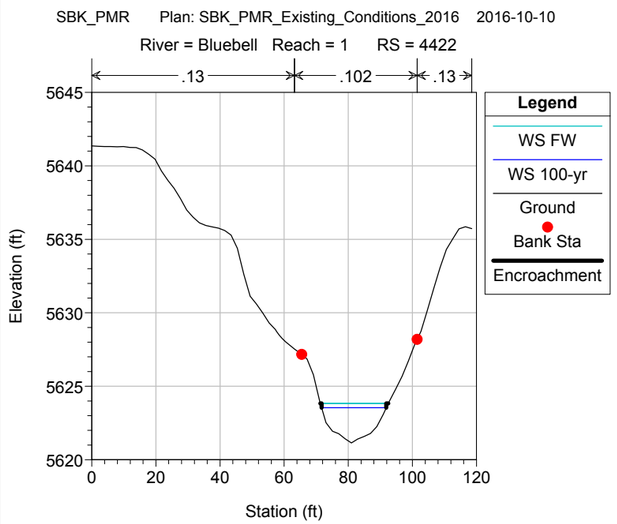


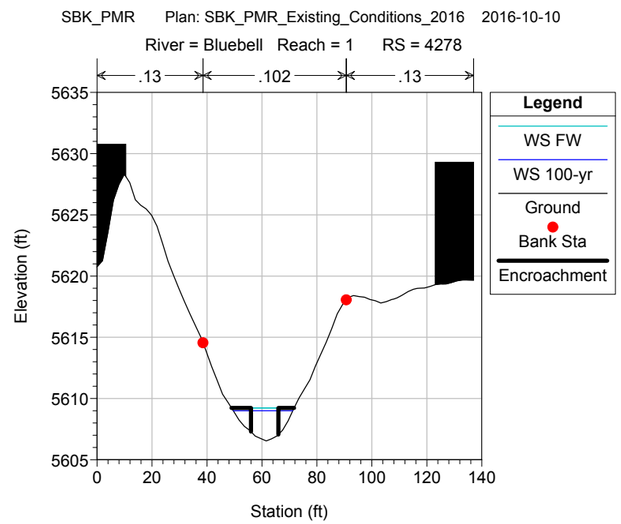

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4745
.08 .115 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

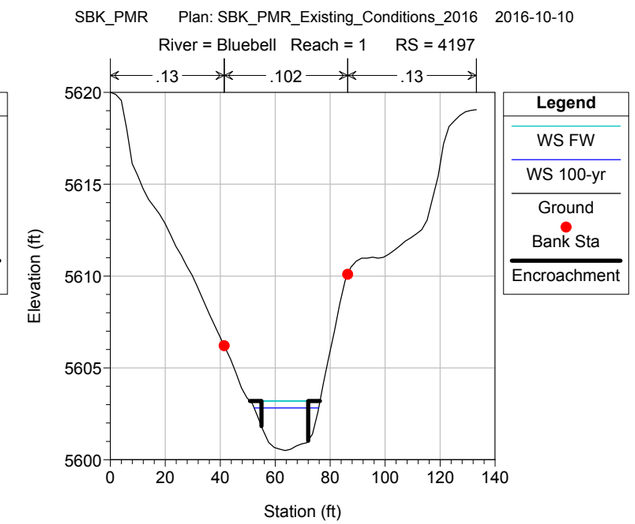

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4720
.08 .115 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

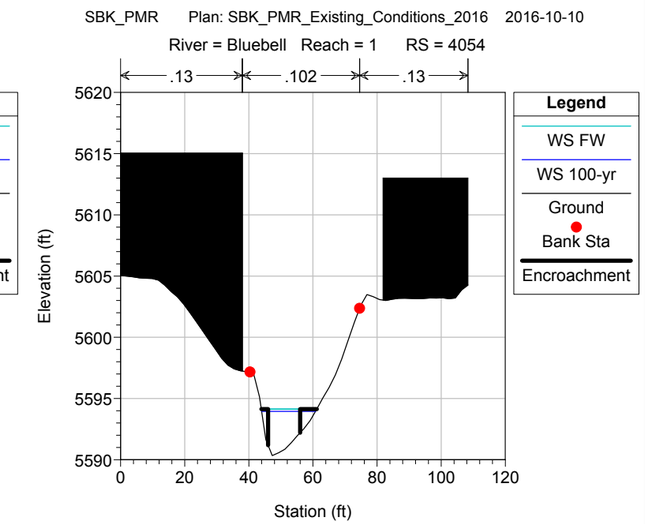

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4671
.08 .115 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

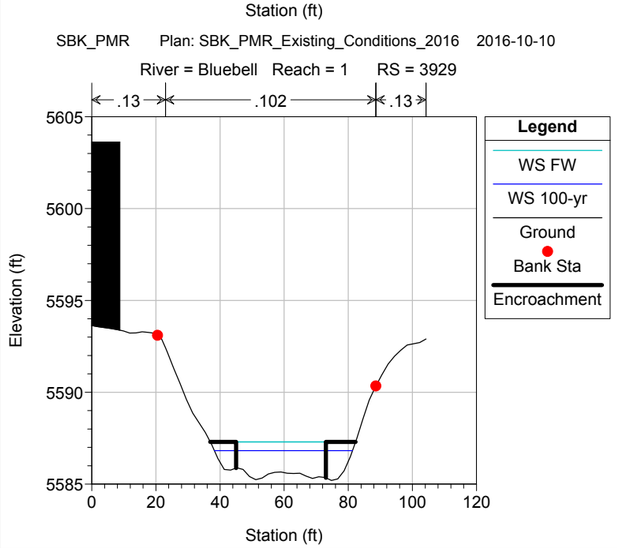

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4538
.08 .115 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

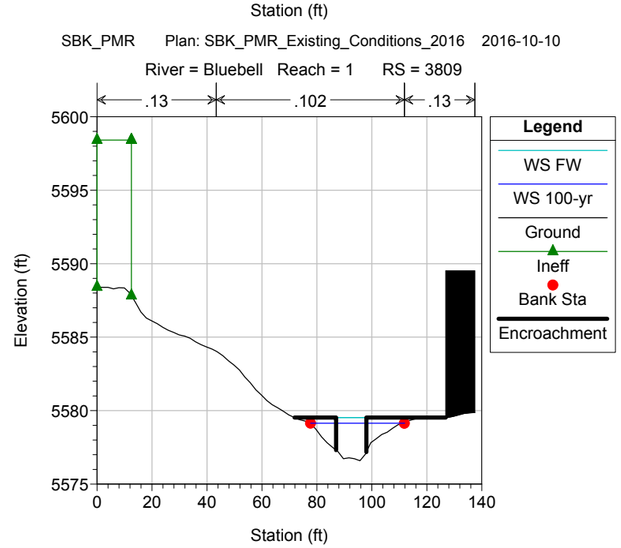

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4422
.13 .102 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

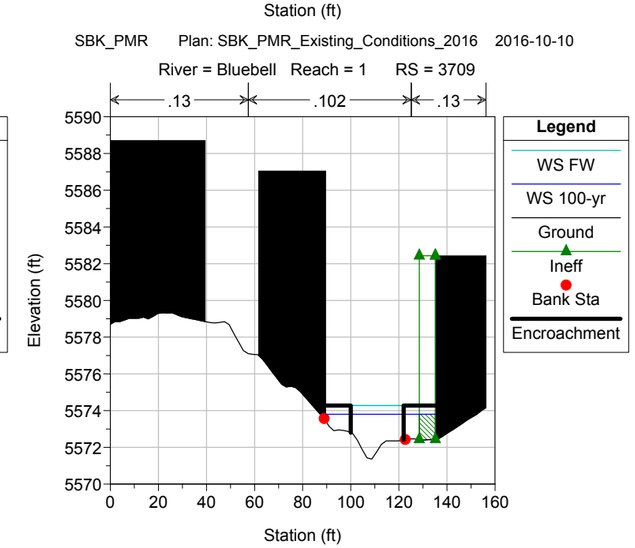

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4278
.13 .102 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

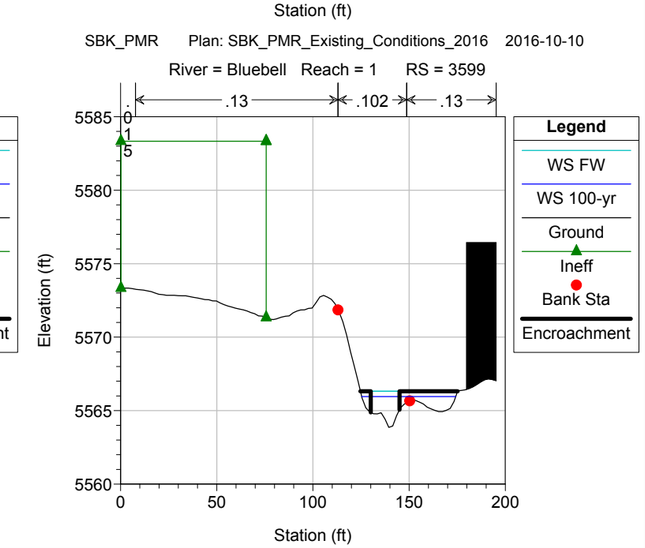

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4197
.13 .102 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

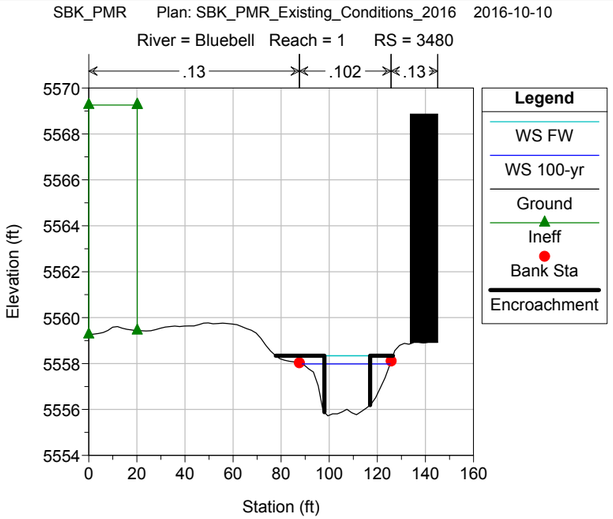

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 4054
.13 .102 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

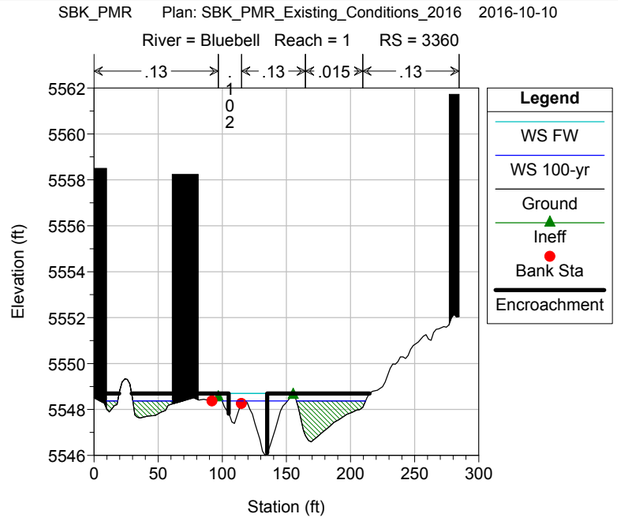

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 3929
.13 .102 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

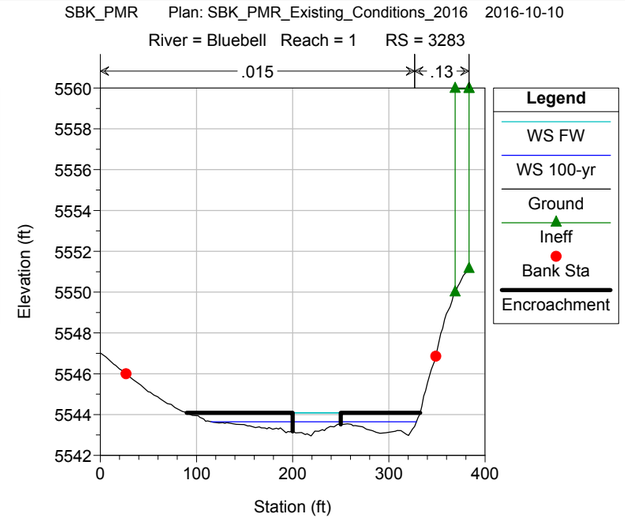

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 3809
.13 .102 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

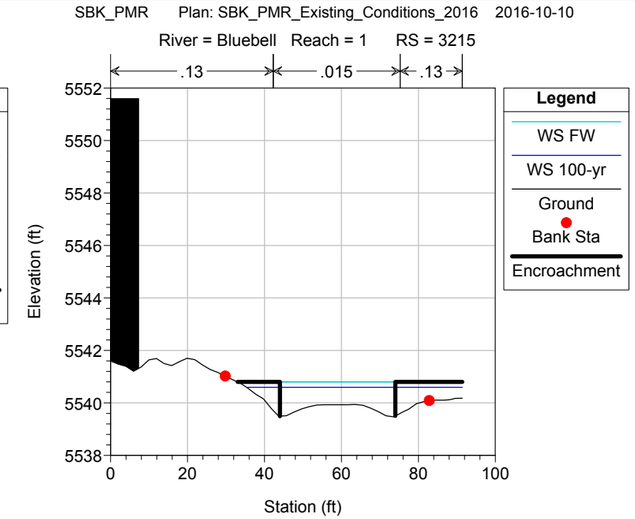

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 3709
.13 .102 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

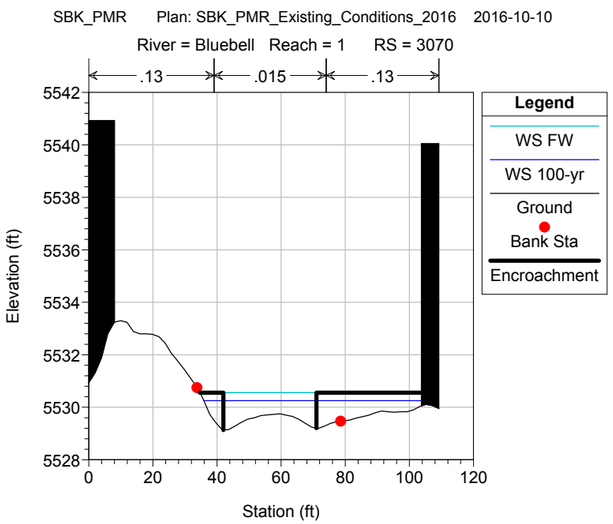

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 3599
.13 .102 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

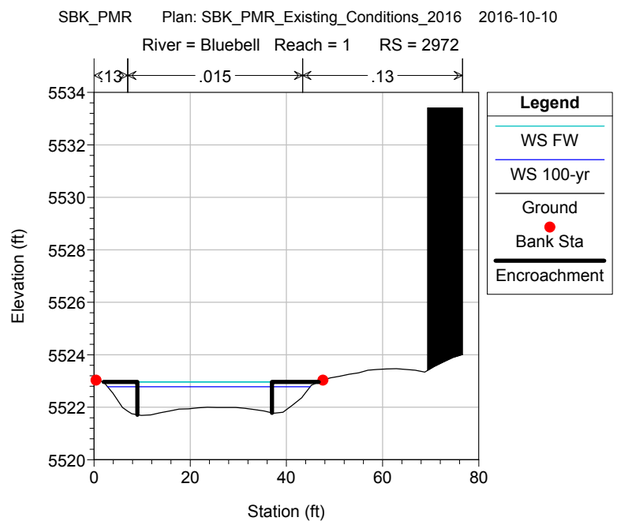

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 3480
.13 .102 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

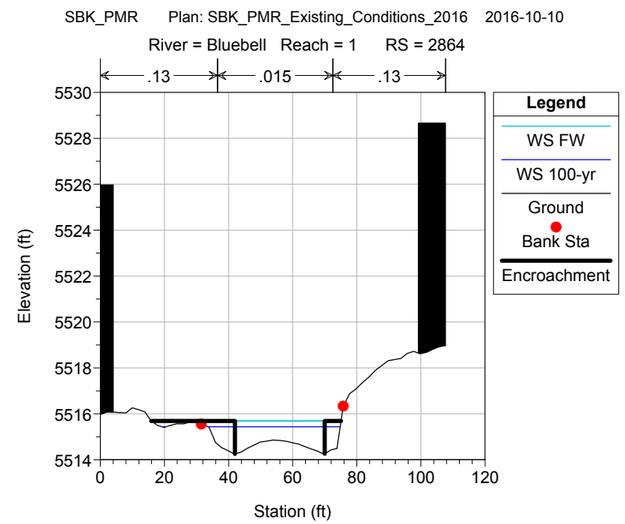

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 3360
.13 .13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

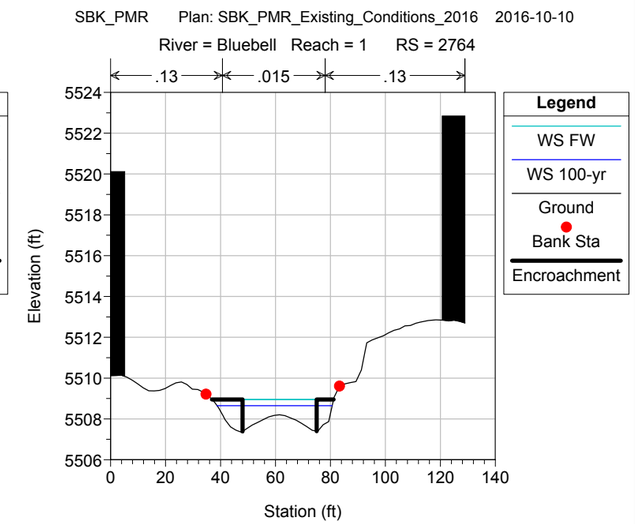

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 3283
.015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

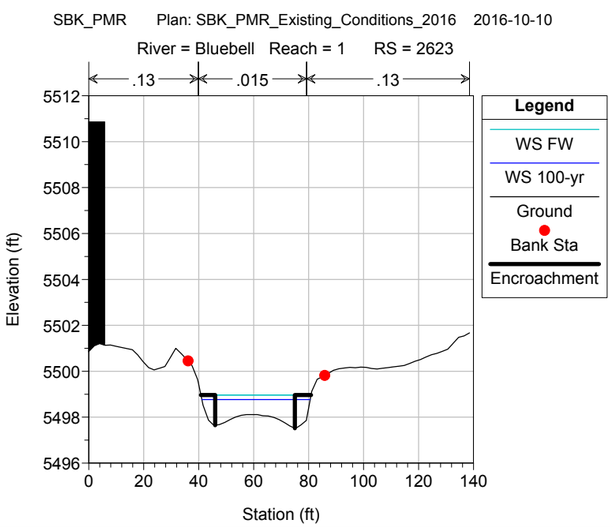

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 3215
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

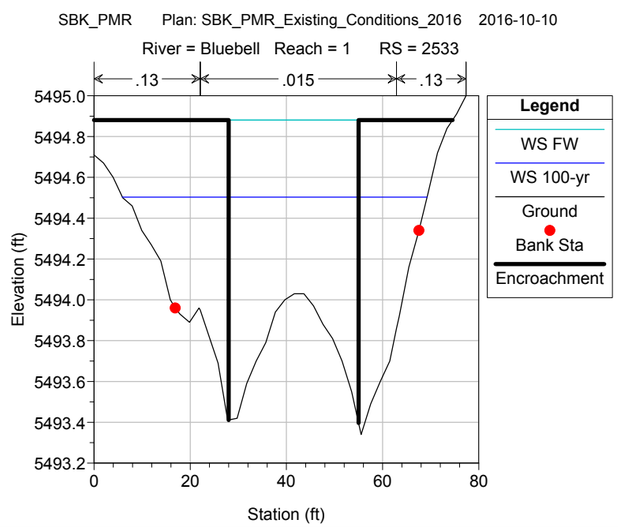

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 3070
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

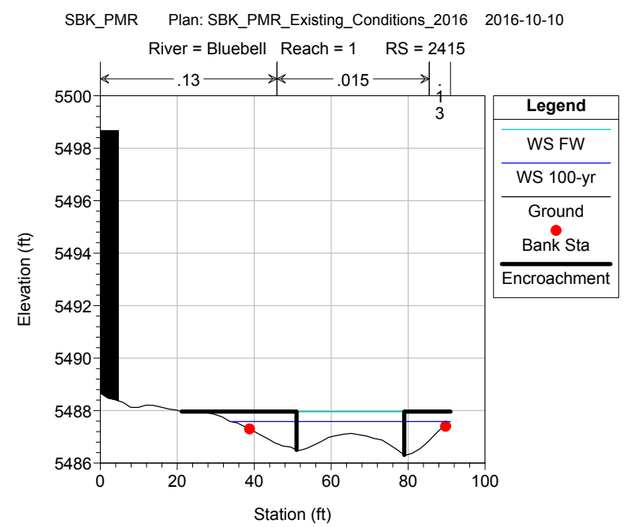

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 2972
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

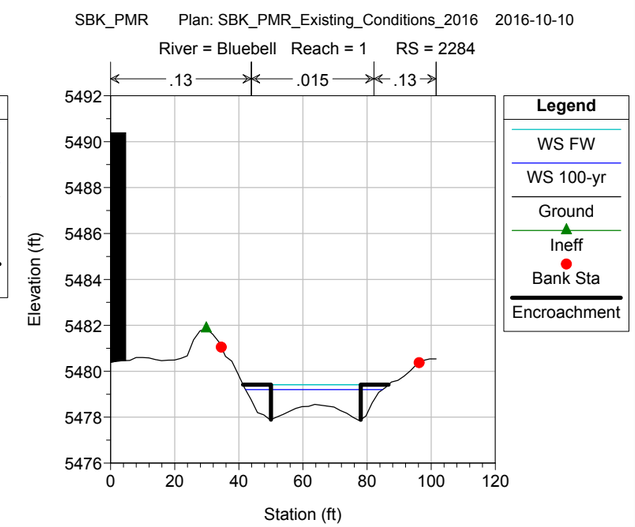

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 2864
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 2764
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 2623
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

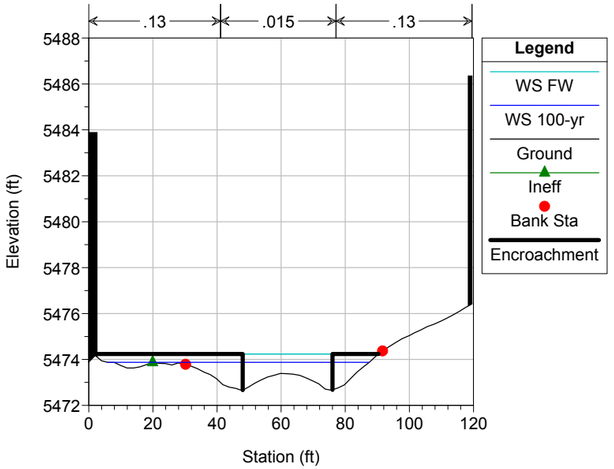

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 2533
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 2415
.13 .015
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 2284
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

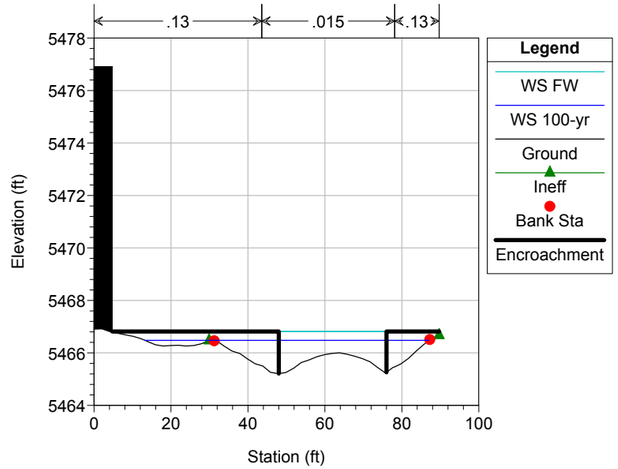
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 2182



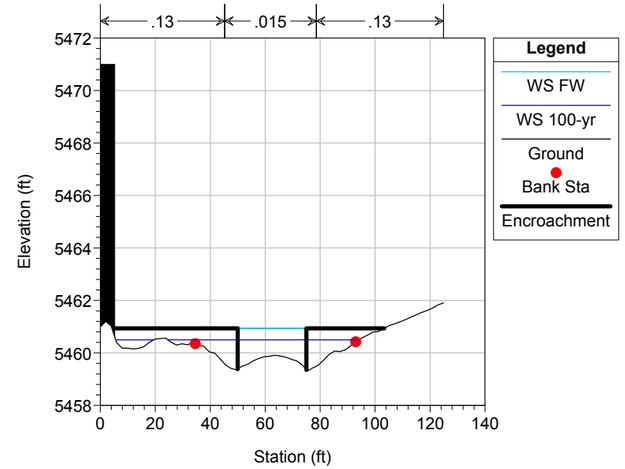
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 2039



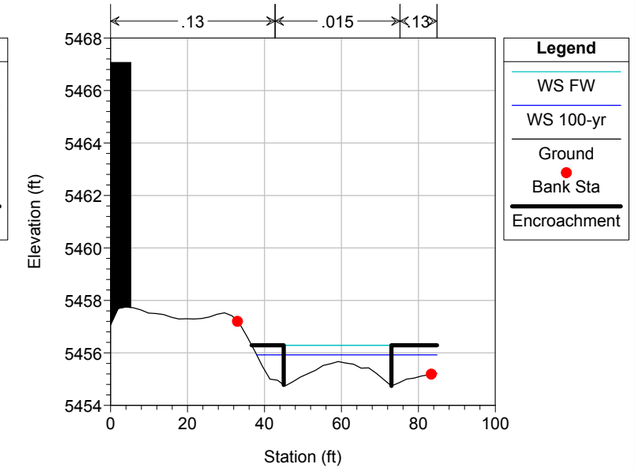
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 1926



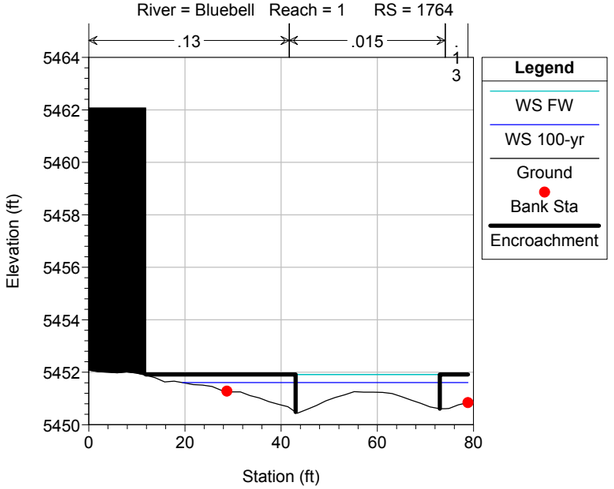
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 1839



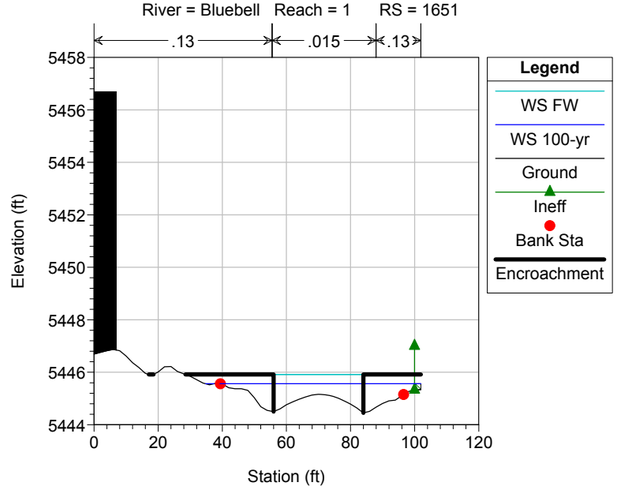
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 1764



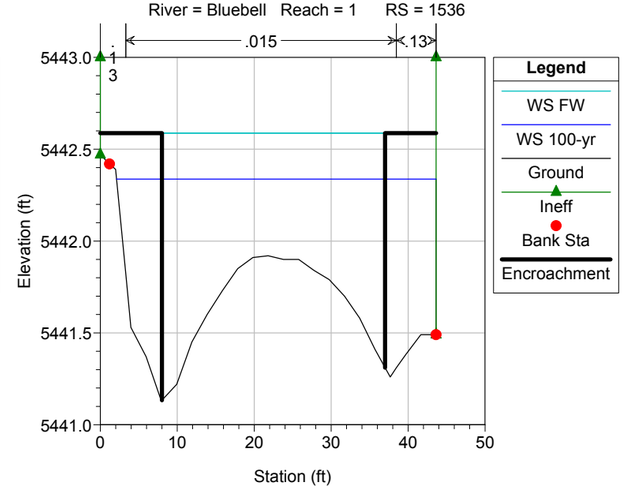
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 1651



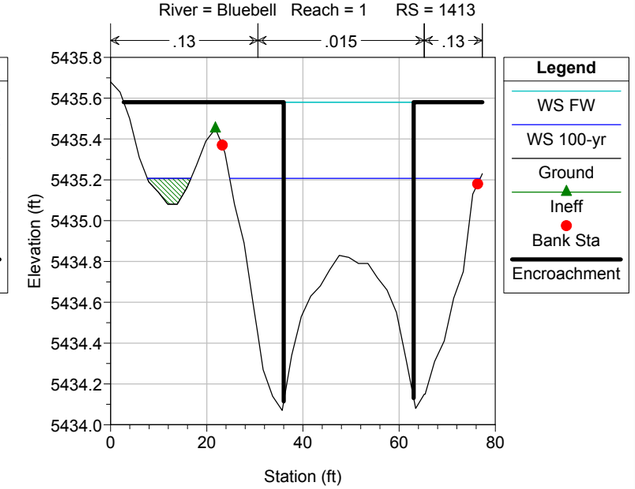
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 1536



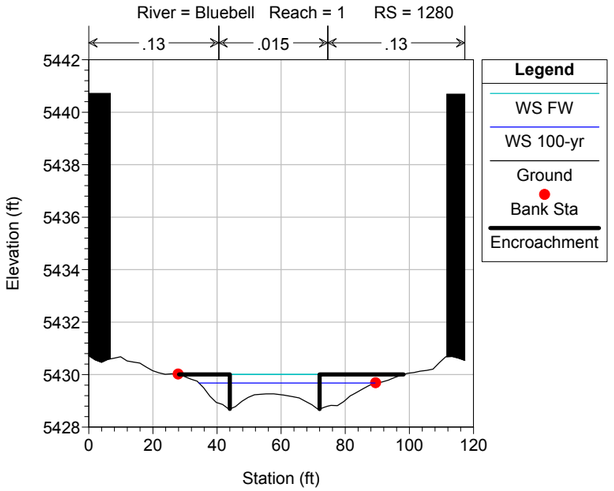
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 1413



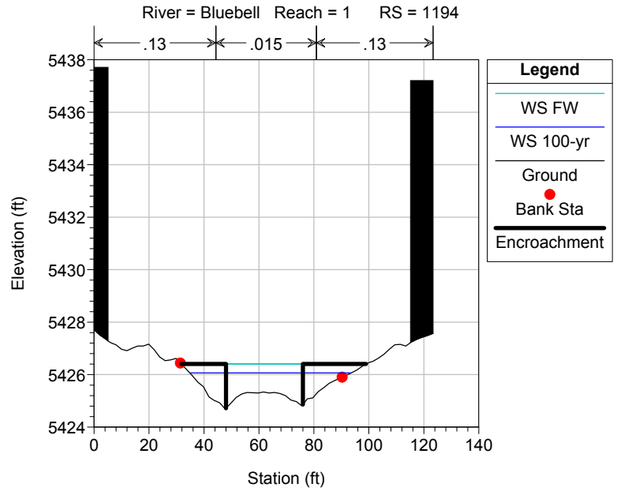
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 1280



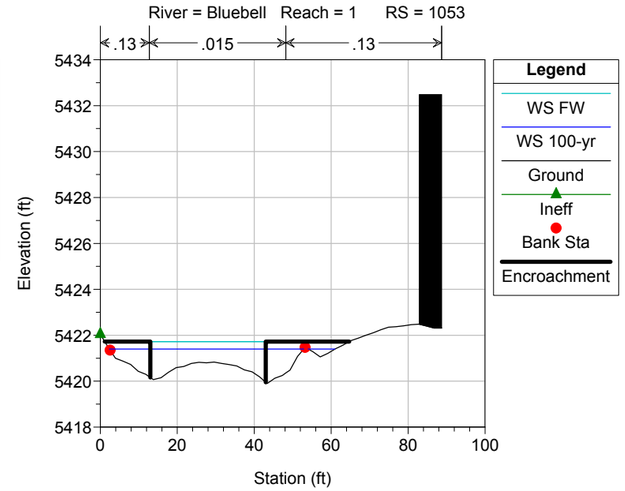
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 1194



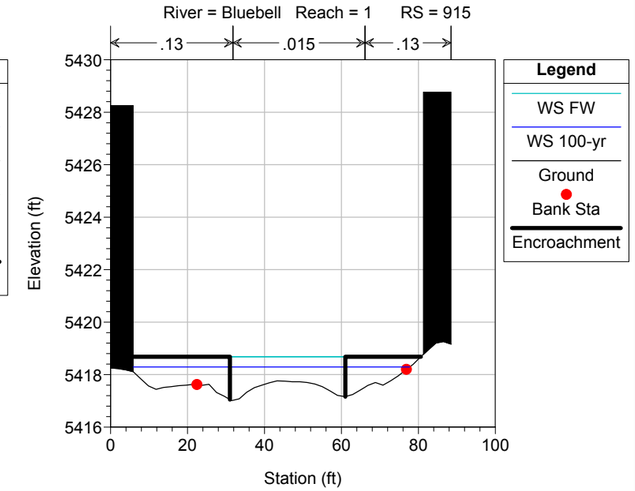
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell Reach = 1 RS = 1053

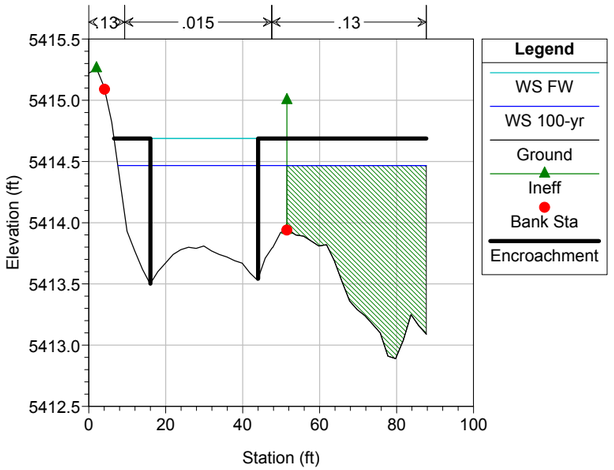


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

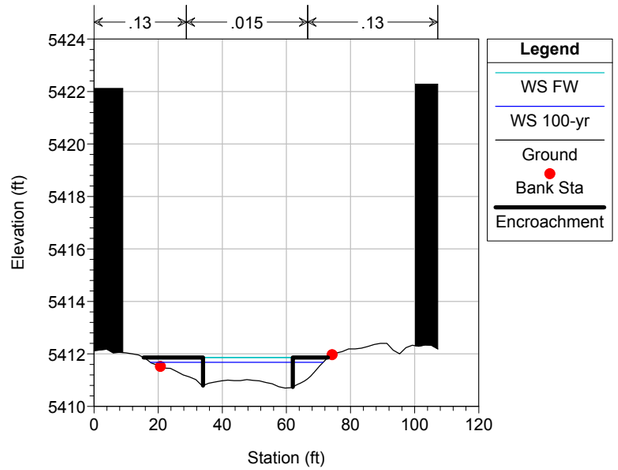
River = Bluebell Reach = 1 RS = 915



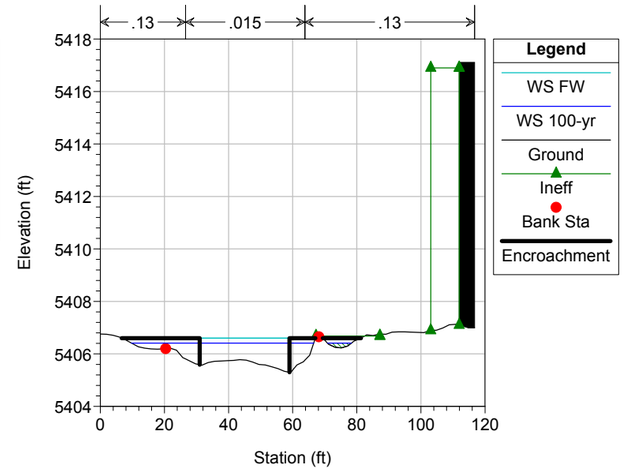
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 799



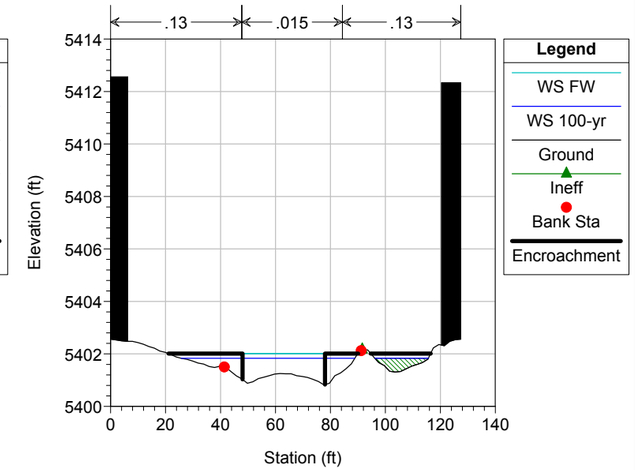
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 732



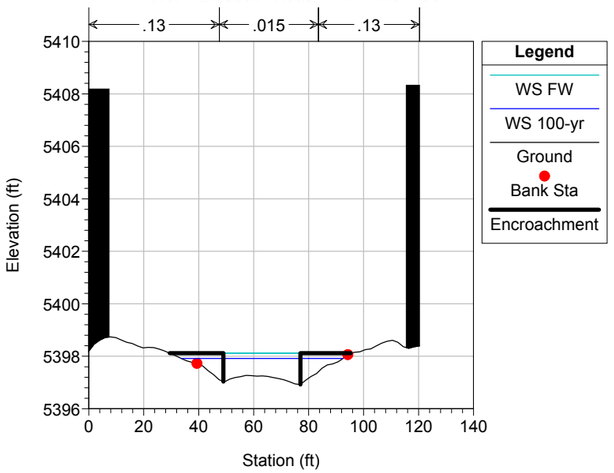
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 599



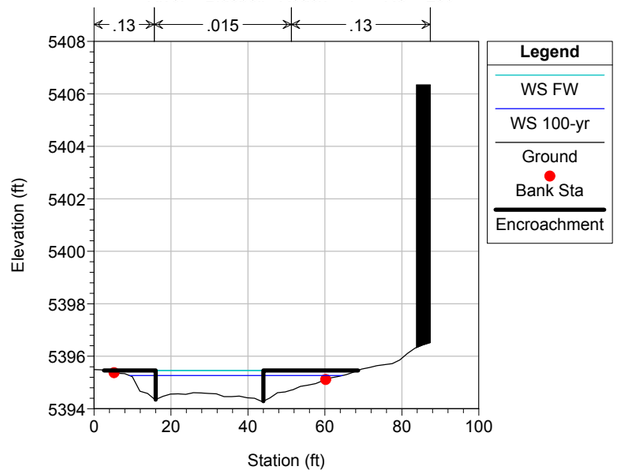
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 481



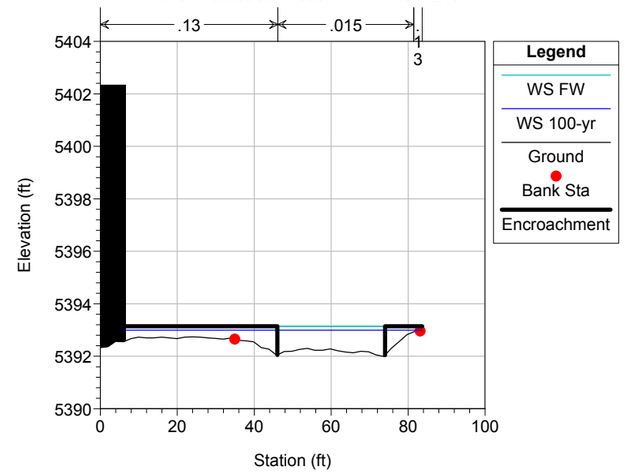
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 367



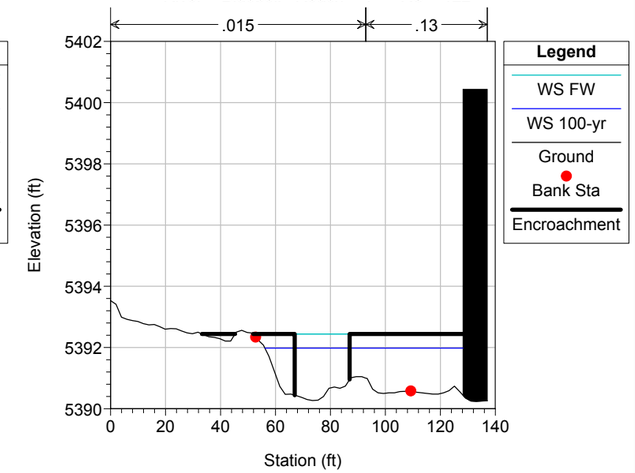
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 289



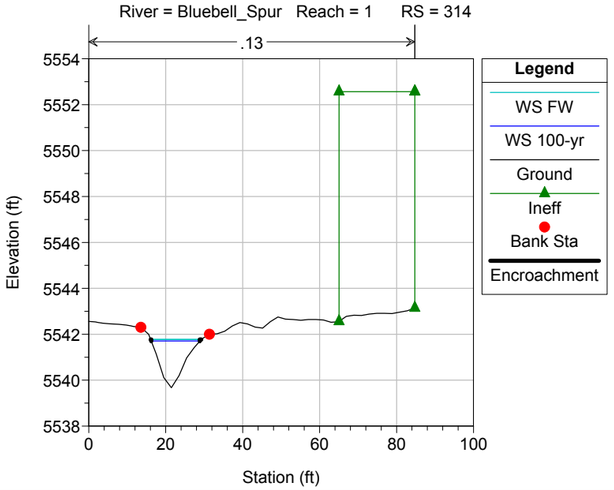
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 219



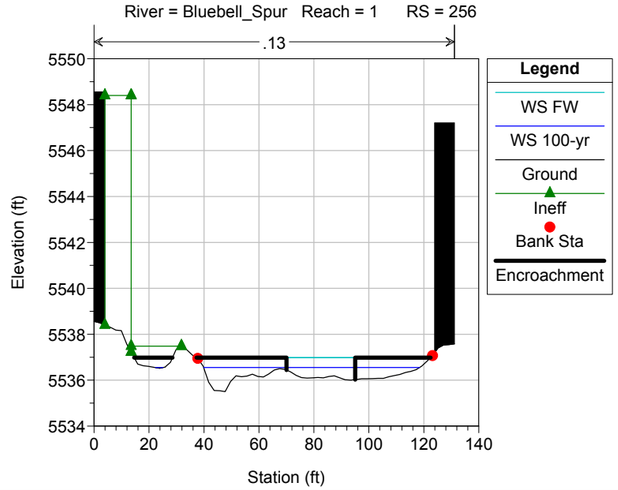
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell Reach = 1 RS = 122



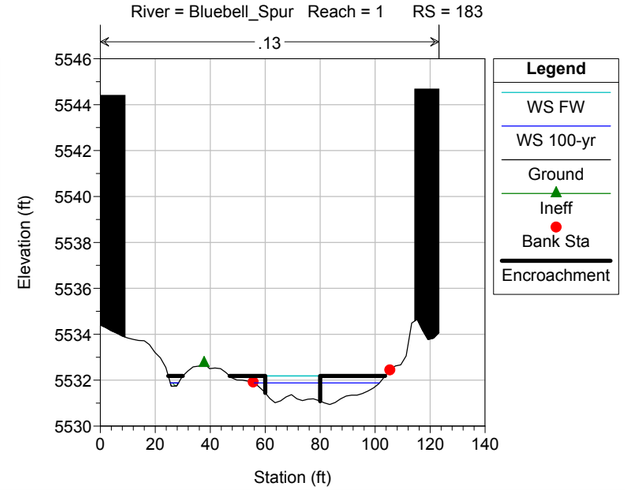
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell_Spur Reach = 1 RS = 314



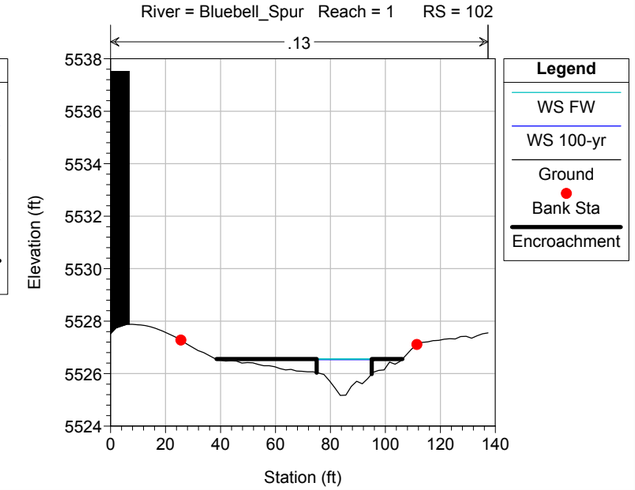
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell_Spur Reach = 1 RS = 256



SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell_Spur Reach = 1 RS = 183

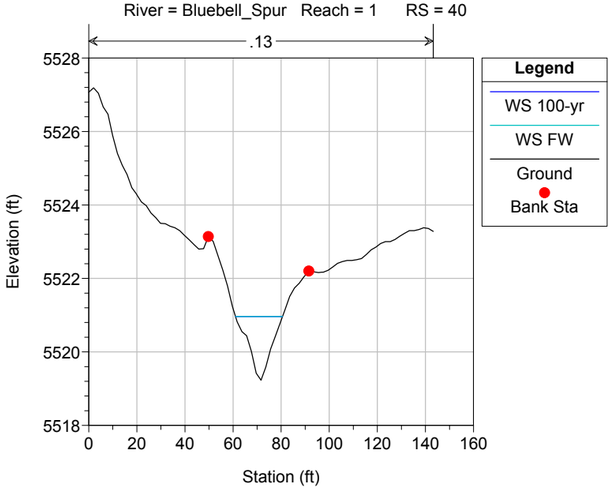


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Bluebell_Spur Reach = 1 RS = 102



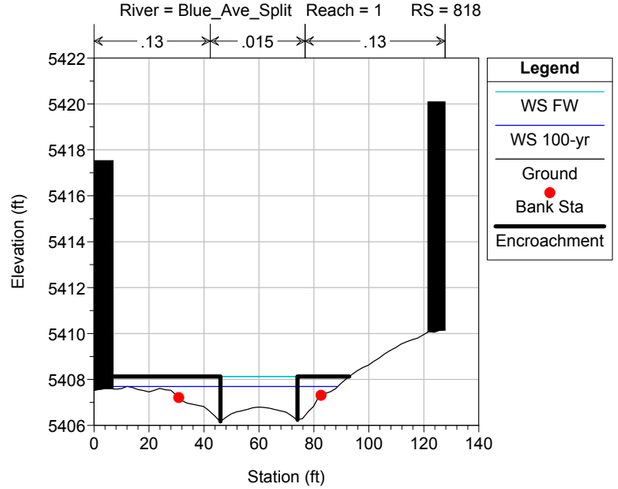
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Bluebell_Spur Reach = 1 RS = 40



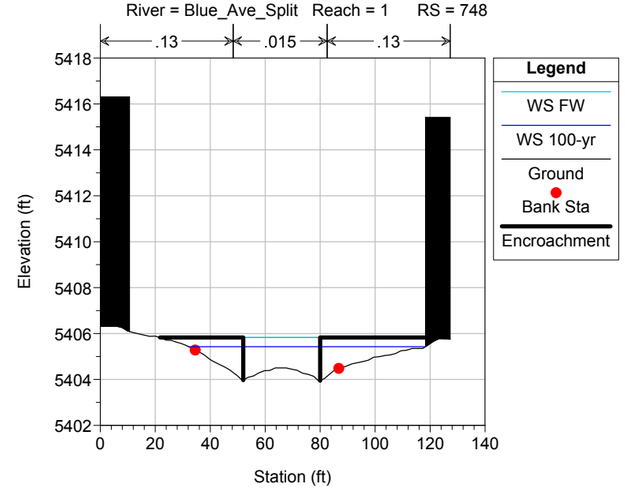
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Blue_Ave_Split Reach = 1 RS = 818



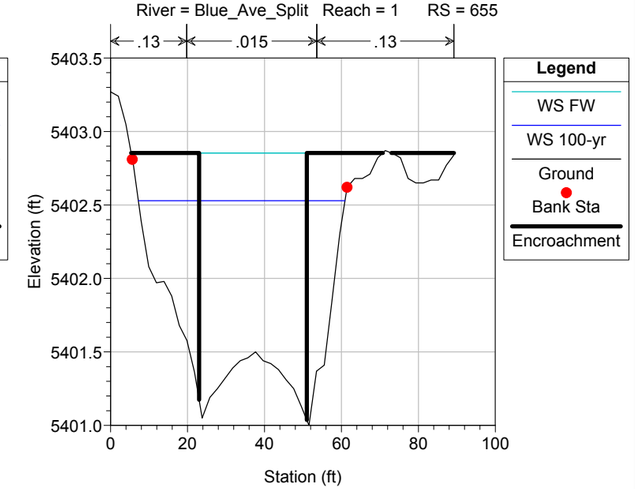
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Blue_Ave_Split Reach = 1 RS = 748



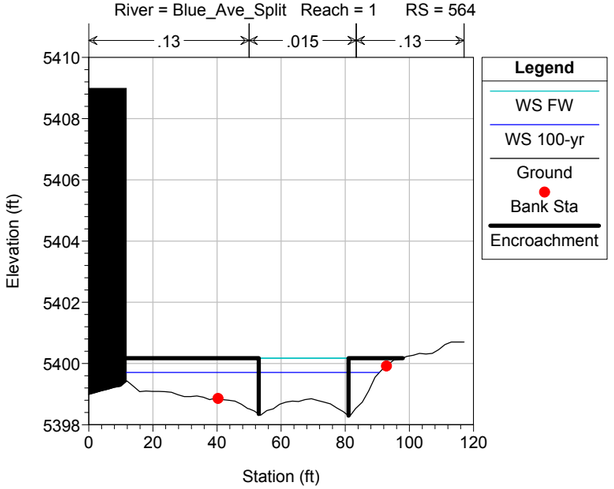
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Blue_Ave_Split Reach = 1 RS = 655



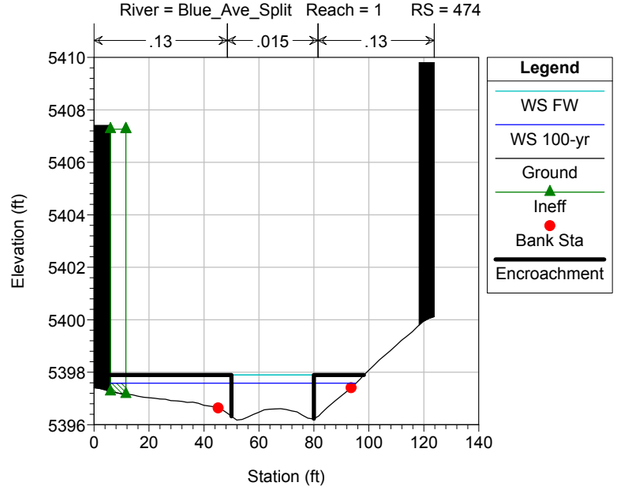
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Blue_Ave_Split Reach = 1 RS = 564



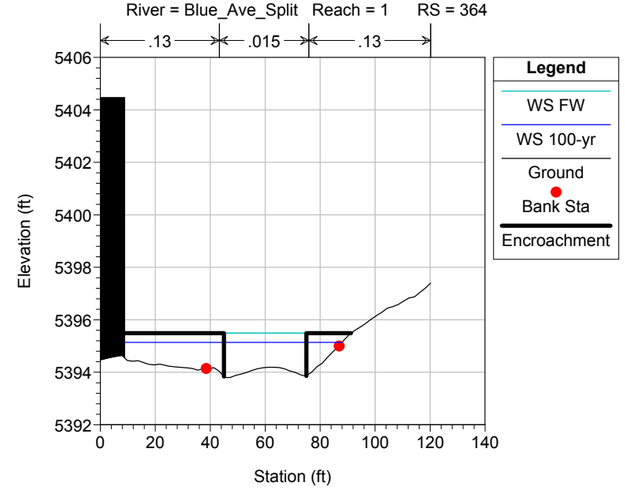
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Blue_Ave_Split Reach = 1 RS = 474



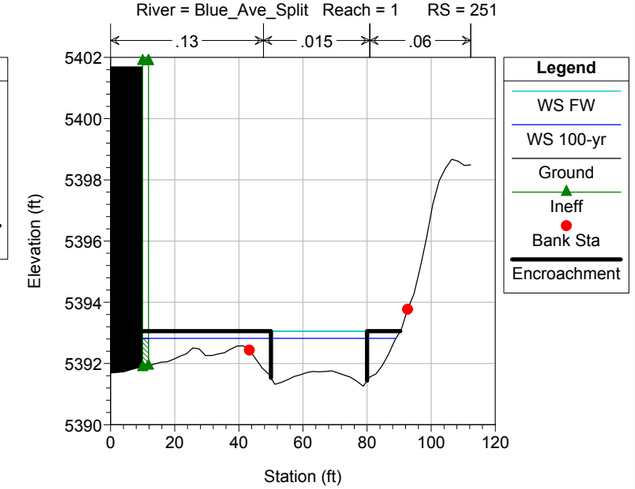
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Blue_Ave_Split Reach = 1 RS = 364



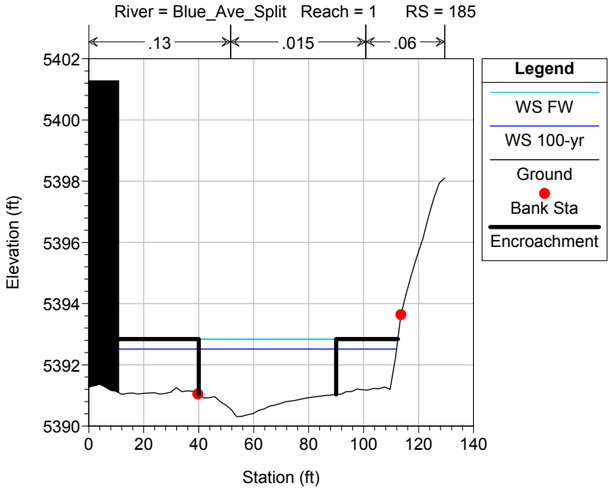
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Blue_Ave_Split Reach = 1 RS = 251



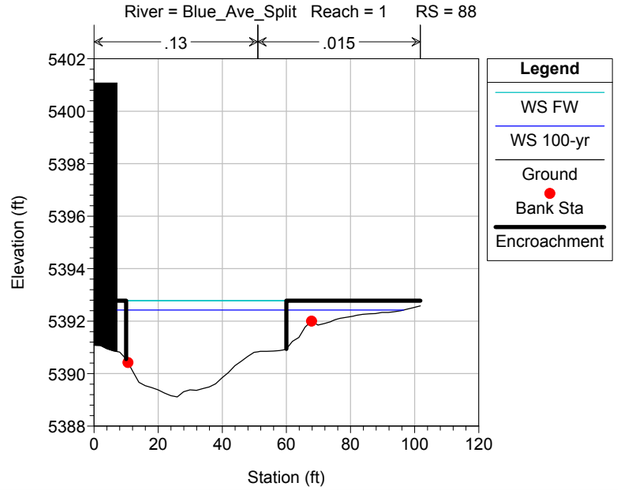
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Blue_Ave_Split Reach = 1 RS = 185



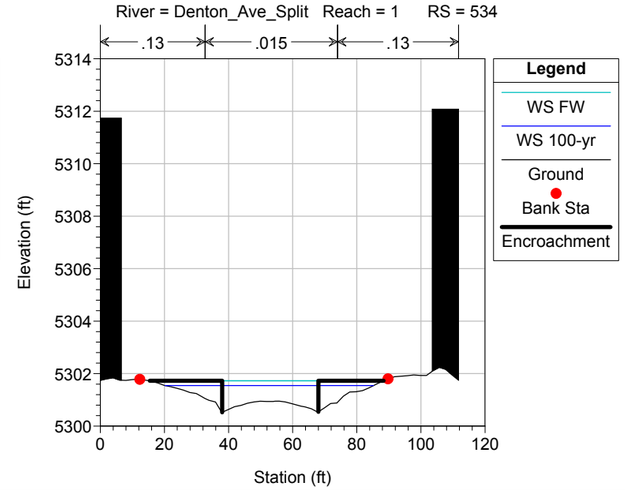
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Blue_Ave_Split Reach = 1 RS = 88



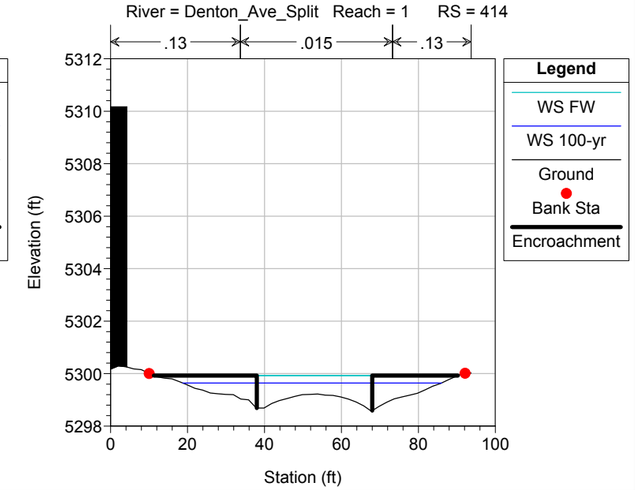
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Denton_Ave_Split Reach = 1 RS = 534



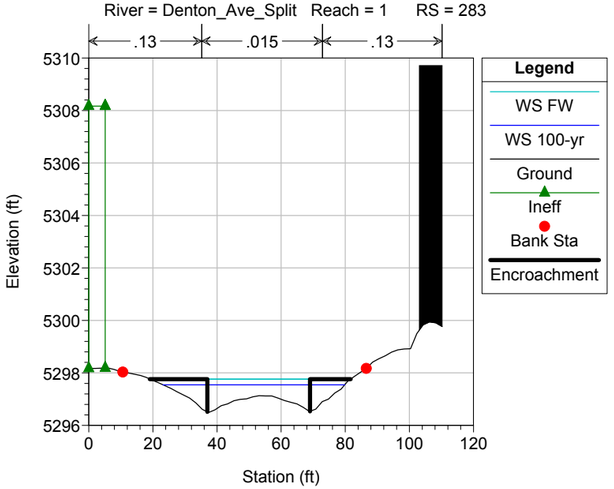
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Denton_Ave_Split Reach = 1 RS = 414



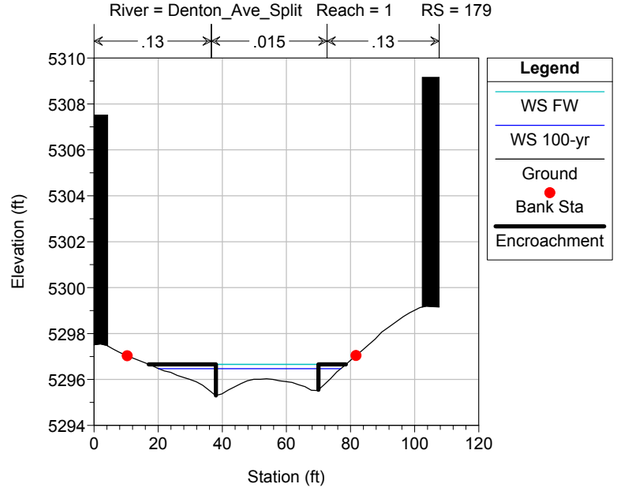
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Denton_Ave_Split Reach = 1 RS = 283



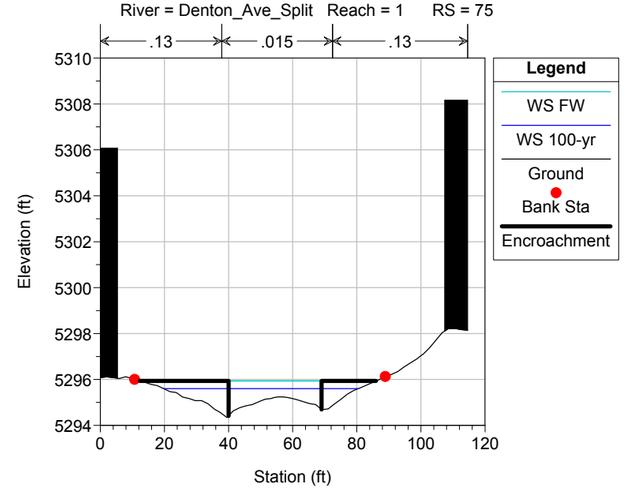
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Denton_Ave_Split Reach = 1 RS = 179



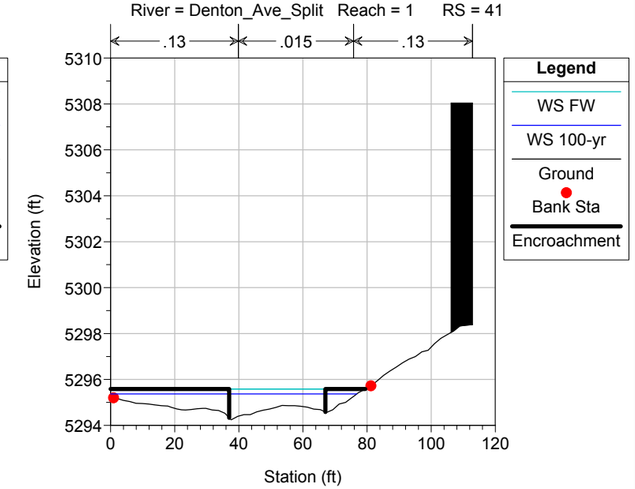
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Denton_Ave_Split Reach = 1 RS = 75



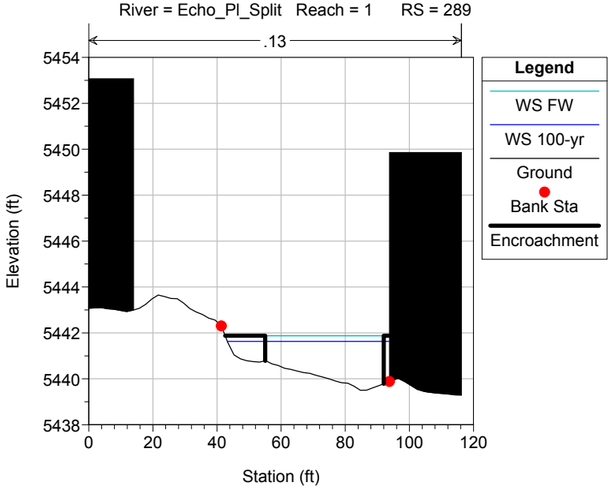
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Denton_Ave_Split Reach = 1 RS = 41



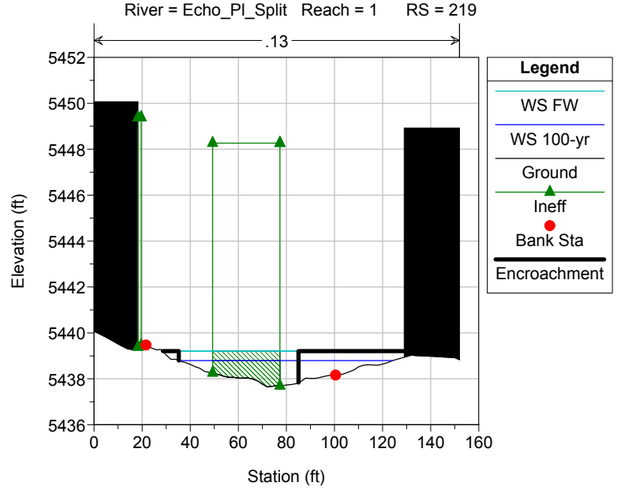
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Echo_Pl_Split Reach = 1 RS = 289



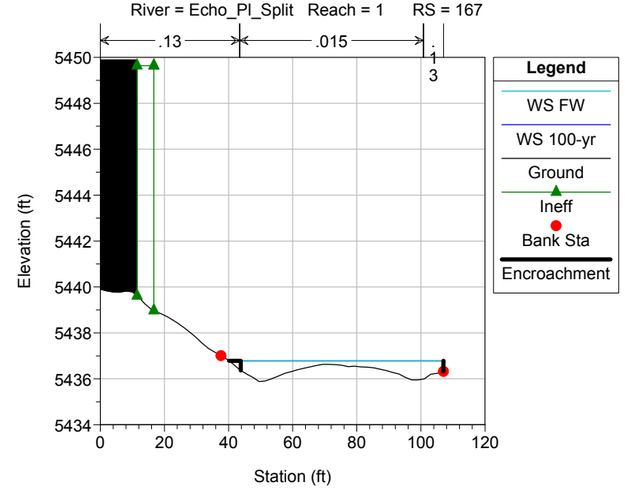
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Echo_Pl_Split Reach = 1 RS = 219



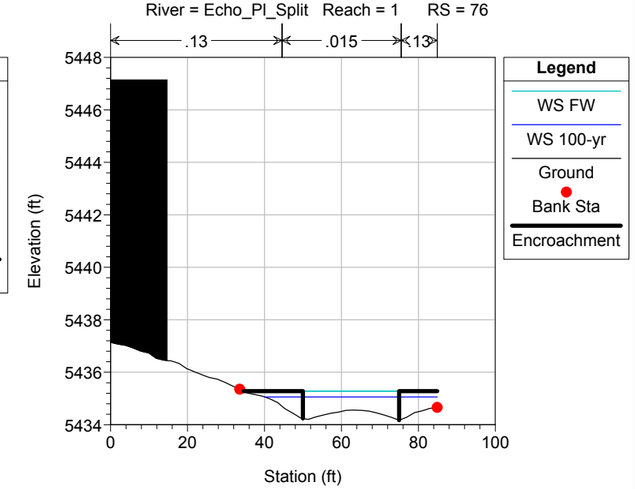
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Echo_Pl_Split Reach = 1 RS = 167



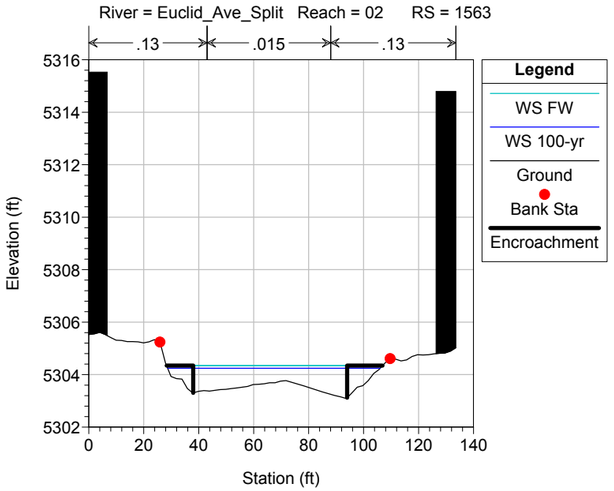
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Echo_Pl_Split Reach = 1 RS = 76



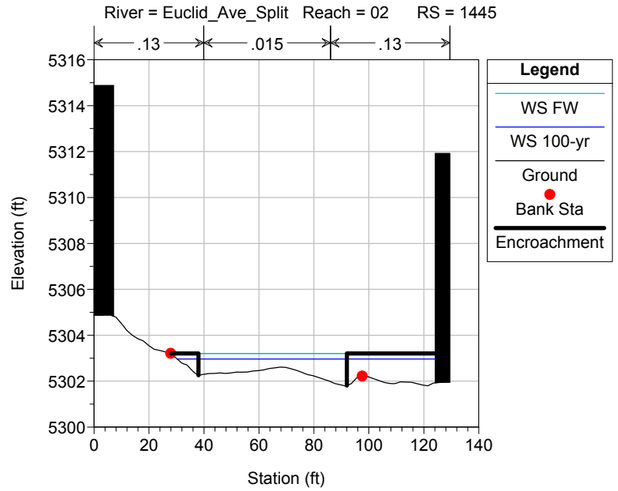
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Euclid_Ave_Split Reach = 02 RS = 1563



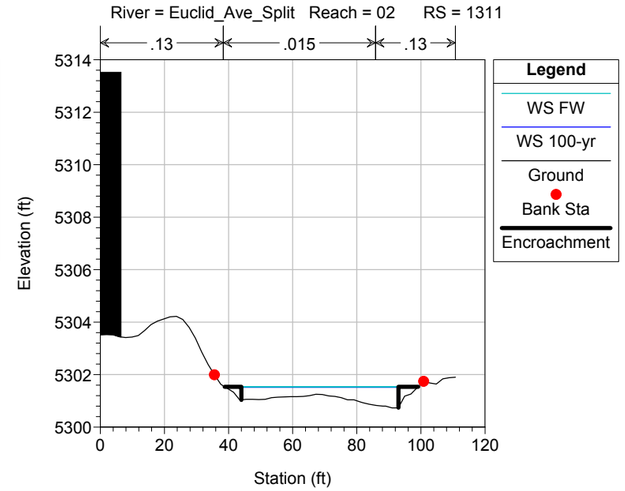
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Euclid_Ave_Split Reach = 02 RS = 1445



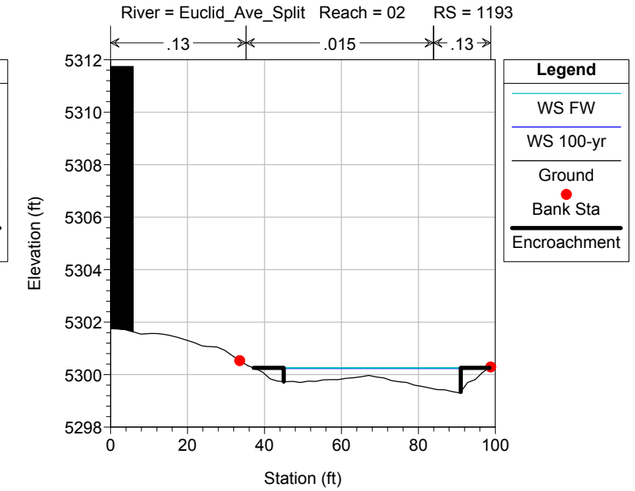
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

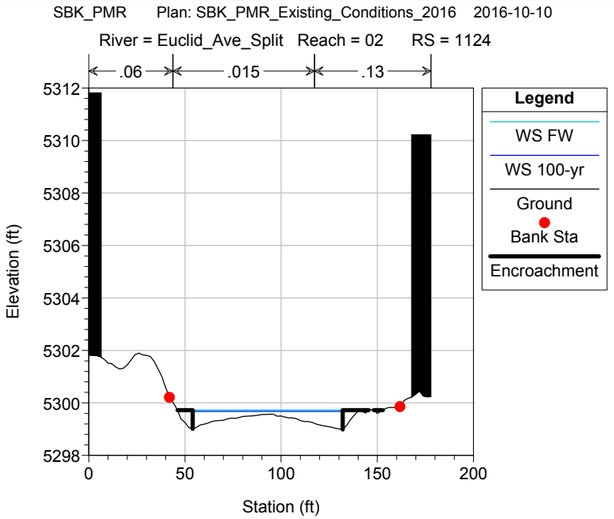
River = Euclid_Ave_Split Reach = 02 RS = 1311

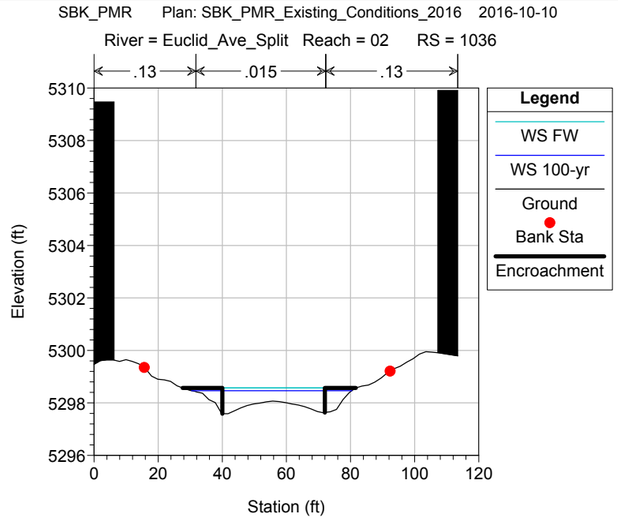


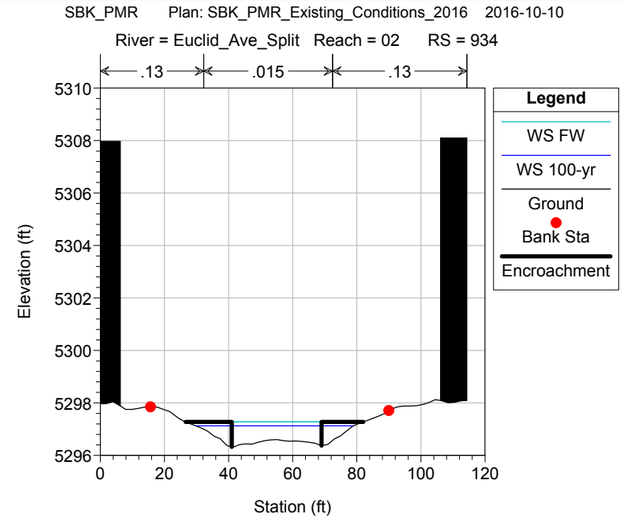
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

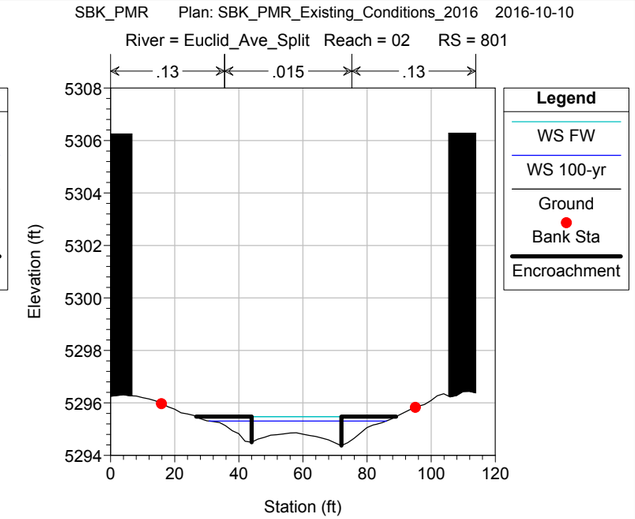
River = Euclid_Ave_Split Reach = 02 RS = 1193

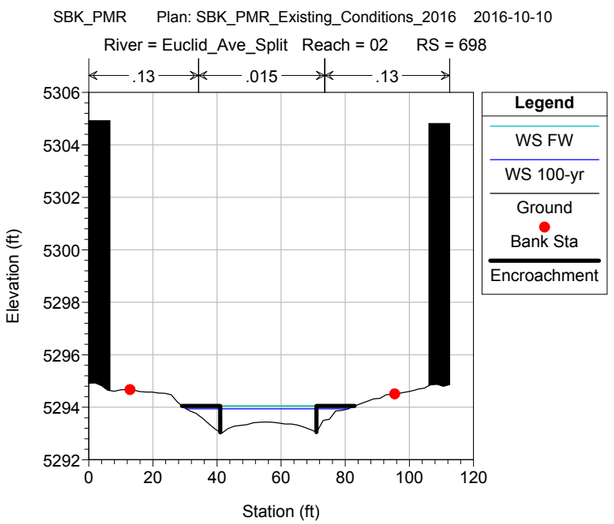


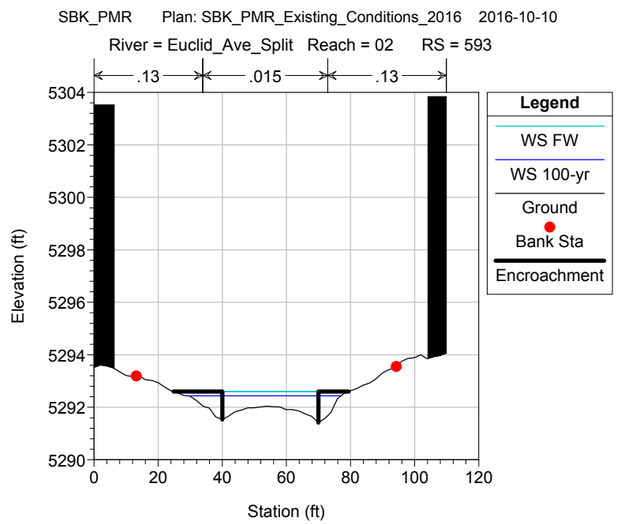

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 02 RS = 1124
.06 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

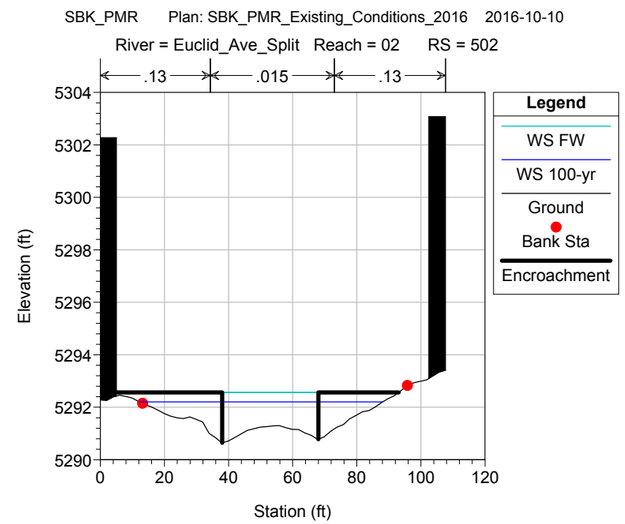

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 02 RS = 1036
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

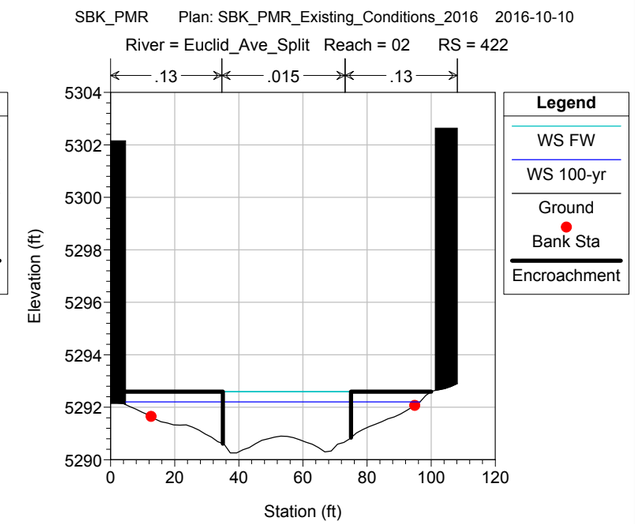

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 02 RS = 934
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

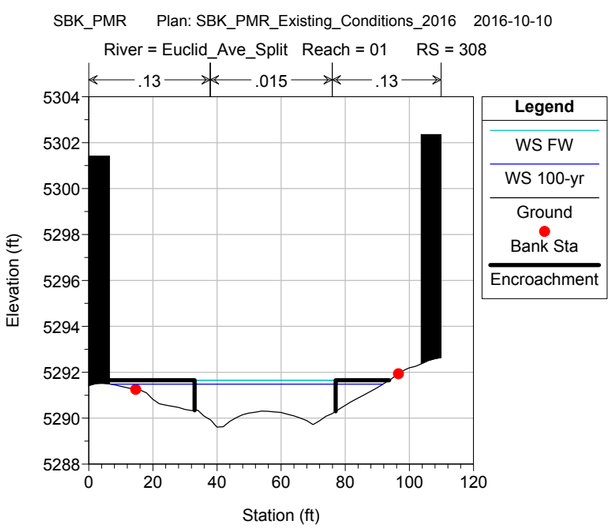

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 02 RS = 801
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

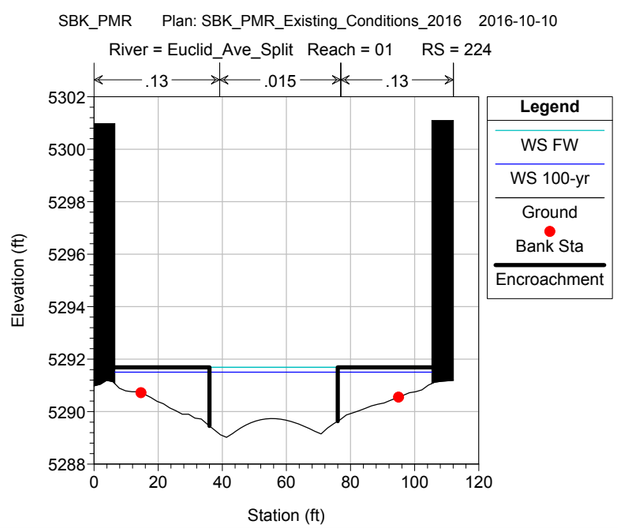

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 02 RS = 698
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

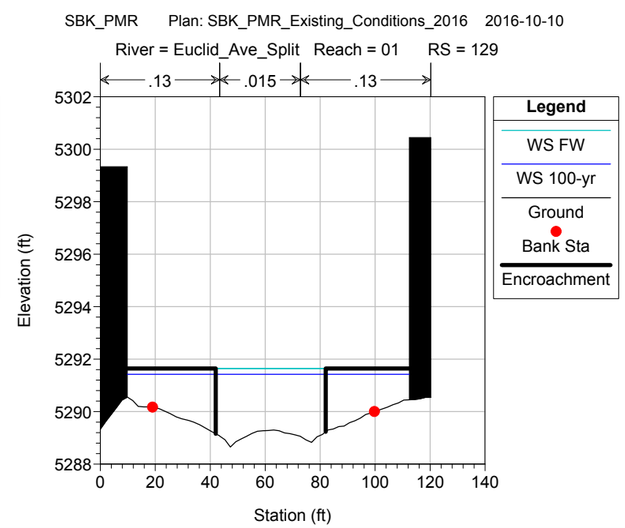

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 02 RS = 593
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

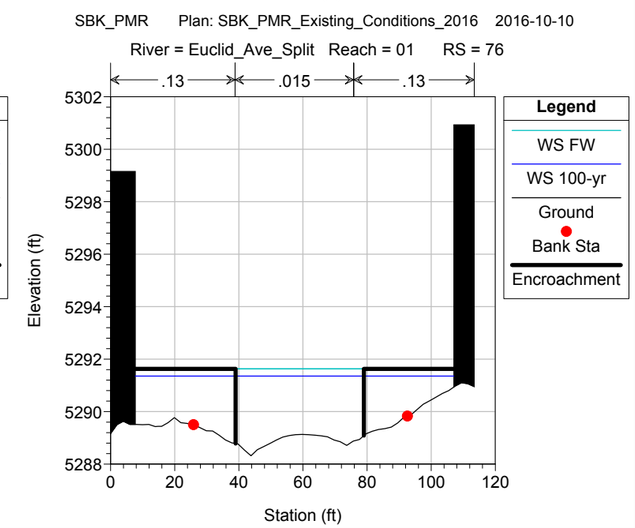

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 02 RS = 502
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 02 RS = 422
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 01 RS = 308
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

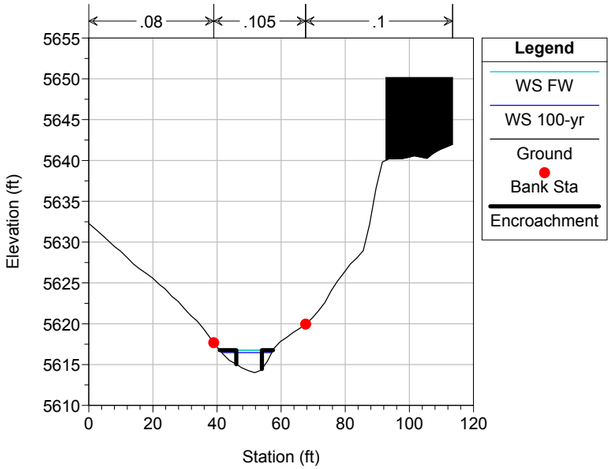

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 01 RS = 224
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 01 RS = 129
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Euclid_Ave_Split Reach = 01 RS = 76
.13 .015 .13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

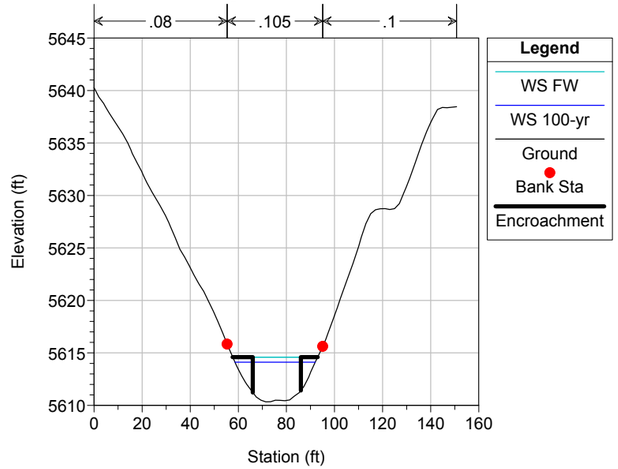
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 3674



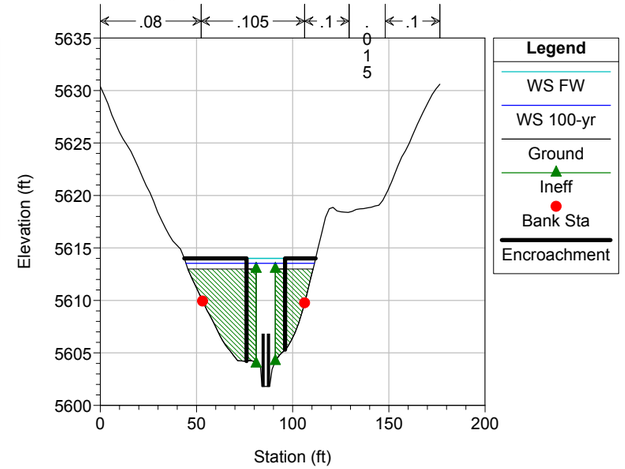
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 3575



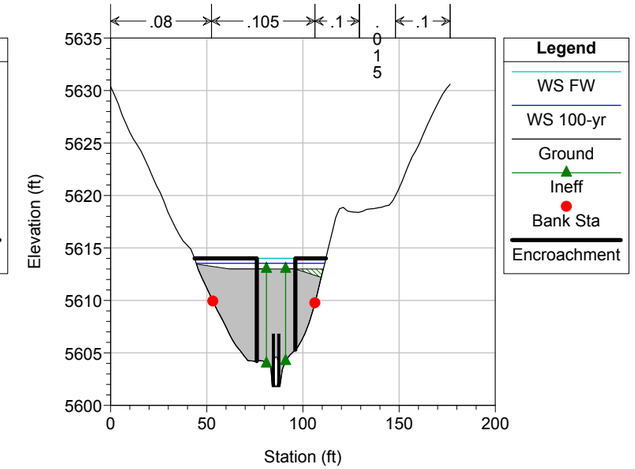
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 3459 Bellevue Drive (U/S)



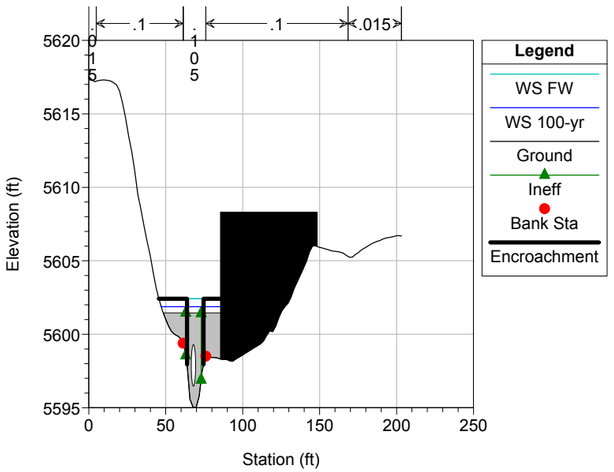
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 3400 Culv Bellevue Drive (50% potential debris block);



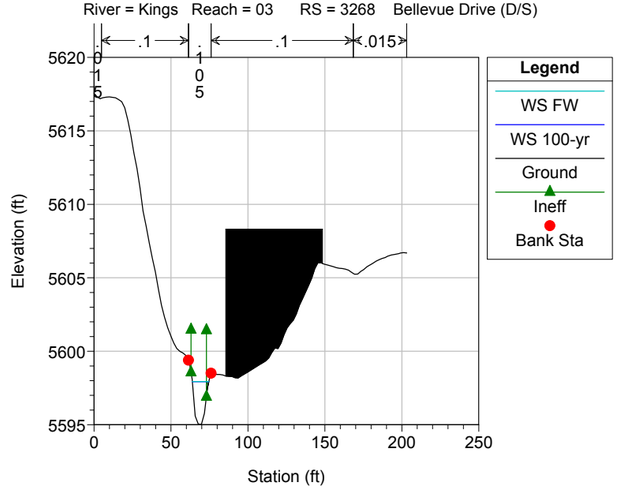
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 3400 Culv Bellevue Drive (50% potential debris block);



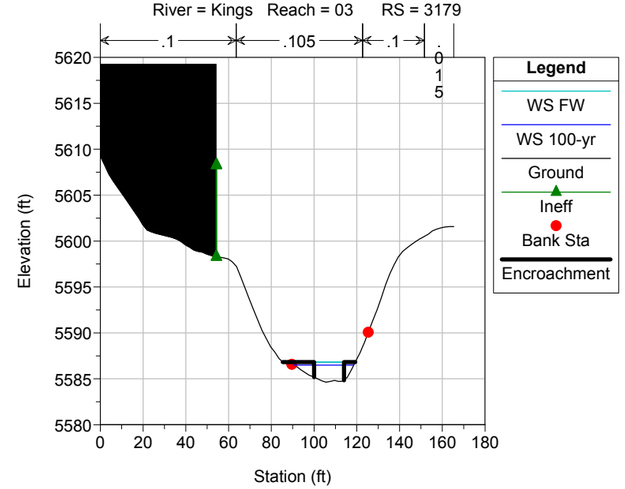
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 3268 Bellevue Drive (D/S)



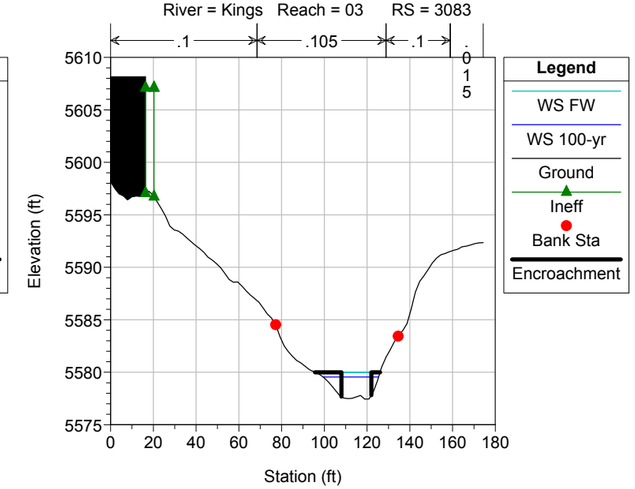
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 3179



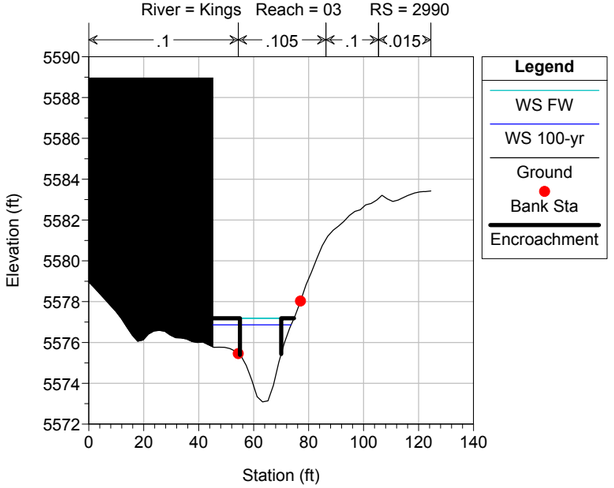
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 3083



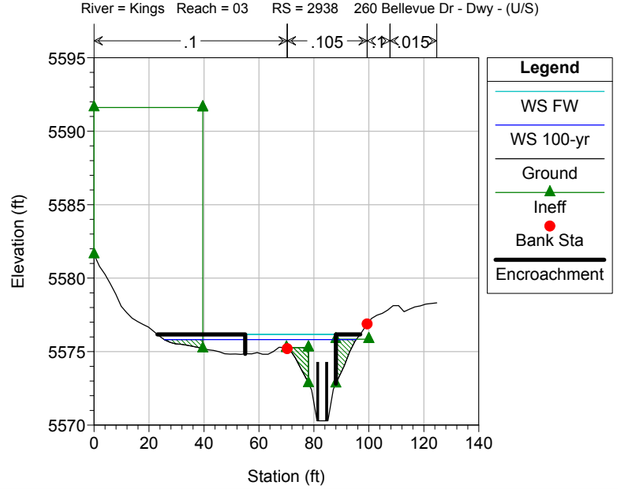
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2990



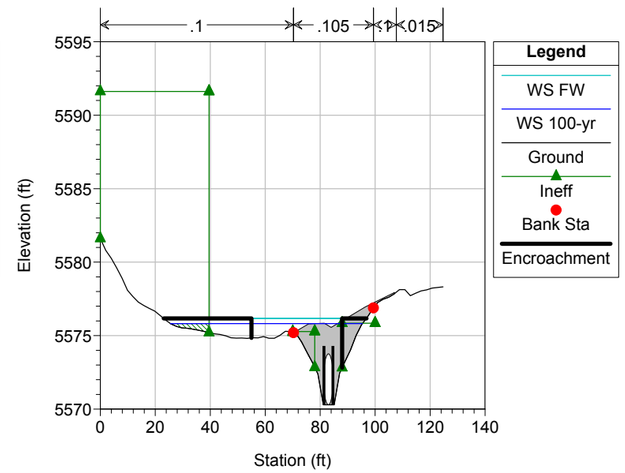
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2938 260 Bellevue Dr - Dwy - (U/S)



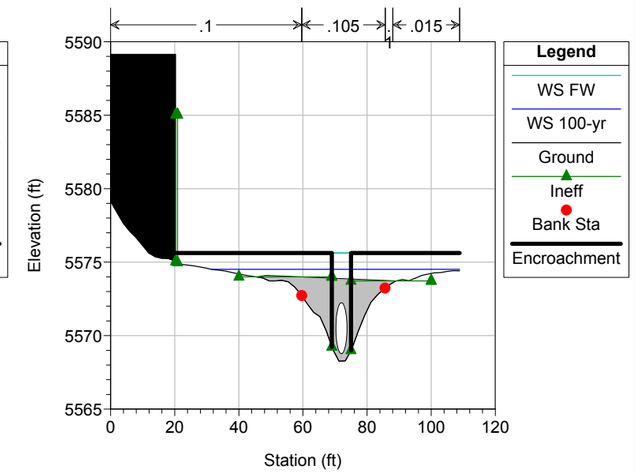
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2920 Culv 260 Bellevue Dr - Driveway (25% Potential Debris Block);



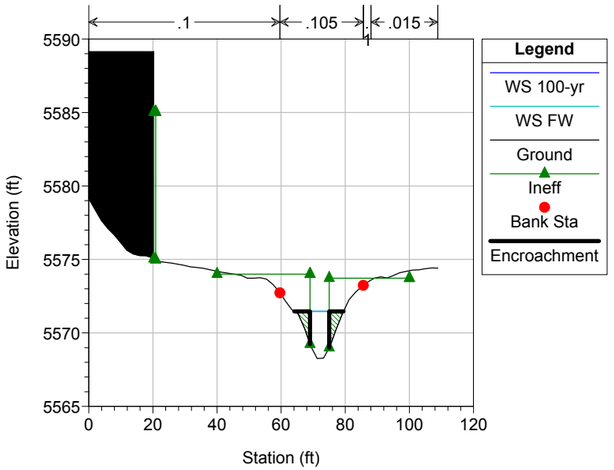
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2920 Culv 260 Bellevue Dr - Driveway (25% Potential Debris Block);



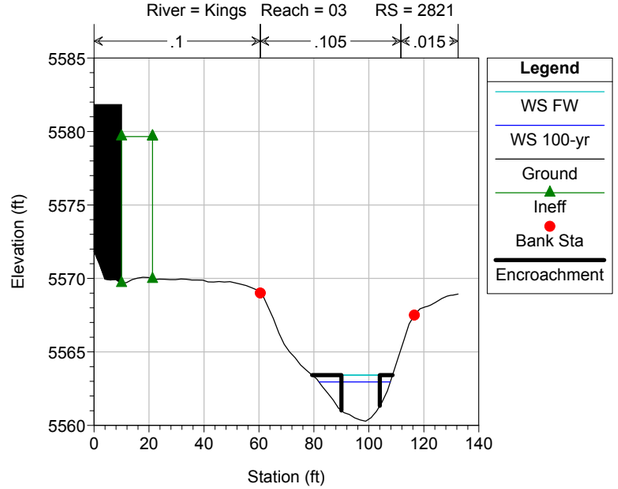
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2900 260 Bellevue Dr - Dwy - (D/S)



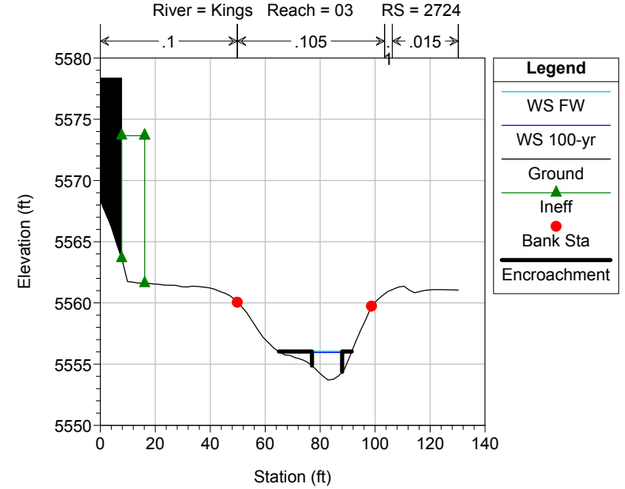
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2821



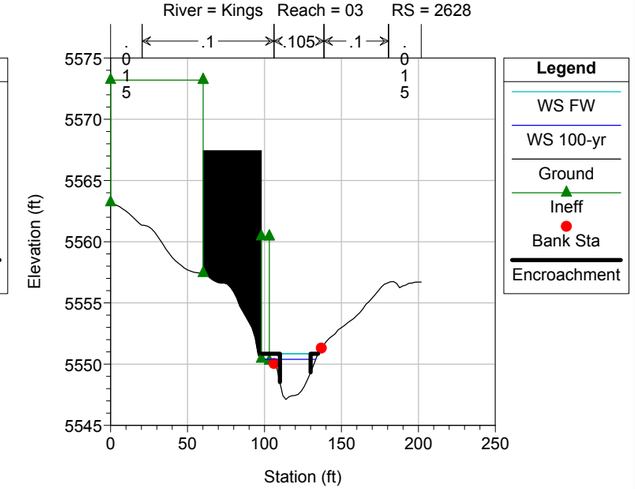
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2724



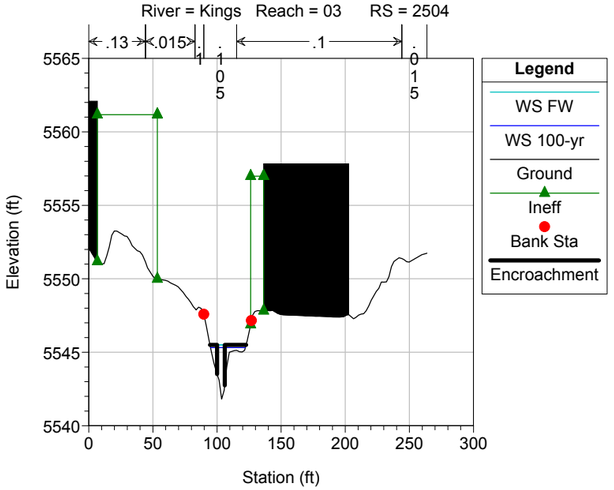
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2628



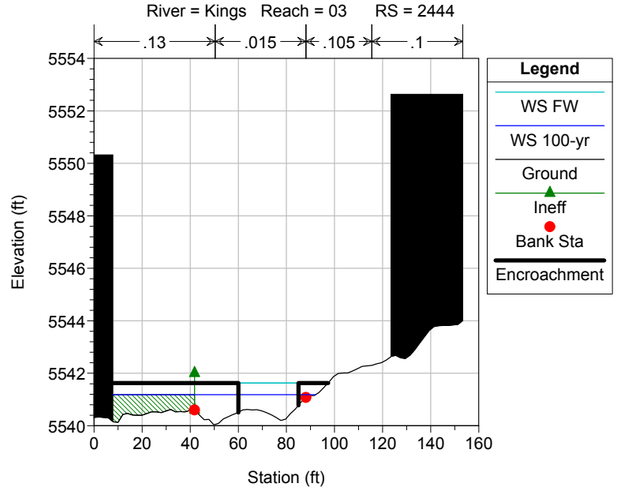
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2504



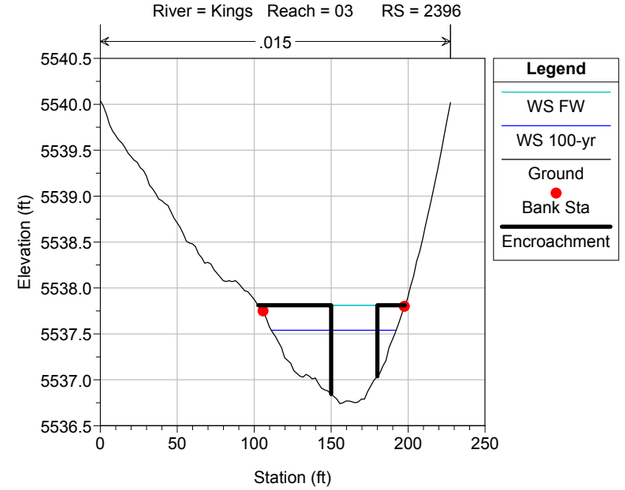
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2444



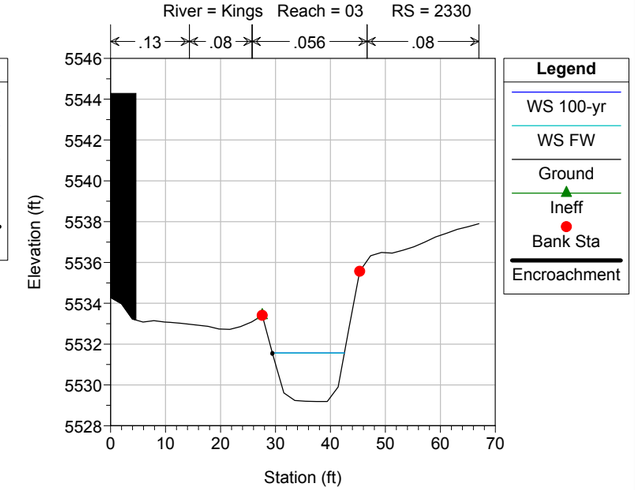
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2396



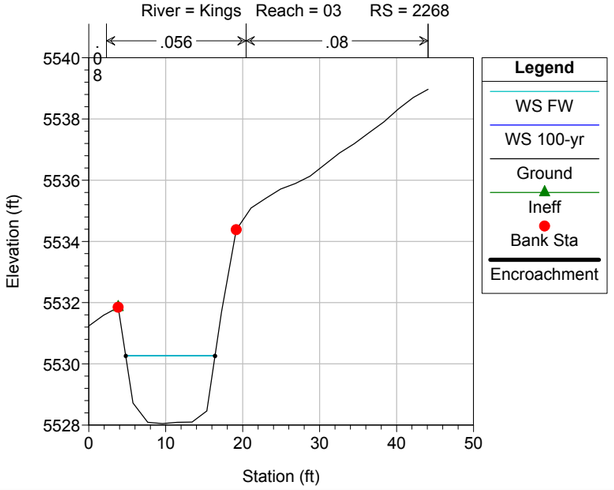
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2330



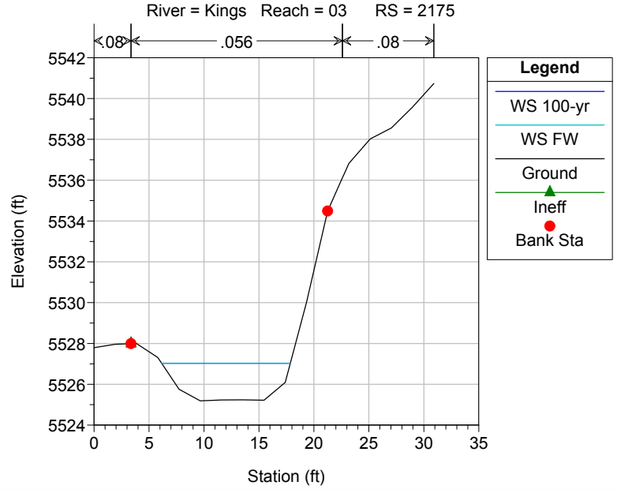
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2268



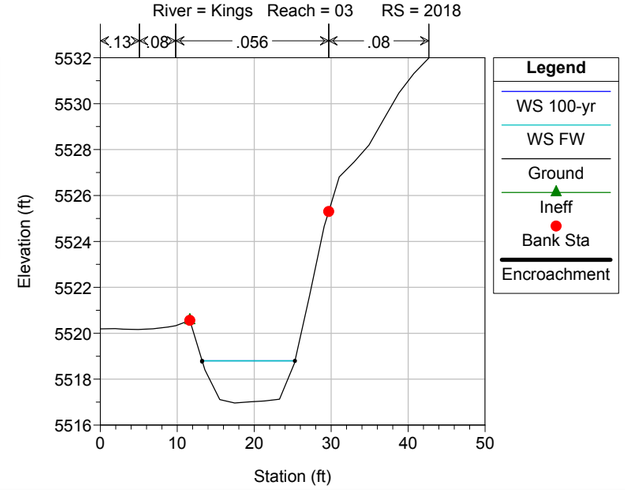
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 03 RS = 2175



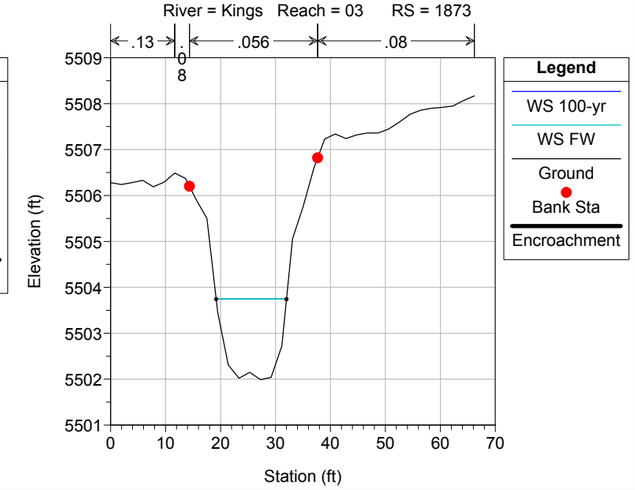
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

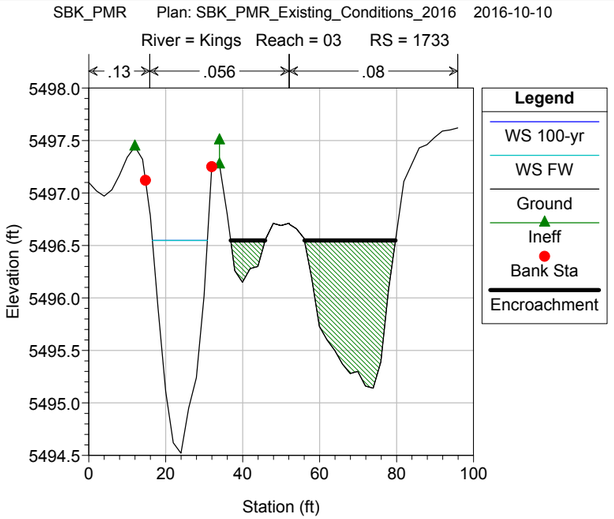
River = Kings Reach = 03 RS = 2018

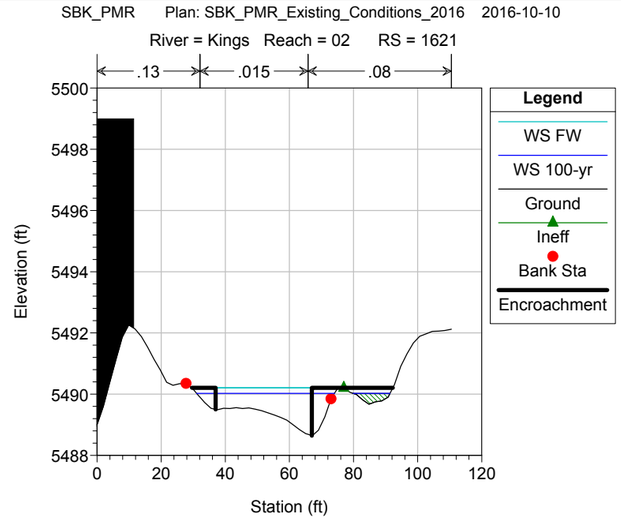


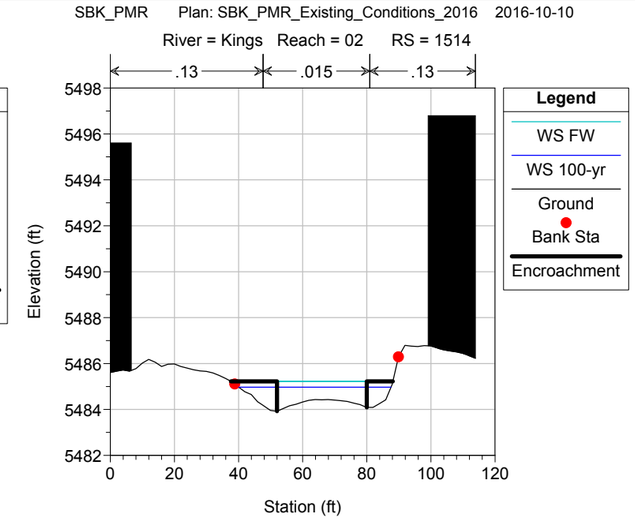
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

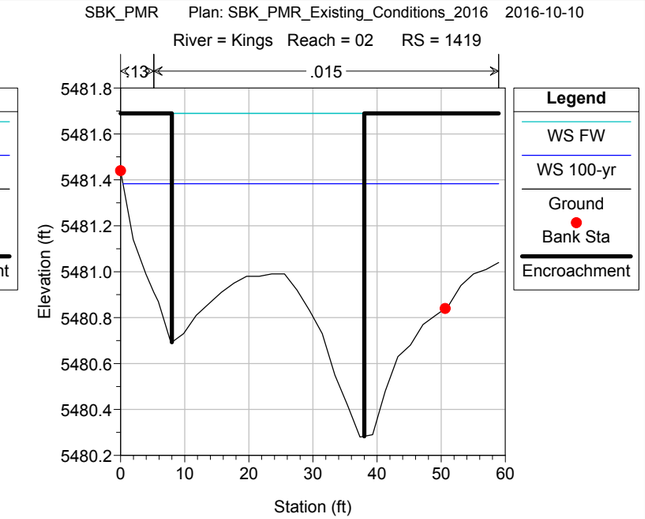
River = Kings Reach = 03 RS = 1873

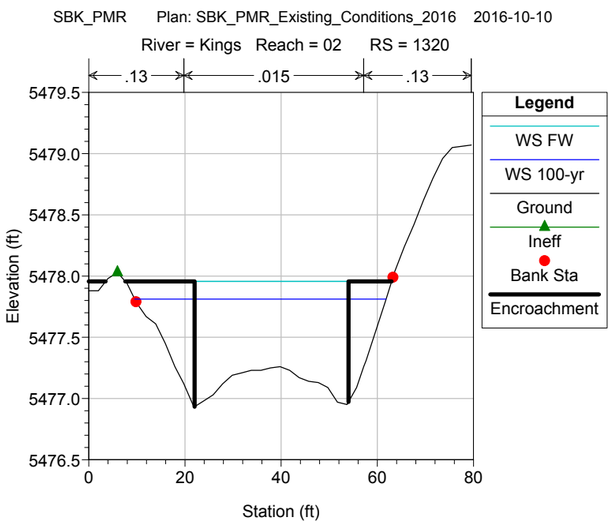


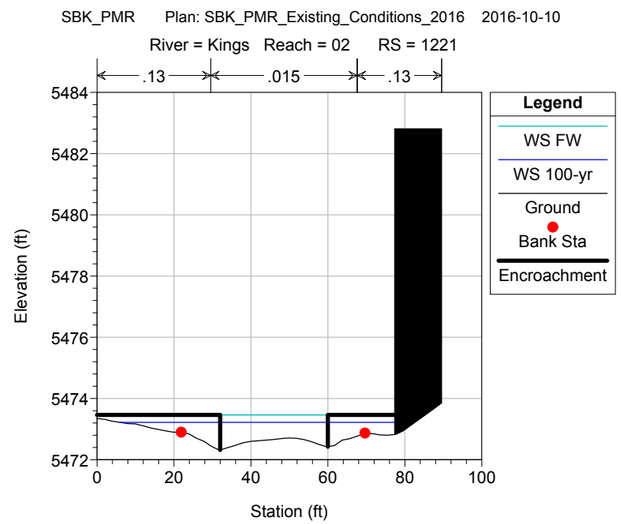

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 03 RS = 1733
.13 .056 .08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS FW
Ground
Ineff
Bank Sta
Encroachment

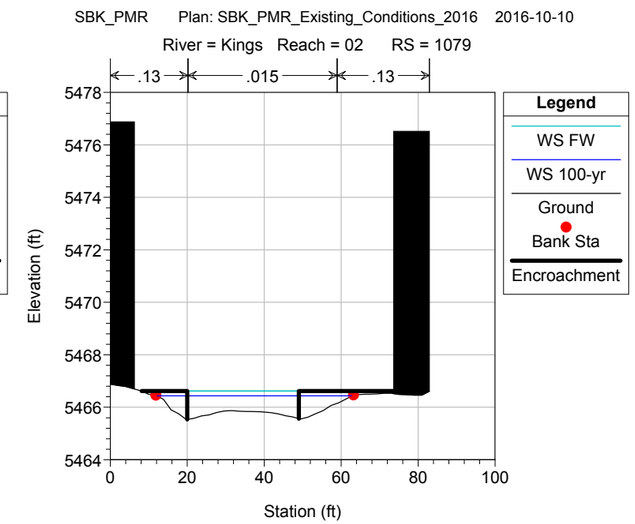

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 1621
.13 .015 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

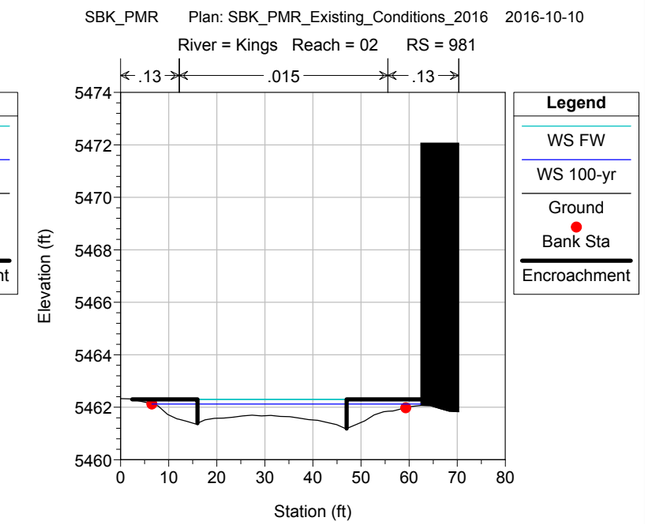

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 1514
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

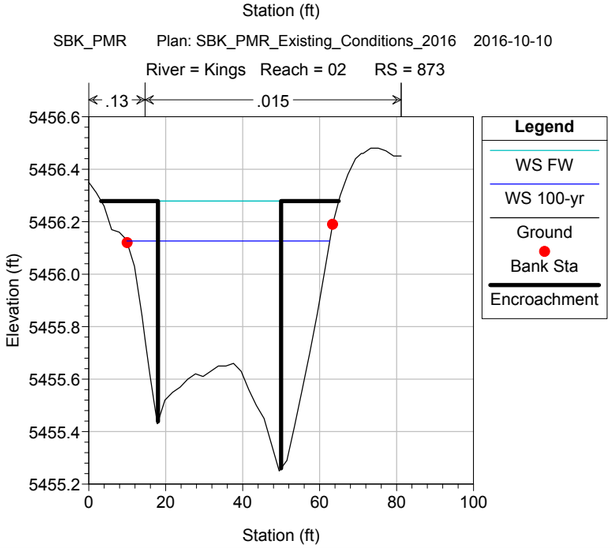

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 1419
.13 .015
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

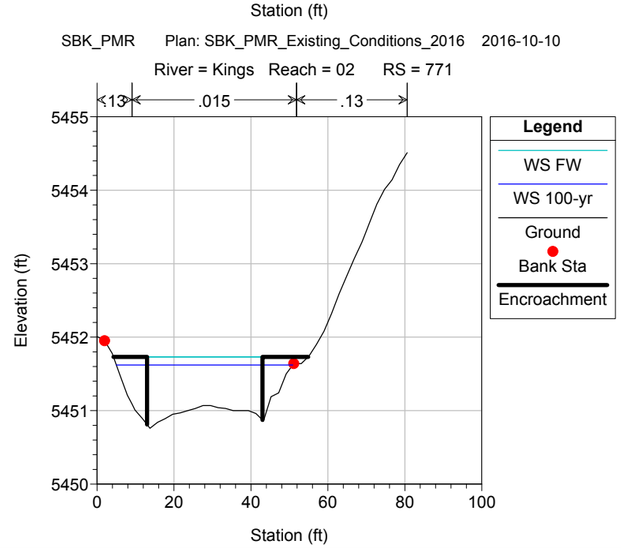

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 1320
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

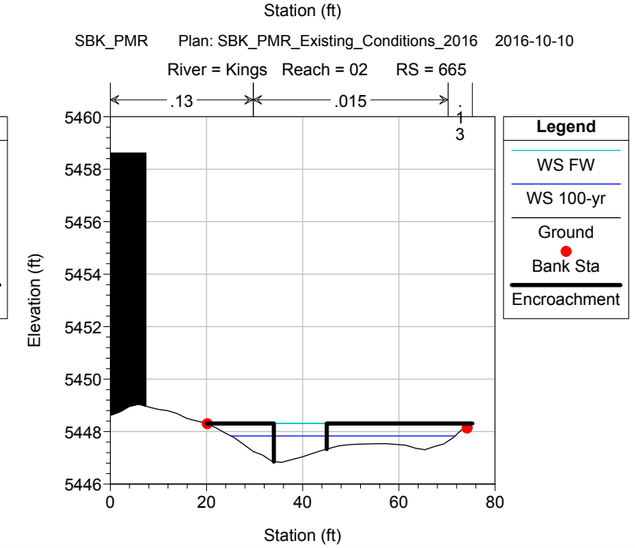

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 1221
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

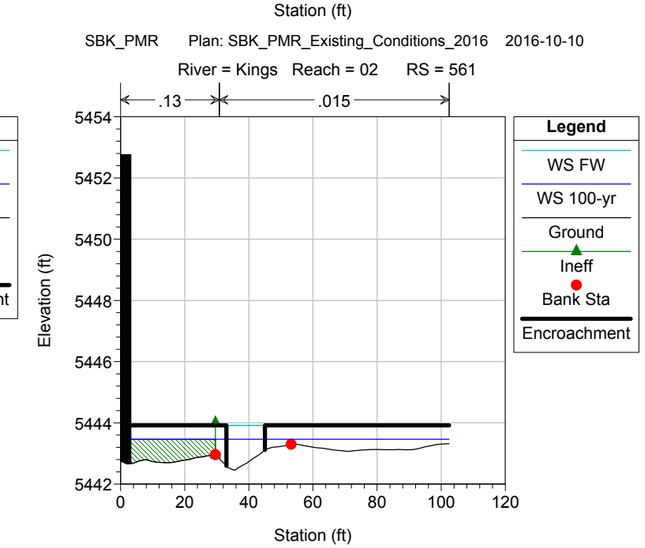

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 1079
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 981
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 873
.13 .015
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

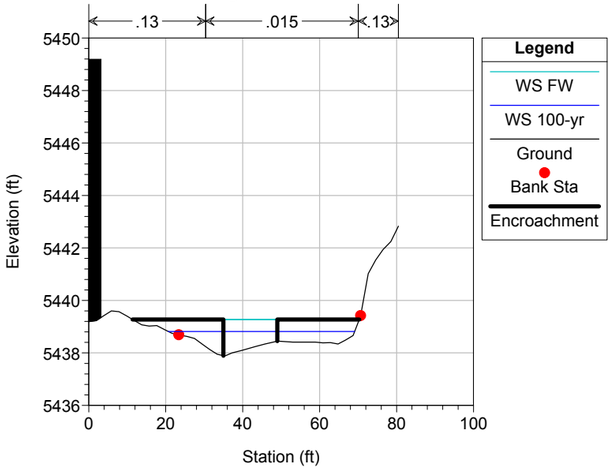

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 771
.13 .015 .13
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 665
.13 .015
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Kings Reach = 02 RS = 561
.13 .015
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

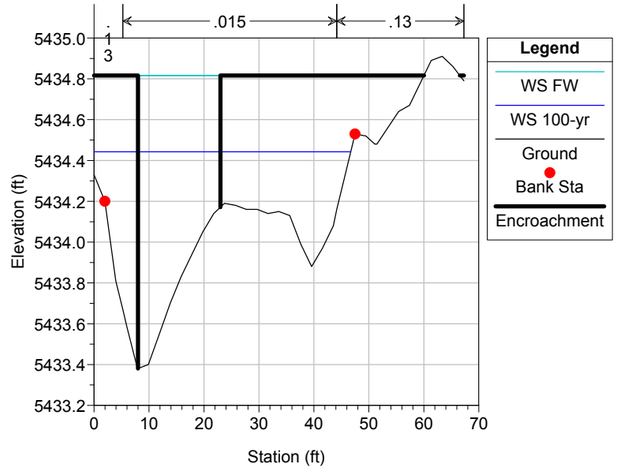
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 02 RS = 435



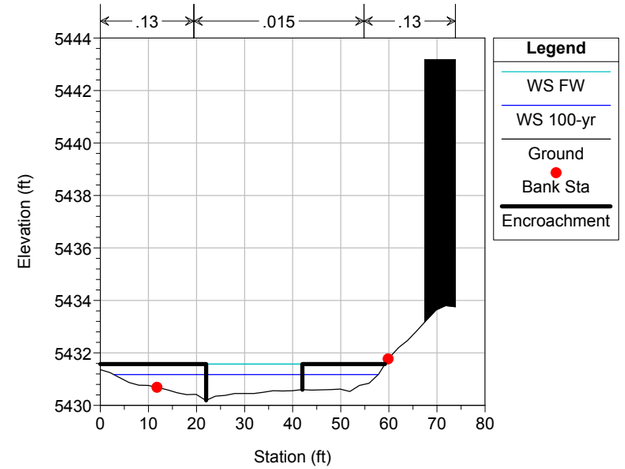
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 02 RS = 311



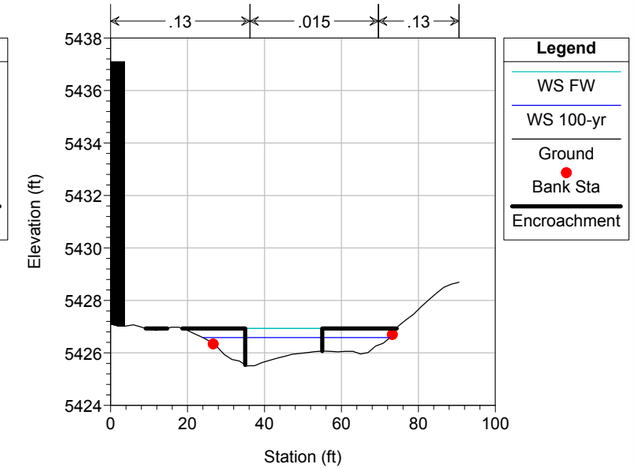
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 01 RS = 215



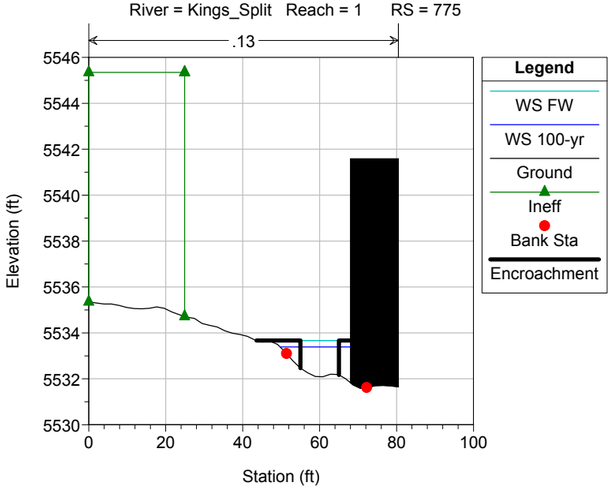
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings Reach = 01 RS = 82



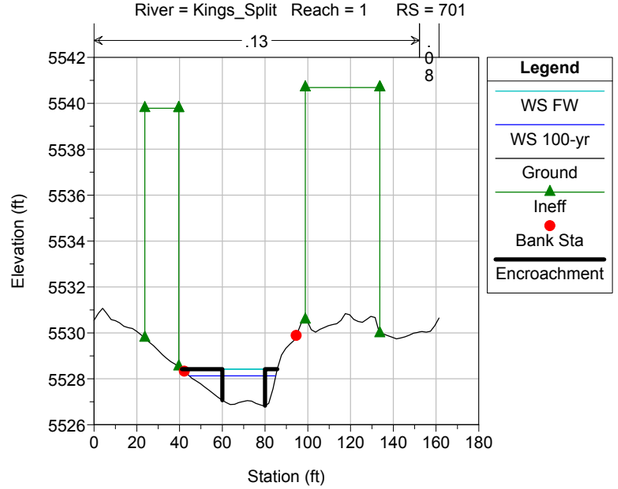
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings_Split Reach = 1 RS = 775



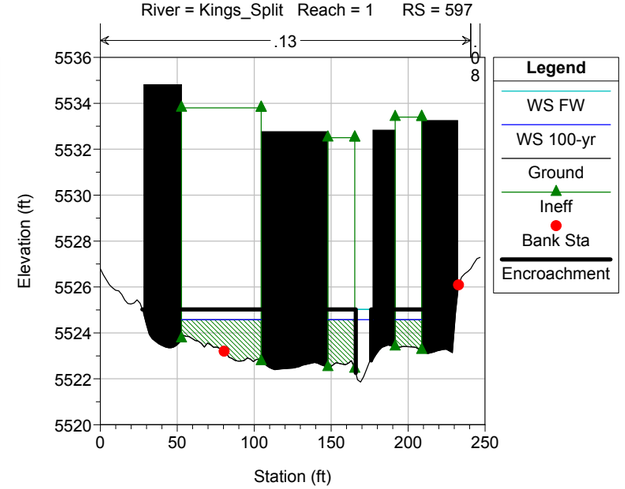
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings_Split Reach = 1 RS = 701



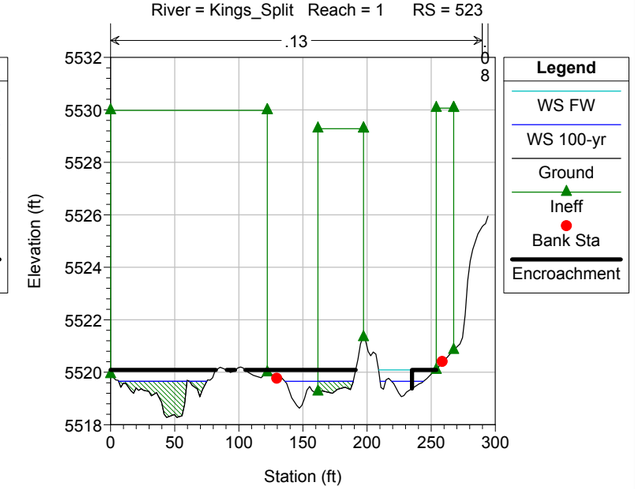
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings_Split Reach = 1 RS = 597



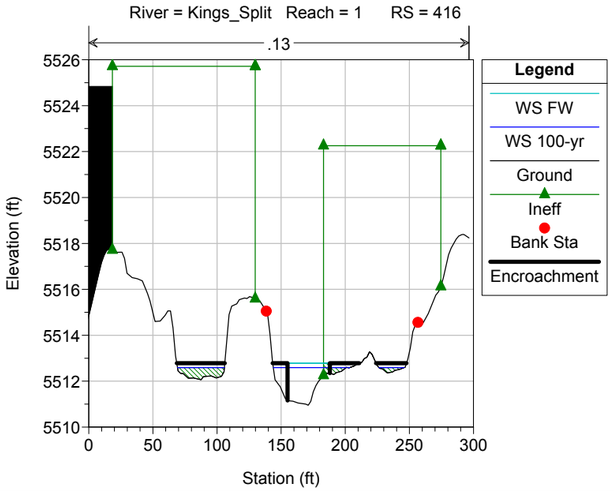
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings_Split Reach = 1 RS = 523



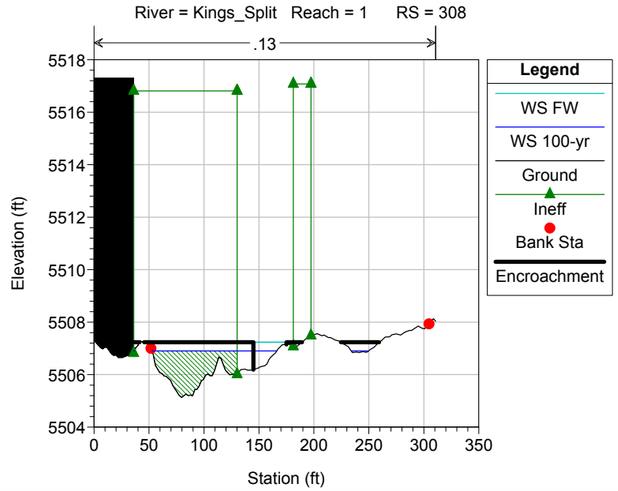
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings_Split Reach = 1 RS = 416



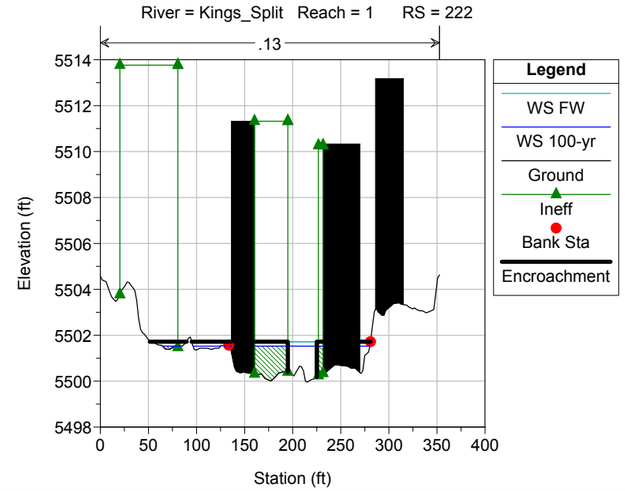
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings_Split Reach = 1 RS = 308



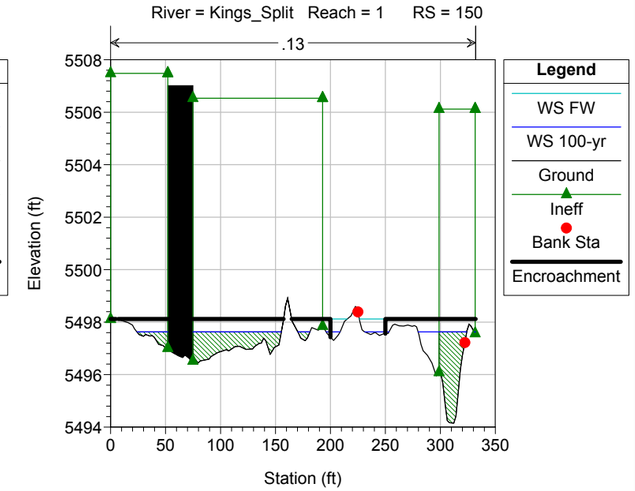
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings_Split Reach = 1 RS = 222



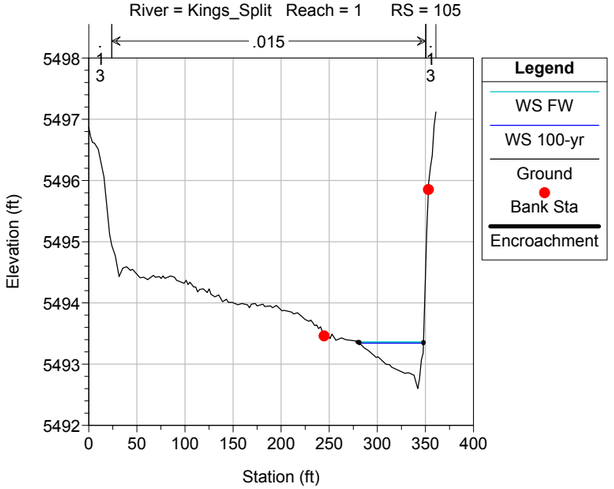
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings_Split Reach = 1 RS = 150



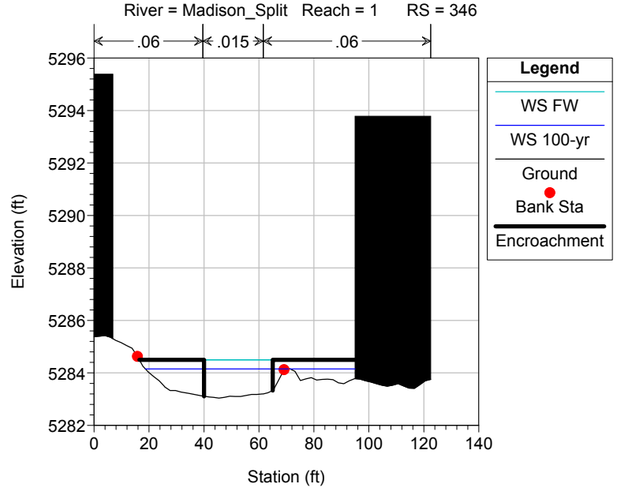
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Kings_Split Reach = 1 RS = 105



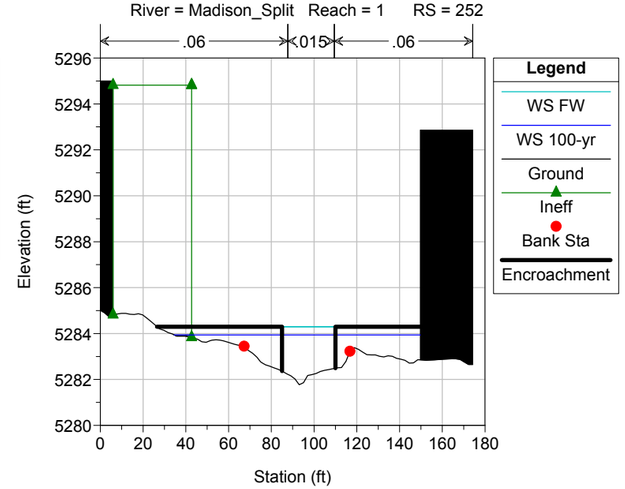
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Madison_Split Reach = 1 RS = 346



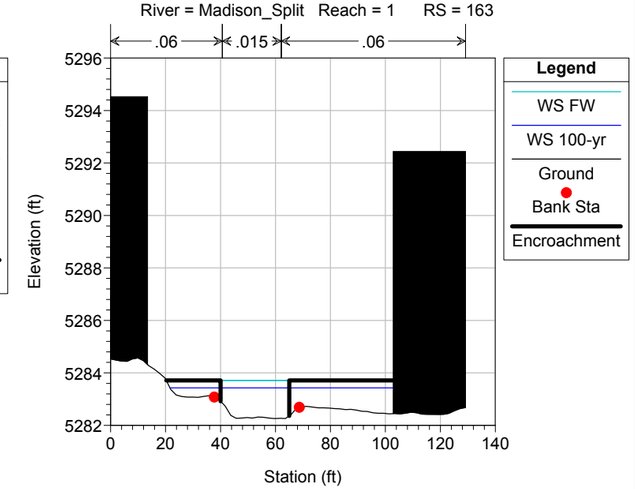
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Madison_Split Reach = 1 RS = 252



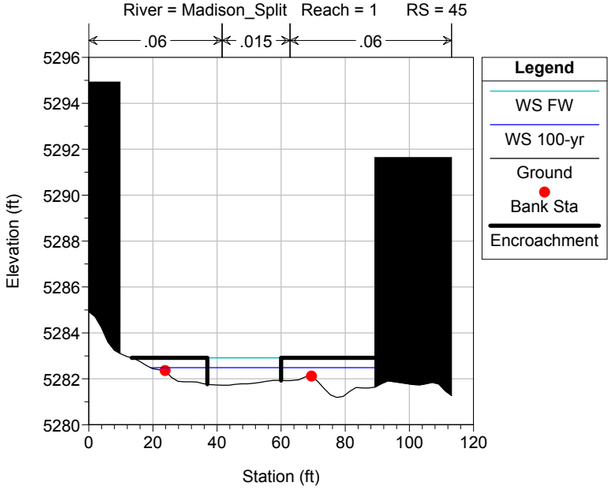
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Madison_Split Reach = 1 RS = 163



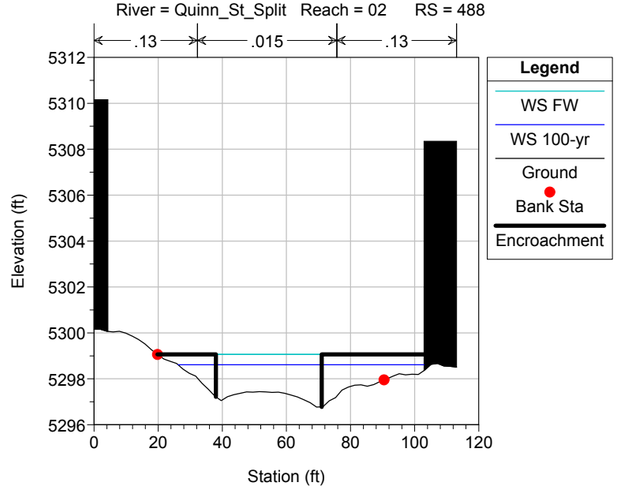
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Madison_Split Reach = 1 RS = 45



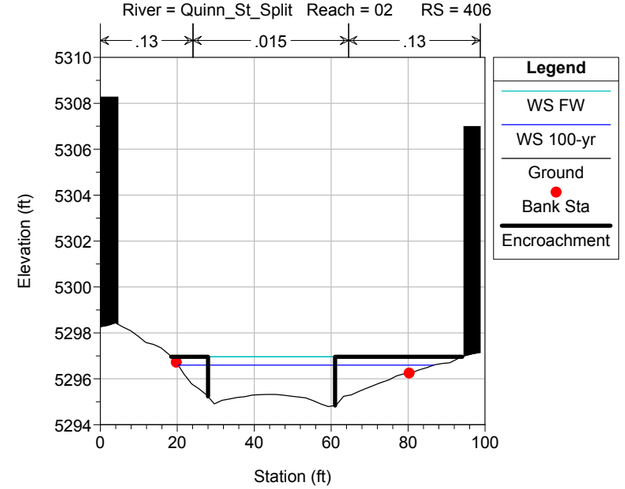
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Quinn_St_Split Reach = 02 RS = 488



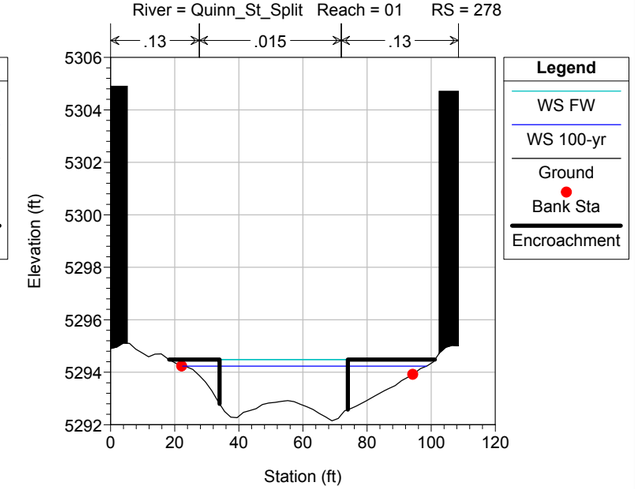
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Quinn_St_Split Reach = 02 RS = 406



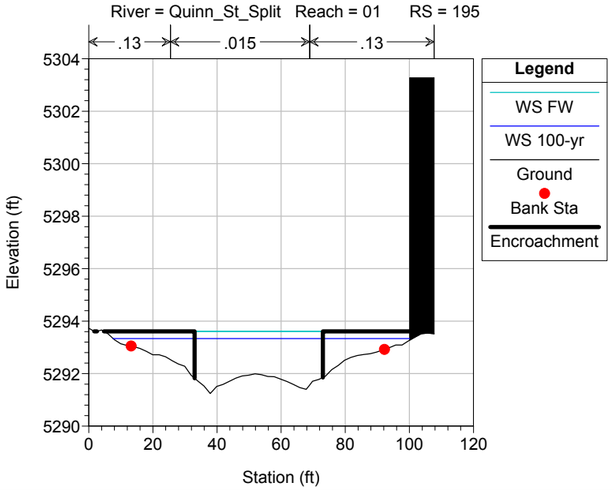
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Quinn_St_Split Reach = 01 RS = 278



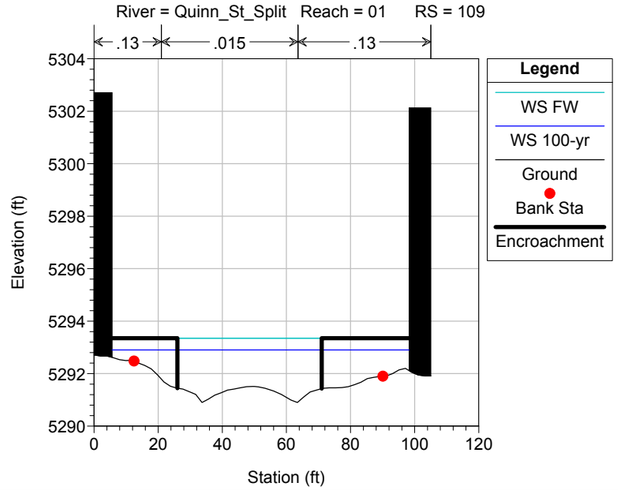
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Quinn_St_Split Reach = 01 RS = 195



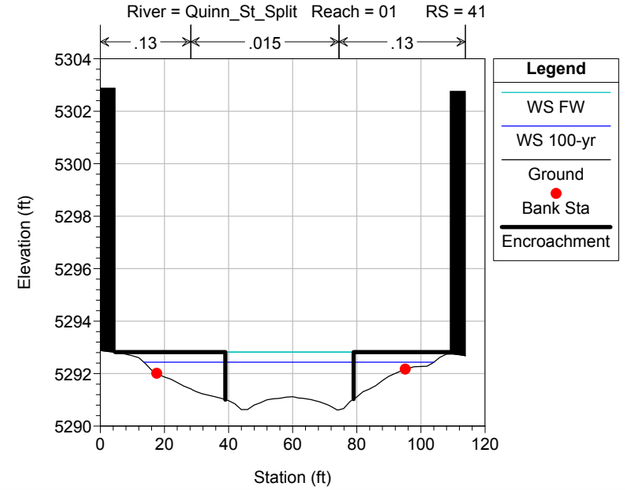
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Quinn_St_Split Reach = 01 RS = 109



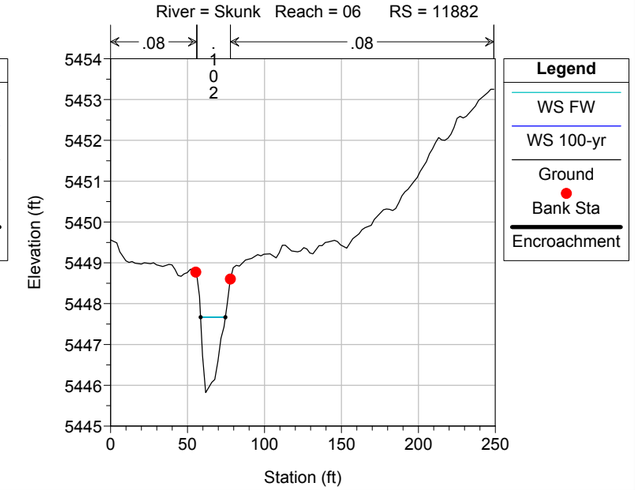
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Quinn_St_Split Reach = 01 RS = 41



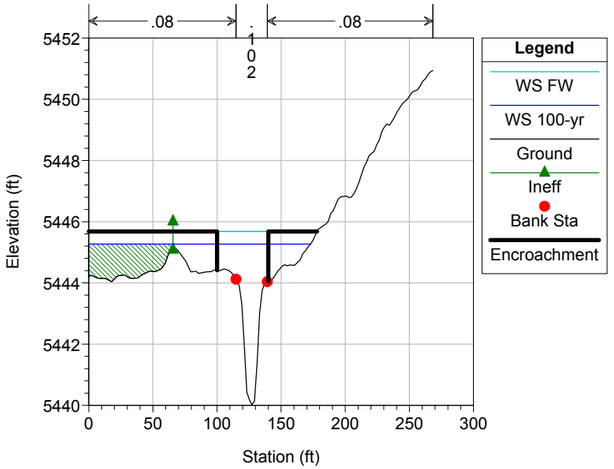
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11882



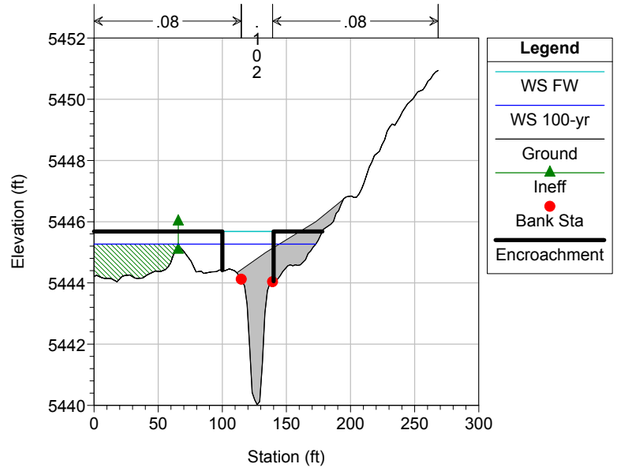
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11713



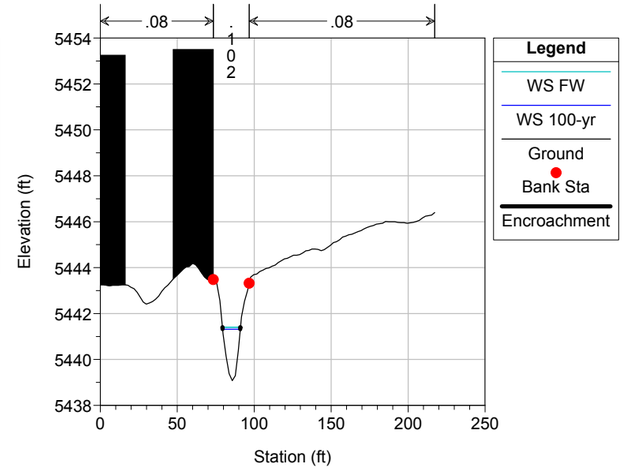
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11700 IS Cemetery Road



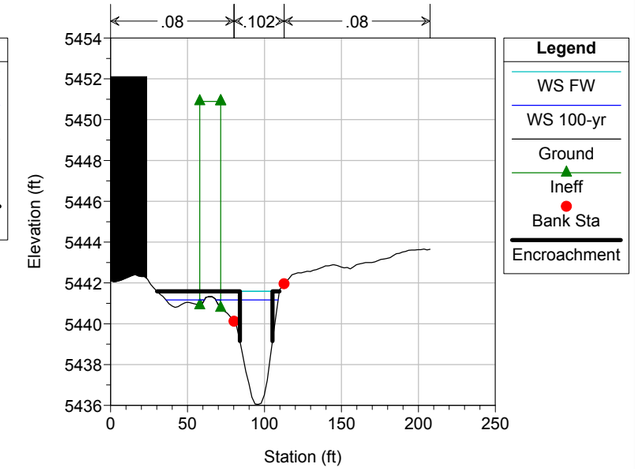
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11673



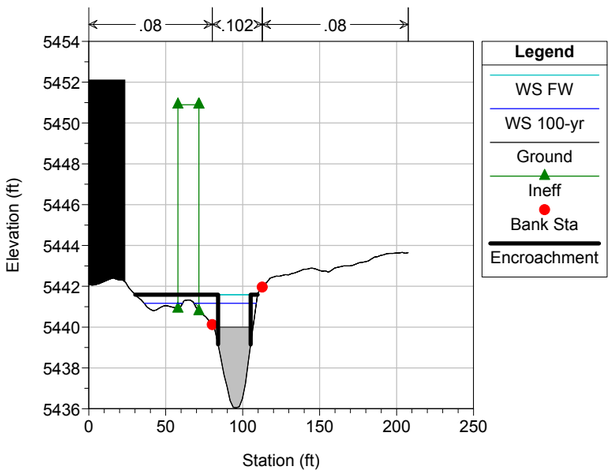
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11613



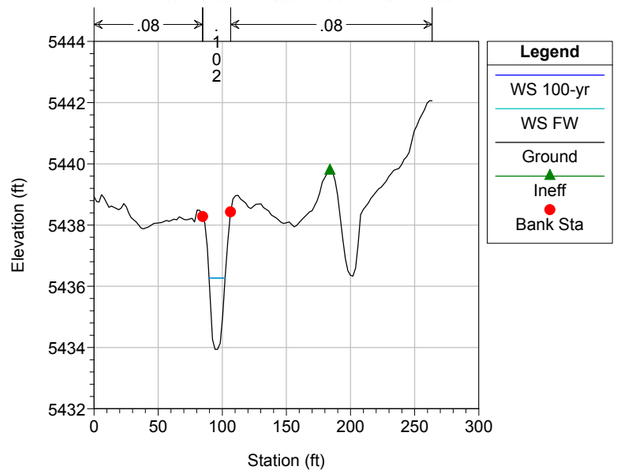
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11583 IS Anderson Ditch Flume Structure



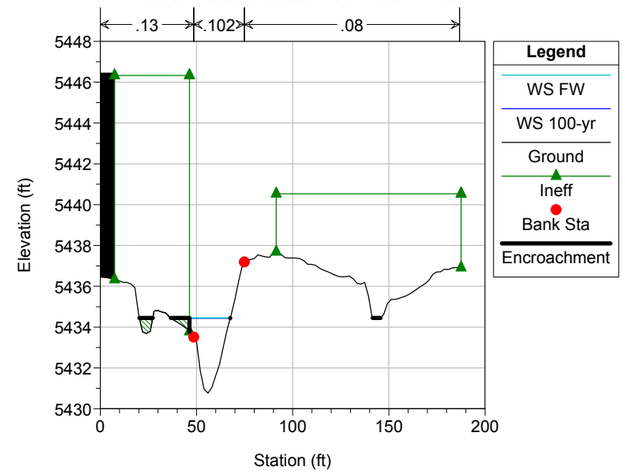
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11524



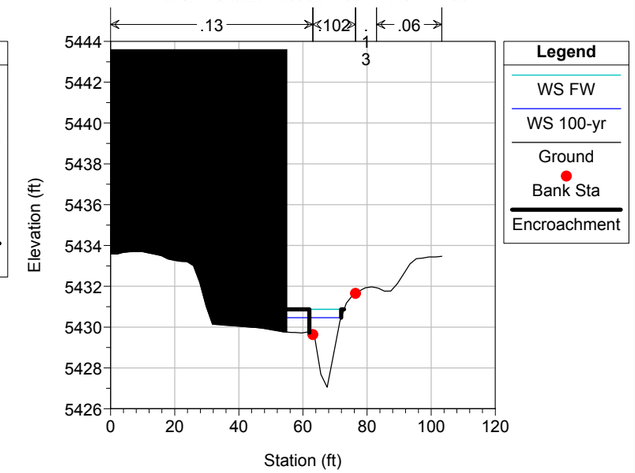
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11457



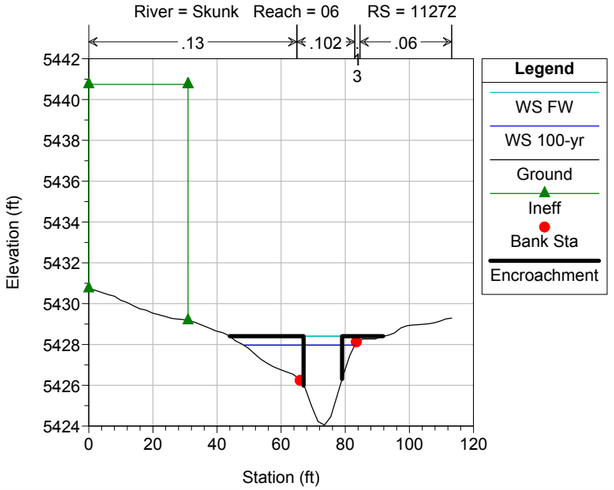
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11364



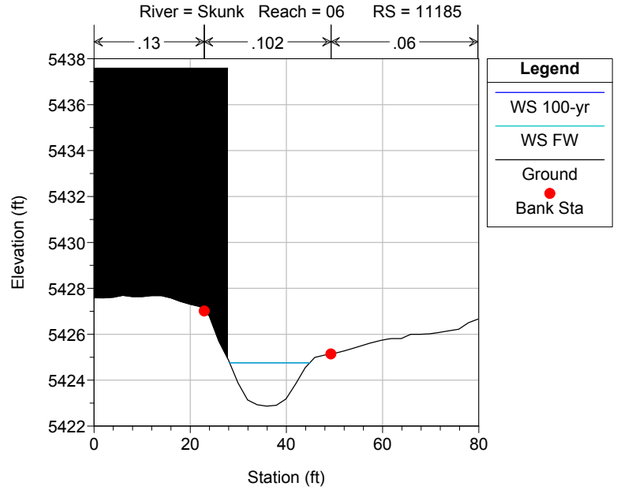
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11272



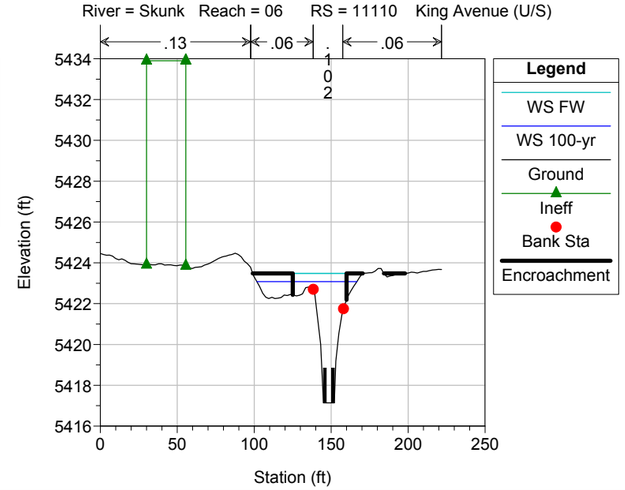
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11185



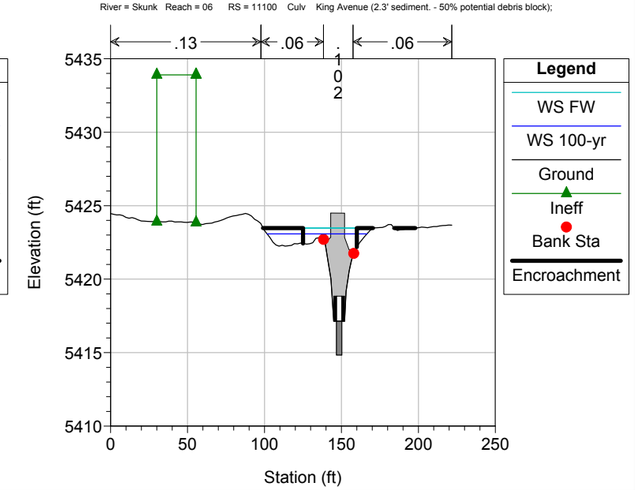
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11110 King Avenue (U/S)



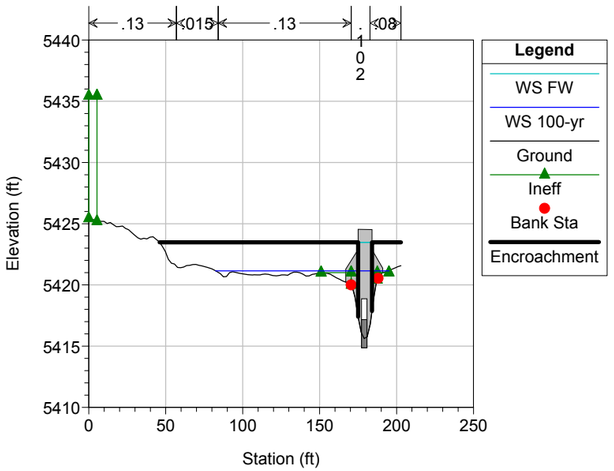
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11100 Culv King Avenue (2.3' sediment. - 50% potential debris block);



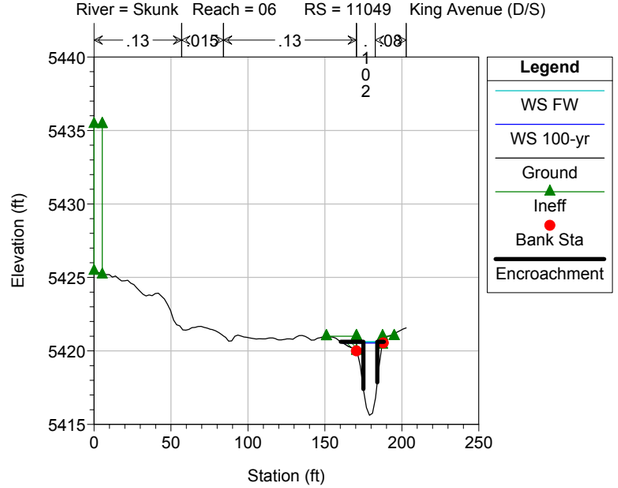
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11100 Culv King Avenue (2.3' sediment. - 50% potential debris block);



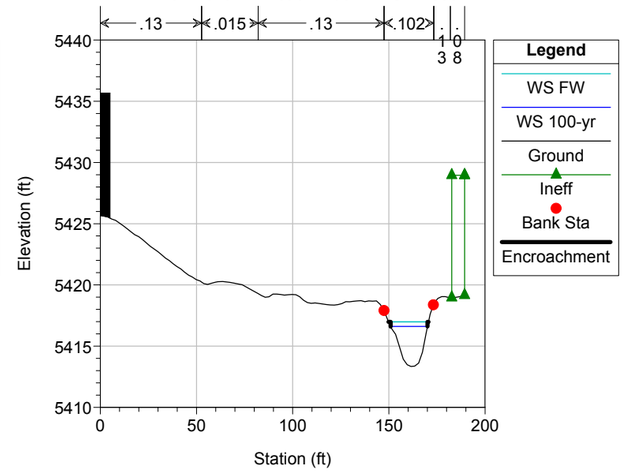
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 06 RS = 11049 King Avenue (D/S)



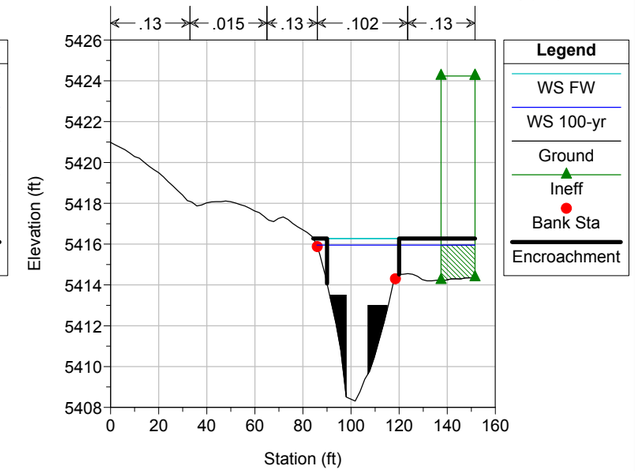
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10981



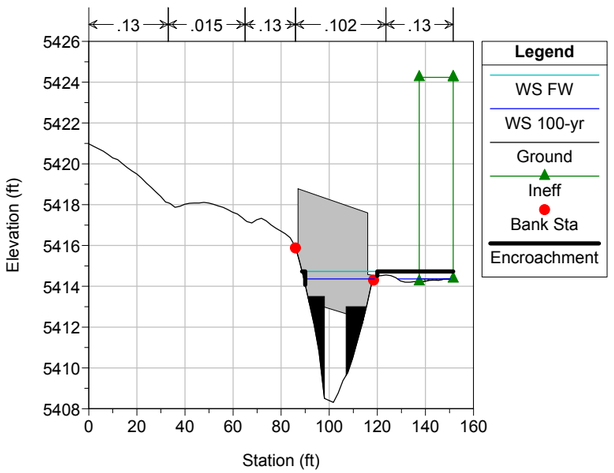
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10910 322 22nd Ave - Driveway (U/S)



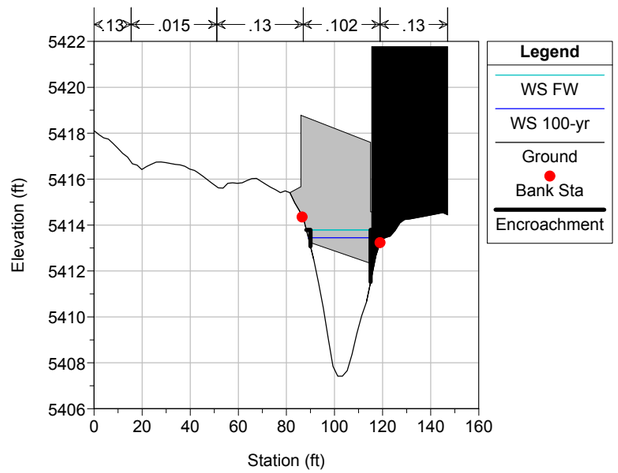
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10890 BR 322 22nd Ave - Driveway (40% potential debris block)



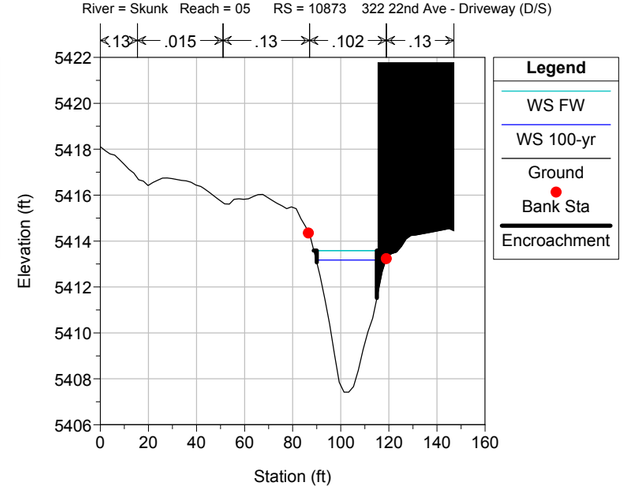
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10890 BR 322 22nd Ave - Driveway (40% potential debris block)



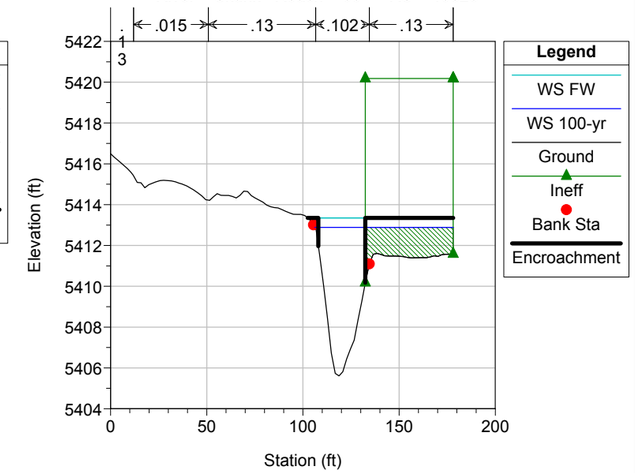
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10873 322 22nd Ave - Driveway (D/S)



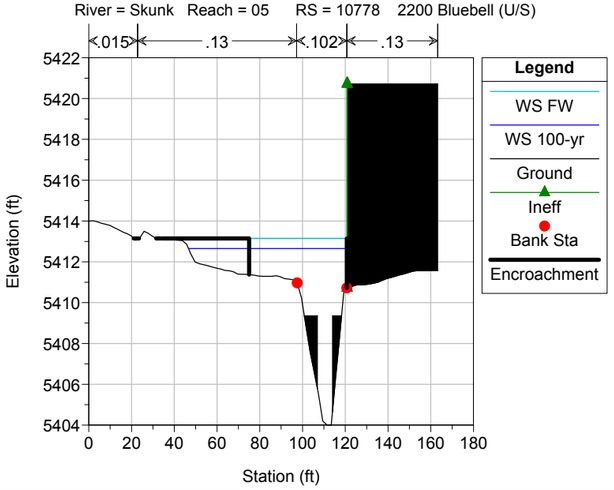
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10826



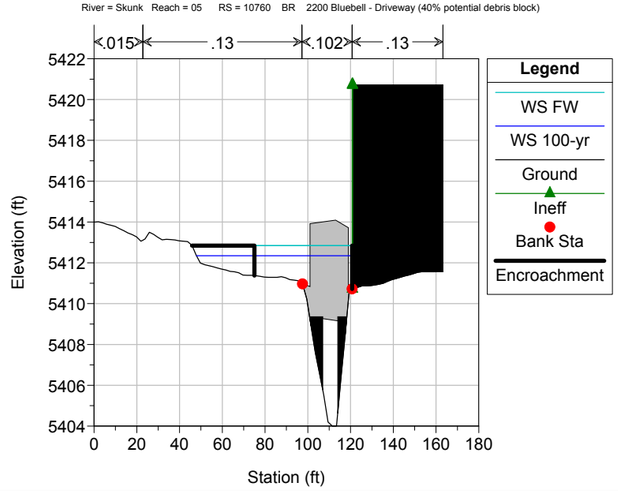
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10778 2200 Bluebell (U/S)



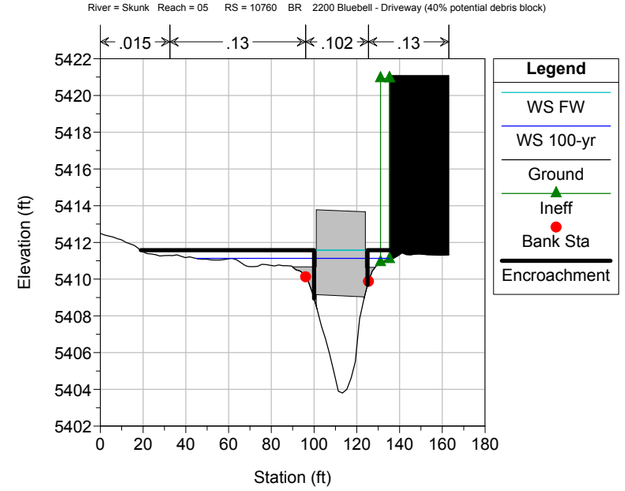
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10760 BR 2200 Bluebell - Driveway (40% potential debris block)



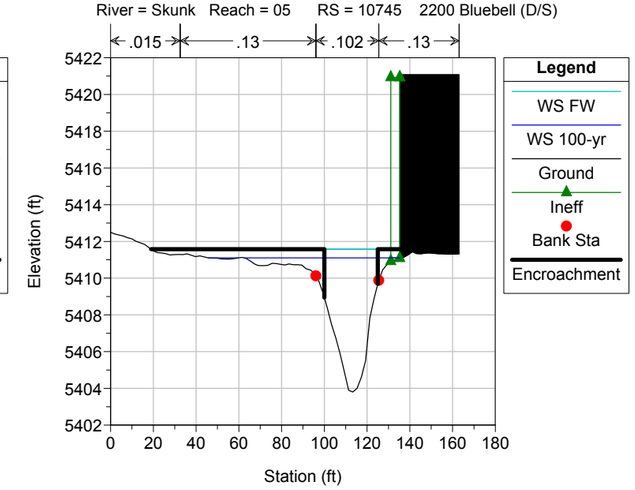
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10760 BR 2200 Bluebell - Driveway (40% potential debris block)



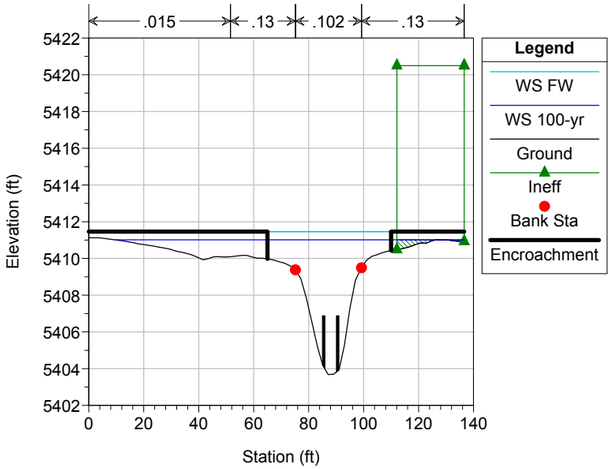
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10745 2200 Bluebell (D/S)



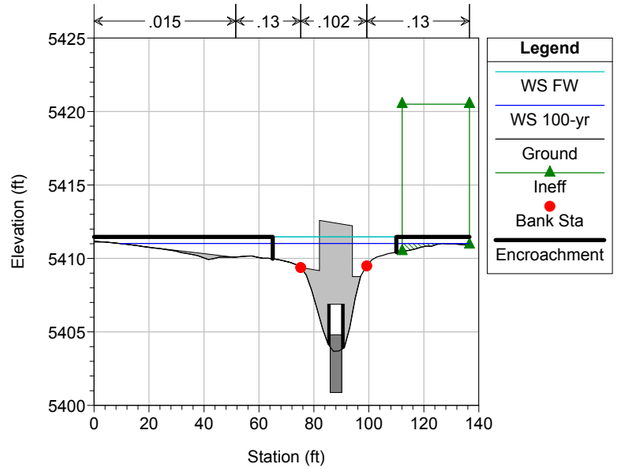
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10722 Bluebell Ave (U/S)



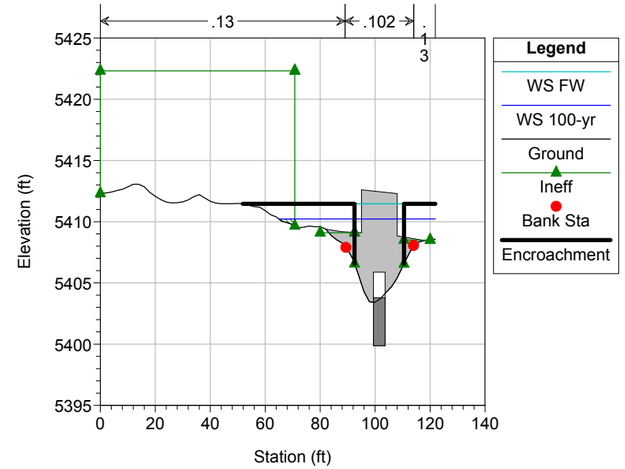
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10700 Culv Bluebell Avenue - 3.92' sediment (30% potential debris block);



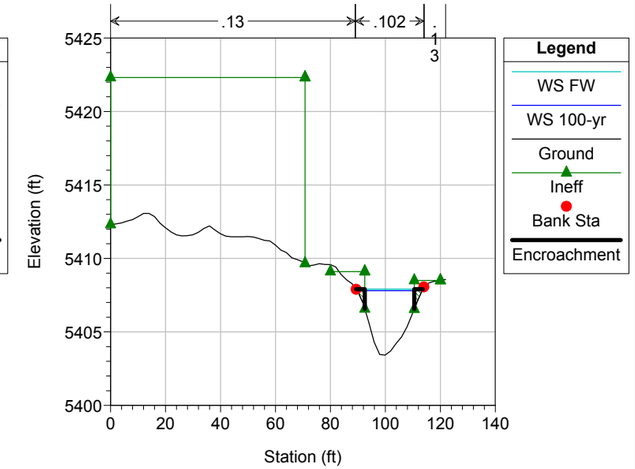
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10700 Culv Bluebell Avenue - 3.92' sediment (30% potential debris block);



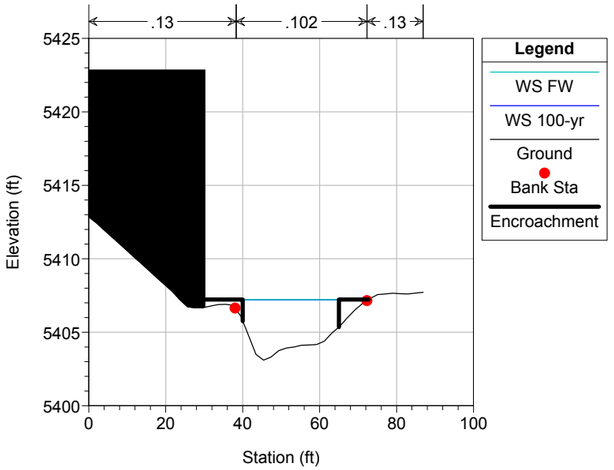
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10655 Bluebell Ave (D/S)



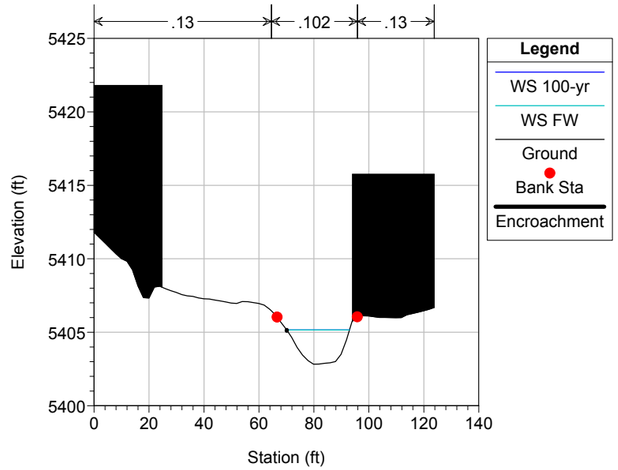
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10616



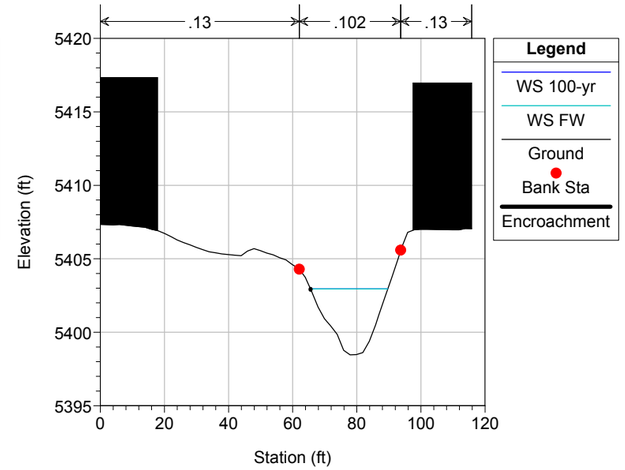
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10560



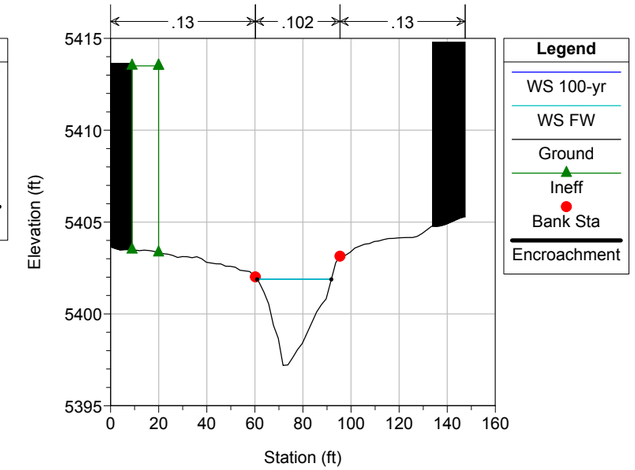
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10488



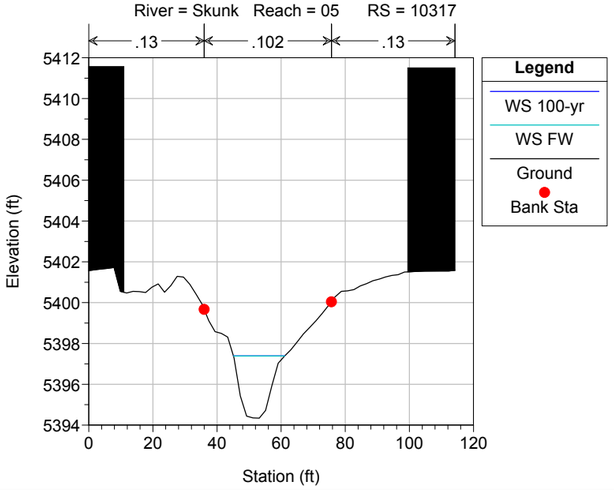
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10421



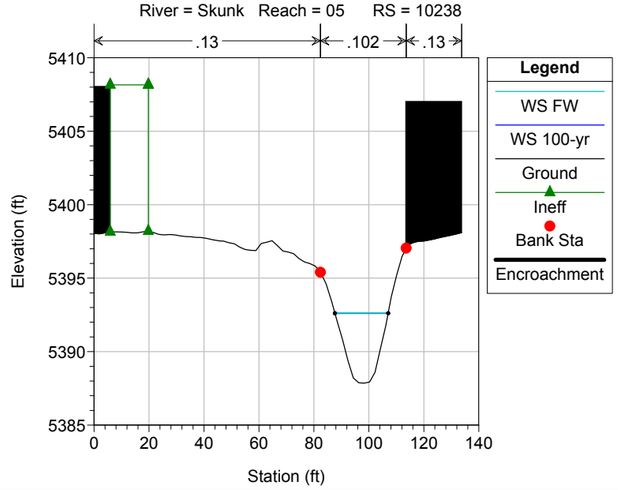
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10317



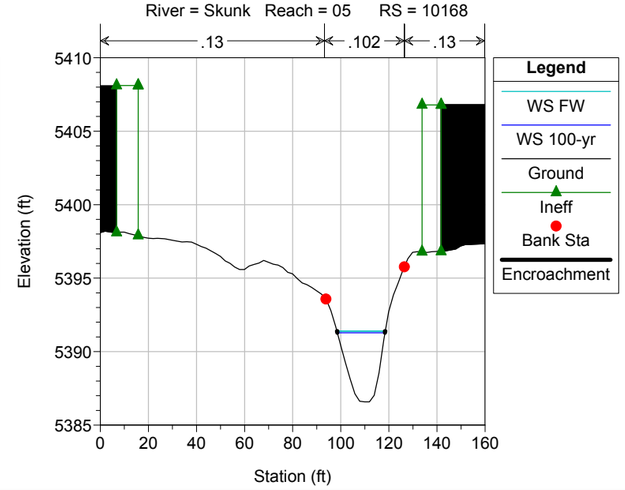
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10238



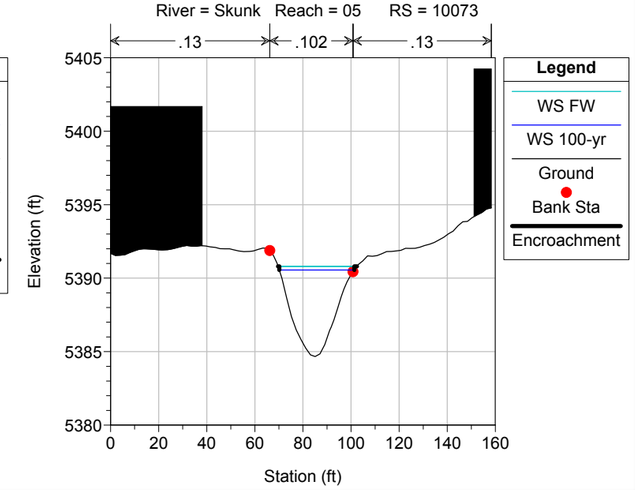
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10168



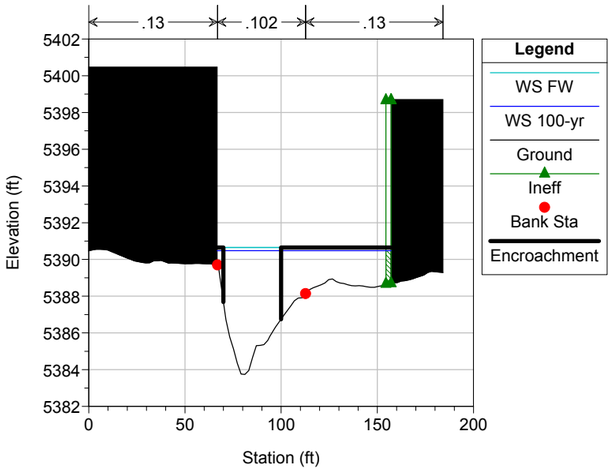
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 10073



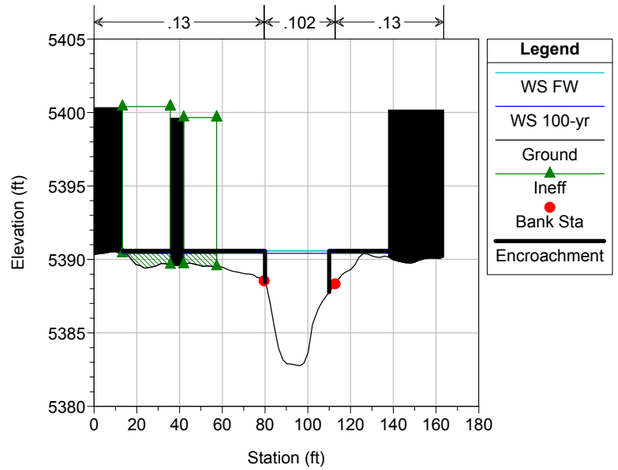
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 9997



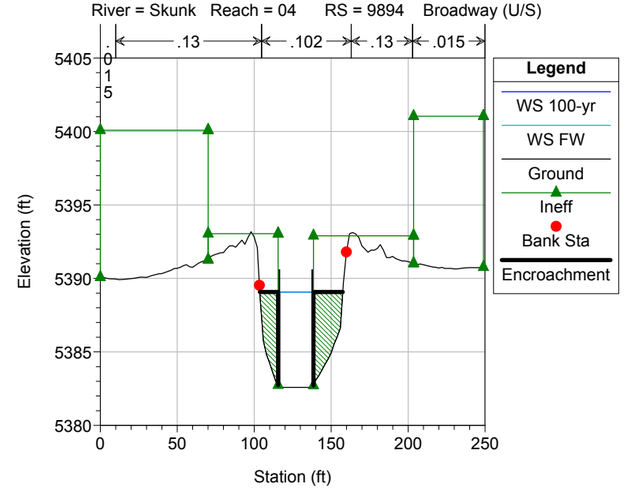
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 05 RS = 9943



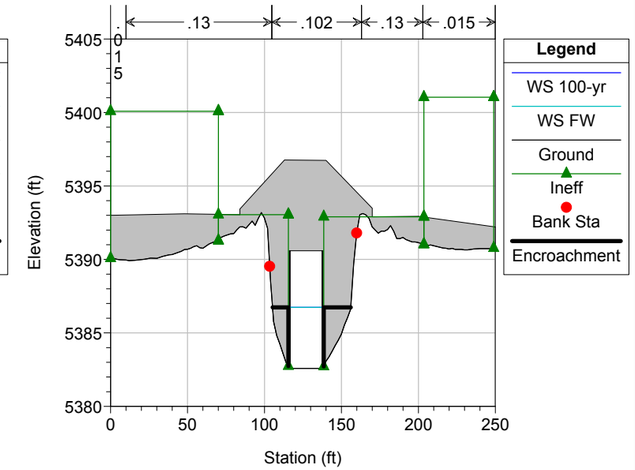
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9894 Broadway (U/S)



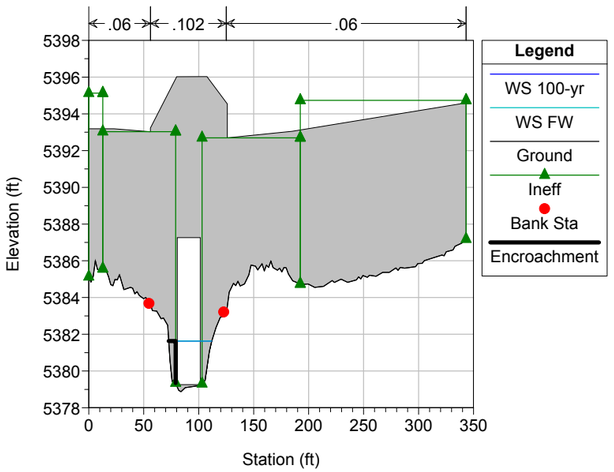
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9850 Culv Broadway (5% potential debris block);



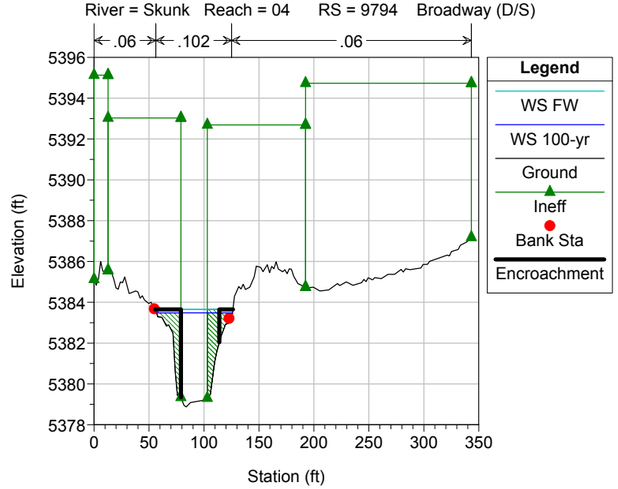
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9850 Culv Broadway (5% potential debris block);



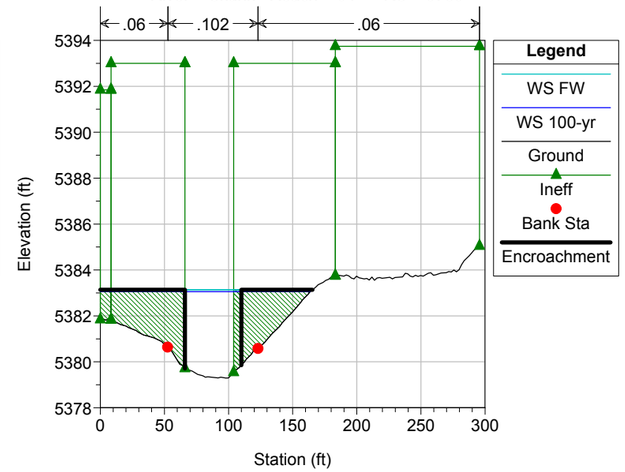
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9794 Broadway (D/S)



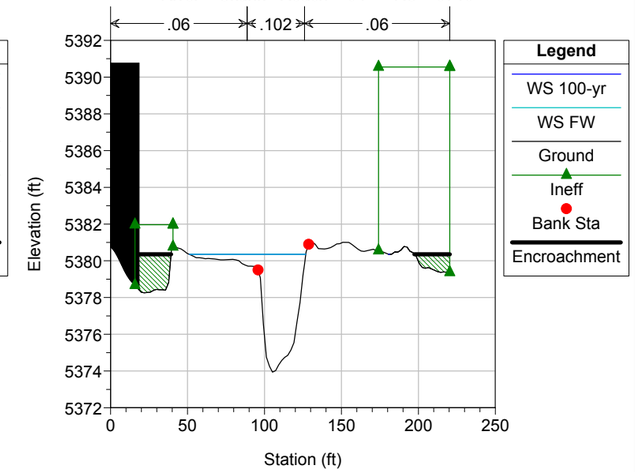
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9780



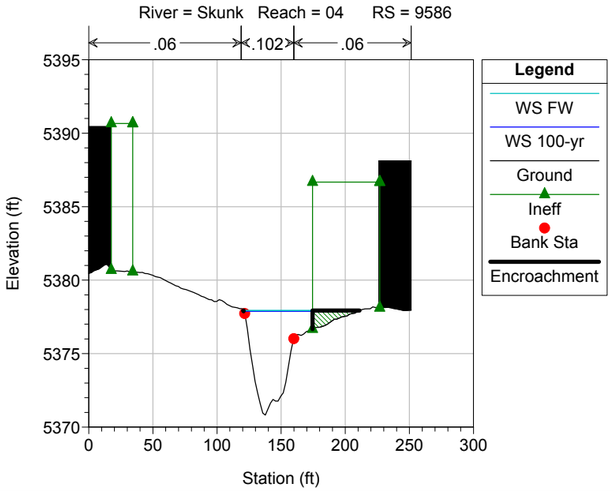
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9710



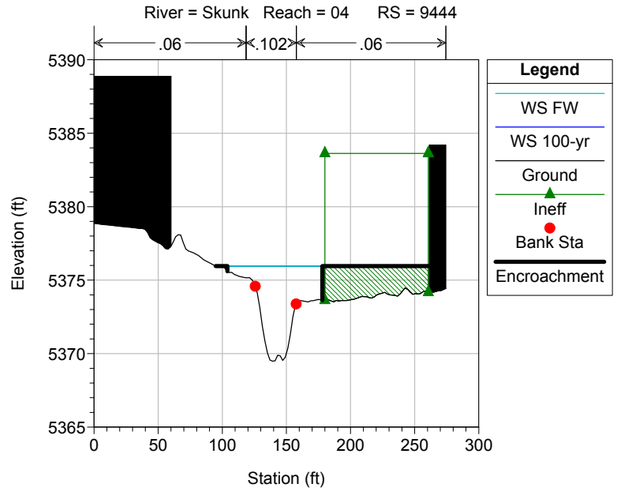
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9586



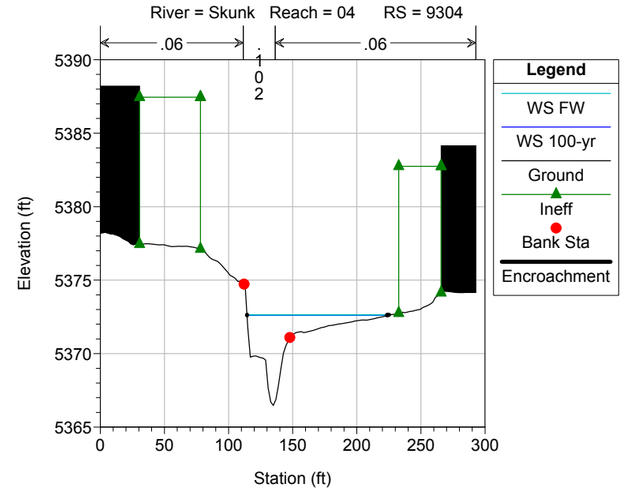
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9444



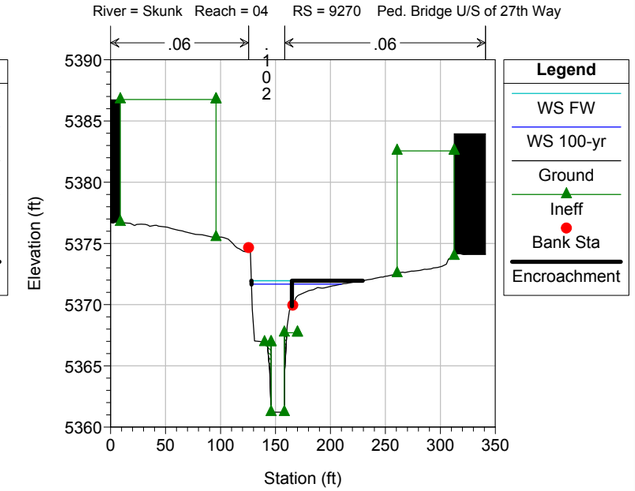
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9304



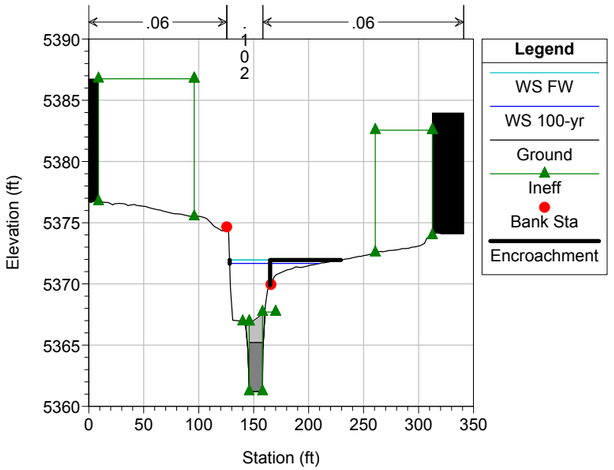
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9270 Ped. Bridge U/S of 27th Way



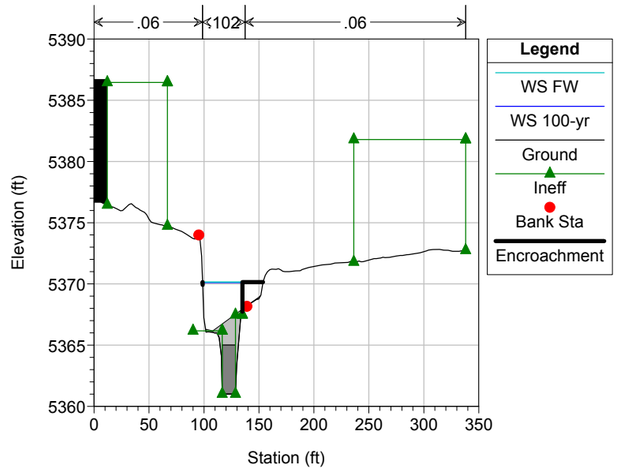
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9260 Culv Ped. Bridge U/S of 27th Way (100% potential debris block)



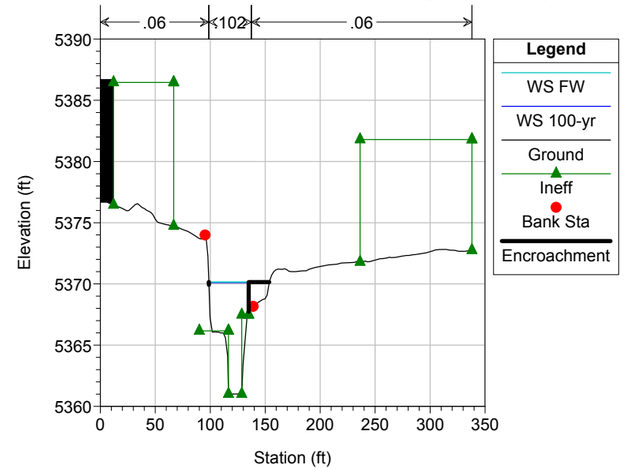
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9260 Culv Ped. Bridge U/S of 27th Way (100% potential debris block)



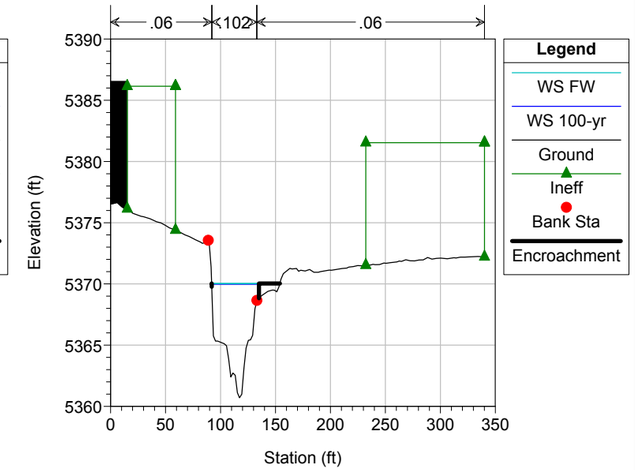
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9246 Ped. Bridge U/S of 27th Way



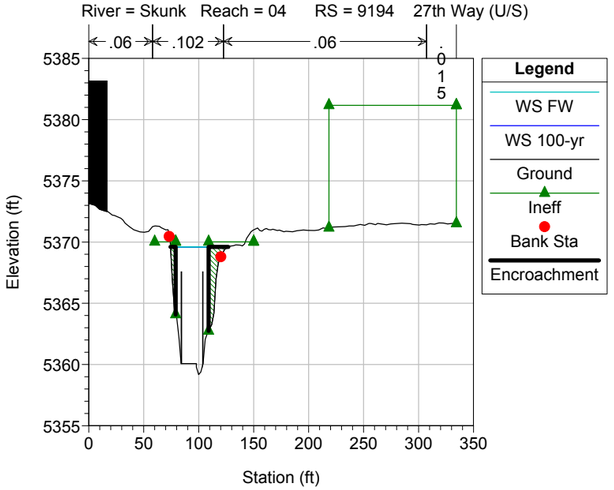
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9234



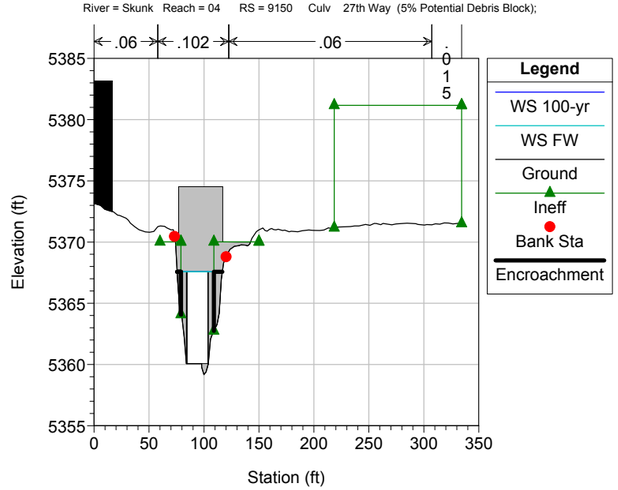
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9194 27th Way (U/S)



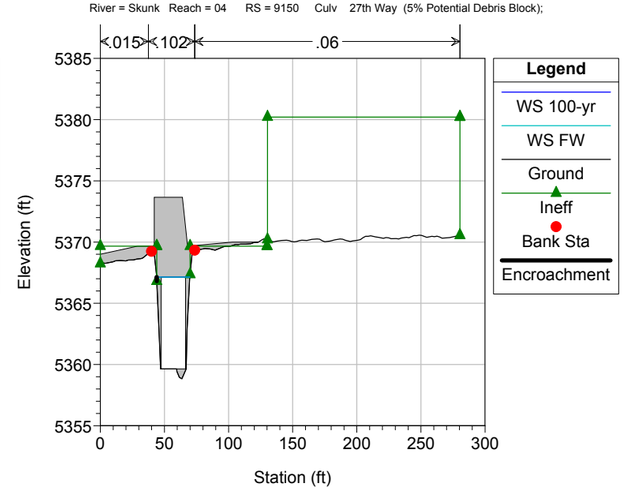
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9150 Culv 27th Way (5% Potential Debris Block);



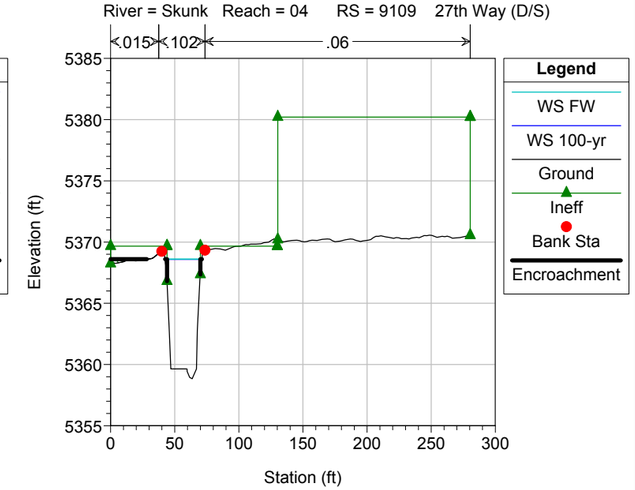
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9150 Culv 27th Way (5% Potential Debris Block);



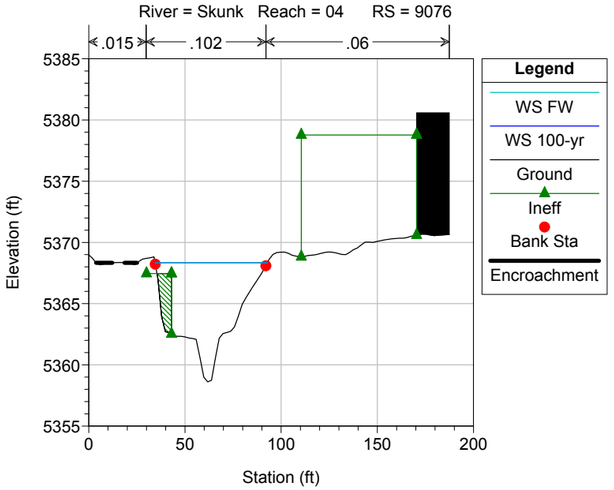
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9109 27th Way (D/S)



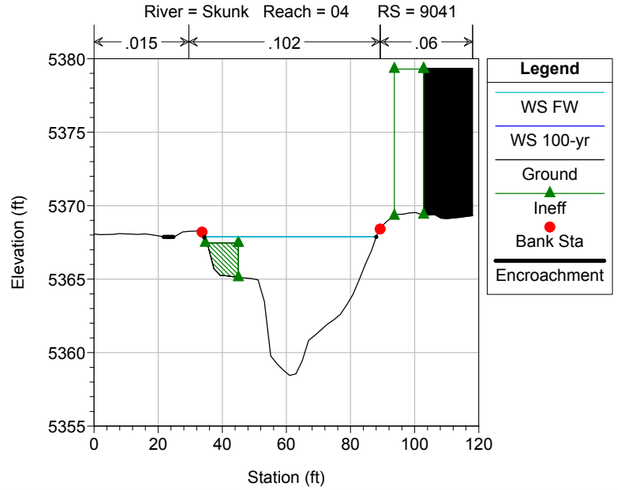
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9076



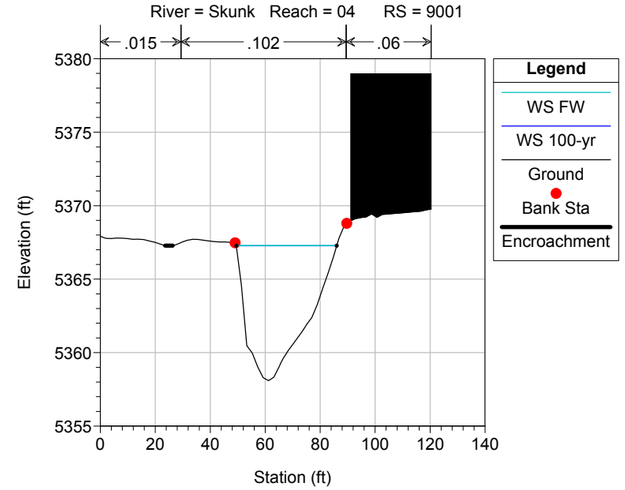
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9041



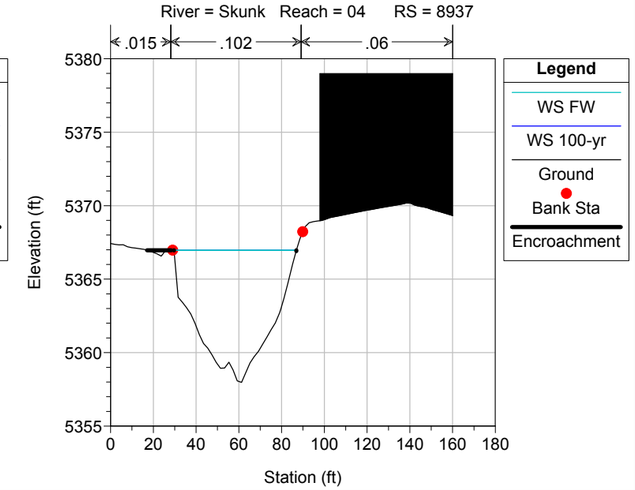
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 9001



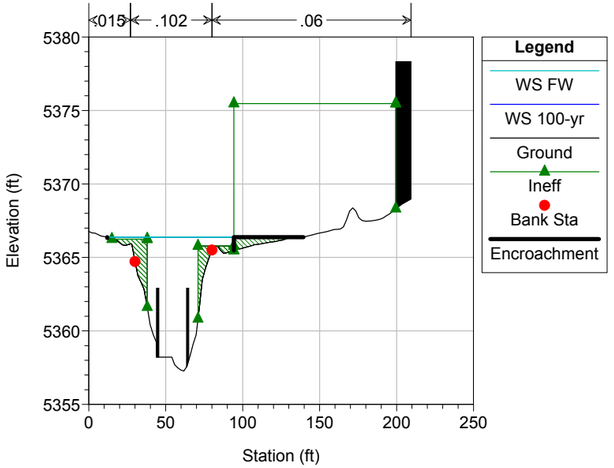
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 8937



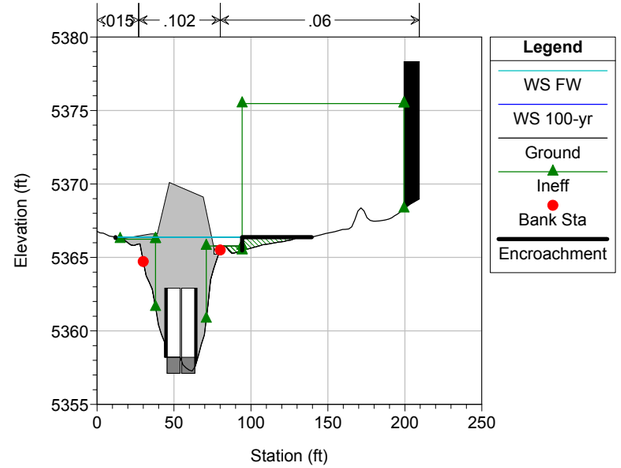
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 8873 Moorhead Avenue (U/S)



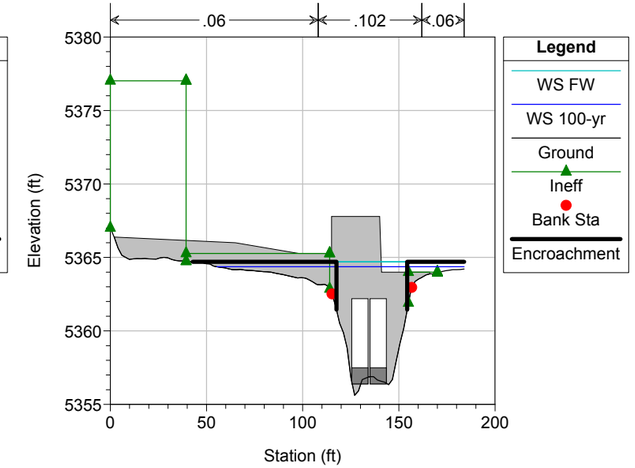
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 8800 Culv Moorhead Avenue (1.1' existing sediment. 15% potential debris b



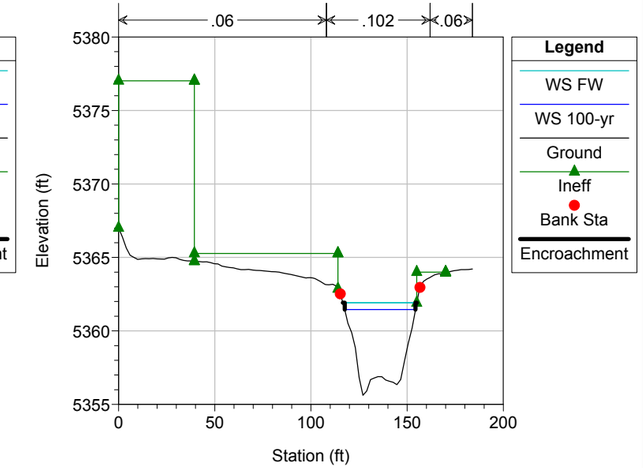
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 8800 Culv Moorhead Avenue (1.1' existing sediment. 15% potential debris b



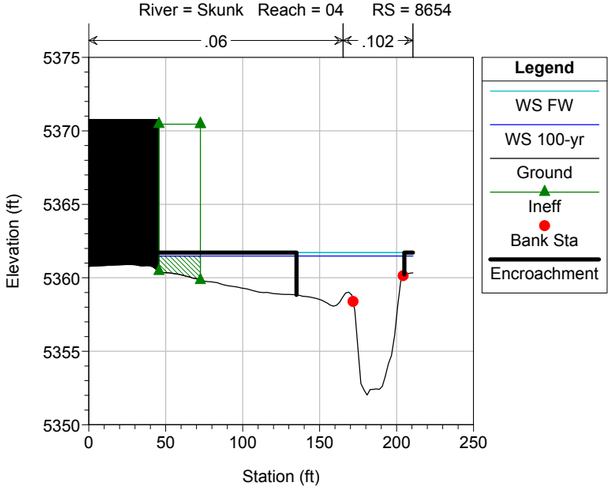
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 8713 Moorhead Avenue (D/S)



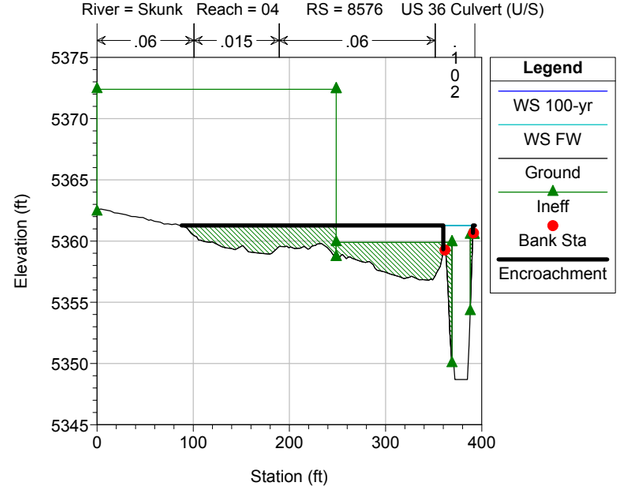
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 8654



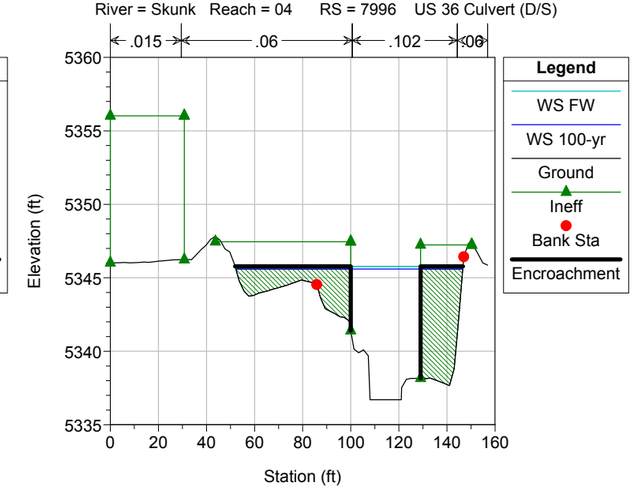
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 8576 US 36 Culvert (U/S)



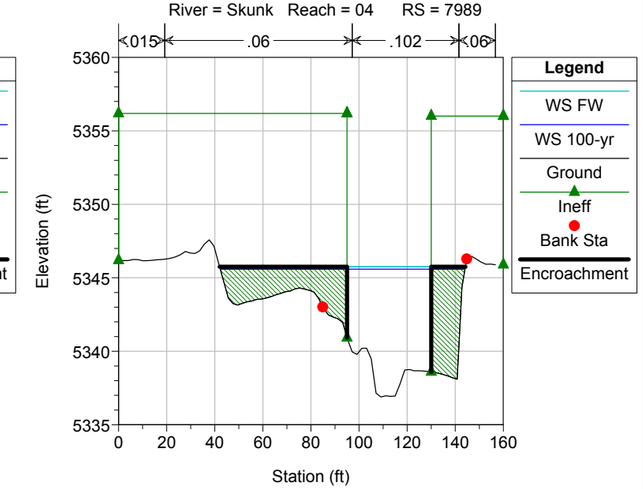
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7996 US 36 Culvert (D/S)



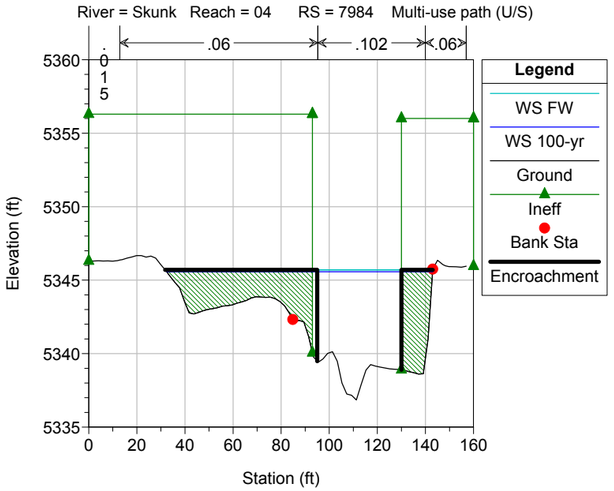
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7989



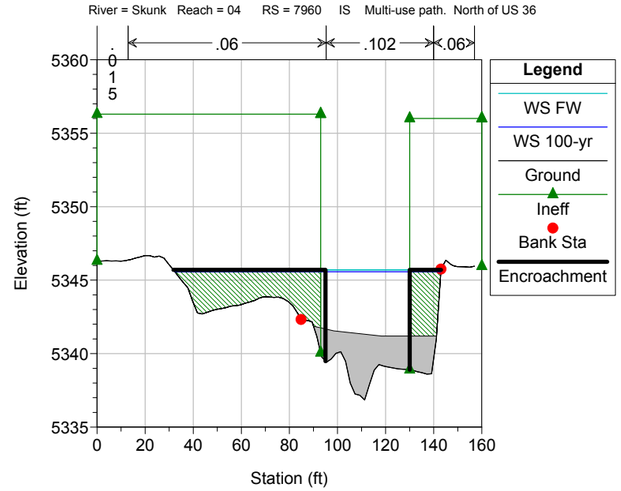
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7984 Multi-use path (U/S)



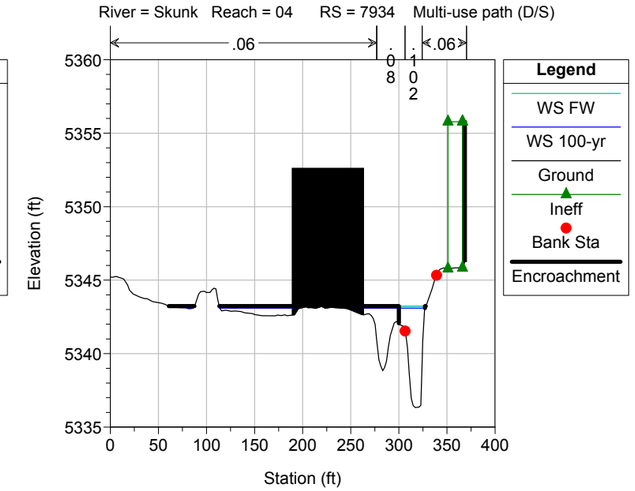
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7960 IS Multi-use path. North of US 36



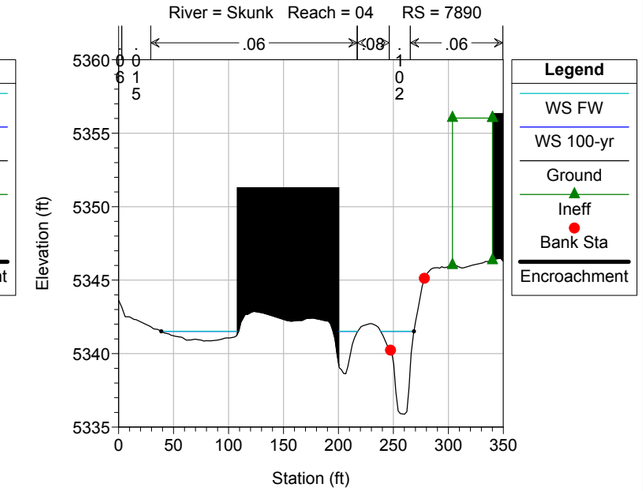
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

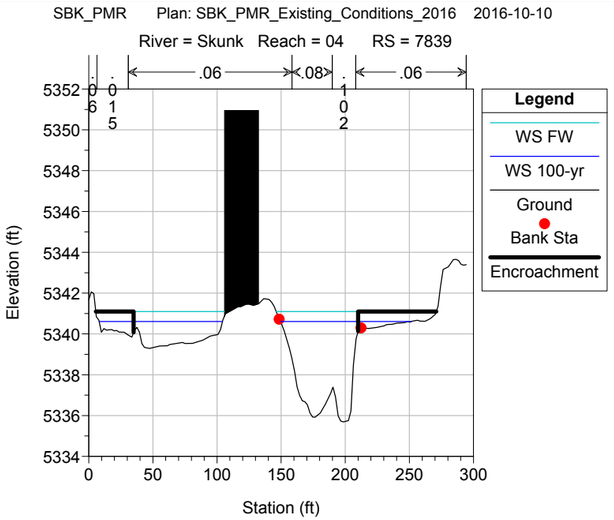
River = Skunk Reach = 04 RS = 7934 Multi-use path (D/S)

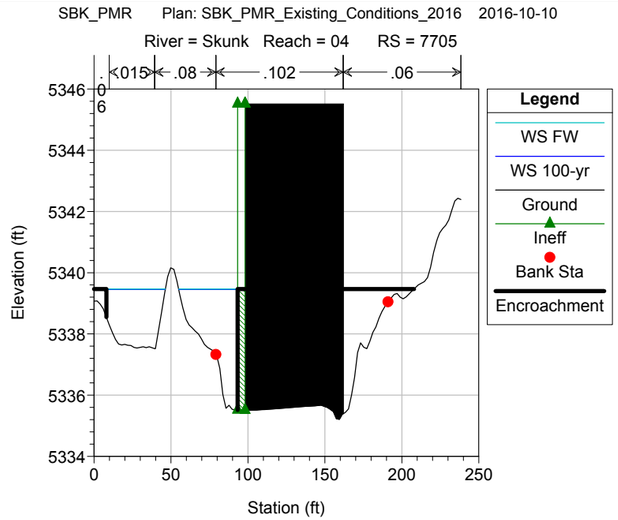


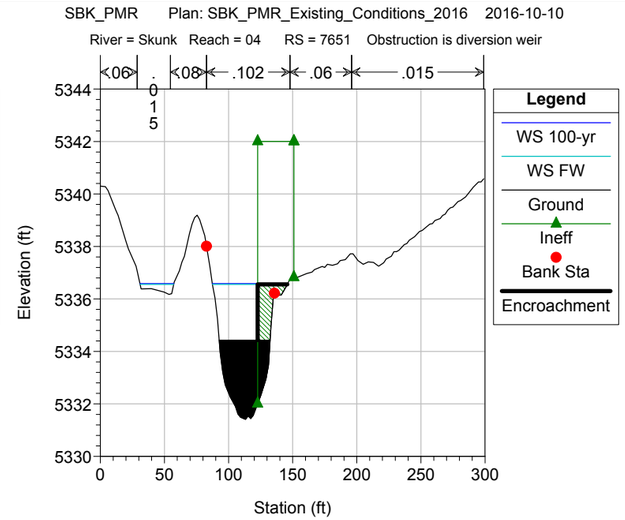
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

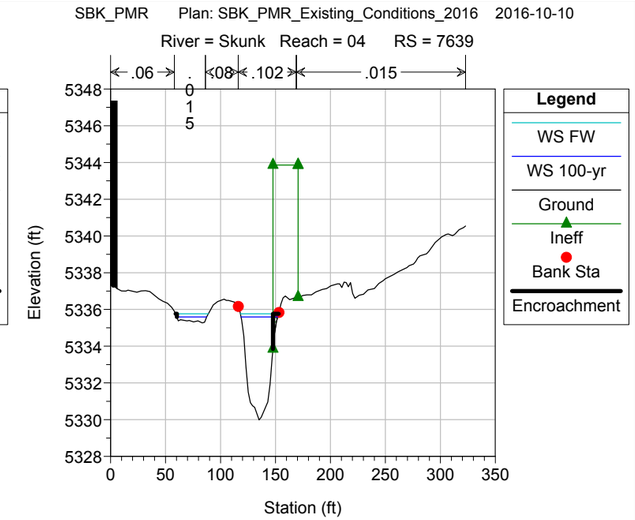
River = Skunk Reach = 04 RS = 7890

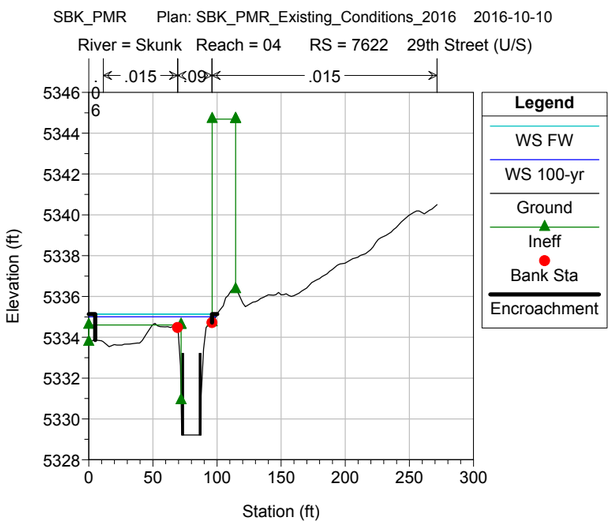


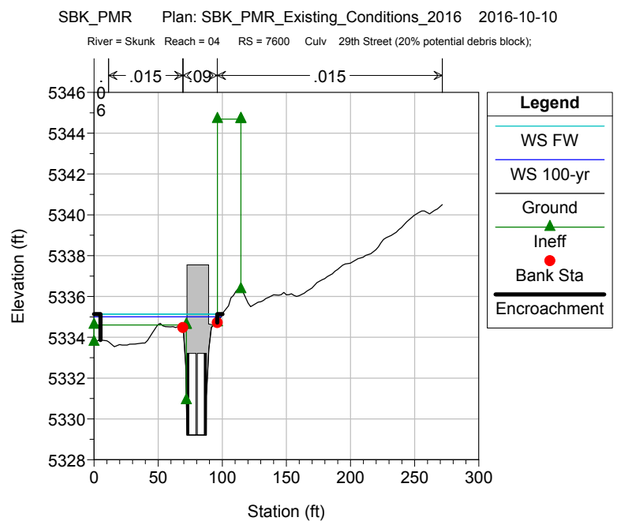

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7839
.06 .08 .06
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

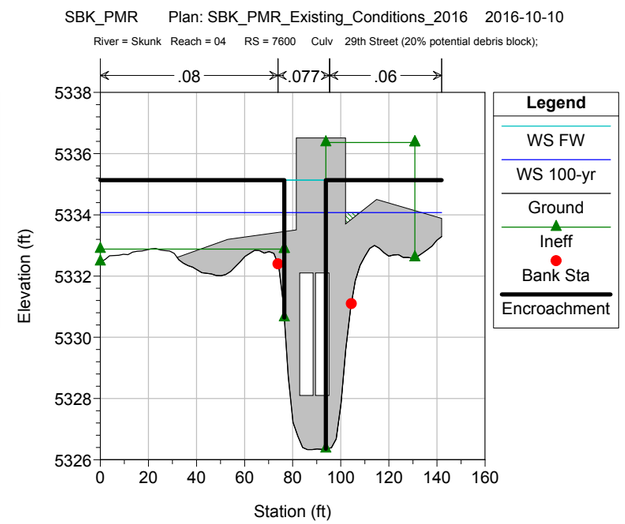

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7705
.015 .08 .102 .06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

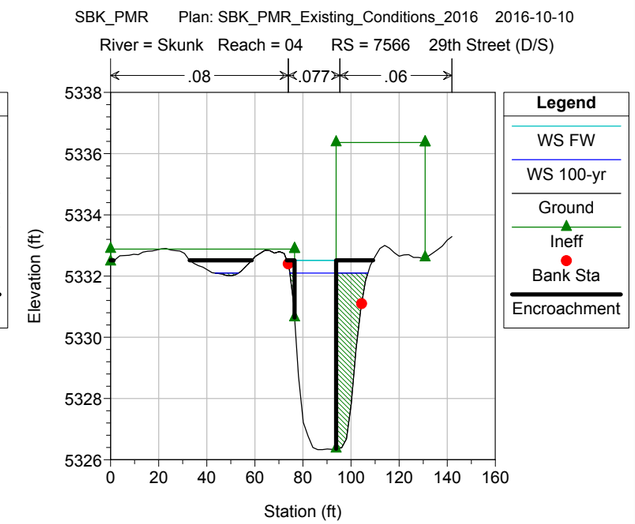

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7651 Obstruction is diversion weir
.06 .08 .102 .06 .015
Legend
WS 100-yr
WS FW
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

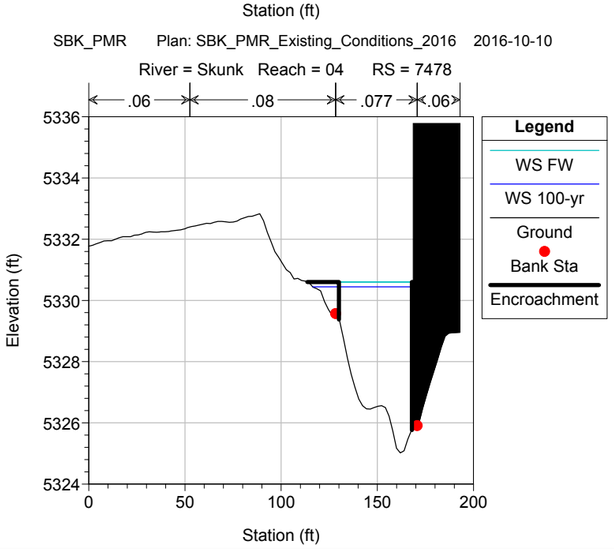

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7639
.06 .08 .102 .015
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

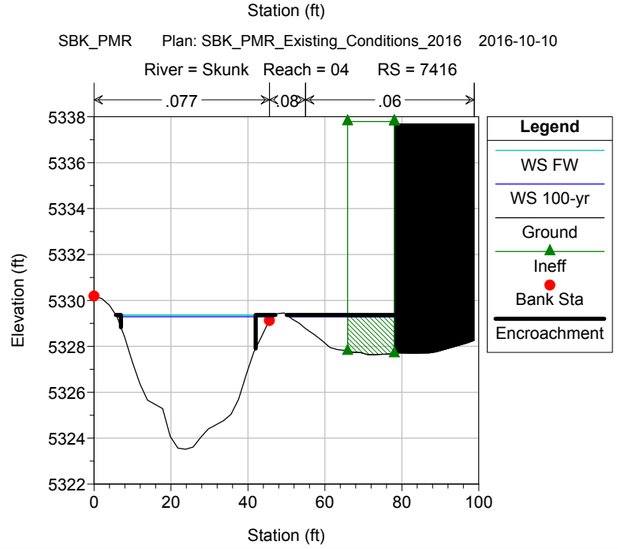

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7622 29th Street (U/S)
.015 .09 .015
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

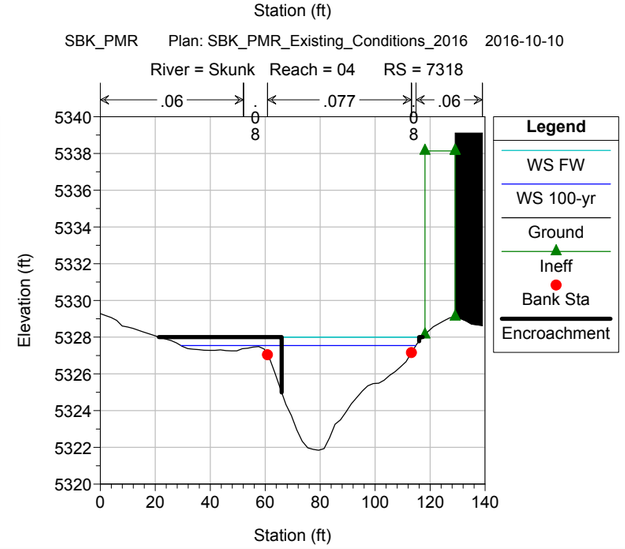

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7600 Culv 29th Street (20% potential debris block);
.015 .09 .015
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

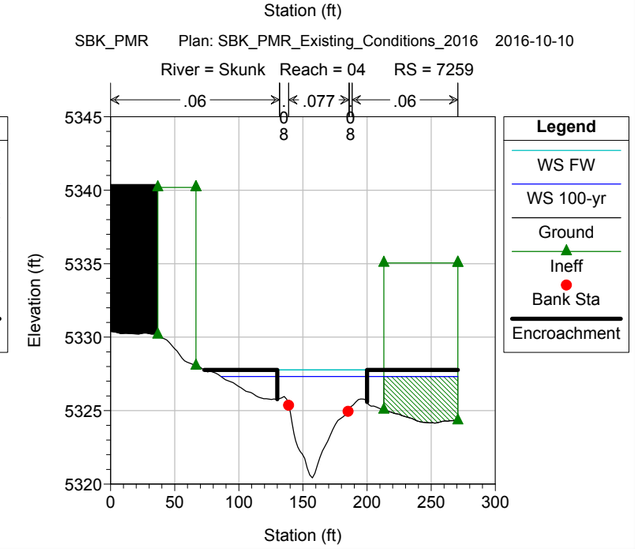

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7600 Culv 29th Street (20% potential debris block);
.08 .077 .06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7566 29th Street (D/S)
.08 .077 .06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7478
.06 .08 .077 .06
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

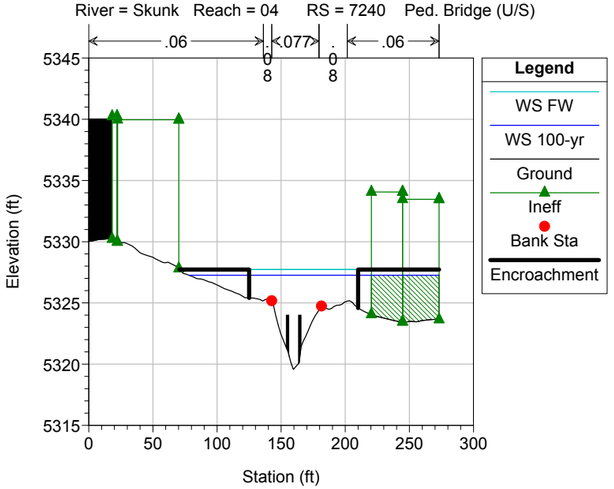

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7416
.077 .08 .06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7318
.06 .077 .06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 04 RS = 7259
.06 .077 .06
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

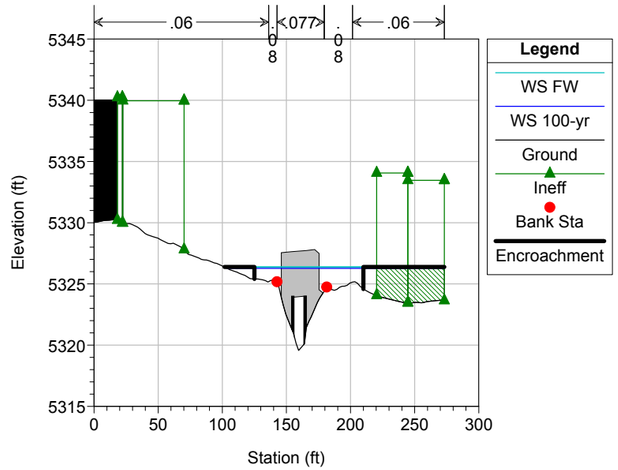
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7240 Ped. Bridge (U/S)



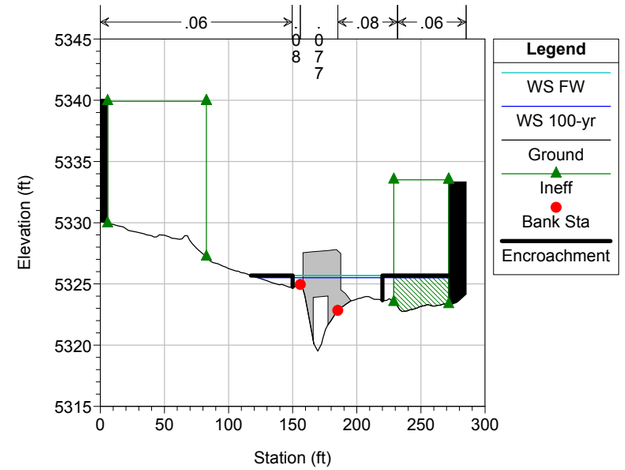
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7230 BR Ped. Bridge - Parking Lot (30% potential debris block)



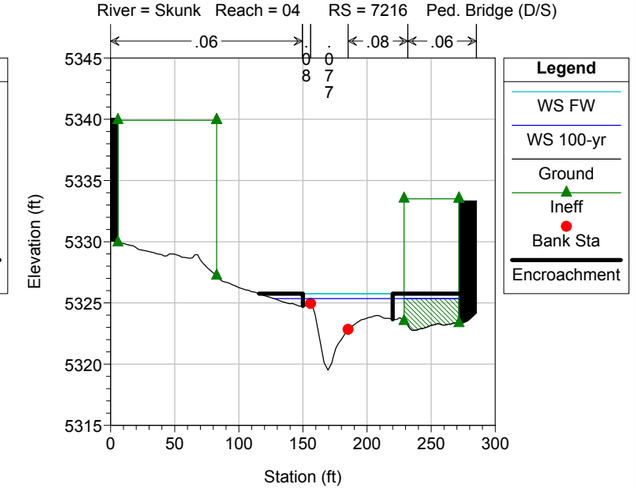
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7230 BR Ped. Bridge - Parking Lot (30% potential debris block)



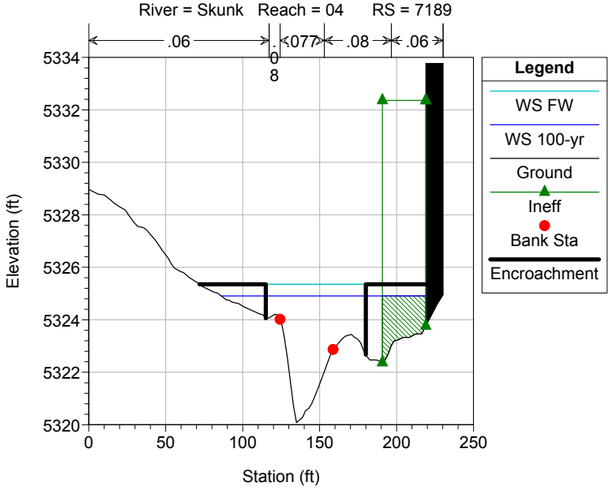
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7216 Ped. Bridge (D/S)



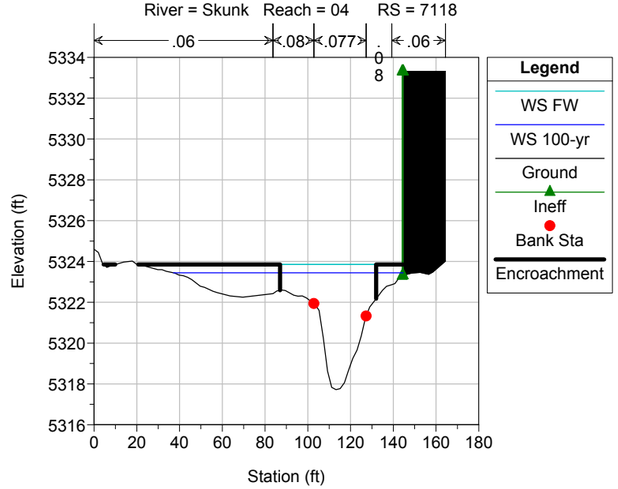
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7189



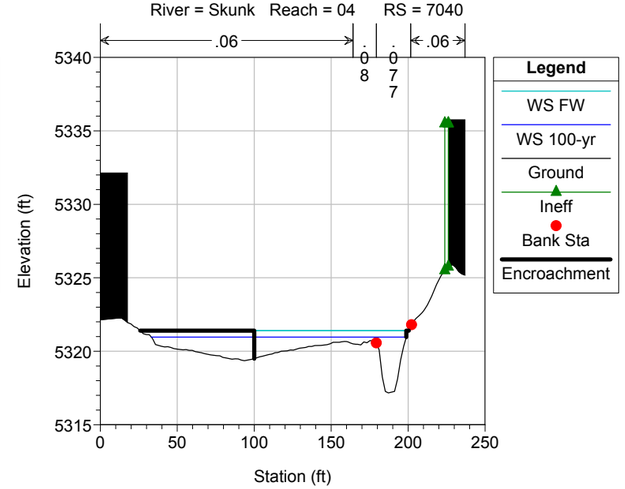
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7118



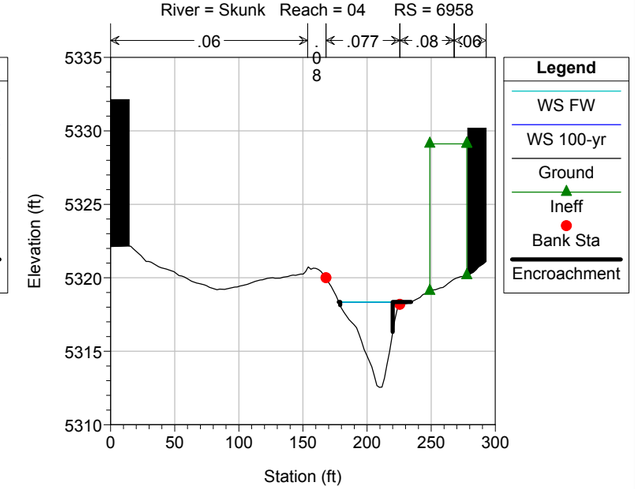
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 7040



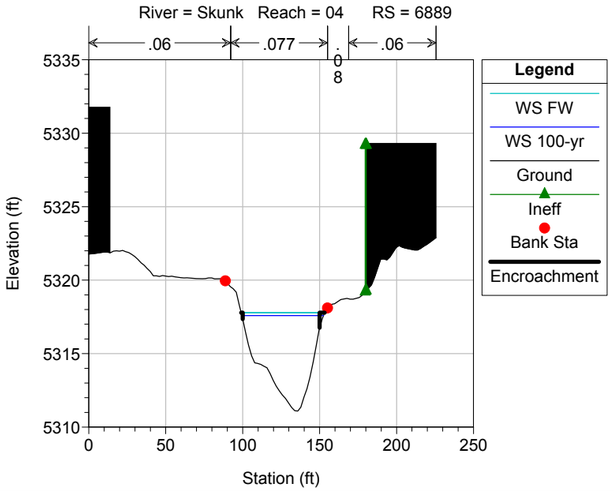
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6958



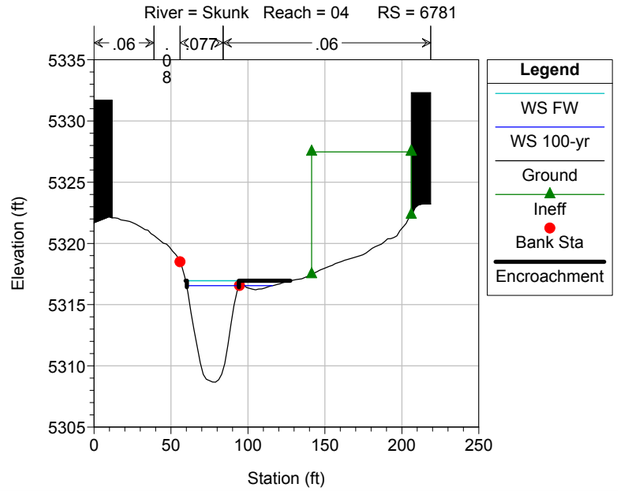
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6889



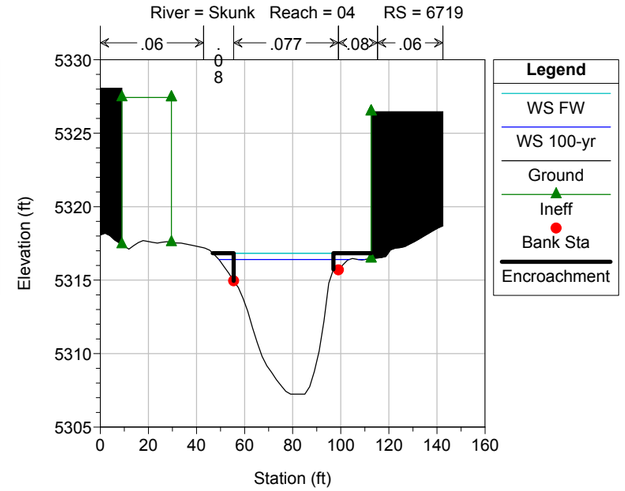
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6781



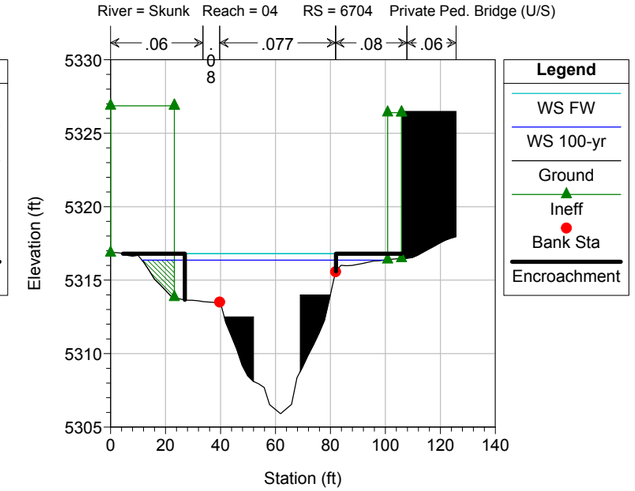
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6719



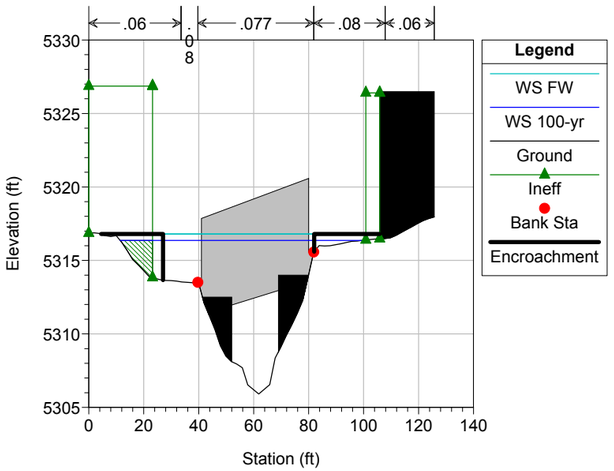
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6704 Private Ped. Bridge (U/S)



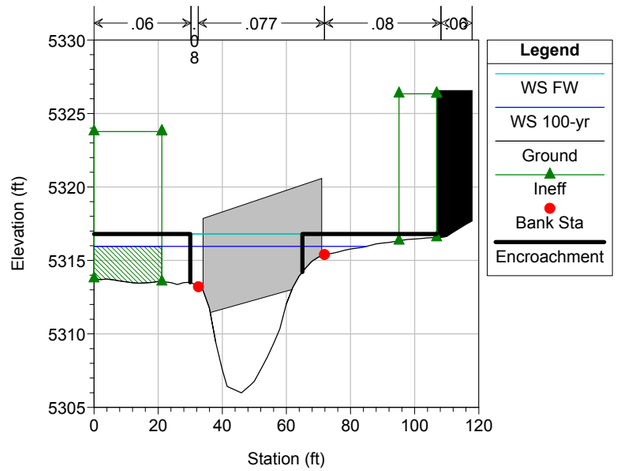
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6690 BR Private Ped. Bridge (west of 30th Street) (30% potential debris



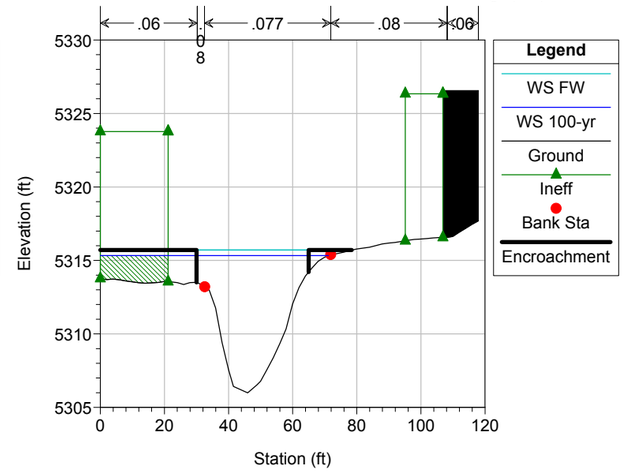
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6690 BR Private Ped. Bridge (west of 30th Street) (30% potential debris



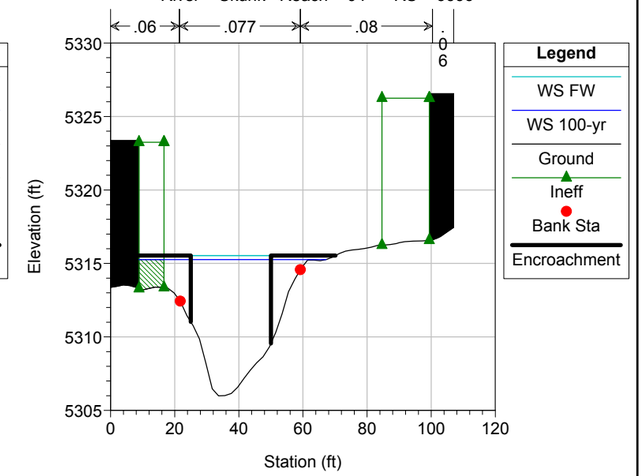
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6685 Private Ped. Bridge (D/S)



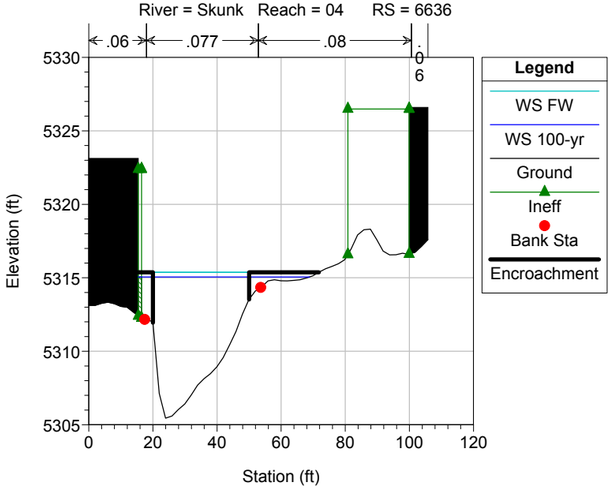
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6666



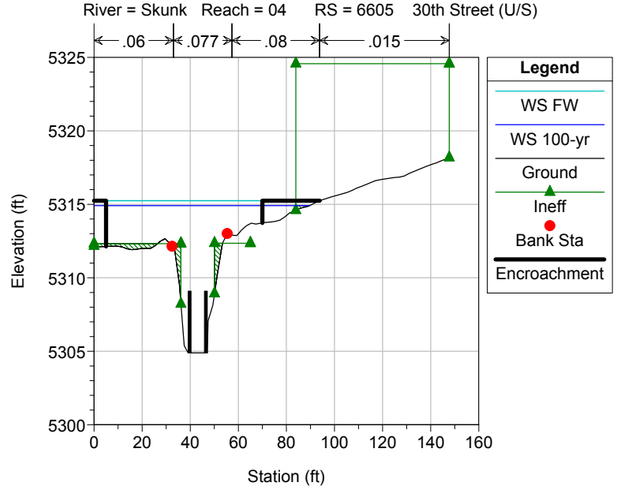
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6636



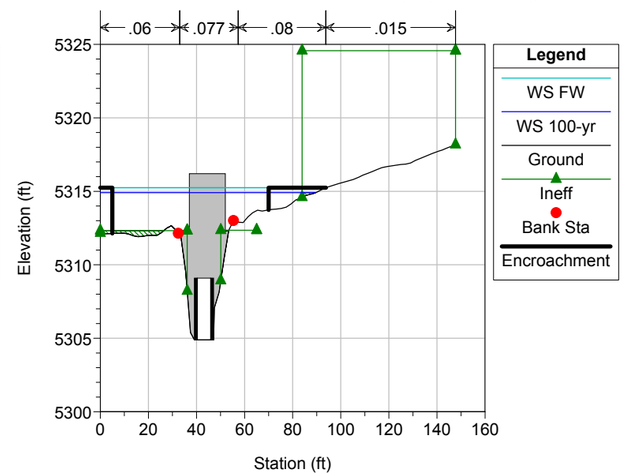
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6605 30th Street (U/S)



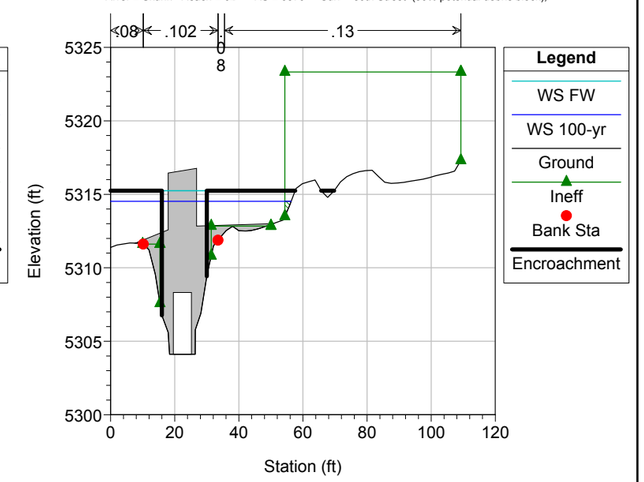
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6570 Culv 30th Street (30% potential debris block);



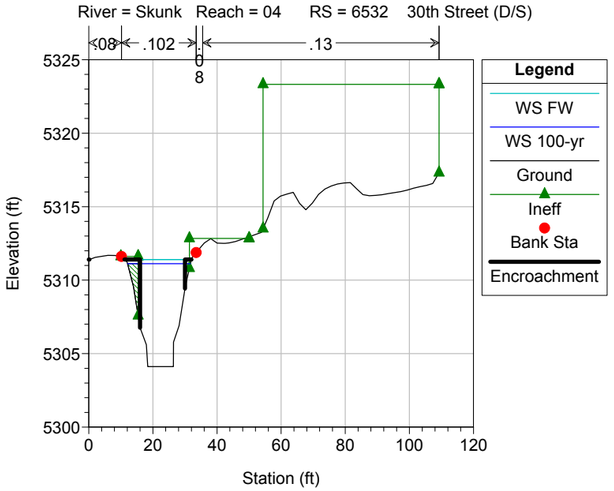
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6570 Culv 30th Street (30% potential debris block);



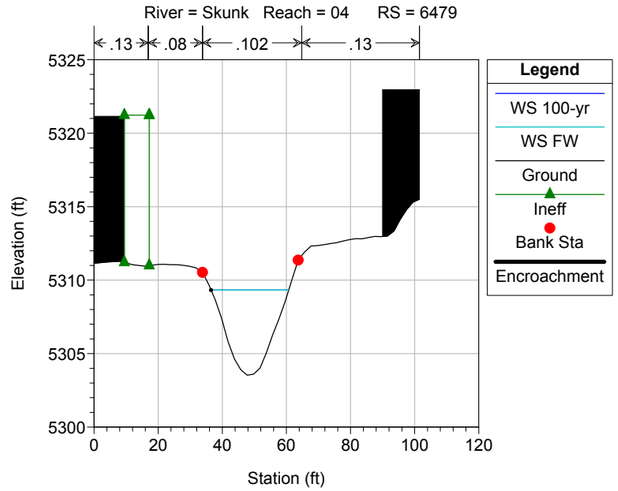
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6532 30th Street (D/S)



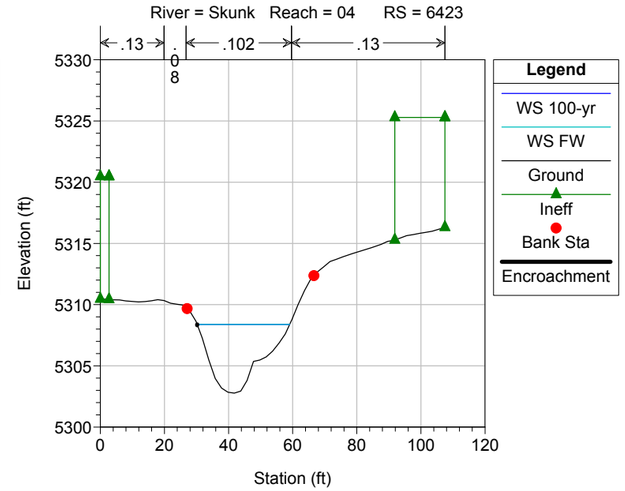
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6479



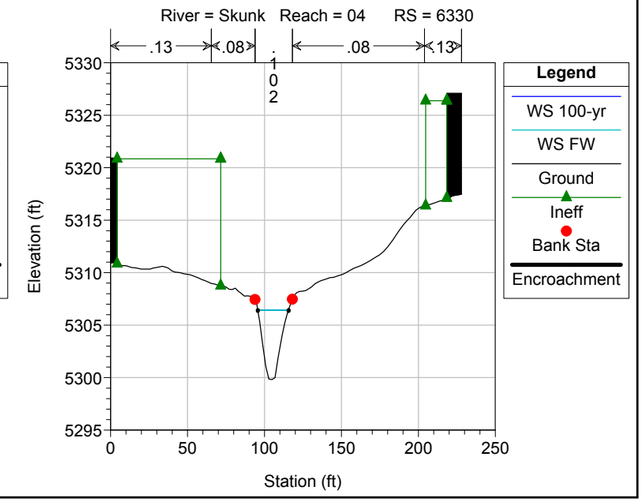
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6423



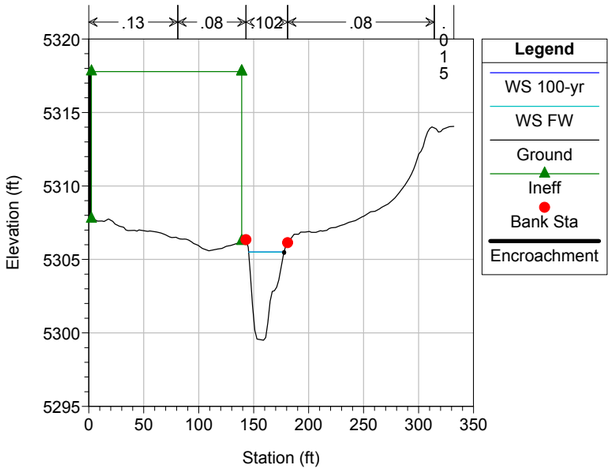
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6330



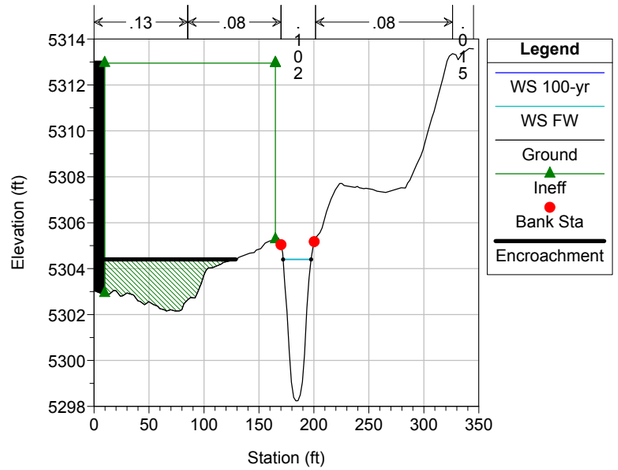
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6254



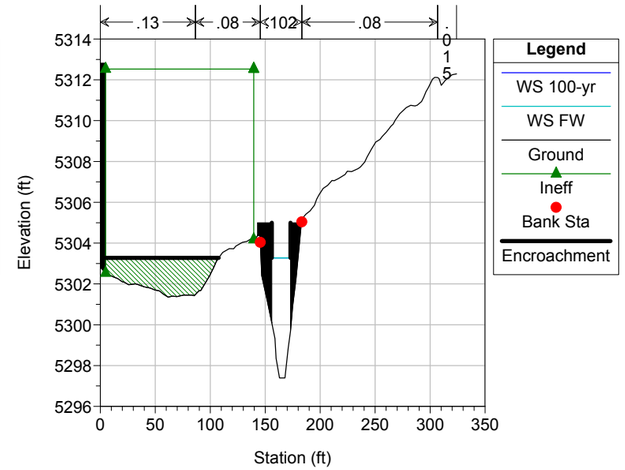
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6158



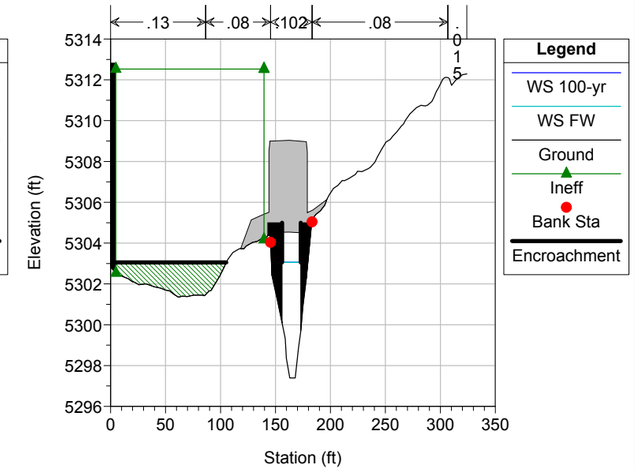
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6087 Arrowwood Park Ped Bridge (U/S)



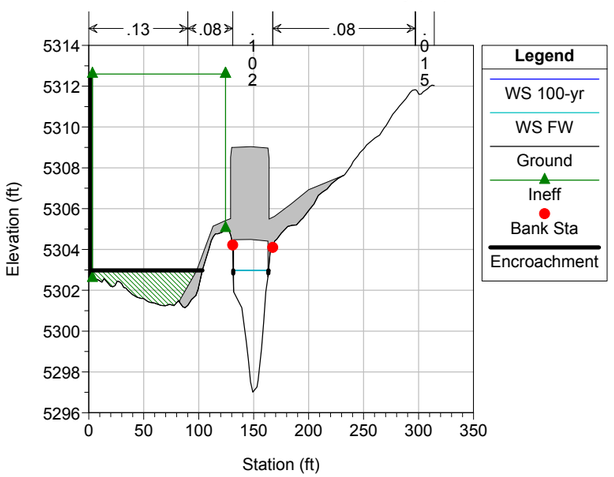
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6070 BR Arrowwood Park Ped. Bridge. (30% potential debris block)



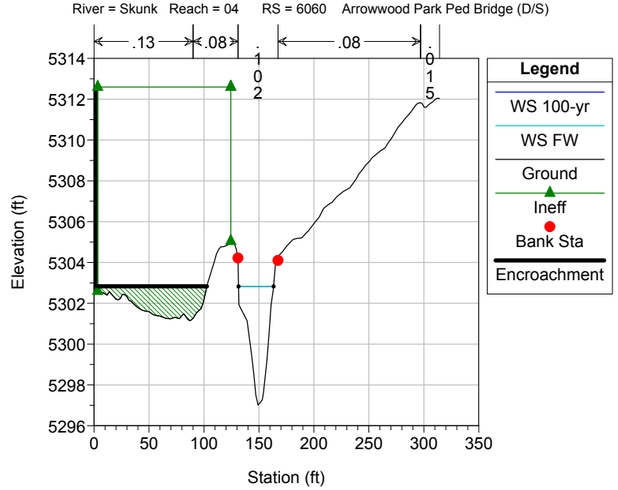
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6070 BR Arrowwood Park Ped. Bridge. (30% potential debris block)



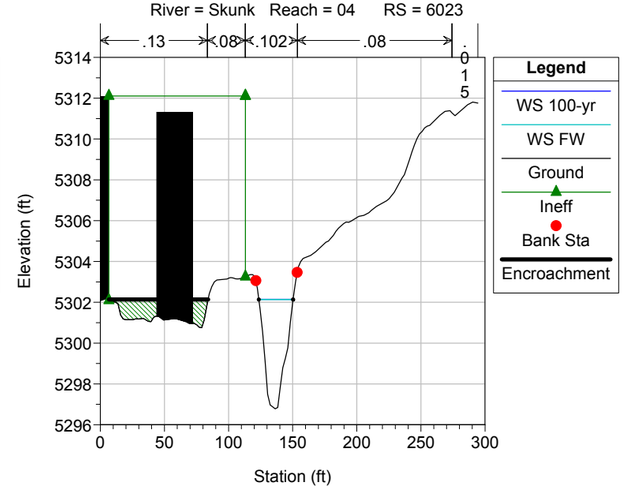
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6060 Arrowwood Park Ped Bridge (D/S)



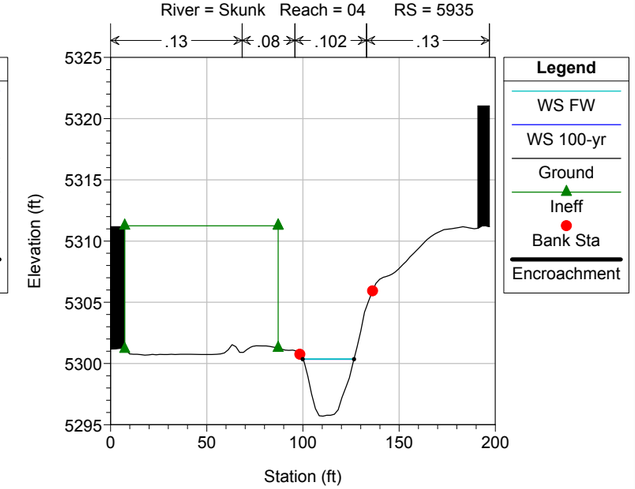
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 6023



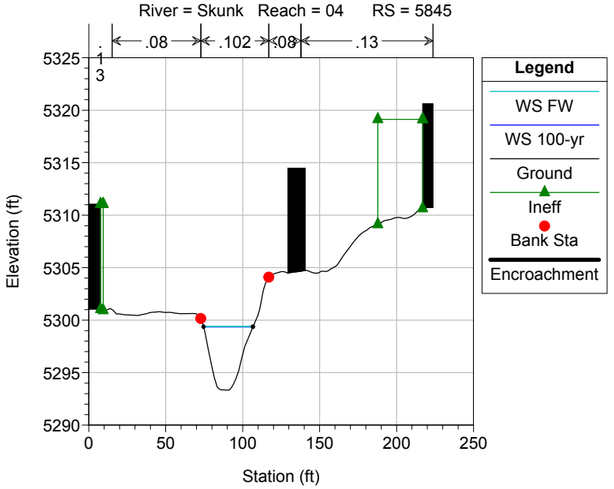
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 5935



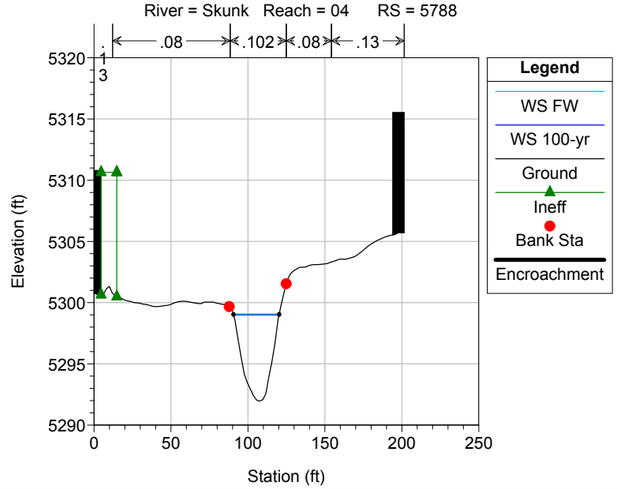
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 5845



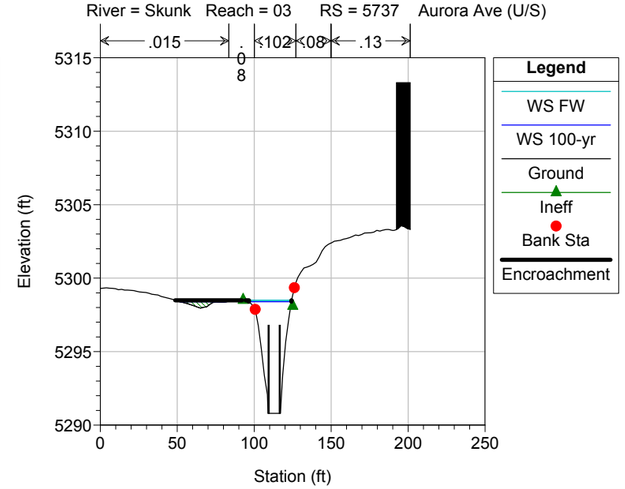
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 04 RS = 5788



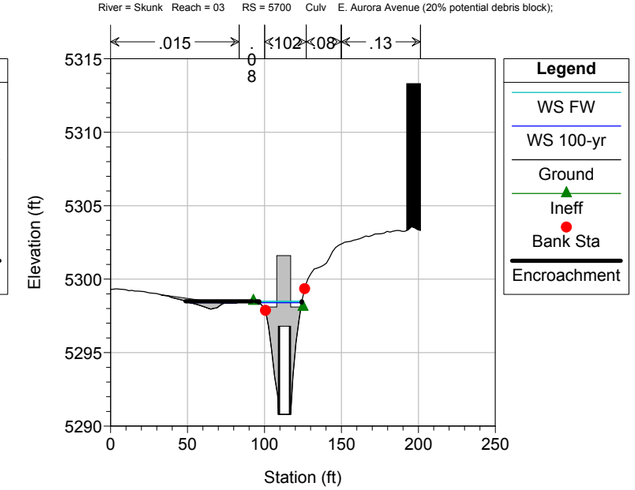
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

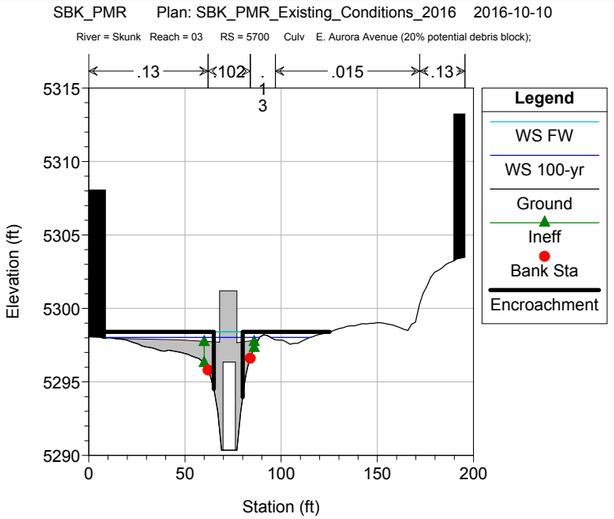
River = Skunk Reach = 03 RS = 5737 Aurora Ave (U/S)

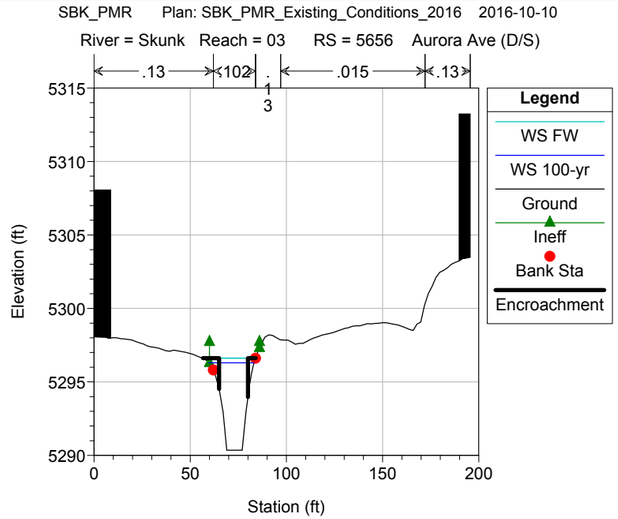


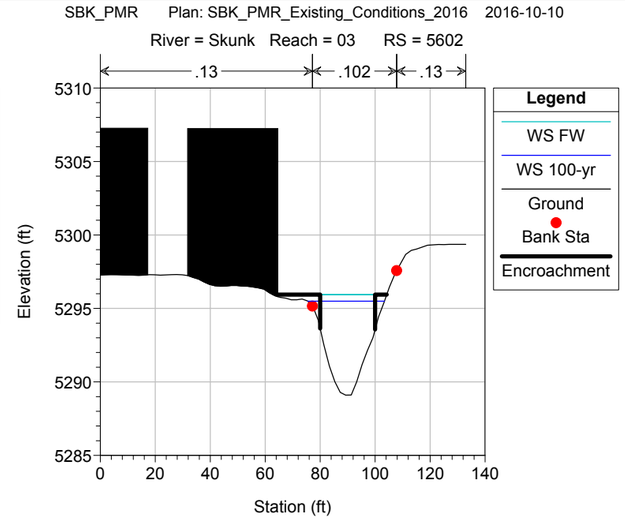
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

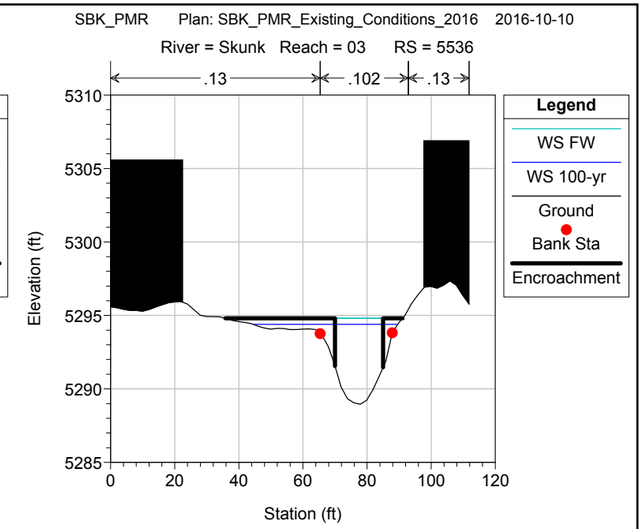
River = Skunk Reach = 03 RS = 5700 Culv E. Aurora Avenue (20% potential debris block);

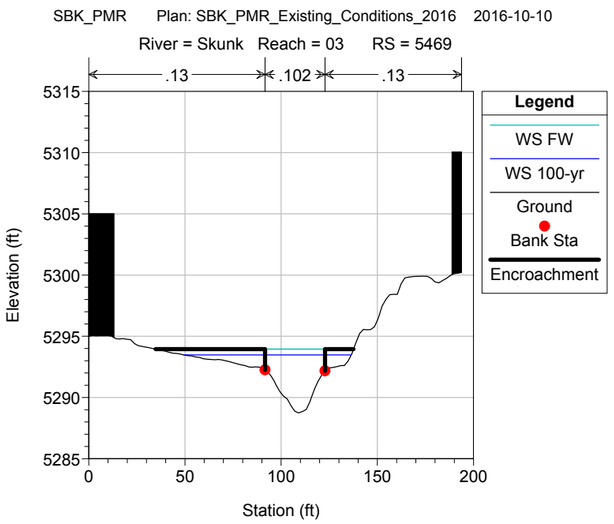


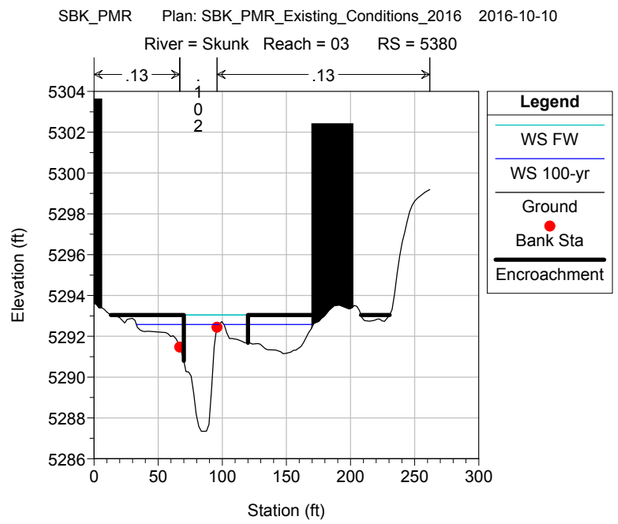

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5700 Culv E. Aurora Avenue (20% potential debris block);
.13
.102
.015
.13
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

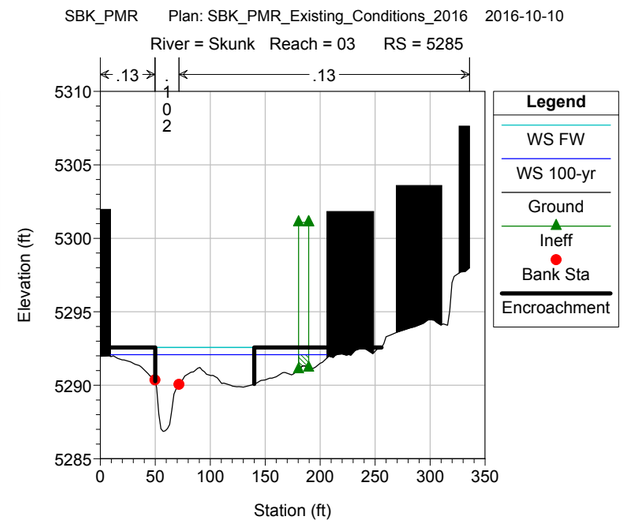

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5656 Aurora Ave (D/S)
.13
.102
.015
.13
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

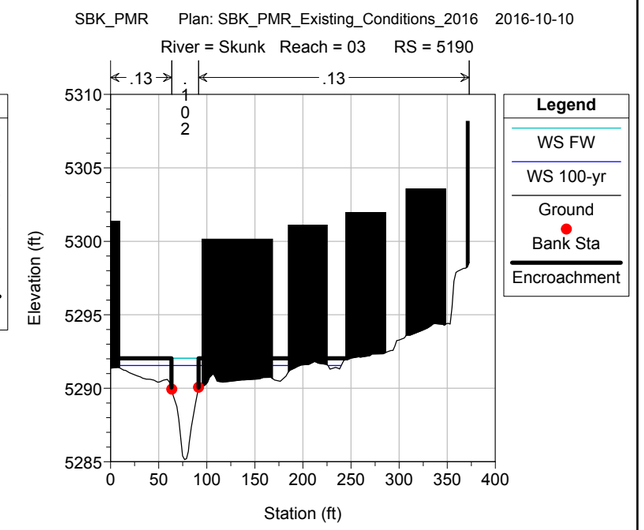

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5602
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

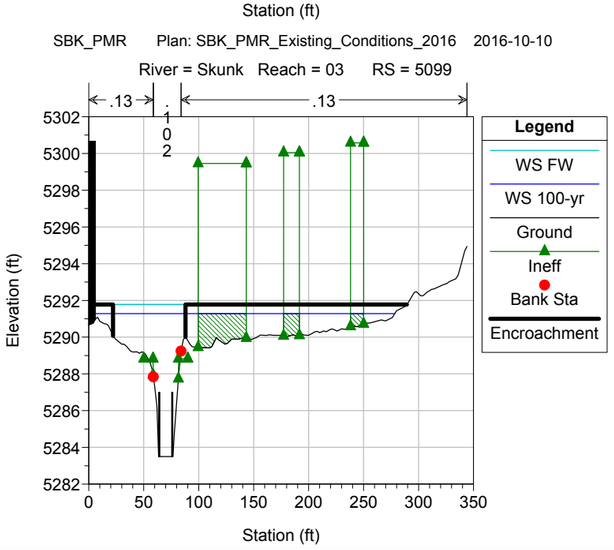

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5536
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

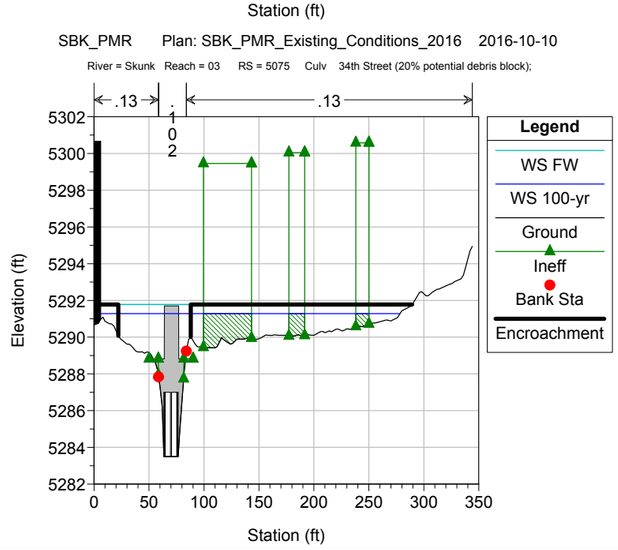

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5469
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

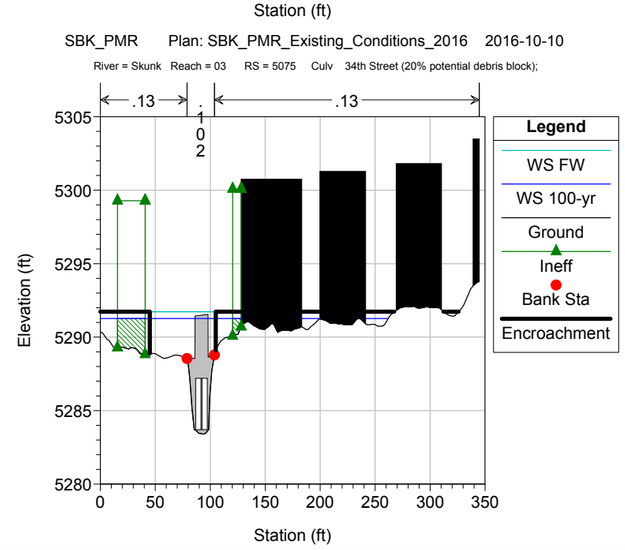

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5380
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

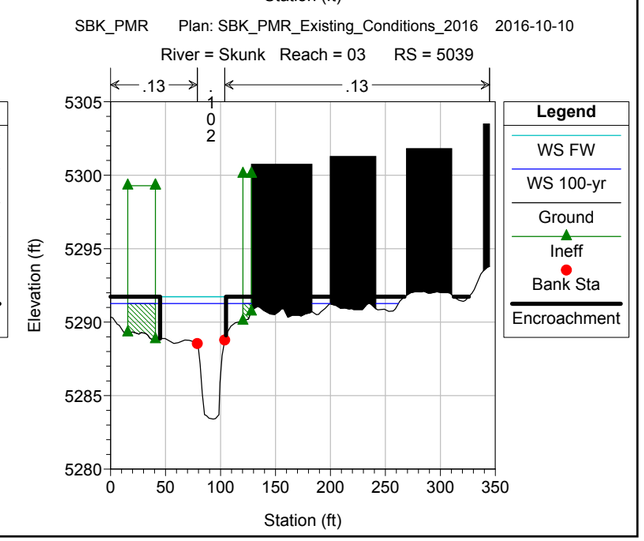

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5285
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5190
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5099
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

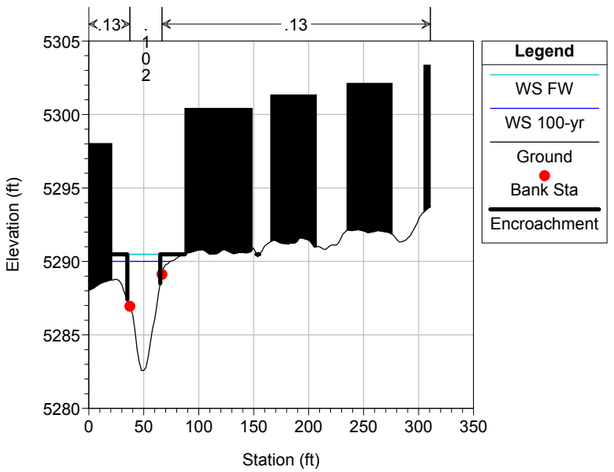

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5075 Culv 34th Street (20% potential debris block);
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5075 Culv 34th Street (20% potential debris block);
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 03 RS = 5039
.13
.102
.13
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

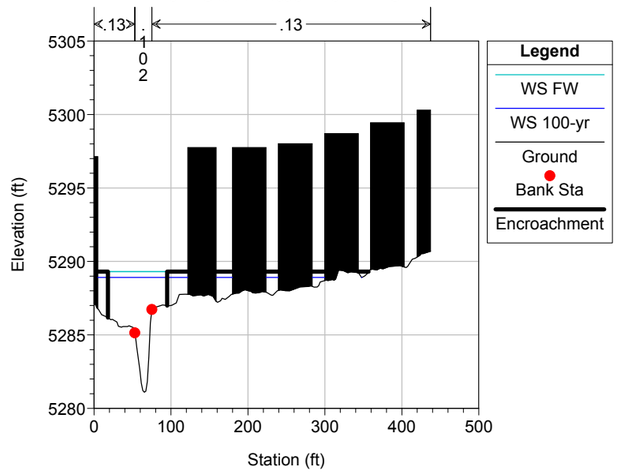
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4999



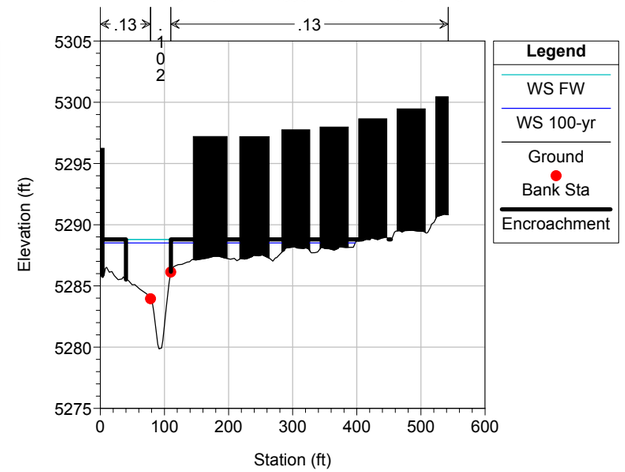
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4911



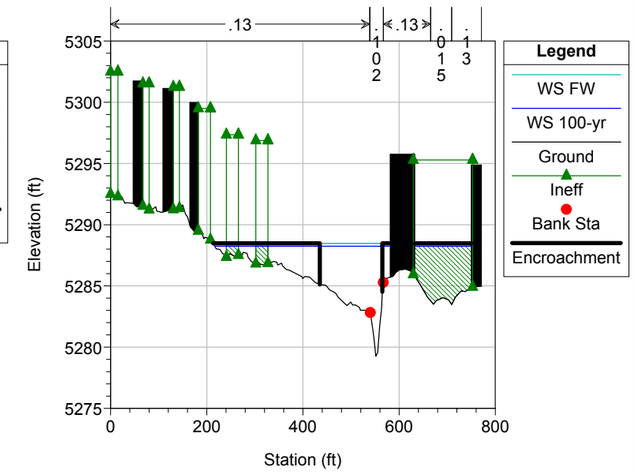
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4848



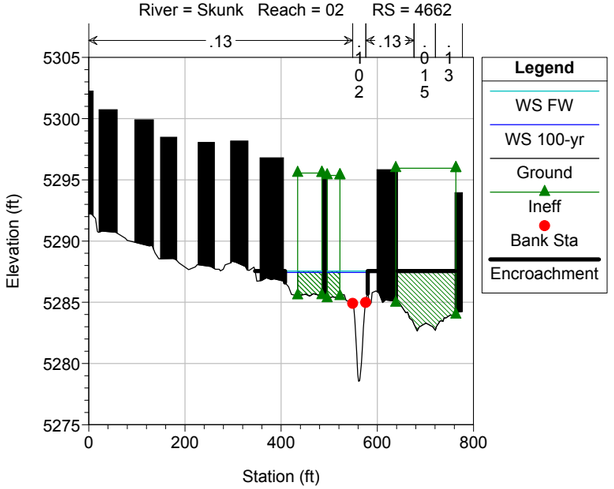
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4748



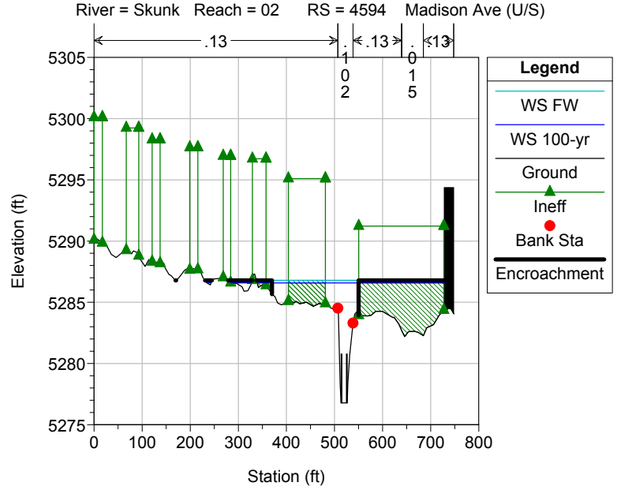
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4662



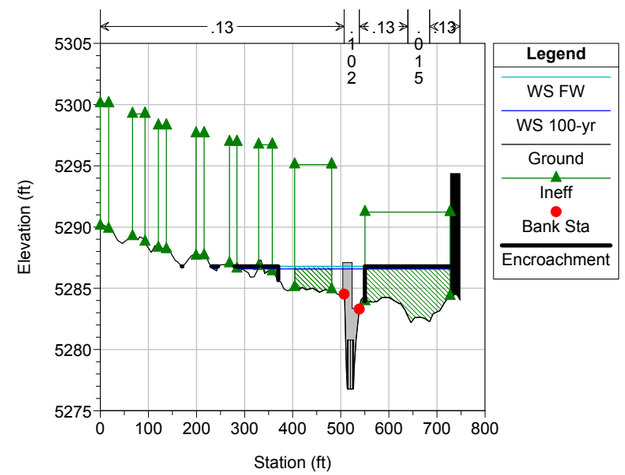
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4594 Madison Ave (U/S)



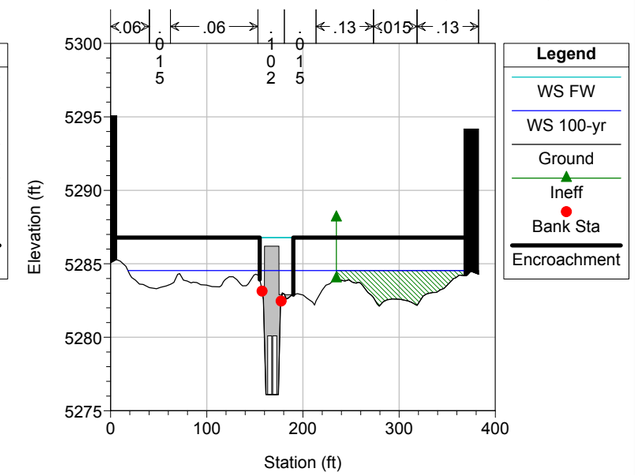
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4550 Culv Madison Ave (30% potential debris block)'



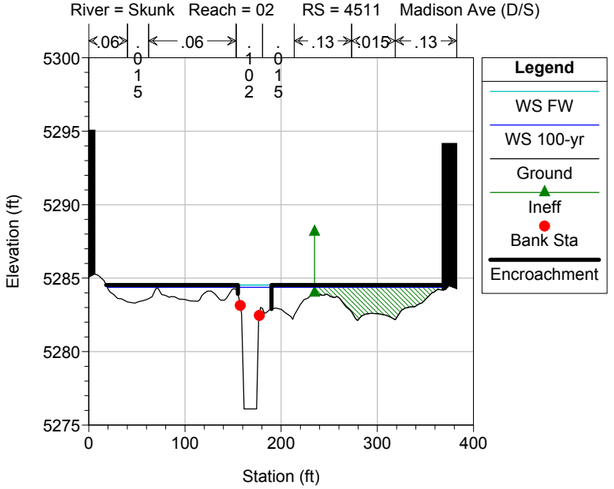
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4550 Culv Madison Ave (30% potential debris block)'



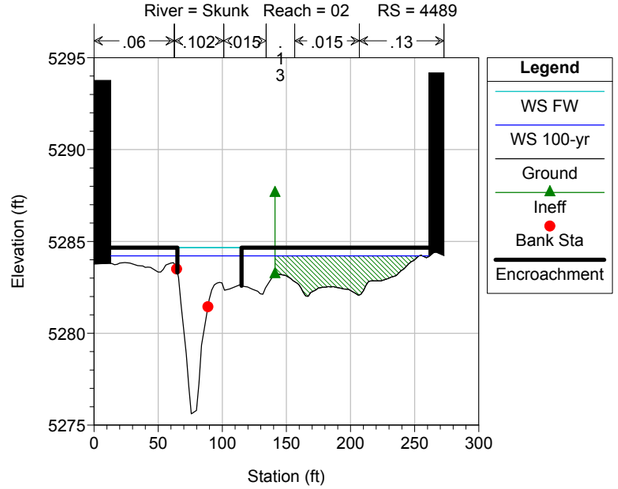
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4511 Madison Ave (D/S)



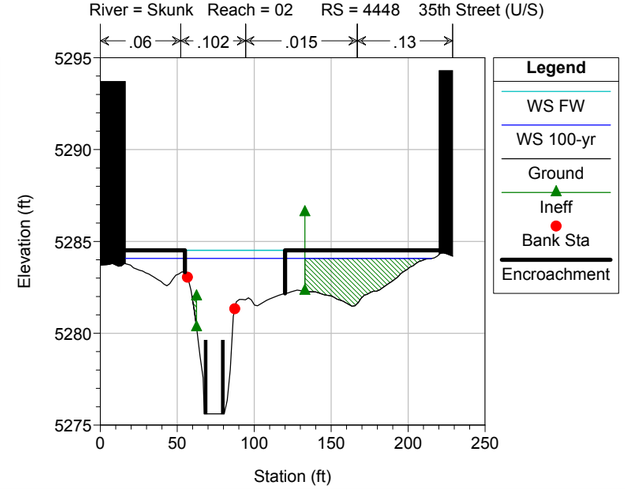
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4489



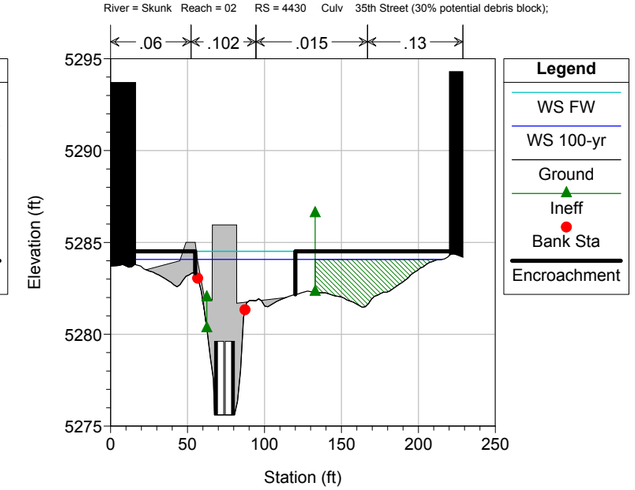
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4448 35th Street (U/S)



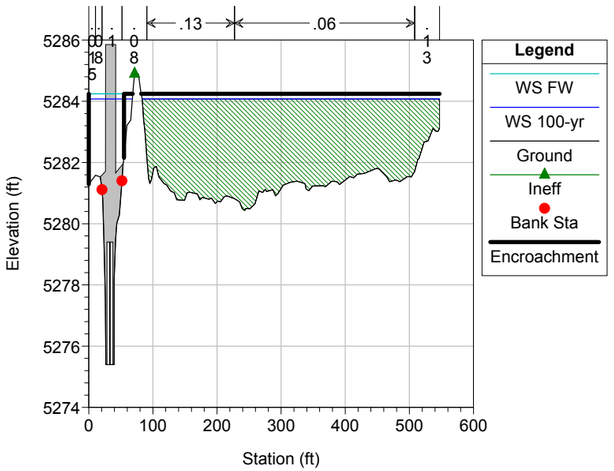
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4430 Culv 35th Street (30% potential debris block);



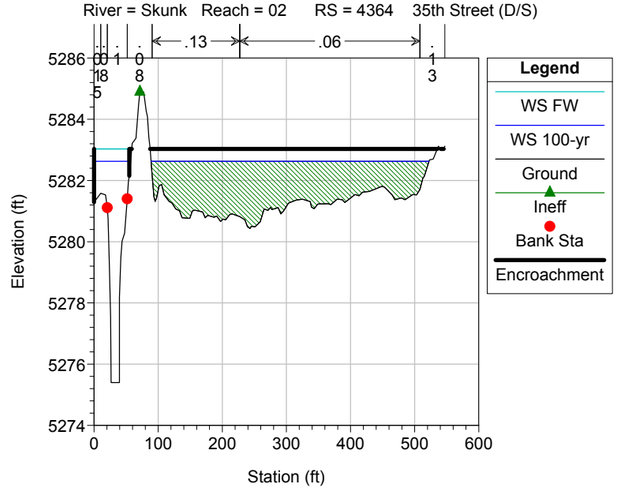
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4430 Culv 35th Street (30% potential debris block);



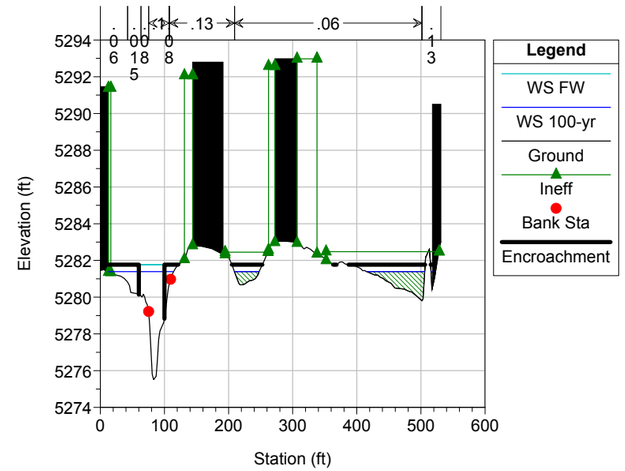
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4364 35th Street (D/S)



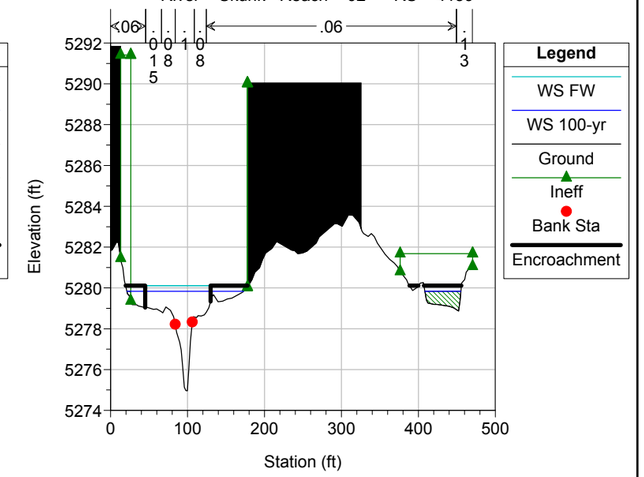
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4252



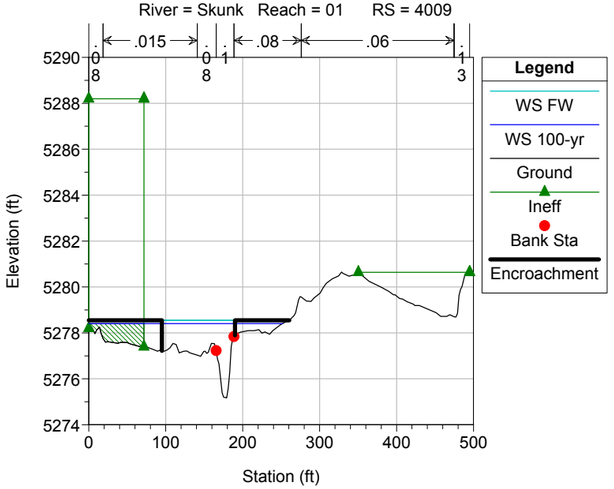
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 02 RS = 4139



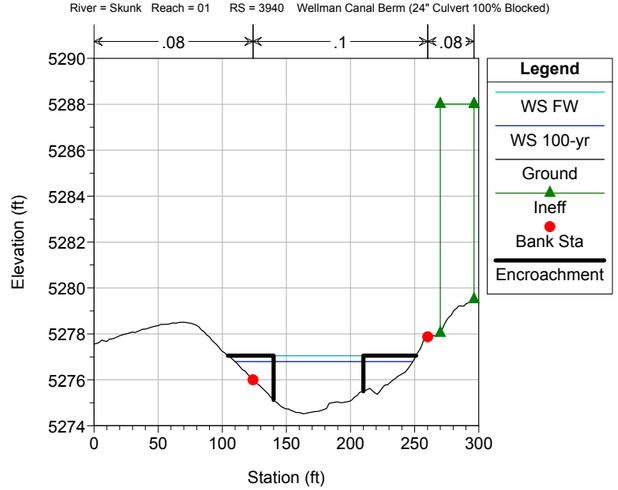
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 4009



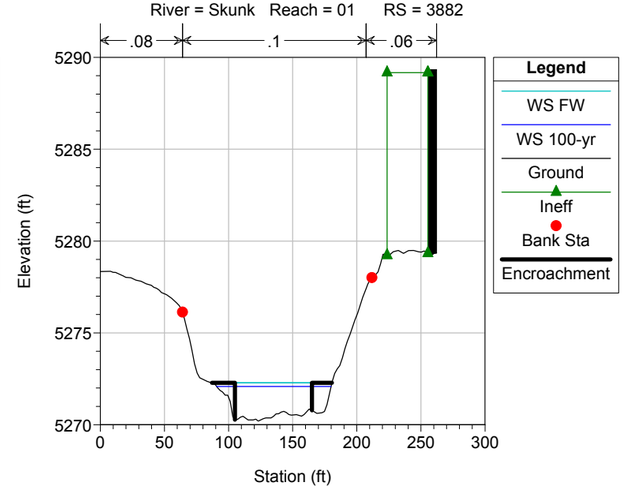
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 3940 Wellman Canal Berm (24" Culvert 100% Blocked)



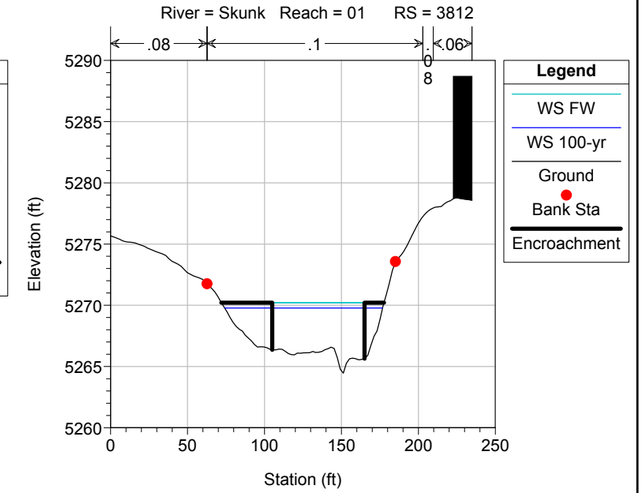
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 3882



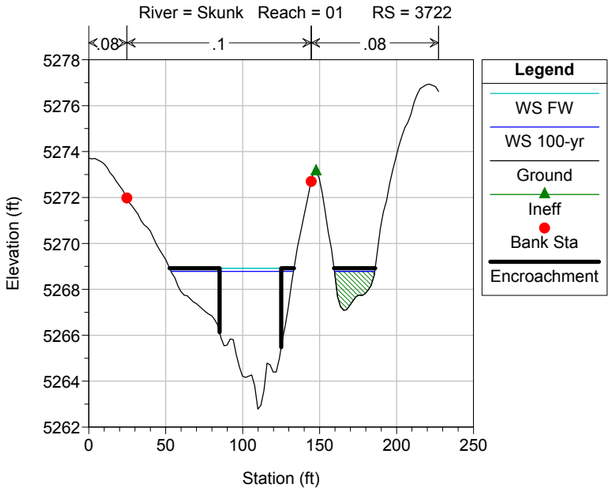
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 3812



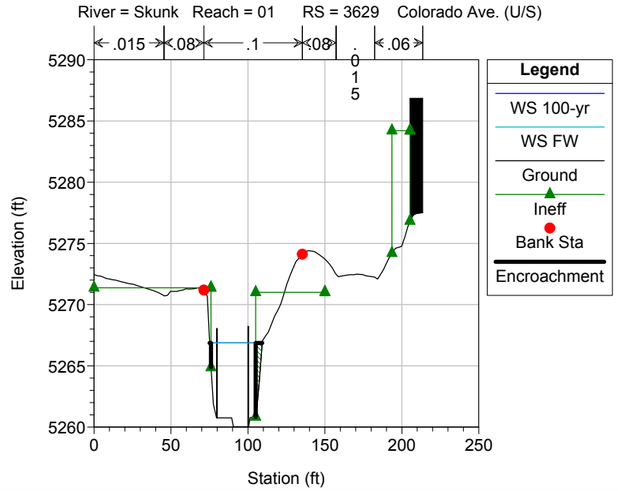
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 3722



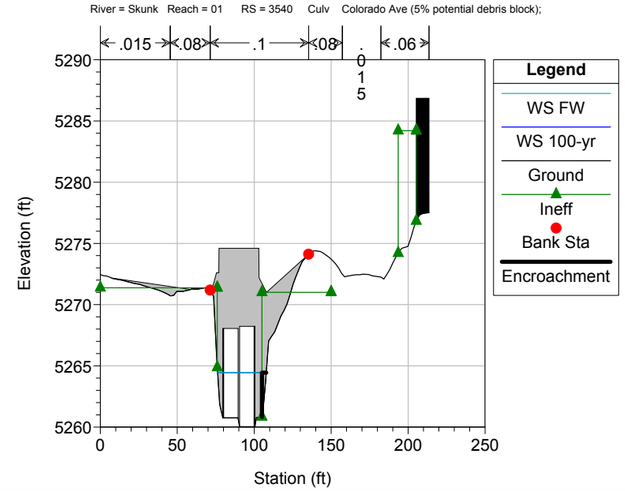
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 3629 Colorado Ave. (U/S)



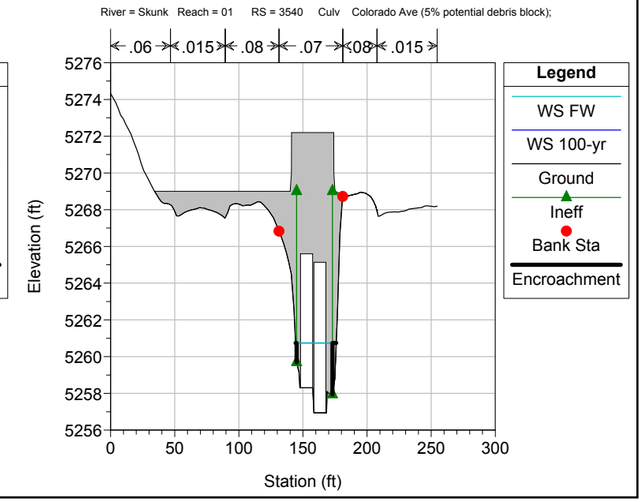
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

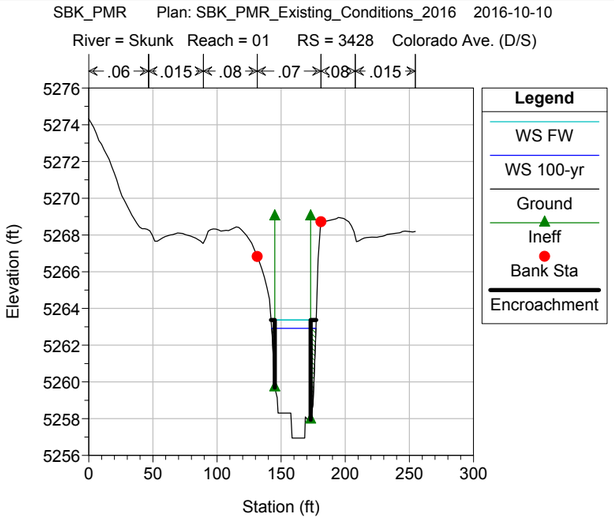
River = Skunk Reach = 01 RS = 3540 Culv Colorado Ave (5% potential debris block);

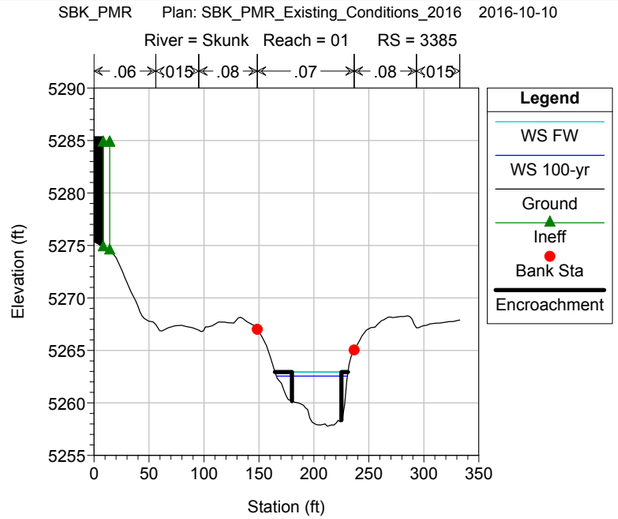


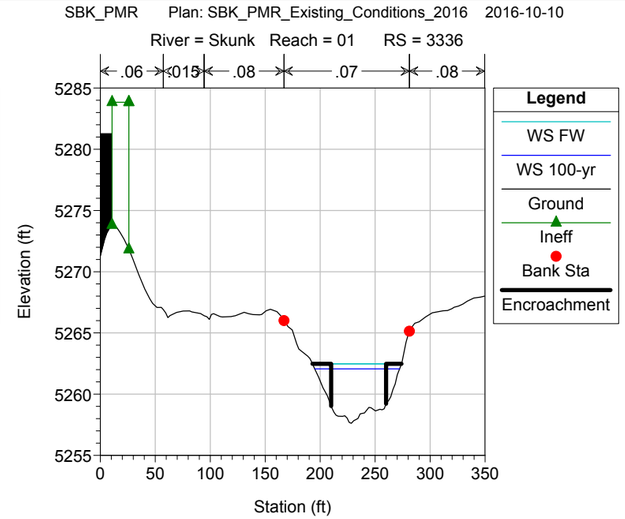
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

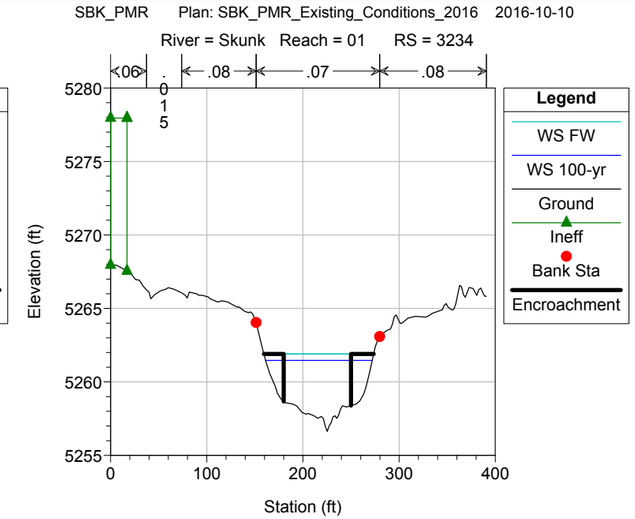
River = Skunk Reach = 01 RS = 3540 Culv Colorado Ave (5% potential debris block);

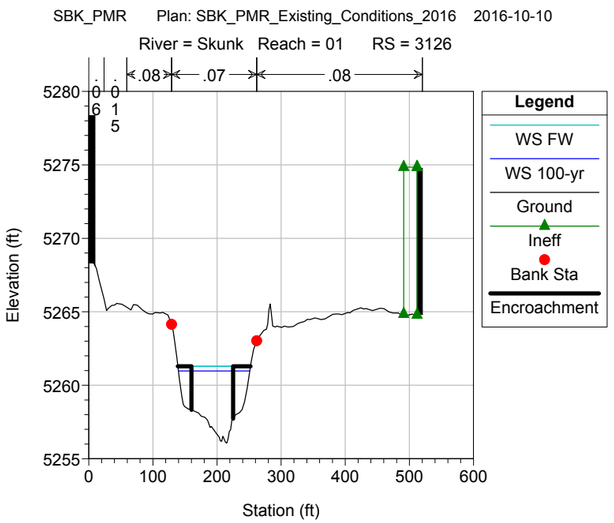


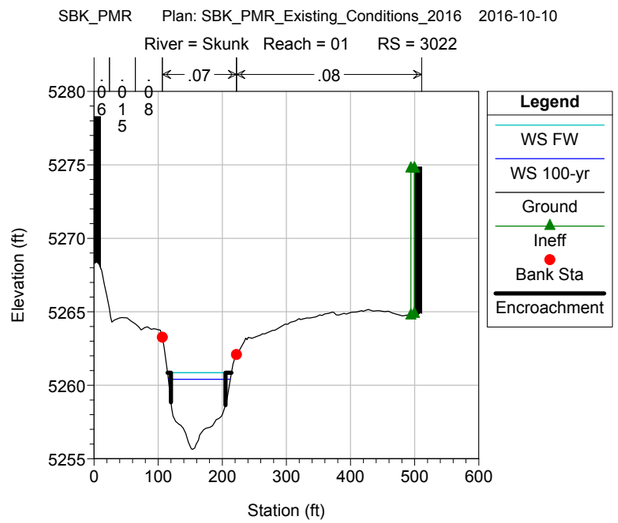

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 3428 Colorado Ave. (D/S)
.06 .015 .08 .07 .08 .015
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

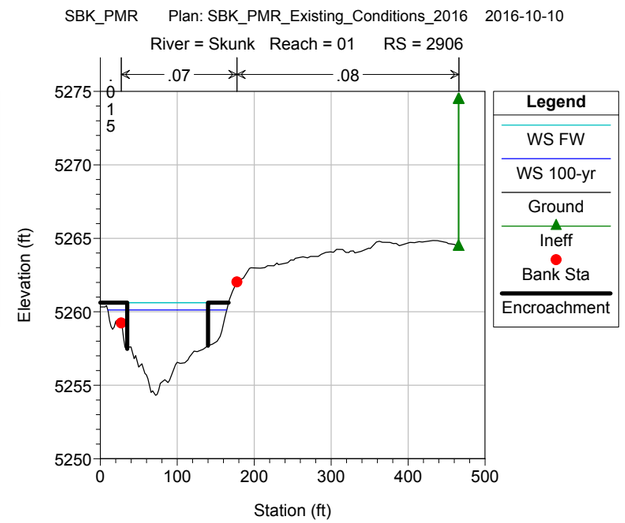

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 3385
.06 .015 .08 .07 .08 .015
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

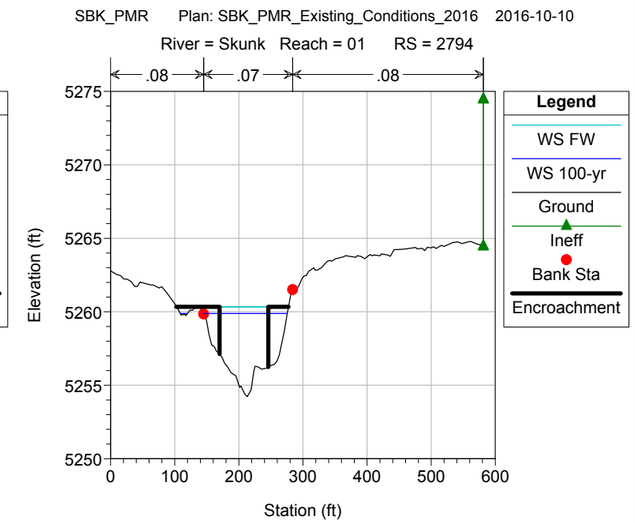

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 3336
.06 .015 .08 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

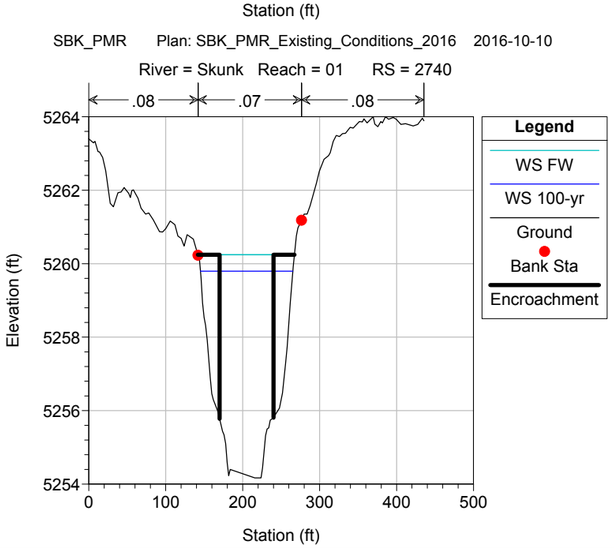

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 3234
.06 .015 .08 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

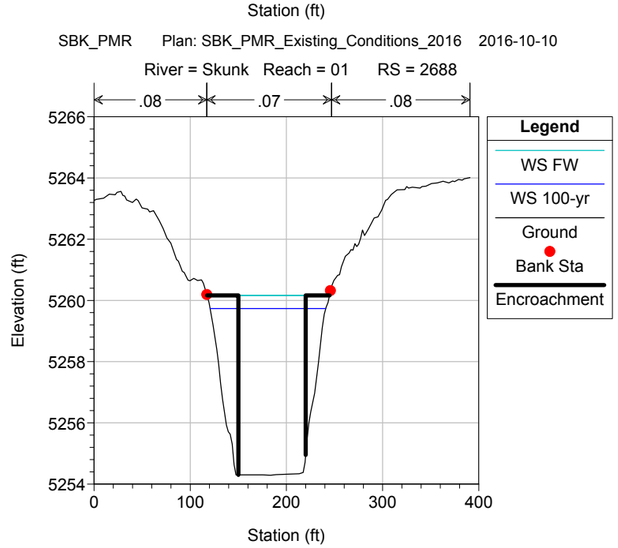

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 3126
.06 .015 .08 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

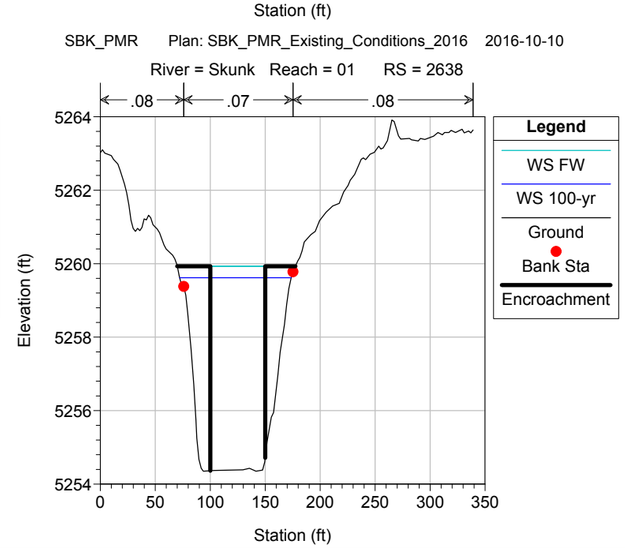

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 3022
.06 .015 .08 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment

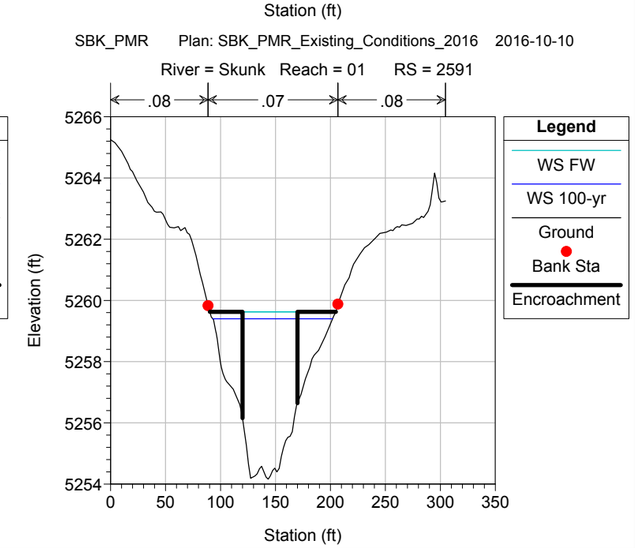

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 2906
.015 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 2794
.08 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 2740
.08 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

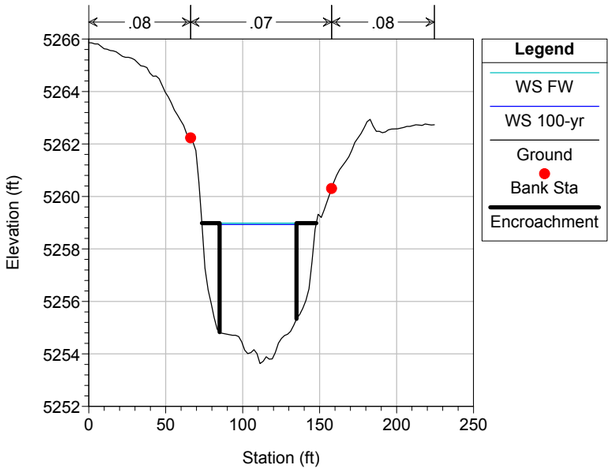

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 2688
.08 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 2638
.08 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 2591
.08 .07 .08
Elevation (ft)
Station (ft)
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment

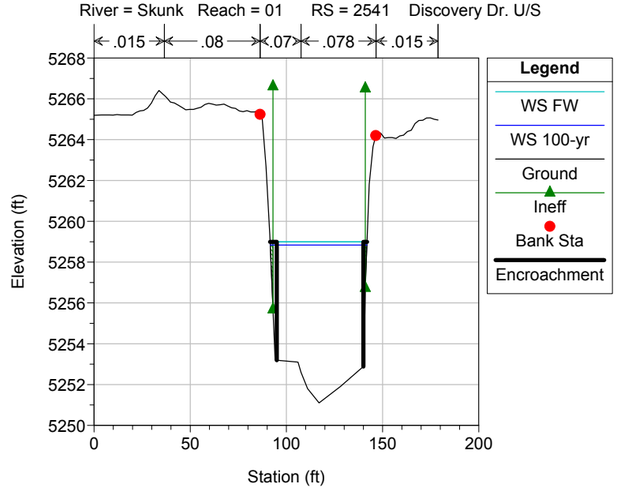
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2560



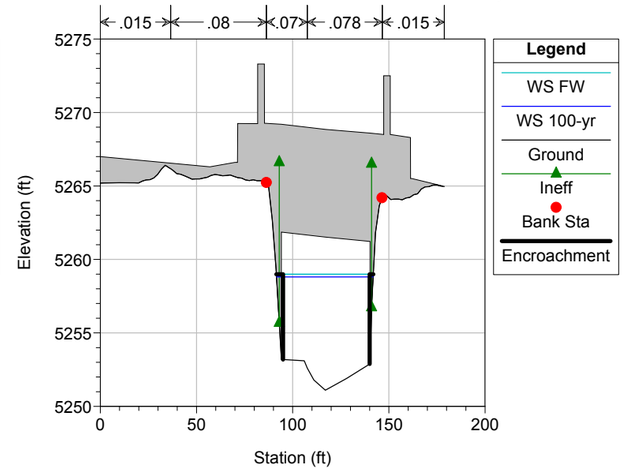
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2541 Discovery Dr. U/S



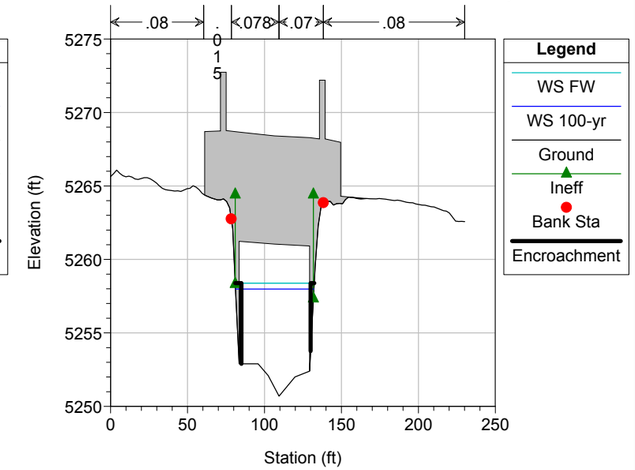
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2490 BR Discovery Drive



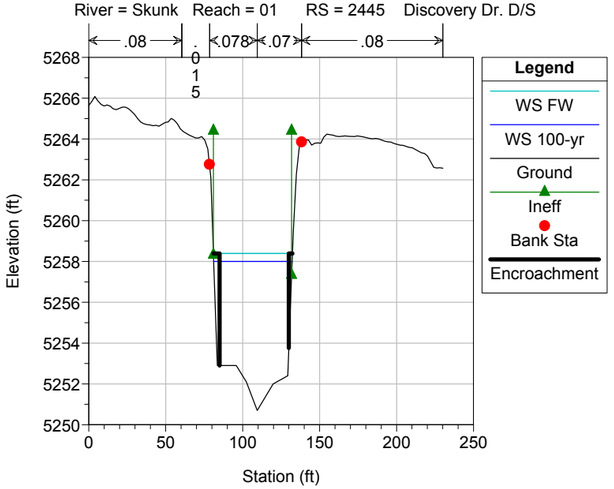
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2490 BR Discovery Drive



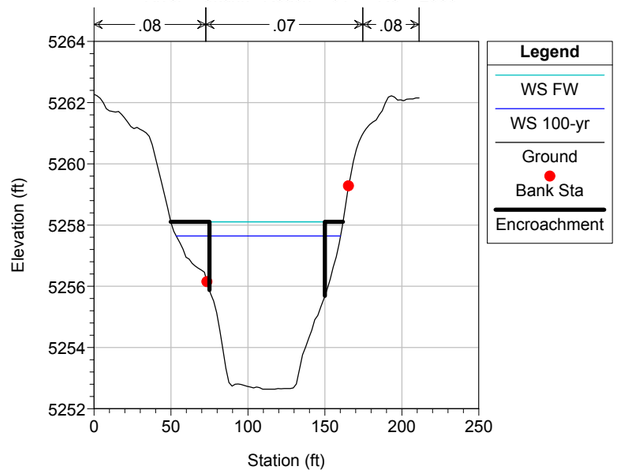
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2445 Discovery Dr. D/S



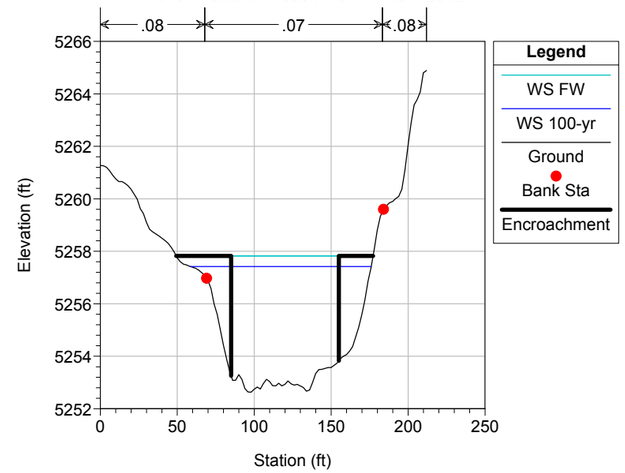
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2388



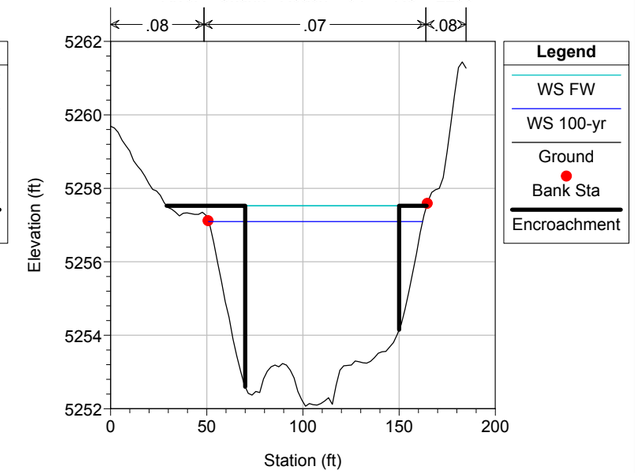
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2342



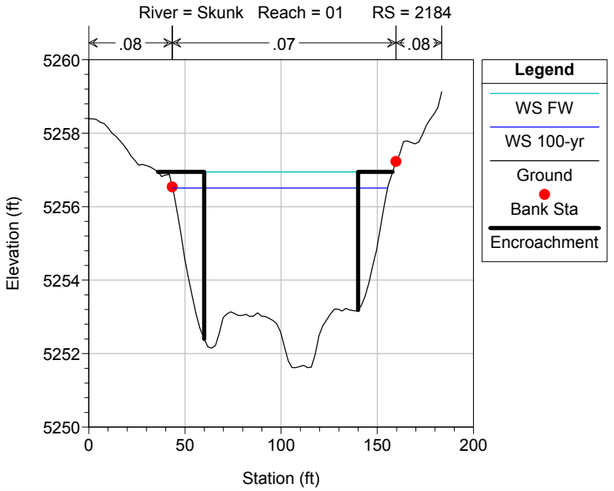
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2280



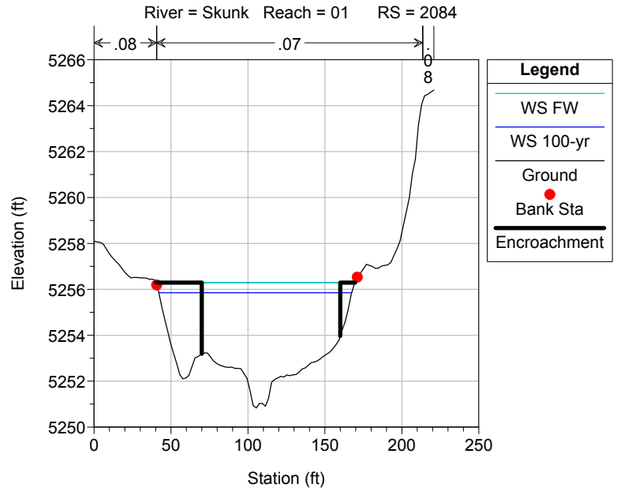
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2184



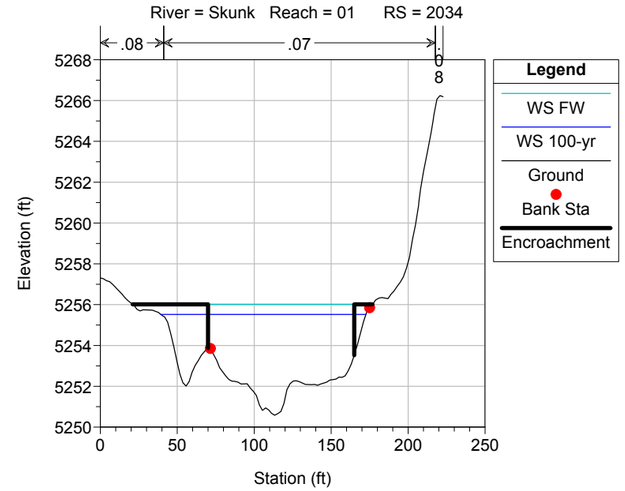
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 2084



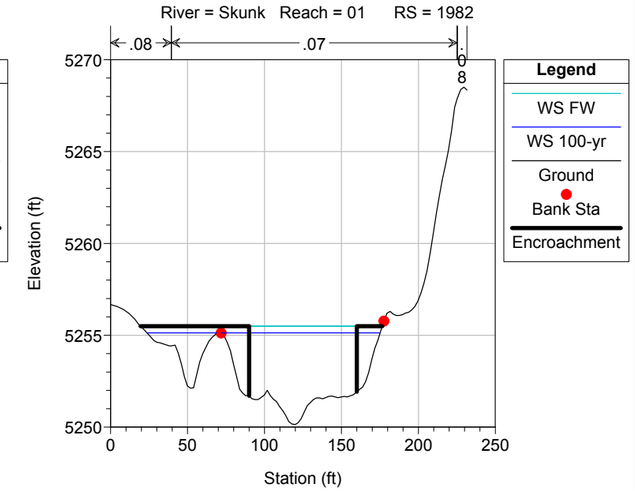
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

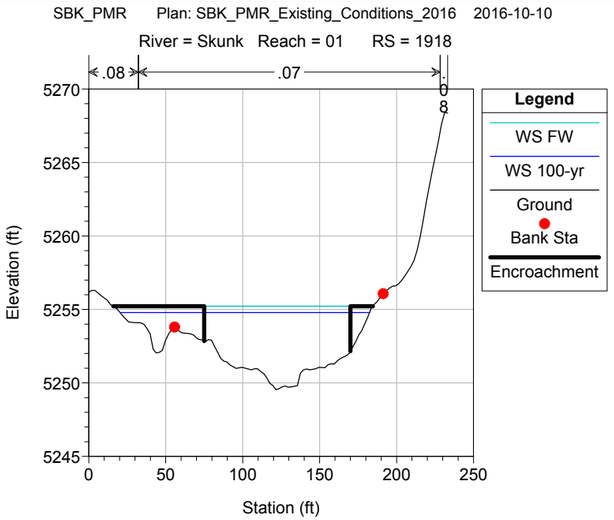
River = Skunk Reach = 01 RS = 2034



SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 1982

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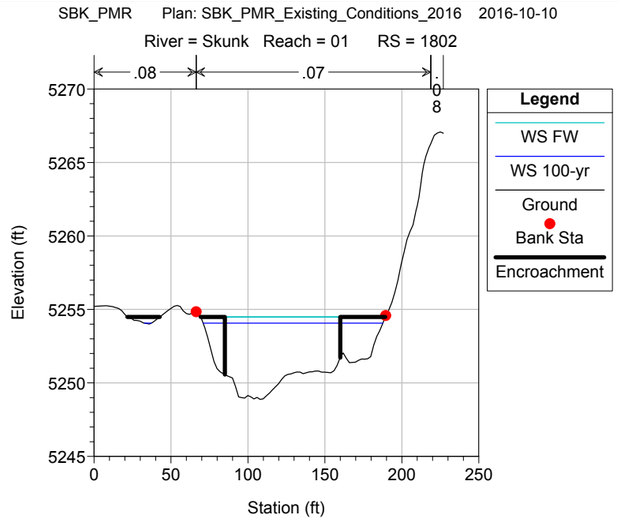
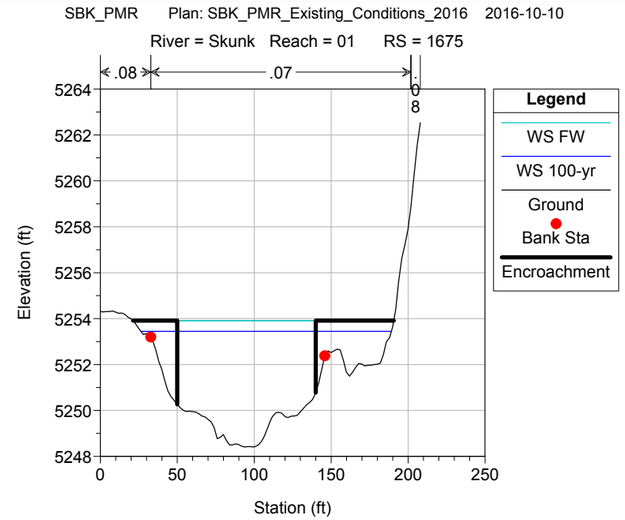
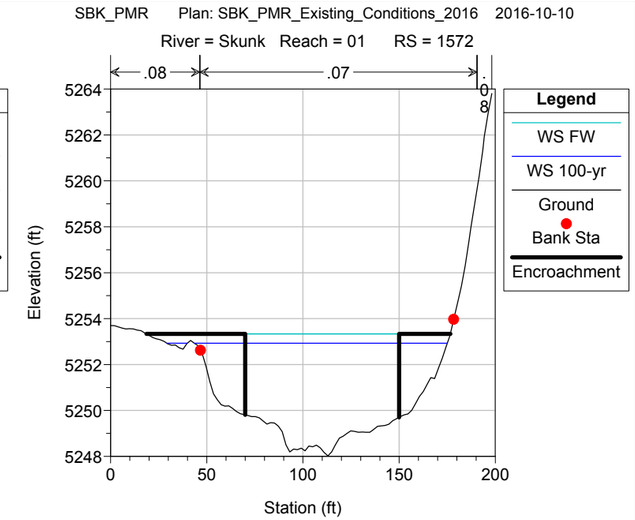
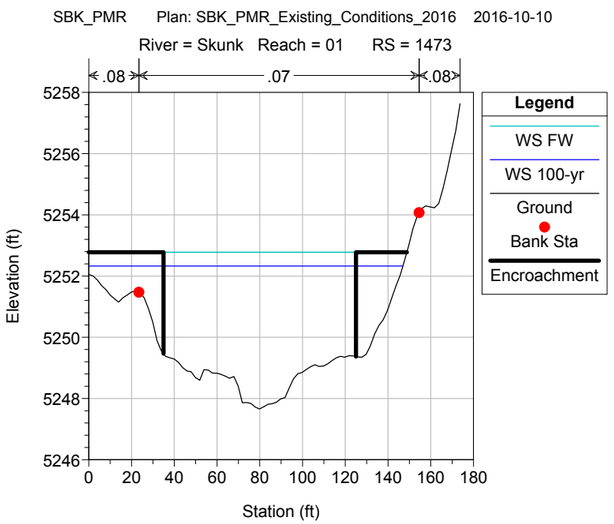
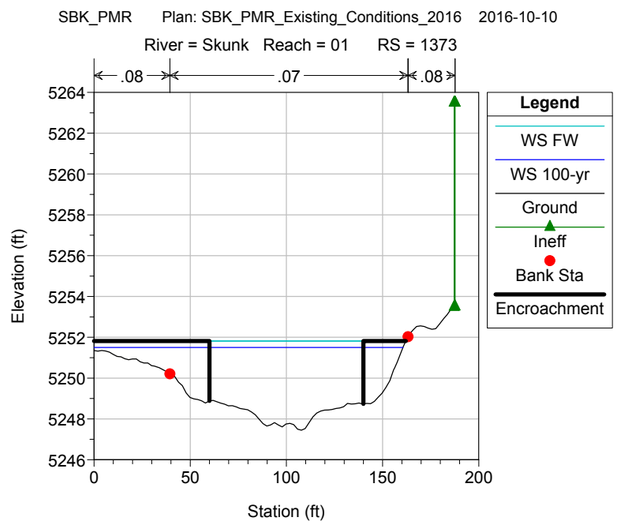
River = Skunk Reach = 01 RS = 1918
.08
.07
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

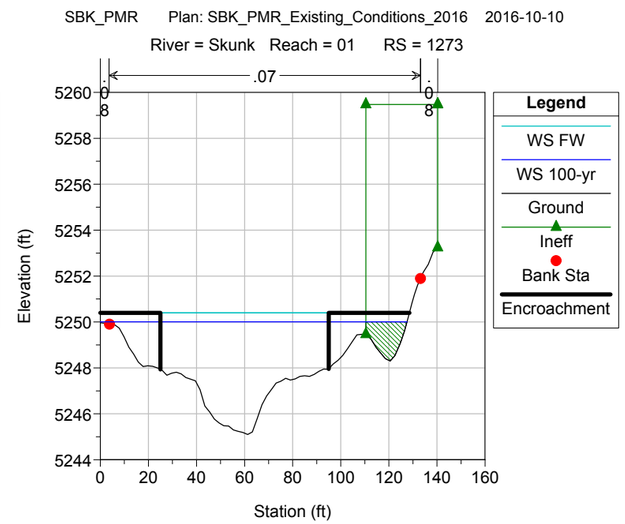

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 1802
.08
.07
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

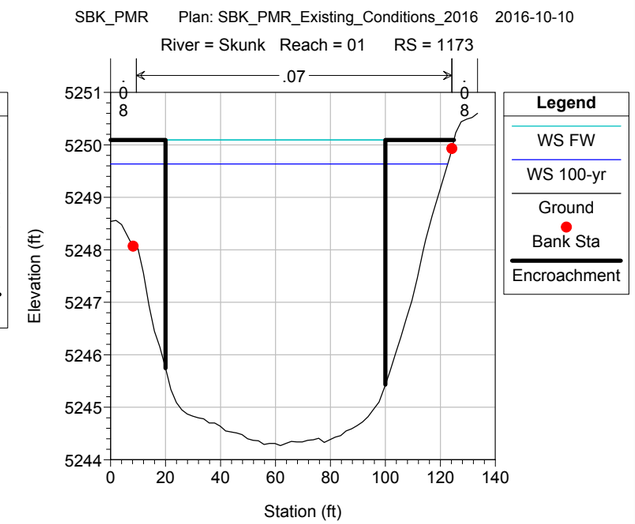

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 1675
.08
.07
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

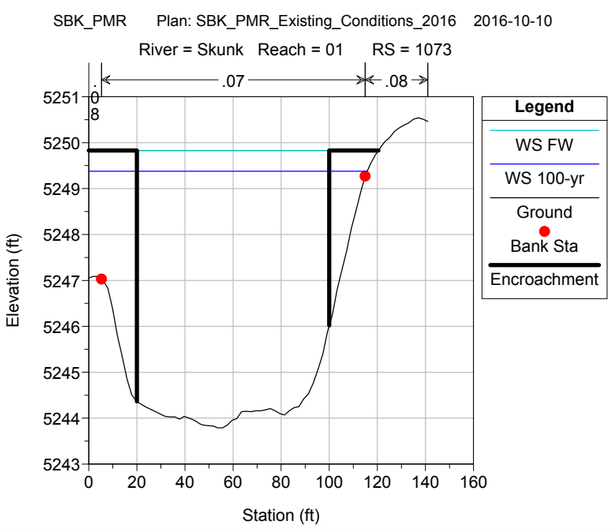

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 1572
.08
.07
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

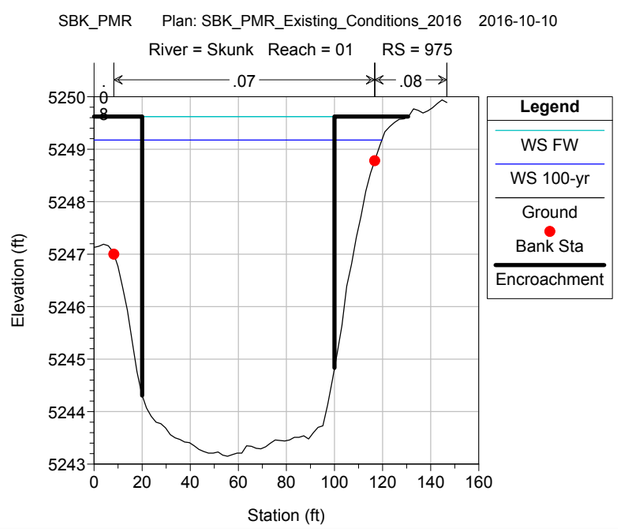

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 1473
.08
.07
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

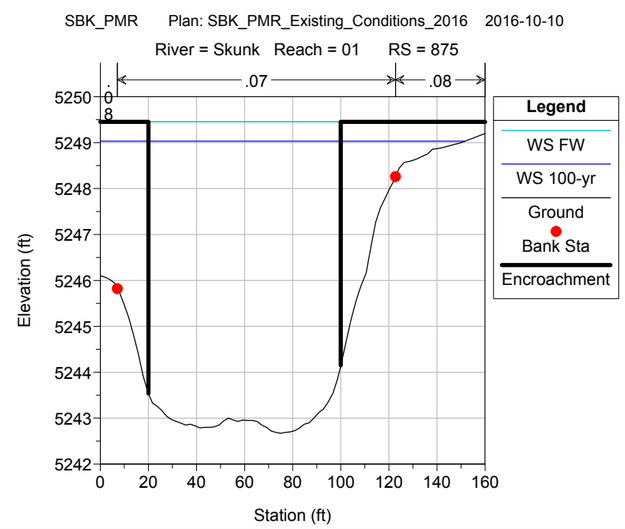

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 1373
.08
.07
.08
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

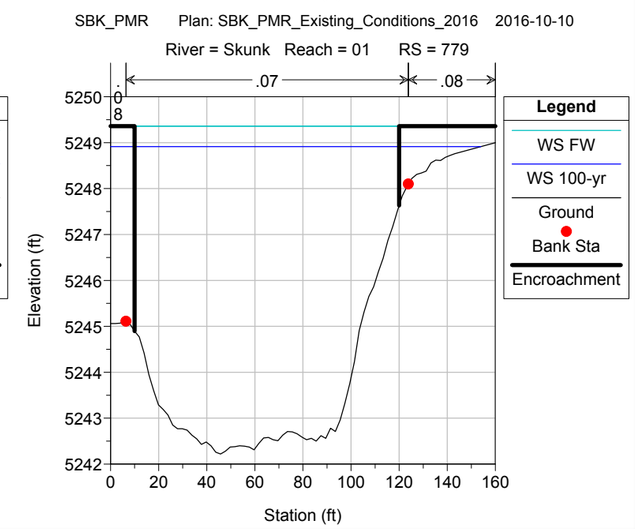

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 1273
.07
.08
.08
Legend
WS FW
WS 100-yr
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 1173
.07
.08
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 1073
.07
.08
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

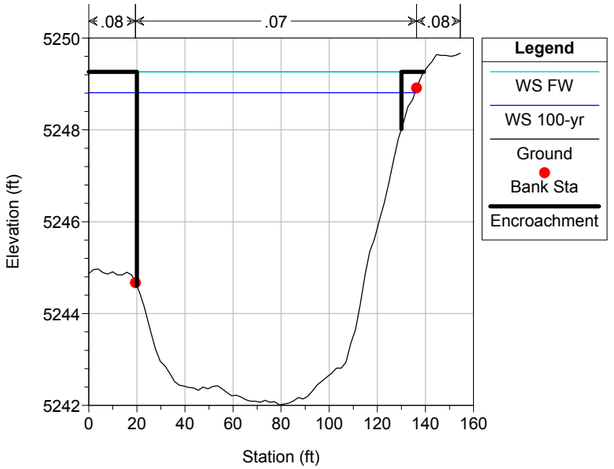

SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 975
.07
.08
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 875
.07
.08
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10
River = Skunk Reach = 01 RS = 779
.07
.08
.08
Legend
WS FW
WS 100-yr
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

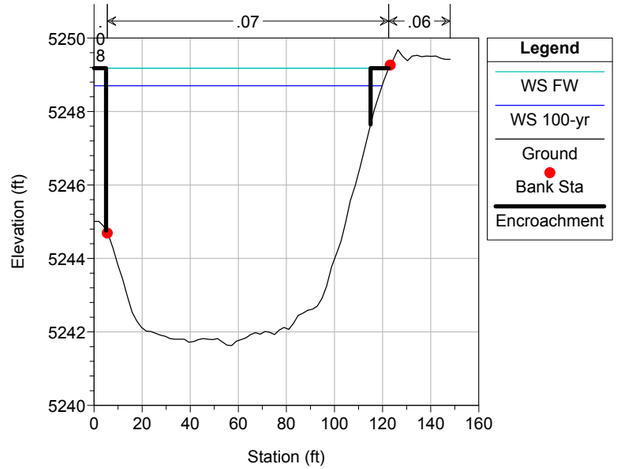
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 680



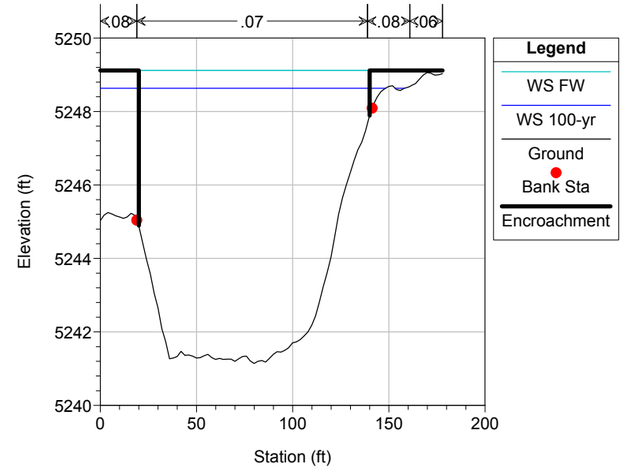
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 579



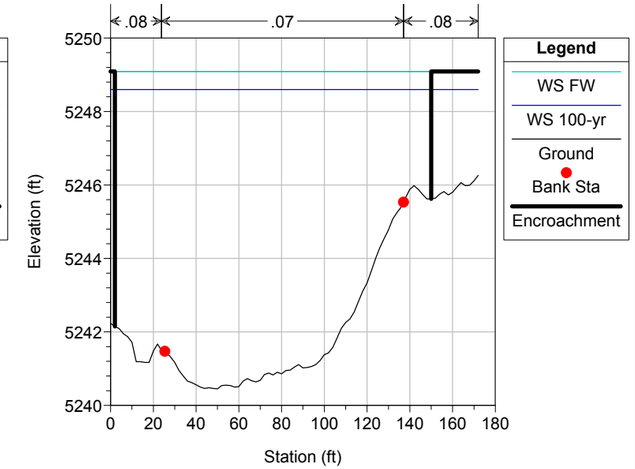
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 480



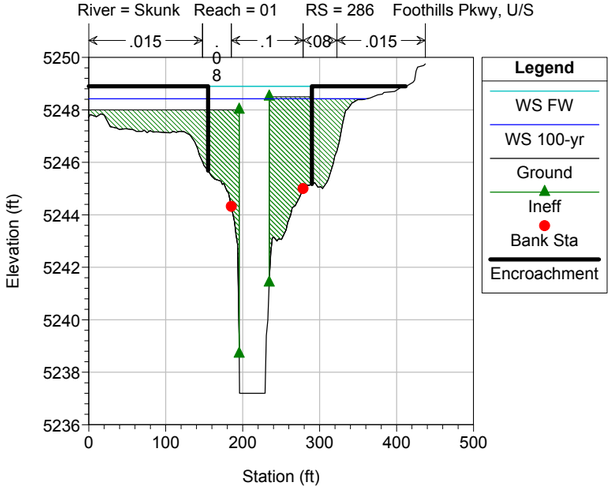
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 378



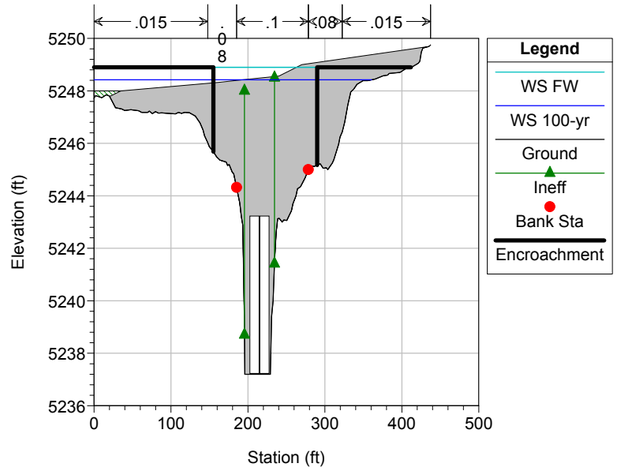
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 286 Foothills Pkwy, U/S



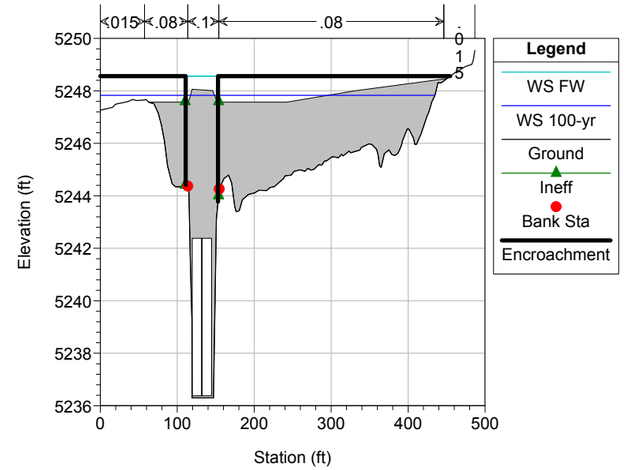
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 210 Culv Foothills Parkway



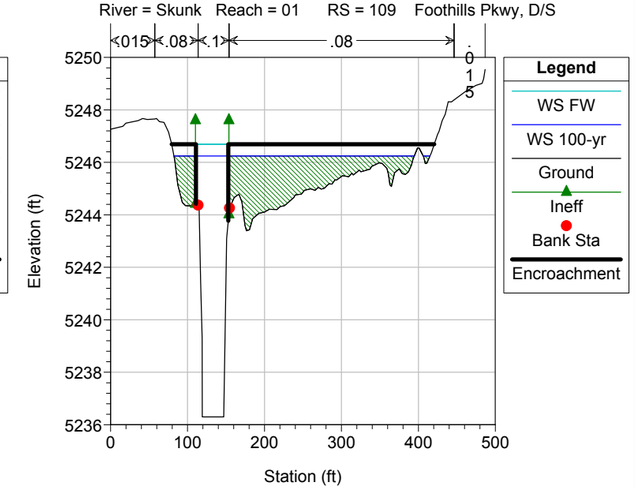
SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 210 Culv Foothills Parkway



SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 109 Foothills Pkwy, D/S



SBK_PMR Plan: SBK_PMR_Existing_Conditions_2016 2016-10-10

River = Skunk Reach = 01 RS = 25

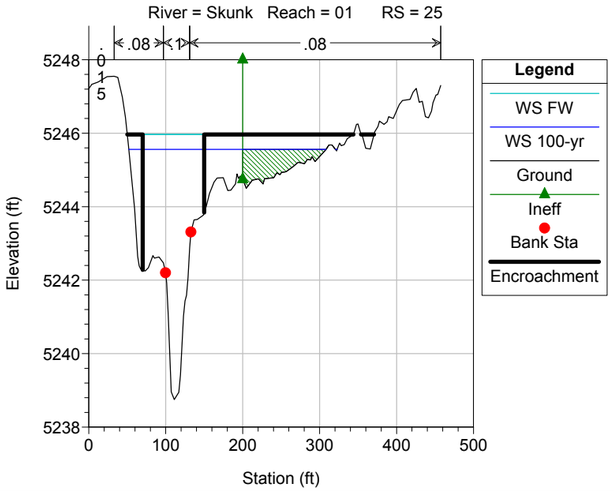


Table E.2: Vertical Extended Sections (100-Year)
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR
ICON Engineering, Inc.

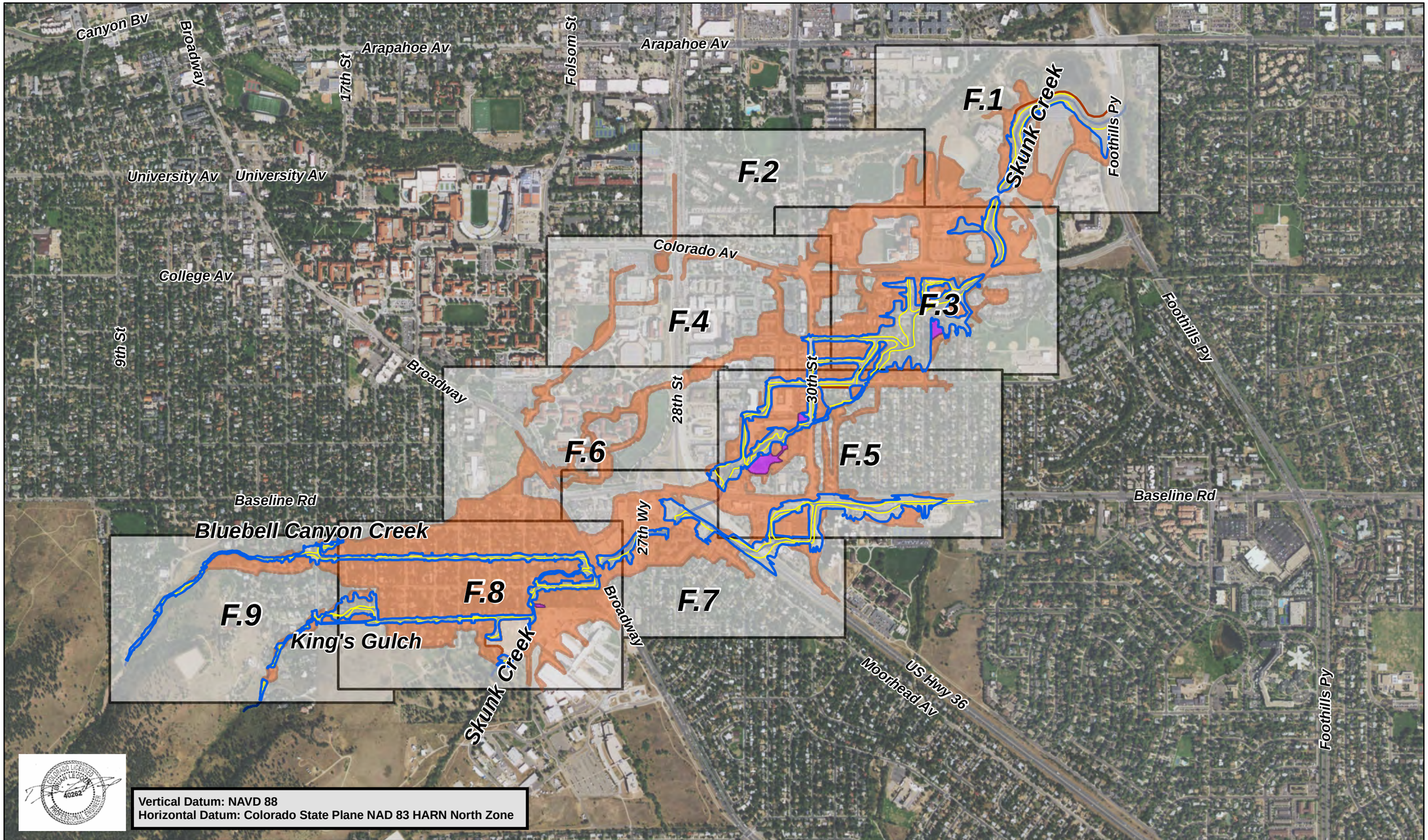
Flooding Source	HEC-RAS Reach	HEC-RAS Cross Section	Water Surface Elevation (NAVD88)	Left Overbank Elevation	Right Overbank Elevation	Extended Depth Left Overbank	Extended Depth Right Overbank	Zone Designation	Comments
Skunk Creek									
	1	286	5248.42	5247.82		0.6	--	AE	Merges with existing Boulder Creek Floodplain
	1	378	5248.60	5242.23	5246.26	6.37	2.34	AE	Merges with existing Boulder Creek Floodplain
	1	480	5248.63	5245.25		3.38	--	AE	Merges with existing Boulder Creek Floodplain
	1	579	5248.70	5245.01		3.69	--	AE	Merges with existing Boulder Creek Floodplain
	1	680	5248.81	5244.97		3.84	--	AE	Merges with existing Boulder Creek Floodplain
	1	779	5248.92	5245.12		3.8	--	AE	Merges with existing Boulder Creek Floodplain
	1	875	5249.03	5246.1		2.93	--	AE	Merges with existing Boulder Creek Floodplain
	1	975	5249.18	5247.19		1.99	--	AE	Merges with existing Boulder Creek Floodplain
	1	1073	5249.38	5247.09		2.29	--	AE	Merges with existing Boulder Creek Floodplain
	1	1173	5249.64	5248.56		1.08	--	AE	Merges with existing Boulder Creek Floodplain
	1	1373	5251.50	5251.35		0.15	--	AE	Merges with existing Boulder Creek Floodplain
	1	1473	5252.33	5252.05		0.28	--	AE	Merges with existing Boulder Creek Floodplain
	2	4364	5282.93	5281.58		1.35	--	AE	35th_St_Split divergence area
	2	4448	5284.02	5283.8		0.22	--	AE	35th_St_Split divergence area
	2	4489	5284.33	5283.81		0.52	--	AE	35th_St_Split divergence area
	2	4594	5286.45		5284.53	--	**1.92**	X	Zone X per FLO-2D model
	2	4662	5287.39		5284.25	--	**3.14**	X	Zone X per FLO-2D model
	2	4748	5288.22		5286.36	--	**1.86**	X	Zone X per FLO-2D model
	2	4848	5288.49	5286.52	5287.2	**1.97**	**1.29**	(L) AE / (R) X	(L) AE due to confluence / (R) Zone X per FLO-2D
	2	4911	5288.92	5287.14	5287.78	**1.78**	**1.14**	(L) AE / (R) X	(L) AE due to confluence / (R) Zone X per FLO-2D
	2	4999	5290.12	5288.78		**1.34**	--	AE	AE due to confluence
	3	5039	5291.44	5290.35	5291.05	1.09	0.39	(L) AE / (R) X	(L) AE due to confluence / (R) Zone X per average extended depth
	3	5099	5291.47	5291.09	5289.99	0.38	**1.48**	(L) AE / (R) X	(L) AE due to confluence / (R) Zone X per average extended depth
	3	5190	5291.76	5291.42	5291	0.34	0.76	(L) AE / (R) X	(L) AE due to confluence / (R) Zone X per average extended depth
	3	5285	5292.21	5292	5292.01	0.21	0.2	(L) AE / (R) X	(L) AE due to confluence / (R) Zone X per average extended depth
	4	6060	5302.83	5302.64		0.19	--	X	Zone X per FLO-2D model
	4	6087	5303.27	5302.82		0.45	--	X	Zone X per FLO-2D model
	4	6158	5304.40	5303.04		**1.36**	--	X	Zone X per FLO-2D model
	4	6605	5314.57	5312.16		**2.41**	--	AE	30th_St_Split divergence area
	4	6636	5314.79	5313.34		**1.45**	--	AO 2	Zone AO 2 per FLO-2D model
	4	6666	5315.03	5313.53		**1.5**	--	AO 2	Zone AO 2 per FLO-2D model
	4	6685	5315.11	5313.81		**1.3**	--	AO 2	Zone AO 2 per FLO-2D model
	4	7216	5325.36		5324.19	--	1.17	AO 2	Zone AO 2 per FLO-2D model
	4	7240	5327.27		5324.06	--	**3.21**	AO 2	Zone AO 2 per FLO-2D model
	4	7259	5327.32		5325.05	--	**2.27**	AO 2	Zone AO 2 per FLO-2D model
	4	7416	5329.29		5328.26	--	1.03	AO 2	Zone AO 2 per FLO-2D model
	4	7478	5330.44		5328.96	--	1.48	AO 2	Zone AO 2 per FLO-2D model
	4	7622	5335.00	5333.87		1.13	--	AE	29th_St_Split divergence area
	4	8576	5361.27		5360.61	--	0.66	AE	Bear Creek Split Flow divergence area
	4	8654	5361.49		5360.34	--	1.15	AE	Bear Creek Split Flow divergence area
	4	9444	5375.94		5374.44	--	**1.50**	X	Substantial building block, Zone X per FLO-2D model
	4	9780	5383.06	5381.88		1.18	--	X	Zone X per FLO-2D model
	5	9997	5390.32		5389.35	--	0.97	X	Zone X per FLO-2D model
	5	10778	5412.64		5411.57	--	1.07	X	Zone X per FLO-2D model
	5	10826	5412.88		5411.58	--	**1.30**	X	Zone X per FLO-2D model
	5	10910	5415.95		5414.37	--	**1.58**	AO 2	Zone AO 2 per FLO-2D model
	6	11713	5445.27	5445.14		0.13	--	X	Zone X per FLO-2D model
Skunk Creek - Echo Pl. Split Flow						--	--		
	1	76	5434.94		5433.37	--	1.57	X	Zone AO 1 per FLO-2D model
	1	167	5436.37		5434.58	--	1.79	X	Zone AO 1 per FLO-2D model
	1	219	5439.04		5439.03	--	0.01	X	Zone AO 1 per FLO-2D model
	1	289	5441.48		5440.02	--	1.46	X	Zone AO 1 per FLO-2D model
Skunk Creek - Blue Ave. Split Flow						--	--		
	1	185	5392.71	5391.37		1.34	--	X	Zone X per FLO-2D model and average left overbank depth
	1	251	5392.82	5391.92		0.9	--	X	Zone X per FLO-2D model and average left overbank depth
	1	364	5395.14	5394.64		0.5	--	X	Zone X per FLO-2D model and average left overbank depth
	1	474	5397.59	5397.41		0.18	--	X	Zone X per FLO-2D model and average left overbank depth
	1	564	5399.71	5399.43		0.28	--	X	Zone X per FLO-2D model and average left overbank depth
	1	655	5402.54	5401.58		0.96	--	X	Zone X per FLO-2D model and average left overbank depth

…continued on next page

Table E.2: Vertical Extended Sections (100-Year) continued
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & PMR
ICON Engineering, Inc.

Flooding Source	HEC-RAS Reach	HEC-RAS Cross Section	Water Surface Elevation (NAVD88)	Left Overbank Elevation	Right Overbank Elevation	Extended Depth Left Overbank	Extended Depth Right Overbank	Zone Designation	Comments
Skunk Creek - Bear Creek Split Flow						--	--		
	1	2637	5340.47	5340.11		0.36	--	X	Zone X per FLO-2D model
	1	2787	5342.89	5342.59	5342.55	0.3	0.34	X	(L) Zone X per FLO-2D model / (R) building obstruction
	1	3053	5345.73		5345.03	--	0.7	none	not identified as Zone X by FLO-2D model
	1	3174	5356.24	5355.79		0.45	--	none	jersey barrier and HWY 36 embankment issue
Skunk Creek - 29th St. Split Flow									
	1	397	5310.16	5309.64		0.52	--	X	Zone X per FLO-2D model
	1	585	5314.62		5313.99	--	0.63	X	Zone X per FLO-2D model
	1	744	5315.70		5314.44	--	1.26	X	Zone X per FLO-2D model
	1	1304	5330.63		5330.57	--	0.06	none	building obstruction
	1	1456	5332.33		5331.64	--	0.69	X	Zone X per FLO-2D model
	1	1539	5333.42		5332.55	--	0.87	X	Zone X per FLO-2D model
Skunk Creek - 30th St. Split Flow									
	1	556	5305.67		5305.45	--	0.22	X	Zone X per FLO-2D model
	1	643	5307.07		5306.79	--	0.28	X	Zone X per FLO-2D model
	1	758	5309.17		5308.91	--	0.26	X	Zone X per FLO-2D model
	1	875	5311.40		5311.26	--	0.14	X	Zone X per FLO-2D model
Skunk Creek - Euclid Ave. Split Flow									
	1	76	5291.39	5289.63	5291.1	1.76	0.29	AE	Zone AE due to confluence
	1	129	5291.45	5290.55	5290.54	0.9	0.91	X	Zone X per FLO-2D model
	1	422	5292.20	5292.15		0.05	--	X	Zone X per FLO-2D model
	1	1445	5302.96		5301.96	--	1.00	X	Zone X per FLO-2D model
Skunk Creek - Denton Ave. Split Flow									
	1	41	5295.38	5295.1		0.28	--	X	Zone X per FLO-2D model
Skunk Creek - Quinn St. Split Flow						--	--		
	1	109	5292.9	5292.71	5292.2	0.19	0.70	X	Zone X per FLO-2D model
Skunk Creek - 35th St. Split Flow									
	1	43	5280.88		5280.38	--	0.5	X	Zone X per FLO-2D model
	1	165	5281.87		5281.72	--	0.15	X	Zone X per FLO-2D model
	1	240	5282.43		5282.09	--	0.34	X	Zone X per FLO-2D model
	1	346	5282.98		5281.27	--	1.71	AE	divergence area from Skunk Creek
Skunk Creek - Apartment Split Flow									
	1	20	5279.47	5278.39		1.08	--	X	Zone X per FLO-2D model
Bluebell Canyon Creek									
	1	122	5391.96		5390.74	--	1.22	AE	confluence area with Skunk Creek
	1	219	5392.88	5392.73	5392.29	0.15	0.59	X	Zone X per FLO-2D model
	1	799	5414.47		5413.94	--	0.53	X	Zone X per FLO-2D model
	1	915	5418.29	5418.25		0.04	--	X	Zone X per FLO-2D model
	1	1413	5435.20		5434.46	--	0.74	X	Zone X per FLO-2D model
	1	1651	5445.56		5445.34	--	0.22	X	Zone X per FLO-2D model
	1	1764	5451.49		5450.78	--	0.71	X	Zone X per FLO-2D model
	1	1839	5455.82		5455.76	--	0.06	X	Zone X per FLO-2D model
	1	3070	5530.27		5530.11	--	0.16	X	Zone X per FLO-2D model
	1	3215	5540.58		5540.18	--	0.40	X	Zone X per FLO-2D model
King's Gulch									
	2	311	5434.42	5433.81		0.61	--	X	Zone X per FLO-2D model
	2	561	5443.47	5442.8	5443.32	0.67	0.15	X	Zone X per FLO-2D model
	2	981	5462.12		5462.07	--	0.05	X	Zone X per FLO-2D model
	2	1419	5481.37	5480.77	5481.04	0.6	0.33	X	Zone X per FLO-2D model
	3	2444	5541.21	5540.6		0.61	--	AE	per bare earth at structure (beyond cross section end)
King's Gulch - King's Split Flow									
	1	775	5533.41		5531.71	--	1.7	AE	building obstruction and area of divergence with King's Gulch

Appendix F –
Floodplain Workmaps



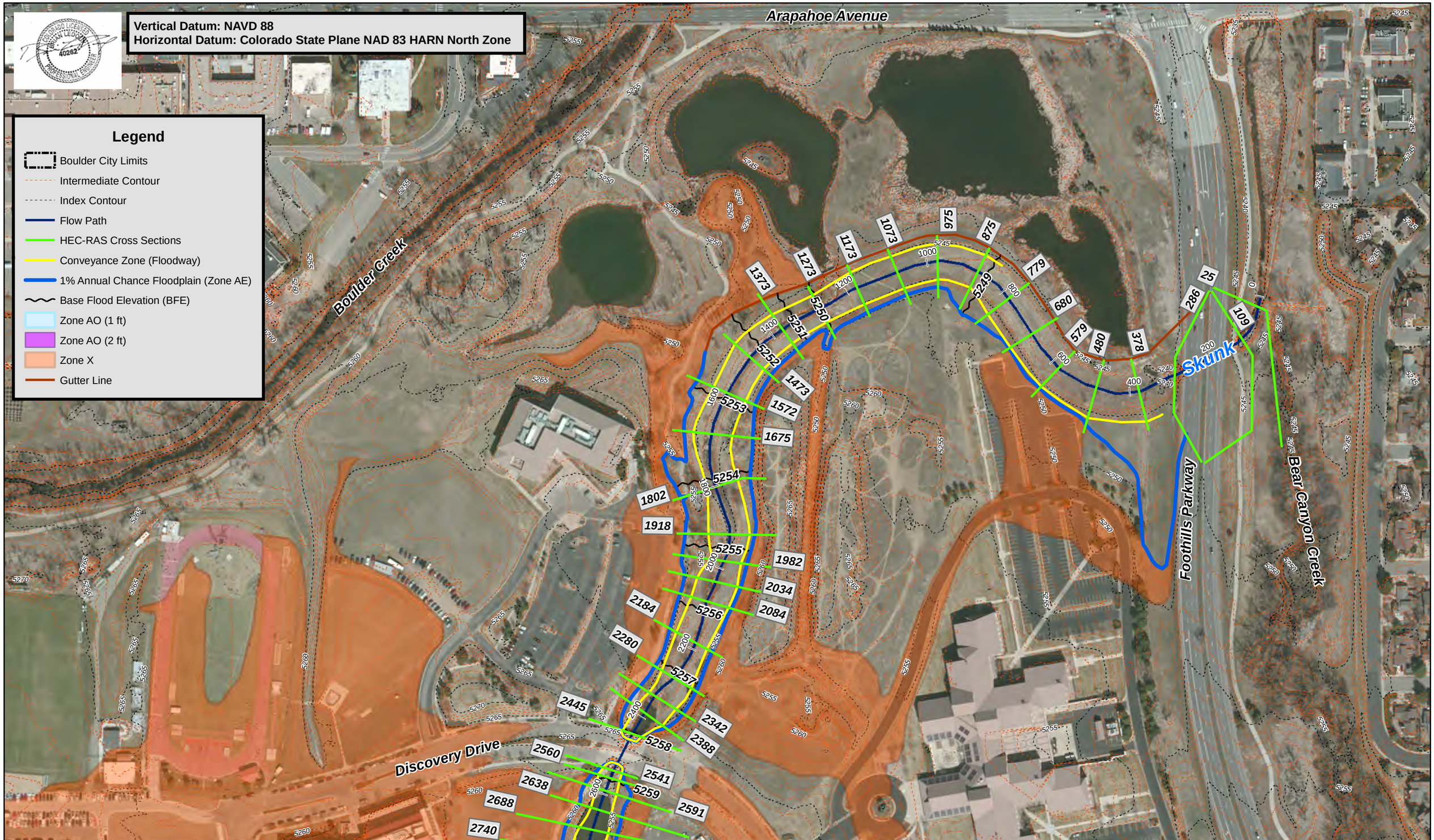
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.0: Floodplain Workmap Index

N

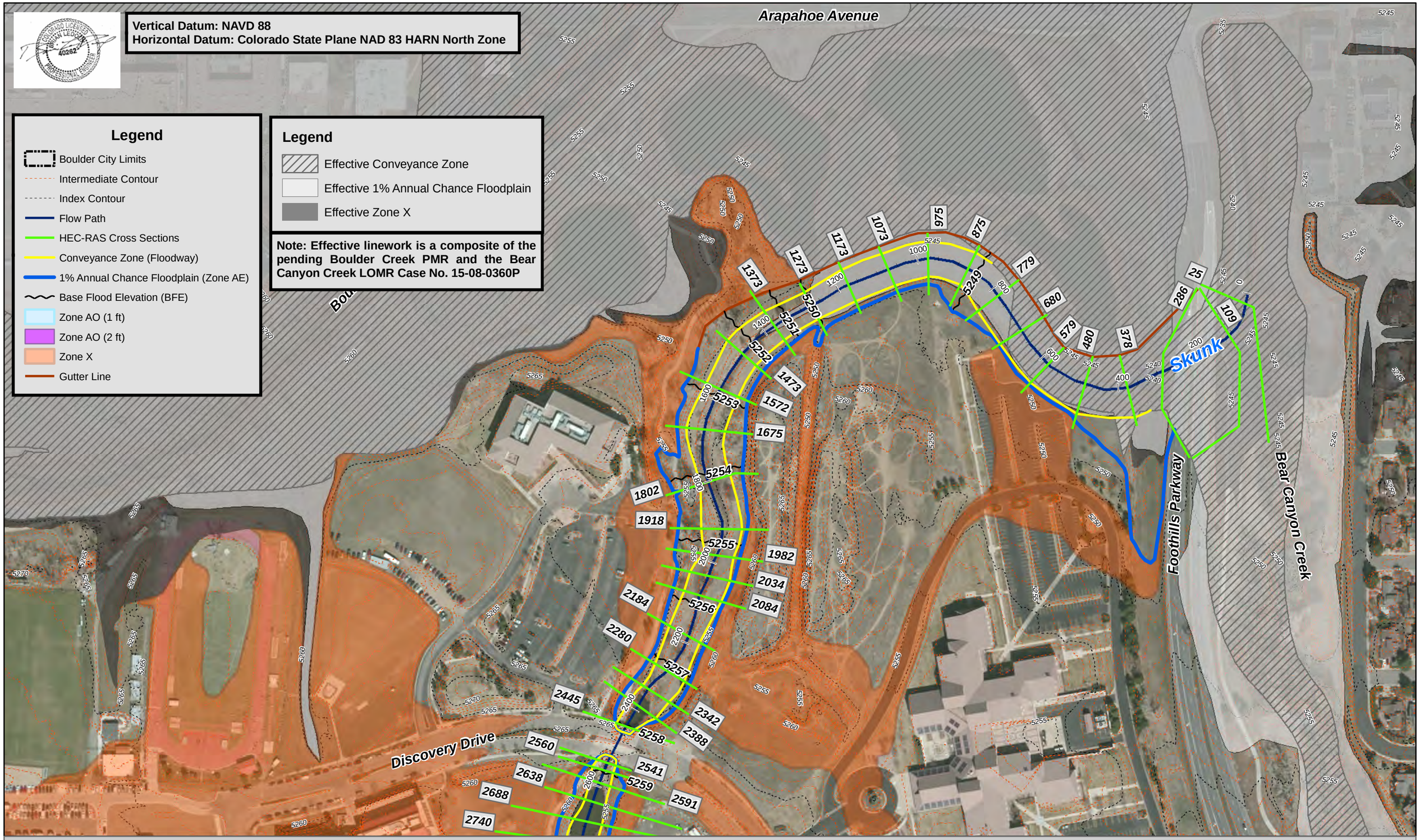
1,000 Feet



ICON ENGINEERING, INC.

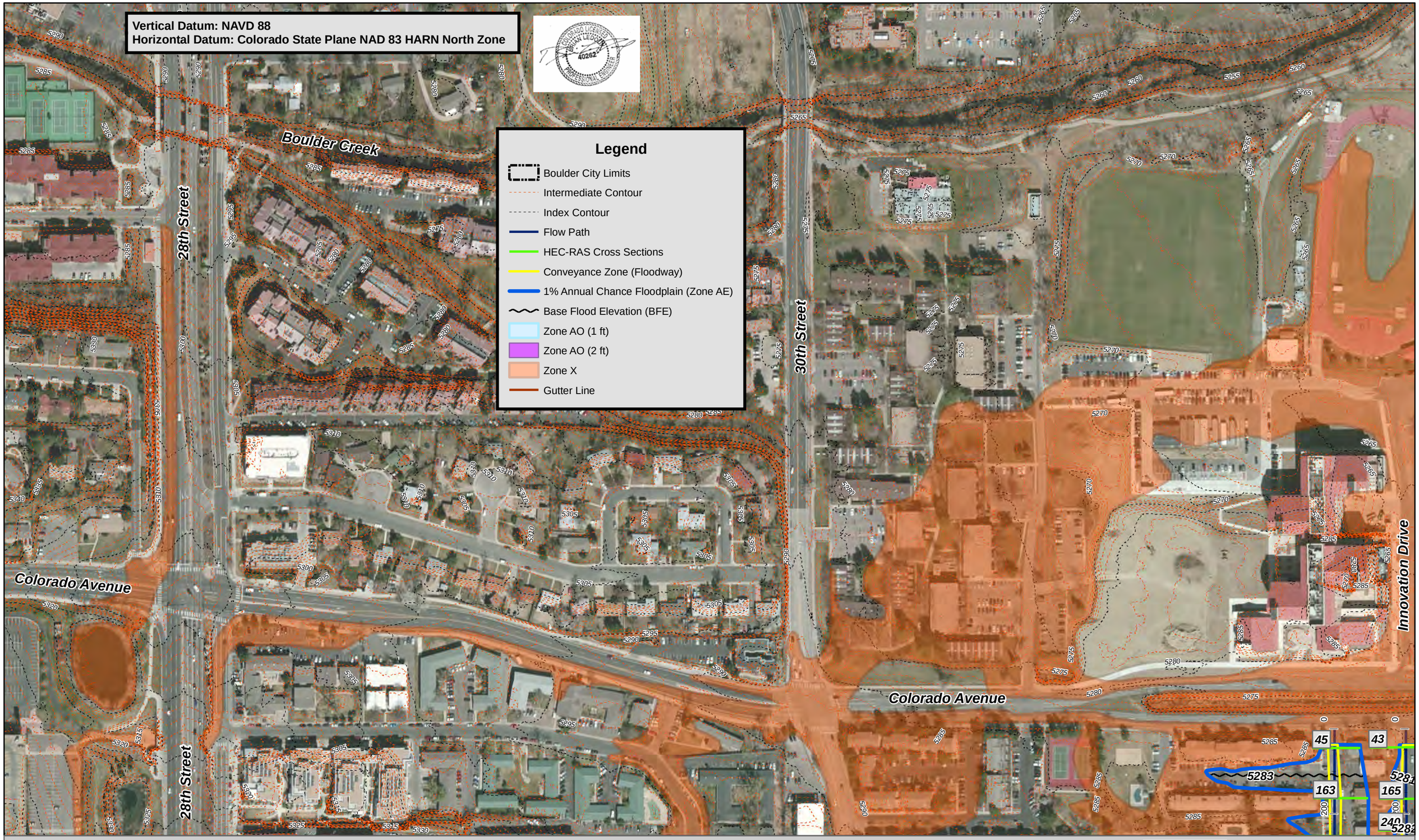
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.1: Floodplain Workmap



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure F.1: Floodplain Workmap



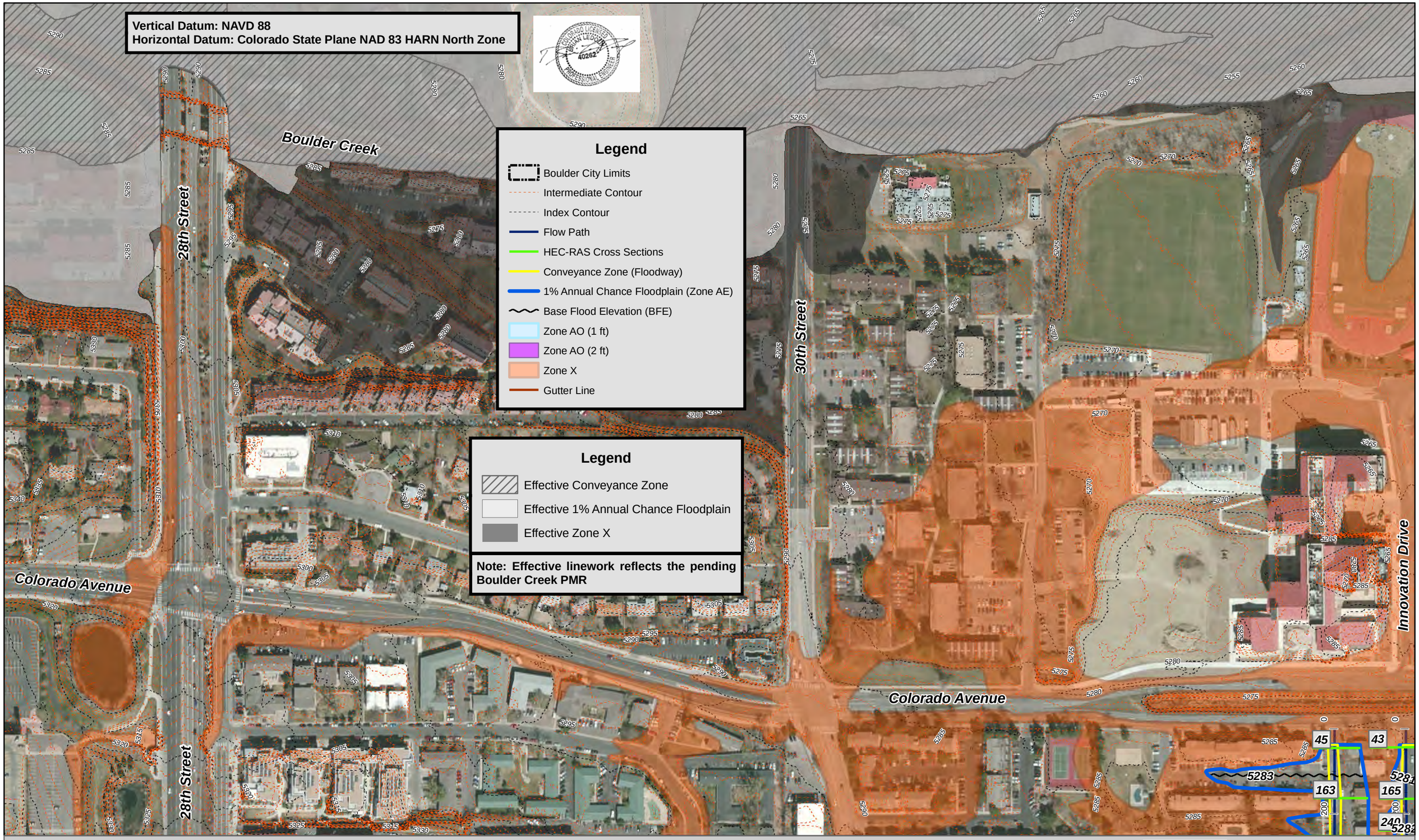
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.2: Floodplain Workmap

N

200 Feet



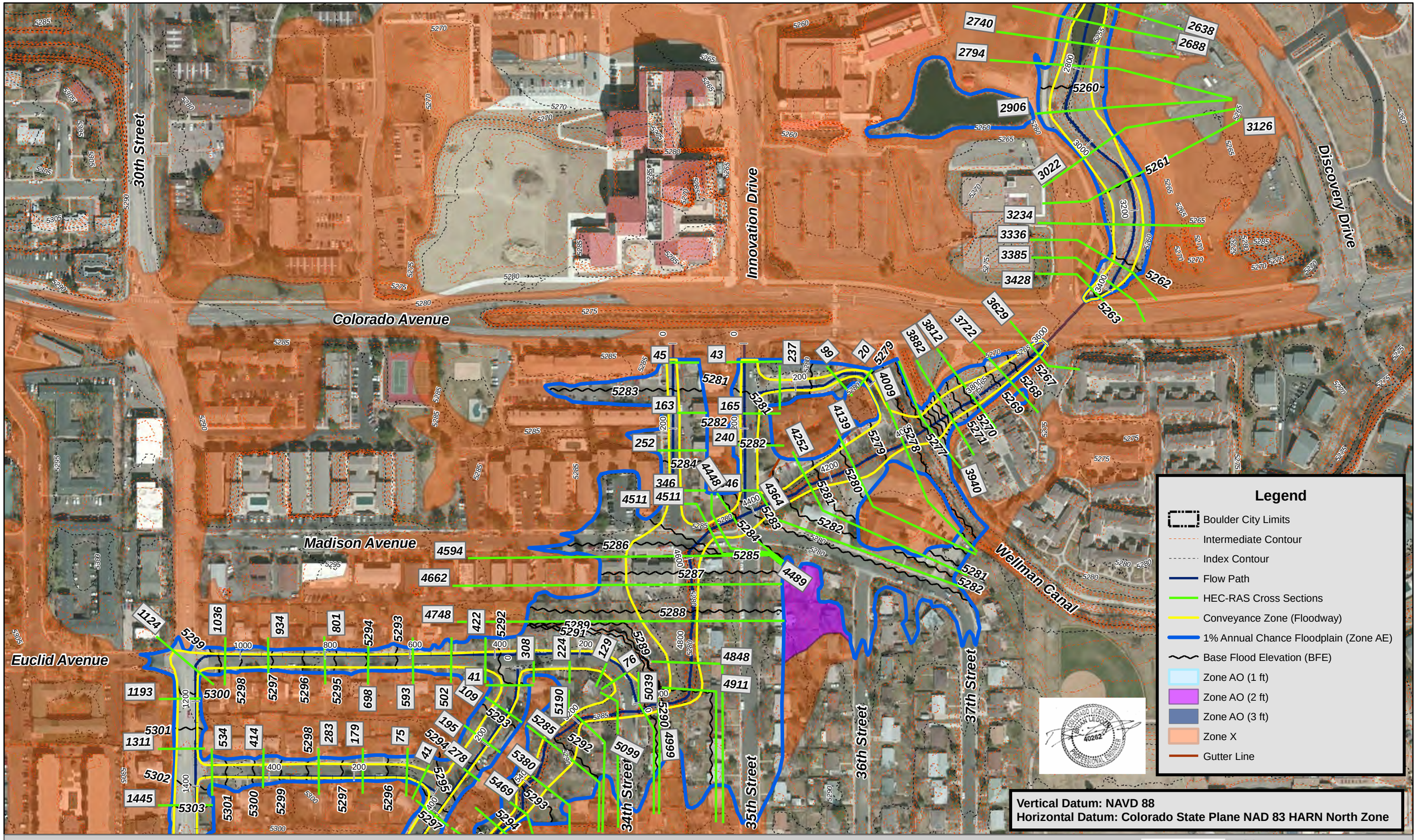
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.2: Floodplain Workmap

N

200 Feet



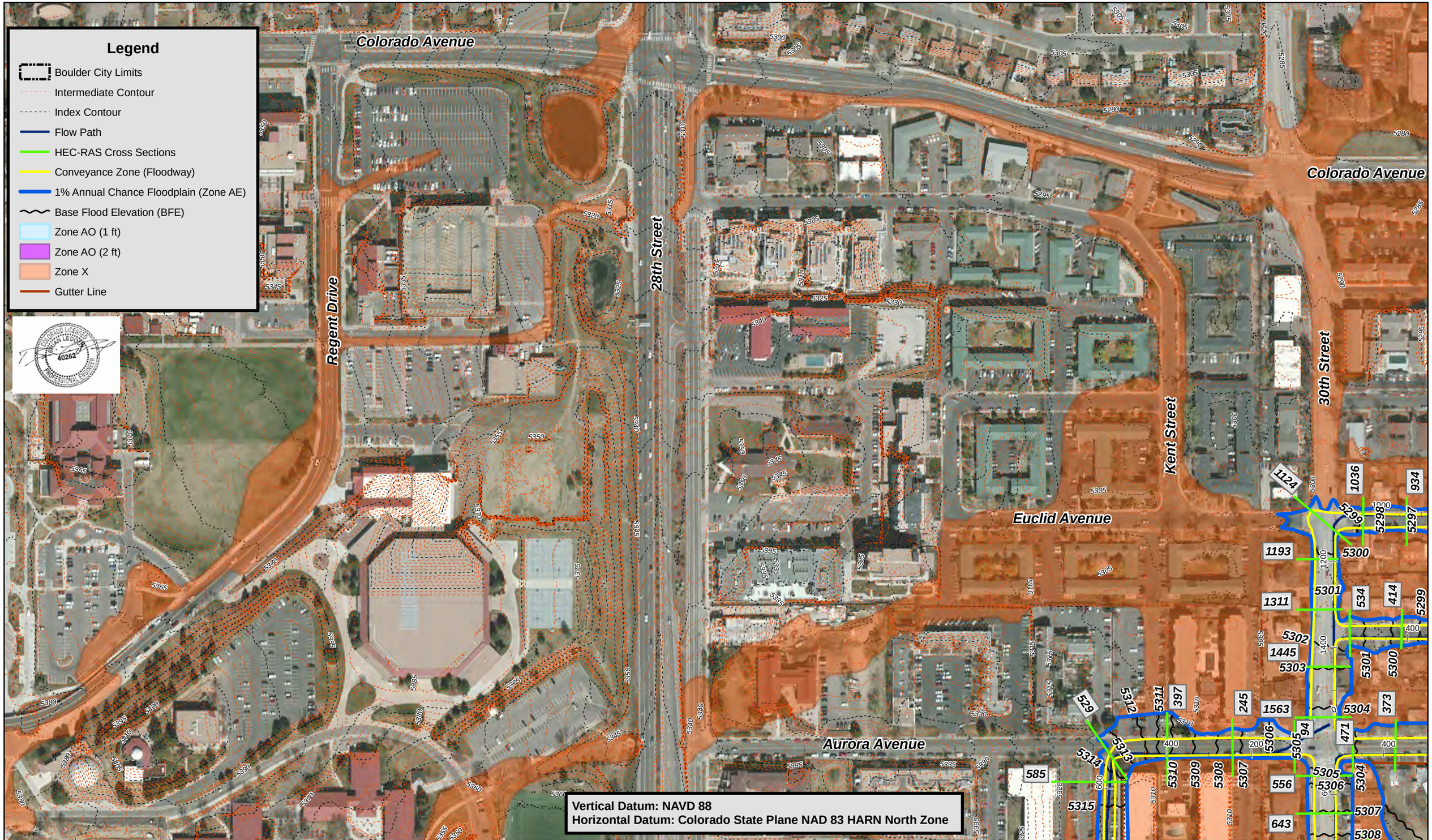
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.3: Floodplain Workmap

N

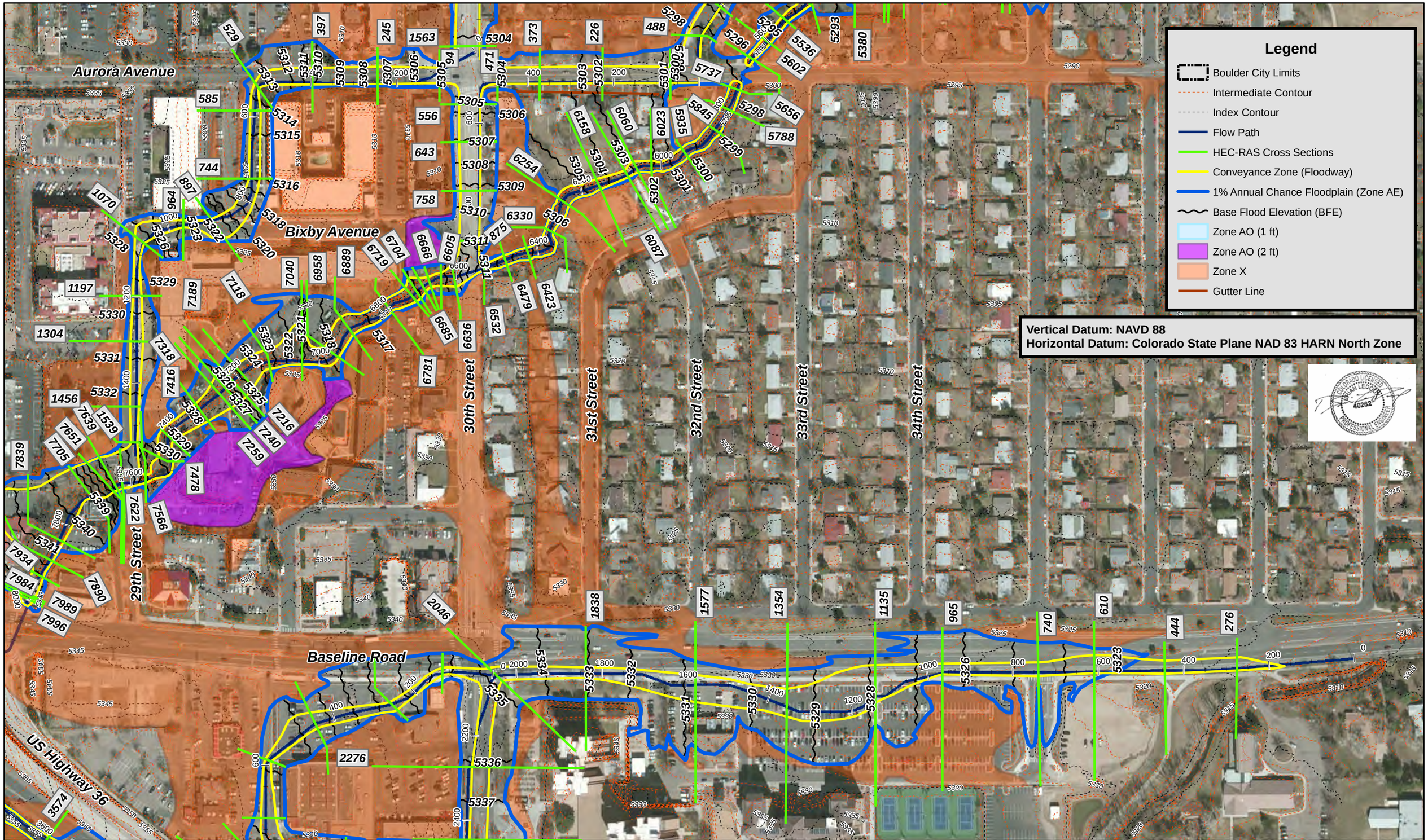
200 Feet



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.4: Floodplain Workmap



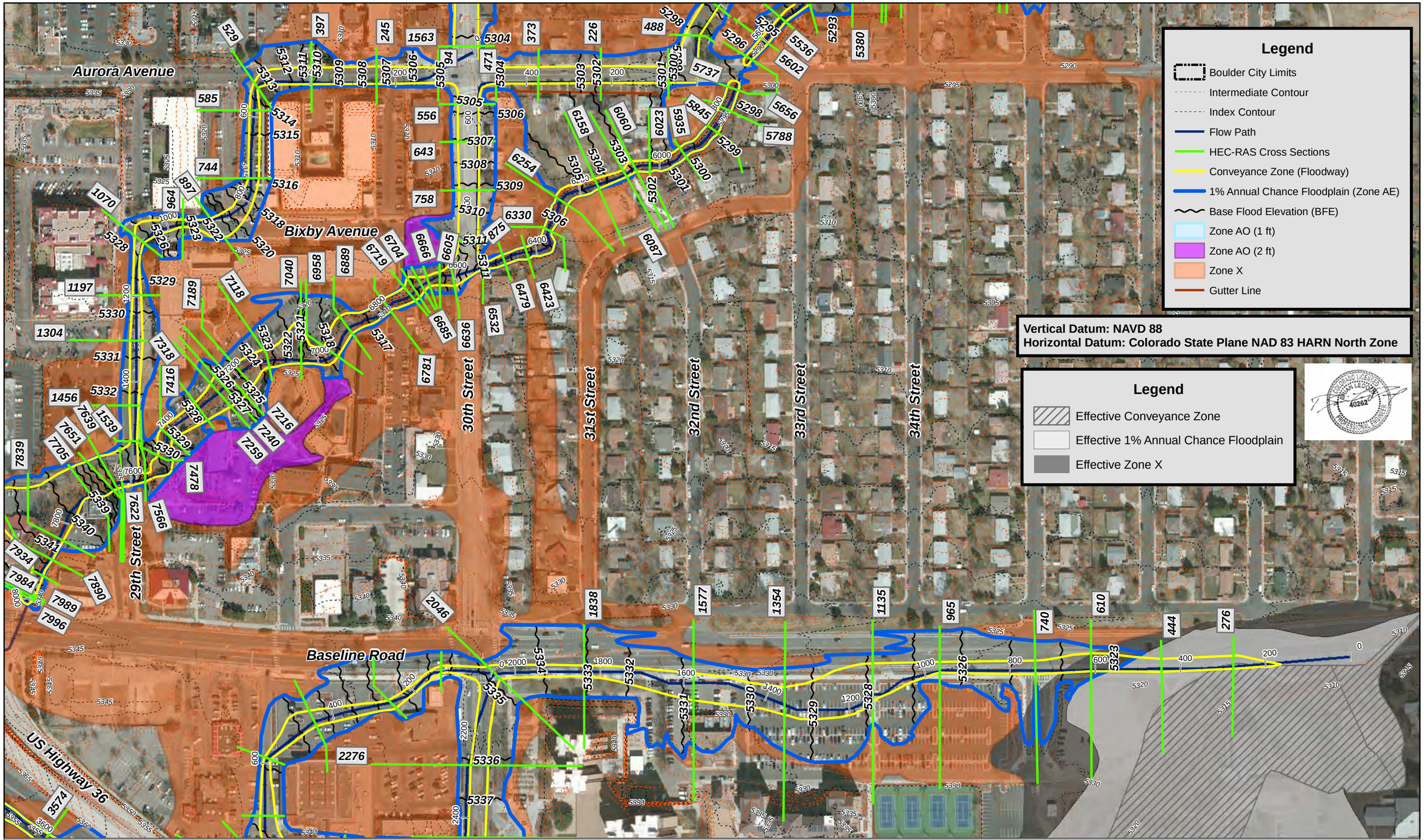
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.5: Floodplain Workmap

N

200 Feet



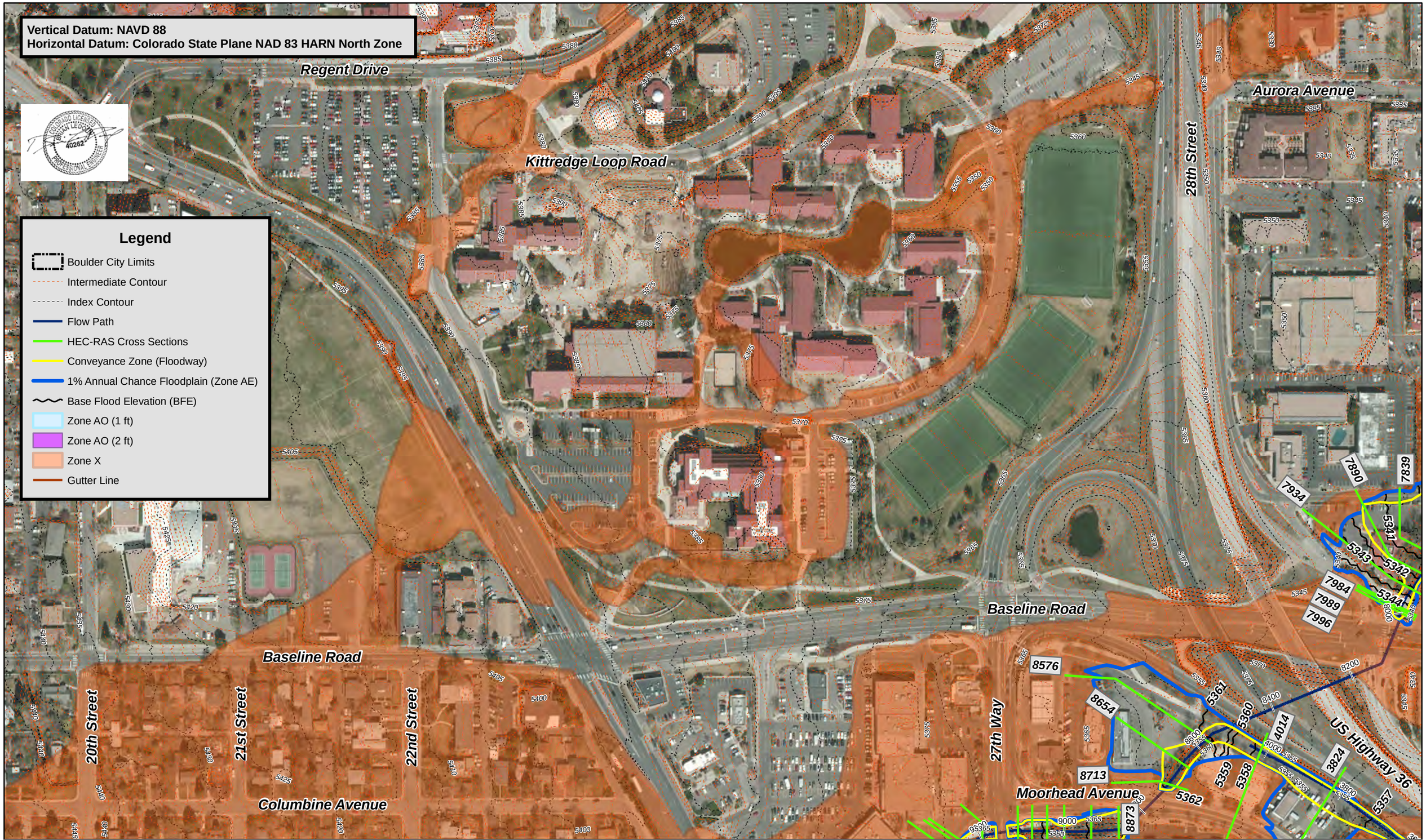
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.5: Floodplain Workmap

N

200 Feet



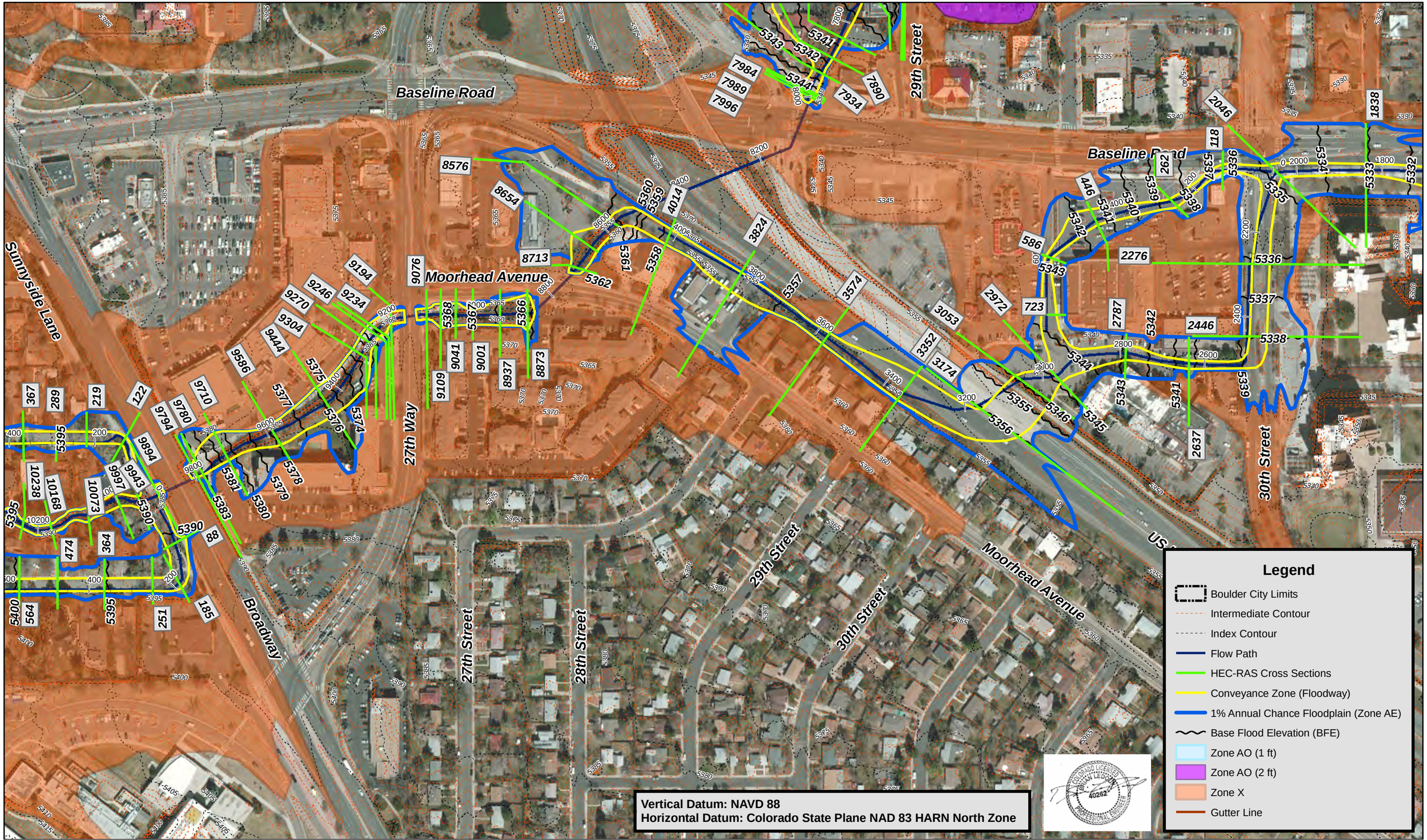
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.6: Floodplain Workmap

N

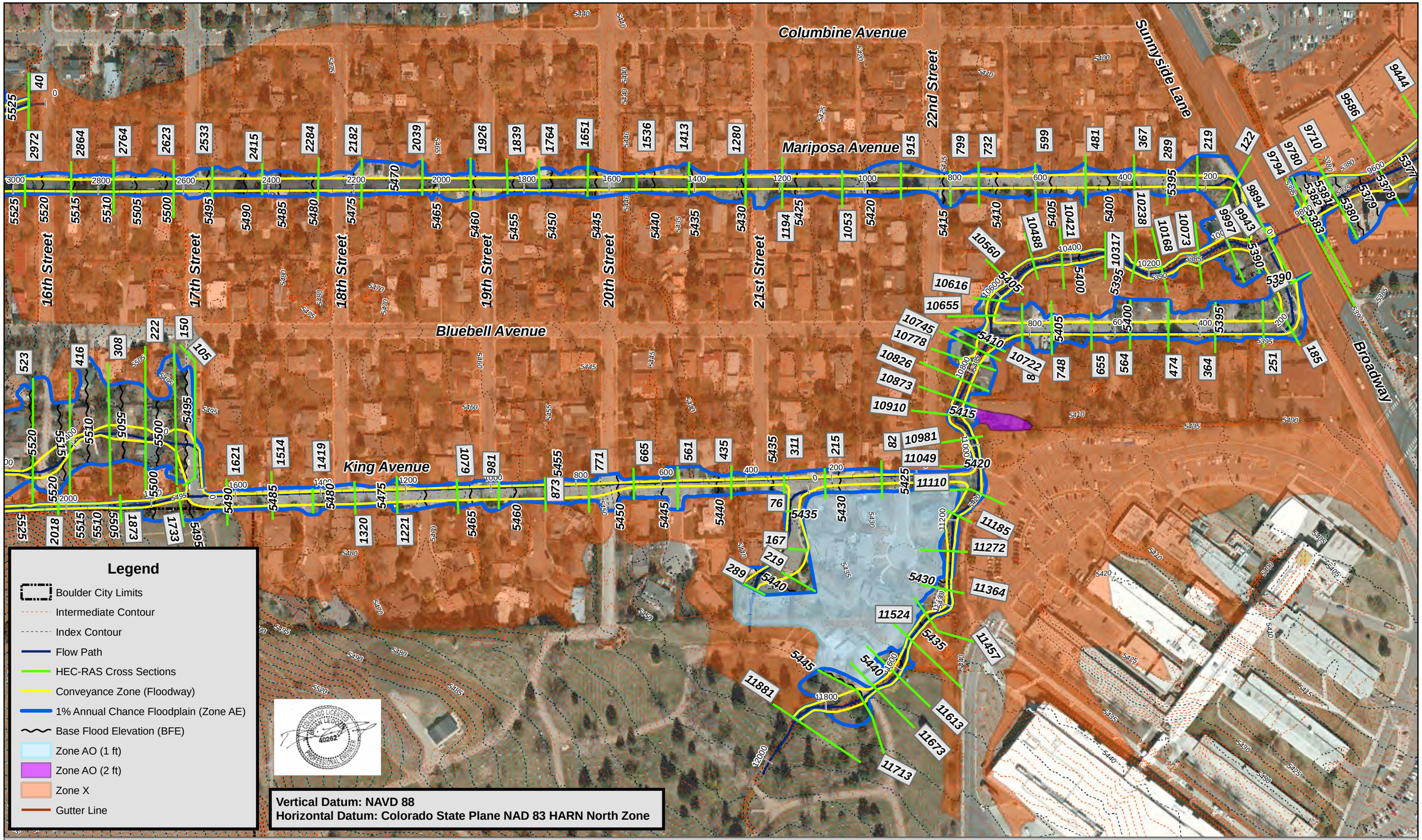
200 Feet



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

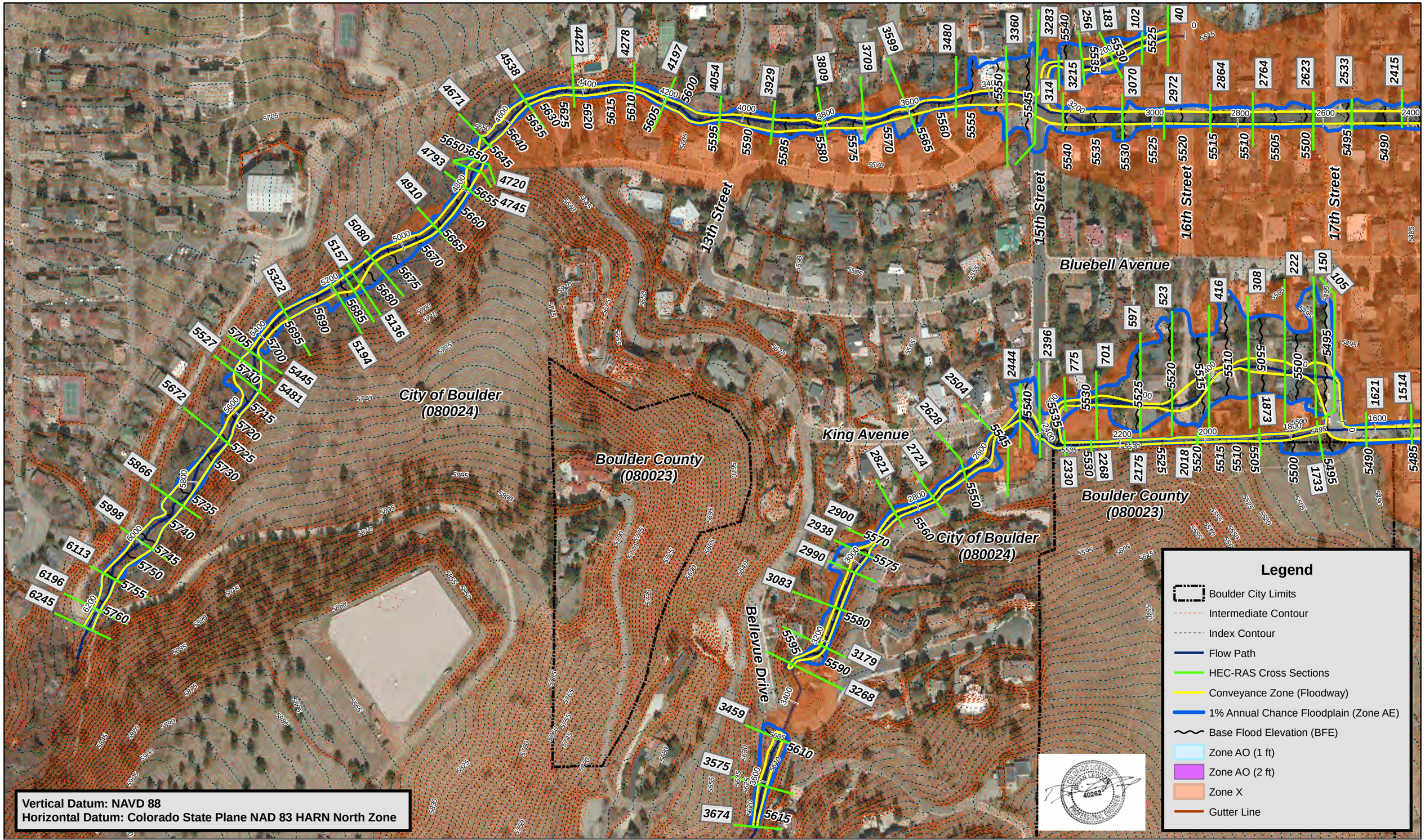
Figure F.7: Floodplain Workmap



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

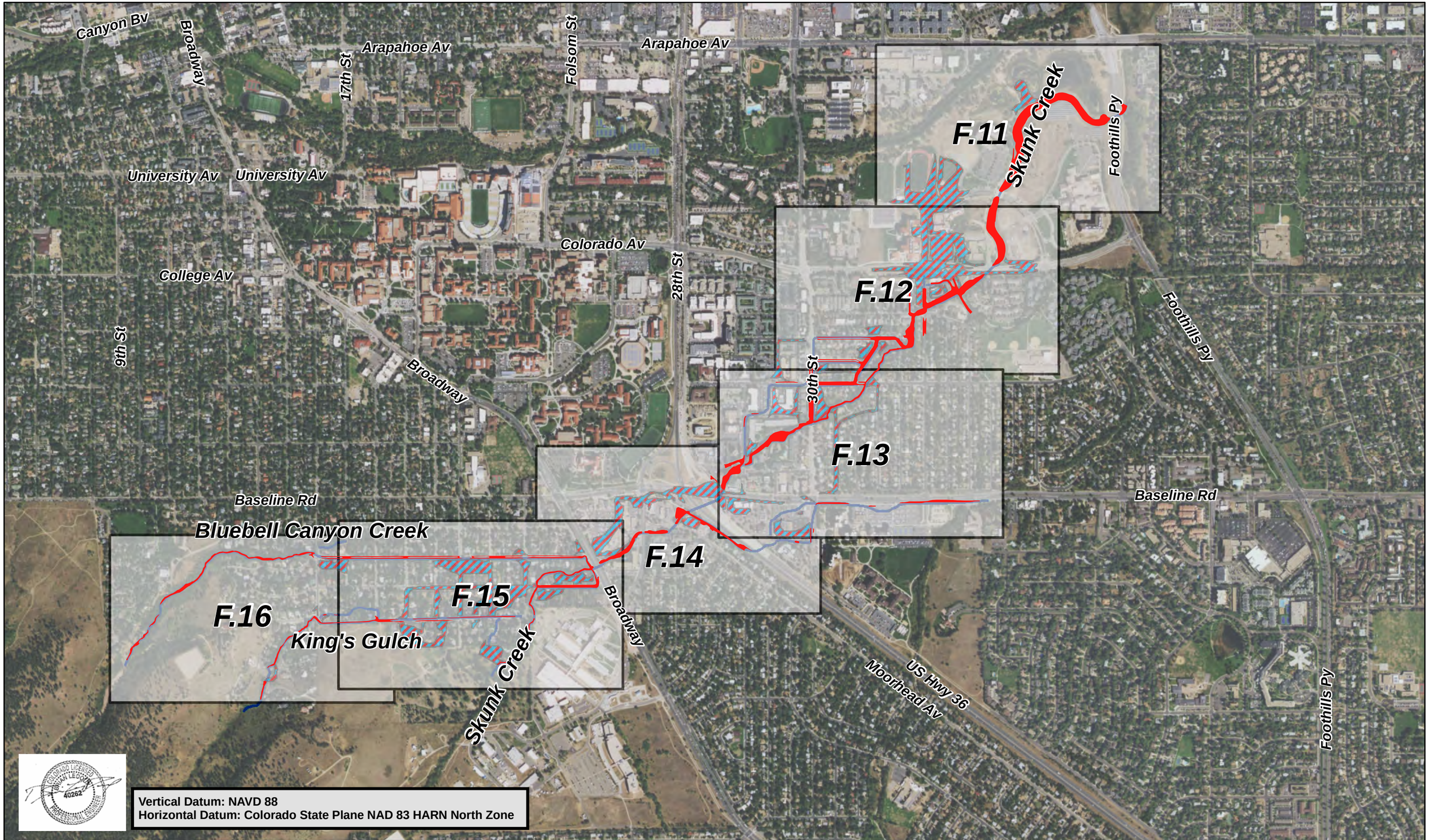
Figure F.8: Floodplain Workmap



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

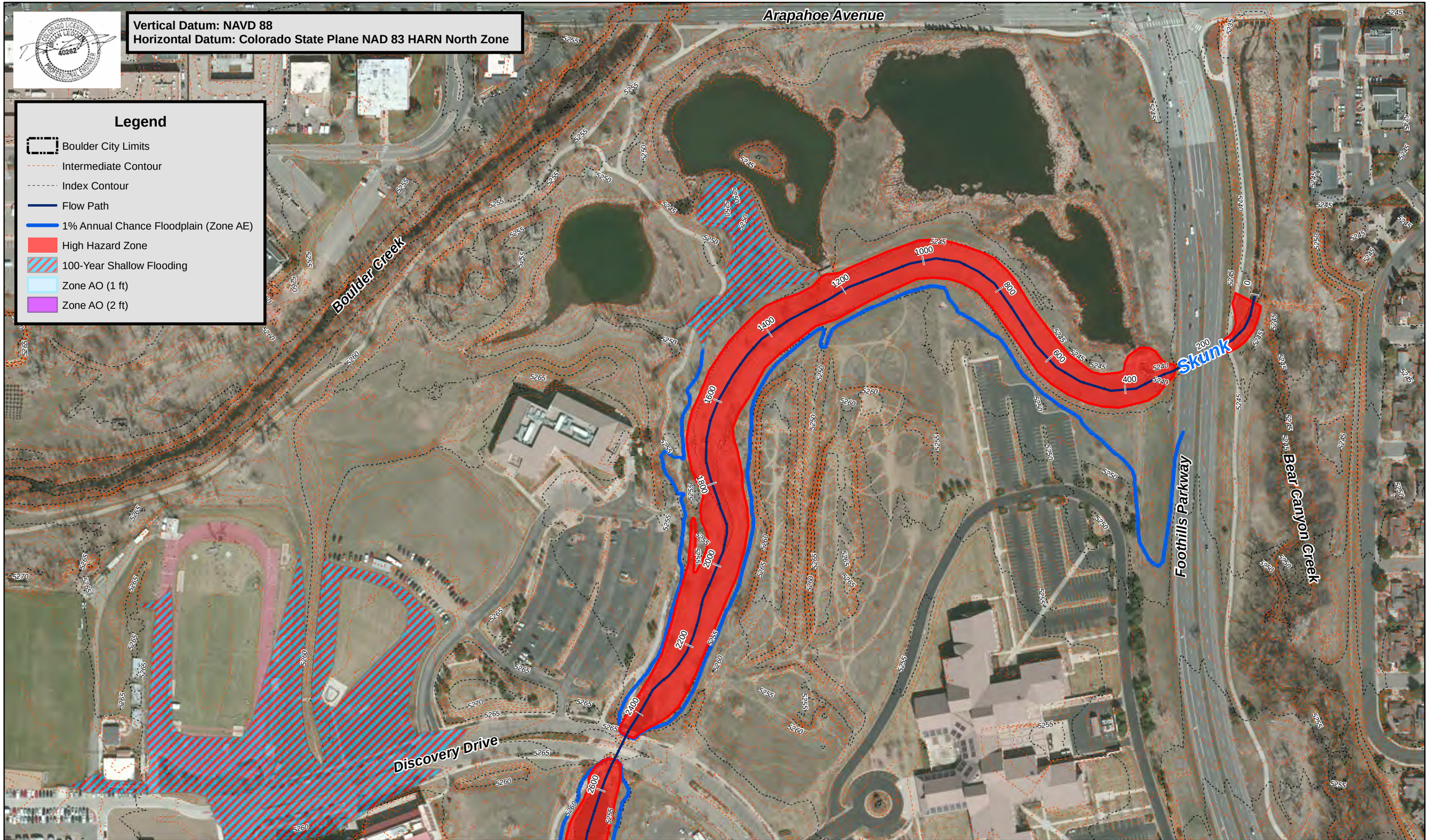
Figure F.9: Floodplain Workmap



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.10: High Hazard Zone and 100-Year Shallow Flooding Workmap Index



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

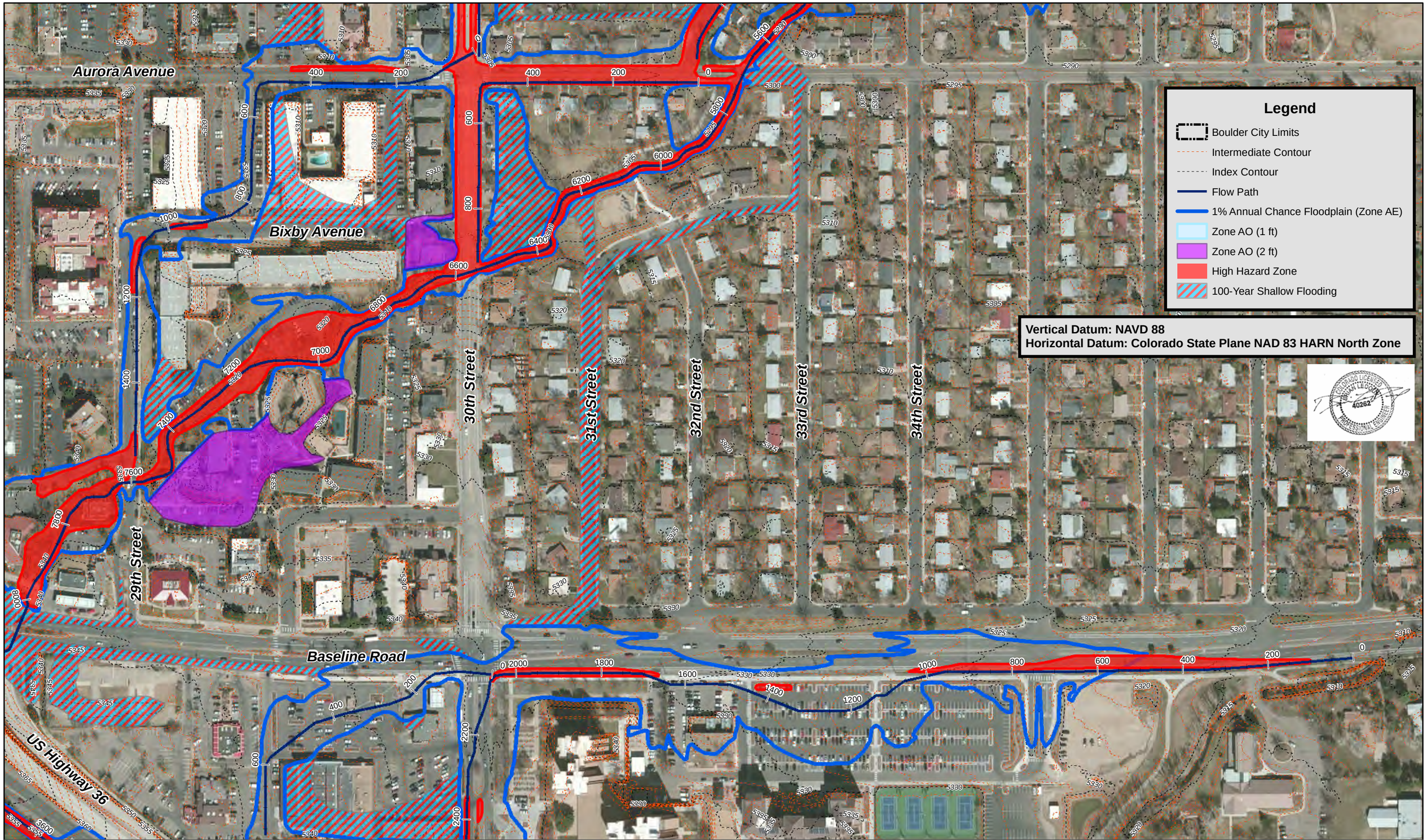
Figure F.11: High Hazard Zone and 100-Year Shallow Flooding Workmap

N

200 Feet

ICON ENGINEERING, INC.

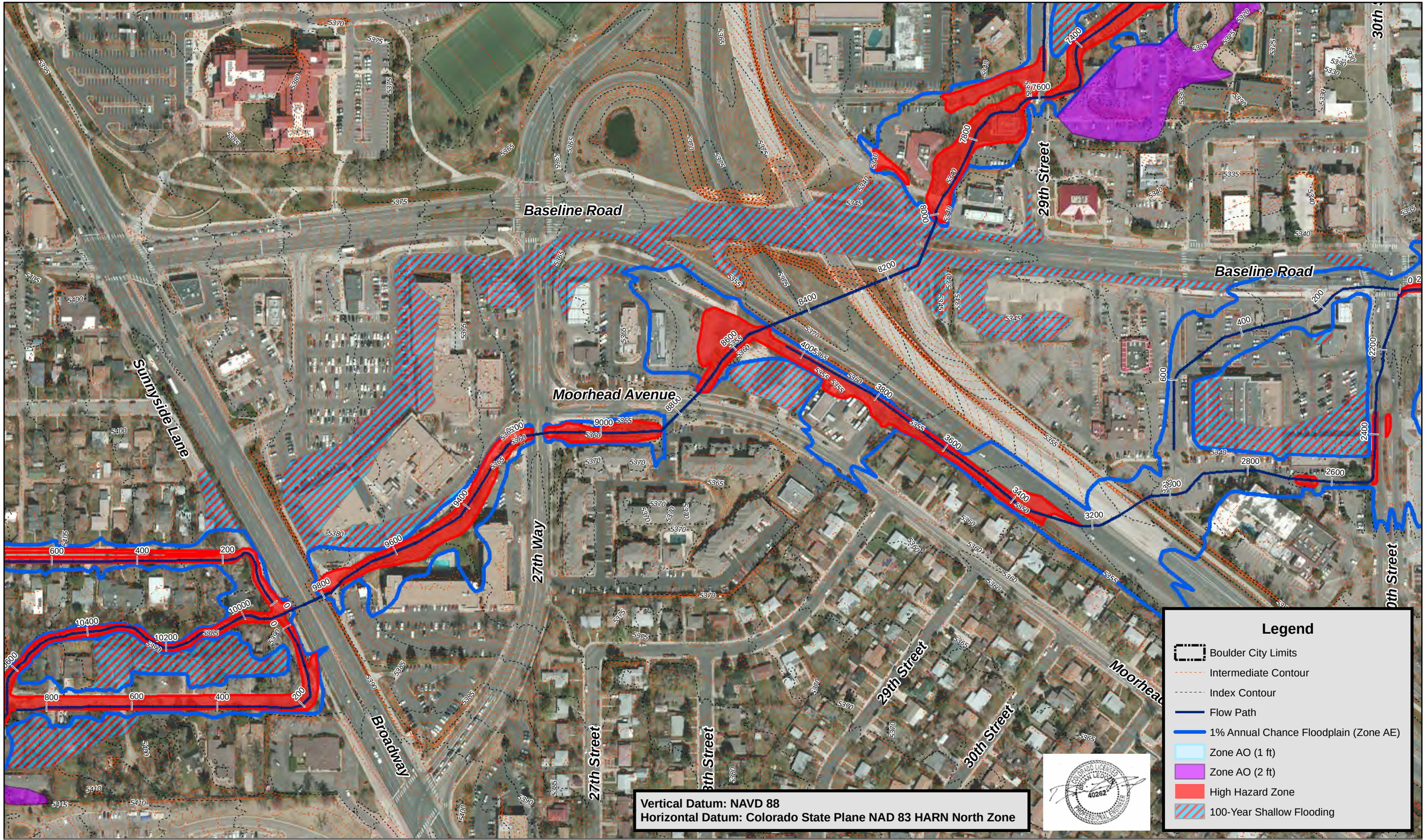
Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure F.12: High Hazard Zone and 100-Year Shallow Flooding Workmap



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

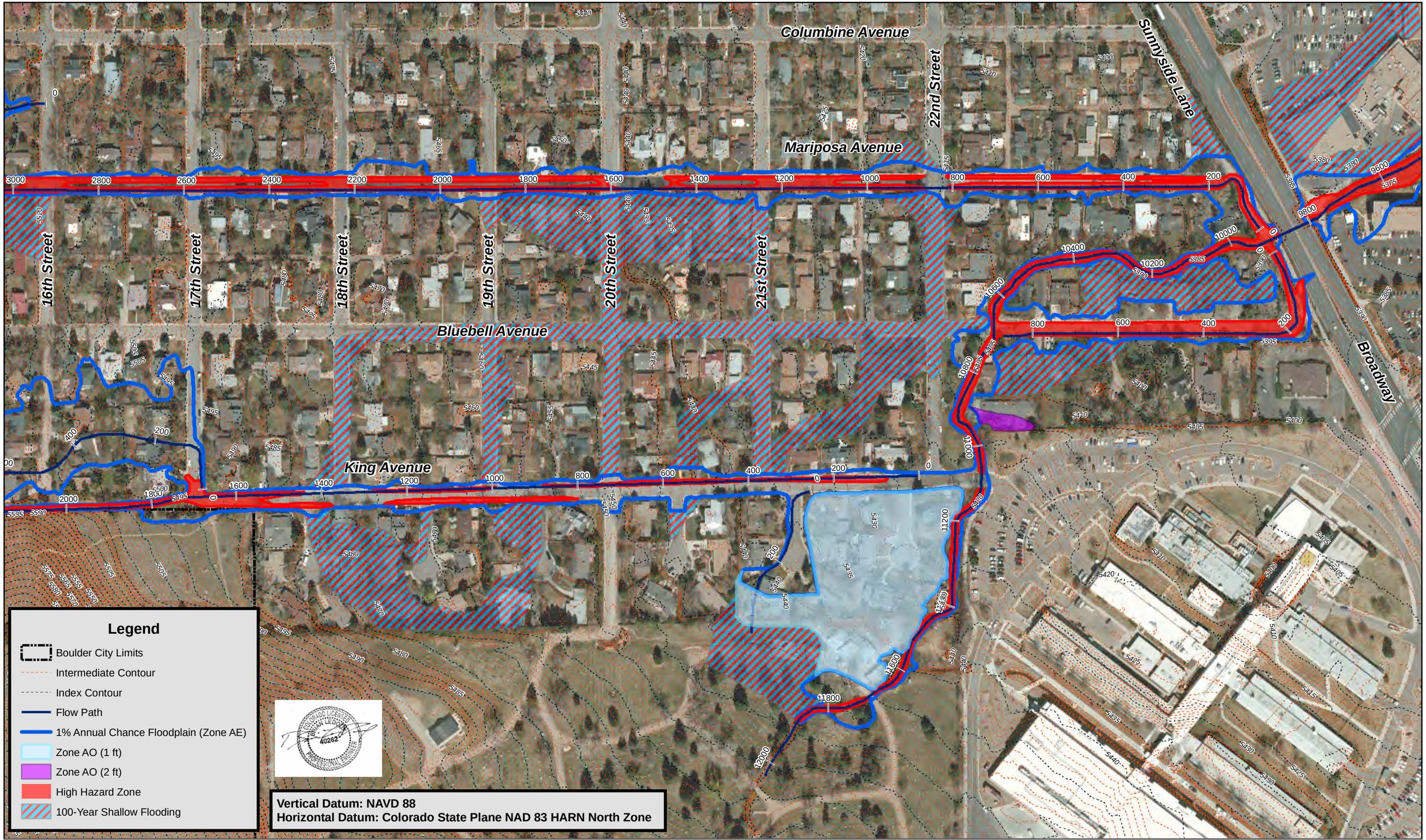
Figure F.13: High Hazard Zone and 100-Year Shallow Flooding Workmap



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

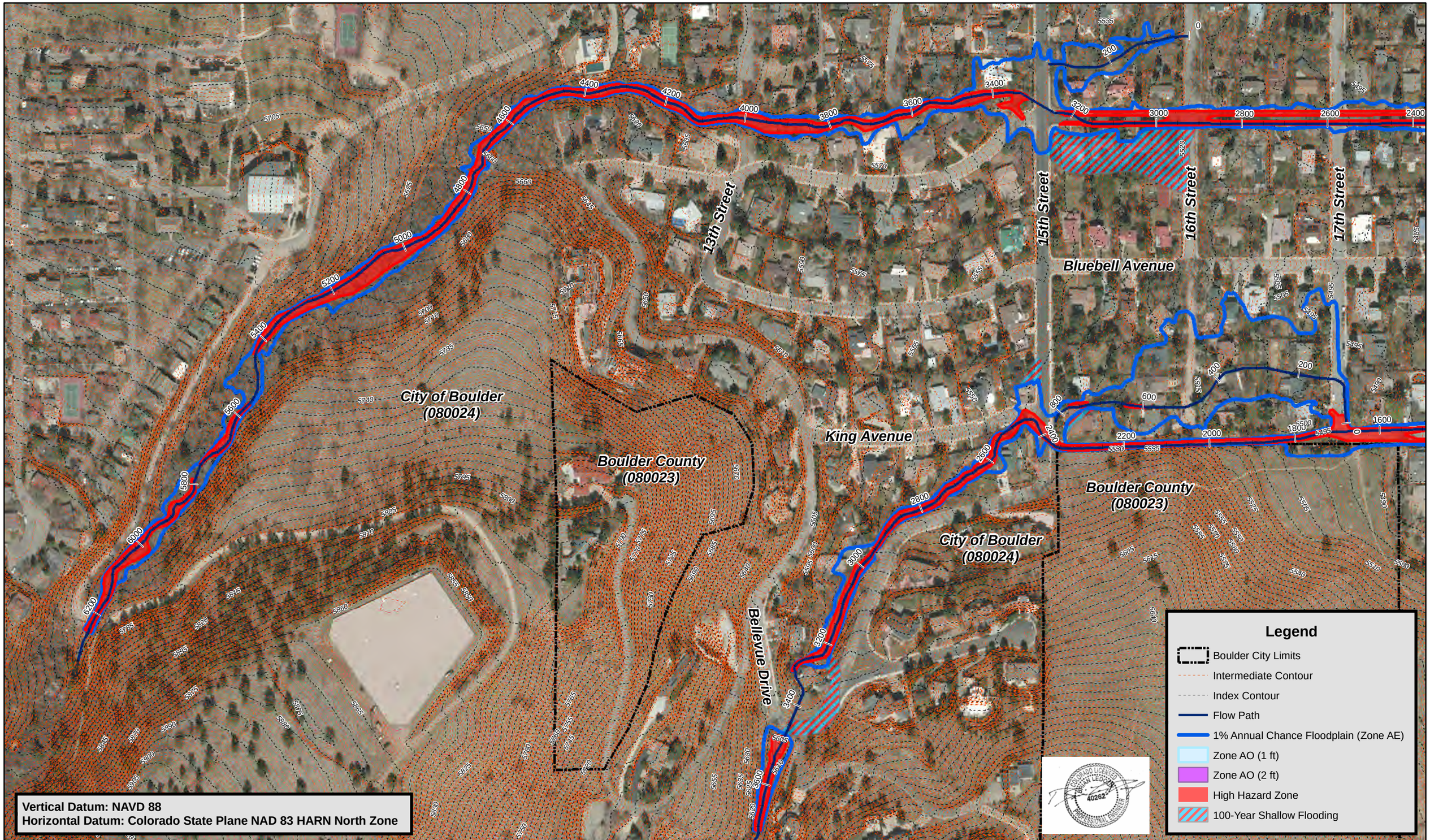
Figure F.14: High Hazard Zone and 100-Year Shallow Flooding Workmap



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

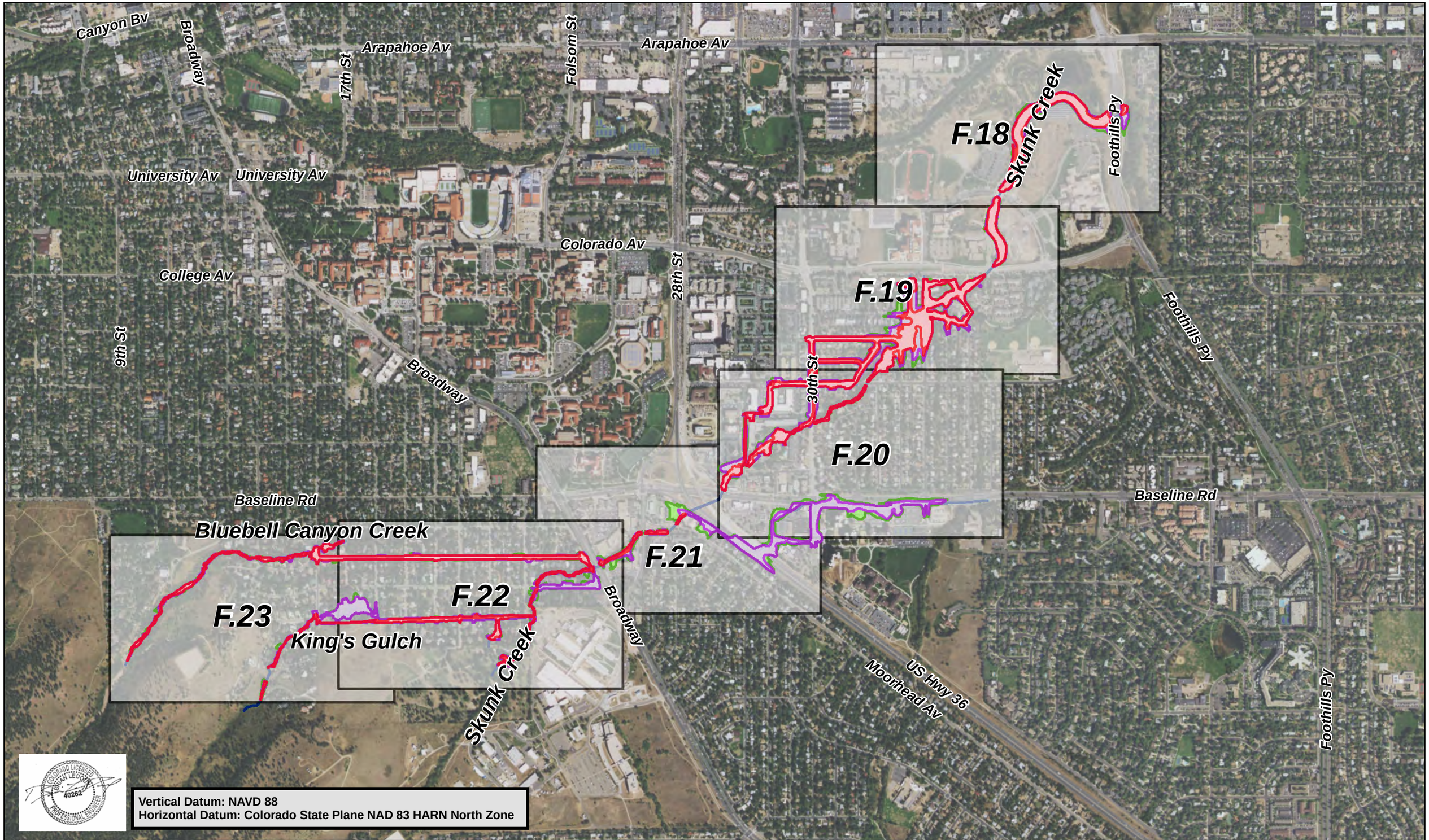
Figure F.15: High Hazard Zone and 100-Year Shallow Flooding Workmap



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.16: High Hazard Zone and 100-Year Shallow Flooding Workmap

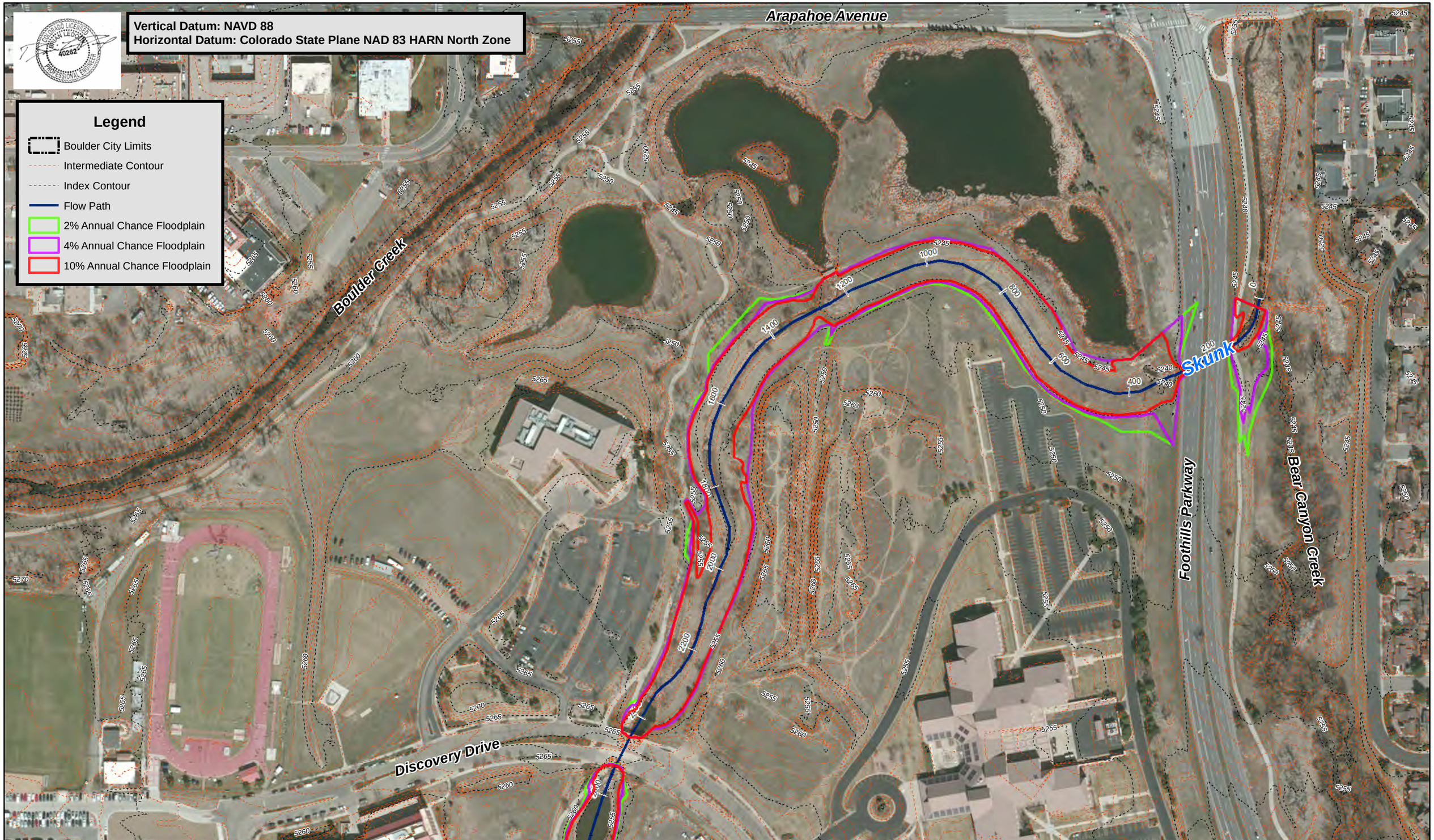


ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure F.17: 10-, 4-, and 2-% Annual Chance Floodplain Workmap Index

N

1,000 Feet

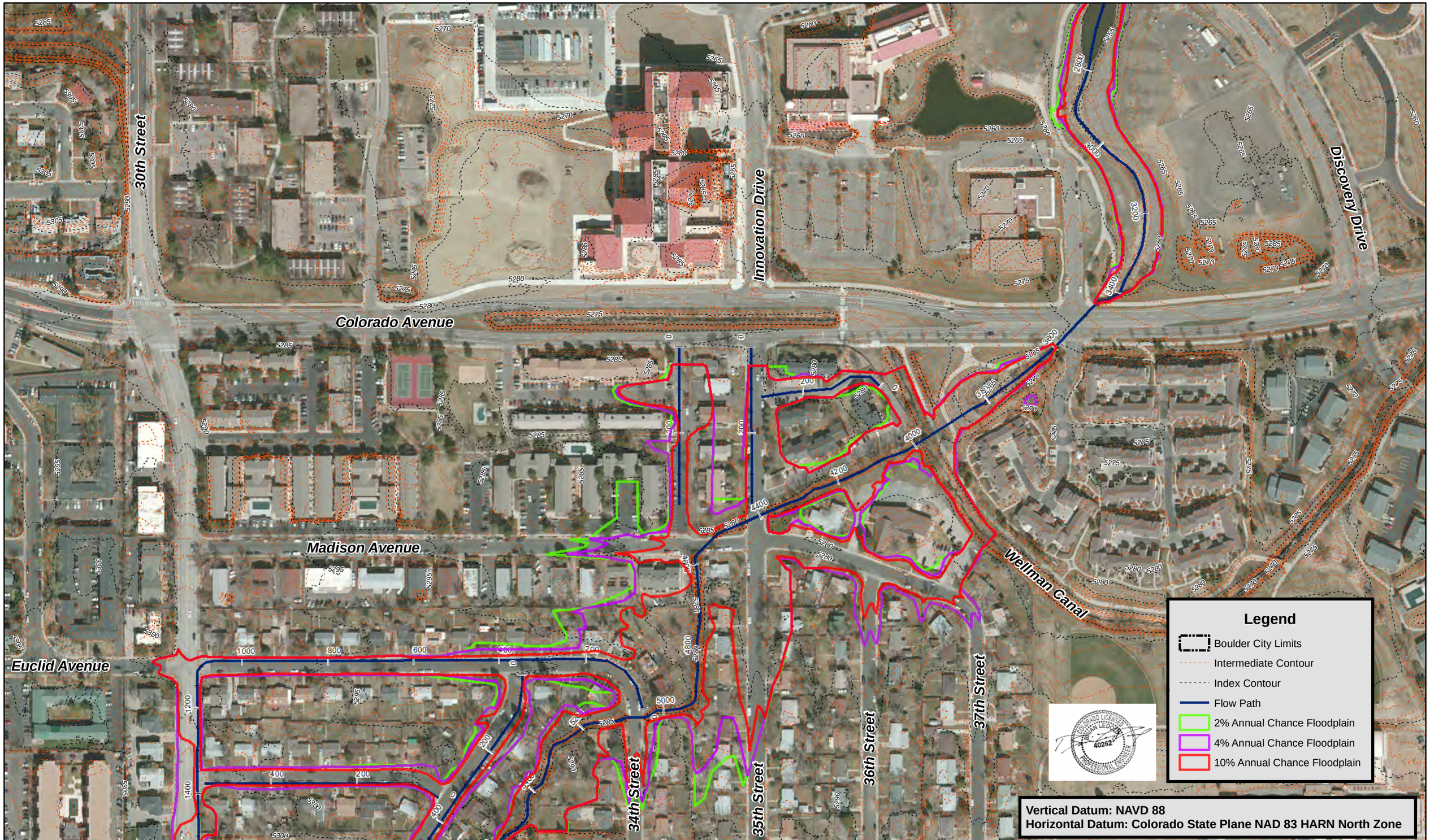


ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure F.18: 10-, 4-, and 2-% Annual Chance Floodplain Workmap

N

200 Feet



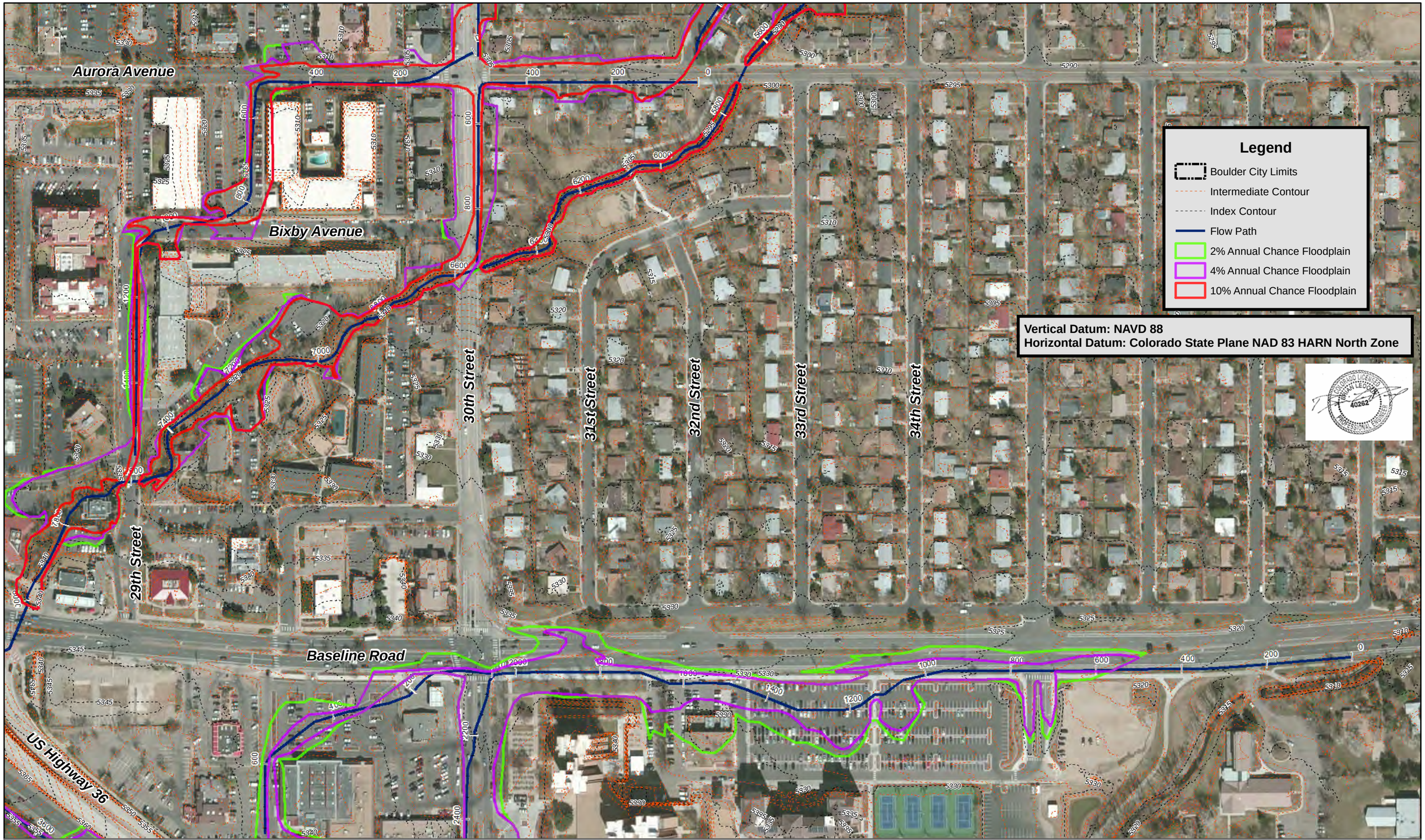
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.19: 10-, 4-, and 2-% Annual Chance Floodplain Workmap

N

200 Feet



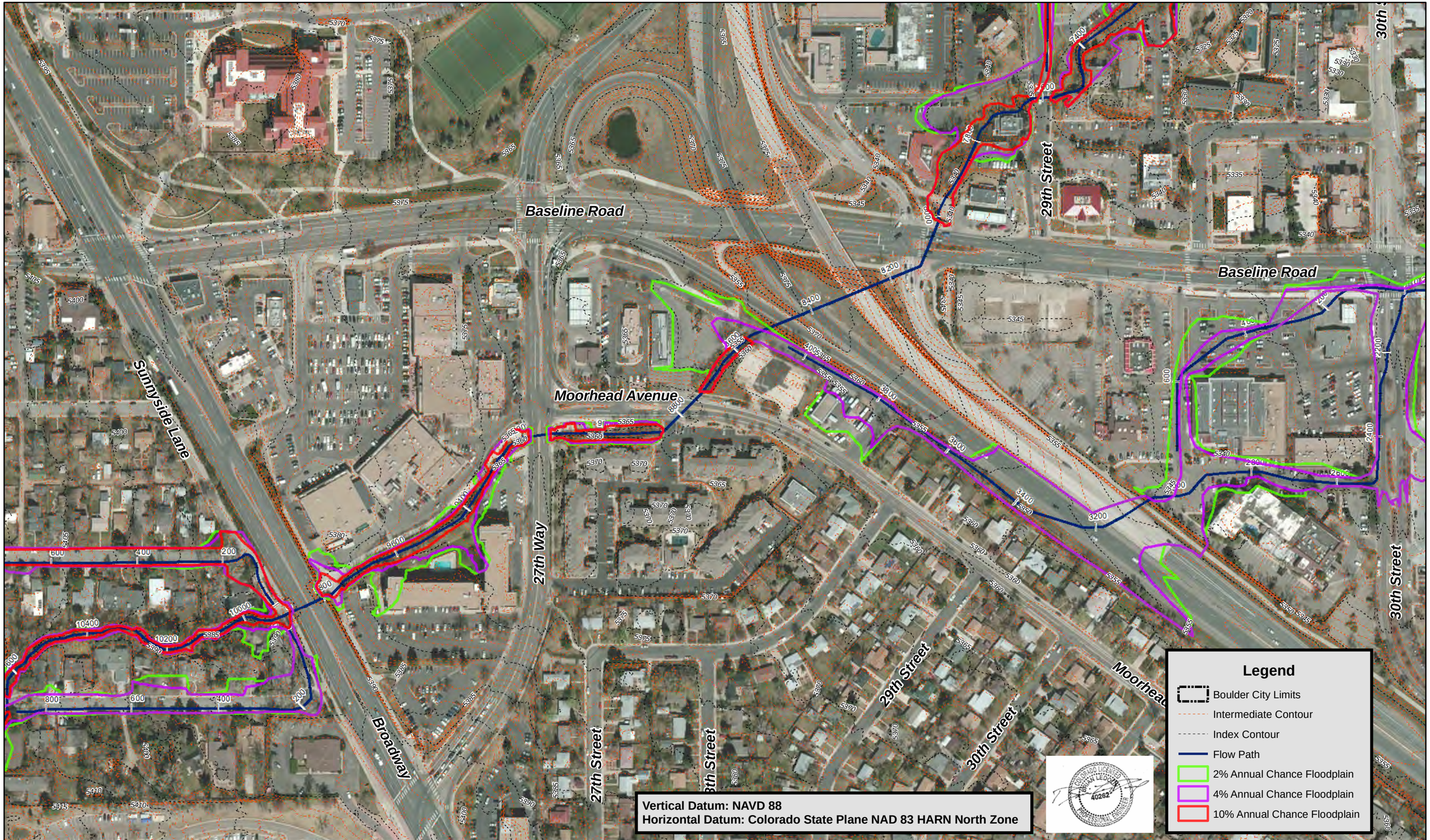
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.20: 10-, 4-, and 2-% Annual Chance Floodplain Workmap

N

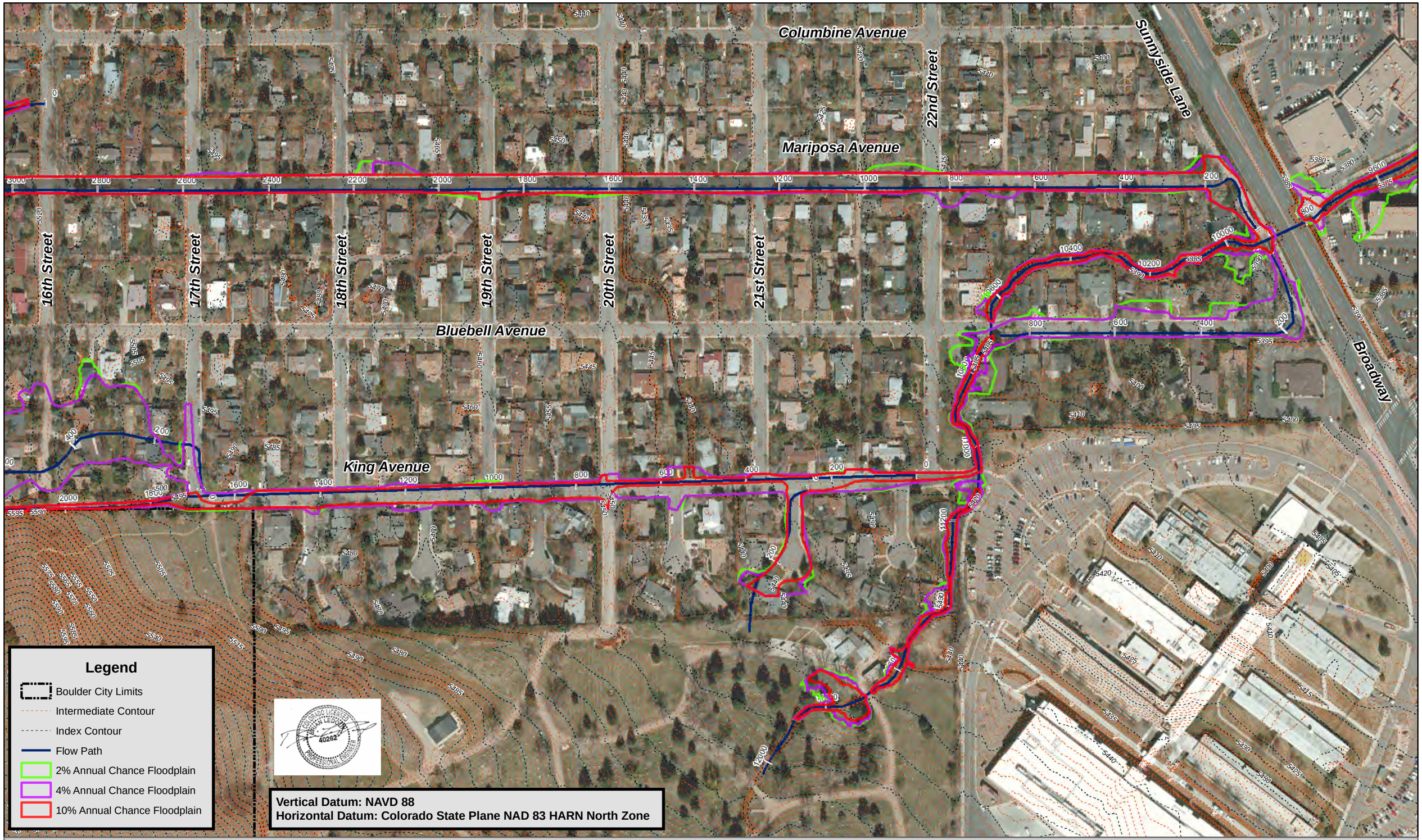
200 Feet



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.21: 10-, 4-, and 2-% Annual Chance Floodplain Workmap



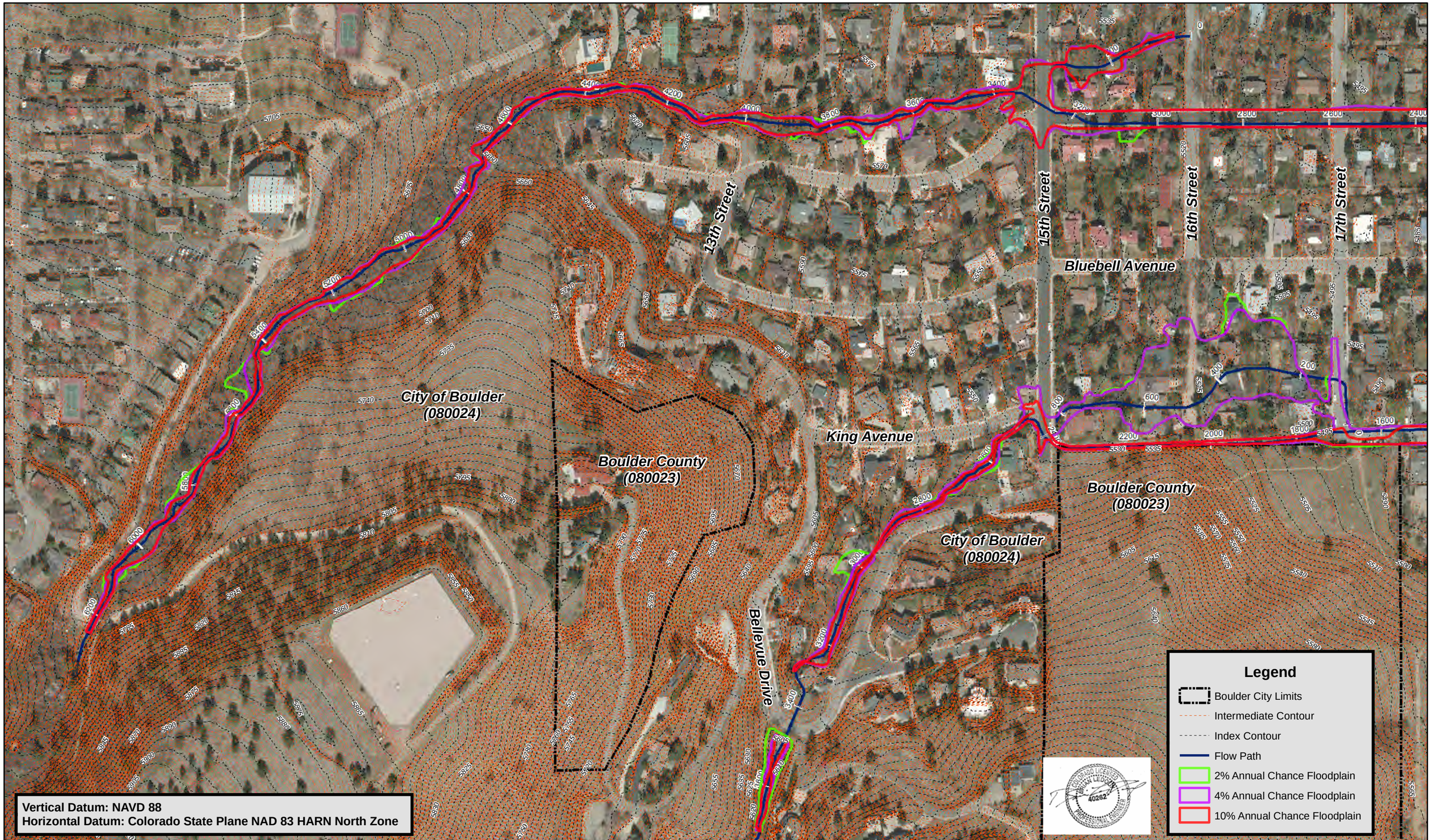
ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure F.22: 10-, 4-, and 2-% Annual Chance Floodplain Workmap

N

200 Feet



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure F.23: 10-, 4-, and 2-% Annual Chance Floodplain Workmap

Appendix G –
DLOMC Agreement Tables and Checklist

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Skunk Creek	25.0	**25**	0	0	0%	0	0	0%	271	n/a	***n/a***	80	n/a	***n/a***	Within Bear Canyon Creek >> OK
	109.0	**109**	84	84	0%	84	84	0%	333	n/a	***n/a***	42	n/a	***n/a***	Within Bear Canyon Creek >> OK
	286.0	**286**	177	177	0%	261	261	0%	361	n/a	***n/a***	135	n/a	***n/a***	Within Bear Canyon Creek >> OK
	378.0	**378**	92	92	0%	353	353	0%	172	172	0	148	149	1	
	480.0	**480**	102	102	0%	455	455	0%	158	154	4	120	138	18	
	579.0	**579**	99	99	0%	554	554	0%	120	120	0	110	114	4	
	680.0	**680**	101	101	0%	655	655	0%	136	126	10	110	122	12	
	779.0	**779**	99	99	0%	754	754	0%	154	154	0	110	123	13	
	875.0	**875**	96	96	0%	850	850	0%	152	157	5	80	83	3	
	975.0	**975**	100	100	0%	950	950	0%	120	120	0	80	83	3	
	1073.0	**1073**	98	98	0%	1048	1048	0%	116	114	2	80	81	1	
	1173.0	**1173**	100	100	0%	1148	1148	0%	123	118	5	80	81	1	
	1273.0	**1273**	100	100	0%	1248	1248	0%	128	127	1	70	71	1	
	1373.0	**1373**	100	100	0%	1348	1348	0%	161	141	20	80	82	2	
	1473.0	**1473**	100	100	0%	1448	1448	0%	147	146	1	90	89	1	
	1572.0	**1572**	99	99	0%	1547	1547	0%	146	146	0	80	82	2	
	1675.0	**1675**	103	103	0%	1650	1650	0%	163	161	2	90	91	1	
	1802.0	**1802**	127	127	0%	1777	1777	0%	155	158	3	75	75	0	
	1918.0	**1918**	116	116	0%	1893	1893	0%	162	162	0	95	96	1	
	1982.0	**1982**	64	64	0%	1957	1957	0%	152	153	1	70	72	2	
	2034.0	**2034**	52	52	0%	2009	2009	0%	133	134	1	95	95	0	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Skunk Creek	2084.0	**2084**	50	50	0%	2059	2059	0%	125	125	0	90	90	0	
	2184.0	**2184**	100	100	0%	2159	2159	0%	112	112	0	80	81	1	
	2280.0	**2280**	96	96	0%	2255	2255	0%	111	112	1	80	80	0	
	2342.0	**2342**	62	62	0%	2317	2317	0%	117	119	2	70	73	3	
	2388.0	**2388**	46	46	0%	2363	2363	0%	107	106	1	75	75	0	
	2445.0	**2445**	57	57	0%	2420	2420	0%	51	50	1	45	47	2	
	2541.0	**2541**	96	96	0%	2516	2516	0%	50	51	1	45	45	0	
	2560.0	**2560**	19	19	0%	2535	2535	0%	74	76	2	50	51	1	
	2591.0	**2591**	31	31	0%	2566	2566	0%	109	110	1	50	50	0	
	2638.0	**2638**	47	47	0%	2613	2613	0%	101	103	2	50	50	0	
	2688.0	**2688**	50	50	0%	2663	2663	0%	120	120	0	70	68	2	
	2740.0	**2740**	52	52	0%	2715	2715	0%	120	121	1	70	70	0	
	2794.0	**2794**	54	54	0%	2769	2769	0%	167	140	***27***	76	75	1	26' wide island shown >> OK
	2906.0	**2906**	112	112	0%	2881	2881	0%	155	156	1	105	106	1	
	3022.0	**3022**	116	116	0%	2997	2997	0%	97	97	0	85	85	0	
	3126.0	**3126**	104	104	0%	3101	3101	0%	111	111	0	65	66	1	
	3234.0	**3234**	108	108	0%	3209	3209	0%	111	111	0	70	71	1	
	3336.0	**3336**	102	102	0%	3311	3311	0%	77	78	1	50	50	0	
	3385.0	**3385**	49	49	0%	3360	3360	0%	65	65	0	45	44	1	
	3428.0	**3428**	43	43	0%	3403	3403	0%	35	35	0	28	30	2	
	3629.0	**3629**	201	201	0%	3604	3604	0%	34	34	0	28	29	1	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Skunk Creek	3722.0	**3722**	93	93	0%	3697	3697	0%	132	105	***27***	40	40	0	berm shown out >> OK
	3812.0	**3812**	90	90	0%	3787	3787	0%	103	102	1	60	60	0	
	3882.0	**3882**	70	70	0%	3857	3857	0%	89	88	1	60	61	1	
	3940.0	**3940**	58	58	0%	3915	3915	0%	139	137	2	70	69	1	
	4009.0	**4009**	69	69	0%	3984	3984	0%	252	296	***44***	95	97	2	island shown >> OK
	4139.0	**4139**	130	130	0%	4114	4114	0%	434	192	***242***	85	85	0	island shown >> OK
	4252.0	**4252**	113	113	0%	4227	4227	0%	505	316	***189***	40	42	2	island shown >> OK
	4364.0	**4364**	112	112	0%	4339	4339	0%	522	532	10	55	57	2	
	4448.0	**4448**	84	84	0%	4423	4423	0%	199	227	***28***	65	65	0	building issue >> OK
	4489.0	**4489**	41	41	0%	4464	4464	0%	248	273	25	50	47	3	
	4511.0	**4511**	22	22	0%	4486	4486	0%	348	363	15	35	39	4	
	4594.0	**4594**	83	83	0%	4569	4569	0%	493	447	***46***	103	179	***76***	island and building issue >> OK
	4662.0	**4662**	68	68	0%	4637	4637	0%	415	430	15	84	170	***86***	island and building issue >> OK
	4748.0	**4748**	86	86	0%	4723	4723	0%	533	607	***74***	130	130	0	u/s spill and building issue >> OK
	4848.0	**4848**	100	100	0%	4823	4823	0%	392	453	***61***	70	71	1	building issue >> OK
	4911.0	**4911**	63	63	0%	4886	4886	0%	343	349	6	77	75	2	
	4999.0	**4999**	88	88	0%	4974	4974	0%	53	202	***149***	30	33	3	spill from upstream >> OK
	5039.0	**5039**	40	40	0%	5014	5014	0%	262	260	2	60	83	23	
	5099.0	**5099**	60	60	0%	5074	5074	0%	272	278	6	66	61	5	
	5190.0	**5190**	91	91	0%	5165	5165	0%	230	240	10	28	29	1	
	5285.0	**5285**	95	95	0%	5260	5260	0%	197	214	17	90	88	2	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Skunk Creek	5380.0	**5380**	95	95	0%	5355	5355	0%	137	141	4	50	51	1	
	5469.0	**5469**	89	89	0%	5444	5444	0%	87	87	0	31	30	1	
	5536.0	**5536**	67	67	0%	5511	5511	0%	45	46	1	15	17	2	
	5602.0	**5602**	66	66	0%	5577	5577	0%	28	27	1	20	21	1	
	5656.0	**5656**	54	54	0%	5631	5631	0%	23	23	0	15	17	2	
	5737.0	**5737**	81	81	0%	5712	5712	0%	73	109	***37***	28	50	22	confluence with split >> OK
	5788.0	**5788**	51	51	0%	5763	5763	0%	30	29	1	30	29	1	
	5845.0	**5845**	57	57	0%	5820	5820	0%	32	31	1	32	31	1	
	5935.0	**5935**	90	90	0%	5910	5910	0%	27	27	0	27	27	0	
	6023.0	**6023**	88	88	0%	5998	5998	0%	144	151	7	27	28	1	
	6060.0	**6060**	37	37	0%	6035	6035	0%	160	162	2	32	28	4	
	6087.0	**6087**	27	27	0%	6062	6062	0%	168	180	12	17	18	1	
	6158.0	**6158**	71	71	0%	6133	6133	0%	188	198	10	25	26	1	
	6254.0	**6254**	96	96	0%	6229	6229	0%	32	32	0	32	32	0	
	6330.0	**6330**	76	76	0%	6305	6305	0%	20	20	0	20	20	0	
	6423.0	**6423**	93	93	0%	6398	6398	0%	29	29	0	29	29	0	
	6479.0	**6479**	56	56	0%	6454	6454	0%	24	26	2	24	24	0	
	6532.0	**6532**	53	53	0%	6507	6507	0%	20	25	5	14	14	0	
	6605.0	**6605**	73	73	0%	6580	6580	0%	90	89	1	65	63	2	
	6636.0	**6636**	31	31	0%	6611	6611	0%	53	68	15	30	31	1	
	6666.0	**6666**	30	30	0%	6641	6641	0%	58	61	3	25	25	0	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Skunk Creek	6685.0	**6685**	19	19	0%	6660	6660	0%	71	66	5	35	37	2	
	6704.0	**6704**	19	19	0%	6679	6679	0%	88	81	7	55	54	1	
	6719.0	**6719**	15	15	0%	6694	6694	0%	61	52	9	41	42	1	
	6781.0	**6781**	62	62	0%	6756	6756	0%	56	34	22	34	34	0	
	6889.0	**6889**	108	108	0%	6864	6864	0%	53	101	***48***	50	50	0	spill from upstream shown >> OK
	6958.0	**6958**	69	69	0%	6933	6933	0%	56	192	***136***	41	42	1	spill from upstream shown >> OK
	7040.0	**7040**	82	82	0%	7015	7015	0%	166	163	3	99	96	3	
	7118.0	**7118**	78	78	0%	7093	7093	0%	107	116	9	45	46	1	
	7189.0	**7189**	71	71	0%	7164	7164	0%	133	142	9	65	66	1	
	7216.0	**7216**	27	27	0%	7191	7191	0%	145	159	14	70	71	1	
	7240.0	**7240**	24	24	0%	7215	7215	0%	195	194	1	85	83	2	
	7259.0	**7259**	19	19	0%	7234	7234	0%	185	184	1	70	72	2	
	7318.0	**7318**	59	59	0%	7293	7293	0%	86	85	1	50	50	0	
	7416.0	**7416**	98	98	0%	7391	7391	0%	72	93	21	35	36	1	
	7478.0	**7478**	62	62	0%	7453	7453	0%	52	193	***141***	38	38	0	spill from upstream shown >> OK
	7566.0	**7566**	88	88	0%	7541	7541	0%	64	110	***46***	17	19	2	spill from upstream shown >> OK
	7622.0	**7622**	56	56	0%	7597	7597	0%	99	98	1	91	88	3	
	7639.0	**7639**	17	17	0%	7614	7614	0%	92	94	2	58	89	***31***	island not shown >> OK
	7651.0	**7651**	12	12	0%	7626	7626	0%	115	117	2	61	93	***32***	island not shown >> OK
	7705.0	**7705**	54	54	0%	7680	7680	0%	208	204	4	77	85	8	
	7839.0	**7839**	134	134	0%	7814	7814	0%	243	255	12	135	175	***40***	island and building issue >> OK
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Skunk Creek	7890.0	**7890**	51	51	0%	7865	7865	0%	230	228	2	116	228	***112***	building issue >> OK
	7934.0	**7934**	44	44	0%	7909	7909	0%	248	215	***33***	27	28	1	left overbank area not shown >> OK
	7984.0	**7984**	50	50	0%	7959	7959	0%	111	110	1	35	35	0	
	7989.0	**7989**	5	5	0%	7964	7964	0%	102	103	1	35	35	0	
	7996.0	**7996**	7	7	0%	7971	7971	0%	94	74	20	29	31	2	
	8576.0	**8576**	580	580	0%	8551	8551	0%	305	307	2	31	34	3	
	8654.0	**8654**	78	78	0%	8629	8629	0%	165	211	***46***	70	70	0	building issue >> OK
	8713.0	**8713**	59	59	0%	8688	8688	0%	37	36	1	37	35	2	
	8873.0	**8873**	160	160	0%	8848	8848	0%	127	126	1	82	82	0	right of high point shown as Zone X >> OK
	8937.0	**8937**	64	64	0%	8912	8912	0%	70	66	4	57	56	1	
	9001.0	**9001**	64	64	0%	8976	8976	0%	62	36	***26***	37	36	1	gutter lines shown as Zone X >> OK
	9041.0	**9041**	40	40	0%	9016	9016	0%	66	52	14	54	52	2	
	9076.0	**9076**	35	35	0%	9051	9051	0%	89	56	***33***	58	56	2	gutter lines shown as Zone X >> OK
	9109.0	**9109**	33	33	0%	9084	9084	0%	71	28	***43***	26	26	0	left of high point shown as Zone X >> OK
	9194.0	**9194**	85	85	0%	9169	9169	0%	52	53	1	30	31	1	
	9234.0	**9234**	40	40	0%	9209	9209	0%	62	61	1	43	43	0	
	9246.0	**9246**	12	12	0%	9221	9221	0%	55	56	1	36	37	1	
	9270.0	**9270**	24	24	0%	9245	9245	0%	82	84	2	37	38	1	
	9304.0	**9304**	34	34	0%	9279	9279	0%	109	110	1	109	106	3	
	9444.0	**9444**	140	140	0%	9419	9419	0%	166	173	7	74	77	3	
	9586.0	**9586**	142	142	0%	9561	9561	0%	89	89	0	54	54	0	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Skunk Creek	9710.0	**9710**	124	124	0%	9685	9685	0%	202	118	***84***	76	73	3	high point is shown >> OK
	9780.0	**9780**	70	70	0%	9755	9755	0%	164	162	2	38	45	7	
	9794.0	**9794**	14	14	0%	9769	9769	0%	69	65	4	24	35	11	
	9894.0	**9894**	100	100	0%	9869	9869	0%	54	92	***38***	22	25	3	confluence area with Bluebell >> OK
	9943.0	**9943**	49	49	0%	9918	9918	0%	124	164	***40***	30	33	3	confluence area with Bluebell >> OK
	9997.0	**9997**	54	54	0%	9972	9972	0%	90	171	***81***	30	31	1	building issue >> OK
	10073.0	**10073**	76	76	0%	10048	10048	0%	31	31	0	31	31	0	
	10168.0	**10168**	95	95	0%	10143	10143	0%	20	19	1	20	19	1	
	10238.0	**10238**	70	70	0%	10213	10213	0%	19	20	1	19	20	1	
	10317.0	**10317**	79	79	0%	10292	10292	0%	16	16	0	16	16	0	
	10421.0	**10421**	104	104	0%	10396	10396	0%	31	30	1	31	30	1	
	10488.0	**10488**	67	67	0%	10463	10463	0%	24	24	0	24	24	0	
	10560.0	**10560**	72	72	0%	10535	10535	0%	23	24	1	23	21	2	
	10616.0	**10616**	56	56	0%	10591	10591	0%	42	48	6	25	25	0	
	10655.0	**10655**	39	39	0%	10630	10630	0%	24	32	8	18	19	1	
	10722.0	**10722**	67	67	0%	10697	10697	0%	127	106	21	45	44	1	
	10745.0	**10745**	23	23	0%	10720	10720	0%	89	93	4	25	27	2	
	10778.0	**10778**	33	33	0%	10753	10753	0%	74	116	***42***	46	45	1	building issue >> OK
	10826.0	**10826**	48	48	0%	10801	10801	0%	72	72	0	24	24	0	
	10873.0	**10873**	47	47	0%	10848	10848	0%	26	30	4	25	26	1	
	10910.0	**10910**	37	37	0%	10885	10885	0%	66	65	1	30	30	0	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Skunk Creek	10981.0	**10981**	71	71	0%	10956	10956	0%	19	19	0	19	19	0	
	11049.0	**11049**	68	68	0%	11024	11024	0%	26	25	1	9	10	1	
	11110.0	**11110**	61	61	0%	11085	11085	0%	65	61	4	35	36	1	
	11185.0	**11185**	75	75	0%	11160	11160	0%	17	18	1	17	18	1	
	11272.0	**11272**	87	87	0%	11247	11247	0%	35	35	0	12	12	0	
	11364.0	**11364**	92	92	0%	11339	11339	0%	17	42	***25***	10	10	0	building issue >> OK
	11457.0	**11457**	93	93	0%	11432	11432	0%	125	37	***88***	21	19	2	right overbank area shown as Zone X >> OK
	11524.0	**11524**	67	67	0%	11499	11499	0%	13	13	0	13	13	0	
	11613.0	**11613**	89	89	0%	11588	11588	0%	73	73	0	21	22	1	
	11673.0	**11673**	60	60	0%	11648	11648	0%	12	13	1	12	13	1	
	11713.0	**11713**	40	40	0%	11688	11688	0%	173	168	5	40	38	2	
Skunk Creek Echo Pl. Split	76.0	**76**	0	0	0%	0	0	0%	45	43	2	25	26	1	
	167.0	**167**	91	91	0%	91	91	0%	67	63	4	63	63	0	
	219.0	**219**	52	52	0%	143	143	0%	89	125	***36***	22	53	***31***	building issue >> OK
	289.0	**289**	70	70	0%	213	213	0%	51	55	4	37	24	13	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Blue Avenue Split Flow	88.0	**88**	0	0	0%	0	0	0%	89	95	6	50	50	0	
	185.0	**185**	97	97	0%	97	97	0%	101	111	10	50	52	2	
	251.0	**251**	66	66	0%	163	163	0%	79	88	9	30	30	0	
	364.0	**364**	113	113	0%	276	276	0%	79	86	7	30	30	0	
	474.0	**474**	110	110	0%	386	386	0%	89	93	4	30	30	0	
	564.0	**564**	90	90	0%	476	476	0%	79	89	10	28	29	1	
	655.0	**655**	91	91	0%	567	567	0%	54	53	1	28	29	1	
	748.0	**748**	93	93	0%	660	660	0%	86	88	2	28	27	1	
	818.0	**818**	70	70	0%	730	730	0%	82	74	8	28	27	1	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Bear Creek Split Flow	276.0	**276**	0	0	0%	0	0	0%	177	n/a	***n/a***	30	30	0	Within Bear Canyon Creek >> OK
	444.0	**444**	168	168	0%	168	168	0%	96	n/a	***n/a***	30	31	1	Within Bear Canyon Creek >> OK
	610.0	**610**	166	166	0%	334	334	0%	165	73	***92***	40	42	2	left overbank shown as Zone X, confluence >> OK
	740.0	**740**	130	130	0%	464	464	0%	102	104	2	30	32	2	
	965.0	**965**	225	225	0%	689	689	0%	116	118	2	25	25	0	
	1135.0	**1135**	170	170	0%	859	859	0%	215	166	***49***	90	89	1	island shown >> OK
	1354.0	**1354**	219	219	0%	1078	1078	0%	220	194	***26***	65	65	0	right overbank shown as Zone X >> OK
	1577.0	**1577**	223	223	0%	1301	1301	0%	167	201	***34***	64	63	1	building issue >> OK
	1838.0	**1838**	261	261	0%	1562	1562	0%	162	163	1	25	25	0	
	2046.0	**2046**	208	208	0%	1770	1770	0%	130	132	2	40	43	3	
	2276.0	**2276**	230	230	0%	2000	2000	0%	125	123	2	40	41	1	
	2446.0	**2446**	170	170	0%	2170	2170	0%	148	150	2	40	41	1	
	2637.0	**2637**	191	191	0%	2361	2361	0%	73	93	20	20	19	1	
	2787.0	**2787**	150	150	0%	2511	2511	0%	65	99	***34***	35	36	1	building issue >> OK
	2972.0	**2972**	185	185	0%	2696	2696	0%	167	168	1	50	51	1	
	3053.0	**3053**	81	81	0%	2777	2777	0%	218	222	4	105	103	2	
	3174.0	**3174**	121	121	0%	2898	2898	0%	232	405	***173***	105	108	3	orientation and jersey barrier issue >> OK
	3352.0	**3352**	178	178	0%	3076	3076	0%	104	105	1	75	75	0	
	3574.0	**3574**	222	222	0%	3298	3298	0%	28	30	2	28	30	2	
	3824.0	**3824**	250	250	0%	3548	3548	0%	207	205	2	50	51	1	
	4014.0	**4014**	190	190	0%	3738	3738	0%	37	40	3	37	37	0	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
29th Street Split Flow	94.0	**94**	0	0	0%	0	0	0%	56	55	1	38	36	2	
	245.0	**245**	151	151	0%	151	151	0%	67	67	0	38	40	2	
	397.0	**397**	152	152	0%	303	303	0%	106	106	0	38	38	0	
	529.0	**529**	132	132	0%	435	435	0%	101	99	2	15	16	1	
	585.0	**585**	56	56	0%	491	491	0%	54	61	7	25	24	1	
	744.0	**744**	159	159	0%	650	650	0%	57	73	16	25	25	0	
	897.0	**897**	153	153	0%	803	803	0%	112	70	***42***	45	54	9	left overbank shown as Zone X >> OK
	964.0	**964**	67	67	0%	870	870	0%	70	53	17	15	17	2	
	1070.0	**1070**	106	106	0%	976	976	0%	80	87	7	22	27	5	
	1197.0	**1197**	127	127	0%	1103	1103	0%	70	50	20	20	20	0	
	1304.0	**1304**	107	107	0%	1210	1210	0%	82	80	2	30	30	0	
	1456.0	**1456**	152	152	0%	1362	1362	0%	49	49	0	20	21	1	
	1539.0	**1539**	83	83	0%	1445	1445	0%	45	45	0	15	15	0	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
30th Street Split Flow	68.0	**68**	0	0	0%	0	0	0%	89	98	9	37	38	1	
	226.0	**226**	158	158	0%	158	158	0%	85	107	22	38	39	1	
	373.0	**373**	147	147	0%	305	305	0%	84	109	***25***	38	39	1	spill from Arrowood Park >> OK
	471.0	**471**	98	98	0%	403	403	0%	70	72	2	37	38	1	
	556.0	**556**	85	85	0%	488	488	0%	95	104	9	48	48	0	
	643.0	**643**	87	87	0%	575	575	0%	99	105	6	49	50	1	
	758.0	**758**	115	115	0%	690	690	0%	92	97	5	45	46	1	
	875.0	**875**	117	117	0%	807	807	0%	97	88	9	47	46	1	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Euclid St. Split Flow	76.0	**76**	0	0	0%	0	0	0%	99	113	14	40	41	1	
	129.0	**129**	53	53	0%	53	53	0%	103	120	17	40	41	1	
	224.0	**224**	95	95	0%	148	148	0%	99	112	13	40	41	1	
	308.0	**308**	84	84	0%	232	232	0%	85	91	6	44	45	1	
	422.0	**422**	114	114	0%	346	346	0%	92	96	4	40	41	1	
	502.0	**502**	80	80	0%	426	426	0%	76	75	1	30	31	1	
	593.0	**593**	91	91	0%	517	517	0%	48	50	2	30	31	1	
	698.0	**698**	105	105	0%	622	622	0%	51	49	2	30	31	1	
	801.0	**801**	103	103	0%	725	725	0%	55	57	2	28	30	2	
	934.0	**934**	133	133	0%	858	858	0%	49	51	2	28	29	1	
	1036.0	**1036**	102	102	0%	960	960	0%	50	52	2	32	33	1	
	1124.0	**1124**	88	88	0%	1048	1048	0%	105	93	12	78	77	1	
	1193.0	**1193**	69	69	0%	1117	1117	0%	61	61	0	46	46	0	
	1311.0	**1311**	118	118	0%	1235	1235	0%	60	60	0	49	48	1	
	1445.0	**1445**	134	134	0%	1369	1369	0%	94	99	5	54	54	0	
	1563.0	**1563**	118	118	0%	1487	1487	0%	77	76	1	56	56	0	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Denton Ave Split Flow	41.0	**41**	0	0	0%	0	0	0%	77	77	0	30	33	3	
	75.0	**75**	34	34	0%	34	34	0%	61	59	2	29	31	2	
	179.0	**179**	104	104	0%	138	138	0%	57	57	0	32	32	0	
	283.0	**283**	104	104	0%	242	242	0%	57	58	1	32	33	1	
	414.0	**414**	131	131	0%	373	373	0%	67	67	0	30	30	0	
	534.0	**534**	120	120	0%	493	493	0%	65	67	2	30	28	2	
Quinn St Split Flow	41.0	**41**	0	0	0%	0	0	0%	90	88	2	40	41	1	
	109.0	**109**	68	68	0%	68	68	0%	93	104	11	45	44	1	
	195.0	**195**	86	86	0%	154	154	0%	92	100	8	40	40	0	
	278.0	**278**	83	83	0%	237	237	0%	76	77	1	40	40	0	
	406.0	**406**	128	128	0%	365	365	0%	66	67	1	33	34	1	
	488.0	**488**	82	82	0%	447	447	0%	77	78	1	33	33	0	
35th St Split Flow	43.0	**43**	0	0	0%	0	0	0%	89	103	14	38	37	1	
	165.0	**165**	122	122	0%	122	122	0%	95	81	14	44	44	0	
	240.0	**240**	75	75	0%	197	197	0%	97	92	5	38	39	1	
	346.0	**346**	106	106	0%	303	303	0%	60	51	9	38	39	1	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Apartment Split Flow	20.0	**20**	0	0	0%	0	0	0%	45	43	2	18	20	2	
	99.0	**99**	79	79	0%	79	79	0%	54	73	19	19	20	1	
	237.0	**237**	138	138	0%	217	217	0%	76	92	16	27	26	1	
Bluebell Canyon Creek	122.0	**122**	0	0	0%	0	0	0%	72	80	8	20	21	1	
	219.0	**219**	97	97	0%	97	97	0%	77	82	5	28	27	1	
	289.0	**289**	70	70	0%	167	167	0%	55	55	0	28	27	1	
	367.0	**367**	78	78	0%	245	245	0%	59	60	1	28	28	0	
	481.0	**481**	114	114	0%	359	359	0%	90	90	0	30	31	1	
	599.0	**599**	118	118	0%	477	477	0%	69	69	0	28	28	0	
	732.0	**732**	133	133	0%	610	610	0%	54	55	1	28	28	0	
	799.0	**799**	67	67	0%	677	677	0%	80	79	1	28	28	0	
	915.0	**915**	116	116	0%	793	793	0%	72	77	5	30	30	0	
	1053.0	**1053**	138	138	0%	931	931	0%	59	58	1	30	30	0	
	1194.0	**1194**	141	141	0%	1072	1072	0%	59	59	0	28	29	1	
	1280.0	**1280**	86	86	0%	1158	1158	0%	55	57	2	28	28	0	
	1413.0	**1413**	133	133	0%	1291	1291	0%	69	71	2	27	28	1	
	1536.0	**1536**	123	123	0%	1414	1414	0%	42	44	2	29	31	2	
	1651.0	**1651**	115	115	0%	1529	1529	0%	67	69	2	28	29	1	
	1764.0	**1764**	113	113	0%	1642	1642	0%	59	56	3	30	30	0	
	1839.0	**1839**	75	75	0%	1717	1717	0%	47	47	0	28	28	0	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Bluebell Canyon Creek	1926.0	**1926**	87	87	0%	1804	1804	0%	88	86	2	25	26	1	
	2039.0	**2039**	113	113	0%	1917	1917	0%	74	75	1	28	28	0	
	2182.0	**2182**	143	143	0%	2060	2060	0%	82	79	3	28	28	0	
	2284.0	**2284**	102	102	0%	2162	2162	0%	43	44	1	28	28	0	
	2415.0	**2415**	131	131	0%	2293	2293	0%	57	57	0	28	29	1	
	2533.0	**2533**	118	118	0%	2411	2411	0%	63	62	1	27	29	2	
	2623.0	**2623**	90	90	0%	2501	2501	0%	39	39	0	29	29	0	
	2764.0	**2764**	141	141	0%	2642	2642	0%	42	43	1	27	28	1	
	2864.0	**2864**	100	100	0%	2742	2742	0%	56	41	15	28	27	1	
	2972.0	**2972**	108	108	0%	2850	2850	0%	42	42	0	28	29	1	
	3070.0	**3070**	98	98	0%	2948	2948	0%	68	74	6	29	29	0	
	3215.0	**3215**	145	145	0%	3093	3093	0%	56	57	1	30	30	0	
	3283.0	**3283**	68	68	0%	3161	3161	0%	213	215	2	50	50	0	
	3360.0	**3360**	77	77	0%	3238	3238	0%	202	183	19	30	32	2	
	3480.0	**3480**	120	120	0%	3358	3358	0%	37	36	1	19	20	1	
	3599.0	**3599**	119	119	0%	3477	3477	0%	49	48	1	15	16	1	
	3709.0	**3709**	110	110	0%	3587	3587	0%	46	66	20	22	21	1	
	3809.0	**3809**	100	100	0%	3687	3687	0%	34	36	2	11	12	1	
	3929.0	**3929**	120	120	0%	3807	3807	0%	43	43	0	28	28	0	
	4054.0	**4054**	125	125	0%	3932	3932	0%	17	17	0	10	11	1	
	4197.0	**4197**	143	143	0%	4075	4075	0%	24	24	1	17	17	0	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Bluebell Canyon Creek	4278.0	**4278**	81	81	0%	4156	4156	0%	22	22	0	10	12	2	
	4422.0	**4422**	144	144	0%	4300	4300	0%	20	19	1	20	19	1	
	4538.0	**4538**	116	116	0%	4416	4416	0%	31	30	1	14	15	1	
	4671.0	**4671**	133	133	0%	4549	4549	0%	29	30	1	29	30	1	
	4720.0	**4720**	49	49	0%	4598	4598	0%	50	37	13	20	19	1	
	4745.0	**4745**	25	25	0%	4623	4623	0%	55	35	20	31	31	0	
	4793.0	**4793**	48	48	0%	4671	4671	0%	35	38	3	12	13	1	
	4910.0	**4910**	117	117	0%	4788	4788	0%	38	30	8	18	19	1	
	5080.0	**5080**	170	170	0%	4958	4958	0%	54	55	1	12	13	1	
	5136.0	**5136**	56	56	0%	5014	5014	0%	53	57	4	37	36	1	
	5157.0	**5157**	21	21	0%	5035	5035	0%	52	56	4	38	39	1	
	5194.0	**5194**	37	37	0%	5072	5072	0%	46	49	3	21	23	2	
	5322.0	**5322**	128	128	0%	5200	5200	0%	25	25	0	25	24	1	
	5445.0	**5445**	123	123	0%	5323	5323	0%	29	33	4	16	33	17	
	5481.0	**5481**	36	36	0%	5359	5359	0%	57	57	0	57	57	0	
	5527.0	**5527**	46	46	0%	5405	5405	0%	74	74	0	62	74	12	
	5672.0	**5672**	145	145	0%	5550	5550	0%	92	26	***66***	26	26	0	left overbank area not shown (large landmass) >> OK
	5866.0	**5866**	194	194	0%	5744	5744	0%	43	42	1	42	42	0	
	5998.0	**5998**	132	132	0%	5876	5876	0%	47	48	1	47	48	1	
	6113.0	**6113**	115	115	0%	5991	5991	0%	36	35	1	36	35	1	
	6196.0	**6196**	83	83	0%	6074	6074	0%	16	16	0	16	16	0	
	6245.0	**6245**	49	49	0%	6123	6123	0%	21	21	0	14	22	8	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
King's Gulch	82.0	**82**	0	0	0%	0	0	0%	49	48	1	20	21	1	
	215.0	**215**	133	133	0%	133	133	0%	55	55	0	20	21	1	
	311.0	**311**	96	96	0%	229	229	0%	47	46	1	15	15	0	
	435.0	**435**	124	124	0%	353	353	0%	48	49	1	14	14	0	
	561.0	**561**	126	126	0%	479	479	0%	99	101	2	12	13	1	
	665.0	**665**	104	104	0%	583	583	0%	47	47	0	11	12	1	
	771.0	**771**	106	106	0%	689	689	0%	46	48	2	30	30	0	
	873.0	**873**	102	102	0%	791	791	0%	53	52	1	32	32	0	
	981.0	**981**	108	108	0%	899	899	0%	56	65	9	31	31	0	
	1079.0	**1079**	98	98	0%	997	997	0%	51	51	0	29	29	0	
	1221.0	**1221**	142	142	0%	1139	1139	0%	71	74	3	28	29	1	
	1320.0	**1320**	99	99	0%	1238	1238	0%	52	52	0	32	32	0	
	1419.0	**1419**	99	99	0%	1337	1337	0%	59	59	0	30	30	0	
	1514.0	**1514**	95	95	0%	1432	1432	0%	48	48	0	28	29	1	
	1621.0	**1621**	107	107	0%	1539	1539	0%	60	44	16	30	30	0	
	1733.0	**1733**	112	112	0%	1651	1651	0%	63	63	0	14	15	1	
	1873.0	**1873**	140	140	0%	1791	1791	0%	13	15	2	13	15	2	
	2018.0	**2018**	145	145	0%	1936	1936	0%	12	11	1	12	11	1	
	2175.0	**2175**	157	157	0%	2093	2093	0%	12	12	0	12	12	0	
	2268.0	**2268**	93	93	0%	2186	2186	0%	12	12	0	12	12	0	
	2330.0	**2330**	62	62	0%	2248	2248	0%	13	12	1	13	12	1	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
King's Gulch	2396.0	**2396**	66	66	0%	2314	2314	0%	81	81	0	30	31	1	
	2444.0	**2444**	48	48	0%	2362	2362	0%	84	94	10	25	27	2	
	2504.0	**2504**	60	60	0%	2422	2422	0%	27	28	1	6	8	2	
	2628.0	**2628**	124	124	0%	2546	2546	0%	33	34	1	20	21	1	
	2724.0	**2724**	96	96	0%	2642	2642	0%	26	25	1	11	12	1	
	2821.0	**2821**	97	97	0%	2739	2739	0%	26	25	1	14	15	1	
	2900.0	**2900**	79	79	0%	2818	2818	0%	15	15	0	6	7	1	
	2938.0	**2938**	38	38	0%	2856	2856	0%	70	66	4	33	32	1	
	2990.0	**2990**	52	52	0%	2908	2908	0%	28	61	***33***	15	15	0	building issue >> OK
	3083.0	**3083**	93	93	0%	3001	3001	0%	26	28	2	14	14	0	
	3179.0	**3179**	96	96	0%	3097	3097	0%	28	29	1	14	14	0	
	3268.0	**3268**	89	89	0%	3186	3186	0%	11	9	2	9	9	0	
	3459.0	**3459**	191	191	0%	3377	3377	0%	67	66	1	20	21	1	
	3575.0	**3575**	116	116	0%	3493	3493	0%	33	33	0	20	19	1	
	3674.0	**3674**	99	99	0%	3592	3592	0%	16	18	2	8	9	1	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
King's Split Flow	105.0	**105**	0	0	0%	0	0	0%	67	119	***52***	67	105	***38***	spill flow across 17th shown through section >> OK
	150.0	**150**	45	45	0%	45	45	0%	308	298	10	39	52	13	
	222.0	**222**	72	72	0%	117	117	0%	216	183	***33***	30	31	1	building issue >> OK
	308.0	**308**	86	86	0%	203	203	0%	214	183	***31***	30	30	0	spill flow from upstream section shown >> OK
	416.0	**416**	108	108	0%	311	311	0%	177	175	2	28	34	6	
	523.0	**523**	107	107	0%	418	418	0%	238	239	1	26	27	1	
	597.0	**597**	74	74	0%	492	492	0%	156	200	***44***	10	10	0	building issue >> OK
	701.0	**701**	104	104	0%	596	596	0%	40	38	2	20	21	1	
	775.0	**775**	74	74	0%	670	670	0%	18	30	12	10	11	1	
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD LOMC AGREEMENT TABLE

PROJECT NAME: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

COMPANY: ICON Engineering Inc.

COMPLETED BY: Brian LeDoux

Community(ies): City of Boulder, Boulder County, Colorado

Flooding Source(s): Skunk Creek, Bluebell Canyon Creek, and King's Gulch

Date: 2016-10-12

Reference Location	Stream Station	Cross Section #	Channel Distance (ft)			Cumulative Channel Distance (ft)			Base Floodplain Width (ft)			Floodway Width (ft)			Comments
			Model	Map	% Difference	Model	Map	% Difference	Model	Map	Difference (ft)	Model	Map	Difference (ft)	
Bluebell Spur	40.0	**40**	-4157	-4157	0%	-82	-82	0%	20	19	1	20	19	1	
	102.0	**102**	62	62	0%	-20	-20	0%	67	68	1	20	20	0	
	183.0	**183**	81	81	0%	61	61	0%	76	45	***31***	20	20	0	left overbank low area not shown >> OK
	256.0	**256**	73	73	0%	134	134	0%	96	80	16	25	25	0	
	314.0	**314**	58	58	0%	192	192	0%	13	14	1	13	11	2	
Bear Bline Split	118.0	**118**	118	118	0%	118	118	0%	71	69	2	15	16	1	
	262.0	**262**	144	144	0%	262	262	0%	151	172	21	25	26	1	
	446.0	**446**	184	184	0%	446	446	0%	133	111	22	40	41	1	
	586.0	**586**	140	140	0%	586	586	0%	53	65	12	15	15	0	
	723.0	**723**	137	137	0%	723	723	0%	63	74	11	37	36	1	
Madison Split	45.0	**45**	45	45	0%	45	45	0%	70	92	22	23	23	0	
	163.0	**163**	118	118	0%	163	163	0%	81	107	***26***	25	26	1	building issue >> OK
	252.0	**252**	89	89	0%	252	252	0%	115	137	22	25	24	1	
	346.0	**346**	94	94	0%	346	346	0%	76	104	***28***	25	25	0	building issue >> OK
ACCEPTABLE TOLERANCES =			**+/- 5% of Model**			**+/- 5% of Model**			**+/- 25 Feet**						

UDFCD DLOMC SUBMITTAL CHECKLIST

PROJECT NAME:	
COMPANY:	
COMPLETED BY:	

DLOMC Submittal Item		Requirements		What Is Submitted	
Item No.	**Item**	**Digital Optional**	**Digital Required**	**Digital**	**Hard Copy**
3.1	Report Text			X	
3.2.a	Hydraulic and/or Hydrologic Models			X	
3.2.b	Hydraulic and/or Hydrologic Reports and Cross-Sections			X	
3.3	Proposed Construction Plans and/or As-Built Survey Information			X	
3.4	FEMA MT-2 Forms			X	
3.5	NFIP Regulation Requirements/Notifications			X	
3.6	Floodplain Workmaps			X	
3.7	Annotated FIRM Panels			X	
3.8.a	Comparison Tables				
3.8.b	Comparison Profile			X	
3.9	Annotated Floodway Data Table			X	
3.10	Agreement Checklists			X	
3.11	Other Items			X	
3.12	CD/DVD Media			X	

Appendix H –
Correspondence / NFIP Section 65.12 Information

The City of Boulder Public Works – Utilities Department, and Boulder County, in accordance with National Flood Insurance Program regulation 65.7(b)(1), hereby gives notice of the City's intent to revise the flood hazard information, generally located between the western City Limits, Boulder Creek on the north, Foothills Parkway on the east, and Dartmouth Avenue on the south. Specifically, the flood hazard information shall be revised along Skunk Creek from the confluence with Bear Canyon Creek to the Green Mountain Cemetery, and along Bluebell Canyon Creek from Skunk Creek to the Enchanted Mesa Trail, and along King's Gulch from Skunk Creek to Belleview Drive.

As a result of the revision, the floodway shall widen and narrow, the 1% annual chance water-surface elevations shall increase and decrease, and the 1% annual chance floodplain shall widen and narrow within the area of revision.

Maps and detailed analysis of the revision can be reviewed at the City of Boulder Public Works – Utilities office at 1739 Broadway, 2nd Floor, Boulder Colorado 80302. Interested persons may call Katie Knapp at 303-441-4077 for additional information.

Figure TBD.
SAMPLE PUBLIC NOTIFICATION FOR FLOOD HAZARD REVISIONS
(to be used by community when placing a notice in a newspaper)

ICONENGINEERING, INC.
7000 S. Yosemite Street, Suite 120, Centennial, CO 80112
303.221.0802 | www.iconeng.com

April 27, 2016

Ms. Katie Knapp, P.E.
Engineering Project Manager
Department of Public Works / Utilities Division
1739 Broadway, 2nd Floor
Boulder, Colorado 80302

RE: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & Physical Map Revision (PMR)

Dear Ms. Knapp,

This letter provides responses to the comments provided by the Urban Drainage and Flood Control District (UDFCD) as part of their peer review regarding the Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update and Physical Map Revision (PMR) report dated March 2, 2016. A revised Floodplain Mapping Update and Physical Map Revision report will be provided under separate cover.

1. **Include versions (CUHP, FLO-2D, EPA SWMM)**
   The report text has been revised to include the appropriate software version information including:
   CUHP 1.4.4.2
   FLO-2D Build No. 15.07.12
   EPA SWMM 5.0.022

2. **Reference to project interactive website.**
   Please note that the interactive website address has slightly changed. The revised address is: **http://iconengineering.github.io/boulder/sbk-map/**

3. **Text revision for Table 2.1 description.**
   Text has been revised.

4. **Include versions (CUHP, FLO-2D, EPA SWMM)**
   The report text has been revised to include the appropriate software version information including:
   CUHP 1.4.4.2
   FLO-2D Build No. 15.07.12
   EPA SWMM 5.0.022

5. **Please include the overall average basin imperviousness used and compare to the average used in the FHAD.**
   The overall average basin imperviousness has been provided along with a comparison to the basin average used in the FHAD.
   This study = 26%
   FHAD = 25%

6. **There are several subbasins with a shape factor greater than 4. Please compare the cfs/acre from those subbasins with other subbasins that have a similar percent impervious to verify the flow isn't underreporting.**
   The basins with a shape factor of greater than 4 include:
   BC_02 (storm sewer contribution, pipe capacity limited)
   BC_03 (storm sewer contribution, pipe capacity limited)
   BL_01 (**revised**, see below)
   BL_02 (matches FHAD basin, upstream limit of basin, low impervious)
   CU_01 (does not contribute to Skunk Creek)
   KG_01 (**revised**, see below)
   KG_02 (generally matches FHAD basin, upstream limit of basin, low impervious)
   KT_04 (does not contribute to 1D modeled portion of Skunk Creek)
   SK_07 (topography limited, low impervious)
   SK_08 (upstream limit of basin, low impervious)

   Of these basins, it was determined by the project team to revise BL_01 and KG_01 in an effort to address the shape factor issue and to provide additional detail for FLO-2D inflow locations. Sub-basin BL_01 was split into 3 sub-basins, and KG_01 was split into 7 sub-basins. Unfortunately, 2 of the 3 BL_XX basins and 3 of the 7 KG_XX basins still have a shape factor greater than 4. Based on the small size and general shape of these basins (steep with east-west roads that influence basin shape) additional discretization to address the shape factor issue was not determined to be necessary or beneficial. The resulting changes to the discharges as a result of the revisions was ultimately minimal, but the additional detail in FLO-2D inflow locations for the lower ends of the BL and KG basins is beneficial for discharge determination for the 1D regulatory models.

7. **Was the inflow (Anderson Ditch) accounted for in the FHAD? If not, explain that this is a contributing reason for the difference in hydrology**
   The Anderson Ditch was not accounted for in the FHAD. The decision to add an inflow discharge from the Anderson Ditch at its intersection with the main channel of Skunk Creek was done to reflect the distinct possibility that during a flood event the ditch will likely be contributing flow to Skunk Creek that originated outside of the Skunk Creek watershed. This additional increase in discharge is a contributing reason for the difference in hydrology between this study and the FHAD. Additional text has been added to the report to reflect this statement.

8. **Figures show 84 cfs – be consistent.**
   The correct value is 83 cfs, as shown on Figure 3.10 at the CU_02_SD design point. The 83 cfs value is also consistent with the R_CU_02 routing element (not shown on Figure 3.10 due to space limitations). The 84 cfs as shown on Figure 3.10 is referencing the R_CU_01 routing element. This negligible increase in reported discharge is an anomaly within the SWMM program.

9. **You're only accounting for a contribution of 26 cfs from BC_01 into the system, which is less than the 29 cfs from BC_02. Is it even necessary to include BC_02? Or is the timing such that the 26 cfs from BC_01 passes before the flows from BC_02 get to the subbasin, therefore prolonging the flow into the Skunk Creek basin?**
   We do find it reasonable to include sub-basin BC_02 for two reasons:
   1. As you noted the expected timing of BC_02 would be after the peak of BC_01 and would result in a prolonged discharge into Skunk Creek.
   2. Regardless of the timing between BC_02 and BC_01, we determined that it would be reasonable to account for the surface flows from the BC_02 storm drain that enter into the BC_01 sub-basin and interact with the spill flows that overtop US Highway 36 (R_BC_03). Originally, the R_BC_02 flows were not routed through the BC_01 storm drain (D_10), but rather were combined with the R_BC_03 surface flows and allowed to split between flowing into Bear Canyon Creek or back into Skunk Creek. After reviewing this area, the SWMM routing has been revised such that following the combination of the surface flows, water is diverted north along 30th Street (per diversion D_13). The remaining discharge that was originally sent directly to Bear Canyon Creek is now run through the BC_01 storm drain diversion (D_10) with flows that exceed the storm sewer capacity then sent to Bear Canyon Creek. This same change has been applied to the BC_01 sub-basin (i.e. flows that don't fit within the R_BC_11 pipe at D_11, have the opportunity to flow east and get into the storm drain below US Highway 36 (D_12). Flows that exceed the storm drain capacity then leave the system and ultimately go to Bear Canyon Creek.

10. **It would help to make these (Design Points) a different color so they are easier to find.**
    Figures have been updated accordingly.

11. **I would argue that a change in the rainfall values used contributed to the change in flow as well.**
    The report text has been revised accordingly.

12. **It is not really clear to me that you have a final product of a SWMM model where the peak flows at design points reflect the flow splits determined from the 2D model. Is that not the case?**
    As noted in Section 3.5, the SWMM model includes 14 flow diversions that were identified by the steady state FLO-2D model and has diversion rating curves incorporated that reflect the FLO-2D results.

13. **It's pretty easy to follow the reason for the flow changes for most points in the table above (Table 3.2) with the exception to the three highlighted.**

    King's Gulch 111: If the drainage area increased, why did the peak flow decrease so much? It doesn't seem like it would be due to just the very slight reduction in percent impervious.
    It appears that the FHAD discharge of 214 cfs may not be correct. Using CUHPB variables from technical appendix and CUHP 1.4.4.2, the resulting discharge would be 183 cfs (at 5% impervious per FHAD) vs. the 170 cfs (at 2% impervious).

    Bluebell at confluence: This is a drastic reduction. The diversion to the north is only 73 cfs, and even if you kept that in Bluebell the peaks are still less than half of the FHAD flows. The drainage area is quite a bit smaller, but is that the only explanation?
    In addition to the reduction in drainage area, the contributing area percent impervious was reduced from 22% to 13.6%. Discharges also spill out of the Bluebell Canyon Creek area and into the King's gulch basin particularly at 15th Street and Mariposa Avenue location.

    Skunk Creek at Highway 36: the drainage area is about the same, but the peak flows are higher. Is that due to the diversion from BC_03 and BC_02 and also that addition of the Ditch flow?
    The spill value at Highway 36 was revised to remove the discharge that overtops US HWY 36 and flows to Bear Canyon Creek in order to reflect the actual discharge upstream of the Highway. This results in a 1% reduction in drainage area and a 5% reduction in discharge.

    It would help to include footnotes or a comment column giving these explanations.
    Footnotes have been added to Table 3.2 and 3.3 in an effort to help clarify changes to discharges and spill flow determinations.

14. **Why is this n/a (Bluebell Canyon Creek at confluence with Skunk Creek discharge value in Table 3.2)? You show a flow of 249 cfs in Table 3.3.**
    This was originally done due to the differences in drainage basin layout at the downstream end of Bluebell Canyon Creek. Table 3.2 has now been updated to include the equivalent discharges as shown in Table 3.3

15. **Why is this n/a (King's Gulch at confluence with Skunk Creek discharge value in Table 3.2)? You show a flow of 403 cfs in Table 3.3**
    This was originally done due to the differences in drainage basin layout at the downstream end of King's Gulch. Table 3.2 has now been updated to include the equivalent discharges as shown in Table 3.3

16. **Include design point on Bluebell Canyon Creek at confluence with Skunk Creek (Figure 3.10).**
    A design point was not included at this location due to the delineation of the associated drainage basins (runoff in this area is run directly to design point SK_06 on the main stem of Skunk Creek). Without re-delineating the sub-basins, a design point at this location would not provide any additional information beyond the discharge that is reported for routing element R_BL_01. If the basins were further discretized, the contributing area to the recommended design point would be very small and would not be expected to provide a notable impact to discharges reported at design point SK_06.

17. **Text revision (page 31; add "and diversion curves?)**
    Text has been revised accordingly.

18. **Delete (value in Legend on Figures 4.1 and 4.2 that reference 0.00 depth)**
    Figures 4.1 and 4.2 have been revised.

19. **I would prefer to think of the need for a split flow path in terms of percentage of mainstream flow. It's fine to leave this, but also include a statement saying "Due to the City's higher mapping standards, this is more detailed than the standard practice in accordance with ___ to ignore splits less than ____% of the peak flow in the mainstem", or something like that. (Shea to provide information for blanks…)**
    Text has been revised accordingly, blanks are waiting for information from Shea.

20. **Final SWMM model? (page 36, Discharges)**
    The SWMM model was completed to provide discharges at major design points along the drainage basin. As noted, the discharges (generally the incremental increase in discharge) as reflected by the SWMM model were incorporated into the FLO-2D model. Discharges along detailed study reaches were then determined by floodplain cross sections within the FLO-2D model. This provides additional discharge detail beyond the SWMM model which is less detailed with respect to minor spill flow paths, but provides reasonable inflow values for use in the FLO-2D model. In other words, the SWMM model was just used to determine inflow values for the FLO-2D model that is the basis for the discharge values used in the HEC-RAS model.

21. **Preference is to include the full input in these SWMM output files.**
    The SWMM input information has been added Appendix D.

Please let me know if there is any additional information needed to clarify our responses to the above review comments.

Sincerely,
ICON Engineering, Inc.

Brian LeDoux, P.E., CFM
Project Manager

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October 14, 2016

Ms. Katie Knapp, P.E.
Engineering Project Manager
Department of Public Works / Utilities Division
1739 Broadway, 2nd Floor
Boulder, Colorado 80302

RE: Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update & Physical Map Revision (PMR)

Dear Ms. Knapp,

This letter provides responses to the comments provided by the Urban Drainage and Flood Control District (UDFCD) as part of their peer review regarding the Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update and Physical Map Revision (PMR) report dated August 30, 2016. A revised Floodplain Mapping Update and Physical Map Revision report will be provided under separate cover.

FLO-2D Model

1. **Grid size is 10x10 feet. Small streets are typically at least 2-3 cells across. Some channels used as HEC-RAS flow paths are only one cell wide.**
   Noted, no revisions completed.

2. **Culverts/bridges are modeled as hydraulic structures using stage-discharge curves and appear to be functioning properly.**
   Noted, no revisions completed.

3. **The surface roughness map is available in PMR report Figure I.1. Most streets use an n-vale of 0.03; campus and commercial areas 0.1; native grasses and parks 0.15; residential areas 0.4.**
   Noted, no revisions completed.

4. **Buildings are represented using area and width reduction factors (ARF/WRF)**
   Noted, no revisions completed.

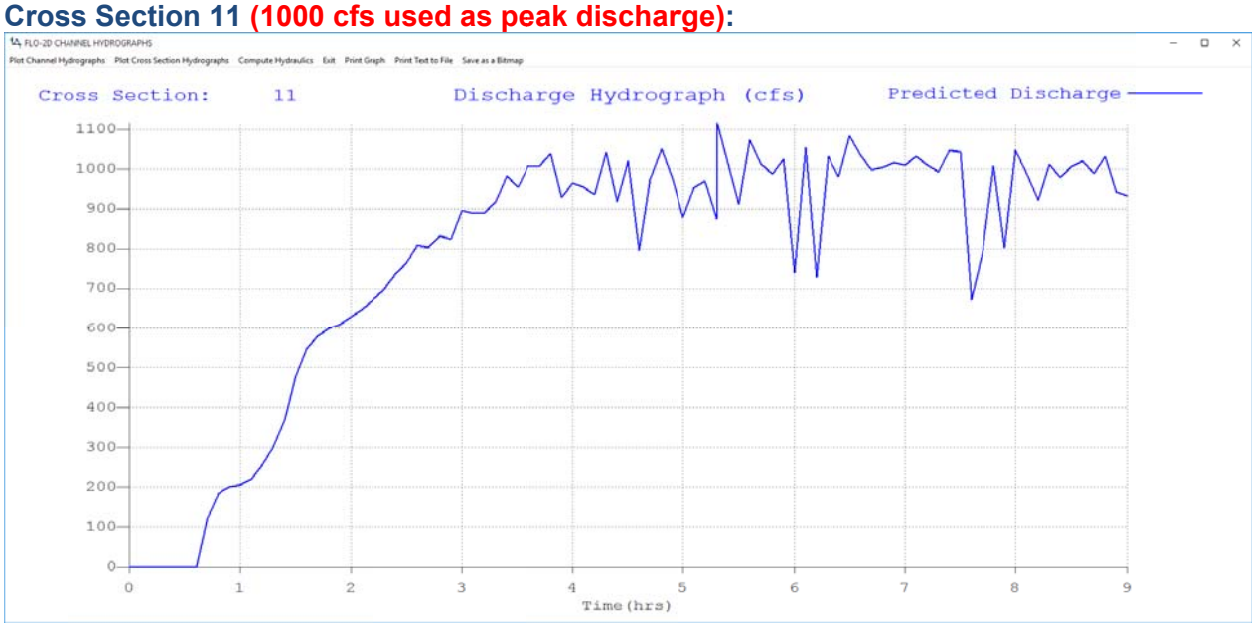
5. **There are discrepancies between the FLO-2D cross section discharges listed in Tables 4.1 and 4.2 in the PMR report as shown in Table 1. Cross sections 11, 24, and 28 are used for determining HEC-RAS flow changes. Discharges in HEC-RAS match the report and not the FLO-2D model.**

Table 1 – FLO-2D cross section and PMR report discrepancies

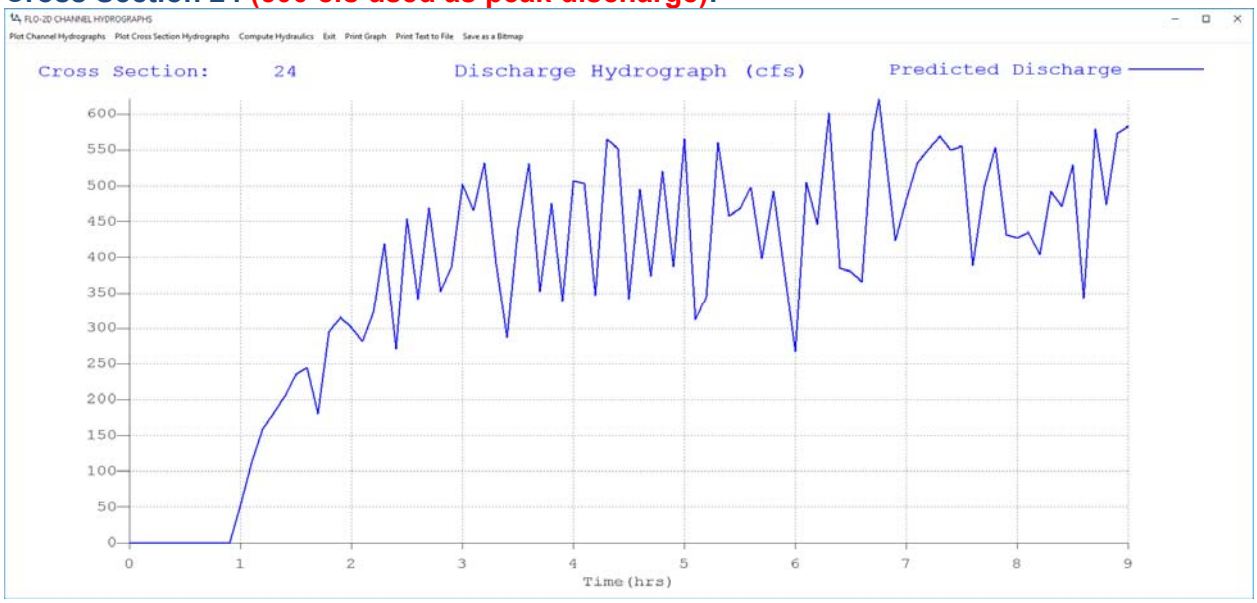
FLO-2D Cross Section	FLO-2D Discharge (cfs)	Report Discharge (cfs)	Diff
2	1218.37	1000	-218.37
11	1115.82	1000	-115.82
24	621.42	500	-121.42
28	635.5	600	-35.5
41	26.4	21	-5.4

These five cross sections do experience some surging in the FLO-2D model which impacts their reported peak discharge value. Given that these were the only sections to exhibit this behavior out of the 106 cross sections within the model, it was determined that an average peak discharge as estimated from the cross section hydrograph would be reasonable for use instead of the single peak discharge as reported in the FLO-2D summary output (as referenced in the above table). The hydrographs for cross sections 11, 24, and 28 are shown below with the estimated peak discharge value that was utilized in the study.

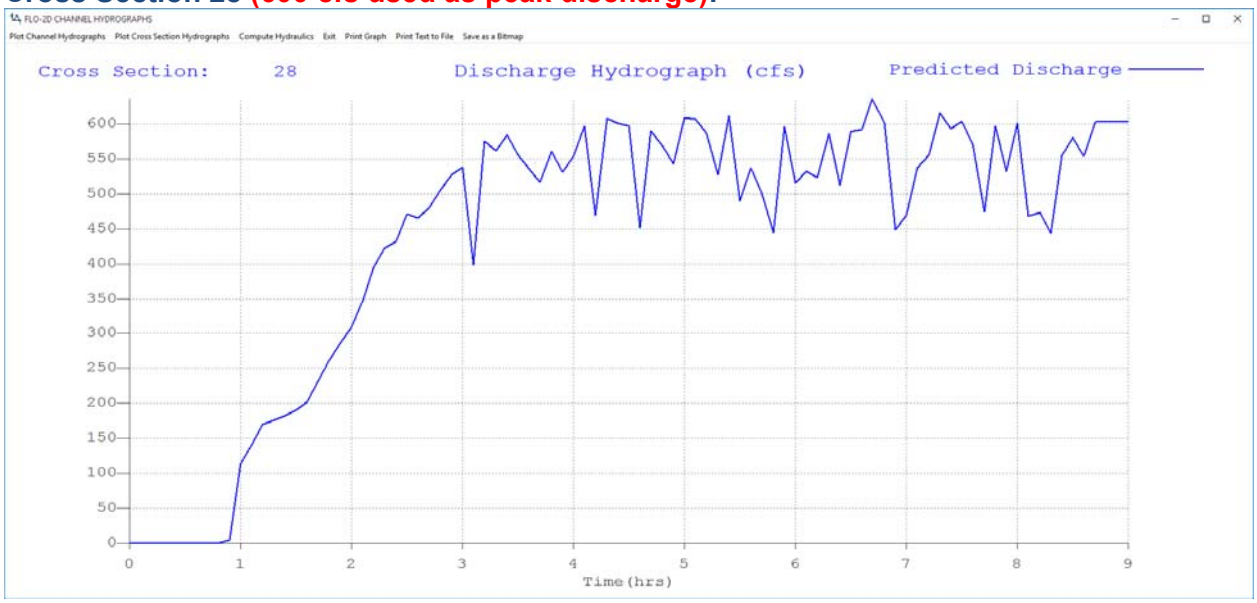
Cross Section 11 (1000 cfs used as peak discharge):



Cross Section 24 (500 cfs used as peak discharge):



Cross Section 28 (600 cfs used as peak discharge):



6. **There is no corresponding inflow in FLO-2D for SWMM node BC_01 (subcatchment BC_01, Q100 = 50 cfs). Additionally, SWMM routing in this area disagrees with subcatchment BC_01 boundaries as shown in Figure 1.**

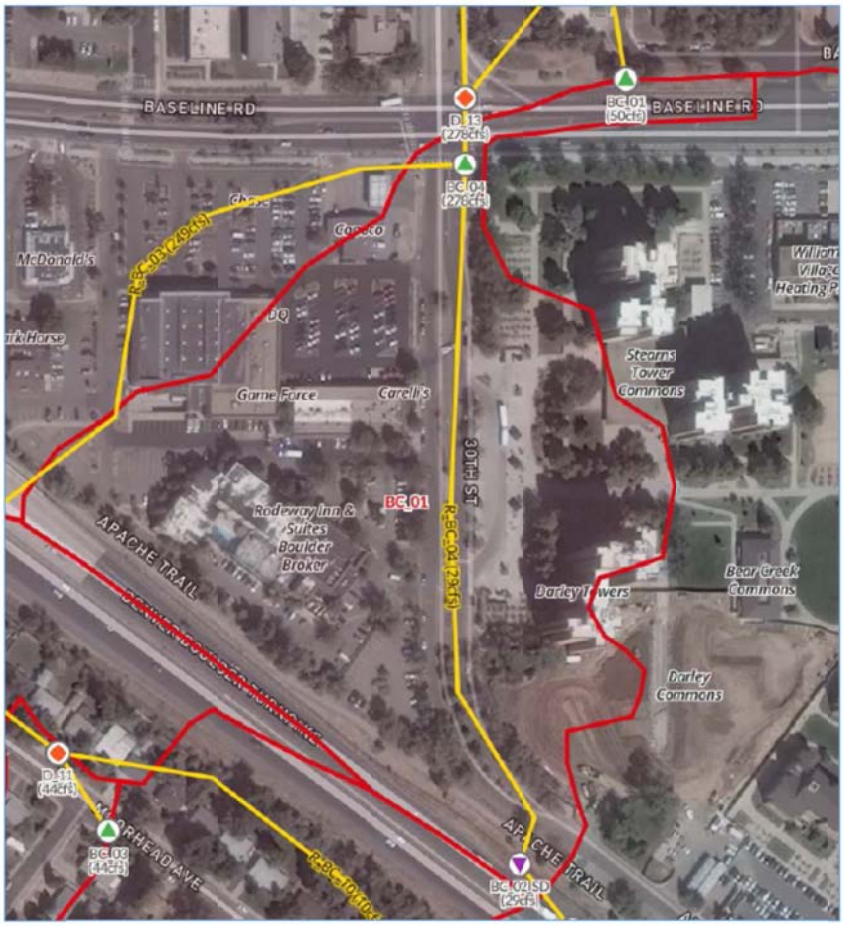


Figure 1 – Subcatchment BC_01 and SWMM routing

The 50cfs from sub-basin BC_01 is restricted by the associated storm drain capacity of 26cfs. This 26cfs is included in the steady state initial 2D modeling that was used to develop diversion rating curves for the SWMM model. The final incremental discharge increase FLO-2D model does not include this additional 26cfs increase as the attenuation realized by the SWMM model at the storm drain outfall location exceeds the 26cfs increase in discharge. Due to size limitations the incremental discharge 2D model was the only model included in the technical appendix which does not include the BC_01 inflow (the only difference between the steady state and the incremental increase 2D models is the inflow values).

SWMM routing reflects overland flow from adjacent Skunk Creek and BC_02 spill flows in addition to surface flows from sub-basin BC_01.

7. **There is no corresponding inflow in FLO-2D for SWMM node BC_03 (subcatchment BC_03, Q100 = 44cfs)**
   This comment covers the same issue and typical response as #6 above, but for the BC_03 sub-basin.

For reference: this same approach was not used with BC_02 as that storm drain outfall is located off of the main channel and the resulting overland flow increases discharges on the spill flow path.

8. **Total outflow approaches but does not quite reach steady state as shown in Figure 2.**

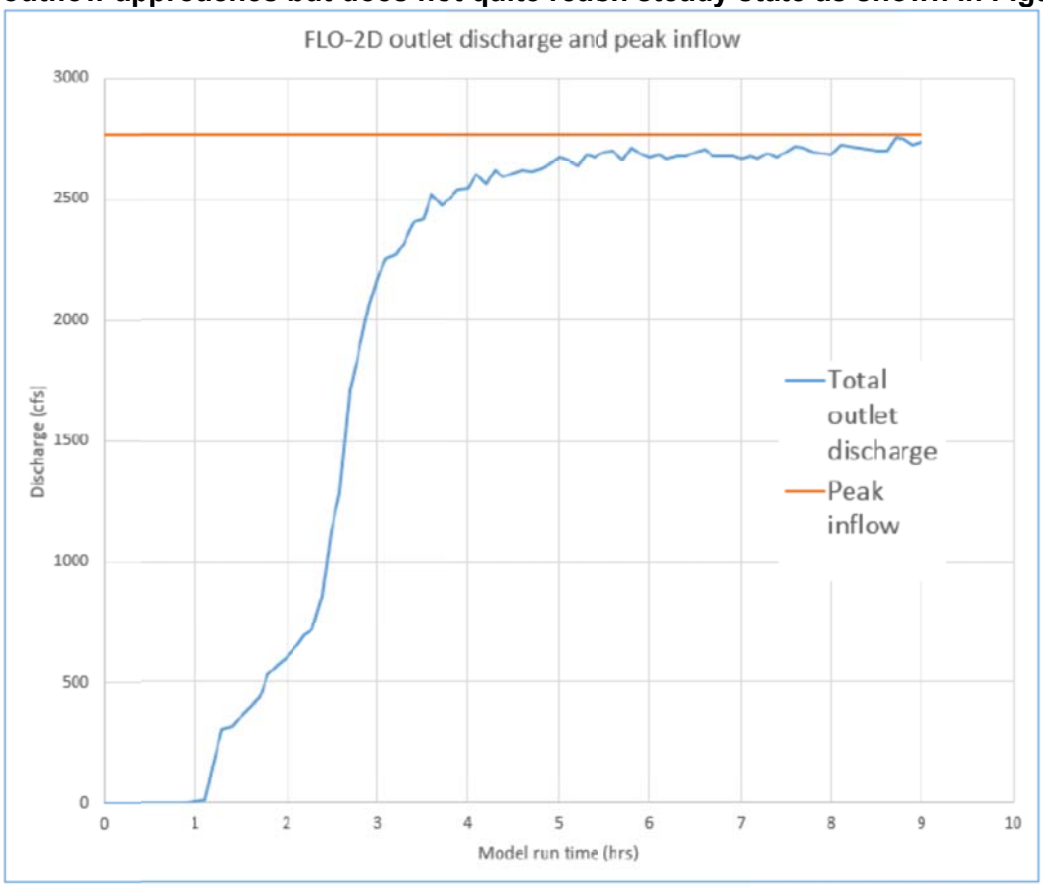


Figure 2 – FLO-2D peak inflow and combined outlet discharge

The peak discharges at all outlet locations totals 2883cfs, with the total inflow of 2770cfs (the difference being routing in timing). This small (~4%) difference is considered negligible for the purposes of this 2D modeling.

9. **HEC-RAS and FLO-2D 100-year WSELs were compared at HEC-RAS cross section locations. The average FLO-2D WSEL along the cross section was calculated and subtracted from the HEC-RAS WSEL. At many cross sections the RAS and FLO-2D WSELs disagree as shown in Figure 3. RAS cross sections were trimmed to the 100-year workmap floodplain before performing statistics.**

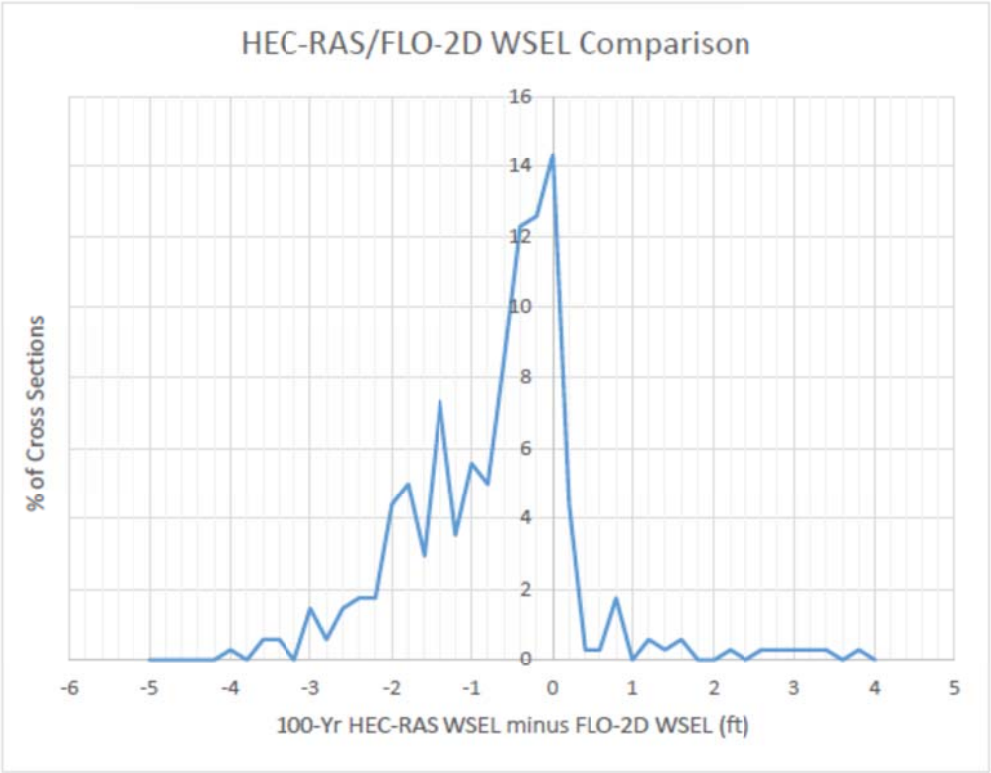


Figure 3 – HEC-RAS minus FLO-2D 100-year WSELs. Negative numbers indicate FLO-2D WSEL is greater than HEC-RAS.

This result is not all that unexpected. The 1D model will provide additional detail to all cross sections, particularly at channel locations, thus resulting in the skew towards the negative value in the graph above. The fundamental differences between the 1D and 2D models will always result in discrepancies and this comparison is not indicative of a modeling flaw from our perspective.

HEC-RAS Model

10. **Culverts in the model are partially blocked using obstructions to represent debris reducing culvert conveyance (see Figure 4). This methodology was tested by removing the obstructions from the model and by fully blocking the culvert opening using an obstruction. WSELs changed upstream of the culvert but discharge through the culvert did not. This indicates that obstructions do not affect flow through the culverts.**

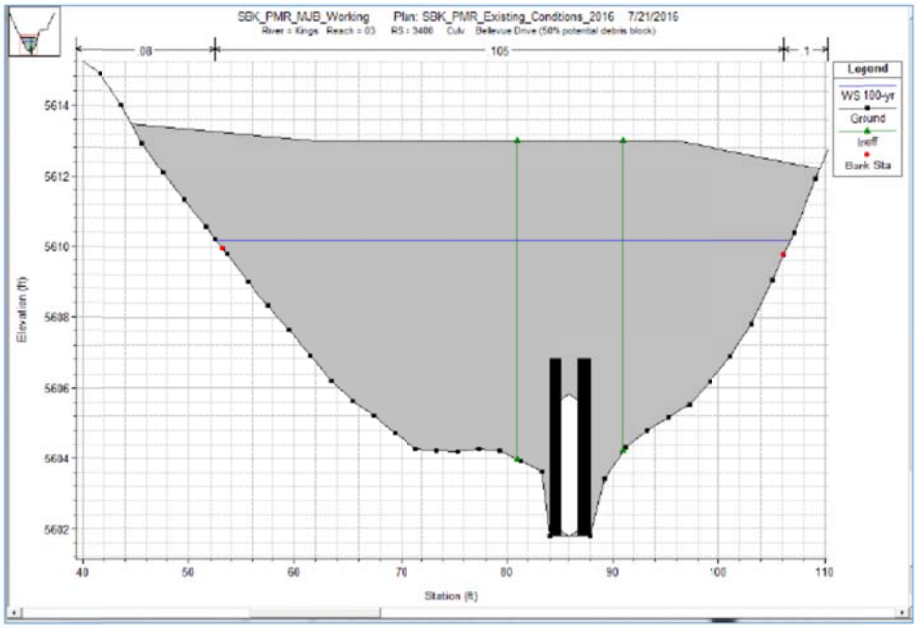


Figure 4 – Obstructions blocking culvert to represent debris

Culverts have been revised such that the width of box culverts, or diameter of circular culverts, is reduced to provide the desired percentage of blockage. The blocked obstruction areas have been left within the upstream cross sections as originally done for consistency between culverts and bridges. The actual culvert sizes and the modeled culvert sizes (reduced to reflect debris blockage) have been included in the HEC-RAS description notes for each culvert.

11. **US 36 crossing at Skunk Creek is not modeled in RAS. There is no fixed WSEL at the upstream end.**

This culvert was modeled by rating curve as noted in the report text:

> The Skunk Creek / US Highway 36 culvert area is complex as a result of several factors including:
>
> 1. Split flows that run south east along the highway and ultimately spill north over the highway.
> 2. Spill flows within Baseline Road.
> 3. Spill flows through a pedestrian underpass located above the Skunk Creek culvert (spills onto Baseline Road).
> 4. Steep culvert (1.8% slope) with bend.
>
> As a result of this complex area, the HEC-RAS modeling of the culvert was not providing results that were consistent with the FLO-2D model. In order to achieve better model correlation, the US Highway 36 culvert was removed from the HEC-RAS model and a rating curve was completed at cross section 8576. The rating curve is based on water surface elevations and discharges taken from the FLO-2D model (which is based on the HY-8 analysis of the culvert).
> Discharge and water surface elevation / stage data is included in Table E.1 in Appendix E. The annotated profiles will show the US Highway 36 culvert in place, though the water surface elevations will be based on the HEC-RAS model that is using the rating curve at cross section 8576.

12. **There are 100 cross sections that exceed floodway surcharge criteria. Minimum HGL/EGL is -0.23 and the maximum is 1.14 feet.**
    As discussed with UDFCD and the project team, it was agreed to base the floodway surcharge on the hydraulic grade line increase of 0.5 feet based on FEMA criteria and the preferred approach of the City of Boulder. Attempts have been made to remove all negative surcharges; however some cross sections that do **not** have an encroachment have a small negative surcharge. This was also not possible to remedy by adjusting encroachments within downstream cross sections.

13. **Skunk Creek uses normal depth for the downstream boundary condition at its confluence with Bear Canyon Creek (Zone AE). The Bear Creek Split also confluences with Bear Canyon Creek and uses normal depth. There is an effective FIS at both locations that can be used as a known WSEL for the boundary condition.**
    Per FEMA criteria, Skunk Creek and Bear Canyon Creek will not have coincident peaks based on drainage basin ratios. Accordingly, the boundary conditions for Skunk Creek and the Bear Creek Split have been set to normal depth, however, the annotated profile will reflect backwater from Bear Canyon Creek at the confluence location.

14. **The 29th St. Split uses normal depth for the downstream boundary condition. If desired, cross sections on both the Euclid Ave. and 30th St. splits could be used as the downstream boundary for the 29th St. Split instead. The 35th St. Split uses normal depth for the downstream boundary condition but does not terminate near another reach or effective floodplain. All other reaches use a RAS confluence for the downstream boundary condition.**
    Given the downstream conditions on the 29th Street Split, 35th Street Split, and Madison Split, using a boundary condition of normal depth has been determined to be reasonable.

15. **Provided GIS channel alignments do not meet at confluences, it is not possible to review confluence lengths.**
    Confluence lengths were measured between cross sections along approximate flow paths as there is no actual channel at these locations - just instances of overland flow. Confluence lengths may be measured and reviewed using workmaps or supplied GIS data.

16. **Cross section ID numbers do not match stationing on Kings reach from 2444 to 3674. Discrepancy varies from 23 to 34 feet.**
    This discrepancy results from a change in centerline such that the mapped centerline does not run through the culvert, but rather on the surface along the gutter line of King Avenue (centerline is now within proposed floodplain and floodway). All downstream reach lengths are correct.

17. **There are crossing profiles at cross sections 11185, 10981, 7639, 4448, 488, and 406.**
    Crossing profiles at 11185, 7639, and 4448 have been remedied. Crossing profiles at cross sections 10981, 488, and 406 remain an issue and our best efforts have been exhausted to remedy the crossing profiles at these sections.

18. **Channel alignment is outside of the bank stations at cross section 3174.**
    The left bank station at cross section 3174 has been adjusted such that the channel alignment is inside of the bank stations.

19. **There are two culverts on upper Skunk Creek that are not modeled and are indicated by arrows in Figure 5. If these culverts are small enough to leave out of the model the cross sections should be realigned along the crossing high points.**

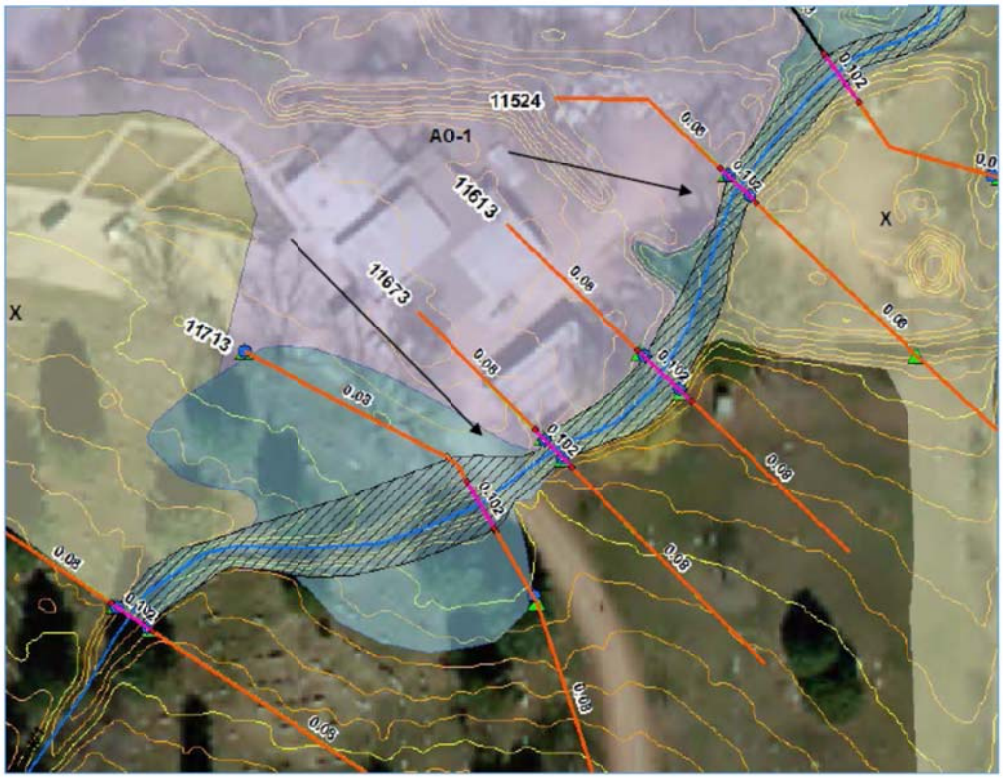


Figure 5 – Non-modeled culverts/channel high points

The upstream location is modeled with an inline weir structure without a culvert opening due to the small size of the culvert. The downstream location reflects a small culvert structure that was washed out in the 2013 flooding and at this time has not been replaced. Please note that a separate inline weir has been added to reflect the Anderson Ditch flume structure that crosses the channel between the two noted locations.

20. **Surface roughness values are generally conservative throughout the model and buildings are represented with obstructions. Building conveyance shadows are represented by using ineffective flow areas (IEFA).**
Noted, no revisions completed.

21. **Bank stations at many locations are unbalanced as shown in Figure 6. Other examples are Bluebell 3709 and Echo Pl 167.**

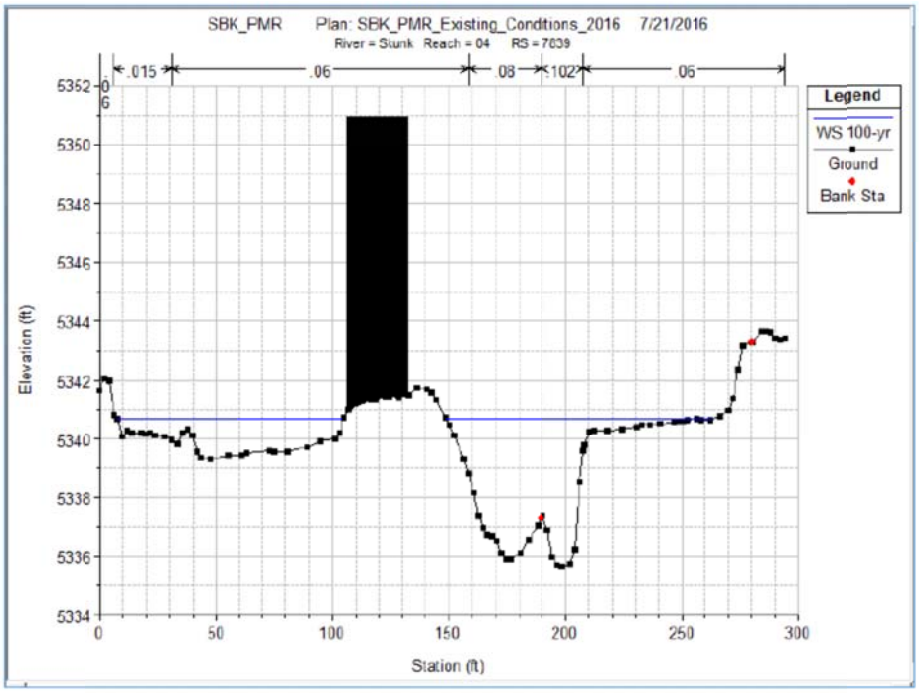


Figure 6 – Uneven bank stations

Bank stations at the noted cross sections, and at other locations, have been adjusted to be more balanced and to better reflect the defining point between channel flow and overbank flow.

22. N-value of 0.013 at Bluebell 6200 seems low for corrugated metal arch.

This culvert is concrete material, so the n-value of 0.013 is appropriate (only chart available in HEC-RAS for a semi-circle culvert includes the (incorrect) notation of "corrugated metal".

23. Channel inverts have not been modified at all culverts as shown in Figure 7.

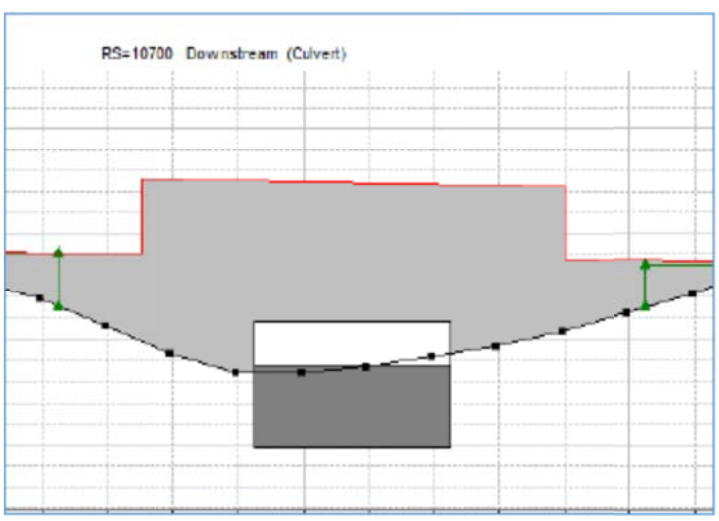


Figure 7 – Channel invert not modified at culvert

The two crossings without invert modifications have significant sediment within the channel through the culverts. These adjacent cross sections were not adjusted to a non-sediment condition at either culvert and the culvert itself was blocked to an elevation equivalent to the average sediment across the face of the structure in order to reflect actual conditions of the crossing (not lose sediment, but very well compacted material that acts as a channel invert and is not expected to flush out as a result of high flows).

24. **Bluebell culvert 6200 has no IEFA at downstream cross section (6113). XS 6113 is ~90 feet downstream of bridge. Accuracy of model would likely be improved by moving the downstream cross section closer to the bridge or adding an additional cross section.**
    The HEC-RAS model has been revised to include an additional cross section (6196) adjacent to the downstream face.

25. **Belleview Dr. (Kings/3 3400 has no IEFA at the downstream cross section.**
    Cross section 3268 has been revised to include IEFA to reflect the downstream end of the Belleview Drive culvert.

26. **29th Street culvert (Skunk/04 7600) opening is partially blocked by IEFA on downstream end as shown in Figure 8. The IEFA may be representing the conveyance shadow of a nearby building.**

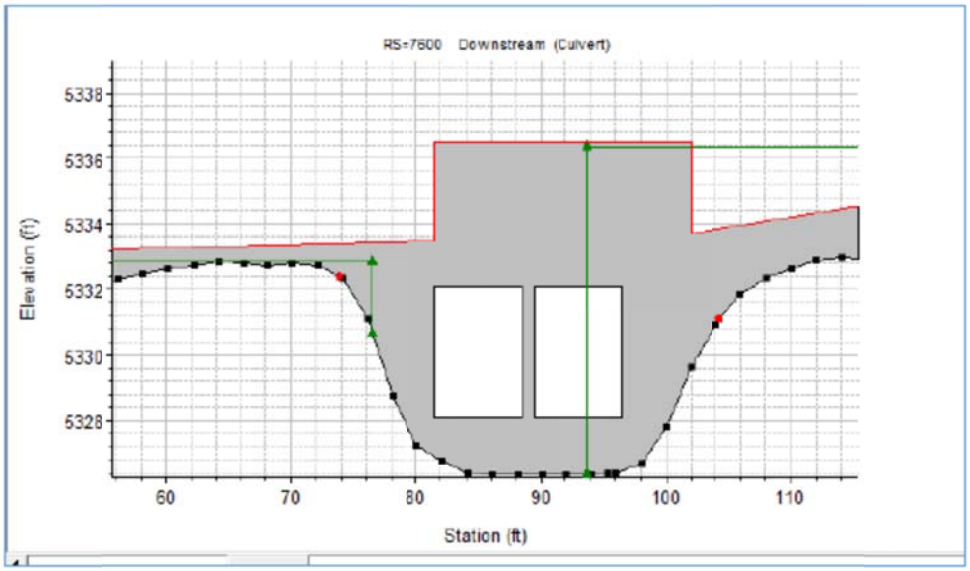


Figure 8 – Culvert opening partially obstructed by IEFA

Correct, IEFA reflects conveyance shadow of an adjacent structure.

27. Channel appears to go through a house at sta 11400 on Skunk as shown in Figure 9. There is no modeled culvert at this location.

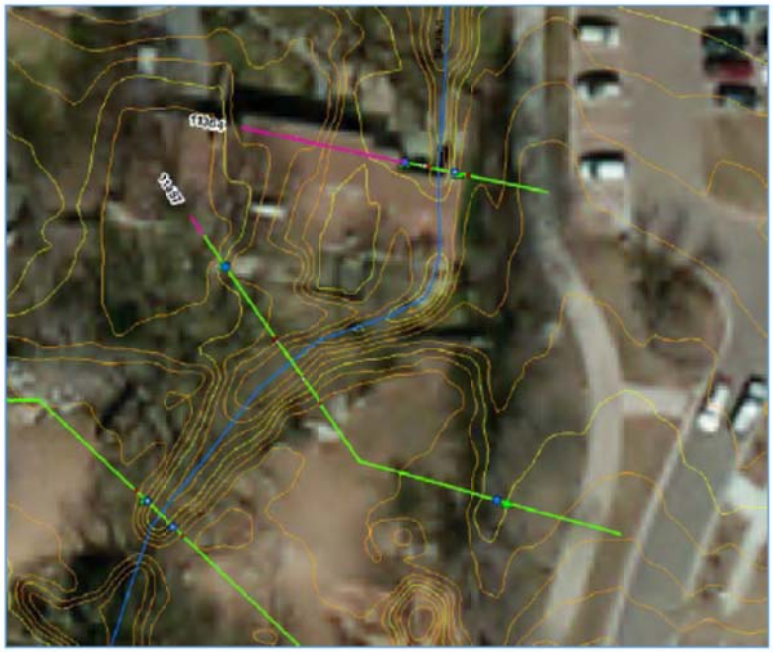


Figure 9 – Channel alignment through house

The structure is cantilevered over the channel therefore no culvert has been modeled at this location. See photo below.

28. Trimming the left side of Bluebell 799 would partially contain the cross section.

Cross section 799 has been truncated on the left bank accordingly.

29. **IEFA should be added to right overbank of Bluebell 219.**
    Cross section 219 has been truncated at the high point to remove the right overbank and the associated structure. See comment 38 for additional details on truncated sections given this condition (perched channel with structures in the lower overbank areas).

30. **IEFA in right overbank of Echo Pl 167 may need to be extended to the left.**
    Cross section 167 and 76 have been truncated at the high point to remove the right overbank and the associated structures. See comment 38 for additional details on truncated sections given this condition (perched channel with structures in the lower overbank areas).

31. **Kings 2444 is not perpendicular to channel alignment and is not parallel to FLO-2D WSEL contours. Bending cross section may contain all events. XS 2396 is also not perpendicular to channel alignment but appears to have a valid alignment.**
    At this location the channel alignment follows the roadway curb flowlines due to the underground culvert which has a small diameter and is not modeled in HEC-RAS. For this reason we believe cross sections 2444 and 2396 adequately represent changes in flow conveyance and that bending the cross sections further in this area would not result in any changes to the floodplain.

32. **Trim or add IEFA to left overbank of Kings 771.**
    Cross section 771 has been truncated at the high point on the left overbank.

33. **Active conveyance between station 125 and 165 on Kings Split 523 may not be valid. Active conveyance in right overbank of Kings Split 308 may not be valid. Active conveyance in left overbank of 150 may not be valid.**
    Active conveyance is valid on 523 and 308 based on potential flow between structures from upstream. The ineffective flow area for cross section 150 has been adjusted to remove the active conveyance in the far left overbank.

34. **Skunk 7984 and 7989 may need additional IEFA in left overbank to represent flow expansion from culvert.**
    The HEC-RAS model has been revised at cross sections 7984 and 7989 to reflect IEFA as a result of flow expansion from the culvert.

35. **The floodplain sharply contracts from Skunk 4748 to 4848. It may be appropriate to increase contraction/expansion coefficients at 4848.**
    Contraction/expansion coefficients at cross section 4848 have been increased.

36. **Several lower Skunk cross sections (378-1572) are completely uncontained on the left side with no corresponding flow reduction. This is causing the discharge at Foothills Parkway to be unrealistically high.**
    Discharges that do leave the design channel in this area enter the Boulder Creek floodplain but then return to Skunk Creek immediately upstream of the Foothills Parkway culvert. Due to this interaction with Boulder Creek and the return of the discharges, flows were not reduced within the Skunk Creek channel. Through discussions with the project team, it was determined that this more conservative approach is reasonable given the complexity of the area and the limited potential for change to the flood risk boundaries.

37. **Areas outside HEC-RAS cross sections are delineated based on FLO-2D depths. As area and width reduction factors are used to represent buildings and set as 100%**

blocked, buildings in the model will always show a water depth of zero. Automatic floodplain delineation based on FLO-2D output may show buildings erroneously outside the floodplain that should be within the floodplain based on WSEL. (e.g. multiple buildings on 29th St. Split, XS 240 on 35th St. Split).

Islands of unshaded Zone X within the shaded Zone X areas have been removed where the structure appeared to be the cause of the area of unshaded Zone X. Islands that are caused by landforms were not removed.

38. **Extending Zone AE to edge of HEC-RAS cross sections seems arbitrary.**

    The mapping of the perched roadway areas was discussed with the UDFCD and the project team. Instead of truncating the cross sections at the structures, the cross sections in HEC-RAS were revised to be truncated at the high point of the perched roadway (or channel). At these locations flows are expected to deviate from the main flow path at depths less than or equal to 1 foot in depth based on the associated FLO-2D and HEC-RAS models. Based on the unconfined nature of this flooding, spill flows have been designated by the Zone X shaded floodplain areas. Approximately 37 HEC-RAS cross sections within this model have been truncated to no longer show the structure(s) at the end of the cross section where the ground slopes away from the perched roadway (or channel). A similar approach was used in the Twomile Canyon Creek LOMR recently approved by FEMA.

39. **At many locations the 100-year floodplain terminates at an obstruction representing a building. The 100-year floodplain frequently ignores the HEC-RAS water surface extent at the obstruction and appears to be delineated based on the WSEL at the XS and the contours. This results in the building being partially within the 100-year floodplain. While this is likely more accurate and conservative than ending the floodplain at the edge of the building, it should be noted that the contours used in the study are based on LiDAR and should be considered suspect within the footprint of buildings (e.g. Bluebell 3709).**

    Floodplains have been delineated through structures where appropriate based on a bare earth condition. We believe this presents a less confusing representation of flood risk than if the floodplain were to be shown around the structure. We agree that the LiDAR within the structures has the potential to be suspect in some cases which has been considered by the floodplain delineations.

40. **Zone AE may need to be extended north and south of Euclid Ave. Split 502 and 422 based on FLO-2D. HEC-RAS indicates shallow flooding.**

    Only cross section 422 is vertically extended in the HEC-RAS model and by a very minor amount (0.06 feet). No changes to the Zone AE boundary have been made. Please note that the 100-year shallow flooding (City of Boulder zone designation, covers the area north and south of cross section 422.

Please let me know if there is any additional information needed to clarify our responses to the above review comments.

Sincerely,
ICON Engineering, Inc.

Brian LeDoux, P.E., CFM
Project Manager

Appendix I –
Field Survey and As-built Information

RE-BID REVISED

Final As-Built

Oversight / NHS	
FHWA FULL OVERSIGHT?	■NO □YES
NATIONAL HIGHWAY SYSTEM?	■NO □YES

DEPARTMENT OF TRANSPORTATION
STATE OF COLORADO

CITY OF BOULDER
DEPARTMENT OF PUBLIC WORKS/TRANSPORTATION DIVISION

HIGHWAY CONSTRUCTION BID PLANS OF PROPOSED
FEDERAL AID PROJECT NO. STE M110-036
27TH WAY UNDERPASS AT SKUNK CREEK
FEDERAL AID PROJECT NO. STU 0931-024
BASELINE ROAD - BROADWAY TO U.S. 36
BOULDER COUNTY

CONSTRUCTION PROJECT CODES NO. 14097 AND 14008
SCALE AS SHOWN ON INDIVIDUAL SHEETS

RELATED PROJECTS:
P.E. UNDER PROJECT:
PROJECT NUMBER
PROJECT CODE
R.O.W. PROJECTS:
R.O.W. PROJECT DESCRIPTION

TABULATION OF LENGTH

STATION	ROADWAY LIN.FT.	ROADWAY MILES
27TH WAY		
STA. 0+70.58 - BEGIN PROJECT NO. STE M110-036 STA. 4+73.00 - END PROJECT NO. STE M110-036	402.42	0.076
PROJECT TOTALS	402.42	0.076

TABULATION OF LENGTH

STATION	ROADWAY LIN.FT.	ROADWAY MILES
BASELINE RD.		
STA. 100+00.00 - BEGIN CONSTRUCTION: BEGIN PROJECT NO. STU 0931-024 STA. 114+31.31 - END CONSTRUCTION	1431.31	0.271
U.S 36 EB ON-RAMP		
STA. 120+00.00 - BEGIN CONSTRUCTION STA.130+00.00 - END CONSTRUCTION: END PROJECT NO. STU 0931-024	1000.00	0.189
PROJECT TOTALS	2431.31	0.460

DESIGN DATA

	27TH WAY
MAXIMUM DEGREE OF CURVE	N/A
MAXIMUM GRADE	N/A
MINIMUM S.S.D. HORIZONTAL	N/A
MINIMUM S.S.D. VERTICAL	N/A
MAXIMUM DESIGN SPEED	35 M.P.H.
e MAX	0.06'/FT.

DESIGN TRAFFIC VOLUME	2005	2025
DHV	2,500	2,500
AADT	27,000	27,000
% TRUCKS	4%	4%

DESIGN DATA

	BASELINE	US36 RAMP
MAXIMUM DEGREE OF CURVE	TANGENT	9° 32'58"
MAXIMUM GRADE	3.10%	2.85%
MINIMUM S.S.D. HORIZONTAL	> 400'	300'
MINIMUM S.S.D. VERTICAL	> 400'	402'
MAXIMUM DESIGN SPEED	> 50 M.P.H.	45 M.P.H.

DESIGN TRAFFIC VOLUME	2005	2025
DHV	2,880	2,880
AADT	34,800	34,800
% TRUCKS	2%	2%

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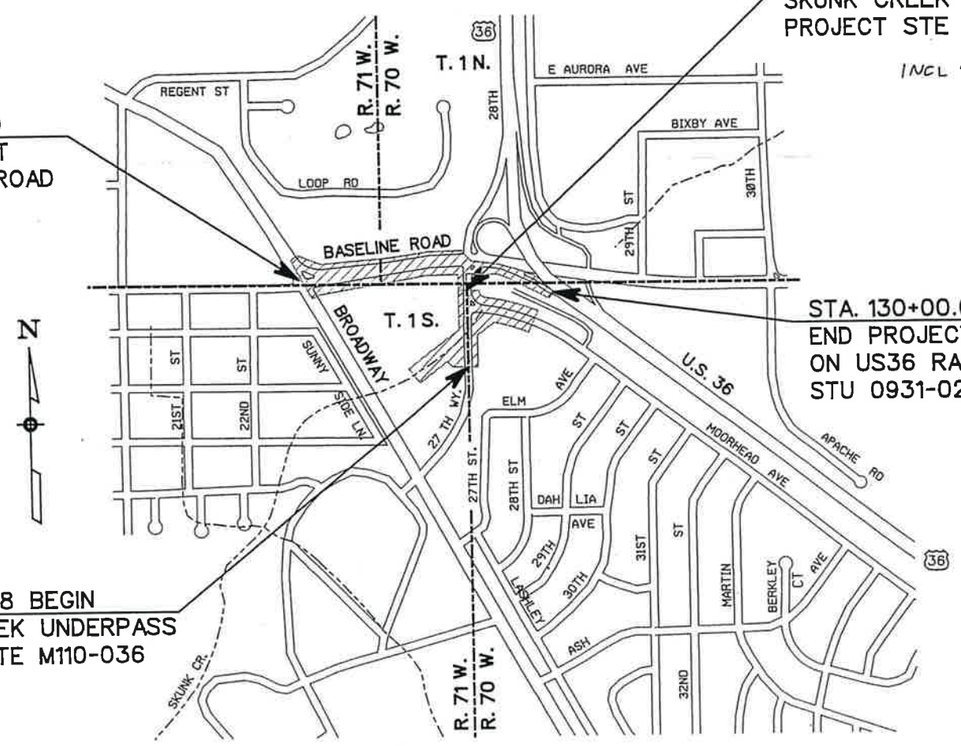
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

STA. 100+00.00
BEGIN PROJECT
ON BASELINE ROAD
STU 0931-024

STA. 4+73.00 END
SKUNK CREEK UNDERPASS
PROJECT STE M110-036

STA. 130+00.00
END PROJECT
ON US36 RAMP
STU 0931-024

STA. 0+70.58 BEGIN
SKUNK CREEK UNDERPASS
PROJECT STE M110-036



VICINITY MAP
N.T.S.

NO SHT 11

SHEET INDEX

SHEET	DESCRIPTION
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2	STANDARD PLANS LIST - COMBINED
3-11	SUMMARY OF APPROXIMATE QUANTITIES - COMBINED
12	SURVEY TABULATION SHEET - COMBINED
13-24	STORMWATER MANAGEMENT PLAN - COMBINED
	27TH WAY UNDERPASS AT SKUNK CREEK
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33-39	ROADWAY DETAILS
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87-101	STRUCTURE PLANS
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169-171	LANDSCAPE PLANS
172	RIGHT OF WAY PLAN
200-203	CROSS SECTIONS - BASELINE ROAD
300-305	CROSS SECTIONS - U.S. 36 RAMP

INCL 90A & 90B

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Sheet Revisions

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Contractor:	
Resident Engineer:	
Project Engineer:	
PROJECT STARTED:	ACCEPTED:
Comments:	

Project No./Code
STE M110-036 & STU 0931-024
14097 & 14008
Sheet Number 1

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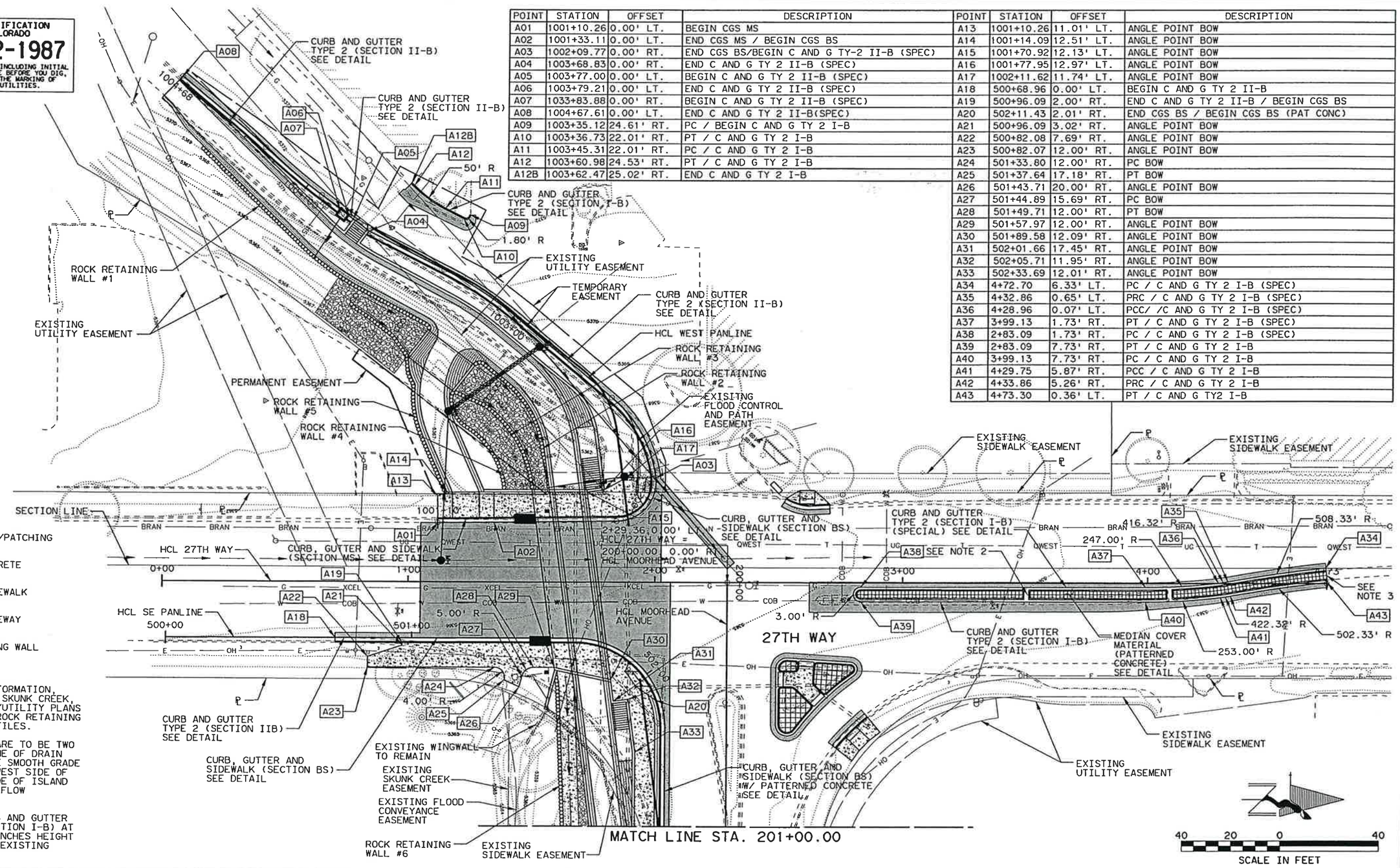
POINT	STATION	OFFSET	DESCRIPTION
A01	1001+10.26	0.00' LT.	BEGIN CGS MS
A02	1001+33.11	0.00' LT.	END CGS MS / BEGIN CGS BS
A03	1002+09.77	0.00' RT.	END CGS BS/BEGIN C AND G TY-2 II-B (SPEC)
A04	1003+68.83	0.00' RT.	END C AND G TY 2 II-B (SPEC)
A05	1003+77.00	0.00' LT.	BEGIN C AND G TY 2 II-B (SPEC)
A06	1003+79.21	0.00' LT.	END C AND G TY 2 II-B (SPEC)
A07	1033+83.88	0.00' RT.	BEGIN C AND G TY 2 II-B (SPEC)
A08	1004+67.61	0.00' LT.	END C AND G TY 2 II-B(SPEC)
A09	1003+35.12	24.61' RT.	PC / BEGIN C AND G TY 2 I-B
A10	1003+36.73	22.01' RT.	PT / C AND G TY 2 I-B
A11	1003+45.31	22.01' RT.	PC / C AND G TY 2 I-B
A12	1003+60.98	24.53' RT.	PT / C AND G TY 2 I-B
A12B	1003+62.47	25.02' RT.	END C AND G TY 2 I-B

POINT	STATION	OFFSET	DESCRIPTION
A13	1001+10.26	11.01' LT.	ANGLE POINT BOW
A14	1001+14.09	12.51' LT.	ANGLE POINT BOW
A15	1001+70.92	12.13' LT.	ANGLE POINT BOW
A16	1001+77.95	12.97' LT.	ANGLE POINT BOW
A17	1002+11.62	11.74' LT.	ANGLE POINT BOW
A18	500+68.96	0.00' LT.	BEGIN C AND G TY 2 II-B
A19	500+96.09	2.00' RT.	END C AND G TY 2 II-B / BEGIN CGS BS
A20	502+11.43	2.01' RT.	END CGS BS / BEGIN CGS BS (PAT CONC)
A21	500+96.09	3.02' RT.	ANGLE POINT BOW
A22	500+82.08	7.69' RT.	ANGLE POINT BOW
A23	500+82.07	12.00' RT.	ANGLE POINT BOW
A24	501+33.80	12.00' RT.	PC BOW
A25	501+37.64	17.18' RT.	PT BOW
A26	501+43.71	20.00' RT.	ANGLE POINT BOW
A27	501+44.89	15.69' RT.	PC BOW
A28	501+49.71	12.00' RT.	PT BOW
A29	501+57.97	12.00' RT.	ANGLE POINT BOW
A30	501+89.58	12.09' RT.	ANGLE POINT BOW
A31	502+01.66	17.45' RT.	ANGLE POINT BOW
A32	502+05.71	11.95' RT.	ANGLE POINT BOW
A33	502+33.69	12.01' RT.	ANGLE POINT BOW
A34	4+72.70	6.33' LT.	PC / C AND G TY 2 I-B (SPEC)
A35	4+32.86	0.65' LT.	PRC / C AND G TY 2 I-B (SPEC)
A36	4+28.96	0.07' LT.	PCC/ /C AND G TY 2 I-B (SPEC)
A37	3+99.13	1.73' RT.	PT / C AND G TY 2 I-B (SPEC)
A38	2+83.09	1.73' RT.	PC / C AND G TY 2 I-B (SPEC)
A39	2+83.09	7.73' RT.	PT / C AND G TY 2 I-B
A40	3+99.13	7.73' RT.	PC / C AND G TY 2 I-B
A41	4+29.75	5.87' RT.	PCC / C AND G TY 2 I-B
A42	4+33.86	5.26' RT.	PRC / C AND G TY 2 I-B
A43	4+73.30	0.36' LT.	PT / C AND G TY2 I-B



LEGEND

- HMA PAVEMENT/PATCHING
- COLORED CONCRETE
- CONCRETE SIDEWALK
- CONCRETE BIKEWAY
- ROCK RETAINING WALL

NOTES:

1. FOR ADDITIONAL INFORMATION, SEE INTERSECTION, SKUNK CREEK, PATHWAY, DRAINAGE/UTILITY PLANS AND PROFILES AND ROCK RETAINING WALL PLAN AND PROFILES.
2. CURB DRAIN SLOTS ARE TO BE TWO FOOT WIDE. FLOWLINE OF DRAIN SLOTS IS TO BE ONE SMOOTH GRADE FROM FLOWLINE ON WEST SIDE OF ISLAND TO EASE SIDE OF ISLAND TO ALLOW WATER TO FLOW THROUGH ISLAND.
3. TAPER HEAD OF CURB AND GUTTER GUTTER TYPE 2 (SECTION I-B) AT NORTH END FROM 6 INCHES HEIGHT DOWN TO HEIGHT OF EXISTING CURB.

CITY OF BOULDER · DIVISION OF TRANSPORTATION

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Index of Revisions

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No Revisions:
Revised:
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27TH WAY UNDERPASS AT SKUNK CREEK

ROADWAY PLAN
27TH WAY

Designer: M. GRANT
Detailer: D. MADDOCK
Structure Numbers
Sheet Subset:
Subset Sheets: 1 of 4

Project No./Code
STE M110-036
14097
Sheet Number 53

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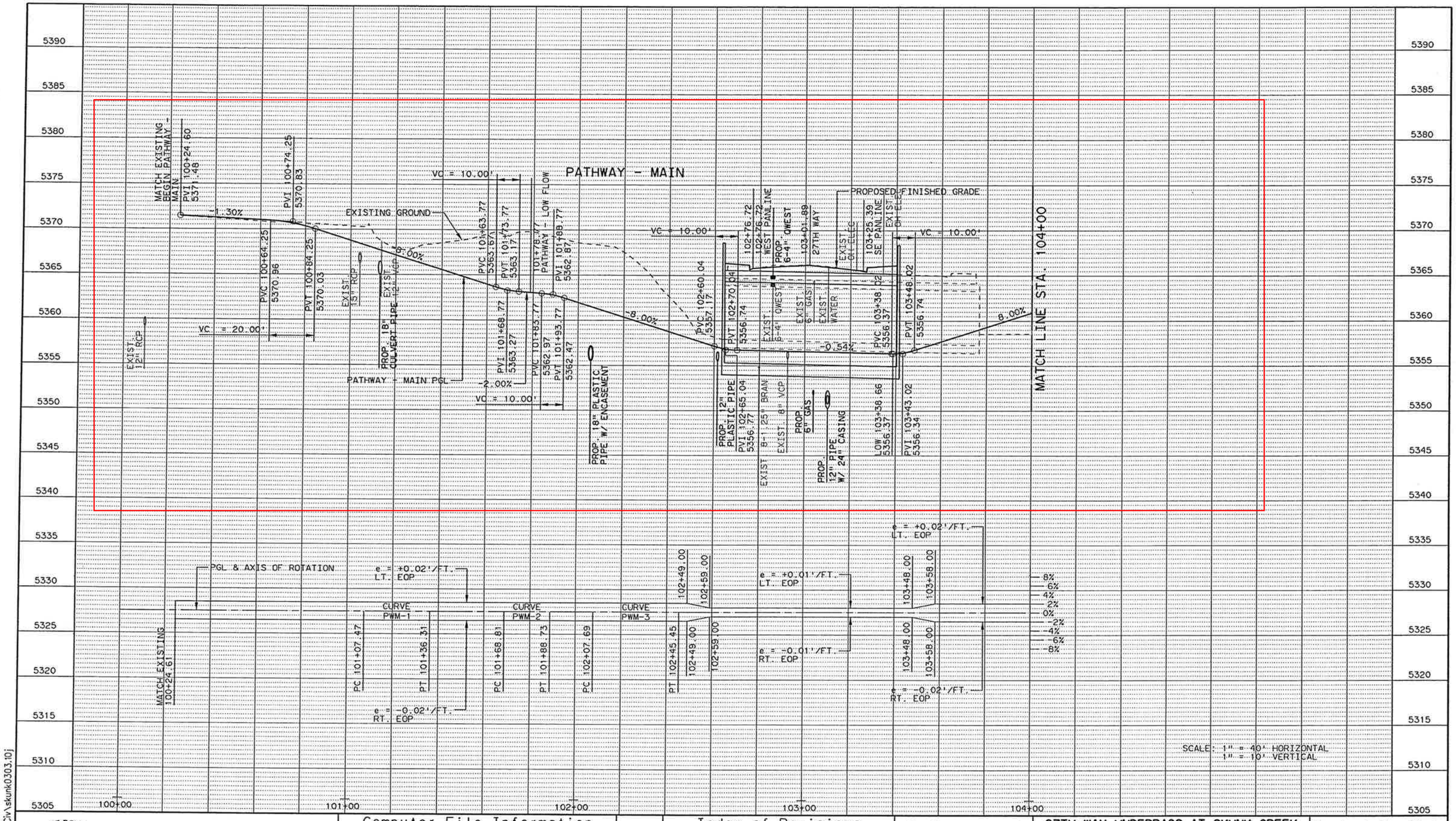

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		Units: English

Index of Revisions

As Constructed
No Revisions:
Revised:
Void:

27TH WAY UNDERPASS AT SKUNK CREEK

PATHWAY - MAIN PROFILE
100+00 TO 104+00

Designer: M. GRANT
Detailer: D. MADOCK
Sheet Subset:
Structure Numbers
Subset Sheets: 2 of 4

Project No./Code
STE M110-036
14097
Sheet Number 60

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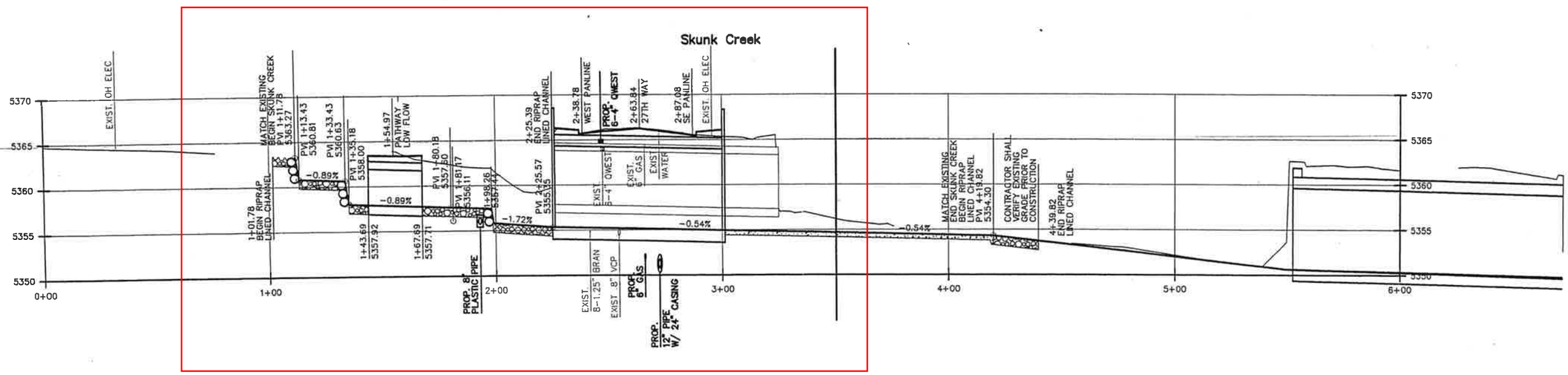

Creek Alignment

1" = 50'

10-13-06

CITY OF BOULDER · DIVISION OF TRANSPORTATION

DAVID EVANS AND ASSOCIATES INC.
1331 - 17th Street, Suite 900
Denver, Colorado 80202
Phone: 720.946.0969

Computer File Information		
Creation Date:	2/17/2005	Initials: DMM
Last Modification Date:	4/3/2006	Initials: DMM
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		Units: English

Index of Revisions

As Constructed
No Revisions:
Revised:
Void:

27TH WAY UNDERPASS AT SKUNK CREEK

SKUNK CREEK PROFILE

Designer: M. GRANT
Detailer: D. MADDOCK
Sheet Subset:
Structure Numbers
Subset Sheets: 3 of 3

Project No./Code
STE M110-036
14097
Sheet Number 65

4/ 2:41:30 PM
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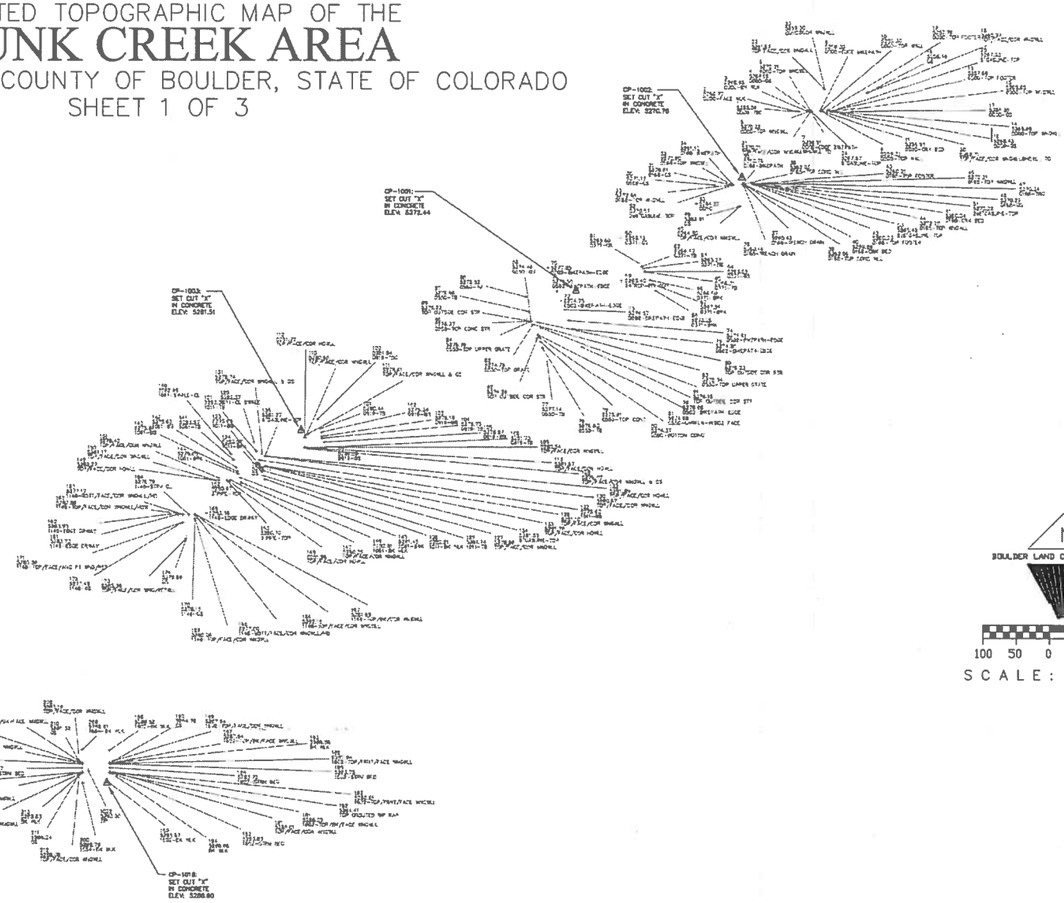
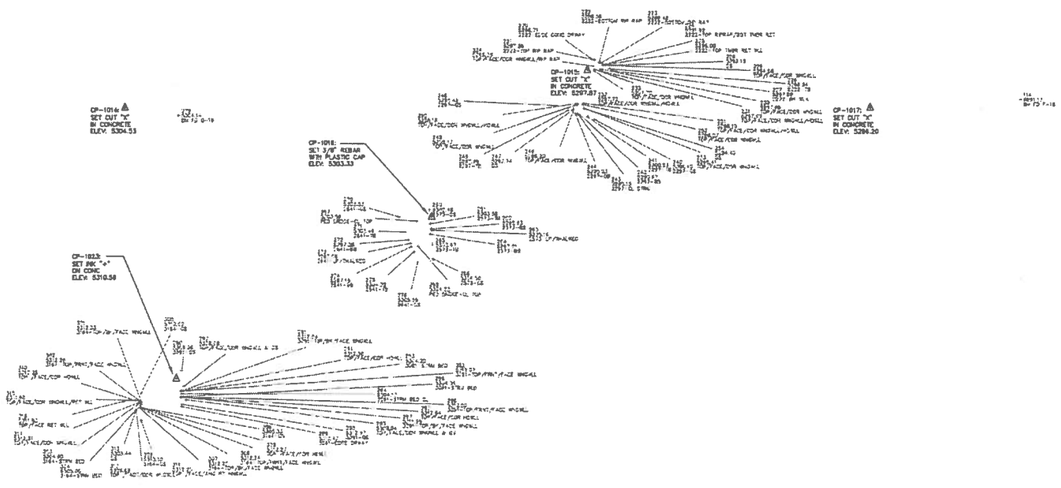
A LIMITED TOPOGRAPHIC MAP OF THE

SKUNK CREEK AREA

CITY OF BOULDER, COUNTY OF BOULDER, STATE OF COLORADO

SHEET 1 OF 3





NOTES

1. THIS MAP DOES NOT REPRESENT A BOUNDARY SURVEY OR TITLE SEARCH PERFORMED BY BOULDER LAND CONSULTANTS, INC. THERE MAY EXIST EASEMENTS AND/OR OTHER ENCUMBRANCES AFFECTING THE SUBJECT PROPERTIES THAT ARE NOT SHOWN HEREON.
2. HORIZONTAL INFORMATION SHOWN HEREON IS BASED ON U.S. STATE PLANE COORDINATES NAD 1983 (2007), COLORADO ZONE 501 NORTH. PROJECT COMBINED SCALE FACTOR IS 0.99971290.
3. PRIMARY BENCHMARK FOR VERTICAL INFORMATION SHOWN HEREON IS NATIONAL GEODETIC SURVEY FIRST ORDER, CLASS II BENCH MARK "J 440" (PID KK1563). ELEVATION: 5492.60', NAVD88 DATUM.
4. NO UNDERGROUND UTILITIES WERE SURVEYED NOR ARE ANY SHOWN HEREON.
5. CERTIFICATION DEFINED: THE USE OF THE WORDS "CERTIFY" OR "CERTIFICATION" BY A REGISTERED PROFESSIONAL LAND SURVEYOR CONSTITUTES AN EXPRESSION OF PROFESSIONAL OPINION REGARDING THE FACTS AND FINDINGS WHICH ARE THE SUBJECT OF THE CERTIFICATION, AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTY, EITHER EXPRESSED OR IMPLIED. THE CERTIFICATION SHOWN HEREON EXTENDS ONLY TO THOSE PARTIES SPECIFICALLY MENTIONED THEREIN (PER COLORADO STATE BOARD RULE 6.2.2).
6. IN ACCORDANCE WITH C.R.S. 13-80-105: NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

SURVEYOR'S CERTIFICATION

I, JASON EMERY, HEREBY CERTIFY TO BELT COLLINS WEST, LTD. THAT, SUBJECT TO THE NOTES SHOWN HEREON, THIS LIMITED TOPOGRAPHIC MAP WAS BASED ON A FIELD SURVEY PERFORMED UNDER MY DIRECT SUPERVISION, AND THAT THIS LIMITED TOPOGRAPHIC MAP ACCURATELY DEPICTS THE RESULTS OF SAID SURVEY, AND THAT THIS MAP DOES NOT REPRESENT A LAND SURVEY PLAT OR BOUNDARY SURVEY OF THE SUBJECT PROPERTY. DATE OF FIELD WORK: ARIL THROUGH MAY 2010.

COLORADO REGISTERED PROFESSIONAL ENGINEER 34 JASON EMERY

MAY 17, 2010

JASON EMERY
COLORADO REGISTERED PROFESSIONAL
LAND SURVEYOR NO. 20034

N

BOULDER LAND CONSULTANTS, INC.

100 50 0 50 100 150

SCALE: 1" = 100'

THIS MAP WAS PREPARED BY

BOULDER LAND CONSULTANTS, INC.

5690 VALMONT RD. BOULDER, CO 80301
(303) 443-3618
www.BLCsurveyors.com

DRAWING: 100018_SITE_CER.dwg
B.C.: INC. PROJECT NO. 06318

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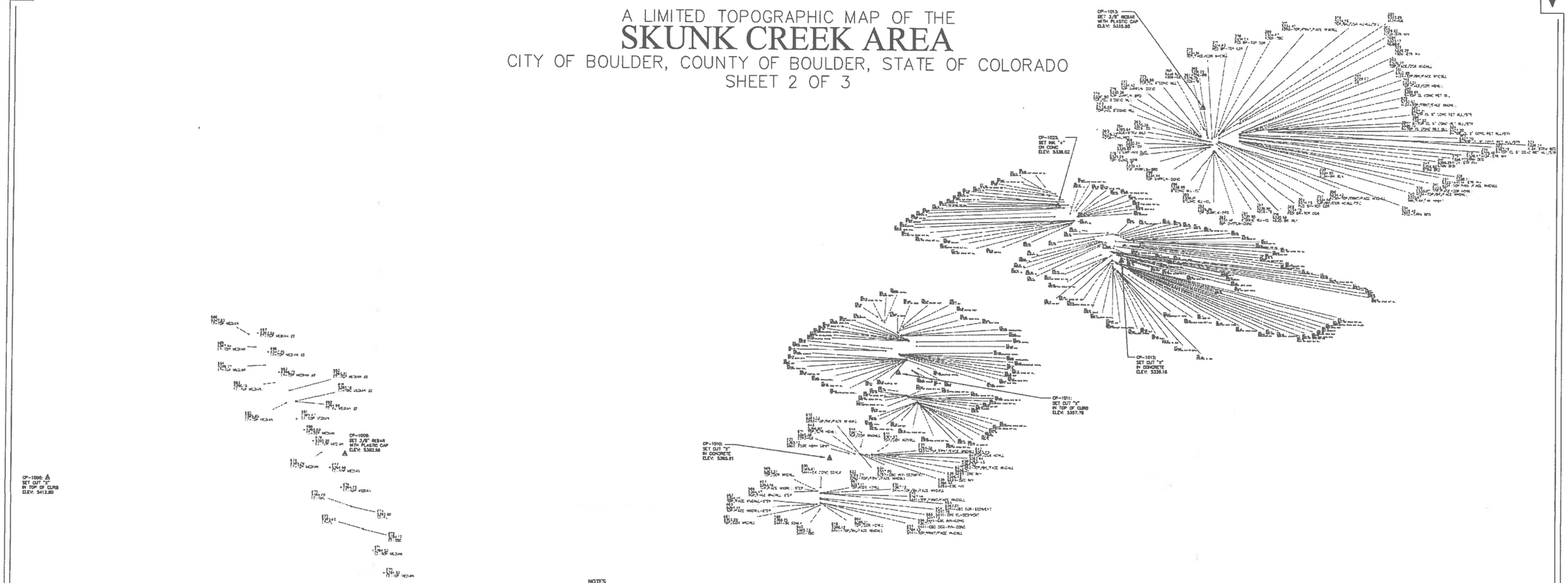
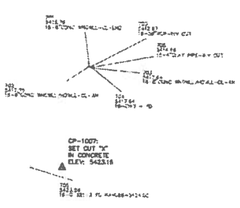
A LIMITED TOPOGRAPHIC MAP OF THE

SKUNK CREEK AREA

CITY OF BOULDER, COUNTY OF BOULDER, STATE OF COLORADO

SHEET 2 OF 3





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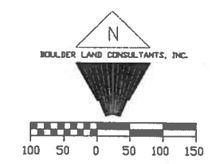
JASON EMERY
COLORADO REGISTERED PROFESSIONAL
LAND SURVEYOR (PLS) 20134

MAY 17, 2010



THIS MAP WAS PREPARED BY

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DRAWING "06010t1_SPC_CERT_2of3.dwg"
BLC, INC. PROJECT NO. 06010

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A LIMITED TOPOGRAPHIC MAP OF THE

SKUNK CREEK AREA

CITY OF BOULDER, COUNTY OF BOULDER, STATE OF COLORADO

SHEET 3 OF 3

NOTES

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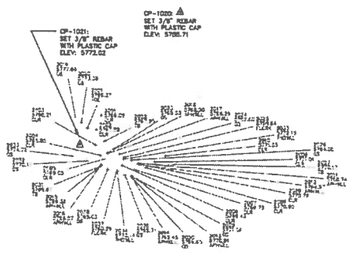
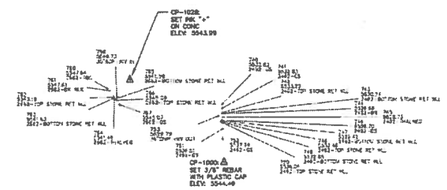
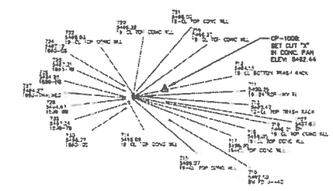
COLORADO REGISTERED PROFESSIONAL LAND SURVEYOR NO. 20104

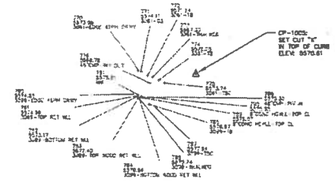
MAY 17, 2010

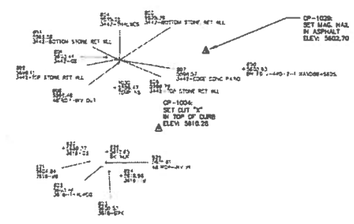
JASON EMERY
COLORADO REGISTERED PROFESSIONAL
LAND SURVEYOR NO. 20104

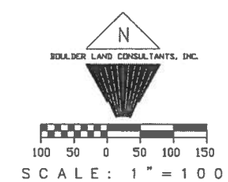












THIS MAP WAS PREPARED BY

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5690 VALMONT RD. BOULDER, CO 80301
(303) 443-3616
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DRAWING: "060101.SKC.CLR.DWG"
BLC, INC. PROJECT NO. 06-01C

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DALEY LAND SURVEYING, INC.
17011 LINCOLN AVE, #361
PARKER, CO 80134
303 953 9841

February 24, 2016
Brian LeDoux
ICON Engineering

RE: Skunk Creek Culvert As-Built Survey Summary

Between January 4th and January 20th, 2016 Daley Land Surveying, Inc. was contracted to perform an as-Built survey on a number of culvert/bridge structures along Skunk Creek between Foothills Parkway across Broadway and down to King Avenue in Boulder, Colorado.

Since the project is located in the Colorado State Plane North Zone (501), horizontal positions for the survey are referenced to that coordinate system. No modification of the coordinates was done, all values are grid.
The vertical element of the survey is referenced to NAVVD88, holding NGS BM G321 Reset near the center of the project (Published Elevation 5387.00 feet). Verification of the benchmark was done with GPS observations at two additional City of Boulder Benchmarks.
COB Benchmark BM-G321-1 (Published Elevation 5394.70 feet), a chiseled box in the top of a retaining wall near the intersection of Broadway & 27th Way, and COB Benchmark BMC-18-1 (Published Elevation of 5249.00 feet), a chiseled box in the top of a catch basin in the parking lot for 4001 Discovery Drive, were both observed and the elevations derived from our GPS survey were within 0.02' at each of the COB benchmarks.

VERTICAL CONTROL ELEVATION COMPARISON

Control Point	Pub. Elev.	DLS Elev.	Difference DLS-Pub
BM G21 Reset	5387.00	5387.00	0.00
COB BM G321-1	5394.70	5394.68	-0.02
COB BMC-18-1	5249.00	5349.02	0.02

Respectfully Submitted,
Daley Land Surveying, Inc.

COLORADO REGISTERED
ROBERT DALEY
35597
PROFESSIONAL LAND SURVEYOR

Rob Daley, PLS

DALEY LAND SURVEYING, INC.
17011 LINCOLN AVE, #361
PARKER, CO 80134
303 953 9841

April 7, 2016
Brian LeDoux
ICON Engineering

RE: Skunk Creek Phase II Culvert As-Built Survey Summary

On March 31st and April 1st, 2016, Daley Land Surveying, Inc. performed an as-Built survey on three culvert/bridge structures along Skunk Creek in the area of 30th Street and Bixby Avenue in Boulder, Colorado.

Since the project is located in the Colorado State Plane North Zone (501), horizontal positions for the survey are referenced to that coordinate system. No modification of the coordinates was done, all values are grid.
The vertical element of the survey is referenced to NAVVD88, holding NGS BM G321 Reset near the center of the project (Published Elevation 5387.00 feet). Verification of the benchmark was done with GPS observations at two additional City of Boulder Benchmarks.
COB Benchmark BM-G321-1 (Published Elevation 5394.70 feet), a chiseled box in the top of a retaining wall near the intersection of Broadway & 27th Way, and COB Benchmark BMC-18-1 (Published Elevation of 5249.00 feet), a chiseled box in the top of a catch basin in the parking lot for 4001 Discovery Drive, were both observed and the elevations derived from our GPS survey were within 0.02' at each of the COB benchmarks.

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COB BMC-18-1	5249.00	5349.02	0.02

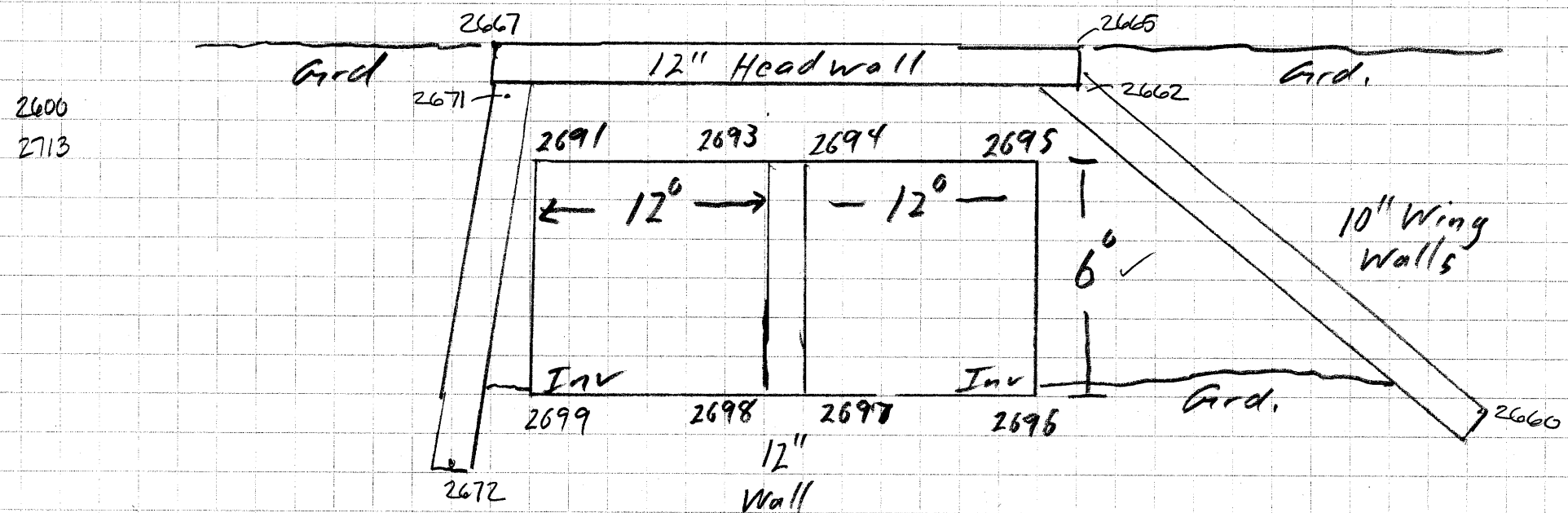
Respectfully Submitted,
Daley Land Surveying, Inc.

COLORADO REGISTERED
ROBERT DALEY
35597
PROFESSIONAL LAND SURVEYOR

Rob Daley, PLS

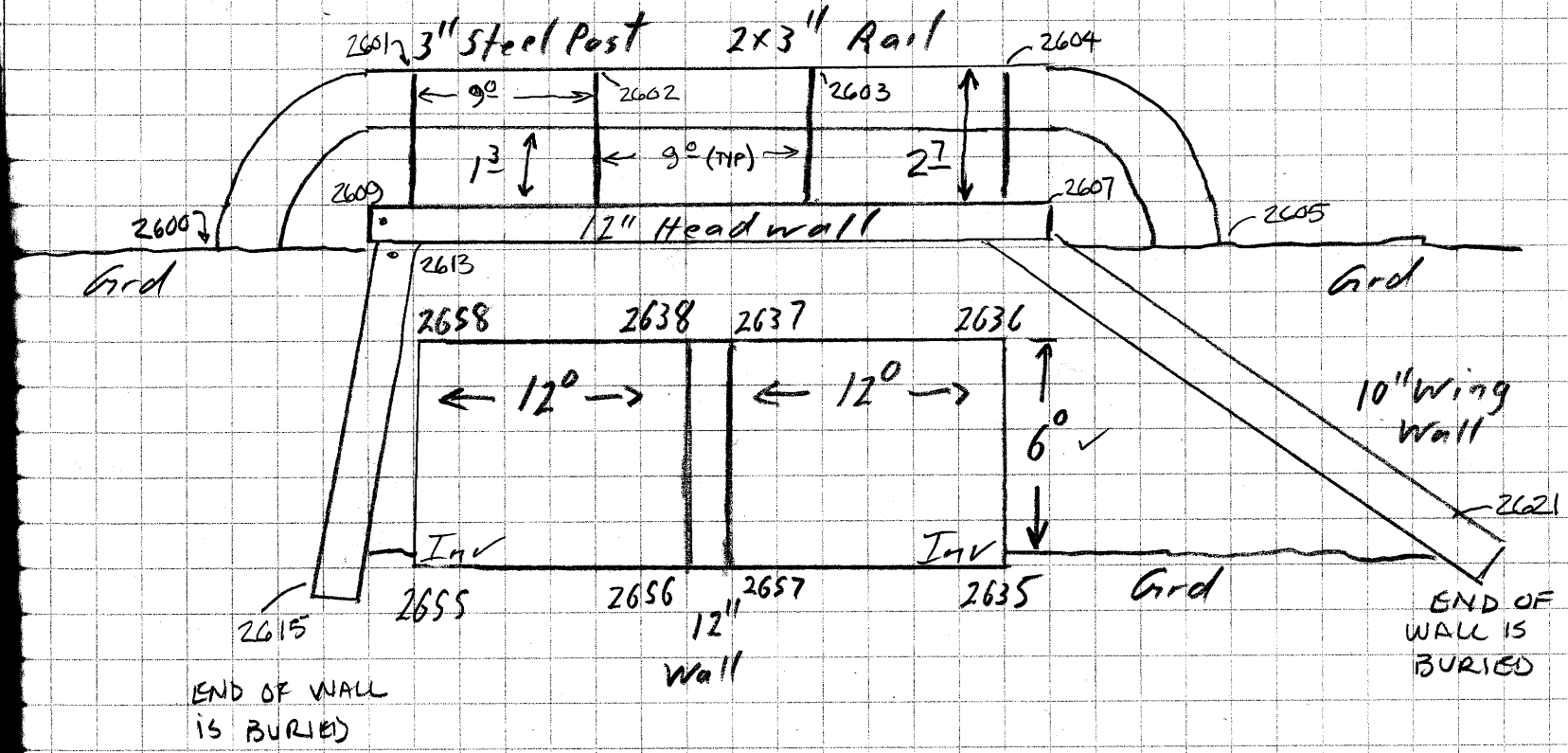
01/22/15 S Estabrooks

Icon - Foothills Parkway
Upstream looking East



01/22/15 S Estebrooks

Icon - Foothills Parkway
Downstream looking West

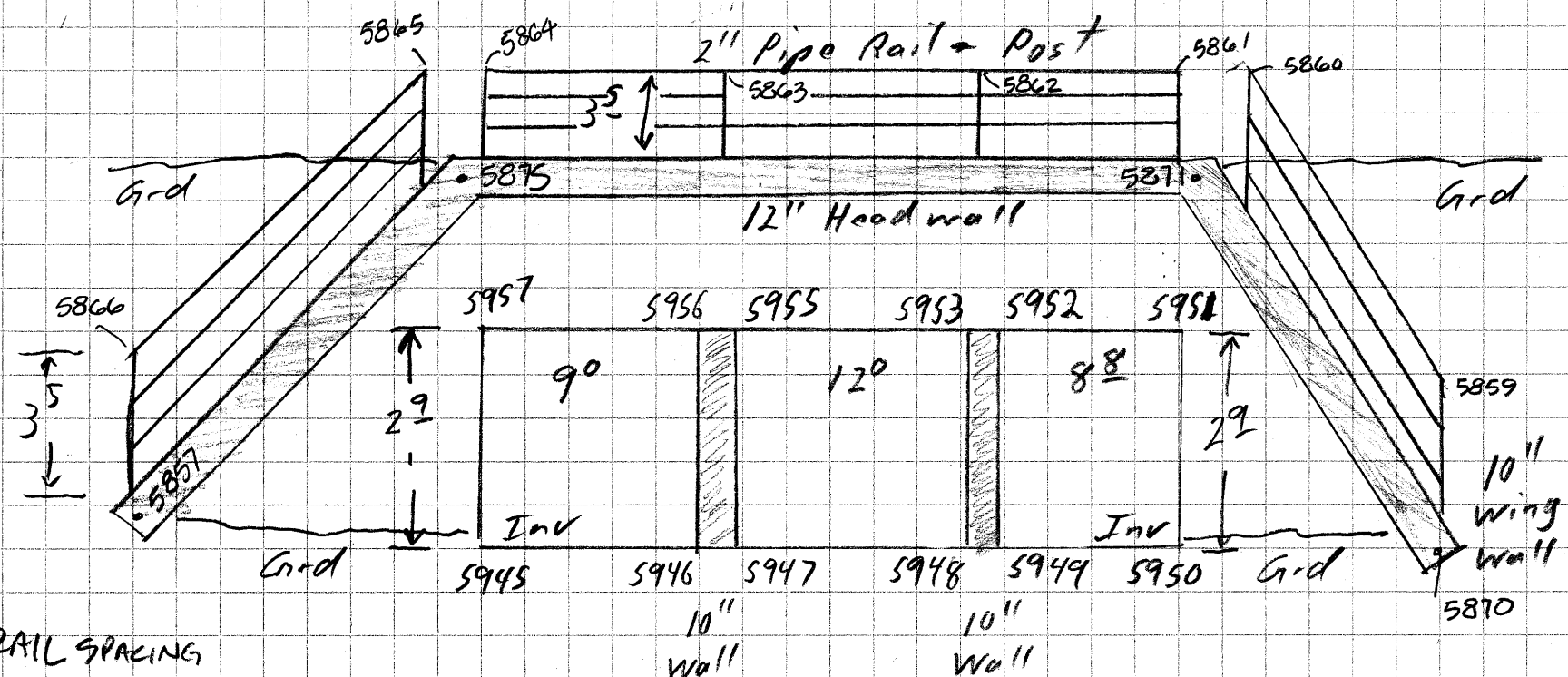


ARAPAHOE
AVENUE

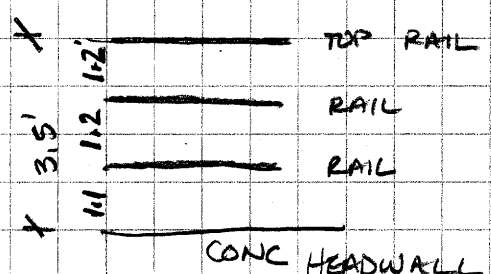
01/22/15 S Estabrooks

5849 - 5957

Icon - Low Flow Culvert
Upstream looking North

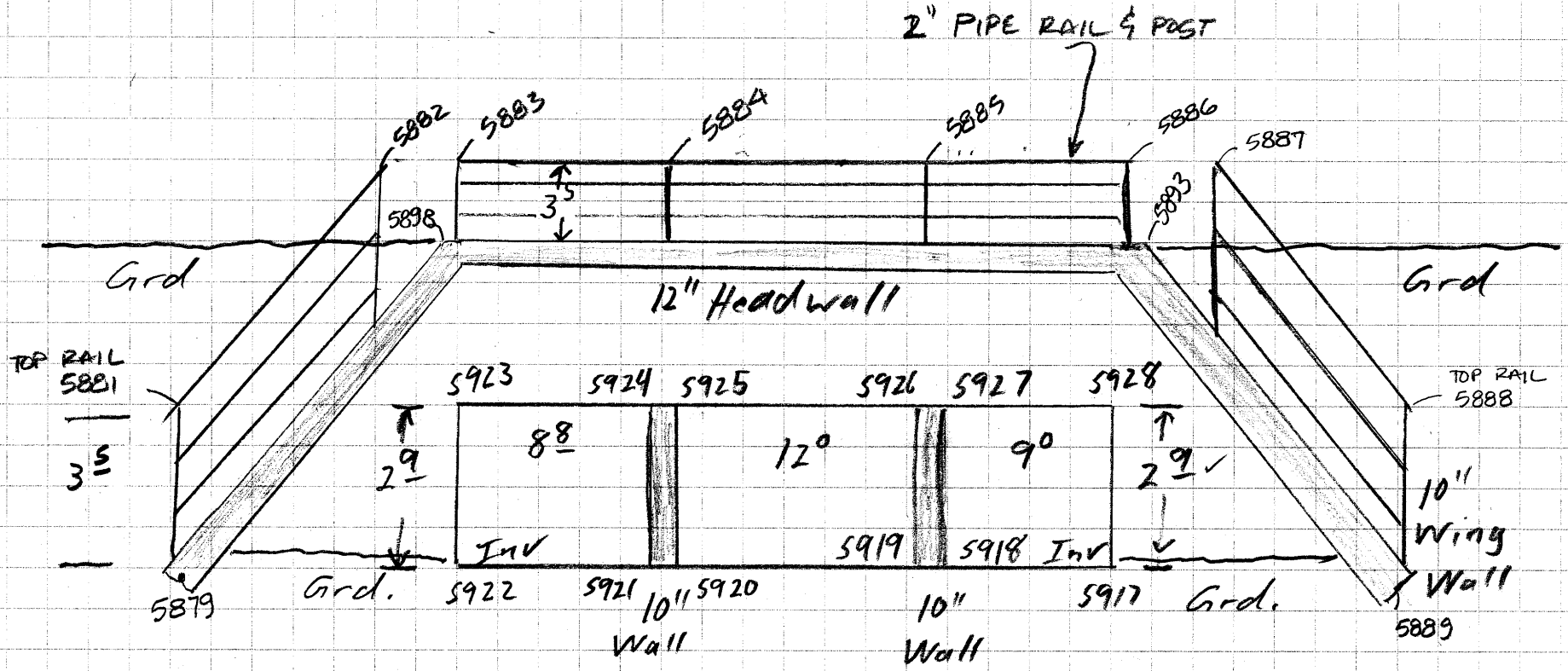


RAIL SPACING



01/22/15 S Estabrooks

Icon - Low Flow Culvert
Downstream looking South



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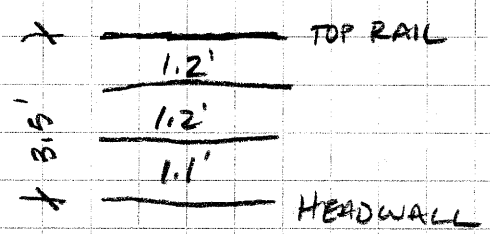


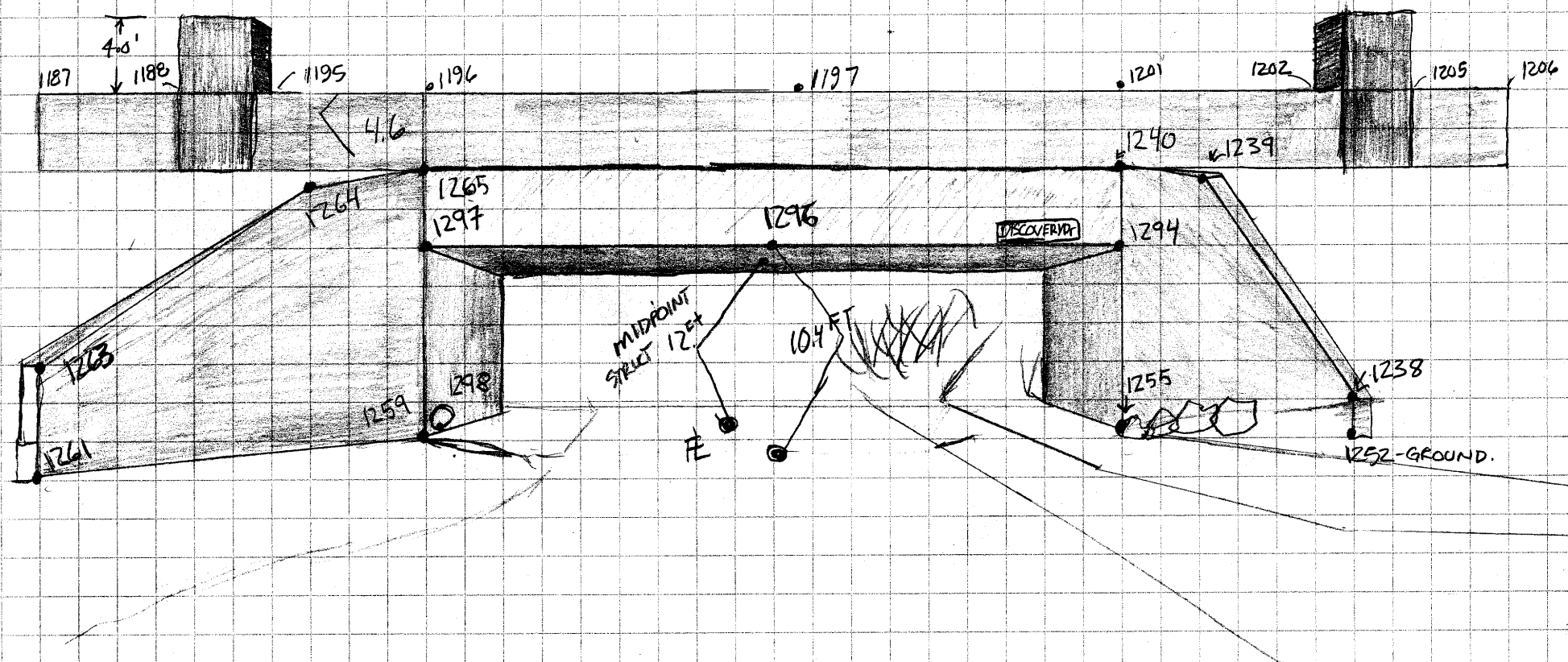
Low Flow Culvert to Ponds

Low Flow Culvert to Ponds

Low Flow Culvert to Ponds

Low Flow Culvert to Ponds

ICON - SKUNK CR. STRUCT AS-BUILT- 1·20·16. DISCOVERY DRIVE LOOKING SOUTH

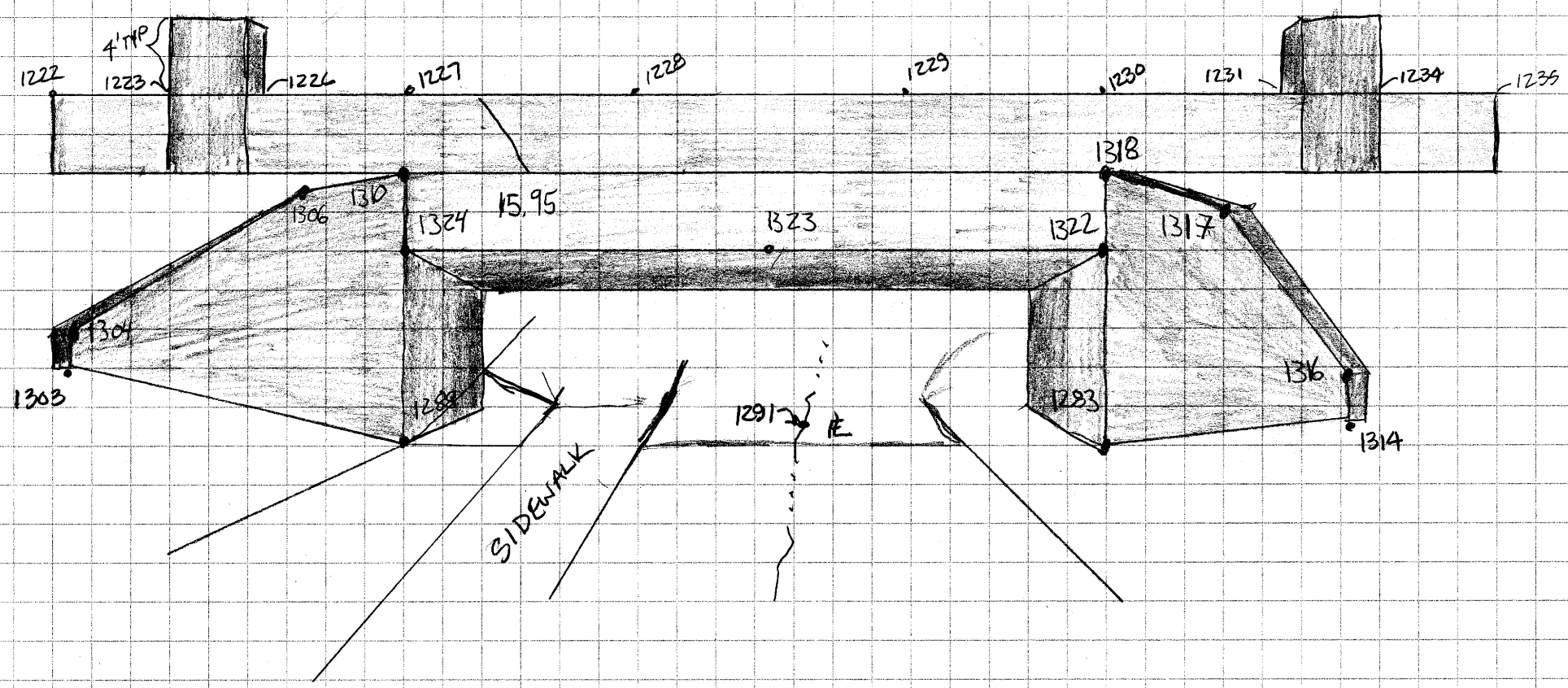


1298 = 18" RCP

1255	to	1294	8.2	1259	to	1297	8.4
1255	to	1240	11.5	1259	to	1265	11.6
1294	to	topwall	7.4	1297	to	topwall	7.4

1126-1324

ICON - SKUNK CR. AS-BUILTS - DISCOVERY DRIVE BRIDGE 1.20.16. LOOKING NORTH



Top wall to 1288 15.95

1283 to top wall 15.62

1324 to 1288 8.6

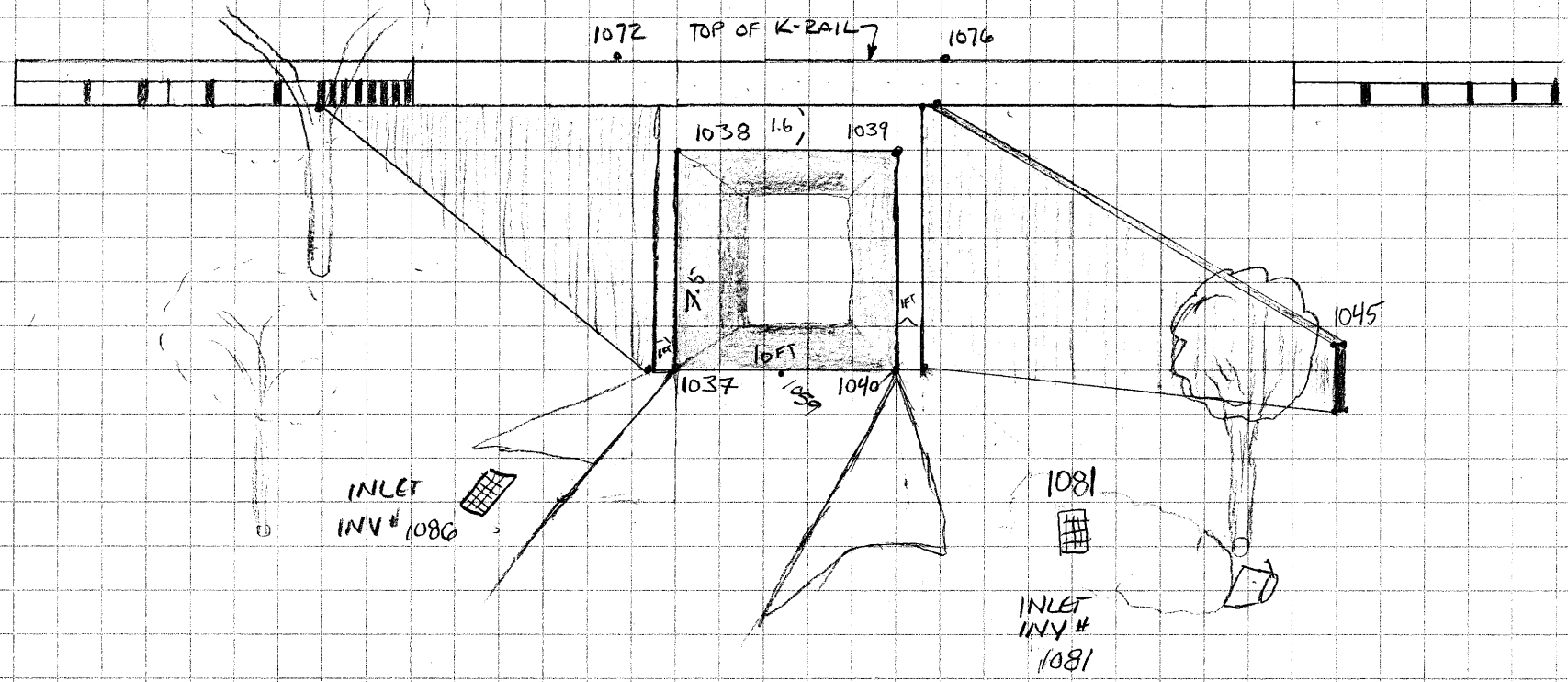
1323 to FL 10.4'

1322 to 1283 8.3

Discovery Dr

Discovery Dr

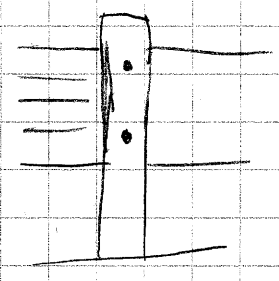
Discovery Dr



1037 to 1038 = 7.5

1037 to 1040 = 10

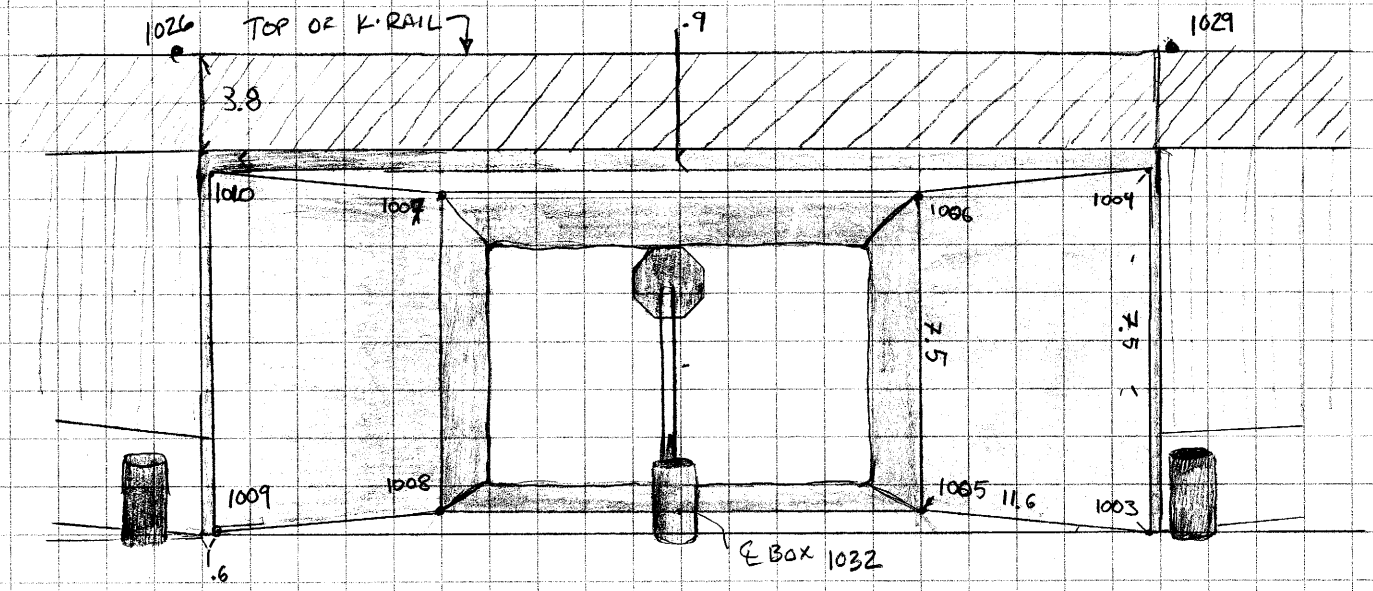
1040 to 1039 = 7.45



Icon Builder 28th Looking East

ICON ENG / CITY OF BOULDER, SKUNK CR. CULVERT ASBUILT

28TH ST PED BOX - LOOKING WEST SE / TD 1·4·16



1003 to 1004 = 7.5
1003 to 1005 = 11.6
1005 to 1006 = 7.5
1008 to 1007 = 7.55
1008 to 1009 = 12.6
1009 to 1010 = 7.5
1008 to 1005 = 10

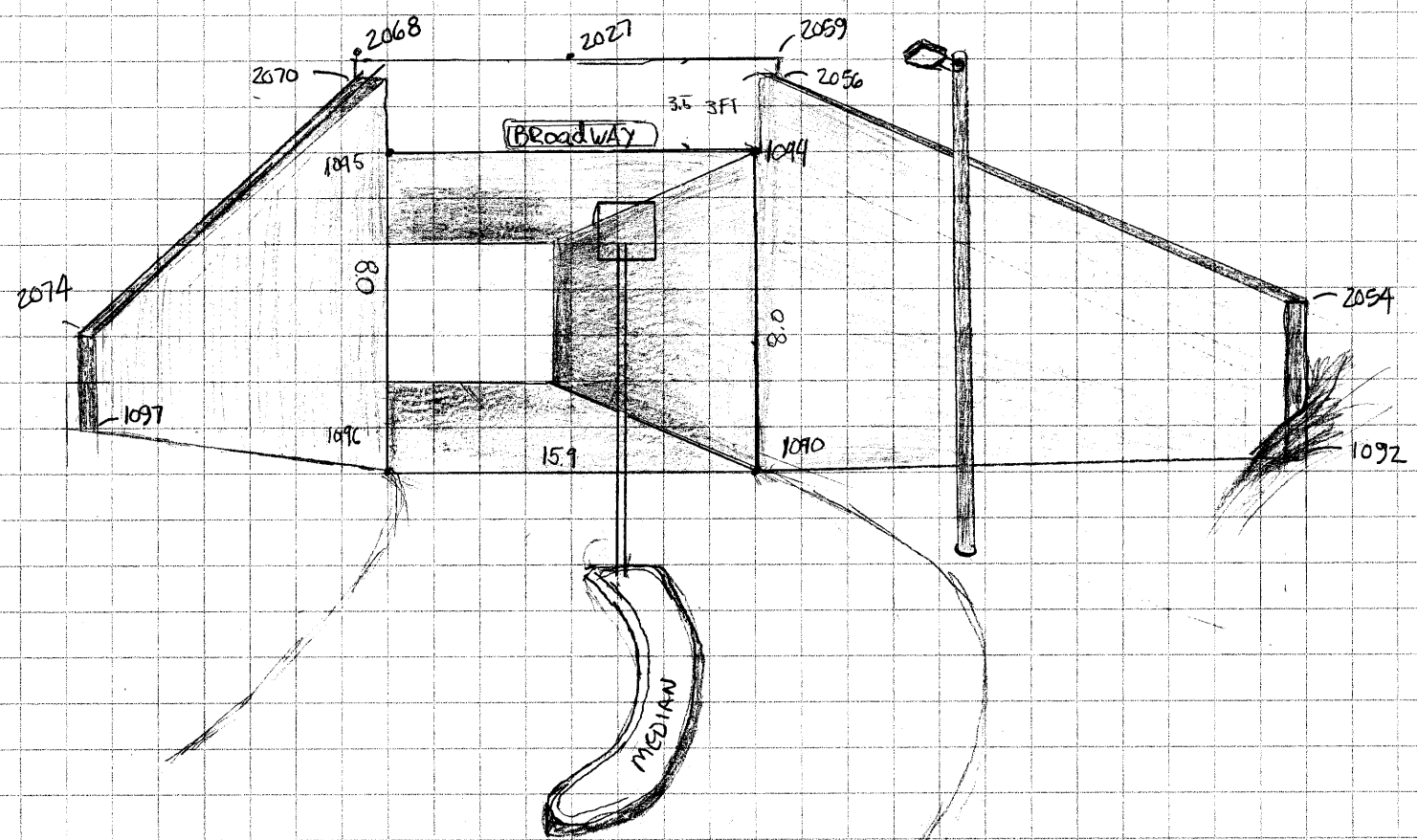
Stop Sign = 7.35
guard post = 1FT D 2.5 Tall
overall high 11.3 tall

28th Street and Aurora

YIELD

01/04/16 Trevor Daley

Icon Boulder Broadway Looking South EAST



1090 to 1094 8FT

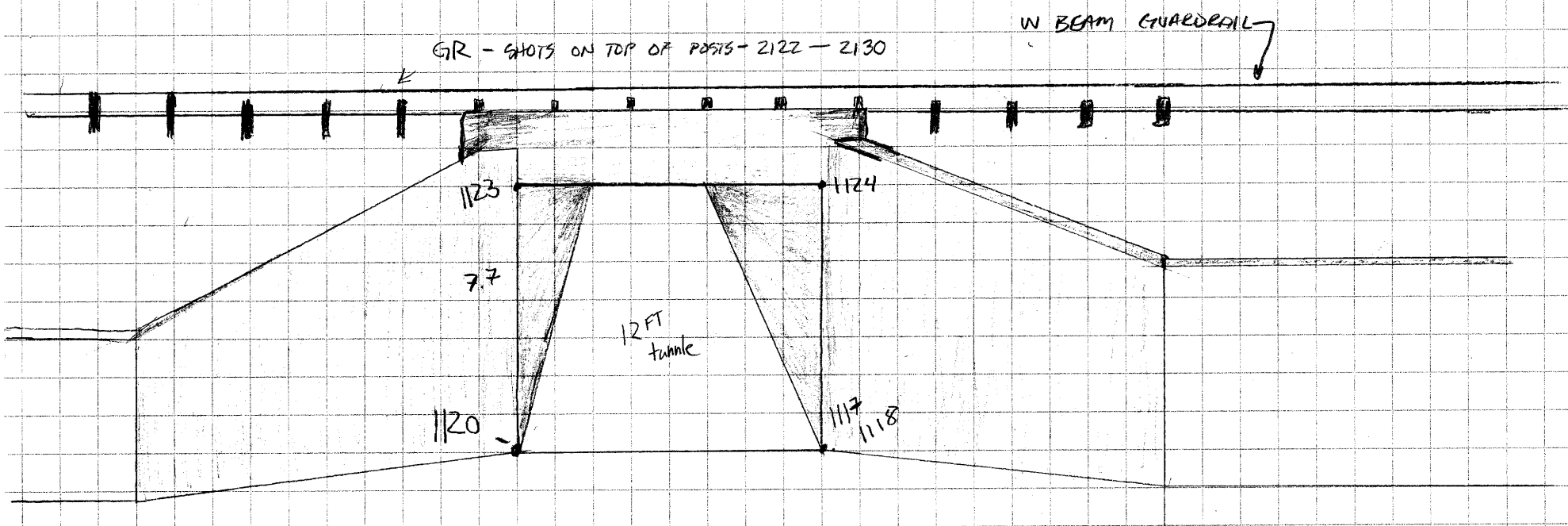
1090 to 1096 15.9

1096 to 1095 8FT

Sighn is 8FT

Total is 11.5

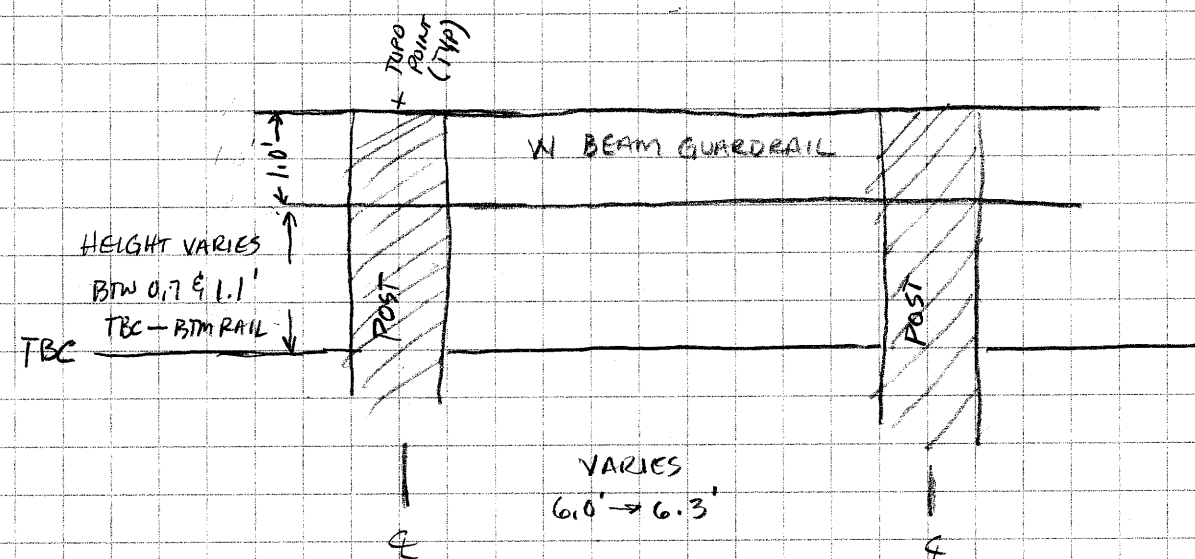
V04/16 Trevor Paley Icon Boulder Broadway Looking North east



1123 to 1120 7.7

1123 to 1117 = 1565

1124 to 1117 7.7

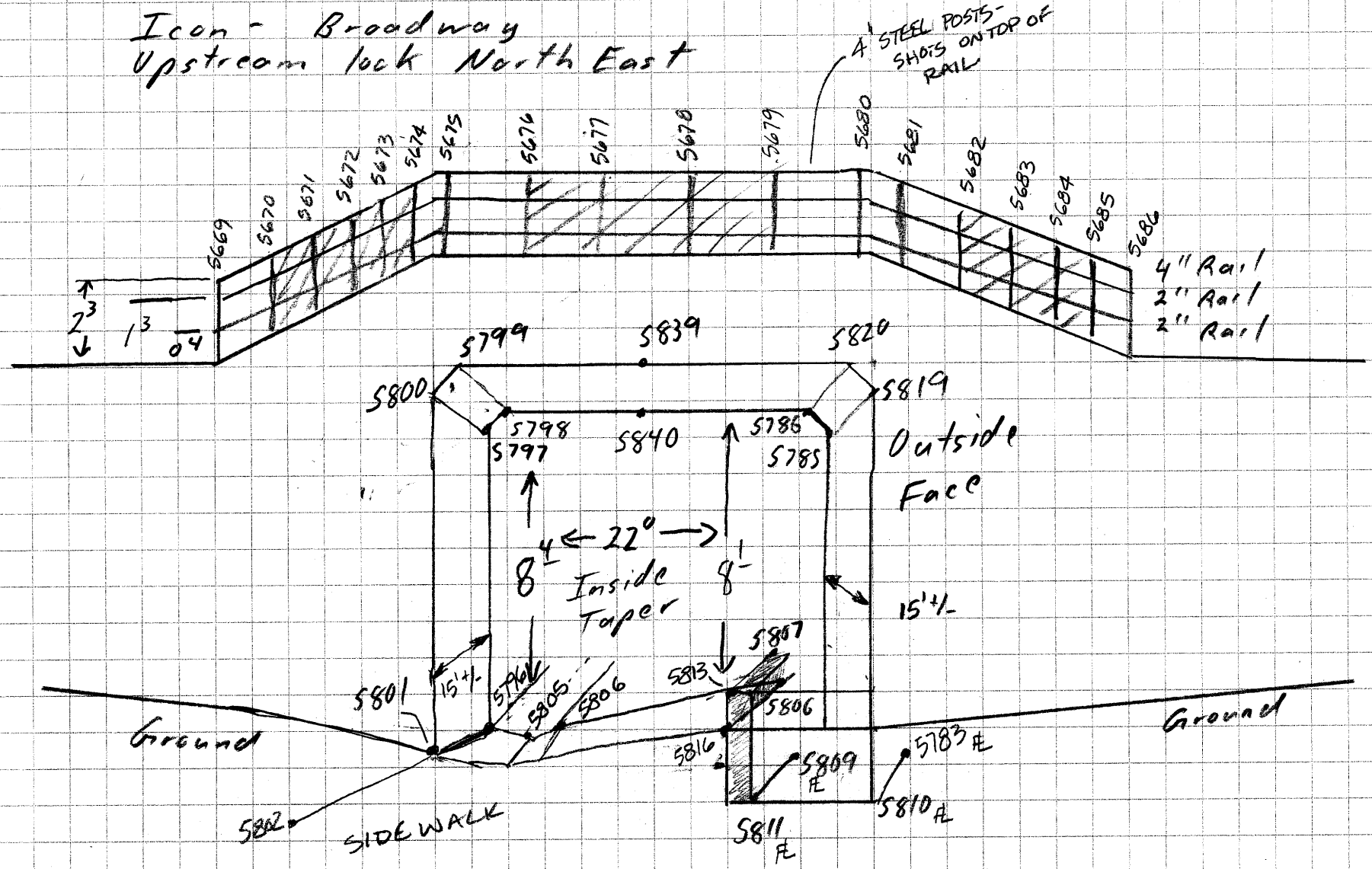


Broadway

Broadway
LANDFILL

01/21/15 S Estabrooks

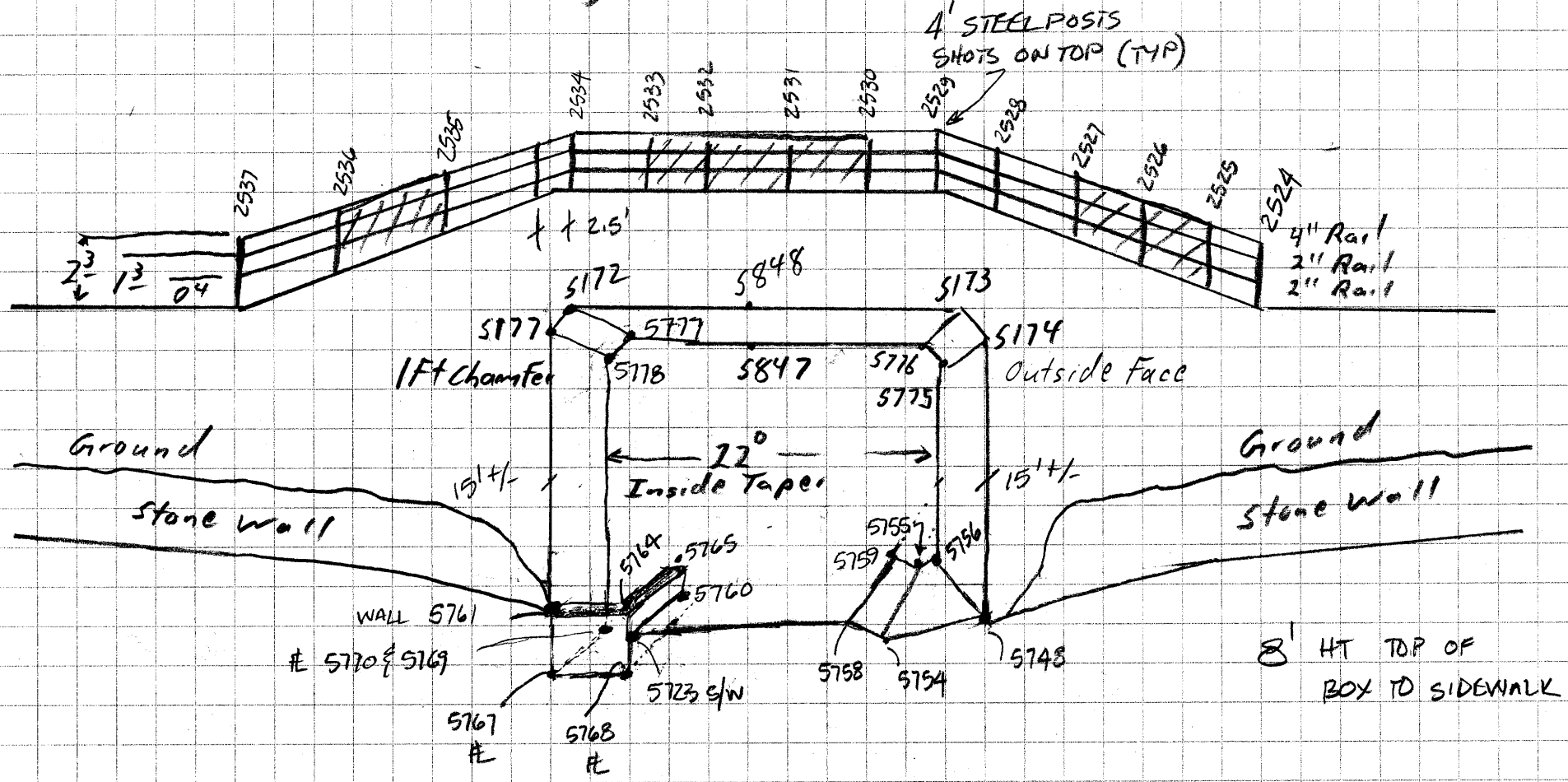
Icon - Broadway
Upstream lock North East



01/21/15 S Estabrooks

2502 - 2582
5628 - 5848

Icon - Broadway
Downstream looking South West



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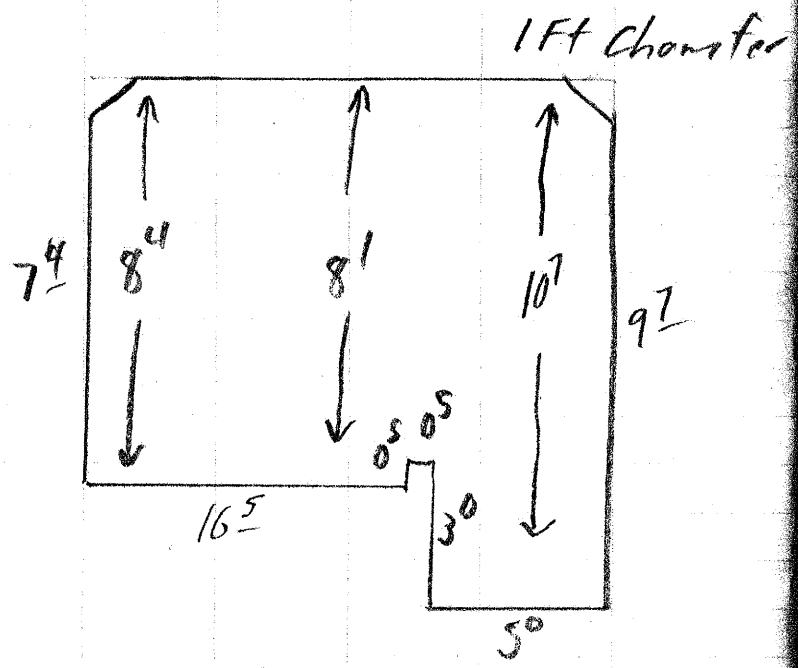
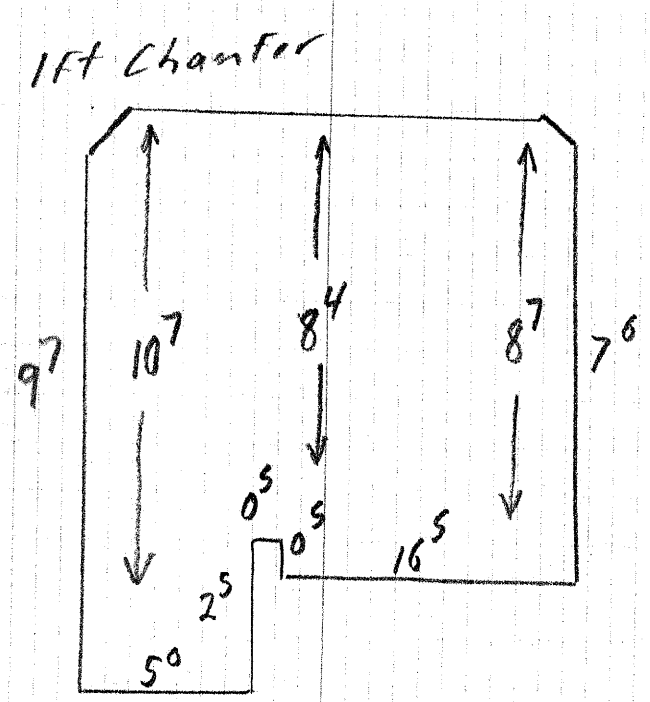


Upstream
Inside Taper

SE



Downstream
Inside Taper

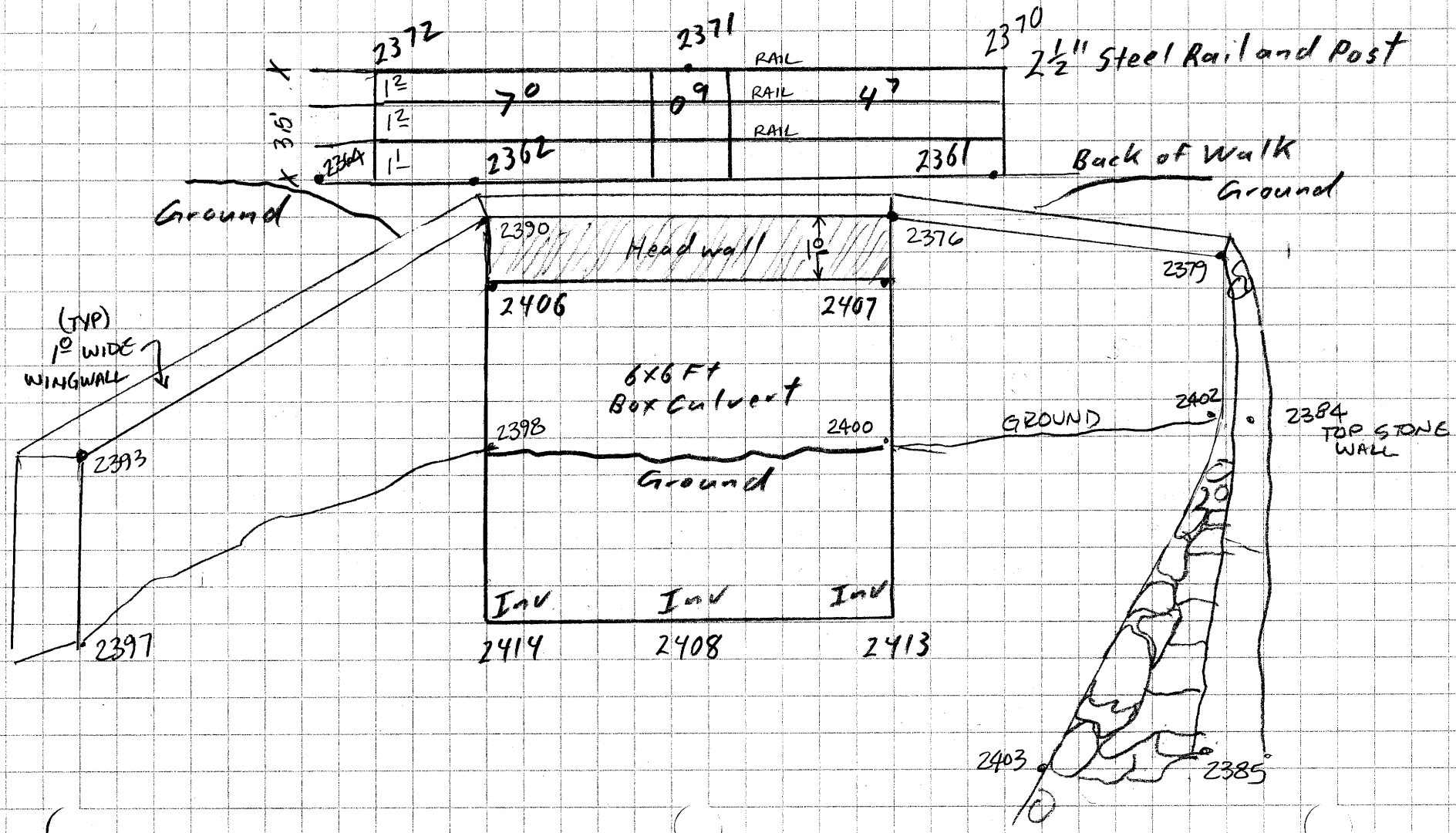
B R O A D W A Y
CAUTION
CUIDADO

B R O A D W A Y

#2312 - 2414

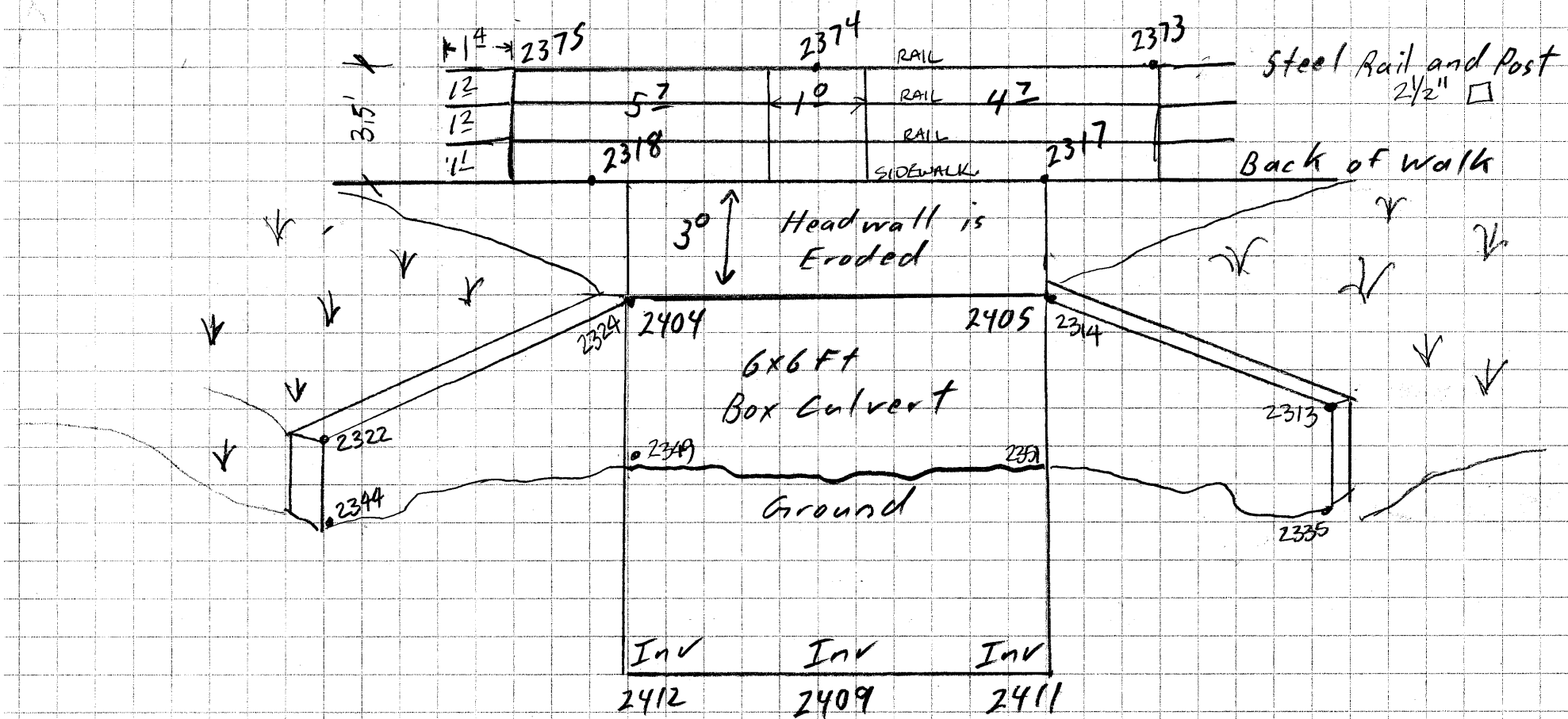
01/20/15 S Estabrooks

Icon - Bluebell Ave
Upstream looking North



01/20/15 S Estabrooks

Icon - Bluebell Ave.
Downstream looking South



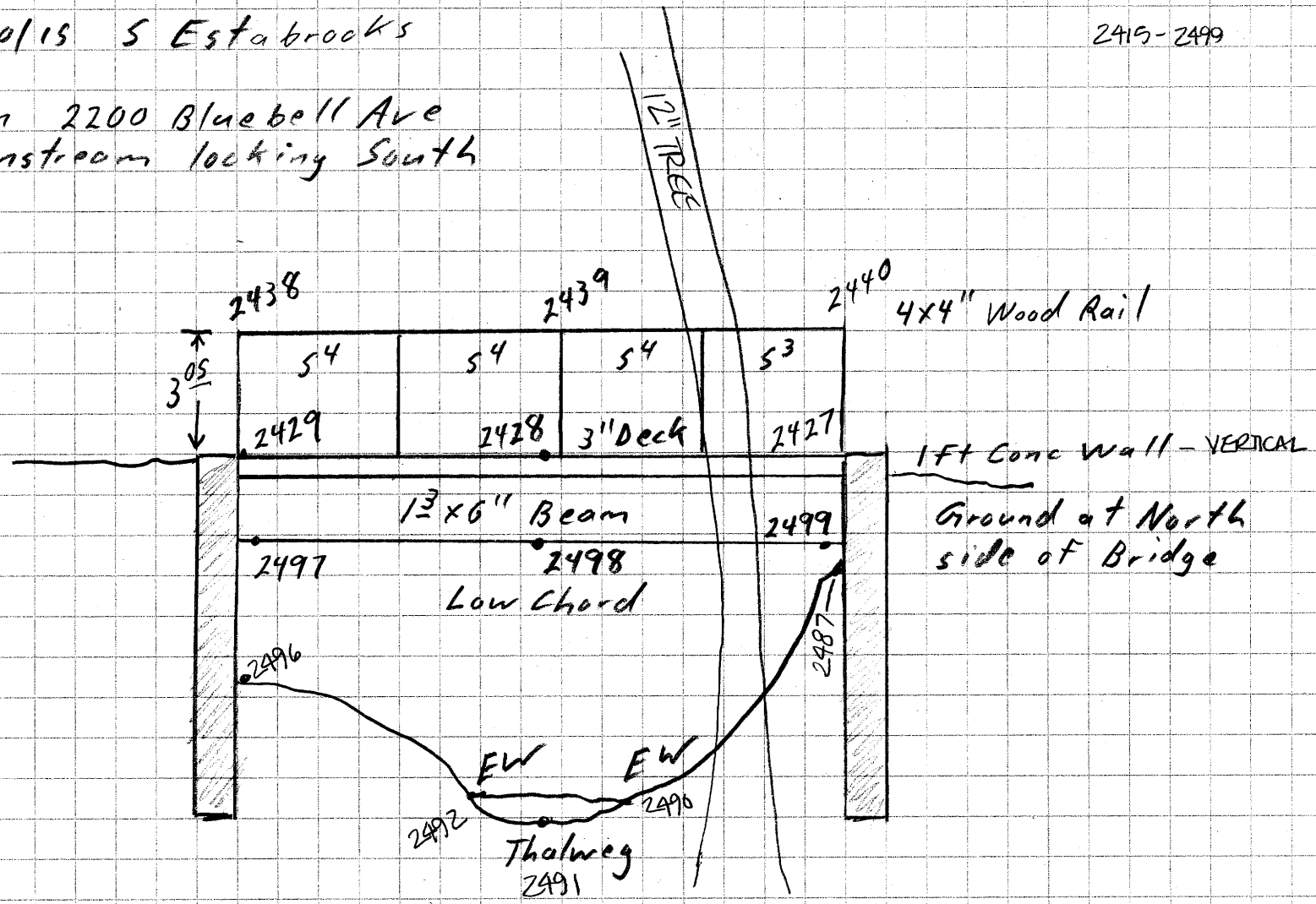
Bluebell Ave.

Bluebell Ave.

01/20/15 S Estabrooks

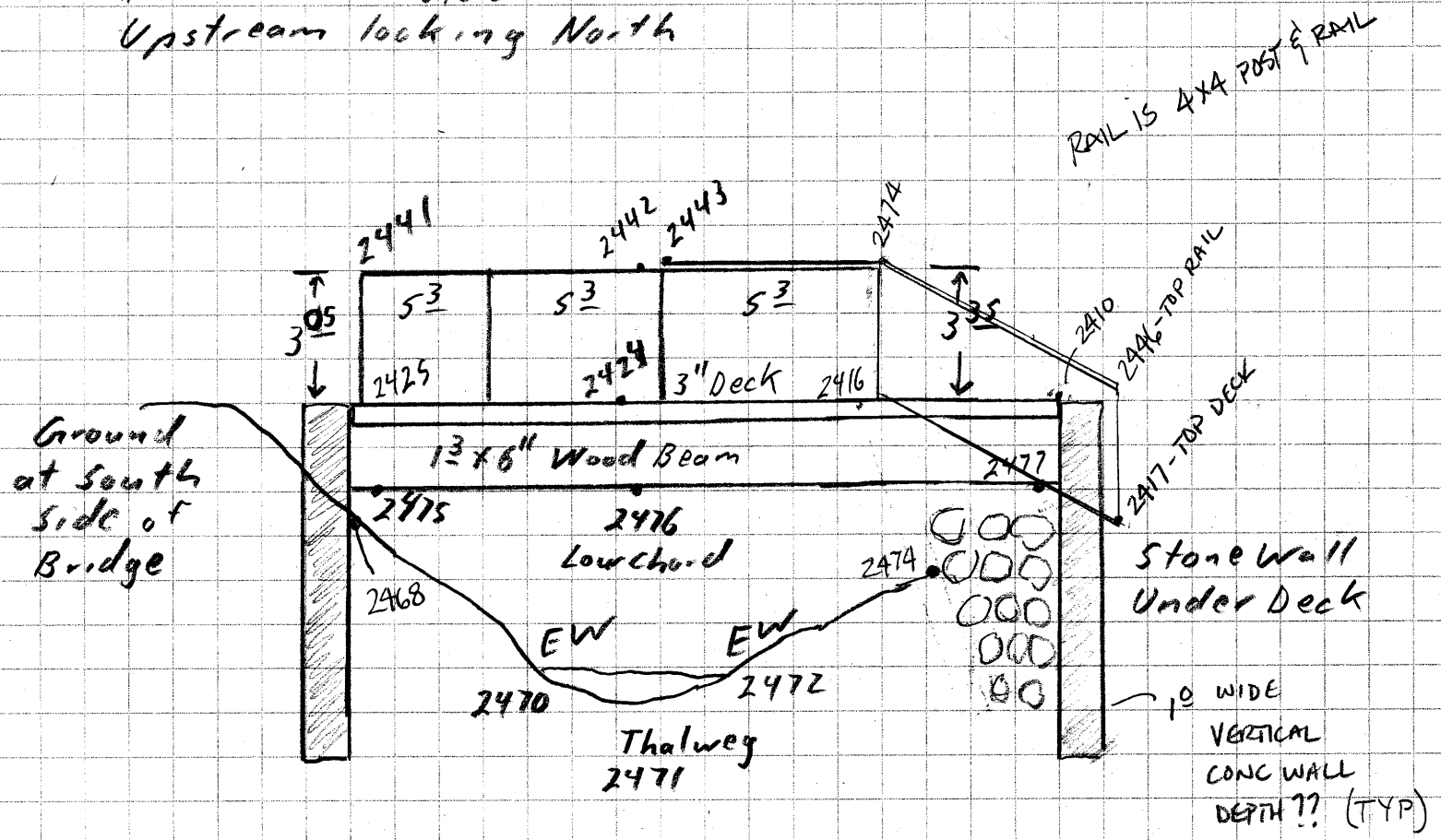
2419-2499

Icon 2200 Bluebell Ave
Downstream looking South



01/20/15 S Estabrooks

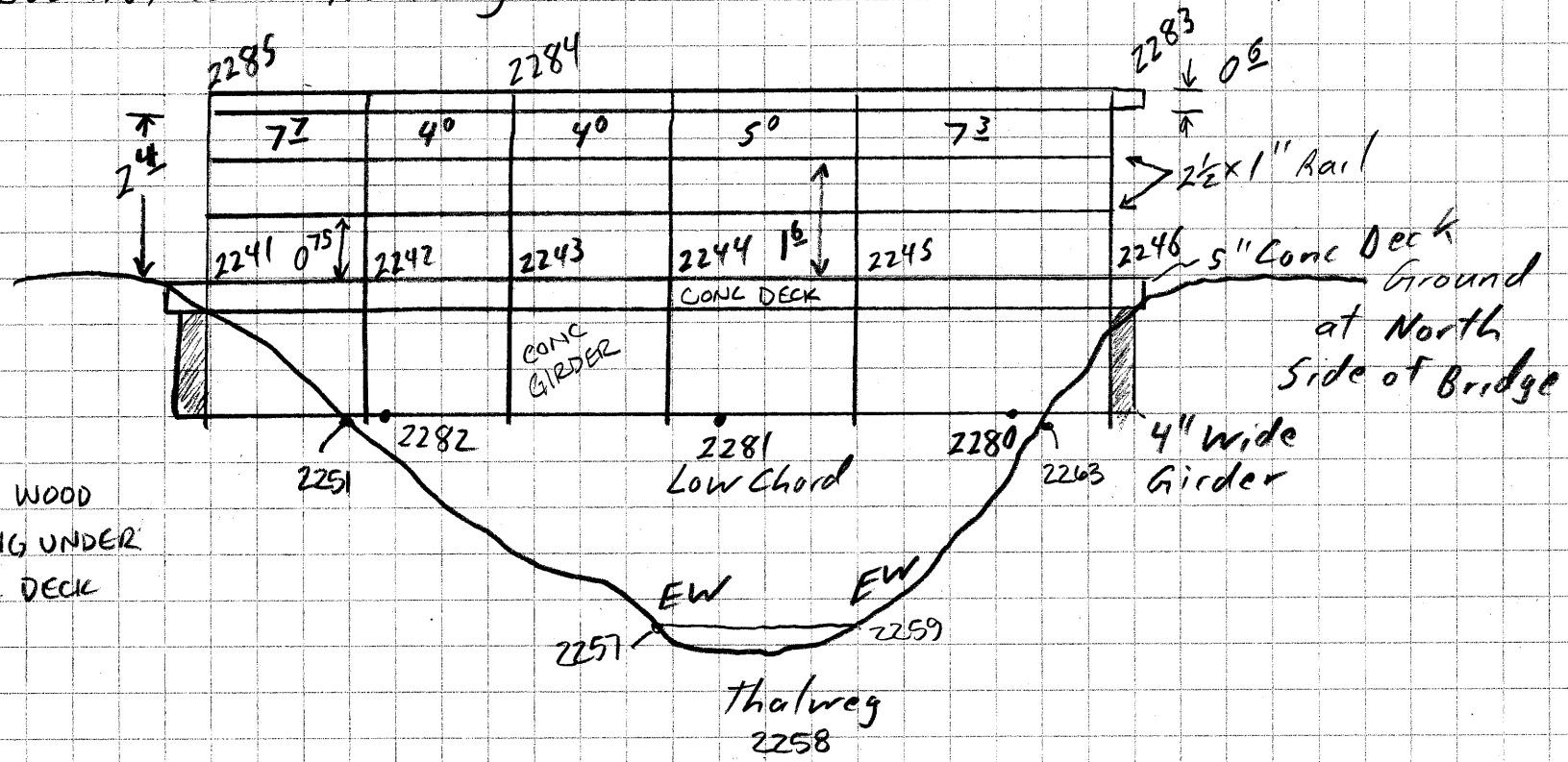
Icon - 2200 Bluebell Ave
Upstream looking North



01/19/15 Scott Estabrooks

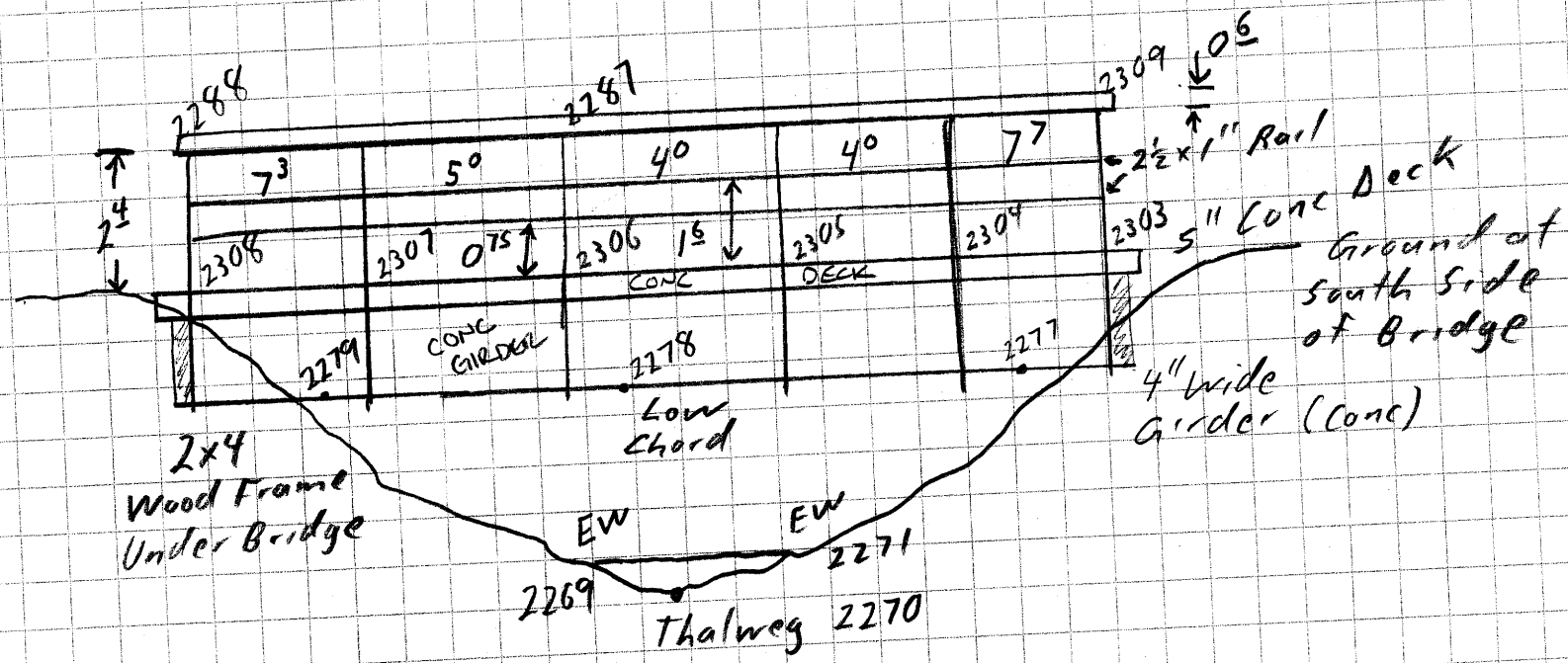
#2229-2291
2303-2309

Icon - 322 22nd Ave
Downstream looking South



01/19/15 Scott Estabrooks

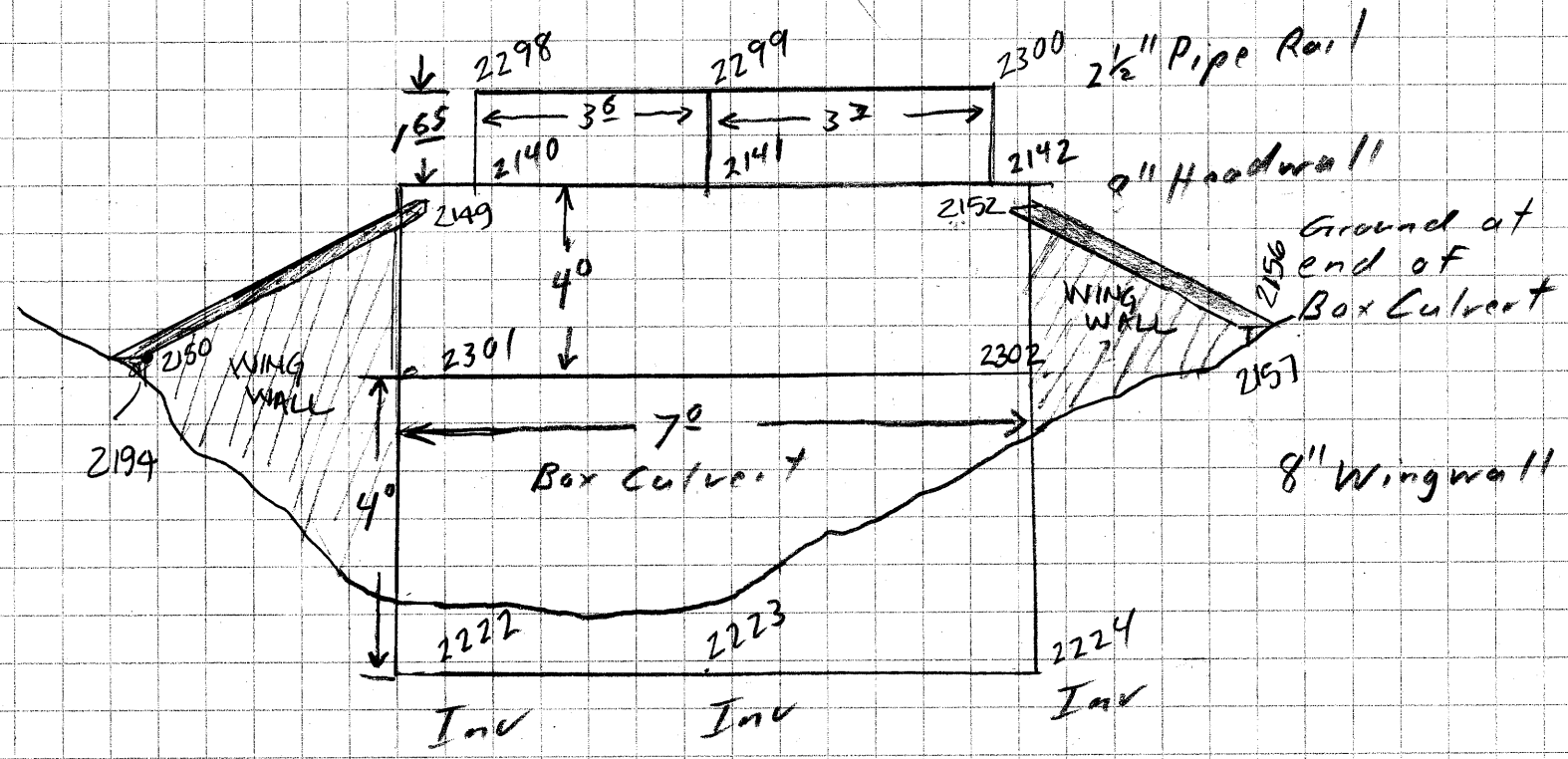
Tcon - 322 22nd Ave
Upstream looking North



01/19/15 Scott Estabrooks

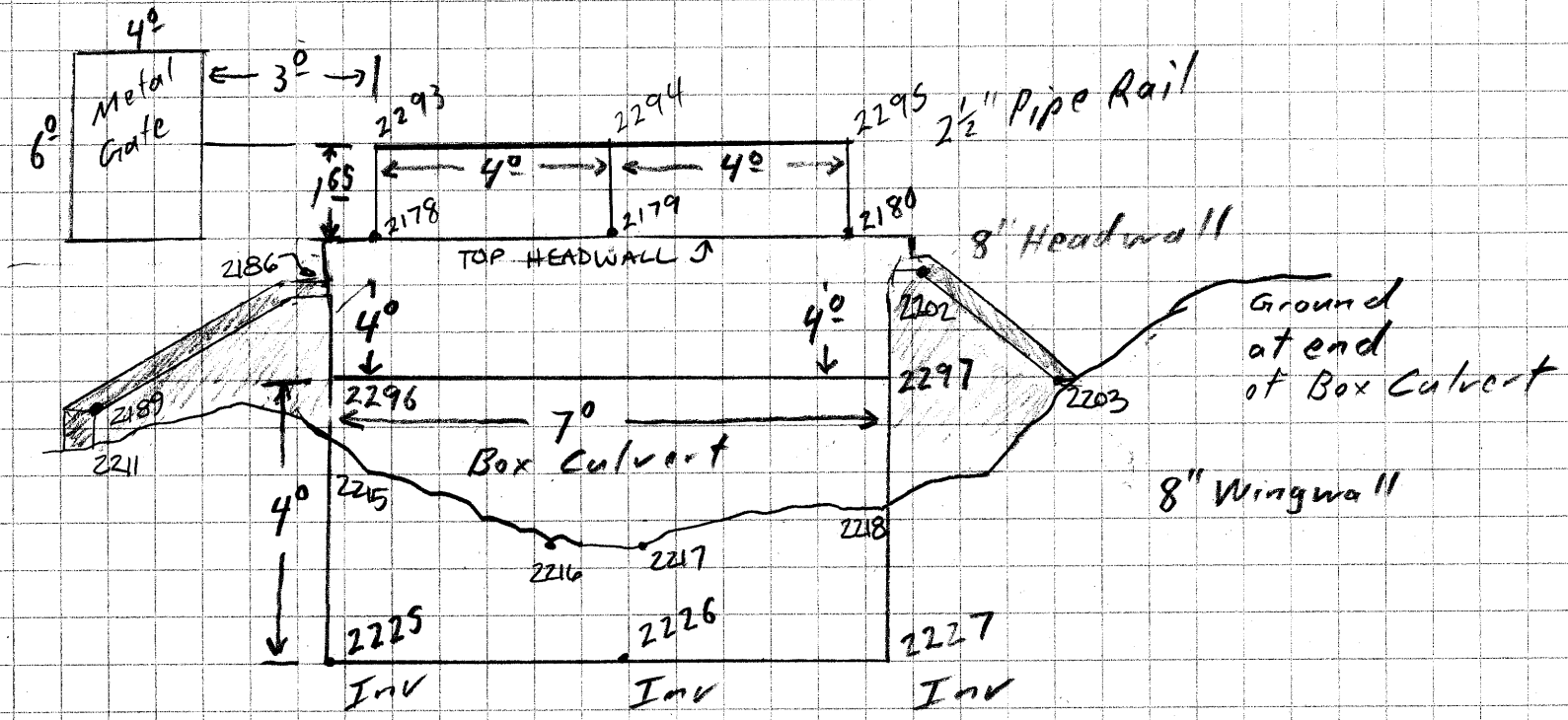
#2140 - 2227
2293 - 2302

Icon - King Avenue
Downstream looking South



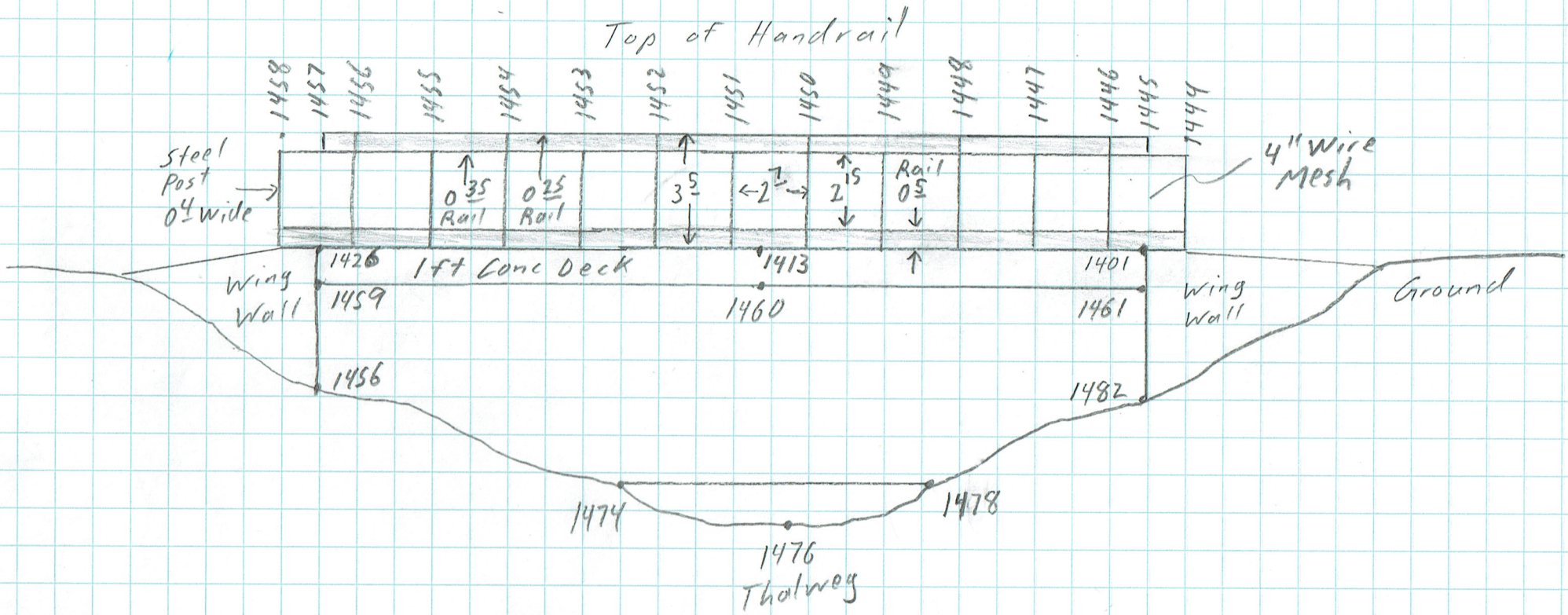
01/19/15 Scott Estabrooks

Icon - King Avenue
Upstream looking North



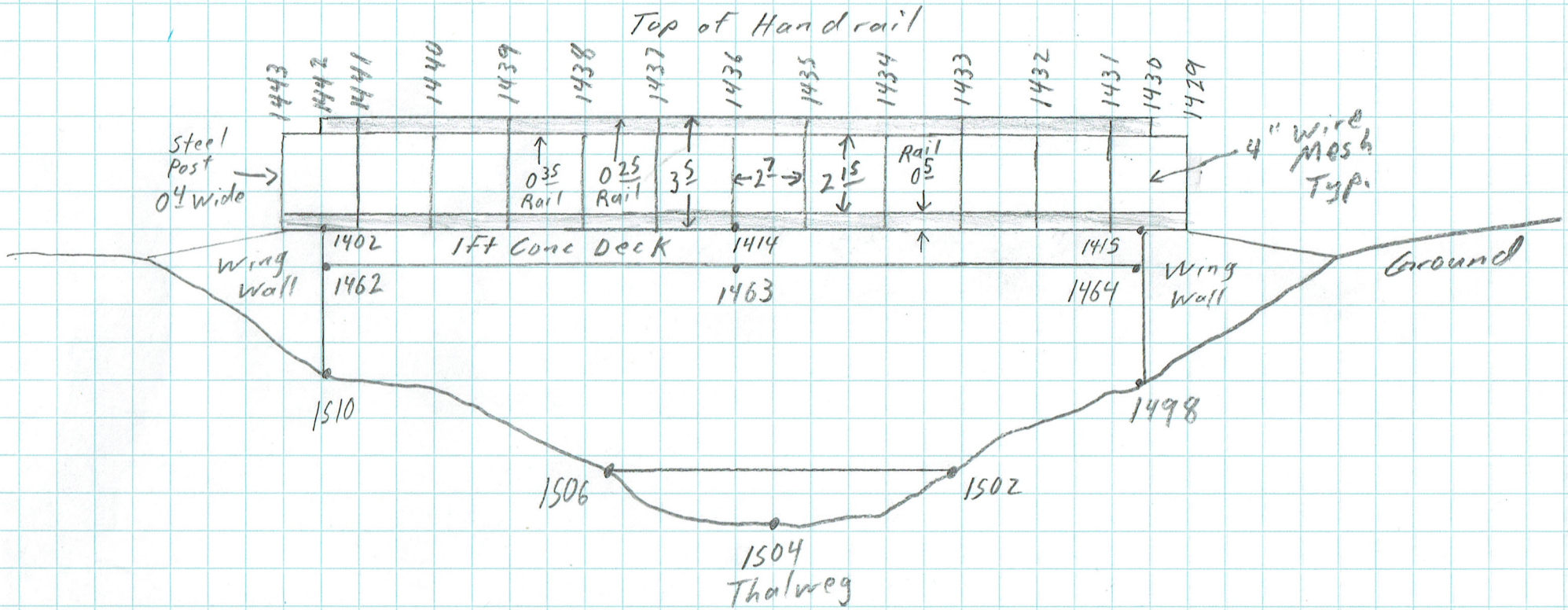
03/31/16 S Estabrooks

Icon - Arrowood Park Bridge
Downstream looking South West



03/31/16 S Estabrooks

Icon - Arrowood Park Bridge
Upstream looking North East

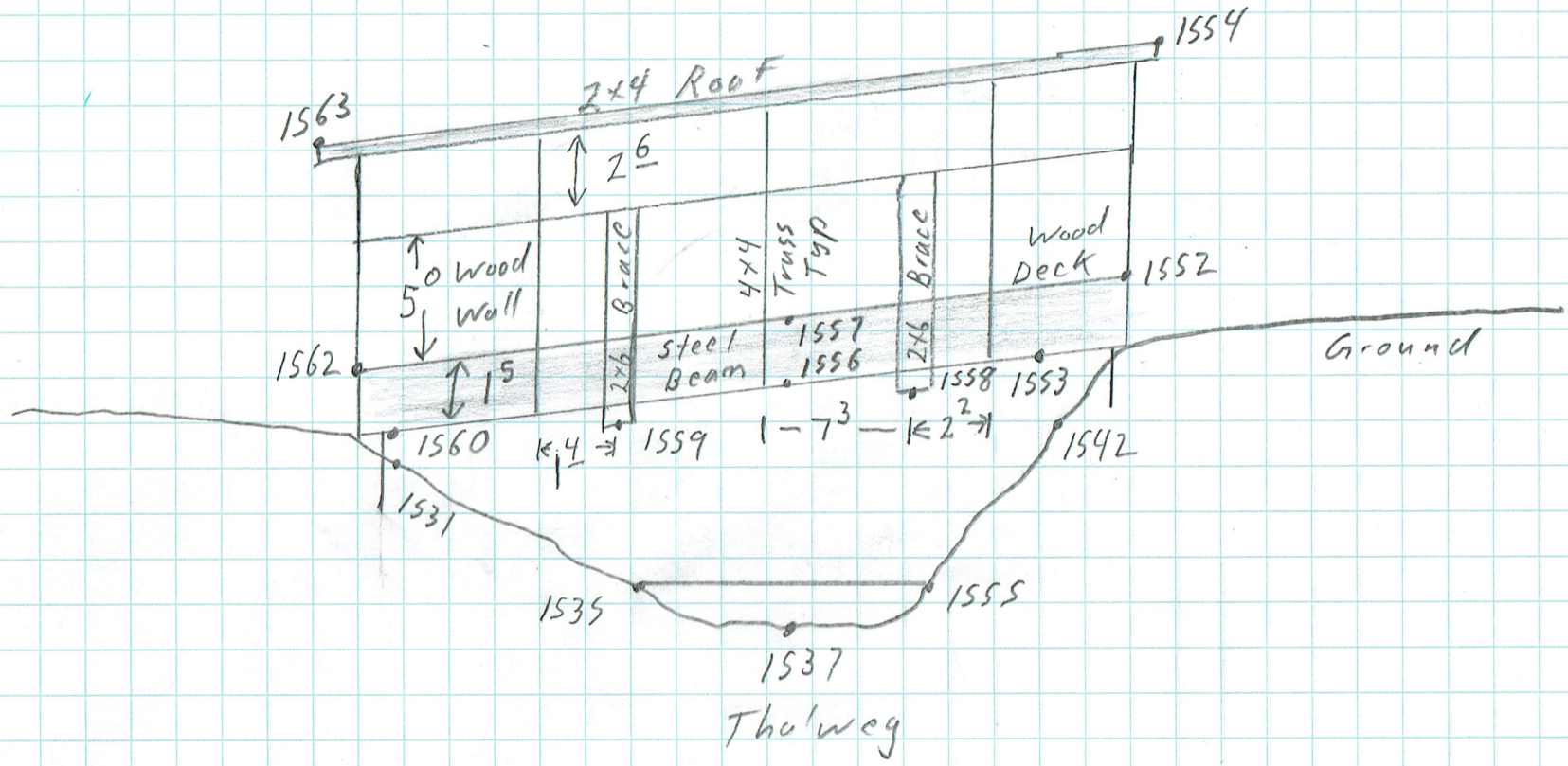


Arrowood Park

Arrowood Park

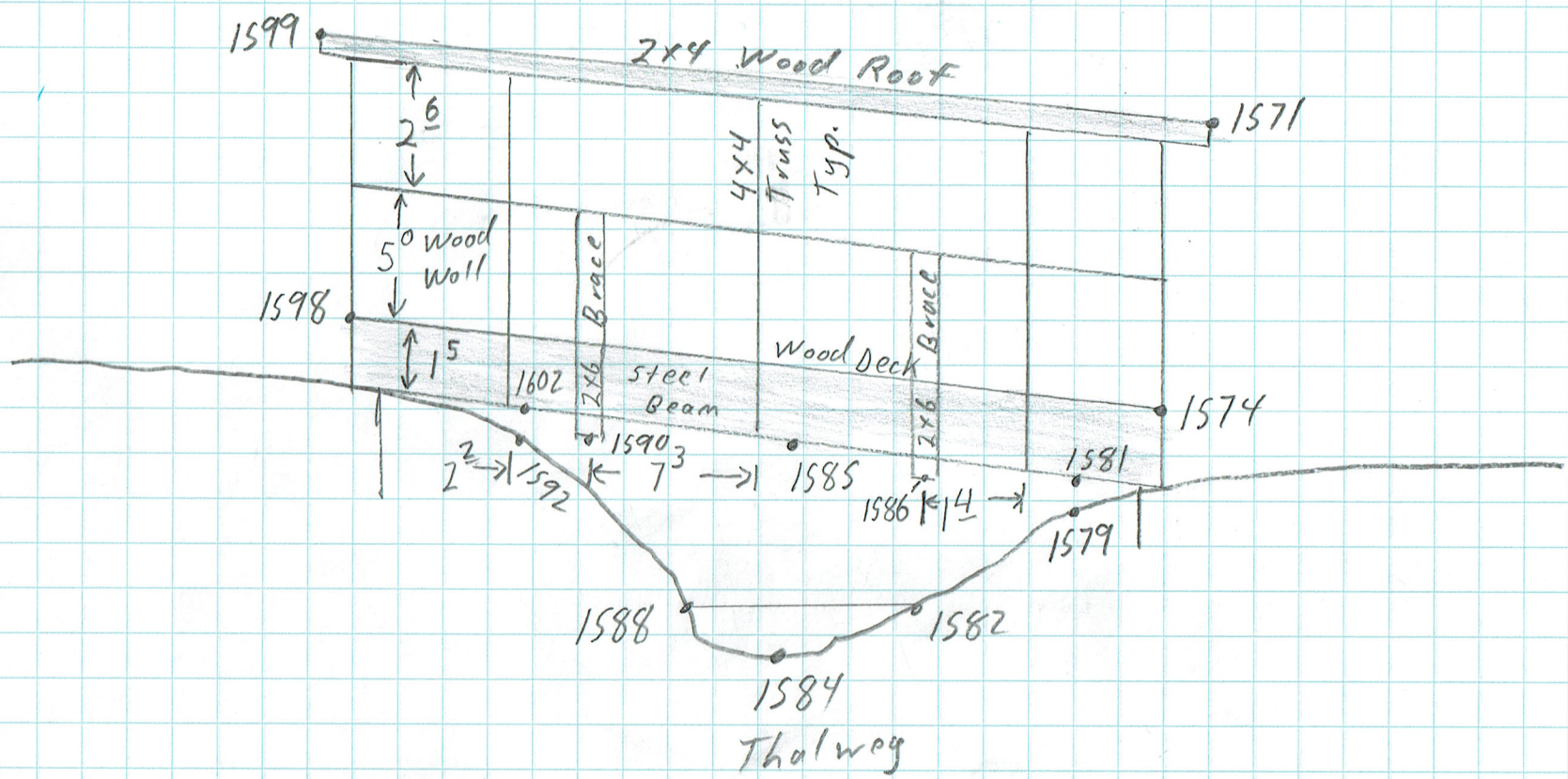
04/01/16 S Estabrooks

Icon - Private Pedestrian Bridge
Upstream looking North East



04/01/16 S Estabrooks

Ieon - Private Pedestrian Bridge
Downstream looking South West

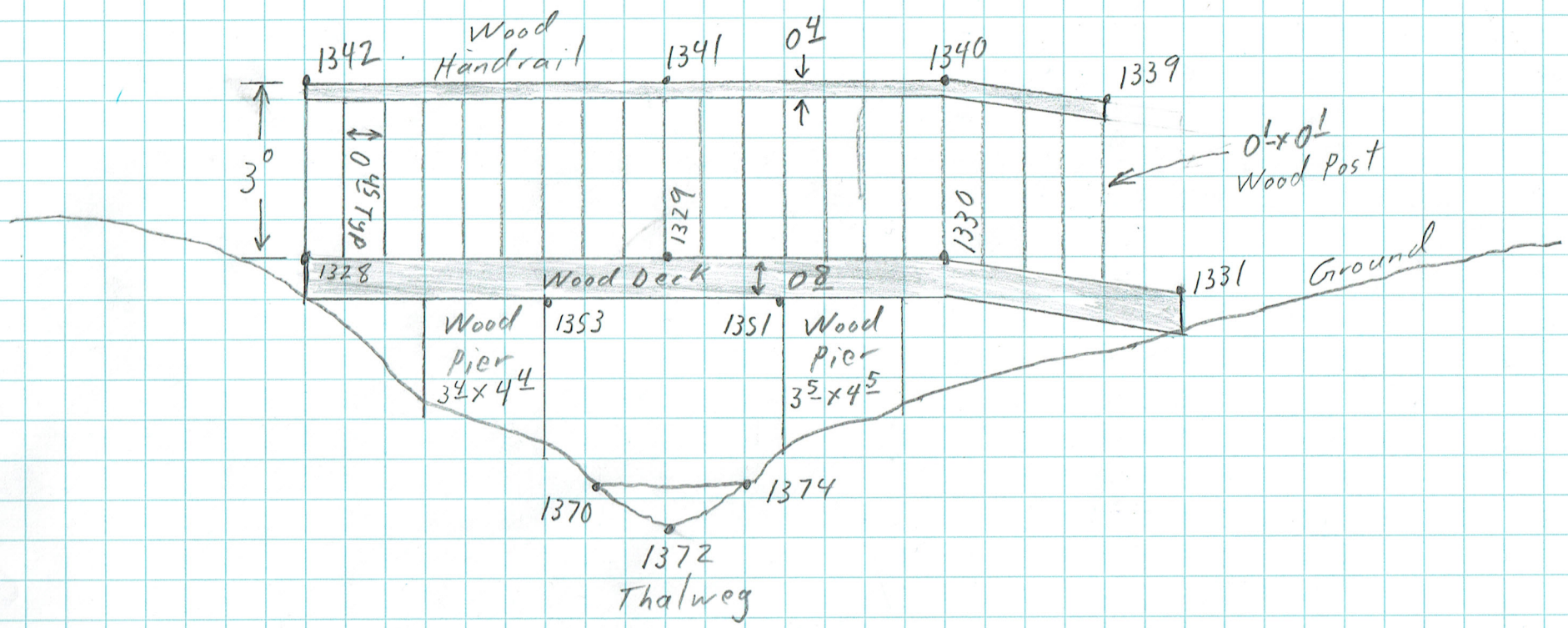


Private Bridge (u/s of 30th)

Private Bridge (u/s of 30th)

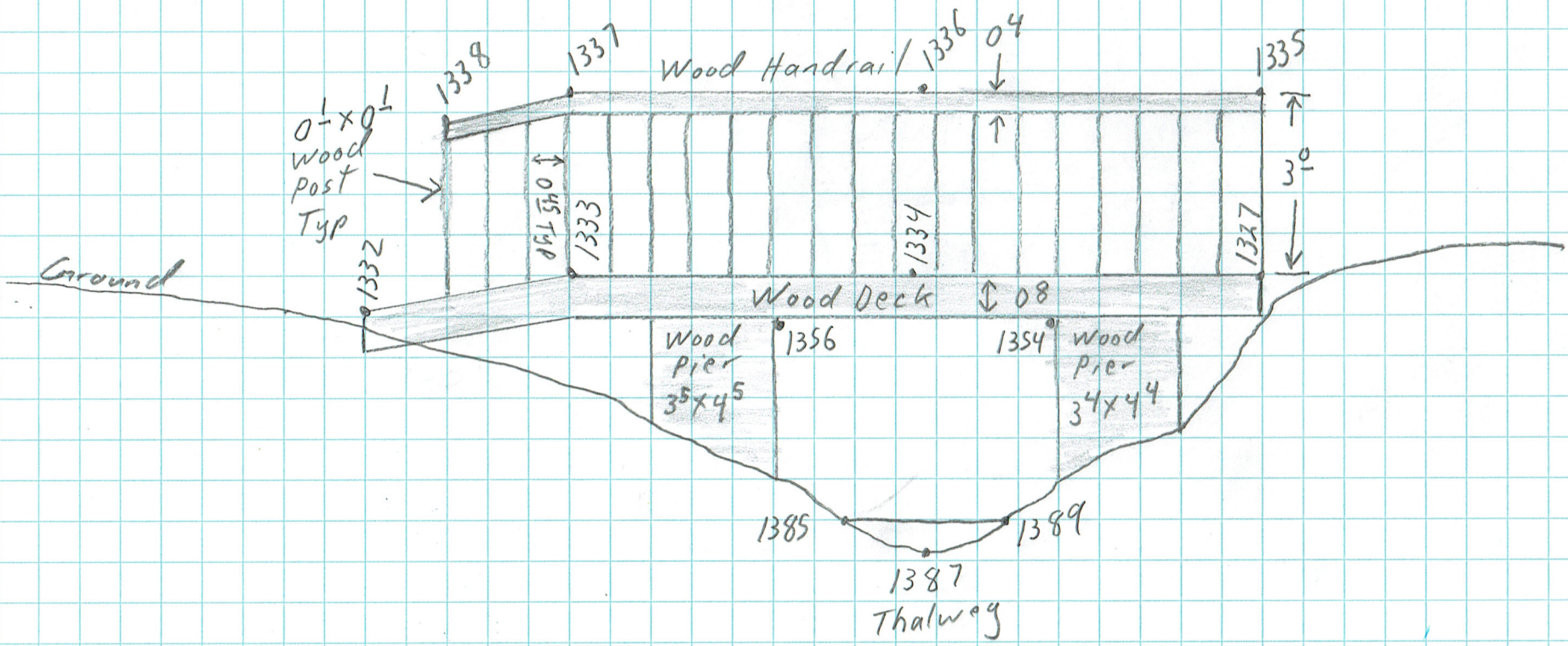
03/31/16 S Estabrooks

Icon - Parking Access Pedestrian Bridge
Upstream looking North East



03/31/16 S Estabrooks

Icon - Parking Access Pedestrian Bridge
Downstream looking South West



from Open-Channel Hydraulics by Chow

TABLE 5-6. VALUES OF THE ROUGHNESS COEFFICIENT n
(**Boldface** figures are values generally recommended in design)

Type of channel and description	Minimum	Normal	Maximum
A. CLOSED CONDUITS FLOWING PARTLY FULL			
A-1. Metal			
a. Brass, smooth	0.009	**0.010**	0.013
b. Steel			
1. Lockbar and welded	0.010	0.012	0.014
2. Riveted and spiral	0.013	0.016	0.017
c. Cast iron			
1. Coated	0.010	0.013	0.014
2. Uncoated	0.011	0.014	0.016
d. Wrought iron			
1. Black	0.012	0.014	0.015
2. Galvanized	0.013	0.016	0.017
e. Corrugated metal			
1. Subdrain	0.017	0.019	0.021
2. Storm drain	0.021	**0.024**	0.030
A-2. Nonmetal			
a. Lucite	0.008	0.009	0.010
b. Glass	0.009	**0.010**	0.013
c. Cement			
1. Neat, surface	0.010	0.011	0.013
2. Mortar	0.011	0.013	0.015
d. Concrete			
1. Culvert, straight and free of debris	0.010	0.011	0.013
2. Culvert with bends, connections, and some debris	0.011	**0.013**	0.014
3. Finished	0.011	0.012	0.014
4. Sewer with manholes, inlet, etc., straight	0.013	0.015	0.017
5. Unfinished, steel form	0.012	0.013	0.014
6. Unfinished, smooth wood form	0.012	**0.014**	0.016
7. Unfinished, rough wood form	0.015	0.017	0.020
e. Wood			
1. Stave	0.010	0.012	0.014
2. Laminated, treated	0.015	0.017	0.020
f. Clay			
1. Common drainage tile	0.011	**0.013**	0.017
2. Vitrified sewer	0.011	0.014	0.017
3. Vitrified sewer with manholes, inlet, etc.	0.013	0.015	0.017
4. Vitrified subdrain with open joint	0.014	0.016	0.018
g. Brickwork			
1. Glazed	0.011	0.013	0.015
2. Lined with cement mortar	0.012	0.015	0.017
h. Sanitary sewers coated with sewage slimes, with bends and connections	0.012	0.013	0.016
i. Paved invert, sewer, smooth bottom	0.016	0.019	0.020
j. Rubble masonry, cemented	0.018	0.025	0.030

TABLE 5-6. VALUES OF THE ROUGHNESS COEFFICIENT n (*continued*)

Type of channel and description	Minimum	Normal	Maximum
B. LINED OR BUILT-UP CHANNELS			
B-1. Metal			
a. Smooth steel surface			
1. Unpainted	0.011	**0.012**	0.014
2. Painted	0.012	0.013	0.017
b. Corrugated	0.021	0.025	0.030
B-2. Nonmetal			
a. Cement			
1. Neat, surface	0.010	0.011	0.013
2. Mortar	0.011	0.013	0.015
b. Wood			
1. Planed, untreated	0.010	0.012	0.014
2. Planed, creosoted	0.011	0.012	0.015
3. Unplaned	0.011	0.013	0.015
4. Plank with battens	0.012	0.015	0.018
5. Lined with roofing paper	0.010	0.014	0.017
c. Concrete			
1. Trowel finish	0.011	**0.013**	0.015
2. Float finish	0.013	0.015	0.016
3. Finished, with gravel on bottom	0.015	0.017	0.020
4. Unfinished	0.014	0.017	0.020
5. Gunite, good section	0.016	0.019	0.023
6. Gunite, wavy section	0.018	0.022	0.025
7. On good excavated rock	0.017	0.020	
8. On irregular excavated rock	0.022	0.027	
d. Concrete bottom float finished with sides of			
1. Dressed stone in mortar	0.015	0.017	0.020
2. Random stone in mortar	0.017	0.020	0.024
3. Cement rubble masonry, plastered	0.016	0.020	0.024
4. Cement rubble masonry	0.020	0.025	0.030
5. Dry rubble or riprap	0.020	0.030	0.035
e. Gravel bottom with sides of			
1. Formed concrete	0.017	0.020	0.025
2. Random stone in mortar	0.020	0.023	0.026
3. Dry rubble or riprap	0.023	0.033	0.036
f. Brick			
1. Glazed	0.011	**0.013**	0.015
2. In cement mortar	0.012	**0.015**	0.018
g. Masonry			
1. Cemented rubble	0.017	0.025	0.030
2. Dry rubble	0.023	0.032	0.035
h. Dressed ashlar	0.013	0.015	0.017
i. Asphalt			
1. Smooth	0.013	0.013	
2. Rough	0.016	0.016	
j. Vegetal lining	0.030	.....	0.500

TABLE 5-6. VALUES OF THE ROUGHNESS COEFFICIENT n (*continued*)

Type of channel and description	Minimum	Normal	Maximum
C. EXCAVATED OR DREDGED			
a. Earth, straight and uniform			
1. Clean, recently completed	0.016	0.018	0.020
2. Clean, after weathering	0.018	**0.022**	0.025
3. Gravel, uniform section, clean	0.022	0.025	0.030
4. With short grass, few weeds	0.022	0.027	0.033
b. Earth, winding and sluggish			
1. No vegetation	0.023	0.025	0.030
2. Grass, some weeds	0.025	0.030	0.033
3. Dense weeds or aquatic plants in deep channels	0.030	0.035	0.040
4. Earth bottom and rubble sides	0.028	0.030	0.035
5. Stony bottom and weedy banks	0.025	0.035	0.040
6. Cobble bottom and clean sides	0.030	0.040	0.050
c. Dragline-excavated or dredged			
1. No vegetation	0.025	0.028	0.033
2. Light brush on banks	0.035	0.050	0.060
d. Rock cuts			
1. Smooth and uniform	0.025	0.035	0.040
2. Jagged and irregular	0.035	0.040	0.050
e. Channels not maintained, weeds and brush uncut			
1. Dense weeds, high as flow depth	0.050	0.080	0.120
2. Clean bottom, brush on sides	0.040	0.050	0.080
3. Same, highest stage of flow	0.045	0.070	0.110
4. Dense brush, high stage	0.080	0.100	0.140
D. NATURAL STREAMS			
D-1. Minor streams (top width at flood stage <100 ft)			
a. Streams on plain			
1. Clean, straight, full stage, no rifts or deep pools	0.025	**0.030**	0.033
2. Same as above, but more stones and weeds	0.030	0.035	0.040
3. Clean, winding, some pools and shoals	0.033	0.040	0.045
4. Same as above, but some weeds and stones	0.035	0.045	0.050
5. Same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
6. Same as 4, but more stones	0.045	0.050	0.060
7. Sluggish reaches, weedy, deep pools	0.050	0.070	0.080
8. Very weedy reaches, deep pools, or floodways with heavy stand of timber and underbrush	0.075	0.100	0.150

TABLE 5-6. VALUES OF THE ROUGHNESS COEFFICIENT n (*continued*)

Type of channel and description	Minimum	Normal	Maximum
b. Mountain streams, no vegetation in channel, banks usually steep, trees and brush along banks submerged at high stages			
1. Bottom: gravels, cobbles, and few boulders	0.030	0.040	0.050
2. Bottom: cobbles with large boulders	0.040	0.050	0.070
D-2. Flood plains			
a. Pasture, no brush			
1. Short grass	0.025	0.030	0.035
2. High grass	0.030	0.035	0.050
b. Cultivated areas			
1. No crop	0.020	0.030	0.040
2. Mature row crops	0.025	0.035	0.045
3. Mature field crops	0.030	0.040	0.050
c. Brush			
1. Scattered brush, heavy weeds	0.035	0.050	0.070
2. Light brush and trees, in winter	0.035	0.050	0.060
3. Light brush and trees, in summer	0.040	0.060	0.080
4. Medium to dense brush, in winter	0.045	0.070	0.110
5. Medium to dense brush, in summer	0.070	0.100	0.160
d. Trees			
1. Dense willows, summer, straight	0.110	0.150	0.200
2. Cleared land with tree stumps, no sprouts	0.030	0.040	0.050
3. Same as above, but with heavy growth of sprouts	0.050	0.060	0.080
4. Heavy stand of timber, a few down trees, little undergrowth, flood stage below branches	0.080	0.100	0.120
5. Same as above, but with flood stage reaching branches	0.100	0.120	0.160
D-3. Major streams (top width at flood stage >100 ft). The n value is less than that for minor streams of similar description, because banks offer less effective resistance.			
a. Regular section with no boulders or brush	0.025	.....	0.060
b. Irregular and rough section	0.035	.....	0.100

from Flo-2D User Manual

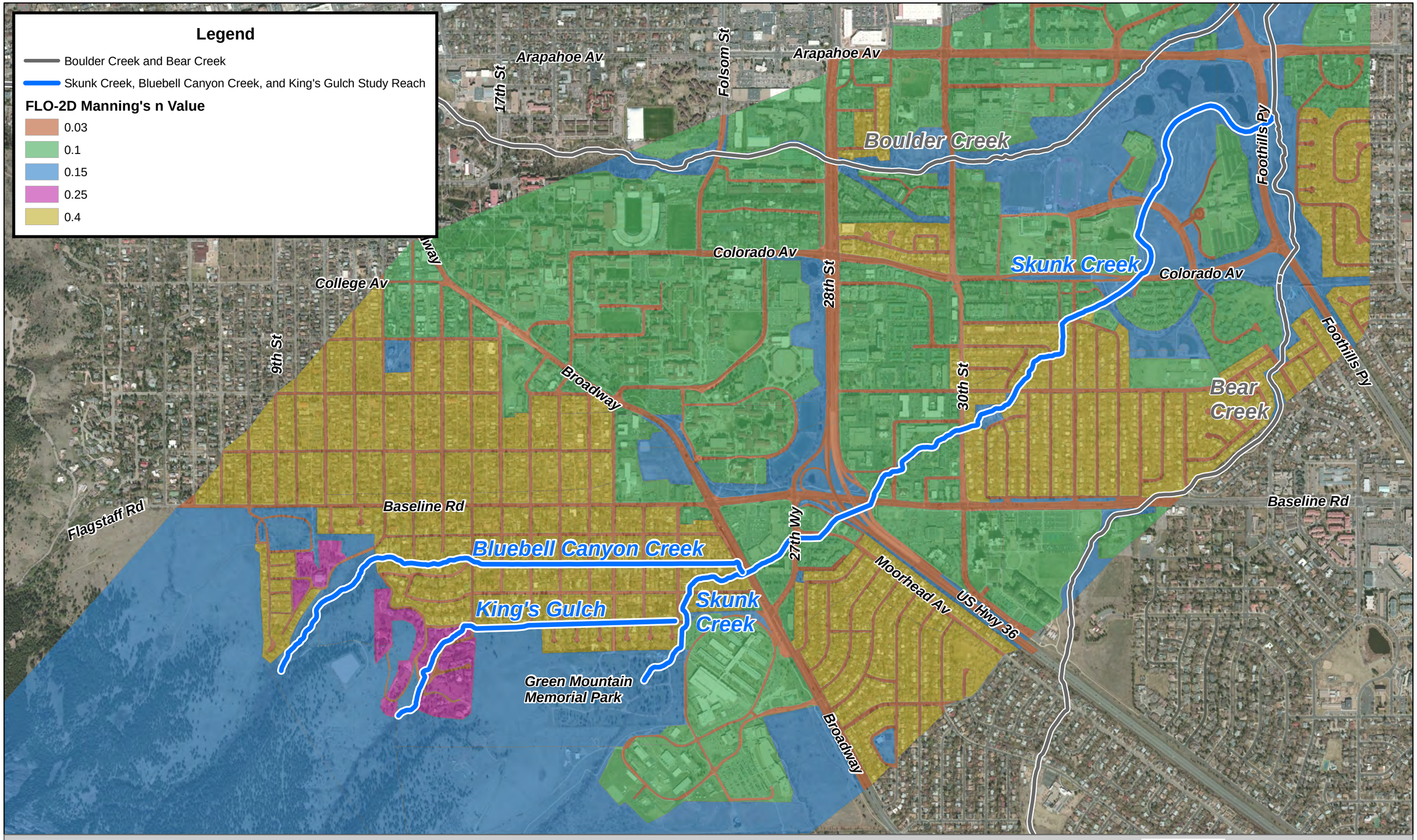
Overland flow velocities and depths vary with topography and the grid element roughness. Spatial variation in floodplain roughness can be assigned through the GDS or FLOENVIR processor. The assignment of overland flow roughness must account for vegetation, surface irregularity, non-uniform and unsteady flow. It is also a function of flow depth. Typical roughness values (Manning's n coefficients) for overland flow are shown in Table 1.

Table 1. Overland Flow Manning's n Roughness Values[1]

Surface	n-value
Dense turf	0.17 - 0.80
Bermuda and dense grass, dense vegetation	0.17 - 0.48
Shrubs and forest litter, pasture	0.30 - 0.40
Average grass cover	0.20 - 0.40
Poor grass cover on rough surface	0.20 - 0.30
Short prairie grass	0.10 - 0.20
Sparse vegetation	0.05 - 0.13
Sparse rangeland with debris	
0% cover	0.09 - 0.34
20 % cover	0.05 - 0.25
Plowed or tilled fields	
Fallow - no residue	0.008 - 0.012
Conventional tillage	0.06 - 0.22
Chisel plow	0.06 - 0.16
Fall disking	0.30 - 0.50
No till - no residue	0.04 - 0.10
No till (20 - 40% residue cover)	0.07 - 0.17
No till (60 - 100% residue cover)	0.17 - 0.47
Open ground with debris	0.10 - 0.20
Shallow glow on asphalt or concrete (0.25" to 1.0")	0.10 - 0.15
Fallow fields	0.08 - 0.12
Open ground, no debris	0.04 - 0.10
Asphalt or concrete	0.02 - 0.05

[1]Adapted from COE, HEC-1 Manual, 1990 and the COE, Technical Engineering and Design Guide, No. 19, 1997 with modifications.

Some FLO-2D projects have been model grid elements inside of the channel. In this case, the channel component is not used and instead the FLO-2D grid system is draped over the channel portion of the topography. While these projects have been conducted with some success, there are several modeling concerns that should be addressed. The FLO-2D model was developed to be able to exchange 1-D channel overbank discharge with the floodplain grid elements. For this reason, the model works well on large flood events and large grid elements. When small grid elements are used inside of a channel with confined flow and large discharges and flow depths, the model may run slow. In addition, there will be zero water surface slope between some grid elements. It should be noted that the application of the Manning's equation for uniform channel to compute the friction slope is no longer valid as the velocity approaches zero (ponded flow condition). The resulting water surface elevations can be accurately predicted but will display some small variation across the channel.



ICON ENGINEERING, INC.

Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update
Figure I.1: FLO-2D Manning's n Map

N

1,000 Feet

Skunk Creek: Confluence with Bear Canyon Creek to Discovery Drive

Channel downstream of Discovery Drive

Downstream of Discovery Drive

Skunk Creek: Discovery Drive to Colorado Avenue

Upstream of Discovery Drive

Downstream of Colorado Avenue

Skunk Creek: Colorado Avenue to 35th Street

Upstream of Colorado Avenue

Downstream of 35th Street

Skunk Creek: 35th to Aurora Avenue

Upstream of 35th Street

Upstream of Madison Avenue

Skunk Creek: 35th to Aurora Avenue (continued)

Downstream of 34th Street

Upstream of 34th Street

Skunk Creek: 35th to Aurora Avenue (continued)

Downstream of Aurora Avenue

Skunk Creek: Aurora Avenue to 30th Street

Upstream of Aurora Avenue

Downstream of multi-use bridge

Skunk Creek: Aurora Avenue to 30th Street (continued)

Upstream of multi-use bridge

Multi-use bridge

Skunk Creek: 30th Street to 29th Street

Upstream of 30th Street

Upstream of private pedestrian bridge

Skunk Creek: 30th Street to 29th Street (continued)

Downstream of 29th Street

Skunk Creek: 29th Street to Baseline Road

Between 29th Street and Baseline Road

Skunk Creek: Moorhead Frontage Road to Broadway

Upstream of Moorhead Frontage Road

Downstream of Moorhead

Skunk Creek: Moorhead Frontage Road to Broadway (continued)

Upstream of Moorhead

Downstream of 27th Way

Skunk Creek: Moorhead Frontage Road to Broadway (continued)

Upstream of 27th Way

Downstream of Broadway

Skunk Creek: Broadway to Bluebell Avenue

Downstream of Bluebell Avenue

Skunk Creek: Bluebell Avenue to King Avenue

Upstream of Bluebell Avenue

Downstream of King Avenue

Skunk Creek: King Avenue to Upstream Limit of Study

Upstream of King Avenue

Downstream of Green Mountain Cemetery

Skunk Creek: King Avenue to Upstream Limit of Study (continued)

Typical channel within Green Mountain Cemetery

Bluebell Canyon Creek: 15th Street to 12th Street

Downstream of 13th Street (extended)

Upstream of 13th Street (extended)

Bluebell Canyon Creek: 12th Street to Upstream Limit of Study

Downstream of McClintock Trail (lower crossing)

Upstream of McClintock Trail (lower crossing)

Bluebell Canyon Creek: 12th Street to Upstream Limit of Study (continued)

Downstream of McClintock Trail (upper crossing)

Upstream of McClintock Trail (upper crossing)

King's Gulch: 17th Street to 15th Street

Upstream of 17th Street

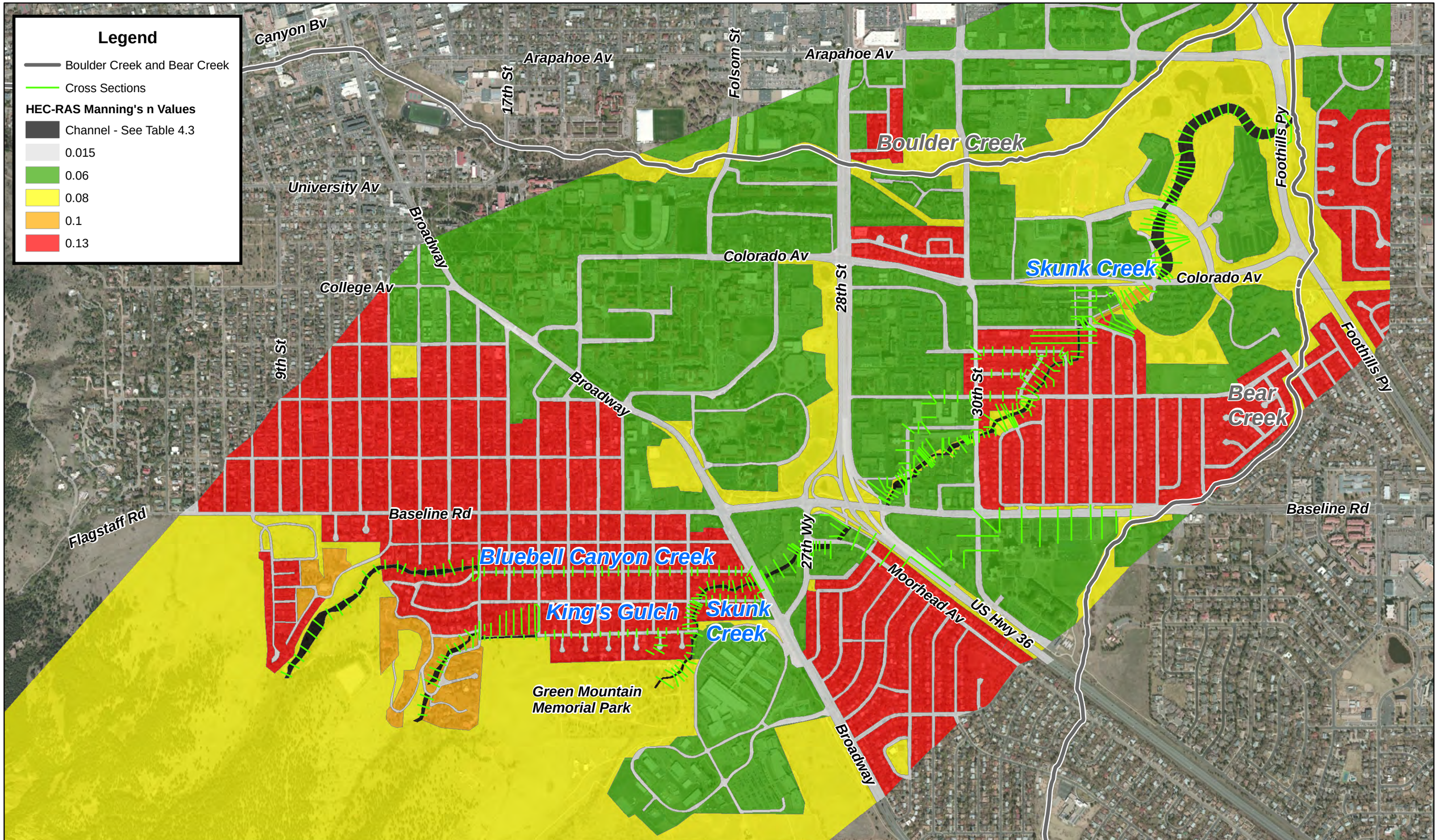
Downstream of 15th Street

King's Gulch: 15th Street to Bellevue Drive

Upstream of 15th Street

King's Gulch: Bellevue Drive to Upstream Limit of Study

Upstream of Bellevue Drive



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Skunk Creek, Bluebell Canyon Creek, and King's Gulch Floodplain Mapping Update

Figure I.2: HEC-RAS Manning's n Map

N

1,000 Feet

Appendix J –
Electronic Models and GIS Data