

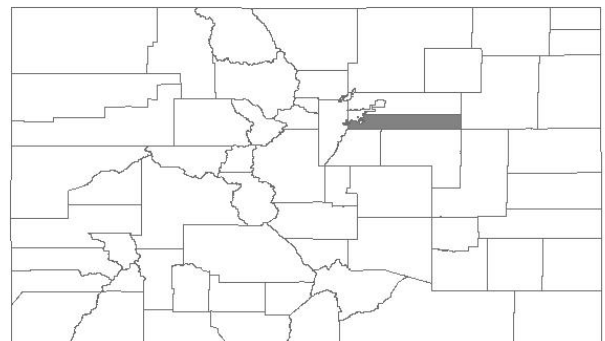
# FLOOD INSURANCE STUDY

VOLUME 2 OF 6



## ARAPAHOE COUNTY, COLORADO AND INCORPORATED AREAS

Community Name	Community Number
ARAPAHOE COUNTY UNINCORPORATED AREAS	080011
AURORA, CITY OF	080002
CENTENNIAL, CITY OF	080315
CHERRY HILLS VILLAGE, CITY OF	080013
COLUMBINE VALLEY, TOWN OF	080014
*DEER TRAIL, CITY OF	080015
ENGLEWOOD, CITY OF	085074
*FOXFIELD, TOWN OF	080091
GLENDALE, CITY OF	080247
GREENWOOD VILLAGE, CITY OF	080195
LITTLETON, CITY OF	080017
SHERIDAN, CITY OF	080018



\*NO SPECIAL FLOOD HAZARD AREAS IDENTIFIED

REVISED: SEPTEMBER 4, 2020



Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER  
08005CV002E



# **TABLE OF CONTENTS**

## VOLUME I

<b>1. INTRODUCTION .....</b>	<b>1</b>
1.1. Purpose of Study .....	1
1.2. Authority and Acknowledgements .....	1
1.3. Coordination .....	3
<b>2. AREA STUDIED .....</b>	<b>4</b>
2.1. Scope of Study .....	4
2.2. Community Description.....	7
2.3. Principal Flood Problems.....	7
2.4. Flood Protection Measures .....	9
<b>3. ENGINEERING METHODS.....</b>	<b>11</b>
3.1. Hydrologic Analyses .....	11
3.2. Hydraulic Analyses .....	25
3.3. Vertical Datum.....	26
<b>4. FLOODPLAIN MANAGEMENT APPLICATIONS .....</b>	<b>28</b>
4.1. Floodplain Boundaries.....	28
4.2. Floodways.....	28

### **TABLES**

Table 1 – Flooding Sources Studied by Detailed Methods .....	4
Table 2 – Flooding Sources Restudied or Newly Studied by Detailed Methods .....	5
Table 3 – Flooding Sources Studied by Approximate Methods .....	6
Table 4 – Summary of Discharges .....	17
Table 5 – Floodway Data Table .....	30

### **FIGURES**

Figure 1 – Frequency-Discharge Drainage Area Curves: Coal Creek, Cherry Creek, Sand Creek .....	13
Figure 2 – Frequency-Discharge Drainage Area Curves: Cottonwood Creek, Big Dry Creek.....	14
Figure 3 – Frequency-Discharge Drainage Area Curves: Murphy Creek, Little Comanche Creek .....	15
Figure 4 – Frequency-Discharge Drainage Area Curves: Piney Creek, Comanche Creek, West Bijou Creek, Box Elder Creek.....	16
Figure 5 – Floodway Schematic.....	29

**TABLE OF CONTENTS**

VOLUME II – September 4, 2020

**5. INSURANCE APPLICATIONS ..... 117**  
**6. FLOOD INSURANCE RATE MAP ..... 117**  
**7. OTHER STUDIES..... 118**  
**8. LOCATION OF DATA..... 120**  
**9. BIBLIOGRAPHY AND REFERENCES ..... 120**  
**10. REVISION DESCRIPTIONS..... 126**  
10.1 First Revision (March 4, 1991)..... 126  
10.2 Second Revision (December 3, 1993) ..... 128  
10.3 Third Revision (August 16, 1995) ..... 130  
10.4 Fourth Revision (December 17, 2010) ..... 132  
10.5 Fifth Revision (February 17, 2017) ..... 133  
10.6 Sixth Revision (April 18, 2018)..... 135  
10.7 Seventh Revision (September 14, 2018)..... 137  
10.8 Eighth Revision (June 19, 2020) ..... 138  
**11. MAP REPOSITORIES ..... 140**

**TABLES**

Table 5 – Floodway Data Table (Continued)..... 94  
Table 6 – Community Map History ..... 119  
Table 7 – Map Repositories ..... 141  
Table 8 – Listing of NFIP Jurisdictions ..... 142

**FIGURES**

Figure 6 – Map Index..... 145  
Figure 7 – FIRM Notes to Users ..... 146  
Figure 8 – Map Legend for FIRM ..... 148

**EXHIBITS**

Exhibit 1 – Flood Profiles

Antelope Creek	Panels 01P-07P
Antelope Creek Split Flow	Panel 08P
Baranmor Ditch	Panels 09P-11P
Bear Creek	Panels 12P-14P
Bear Gulch	Panels 15P-21P

VOLUME III – September 4, 2020

**EXHIBITS**

Exhibit 1 – Flood Profiles

Big Dry Creek	Panels 22P-40P
Big Dry Creek Tributary A	Panels 41P-43P
Blackmer Gulch	Panels 44P-49P
Box Elder Creek	Panels 50P-61P
Box Elder Creek Spill 3	Panel 62P
Box Elder Creek Spill 4	Panel 63P
Box Elder Creek Spill 5	Panels 64P-65P
Box Elder Creek Split 2	Panels 66P-68P
Box Elder Creek Split 2A	Panel 69P
Box Elder Creek Split 2B	Panel 70P
Cherry Creek Below Cherry Creek State Park	Panels 71P-74P
Cherry Creek	Panels 75P-80P
Cherry Creek (Right Overbank Split Flow)	Panel 81P
Cherry Creek Spillway Drain	Panels 82P-85P
Coal Creek	Panels 86P-98P
Comanche Creek	Panel 99P
Coon Creek	Panel 100P
Cottonwood Creek	Panels 101P-107P

VOLUME IV – September 4, 2020

**EXHIBITS**

Exhibit 1 – Flood Profiles

Coyote Run	Panels 108P-120P
Dutch Creek	Panels 121P-122P
East Toll Gate Creek	Panels 123P-131P
First Creek	Panels 132P-140P
First Creek E-470 Split	Panel 141P
First Creek Tributary T	Panels 142P-145P
Goldsmith Gulch	Panels 146P-150P
Granby Ditch	Panels 151P-155P
Greenwood Gulch	Panels 156P-162P
Greenwood Gulch Bypass	Panels 163P-165P
Happy Canyon Creek	Panel 166P
Havana Tributary	Panels 167P-168P
Inverness Tributary	Panels 169P-170P
Lee Gulch	Panels 171P-180P
Little Comanche Creek	Panel 181P

VOLUME V – September 4, 2020

**EXHIBITS**

Exhibit 1 – Flood Profiles

Little Dry Creek	Panels 182P-208P
Little's Creek	Panels 209P-218P
Lone Tree Creek	Panels 219P-224P
Murphy Creek	Panels 225P-235P
Murphy Creek Tributary	Panel 236P
Peoria Tributary	Panels 237P-239P
Piney Creek	Panels 240P-252P
Piney Creek Split Flow	Panel 253P
Prentice Gulch	Panel 254P
Quincy Gulch	Panels 255P-257P
Sable Ditch	Panels 258P-261P
Sable Ditch Overflow	Panel 262P
Sand Creek	Panels 263P-266P
Second Creek	Panels 267P-270P
Senac Creek	Panels 271P-274P

VOLUME VI – September 4, 2020

**EXHIBITS**

Exhibit 1 – Flood Profiles

SJCD 6100	Panels 275P-277P
SJCD 6200	Panels 278P-279P
Slaughterhouse Gulch	Panels 280P-284P
South Platte River	Panels 285P-286P
South Tributary Slaughterhouse Gulch	Panels 287P-288P
Spring Creek	Panels 289P-290P
Sterne Parkway Overflow	Panel 291P
Three Lakes Tributary	Panel 292P
Toll Gate Creek	Panel 293P-295P
Tributary to Unnamed Creek	Panel 296P
Unnamed Creek	Panels 297P-301P
West Bijou Creek	Panels 302P-304P
West Harvard Gulch	Panels 305P-307P
West Toll Gate Creek, Lower Reach	Panels 308P-313P
West Toll Gate Creek, Upper Reach	Panels 314P-316P
West Toll Gate Creek Tributary	Panels 317P
West Tributary To Goldsmith Gulch	Panels 318P-320P
Westerly Creek	Panels 321P-326P
Westerly Creek Overflow	Panel 327P
Willow Creek	Panels 328P-331P
Wolf Creek	Panels 332P-333P
Wolf Creek Tributary	Panel 334P

Exhibit 2 (published separately) – Flood Insurance Rate Map Index  
Flood Insurance Rate Map

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Piney Creek								
A	1,386	228	1,065	9.7	5,632.2	5,632.2	5,632.2	0.0
B	2,110	378	1,322	7.8	5,638.1	5,638.1	5,638.1	0.0
C	2,535	228	1,250	9.0	5,640.5	5,640.5	5,640.5	0.0
D	2,835	94	807	14.8	5,641.6	5,641.6	5,641.6	0.0
E	3,238	255	1,698	7.5	5,649.1	5,649.1	5,649.1	0.0
F	3,394	273	1,907	6.1	5,649.7	5,649.7	5,649.7	0.0
G	3,671	395	1,850	6.3	5,650.5	5,650.5	5,650.5	0.0
H	4,383	239	1,525	6.7	5,651.6	5,651.6	5,651.6	0.0
I	4,881	279	1,769	5.7	5,653.3	5,653.3	5,653.3	0.0
J	5,408	342	1,345	7.6	5,655.2	5,655.2	5,655.2	0.0
K	6,642	210	948	10.7	5,663.4	5,663.4	5,663.4	0.0
L	7,511	242	1,150	8.8	5,668.1	5,668.1	5,668.1	0.0
M	8,427	281	1,123	9.3	5,675.9	5,675.9	5,675.9	0.0
N	8,887	243	1,127	9.9	5,680.4	5,680.4	5,680.4	0.0
O	9,948	324	1,732	5.7	5,684.8	5,684.8	5,684.8	0.0
P	10,511	186	1,060	9.2	5,690.5	5,690.5	5,690.5	0.0
Q	10,849	166	835	11.7	5,695.5	5,695.5	5,695.5	0.0
R	11,239	418	1,444	7.5	5,700.5	5,700.5	5,700.5	0.0
S	11,634	560	2,341	4.2	5,703.3	5,703.3	5,703.3	0.0
T	12,495	422	1,519	6.4	5,708.2	5,708.2	5,708.2	0.0
U	12,972	661	2,486	3.9	5,710.6	5,710.6	5,710.6	0.0
V	13,378	741	2,603	3.9	5,711.8	5,711.8	5,711.8	0.0
W	13,779	676	2,453	4.0	5,713.0	5,713.0	5,713.0	0.0
X	14,538	314	1,662	5.9	5,718.1	5,718.1	5,718.1	0.0
Y	15,700	456	1,954	4.9	5,723.3	5,723.3	5,723.3	0.0
Z	16,841	632	2,967	3.3	5,733.8	5,733.8	5,733.8	0.0

<sup>1</sup> Stream distance in feet above confluence with Cherry Creek

**TABLE 5**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS**

**FLOODWAY DATA**

**PINEY CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQURE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Piney Creek								
AA	18,276	294	977	9.6	5,738.7	5,738.7	5,738.8	0.1
AB	19,024	731	1,492	6.3	5,745.6	5,745.6	5,745.6	0.0
AC	19,444	709	2,091	4.5	5,747.9	5,747.9	5,748.1	0.2
AD	20,694	637	1,714	5.4	5,755.0	5,755.0	5,755.2	0.2
AE	21,379	685	1,194	7.7	5,762.4	5,762.4	5,762.4	0.0
AF	22,284	718	1,146	7.9	5,769.6	5,769.6	5,769.6	0.0
AG	22,744	842	2,096	4.3	5,773.3	5,773.3	5,773.3	0.0
AH	23,119	500	1,349	6.7	5,778.3	5,778.3	5,778.3	0.0
AI	23,673	135	848	10.7	5,782.8	5,782.8	5,782.8	0.0
AJ	24,198	314	1,069	6.8	5,786.1	5,786.1	5,786.1	0.0
AK	24,693	149	654	11.2	5,790.9	5,790.9	5,790.9	0.0
AL	25,270	394	1,115	6.3	5,794.9	5,794.9	5,794.9	0.0
AM	25,755	312	1,083	6.4	5,799.2	5,799.2	5,799.2	0.0
AN	26,199	328	815	8.6	5,801.0	5,801.0	5,801.0	0.0
AO	26,991	394	939	7.4	5,810.5	5,810.5	5,810.5	0.0
AP	27,748	180	703	9.9	5,814.8	5,814.8	5,814.8	0.0
AQ	28,424	226	764	9.1	5,820.6	5,820.6	5,820.6	0.0
AR	29,788	163	1,002	6.2	5,832.0	5,832.0	5,832.4	0.4
AS	30,373	253	870	7.2	5,835.9	5,835.9	5,836.1	0.2
AT	30,856	244	917	6.8	5,840.2	5,840.2	5,840.3	0.1
AU	31,222	212	778	8.0	5,844.1	5,844.1	5,844.3	0.2
AV	31,545	163	855	7.2	5,847.6	5,847.6	5,848.0	0.4
AW	32,070	205	1,098	5.6	5,850.5	5,850.5	5,850.9	0.4
AX	32,666	282	936	5.5	5,855.3	5,855.3	5,855.3	0.0
AY	32,917	376	1,165	4.4	5,858.9	5,858.9	5,858.9	0.0
AZ	33,223	267	756	6.8	5,861.0	5,861.0	5,861.0	0.0

<sup>1</sup> Stream distance in feet above confluence with Cherry Creek

**TABLE 5**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS**

**FLOODWAY DATA**

**PINEY CREEK**



FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Piney Creek								
BA	33,520	168	837	6.1	5,865.4	5,865.4	5,865.6	0.2
BB	34,154	315	1,108	4.6	5,869.2	5,869.2	5,869.3	0.1
BC	34,476	277	1,316	3.9	5,873.9	5,873.9	5,873.9	0.0
BD	34,902	308	953	6.6	5,875.2	5,875.2	5,875.2	0.0
BE	35,175	314	862	6.0	5,878.1	5,878.1	5,878.1	0.0
BF	35,825	267	1,146	4.4	5,886.9	5,886.9	5,886.9	0.0
BG	36,346	534	1,467	3.4	5,889.0	5,889.0	5,889.0	0.0
BH	36,736	424	893	5.7	5,891.5	5,891.5	5,891.5	0.0
BI	37,081	178	536	9.4	5,895.8	5,895.8	5,895.8	0.0
BJ	37,664	384	1,676	3.0	5,902.4	5,902.4	5,902.4	0.0
BK	37,868	242	625	8.0	5,903.2	5,903.2	5,903.2	0.0
BL	38,421	225	590	8.4	5,906.2	5,906.2	5,906.4	0.2
BM	38,808	423	1,217	2.8	5,908.6	5,908.6	5,909.0	0.4
BN	39,033	414	932	3.7	5,910.4	5,910.4	5,910.8	0.4
BO	39,426	284	466	7.4	5,913.4	5,913.4	5,913.7	0.3
BP	39,699	181	508	6.8	5,916.5	5,916.5	5,916.8	0.3
BQ	40,361	138	405	8.5	5,921.7	5,921.7	5,921.8	0.1
BR	40,973	173	549	6.3	5,928.2	5,928.2	5,928.3	0.2
BS	41,299	157	480	7.2	5,932.0	5,932.0	5,932.4	0.4
BT	41,800	258	1,176	3.1	5,940.1	5,940.1	5,940.1	0.0
BU	42,291	168	436	7.8	5,943.5	5,943.5	5,943.5	0.0
BV	42,987	159	456	7.5	5,952.0	5,952.0	5,952.0	0.0
BW	43,428	324	755	4.4	5,956.1	5,956.1	5,956.1	0.0
BX	43,825	318	545	6.1	5,960.5	5,960.5	5,960.5	0.0
BY	44,569	150	1,322	6.1	5,970.6	5,970.6	5,970.6	0.0
BZ	45,400	211	558	5.8	5,979.7	5,979.7	5,979.7	0.0

<sup>1</sup> Stream distance in feet above confluence with Cherry Creek

**TABLE 5**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS**

**FLOODWAY DATA**

**PINEY CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION				
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY		WITH FLOODWAY	INCREASE
						FEET (NAVD88)			
Prentice Gulch									
A	849 <sup>1</sup>	133	220	3.7	5,498.2	5,498.2	5,499.1	0.9	
B	1471 <sup>1</sup>	112	182	4.5	5,505.1	5,505.1	5,505.7	0.6	
C	2524 <sup>1</sup>	79	130	6.3	5,522.0	5,522.0	5,522.1	0.1	
D	2616 <sup>1</sup>	195	456	1.8	5,525.0	5,525.0	5,525.0	0.0	
Quincy Gulch									
A	382 <sup>2</sup>	90	121	5.3	5,416.1	5,416.1	5,416.1	0.0	
B	919 <sup>2</sup>	777	11	2.6	5,423.6	5,423.6	5,423.6	0.0	
C	2088 <sup>2</sup>	50	121	5.3	5,435.6	5,435.6	5,436.1	0.5	
D	2358 <sup>2</sup>	60	161	4.0	5,440.7	5,440.7	5,441.2	0.5	
E	2414 <sup>2</sup>	40	1,070	0.6	5,448.7	5,448.7	5,448.7	0.0	

<sup>1</sup> Feet Above Confluence With Highline Canal

<sup>2</sup> Feet Above Confluence With Blackmer Gulch

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
AND INCORPORATED AREAS

FLOODWAY DATA

**PRENTICE & QUINCY GULCHES**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
SABLE DITCH								
A	257	78	209	9.3	5,342.1	5,342.1	5,342.1	0.0
B	801	63	276	4.1	5,346.4	5,346.4	5,346.4	0.0
C	1,426	30	107	10.7	5,348.7	5,348.7	5,348.7	0.0
D	2,051	33	110	10.4	5,356.0	5,356.0	5,356.0	0.0
E	2,576	28	103	10.9	5,364.0	5,364.0	5,364.0	0.0
F	3,101	27	103	10.9	5,373.7	5,373.7	5,373.7	0.0
G	3,476	44	219	5.1	5,377.8	5,377.8	5,377.8	0.0
H	3,826	53	254	4.4	5,379.7	5,379.7	5,379.7	0.0
I	4,301	27	92	10.5	5,381.7	5,381.7	5,381.7	0.0
J	4,626	29	146	6.6	5,385.3	5,385.3	5,385.3	0.0
K	5,126	27	86	10.0	5,388.9	5,388.9	5,388.9	0.0
L	5,526	30	153	5.6	5,392.9	5,392.9	5,392.9	0.0
M	6,076	30	159	5.7	5,396.8	5,396.8	5,396.8	0.0
N	6,801	45	132	5.6	5,409.0	5,409.0	5,409.0	0.0
O	7,201	29	140	6.8	5,410.3	5,410.3	5,410.3	0.0
P	7,776	28	109	5.3	5,414.1	5,414.1	5,414.1	0.0
Q	8,251	27	104	6.2	5,415.7	5,415.7	5,415.7	0.0
R	8,651	39	156	4.5	5,418.5	5,418.5	5,418.5	0.0
S	9,514	30	198	3.2	5,422.3	5,422.3	5,422.3	0.0

<sup>1</sup> Stream Distance in Feet Above Confluence with Toll Gate Creek

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
**AND INCORPORATED AREAS**

FLOODWAY DATA

**SABLE DITCH**

TABLE 5

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
SAND CREEK								
A	36,760	764	4,492	6.5	5,299.5	5,299.5	5,299.6	0.1
B	39,512	695	4,581	7.9	5,314.3	5,314.3	5,314.3	0.0
C	41,354	779	5,875	8.7	5,320.7	5,320.7	5,320.7	0.0
D	42,103	859	5,570	5.3	5,324.8	5,324.8	5,324.8	0.0
E	43,134	160	1,562	13.8	5,328.0	5,328.0	5,328.0	0.0
F	46,390	176	1,620	13.3	5,347.6	5,347.6	5,347.6	0.0
G	47,670	206	2,305	9.3	5,353.8	5,353.8	5,353.8	0.0
H	48,970	344	2,184	9.8	5,365.6	5,365.6	5,365.6	0.0
I	50,175	157	1,604	13.4	5,373.6	5,373.6	5,373.6	0.0
J	51,785	312	3,191	6.7	5,383.0	5,383.0	5,383.5	0.5
K	52,890	368	2,161	10.0	5,386.7	5,386.7	5,387.3	0.6
L	56,928	419	4,144	5.2	5,400.4	5,400.4	5,400.4	0.0
M	58,489	223	2,490	8.6	5,412.2	5,412.2	5,412.2	0.0
N	61,243	192	3,338	6.4	5,427.5	5,427.5	5,427.5	0.0
O	63,236	375	3,148	6.8	5,435.0	5,435.0	5,435.0	0.0
P	64,516	373	2,387	9.0	5,439.2	5,439.2	5,439.5	0.3
Q	65,160	550	4,650	3.9	5,442.3	5,442.3	5,442.4	0.1
R	66,140	398	1,848	9.9	5,443.5	5,443.5	5,443.7	0.2
S	68,025	317	1,477	12.4	5,453.3	5,453.3	5,453.3	0.0
T	68,640	326	2,530	7.3	5,458.6	5,458.6	5,458.6	0.0
U	69,350	507	2,840	6.5	5,460.6	5,460.6	5,460.7	0.1
V	70,065	340	2,274	8.1	5,464.8	5,464.8	5,465.0	0.2
W	72,230	810	3,695	5.0	5,475.9	5,475.9	5,476.3	0.4
X	75,010	1,394	4,500	4.1	5,488.9	5,488.9	5,488.9	0.0

<sup>1</sup> Feet Above Mouth

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

**ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS**

**FLOODWAY DATA**

**SAND CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
SECOND CREEK								
H	75,772	175	505	4.5	5,344.2	5,344.2	5,344.7	0.5
I	76,672	112	322	7.0	5,350.4	5,350.4	5,350.7	0.3
J	77,497	115	367	6.0	5,355.5	5,355.5	5,355.9	0.4
K	78,071	130	348	6.5	5,359.1	5,359.1	5,359.5	0.4
L	78,499	193	486	4.2	5,363.8	5,363.8	5,364.1	0.3
M	79,188	132	313	6.6	5,367.2	5,367.2	5,367.3	0.1
N	79,969	126	273	6.5	5,371.6	5,371.6	5,371.9	0.3
O	80,870	168	249	7.4	5,379.4	5,379.4	5,379.4	0.0
P	82,171	135	253	6.9	5,392.1	5,392.1	5,392.3	0.2
Q <sup>2</sup>								
S	85,084	168	838	1.7	5,421.4	5,421.4	5,421.8	0.4
T	86,105	125	191	7.4	5,426.4	5,426.4	5,426.5	0.1
U	87,671	127	177	4.5	5,442.5	5,442.5	5,442.9	0.4
V	88,501	116	128	6.6	5,451.8	5,451.8	5,452.0	0.2
W	89,025	69	106	7.5	5,457.6	5,457.6	5,457.6	0.0
X	89,667	106	131	4.5	5,467.9	5,467.9	5,468.2	0.3
Y	90,646	73	92	6.8	5,479.8	5,479.8	5,479.9	0.1
Z	91,446	71	103	4.5	5,487.4	5,487.4	5,487.8	0.4
AA	91,950	51	83	5.3	5,492.2	5,492.2	5,492.4	0.2

<sup>1</sup> Stream distance in feet above confluence with South Platte River

<sup>2</sup> Cross Sections outside Arapahoe County Corporate Limits

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
**AND INCORPORATED AREAS**

**FLOODWAY DATA**

**SECOND CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						(FEET NAVD)		
Senac Creek								
A	820	148	559	8.6	5,642.5	5,642.5	5,642.9	0.4
B	1,331	183	725	6.5	5,646.9	5,646.9	5,647.4	0.5
C	2,181	159	747	6.3	5,651.1	5,651.1	5,651.1	0.0
D	2,830	109	595	7.9	5,654.7	5,654.7	5,655.0	0.3
E	3,794	183	876	5.4	5,663.6	5,663.6	5,664.0	0.4
F	4,714	260	1,046	4.5	5,667.6	5,667.6	5,668.1	0.5
G	5,461	306	674	6.6	5,670.9	5,670.9	5,671.3	0.4
H	6,192	255	725	6.1	5,674.8	5,674.8	5,675.3	0.5
I	6,908	364	1,115	8.6	5,680.9	5,680.9	5,681.0	0.1
J	7,354	564	946	4.7	5,685.2	5,685.2	5,685.5	0.3
K	8,030	408	867	5.1	5,693.5	5,693.5	5,693.9	0.4
L	8,656	333	624	7.1	5,701.4	5,701.4	5,701.7	0.3
M	9,511	347	866	5.1	5,706.8	5,706.8	5,707.2	0.4
N	10,163	753	1,089	4.1	5,711.2	5,711.2	5,711.3	0.1
O	11,039	360	862	3.4	5,717.3	5,717.3	5,717.8	0.5
P	11,593	458	602	4.8	5,721.1	5,721.1	5,721.3	0.2
Q	11,646	455	1,497	1.9	5,724.0	5,724.0	5,724.3	0.3
R	12,354	462	938	3.1	5,724.7	5,724.7	5,725.1	0.4
S	13,118	380	903	3.2	5,730.0	5,730.0	5,730.2	0.2
T	13,709	344	485	6.0	5,733.2	5,733.2	5,733.4	0.2
U	14,363	251	629	4.6	5,737.6	5,737.6	5,737.9	0.3
V	15,413	330	691	4.2	5,743.3	5,743.3	5,743.7	0.4
W	16,413	365	385	7.5	5,747.7	5,747.7	5,747.9	0.2
X	16,913	218	661	4.4	5,752.1	5,752.1	5,752.5	0.4
Y	17,615	138	712	4.1	5,757.0	5,757.0	5,757.2	0.2
Z	17,937	159	1,177	2.5	5,764.1	5,764.1	5,764.1	0.0

<sup>1</sup> Stream distance in feet above confluence with Coal Creek

**TABLE 5**

**FEDERAL EMERGENCY MANAGEMENT AGENCY  
ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS**

**FLOODWAY DATA**

**SENAC CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE
Senac Creek								
AA	18,658	95	418	3.7	5,764.5	5,764.5	5,764.5	0.0
AB	19,413	63	277	4.3	5,768.0	5,768.0	5,768.5	0.5
AC	20,413	46	233	5.1	5,775.1	5,775.1	5,775.5	0.4
AD	20,942	71	274	4.3	5,777.7	5,777.7	5,778.2	0.5
AE	21,495	63	273	4.3	5,781.6	5,781.6	5,781.8	0.2
AF	22,413	102	312	3.8	5,787.2	5,787.2	5,787.7	0.5
AG	23,413	46	169	7.0	5,792.6	5,792.6	5,792.7	0.1
AH	24,036	39	118	4.7	5,795.9	5,795.9	5,796.1	0.2
AI	25,408	25	88	6.3	5,804.4	5,804.4	5,804.8	0.4

<sup>1</sup> Stream distance in feet above confluence with Coal Creek

**TABLE 5**

**FEDERAL EMERGENCY MANAGEMENT AGENCY  
ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS**

**FLOODWAY DATA**

**SENAC CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION				
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY		WITH FLOODWAY	INCREASE
						FEET (NAVD88)			
Slaughterhouse Gulch									
A	620 <sup>1</sup>	21	241	5.8	5,328.0	5,328.0	5,328.0	5,328.0	0.0
B	1,160 <sup>1</sup>	260	337	4.5	5,332.7	5,332.7	5,332.7	5,332.7	0.0
C	1,655 <sup>1</sup>	70	171	8.9	5,343.1	5,343.1	5,343.1	5,343.1	0.0
D	2,480 <sup>1</sup>	89	188	8.1	5,355.7	5,355.7	5,355.7	5,355.7	0.0
E	3,010 <sup>1</sup>	86	189	8.1	5,361.6	5,361.6	5,361.6	5,361.6	0.0
F	3,785 <sup>1</sup>	131	202	6.4	5,381.9	5,381.9	5,381.9	5,381.9	0.0
G	4,135 <sup>1</sup>	139	411	3.1	5,386.1	5,386.1	5,386.1	5,386.1	0.0
H	4,495 <sup>1</sup>	134	348	3.7	5,391.3	5,391.3	5,391.3	5,391.3	0.0
I	5,660 <sup>1</sup>	85	173	7.4	5,401.9	5,401.9	5,401.9	5,401.9	0.0
J	5,840 <sup>1</sup>	123	450	2.9	5,403.2	5,403.2	5,403.2	5,403.2	0.0
K	6,540 <sup>1</sup>	108	190	6.8	5,415.0	5,415.0	5,415.0	5,415.0	0.0
South Tributary Slaughterhouse Gulch									
A	555 <sup>2</sup>	100	74	6.4	5,384.3	5,384.3	5,384.3	5,384.3	0.0
B	1,010 <sup>2</sup>	68	122	3.7	5,394.5	5,394.5	5,394.5	5,394.7	0.2
C	1,310 <sup>2</sup>	69	75	6.0	5,401.0	5,401.0	5,401.0	5,401.1	0.1
D	1,705 <sup>2</sup>	90	82	5.5	5,407.0	5,407.0	5,407.0	5,407.2	0.2
E	1,795 <sup>2</sup>	75	68	5.5	5,408.7	5,408.7	5,408.7	5,409.0	0.3

<sup>1</sup> Feet Above Confluence With South Platte River

<sup>2</sup> Feet Above Confluence With Slaughterhouse Gulch

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
 AND INCORPORATED AREAS

FLOODWAY DATA

**SLAUGHTERHOUSE GULCH AND TRIBUTARY**



LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/ SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
THREE LAKES TRIBUTARY								
A	131	41	104	8.5	5,371.7	5,371.7	5,371.8	0.1
B	300	39	114	7.8	5,374.4	5,374.4	5,374.4	0.0

<sup>1</sup>Feet above confluence with Dutch Creek

TABLE 5	<b>FEDERAL EMERGENCY MANAGEMENT AGENCY ARAPAHOE COUNTY, CO AND INCORPORATED AREAS</b>	<b>FLOODWAY DATA</b>
		<b>THREE LAKES TRIBUTARY</b>

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	482	201	1,885	12.4	5,326.5 <sup>2</sup>	5,323.0	5,323.0	0.0
B	739	199	1,958	11.9	5,329.2	5,329.2	5,329.2	0.0
C	1,408	219	1,773	13.2	5,331.5	5,331.5	5,331.5	0.0
D	1,925	208	2,387	9.8	5,334.4	5,334.4	5,334.4	0.0
E	2,589	191	2,087	11.2	5,335.6	5,335.6	5,335.6	0.0
F	3,162	231	2,632	8.6	5,337.6	5,337.6	5,337.6	0.0
G	4,059	136	1,283	17.7	5,340.1	5,340.1	5,340.1	0.0
H	4,677	145	1,504	15.1	5,344.9	5,344.9	5,344.9	0.0
I	5,094	139	1,304	17.4	5,346.8	5,346.8	5,346.8	0.0
J	5,885	144	1,553	14.6	5,352.1	5,352.1	5,352.1	0.0
K	6,362	178	1,818	12.5	5,357.6	5,357.6	5,357.6	0.0
L	7,156	169	1,995	11.9	5,361.8	5,361.8	5,361.8	0.0
M	7,887	152	1,506	15.9	5,366.8	5,366.8	5,366.8	0.0
N	8,365	137	1,652	13.6	5,371.1	5,371.1	5,371.1	0.0
O	9,005	157	2,007	11.2	5,375.5	5,375.5	5,375.5	0.0
P	9,543	194	2,247	9.8	5,379.5	5,379.5	5,379.5	0.0
Q	10,239	198	1,822	11.8	5,380.4	5,380.4	5,380.5	0.1
R	10,820	166	2,096	10.3	5,384.1	5,384.1	5,384.1	0.0
S	11,431	192	2,411	8.9	5,385.7	5,385.7	5,385.7	0.0
T	11,890	244	2,974	7.2	5,386.7	5,386.7	5,386.7	0.0
U	12,451	179	2,099	10.2	5,387.3	5,387.3	5,387.3	0.0

<sup>1</sup> FEET ABOVE CONFLUENCE WITH SAND CREEK

<sup>2</sup> ELEVATION DUE TO BACKWATER FROM SAND CREEK

**TABLE 5**

FEDERAL EMERGENCY MANAGEMENT AGENCY

**ARAPAHOE COUNTY, CO**

AND INCORPORATED AREAS

**FLOODWAY DATA**

**TOLL GATE CREEK**

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	13,246	171	2,196	9.8	5,390.2	5,390.2	5,390.2	0.0
W	13,891	169	2,203	9.8	5,391.4	5,391.4	5,391.4	0.0
X	14,487	146	1,731	10.4	5,392.1	5,392.1	5,392.1	0.0
Y	14,949	158	1,790	12.3	5,398.3	5,398.3	5,398.3	0.0
Z	16,703	230	1,657	12.8	5,404.7	5,404.7	5,404.7	0.0
AA	17,775	773	3,188	6.7	5,410.1	5,410.1	5,410.1	0.0

<sup>1</sup> FEET ABOVE CONFLUENCE WITH SAND CREEK

**TABLE 5**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
AND INCORPORATED AREAS

**FLOODWAY DATA**

**TOLL GATE CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
UNNAMED CREEK								
A	1,798	140	580	4.6	5,575.0	5,575.0	5,575.0	0.0
B	2,775	269	661	4.0	5,576.7	5,576.7	5,576.7	0.0
C	3,566	56	232	11.5	5,589.0	5,589.0	5,589.1	0.1
D	4,385	177	756	3.5	5,593.4	5,593.4	5,593.4	0.0
E	5,376	245	488	5.5	5,605.9	5,605.9	5,605.9	0.0
F	6,917	363	524	3.9	5,615.3	5,615.3	5,615.3	0.0
G	8,310	174	320	6.5	5,625.4	5,625.4	5,625.4	0.0
H	8,934	282	416	5.0	5,630.2	5,630.2	5,630.2	0.0
I	10,964	208	282	5.7	5,645.1	5,645.1	5,645.1	0.0
J	11,935	348	1,960	0.6	5,657.3	5,657.3	5,657.3	0.0
K	14,538	360	311	3.6	5,680.5	5,680.5	5,680.5	0.0
L	15,346	70	148	7.5	5,685.2	5,685.2	5,685.2	0.0
M	16,629	179	281	4.0	5,700.4	5,700.4	5,700.4	0.0
N	17,909	584	3,971	0.3	5,720.5	5,720.5	5,720.5	0.0
O	19,406	152	176	6.1	5,722.5	5,722.5	5,722.5	0.0
P	22,299	191	1,192	0.4	5,757.1	5,757.1	5,757.1	0.0
Q	24,184	116	99	5.3	5,783.0	5,783.0	5,783.0	0.0
R	25,578	131	774	1.9	5,805.9	5,805.9	5,805.9	0.0
S	26,442	78	178	8.2	5,823.4	5,823.4	5,823.5	0.1
T	27,862	65	170	8.5	5,858.2	5,858.2	5,858.3	0.1
U	28,579	56	161	9.1	5,878.2	5,878.2	5,878.3	0.1

<sup>1</sup> Feet above confluence with West Toll Gate Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
**AND INCORPORATED AREAS**

FLOODWAY DATA

**UNNAMED CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION				
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY		WITH FLOODWAY	INCREASE
						FEET (NAVD88)			
West Bijou Creek									
A	72,000	2,200	5,412	6.4	5,167.6	5,167.6	5,168.6	1.0	
B	74,320	1,100	3,458	10.4	5,179.1	5,179.1	5,179.1	0.0	
C	75,120	650	5,721	6.1	5,182.8	5,182.8	5,183.1	0.3	
D	75,520	350	3,389	10.3	5,182.8	5,182.8	5,183.1	0.3	
E	75,620	350	3,227	10.8	5,183.2	5,183.2	5,183.4	0.2	
F	76,320	510	4,290	8.1	5,187.4	5,187.4	5,187.6	0.2	
G	77,120	450	3,266	9.7	5,189.6	5,189.6	5,190.0	0.4	
H	78,020	300	2,070	15.3	5,189.8	5,189.8	5,190.1	0.3	
I	78,270	450	2,087	15.2	5,190.0	5,190.0	5,190.3	0.3	
J	78,870	450	4,815	6.6	5,196.3	5,196.3	5,196.5	0.2	
K	80,270	600	5,111	6.2	5,198.9	5,198.9	5,199.4	0.5	
L	81,170	450	2,960	10.7	5,201.5	5,201.5	5,201.6	0.1	
M	82,370	200	3,567	8.9	5,207.8	5,207.8	5,207.8	0.0	
N	83,270	320	3,390	9.4	5,210.4	5,210.4	5,210.4	0.0	
O	85,120	550	4,337	7.3	5,215.2	5,215.2	5,216.2	1.0	
P	86,820	300	2,938	10.8	5,221.1	5,221.1	5,221.1	0.0	

<sup>1</sup> Feet Above Mouth

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
 AND INCORPORATED AREAS

FLOODWAY DATA

**WEST BIJOU CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
West Toll Gate Creek Lower Reach								
A	18,527	1,158	4,579	4.6	5,411.5	5,411.5	5,411.5	0.0
B	19,062	465	2,056	8.9	5,414.7	5,414.7	5,414.7	0.0
C	20,093	659	4,121	4.3	5,418.7	5,418.7	5,418.7	0.0
D	21,570	406	2,798	5.3	5,422.5	5,422.5	5,422.5	0.0
E	22,015	172	1,427	10.4	5,424.4	5,424.4	5,424.4	0.0
F	23,213	470	2,997	5.0	5,434.5	5,434.5	5,434.5	0.0
G	24,918	147	1,106	13.5	5,439.3	5,439.3	5,439.3	0.0
J	26,358	213	2,091	7.0	5,448.7	5,448.7	5,448.9	0.2
I	27,993	271	2,247	6.5	5,459.6	5,459.6	5,459.6	0.0
J	29,477	280	2,068	7.1	5,469.1	5,469.1	5,469.1	0.0
K	30,251	269	1,871	7.8	5,471.1	5,471.1	5,471.1	0.0
L	30,856	201	1,936	8.2	5,480.6	5,480.6	5,480.6	0.0
M	31,252	225	2,136	7.5	5,481.6	5,481.6	5,481.6	0.0
N	32,630	227	2,236	7.1	5,483.5	5,483.5	5,483.5	0.0
O	34,118	246	2,703	5.9	5,485.7	5,485.7	5,485.7	0.0
P	34,336	151	1,940	8.2	5,485.9	5,485.9	5,485.9	0.0
Q	34,393	202	1,655	9.6	5,489.4	5,489.4	5,489.4	0.0
R	34,779	517	2,973	5.4	5,491.9	5,491.9	5,491.9	0.0
S	35,218	802	2,405	6.3	5,503.6	5,503.6	5,503.7	0.1
T	35,514	709	2,382	6.4	5,503.6	5,503.6	5,503.7	0.1
U	36,210	670	2,440	6.2	5,509.6	5,509.6	5,509.6	0.0
V	37,219	543	2,354	5.4	5,516.3	5,516.3	5,516.4	0.2

<sup>1</sup> Feet above confluence with Toll Gate Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
**AND INCORPORATED AREAS**

FLOODWAY DATA

**WEST TOLL GATE CREEK, LOWER REACH**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
West Toll Gate Creek Lower Reach								
W	37,708	450	1,992	6.4	5,517.5	5,517.5	5,517.7	0.2
X	38,499	297	1,580	8.1	5,519.8	5,519.8	5,519.8	0.0
Y	39,140	266	1,697	7.5	5,522.0	5,522.0	5,522.0	0.0
Z	39,584	185	669	10.8	5,525.3	5,525.3	5,525.3	0.0
AA	40,010	134	742	9.7	5,530.5	5,530.5	5,530.5	0.0
AB	40,447	137	676	10.7	5,534.2	5,534.2	5,534.2	0.0
AC	41,637	303	954	7.6	5,539.0	5,539.0	5,539.1	0.1
AD	42,287	216	748	9.6	5,543.2	5,543.2	5,543.2	0.0
AE	43,131	301	1,087	6.6	5,549.2	5,549.2	5,549.4	0.2
AF	44,433	266	859	8.4	5,554.8	5,554.8	5,554.9	0.1
AG	45,780	217	644	7.1	5,571.0	5,571.0	5,571.1	0.1
AH	47,508	231	527	7.5	5,584.4	5,584.4	5,584.4	0.0
AI	48,943	79	280	11.0	5,594.4	5,594.4	5,594.5	0.1
AJ	50,594	48	242	12.7	5,607.2	5,607.2	5,607.3	0.1
AK	51,597	167	215	6.6	5,615.9	5,615.9	5,615.9	0.0
AL	52,993	219	345	4.1	5,625.9	5,625.9	5,625.9	0.0
AM	54,783	148	313	4.5	5,640.5	5,640.5	5,640.5	0.0
AN	55,237	247	1,119	1.3	5,646.5	5,646.5	5,646.5	0.0
AO	56,235	150	209	6.7	5,650.4	5,650.4	5,650.4	0.0
AP	57,169	50	172	8.2	5,657.2	5,657.2	5,657.2	0.0
AQ	57,686	200	1,099	1.3	5,662.0	5,662.0	5,662.0	0.0
AR	58,654	171	219	6.4	5,699.3	5,699.3	5,699.3	0.0

<sup>1</sup> Feet above confluence with Toll Gate Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
**AND INCORPORATED AREAS**

FLOODWAY DATA

**WEST TOLL GATE CREEK, LOWER REACH**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
West Toll Gate Creek Upper Reach								
AS	65,232	189	633	3.0	5,727.2	5,727.2	5,727.2	0.0
AT	67,579	117	197	4.1	5,735.9	5,735.9	5,735.9	0.0
AU	69,254	75	155	5.3	5,756.3	5,756.3	5,756.3	0.0
AV	70,199	205	204	4.0	5,767.1	5,767.1	5,767.1	0.0
AW	71,650	82	200	4.1	5,781.3	5,781.3	5,781.3	0.0
AX	73,538	150	210	3.2	5,802.6	5,802.6	5,802.6	0.0
AY	74,642	332	3,043	0.2	5,822.5	5,822.5	5,822.5	0.0
AZ	76,538	118	147	4.6	5,839.6	5,839.6	5,839.6	0.0
BA	77,592	45	63	5.7	5,852.0	5,852.0	5,852.0	0.0
BB	78,856	42	55	6.4	5,865.9	5,865.9	5,866.0	0.1
BC	80,989	108	82	4.3	5,898.5	5,898.5	5,898.5	0.0
BD	82,486	117	108	5.1	5,926.8	5,926.8	5,926.8	0.0
BE	83,347	59	86	6.4	5,949.3	5,949.3	5,949.3	0.0

<sup>1</sup> Feet above confluence with Toll Gate Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
**AND INCORPORATED AREAS**

FLOODWAY DATA

**WEST TOLL GATE CREEK, UPPER REACH**



FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION				
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY		WITH FLOODWAY	INCREASE
						FEET (NAVD88)			
West Toll Gate Creek Tributary									
A	776	126	334	9.3	5,526.2	5,526.2	5,526.2	5,526.2	0.0
B	3,750	169	1,069	2.3	5,573.8	5,573.8	5,573.8	5,573.8	0.0
C	4,040	224	1,195	2.0	5,573.9	5,573.9	5,573.9	5,573.9	0.0

<sup>1</sup> Feet Above Confluence With West Toll Gate Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
 AND INCORPORATED AREAS

FLOODWAY DATA

**WEST TOLL GATE CREEK TRIBUTARY**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION				
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY		WITH FLOODWAY	INCREASE
						FEET (NAVD88)			
West Tributary To Goldsmith Gulch									
A	430	136	381	2.7	5,641.4	5,641.4	5,642.4	1.0	
B	821	45	123	8.3	5,646.5	5,646.5	5,646.7	0.2	
C	1,247	39	113	9.1	5,651.4	5,651.4	5,651.7	0.3	
D	1,815	286	1,172	0.7	5,662.6	5,662.6	5,662.7	0.1	
E	2,065	90	251	3.2	5,662.5	5,662.5	5,662.4	-0.1	
F	2,089	115	374	2.1	5,662.3	5,662.3	5,663.5	1.2	
G	2,309	50	219	3.6	5,663.0	5,663.0	5,663.5	0.5	
H	2,719	30	86	9.3	5,668.4	5,668.4	5,667.0	-1.4	
I	2,758	73	175	4.6	5,669.7	5,669.7	5,669.9	0.2	
J	3,111	28	77	9.4	5,672.5	5,672.5	5,672.7	0.2	
K	3,469	85	271	2.7	5,676.9	5,676.9	5,677.4	0.5	
L	3,540	72	189	3.8	5,679.5	5,679.5	5,679.6	0.1	
M	4,000	65	96	6.7	5,682.6	5,682.6	5,683.4	0.8	
N	4,270	60	116	7.6	5,688.3	5,688.3	5,688.7	0.4	
O	4,404	30	134	6.6	5,693.4	5,693.4	5,693.4	0.0	
P	4,542	61	87	6.8	5,697.6	5,697.6	5,697.6	0.0	
Q	5,007	89	75	5.1	5,702.6	5,702.6	5,702.6	0.0	
R	5,204	62	114	3.3	5,704.0	5,704.0	5,704.0	0.0	
S	5,256	10	31	12.3	5,707.7	5,707.7	5,707.7	0.0	
T	5,319	36	46	8.3	5,712.0	5,712.0	5,712.0	0.0	
U	5,440	45	61	6.2	5,716.5	5,716.5	5,716.5	0.0	
V	5,660	111	339	1.1	5,717.4	5,717.4	5,717.4	0.0	
W	5,794	108	26	2.9	5,727.3	5,727.3	5,727.3	0.0	
X	6,091	30	18	4.2	5,734.9	5,734.9	5,734.9	0.0	
Y	6,227	48	21	3.6	5,738.7	5,738.7	5,738.7	0.0	

<sup>1</sup> Feet Above Confluence With Goldsmith Gulch

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
 AND INCORPORATED AREAS

FLOODWAY DATA

**WEST TRIBUTARY TO GOLDSMITH GULCH**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
WESTERLY CREEK								
A	6,292	270	899	7.4	5,300.2	5,300.2	5,300.3	0.1
B	6,710	402	1,790	4.0	5,301.0	5,301.0	5,301.1	0.1
C	10,000	363	1,993	1.2	5,316.7	5,316.7	5,317.6	0.9
D	11,500	165	254	3.8	5,322.2	5,322.2	5,322.7	0.5
E	13,774	85	50	0.3	5,333.5	5,333.5	5,333.5	0.0
F	29,400	347	738	2.8	5,434.6	5,434.6	5,435.4	0.8
G	30,411	182	247	6.7	5,445.4	5,445.4	5,445.4	0.0
H	30,751	166	202	6.4	5,448.3	5,448.3	5,448.6	0.3
I	31,410	294	245	4.9	5,462.6	5,462.6	5,462.6	0.0
J	31,650	150	300	5.5	5,471.9	5,471.9	5,471.9	0.0
K	34,645	32	152	2.9	5,471.9	5,471.9	5,471.9	0.0

<sup>1</sup> Feet Above Mouth

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

**ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS**

**FLOODWAY DATA**

**WESTERLY CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
WILLOW CREEK								
A	751	97	350	1.6	5,541.8	5,541.8	5,541.8	0.0
B	1,303	99	933	0.6	5,548.2	5,548.2	5,548.2	0.0
C	1,502	190	560	1.0	5,548.2	5,548.2	5,548.2	0.0
D	1,757	35	165	3.4	5,548.2	5,548.2	5,548.2	0.0
E	2,088	59	233	2.4	5,550.1	5,550.1	5,550.1	0.0
F	2,371	46	175	3.2	5,550.4	5,550.4	5,550.5	0.1
G	2,724	38	122	4.6	5,551.5	5,551.5	5,551.5	0.0
H	3,018	37	92	6.1	5,553.7	5,553.7	5,553.7	0.0
I	3,515	39	193	2.9	5,556.0	5,556.0	5,556.1	0.1
J	4,092	26	64	8.8	5,558.9	5,558.9	5,558.9	0.0
K	8,638	365	2,180	4.1	5,610.1	5,610.1	5,610.6	0.5
L	8,794	85	861	12.0	5,613.0	5,613.0	5,613.2	0.2
M	8,833	222	1,404	4.9	5,615.2	5,615.2	5,615.2	0.0
N	9,543	182	1,557	4.4	5,618.3	5,618.3	5,618.7	0.4
O	9,993	246	1,418	4.8	5,620.4	5,620.4	5,620.8	0.4
P	10,900	179	765	8.9	5,625.3	5,625.3	5,625.4	0.1
Q	11,792	184	1,409	4.9	5,634.9	5,634.9	5,635.8	0.9
R	12,302	184	1,180	5.8	5,638.6	5,638.6	5,638.8	0.2
S	12,912	445	1,796	4.4	5,647.8	5,647.8	5,647.9	0.1
T	13,203	130	1,091	6.3	5,650.7	5,650.7	5,650.7	0.0
U	13,901	356	1,535	4.5	5,658.1	5,658.1	5,658.1	0.0
V	14,407	239	1,161	5.9	5,660.6	5,660.6	5,660.6	0.0
W	15,017	290	2,620	3.4	5,672.5	5,672.5	5,672.8	0.3
X	16,051	281	1,466	4.7	5,675.3	5,675.3	5,675.4	0.1
Y	16,425	140	618	11.0	5,681.9	5,681.9	5,681.9	0.0
Z	17,088	140	607	11.2	5,691.2	5,691.2	5,691.2	0.0
AA	18,266	135	1,038	5.0	5,704.1	5,704.1	5,704.2	0.1

<sup>1</sup> Stream distance in feet above confluence with Little Dry Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**WILLOW CREEK**

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE <sup>1</sup>	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
WILLOW CREEK (Continued)								
AB	19,067	132	817	5.4	5,712.7	5,712.7	5,712.7	0.0
AC	19,647	69	563	9.7	5,718.3	5,718.3	5,718.3	0.0

<sup>1</sup> Stream distance in feet above confluence with Little Dry Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
 AND INCORPORATED AREAS

**FLOODWAY DATA**

**WILLOW CREEK**

## **5. INSURANCE APPLICATIONS**

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

### **Zone A**

Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or base flood depths are shown within this zone.

### **Zone AE**

Zone AE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

### **Zone AH**

Zone AH is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

### **Zone AO**

Zone AO is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot base flood depths derived from the detailed hydraulic analyses are shown within this zone.

### **Zone X**

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

### **Zone X (Future Base Flood)**

Zone X (Future Base Flood) is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined based on future-conditions hydrology. No BFEs or base flood depths are shown within this zone.

## **6. FLOOD INSURANCE RATE MAP**

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in

Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The current FIRM presents flooding information for the geographic area of Arapahoe County, including those communities which fall within more than one county as described in Section 1.1. Previously, separate FIRMs were prepared for the cities of Aurora and Littleton, and for Arapahoe County and Incorporated Areas. Historical data relating to the maps prepared for each community, prior to the first countywide maps, are presented in Community Map History (Table 6).

## **7. OTHER STUDIES**

This Flood Insurance Study supersedes all previous FIS reports and FIRMs covering the unincorporated areas of Arapahoe County and the incorporated areas of the Cities of Aurora, Centennial, Cherry Hills Village, Englewood, Glendale, Greenwood Village, Littleton, and Sheridan; and the Town of Columbine Valley (References 2, 5, 7, 8, 9, 10, 88 and 89).

The reaches of East Toll Gate Creek from Chambers Road to 1,300 feet upstream and from South Buckley Road to 0.8 mile upstream were analyzed by Merrick and Company and Greiner Engineering Sciences, Inc., respectively (References 18 and 19, respectively). The revised hydraulic analyses for West Toll Gate Creek from Mississippi Avenue to approximately 800 feet upstream of Mexico Avenue, and the portion of West Toll Gate Creek from South Buckley Road upstream to East Hampden Avenue were performed by the City of Aurora Engineering Division (References 21 and 22). The analyses for the portion of West Toll Gate Creek between East Hampden and East Quincy Avenues was performed by Merrick and Company (Reference 19). The hydrologic analyses for all the revisions were originally performed by the COE and Gingery and Associates for the effective FIS for Aurora (Reference 2).

Revised hydrologic and hydraulic analyses for the portion of Cherry Creek from Cherry Creek State Recreation Area to upstream of the Arapahoe/Douglas County line were performed by Greiner Engineering Sciences, Inc. as a part of the River Run Development Report (Reference 17).

The revised hydraulic analyses for portions of Prentice Gulch, Willow Creek, Greenwood Gulch, Spring Creek, Goldsmith Gulch, SJCD 6100, SJCD 6200, Dutch Creek, Coon Creek, and Lee Gulch were taken from published UDFCD reports (References 44, 60, 61, 62, 63, and 64).

Flood Insurance Studies have been prepared for the City and County of Denver and Adams, Douglas, and Jefferson Counties (References 65, 66, 67, and 68, respectively). Those studies are in general agreement with this study.

Historical data relating to the maps prepared for each community are presented in the Community Map History data (Table 5).

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE(S)	FIRM EFFECTIVE DATE(S)	FIRM REVISION DATE(S)
Arapahoe County (Unincorporated Areas)	December 20, 1974		August 15, 1977	
Aurora, City of	July 26, 1974		June 1, 1978	September 7, 1998
**Centennial, City of	December 20, 1974		August 15, 1977	
Cherry Hills Village, City of	May 10, 1974	January 31, 1975	August 1, 1978	
Columbine Valley, Town of	January 25, 1974	April 23, 1976	June 15, 1978	December 2, 1980
***Deer Trail, City of	November 29, 1974		N/A	
Englewood, City of	February 26, 1971		February 9, 1972	July 1, 1974 April 11, 1975 June 24, 1977 July 28, 1978 December 5, 1979
**Foxfield, Town of <sup>1</sup>	December 20, 1974		August 15, 1977	
***Glendale, City of	N/A		N/A	
Greenwood Village, City of	December 27, 1974		January 5, 1978	December 16, 1980
Littleton, City of	February 1, 1974	April 23, 1976	December 1, 1978	February 3, 1981
Sheridan, City of	May 3, 1974	January 23, 1976	July 13, 1976	December 4, 1985

<sup>1</sup> No Special Flood Hazard Areas Identified

\*\* Dates from Arapahoe County (Unincorporated Areas)

\*\*\* This community had no FIRM history prior to first time countywide

**TABLE 6**

**FEDERAL EMERGENCY MANAGEMENT AGENCY**

**ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS**

**COMMUNITY MAP HISTORY**



## **8. LOCATION OF DATA**

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting:

FEMA Mitigation Division,  
Denver Federal Center, Building 710  
Box 25267  
Denver, Colorado 80225-0267

## **9. BIBLIOGRAPHY AND REFERENCES**

1. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, Arapahoe County, Colorado, (Unincorporated Areas), August 15, 1977.
2. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Aurora, Colorado, August 31, 1982.
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## **10. REVISION DESCRIPTIONS**

This section has been added to provide information regarding significant revisions made since the original FIS report and FIRM were printed. Future revisions may be made that do not result in the republishing of the FIS report. All users are advised to contact the community repositories of flood hazard data to obtain the most up-to-date flood hazard information.

### **10.1 First Revision (March 4, 1991)**

This study was revised on March 4, 1991, to show modifications to the flooding and base flood elevations along Little Dry Creek as the result of revised hydrology for the entire basin and culvert and channel improvements from the South Platte River upstream to Clarkson Street, as approved in the Conditional Letters of Map Revision issued on February 19, 1987, and August 21, 1987.

An updated hydrologic evaluation for Little Dry Creek was conducted by McLaughlin Water Engineers, Ltd. (MWE), in July 1986 to determine the 100-year flow by utilizing the 1982 version of Colorado Urban Hydrograph Procedure in conjunction with the UDSWM2-PC model. The 100-year discharge used for this floodplain analysis was taken from the updated 1986 hydrologic analysis for the 100-year event. The hydrologic analyses for the 10-, 50-, and 500-year events are based on an earlier report by Sellards and Grigg, Inc., in 1981. Along Little Dry Creek, the 100-year discharge of 3,770 cfs from the 1986 updated hydrologic study is lower than the 100-year discharge of 6,650 cfs presented in the previous Flood Insurance Study report due to the effects of the Holly and Englewood Dams.

The basis for this revision is the completion of a box culvert and channel improvements along Little Dry Creek from the confluence of the South Platte River to Clarkson Street in Englewood, Colorado. The box culvert, located approximately 800 feet upstream of Santa Fe Drive and approximately 600 feet downstream of South Broadway Street, was designed to convey the 10-, 50-, and 100-year floods. The 100- and 500-year floodplain and 100-year floodway delineations and base flood elevations were modified based on the following information:

- Drawings 1 through 12, XI and X2 of "as-built" plans entitled "Little Dry Creek - South Platte River to Clarkson Street, City of Englewood, Colorado; Floodplain Delineation for Constructed Improvements," prepared by MWE, dated April 1989, for the City of Englewood, Colorado.
- A report entitled "Hydraulic Calculations for Little Dry Creek through the City of Englewood," dated April 1989, also prepared by MWE. This report contains hydraulic calculations and HEC-2 hydraulic computer model runs for the 10-, 50-, 100-, and 500-year recurrence interval floods for a reach of Little Dry Creek from the South Platte River to Clarkson Street.

These calculations and models reflect the effects of the construction of the culvert located from Santa Fe Drive upstream to Broadway Street, and channel improvements from the South Platte River to Santa Fe Drive and from Broadway Street to Clarkson Street. As a result of these improvements, the base flood elevations were decreased, and modifications to the floodway and the 100- and 500-year floodplain boundaries were made, as shown on Flood Insurance Rate Map Panels 0060 and 0070. Because a revised hydraulic analysis was not developed upstream of South Clarkson Street, there is an approximate Zone A transition from South Clarkson Street to the culvert entrance. Also, because the 500-year recurrence interval flood is not conveyed by the culvert, a separate water-surface profile panel labeled "500-year overflow" is included in the water-surface profile panels for Little Dry Creek.

Distances on the profiles and Floodway Data Tables have been corrected to reflect miles measured from the confluence with the South Platte River. Cross sections previously labeled A through BM along Little Dry Creek as shown on the Flood Insurance Rate Map have been relabeled 0 through CA to account for the addition of the new cross sections labeled A through N along the study reach. The water-surface profile panels for Little Dry Creek have also been renumbered in order to take into account the addition of six profiles for the study area, and the profiles listed after Little Dry Creek in the Flood Insurance Study report have been renumbered as a result of this addition. The Floodway Data Tables and Summary of Discharges Table have also been revised to reflect the effects of the reanalysis.

The communities affected by this revision along Little Dry Creek are the unincorporated areas of Arapahoe County, the City of Cherry Hills Village, the City of Englewood, and the City of Greenwood Village.

The reach of Big Dry Creek from approximately 1,360 feet downstream of Colorado Boulevard to approximately 2,440 feet upstream of Colorado Boulevard has been revised to reflect the change in base flood elevations and floodway and floodplain delineations due to the newly built Colorado Boulevard Bridge and channel improvements. The COE HEC-2 hydraulic computer program was used by Merrick and Company to perform the new hydraulic analyses. The 100-year floodway and floodplain delineations were also prepared by Merrick and Company on a topographic map at a scale of 1:50, with a contour interval of 2 feet (Reference 69). The Floodway Data Table and Flood Profile Panels for Big Dry Creek have been revised between cross sections BA and BE as a result of this analysis.

This revision also incorporated the Letter of Map Revision (LOMR) issued for Arapahoe County, Colorado on August 13, 1990, for an area along Cottonwood Creek from an existing pedestrian bridge (located approximately 900 feet upstream of Inverness Drive East) to County Line Road. This LOMR was based on better topographic data and a revised hydraulic analysis. The basis for this LOMR was the following submitted data: a report entitled "Request for Letter of Map Revision and Request for Conditional Letter of Map Revision for Cottonwood Creek, Arapahoe County, Colorado," dated March 1990, and prepared by Greenhorne &



O'Mara, Inc., and an as built drawing entitled "Cottonwood Creek Floodplain and Floodway for Letter of Map Revision," dated January 1990, prepared by Greenhorne & O'Mara, Inc. As a result of the above-referenced data, profile panels were also revised.

## 10.2 Second Revision (December 3, 1993)

This study was revised on December 3, 1993, to show revised floodplain analyses for Big Dry Creek, Goldsmith Gulch, Piney Creek, and Willow Creek.

The hydraulic analysis was performed by Love & Associates, Inc., Boulder, Colorado, for the Federal Emergency Management Agency (FEMA) under their Limited Map Maintenance Program (LMMP), Contract No. EMW-90-C-3132, completed in March 1992.

An initial Consultation and Coordination Officer (CCO) meeting was held in July 1990, and attended by representatives of Arapahoe County, FEMA, and Love & Associates, Inc.

Contacts to acquire information were made with the Arapahoe County Department of Highways /Engineering, the Urban Drainage and Flood Control District, and FEMA. The area of study included portions of the City of Greenwood Village and the unincorporated areas of Arapahoe County.

### Principal Flood Problems

Factors that aggravate flood problems: All streams studied in this Flood Insurance Study have had structural improvements, but intense and infrequent thunderstorms can generate floods in excess of existing structural capacities. Urbanization has occurred and development continues along these streams. This will increase debris loading in flood events and cause obstruction of bridges and culverts, thus causing more extensive damage.

### Flood Protection Measures

Structures: Drop structures have been constructed on several of the creeks studied, as well as improved culverts and bridges on roads.

Dams: Englewood Dam, located on Willow Creek, provides flood protection for the area around Willow Creek downstream of the dam to its confluence with Little Dry Creek.

### Hydrologic Analyses

In general, the only source of hydrologic information for these creeks is the previous Flood Insurance Studies and HEC-2 decks, although some additional information was available for Big Dry Creek and Willow Creek.

Goldsmith Gulch: The only source of information for Goldsmith Gulch in the LMMP study reach is the previous Flood Insurance Study HEC-2 deck in which the discharge varies by reach. At Dayton Street the 100-year discharge is 1,090 cubic feet per second (cfs) and at the outlet of Arapahoe Lake

the 100-year discharge is 800 cfs.

Piney Creek: The only source of information for Piney Creek hydrology is the previous Flood Insurance Study HEC-2 deck in which the discharge varies by reach. The discharges at Parker Road are:

Piney Creek 100-Year Discharges

<u>Return Period (year)</u>	<u>Flood Insurance Study (cfs)</u>
10	5,400
50	8,500
100	9,800
500	21,000

Willow Creek: The primary source of information for Willow Creek is the McCall, Ellingson & Morrill (1974) report which was used for the previous Flood Insurance Study. The computer model input was unavailable for this study. Greenhorne & O'Mara (1989) used the McCall, Ellingson & Morrill report as a basis for a study located upstream of Englewood Dam. Downstream of Englewood Dam, the McCall, Ellingson & Morrill report presents a flow rate at the confluence with Little Dry Creek, but does not report the outflow rate of the dam. McLaughlin Water Engineers (1986) present flow rates for the outlet of Englewood Dam and at the confluence with Little Dry Creek. The 100-year discharge from each of these sources is presented below (References 70, 71, and 72).

Willow Creek 100-Year Discharges

<u>Downstream of Englewood Dam</u>		<u>Upstream of Englewood Dam</u>			
Confluence with Little Dry Creek (0.37 mi <sup>2</sup> )	Englewood Dam outlet outflow	Dry Creek Road (8.1 mi <sup>2</sup> )	Upstream of Confluence with Tributary (6.9 mi <sup>2</sup> )	Quebec Street (6.55 mi <sup>2</sup> )	Mineral Avenue (5.46 mi <sup>2</sup> )
660 <sup>1</sup>	190 <sup>2</sup>	6100 <sup>1</sup>	5200 <sup>1</sup>	5070 <sup>3</sup>	4600 <sup>1</sup>
880 <sup>2</sup>					

<sup>1</sup> McCall, Ellingson & Morrill (1974)

<sup>2</sup> McLaughlin Water Engineers (1986)

<sup>3</sup> Greenhorne & O'Mara (1989)

Big Dry Creek: Two sources of information exist for Big Dry Creek. The first is a previous Flood Insurance Study HEC-2 deck, and the second is a FEMA accepted Letter of Map Revision (LOMR) for the channel from approximately 2,000 feet upstream of South Colorado Boulevard to approximately 1,000 feet downstream of South Colorado Boulevard (Reference 73). The table below shows the flow rates for Big Dry Creek at South Colorado Boulevard. The 100-year flow rates for the two FEMA

accepted studies differ by over 1,000 cfs at this location. The data from the 1974 Flood Insurance Study were used for this study.

#### Big Dry Creek at South Colorado Boulevard

Return Period (year)	Flood Insurance Study (1974)	LOMR (1988)
10	6,673	
50	8,520	
100	9,757	8,600
500	15,968	

#### Hydraulic Analysis

Cross section data for streams in the area were digitized from maps and copied from previous HEC-2 decks.

All bridges and culverts were surveyed to obtain elevation data and structural geometry.

Roughness coefficients (Manning's "n") were estimated from field inspection and photographs of the study reaches. Water-surface profiles were developed using the HEC-2 computer backwater model (Reference 74). Profiles were determined for the 100-year floods on Goldsmith Gulch and Willow Creek, and the 10-, 50-, 100-, and 500-year floods for Piney Creek and Big Dry Creek.

The starting water-surface elevations for all streams were obtained from the previous Flood Insurance Study.

All elevations are referenced to National Geodetic Vertical Datum of 1929.

#### Maps used for floodplain boundaries are as follows:

- 1) Topographic maps used as work maps: Scale 1:1,200, Contour interval 2 feet, (References 75, 76, 77, and 78)
- 2) Arapahoe County Base Maps: Scale 1:2,400, no contours (Reference 79)
- 3) USGS quad map; Highlands Ranch Quadrangle: Scale 1:12,000, Contour interval 10 feet, (Reference 80)
- 4) Federal Emergency Management Agency, Flood Insurance Rate Map Panel 0800500095F; Arapahoe County: Scale 1:6,000, no contours (Reference 81)

#### Floodways

Equal conveyance reduction encroachment Method 4 was used for the floodway determination for Big Dry Creek and Piney Creek.

### 10.3 Third Revision (August 16, 1995)

#### Digital Update

The mapping for this update dated August 16, 1995 has been prepared using digital data. Previously published Flood Insurance Rate Map data produced manually have been converted to vector digital data by a digitizing process. These vector data were fit to raster digital images of the USGS quadrangle maps of the county area to provide horizontal positioning.

Road, highway names and centerline data have been obtained from the United States Census Bureau's TIGER (Topologically Integrated Geographic Encoding and Referencing) File. The centerlines were modified to the positional accuracy of the USGS quadrangle, and the roads, highways, and street names were modified from the Flood Insurance Rate Map panels. The City of Aurora road and highway names and centerline data have been obtained from the City of Aurora, Department of Public Works, Geographic Information System. The adjusted centerline data were then computer plotted with the digitized floodplain data to produce the countywide Flood Insurance Rate Map panels. Floodplain data for South Platte River were added based on work maps produced by Wright Water Engineers, Inc., for the Urban Drainage and Flood Control District in September 1987. Floodplain representation was matched to that in Denver County for a reach of 1,500 feet downstream (north) of Dartmouth Avenue.

Floodplain data for 3,600 feet of West Harvard Gulch were added to Arapahoe County based on work maps and analyses produced by Gingery Associates, Inc., for the Urban Drainage and Flood Control District, October 1978. Floodplain data were tied into that in Denver County at Colorado Southern Railroad (downstream) and South Zuni Street (upstream).

Floodplain data for Littles Creek were updated based upon hydrologic and hydraulic analyses performed by J. F. Sato and Associates for FEMA under Contract No. EMW-84-C-1631, completed in August 1985.

As a result of the channel improvement project for the reach of Littles Creek downstream from the Atchison, Topeka and Santa Fe and the Denver and Rio Grande Western railroads to its confluence with the South Platte River, the 100-year base flood would be contained within the channel. The hydraulic reanalysis for this reach of Littles Creek was performed by Love and Associates, Inc., in January 1989 (Reference 82).

The LOMR issued on July 15, 1991, for the City of Greenwood Village, to show the effects of more detailed topographic information along Prentice Gulch from the confluence of Greenwood Gulch to Holly Street, was included in this update. As a result of the more detailed topographic information, the 100-year floodplain boundary, base flood elevations, and floodway boundary have been revised along Prentice Gulch. The Floodway Data Table has also been updated.

The LOMR issued on April 20, 1992, for the City of Greenwood Village to show the effects of a revised hydraulic analysis which utilized better topographic data along Greenwood Gulch from the confluence with Prentice Gulch and Highline Canal upstream to South Holly Street was included in this update. As a result of the revised hydraulic analysis, the 100-year floodplain boundary, base flood elevations, floodway boundary, and Floodway Data Table were revised.

The LOMR issued on April 16, 1993, for the City of Greenwood Village to show the effects of channel improvements, which include realignment of the channel and more detailed topographic information along Goldsmith Gulch between East Belleview Avenue and South Yosemite Street was included in this update. As a result of the improvements and more detailed topographic information, the 100-year floodplain boundary and floodway have been shifted approximately 150 feet to the east. In addition, base flood elevations were increased a maximum of 4 feet, from approximately 450 feet upstream of East Belleview Avenue to approximately 150 feet upstream of Yosemite Street. The Floodway Data Table has also been updated. The LOMR issued on September 26, 1994, for Arapahoe County to show the effects of more detailed topographic information and the existing bridge at East Iliff Avenue along Cherry Creek, from approximately 1,000 feet downstream of East Iliff Avenue to approximately 1,050 feet upstream of East Iliff Avenue, was included in this update. As a result of the more detailed topographic information, the elevations and floodplain boundary delineations along Cherry Creek have been revised.

#### 10.4 Fourth Revision (December 17, 2010)

This study was revised on December 17, 2010 as part of a Digital Flood Insurance Rate Map (DFIRM) conversion for Arapahoe County and incorporated areas. This study incorporated the new countywide DFIRM conversion prepared by the UDFCD. The UDFCD contracted Merrick and Company to digitize the flood data from various sources and to prepare the data in conformance with the FEMA DFIRM specifications.

The cities of Aurora, Littleton, and Centennial were added to the DFIRM as a part of this revision. Previously, Aurora and Littleton had separate FIRMs. Centennial was incorporated after the date of the previous effective FIS and FIRM.

Flood information used for the DFIRM conversion came from three sources: the UDFCD's Flood Hazard Area Delineation studies; the work maps from the original FIS; and the work maps from several Letters of Map Revision (LOMRs).

##### Flood Hazard Area Delineation Studies

The UDFCD published a Flood Hazard Area Delineation report (Reference 83) for the Lower Box Elder Creek watershed in September 2001. This

report identified flood hazard information on Box Elder Creek and Bear Gulch. This report was incorporated into this FIS.

The UDFCD published a Flood Hazard Area Delineation report (Reference 84) for the Upper Box Elder Creek watershed in December, 1995. This report identified flood hazard information on Box Elder Creek, Coyote Run and several tributaries. This report was incorporated into this FIS.

The UDFCD published a Flood Hazard Area Delineation report (Reference 85) for the Cherry Creek watershed in May, 2003. This report identified flood hazard information on Cherry Creek from Cherry Creek Reservoir to the Douglas County line. This report was incorporated into this FIS.

The UDFCD published a Flood Hazard Area Delineation report (Reference 86) for the Little Dry Creek watershed in August, 2003. This report identified flood hazard information on Little Dry Creek, Willow Creek, Greenwood Gulch, Quincy Gulch, Blackmer Gulch and Prentice Gulch. This report was incorporated into this FIS. An unpublished study revised the flood hazard information from Holly Dam to Quebec Street to correct obvious errors in the previous mapping.

The UDFCD published a Flood Hazard Area Delineation report (Reference 87) for the Upper Goldsmith Gulch watershed in April, 2005. This report identified flood hazard information on Goldsmith Gulch and the West Tributary. This report was incorporated into this FIS. An unpublished study revised the flood hazard information immediately above Caley Avenue to reflect a new detention pond.

The UDFCD published a Flood Hazard Area Delineation report (Reference 90) for the Massey Draw and SJCD 6200 watersheds in December, 2005. This report identified flood hazard information on SJCD 6200 and the North Tributary. This report was incorporated into this FIS.

The UDFCD published a Flood Hazard Area Delineation report (Reference 91) for the Murphy Creek watershed in September, 2006. This report identified flood hazard information on Murphy Creek. This report was incorporated into this FIS.

#### Letters of Map Revision (LOMRs)

All LOMRs effective after the date of the last revision (August 16, 1995) through March 16, 2010, have been incorporated into this revision.

#### 10.5 Fifth Revision (February 17, 2017)

This study was revised on February 17, 2017, to incorporate six different Flood Hazard Area Delineation Reports from UDFCD and several LOMRs.

The UDFCD published a Flood Hazard Area Delineation report (Reference 92) for Cottonwood Creek and its tributaries in August 2011. The analysis was conducted by Muller Engineering Company, Inc., and identified flood hazard information on Cottonwood Creek, Havana Tributary, Inverness

Tributary, and Peoria Tributary. This report was incorporated into this FIS and the DFIRM.

The UDFCD published a Flood Hazard Area Delineation report (Reference 93) for upper East Toll Gate Creek in December 2010. The analysis was conducted by J3 Engineering Consultants and identified flood hazard information on East Toll Gate Creek. This report was incorporated into this FIS and the DFIRM.

The UDFCD published a Flood Hazard Area Delineation report (Reference 94) for First Creek and its tributary in October 2011. The analysis was conducted by Moser and Associates Engineering, and identified flood hazard information on First Creek, First Creek Tributary T, and First Creek – E470 Split. This report was incorporated into this FIS and the DFIRM.

The UDFCD published a Flood Hazard Area Delineation report (Reference 95) for Piney Creek and Antelope Creek in December 2011. The analysis was conducted by WRC Engineering, Inc., and identified flood hazard information on Piney Creek, Piney Creek Split Flow, Antelope Creek, and Antelope Creek Split Flow. This report was incorporated into this FIS and DFIRM.

The UDFCD published a Flood Hazard Area Delineation report (Reference 96) for Second Creek in May 2011. This analysis was conducted by Olsson Associates and Matrix Design Group, Inc., and identified flood hazard information on Second Creek upstream of Denver International Airport. This report was incorporated into this FIS and DFIRM.

The UDFCD published a Flood Hazard Area Delineation report (Reference 97) for Willow Creek in December 2010. This analysis was conducted by CH2M Hill and identified flood hazard information on Willow Creek. The existing conditions flood hazard area information developed with this report was incorporated into this FIS and DFIRM.

The following Letters of Map Revision (LOMRs) were incorporated into this revision. These cases went effective since the last revision and were incorporated into the respective DFIRM panels, FIS profiles, Summary of Discharges Tables, and Floodway Data Tables for clarity and consistency.

Letter of Map Revisions (LOMRs)

Case Number	Effective Date	Flooding Source	FIRM Panel(s)
10-08-1061P	December 18, 2010	Unnamed Creek and the Tributary to Unnamed Creek	08005C0213K 08005C0501K
11-08-1095P	April 13, 2012	Spring Creek	08005C0458K
12-08-0411P	October 29, 2012	Lone Tree Creek	08005C0477K 08005C0479K
12-08-0590P	March 22, 2013	Murphy Creek and Murphy Creek Tributary	08005C0502K
12-08-0553P	April 12, 2013	Little Dry Creek	08005C0456K 08005C0457K 08005C0458K 08005C0459K
13-08-0357P	November 8, 2013	Lone Tree Creek	08005C0477K 08005C0479K
14-08-0918P	July 10, 2015	Piney Creek	08005C0501K 08005C0503K
15-08-0299P	December 11, 2015	Goldsmith Gulch	08005C0476K
15-08-1087P	May 26, 2016	Unnamed Creek	08005C0213K

10.6 Sixth Revision (April 18, 2018)

This study was revised on April 18, 2018, to incorporate the Flood Hazard Area Delineation Reports from UDFCD as described below.

The UDFCD published a Flood Hazard Area Delineation report (Reference 98) for Dutch Creek, Coon Creek, Lilley Gulch and Three Lakes Tributary in March 2008. The analysis was conducted by PBS&J, and identified flood hazard information on the above stream reaches. This report was incorporated into this revision of the FIS and DFIRM for portions of Dutch Creek, Coon Creek and Three Lakes Tributary.

The UDFCD published a Flood Hazard Area Delineation report (Reference 99) for Coal Creek in August 2014. The analysis was conducted by Matrix Design Group, and identified flood hazard information on the above stream reaches. This report was incorporated into this revision of the FIS and FIRM for portions of Coal Creek in Arapahoe County. The respective FIS profiles, Summary of Discharges Tables, Floodway Data Tables and other FIS tables for these streams were updated for for clarity and consistency.

a. Acknowledgments

The Dutch Creek, Coon Creek and Three Lakes Tributary study flow path through Arapahoe County, Colorado were performed by PBS&J for Urban Drainage and Flood Control District as part of the “Flood Hazard Area Delineation Dutch Creek, Coon Creek, Lilley Gulch, and Three Lakes



Tributary”. FEMA reviewed and accepted these data for the purposes of this revision (Pending).

The Coal Creek study flow path through Arapahoe County, Colorado were performed by Matrix Design Group, Inc. for Urban Drainage and Flood Control District as part of the “Flood Hazard Area Delineation Sand Creek Colfax to Yale Study”. FEMA reviewed and accepted these data for the purposes of this revision.

b. Scope

Detailed hydrologic and hydraulic analyses were conducted for these portions of Dutch Creek, Coon Creek and Three Lakes Tributary. This portion of Coon Creek is approximately 1,460 feet long, Dutch Creek is approximately 9840 feet long. Three Lakes Tributary is approximately 510 feet long.

Detailed hydrologic and hydraulic analyses were conducted for this portion of Coal Creek. Topography within the study area generally slopes to the northwest with slopes ranging from 0 to 4 percent. The lowest and highest elevations within the study area are 5,640 feet and 5,960 feet NAVD, respectively. This portion of Coal Creek is approximately 52,440 feet long, measured along the low flow channel inside the study area, starting at the approximately 690 feet upstream of the Corporate Limits of the City of Aurora and ending at the Arapahoe County corporate limits. Coal Creek is a broad, natural drainageway with mild to steep sloping banks.

c. Hydrology

For Dutch Creek, Coon Creek, Three Lakes Tributary and Coal Creek study, Peak discharges for the 0.2-, 1-, 2, and 10-percent-annual-chance of occurrence events were analyzed using the Colorado Urban Hydrograph Procedure (CUHP 2005), version 1.3.3, to generate hydrographs for each subwatershed. Hydrographs for the subwatersheds were routed using the Environmental Protection Agency Stormwater Management Model (EPA SWMM), version 5.0, to determine peak discharge rates at selected design points. The EPA SWMM results were then compared to watersheds of similar size and imperviousness.

d. Hydraulic

For Dutch Creek, Coon Creek and Three Lakes Tributary study, the U.S. Army Corps of Engineer’s step backwater program HEC-RAS, Version 3.1.3, was used for the floodplain analysis of the drainage ways. Cross sections used by the HEC-RAS model were developed from the digital elevation model (DEM) developed from the breakline survey file provided by Urban Drainage under separate survey contract. Bridges and culverts were individually surveyed or measured in the field.

For Coal Creek Study, the U.S. Army Corps of Engineer’s step backwater program HEC-RAS, Version 4.1.0, was used for the floodplain analysis of

the drainage ways. Cross sections used by the HEC-RAS model were developed electronically by cutting the triangulated irregular network (TIN) developed from the USGS topographic 2-foot contour mapping provided by UDFCD. Bridges and culverts were individually surveyed or measured in the field. The average spacing of cross sections is 372 feet, with the maximum spacing at 702 feet.

A steady flow analysis was utilized to determine the flood profiles for the 0.2-, 1-, 2, and 10-percent-annual-chance storm events. Flow change locations were established at critical design points where there are significant changes in hydrology as determined by the EPA SWMM model. Between flow change locations, steady flow is maintained for defined channel segments along the reach.

e. Manning

For Dutch Creek, Coon Creek and Three Lakes Tributary study, estimates of channel and overbank roughness were made from aerial photographs and field observations. Manning's 'n' values ranged from 0.03 to 0.045 in the channel and from 0.03 to 0.08 in the overbank areas. Blocked obstructions and ineffective flow were utilized to account for large structures and flow conveyance paths.

For Coal Creek Study, estimates of channel and overbank roughness for existing conditions were made from aerial photographs and field observation, and through experience for future fully developed conditions. Manning's n values in the hydraulic model ranged from 0.035 to 0.075 in the channel section, and from 0.02 to 0.08 in the overbank areas.

10.7 Seventh Revision (September 14, 2018)

This study was revised on September 14, 2018, to incorporate the Flood Hazard Area Delineation Reports from UDFCD as described below. The final CCO meeting was held on October 5, 2016 and attended by FEMA, Urban Drainage Flood Control District, BakerAECOM, the City of Aurora and Arapahoe County.

The UDFCD published a Flood Hazard Area Delineation report (Reference 98) for Box Elder Creek (Downstream of Jewell Avenue) and Coyote Run in December 2014. The analysis was conducted by Olsson Associates, and identified flood hazard information on the above stream reaches. This report was incorporated into this revision of the FIS and FIRM for portions of Box Elder Creek and Coyote Run. The respective FIS profiles, Summary of Discharges Tables, Floodway Data Tables and other FIS tables for these streams were updated for for clarity and consistency.

a. Acknowledgments

The Box Elder Creek, Box Elder Spill 3, Box Elder Spill 4, Box Elder Spill 5, Box Elder Split 2, Box Elder Split 2A, Box Elder Split 2B and Coyote Run study flow path through the Arapahoe County, Colorado were

performed by Olsson Associates for the Urban Drainage and Flood Control District as part of the “Box Elder Creek (Downstream of Jewell Avenue) and Coyote Run Flood Hazard Area Delineation”. FEMA reviewed and accepted these data for the purposes of this revision.

b. Scope

Detailed hydrologic and hydraulic analyses were conducted for this portion of Box Elder Creek, Box Elder Spill 3, Box Elder Spill 4, Box Elder Spill 5, Box Elder Split 2, Box Elder Split 2A, Box Elder Split 2B and Coyote Run. This portion of Box Elder Creek is approximately 30.9 miles long and generally slopes to the north at a slope between 0.3% and 0.5%. Coyote Run is approximately 15.9 miles long and generally slopes to the north at a slope between 0.2% and 1.2%.

c. Hydrology

For Box Elder Creek, Box Elder Spill 3, Box Elder Spill 4, Box Elder Spill 5, Box Elder Split 2, Box Elder Split 2A, Box Elder Split 2B and Coyote Run, peak discharges for the 1% future, 1%, 2%, and 10% annual chance of occurrence events were analyzed. Hydrology for the Box Elder Creek watershed was completed to update the older CUHP and UDSWM models from previous studies (1995 and 2001 Outfall System Plans) to CUHP 2005 version 1.3.3, and EPA SWMM version 5.0.022.

d. Hydraulic

For Box Elder Creek, Box Elder Spill 3, Box Elder Spill 4, Box Elder Spill 5, Box Elder Split 2, Box Elder Split 2A, Box Elder Split 2B and Coyote Run, the U.S. Army Corps of Engineer’s step backwater program HEC-RAS, Version 4.1.0, was used for the floodplain analysis. Cross sections for HEC-RAS were developed electronically using the 2-foot interval LiDAR data. The survey data collected for all of the major bridges and culverts was used in the model.

e. Manning

For Box Elder Creek, Box Elder Spill 3, Box Elder Spill 4, Box Elder Spill 5, Box Elder Split 2, Box Elder Split 2A, Box Elder Split 2B and Coyote Run, estimates of channel and overbank roughness were determined using aerial photography and field observation, primarily at road crossings. The channel and bank roughness values ranged from 0.03 to 0.06. Sandy portions of the channel were set at 0.03. Areas that appeared to have short grasses were set at 0.035. Areas with longer grass and scattered trees were set at 0.04 to 0.045. Areas with thick trees and brush were set at 0.06.

## 10.8 Eighth Revision (September 4, 2020)

This study was revised on September 4, 2020 to incorporate six Flood Hazard Area Delineation (FHAD) studies from the Urban Drainage and Flood Control District (UDFCD). The final community coordination meeting

for this study was held on July 28, 2016, and was attended by FEMA, CWCB, UDFCD, the communities, and the study contractor. All issues from the meeting were resolved.

The UDFCD published a FHAD for the Cherry Creek watershed in November 2013 (Reference 98). The study used updated hydrology and hydraulic analyses to modify flood hazard information from Cherry Creek Dam to the South Platte River. This report was incorporated into this FIS.

The UDFCD published a FHAD for the Toll Gate Creek and East Toll Gate Creek watersheds in November 2013 (Reference 100). The study revised flood hazard information along Toll Gate Creek from the confluence with Sand Creek to the confluence with East and West Toll Gate Creeks, and along East Toll Gate Creek from the confluence with Toll Gate Creek to approximately 700 feet downstream of East Hampden Avenue. This report was incorporated into this FIS.

The UDFCD published a FHAD for the Happy Canyon Creek watershed in July 2014 (Reference 101). The study revised flood hazard information along Happy Canyon Creek from the confluence with Cherry Creek to the Arapahoe - Douglas County boundary; and along Green Acres Tributary from the confluence with Happy Canyon Creek to the Arapahoe - Douglas County boundary. This report was incorporated into this FIS.

The UDFCD published a FHAD for the Senac Creek watershed in November 2013 (Reference 102). The study revised flood hazard information along Senac Creek from the confluence with Coal Creek to the Aurora Reservoir Dam. This report was incorporated into this FIS.

The UDFCD published a FHAD for the West Toll Gate Creek watershed in November 2013 (Reference 103). The study revised flood hazard information along West Toll Gate Creek from the confluence with Toll Gate Creek to upstream of Quincy Reservoir, and established flood hazard information from upstream of Quincy Reservoir to approximately 2,000 feet upstream of South Riviera Way; and revised flood hazard information along Unnamed Creek (Tributary to West Tollgate Creek) from the confluence with West Toll Gate to approximately 4,100 feet upstream of Copperleaf Boulevard. This report was incorporated into this FIS.

The UDFCD published a FHAD for the Littles Creek watershed in July 2012 (Reference 104). The study revised flood hazard information from the confluence with the South Platte River to South Broadway; and established flood hazard information from South Broadway to East Dry Creek Road. This report was incorporated into this FIS.

The FHADs mentioned above were incorporated into the respective FIRM panels, FIS profiles, Summary of Discharges Tables, Floodway Data Tables and other FIS tables for for clarity and consistency.

The following Letters of Map Revision (LOMRs) were incorporated into this revision. These cases went effective since the last revision and were incorporated into the respective FIRM panels, FIS profiles, Summary of Discharges Tables, Floodway Data Tables and other FIS tables for clarity and consistency.

Letters of Map Revision (LOMRs)

Case Number	Effective Date	Flooding Source	FIRM Panel(s)
10-08-0937P*	March 10, 2011	Sand Creek	08005C0039L
11-08-0669P	February 10, 2012	Sable Ditch	08005C0039L, 08005C0177L, 08005C0181L
13-08-1142P	September 5, 2014	Cherry Creek	08005C0483L
14-08-1180P*	May 22, 2015	Cherry Creek	08005C0483L
16-08-0957P	August 11, 2017	Cherry Creek Spillway Drain	08005C0191L
17-08-0697P*	February 2, 2018	Baranmor Ditch	08005C0039L
18-08-0814P*	April 19, 2018	Sand Creek	08005C0039L
18-08-0169P*	September 17, 2018	Antelope Creek, Antelope Creek Split Flow, Piney Creek, Piney Creek Split Flow	08005C0482M, 08005C0501M
18-08-0713P	April 12, 2019	Toll Gate Creek	08005C0177L

\* These LOMRs were fully incorporated into the FIS and into the FIRM panels indicated. They overlap onto FIRM panels that are not being updated at this time. The portion of the LOMR located on unrevised panels will be reissued at a later time.

## **11. MAP REPOSITORIES**

For previous versions of the FIRM Index, the Map Repository information was included on the FIRM Index itself. The map repositories are listed in Table 7 in the FIS. Listing of NFIP Jurisdictions is shown in Table 8.

Table 7 – Map Repositories

Community	Address	City	State	Zip Code
Arapahoe County, Unincorporated Areas	Public Works and Development Department 6924 South Lima Street	Centennial	CO	80112
City of Aurora	Public Works Department 15151 East Alameda Parkway, Suite 3200	Aurora	CO	80012
City of Centennial	Southeast Metro Stormwater Authority 7437 South Fairplay Street	Centennial	CO	80112
City of Cherry Hills Village	Village Center 2450 East Quincy Avenue	Cherry Hills Village	CO	80113
Town of Columbine Valley	Town Hall 2 Middlefield Road	Columbine Valley	CO	80123
City of Deer Trail	Planning Department 555 Second Avenue	Deer Trail	CO	80105
City of Englewood	Englewood Civic Center 1000 Englewood Parkway	Englewood	CO	80110
Town of Foxfield	Arapahoe County Public Works and Development Department 6924 South Lima Street	Centennial	CO	80112
City of Glendale	Glendale Municipal Offices 950 South Birch Street	Glendale	CO	80246
City of Greenwood Village	City Hall 6060 South Quebec Street	Greenwood Village	CO	80111
City of Littleton	Public Works Department 2255 West Berry Avenue	Littleton	CO	80120
City of Sheridan	Building Development 4101 South Federal Boulevard	Sheridan	CO	80110

Table 8 – Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
ARAPAHOE COUNTY UNINCORPORATED AREAS	080011	10190002 10190003 10190010 10190011 10190012 10190013	08005C0141K <sup>2</sup> , 08005C0142K, 08005C0143K, 08005C0144K, 08005C0159K <sup>2</sup> , 08005C0162K <sup>2</sup> , 08005C0163K, 08005C0164K, 08005C0166K <sup>2</sup> , 08005C0167L, 08005C0168K, 08005C0169K <sup>2</sup> , 08005C0186K <sup>2</sup> , 08005C0187K <sup>2</sup> , 08005C0188L, 08005C0189K <sup>2</sup> , 08005C0192L, 08005C0193L, 08005C0194L, 08005C0201L, 08005C0202L, 08005C0203L, 08005C0204K, 08005C0206L, 08005C0207K, 08005C0208L, 08005C0209L, 08005C0211L, 08005C0212K, 08005C0213M, 08005C0214L, 08005C0216M, 08005C0217L, 08005C0218M, 08005C0219L, 08005C0226L, 08005C0227L, 08005C0228L, 08005C0229L, 08005C0231L, 08005C0233L, 08005C0235L <sup>2</sup> , 08005C0236M, 08005C0237M, 08005C0240M, 08005C0241L, 08005C0245L, 08005C0255K <sup>2</sup> , 08005C0260K, 08005C0265K, 08005C0270K, 08005C0300K, 08005C0325K, 08005C0350K, 08005C0375K, 08005C0400K <sup>2</sup> , 08005C0425K <sup>2</sup> , 08005C0431L, 08005C0432M, 08005C0433K, 08005C0451L, 08005C0457K, 08005C0459L, 08005C0476L, 08005C0477L, 08005C0478L, 08005C0479K, 08005C0481L, 08005C0482M, 08005C0483L, 08005C0501M, 08005C0502L, 08005C0503L, 08005C0504L, 08005C0506L, 08005C0507L, 08005C0508K, 08005C0509K <sup>2</sup> , 08005C0530L, 08005C0550L, 08005C0575K, 08005C0600K, 08005C0625K, 08005C0650K, 08005C0675K, 08005C0700K <sup>2</sup> , 08005C0725K <sup>2</sup>	

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
AURORA, CITY OF	080002	10190003	08005C0019K, 08005C0038K, 08005C0039L, 08005C0043K, 08005C0044K <sup>2</sup> , 08005C0050K <sup>2</sup> , 08005C0054L, 08005C0055K <sup>2</sup> , 08005C0059L, 08005C0060K <sup>2</sup> , 08005C0061L, 08005C0062L, 08005C0063L, 08005C0064L, 08005C0066L, 08005C0067L, 08005C0068L, 08005C0069L, 08005C0078L, 08005C0086L, 08005C0087K, 08005C0088L, 08005C0089L, 08005C0095K <sup>2</sup> , 08005C0125K <sup>2</sup> , 08005C0157K, 08005C0159K <sup>2</sup> , 08005C0167L, 08005C0169K <sup>2</sup> , 08005C0176K <sup>2</sup> , 08005C0177L, 08005C0178K, 08005C0179L, 08005C0181L, 08005C0182K, 08005C0183L, 08005C0184L, 08005C0186K <sup>2</sup> , 08005C0187K <sup>2</sup> , 08005C0189K <sup>2</sup> , 08005C0191L, 08005C0192L, 08005C0193L, 08005C0194L, 08005C0201L, 08005C0202L, 08005C0203L, 08005C0204K, 08005C0206L, 08005C0207K, 08005C0208L, 08005C0209L, 08005C0211L, 08005C0212K, 08005C0213M, 08005C0214L, 08005C0216M, 08005C0217L, 08005C0218M, 08005C0226L, 08005C0227L, 08005C0231L, 08005C0235L <sup>2</sup> , 08005C0477L, 08005C0479K, 08005C0481L, 08005C0482M, 08005C0483L, 08005C0484L, 08005C0500K <sup>2</sup> , 08005C0501M, 08005C0502L, 08005C0503L, 08005C0504L, 08005C0506L, 08005C0507L, 08005C0508K, 08005C0509K <sup>2</sup> , 08005C0515L	
BENNETT, TOWN OF	080003	10190010 10190003	NA	Adams County, Colorado FIS Report, 2018
BOW MAR, TOWN OF	080232	10190002	NA	Jefferson County, Colorado FIS Report, 2016

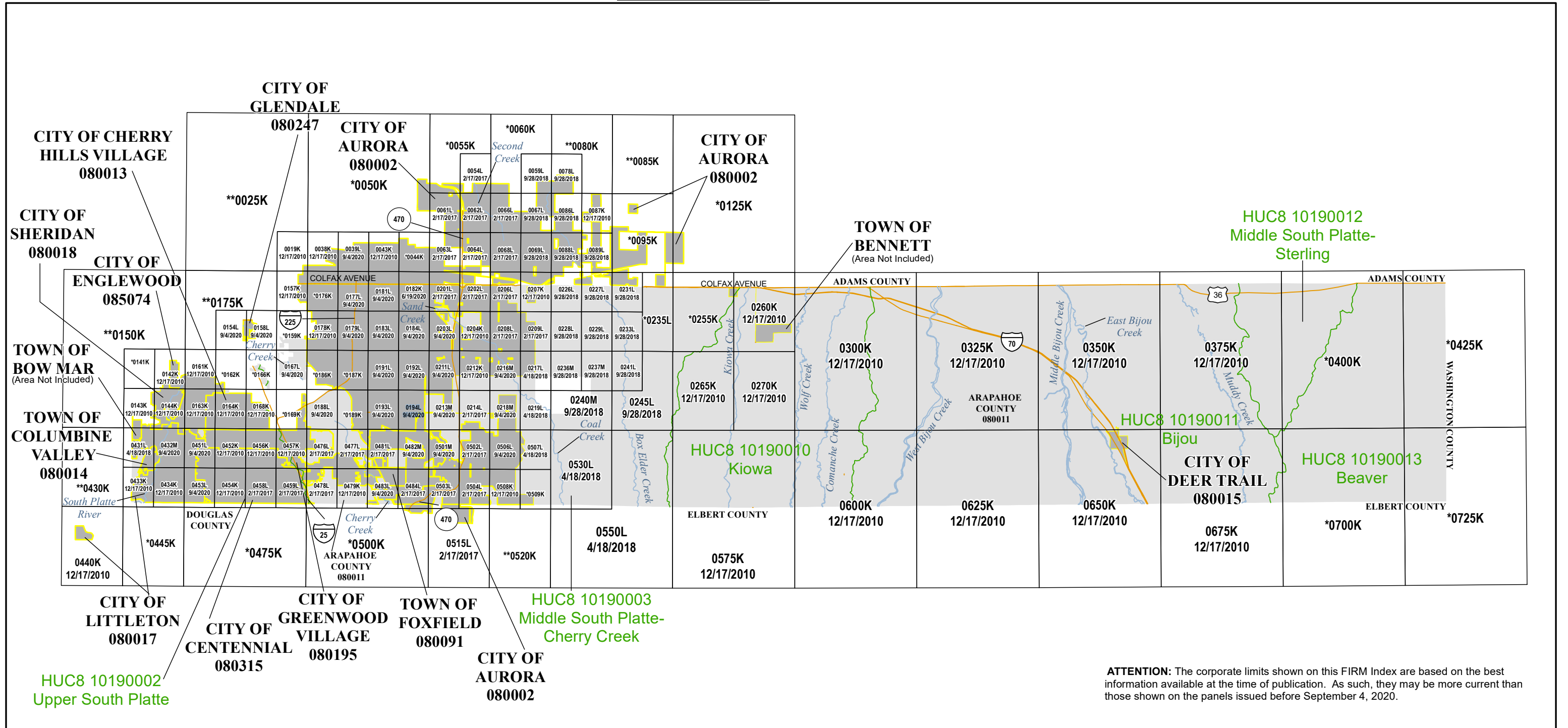


Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
CENTENNIAL, CITY OF	080315	10190002 10190003	08005C0193L, 08005C0194L, 08005C0451L, 08005C0452K, 08005C0453L, 08005C0454K, 08005C0456K, 08005C0457K, 08005C0458L, 08005C0459L, 08005C0476L, 08005C0477L, 08005C0478L, 08005C0479K, 08005C0481L, 08005C0482M, 08005C0483L, 08005C0484L, 08005C0501M, 08005C0503L	
CHERRY HILLS VILLAGE, CITY OF	080013	10190002 10190003	08005C0163K, 08005C0164K, 08005C0168K, 08005C0451L, 08005C0452K, 08005C0456K	
COLUMBINE VALLEY, TOWN OF	080014	10190002	08005C0431L, 08005C0432M, 08005C0433K, 08005C0434K	
<sup>1</sup> DEER TRAIL, CITY OF	080015	10190011	08005C0350K, 08005C0650K	
ENGLEWOOD, CITY OF	085074	10190002	08005C0142K, 08005C0143K, 08005C0144K, 08005C0161K, 08005C0162K <sup>2</sup> , 08005C0163K, 08005C0164K, 08005C0431L, 08005C0432M, 08005C0451L	
<sup>1</sup> FOXFIELD, TOWN OF	080091	10190003	08005C0481L, 08005C0482M, 08005C0483L, 08005C0484L	
GLENDALE, CITY OF	080247	10190003	08005C0154L, 08005C0158L	
GREENWOOD VILLAGE, CITY OF	080195	10190002 10190003	08005C0169K <sup>2</sup> , 08005C0188L, 08005C0451L, 08005C0452K, 08005C0456K, 08005C0457K, 08005C0459L, 08005C0476L, 08005C0478L	
LITTLETON, CITY OF	080017	10190002	08005C0143K, 08005C0144K, 08005C0431L, 08005C0432M, 08005C0433K, 08005C0434K, 08005C0440K, 08005C0451L, 08005C0453L	
SHERIDAN, CITY OF	080018	10190002	08005C0142K, 08005C0143K, 08005C0144K	

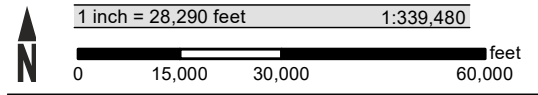
<sup>1</sup> No Special Flood Hazard Areas Identified

<sup>2</sup> Panel Not Printed

Figure 6 – Map Index



**ATTENTION:** The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on the panels issued before September 4, 2020.

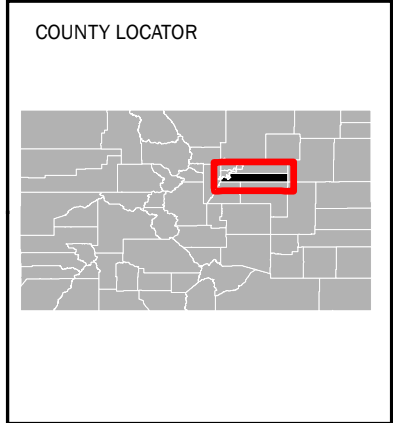


Map Projection:  
 Universal Transverse Mercator Zone 13 North, Meters;  
 North American Datum 1983

**THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTPS://MSC.FEMA.GOV](https://MSC.FEMA.GOV)**

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

\*PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS  
 \*\*PANEL NOT PRINTED - AREA OUTSIDE COUNTY BOUNDARY



**NATIONAL FLOOD INSURANCE PROGRAM**  
 FLOOD INSURANCE RATE MAP INDEX

**ARAPAHOE COUNTY, COLORADO AND INCORPORATED AREAS**

PANELS PRINTED:  
 0019, 0038, 0039, 0043, 0054, 0059, 0061, 0062, 0063, 0064, 0066, 0067, 0068, 0069, 0078, 0086, 0087, 0088, 0089, 0142, 0143, 0144, 0154, 0157, 0158, 0161, 0163, 0164, 0167, 0168, 0177, 0178, 0179, 0181, 0182, 0183, 0184, 0188, 0191, 0192, 0193, 0194, 0201, 0202, 0203, 0204, 0206, 0207, 0208, 0209, 0211, 0212, 0213, 0214, 0216, 0217, 0218, 0219, 0226, 0227, 0228, 0229, 0231, 0233, 0236, 0237, 0240, 0241, 0245, 0260, 0265, 0270, 0300, 0325, 0350, 0375, 0431, 0432, 0433, 0434, 0440, 0451, 0452, 0453, 0454, 0456, 0457, 0458, 0459, 0476, 0477, 0478, 0479, 0481, 0482, 0483, 0484, 0501, 0502, 0503, 0504, 0506, 0507, 0508, 0515, 0530, 0550, 0575, 0600, 0625, 0650, 0675

**FEMA**

MAP NUMBER  
 08005CIND0E

MAP REVISED  
 SEPTEMBER 4, 2020

Figure 7: FIRM Notes to Users

## NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at [msc.fema.gov](http://msc.fema.gov). Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Flood Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 6 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

**BASE FLOOD ELEVATIONS:** For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Non-Coastal Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

**FLOODWAY INFORMATION:** Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

**FLOOD CONTROL STRUCTURE INFORMATION:** Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

**PROJECTION INFORMATION:** The projection used in the preparation of the map was Universal Transverse Mercator (UTM) Zone 13N. The horizontal datum was the North American Datum of 1983 NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Figure 7: FIRM Notes to Users

**ELEVATION DATUM:** Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at [www.ngs.noaa.gov](http://www.ngs.noaa.gov).

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table 7 of this FIS Report.

**BASE MAP INFORMATION:** Base map information shown on this FIRM is current as of 2015, provided in digital format by the Arapahoe County, City of Aurora, and City of Littleton Geographic Information System (GIS) Departments.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

### **NOTES FOR FIRM INDEX**

**REVISIONS TO INDEX:** As new studies are performed and FIRM panels are updated within **Arapahoe County, CO**, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 6 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

### **SPECIAL NOTES FOR SPECIFIC FIRM PANELS**

This Notes to Users section was created specifically for Arapahoe County, CO, effective September 4, 2020

**Accredited Levee:** 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 [www.fema.gov/national-flood-insurance-program](http://www.fema.gov/national-flood-insurance-program).

**FLOOD RISK REPORT:** A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Figure 8: Map Legend for FIRM

**SPECIAL FLOOD HAZARD AREAS: The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.**



Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)

- Zone A The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
- Zone AE The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.
- Zone AH The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
- Zone AO The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
- Zone AR The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- Zone A99 The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
- Zone V The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.

Figure 8: Map Legend for FIRM


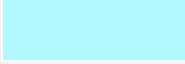





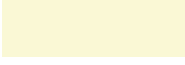
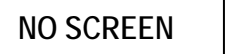





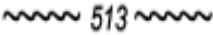










<p>Zone VE</p> 	<p>Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.</p> <p>Regulatory Floodway determined in Zone AE.</p>
  <p>FLOOD INSURANCE IS NOT AVAILABLE FOR STRUCTURES NEWLY BUILT OR SUBSTANTIALLY IMPROVED ON OR AFTER APRIL 8, 1987, IN THE DESIGNATED COLORADO RIVER FLOODWAY</p>	<p><b>Non-encroachment zone (see Section 2.4 of this FIS Report for more information)</b></p> <p><b>The Colorado River Floodway was established by Congress in the Colorado River Floodway Protection Act of 1986, Public Law 99-450 (100 Statute 1129). The Act imposes certain restrictions within the Floodway.</b></p>
<p><b>OTHER AREAS OF FLOOD HAZARD</b></p>	
	<p>Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.</p>
	<p>Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.</p>
	<p>Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood. <b>See Notes to Users for important information.</b></p>
	<p>Area with Flood Risk due to Levee: Areas where a non-accredited levee, dike, or other flood control structure is shown as providing protection to less than the 1% annual chance flood.</p>
<p><b>OTHER AREAS</b></p>	
	<p>Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.</p>
 <p>NO SCREEN</p>	<p>Unshaded Zone X: Areas of minimal flood hazard.</p>
<p><b>FLOOD HAZARD AND OTHER BOUNDARY LINES</b></p>	
 <p>(ortho) (vector)</p>	<p>Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)</p>
	<p>Limit of Study</p>
	<p>Jurisdiction Boundary</p>

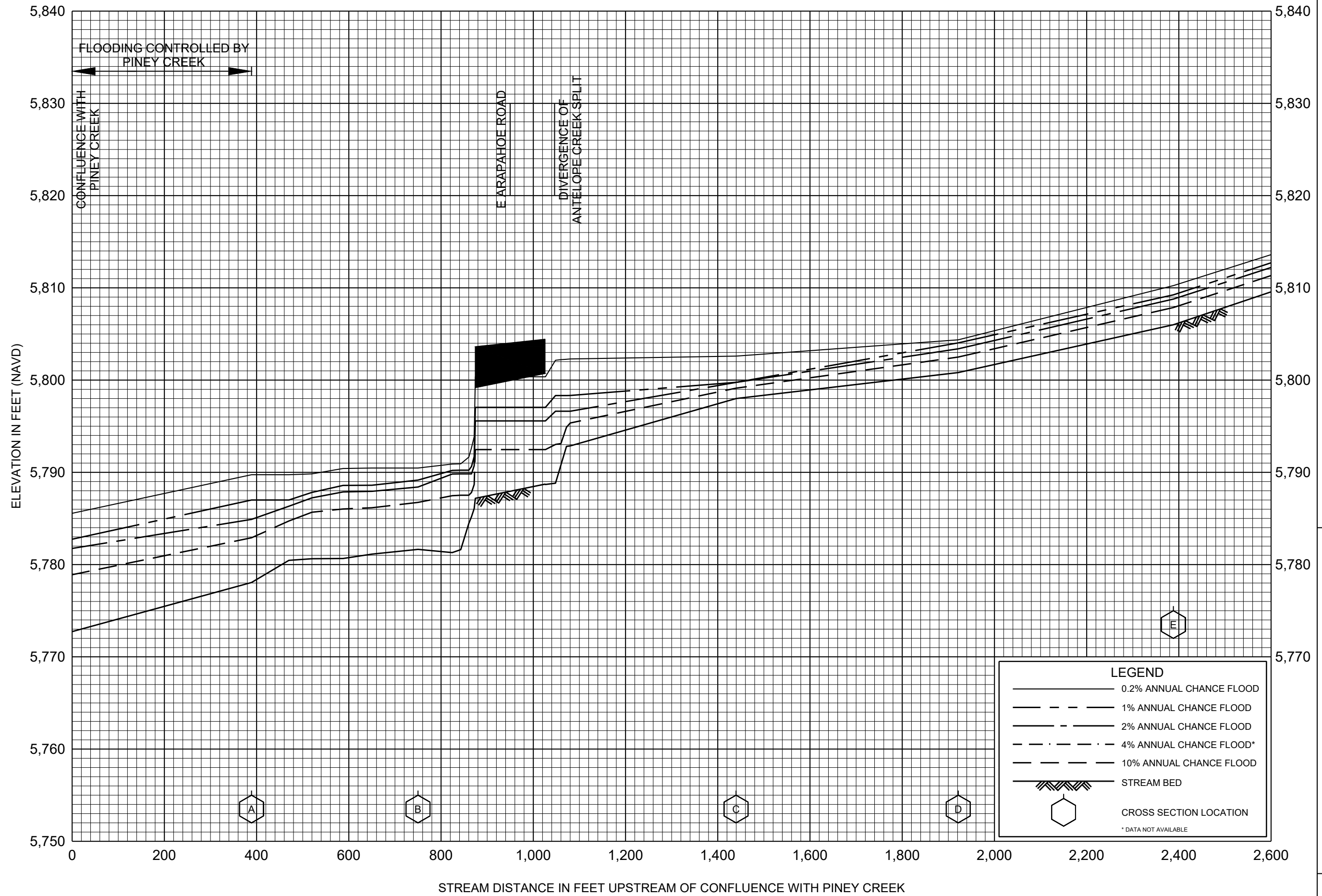
Figure 8: Map Legend for FIRM

	<p>Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet</p>
<p><b>GENERAL STRUCTURES</b></p>	
<p>Aqueduct Channel Culvert Storm Sewer</p>	<p>Channel, Culvert, Aqueduct, or Storm Sewer</p>
<p>Dam Jetty Weir</p>	<p>Dam, Jetty, Weir</p>
	<p>Levee, Dike, or Floodwall</p>
<p>Bridge</p>	<p>Bridge</p>
<p><b>COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA):</b> <i>CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas. See Notes to Users for important information.</i></p>	
<p>CBRS AREA 09/30/2009</p>	<p>Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.</p>
<p>OTHERWISE PROTECTED AREA 09/30/2009</p>	<p>Otherwise Protected Area</p>
<p><b>REFERENCE MARKERS</b></p>	
<p>22.0</p>	<p>River mile Markers</p>
<p><b>CROSS SECTION &amp; TRANSECT INFORMATION</b></p>	
<p>B 20.2</p>	<p>Lettered Cross Section with Regulatory Water Surface Elevation (BFE)</p>
<p>5280 21.1</p>	<p>Numbered Cross Section with Regulatory Water Surface Elevation (BFE)</p>
<p>17.5</p>	<p>Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)</p>
<p>8</p>	<p>Coastal Transect</p>

Figure 8: Map Legend for FIRM

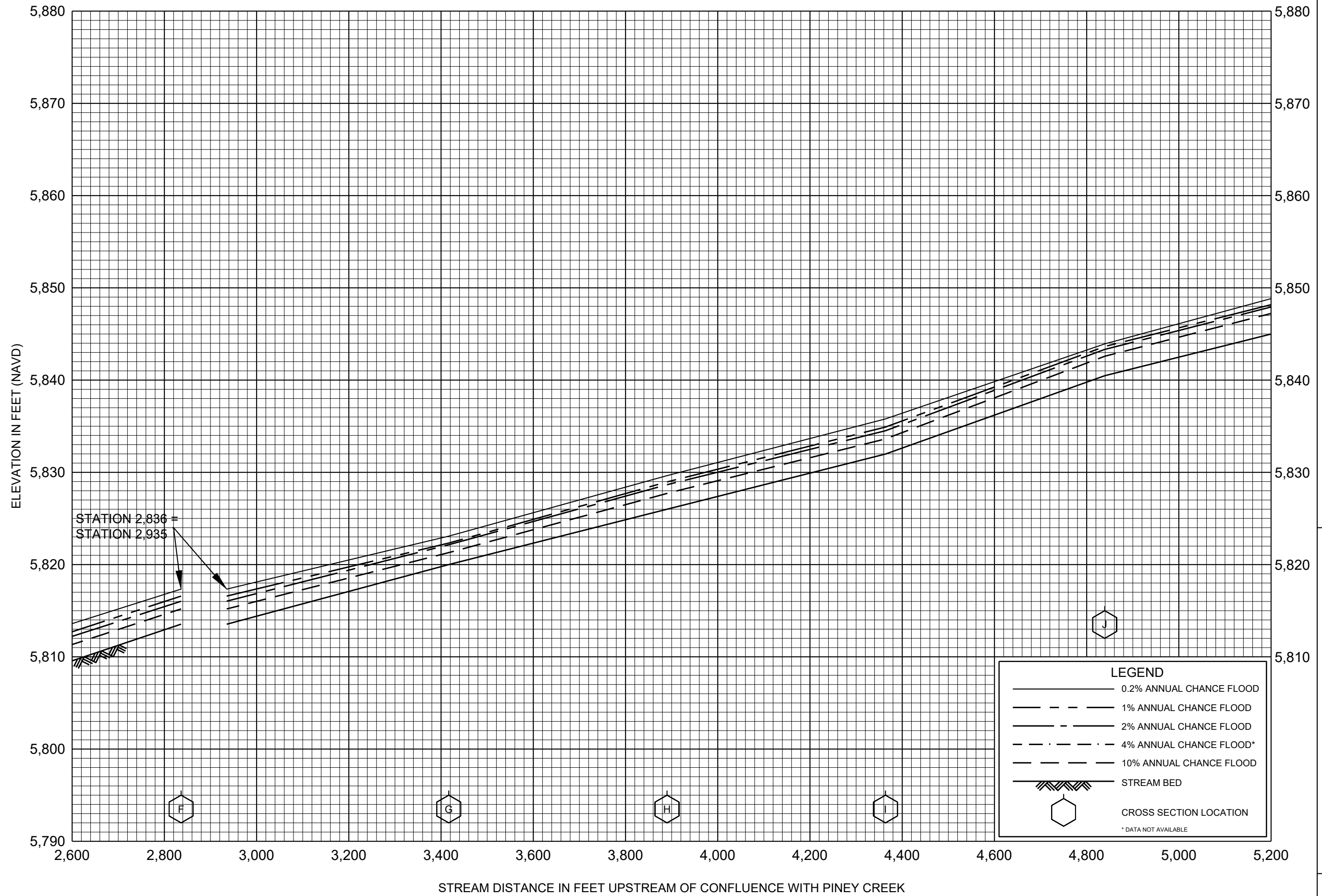
	Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.
	Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.
	Base Flood Elevation Line
<b>ZONE AE (EL 16)</b>	Static Base Flood Elevation value (shown under zone label)
<b>ZONE AO (DEPTH 2)</b>	Zone designation with Depth
<b>ZONE AO (DEPTH 2) (VEL 15 FPS)</b>	Zone designation with Depth and Velocity
<b>BASE MAP FEATURES</b>	
	River, Stream or Other Hydrographic Feature
	Interstate Highway
	U.S. Highway
	State Highway
	County Highway
	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
<b>4276<sup>000</sup>mE</b>	Horizontal Reference Grid Coordinates (UTM)
<b>365000 FT</b>	Horizontal Reference Grid Coordinates (State Plane)
<b>80° 16' 52.5"</b>	Corner Coordinates (Latitude, Longitude)





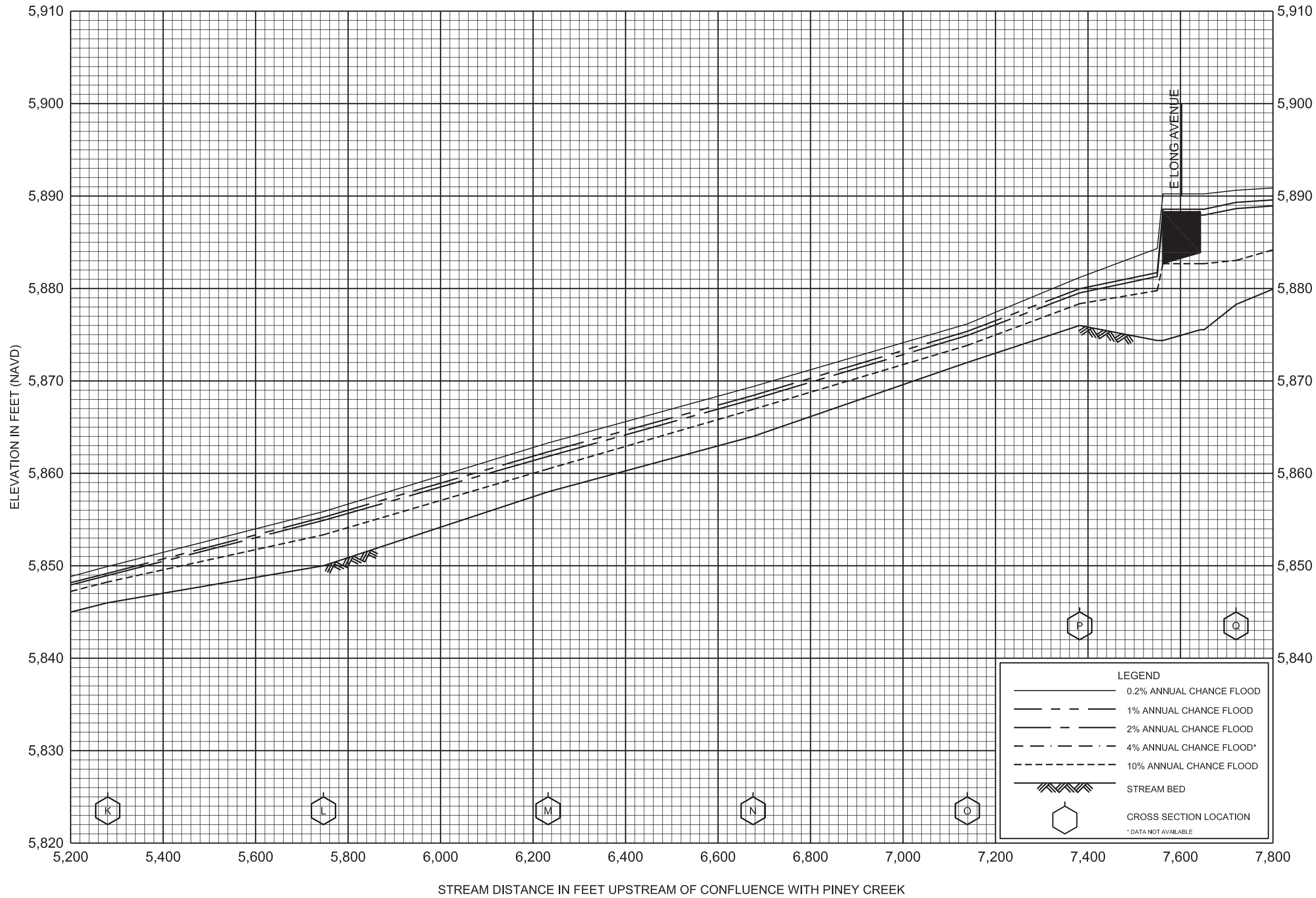
**FLOOD PROFILES**  
**ANTELOPE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
 AND INCORPORATED AREAS



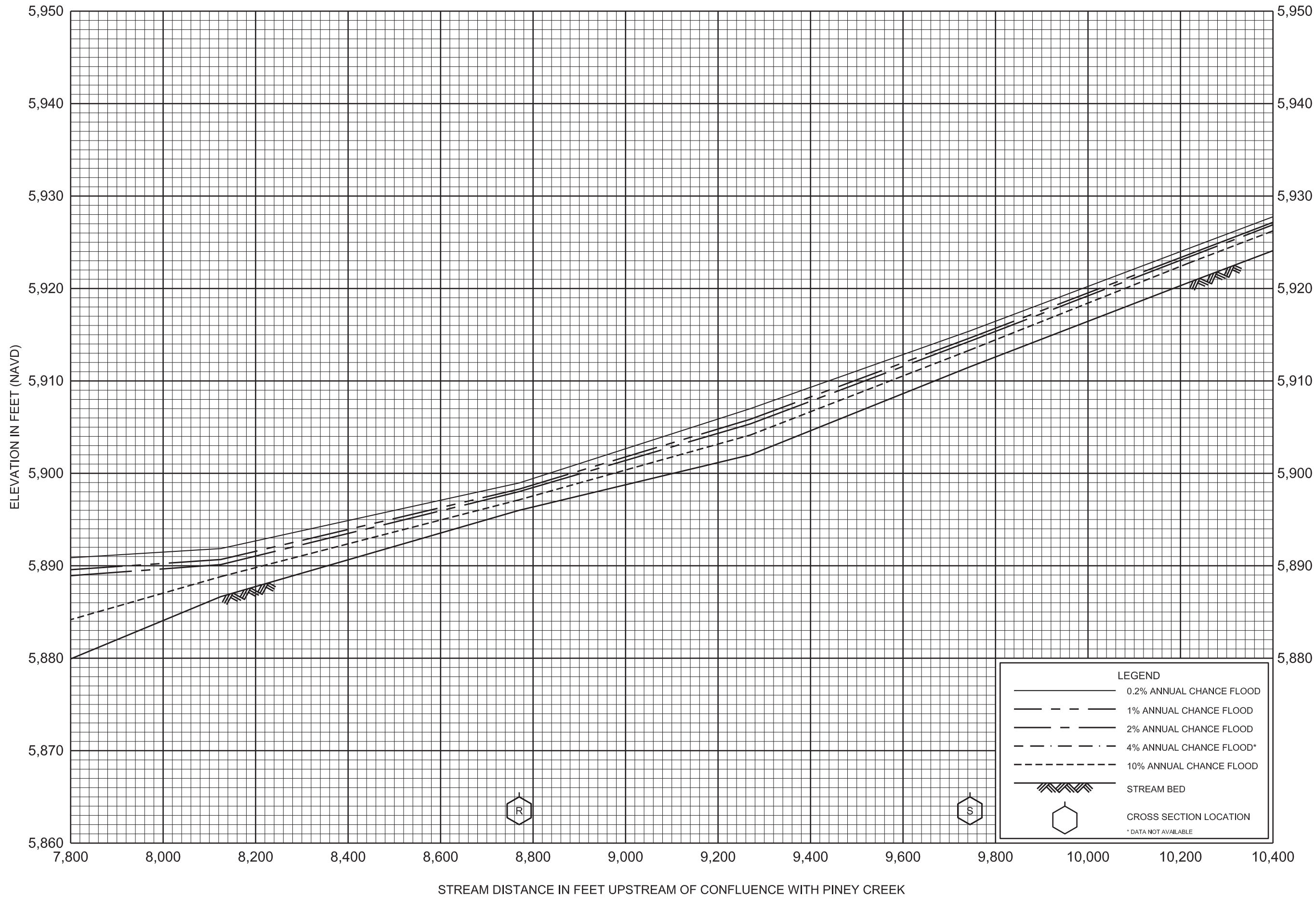
**FLOOD PROFILES**  
**ANTELOPE CREEK**

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**ARAPAHOE COUNTY, CO**  
 AND INCORPORATED AREAS



FLOOD PROFILES  
ANTELOPE CREEK

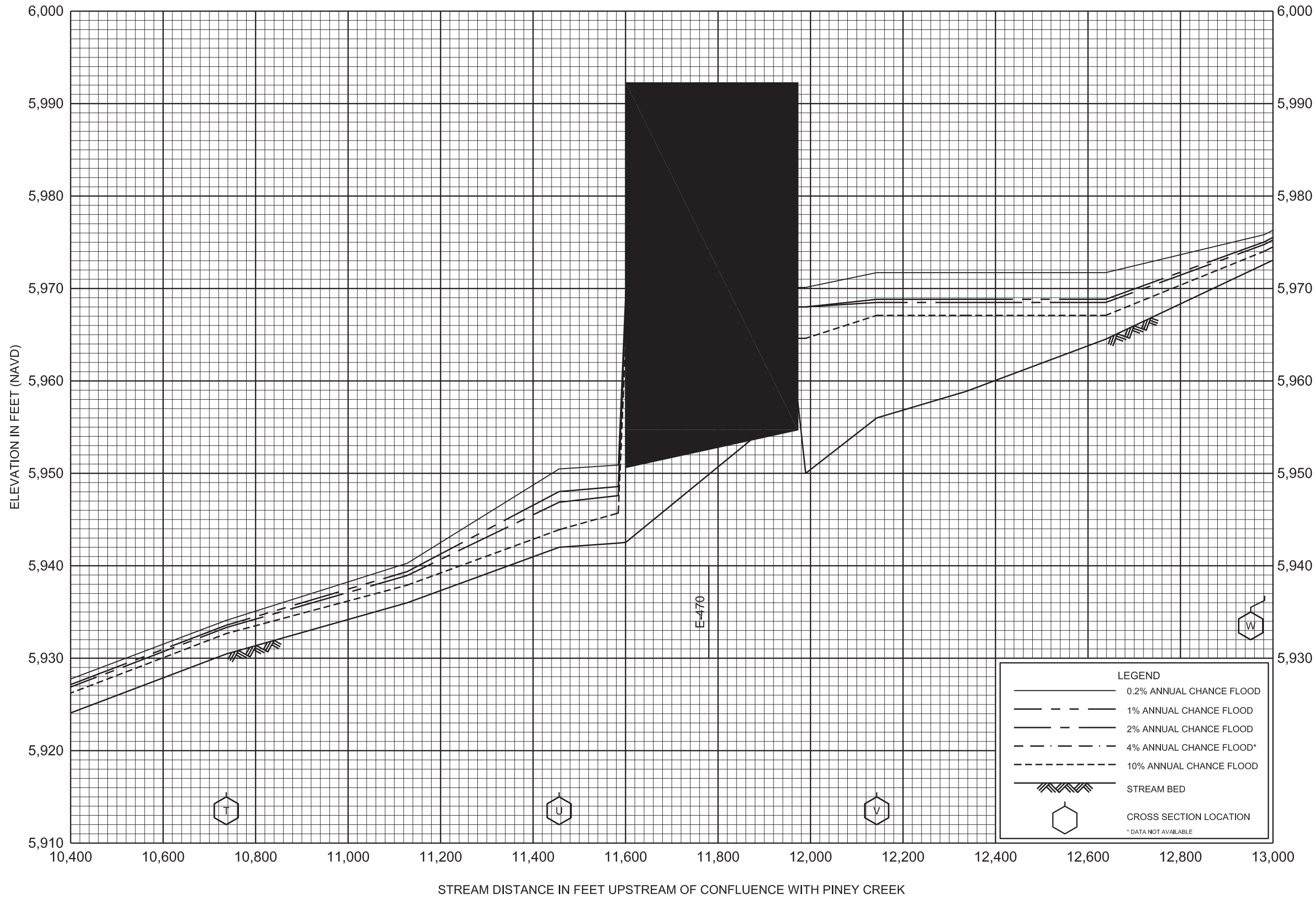
FEDERAL EMERGENCY MANAGEMENT AGENCY  
ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS



FLOOD PROFILES  
ANTELOPE CREEK

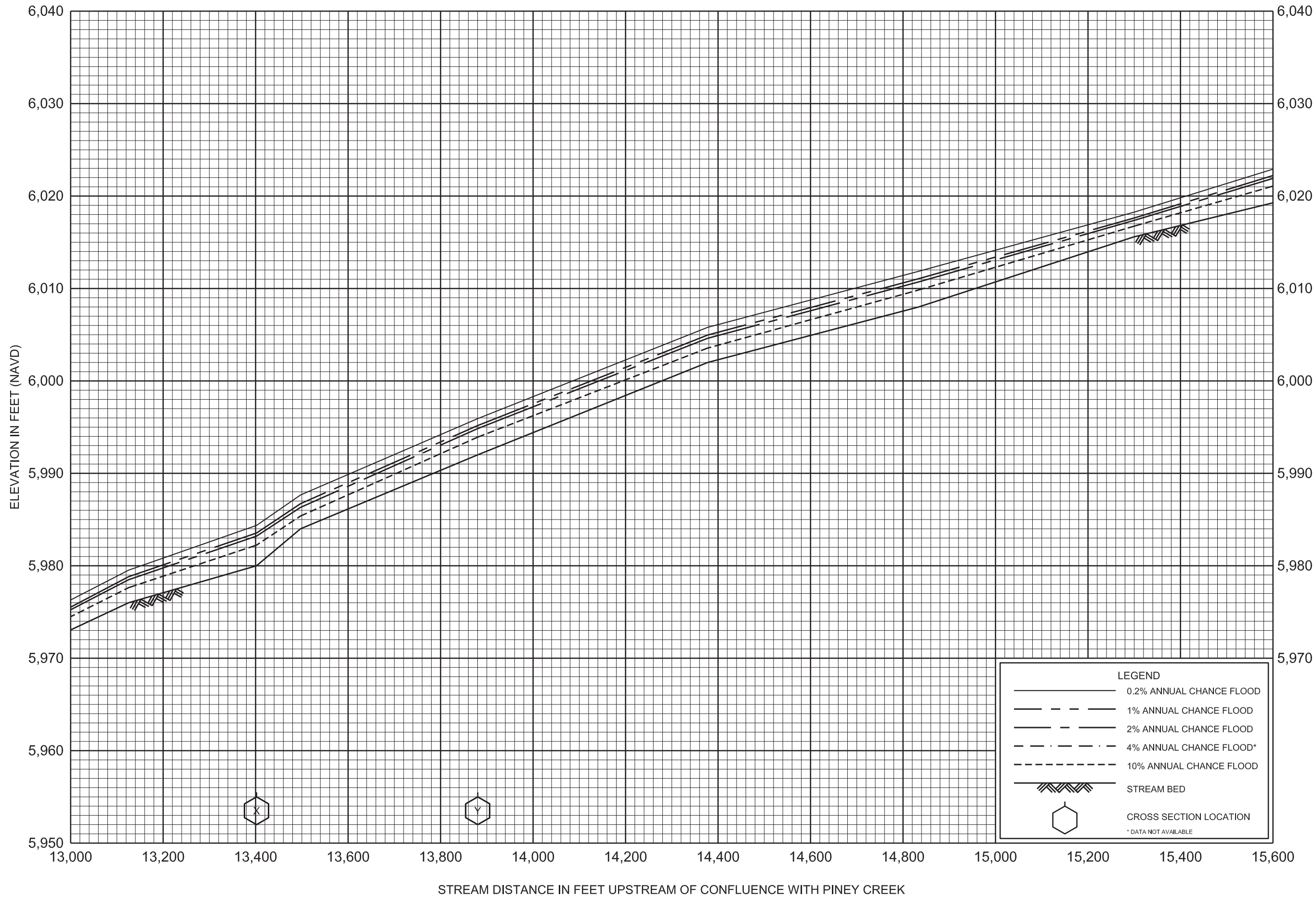
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ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS

04P



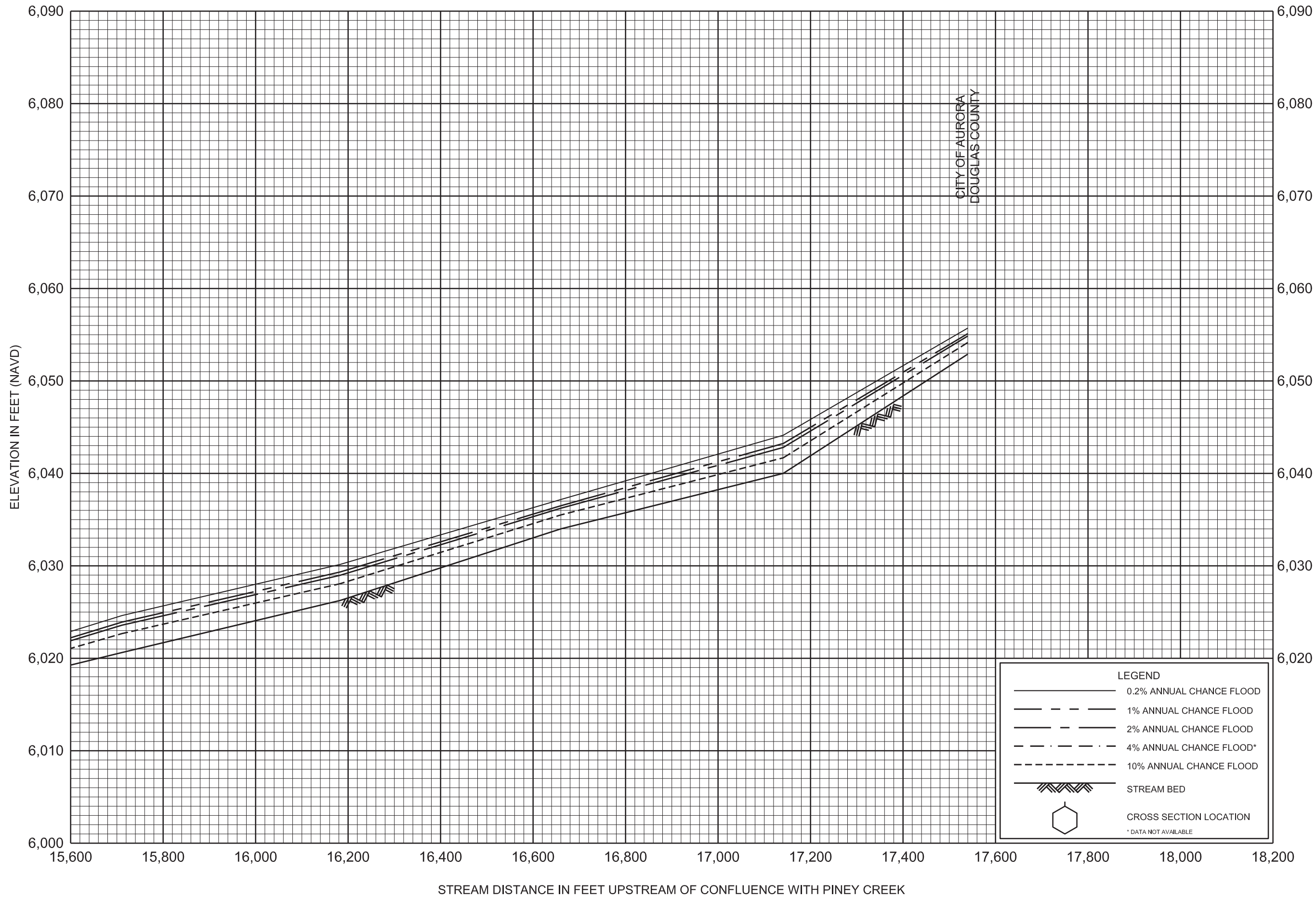
FLOOD PROFILES  
ANTELOPE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS



FLOOD PROFILES  
ANTELOPE CREEK

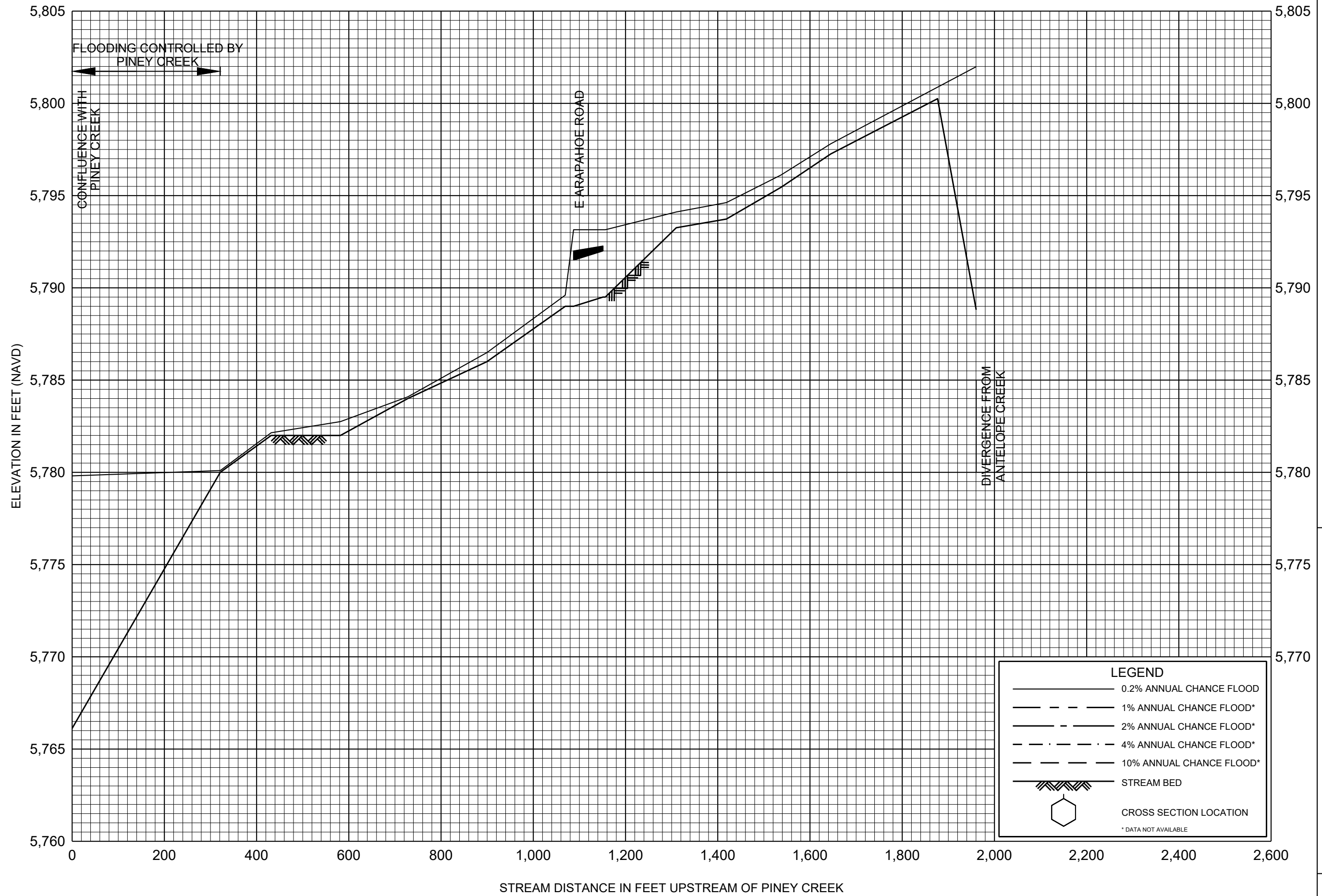
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ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS



FLOOD PROFILES  
ANTELOPE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY  
ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS

07P

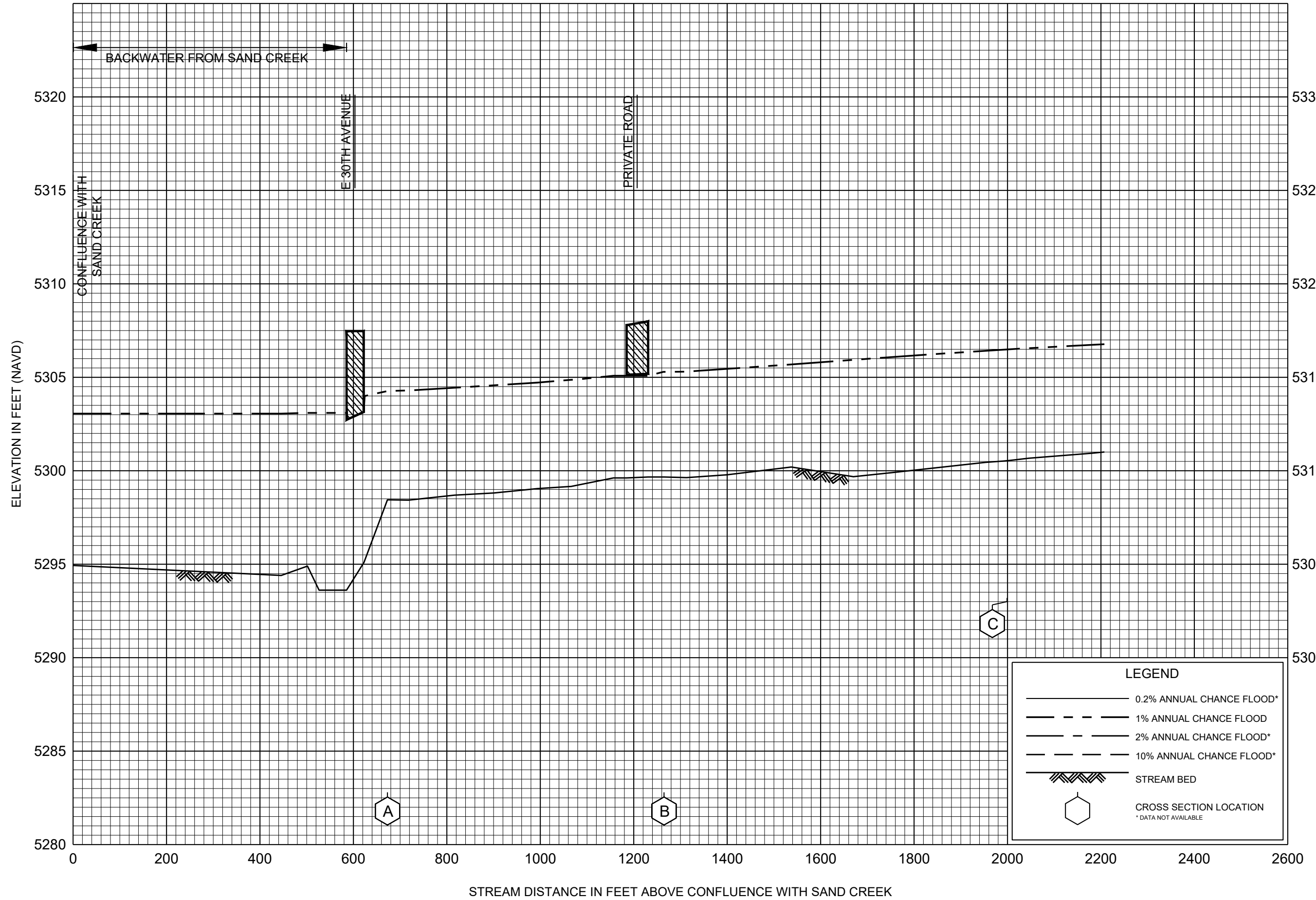


FLOOD PROFILES

ANTELOPE CREEK SPLIT FLOW

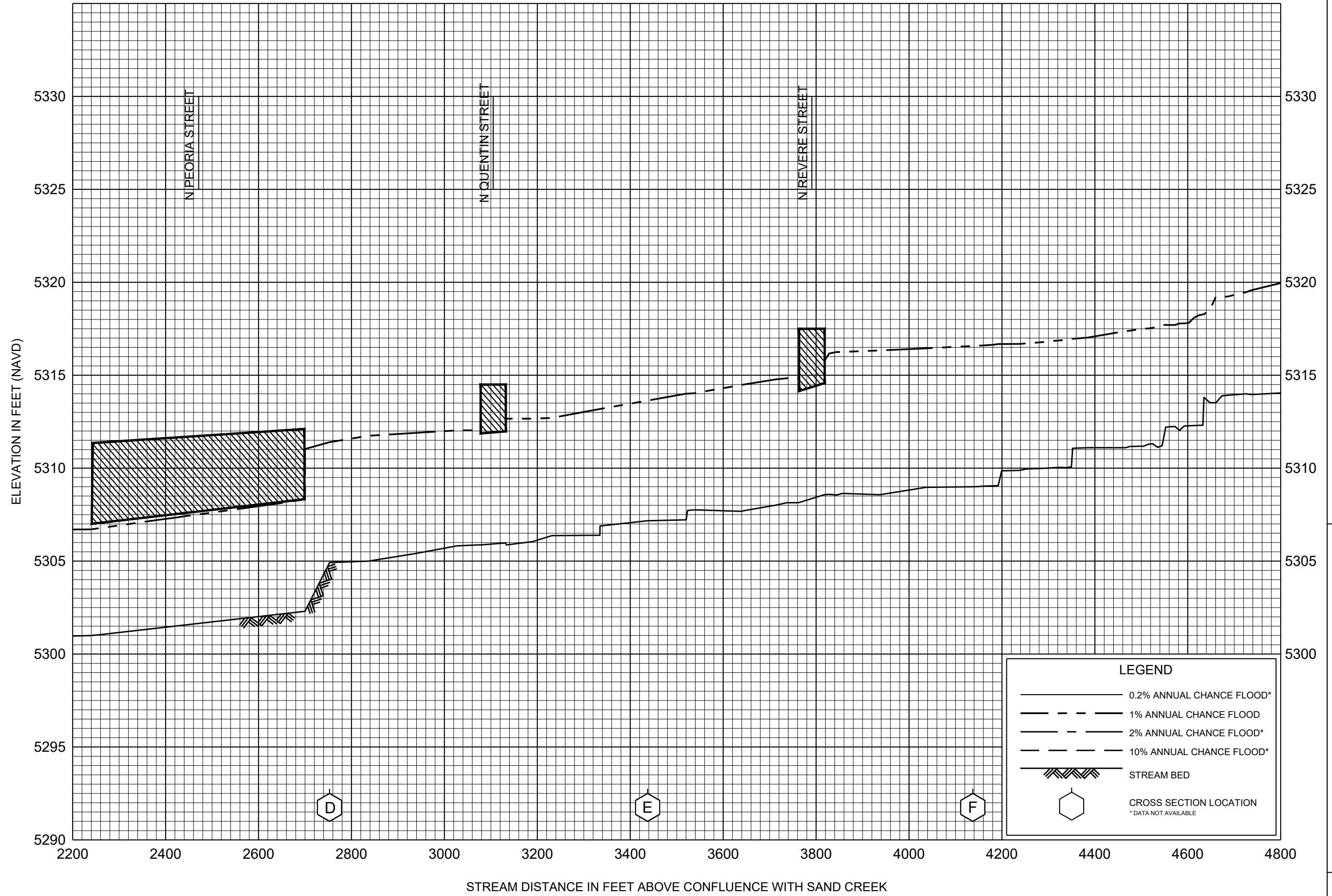
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**ARAPAHOE COUNTY, CO**  
 AND INCORPORATED AREAS

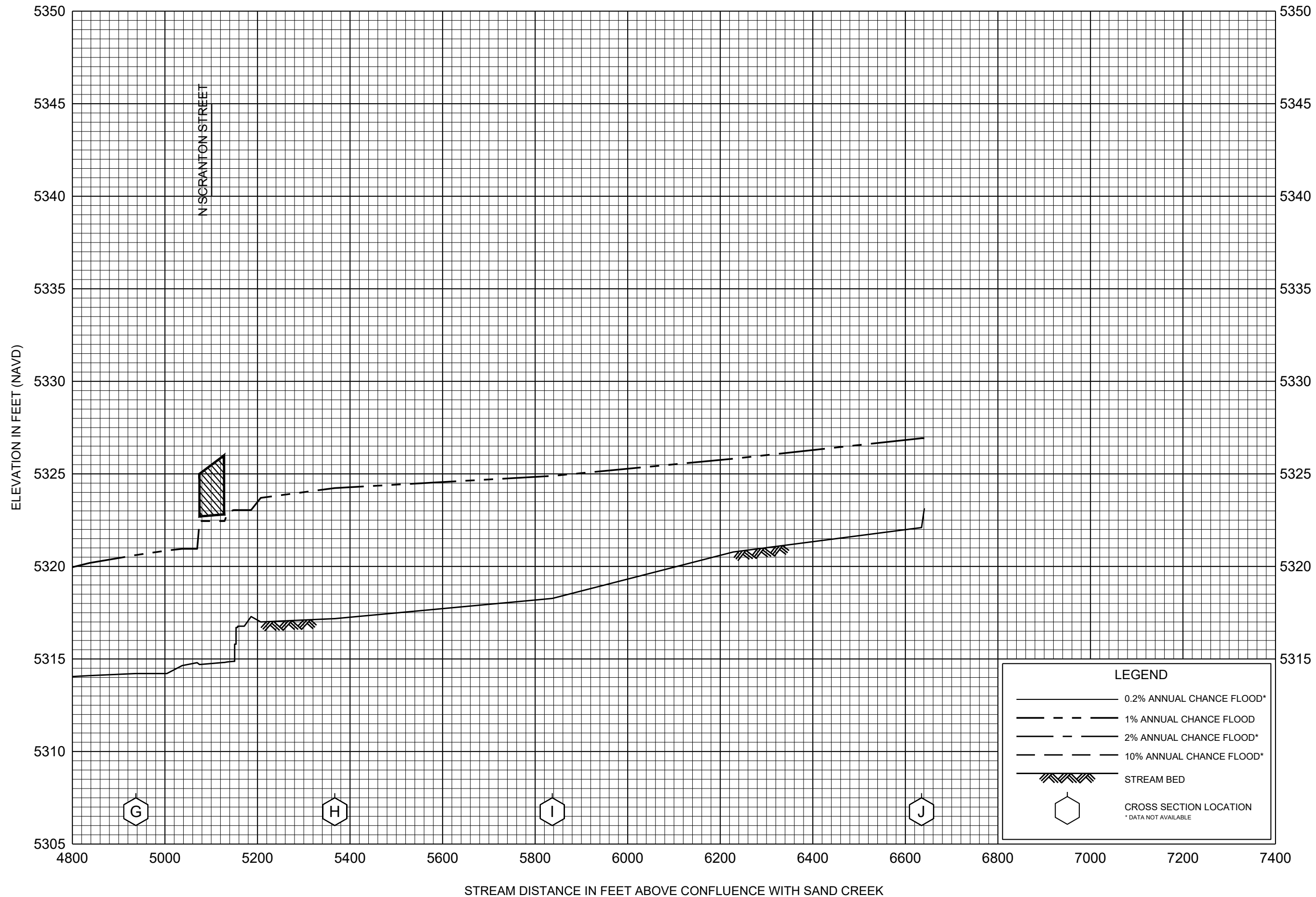




FLOOD PROFILES  
 BARANMOR DITCH

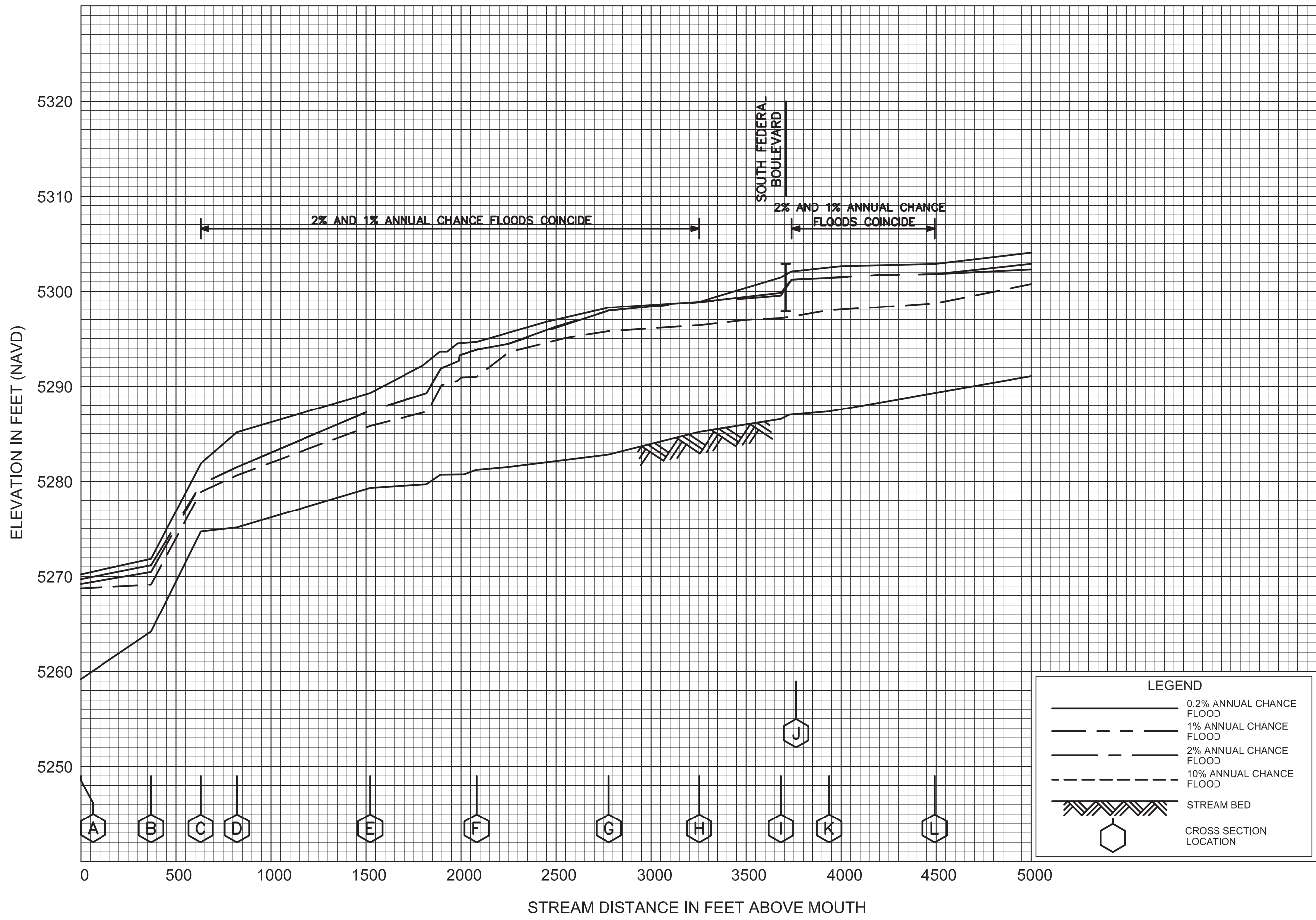
FEDERAL EMERGENCY MANAGEMENT AGENCY  
 ARAPAHOE COUNTY, CO  
 AND INCORPORATED AREAS





FLOOD PROFILES  
BARANMOR DITCH

FEDERAL EMERGENCY MANAGEMENT AGENCY  
ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS

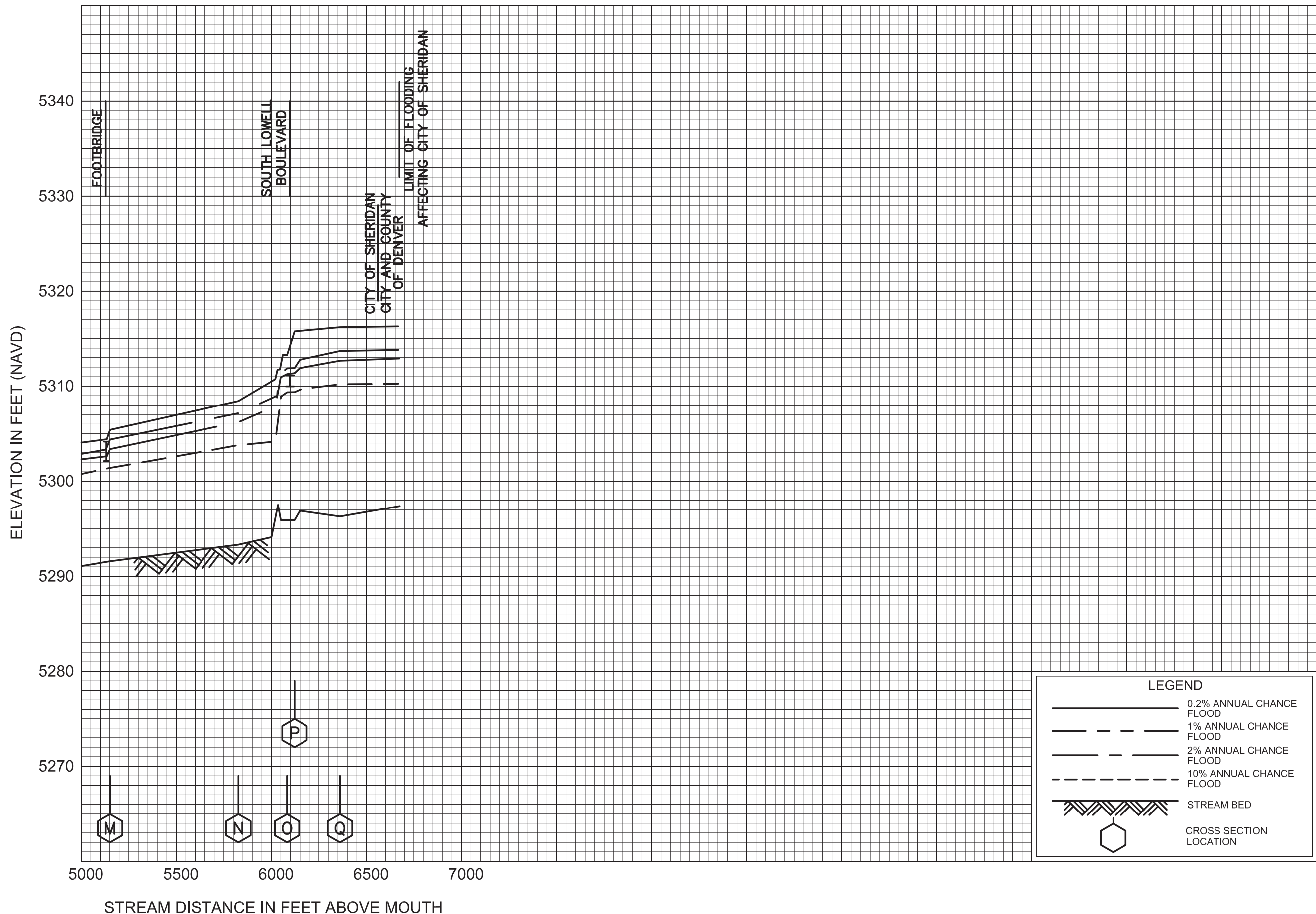


FLOOD PROFILES

BEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS

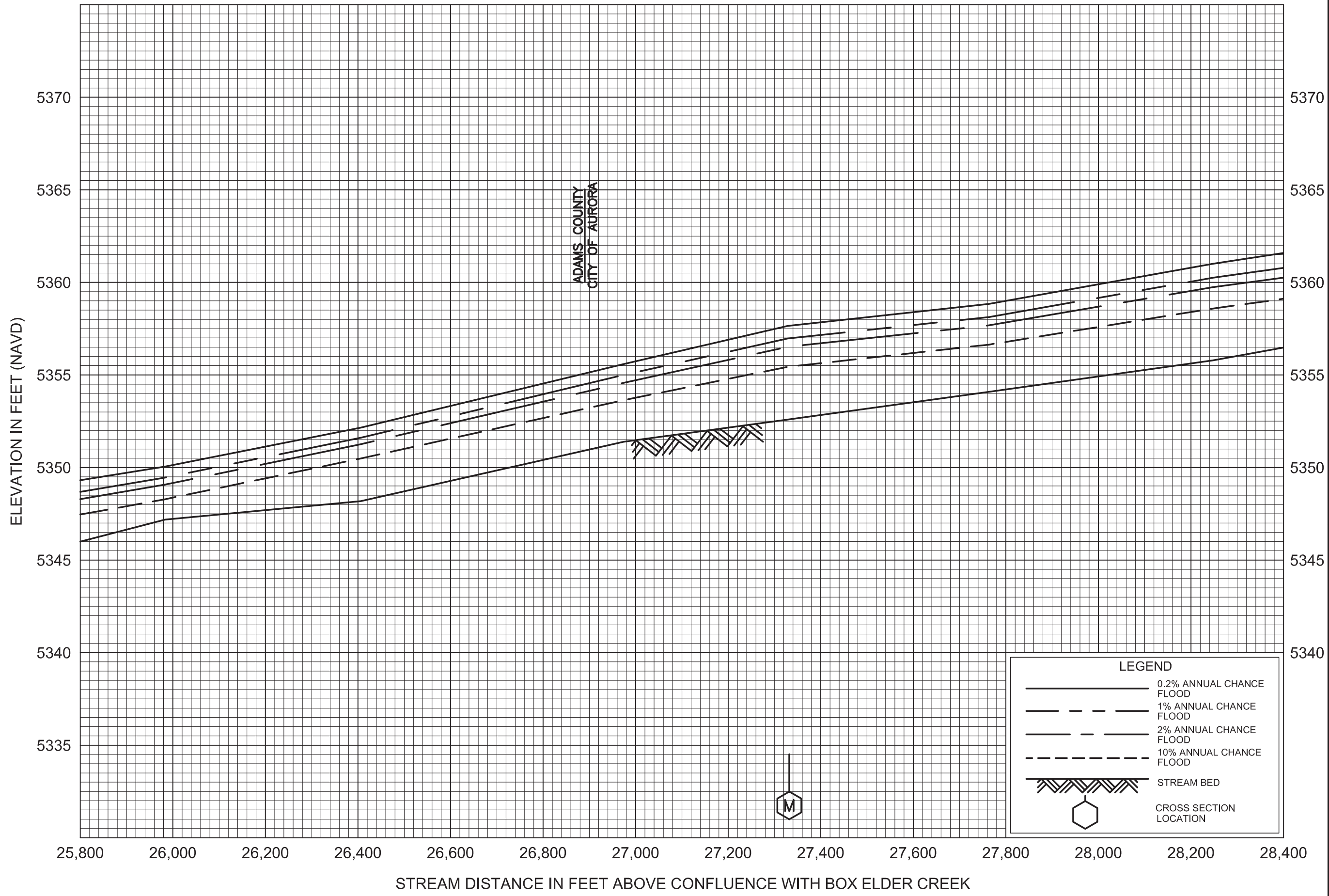


FLOOD PROFILES

BEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

ARAPAHOE COUNTY, CO  
AND INCORPORATED AREAS

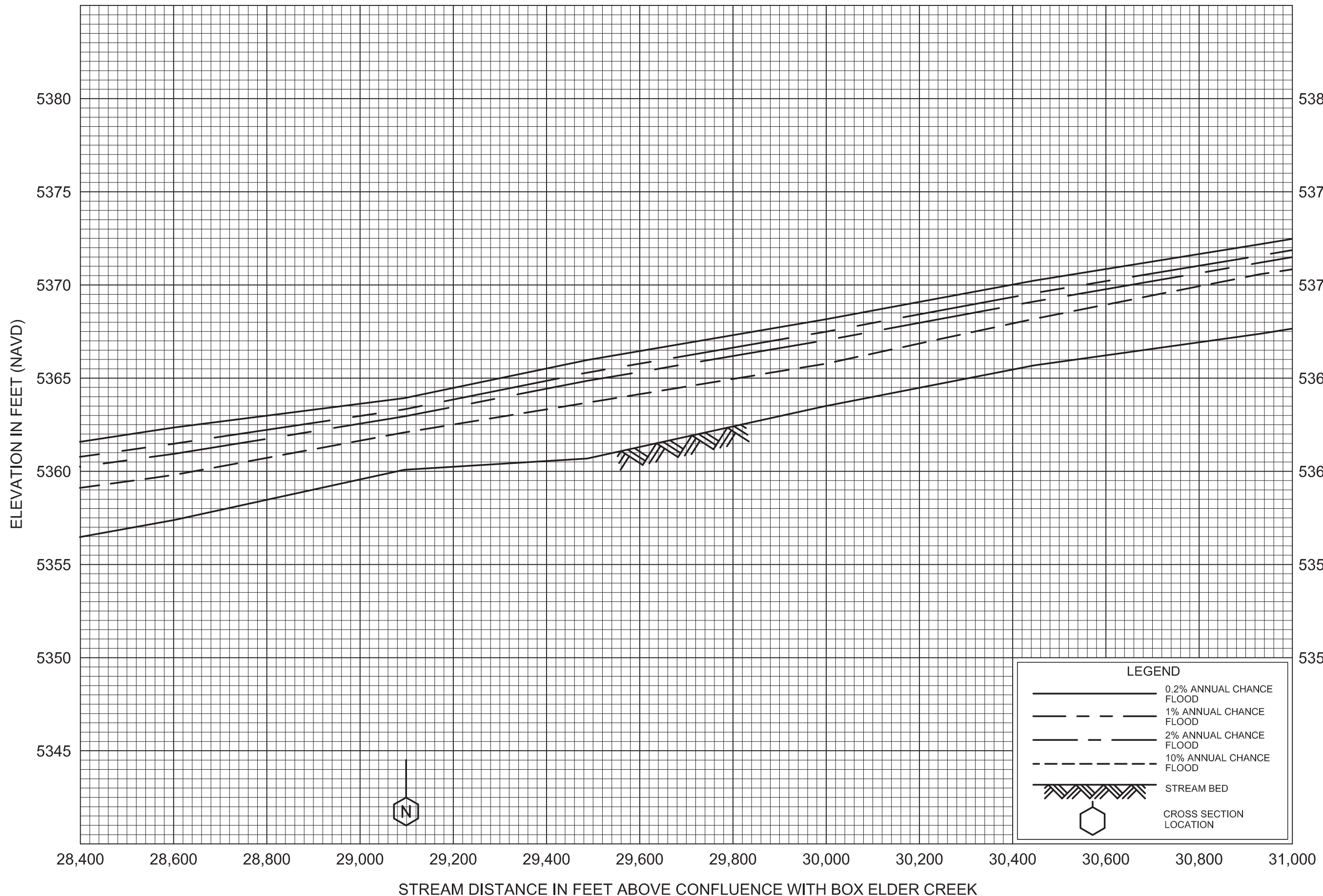


FLOOD PROFILES

BEAR GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ARAPAHOE COUNTY, CO  
(AND INCORPORATED AREAS)

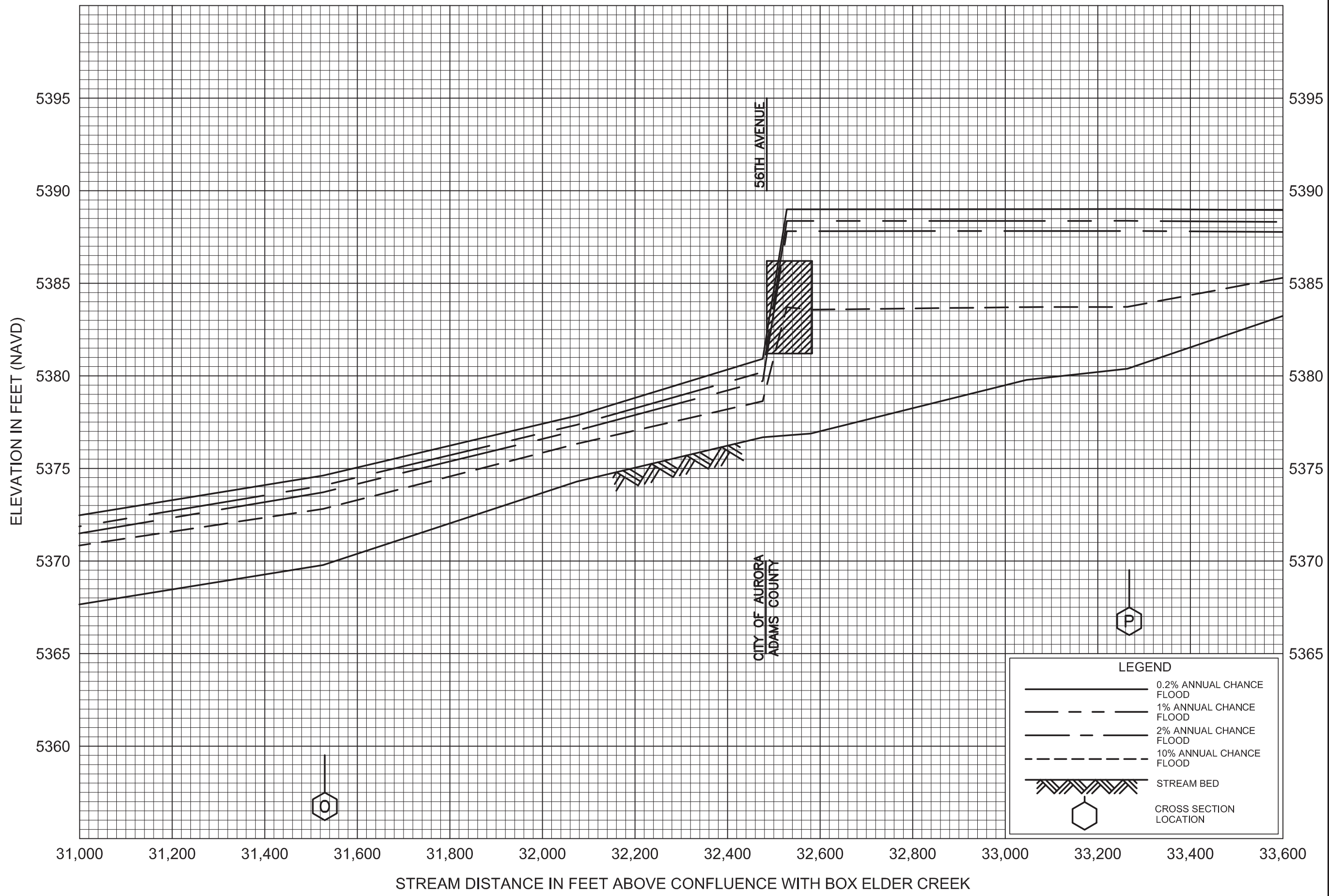


FLOOD PROFILES

BEAR GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ARAPAHOE COUNTY, CO  
(AND INCORPORATED AREAS)



LEGEND	
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

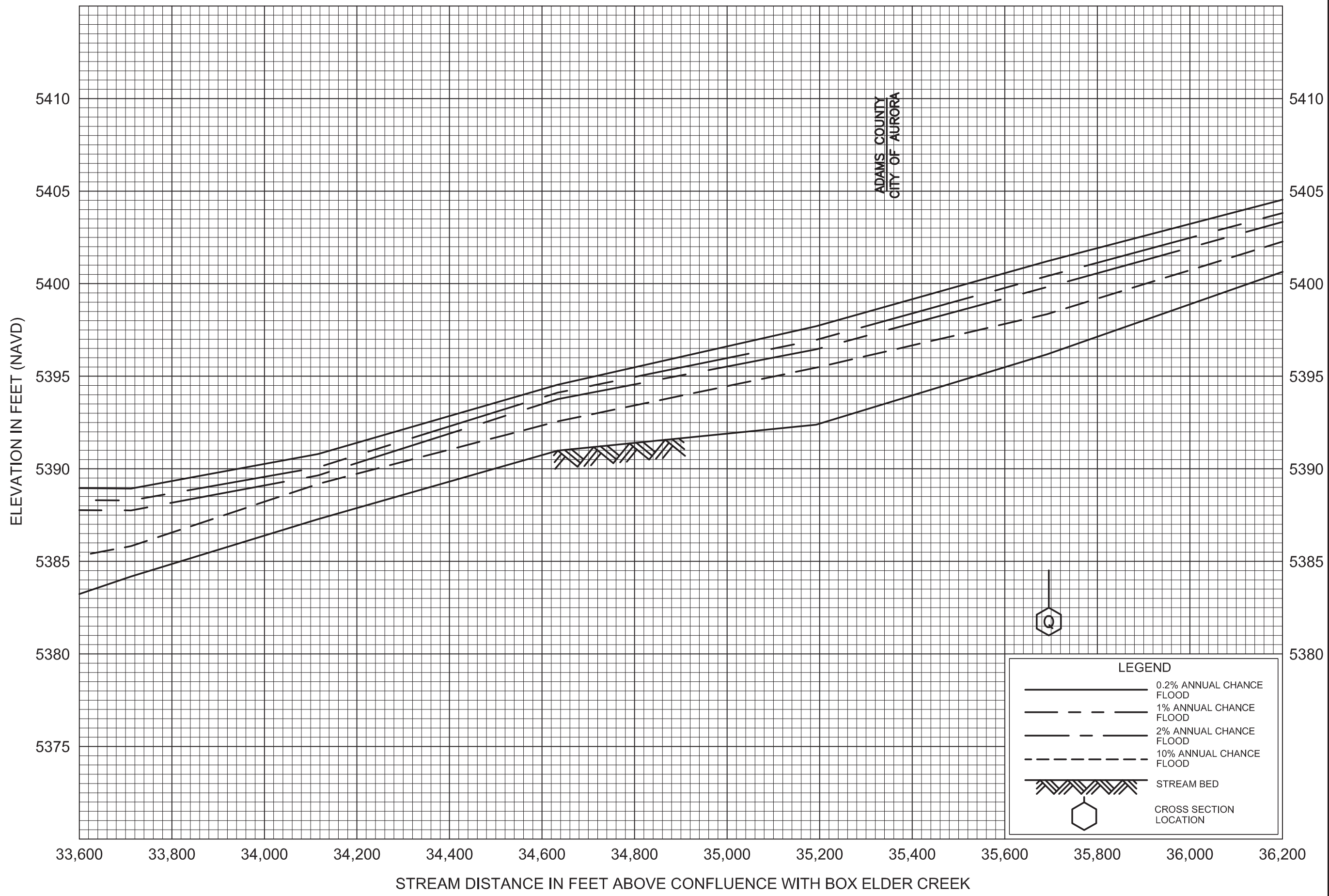
FLOOD PROFILES

BEAR GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ARAPAHOE COUNTY, CO  
(AND INCORPORATED AREAS)

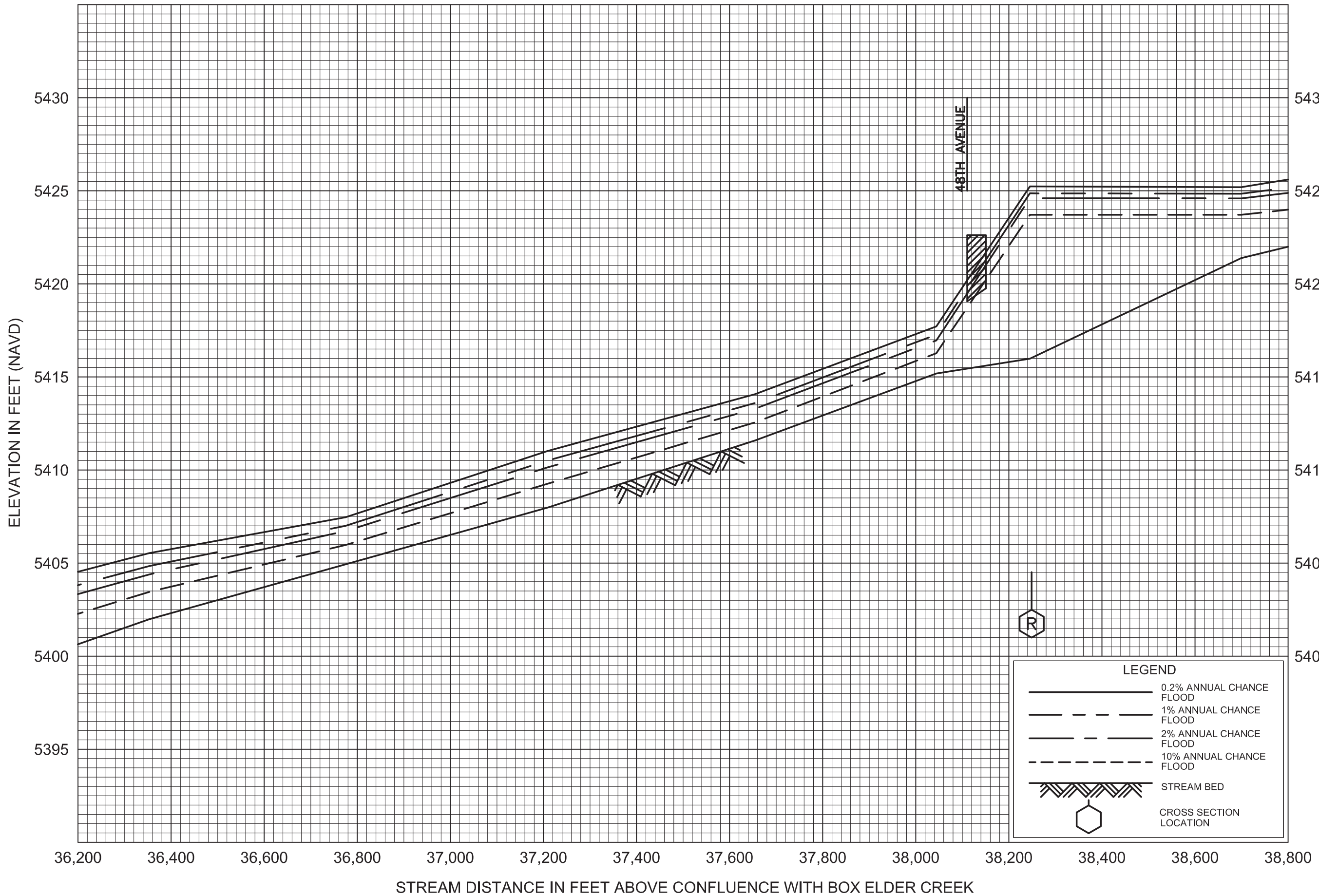




FLOOD PROFILES
BEAR GULCH
FEDERAL EMERGENCY MANAGEMENT AGENCY ARAPAHOE COUNTY, CO (AND INCORPORATED AREAS)
17P

**LEGEND**

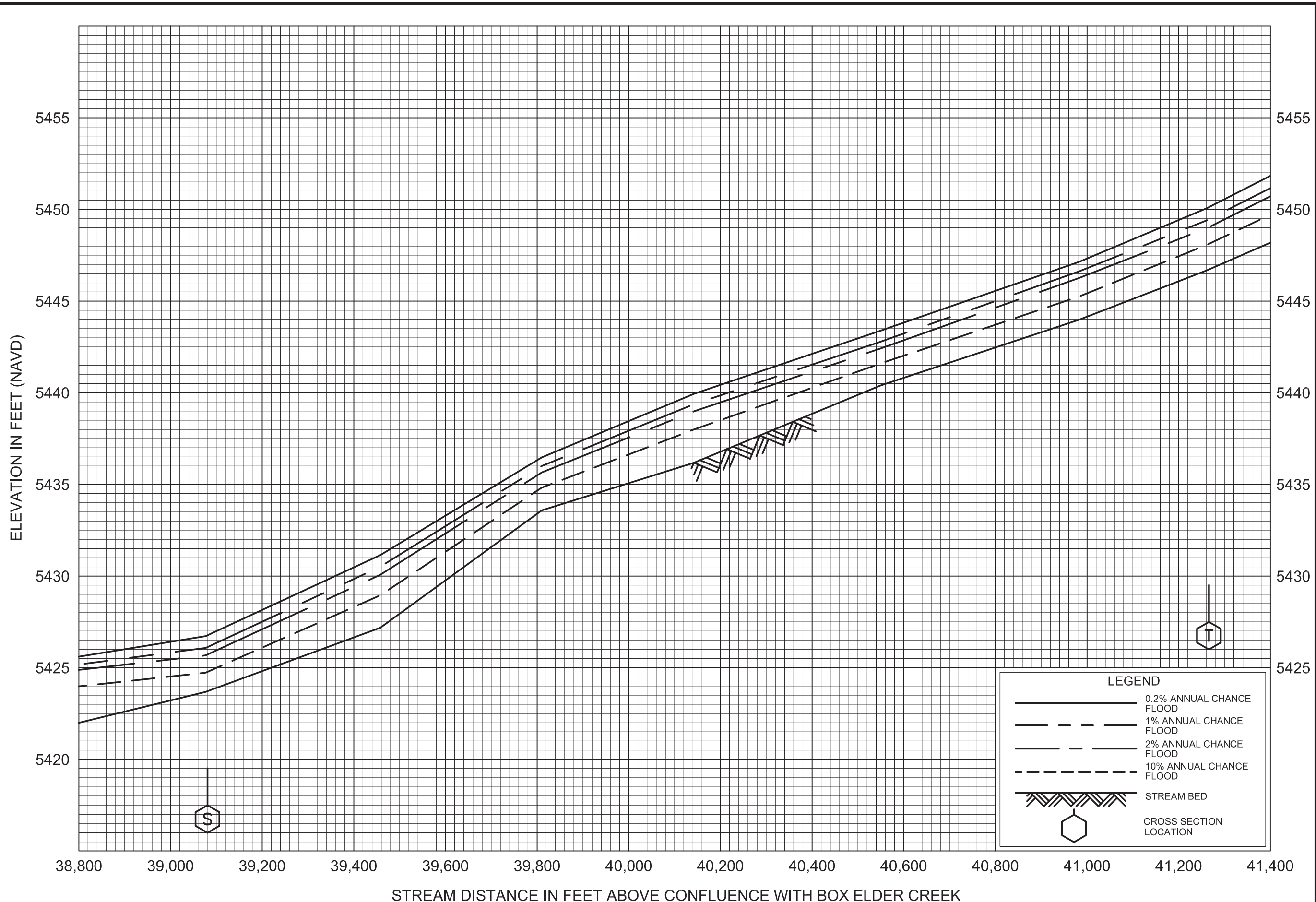
	0.2% ANNUAL CHANCE FLOOD
	1% ANNUAL CHANCE FLOOD
	2% ANNUAL CHANCE FLOOD
	10% ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION



FLOOD PROFILES

BEAR GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY  
ARAPAHOE COUNTY, CO  
(AND INCORPORATED AREAS)



**LEGEND**

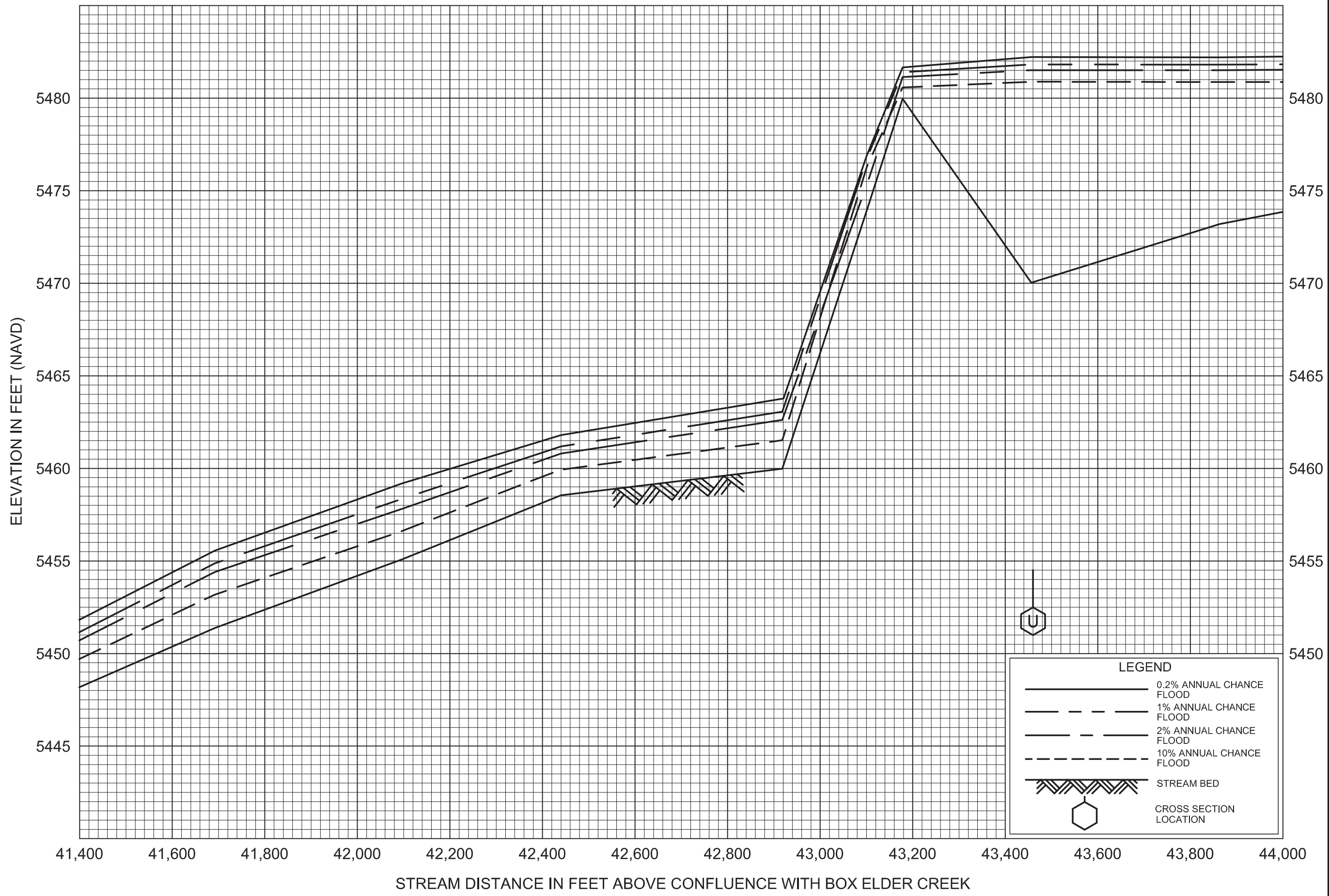
- 0.2% ANNUAL CHANCE FLOOD (solid line)
- 1% ANNUAL CHANCE FLOOD (dashed line)
- 2% ANNUAL CHANCE FLOOD (solid line with long dashes)
- 10% ANNUAL CHANCE FLOOD (solid line)
- STREAM BED (hatched area)
- CROSS SECTION LOCATION (hexagonal symbol)

FLOOD PROFILES

BEAR GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY  
ARAPAHOE COUNTY, CO  
(AND INCORPORATED AREAS)

19P



**LEGEND**

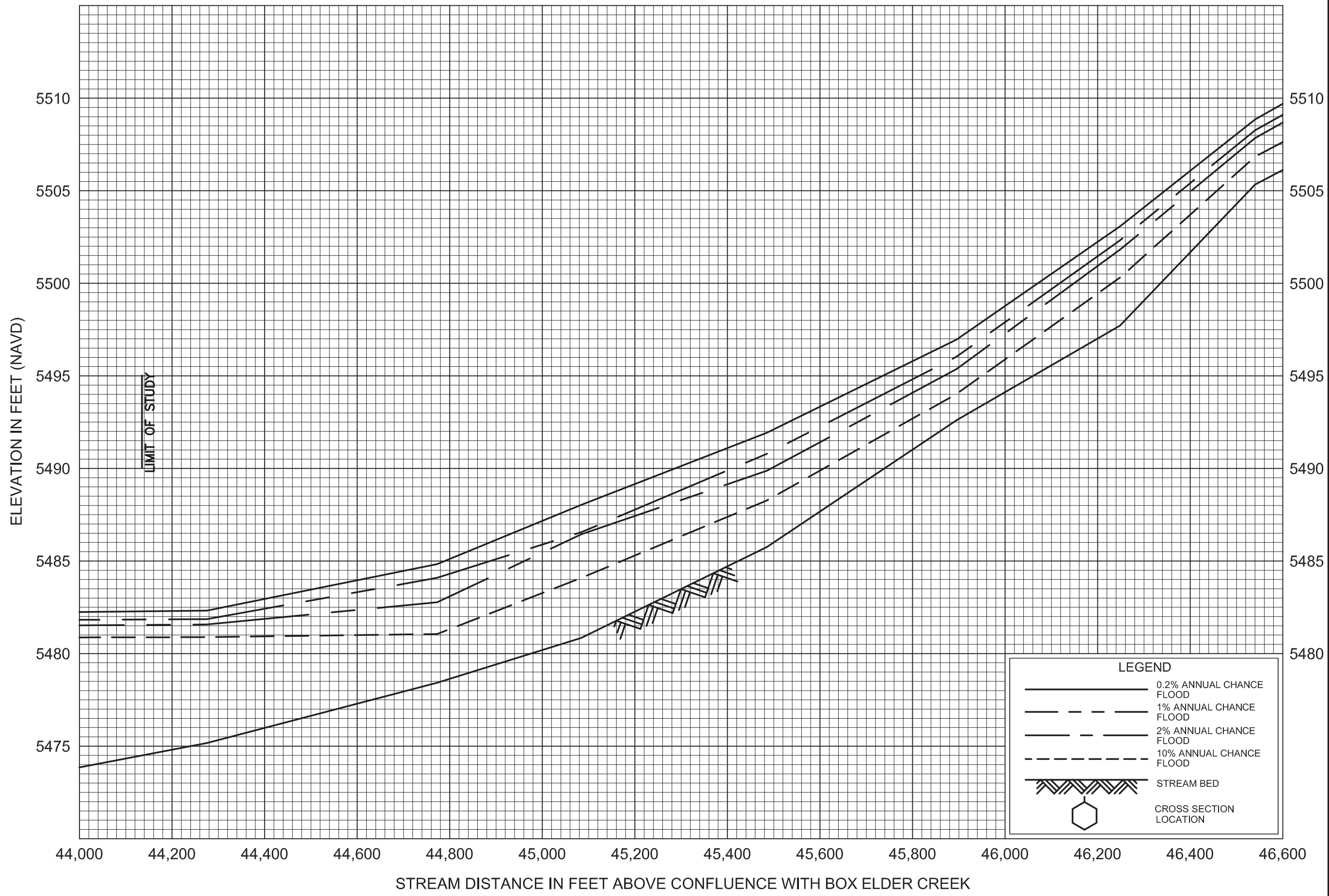
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

BEAR GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ARAPAHOE COUNTY, CO  
(AND INCORPORATED AREAS)



**LEGEND**

- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

BEAR GULCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

ARAPAHOE COUNTY, CO  
(AND INCORPORATED AREAS)

21P