FLOOD INSURANCE STUDY

for

NEW CASTLE, COLORADO

COLORADO RIVER
AND
ELK CREEK

November 4, 2003

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TABLE OF CONTENTS

FLOOD INSURANCE STUDY

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study has been prepared to provide the Town of New Castle the opportunity to become part of the National Flood Insurance Program. This information will be used by the Town of New Castle in support of their flood plain regulations and as part of the regular program of flood insurance by the Federal Emergency Management Agency (FEMA). The information will also be used by local and regional planners to further promote sound land use and flood plain development.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the Colorado River portion of this study were performed by the U.S. Army Corps of Engineers (USACE), Sacramento District, for the Colorado River in

1986. Mapping of the Colorado River corridor was prepared for the Colorado Water Conservation Board (CWCB) and Garfield County. The study and mapping prepared by the USACE was part of a regional study that extends from Debeque Canyon to West Glenwood Springs. Schmueser Gordon Meyer, Inc, has condensed this study to provide information specific to those portions of the Colorado River that are within and immediately adjacent to the Town of New Castle.

The hydrologic and hydraulic analysis for Elk Creek and its tributaries were performed by the U.S. Department of Agriculture, Soil Conservation Service, Denver, Colorado in cooperation with the Colorado Water Conservation Board, the Town of New Castle and Garfield County. This particular study was performed in 1986. Schmueser Gordon Meyer, Inc., has condensed this study to provide information specific to those portions of Elk Creek and it's tributaries that are within and immediately adjacent to the Town of New Castle.

1.3 Coordination

The Flood Insurance Study for the Colorado River was performed in 1986 by the USACOE. Unfortunately, funding to adopt the study by both the CWCB and FEMA was unavailable and the study was never adopted.

Additionally, in 1984, the Soil Conservation Service (SCS) performed the technical studies and report for Elk Creek and it's tributaries. This information is part of and is contained in the report published by the Soil Conservation Service entitled "Flood Plain Management Study, Colorado River Tributaries, Porcupine Creek,

Beaver Creek, Mamm Creek, Dry Hollow Creek, Divide Creek, Garfield Creek, Alkali Creek, South Canyon Creek, Canyon Creek, Elk Creek"

In the fall of 2003, the Town of New Castle Town Council prepared an Ordinance that created flood plain regulations for the Town. This was the first step for the Town to become a member of the National Flood Insurance Program. The Town desired to become part of the National Flood Insurance Program in an attempt to allow its citizens the opportunity to purchase flood insurance. As part of that process, this flood insurance study (which is a consolidation effort of existing studies) was prepared to become the "official document" guiding the Town in it's enforcement of the flood plain regulations.

2.0 AREA STUDIED

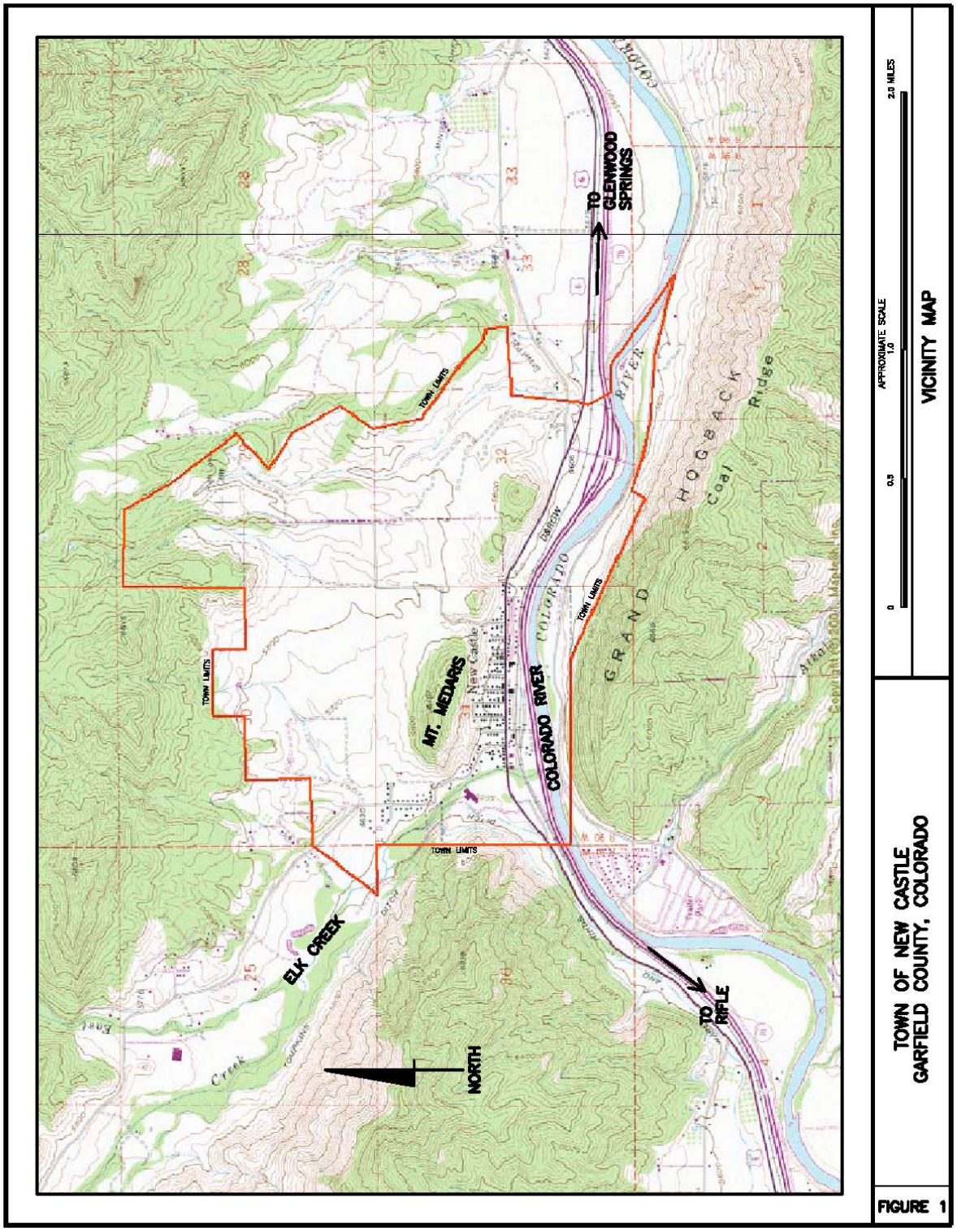
2.1 Scope of Study

This Flood Insurance Study covers the incorporated areas of the Town of New Castle, Garfield County, Colorado. The area of study is shown on the Vicinity Map (Figure 1).

Flooding caused by overflow of the Colorado River, Elk Creek and an unnamed tributary was studied in detail.

The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through 2003. Those areas selected for detailed methods evaluation remained unchanged from

the time the studies were performed in both the USACOE and the SCS studies.



2.2 Community Description

The Town of New Castle is located in east-central Garfield County, in northwestern Colorado. It is situated approximately 12 miles west of Glenwood Springs, Colorado, the county seat of Garfield County. Unincorporated areas of Garfield County border the town on all sides.

All streams in New Castle are direct or indirect tributaries to the Colorado River which flows westerly through the southern portion of the community. Elk Creek flows in a southerly direction through the west side of Town. Elk Creek joins the Colorado River at the southern city limits near the western city limits for the town. The Elk Creek basin drains approximately 6.01 square miles. The Elk Creek basin is bounded on the west by the Rifle Creek basin, on the north by the White River basin and on the east by the Canyon Creek basin.

Elevations in the Elk Creek basin range from approximately 5,550 feet at the Colorado River to approximately 11,000 feet in the higher headwater ranges of the basin.

Vegetation in the upper Elk Creek basin consists of aspen, conifers, and a moderate cover of native grasses. In the lower portion of the Elk Creek basin, vegetation consists of sagebrush, juniper, pinon, and a sparse cover of native grasses and forbs on the south facing slopes with moderate cover of native grasses on the north facing slopes.

The climate of the Upper Colorado River basin can be characterized as semiarid, except in the higher elevations where

precipitation is moderately heavy. Precipitation ranges from less than 10 inches per year in the lower valleys to more than 50 inches per year on the higher peaks. Most precipitation over the basin occurs as snow during the winter and early spring. The Elk Creek watershed is subjected to moderate cloudburst activity with high-intensity rainfall of short duration during the summer and fall. Average annual temperatures vary from less than 32 degrees Fahrenheit in the high headwater areas to approximately 50 degrees Fahrenheit in the lower valleys.

The surface cover of western Colorado ranges from barren rock to deep, fertile, friable loams and clays of good to excellent quality for plant growth. Along the south side of the Colorado River and the south/west side of Elk Creek is a prominent ridge known as the “hogback” or “Coal Ridge”. The Town of New Castle is bounded by Coal Ridge on the south and the foothills of the “flat tops” to the north. A prominent ridge separates the older portions of town from the newer development that is occuring in the northern portions of town. This prominent ridge is known as Mount Medaris and is characterized by being a barren escarpment along it’s south flank with moderately steep slopes on its north flank that are moderately vegetated with native grasses, junipers, pinons and brush. Most of the area has fairly deep soils and steep slopes. Sedimentary formations are nearly horizontal in the upper part of the Elk Creek basin.

Development in the study area for both the Colorado River and Elk Creek can be expected to be limited. In the Colorado River study area, growth will be limited due to the geographic constraints characterized by steep slopes from the stream to the adjacent banks. Excepting park/riparian type development in isolated areas

of the floodplain, no other development is anticipated to occur within the Colorado River study area. In the Elk Creek study area, limited residential growth is anticipated to occur in relation to the Castle Valley Ranch subdivision. This will occur in the northwest quadrant of the Town.

2.3 Principal Flood Problems

Elk Creek and the Colorado River both are not characterized to have created significant flood problems for the Town. Typically, flooding associated with Elk Creek and the Colorado River can be associated with snowmelt runoff in the spring of the year.

The principal flood problems for the Town are related to short duration high intensity rainfall events producing mud flows from the barren south facing slopes and escarpments of Mount Medaris. As recently as July of 2001, a high intensity rainfall event created considerable damage to homes that were tributary to small gulches and drainage paths from Mount Medaris. The town's main transportation corridor (Main Street/Highway 6&24) was deluged with debris, rock and mud from this event as floodwaters were attempted to be directed to the west (to Elk Creek) by Main Street. The changed flow path and softer gradients caused the floodwaters to deposit their sediment/debris on Main Street and in some cases overtop Main Street and flood areas on the south side of Town.

Elk Creek is expected to create problems on areas adjacent to the creek near it's confluence with the Colorado River. In the low lying areas of South 8th Street, the anticipated flood levels of Elk Creek will cause damage to existing residential and commercial areas

between Main Street and the railroad tracks and extending as far east as South 7th Street.

Without a flood protection berm constructed in 1984, the town's wastewater treatment facility would experience flooding from backwater of Elk Creek. The town's treatment facility is landlocked between the railroad tracks on the north and east sides, Elk Creek on the west side and Interstate 70 on the south and east sides. As long as the berm's functionality to serve as flood protection is maintained, the wastewater treatment plant will be protected. There have not been any documented cases where the wastewater treatment plant has been flooded.

North of Main Street and west of 7th Street is another area of the town that is protected from flooding on Elk Creek by a flood protection wall. It is noted on the SCS mapping that this area is inundated by floodwaters if the wall should fail. There have not been any documented cases where this area has been flooded.

The un-named tributary that combines with Elk Creek just north of Riverside School is a tributary that is currently subjected to significant residential growth. Given the acknowledgement of the mapped floodplain in the SCS study, the Town has been utilizing the SCS study in the past to assure that this tributary is left undisturbed and accommodated by new development. No flooding damage is known to have been documented in this tributary. As long as adjacent development continues to respect this tributary's existence, flooding problems should be minimal.

2.4 Flood Protection Measures

There are two flood protection structures that exist within the Town. One is a flood protection wall that extends on the east side of Elk Creek from Riverside School south to Highway 6 & 24. The second is a flood protection berm that extends on the east side of Elk Creek from the railroad tracks south to Interstate 70. The flood protection wall protects existing residential homes while the flood protection berm protects the town's wastewater treatment plant.

Additional flood protection measures exist with responsible planning and development of the developments occurring within Town.

3.0 ENGINEERING METHODS/INTERPRETATION AND USE OF REPORT

A. Frequency and Discharge

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been select as having special significance for flood plain management and for flood insurance rates. These event, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average

period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

B. 10-Year and 50-Year Flood Events

Information regarding these lower frequency floods is especially useful for future engineering studies and land use planning purposes related to minor road systems, minor channel improvements, the location of parks and recreational facilities, agricultural lands, and appurtenant structures. The use of the lower frequency floods may be considered in planning flood prevention projects to protect agricultural areas, or other property where risk to life is not a factor.

C. 100-Year Flood Events

The 100-year flood event may be used in lieu of lower frequencies for engineering design purposes where greater security from structure failure is desired.

However, the most important use of the 100-year flood event lies in flood plain management and land use planning as set forth in the

state statutes. The State of Colorado considers the 100-year frequency flood as the flood event to be used in designing and protecting structures and dwellings for human occupation. Therefore, all flood plain regulations are based upon the 100-year flood.

D. 500-Year Flood Event

The 500-year flood event is useful in making the public aware that floods larger than the 100-year flood can and do occur. Just because a person is living above the 100-year flood boundary does not mean that he is completely safe from flooding. The 500-year flood event can also be used for regulating high risk developments within the flood plain such as nuclear power plants, or the storage or manufacture of toxic or explosive materials.

E. Flood Elevation

Flood crest elevations for the 10-, 50-, 100-, and 500-year floods, as determined at each cross section, may be found in Table 2 (Appendix A-1) “Flood Frequency-Elevation and Discharge Data”. Water surface elevations computed at each cross section were used to prepare flood profiles, Profile Sheets 1 through 11 (for the Colorado River) and 30 through 37 (for Elk Creek), which show the streambed elevation in relation to water surface elevations for the 10-, 50-, 100-, and 500-year frequency floods.

The flood profiles may be used in areas where controversy arises over the 100-year flood boundary shown on the Flood Plain Maps. Since the flood profile exhibits give the water surface elevation at a specific point on the reference line, the flood elevations can be

surveyed on the ground to alleviate any discrepancies on the base map.

F. FLOODED AREAS

Flood Plain maps, Plan Sheets 1 through 5 (Colorado River) and 1 through 3 (Elk Creek), show the boundary of the 100-year floodplain. Normally the 500-year frequency flood plain is also shown on these maps, however, for Elk Creek, the steep slopes involved in the SCS Study made it impossible in most locations to accurately differentiate between the two frequencies on the scale of maps published in this report. The flood plain boundary was plotted form the flood profiles by determining channel stationing of flood contours at the same interval as the topographic maps. Flood contours, shown as wiggly lines, extend perpendicular to the direction of flow and intersect the ground at the edge of the flood plain.

G. FLOODWAY

Artificial fill encroachment on flood plains can reduce the areal extent of a flood plain and provide additional space for other uses. As an alternative to the present flooding situation, a possible floodway with flood plain encroachment was analyzed in this study for the Colorado River. Elk Creek does not have a separate floodway delineation contained within this report. However, reference is given to the SCS study, which describes an appendix that identifies the original studies development of floodway delineation for Elk Creek.

3.1 Hydrologic Analysis

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the community.

Peak flows on the Colorado River were based on records from USGS stream-gaging stations.

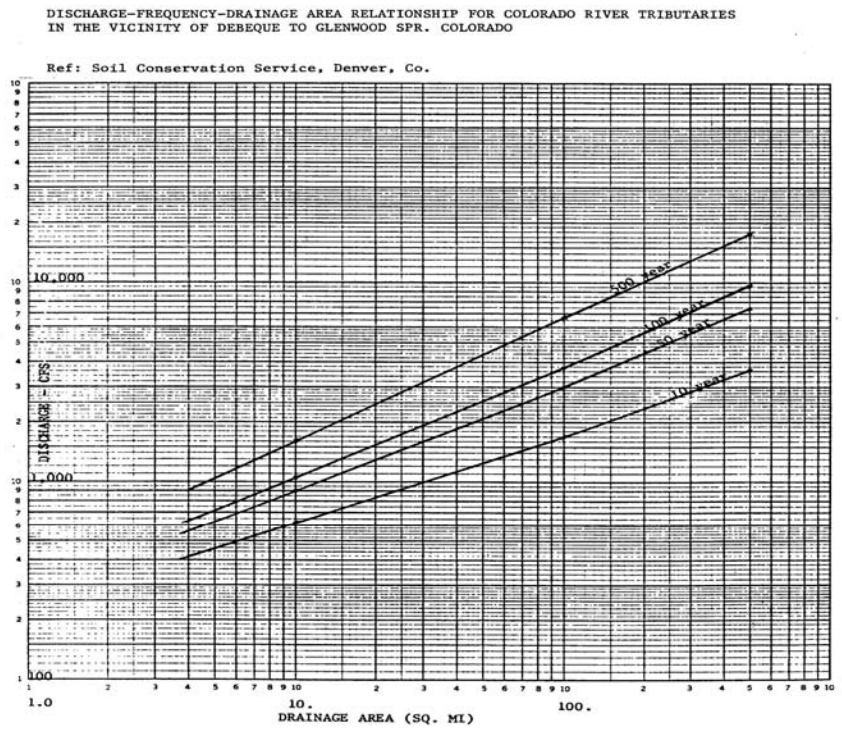
Peak flows for Elk Creek and any of its tributaries considered the aspect that snowmelt flooding and spring/summer rainfall were characteristic of these streams. The intent of the SCS study was to separate the annual peak discharges into rainfall events and snowmelt events. Separate frequency curves should be combined statistically to produce a final discharge frequency curve. There was insufficient streamflow data of rainfall flood events to accomplish this, therefore, the SCS TR-20 computer program was used to simulate rainfall flood peaks. The model was used on 16 watersheds of varying sizes and a regional curve of drainage area versus peak discharge and frequency was developed for rainfall flooding. The TR-20 analysis included the standard SCS Type II (24 hour) rainfall distribution and curve numbers for an average antecedent soil moisture condition (AMC-II). The discharge versus drainage area data from this analysis were plotted, and a regression line fitted for several frequencies.

A regional curve was developed for snowmelt flood events using data from 8 stream gages in the area. The Log Pearson III

frequency distribution (as defined in the WRC Bulletin 17-B) was used with a regional skew weighted with each computed station skew. The data was plotted and discharge-drainage area lines drawn for several frequencies.

The two regional discharge frequency-drainage area curves (rainfall and snowmelt) were combined using a standard probability equation: P(comb)=P(snow)+P(rain)-(P(snow)xP(rain))

This combined regional curve is recommended for studies along the Colorado River Tributaries in the vicinity of Debeque to Glenwood Springs, Colorado for streams that have independent snowmelt and rainfall flood histories.



The following table is a hydrology summary showing the discharge frequency data at selected locations for both Elk Creek (from SCS study) and the Colorado River (from the USACE study).

Table 1
Hydrology Summary

Location, Tributary and Cross Section	Drainage Area in Square Miles	10-year Discharge (cfs)	50-year Discharge (cfs)	100-year Discharge (cfs)	500-year Discharge (cfs)
Elk Creek Section 633	177.1	2200	4200	5200	9300
Elk Creek Section 646	0.26	60	70	78	101
Elk Creek Section 652	169.9	2180	4000	5100	9100
Elk Creek Section 653	130	1900	3450	4380	7700
Elk Creek Section 671	39.9	1120	1840	2250	3780
Colorado River Section 632	N/a	27,600	36,900	40,900	50,300
Colorado River Section 706	N/a	26,800	36,000	39,900	49,200

3.2 Hydraulic Analysis

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Water-surface elevations of floods of the selected recurrence intervals were computed using the USACE HEC-2 step-backwater program (Reference 6). Additional analyses was performed in 2004 to modify Colorado River models created in 1987 to condense that study to New Castle specific.

Cross section data for the Colorado River were developed from topographic maps furnished by the Colorado Water Conservation Board. Cross section data for Elk Creek were developed from photogrammetric maps that were prepared especially for the SCS Study. All bridges and culverts were field surveyed to obtain elevation data and structural geometry.

Roughness factors (Manning's "n") used in the hydraulic computations were computed from stream gage data or determined by field observation using engineering judgement. Roughness values for the main channel of the Colorado River ranged from 0.035 to 0.040, whereas overbank roughness values ranged from 0.050 to 0.070. Roughness values for the main channel of Elk Creek ranged from 0.035 to 0.040, while the overbank roughness values ranged from 0.050 to 0.080.

The starting water-surface elevations for the Colorado River and Elk Creek were determined by the "known water surface" method.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program (NFIP) encourages State and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing and implementing flood plain management measures.

4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the Colorado River, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each cross section. For Elk Creek, only the 100-year flood plain boundary has been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps.

4.2 Floodways

Encroachment on flood plains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is

used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood plain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodway presented in the Colorado River portion of this study was computed on the basis of equal conveyance reduction from each side of the floodplain. The results of these computations are tabulated at selected cross sections for the Colorado River stream segment incorporated into this study. (Table 3)

As shown on the Plan Sheets 1 through 5 (Colo. River), the floodway boundaries were computed at cross sections. Between cross section, the boundaries were interpolated. In cases where the floodway and the 100-year flood plain boundaries are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the 100-year flood plain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical

relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

Table 3

Colorado River Floodway Data Table

River Section	Top Width (ft)	Area (sq ft)	Vel (ft/s)	Total W.S. (ft)	Base WS (ft)	Delta WS (ft)
609	334.09	3949.96	10.35	5518.61	5518.61	0.00
610	198.44	2538.09	16.11	5522.59	5522.41	0.18
630	251.67	3852.45	10.62	5529.22	5529.22	-0.01
631	244.73	3617.88	11.30	5531.33	5531.34	-0.01
632	236.52	3616.59	11.31	5534.37	5534.36	0.02
706	343.63	4630.90	8.83	5538.37	5538.30	0.07
707	308.00	3788.46	10.80	5540.18	5540.15	0.04
708	340.00	3476.84	11.76	5543.89	5543.90	-0.01
709	425.00	3775.97	10.83	5547.86	5547.82	0.04
710	431.48	6117.02	6.69	5551.47	5551.52	-0.05
711	343.95	4863.15	8.41	5552.12	5552.16	-0.04
712	241.29	3402.98	12.02	5553.55	5553.58	-0.03
713.1	212.25	3273.28	12.50	5553.63	5553.65	-0.02
BR D	207.25	3187.65	12.83	5553.63	5553.65	-0.02
BR U	207.25	3187.65	12.83	5553.63	5553.65	-0.02
713.2	212.78	3318.73	12.32	5553.84	5553.86	-0.02
714	216.53	3245.00	12.60	5554.00	5554.02	-0.02
715	413.92	3127.59	13.08	5558.98	5559.07	-0.09
716	451.98	6313.60	6.48	5565.19	5564.26	0.93
717	388.89	3688.20	10.82	5565.90	5565.21	0.69

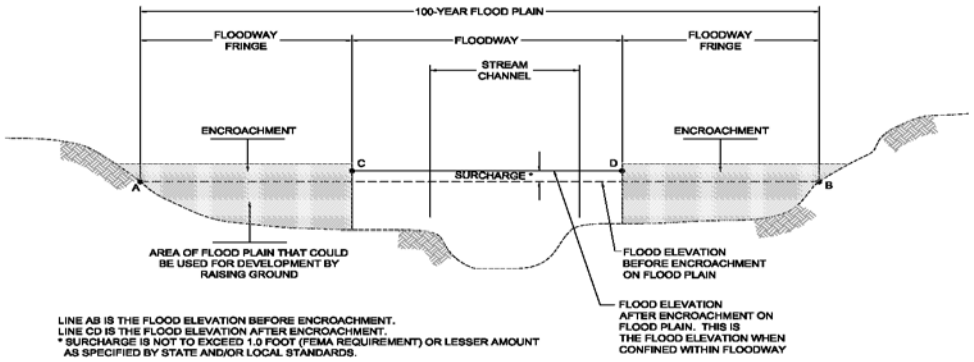


FIGURE- 2
FLOODWAY SCHEMATIC

5.0 INSURANCE APPLICATION

To establish actuarial insurance rates, data from the engineering study must be transformed into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source studied in detail affecting the Town of New Castle.

5.1 Reach Determinations

Reaches are defined as sections of flood plain that have relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference may not have a variation greater than that indicated in the following table (Table 4) for more than 20 percent of the reach:

Table 4

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of New Castle are shown on the Flood Profiles and summarized in Table 5.

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is used to establish relationships between depth and frequency of flooding in any reach. This relationship is then used with depth-damage relationships for various classes of structures to establish actuarial insurance rate tables.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations rounded to the nearest one-half foot, multiplied by 10, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year flood water-surface elevations is greater than 10.0 feet, it is rounded to the nearest whole foot.

5.3 Flood Insurance Zones

Flood insurance zones and zone numbers are assigned based on the type of flood hazard and the FHF, respectively. A unique zone number is associated with each possible FHF, and varies from 1 for a FHF of 005 to a maximum of 30 for a FHF of 200 or greater.

Zone A: Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHF's determined.

Zone A0: Special Flood Hazard Areas inundated by types of 100-year shallow flooding where depths are between 1.0 and 3.0 feet; depths are shown, but no FHF's are determined.

Zones A2 – A6: Special Flood Hazard Areas inundated by the 100-year flood; with base flood elevations shown, and zones subdivided according to FHFs.

Zone B: Areas between the Special Flood Hazard Areas and the limits of the 500-year flood; areas that are protected from the 100- or 500-year floods by dike, levee, or other local water-control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C: Areas of minimal flood hazard; not subdivided.

Zone D: Areas of undetermined, but possible flood hazard.

The flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community are summarized in Table 5.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Town of New Castle is for insurance purposes, the principal product of the Flood Insurance Study. This map contains the official delineation of flood insurance zones and base flood elevations. Base flood elevation lines show the locations of the expected whole-foot water-surface elevation of the base (100-year) flood. The base flood elevations and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the NFIP.

6.0 OTHER STUDIES

As has been referred to in several areas of this report, this report is a compilation of two primary reports or study efforts. The first of these efforts is the 1986 work conducted by the U.S. Army Corps of Engineers, Sacramento District, for the Colorado River. This work was never published, however, the Colorado Water Conservation Board, Garfield County and the Town of New Castle was provided the mapping and data developed from this study. It is one of the primary purposes of this report to adopt at least the New Castle area and immediate vicinity of the Colorado River from the USACE study.

The second report is that prepared by the U.S. Department of Agriculture, Soil Conservation Service, Denver, Colorado in cooperation with the Colorado Water Conservation Board, Town of New Castle and Garfield County, Colorado in July of 1986. It is this report that developed the information specific to Elk Creek and it's

tributaries for this report. This report will be helpful for adoption as the Town of New Castle experiences growth east, towards Canyon Creek, and/or west, toward Alkali and Garfield Creeks.

7.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Town of New Castle, P.O. Box 90, New Castle, Colorado 81647.

8.0 BIBLIOGRAPHY AND REFERENCES

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Table 2
Colorado River Elevation Data

Cross Section Designation	Stream Bed Elevation	10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
609	5505	5516.3	5517.5	5518.6	5518.9
610	5507	5520.1	5521.9	5522.4	5524.1
630	5511	5525.6	5528.1	5529.2	5531.5
631	5513	5527.7	5530.3	5531.3	5533.6
632	5516	5530.9	5533.4	5534.4	5536.6
706	5522.5	5534.8	5537.3	5538.3	5540.6
707	5524.7	5537.1	5539.3	5540.2	5542.2
708	5527	5541.0	5543.2	5543.9	5545.5
709	5532	5545.0	5547.1	5547.8	5549.3
710	5535	5548.2	5550.6	5551.5	5553.2
711	5536	5549.0	5551.3	5552.2	5553.9
712	5537.5	5550.5	5552.7	5553.6	5555.3
713.1	5536.5	5550.6	5552.8	5553.7	5555.3
713.2	5536.5	5550.8	5553.0	5553.9	5555.6
714	5537	5550.9	5553.2	5554.0	5555.8
715	5543	5555.7	5558.1	5559.1	5561.4
716	5548.4	5561.6	5563.6	5564.3	5565.8
717	5551	5562.5	5564.5	5565.2	5566.74

FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
632	0 + 00	Co River at Elk Cr	5516.5	5531.0 29400 2/	5531.0 29400 2/	5531.0 29400 2/	5531.0 29400 2/
633	5 + 80	Elk Cr	5523.5	5533.4 2200	5533.4 4200	5533.4 5200	5533.4 9300
634	6 + 45	Interstate Highway I-70	5524.1	5533.4 2200	5533.4 4200	5533.4 5200	5533.8 9300
635	7 + 55	Interstate Highway I-70	5524.1	5533.4 2200	5533.6 4200	5533.9 5200	5534.5 9300
636	7 + 85	Elk Cr	5526.4	5533.4 2200	5533.9 4200	5534.1 5200	5538.5 9300
637	9 + 70	Elk Cr	5529.3	5534.3 2200	5535.2 4200	5535.5 5200	5538.5 9300
638.1	10 + 40	Denver & Rio Grande Western Railroad	5530.0	5534.9 2200	5535.3 4200	5535.5 5200	5538.5 9300
638.2	10 + 90	Denver & Rio Grande Western Railroad	5530.0	5534.9 2200	5535.3 4200	5535.5 5200	5538.5 9300

1/ Flood elevations pertain to the primary channel and usually remain constant in a lateral direction across the flood plain. However, flood elevations in the outer portions of a cross section may differ from the primary channel due to road crossings, upstream diversions, etc.

2/ Discharge in Colorado River at 25 year frequency.

TABLE 2 - ELK CREEK

FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
639	11 + 70	Elk Cr	5532.2	5535.9 2200	5537.9 4200	5538.7 5200	5540.9 9300
640	13 + 60	Elk Cr	5535.1	5539.1 2200	5540.8 4200	5541.4 5200	5544.2 9300
641.1	14 + 20	New Castle Main St	5535.5	5539.9 2200	5541.3 4200	5541.4 5200	5544.2 9300
641.2	14 + 55	New Castle Main St	5535.5	5539.9 2200	5541.3 4200	5541.4 5200	5544.2 9300
642	14 + 85	Elk Cr	5535.7	5539.9 2200	5541.3 4200	5541.8 5200	5544.7 9300
643	19 + 05	Elk Cr	5540.5	5544.9 2200	5546.6 4200	5547.2 5200	5550.2 9300
644	22 + 55	Elk Cr	5544.9	5549.2 2200	5551.1 4200	5551.9 5200	5554.5 9300
645	29 + 45	Elk Cr	5554.1	5558.7 2200	5560.3 4200	5560.9 5200	5563.0 9300

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FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
648	36 + 45	Elk Cr	5562.8	5568.1 2200	5569.2 4200	5569.8 5200	5571.5 9300
649	44 + 85	Elk Cr	5574.4	5577.2 2200	5578.6 4200	5579.0 5200	5580.7 9300
650	58 + 85	Elk Cr	5592.1	5595.1 2200	5596.5 4200	5596.9 5200	5598.2 9300
651	68 + 45	Elk Cr	5600.9	5605.3 2200	5606.4 4200	5606.8 5200	5608.1 9300
652	79 + 75	Elk Cr at East Elk Cr	5616.1	5619.2 2180	5619.9 4000	5620.3 5100	5621.4 9100
653	87 + 75	Elk Cr	5622.7	5626.6 1900	5627.8 3450	5628.2 4380	5629.8 7700
654	94 + 95	Elk Cr	5629.8	5633.5 1900	5634.6 3450	5635.2 4380	5636.3 7700
655	102 + 55	Elk Cr	5636.9	5641.5 1900	5642.5 3450	5643.2 4380	5644.6 7700

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TABLE 2 - ELK CREEK

FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
656	113 + 75	Elk Cr	5645.5	5649.5 1900	5650.8 3450	5651.2 4380	5652.1 7700
657	122 + 55	Elk Cr	5653.3	5656.7 1900	5658.1 3450	5658.8 4380	5661.5 7700
658	130 + 50	Elk Cr	5659.5	5664.3 1900	5665.7 3450	5666.3 4380	5667.4 7700
659	136 + 10	Elk Cr	5663.8	5668.1 1900	5670.1 3450	5670.9 4380	5673.7 7700
660	136 + 35	Elk Cr	5664.0	5668.8 1900	5671.0 3450	5673.5 4380	5675.8 7700
661	136 + 95	Elk Cr	5665.3	5671.0 1900	5674.1 3450	5675.3 4380	5677.2 7700
662	143 + 20	Elk Cr	5670.5	5676.3 1900	5677.1 3450	5677.6 4380	5678.5 7700
663	150 + 00	Elk Cr	5677.8	5681.9 1900	5683.3 3450	5684.0 4380	5685.5 7700

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TABLE 2 - ELK CREEK

FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
664	155 + 30	Elk Cr	5682.7	5687.6 1900	5689.0 3450	5689.5 4380	5691.2 7700
665	167 + 50	Elk Cr	5695.8	5699.8 1900	5700.7 3450	5701.2 4380	5702.4 7700
666	174 + 30	Elk Cr	5698.5	5704.1 1900	5705.7 3450	5706.3 4380	5708.3 7700
667	180 + 10	Elk Cr	5705.4	5709.1 1900	5710.9 3450	5711.5 4380	5713.2 7700
668	185 + 40	Elk Cr	5710.2	5715.3 1900	5716.7 3450	5717.4 4380	5719.0 7700
669	191 + 20	Elk Cr	5714.6	5719.7 1900	5721.2 3450	5721.6 4380	5722.7 7700
670	201 + 80	Upper Study Limit	5722.3	5728.0 1900	5728.4 3450	5728.7 4380	5730.0 7700

1/ Flood elevations pertain to the primary channel and usually remain constant in a lateral direction across the flood plain. However, flood elevations in the outer portions of a cross section may differ from the primary channel due to road crossings, upstream diversions, etc.

TABLE 2 - ELK CREEK

FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
652	79 + 75	Elk Cr at East Elk Cr	5616.1	5619.2 2180	5619.9 4000	5602.3 5100	5621.4 9100
671	88 + 15	East Elk Cr	5629.9	5634.4 1120	5635.4 1840	5636.0 2250	5637.3 3780
672.1	88 + 25	Private Road	5630.0	5634.6 1120	5637.4 1840	5637.7 2250	5638.5 3780
672.2	88 + 40	Private Road	5630.0	5634.6 1120	5637.6 1840	5637.9 2250	5638.9 3780
673	88 + 60	East Elk Cr	5630.1	5636.6 1120	5638.2 1840	5638.5 2250	5639.5 3780
674	93 + 00	East Elk Cr	5640.3	5644.2 1120	5645.2 1840	5645.6 2250	5646.4 3780
675	96 + 80	East Elk Cr	5649.5	5652.9 1120	5654.1 1840	5654.5 2250	5655.6 3780
676	104 + 80	Foot Bridge	5663.7	5667.5 1120	5669.1 1840	5669.4 2250	5670.1 3780

1/ Flood elevations pertain to the primary channel and usually remain constant in a lateral direction across the flood plain. However, flood elevations in the outer portions of a cross section may differ from the primary channel due to road crossings, upstream diversions, etc.

TABLE 2 - ELK CREEK

FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
678	105 + 15	East Elk Cr	5665.2	5669.2 1120	5670.5 1840	5670.9 2250	5671.6 3780
679	116 + 55	East Elk Cr	5687.0	5690.1 1120	5691.1 1840	5691.6 2250	5693.4 3780
680	122+ 55	East Elk Cr	5697.4	5701.8 1120	5703.2 1840	5703.7 2250	5705.1 3780
681.1	122 + 70	Buford Road	5697.5	5702.2 1120	5703.2 1840	5703.7 2250	5705.9 3780
681.2	122 + 95	Buford Road	5697.5	5702.3 1120	5703.5 1840	5705.0 2250	5707.6 3780
682	123 + 35	East Elk Cr	5697.6	5703.1 1120	5705.0 1840	5706.5 2250	5709.8 3780
683	130 + 65	East Elk Cr	5713.7	5717.8 1120	5719.4 1840	5719.9 2250	5721.2 3780
684	136 + 35	East Elk Cr	5728.9	5731.8 1120	5732.7 1840	5733.2 2250	5734.8 3780

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TABLE 2 - ELK CREEK

FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
685	145 + 15	East Elk Cr	5751.7	5754.8 1120	5755.8 1840	5757.0 2250	5758.3 3780
686	152 + 15	East Elk Cr	5764.2	5767.1 1120	5767.9 1840	5768.1 2250	5769.3 3780
687.1	152 + 50	Private Road	5764.5	5768.7 1120	5771.4 1840	5771.8 2250	5772.7 3780
687.2	152 + 68	Private Road	5764.5	5769.9 1120	5772.8 1840	5773.3 2250	5774.5 3780
688	152 + 83	East Elk Cr	5765.7	5770.6 1120	5772.8 1840	5773.3 2250	5774.5 3780
689	158 + 63	East Elk Cr	5776.9	5780.0 1120	5781.0 1840	5781.4 2250	5783.7 3780
690.1	159 + 08	Private Road	5778.2	5781.4 1120	5782.6 1840	5783.2 2250	5786.0 3780
690.2	159 + 26	Private Road	5778.2	5781.5 1120	5784.9 1840	5785.4 2250	5787.3 3780

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TABLE 2 - ELK CREEK

FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
691	159 + 71	East Elk Cr	5780.3	5782.7 1120	5785.2 1840	5785.8 2250	5787.3 3780
692	160 36	East Elk Cr	5787.1	5790.3 1120	5791.4 1840	5791.9 2250	5793.7 3780
693	164 + 76	East Elk Cr	5792.3	5795.3 1120	5796.2 1840	5796.7 2250	5798.1 3780
694	165 + 16	Dam	5790.8	5795.5 1120	5796.4 1840	5796.9 2250	5798.2 3780
695	171 + 76	East Elk Cr	5802.9	5806.7 1120	5807.6 1840	5808.0 250	5809.3 3780
696.1	172 + 14	Private Road	5803.1	5807.0 1120	5808.5 1840	5810.5 2250	5812.1 3780
696.2	172 + 29	Private Road	5803.1	5807.5 1120	5808.7 1840	5810.6 2250	5812.2 3780
697	172 + 52		5804.0	5808.5 1120	5810.7 1840	5811.6 2250	5812.8 3780

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FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
698	175 + 22	East Elk Cr	5806.8	5810.7 1120	5812.0 1840	5812.5 2250	5814.2 3780
699.1	175 + 42	Private Road	5807.0	5810.7 1120	5812.1 1840	5812.8 2250	5815.9 3780
699.2	175 + 57	Private Road	5807.0	5811.2 1120	5813.1 1840	5814.8 2250	5820.2 3780
700	175 + 92	East Elk Cr	5808.3	5812.4 1120	5814.5 1840	5815.9 2250	5820.2 3780
701	180 + 92	East Elk Cr	5815.2	5818.2 1120	5819.0 1840	5819.3 2250	5820.4 3780
702	186 + 32	East Elk Cr	5822.7	5826.4 1120	5826.9 1840	5827.1 2250	5827.9 3780
703.1	186 + 72	Private Road	5823.0	5826.8 1120	5828.1 1840	5828.8 2250	5831.7 3780
703.2	186 + 87	Private Road	5823.0	5826.8 1120	5829.5 1840	5830.0 2250	5832.3 3780

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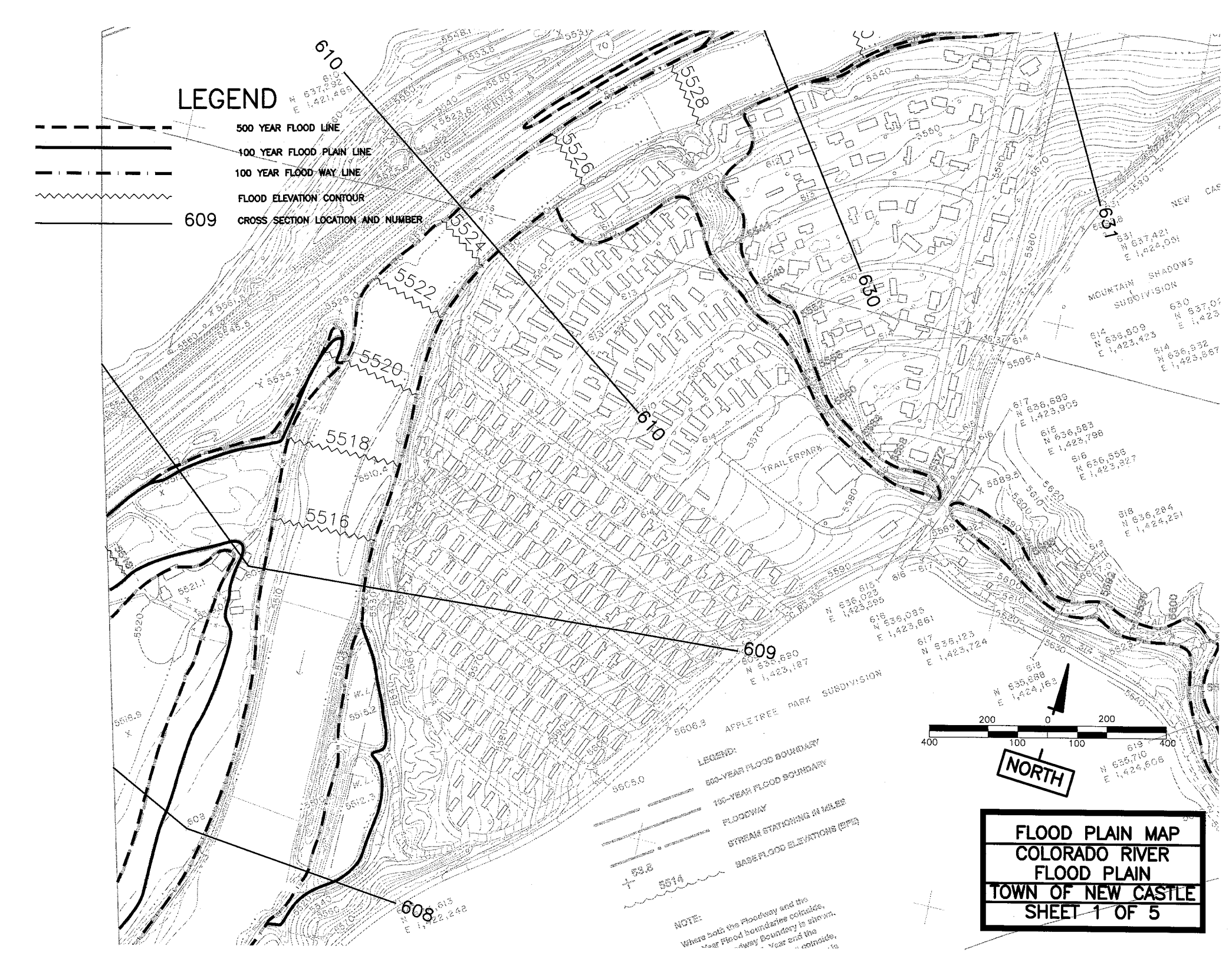
FLOOD FREQUENCY-ELEVATION AND DISCHARGE DATA 1/

Cross Section Design-nation	Stationing from Lower Study Limit Feet (Meters)	Identification	Stream Bed Elevation Feet (Meters) N.G.V.D.	Crest-Elevation Feet National Geodetic Vertical Datum, and Peak Discharge c.f.s.			
				10-Year Flood	50-Year Flood	100-Year Flood	500-Year Flood
704	187 + 12	East Elk Cr	5824.5	5828.1 1120	5830.6 1840	5831.2 2250	5832.7 3780
705	195 + 52	Upper Study Limit	5837.5	5841.2 1120	5841.9 1840	5842.3 2250	5842.9 3780

1/ Flood elevations pertain to the primary channel and usually remain constant in a lateral direction across the flood plain. However, flood elevations in the outer portions of a cross section may differ from the primary channel due to road crossings, upstream diversions, etc.

TABLE 2 - ELK CREEK


LEGEND
500 YEAR FLOOD LINE
100 YEAR FLOOD PLAIN LINE
100 YEAR FLOOD WAY LINE
FLOOD ELEVATION CONTOUR
609 CROSS SECTION LOCATION AND NUMBER
610
5528
5526
5524
5522
5520
5518
5516
609
608
630
631
TRAIL ERRANT
MOUNTAIN SHADOWS SUBDIVISION
APPLETREE PARK SUBDIVISION
LEGEND:
500-YEAR FLOOD BOUNDARY
100-YEAR FLOOD BOUNDARY
FLOODWAY
STREAM STATIONING IN MILES
BASE FLOOD ELEVATIONS (BFE)
NOTE:
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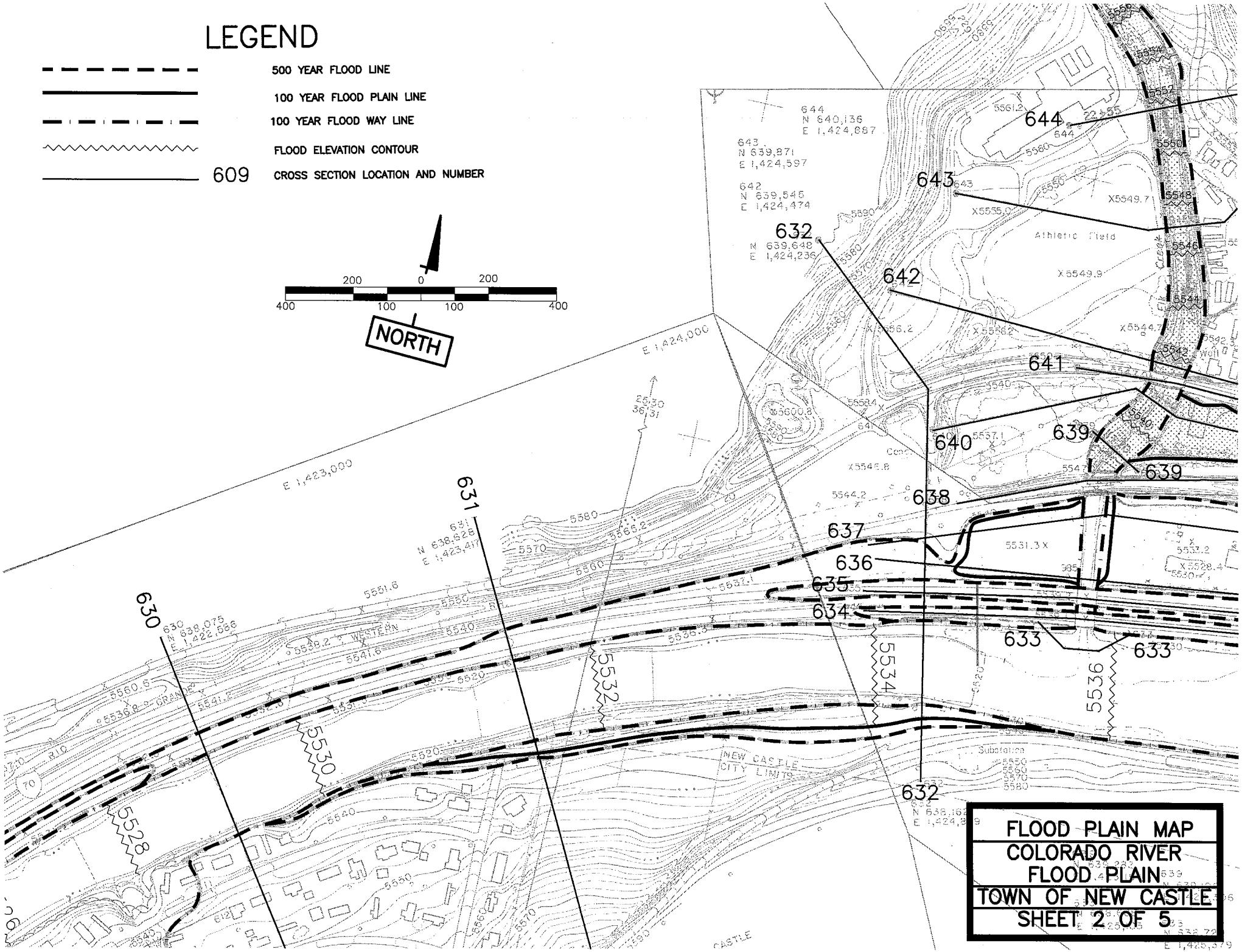
400 100 100 400
NORTH
FLOOD PLAIN MAP
COLORADO RIVER
FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 1 OF 5


LEGEND
500 YEAR FLOOD LINE
100 YEAR FLOOD PLAIN LINE
100 YEAR FLOOD WAY LINE
FLOOD ELEVATION CONTOUR
609 CROSS SECTION LOCATION AND NUMBER
200 0 200
400 100 100 400
NORTH
630
631
632
633
634
635
636
637
638
639
640
641
642
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5534
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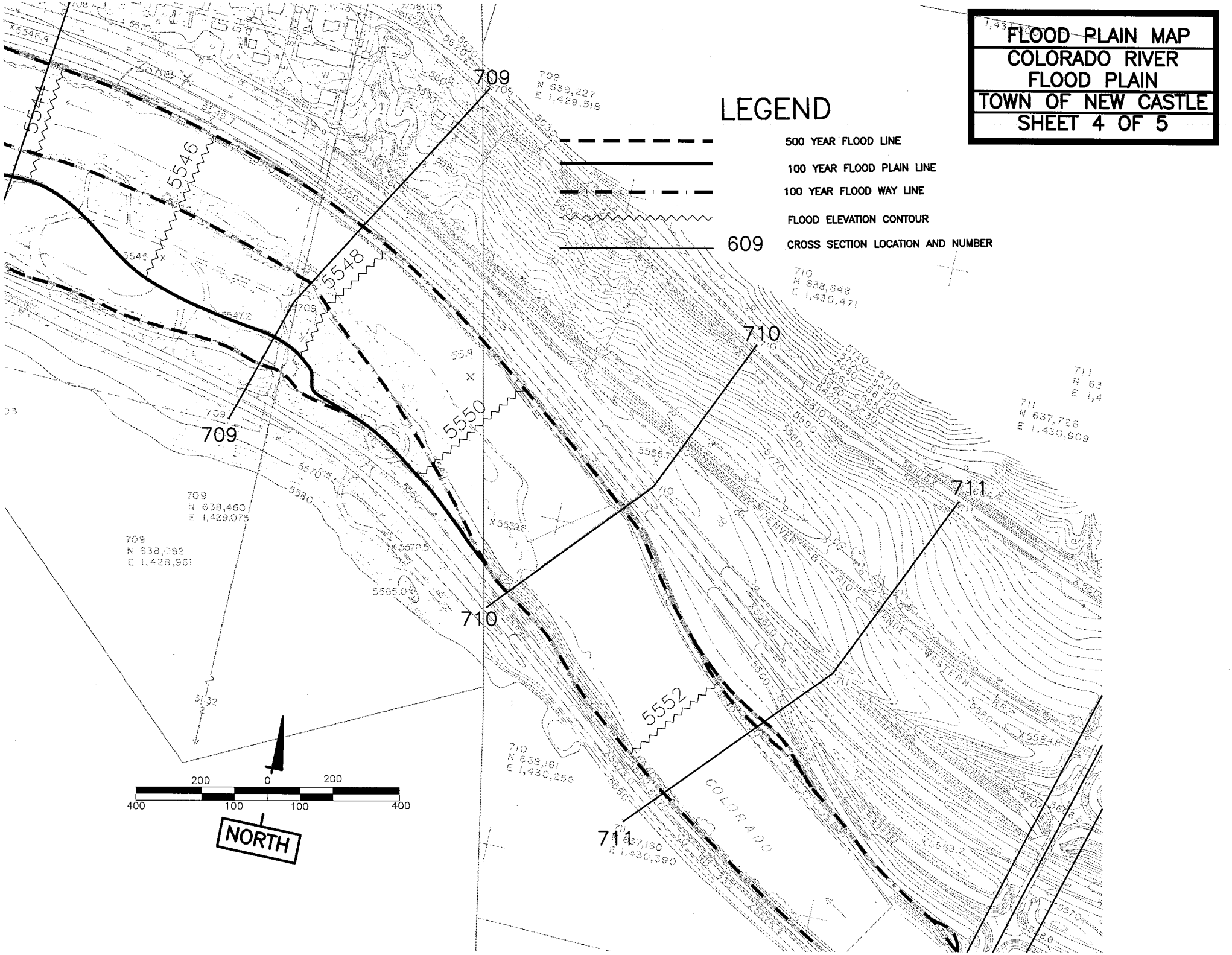
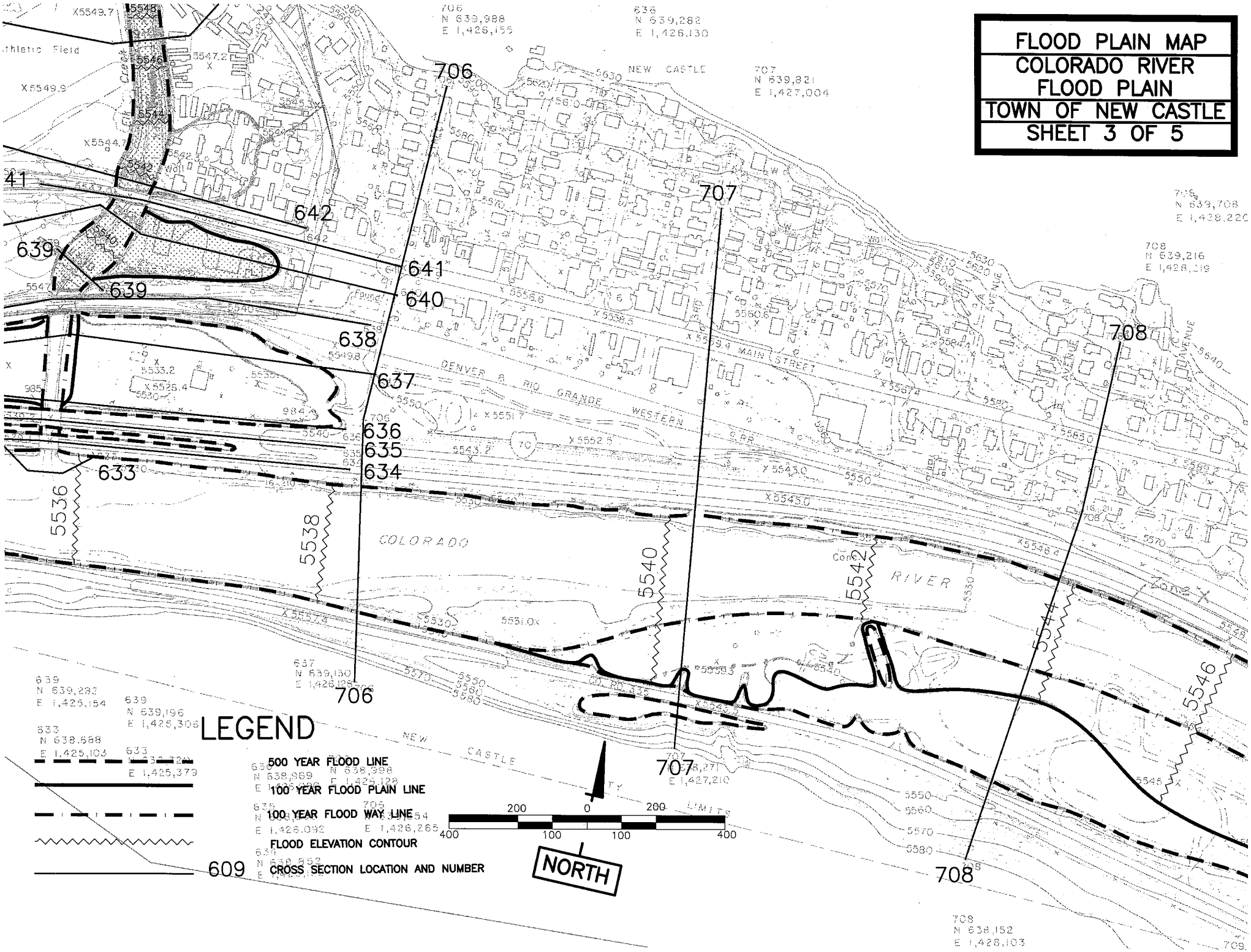
FLOOD PLAIN MAP
COLORADO RIVER
FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 2 OF 5


FLOOD PLAIN MAP
COLORADO RIVER
FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 4 OF 5
LEGEND
500 YEAR FLOOD LINE
100 YEAR FLOOD PLAIN LINE
100 YEAR FLOOD WAY LINE
FLOOD ELEVATION CONTOUR
609 CROSS SECTION LOCATION AND NUMBER
709
710
711
5544
5546
5548
5550
5552
200 0 200
400 100 100 400
NORTH
COLORADO


FLOOD PLAIN MAP
COLORADO RIVER
FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 3 OF 5
LEGEND
500 YEAR FLOOD LINE
100 YEAR FLOOD PLAIN LINE
100 YEAR FLOOD WAY LINE
FLOOD ELEVATION CONTOUR
609 CROSS SECTION LOCATION AND NUMBER
NORTH
200 0 200
400 100 100 400
COLORADO RIVER
DENVER & RIO GRANDE WESTERN
MAIN STREET
NEW CASTLE
Zone X
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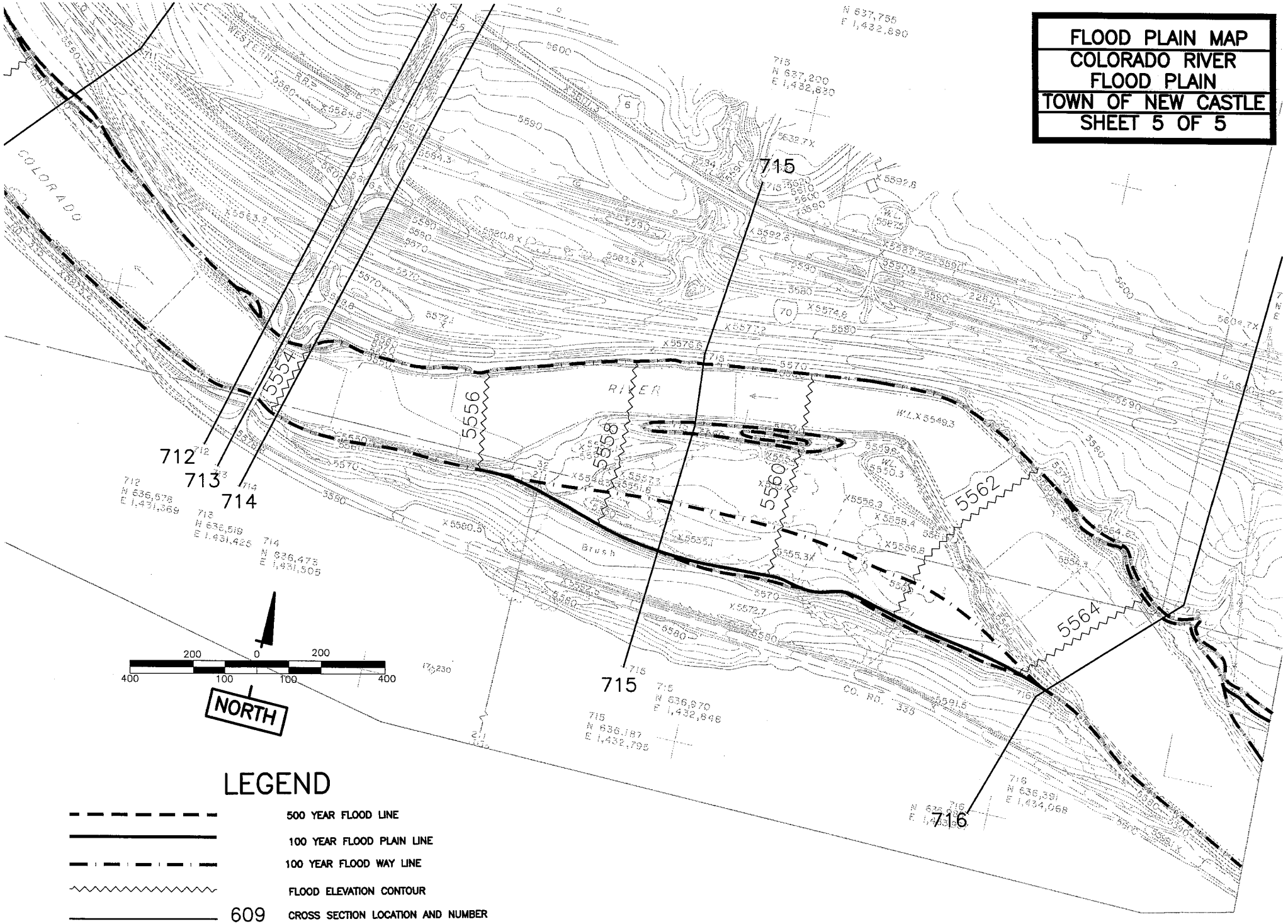
FLOOD PLAIN MAP
COLORADO RIVER
FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 5 OF 5
712
713
714
715
716
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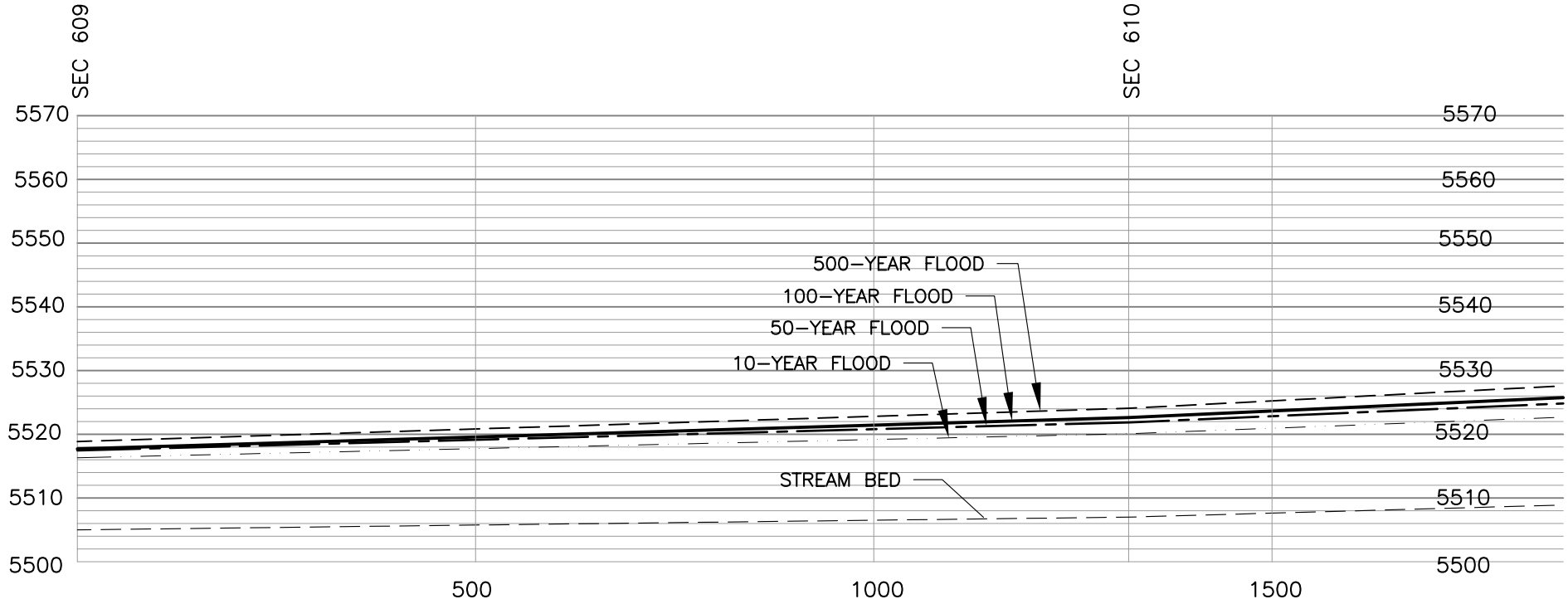
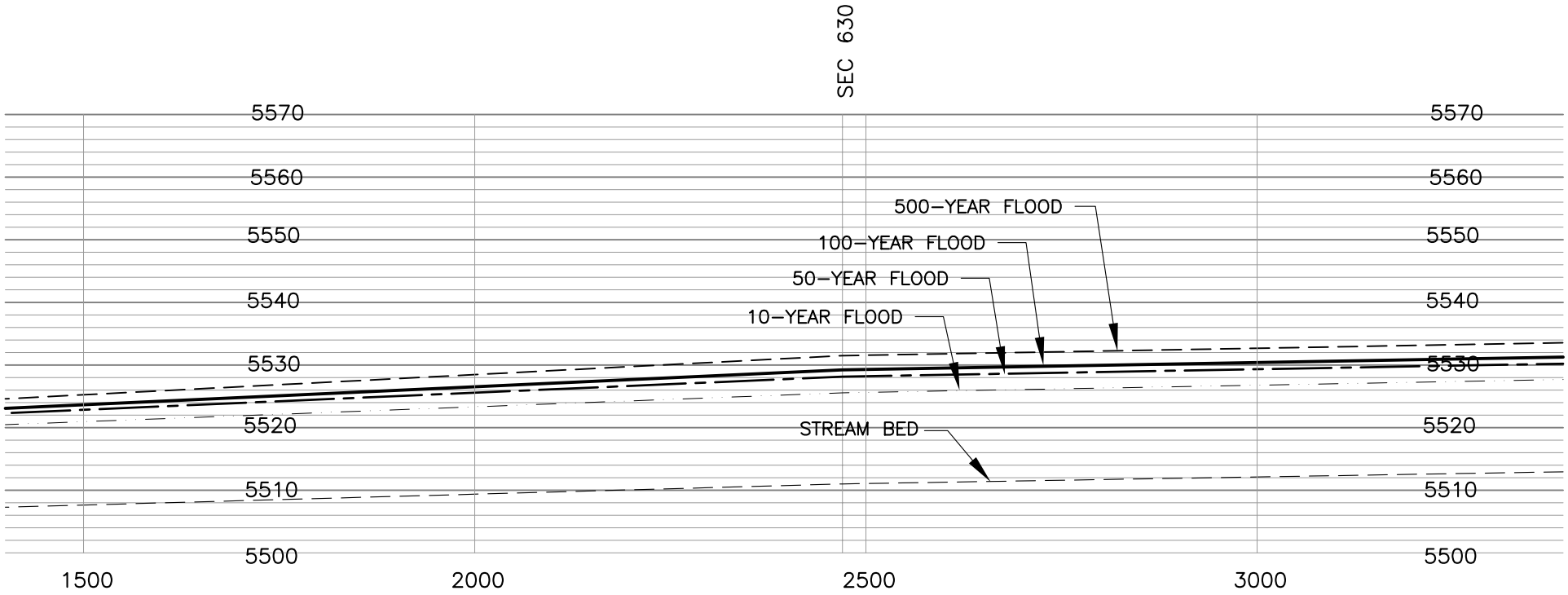
5556
5558
5560
5562
5564
RIVER
COLORADO
Brush
CO. RD. 335
200
0
200
400
100
100
400
NORTH
LEGEND
500 YEAR FLOOD LINE
100 YEAR FLOOD PLAIN LINE
100 YEAR FLOOD WAY LINE
FLOOD ELEVATION CONTOUR
609
CROSS SECTION LOCATION AND NUMBER

PROFILE SHEET 1



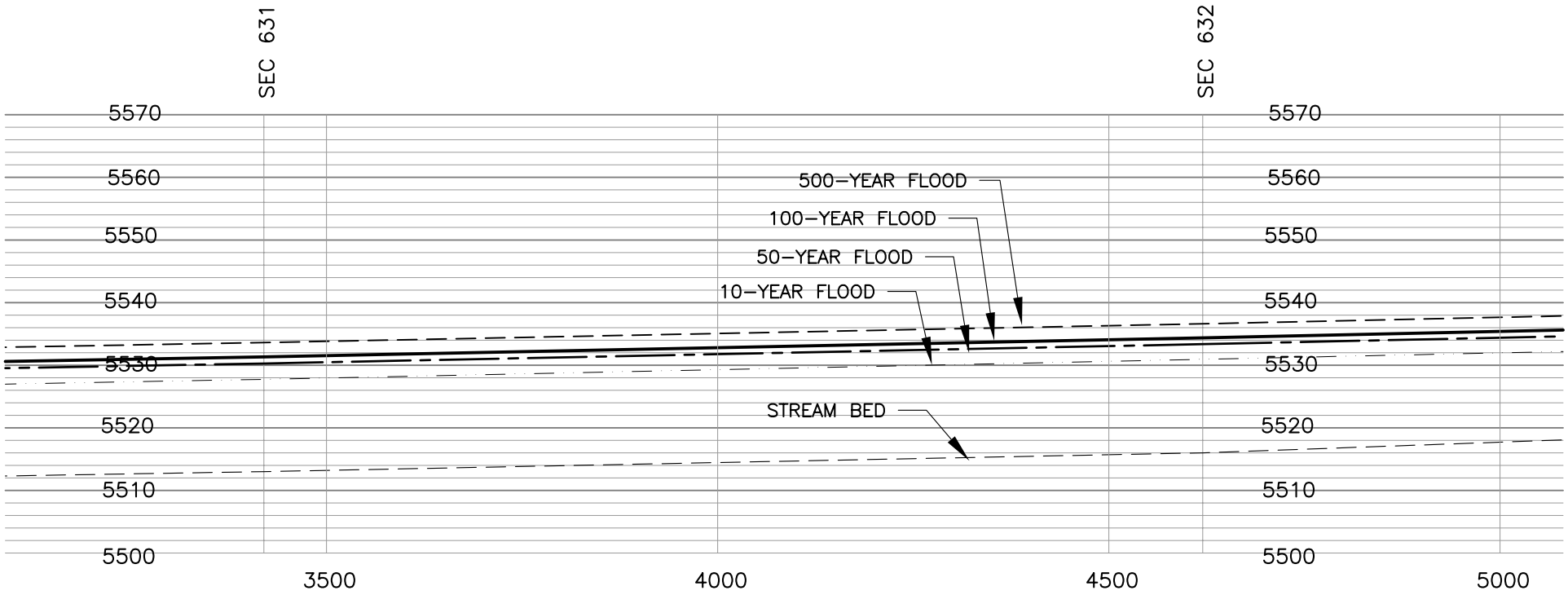
PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 1 OF 11

PROFILE SHEET 2

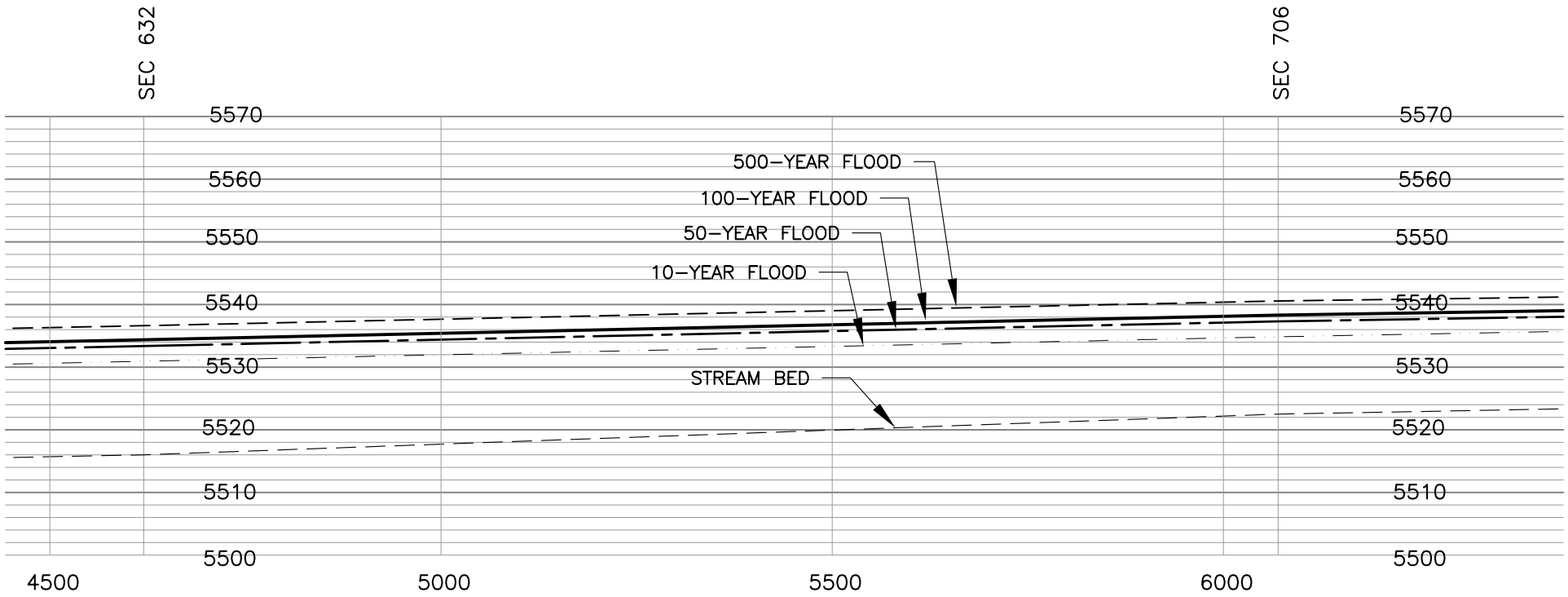


PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 2 OF 11

PROFILE SHEET 3

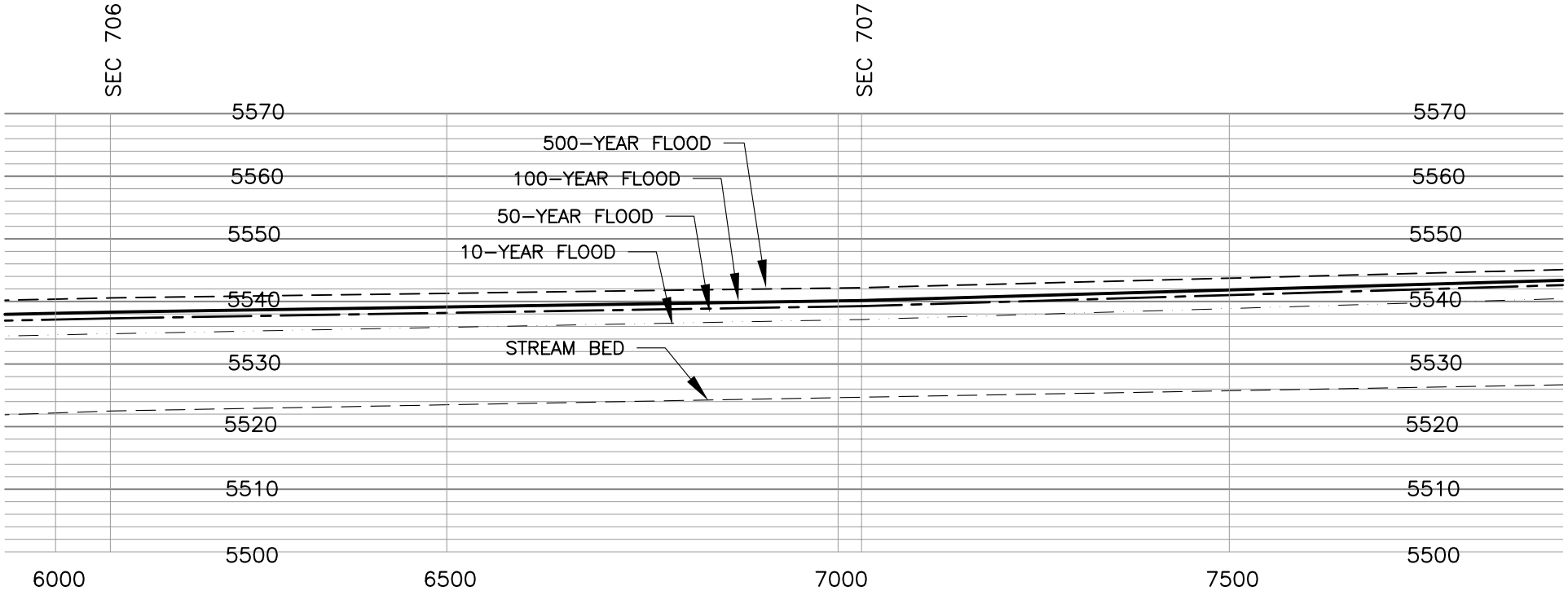


PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 3 OF 11



PROFILE SHEET 4

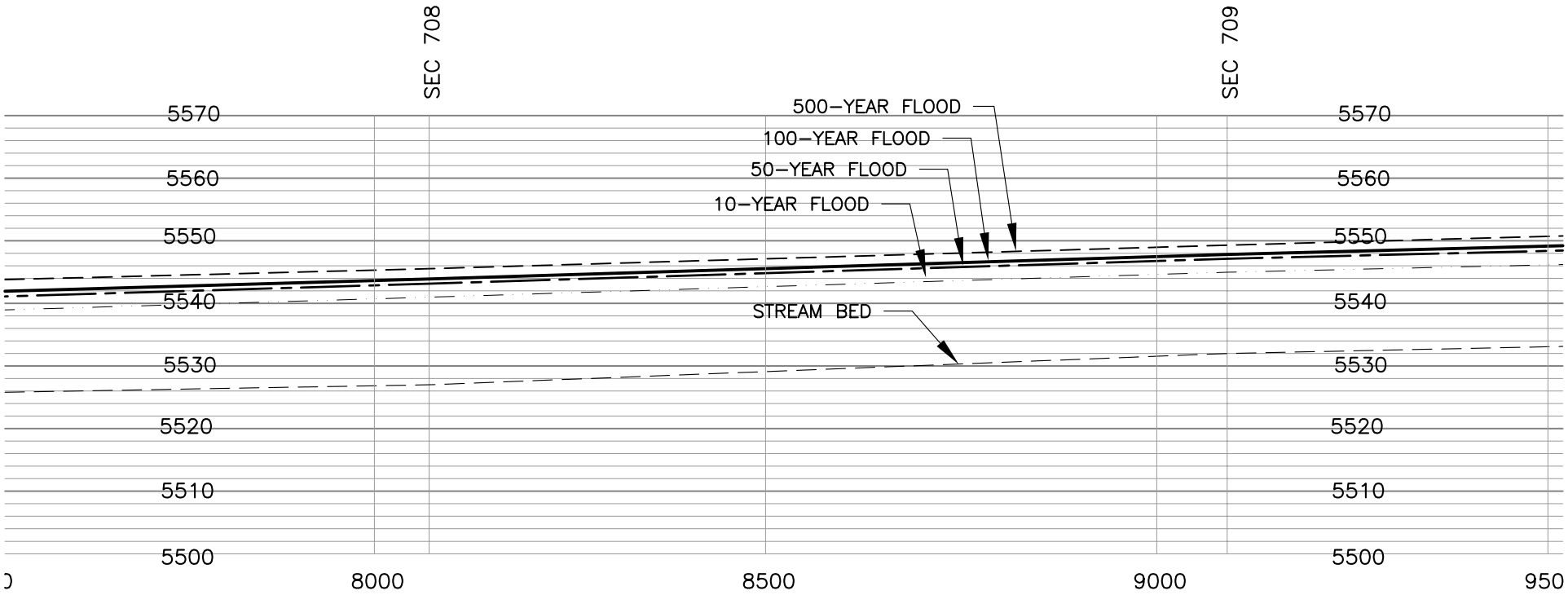
PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 4 OF 11



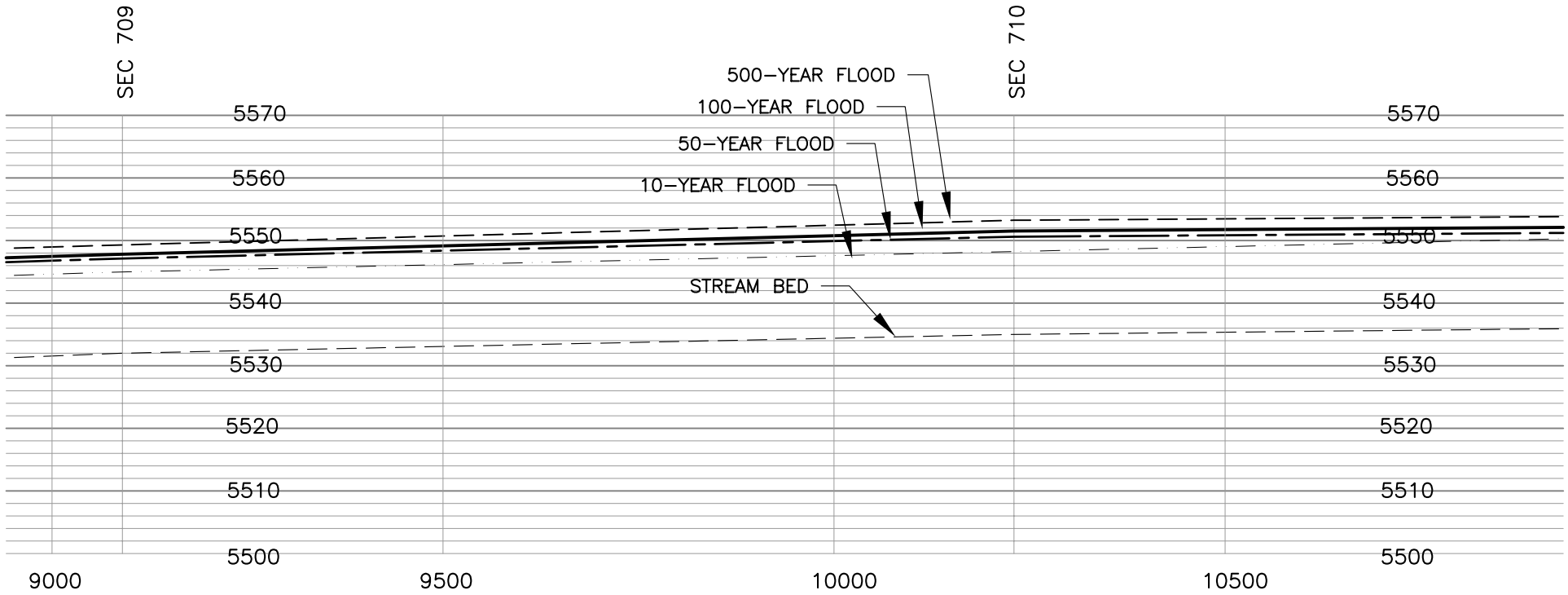
PROFILE SHEET 5

PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 5 OF 11

PROFILE SHEET 6

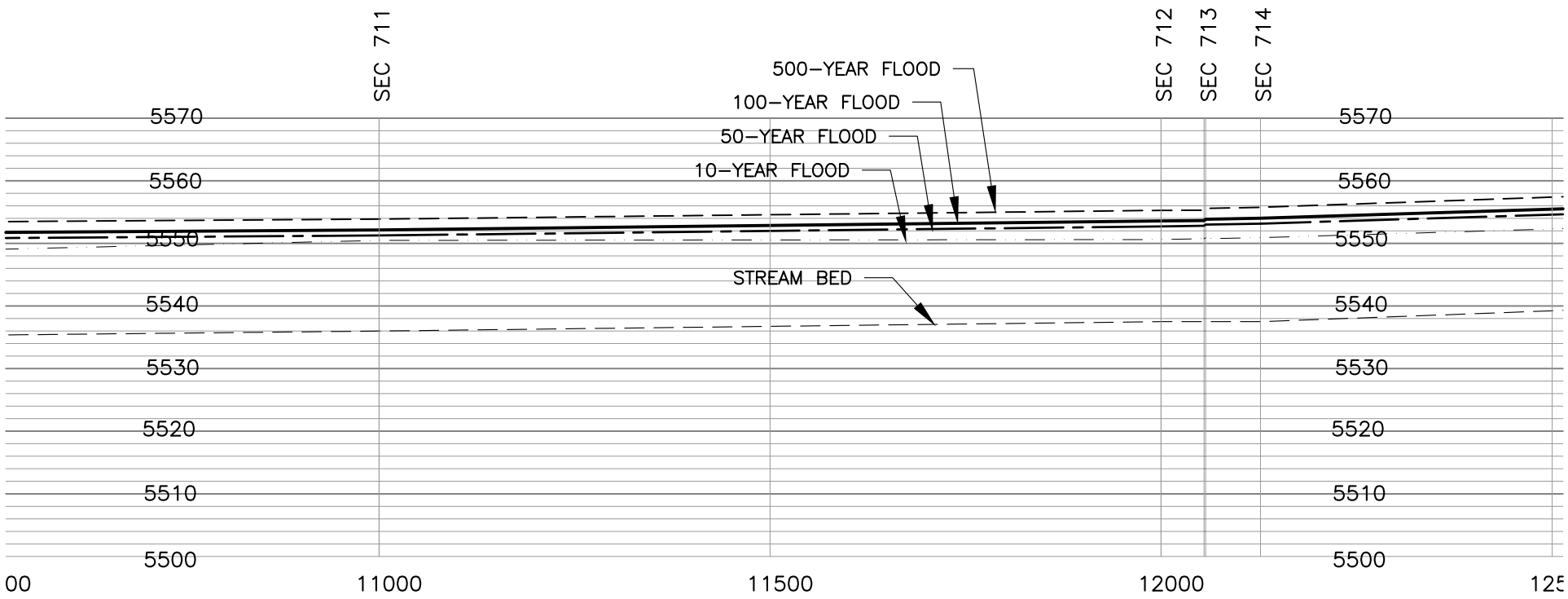


PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 6 OF 11



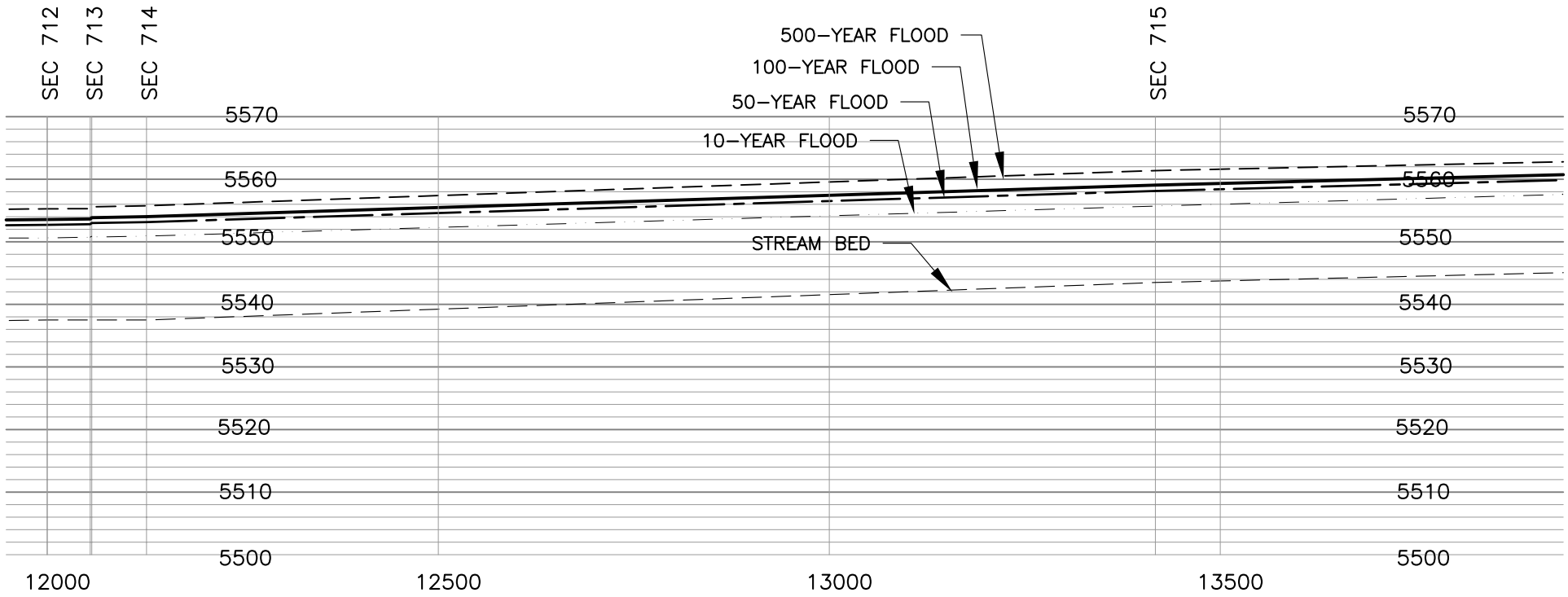
PROFILE SHEET 7

PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 7 OF 11



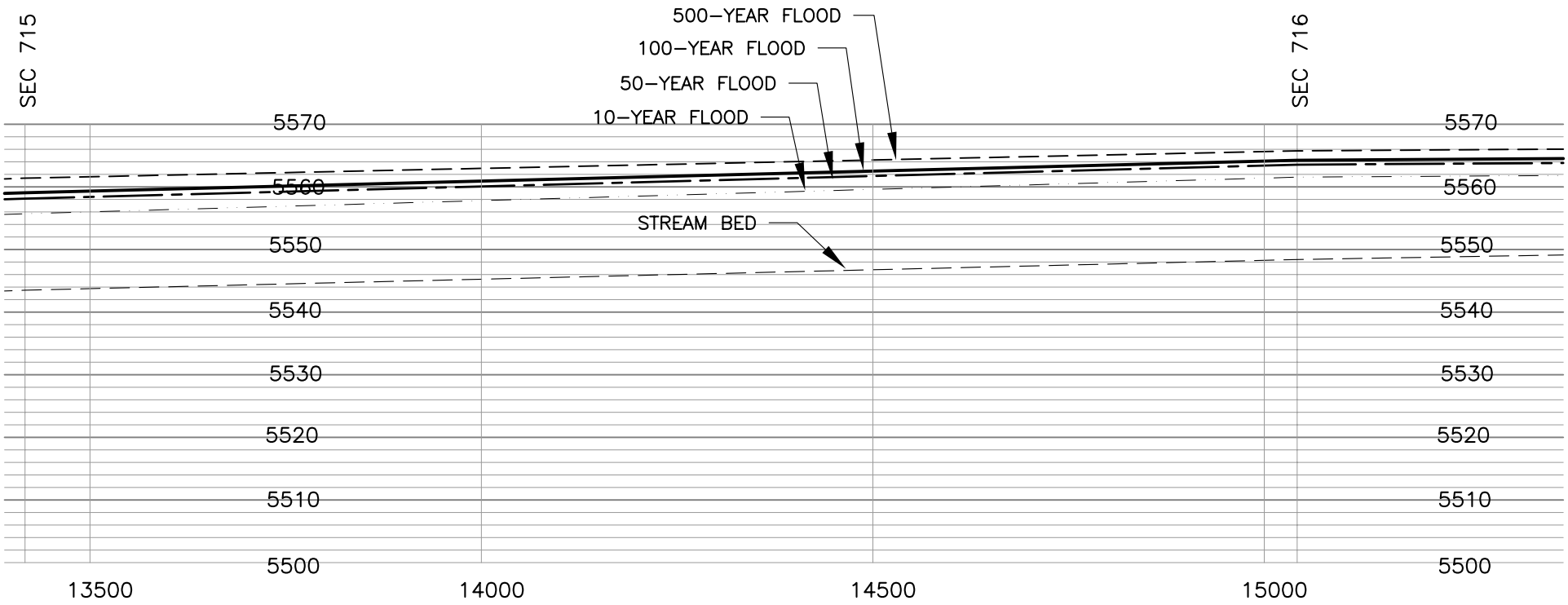
PROFILE SHEET 8

PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 8 OF 11



PROFILE SHEET 9

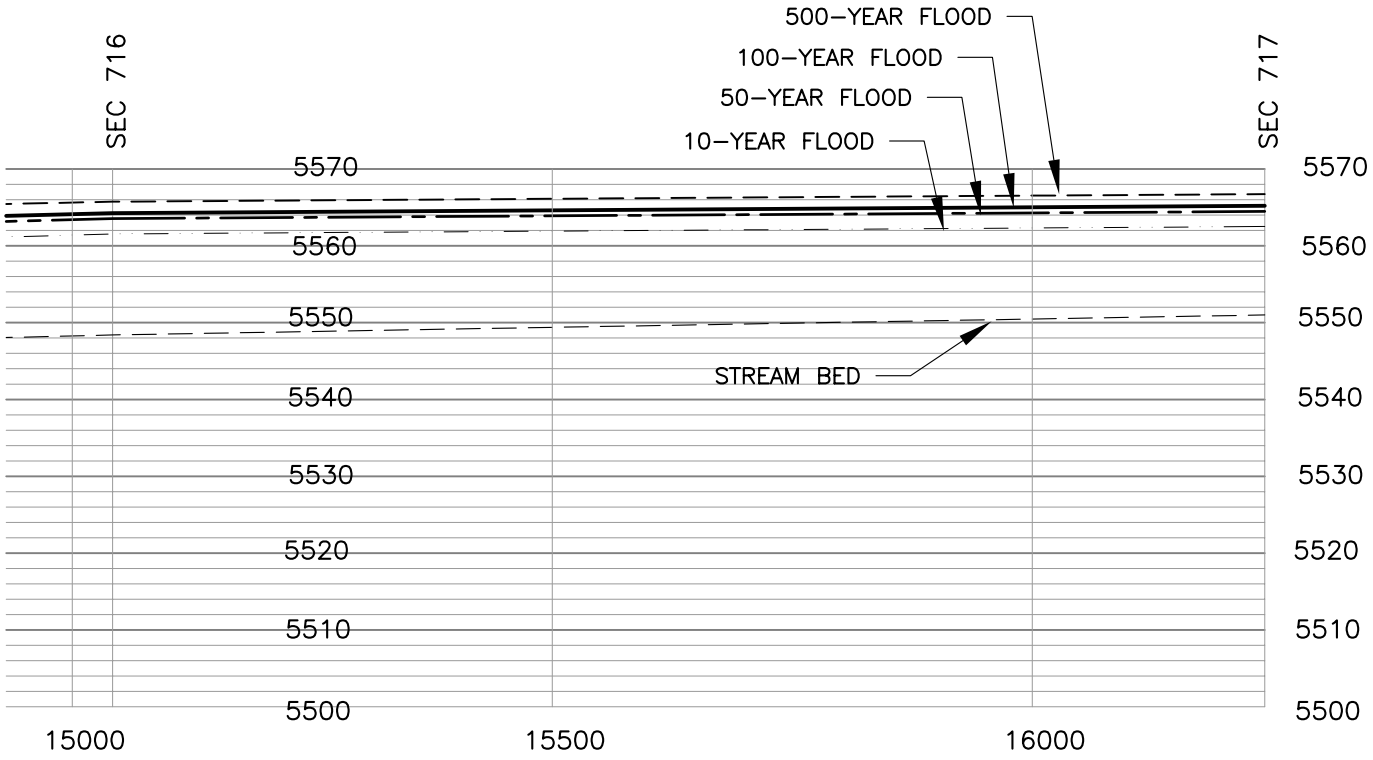
PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 9 OF 11



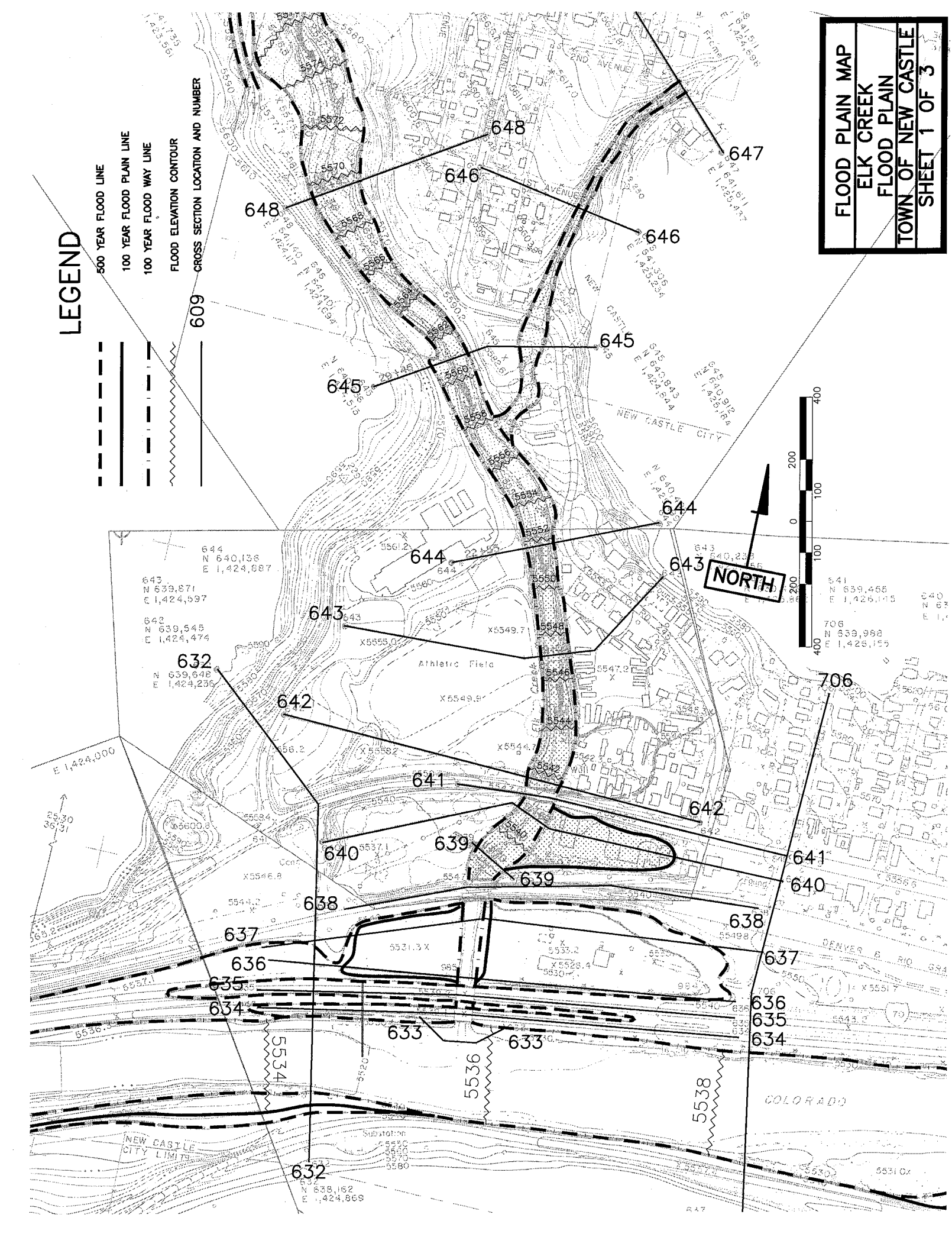
PROFILE SHEET 10

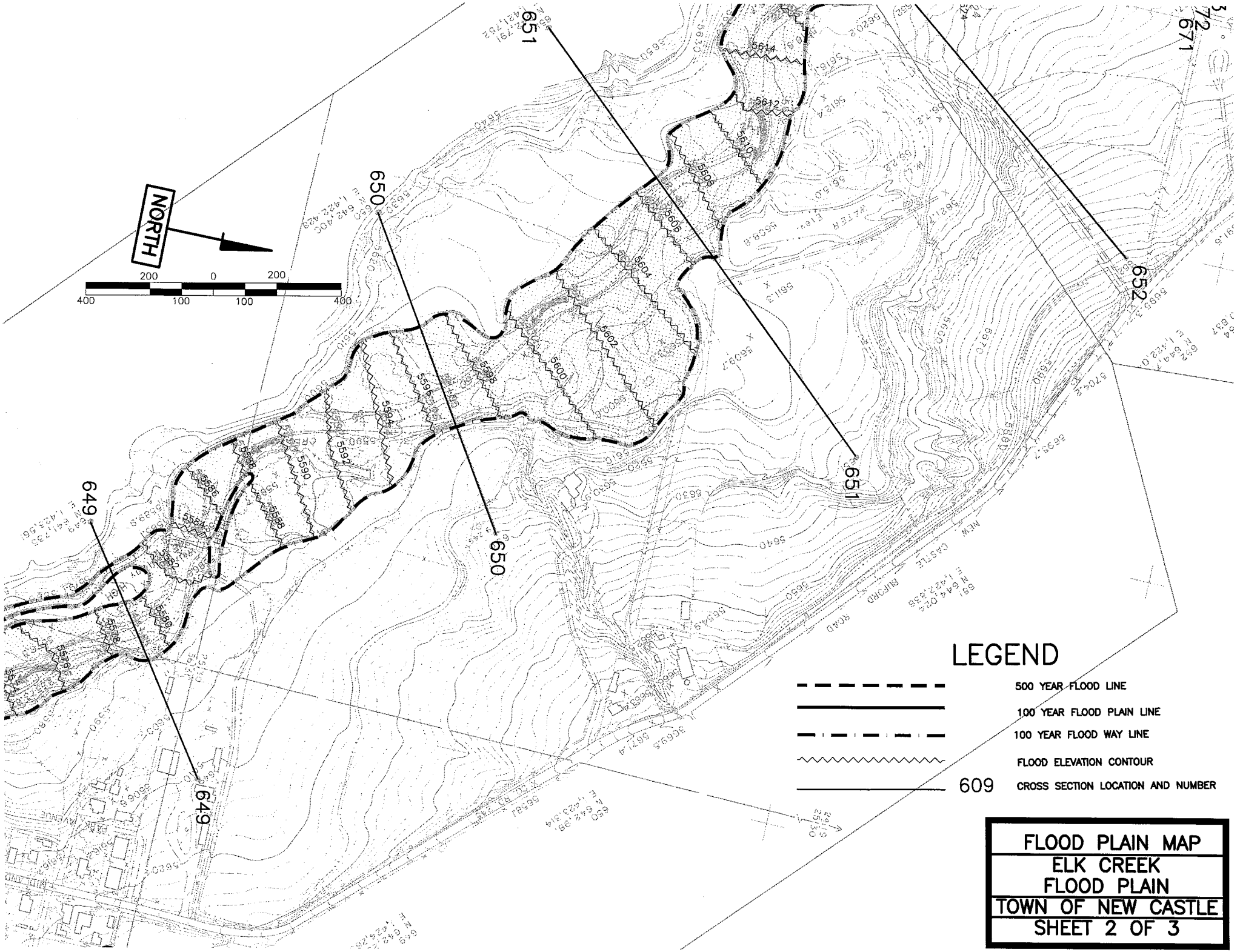
PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 10 OF 11

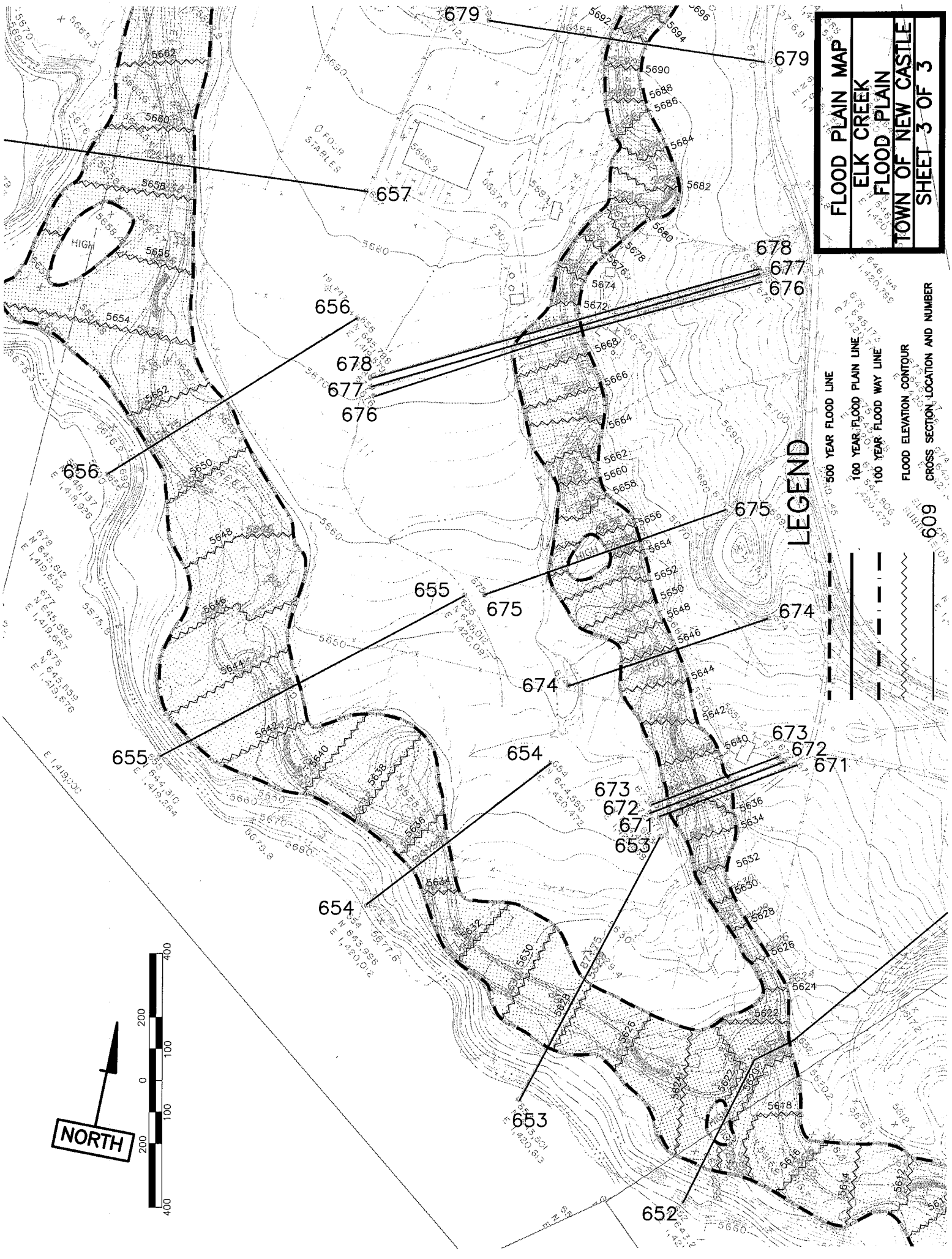
PROFILE SHEET 11

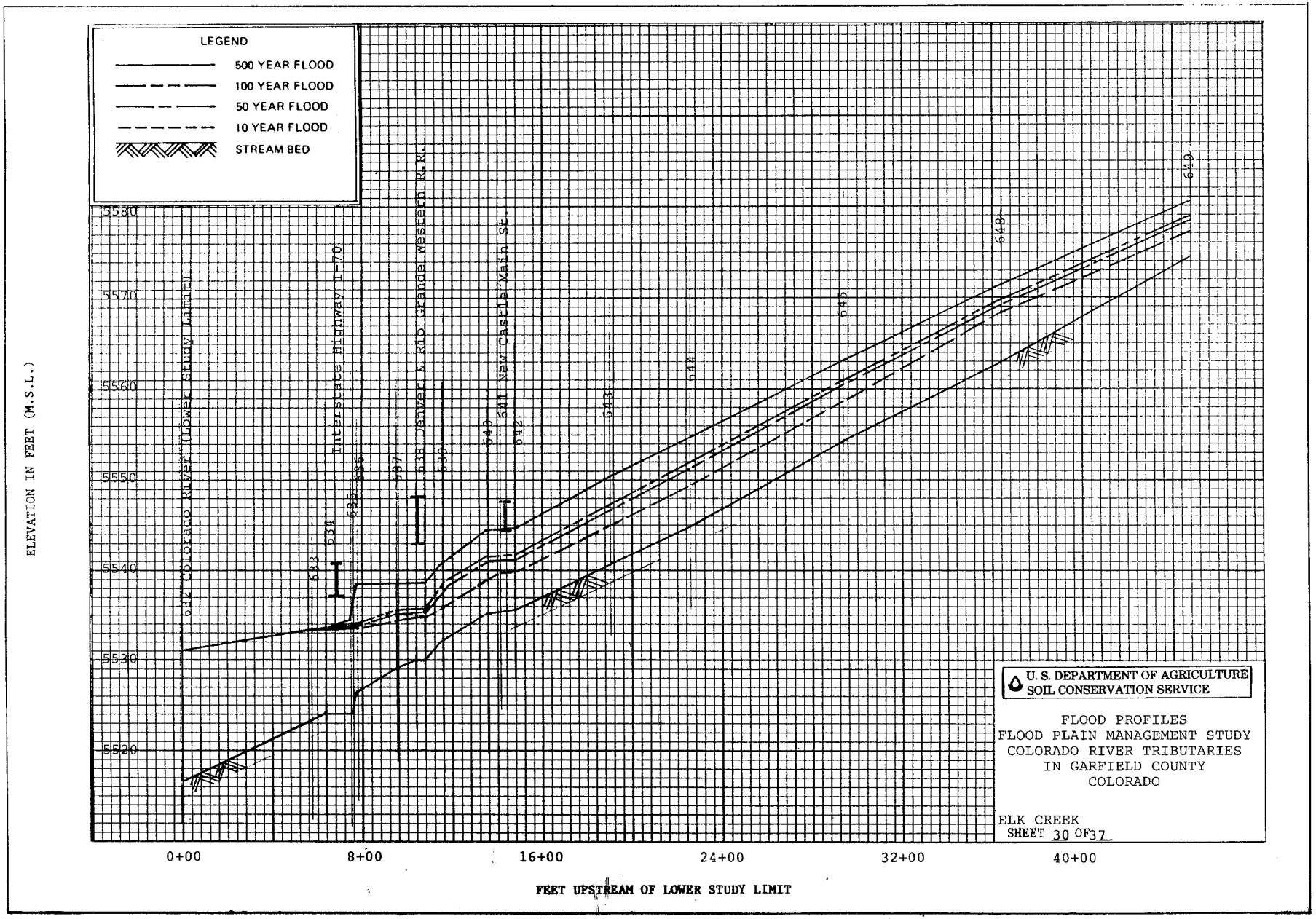


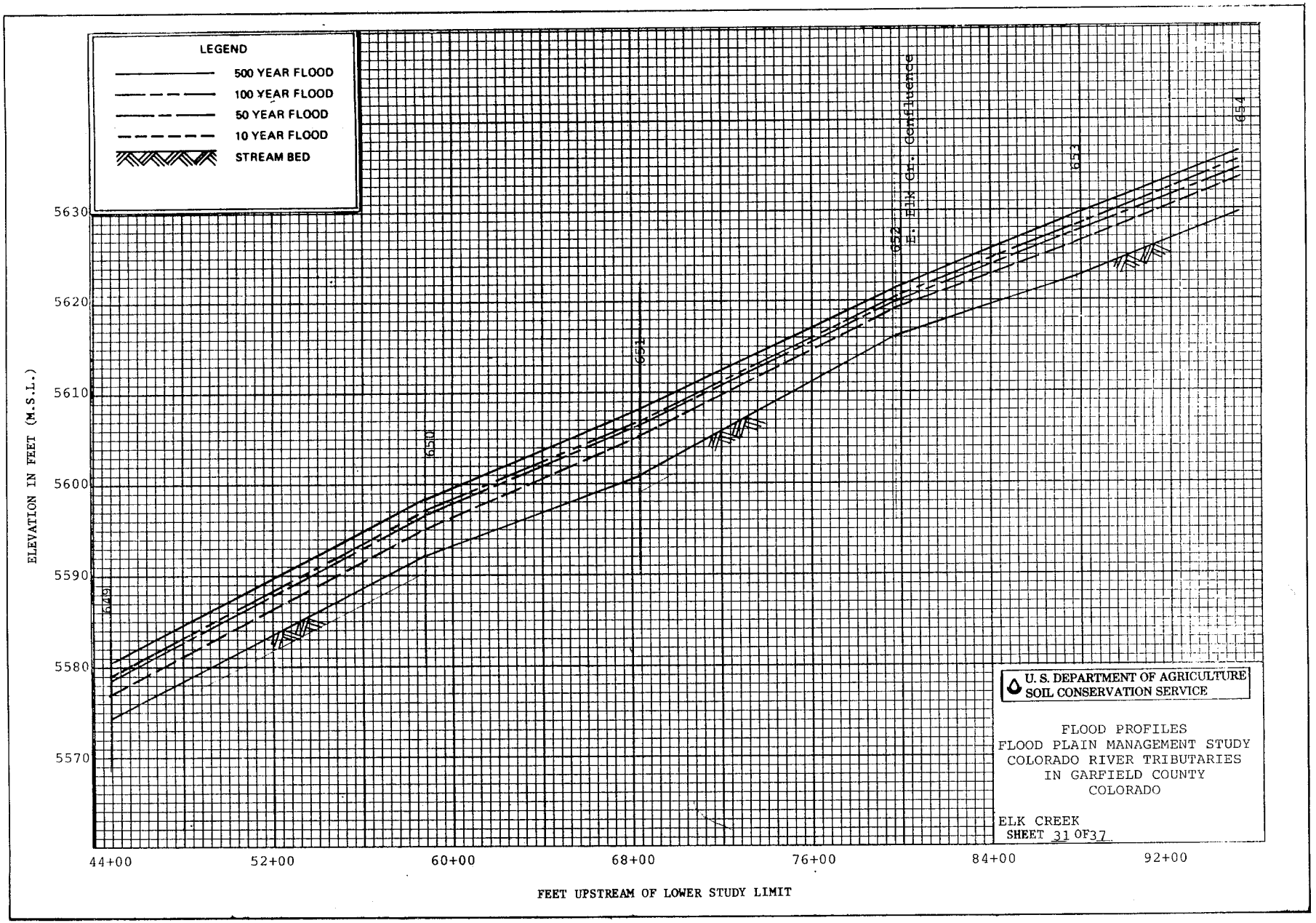
PROFILE SHEET
COLORADO RIVER FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 11 OF 11

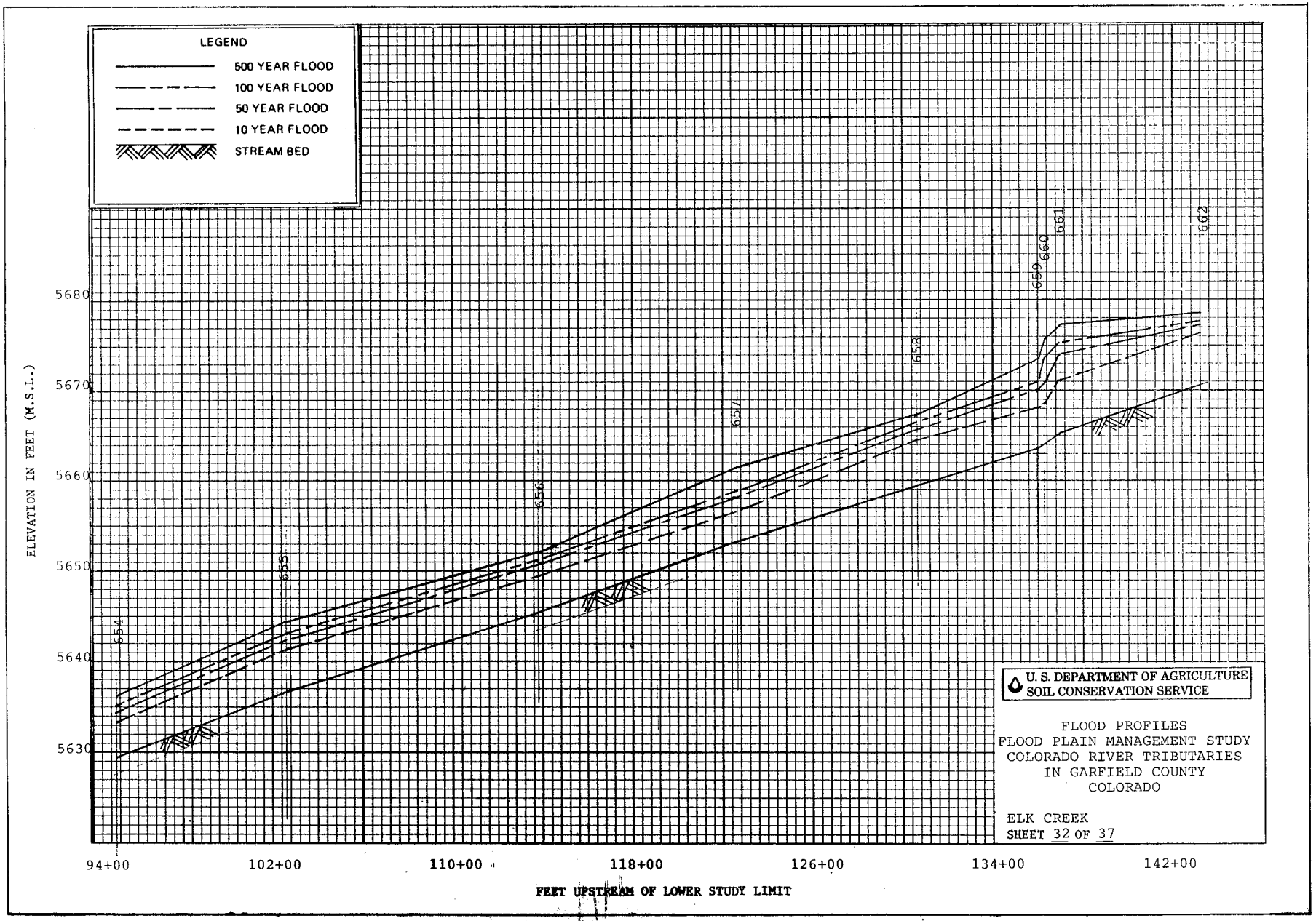

FLOOD PLAIN MAP
ELK CREEK
FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 1 OF 3
LEGEND
500 YEAR FLOOD LINE
100 YEAR FLOOD PLAIN LINE
100 YEAR FLOOD WAY LINE
FLOOD ELEVATION CONTOUR
CROSS SECTION LOCATION AND NUMBER
609
NORTH
400
200
0
100
200
400
NEW CASTLE CITY LIMITS
Athletic Field
COLORADO
5534
5536
5538
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
706

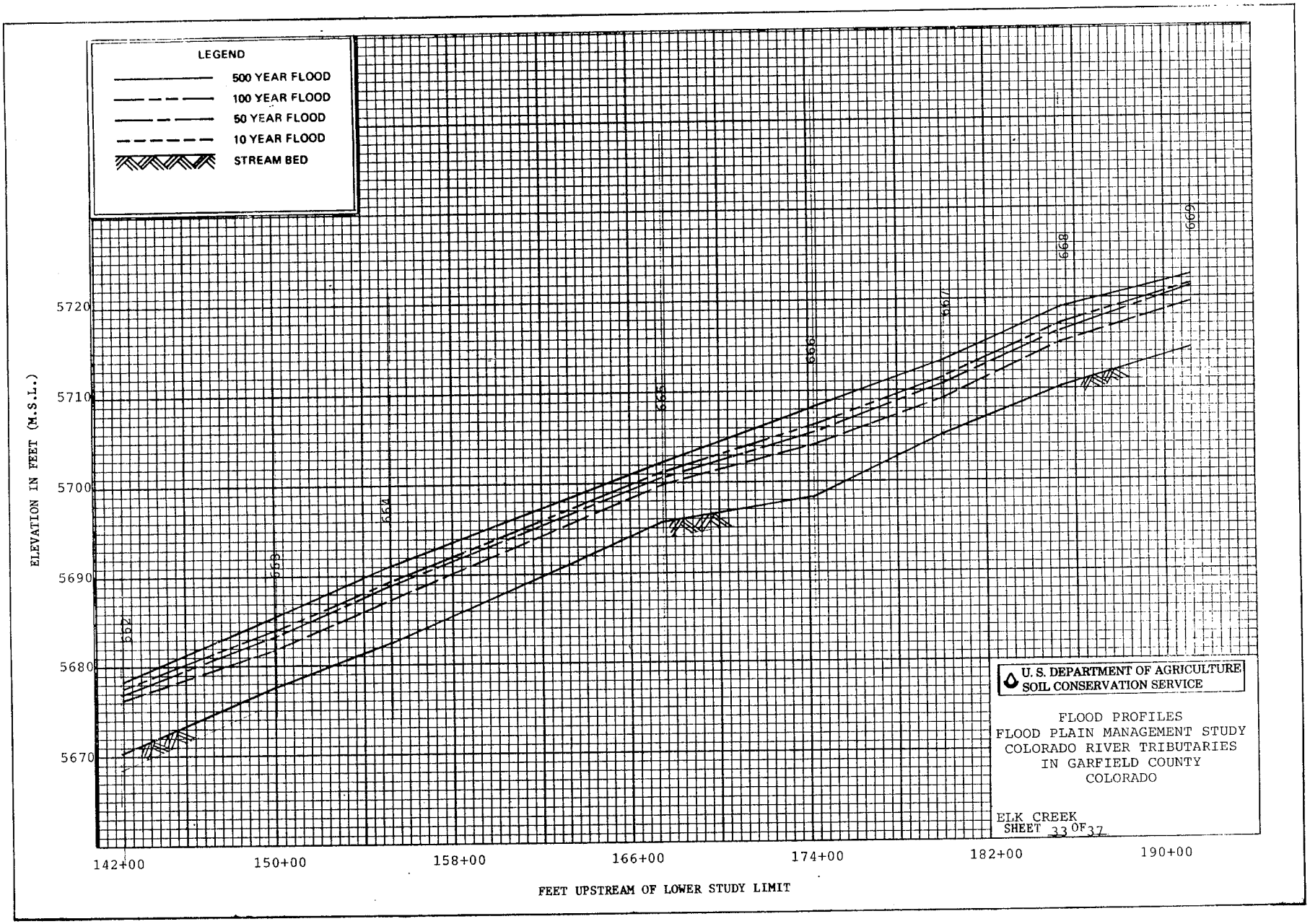

NORTH
200 0 200
400 100 100 400
649
650
651
652
671
LEGEND
500 YEAR FLOOD LINE
100 YEAR FLOOD PLAIN LINE
100 YEAR FLOOD WAY LINE
FLOOD ELEVATION CONTOUR
609 CROSS SECTION LOCATION AND NUMBER
FLOOD PLAIN MAP
ELK CREEK
FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 2 OF 3

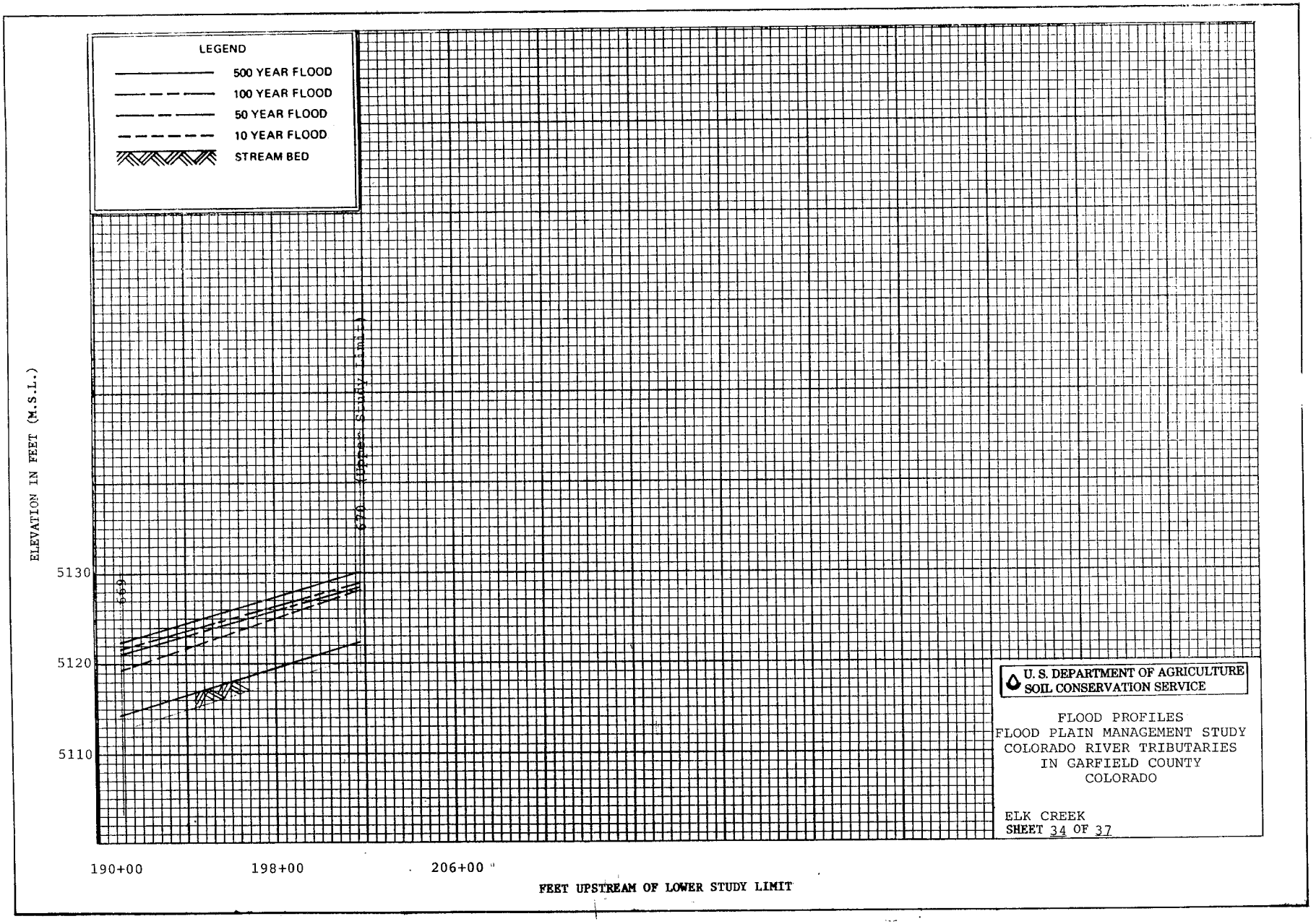

FLOOD PLAIN MAP
ELK CREEK
FLOOD PLAIN
TOWN OF NEW CASTLE
SHEET 3 OF 3
LEGEND
500 YEAR FLOOD LINE
100 YEAR FLOOD PLAIN LINE
100 YEAR FLOOD WAY LINE
FLOOD ELEVATION CONTOUR
CROSS SECTION LOCATION AND NUMBER
NORTH
679
678
677
676
675
674
673
672
671
657
656
655
654
653
652
609
HIGH
200
100
0
100
200
400

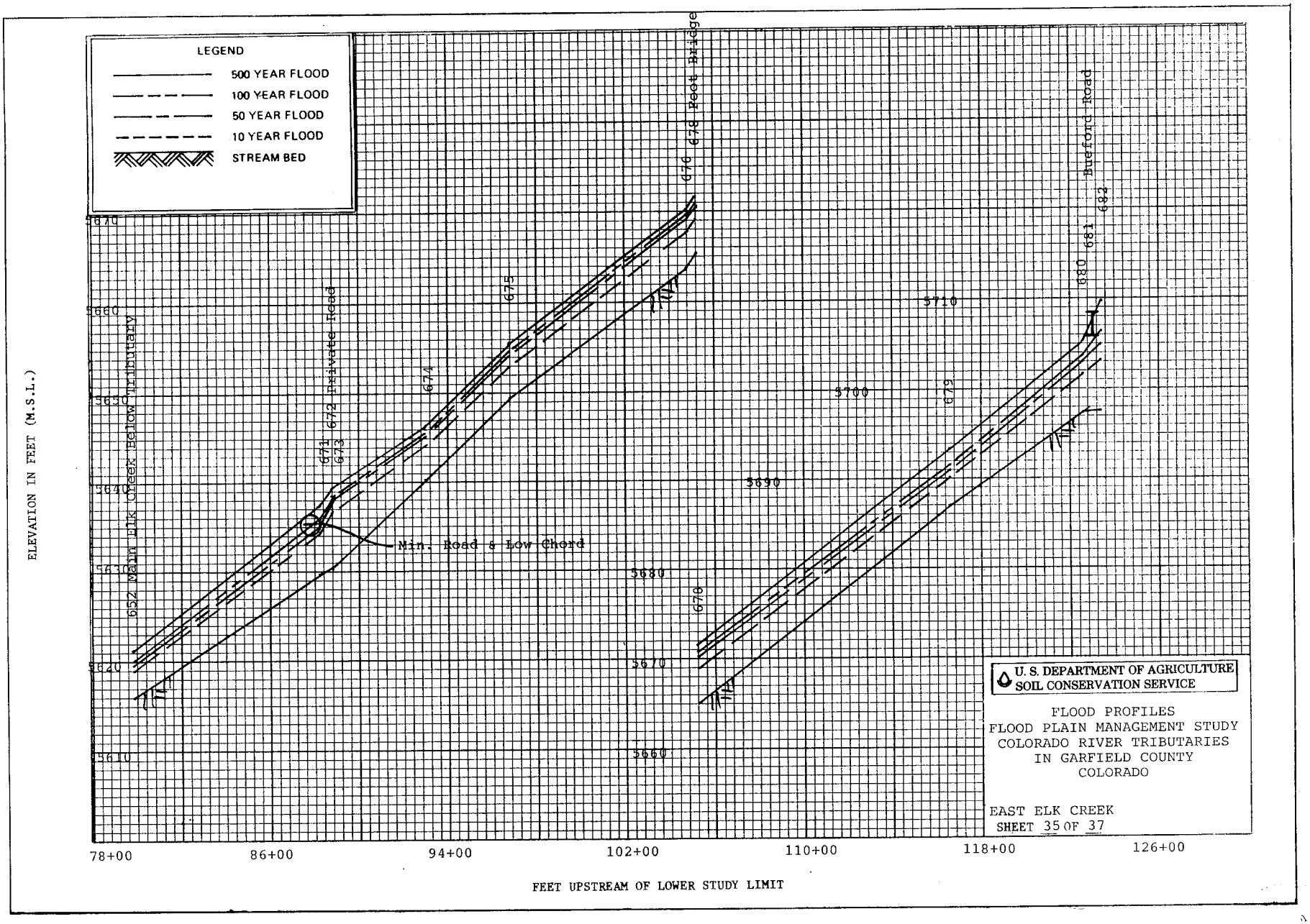

LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5580
5570
5560
5550
5540
5530
5520
632 Colorado River (Lower Study Limit)
633
634
Interstate Highway I-70
635
636
637
638 Denver & Rio Grande Western R.R.
639
641 New Castle Main St.
642
643
644
645
646
649
0+00
8+00
16+00
24+00
32+00
40+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
COLORADO RIVER TRIBUTARIES
IN GARFIELD COUNTY
COLORADO
ELK CREEK
SHEET 30 OF 37

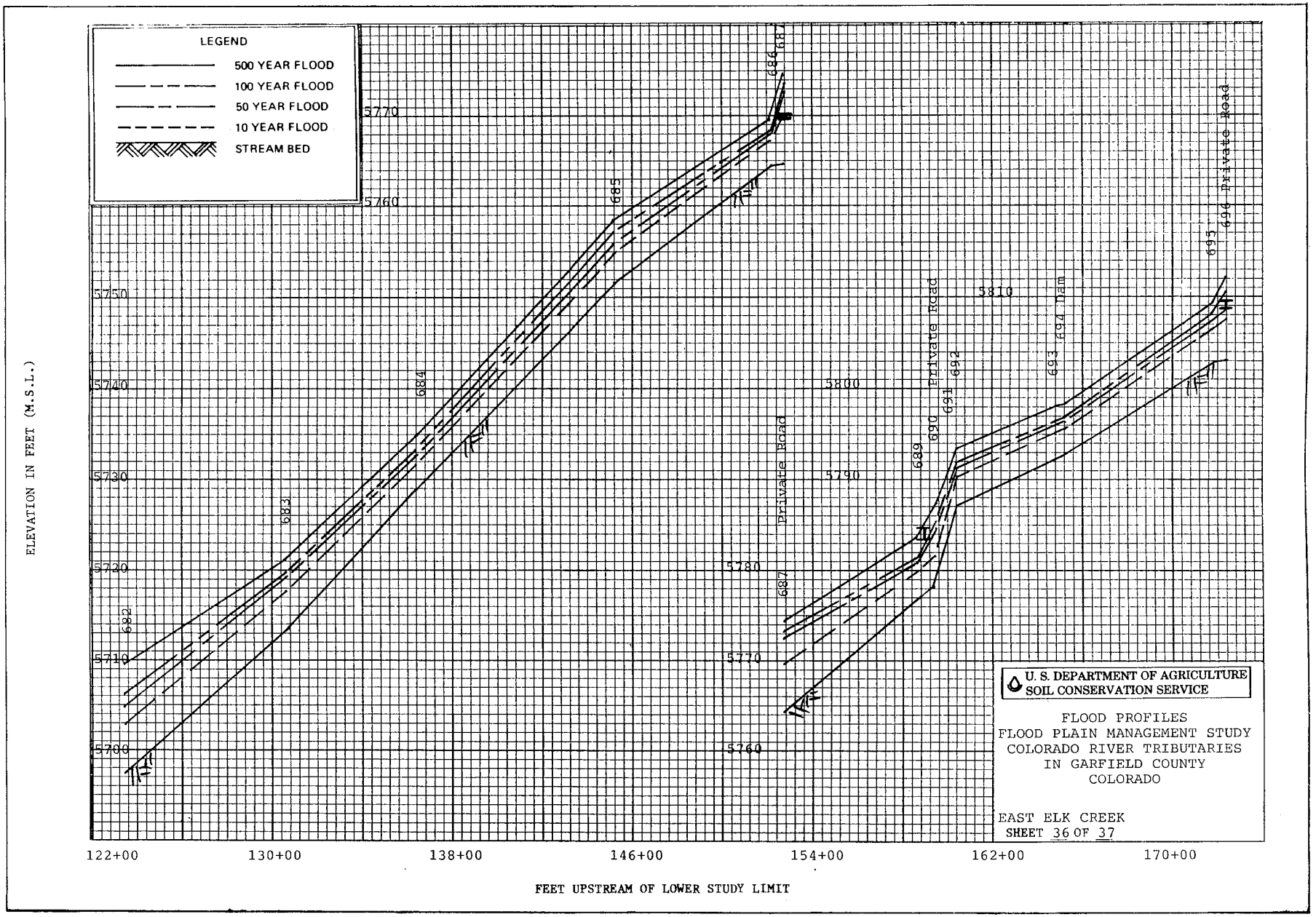

LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5630
5620
5610
5600
5590
5580
5570
649
650
652
E. Elk Cr. Confluence
653
654
44+00
52+00
60+00
68+00
76+00
84+00
92+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
COLORADO RIVER TRIBUTARIES
IN GARFIELD COUNTY
COLORADO
ELK CREEK
SHEET 31 OF 37

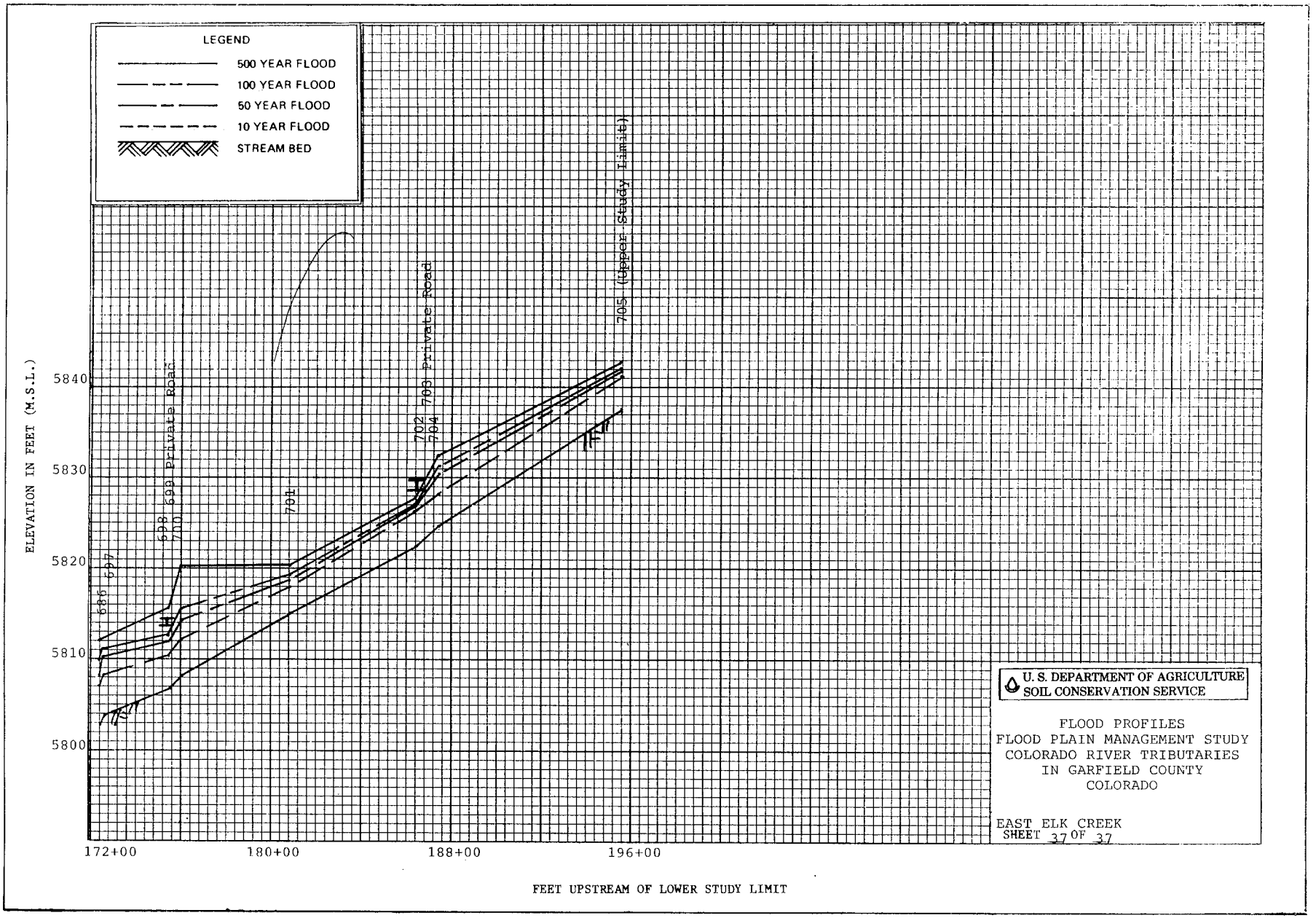

LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5680
5670
5660
5650
5640
5630
654
655
656
657
658
659
660
661
662
94+00
102+00
110+00
118+00
126+00
134+00
142+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
COLORADO RIVER TRIBUTARIES
IN GARFIELD COUNTY
COLORADO
ELK CREEK
SHEET 32 OF 37


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5720
5710
5700
5690
5680
5670
669
664
665
666
667
668
669
142+00
150+00
158+00
166+00
174+00
182+00
190+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
COLORADO RIVER TRIBUTARIES
IN GARFIELD COUNTY
COLORADO
ELK CREEK
SHEET 33 OF 37


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5130
5120
5110
669
670 (Upper Study Limit)
190+00
198+00
206+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
COLORADO RIVER TRIBUTARIES
IN GARFIELD COUNTY
COLORADO
ELK CREEK
SHEET 34 OF 37


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5670
5660
5650
5640
5630
5620
5610
5710
5700
5690
5680
5670
5660
652 Main Elk Creek Below Tributary
671
672 Private Road
673
674
675
676 Road Bridge
678
679
680
681
682 Buford Road
Min. Road & Low Chord
78+00
86+00
94+00
102+00
110+00
118+00
126+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
COLORADO RIVER TRIBUTARIES
IN GARFIELD COUNTY
COLORADO
EAST ELK CREEK
SHEET 35 OF 37


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5700
5710
5720
5730
5740
5750
5760
5770
5780
5790
5800
5810
682
683
684
685
686
687
689
690
691
692
693
694 Dam
695
696 Private Road
Private Road
Private Road
122+00
130+00
138+00
146+00
154+00
162+00
170+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
COLORADO RIVER TRIBUTARIES
IN GARFIELD COUNTY
COLORADO
EAST ELK CREEK
SHEET 36 OF 37


LEGEND
500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
ELEVATION IN FEET (M.S.L.)
5840
5830
5820
5810
5800
686
699
698 699 Private Road
700
701
702
704
703 Private Road
705 (Upper Study Limit)
172+00
180+00
188+00
196+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
COLORADO RIVER TRIBUTARIES
IN GARFIELD COUNTY
COLORADO
EAST ELK CREEK
SHEET 37 OF 37