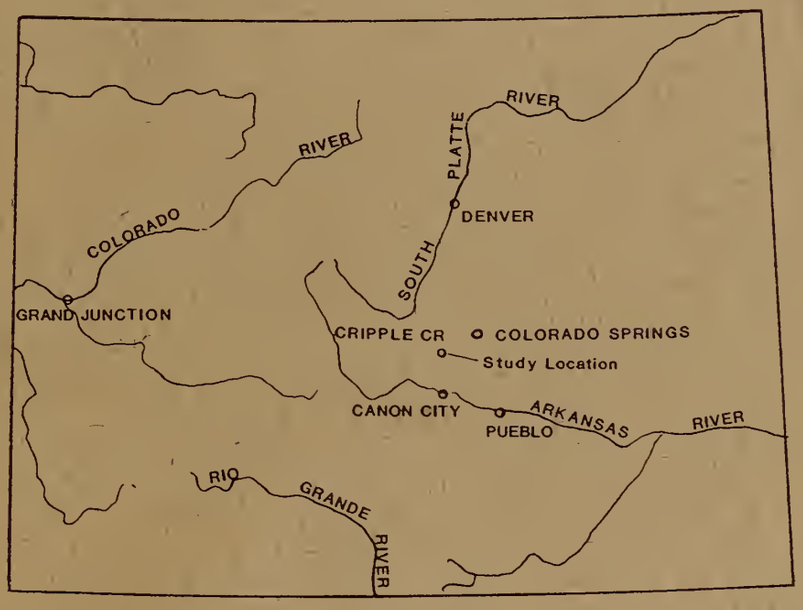
United States
Department of
Agriculture

Soil
Conservation
Service

Lakewood
Colorado

FLOOD PLAIN MANAGEMENT STUDY

CRIPPLE CREEK, COLORADO

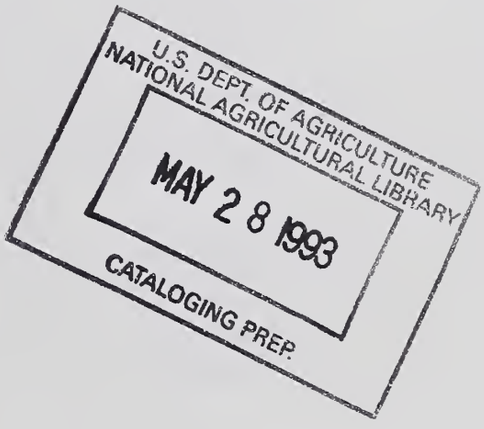


COLORADO

DECEMBER 1992

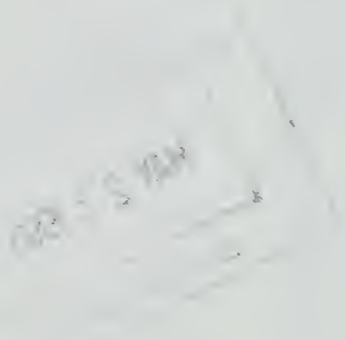
FLOOD PLAIN MANAGEMENT STUDY

CRIPPLE CREEK IN TELLER COUNTY, COLORADO



Prepared by the
U.S. Department of Agriculture
Soil Conservation Service
Lakewood, Colorado
in cooperation with the
Colorado Water Conservation Board
Teller County and the City of Cripple Creek

December 1992



PREFACE

This report includes information on the flood hazard areas along Cripple Creek and tributaries within the city of Cripple Creek, Colorado.

Because of the potential for flood damages, detailed flood hazard studies have been recognized as an essential item in guiding the use of flood plains. The purpose of this report is to provide adequate mapping and data for implementing flood plain management programs.

Rapid development is occurring within the city of Cripple Creek as a result of the authorization of limited stakes gambling. The only flood plain information currently available is an approximate map prepared by the Federal Emergency Management Agency. This map has been supplemented with additional flow data prepared by the Colorado Water Conservation Board. The available flood plain information is not suitable for guiding development and preventing structures from being built in the flood plain. Discussions with local residents, review of historic information, and field visits all indicate that there are definite flood problems in certain areas of the city.

Included in this report are information on past floods, the potential for future floods, flooded area maps, water surface profiles, selected cross sections, peak discharge data, and recommendations for reducing potential flood damages.

The Soil Conservation Service conducted the technical studies and prepared the report. These services were carried out in accordance with the Plan of Work of August, 1991.

The assistance and cooperation provided by the Colorado Water Conservation Board, Teller County, and the City of Cripple Creek are appreciated and gratefully acknowledged.

The field surveys, hydrologic, hydraulic, and other pertinent data and computations are on file with the U.S. Department of Agriculture, Soil Conservation Service, 655 Parfet St., Lakewood, Colorado 80215-5517, telephone (303) 236-2900. Additional copies of this report may be obtained from the Soil Conservation Service.

LIST OF TABLES, FIGURES, MAPS, EXHIBITS

INTRODUCTION

This flood plain management report was prepared by the U.S. Department of Agriculture, Soil Conservation Service, in cooperation with the Colorado Water Conservation, Teller County, and the City of Cripple Creek, Colorado. Interpretations of the flood plain management study and recommendations to reduce damages are included; however it is beyond the scope of this report to provide detailed proposals or plans to rectify the flooding problems.

Objectives

The objective of this study is to provide detailed flood plain management information and mapping to Teller County and the city of Cripple Creek for use in implementing flood plain management programs which will minimize potential flood losses. Included in the report are engineering and hydrologic data which will facilitate the development of a flood plain management plan, road and bridge designs, and flood control measures (if needed).

Authority

Section 37-60-106(1)(c), Colorado Revised Statutes, authorizes the Colorado Water Conservation Board "to designate and approve storm or floodwater runoff channels or basins, and to make such designations available to legislative bodies of cities and incorporated towns, to county planning commissions, and to boards of adjustment of cities, incorporated towns, and counties of this state". The board provides assistance to local governments in development and adoption of effective floodplain ordinances. In addition, the board will provide technical assistance to local entities during the performance of floodplain information studies within Colorado. Presently, direct financial assistance for the performance of floodplain studies is no longer available from the board.

Section 30-28-111 C.R.S. for county governments and Section 1-23-301 C.R.S. for municipal governments of the Colorado Revised Statutes, state the cities, incorporated towns, and counties within the study area may provide zoning regulations "...to establish, regulate, restrict, and limit such uses on or along any storm or floodwater runoff channel or basin that has been designated and approved by the Colorado Water Conservation Board, in order to lessen or avoid the hazards to persons and damage to property resulting from the accumulation of storm or floodwaters..."

Therefore, upon official approval of this report by the Colorado Water Conservation Board, the areas described as being inundated by the 100-year flood can be designated as flood hazard areas and their use regulated accordingly by the local governments.

Flood plain management studies are carried out by the Soil Conservation Service as an outgrowth of the recommendations in A Report by the Task Force on Federal Flood Control Policy, House Document No. 465 (89th Congress, August 10, 1966), especially Recommendation 9(c), Regulation of Land Use, which recommended the preparation of preliminary reports for guidance in those areas where assistance is needed before a full flood plain information report can be prepared or where a full report is not scheduled.

Authority for funding flood plain management studies is provided by Section 6 of Public Law 83-566, which authorizes the U.S. Department of Agriculture to cooperate with other federal, state and local agencies to make investigations and surveys of the watersheds and rivers and other waterways as a basis for the development of coordinated programs. In carrying out flood plain management studies, the Soil Conservation Service is being responsive to Executive Order 11988, entitled "Flood Plain Management", and Executive Order 11990, entitled "Protection of Wetlands" (both effective May 24, 1977).

DESCRIPTION OF STUDY AREA

Basin Characteristics

The watersheds that produce runoff to channels in and around Cripple Creek are relatively small in size and at high elevation. These two characteristics are very significant to the area hydrology. Elevations range from 10500 ft at the upper reaches of the watersheds to 9300 ft at the southern boundary of the city of Cripple Creek. Slopes range from 4 percent to 20 percent and greater.

The soils in the basin are alluvium along stream channels (hydrologic group B), and a mix of skeletal soils (hydrologic C and D) on the slopes accompanied by areas of rock outcrop (hydrologic group D). The parent material is generally Trachyte, a light colored igneous rock consisting essentially of alkalic feldspar with low shrink swell. There is no detailed soil survey report available for the basin.

The vegetation in the upper watersheds is predominately native range with some forest and rock outcrop areas. A significant part of the lower basin is occupied by residential and commercial properties. Past mining activities have left numerous scars in the watersheds where little vegetation exists.

The flood plains, within the study limits, generally contain typical residential and commercial property improvements such as buildings, yards, fences, streets, vehicles, etc. Vegetation such as lawns, shrubs, trees, flowers, and forbes are a part of the landscape. There are some willows and cottonwoods along those channels that have a sustained water supply. The channel does a considerable amount of meandering which enhances the visual aesthetics and wildlife habitat values in the area.

The mean annual precipitation for the basin ranges from 16 to 20 inches. The mean annual precipitation in Cripple Creek itself is 16.3 inches with July and August accounting for the greatest monthly values. Snowfall does occur throughout the winter period however there is no large accumulation. An analysis into the contribution of spring snowmelt to flooding suggests it is not a significant factor. Summer rains are the most likely to produce flooding in the study area.

Study Limits

The study includes most of the drainage ways within the corporate limits of the City of Cripple Creek. This includes the following reaches;

Reach	Length
Main Street Tributary	0.38 Miles
Cripple Creek	1.06
Poverty Gulch	0.41
Second Street Tributary	0.63
Courthouse Tributary	0.35
Thurlow Avenue Tributary	0.19
Pony Gulch	1.06
Total	4.26 Miles

An index map showing the location of flood plain mapping is included as figure 2. The flood plain maps themselves are shown as sheets 1 and 2 following the index map.

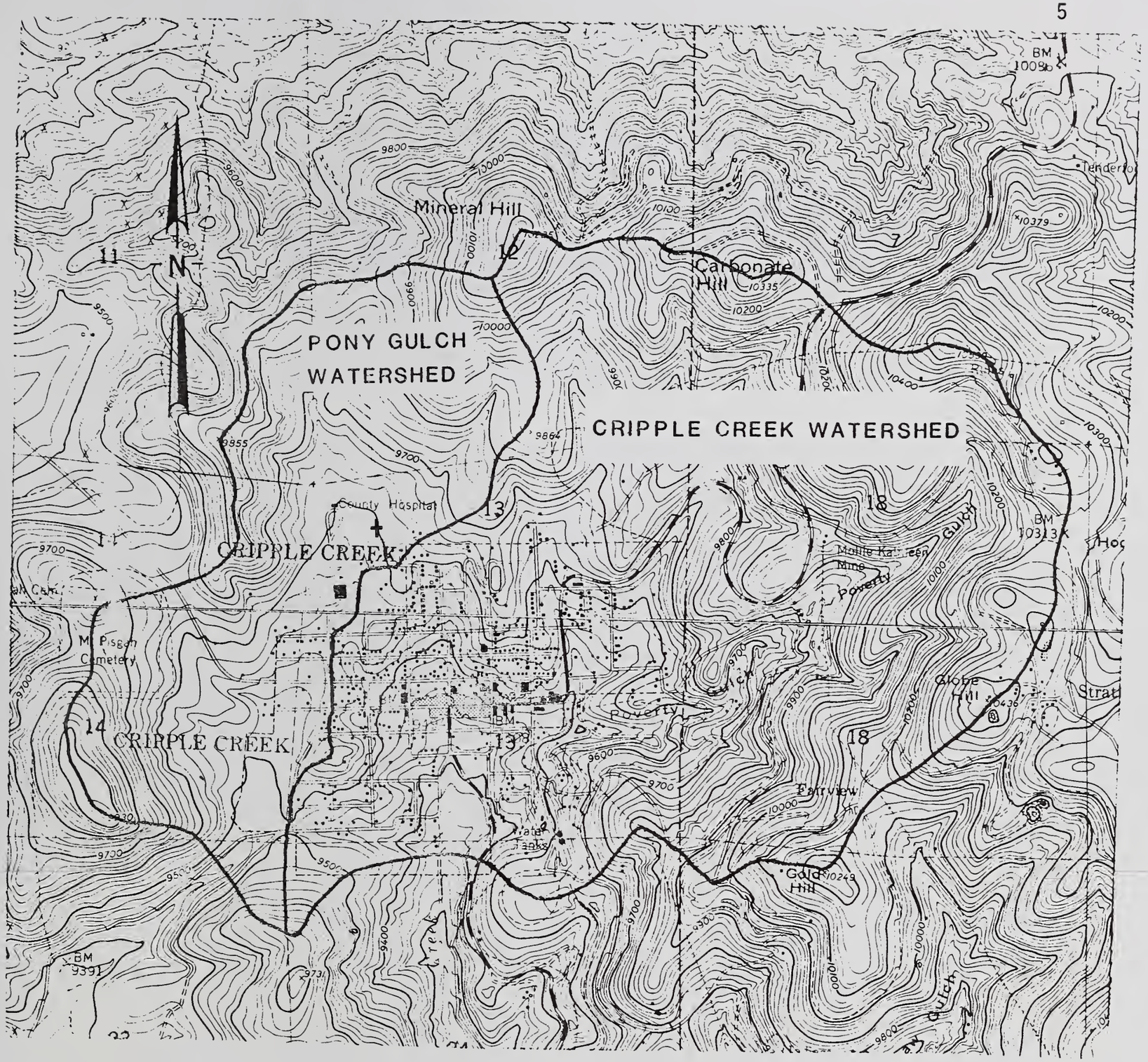


FIG 1

WATERSHED MAP

CRIPPLE CREEK FLOOD PLAIN MANAGEMENT STUDY

INVESTIGATIONS AND ANALYSIS

Interpretation and Use of Report

A. Frequency and Discharge

The 10-, 25-, 50-, and 100-year flood events are used as the flood frequencies for this flood plain analysis. Thus, the data developed in this report will be suitable not only for regulation purposes, and H.B. 1041 designation but is also consistent with Federal Insurance Administration flood insurance studies conducted by the Federal Emergency Management Agency.

These various flood events have an average occurrence of once in the number of years as indicated. For example, the 100-year flood occurs, on the average, once in a 100-year period, and has a one percent chance of being equaled or exceeded in any given year.

The particular uses for the various flood events in addition to those stated above are as follows:

10-year, 25-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.

100-year Flood Event

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 and the Federal Government consider 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.

B. Flood Elevation

Water surface elevations for the 10-, 25-, 50-, and 100-year floods, as determined at each cross section, may be found in Table 3 "Flood Frequency-Elevation and Discharge Data". The flood profile data (sheets 1-13) show a graphical relationship of water surface elevations along the stream reaches for the given frequencies. Selected typical cross sections from different reaches within the study area are shown on sheets 1 thru 6.

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.

C. Flooded Areas

Flood plain maps , sheets 1 and 2, show the boundary of the 100-year flood plain. The flood plain boundary was plotted using flood contour elevations and stationing from the plotted flood profiles. This was done at elevation intervals compatible with the map contour intervals. Flood contours are shown as wiggly lines at 5-ft intervals perpendicular to the direction of flow.

Rather than repeat review further details of the hydrology analysis, we refer to the previously mentioned drainage master plan which has good documentation of the methodology used.

Table 1 Runoff Curve Numbers (CN)

Land Use	Alluvium Along Streams	Hillside
Open Space (Parks etc)	79	87
Residential		
1/4 ac lots	75	85
1/2 ac lots	70	82
1 ac lots	68	81
Commercial & Business	92	94

Table 2 Rainfall Intensity I

	Frequency		
	10 yr	50 yr	100 yr
24 Hr Precip (In)	2.03	3.25	3.93
30 Min Precip (In)	0.77	1.23	1.49
I (In/Hr)	1.53	2.46	2.97

Hydraulics

Hydraulic analyses conducted in this study were done using U.S. Army Corp of Engineers computer model HEC-2. The general land slope in the study reach is greater than 4 percent, therefore supercritical flow conditions prevail through almost all study reaches.

It was determined by representatives of the Colorado Water Conservation Board, Soil Conservation Service, GMS Inc., and FEMA in a meeting on June 11, 1992 that a backwater analysis would be computed and used in preparing flood elevations for this study in lieu of using supercritical drawndown analysis. This is in compliance with FEMA's 1985 guidelines and specifications which state that flood hazard areas of natural streams with supercritical flow should be based upon the critical flow profile.

Discharge values were discussed in the hydrology section of this report. Most of the cross section data were digitized from topographic maps with a scale of 1 inch = 200 ft with 5-ft contour intervals. Some supplemental field surveys were made at specific sites and a number of additional cross sections needed at road crossings were developed from the topographic maps. Dimensions of bridges and hydraulic roughness coeficients (n- values) were determined from field investigations and from the "Drainage Master Plan for The City of Cripple Creek".

Water surface profiles, typical cross sections, and maps showing the 100-year flood boundaries are shown on included exhibits and flood plain maps. Table 3 shows computed flood elevations at specific cross sections.

Flood boundaries were located on the set of topographic maps, previously referred to, by transferring flood elevations (at map contour intervals) from plotted profiles (from HEC-2) to the maps using stationing along the main channel as the location reference. These points were connected and smoothed to create the map flood boundaries.

Changes are being made almost daily in Cripple Creek. Some have an influence on the watershed hydraulic characteristics therefore the following assumptions are made pertaining to recent constructions projects:

1. A new double-cell culvert is in place on Cripple Creek at Fourth Street and Meyers Avenue.
2. A new pipeline system is in place along Second Street between Warren Avenue and Carr Avenue which will essentially eliminate the flood plain through that reach.
3. A project near the Cripple Creek/Victor School at the intersection of "A" Street and West Avenue will prevent any trans-basin diversion of flood waters between Pony Gulch and Second Street tributary.

FLOOD PLAIN MANAGEMENT

Potential flood damages to existing development and possible loss of life can be alleviated or lessened through non-structural and structural flood hazard mitigation methods.

Non-structural methods include: local flood plain regulations, land treatment, flood warning and forecasting systems, flood insurance, flood proofing, flood fighting and emergency evacuations.

Local Regulations

The need to minimize property damage due to flooding has been recognized by planners and local community officials. Subdividers and developers are required to submit proposed storm drainage plans to the planning commission for approval. In the past, drainage plans have been prepared singularly or on a plat-by-plat basis. Information contained in this report will be useful in developing a master drainage plan for the study area. This report provides the outline of flood hazard areas on large scale maps specifically for this purpose.

The city may provide zoning regulations "...to establish, regulate, restrict, and limit such uses on or along any storm or floodwater runoff channel or basin, as such storm or floodwater runoff channel or basin has designated and approved by the Colorado Water Conservation Board, in order to lessen or avoid the hazards to persons and damage to property resulting from the accumulation of storm or floodwaters..." as stated in Section 30-28-111 for county governments and Sections 31-23-302 for municipal governments of the Colorado Revised Statutes.

Colorado Natural Hazard Area Regulations

In 1974, the Colorado General Assembly passed House Bill 1041, a bill "concerning land use, and providing for identification, designation, and administration of areas and activities of State interest,..." (H.B. 1041, Title 24, Article 65.1, CRS, as amended). Areas of State interest include natural hazard areas, or those areas that are "so adverse to past, current, or foreseeable construction or land use as to constitute a significant hazard to public health and safety or to property". Flood plains are natural hazard areas.

With reference to the administration of natural hazard areas, Section 24-65.1-202(2)(a) of the Act provides: Flood plains shall be administered so as to minimize significant hazard to public health and safety or to property; open space activities shall be encouraged; structures shall be designed in terms of use and hazards; disposal sites and systems shall be discouraged which, in time of flooding, would create significant hazards to public health and safety or to property.

The Act further provides that after promulgation of guidelines for land use in natural hazard areas..., the natural hazard areas shall be administered by local government in a manner which is consistent with the guidelines for land use in each of the natural hazard areas.

Colorado Water Conservation Board Designation

Concerning the designation of the flood plain, the Colorado Water Conservation Board is charged with the primary responsibility for:

1. Making recommendations to local governments and the Colorado Land Use Commission.
2. Providing technical assistance to local governments.

The Board's power and duty is...

> ...to devise and formulate methods, means and plans for bringing about the greater utilization of the waters of the state and prevention of flood damages therefrom, and to designate and approve storm or floodwater runoff channels or basins, and to make such designations available to legislative bodies of cities and incorporated towns, to county planning commissions, and to boards of adjustment of cities, incorporated towns, and counties of this state"..

as stated in Section 37-60-106 (1)(c) of the Colorado Revised Statutes.

Upon review and approval of this report, the Colorado Water Conservation Board will designate and approve as flood plain areas those areas inundated by the 100-year flood as described by the floodwater surface elevations and profiles in this report. The use of the designated flood plain areas may then be regulated by the local government.

Model Regulations

Model flood plain regulations have been promulgated by the Colorado Water Conservation Board, with the purpose to promote public health, safety, and general welfare, and minimize flood hazards and losses. The model includes provisions designed to:

1. Promote sound planning and permit only such uses within flood plains that will not endanger life, health, and public safety or property in times of flooding.
2. Protect the public from avoidable financial expenditures for flood control projects, flood relief measures, and the repair and restoration of damaged public facilities.
3. Prevent avoidable interruption of business and commerce.
4. Minimize victimization of unwary home and land purchases.
5. Facilitate the administration of flood hazard areas by establishing requirements that must be met before use or development is permitted.

The Board's model flood plain regulations offer two options for management of the 100-year flood plain. These are the Hazard Area Concept and the Floodway Concept.

The Hazard Area concept defines the areas of the flood plain in which waters of the 100-year flood attain a maximum depth greater than one and one-half feet as a high hazard area, and a depth less than this as a low hazard area.

The Floodway concept defines the channel of a stream and adjacent flood plain areas that must be kept free of development in order to safely pass the 100-year flood with a minimal rise in the water surface elevation. The rise must be no more than one foot to meet federal standards.

Flood Insurance

The National Flood Insurance Act of 1968 (Title XIII of the Housing and Urban development Act, P.L. 90-448) recognized the necessity for flood plain management. This Act makes federally subsidized insurance available to citizens in communities that adopt regulations controlling future developments of their flood plain. With respect to encroachment on the flood plain, the regulations require:

1. New residential construction or substantial improvement of existing homes must have the lowest floor level at or above the elevation of the 100-year flood.
2. Non-residential construction must meet the same standard or be flood proofed to that level.

The 1968 Act benefits owners of structures already in the flood-prone areas by providing insurance coverage that had been unavailable through private companies. The Act created a cooperative program of insurance against flood damage by the private flood insurance industry and the federal government.

The amount of coverage available and the premium rate varies considerably depending on property location within the flood plain and the property value. All property owners shown in this study to be within areas subject to flooding should consider the purchase of flood insurance.

Additional information on the Flood Insurance Program is available from local insurance agents or brokers and the:

Federal Emergency Management Agency, Region VIII
Natural and Technological Hazard Division
Building 710
Denver Federal Center
Denver, Co 80225
Telephone 235-4830

The National Flood Insurance Program used the floodway concept in its rate studies for communities participating in the regular phase of the program.

Flood Warning and Flood Forecasting Systems

The National Oceanic and Atmospheric Administration (NOAA) through it's National Weather Service (NWS), maintains year-round surveillance of weather and flood conditions. Daily weather forecasts are issued through the NWS and disseminated by radio and television stations. A general alert to the danger of flash flooding is one of the services provided by the NWS.

The office of the Colorado State Engineer, Division of Water Resources, in cooperation with the National Weather Service, operates a statewide flood warning system utilizing 78 stream gaging stations that are part of the Colorado satellite-linked water resources monitoring network operated by the State Engineer.

Evacuation Plan

An "Emergency Evacuation and Operations Plan" would provide for alerting the public of potential flooding, and coordinating community and county services during an emergency. Plan implementation during the time of an emergency requires cooperation of the general public as well as local officials. This is especially important for flood fighting, evacuation, and rescue operations. Communication is extremely important during flood alerts. Warnings issued through the NWS are disseminated by radio to state and local officials.

RECOMMENDATIONS

The following recommendations are included for consideration in reducing potential flood damages:

1. Carry out periodic maintenance of bridges and culverts to preserve hydraulic capacity.
2. Implement design recommendations included in the "Drainage Master Plan for The City of Cripple Creek".
3. Do detailed study of need for flood proofing around facilities in the flood plain or consider flood insurance.
4. Information and education programs on flood hazards should be made available to the public.
5. The main channels should be maintained to preserve a balance between native vegetation, conveyance capacity, channel stability, and provide wildlife habitat.

GLOSSARY OF TERMS

Channel - A natural or artificial water course of perceptible extent with definite banks to confine and conduct continuously or periodically flowing water. Channel flow is that water which is flowing within the limits of the defined channel.

Flood - Water from a river, stream, water course, lake or other body of standing water, that temporarily overflows the boundaries within which it is ordinarily confined.

Flood Crest - The maximum stage or elevation reached by the waters of a flood at a given location.

Flood Frequency - A means of expressing the probability of flood occurrences as determined from statistical analysis of representative streamflow or rainfall and runoff records. The frequency of a particular stage or discharge is usually expressed as occurring once in a specified number of years. The 10-, 50-, 100-, and 500-year frequency floods have an average frequency of occurrence in the order of once in the number of years indicated.

Flood Hazard Areas - Areas susceptible to flood damage.

Flood Peak - The highest stage or discharge attained during a flood event; also referred to as peak stage or peak discharge.

Flood Plain - The relatively flat or lowland area adjoining a river, stream, watercourse, lake, or other body of water which has been or may be covered temporarily by flood water. For administrative purposes the flood plain may be defined as the area that would be inundated by the 100-year flood.

Left or Right Stream Bank - The left or right bank of the stream looking downstream.

Perched Channel Flow - A condition where the flow elevation in the outer portions of the flood plain is higher than the flow elevation in the main channel. This condition occurs when a secondary channel receives inflow from some location upstream and maintains a flatter slope than the main channel.

Reach - A hydraulic engineering term used to describe longitudinal segments of a stream or river.

Runoff - That part of precipitation, as well as any other flow contributions, which appears in surface streams of either perennial or intermittent form.

Stream - Any natural channel or depression through which water flows whether continuously, or intermittently, including modification of the natural channel or depression.

Structure - Anything constructed or erected, the use of which requires a more or less permanent location on or in the ground. Includes but is not limited to bridges, buildings, canals, dams, ditches, diversions, irrigation systems, pumps, pipelines, railroads, roads, sewage disposal systems, underground conduits, water supply systems and wells.

Valley Cross Section - A plotting of the topography of a stream channel and adjoining landscape as viewed perpendicular to the flow in a downstream direction. The plotting represents a specified location within a designated stream reach.

Water Surface Profile - (This term is synonymous with Flood Profile) - a graph showing the longitudinal relationship of the water surface elevation of a flood event to location along a stream or river.

Watershed - A drainage basin or area which contributes to runoff and transmits it usually by means of streams and tributaries to the outlet of the basin.

BIBLIOGRAPHY AND REFERENCES

Colorado Water Conservation Board - Manual for Local Governments, Flood Plain Management, Flood Control and Flood Disaster Programs, June 1976.

Colorado Water Conservation Board - Rules and Regulations for the Designation and Approval of Floodplains and of Storm or Floodwater Runoff Channels in Colorado, Effective 1/30/88.

Colorado Water Conservation Board - Model Floodplain Regulations, September 22, 1988.

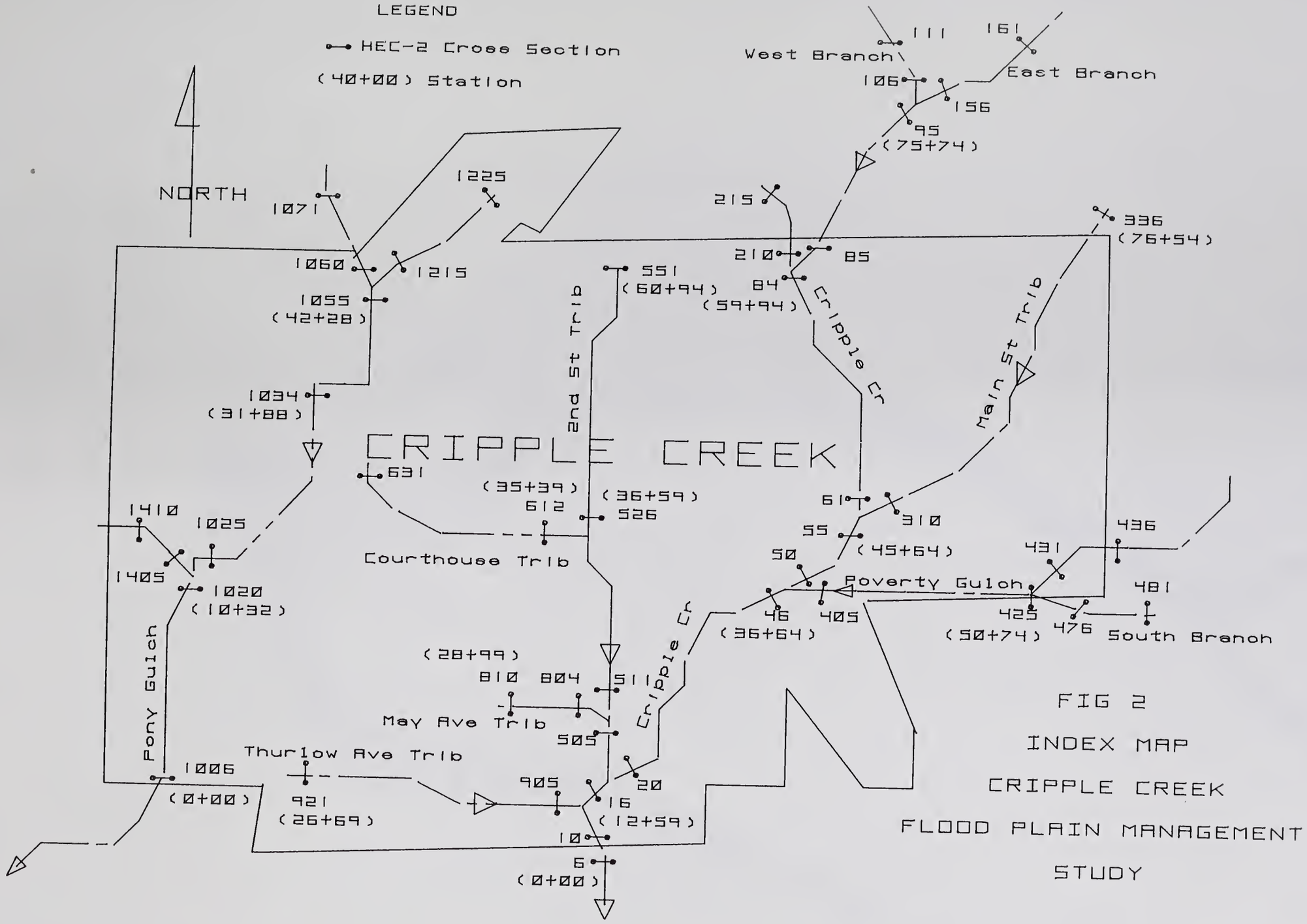
Department of Agriculture, Soil Conservation Service - Flood Plain Management and Wetlands Protection, Implementation of Executive Orders 11988, Federal Register, Vol. 43, No. 107, June 2, 1978.

GMS, Inc. Consulting Engineers - Drainage Master Plan for The City of Cripple Creek, Apr, 1992.

U.S. Department of Agriculture, Soil Conservation Service - Guide for Selecting Roughness Coeficients "N" Values for Channels, December 1973.

U.S. Department of the Army, Corps of Engineers - HEC-2 Water Surface Profile, September 1982.

U.S. Geological Survey - Determination of Roughness Coefficients For Streams in Colorado, 1985.p


LEGEND
HEC-2 Cross Section
(40+00) Station
NORTH
CRIPPLE CREEK
West Branch
East Branch
2nd St Trib
Cripple Cr
Main St Trib
Courthouse Trib
May Ave Trib
Thurlow Ave Trib
Pony Gulch
Poverty Gulch
South Branch
111
161
106
156
95
(75+74)
1225
1071
215
336
(76+54)
1060
1215
210
85
84
(59+94)
551
(60+94)
1055
(42+28)
1034
(31+88)
631
(35+39)
612
(36+59)
526
1410
1025
1405
1020
(10+32)
1006
(0+00)
921
(26+69)
(28+99)
810
804
511
505
905
16
(12+59)
10
6
(0+00)
20
61
310
55
(45+64)
50
46
(36+64)
405
436
431
481
425
(50+74)
476
FIG 2
INDEX MAP
CRIPPLE CREEK
FLOOD PLAIN MANAGEMENT
STUDY

TOPOGRAPHY COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY TAKEN OCTOBER, 1989. THE MAPS WERE PROVIDED TO THE CITY OF CRIPPLE CREEK BY THE PIKES PEAK MINING COMPANY.

THE COLORADO WATER CONSERVATION BOARD PROVIDED VERTICAL CONTROL AS NEEDED AND FORESIGHT WEST SURVEYING PREPARED ACCOMPANYING HORIZONTAL GROUND CONTROL.

CROSS SECTION DATA WAS DIGITIZED BY INTRASEARCH INC. FROM AERIAL PHOTOGRAPHY TAKEN IN 1991

THESE MAPS COMPLY WITH NATIONAL MAP ACCURACY STANDARDS.

100-YEAR FLOOD BOUNDARY

5520 100-YEAR FLOOD ELEVATION

CROSS SECTION

R STREAM CENTERLINE AND STATION IN 100 FT FROM LOWER STUDY LIMIT

200 0 200 400
SCALE FEET
MAP CONTOUR INTERVAL = 5 FT

SHEET INDEX

FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY
COLORADO

SHEET 1 OF 2

TOPOGRAPHY COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY TAKEN OCTOBER, 1989. THE MAPS WERE PROVIDED TO THE CITY OF CRIPPLE CREEK BY THE PIKES PEAK MINING COMPANY.

THE COLORADO WATER CONSERVATION BOARD PROVIDED VERTICAL CONTROL AS NEEDED AND FORESIGHT WEST SURVEYING PREPARED ACCOMPANYING HORIZONTAL GROUND CONTROL.

CROSS SECTION DATA WAS DIGITIZED BY INTRASEARCH INC., FROM AERIAL PHOTOGRAPHY TAKEN IN 1991.

THESE MAPS COMPLY WITH NATIONAL MAP ACCURACY STANDARDS.

100-YEAR FLOOD BOUNDARY

9528 100-YEAR FLOOD ELEVATION

CROSS SECTION

STREAM CENTERLINE AND STATION IN 100 FT FROM LOWER STUDY LIMIT

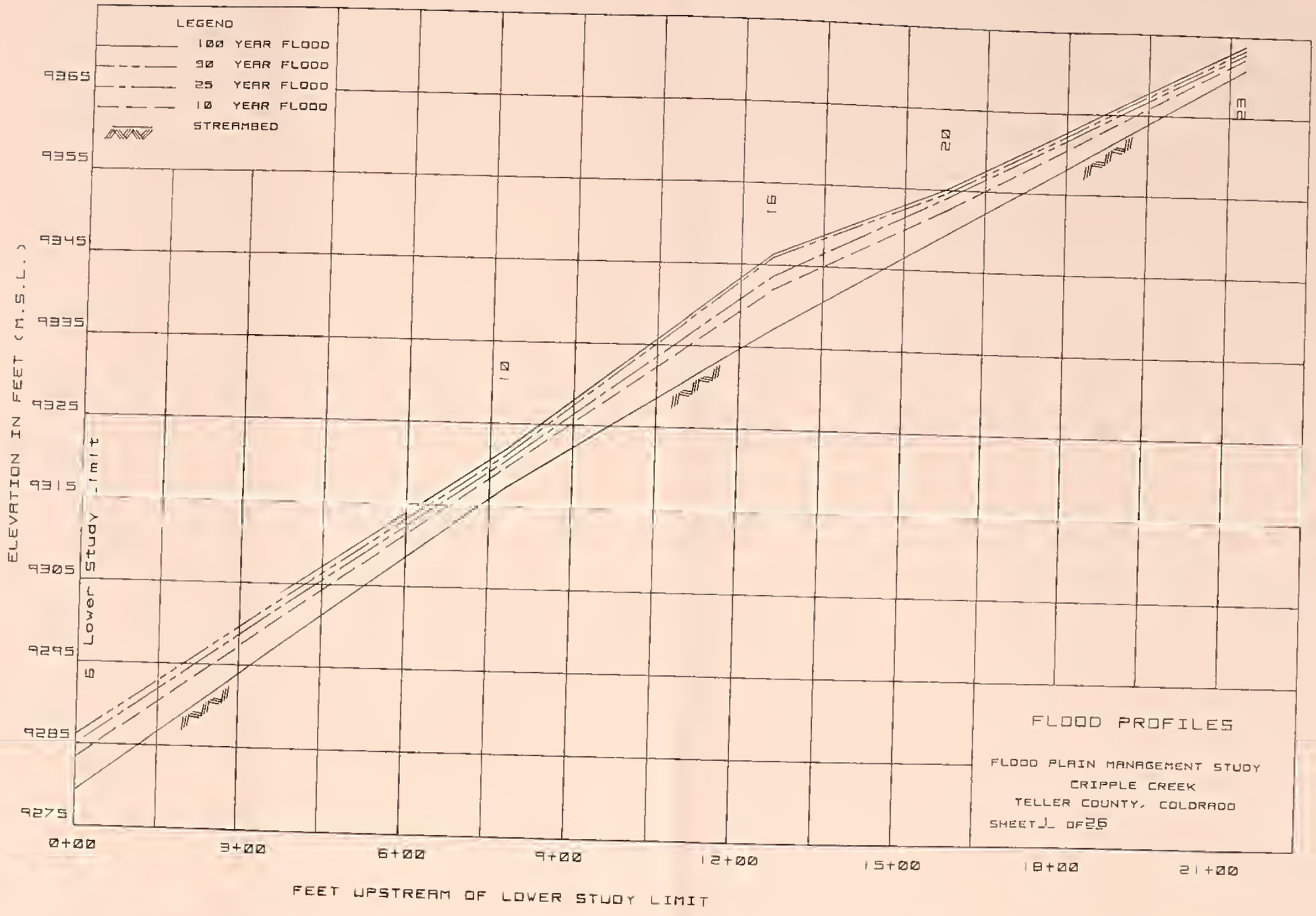
SCALE 200 0 200 400 FEET

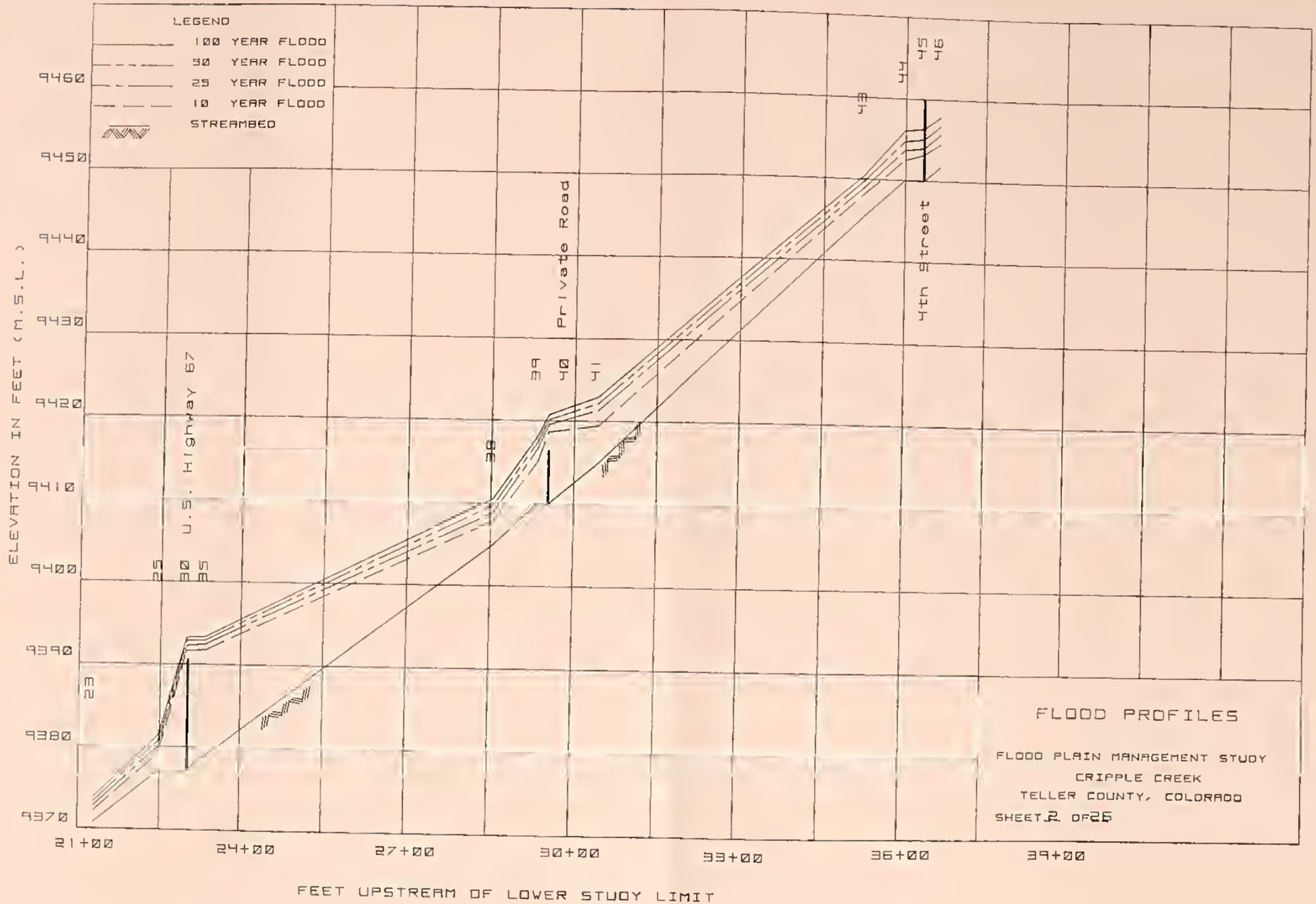
MAP CONTOUR INTERVAL = 5 FT

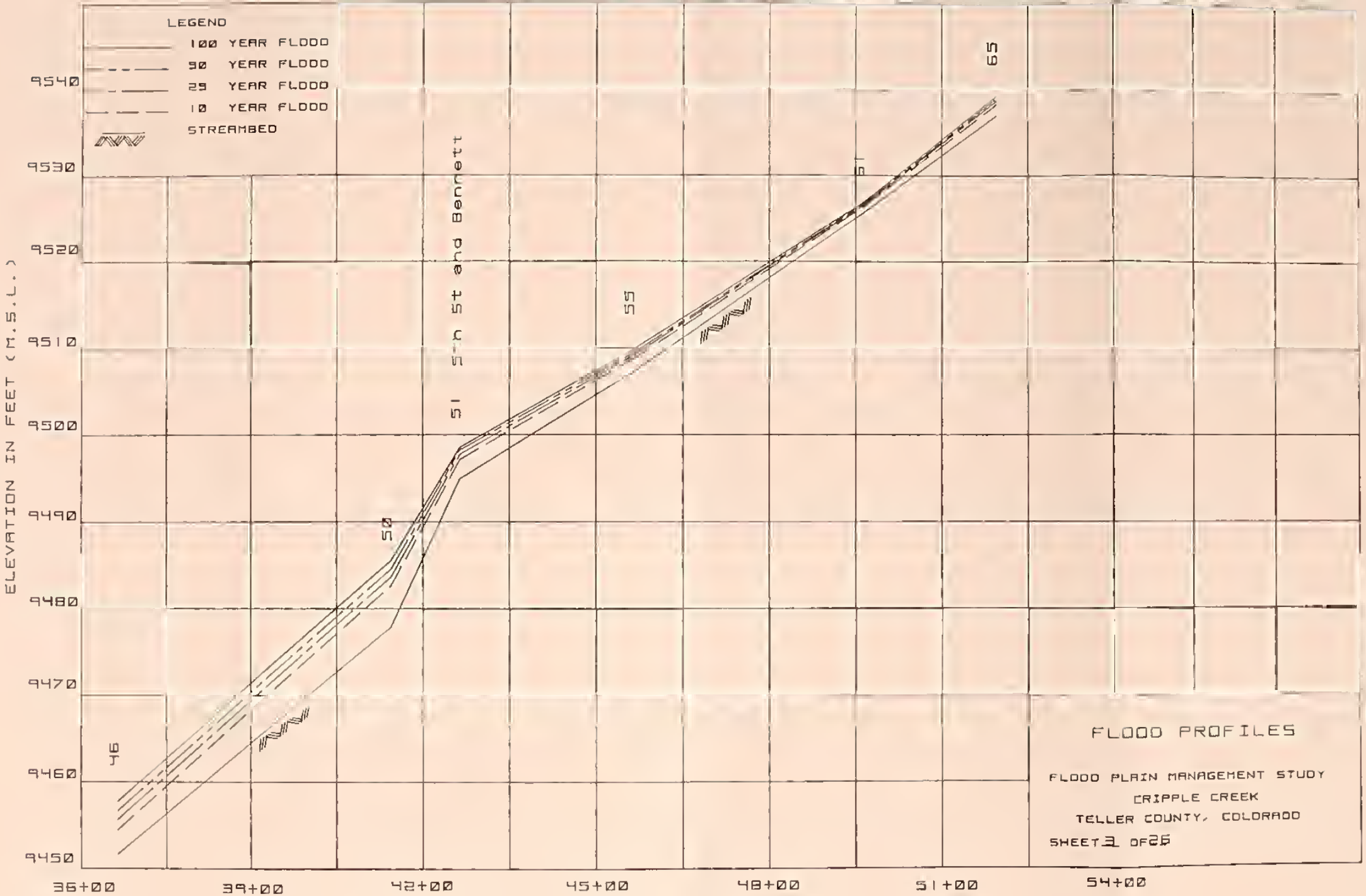
SHEET INDEX

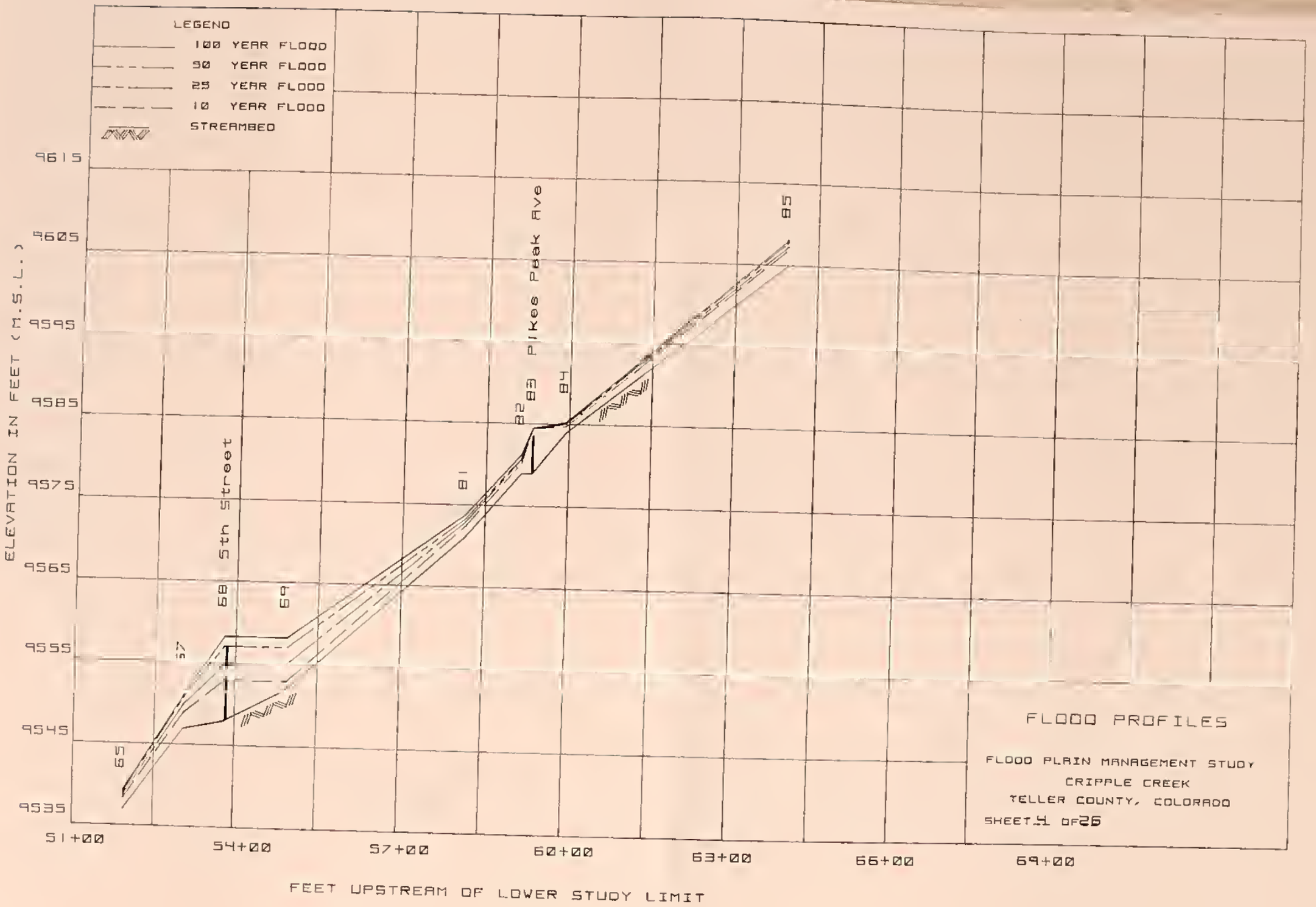
FLOOD PLAINS
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY
COLORADO

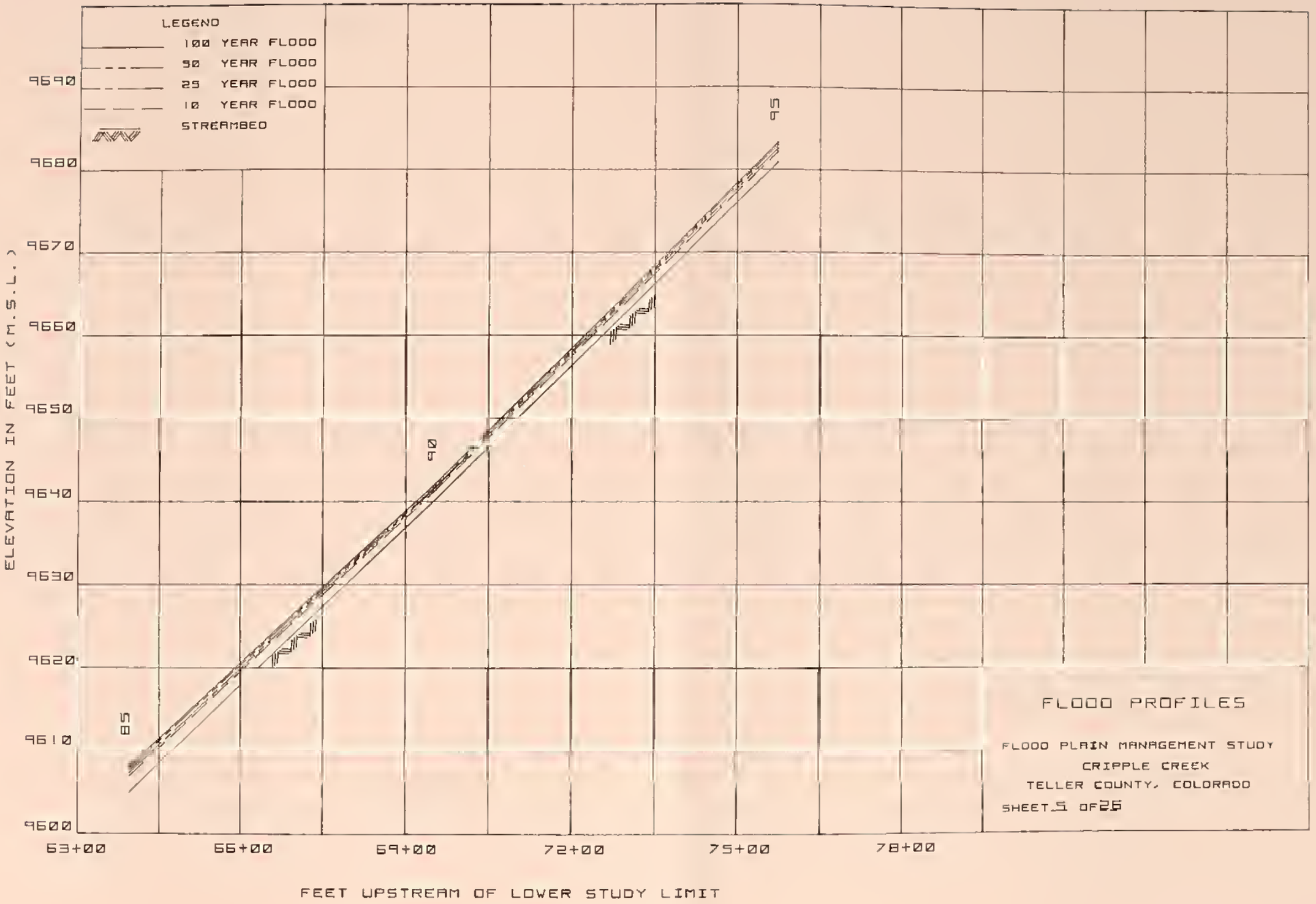
SHEET 2 OF 2

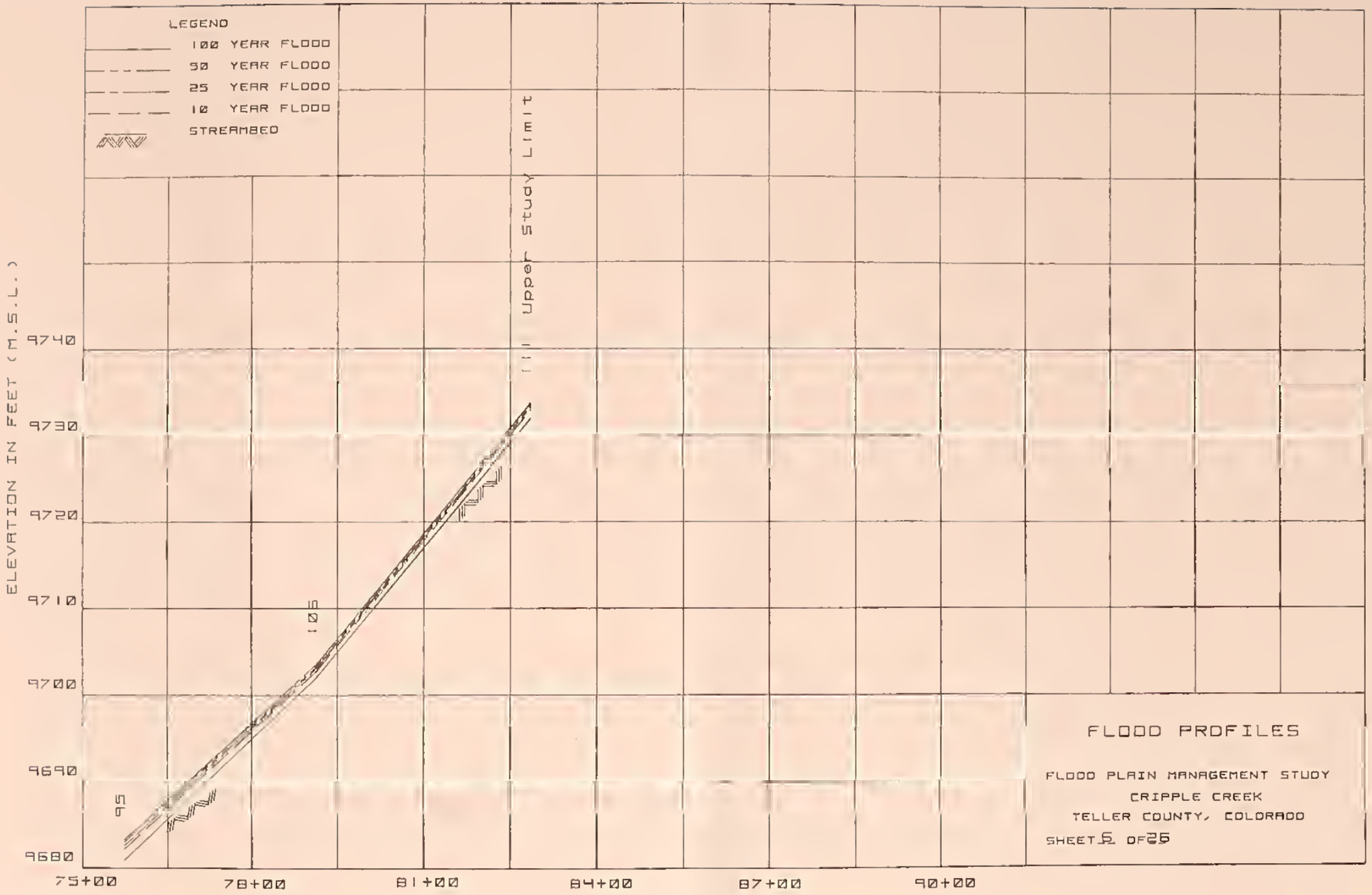

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9365
9355
9345
9335
9325
9315
9305
9295
9285
9275
0+00
3+00
6+00
9+00
12+00
15+00
18+00
21+00
FEET UPSTREAM OF LOWER STUDY LIMIT
Lower Study Limit
5
10
15
20
25
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY, COLORADO
SHEET 1 OF 25


LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9460
9450
9440
9430
9420
9410
9400
9390
9380
9370
21+00
24+00
27+00
30+00
33+00
36+00
39+00
FEET UPSTREAM OF LOWER STUDY LIMIT
U.S. Highway 67
Private Road
4th Street
23
25
30
35
39
40
41
44
45
46
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY, COLORADO
SHEET 12 OF 25


LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
9540
9530
9520
9510
9500
9490
9480
9470
9460
9450
ELEVATION IN FEET (M.S.L.)
51 St 5th and Bennett
46
50
55
61
65
36+00
39+00
42+00
45+00
48+00
51+00
54+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY, COLORADO
SHEET 3 OF 25

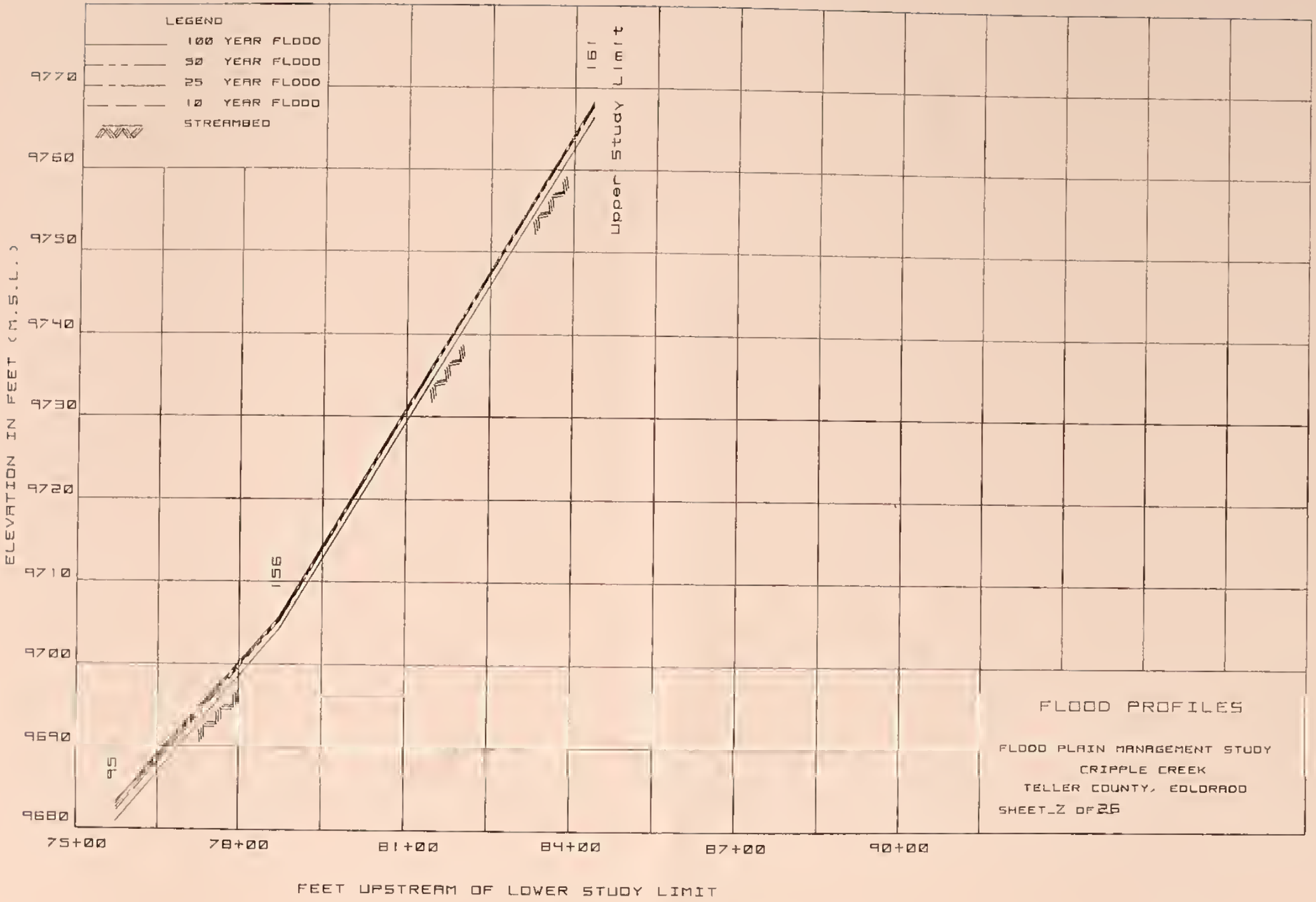

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9615
9605
9595
9585
9575
9565
9555
9545
9535
5th Street
Pikes Peak Ave
85
84
83
82
81
69
68
57
65
51+00
54+00
57+00
60+00
63+00
66+00
69+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY, COLORADO
SHEET 4 OF 26

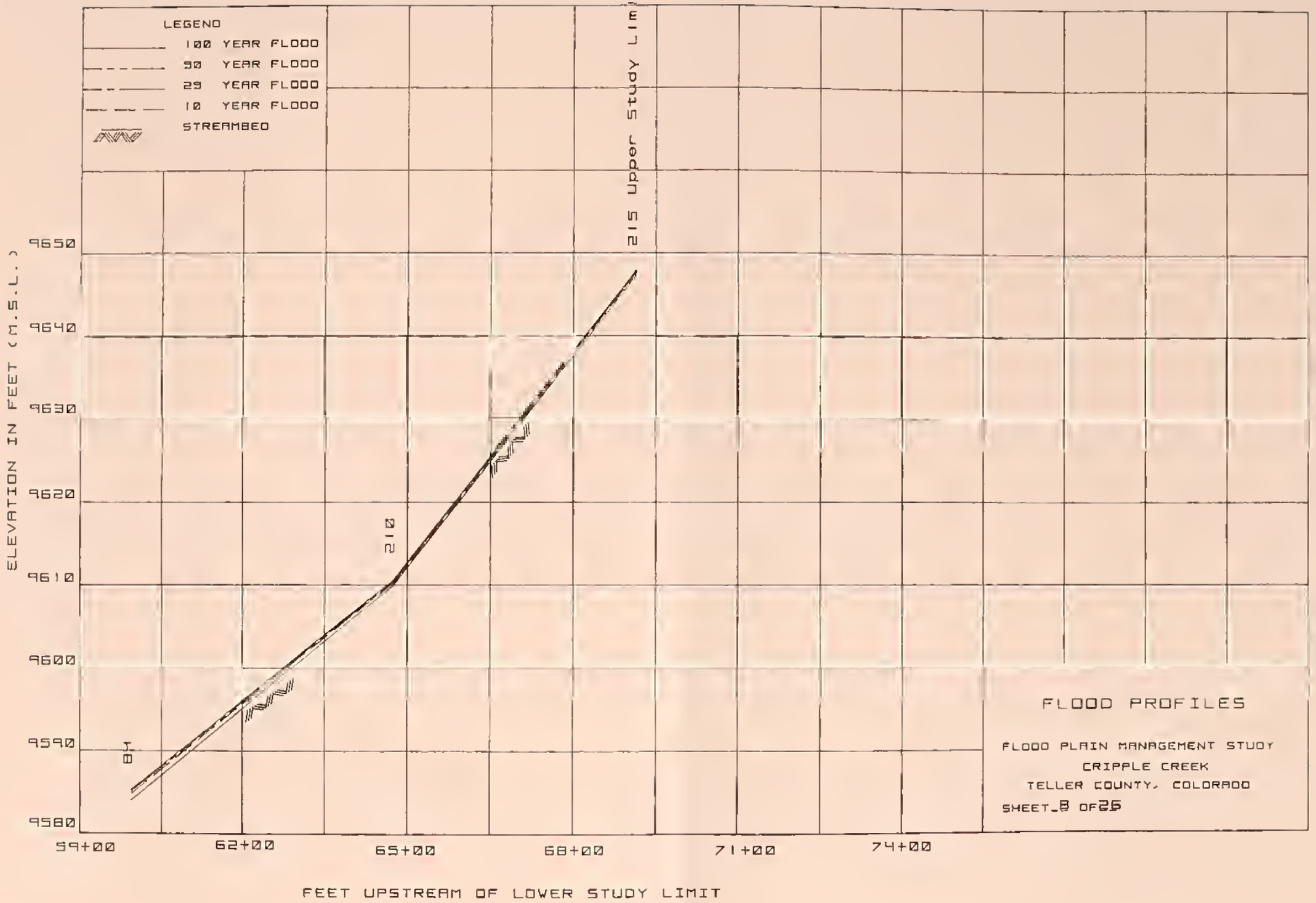

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
9690
9680
9670
9660
9650
9640
9630
9620
9610
9600
ELEVATION IN FEET (M.S.L.)
63+00
66+00
69+00
72+00
75+00
78+00
FEET UPSTREAM OF LOWER STUDY LIMIT
85
90
95
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY, COLORADO
SHEET 5 OF 26

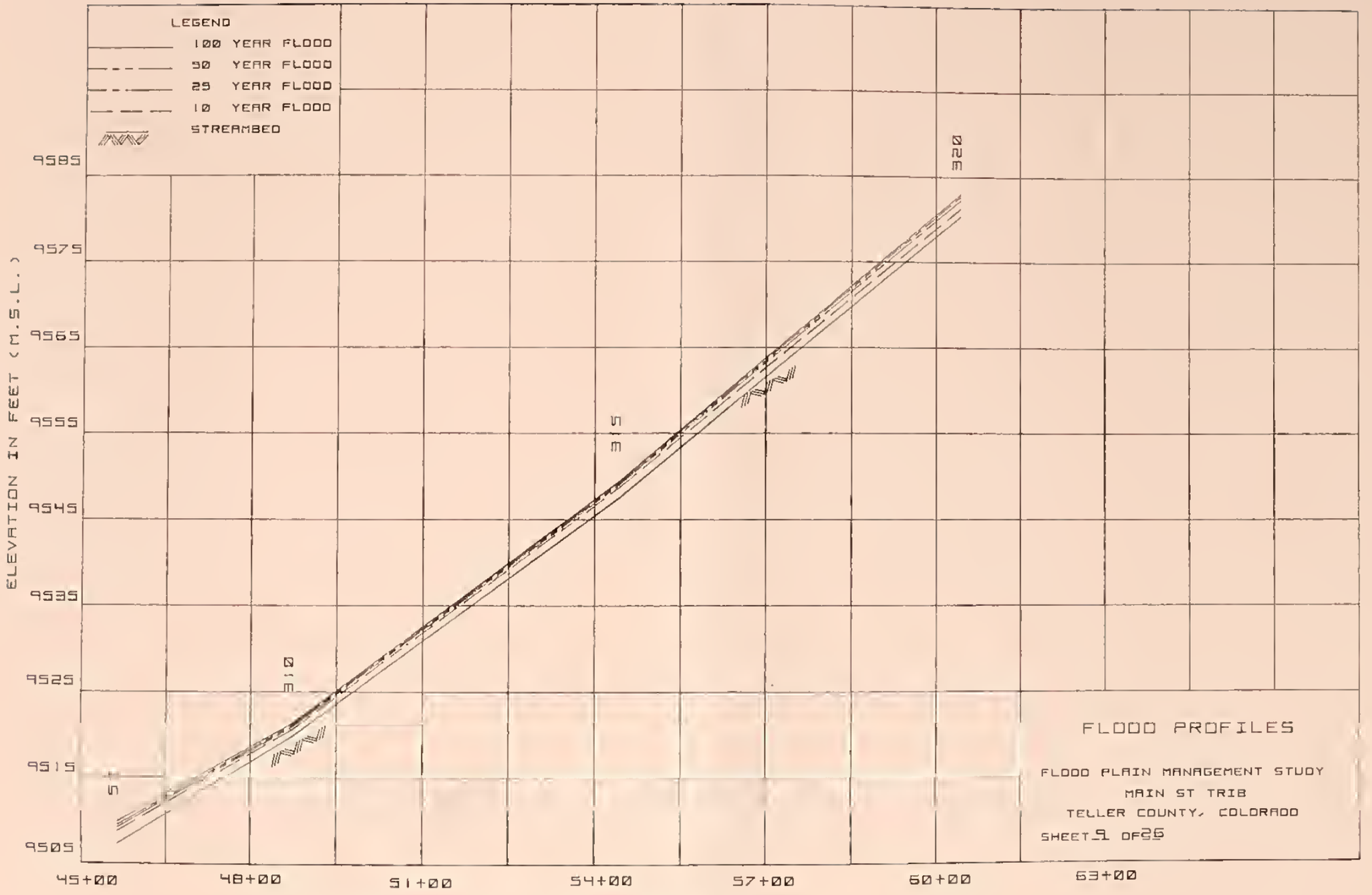


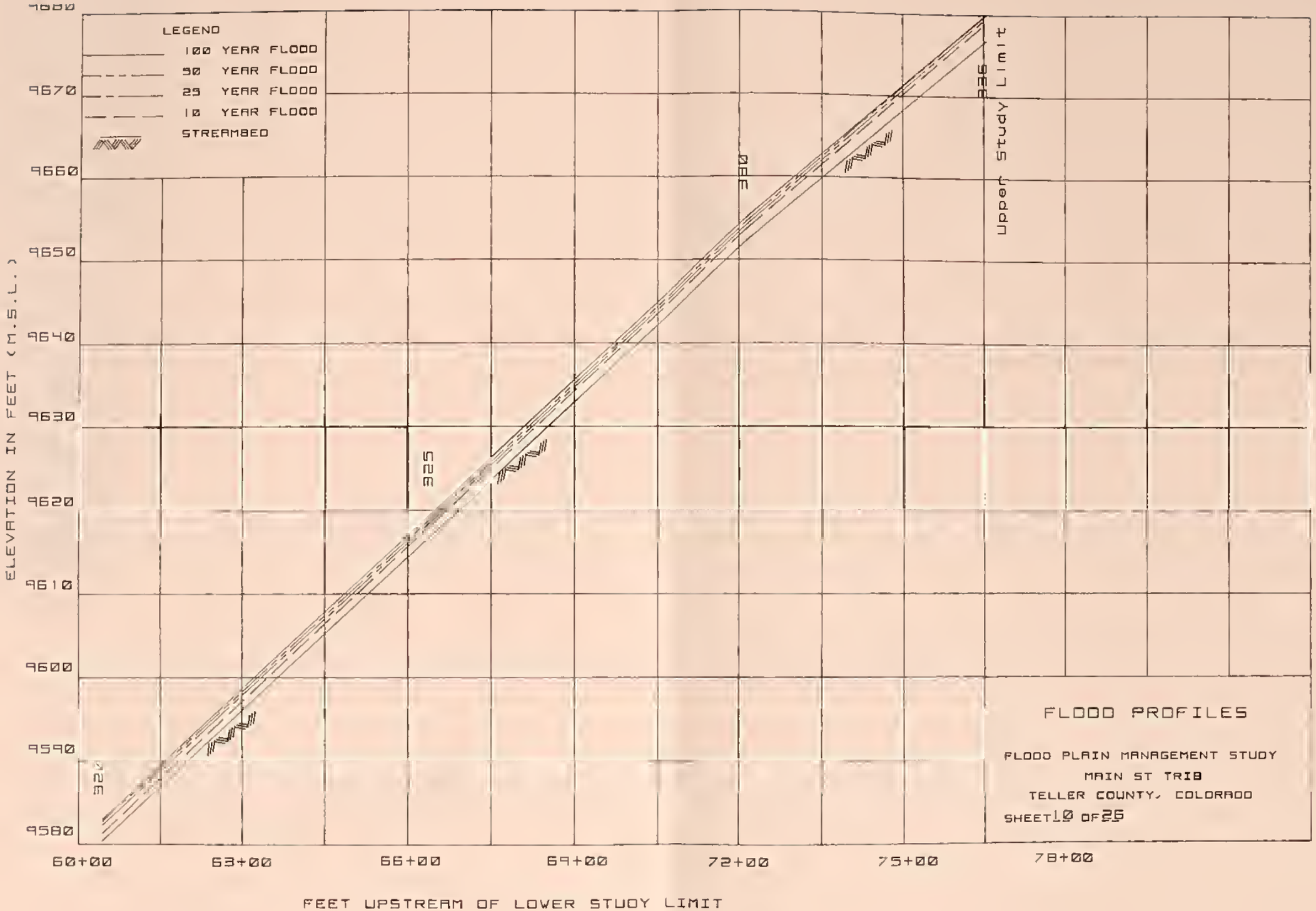
FLOOD PROFILES

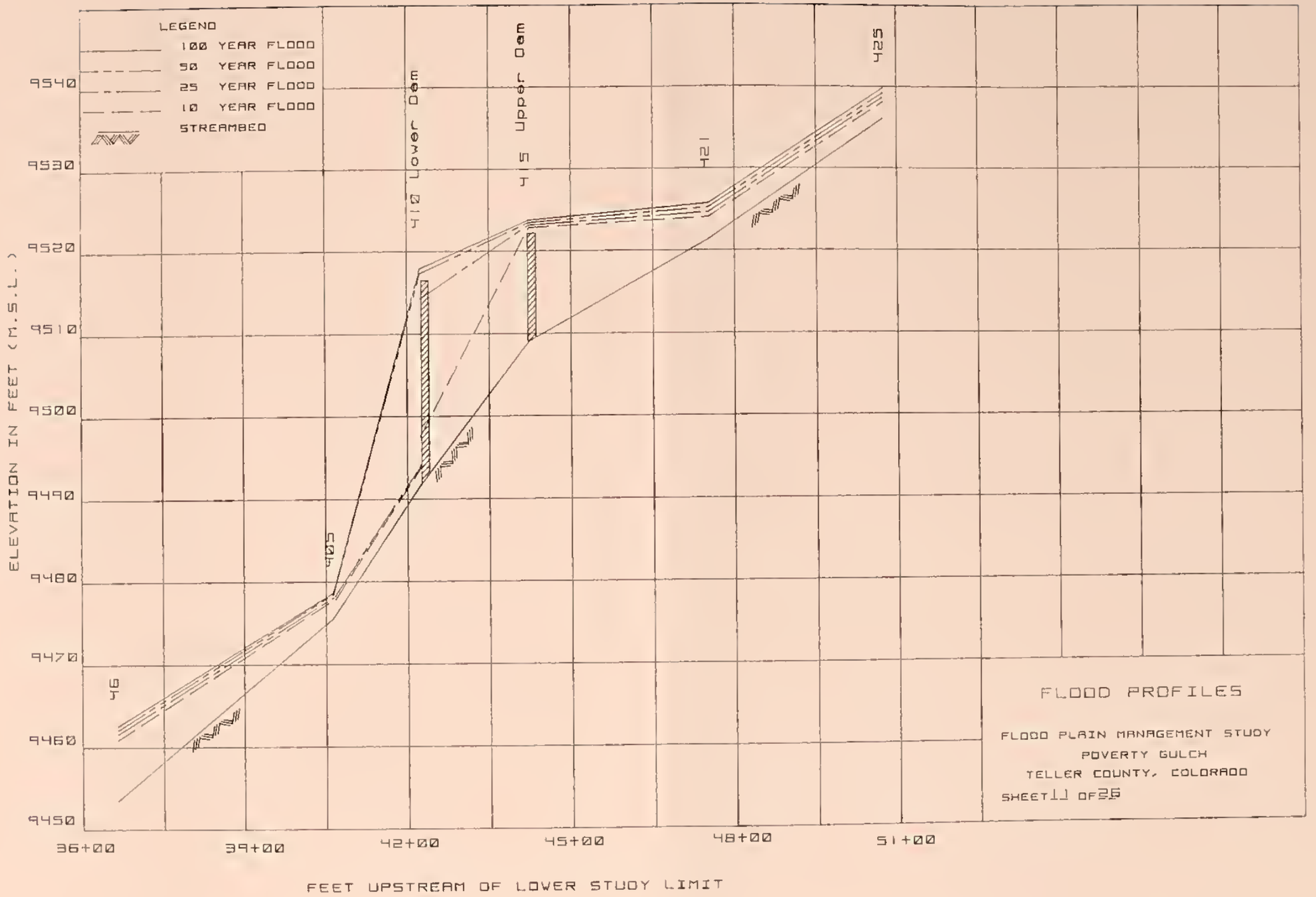
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY, COLORADO
SHEET 5 OF 25

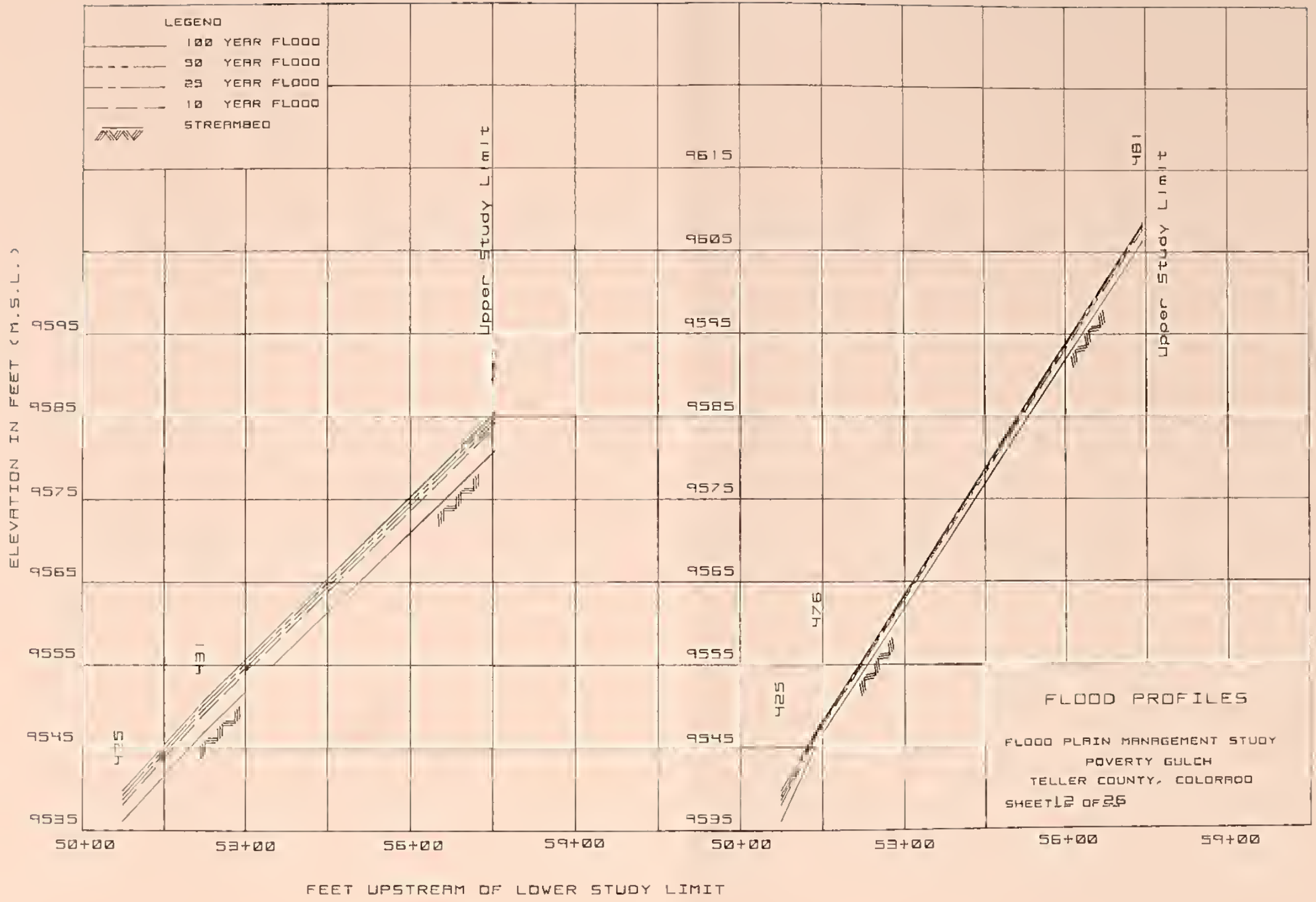

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9770
9760
9750
9740
9730
9720
9710
9700
9690
9680
75+00
78+00
81+00
84+00
87+00
90+00
FEET UPSTREAM OF LOWER STUDY LIMIT
161
Upper Study Limit
156
95
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY, COLORADO
SHEET 2 OF 26


LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
215 Upper Study Limit
210
B1
ELEVATION IN FEET (M.S.L.)
9650
9640
9630
9620
9610
9600
9590
9580
59+00
62+00
65+00
68+00
71+00
74+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
CRIPPLE CREEK
TELLER COUNTY, COLORADO
SHEET 8 OF 25


LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9585
9575
9565
9555
9545
9535
9525
9515
9505
45+00
48+00
51+00
54+00
57+00
60+00
63+00
FEET UPSTREAM OF LOWER STUDY LIMIT
S
S10
S15
S20
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
MAIN ST TRIB
TELLER COUNTY, COLORADO
SHEET 9 OF 26

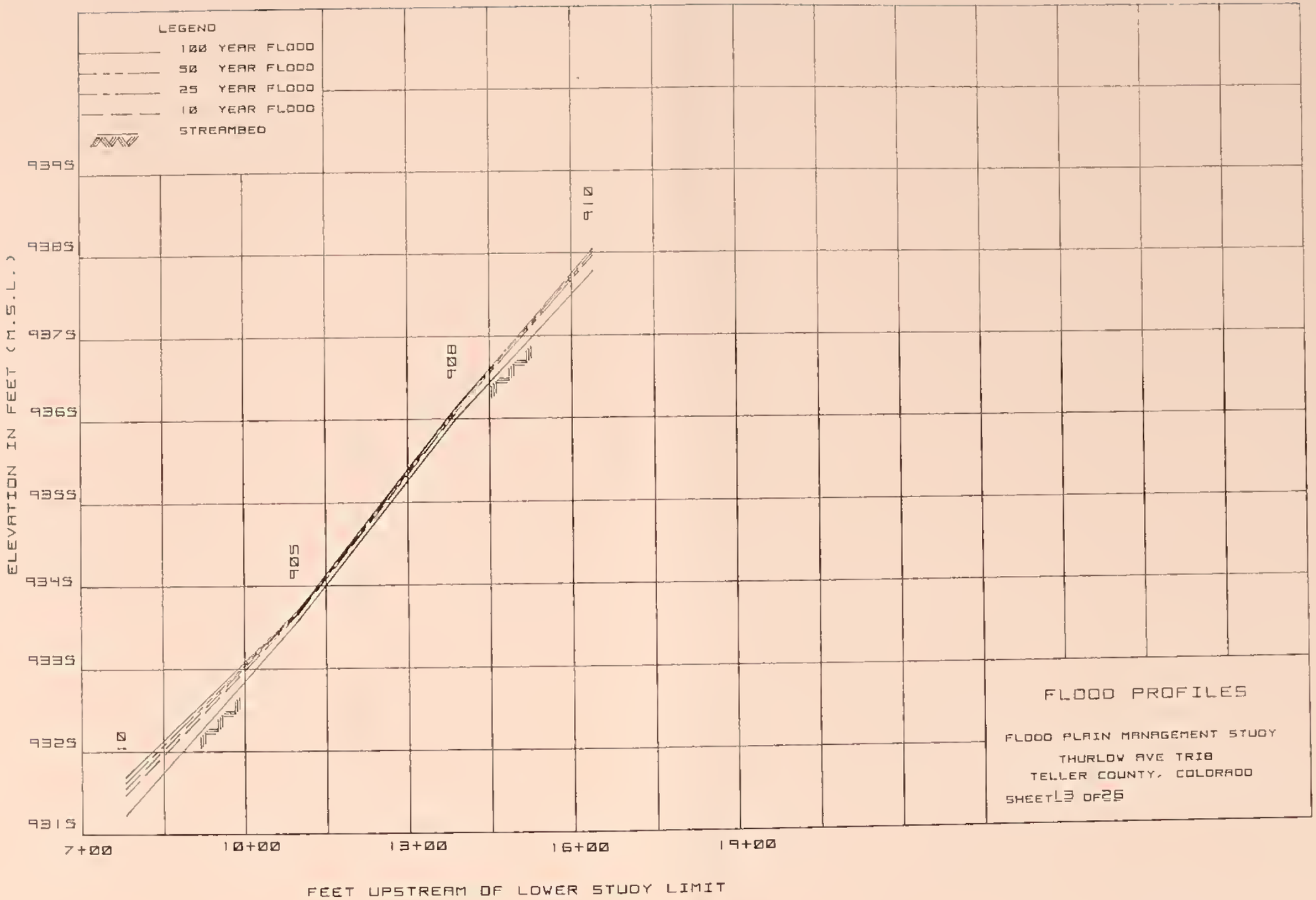

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9680
9670
9660
9650
9640
9630
9620
9610
9600
9590
9580
60+00
63+00
66+00
69+00
72+00
75+00
78+00
FEET UPSTREAM OF LOWER STUDY LIMIT
Upper Study Limit
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
MAIN ST TRIB
TELLER COUNTY, COLORADO
SHEET 10 OF 25

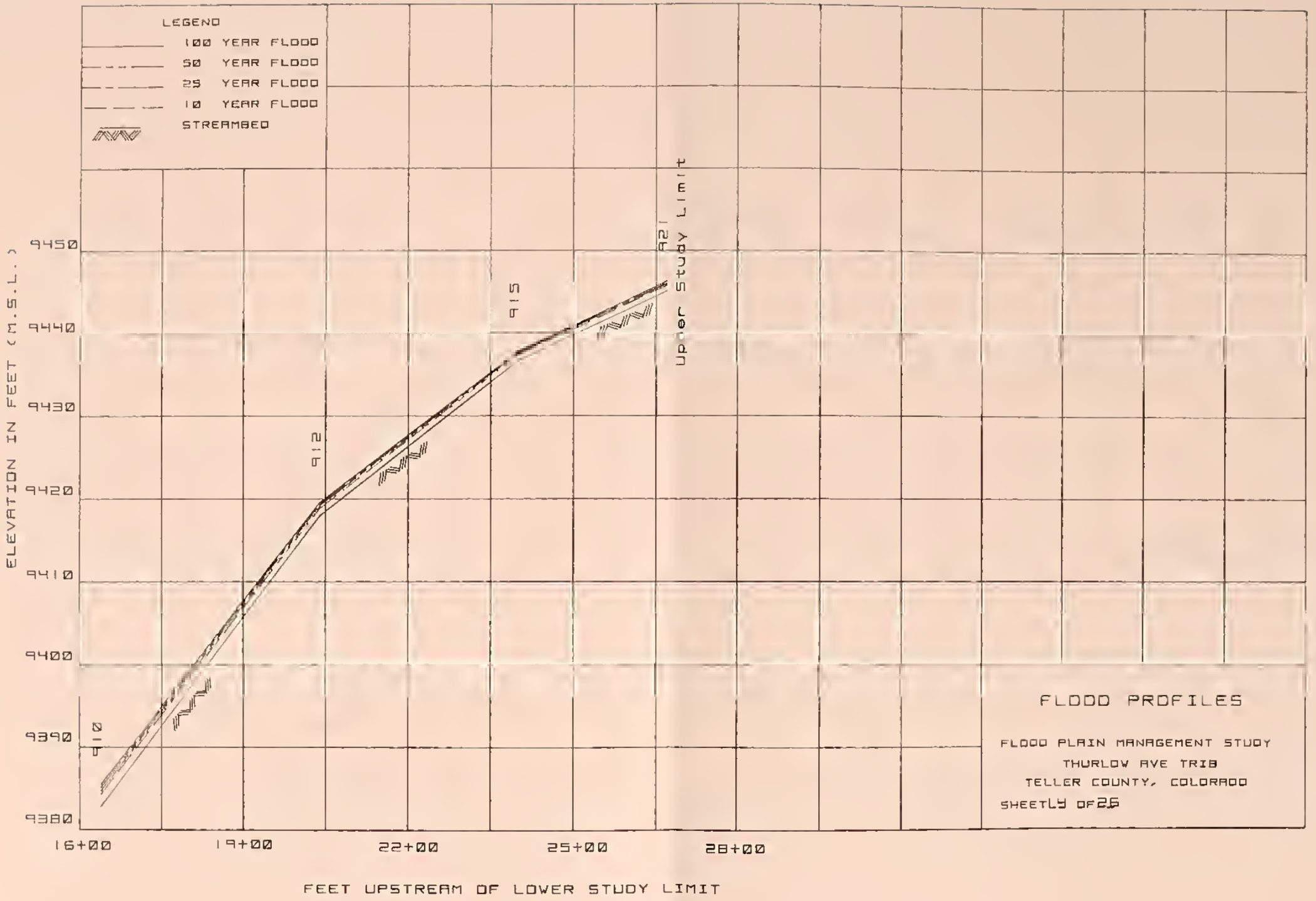

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
Lower Dam
Upper Dam
46
50b
50a
51
52
54
ELEVATION IN FEET (M.S.L.)
9540
9530
9520
9510
9500
9490
9480
9470
9460
9450
36+00
39+00
42+00
45+00
48+00
51+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
POVERTY GULCH
TELLER COUNTY, COLORADO
SHEET 11 OF 25



FLOOD PROFILES

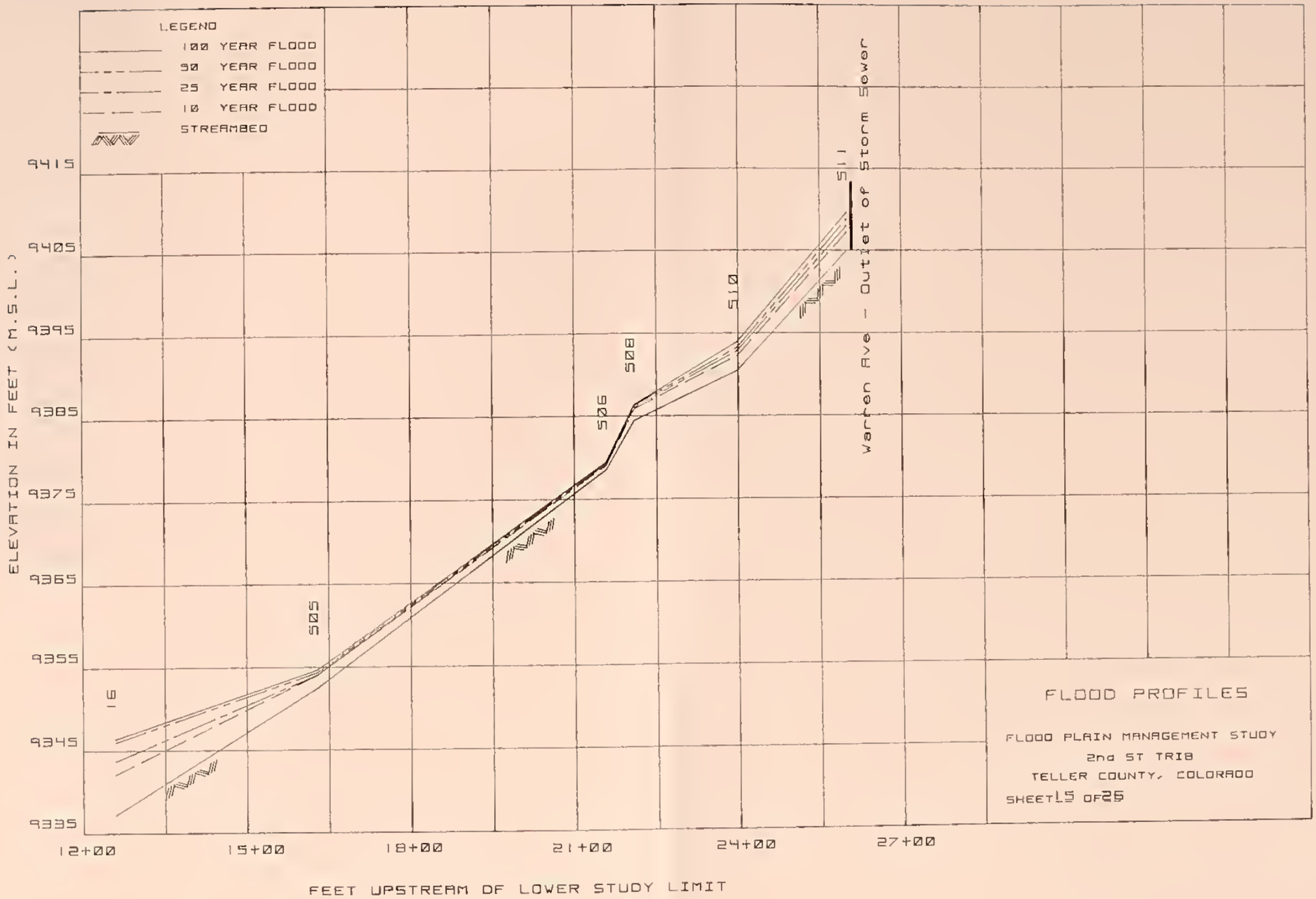
FLOOD PLAIN MANAGEMENT STUDY
POVERTY GULCH
TELLER COUNTY, COLORADO
SHEET 12 OF 26

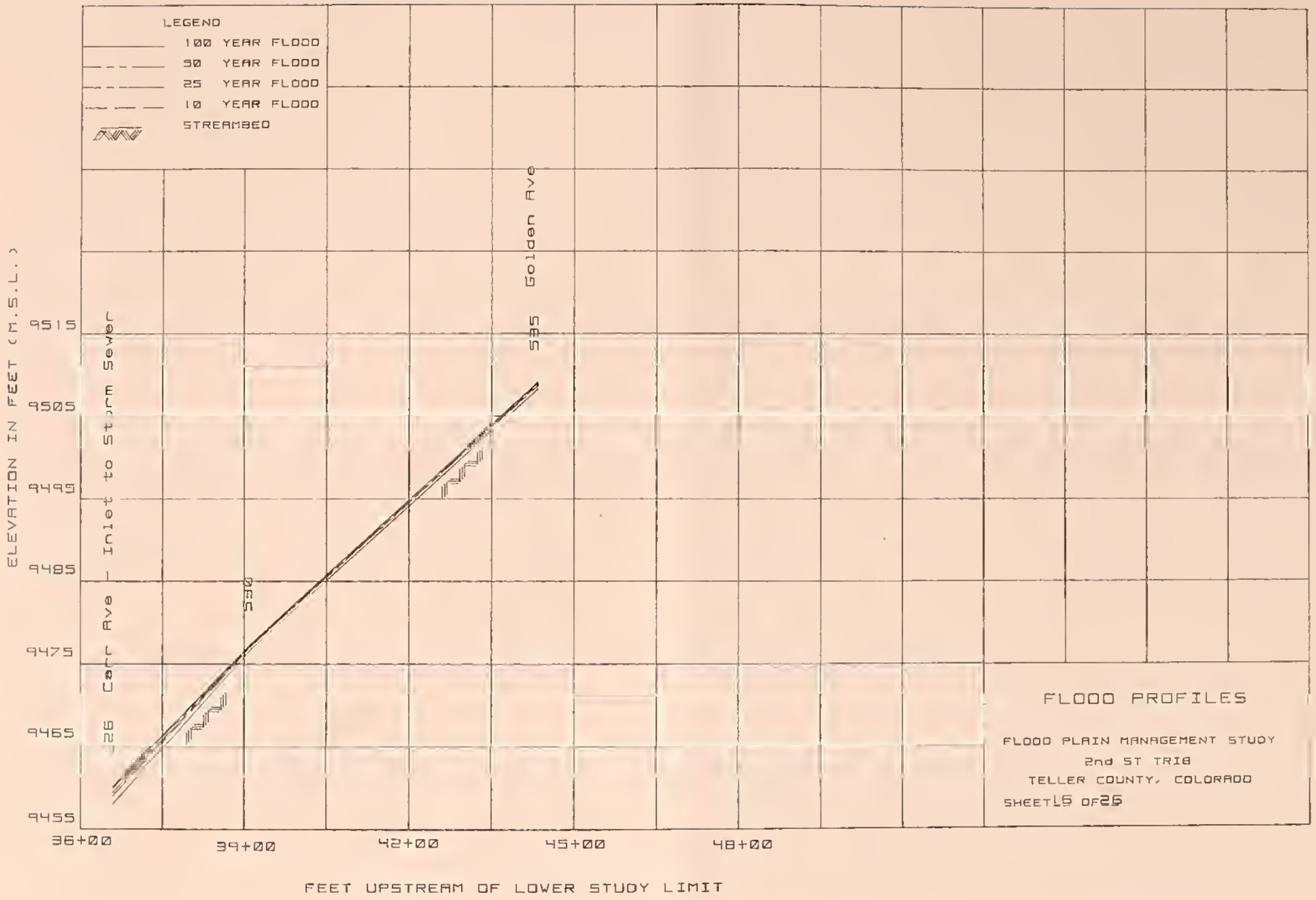

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9395
9385
9375
9365
9355
9345
9335
9325
9315
7+00
10+00
13+00
16+00
19+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
THURLOW AVE TRIB
TELLER COUNTY, COLORADO
SHEET 13 OF 25

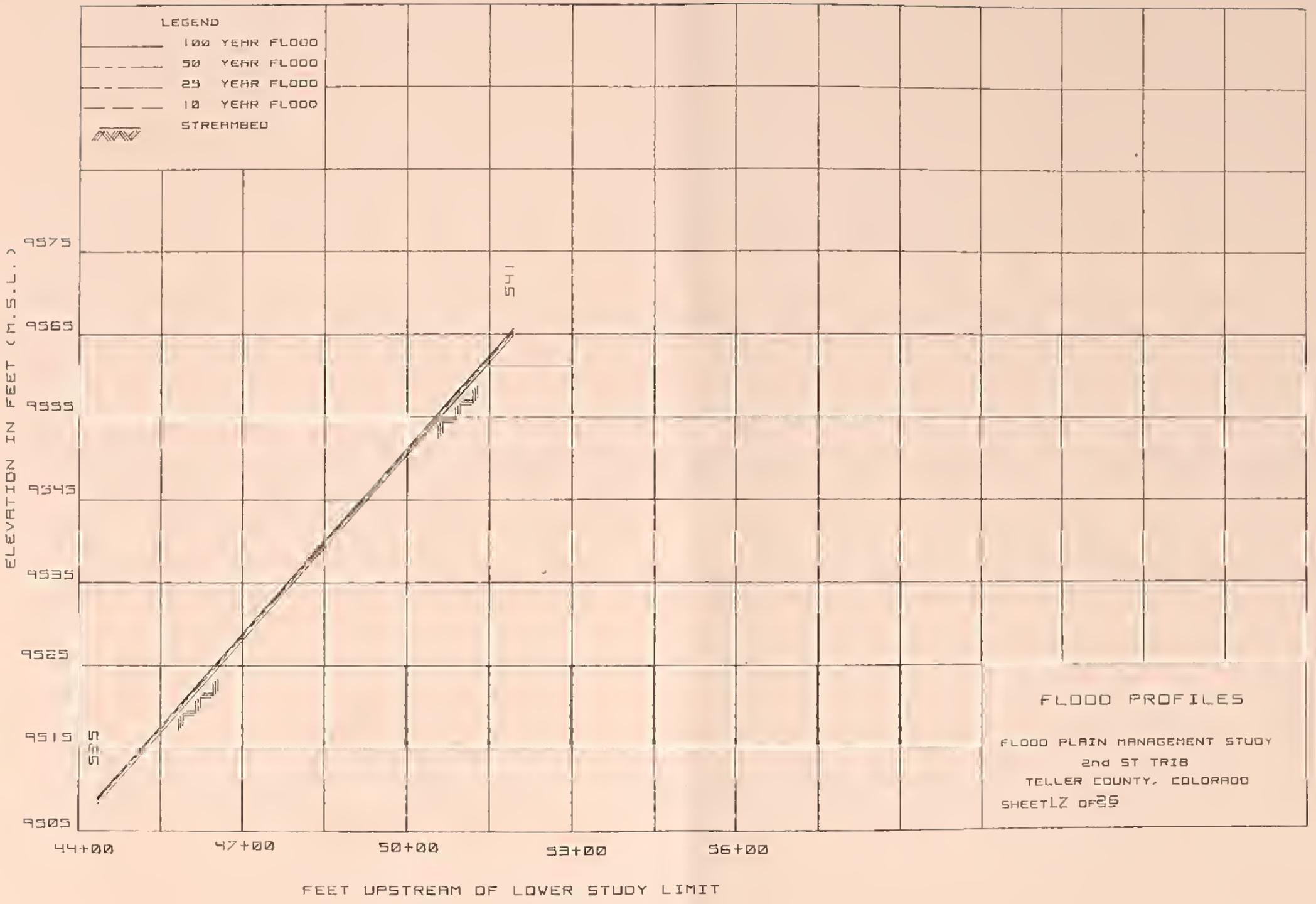


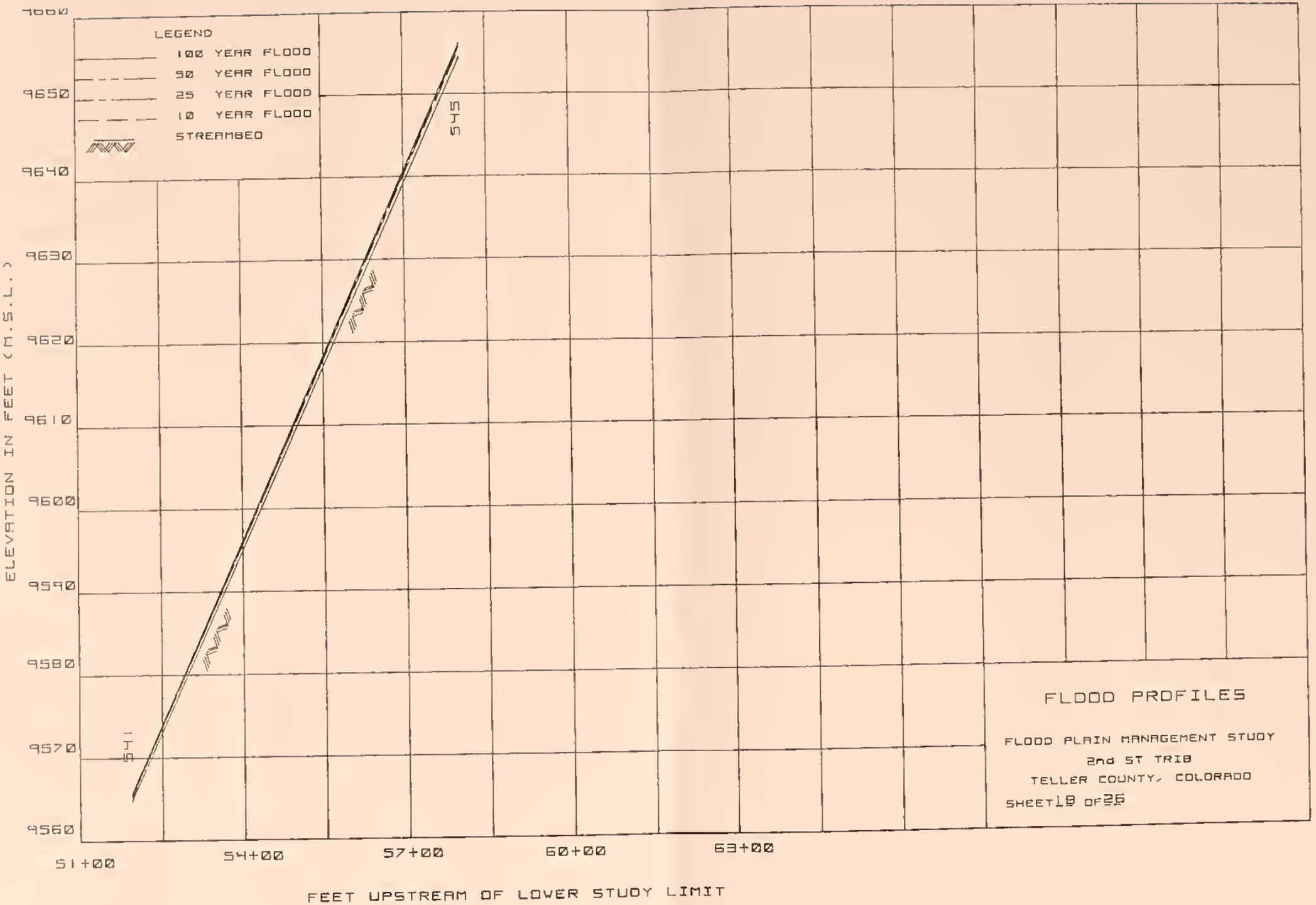
FLOOD PROFILES

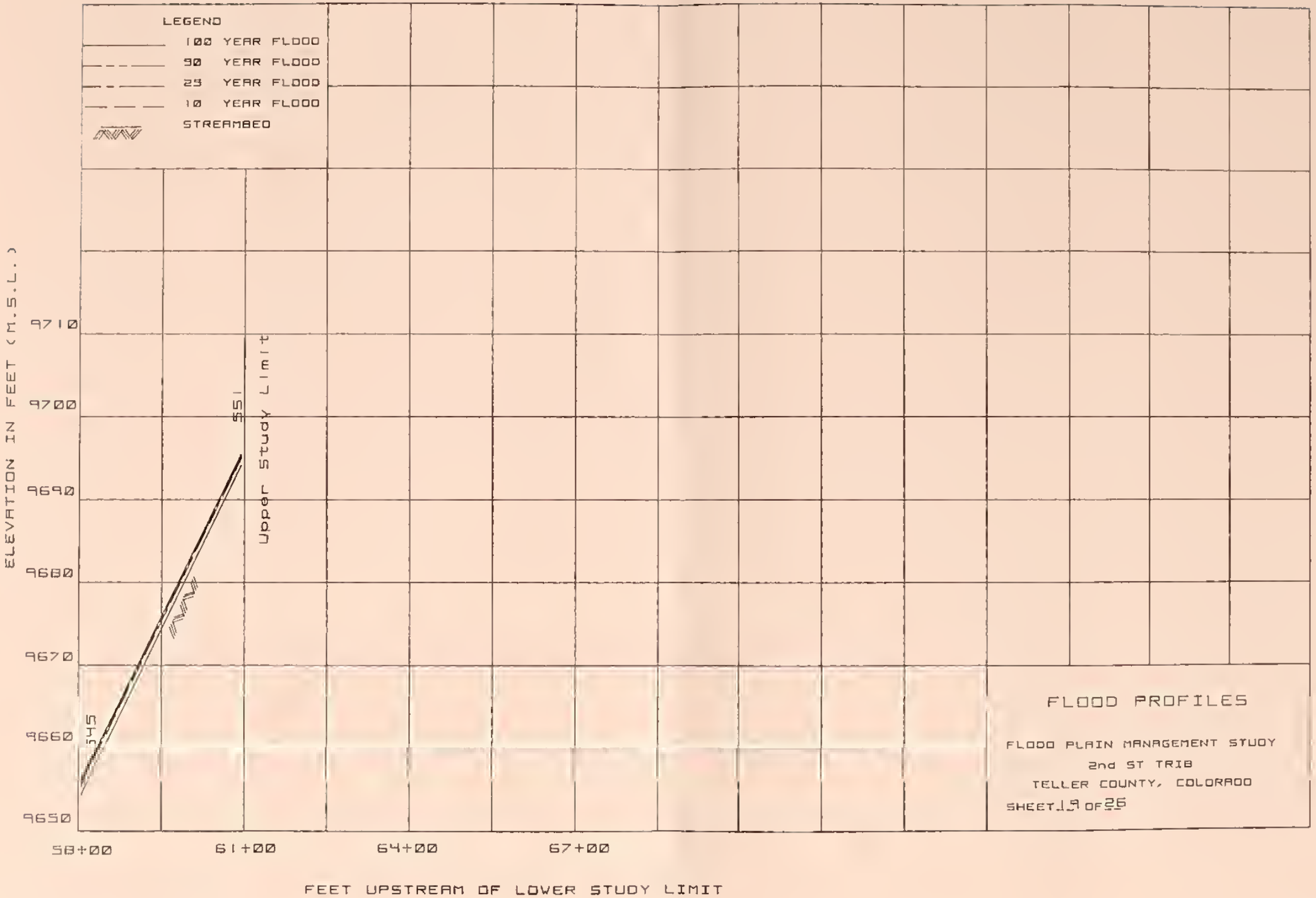
FLOOD PLAIN MANAGEMENT STUDY
THURLOW AVE TRIB
TELLER COUNTY, COLORADO
SHEET 19 OF 25

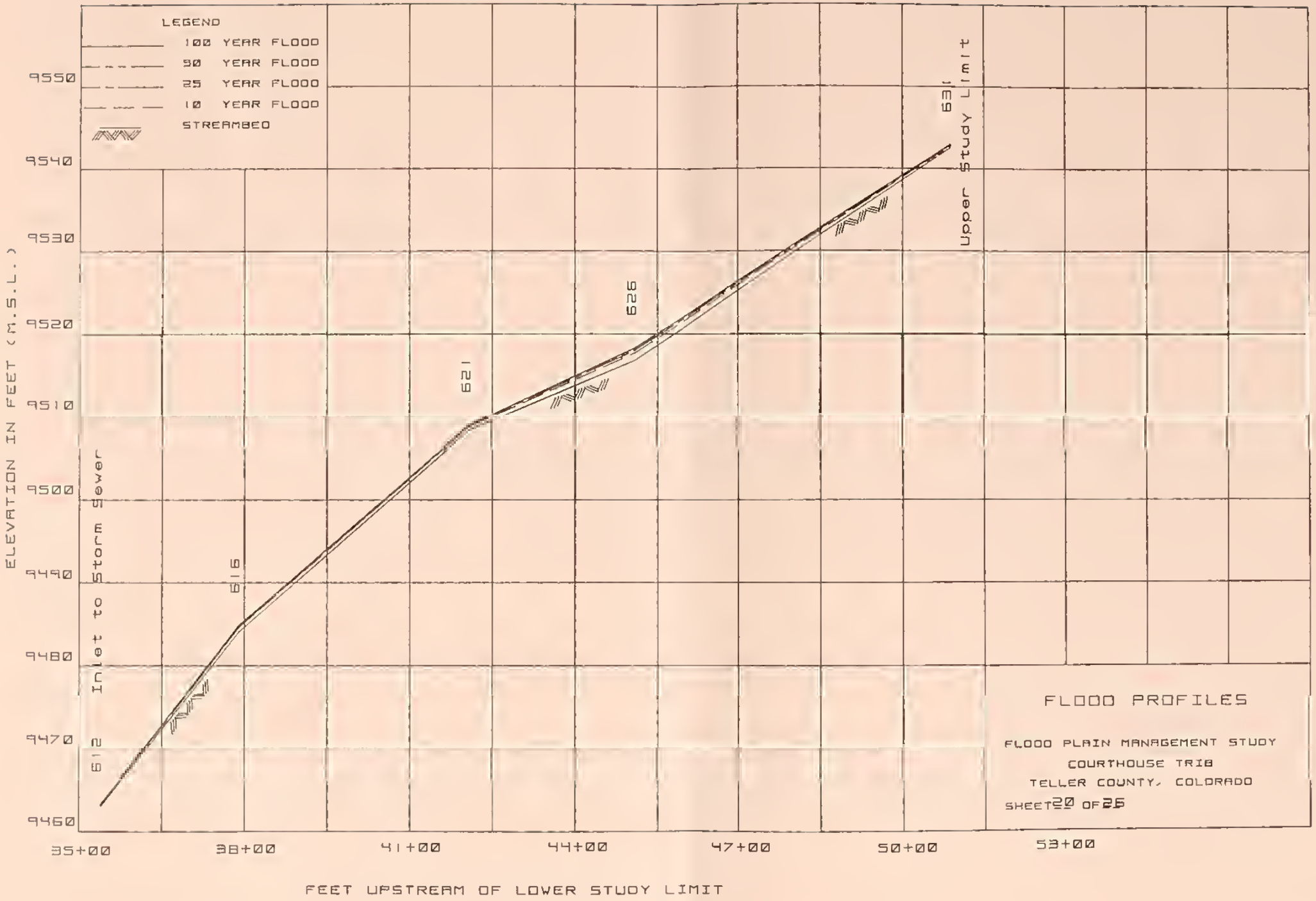

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9415
9405
9395
9385
9375
9365
9355
9345
9335
12+00
15+00
18+00
21+00
24+00
27+00
FEET UPSTREAM OF LOWER STUDY LIMIT
16
505
506
508
510
511
Warren Ave - Outlet of Storm Sewer
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
2nd ST TRIB
TELLER COUNTY, COLORADO
SHEET 15 OF 25

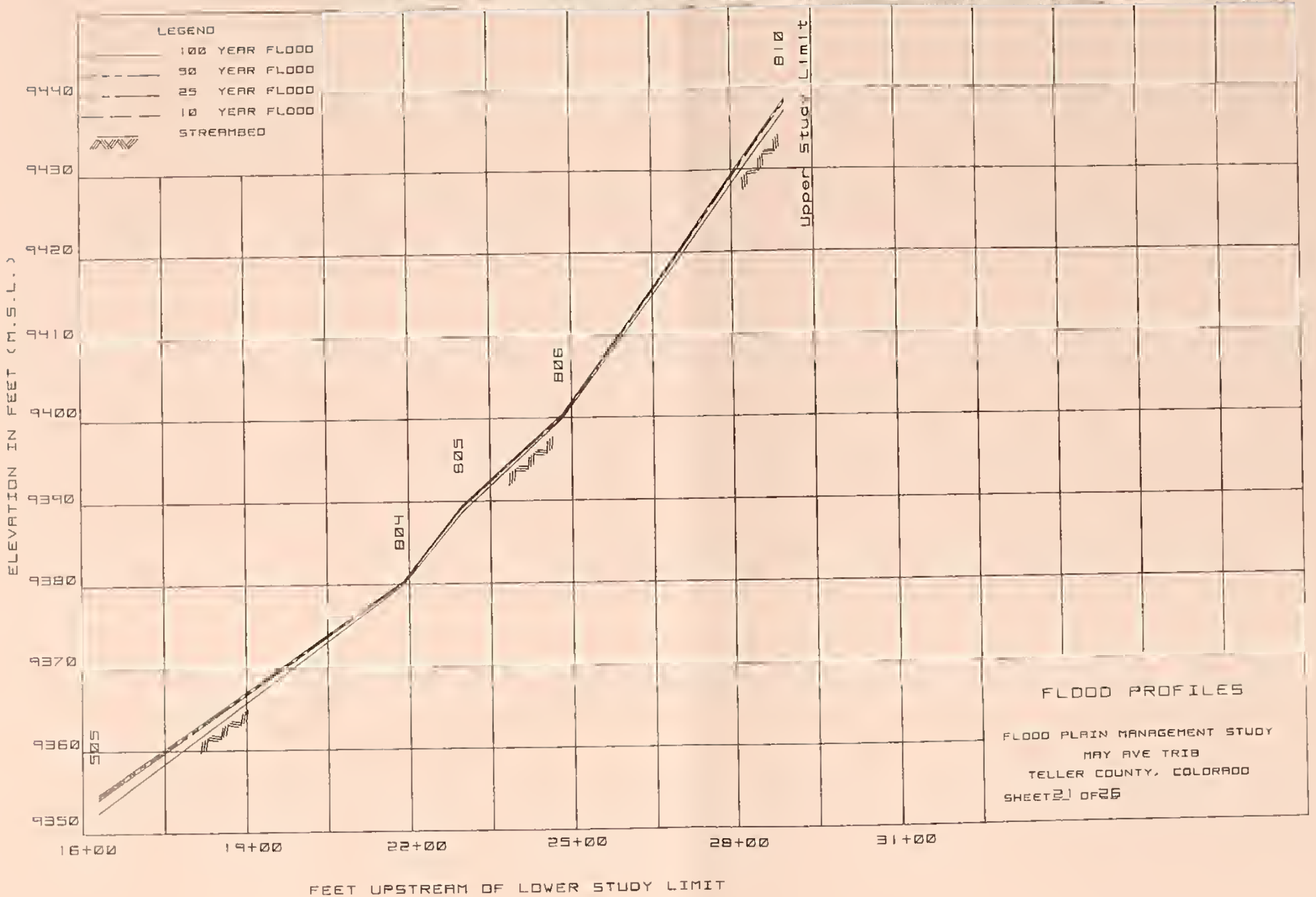

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9515
9505
9495
9485
9475
9465
9455
36+00
39+00
42+00
45+00
48+00
FEET UPSTREAM OF LOWER STUDY LIMIT
26 Carr Ave
Inlet to Storm Sewer
530
535 Golden Ave
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
2nd ST TRIB
TELLER COUNTY, COLORADO
SHEET 16 OF 25

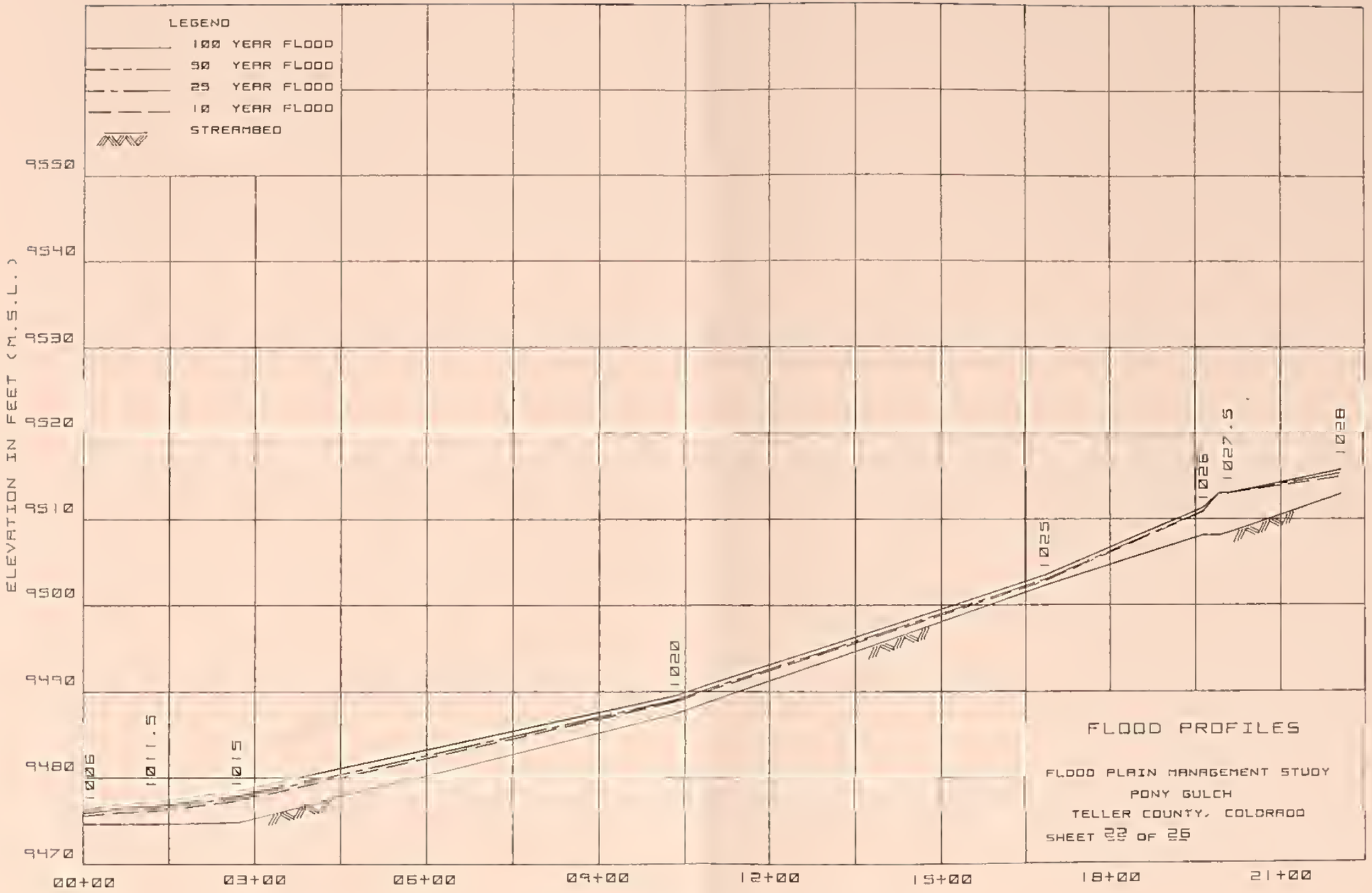

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9575
9565
9555
9545
9535
9525
9515
9505
SJ1
SJ5
44+00
47+00
50+00
53+00
56+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
2nd ST TRIB
TELLER COUNTY, COLORADO
SHEET 12 OF 26

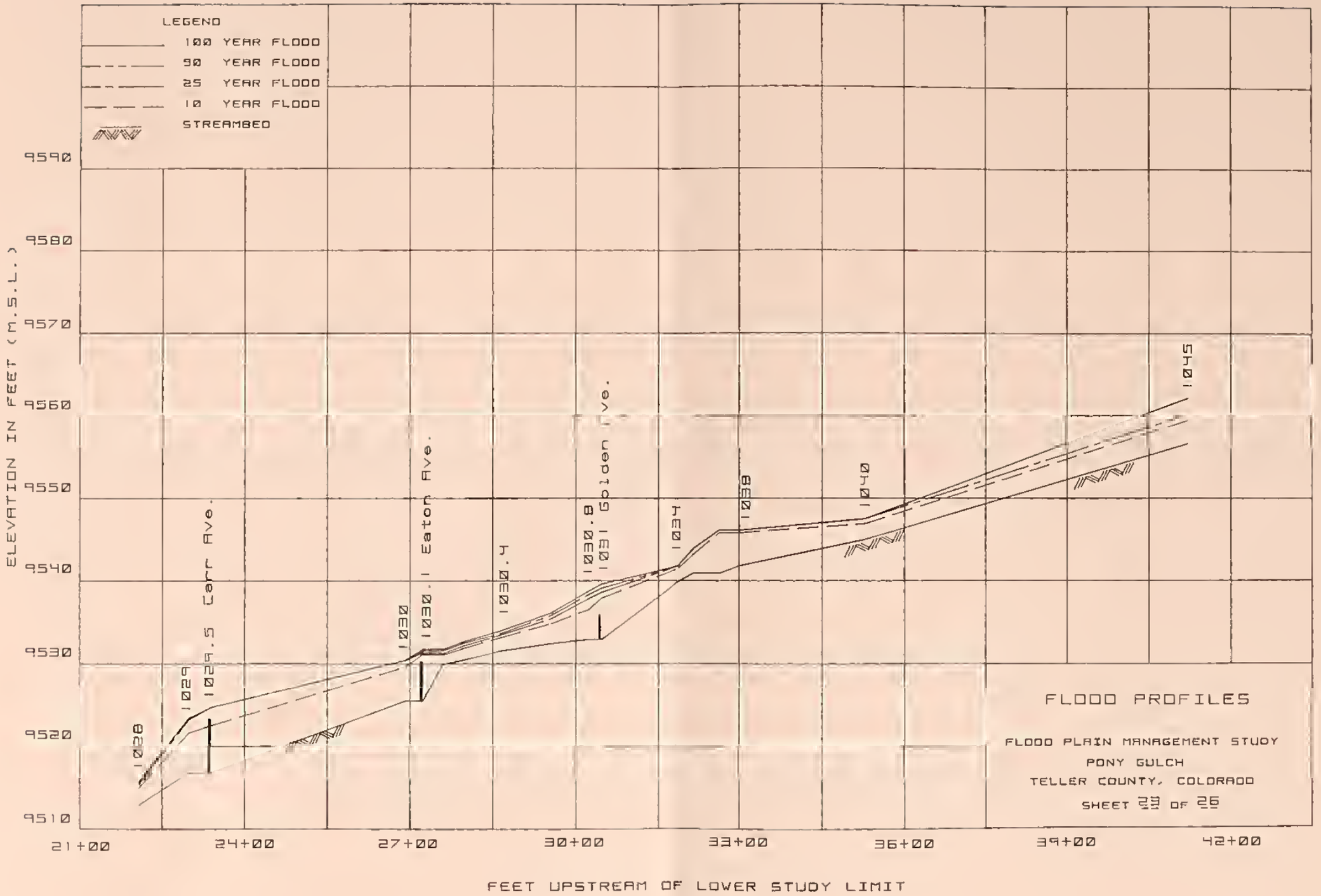

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
9660
9650
9640
9630
9620
9610
9600
9590
9580
9570
9560
ELEVATION IN FEET (M.S.L.)
51+00
54+00
57+00
60+00
63+00
FEET UPSTREAM OF LOWER STUDY LIMIT
545
511
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
2nd ST TRIB
TELLER COUNTY, COLORADO
SHEET 19 OF 26

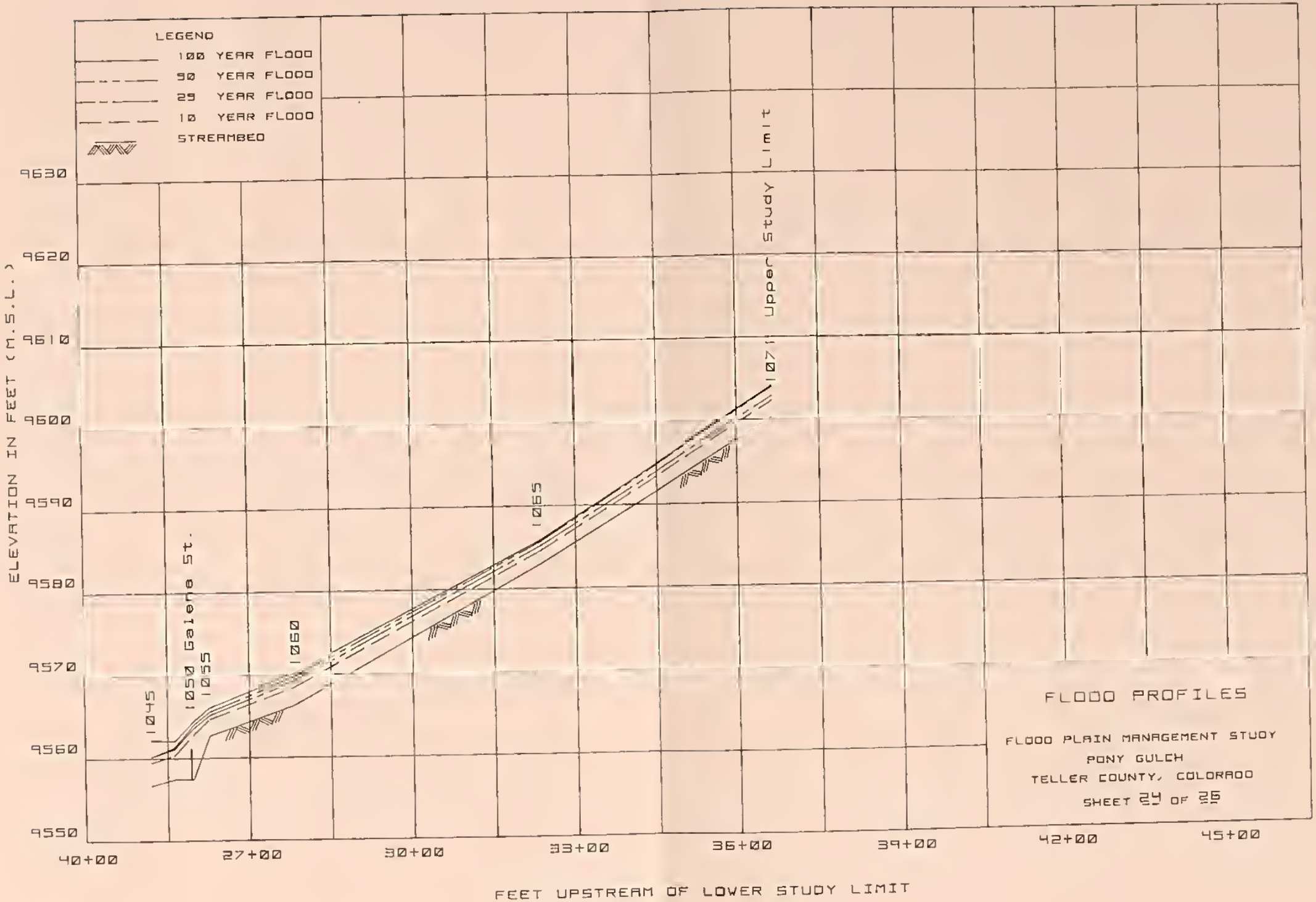

LEGEND
100 YEAR FLOOD
90 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9710
9700
9690
9680
9670
9660
9650
551
Upper Study Limit
545
58+00
61+00
64+00
67+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
2nd ST TRIB
TELLER COUNTY, COLORADO
SHEET 19 OF 26

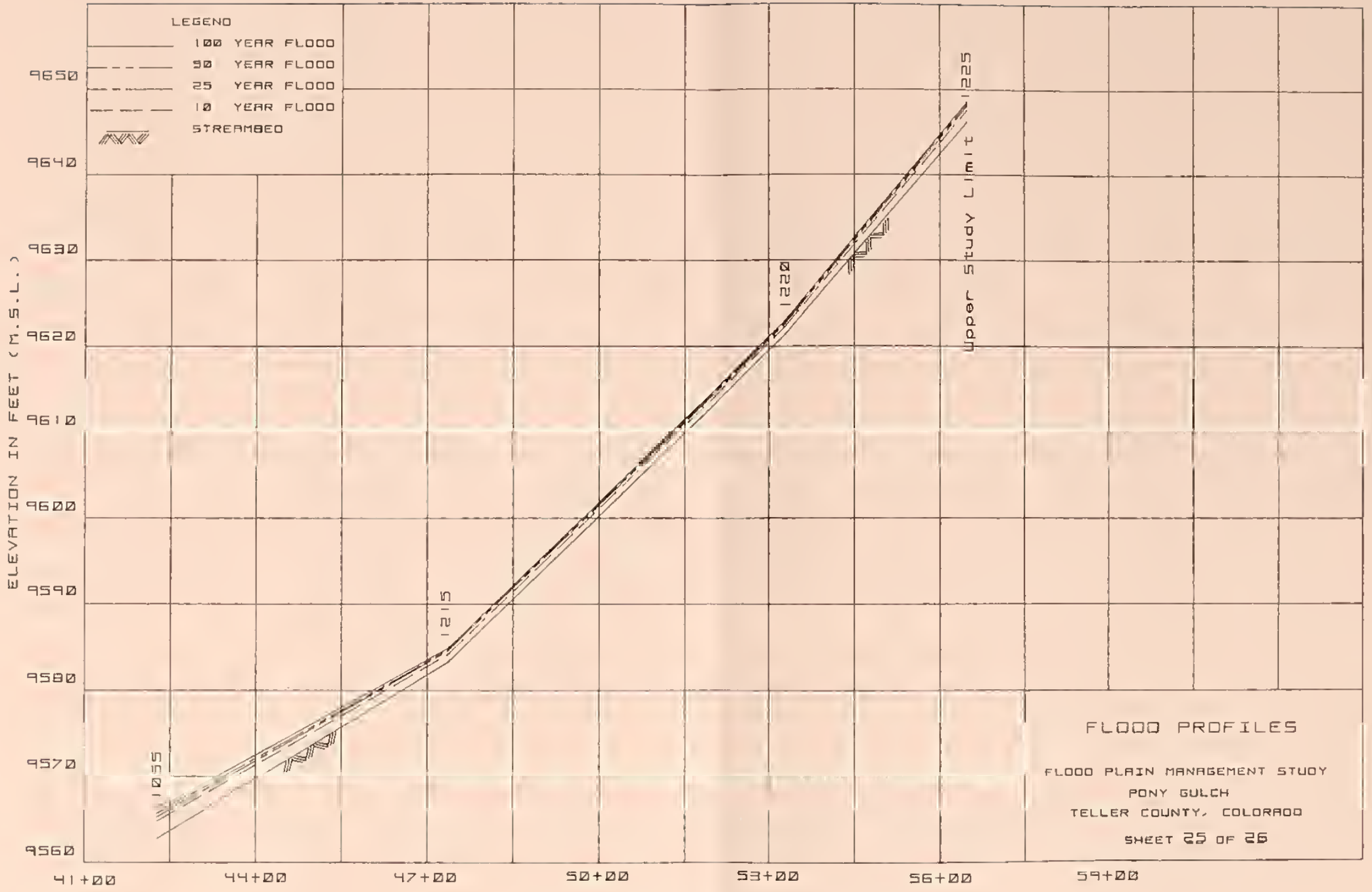

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
9550
9540
9530
9520
9510
9500
9490
9480
9470
9460
ELEVATION IN FEET (M.S.L.)
612
Inlet to Storm Sewer
619
621
629
631
Upper Study Limit
35+00
38+00
41+00
44+00
47+00
50+00
53+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
COURTHOUSE TRIB
TELLER COUNTY, COLORADO
SHEET 20 OF 25


LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9440
9430
9420
9410
9400
9390
9380
9370
9360
9350
16+00
19+00
22+00
25+00
28+00
31+00
FEET UPSTREAM OF LOWER STUDY LIMIT
Upper Study Limit
810
808
805
804
805
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
MAY AVE TRIB
TELLER COUNTY, COLORADO
SHEET 21 OF 26


LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9550
9540
9530
9520
9510
9500
9490
9480
9470
1006
1011.5
1015
1020
1025
1026
1027.5
1028
00+00
03+00
06+00
09+00
12+00
15+00
18+00
21+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
PONY GULCH
TELLER COUNTY, COLORADO
SHEET 22 OF 26


LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9590
9580
9570
9560
9550
9540
9530
9520
9510
21+00
24+00
27+00
30+00
33+00
36+00
39+00
42+00
FEET UPSTREAM OF LOWER STUDY LIMIT
1028
1029
1029.5 Carr Ave.
1030
1030.1 Eaton Ave.
1030.4
1030.8
1031 Golden Ave.
1034
1038
1040
1045
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
PONY GULCH
TELLER COUNTY, COLORADO
SHEET 23 OF 25

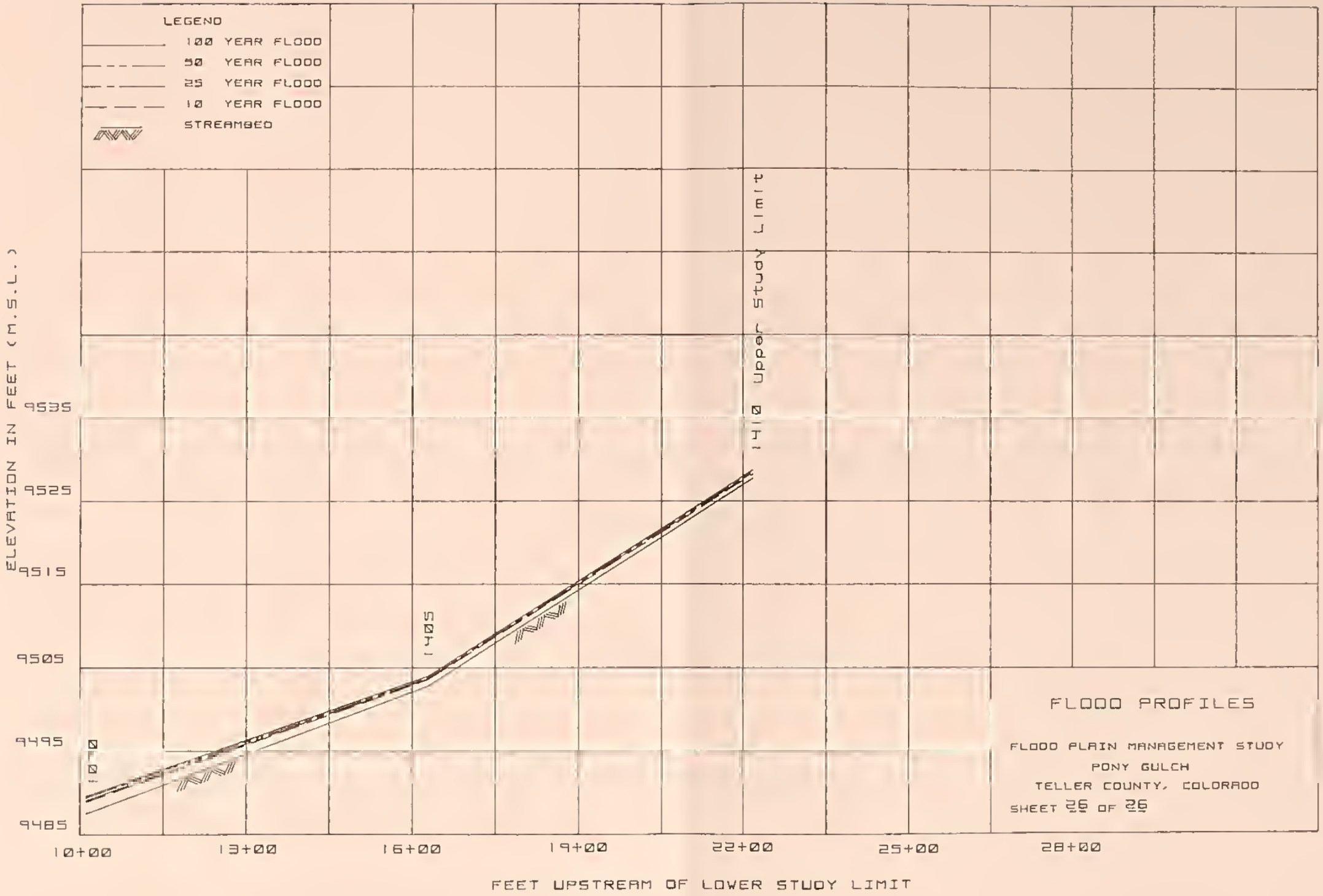

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
9630
9620
9610
9600
9590
9580
9570
9560
9550
ELEVATION IN FEET (M.S.L.)
1045
1050 Galena St.
1055
1060
1065
1071 Upper Study Limit
40+00
27+00
30+00
33+00
36+00
39+00
42+00
45+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
PONY GULCH
TELLER COUNTY, COLORADO
SHEET 24 OF 25

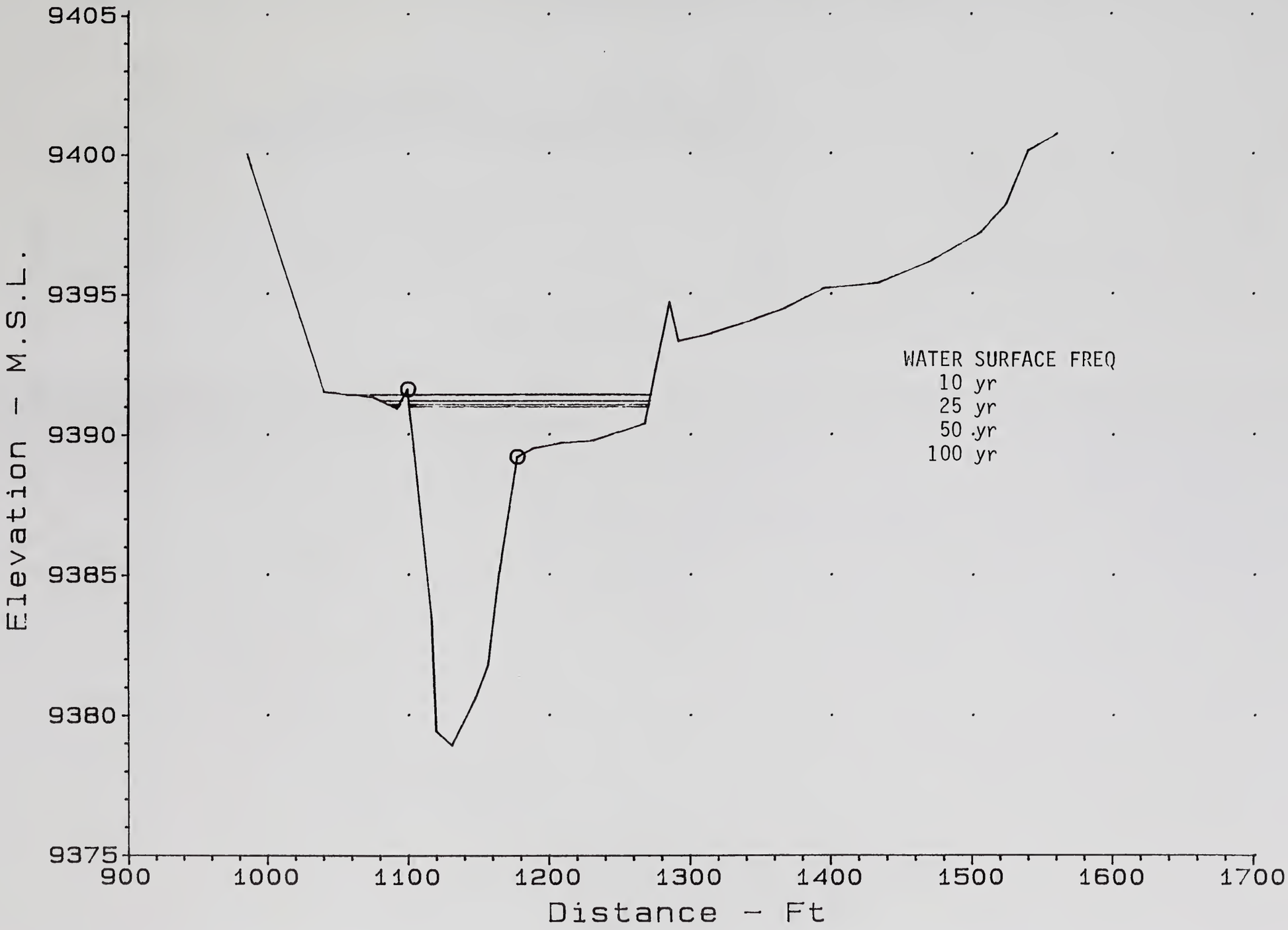


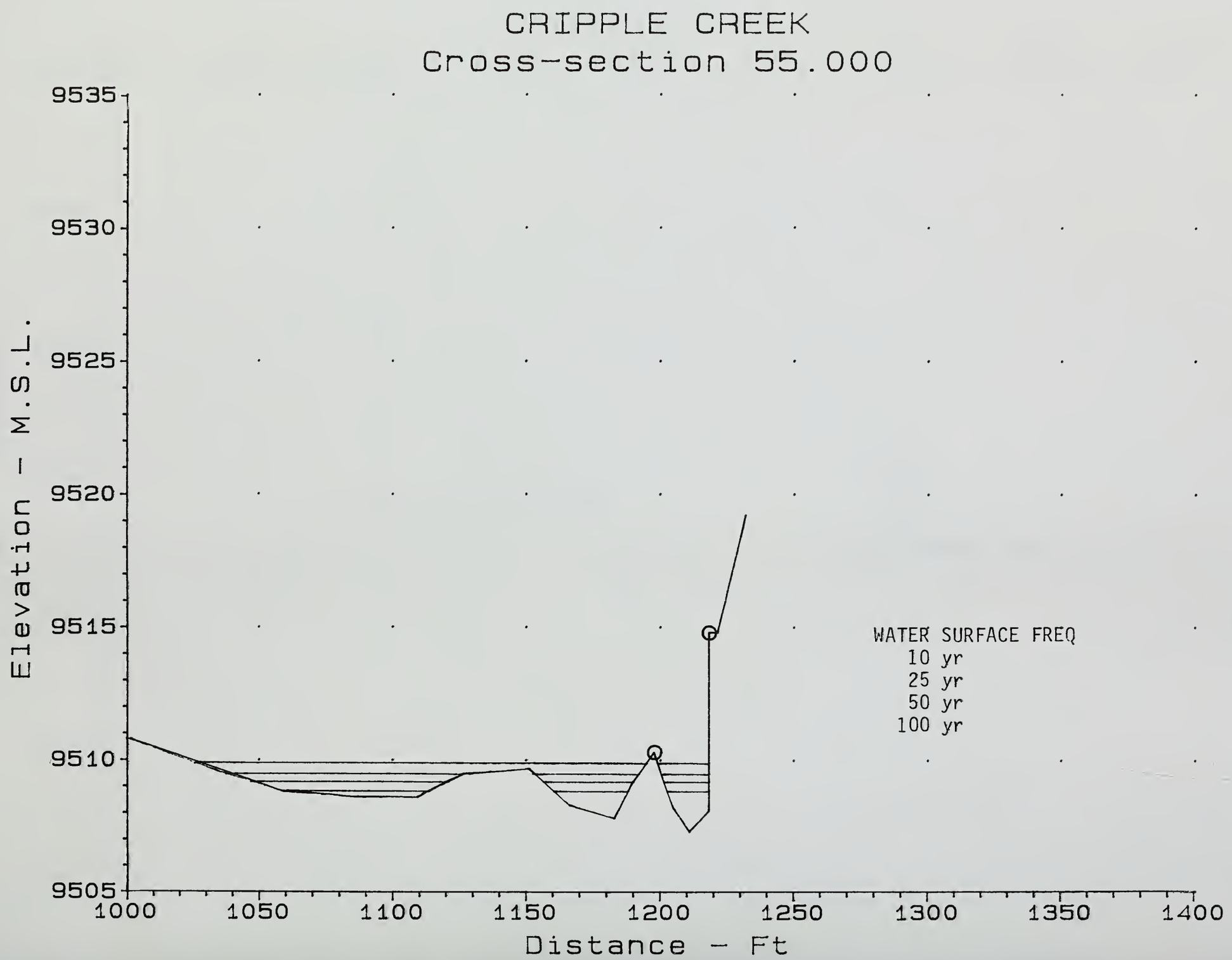
FLOOD PROFILES

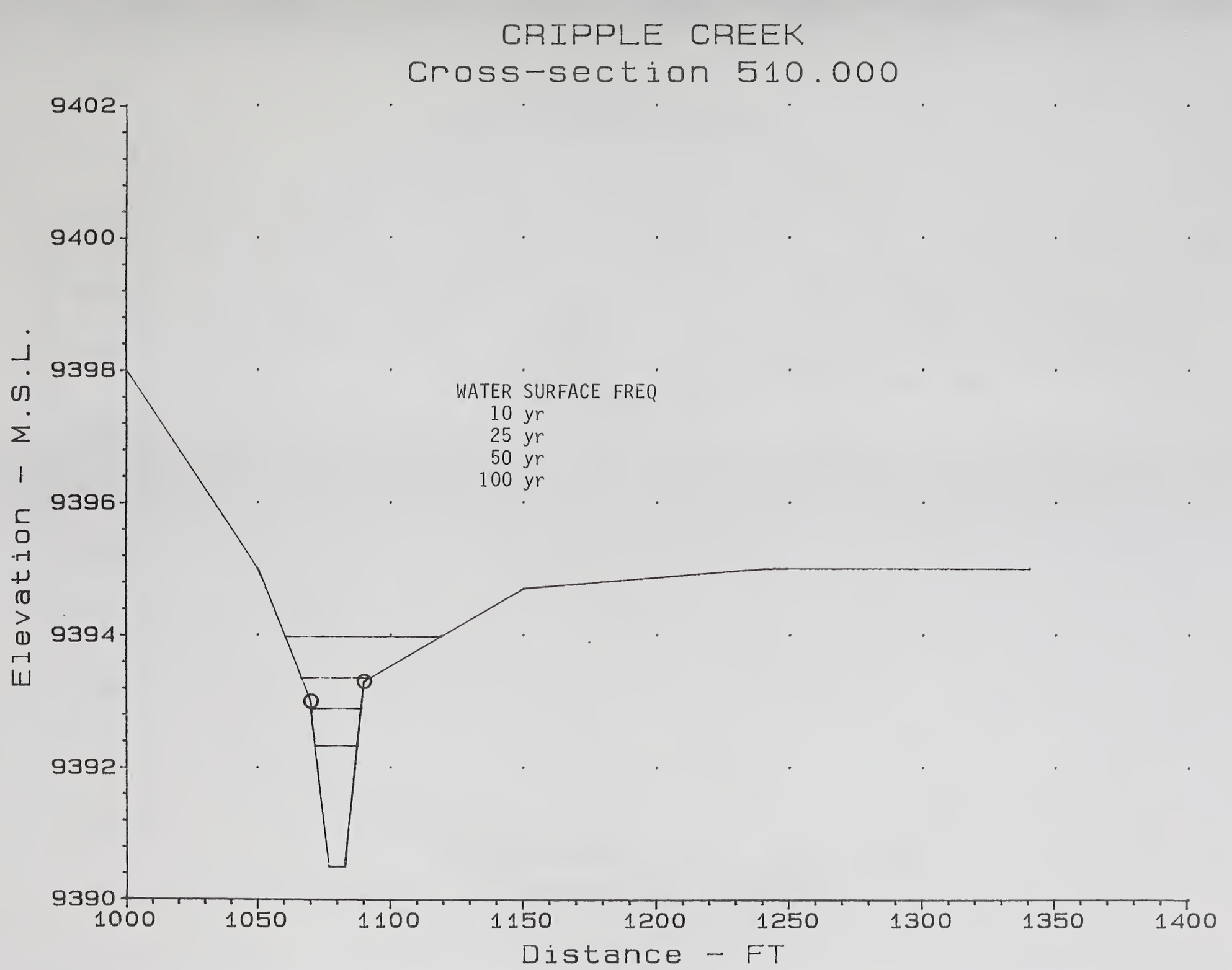
FLOOD PLAIN MANAGEMENT STUDY
PONY GULCH
TELLER COUNTY, COLORADO

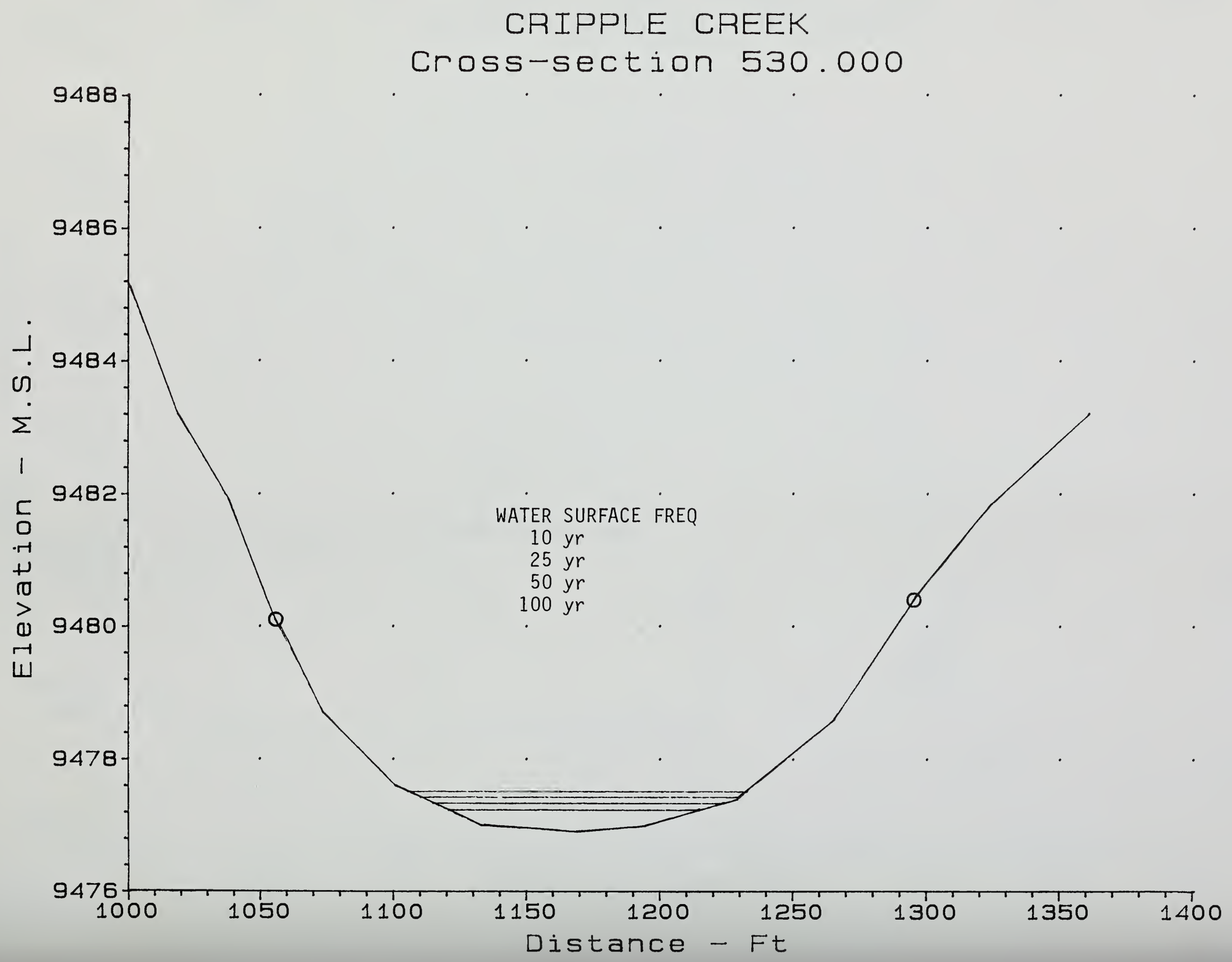
SHEET 25 OF 26

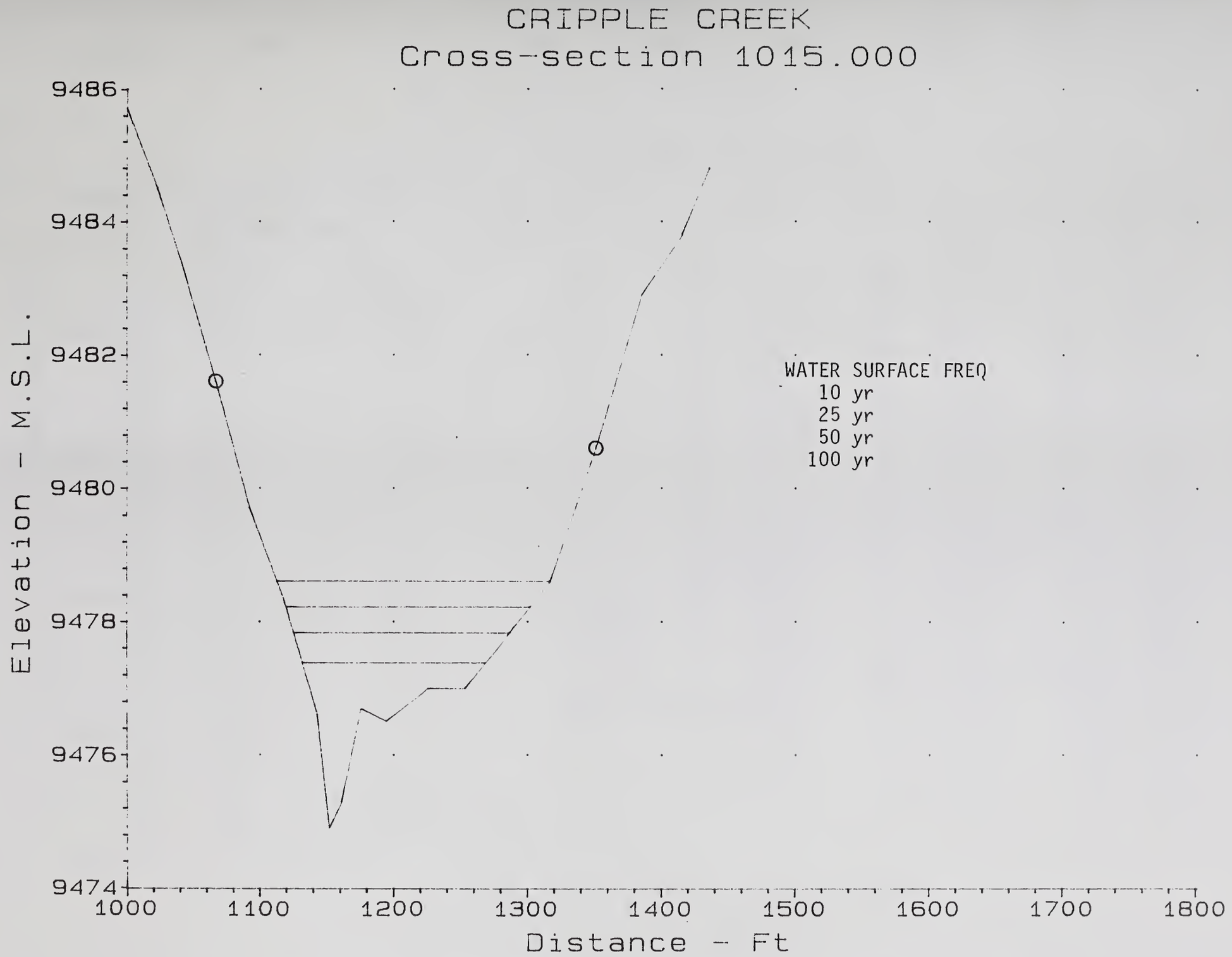

LEGEND
100 YEAR FLOOD
50 YEAR FLOOD
25 YEAR FLOOD
10 YEAR FLOOD
STREAMBED
ELEVATION IN FEET (M.S.L.)
9535
9525
9515
9505
9495
9485
1405
1410
Upper Study Limit
10+00
13+00
16+00
19+00
22+00
25+00
28+00
FEET UPSTREAM OF LOWER STUDY LIMIT
FLOOD PROFILES
FLOOD PLAIN MANAGEMENT STUDY
PONY GULCH
TELLER COUNTY, COLORADO
SHEET 26 OF 26


CRIPPLE CREEK
Cross-section 35.000
9405
9400
9395
9390
9385
9380
9375
Elevation - M.S.L.
900
1000
1100
1200
1300
1400
1500
1600
1700
Distance - Ft
WATER SURFACE FREQ
10 yr
25 yr
50 yr
100 yr


CRIPPLE CREEK
Cross-section 55.000
Elevation - M.S.L.
9535
9530
9525
9520
9515
9510
9505
1000
1050
1100
1150
1200
1250
1300
1350
1400
Distance - Ft
WATER SURFACE FREQ
10 yr
25 yr
50 yr
100 yr


CRIPPLE CREEK
Cross-section 510.000
9402
9400
9398
9396
9394
9392
9390
Elevation - M.S.L.
WATER SURFACE FREQ
10 yr
25 yr
50 yr
100 yr
1000
1050
1100
1150
1200
1250
1300
1350
1400
Distance - FT


CRIPPLE CREEK
Cross-section 530.000
9488
9486
9484
9482
9480
9478
9476
Elevation - M.S.L.
1000
1050
1100
1150
1200
1250
1300
1350
1400
Distance - Ft
WATER SURFACE FREQ
10 yr
25 yr
50 yr
100 yr


CRIPPLE CREEK
Cross-section 1015.000
9486
9484
9482
9480
9478
9476
9474
Elevation - M.S.L.
1000
1100
1200
1300
1400
1500
1600
1700
1800
Distance - Ft
WATER SURFACE FREQ
10 yr
25 yr
50 yr
100 yr

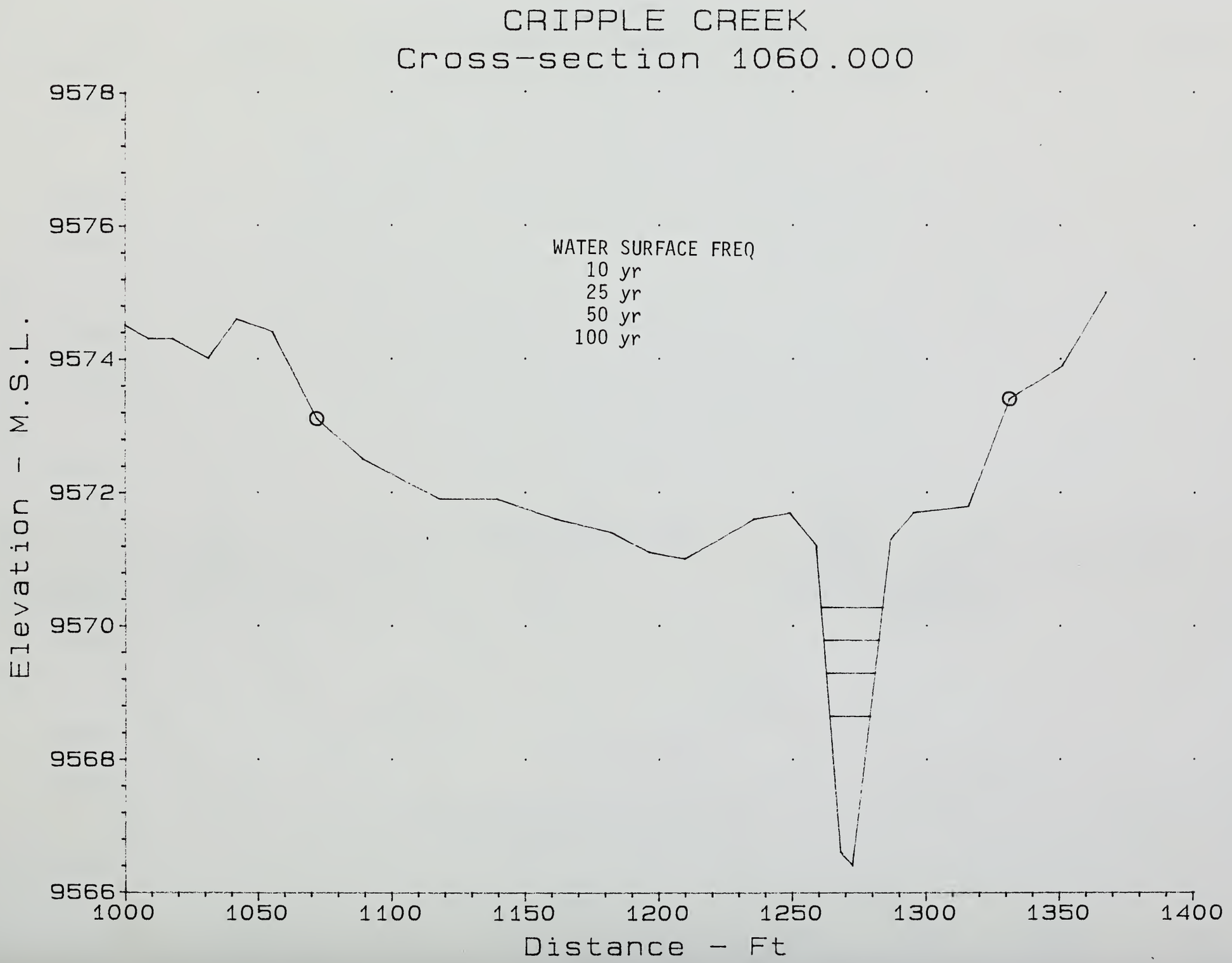

CRIPPLE CREEK
Cross-section 1060.000
WATER SURFACE FREQ
10 yr
25 yr
50 yr
100 yr
Elevation - M.S.L.
9578
9576
9574
9572
9570
9568
9566
1000
1050
1100
1150
1200
1250
1300
1350
1400
Distance - Ft

TABLE 3 FLOOD FREQUENCY - ELEVATION AND DISCHARGE DATA
PROJECT: CRIPPLE CREEK

X-SEC ID	REACH L FT	X-SEC STATION FT	STREAM BTM ELEV	10-YEAR FREQ ELEV	10-YEAR FREQ CFS	25-YEAR FREQ ELEV	25-YEAR FREQ CFS	50-YEAR FREQ ELEV	50-YEAR FREQ CFS	100-YEAR FREQ ELEV	100-YEAR FREQ CFS
			CRIPPLE CREEK								
6.0	0	0	9279.4	9283.4	633	9285.1	1150	9286.2	1720	9287.2	2400
10.0	779	779	9317.3	9319.7	633	9320.5	1150	9321.2	1720	9321.9	2400
16.0	480	1259	9337.2	9342.1	581	9343.7	1070	9346.0	1570	9346.4	2216
20.0	320	1579	9349.6	9352.6	487	9354.1	900	9354.7	1360	9355.2	1911
23.0	550	2129	9370.8	9372.2	487	9372.8	900	9373.3	1360	9373.8	1911
25.0	120	2249	9377.1	9379.2	487	9380.0	900	9380.7	1360	9381.4	1911
30.0	50	2299	9377.1	9391.7	487	9392.3	900	9392.9	1360	9393.3	1911
35.0	35	2334	9378.9	9391.8	487	9392.5	900	9393.0	1360	9393.4	1911
38.0	520	2854	9405.0	9407.9	487	9408.9	900	9409.8	1360	9410.6	1911
39.0	80	2934	9410.0	9415.1	487	9416.7	900	9417.5	1360	9418.2	1911
40.0	20	2954	9410.0	9418.7	487	9419.6	900	9420.2	1360	9420.8	1911
41.0	90	3044	9415.0	9419.5	475	9421.4	860	9422.2	1300	9423.0	1855
43.0	480	3524	9445.5	9448.2	475	9449.0	860	9449.8	1300	9450.5	1855
44.0	75	3599	9450.0	9452.5	475	9453.7	860	9454.8	1300	9456.1	1855
45.0	35	3634	9450.0	9453.2	475	9454.0	860	9455.1	1300	9456.4	1855
46.0	30	3664	9451.7	9454.5	475	9455.7	860	9456.7	1300	9457.8	1855
50.0	480	4144	9477.9	9482.7	304	9483.7	555	9484.6	820	9485.6	1197
51.0	120	4264	9495.0	9497.2	144	9497.8	340	9498.3	610	9498.6	1037
55.0	300	4564	9507.3	9508.8	144	9509.2	340	9509.5	610	9509.9	1037
61.0	400	4964	9525.7	9526.4	153	9526.6	275	9526.7	420	9526.9	598
65.0	230	5194	9537.0	9538.3	153	9538.7	275	9539.0	420	9539.3	598
67.0	110	5304	9547.0	9548.9	153	9549.9	275	9550.7	420	9551.0	598
68.0	75	5379	9548.0	9552.9	153	9554.8	275	9557.1	420	9558.3	598
69.0	115	5494	9552.0	9553.0	119	9555.1	220	9557.1	335	9558.3	486
81.0	320	5814	9571.1	9572.4	119	9572.9	220	9573.3	335	9573.8	486
82.0	100	5914	9579.0	9580.3	119	9580.7	220	9580.9	335	9581.3	486
83.0	20	5934	9579.0	9584.5	119	9584.5	220	9584.5	335	9584.5	486
84.0	60	5994	9584.0	9584.8	119	9585.1	220	9585.2	335	9585.3	486
85.0	400	6394	9605.0	9606.9	96	9607.3	178	9607.8	275	9608.1	394
90.0	560	6954	9640.3	9641.4	96	9641.7	178	9641.9	275	9642.2	394
95.0	620	7574	9680.9	9682.2	96	9682.6	178	9683.0	275	9683.3	394
106.0	340	7914	9702.1	9702.8	64	9703.1	120	9703.3	185	9703.6	264
111.0	370	8284	9731.9	9732.9	64	9733.2	120	9733.4	185	9733.7	264

TABLE 3 FLOOD FREQUENCY - ELEVATION AND DISCHARGE DATA
PROJECT: CRIPPLE CREEK

X-SEC ID	REACH L FT	X-SEC STATION FT	STREAM BTM ELEV	10-YEAR FREQ ELEV	10-YEAR FREQ CFS	25-YEAR FREQ ELEV	25-YEAR FREQ CFS	50-YEAR FREQ ELEV	50-YEAR FREQ CFS	100-YEAR FREQ ELEV	100-YEAR FREQ CFS
			CRIPPLE CREEK CONTINUED								
95.0	0.0	7574	9680.9	9682.2	96	9682.6	178	9683.0	275	9683.3	394
156.0	300	7874	9704.4	9705.3	32	9705.5	60	9705.7	92	9705.9	130
161.0	560	8434	9766.4	9767.4	32	9767.7	60	9768.0	92	9768.3	130
84.0	0.0	5994	9584.0	9584.8	119	9585.1	220	9585.2	335	9585.3	486
210.0	480	6474	9610.0	9610.3	11	9610.4	21	9610.5	33	9610.6	47
215.0	440	6914	9647.3	9647.6	11	9647.7	21	9647.8	33	9647.9	47
			MAIN ST TRIB								
55.0	0.0	4564	9507.3	9508.8	144	9509.2	340	9509.5	610	9509.9	1037
310.0	310	4874	9519.9	9520.7	153	9521.0	280	9521.2	430	9521.4	605
315.0	570	5444	9547.6	9548.8	153	9549.1	280	9549.3	430	9549.5	605
320.0	600	6044	9580.4	9581.3	153	9582.3	280	9582.7	430	9583.0	605
325.0	600	6644	9617.1	9618.4	115	9618.8	215	9619.2	330	9619.7	465
330.0	570	7214	9652.3	9653.7	115	9654.2	215	9654.6	330	9655.1	465
336.0	440	7654	9676.8	9679.0	115	9679.6	215	9680.1	330	9680.7	465
			POVERTY GULCH								
46.0	0.0	3664	9453.5	9460.9	475	9461.6	860	9462.1	1300	9462.6	1855
405.0	400	4064	9475.6	9477.8	225	9478.1	410	9478.5	620	9478.7	893
410.0	160	4224	9491.7	9497.6	225	9514.3	410	9517.4	620	9518.0	893
415.0	200	4424	9509.1	9522.9	225	9523.2	410	9523.5	620	9523.8	893
421.0	330	4754	9521.4	9524.1	225	9524.7	410	9525.3	620	9525.8	893
425.0	320	5074	9536.1	9538.1	225	9538.7	410	9539.2	620	9539.8	893
431.0	150	5224	9546.9	9549.1	148	9549.7	272	9550.2	410	9550.7	581
436.0	530	5754	9580.8	9583.7	148	9584.3	272	9584.8	410	9585.4	581
425.0	320	5074	9536.1	9538.1	225	9538.7	410	9539.2	620	9539.8	893
476.0	70	5144	9546.2	9547.1	48	9547.4	86	9547.6	128	9547.7	181
481.0	600	5744	9606.3	9607.7	48	9608.1	86	9608.3	128	9608.5	181
			THURLOW AVE TRIB								
10.0	0.0	779	9317.3	9319.7	633	9320.5	1150	9321.2	1720	9321.9	2400
905.0	320	1099	9340.8	9341.6	52	9341.8	92	9341.9	135	9342.1	184
908.0	290	1389	9365.0	9365.7	52	9365.9	92	9366.2	135	9366.4	184
910.0	250	1639	9382.8	9384.3	52	9384.7	92	9385.1	135	9385.5	184
912.0	400	2039	9418.0	9418.9	52	9419.2	92	9419.4	135	9419.6	184
915.0	360	2399	9436.7	9437.4	32	9437.6	55	9437.7	80	9437.8	109
921.0	270	2669	9445.2	9445.9	32	9446.1	55	9446.2	80	9446.4	109

TABLE 3 FLOOD FREQUENCY - ELEVATION AND DISCHARGE DATA
PROJECT: CRIPPLE CREEK

X-SEC ID	REACH L FT	X-SEC STATION FT	STREAM BTM ELEV	10-YEAR FREQ ELEV	10-YEAR FREQ CFS	25-YEAR FREQ ELEV	25-YEAR FREQ CFS	50-YEAR FREQ ELEV	50-YEAR FREQ CFS	100-YEAR FREQ ELEV	100-YEAR FREQ CFS
			SECOND ST TRIB								
16.0	0	1259	9337.2	9342.1	581	9343.7	1070	9346.0	1570	9346.4	2216
505.0	370	1629	9352.5	9354.1	133	9354.1	225	9354.4	320	9354.7	432
506.0	530	2159	9378.6	9379.1	127	9379.3	210	9379.4	295	9379.5	390
508.0	50	2209	9384.5	9385.9	127	9386.1	210	9386.3	295	9386.4	390
510.0	190	2399	9390.5	9392.3	127	9392.9	210	9393.3	295	9394.0	390
511.0	200	2599	9405.0	9407.2	127	9408.0	210	9408.8	295	9409.6	390
526.0	0	3659	9458.0	9459.0	57	9459.4	97	9459.9	140	9460.1	195
530.0	255	3914	9476.9	9477.2	57	9477.3	97	9477.4	140	9477.5	195
535.0	520	4434	9508.3	9508.7	57	9508.8	97	9508.9	140	9509.1	195
541.0	760	5194	9564.9	9565.3	11	9565.4	19	9565.6	28	9565.7	38
545.0	610	5804	9654.4	9655.4	11	9655.7	19	9655.9	28	9656.1	38
551.0	290	6094	9694.2	9695.0	11	9695.2	19	9695.4	28	9695.5	38
			COURTHOUSE TRIB								
612.0	0	3539	9463.0	9463.1	23	9463.2	39	9463.2	54	9463.3	73
616.0	250	3789	9484.1	9484.6	23	9484.7	39	9484.8	54	9484.9	73
621.0	420	4209	9508.5	9508.9	23	9509.0	39	9509.0	54	9509.1	73
626.0	300	4509	9516.9	9517.8	13	9518.0	23	9518.2	35	9518.4	49
631.0	580	5089	9542.6	9542.8	13	9542.9	23	9542.9	35	9543.0	49
			MAY AVE TRIB								
505.0	0	1629	9352.5	9354.1	133	9354.1	225	9354.4	320	9354.7	432
804.0	560	2189	9380.0	9380.2	13	9380.2	22	9380.3	34	9380.4	46
805.0	110	2299	9388.8	9389.3	13	9389.4	22	9389.5	34	9389.6	46
806.0	185	2484	9400.0	9400.2	13	9400.3	22	9400.4	34	9400.5	46
810.0	415	2899	9437.1	9438.1	13	9438.3	22	9438.5	34	9438.6	46

TABLE 3 FLOOD FREQUENCY - ELEVATION AND DISCHARGE DATA
PROJECT: CRIPPLE CREEK

X-SEC ID	REACH L FT	X-SEC STATION FT	STREAM BTM ELEV	10-YEAR FREQ ELEV	10-YEAR FREQ CFS	25-YEAR FREQ ELEV	25-YEAR FREQ CFS	50-YEAR FREQ ELEV	50-YEAR FREQ CFS	100-YEAR FREQ ELEV	100-YEAR FREQ CFS
				PONY GULCH							
1006.0	0	0	9474.7	9475.6	303	9475.9	550	9476.1	820	9476.3	1157
1011.0	60	60	9474.7	9476.0	303	9476.4	550	9476.7	820	9477.0	1157
1011.5	64	124	9474.7	9476.2	303	9476.6	550	9477.0	820	9477.3	1157
1015.0	148	272	9474.9	9477.4	303	9477.8	550	9478.2	820	9478.6	1157
1020.0	760	1032	9487.5	9488.9	233	9489.1	425	9489.3	630	9489.6	894
1025.0	656	1688	9502.4	9502.9	199	9503.1	366	9503.4	545	9503.6	767
1026.0	276	1964	9508.2	9510.9	196	9511.0	355	9511.2	532	9511.4	757
1027.0	28	1992	9508.2	9513.1	196	9513.1	355	9513.1	532	9513.1	757
1027.5	16	2008	9508.5	9513.1	196	9513.1	355	9513.1	532	9513.1	757
1028.0	200	2208	9513.0	9515.0	198	9515.4	365	9515.6	545	9515.8	767
1029.0	92	2300	9516.9	9521.7	198	9523.3	365	9523.5	545	9523.5	767
1029.5	40	2340	9516.9	9522.6	198	9524.8	365	9524.8	545	9524.8	767
1030.0	352	2692	9525.6	9529.7	198	9530.5	365	9530.5	545	9530.5	767
1030.1	32	2724	9525.6	9531.2	193	9531.4	355	9531.6	530	9531.8	754
1030.2	36	2760	9530.0	9531.1	193	9531.4	355	9531.6	530	9531.8	754
1030.3	36	2796	9530.5	9531.9	193	9532.2	355	9532.5	530	9532.7	754
1030.4	68	2864	9531.6	9533.2	193	9533.5	355	9533.7	530	9534.0	754
1030.7	92	2956	9532.5	9534.9	195	9535.5	357	9535.9	538	9536.2	761
1030.8	68	3024	9533.0	9536.6	181	9537.9	340	9538.4	506	9538.8	713
1031.0	24	3048	9533.0	9538.0	181	9538.7	340	9539.2	506	9539.7	713
1034.0	140	3188	9540.0	9541.6	171	9541.9	277	9541.9	277	9541.9	277
1034.6	28	3216	9541.0	9543.3	171	9544.0	277	9544.0	277	9544.0	277
1035.0	48	3264	9541.0	9545.9	171	9546.2	277	9546.2	277	9546.2	277
1038.0	36	3300	9541.9	9545.9	171	9546.2	277	9546.2	277	9546.2	277
1040.0	228	3528	9545.1	9547.0	171	9547.6	277	9647.6	277	9547.6	277
1045.0	592	4120	9556.7	9559.5	171	9560.2	277	9560.2	277	9562.2	277
1045.5	44	4164	9557.5	9560.4	167	9561.2	310	9561.4	460	9562.2	658
1050.0	34	4198	9557.5	9562.9	167	9563.7	310	9564.1	460	9564.5	658
1055.0	30	4228	9562.8	9564.8	167	9565.3	310	9565.7	460	9566.2	658
1060.0	156	4384	9566.4	9568.6	75	9569.3	143	9569.8	218	9570.3	313
1065.0	452	4836	9583.0	9584.6	75	9585.2	143	9585.7	218	9585.9	313
1071.0	428	5264	9600.3	9602.3	75	9602.9	143	9604.0	218	9604.1	313
-1055.0	30	4228	9562.8	9564.8	167	9565.3	310	9565.8	460	9566.2	658
1215.0	508	4736	9583.3	9584.2	33	9584.6	63	9584.7	96	9584.9	138
1220.0	592	5328	9621.4	9622.3	33	9622.6	63	9622.8	96	9623.0	138
1225.0	320	5648	9646.2	9647.6	33	9648.1	63	9648.4	96	9648.6	138
-1020.0	760	1032	9487.5	9488.9	233	9489.1	425	9489.3	630	9489.6	894
1405.0	664	1696	9502.9	9503.8	50	9503.8	63	9503.9	95	9504.1	186
1410.0	588	2284	9527.8	9528.3	16	9528.5	28	9528.7	40	9528.8	55

☆U.S GOVERNMENT PRINTING OFFICE: 1992—838-183