FLOOD HAZARD STUDY
LAS VEGAS WASH AND TRIBUTARIES
Clark County, Nevada



Prepared by:

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Reno, Nevada

In Cooperation with
Clark County Commissioners
City of Las Vegas, City of North Las Vegas
Clark County Waste Water Agency
Clark County Conservation District
and the
Nevada Water Resources Division

February 1979

USDA-SCS-PORTLAND, OR. 1979

FLOOD HAZARD STUDY

LAS VEGAS WASH AND TRIBUTARIES

Clark County, Nevada

Cover Photograph Courtesy of

The Las Vegas Review Journal

Prepared By

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Reno, Nevada

In Cooperation With
Clark County Commissioners
City of Las Vegas, City of North Las Vegas
Clark County Waste Water Agency
Clark County Conservation District
and the
Nevada Water Resources Division

February 1979

TABLE OF CONTENTS

FOREWORD..... ii

PHOTOGRAPHS OF FLOODING..... iv

INTRODUCTION..... 1

DESCRIPTION OF STUDY AREA..... 2
Climate..... 3
Geology and Physical Geography..... 3
Soils..... 4
Hydrologic Designation..... 5
Land Use and Population..... 5
Natural and Beneficial Floodplain Values..... 6

DETAILED STUDY LIMITS..... 8

FLOOD HISTORY.....10

FLOOD POTENTIAL
Present Conditions.....16
Maximum Flow Depths and Inundated Areas.....17
Maps and Tables.....18
Future Conditions.....20

FLOODPLAIN MANAGEMENT.....21

APPENDIX A Index Map.....A-1
APPENDIX B Flood Hazard Area Photograph Maps.....B-1
APPENDIX C Flood Profiles and Tabulation of Water Surface Elevations.....C-1
Table C-1: Las Vegas Wash
Table C-2: Duck Creek
Table C-3: Flamingo Wash
Table C-4: Tropicana Wash
Table C-5: Las Vegas Creek
Table C-6: Las Vegas Range Wash

APPENDIX D Selected Cross Sections.....D-1
APPENDIX E Tabulation of Floodway Data.....E-1
APPENDIX F Investigations, Analyses, and Technical Data.....F-1
1. Survey Procedures and Background Data.....F-1
2. Hydrology and Hydraulics.....F-2
3. Soil Survey Data.....F-6
4. Elevation Reference Marks.....F-7
APPENDIX G Glossary.....G-1
APPENDIX H Bibliography.....H-1

FIGURE 1 Streams Studied in Detail and Vicinity Map..... 9

EXHIBIT 1 Perspective View of a Floodplain and Floodway.....26
EXHIBIT 2 Floodway Schematic.....27

TABLE 1 Summary of Historical Floods.....14
TABLE 2 Flooded Area (Acres).....19

FOREWORD

The information contained in this report is intended to serve as a technical base from which local floodplain management decisions can be made. The State and local units of government, as well as interested citizens, will benefit from the increased knowledge concerning flood hazards along Las Vegas Wash and its tributaries. This report does not contain any project type structural proposals for alleviating flooding.

The City of North Las Vegas and the City of Las Vegas surveying crews assisted in obtaining field surveys.

Clark County Public Works Department assisted in obtaining copies of the Las Vegas Valley regional aerial mapping. These maps provided valuable information which helped expedite the study.

The Corps of Engineers prepared a report on a survey for flood control for Las Vegas Wash and tributaries, Las Vegas and vicinity, Nevada in 1959 (Reference 1). The flood control measures proposed in this report were never installed due to the lack of support by the local sponsors and citizens. In 1967 the Corps of Engineers also prepared a Floodplain Information (FPI) report for Lower Las Vegas Wash, Clark County, Nevada. This FPI study covered Las Vegas Wash from a point 5.8 miles upstream from its mouth at Lake Mead to stream mile 13.8, a distance of

about 8 miles. This upper limit is approximately the intersection of Charleston Boulevard and Las Vegas Wash in the City of Las Vegas (Reference 2). These reports provided some background information and history of the study area.

This report covers Las Vegas Wash from its confluence with Duck Creek to the approximate upstream boundaries of present urbanization. It also includes the following tributaries from their confluence with Las Vegas Wash to their approximate boundaries of present development:

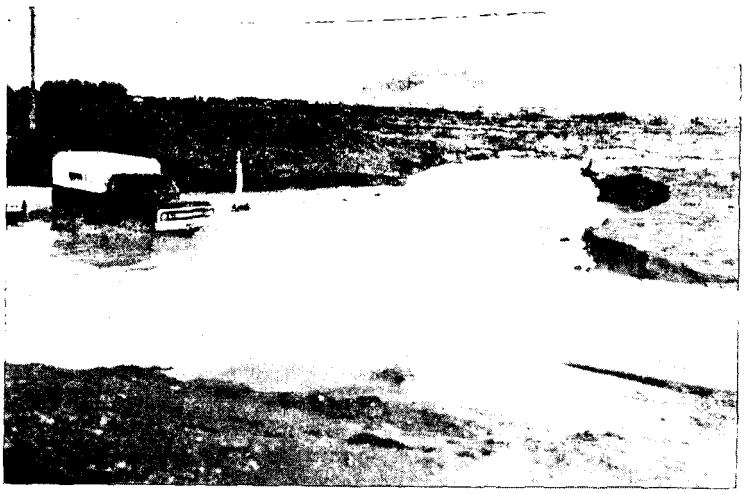
1) Duck Creek
2) Las Vegas Range Wash
3) Flamingo Wash and its tributary Tropicana Wash
4) Las Vegas Creek

The study area includes portions of the City of North Las Vegas, City of Las Vegas, and the unincorporated communities of East Las Vegas, Paradise, Winchester, and Sunrise.

Some photographs of flooding in the study area follow.



Flamingo Wash at Harmon just west of Paradise Road from storm of February 1976. (Courtesy of the Las Vegas Sun)



Looking downstream where Las Vegas Wash crosses Lamb Boulevard on 2-9-76. (SCS photo)



Looking upstream at Las Vegas Wash from Bonanza Road bridge on 2-9-76. (SCS photo)



Flow at Indios and Twain on 9-11-77. (Courtesy of the Las Vegas Sun)



Flow on Tropicana Wash at Flamingo Road between Paradise Road and Maryland Parkway on 2-9-76. (Courtesy of Las Vegas Sun)



Removing flood damaged automobiles from parking lot after storm of July 3-4, 1975. (Courtesy of the Las Vegas Sun)

FLOOD HAZARD ANALYSES REPORT

For

The Las Vegas Wash and Tributaries

February 1979

INTRODUCTION

The Nevada Water Resources Division (NWRD) recognized the need for floodplain studies to form a basis for floodplain regulation and land use planning to reduce potential flood losses. In December 1974, the Nevada Water Resources Division signed a joint coordination agreement with the Soil Conservation Service (SCS) for Flood Hazard Analyses and Floodplain Studies. A plan of study for a Flood Hazard Analyses of Las Vegas Wash and Tributaries, Clark County, Nevada, was signed in March 1975. The local sponsors of this study are the Clark County Conservation District, Clark County Commissioners, City of Las Vegas, City of North Las Vegas, and Clark County Waste Water Agency.

The Nevada Water Resources Division operating authority is found in Nevada Revised Statute 543.020. The Soil Conservation Service carries out flood hazard studies under the authority of Section 6 of Public Law 83-566, in response to Recommendation 9(c) of House Document No. 456, 89th Congress and Executive Order 11988 dated May 24, 1977.

The Las Vegas Valley is subject to increasing flood damages from existing and increasing developments by man in the floodplain areas. The floodplains of Las Vegas Wash and its tributaries of Duck Creek, Las Vegas Range Wash, Flamingo Wash and its tributary of Tropicana Wash, and Las Vegas Creek were studied to determine the extent and frequency of flooding. The portion of Las Vegas Wash that was studied in detail extended from Lone Mountain Road in North Las Vegas downstream to the confluence of Duck Creek which is near the Las Vegas Stadium. The portions of the tributaries to Las Vegas Wash that are within metropolitan Las Vegas were also studied in detail.

DESCRIPTION OF STUDY AREA

The Las Vegas metropolitan area is located in the southern portion of Nevada, in the central part of Clark County, and occupies the central part of a broad, open desert basin. Las Vegas Wash originates in the mountains about 28 miles north of Las Vegas and continues southeastward for about 42 miles to where it terminates at Lake Mead. The drainage basin is bounded by the Spring Mountains on the west, by parts of Desert, Sheep, and Las Vegas Ranges on the north, by Frenchman and River mountains and a low range of hills on the east, and by Spring Mountains and Bird Spring and McCullough Ranges on the south. The region is characterized by well-defined mountain ranges running generally north and south with broad alluvial valleys between the ranges (Reference 1). The flow patterns on the alluvial fans are complex with areas of concentrated but frequently shifting flows. The drainage area at the

confluence of Duck Creek and Las Vegas Wash is approximately 1,449 square miles. Las Vegas Wash and its tributaries are dry washes that only flow after rainstorm events.

Climate

The climate in the Las Vegas area has four well defined seasons. The summer ranges from June to September with daytime temperatures over 100 degrees Fahrenheit. The spring and fall seasons are relatively short with temperatures in the 70's. Winters are generally snowless, with daytime temperatures from 50 to 60° F. Nights during January and February are near freezing. The average annual precipitation is 3.94 inches and the average annual temperature is 66 degrees (Reference 3).

Geology and Physical Geography

Las Vegas Valley is a structural depression in the bedrock, partially filled with alluvium and lake deposits. The Las Vegas Shear Zone delineates the northeast boundary and separates the Spring Mountains on the southwest from the Sheep and Las Vegas Ranges to the north. La Madre Fault, another major southeast trending displacement, roughly parallels the Las Vegas Shear Zone approximately 10 to 20 miles to the south. The La Madre along with the Bird Spring Thrust and many other smaller faults roughly delineate the southwest boundary of the basin. The southeast portion of the basin is blocked by a series of volcanic flows which may also be displaced by faulting.

The Las Vegas basin is made up of three types of land forms: mountains, alluvial fans and valley lowlands. The rugged topography of the mountainous areas is characterized by sharp peaks and ridges, steep slopes and deep, steepsided canyons.

Many large alluvial fans exist around the perimeter of the valley. All fans are dissected by gullies. These gullies exhibited a dendritic drainage pattern throughout the intermediate and lower parts of the watershed prior to the expansion of the Las Vegas residential area. Because of this development, some of the small gullies have been diverted into other drainages. (Reference 4).

Soils

The characteristics of the soils in Las Vegas Valley are those generally associated with soils of arid regions. Weathering of the constituent rocks and minerals has been slow, leaching of soluable salts is incomplete, the organic matter content is low, and calcium and gypsum have concentrated in the subsurface layers.

For the most part, these soils overlie valley fill and alluvial fan deposits. The soils underlain by valley fill consist largely of fine-grained sand, silt, and clay. Those on alluvial fans consist of poorly sorted gravel, sand, and silt but are predominantly coarse textured. Lime-cemented strata are common in most of the soils. The

soils on floodplains consist of material of many different textures and are generally stratified and saline. Soils are also present which contain chlorides and sulfates which are corrosive to steel and concrete. (Reference 5).

Hydrologic Designation

The Water Resources Council hydrologic unit code for the study area is 15010015. The region is the Lower Colorado (Reference 6).

Land Use and Population

In the Las Vegas Valley, agriculture is minimal, consisting of approximately 2,012 acres. This is because of water quantity and quality limitations. Alfalfa, barley, sorghum, and corn are irrigated using groundwater and wastewater.

Most of the major drainage ways within the cities of North Las Vegas and Las Vegas have improved channels with housing developments bordering the channels. The washes located in the unincorporated metropolitan area around the two cities contain only a small amount of channelization. Encroachment has occurred by construction in the floodplains of the channels. Residential expansion is occurring on the alluvial fans west of Interstate 15 which is changing drainage patterns and points of concentrated flows. The expansion of the urban Las Vegas area is expected

to continue until it is limited by the available water supply. The population of the Las Vegas Valley has grown from about 1,000 people in 1910 to 8,400 in 1940, 28,500 in 1950, 82,800 in 1960, 226,000 in 1970 (Reference 7), and 323,200 estimated in 1975 (Reference 8).

Natural and Beneficial Flood Plain Values

Two major biotic communities occupy the flood plains of Las Vegas Wash and its tributaries. The Streamside and Riparian community is found along the permanent sections of Lower Las Vegas Wash and is composed of willows *(Salix)*, cottonwoods *(Populus fremontii)*, saltcedars *(Tamarix gallica)*, arrowweed *(Pluchea sericea)*, seepwillow *(Boccharis glutinosa)*, sedges *(Carex)*, rushes *(juncus)*, cattails *(Typha)*, and various grasses.

The Cresote Bush Community surrounds Las Vegas Wash and consists of creosotebush *(Larrea divaricata)*, burro bush *(Ambrosia dumosa)*, yucca, and cactii. The herbaceous vegetation includes a large variety of small desert annuals such as composites, mustards and legumes.

The Las Vegas Wash waters contain mosquitofish *(Grom busia offinis)*, sunfish *(Lepomis macrochirus)*, possibly channel catfish *(Ictalmus punctatus)*, and carp *(Cyrinus Carpio)*. Reptiles such as turtles, lizards and snakes are found in the creosote bush communities. The Las Vegas Wash ecosystem supports probably the most diverse and abundant bird community in the region. Rodents such as black tail jackrabbit *(Lepus californicus)* and desert cottontail *(Sylivilagus audobonii)* are also found in the area (Reference 19).

The Duck Creek area is an archaeological resource because evidence of three different cultural groups is found: The Pueblo, the Lower Colorado River People, and the Paiute.

Presently the floodplains encompass irrigated farmland comprising about 1,300 acres or about two square miles, residences, and some large casino-hotel complexes. Golf courses are located on Las Vegas Wash, Tropicana Wash, and Flamingo Wash.

If future development of the floodplain areas for recreation or visual purposes does not occur, the washes will function mainly as open space corridors. These will preserve some views of the surrounding mountains from within the urbanized areas. If landscape and recreational development does occur, then the washes could become important landscape buffer zones. The zones would visually separate communities and neighborhoods, providing visual interest, contrast and accessible recreational opportunity close to residential areas (Reference 19).

The dense vegetation and wide floodplain in Lower Las Vegas Wash (near the Duck Creek confluence) helps retard flood flows. Flow velocities are reduced and flood waters spread to shallow depths.

The floodplains could provide a substantial portion of community park acreage needs, and a certain portion of neighborhood park acreage needs. However, the floodplain locations preclude the possibility of their

satisfying all community and neighborhood park needs. Maintaining the marsh area in Lower Las Vegas Wash by limiting the release of effluent to make a regional wetlands park is now under study by the Clark County Department of Parks and Recreation (Reference 19).

DETAILED STUDY LIMITS

The streams that were studied in detail are as follows and are shown in Figure 1.

Stream	Length (Mi)
Las Vegas Wash	18.3
Duck Creek	8.9
Las Vegas Range Wash	10.2
Flamingo Wash	13.6
Tropicana Wash	9.9
Las Vegas Creek	3.4
Total	64.3 Miles

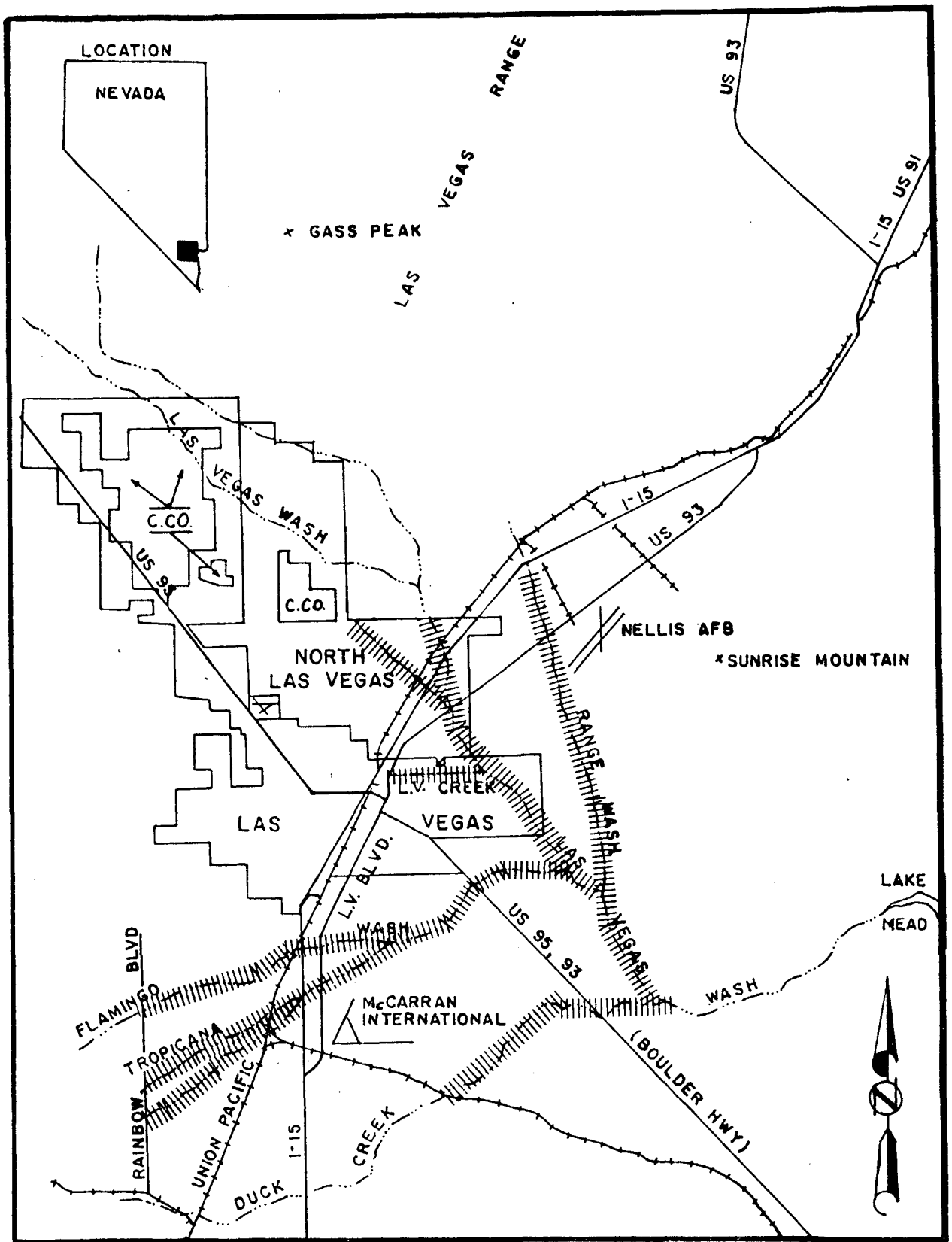


FIGURE 1 Streams studied in detail

LAS VEGAS WASH FLOOD HAZARD ANALYSES

CLARK CO., NEV.

USDA SCS-PORTLAND, OR. 1979

FLOOD HISTORY

The precipitation that causes flood problems in the Las Vegas area occurs during two clearly defined rainy seasons - winter and summer. During the winter, frontal storms produce large area, low intensity rainfall. Some frontal storms also occur during the summer, but most rainfall during this season results from thundershowers occurring during periods when warm, moist, tropical air invade the area. Slightly over one-third of the average annual precipitation occurs as short term, high intensity rainfall during these thunderstorms, which can be quite severe and commonly result in flash floods. The majority of the flood events in Las Vegas have occurred in July and August (Reference 9).

The records of flood occurrences for the past few years indicate that a minor flood occurs on the average of once each year. Such storms are usually concentrated in a relatively small area and have a high intensity of precipitation during the first five or ten minutes. Normally, the duration of this type of storm is less than one hour, and it is not uncommon for forty percent or more of the precipitation to occur during the first five minutes. The stream channels, which are mostly on debris cones or alluvial fans, are generally inadequate to accommodate even minor flood flows (Reference 10).

Some of the major storms that have occurred in the Las Vegas area are as follows:

July 23, 1923 - In a one hour period, 1.98 inches of precipation were registered but it was estimated that the measurement was 50 percent greater than the storm amount due to high winds. The storm was local and centered in Las Vegas. Water flowed through most every building in the city including those along Fremont Avenue. An estimate of damage was $25,000.

October 12, 1947 - Damages from fallen trees, wind, and a heavy rainfall of 1.04 inches were reported. Approximately $100,000 of damage occurred in the Mayfair Trail immediately south of Fremont Avenue near 17th Street. Water flowed down Fremont Stree and Charleston Boulevard.

June 13, 1955 - Precipatation of nearly three inches was reported for this large storm covering nearly 500 square miles. The official rain gage at McCarran Field only recorded .39 inches. The Corps of Engineers prepared a special report on this storm and estimated damages at $1.5 million. Other sources indicate damages from $2,375,000 to $3,000,000 to buildings, contents of buidlings, public utilities, streets and alleys, the Union Pacific Railroad, automobiles, and personal property. The sewage disposal plant for Las Vegas was flooded and clogged by silt and mud. An estimated $83,000 damages occurred to the sewer plant and its connecting lines.

The Corps of Engineers estimated a peak discharge of 6,000 cubic feet per second (cfs) along the west side of the Union Pacific Railroad track about 200 feet north of San Francisco Street (now known as Sahara Avenue). See Reference 11 for the detailed Corps of Engineers report. This flood has an approximate return period of 23 years.

July 24, 1955 - Official recorded precipitation was 1.29 inches, However, the Corps of Engineers reported up to 1.9 inches. The storm covered most of the city of Las Vegas and resulted in an estimated total property damage of $200,000 in Las Vegas and adjacent areas of North Las Vegas. A peak flow of 600 cfs was reported by the Corps of Engineers (Reference 12).

August 21, 1957 - The Las Vegas Valley was drenched by 2.57 inches of rain damaging city streets estimated at $50,000. This storm gave a discharge of 1,400 cfs at the U.S. Geological Survey stream gaging station on Las Vegas Wash near Henderson. The average return period of this storm is approximately three years.

September 13, 1969 - Heavy rains pushed by Pacific coast tropical storms hit the Las Vegas Valley. The only rainfall that was measured was .48 inches at Little Red Rock west of Las Vegas. Conservative damage estimates from this storm were in excess of a quarter of a million dollars. More than a dozen automobiles were swept from Caesars Palace parking lot under the bridge crossing the Strip

where they jammed up, causing a crude dam that forced the water still higher. The U. S. Geological Survey recorded a peak discharge of 1,500 cfs at Maryland Parkway. This is the second largest recorded flow on Flamingo Wash at this point in a period of nine years. This flood has an average return period of approximately 17 years.

July 3-4, 1975 - Heavy thunderstorm precipitation between metropolitan Las Vegas and the mountains to the south, west, and north, caused flash flooding in the city area. Total storm precipitation equaled or exceeded three inches in some areas. Peak flows on Tropicana Wash, Flamingo Wash, Las Vegas Creek, and Las Vegas Wash were the highest ever determined. Flooding caused the loss of two lives and inflicted extensive property damage estimated by the Clark County Flood Control District at four to five million dollars. The approximate return period of this flood is 111 years for Las Vegas Wash and 53 years for Flamingo Wash.

A summary of these and other historical flood events is given in Table 1. Additional flood history information is available in the Special Report, "History of Flooding, Clark County, Nevada, 1905-1975", (Reference 14) prepared by the Soil Conservation Service as a supplement to this report.

Table 1

SUMMARY OF HISTORICAL FLOODS

Date	Precipitation (Inches)	Estimated Damages	Remarks
July 23, 1923	1.98 1/	$25,000	Water flowed through practically every building in the city including those along Fremont Street.
August 12, 1931	2.74	Not determined	Water completely covered the streets and highway in places in the south end of the city.
February 1, 1940	.74	Not recorded	Water ran nearly curb deep. Type of storm normally to be expected at this time of year.
August 9-10, 1942	1.75	Minor report of damage	Rain storm hit Las Vegas and Boulder City. On Mt. Charleston, 2 1/2 inches of rain fell.
October 12, 1947	1.04	$100,000	Five miles of water flowed down Fremont Street and Charleston Boulevard.
July 31, 1949	0.7 - .52	$10,000 +	Water in the streets ran 6 inches deep.
September 28, 1951	.98	Minor	Gutters flowed full and a few curbs were undermined in new areas.
July 25, 1954	1.18	Unknown	A four-foot high wall of water raged through a backyard at 211 Spencer St.
June 13, 1955	. 39 - 3	$1,500,000 - $3,000,000	Large storm that covered nearly 500 square miles.

1/ Measurement of precipitation estimated to be 50 percent greater than actual storm amount due to high winds.

Table 1 (Continued)

SUMMARY OF HISTORICAL FLOODS

Date	Precipitation (Inches)	Estimated Damages	Remarks
July 24, 1955	1.29 - 1.9	$200,000	Storm caused flooding in Las Vegas and Henderson. 150 foot section of retaining wall above the Twin Lakes Village was carried away by flood waters.
August 21, 1957	2.57	$50,000	Storm resulted in second largest peak flow recorded by USGS on Las Vegas Wash near Henderson.
September 16, 1961	.09 +	$500,000	Lamb Boulevard was washed out in places.
September 4, 1963	.80	Minor	Streets flooded.
September 13, 1969	.48 @ Little Rock	$250,000	Storm resulted in second largest peak flow recorded by USGS on Flamingo Wash at Maryland Parkway. Cars were swept from Caesar's Palace parking lot.
July 3-4, 1975	.22 - 3	$4-5,000,000	Large thunderstorm which caused highest recorded peak flows on Las Vegas, Tropicana and Flamingo Washes and on Las Vegas Creek. Flooding caused the loss of two lives and more than 100 cars were submerged in Caesers Palace parking lot.

FLOOD POTENTIAL

Present Conditions

Potential flood areas exist along the streams studied in this report. Possible flood damages include damage to residential buildings from water in the first floor, sewer backup and foundation damage from erosion. Water ponding on flat roofs may cause their collapse and subsequent water damage. Deposition of sediment on floors, driveways, sidewalks and streets is also possible in both residential and commercial areas. Flooding of the agricultural land in the lower Las Vegas Wash resulting in crop damage or loss is a potential threat. Streambank erosion is also a problem which is a potential threat. Streambank erosion is also a problem which is resulting in undermining of bridge culverts, roadways, and cinder block fence foundations. Other possible urban damage areas includes lawns, roads, and bridges in the floodplains. Since many of the culvert and bridge installations don't have the capacity to pass the 100-year flood without overtopping, damage to the abutments is possible.

The bridges and culverts were analyzed assuming unobstructed flow. However, bridge openings may become plugged during flow events due to debris from buildings, tumbleweeds, automobiles and other objects located on the floodplains.

The following bridge locations have high head losses and therefore, restrict the passage of floodwaters: Las Vegas Wash at Stewart Avenue and Cheyenne Avenue; Flamingo Wash at Swenson Road, Eastern Avenue, and Tropicana Avenue; and Tropicana Wash at Las Vegas Boulevard and at the Union Pacific Railroad.

Maximum Flow Depths and Inundated Areas

The maximum depth of water on the floodplain from a 100-year frequency flood varies from three to six feet on lower Las Vegas Wash near the confluence with Duck Creek and is 2.5 feet near Interstate 15 in North Las Vegas. The typical channel velocity in Las Vegas Wash is six feet per second and the typical velocity of water in the floodplain is one foot per second.

The maximum depth of water on the floodplains of Las Vegas Creek, Flamingo Wash, Tropicana Wash, Las Vegas Range Wash, and Duck Creek varies from .5 to 1.5 feet. The velocities are approximately six feet per second or less for the channels and one foot per second for the floodplains.

At a typical cross section on Las Vegas Wash (such as at Las Vegas Boulevard) (Cross Section AS) the flow for a 100-year frequency flood rises rapidly approximately two hours after rainfall begins and flooding continues for 14 hours.

The area in acres expected to be inundated by the 100-year and 500-year floods are summarized in Table 2. The land uses shown in Table 2 are those existing at the time of this report.

Maps and Tables

The major items included in this report are the flood hazard areas mosaics, water surface profiles and tables, and floodway tables (Appendix B, C, and E, respectively). Other areas may be inundated from localized storms. Only the major drainage ways are shown on the flood maps. Localized drainage problems (on-site, construction areas, temporary diversions, etc.), wet or poorly drained areas, and small drainage areas are not considered in this study. Information about these areas may be available from the Clark County Flood Control District.

Water surface profiles show the location of cross sections and roads along the streams and the elevation of the water surface for the 10, 50, 100, and 500-year floods. The water surface elevations at a particular location can be found by first locating the desired point on the flood hazard area mosaics. The next step is to measure The distance along the stream to the nearest cross section, then measure the same distance away from the cross section on the plot of water surface profiles (Appendix C). At this point, the water surface elevations can be read. The water surface profiles are also tabulated (Appendix C-2) for valley and road cross sections. These tables correspond to the elevations plotted in Appendix C.

Table 2

FLOOD HAZARD ANALYSES

Las Vegas Wash and Tributaries

Sheet 1 of 1

FLOODED AREA (Acres)

Reach	DEVELOPED				UNDEVELOPED	
	Open Space 1/		Urban Land		Vacant Land	
	100-Year	500-Year	100-Year	500-Year	100-Year	500-Year
Las Vegas Wash						
Duck Creek to Charleston Avenue	429	465	464	561	1402	1619
Charleston Avenue to Lone Mountain Road	-	-	2179	2595	488	904
Las Vegas Creek	-	-	199	403	-	-
Las Vegas Range Wash	659	698	859	1120	989	1166
Flamingo Wash						
Mouth to Las Vegas Boulevard	35	50	202	592	507	890
Las Vegas Boulevard to Rainbow Road	-	-	31	64	127	176
Tropicana Wash	10	17	11	35	245	354
Tropicana Wash Tributary					36	50
Duck Creek			132	166	390	614
Duck Creek Tributary					17	39
TOTAL	1133	1230	4077	5536	4201	5812

1/ Includes parks, golf courses, and agricultural land.

Future Conditions

By the year 1990, the population of the Las Vegas Valley is expected to double with 664,000 inhabitants (Reference 15). Some landuse changes will occur. The major residential growth is projected to continue in the West and South of the Las Vegas Valley with only limited development taking place in North Las Vegas and areas to the East. The projected increase in casinos, hotels and related retail businesses will generate land demands for use of the majority of vacant land along the existing Strip, to the east extending to Maryland Parkway, and further extension of the Strip to the south. The present Strip pattern will probably be transformed into a more dense, high rise area serving as a center for both entertainment, shopping and office uses.

Market pressures for casino, hotel, office, and retail uses should exist to require replacement and intensification of land use in downtown Las Vegas. The extent to which this occurs will depend on the degree of private and public commitment to this area (Reference 16).

The projected land use for the year 2000 of the metropolitan Las Vegas area has been mapped by the Clark County Regional Planning Council and is available from them. This map was used to compare the existing runoff potential with the anticipated land uses. There would not be a significant change in runoff potential from the future development. But as development occurs on the alluvial fans, some of the

existing small channels will be filled and new diversions will be installed to protect areas from alluvial fan flows. This will make permanent changes to the existing flow patterns causing new points of flow concentration that should be coordinated into an overall drainage plan for the developments.

FLOODPLAIN MANAGEMENT

A growing awareness of the values, hazards, and high damages associated with floodplains has resulted in some procedures and policies for managing floodplain areas. Some of these management alternatives that are presently in use are listed below:

ZONING -- Zoning is a legal tool that is used to implement and enforce the details of the floodplain management program, preserve property values and to achieve the most appropriate and beneficial use of available land. Zoning regulates the use of land and degree of development in flood hazard areas. Effective zoning requires enforcement of the zoning ordinances which in turn depends on ordinance that is clear, concise and comprehensive.

SUBDIVISION REGULATION -- Subdivision regulations are used to specify the manner in which land may be subdivided within the entire area. Regulations state the required width of streets, requirements for curbs and gutters, size of lots, percentage of open space, size of floodways and other requirements for the welfare of the community and protection of the owners.

In reference to flood hazard areas, subdivision regulations may:

(1) require location of flood-prone areas to be shown on the plat map,

(2) require placement of streets and public utilities above a selected flood elevation,

(3) require installation of adequate drainage facilities,

(4) prohibit encroachment in floodway or flood hazard areas,

(5) provide safe building elevations on lots above selected flood heights by means of fill or open structural support.

BUILDING CODES -- Building codes establish minimum standards for controlling the design, construction and quality of materials used in buildings and structures within a given area so that life, health, property, and public welfare are safeguarded. Since it may not be practical to prevent building in all areas subject to flooding, building codes can minimize structural and other damages resulting from inundation. Proper building restriction codes can:

(1) prevent floatation of buildings from their foundations by specifying adequate anchorage,

(2) establish basement elevations and minimum first floor elevations consistent with potential flood occurrences,

(3) prohibit basements in those areas subject to very shallow, frequent flooding where filling and slab construction would prevent virtually all damage,

(4) require building reinforcement to withstand water pressure or high velocity flow and restrict the use of materials which deteriorate rapidly in the presence of water,

(5) prohibit equipment that might be hazardous to life when submerged, such as chemical storage, boilers, and electrical equipment.

Other alternatives that may be implemented are:

LAND USE RESTRICTIONS -- Conservation, scenic or flood control restrictions or easements may be acquired for floodway or flood hazard areas where little or no development is desirable. Land use restrictions prevent development incompatible with public objectives, while allowing continued private ownership of the land. Certain future land use rights, such as construction of buildings that are not consistent with floodplain management could be purchased from present landowners. Permitted uses could be farming, wildlife, low-intensity recreation and woodland. Land use restrictions may also result in a lowering of the landowner's tax assessment.

GREENBELTS -- A term related to the development and retention of stream frontage and floodplains is "greenbelt" or "open space." Use of these public or private lands for pasture or grazing, linear parks, golf courses and similar uses would materially reduce or regulate the damage potential in a high-hazard floodplain area.

FLOOD INSURANCE -- This program was established under the Housing and Urban Development Act of 1968, and expanded by the Flood Disaster Protection Act of 1973, to make limited amounts of flood insurance, which was previously unavailable from private insurers, available to property owners by means of a federal subsidy. In return for this subsidy, the Act requires that state and local governments adopt and enforce land use and control measures that will restrict future development in flood-prone areas in order to avoid or reduce future flood damage. Flood insurance is available through local insurance agents only after a town applies for and is declared eligible for insurance by the Flood Insurance Administration, U. S. Department of Housing and Urban Development.

In those communities participating in the HUD flood insurance program, owners and occupants of all buildings and mobile homes in the entire community are eligible to obtain flood insurance coverage.

ENCROACHMENT LINES AND FLOODWAYS -- Encroachment lines are the lateral boundaries of a designated floodway, and are two definitely established lines, one on each side of the stream. Between these lines no construction or filling should be permitted which would impede the flood flow.

The purpose of a floodway is to limit use of the floodplains by allowing encroaching or filling of the floodplain only to a point which causes an increase of elevation of not more than 1.0 foot for the 100-year flood. Another purpose of the floodway is to identify that part of the floodplain where potential damage is the greatest, i.e., the velocity and depth of flooding are greatest. Exhibits 1 and 2 illustrate a typical floodway. Floodway data are tabulated in Appendix E-1 for each cross section.

Floodway delineations on the photomosaics may be used to help establish zoning boundaries and/or regulations controlling land use in the floodplain. The floodways drawn on the flood maps (Appendix B) are theoretical and are only proposed. These floodways may be recalculated and modified prior to their adoption by Clark County.

TAX ADJUSTMENTS -- Lowering the tax rate on land dedicated to agriculture, recreation, conservation, or other open-space uses may be effective in preserving existing floodplains or floodways along streams.

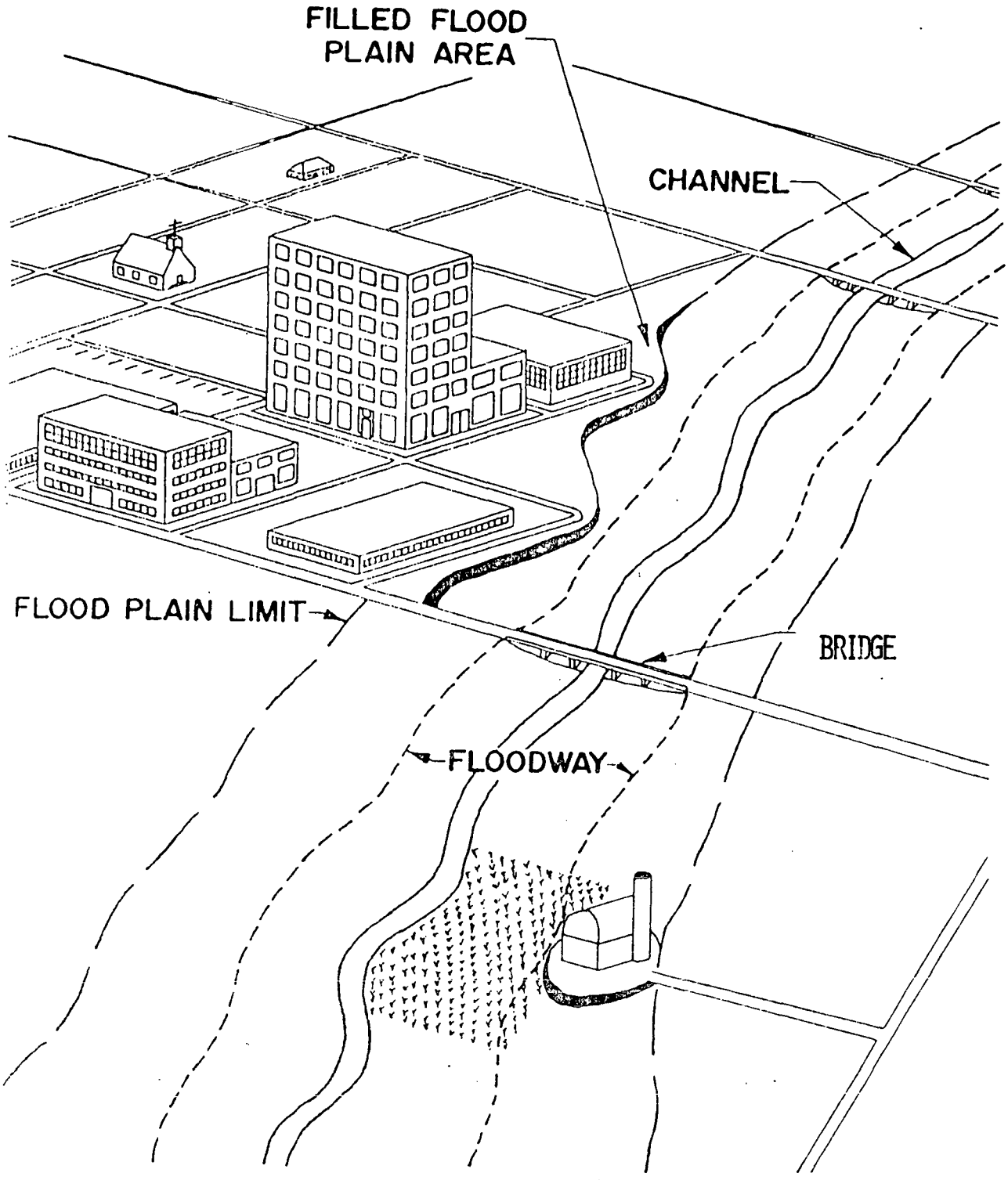
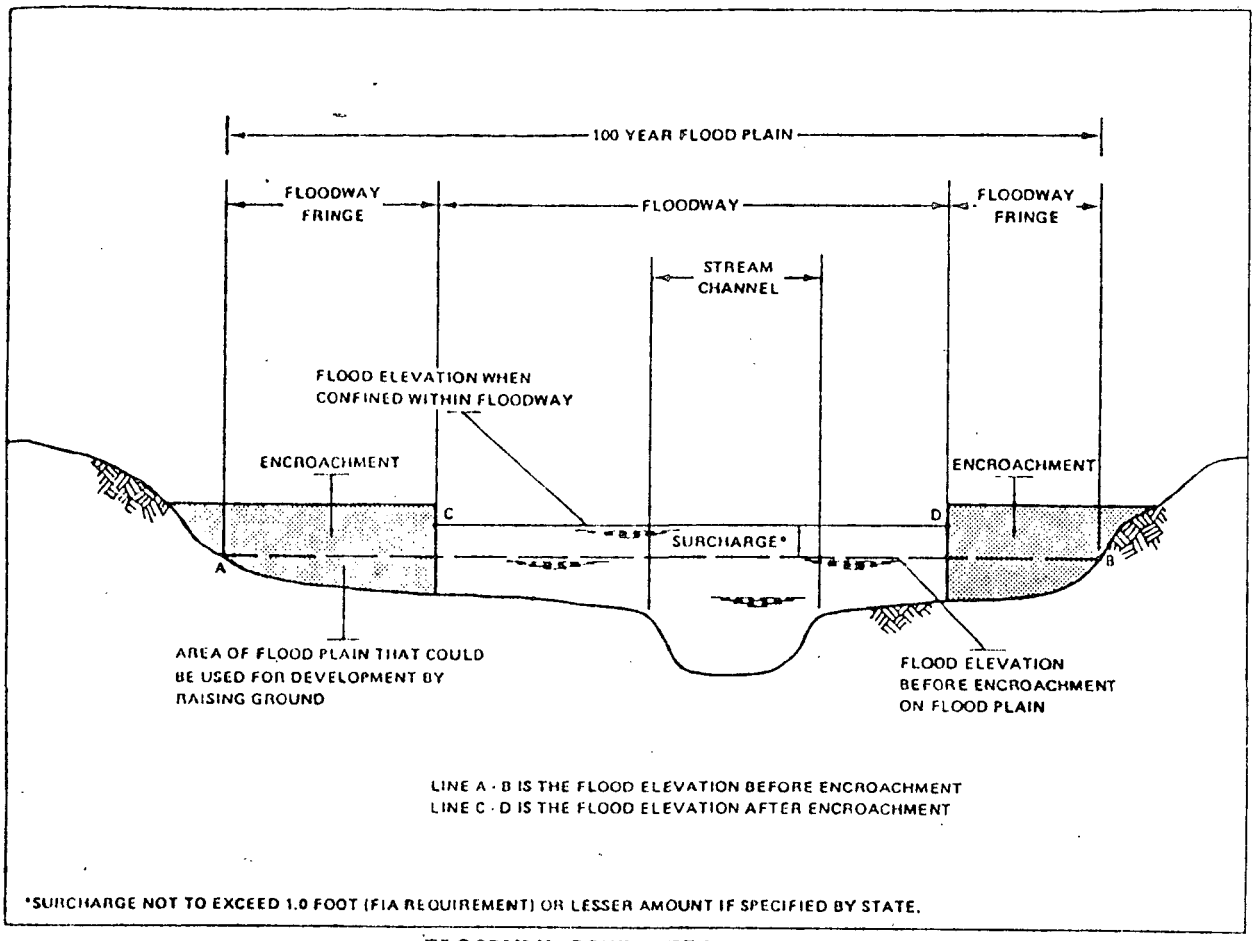


EXHIBIT I

PERSPECTIVE VIEW OF A
FLOOD PLAIN AND FLOODWAY



FLOODWAY SCHEMATIC

EXHIBIT 2

WARNING SIGNS -- Erecting signs in prominent locations within the floodplain will help to inform the public that a flood hazard exists.

FLOOD WATCH AND WARNING SYSTEMS -- The National Weather Service of the National Oceanic and Atmospheric Administration issues flood forecasts and warnings on larger rivers and provides flood warnings on smaller streams.

Local programs can also be implemented to give advance warnings in flood-prone areas of potential or impending flood danger. Monitoring of remote staff gages can be accomplished by use of float-activated electronic warning signals connected to the police or fire department. All warning systems should be coordinated with local Civil Defense Disaster Plans.

FLOOD PREVENTION MEASURES

Actions to help reduce damage from major floods are enumerated.

LAND TREATMENT -- Vegetative and mechanical land treatment measures can be installed on the uplands to prevent destruction of land by erosion, to reduce the movement of damaging amounts of sediment to the streams, and to reduce the rate and amount of storm runoff. These measures can include range rehabilitation and management, diversions, and sediment basins. Agricultural lands should be protected and maintained by the appropriate measures. Land in transition from one use to another (traditionally urban) should be protected during the transition and then maintained to control and reduce the rate and volume of storm runoff and erosion.

FLOODWATER RETARDING STRUCTURES -- These structures are earthfill or concrete impoundments that check the uncontrolled flow of floodwater. These structures are located and planned to protect the largest possible area of land subject to flooding, encroach as little as possible on high value lands, and provide a high level of protection to downstream property. Compatible use of normally dry reservoir areas often includes parks or recreation uses (Reference 17).

STREAM IMPROVEMENTS -- Improvement of a stream channel to increase its capacity to carry floodwater can be made by straightening, deepening, widening, clearing, or by lining the channel to confine the flood flows and convey them safely though the area. Adverse effects to the environment and possibly greater flooding downstream may result.

LEVEES -- A levee is an embankment or floodwall along the bank of a stream built to confine flood flows to the channel or floodway. Levees are normally used to provide protection to high risk flood-prone areas.

FLOOD PROOFING OF BUILDINGS -- Techniques to make existing buildings, contents and grounds located in flood hazard areas less vulnerable to flood damage are:

(1) Permanent measures built as an integral part of the structure, such as raising the elevation of the structure, waterproofing of basement and foundation walls, anchorage and reinforcement of floors and walls, and use of water-resistant materials.

(2) contingency measures which require action to be taken to make them effective such as manually closed sewer valves and removable bulkheads.

(3) emergency measures carried out during floods according to emergency plans such as sand bagging, pumping, and removal of contents to higher levels.

FLOODPLAIN RECLAMATION -- This includes the permanent evacuation of developed areas subject to inundation and the acquisition of lands by purchase, the removal of structures, and the relocation of the population from such areas. Such lands can then be returned to a natural wildlife habitat or used for agriculture, low intensity recreation, or other purposes which will not interfere with flood flows.

STRUCTURAL FLOOD CONTROL MEASURES

The structural flood control measures consist of channelization of the major washes. Las Vegas Wash is predominantly an excavated, unlined earth channel. Las Vegas Creek has some sections of riprap and concrete lining. Flamingo Wash and Duck Creek each have some sections of excavated channel. Tropicana Wash channel has not been improved. Las Vegas Range Wash has no well defined channel between Nellis Air Force Base and Vegas Valley Dirve and presently, flow spreads across a wide area. Plans are underway to excavate a channel, which will collect and transport flood flows through this portion of Las Vegas Range Wash.

In addition to the flood control works proposed by the U. S. Army Corps of Engineers in 1959, the U. S. Soil Conservation Service had identified some potential floodwater retarding sited in the Las Vegas Valley that might be feasible (Reference 4). Additional planning and feasibility studies are needed to identify those sites that have potential for development.

STATE LEGISLATION

The Nevada Revised Statutes provide for the establishment of zoning districts which shall adopt zoning regulations for protection of life and property in areas subject to floods and other natural disasters and to be financed by a revolving fund from monies supplied by the participating counties. The Director of the State Department of Conservation and Natural Resources is authorized to make expenditures from the flood control revolving fund to carry out any actions required by the Secretary of Army and the Congress of the United States in connection with flood control projects in the State of Nevada, when and as directed by acts of the legislature of the State of Nevada (Reference 18). To date, however, flood districts have not been established under these statutes.

LOCAL ORGANIZATION

Clark County has a flood control district which is under the Director of Public Works. The cities of Las Vegas and North Las Vegas cooperate with the flood control district in the design, installation, and management of flood control projects. The flood control district is not financed by the revolving fund as described in the preceeding section.

One of the water quality objectives of the Clark County 208 plan is to "prevent the hazards to life and property caused by stormwater runoff." A stormwater management plan will be developed emphasizing public safety during flooding. This plan will include the following:

1) Valleywide drainage inventory
2) Adoption of watercourse protection ordinances
3) Improvement of construction management practices, and
4) Cleaning of storm drains and channels (Reference 19)

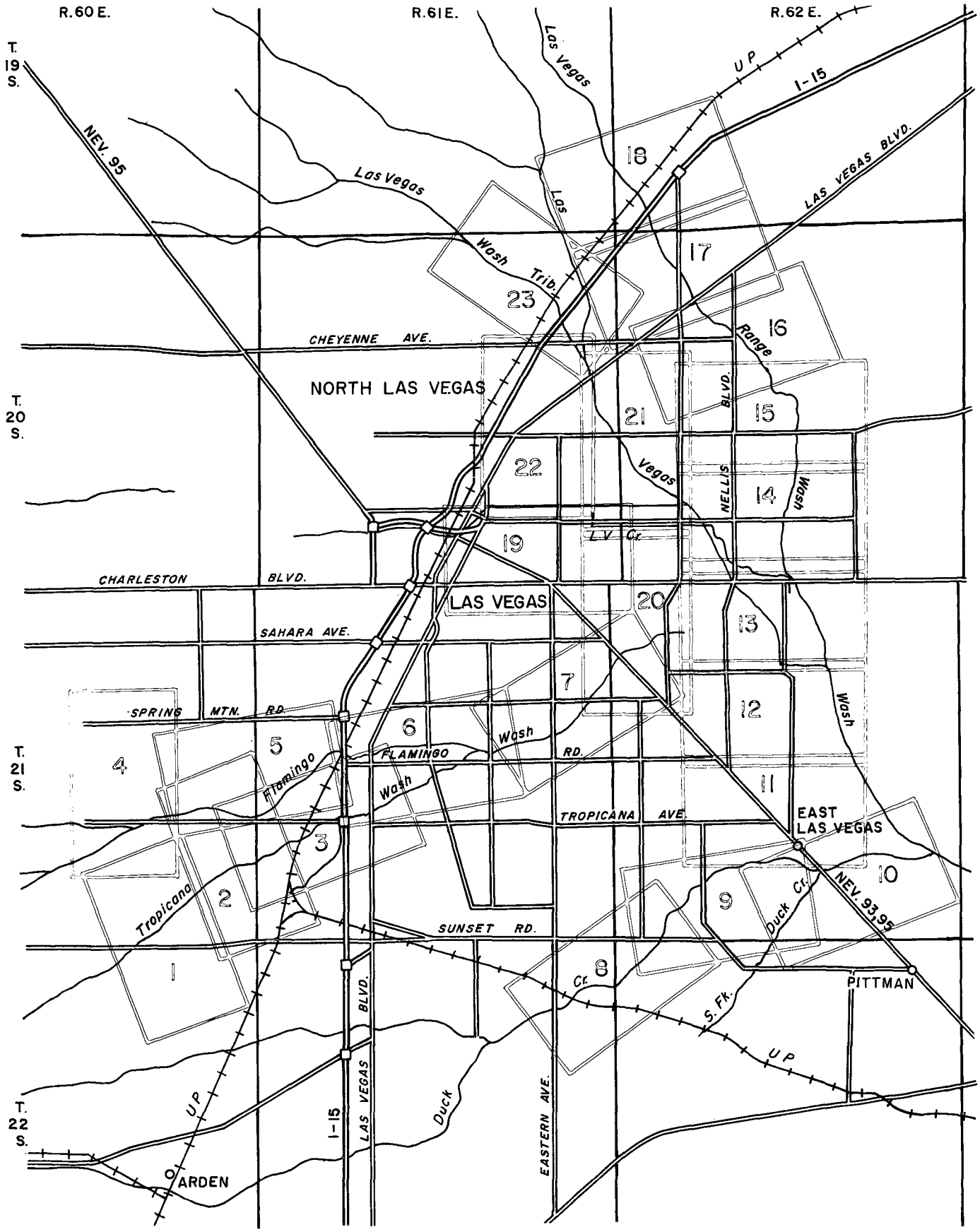
Las Vegas, North Las Vegas, and Clark County are participating in the emergency program of the Flood Insurance Program. It is expected that within two years these entities will be enrolled in the regular Flood Insurance Program.

RECOMMENDATIONS

Structural measures for floodplain management should be employed to protect existing or proposed construction in the floodplain. Increasing the flow capacity of the tributaries to Las Vegas Wash and completing the channelization of Las Vegas Wash will help reduce the flood damage caused by overflow of the washes. The adoption of floodplain zoning regulations will help control future floodplain development in the vacant land areas. Some of the buildings located within the floodplains should be flood proofed. Additional signs should be posted in flood prone areas. Public address systems located in casinos, hotels, and retail businesses should be employed to advise visitors and citizens of possible flooding events when local government personnel, with civil defense responsibilities, are informed of flash flood forecasts that are made by the National Weather Service. Increased usage of floodplains for agriculture, parks, playgrounds, and recreation is encouraged.

It is recommended that buildings and mobile homes located within or adjacent to the delineated flood hazard areas carry flood insurance on the structure and contents. Natural and benefical floodplain values such as wildlife habitat, open space, and recreation areas will be enhanced and preserved with the implementation of the management techniques previously described.

APPENDIX A



INDEX TO MAP SHEETS

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

1 0 1 2 3

SCALE IN MILES

APPENDIX B

APPENDIX C

APPENDIX D

APPENDIX E

Las Vegas Wash and Tributaries

Table E-1: Floodway Data

Cross Section Number	FLOODWAY					100 Year Present Condition Elevation
	Profile Station	Width in Feet	Area (Sq. Ft.)	Mean Velocity (Ft/Sec)	Water Surface Elevation	
			Las Vegas	Wash		
A	4+00	1292	8530	2.26	1569.0	1568.0
B	30+85	1536	7038	2.26	1579.0	1578.0
C	58+20	920	4495	2.19	1597.2	1596.2
D	83+10	1780	7813	2.04	1617.5	1616.5
E	101+65	1598	3350	4.75	1633.5	1632.5
F	123+40	838	3364	4.60	1649.7	1648.7
G	145+60	2815	6401	2.68	1664.1	1663.1
H	166+25	740	4010	3.96	1674.1	1673.1
I	185+20	1194	6754	2.35	1680.1	1679.1
J	209+85	873	3486	4.62	1688.5	1687.5
K	234+85	761	4452	3.62	1696.4	1695.4
L	252+70	760	2790	5.77	1697.8	1696.8
M	292+05	620	2886	5.20	1709.3	1708.3
N	301+55	2022	4553	3.29	1711.6	1710.6
O	325+10	3010	4509	2.71	1715.5	1714.5
P	346+20	1078	2167	5.63	1727.3	1726.3
Q	370+60	370	1518	8.04	1732.4	1731.4
S	373+60	175	1945	6.27	1736.2	1735.2
T	383+85	145	1696	7.19	1737.2	1736.2
V	386+75	7363	37926	0.32	1739.7	1738.7
W	410+75	6189	6315	1.92	1741.2	1740.2
Z	426+70	160	1042	11.61	1752.0	1751.0
AA	441+25	157	1320	9.17	1758.6	1757.6
AD	455+05	3409	2773	4.36	1765.8	1764.8
AE	472+50	2558	2861	4.23	1774.6	1773.6
AF	493+45	3341	2755	4.39	1783.9	1782.9
AG	512+70	145	1235	9.79	1792.1	1791.1
AH	533+70	2819	3394	3.57	1801.4	1800.4
AI	552+00	246	1446	8.37	1811.4	1810.4
AJ	570+55	1877	1645	7.17	1821.4	1820.4
AL	574+05	2670	8659	1.36	1825.5	1824.5
AM	602+35	1207	1897	6.22	1836.9	1835.9
AP	604+95	2375	12878	0.92	1842.1	1841.1
AQ	629+45	1421	2365	4.99	1849.6	1848.6
AS	632+45	110	969	12.17	1851.8	1850.8
AT	640+35	110	1108	10.65	1855.4	1854.4
AU	657+35	5888	5370	1.71	1858.1	1857.1
AW	660+65	6156	27855	0.33	1865.9	1864.9
AX	677+65	4951	3358	2.74	1867.8	1866.8
AY	709+05	125	919	10.01	1890.7	1889.7
AZ	726+00	2782	1888	4.87	1903.0	1902.0
BB	730+35	114	701	13.13	1908.3	1907.3
BC	739+10	273	2124	4.33	1910.6	1909.5

Table E-1: Floodway Data

Cross Section Number	FLOODWAY					100 Year Present Condition Elevation
	Profile Station	Width in Feet	Area (Sq. Ft.)	Mean Velocity (Ft/Sec)	Water Surface Elevation	
		Las	Vegas Wash	(Continued)		
BD	741+60	129	788	11.67	1912.7	1911.7
BE	764+50	375	1525	6.03	1924.4	1923.4
BF	781+70	438	1316	6.99	1942.5	1941.5
		Las	Vegas Wash	Tributary		
A	20+15	56	437	11.67	1867.2	1866.2
C	23+85	180	549	9.28	1872.5	1871.5
D	31+10	110	572	8.92	1882.7	1881.7
E	45+80	100	575	8.87	1892.6	1891.6
F	58+75	81	547	9.33	1895.5	1894.5
G	90+85	835	1920	2.66	1916.8	1915.8
H	117+40	44	350	14.58	1941.5	1940.5
I	149+50	789	624	8.18	1982.1	1981.1
J	190+30	129	490	10.40	2028.9	2027.9
		Duck	Creek			
A	-16+40	496	1889	1.08	1594.0	1593.0
B	5+20	535	1455	2.61	1607.2	1606.2
J	94+85	105	551	6.32	1665.0	1664.0
L	96+35	85	735	4.57	1667.3	1666.3
N	122+20	319	518	7.33	1688.4	1687.4
P	160+00	161	409	9.30	1758.4	1757.4
R	190+50	775	967	3.17	1831.2	1830.2
S	210+80	1657	783	4.83	1860.4	1859.4
T	221+30	55	454	7.02	1881.0	1880.0
U	234+00	149	605	2.31	1909.3	1908.3
V	245+50	127	451	8.43	1923.4	1922.4
W	250+30	178	536	2.34	1928.9	1927.9
X	255+00	2393	3128	1.24	1931.8	1930.8
Y	268+00	151	814	2.38	1941.1	1940.1
Z	279+00	442	1187	1.71	1950.4	1949.4
AA	292+40	728	1218	3.20	1962.2	1961.2
AC	311+55	636	1981	1.87	1977.0	1976.0
AD	333+80	47	293	9.80	2001.0	2000.0
AE	343+50	440	946	5.54	2015.9	2014.9
AF	353+40	55	363	10.20	2027.2	2026.2
AG	354+40	71	559	5.18	2027.9	2026.9
AH	355+70	95	578	6.95	2028.5	2027.5

Table E-1: Floodway Data

Cross Section Number	FLOODWAY					100 Year Present Condition Elevation
	Profile Station	Width in Feet	Area (Sq. Ft.)	Mean Velocity (Ft/Sec)	Water Surface Elevation	
			Duck Creek Tributary			
G	0+00	284	1063	3.57	1643.7	1642.7
A	2+30	53	191	1.80	1644.8	1643.8
B	33+00	55	154	5.84	1669.0	1668.0
D	63+70	180	288	1.47	1690.9	1689.9
			Flamingo Wash			
A	14+90	2380	1810	2.52	1713.7	1712.7
B	41+40	73	476	6.60	1727.5	1726.5
E	45+50	1837	3891	1.18	1730.5	1729.5
F	67+45	550	1418	2.93	1742.8	1741.8
G	93+85	70	455	9.15	1774.0	1773.0
J	117+55	163	775	2.38	1789.1	1788.1
K	136+05	69	409	4.25	1801.0	1800.0
M	139+55	55	327	5.53	1804.7	1803.7
N	141+65	46	303	8.11	1807.0	1806.0
O	161+95	80	504	6.04	1819.1	1818.1
P	183+50	58	296	11.49	1850.0	1849.0
S	194+90	70	407	4.33	1864.1	1863.1
U	197+90	68	401	8.49	1869.3	1868.3
V	219+85	101	578	4.30	1887.6	1886.6
W	245+05	175	805	3.81	1909.2	1908.2
Y	248+05	165	1568	2.17	1917.7	1916.7
Z	276+05	51	311	6.40	1940.7	1939.7
AB	278+85	85	629	4.09	1945.2	1944.2
AC	308+90	43	362	6.07	1971.1	1970.1
AF	312+85	133	1254	2.76	1989.3	1988.3
AG	325+10	110	616	5.12	1998.1	1997.1
AH	336+85	90	409	5.23	2016.8	2015.8
AJ	339+55	156	1282	1.58	2024.5	2023.5
AK	348+80	70	399	8.77	2034.2	2033.2
AN	365+60	1189	4180	0.79	2049.6	2048.6
AO	392+00	230	713	1.50	2072.5	2071.5
AR	419+33	57	338	7.75	2102.6	2101.6
AT	422+50	108	709	2.90	2106.5	2105.5
AU	423+95	103	535	4.19	2106.5	2105.5
AV	435+70	73	260	9.40	2112.8	2111.8
AW	442+45	80	376	7.86	2114.6	2113.6
AY	447+70	65	425	6.33	2121.0	2120.0
BD	457+55	101	414	7.15	2134.1	2133.1
BF	459+55	57	3311	4.86	2139.3	2138.3
BG	481+65	165	528	3.38	2156.4	2155.4
BH	489+05	103	404	2.99	2164.1	2163.1
BI	513+95	200	455	2.51	2195.0	2194.0

Table E-1: Floodway Data

Cross Section Number	FLOODWAY					100 Year Present Condition Elevation
	Profile Station	Width in Feet	Area (Sq. Ft.)	Mean Velocity (Ft/Sec)	Water Surface Elevation	
			Flamingo Wash (Continued)			
BJ	523+35	110	484	8.32	2206.9	2205.9
BL	541+95	200	560	3.75	2235.3	2234.3
BM	559+40	416	1097	2.85	2246.3	2245.3
BN	570+40	93	336	3.42	2263.7	2262.7
BO	592+80	60	402	7.86	2279.2	2278.2
BP	599+35	200	645	3.54	2291.3	2290.3
BQ	622+15	65	292	6.54	2316.3	2315.3
BR	636+95	130	572	3.84	2331.5	2330.5
BS	644+18	46	317	7.92	2334.4	2333.4
BU	646+35	61	682	3.96	2340.7	2339.7
BV	647+12	34	276	7.99	2340.7	2339.7
BX	657+25	200	645	4.34	2348.1	2347.1
BY	677+40	340	884	2.72	2377.6	2376.6
BZ	716+95	133	447	2.17	2416.2	2415.2
			Tropicana Wash			
A	7+50	70	266	5.33	2016.3	2015.3
C	9+95	110	354	3.75	2022.7	2021.7
D	33+80	109	268	2.22	2038.2	2037.2
E	37+75	100	279	2.52	2043.6	2042.6
G	39+75	296	1083	0.56	2047.7	2046.7
H	43+15	113	400	3.59	2048.4	2047.4
I	60+10	65	280	4.11	2063.0	2062.0
K	63+40	112	665	1.85	2068.1	2067.1
O	84+30	46	268	3.40	2086.1	2085.1
P	107+80	58	212	6.17	2112.3	2111.3
R	116+70	75	411	2.50	2120.5	2119.5
X	141+05	114	634	1.13	2149.7	2148.7
Y	155+00	71	176	3.56	2169.3	2168.3
Z	165+35	70	301	2.93	2181.8	2180.8
AA	168+85	100	250	3.03	2186.8	2185.8
AB	175+15	40	148	8.75	2196.3	2195.3
AC	182+10	100	265	2.36	2205.6	2204.6
AE	185+70	370	3060	0.31	2217.5	2216.5
AF	197+00	94	274	1.83	2222.6	2221.6
AG	216+55	315	614	1.87	2243.9	2242.9
AH	234+25	390	702	1.26	2262.3	2261.3
AI	243+85	182	256	1.33	2271.5	2270.5
AJ	265+90	125	251	2.33	2288.1	2287.1
AK	278+90	50	162	2.63	2302.5	2301.5
AL	308+00	100	211	4.68	2332.2	2331.2
AM	332+25	25	126	6.65	2359.8	2358.8

Table E-1: Floodway Data

Cross Section Number	FLOODWAY					100 Year Present Condition Elevation
	Profile Station	Width in Feet	Area (Sq. Ft.)	Mean Velocity (Ft/Sec)	Water Surface Elevation	
			Tropicana Wash (Continued)			
AN	338+65	56	177	2.44	2389.0	2388.0
AO	361+80	220	341	0.91	2416.8	2415.8
AP	387+35	38	115	4.15	2456.3	2452.3
			Tropicana Wash Tributary			
A	19+80	220	211	1.42	2168.1	2167.1
B	38+10	30	72	4.17	2194.9	2193.9
C	51+60	250	283	1.06	2211.1	2210.1
D	53+40	200	225	1.27	2213.9	2212.9
E	57+80	35	94	2.14	2217.2	2216.2
F	83+10	267	128	2.35	2246.9	2245.9
I	86+00	105	141	2.13	2249.1	2248.1
J	90+00	180	143	2.10	2257.7	2256.7
K	104+20	140	180	1.67	2273.0	2272.0
L	135+20	44	85	3.52	2315.7	2314.7
			Las Vegas Range Wash			
A	47+55	805	1283	1.6	1712.8	1711.8
B	68+05	255	625	3.2	1722.1	1721.1
C	94+65	670	1306	1.5	1729.8	1728.8
D	102+65	405	931	2.2	1731.3	1730.3
E	126+10	360	792	2.6	1738.8	1737.8
F	148+95	520	968	2.2	1745.8	1744.8
G	176+25	700	1034	2.0	1757.6	1756.6
H	190+80	1205	1838	1.1	1763.5	1762.5
I	209+20	1220	2180	1.0	1769.6	1768.6
J	248+40	131	455	4.6	1788.8	1787.8
K	279+90	125	406	3.4	1798.2	1797.2
L	322+75	80	320	4.4	1816.7	1815.7
M	360+95	1195	2152	.7	1826.5	1825.5
N	422+15	600	1083	1.3	1852.7	1851.7
P	426+45	60	288	4.9	1854.7	1853.7
Q	465+45	430	817	1.7	1871.1	1870.1
R	492+75	65	175	3.4	1892.6	1891.6
S	519+95	51	103	5.8	1926.1	1925.1
T	537+95	60	120	5.0	1945.6	1944.6

Table E-1: Floodway Data

Cross Section Number	FLOODWAY					100 Year Present Condition Elevation
	Profile Station	Width in Feet	Area (Sq. Ft.)	Mean Velocity (Ft/Sec)	Water Surface Elevation	
			Las Vegas Creek			
A	17+89	33	242	6.6	1780.9	1779.9
C	20+39	20	166	9.6	1784.4	1783.4
E	45+98	19	123	13.0	1794.8	1793.8
G	70+35	26	159	10.1	1803.7	1802.7
J	77+40	30	155	10.3	1807.8	1806.8
Z	151+75	36	152	10.5	1871.6	1870.6

APPENDIX F

INVESTIGATIONS, ANALYSES, AND TECHNICAL DATA

1. Survey Procedures and Background Data

A meeting with representatives from the cities of Las Vegas, North Las Vegas, and Clark County was held in December 1975. The study limits were discussed and pertinent engineering data was requested. In February 1976, field surveys were begun with SCS personnel and city surveying crews. Approximately 66 miles of cross sections were surveyed by transit-tape methods with differential leveling to third order accuracy. Culvert and bridge measurements were also obtained. The Clark County Regional Aerial Mapping Project 5-foot contour interval maps (horizontal Scale 1 inch = 200 feet) were made available in February 1977 for the City of Las Vegas and the unincorporated metropolitan area adjacent to Las Vegas. The North Las Vegas topographic maps were made available in August 1977. These maps provided information for additional cross sections and also were used for the flood delineations. This study used 285 cross sections which included 4 major bridges and 38 culverts. U. S. Geological Survey 15 minute quadrangle maps of the Las Vegas Valley were used to determine the watershed boundaries of the washes. Soils, vegetation, and land use were determined from field investigations, USDA, SCS soil survey reports, aerial photographs, and quadrangle maps.

The various stream's resistance to water flow due to channel variations, vegetation, and obstructions were estimated for the valley, bridge, and road cross sections.

Technical data from the U. S. Army Corps of Engineers was reviewed (References 1, 2).

2. Hydrology and Hydraulics

A. General

The U. S. Geological Survey stream gaging data for stations located within the Las Vegas Valley were obtained and analyzed in accordance with U. S. Water Resources Council Bulletin #17A (Reference 20). A schematic model of the Valley was prepared and data processed by the Soil Conservation Service's precipitation-runoff computer program known as TR-20 (Reference 21). Precipitation and runoff data from the July 3-4, 1975 storm in Las Vegas was obtained from the U. S. Geological Survey report (Reference 13) and was used to calibrate the TR-20 model. The U. S. National Weather Service was consulted and they advised that a large, intense, short duration thunderstorm would most likely cause the largest flooding problem. A three hour convective storm was used in the TR-20 model to calculate the discharges for the frequency storms. A detailed summary of

the hydrologic analyses is available as a supplement to this report (Reference 22). A hydrologic procedure that can be used to estimate the magnitude of peak discharges within the Las Vegas Valley is available from the Clark County Public Works Department and is a supplement to this report.

Using the roughness coefficient data, cross sections, and flow rates from the hydrologic analyses, the SCS national water surface profile computer program WSP-2 (Reference 23) was used to compute water surface elevations for the 10-year, 50-year, 100-year and 500-year frequency floods.

Flood lines were delineated on contour maps and transposed to aerial photomosaics using the width of the floodplain at each cross section and interpolating between cross sections.

Floodway areas were determined at each valley cross section. Floodway widths were computed for an increased flow depth of one foot. The floodway widths were calculated by decreasing the conveyance (ability of the channel to carry water) at each side of the channel by equal amounts at each valley cross section until an increased depth of flow of one foot was obtained (See Exhibit 1 and 2 and Appendix E).

In making computations, normal bridge flow conditions were

assumed. No consideration was made for openings blocked by debris, ice, floodplain filling or other encroachments which could adversly effect the water surface elevations. Computations for the study considered only those features in the floodplain at the time field surveys were made. Additional and significent watershed and floodplain development and/or channel modifications will require revised water surface profile computations.

B. Documentation of Validity

The 100-year water surface elevation shown in this report for Las Vegas Creek agrees within one foot of the profiles prepared by the U. S. Geological Survey in 1972 for a flood insurance study of the City of Las Vegas. The U. S. Army Corps of Engineers. Los Angeles District, in their Floodplain Information, Lower Las Vegas Wash, dated December 1967 (Reference 2) show 100-year water surface profiles on Las Vegas Wash at Charleston Boulevard which agree within one-half foot of the profiles given in this report for the same location.

Aerial photography of the July 3, 1975 flood in Las Vegas Valley was obtained from the Nevada State Highway Department. This aided in the delineation of the floodlines, particularily on Las Vegas, Flamingo, and Tropicana Washes. The delineation of the floodplains based on the water surface profiles agreed

very closely with the areas that were shown to have been flooded on the photography.

The results of these hydrologic and hydraulic analyses were also used to prepare Flood Insurance Rate and Zone Boundary Maps for the City of North Las Vegas, the City of Las Vegas, and the metropolitan Clark County Unincorporated area. The 500-year and 100-year floodplain delineations shown in this report will agree exactly with the delineations shown in the Flood Insurance Study Reports.

The hydrologic analyses performed for this study were reviewed and coordinated with other federal agencies. An inter-agency hydrology coordination meeting was held in December 1977 with representatives of the U. S. Army Corps of Engineers, U. S. Geological Survey, Bureau of Reclamation, Flood Insurance Administration, and the Soil Conservation Service. Final discharge values were coordinated in April 1978 with the previously named agencies.

Discharge values calculated by the TR-20 model for the July 3-4, 1975 storm are in close agreement with the measured peak discharge values. The results are shown in the following table:

Station Number 1/	Station Name	TR-20 X-Sec. Number	Measured Discharge (cfs)	TR-20 Discharge (cfs)
09-4196.50	Las Vegas Wash @ North Las Vegas	101	12,000	4420
M	Las Vegas Creek above F Street	104	1,000	1160
M	L.V. Wash @ Winterwood Golf Course	110	4,400	4550
09-4196.75	Flamingo Wash @ Las Vegas	116	3,900	1980
M	Tropicana Wash above I-15	129	1,700	1520
09-4196.77	Flamingo Wash @ Maryland Parkway	133	2,700	2430
09-4196.78	Flamingo Wash near Mouth	136	2,900	2420
M	Duck Creek near Whitney	151	300	60
09-4196.90	Duck Creek at Whitney	159	80	50
	L.V.W. @ Confluence w/Duck Creek	161		6570
09-4197.00	Las Vegas Wash near Henderson		6,510	

M is a miscellaneous site.

3. Soil Survey Data

A soil survey report of Las Vegas and Eldorado Valleys area was issued in February 1967. This report is available at the Clark County Conservation District and the U. S. Soil Conservation Service office in Las Vegas. Included in the report are engineering and agricultural interpretations as well as land use interpretations for each soil type. Additional soil surveys are being conducted and an updated soils report is due to be published after 1980.

4. Elevation Reference Marks

Following are Elevation Reference Marks (RM) in the Las Vegas valley within or near the study area. They are listed according to the sheet number of the photograph map (Appendix B) on which they are located. The datum is the National Geodetic Vertical Datum (NGVD) formerly referred to as mean sea level of 1929.

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
			Sheet 1
90	CC 499	2380.27	Hub at section corner $\frac{35\|36}{2\|1}$ T 21S, T22S, R60E.
91	CC 498	2455.11	Brass disc in concrete which is the section corner $\frac{34\|35}{3\|2}$ T21S, T22S, R60E.
95	CLN 021L	2398.63	BLM brass cap at Rainbow Blvd. and Russell Rd. which is section corner $\frac{27\|26}{34\|35}$ T21S, R60E.
			Sheet 2
74	DODO 2	2278.6	USC & GS brass cap horizontal control marker approximately 1/4 mile west of Decatur Blvd. and 1/2 mile south of Flamingo Road.
76	BM #9	2302.42	3-inch brass cap BLM section corner $\frac{23\|24}{26\|25}$ T21S, R60E in the intersection of West Tropicana Ave. and Jones Blvd.
83	CC 1129	2352.27	Brass cap which is the center of Section 26, T21S, R60E.
84	CC 1126	2295.09	USC & GS brass cap which is the center of Section 25, T21S, R60E.
87	CC 500	2326.86	GLO brass cap which is the section corner $\frac{36\|31}{1\|6}$ T21S, T22S, R60E.
88	BM #14	2318.89	BLM brass cap which is the East 1/16 corner section 36, T21S, R60E.

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
			Sheet 3
65	CC 1056	2098.61	GLO brass cap 1/4 corner section 21/28 T21S, R61E at the intersection of Tropicana Ave. and Koval.
66	BM #7	2091.13	Aluminum cap in intersection of Harmon and Koval-Suzanne marked VTN RLS 4046.
67	CLM 009H	2153.38	Brass cap located in the center median of I-15 about 6.3 miles south of the downtown interchange.
68	CLM 010	2166.53	Brass cap located just south of Tropicana Ave. between the northbound lane of I-15 and the Tropicana off ramp.
85	CC C-170	2230.27	Brass disc in concrete which is the center of Section 30, T21S, R61E.
86	BM #13	2180.90	Brass cap in center of intersection of Tropicana Ave. and Valley View Dr. which is section corner 19|20/30|29 T21S, R61E.
			Sheet 4
77	CC 492	2353.84	RR spike in center of intersection of West Flamingo Rd. and Rainbow Blvd. and the section corner of 15|14/22|23 T21S, R60E.
78	BM #10	2377.06	3-inch brass cap BLM 1/4 corner section 27/26 T21S, R60E, which is 1/2 mile south of Tropicana in the center of Rainbow Rd.
79	BM #11	2446.67	Nail in center of West Flamingo Road in line with west edge of Buffalo Drive.
80	BM #12	2428.69	3-inch BLM brass cap at the intersection of Tropicana Ave. and Buffalo Dr. which is the section corner for 21|22/28|27 T21S, R60E.

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
			Sheet 5
71	CC 525	2154.29	RR spike center of intersection of Flamingo Rd. and Valley View Drive and is section corner 18|17 / 19|20 T21S, R61E.
72	BM #8	2217.40	USGS brass cap in center of intersection of Tropicana Ave. and Arville St. and is the 1/4 corner of section 19/30 T21S, R61E.
73	CC 523	2227.44	Nail at section corner 13|18 / 24|19 T21S, R60E, R61E.
75	CC 491	2303.99	3-inch brass cap BLM section corner 14|13 / 23|24 T21S, R60E in the intersection of West Flamingo Rd. and Jones Blvd.
			Sheet 6
62	CC 536	2002.21	2-inch brass cap in intersection of Flamingo Road and Maryland Parkway.
63	CC 529	2050.09	Brass cap in concrete near Flamingo Blvd. and Paradise Road which is the section corner of 16|15 / 21|22 T21S, R61E.
64	CC 531	2071.62	RR spike in Tropicana Ave. at section corner 21|22 / 28|27 T21S, R61E.
69	CLM 011	2147.3	2-inch brass cap located 11 feet west of I-15 southbound lane and 4.5 feet south of Flamingo Road.
			Sheet 7
55	CLM 056	1778.60	2-inch brass cap on north side of Sahara Ave. .2 mile west of Lamb Blvd.
56	CLN 065	1817.86	2-inch brass cap at the NE corner of Glen Ave. and Boulder Highway.

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
		Sheet 7 (con't)	
57	CLN 057	1816.13	2-inch brass cap on Boulder Highway in median, across southbound land from auto sales at 3780 Boulder Highway.
58	CC 515	1863.66	5/8 inch rebar in the intersection of Pecos Road and Desert Inn Road.
59	BM #5	1864.40	Center of spike with punch hole in center of intersection of Desert Inn Rd and Mojave Road.
60	CC 537	1948.36	2-inch brass cap in concrete in intersection of Flamingo Road and Eastern Ave. Also section corner $\frac{14 \mid 13}{23 \mid 24}$ T21S, R61E.
61	BM #6	1923.41	2-inch brass cap marked "Clark County Engineering Dept. P.O.T." at intersection of Eastern Ave. and Emerson.
		Sheet 8	
36	CLN 076	1946.65	2-inch brass cap on north side of Sunset Rd. .40 mile east of Sandhill Rd.
37	CLN 068	1934.91	RR spike at the junction of Sandhill Rd. and Sunset Rd. in the centerline of Sandhill and at the north edge of Sunset.
38	CC 510	1948.69	Brass disc in concrete at section corner $\frac{36 \mid 31}{1 \mid 6}$ which is the SE corner of section 36, T21S, R61E.
40	CC 1005	2047.52	GLO brass cap at the junction of Danielson Dr. and Section line 12/7 T22S, R61E, R62E.
43	CLN 069	1948.5	RR spike at the NE corner of the junction of Sunset Rd. and Pecos Rd.
45	TBM #3	2031.65	Brass cap at 1/4 corner sections 2/1, T22S, R61E.

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
			Sheet 9
34	Whitney 2	1906.	USC & GS brass cap in concrete approximately 800 feet west of section corner 29|28 / 32|33 T21S, R62E.
41	BM #1	1668.21	GLO brass cap at section corner 28|27 / 33|34 T21S, R62E.
42	BM #2	1705.91	GLO brass cap at 1/4 corner section 28 / 33 T21S, R62E.
46	BM #4	1858.17	GLO brass cap at the intersection of Lamb Blvd. and Russell Rd. Also section corner 30|29 / 31|32 T21S, R62E.
			Sheet 10
32	CC 298	1597.48	GLO brass cap at section corner 26|25 / 35|36 T21S, R62E.
33	CC 297	1630.84	GLO brass cap at section corner 27|26 / 34|35 T21S, R62E.
			Sheet 11
47	CC 262	1678.24	Nail and tin in intersection of Monson Rd. and Stephanie.
48	CC 260	1702.44	Nail in intersection of Monson Rd. and Nellis Blvd.
49	CLN 066	1706.19	2-inch brass cap in traffic island at Nellis Blvd. and Boulder Highway on north side of Nellis.
			Sheet 12
50	CC 1017	1711.21	Nail and tin in Vegas Valley Drive 1/2 mile east of Nellis Blvd.
51	CC 1018	1694.88	Aluminum cap in Vegas Valley Drive 0.4 mile west of Hollywood Blvd.

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
		Sheet 13	
21	CLN 054	1752.48	At the NW corner of Lamb Blvd. and Charleston Blvd.
52	CC 248	1728.61	Bolt in intersection of Sloan Lane and E. Charleston Blvd.
		Sheet 14	
18	CLN 064	1781.47	2-inch brass cap at the North edge of Lamb Blvd. at the Three Crowns Mobile Manor - 867 Lamb.
19	CC 325 (CLN 053)	1760.32	At the intersection of Stewart Street and Lamb Blvd. in the centerline of Stewart St.
20	CC 329	1748.19	Railroad spike at the intersection of Stewart Street and Nellis Blvd. 1/4 corner of Sec. 32|33 T20S, R62E.
23	CC 1037	1771.87	Spike located in Marion Drive approximately 500 feet north of Washington Avenue.
25	CLN 052	1772.05	Railroad spike in the asphalt at the centerline of Lamb and centerline of Bonanza.
26	CC 1038	1762.19	Nail in Christy Lane approximately 500 feet north of Washington Avenue.
		Sheet 15	
11	CLN 086	1815.5	2-inch brass cap at the junction of Lamb and Carey in the centerline of Carey in line with the west edge of Lamb.
12	CLN 087	1803.74	2-inch brass cap at the junction of Lamb and Lake Mead Blvd. at the NW corner in line with the north edge of Lake Mead Blvd.

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
		Sheet 15 (con't)	
24	CC 088	1790.10	2-inch brass cap at the junction of Lamb and Owens Avenue.
93	CC 204	1798.03	Brass disc in the intersection of Nellis Blve. and Carey Ave.
94	CC Q-368	1789.13	Brass disc in concrete in intersection of Lake Mead Blvd. and Sloan Lane.
96	CC 206	1796.73	Brass cap at section corner $\frac{16\|15}{21\|22}$ T20S, R62E.
98	CC 202	1815.41	Copper weld monument in the intersection of Carey Ave. and Lamb Blvd.
99	CC 1039	1810.51	Aluminum cap in the intersection of Alto Ave. and Christy Lane.
		Sheet 16	
10	CLN 085	1865.45	2-inch brass cap .40 mile south of the junction of Las Vegas Blvd. and Lamb Blvd. on Lamb.
		Sheet 17	
4	CLM 024	1937.50	Railroad spike in an island on the south side of Craig Road at the junction of I-15 north-bound off-ramp and Craig Road.
6	CC 100-6	1871.5	PK Nail @ intersection Gowan Rd. and Pecos Rd.
102	CLN 039	1903.6	2-inch brass cap located 500 feet south on Lamb from junction with Craig Road and 60 feet west of Lamb on top of a small sandy hill.
108	View	1892.7	USC & GS brass cap in concrete station 1047 on Quad No. 361152 located approximately 1700 feet east of the intersection of Walnut Road and Gowan.

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
			Sheet 18
101	CC 241	1922.58	State highway brass disc at intersection of Lamb Blvd. and Lone Mountain Road.
103	CC 1048	1945.62	Brass cap at the section corner of 29|28 / 32|33 T19S, R62E.
104	CC 1035	1961.94	Iron post with cap at north 1/4 corner section 32 T19S, R62E.
105	CC L-365	1970.69	Brass disc in concrete approximately 1000 feet north of the section corner of 30|29 / 31|32 T19S, R62E.
			Sheet 19
15	CLN 050	1833.83	2-inch brass cap in a traffic island at the SW corner of Bonanza and 25th Street.
28	CC 1087	1917.48	At intersection of Washington Ave. and Mojave Rd. center of section 25, T20S, R61E.
29	CC 1084	1867.67	At intersection of Washington Ave. and Bruce St. center of section 26, T20S, R61E.
30	CLN 051	1808	Railroad spike in center of left turn lane of westbound lane. 78 feet east of Mojave Road on Bonanza Road.
31	CLN 049	1976.76	Railroad spike at the SE corner of Bonanza and 12th Street.
			Sheet 20
5	CC 239	1926.88	Brass cap @ section corner 36|31 / 1 | 6 T19S, T20S; R61E, R62E.
			Sheet 21
7	CC 100-5	1854.89	Concrete mon. with RLS tag 3645 sec. corner 12|7 / 13|18 T20S, R61E. (intersection of Cheyenne Ave. and Pecos Road)

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
		Sheet 21 (Con't)	
8	CC 201	1827.72	Alum. cap @ section corner 13|18 / 24|19 T20S, R61E (intersection of Carey Avenue and Pecos Road).
9	CC 328	1812.41	Brass cap at section corner 24|19 / 25|30 T20S, R61E (intersection of Owens Ave. and Pecos Road).
16	K-368	1811.24	Brass disc in concrete center of Section 19, T20S, R63E; at intersection of Lake Mead Blvd. and Walnut Road.
22	CC 1034	1792.81	Spike in curb at Washington Avenue and Walnut Road.
		Sheet 22	
2	CLM 023	1944.98	NHD 2" brass cap in island of Cheyene Ave. at I-15.
3	CC 100-15	1850.61	Nail & tin @ intersection of Carey Ave. and Carroll Street.
		Sheet 23	
1	CC 238	1947.43	2x2 hub @ section corner 35|36 / 2|1 T19S, R61E.
Reference marks located near the study area, but not shown on the photo maps.			
35	CC 839	1711.97	GLO brass cap at section corner 33|34 / 4|3 T21S, R62E.
39	CC 508	2021.93	Brass cap at section corner 35|36 / 2|1 T21S, R61E in the intersection of Sunset Rd. and Eastern Ave.
44	CLN 071	2022.4	RR spike at the junction of Sunset aand Eastern in the centerline of Sunset at the east edge of Eastern.

Reference Mark Number	Reference Mark	Elevation (NGVD)	Description
54	CC 327	1791.53	Nail and tin in intersection of Stewart Avenue and Pecos Road.
70	CLM 012	2153.8	2-inch brass cap located 2.9 feet west of the northbound lane of I-15 and north of the Union Pacific RR crossing.
81	CC 1133	2400.57	Brass cap which is the center of Section 27, T21S, R60E.
82	CC 1136	2452.16	Brass cap which is the center of Section 28, T21S, R60E.
89	CLN 041	2327.98	Nevada State Highway copper weld monument approximately 1.1 mile west of Industrial Road and .3 miles south of Sunset Road.
92	CC 247	1801.59	2 x 2 hub 1080 feet east of the NW corner of Section 2, T21S, R62E.
97	CC 207	1912.50	Spike at section corner 15|14 / 22|23 T20S, R62E.
100	CC 244	1893.29	4 x 4 post approximately 300 feet north of the intersection of Highway 91-93 and D Street at the section corner of 33|34 / 4 | 3 T19S, T20S, R62E.
106	CC 227	2021.47	Brass cap at section corner 19|20 / 30|29 T19S, R62E.
107	CC 226	2019.19	Brass cap at section corner 20|21 / 29|28 T19S, R62E.

APPENDIX G

GLOSSARY

ALLUVIAL - Pertaining to or composed of soil, sand, gravel or similar material deposited by running water, generally during geologic time.

BACKWATER - A back up or ponding effect of water caused by obstructions in the flow path of the water.

CALCAREOUS - Containing calcium, calcium carbonate or carbonate of lime.

CALICHE - A crust or succession of crusts of calcium carbonate that forms within or on top of the stony soil of arid or semiarid regions.

CHANNEL - A depression in the land where water runs or may run.

COLLUVIAL - Pertaining to material or soils washed from hillsides.

CONGLOMERATE - A rock composed of rounded fragments, varying from small pebbles to large boulders, in a cement of hardened clay, calcareous material, iron oxide, or silica.

CONVEYANCE - A measure of the water carrying capacity of the valley and/or channel section.

CROSS SECTION - A line taken at right angles to a stream channel which shows the channel bottom and banks of the channel and the floodplain adjacent to the channel.

DENDRITIC - Pertaining to or resembling branching, figure like a tree.

DISCHARGE - The rate of flow or volume of water per unit of time. Usually expressed in cubic feet per second.

ENCROACHMENT - The results of any acts of man or nature which tend to fill in or block a channel.

FLOOD - An overflow onto lands not normally covered with water.

FLOOD FREQUENCY - The percent chance of occurrence of a flood; e.g., a 100-year flood frequency would have a one percent chance of occurrence or would be expected to occur on the average of once in 100 years.

FLOOD HAZARD FACTOR - Used by FIA to define the difference in elevation between the 10-year and the 100-year flood. This correlates flood frequency information directly into insurance rate tables.

FLOODPLAIN - The relatively flat area or low lands adjacent to a stream channel sometimes known as bottom land. This land is subject to being covered by flood waters.

FLOODWAY - The minimum area required to carry the existing condition 100-year flood when the water surface is raised 1.0 foot.

HEADWATER ELEVATION - The elevation of the water surface above mean sea level on the upstream side of a bridge.

HEAD LOSS - The difference in headwater and tailwater elevations.

HYDRAULIC RADIUS - The ratio of the area of a cross section to its wetted perimeter.

INFILTRATION - The entering of water into soil.

INUNDATION - The covering of grounds by water.

PHREATOPHYTES - Deep-rooted plants which obtain all their water from the water table or the layer of soil just above it.

PROFILE - A representation of the bottom of a stream channel which shows the slope of the channel.

REACH - A portion or segment of a stream channel or waterway.

RIPRAP - A foundation or sustaining wall on an incline consisting of stones placed without order or with very minor order.

SCOUR - The removal of soil particles by running water.

TAILWATER - The elevation of the water surface above mean sea level at the downstream side of a bridge.

WATERSHED - The area above a point which contributes runoff water to that point.

WATER SURFACE PROFILE - A line showing the depth of water above the bottom of a channel. This line usually runs nearly parallel to the slope of the channel.

URBANIZATION - The covering of land by impervious structures, such as roads, sidewalks, parking lots, and houses.

APPENDIX H

BIBLIOGRAPHY

1. "Report on Survey for Flood Control, Las Vegas Wash and Tributaries, Las Vegas and Vicinity, Nevada", U. S. Department of Army, Corps of Engineers, September 30, 1959.

2. "Floodplain Information, Lower Las Vegas Wash, Clark County, Nevada", U. S. Department of Army, Corps of Engineers, December 1967.

3. "Las Vegas General Information", Greater Las Vegas Chamber of Commerce, February 1977.

4. "Interim Report to the Flood Hazard Analysis, Metropolitan Area, Las Vegas Valley, Clark County, Nevada", Clark County Conservation District in cooperation with USDA, Soil Conservation Service, June 1976.

5. "Soil Survey - Las Vegas and Eldorado Valleys Area, Nevada", USDA, Soil Conservation Service, February 1967.

6. "Hydrologic Unit Map - 1974, State of Nevada, U.S. Geological Survey, Map Scale 1:500,000, 1974.

7. "1970 Census of Population", U. S. Department of Commerce, Bureau of Census, 1973.

8. "Population Estimates of Clark County and Its Entities", Nevada Department of Economic Development, Office of State Planning Coordinator, 1976.

9. "Influence of Surface and Near-Surface Caliche Distribution on Infiltration Characteristic and Flooding, Las Vegas Area, Nevada", R. L. Cooley, G. W. Fiero, Jr., L. H. Lattman, A. L. Mindling, February 1973.

10. "Las Vegas Master Drainage Plan", VTN Engineers, Las Vegas, Nevada, 1963.

11. "Report on Flood of 13 June 1955, Las Vegas and Vicinity, Nevada", U. S. Department of Army, Corps of Engineers, 6 July 1955.

12. "Report on Flood of 24 July 1955 at Las Vegas and Henderson, Nevada", U. S. Department of Army, Corps of Engineers, August 1955.

13. "A Brief Hydrologic Appraisal of the July 3-4, 1975, Flash Flood in Las Vegas Valley, Nevada", Clark County Flood Control Division, Department of Public Works in cooperation with the U. S. Department of Interior, Geological Survey, 1976.

14. "History of Flooding, Clark County, Nevada, 1905-1975", SPECIAL REPORT, U. S. Department of Agriculture, Soil Conservation Service in cooperation with Clark County Conservation District and others, 1977.

15. "Growth Forecasts, Environmental Report No. 3", McDonald and Grefe, Inc., from Clark County 208 Water Quality Management Plan, November 1977.

16. "Base Case Projection of Future Land Use Pattern, Final Report, Management Program", Sedway/Cooke, from Clark County 208 Water Quality Management Plan, November 1977.

17. "Detention Basin Design and Development", Richard Lanyon, Supervising Engineer of Flood Control Metropolitan District of Chicago, Illinois, 1974.

18. State of Nevada, Nevada Revised Statutes 278.250, 543.010 through 543.050.

19. "Clark County 208 Water Quality Management Plan", Clark County Sanitation District, 208 Project Staff, May 9, 1978.

20. "Guidelines for Determining Flood Flow Frequency", Bulletin No. 17A, U. S. Water Resources Council, Revised June 1977.

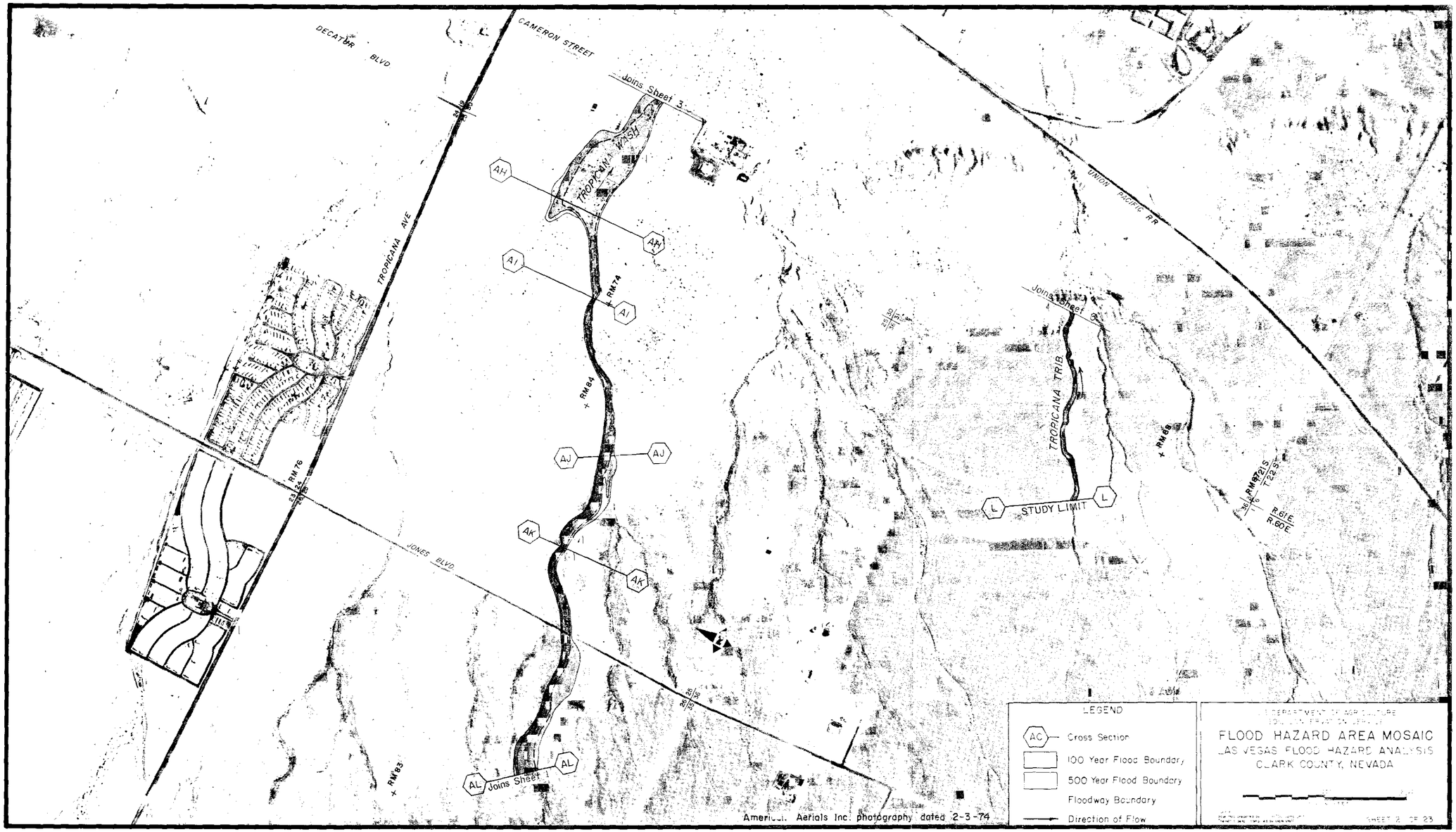
21. "Computer Program for Project Formulation - Hydrology", Technical Release No. 20, U. S. Department of Agriculture, Soil Conservation Service, 1965.

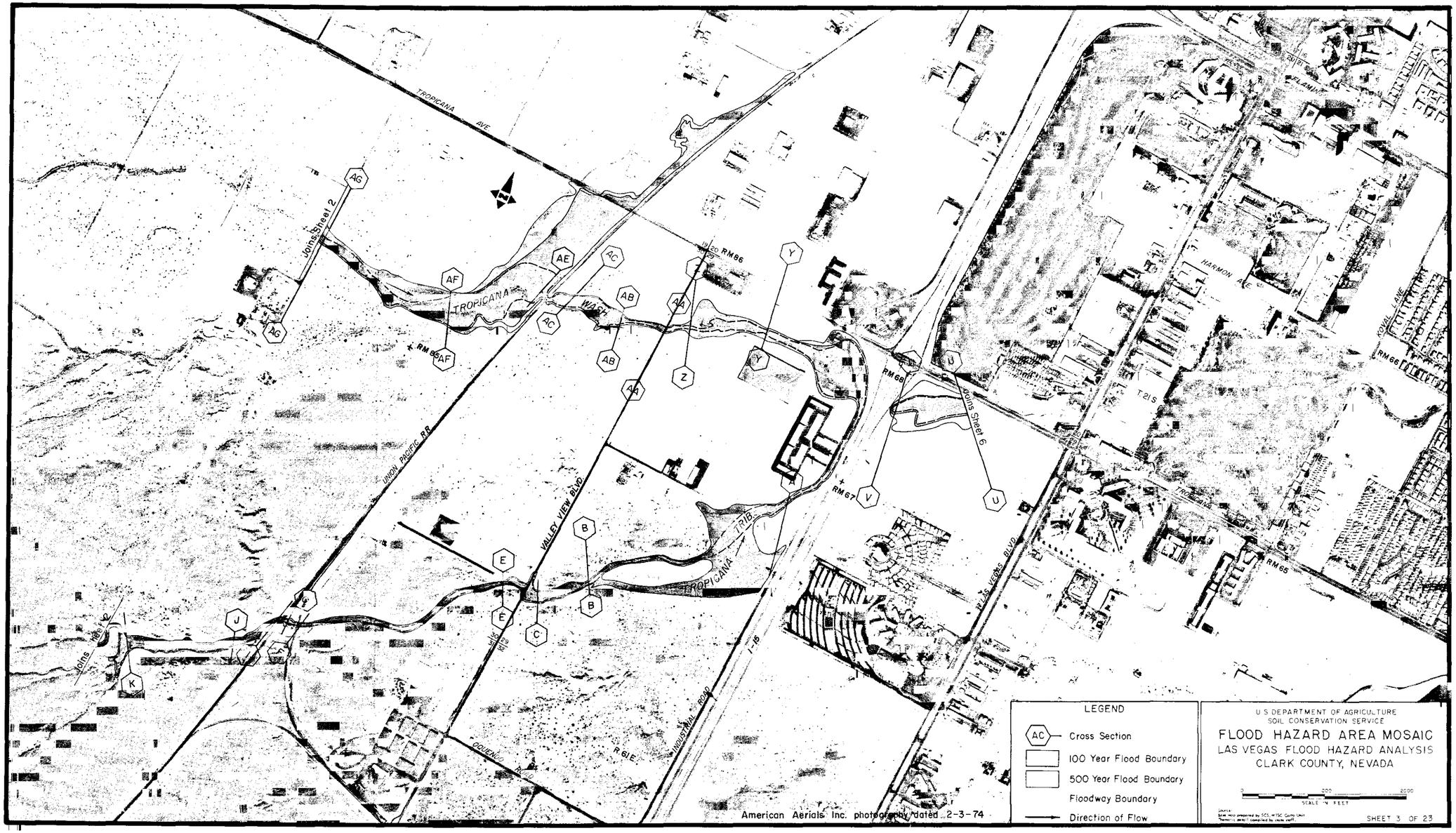
22. "Flood Flow Frequency Analysis", Supplement to Las Vegas Wash and Tributaries - Flood Hazard Analyses, Clark County, Nevada, USDA, Soil Conservation Service, July, 1978.

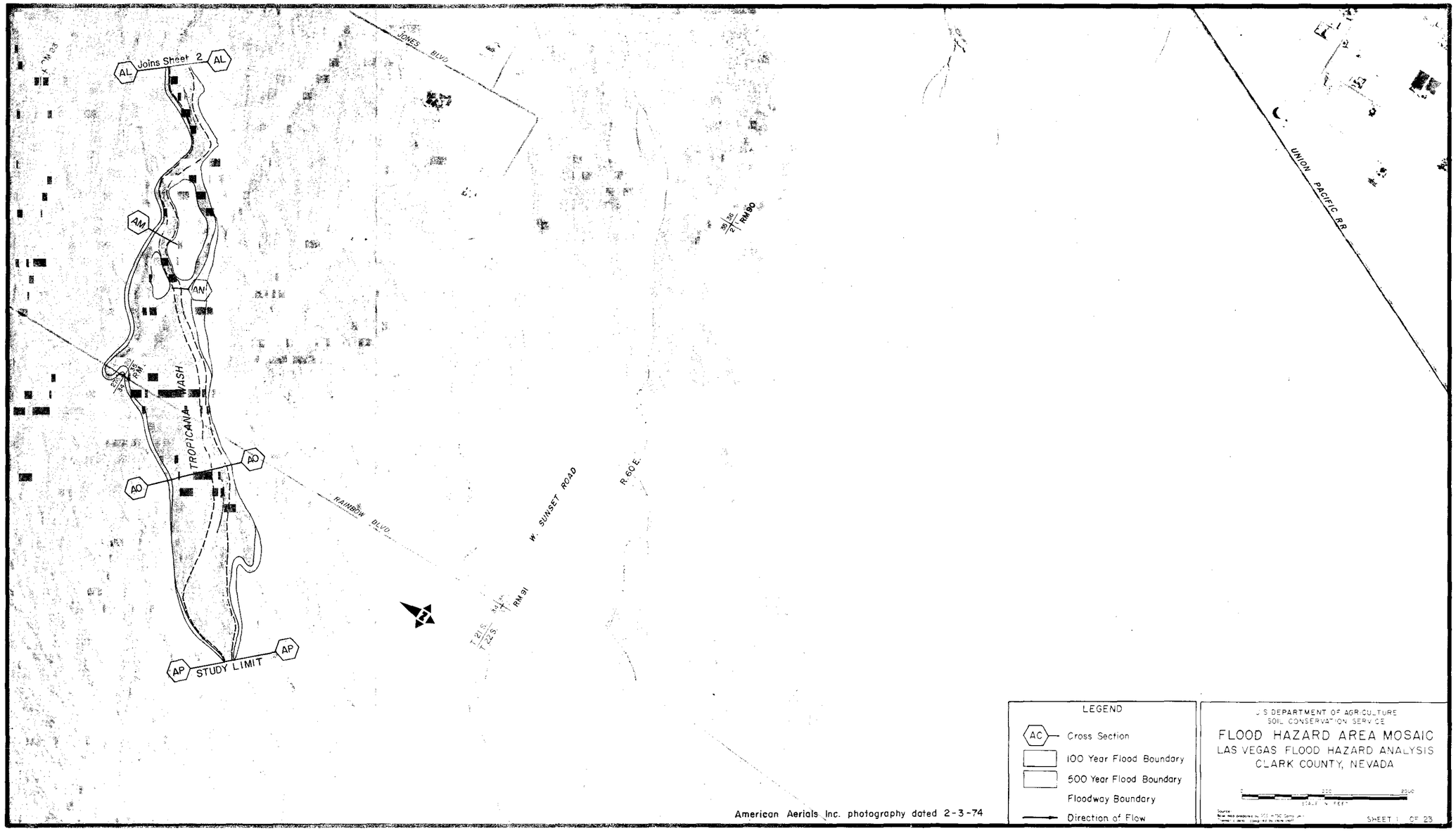
23. "WSP-2 Computer Program", (Technical Release No. 61), USDA, Soil Conservation Service, May 1976.

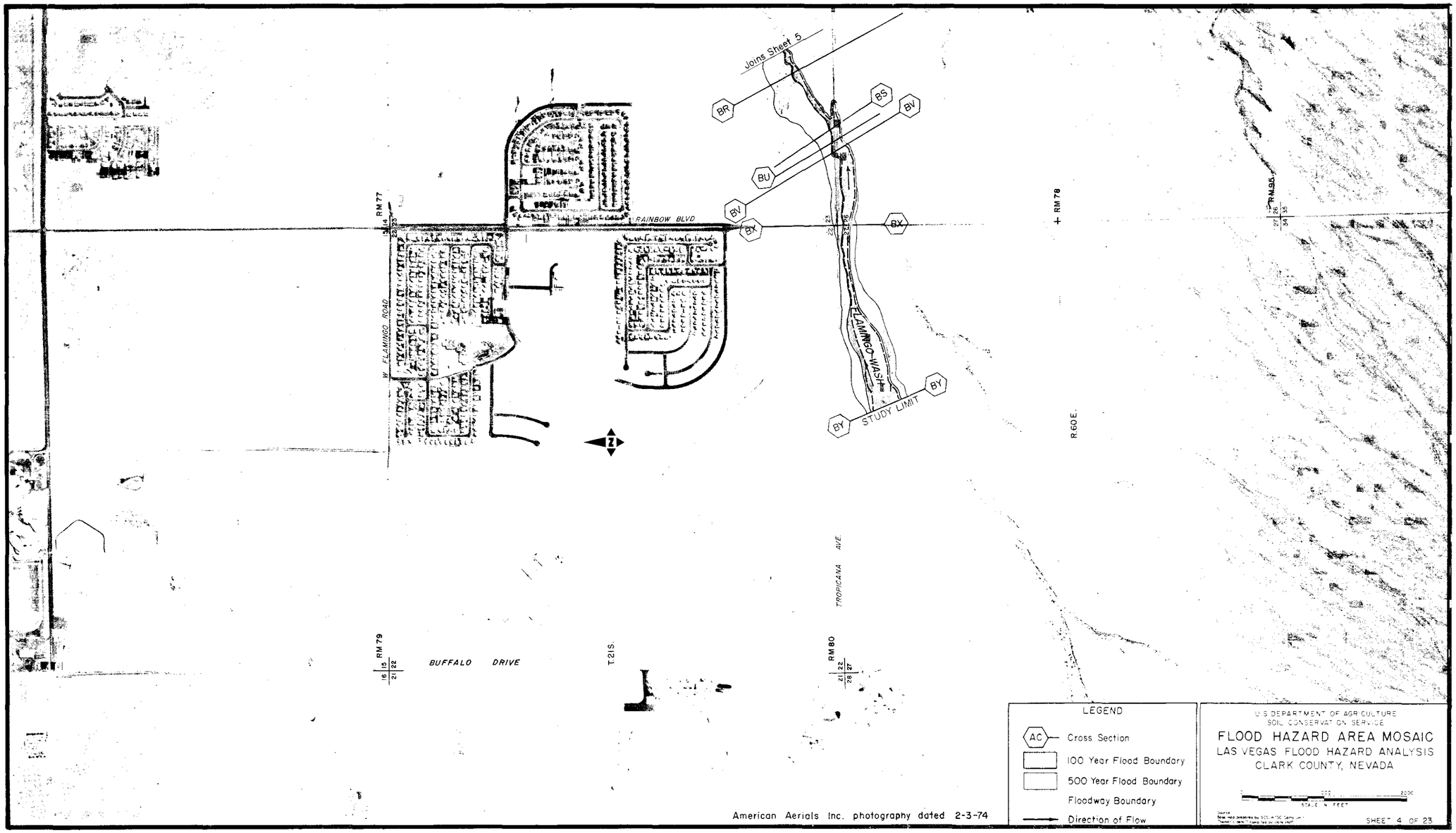
FLOOD HAZARD STUDY-LAS VEGAS WASH AND TRIBUTARIES, CLARK CO., NV.

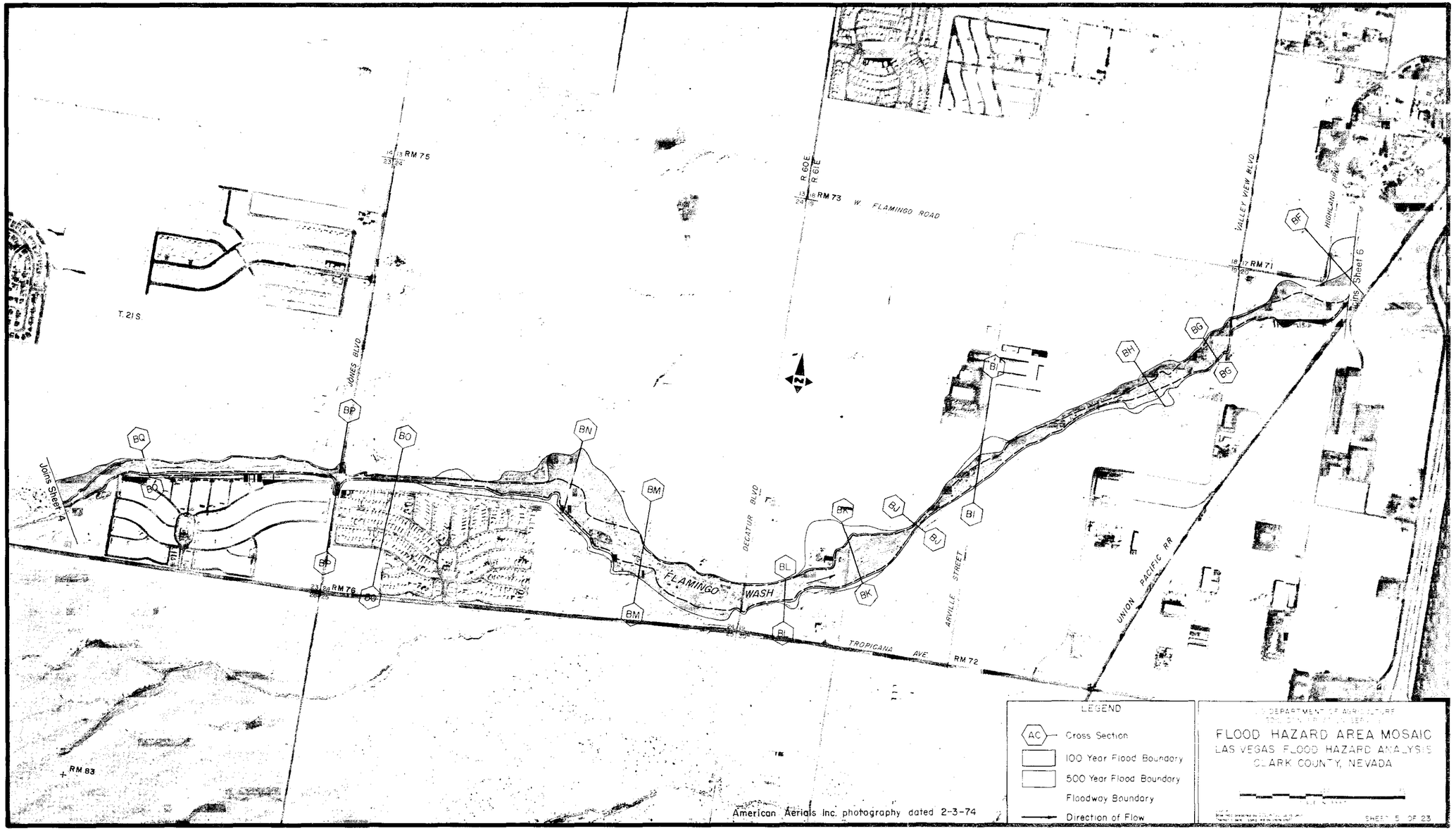
SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

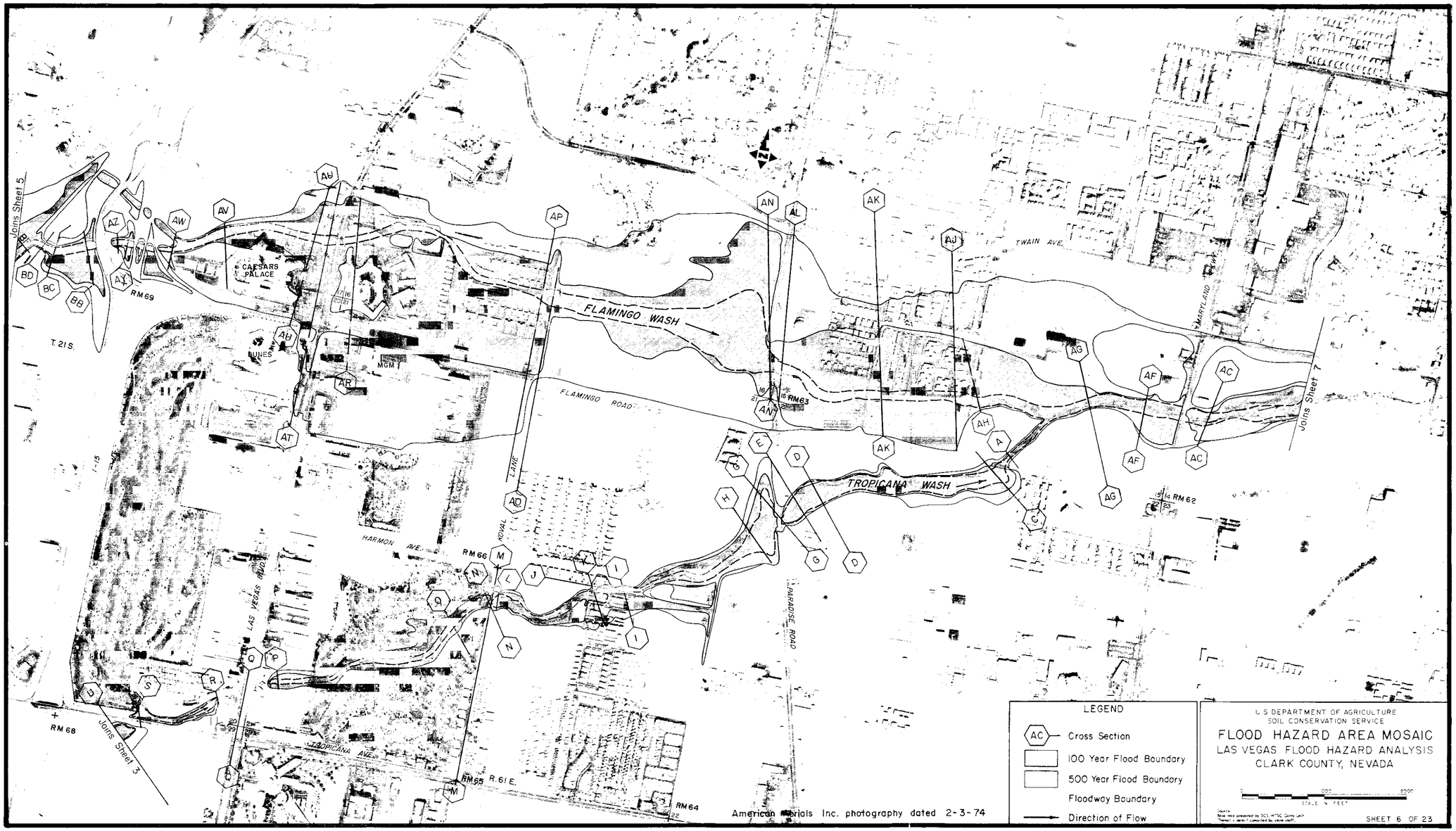

DECATUR BLVD
CAMERON STREET
TROPICANA AVE
JONES BLVD
UNION PACIFIC RR
TROPICANA WASH
TROPICANA TRIB
RM 76
RM 83
RM 84
RM 85
RM 87
STUDY LIMIT
Joins Sheet 3
Joins Sheet 2
Joins Sheet 1
AH
AI
AJ
AK
AL
T.21S
T.22S
R.61E
R.60E
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
American Aerials Inc. photography dated 2-3-74

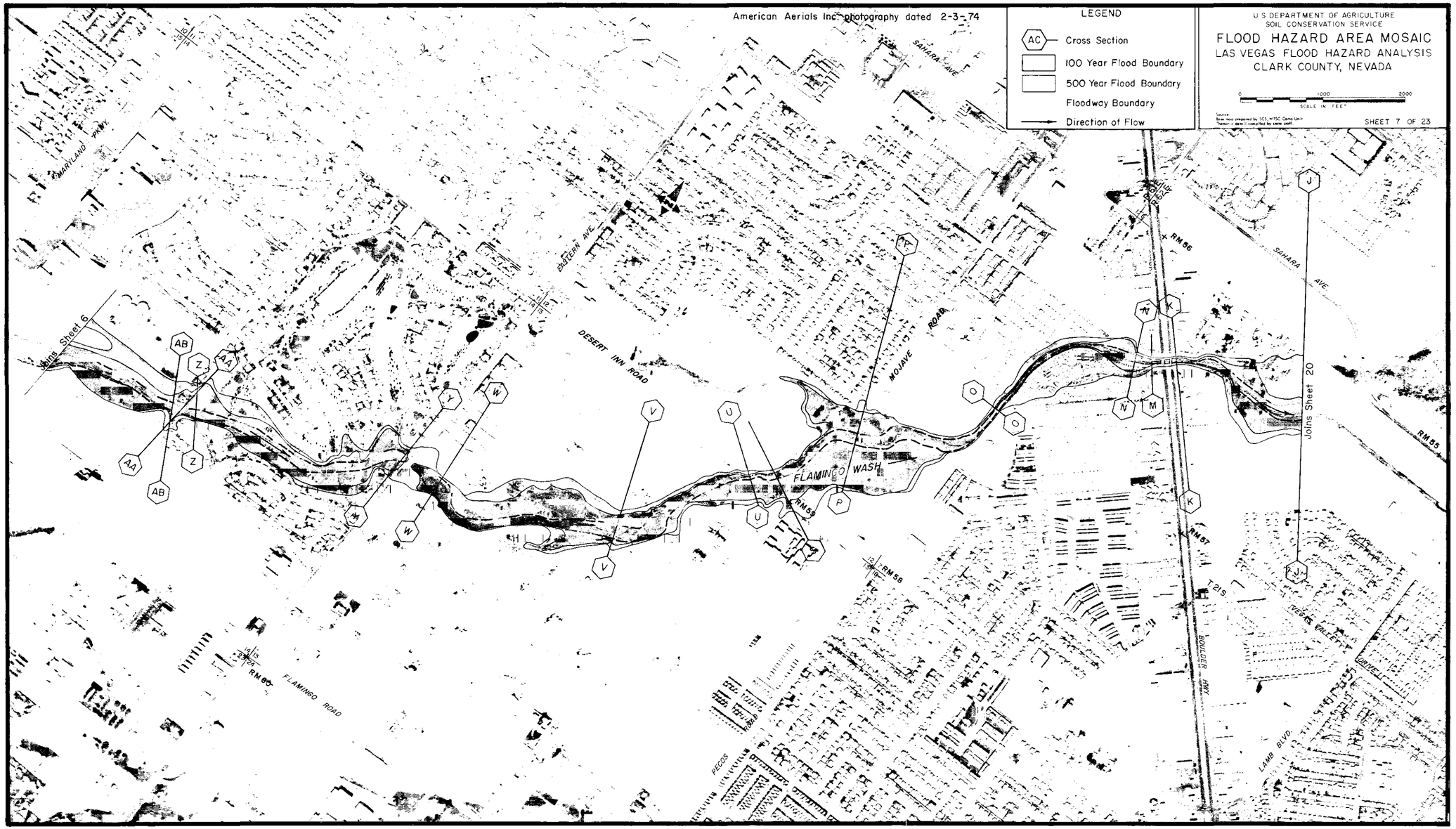

TROPICANA AVE
TROPICANA WASH
UNION PACIFIC RR
VALLEY VIEW BLVD
TROPICANA TRIB.
I-15
INDUSTRIAL ROAD
LAS VEGAS BLVD
HARMON AVE
JOINS SHEET 2
JOINS SHEET 6
JOINS SHEET 5
RM 66
RM 67
RM 68
RM 65
RM 86
T.21S.
R.61E.
AG
AF
AE
AC
AB
AA
Y
Z
V
U
B
E
C
J
K
LEGEND
Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
American Aerials Inc. photography dated 2-3-74
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 3 OF 23

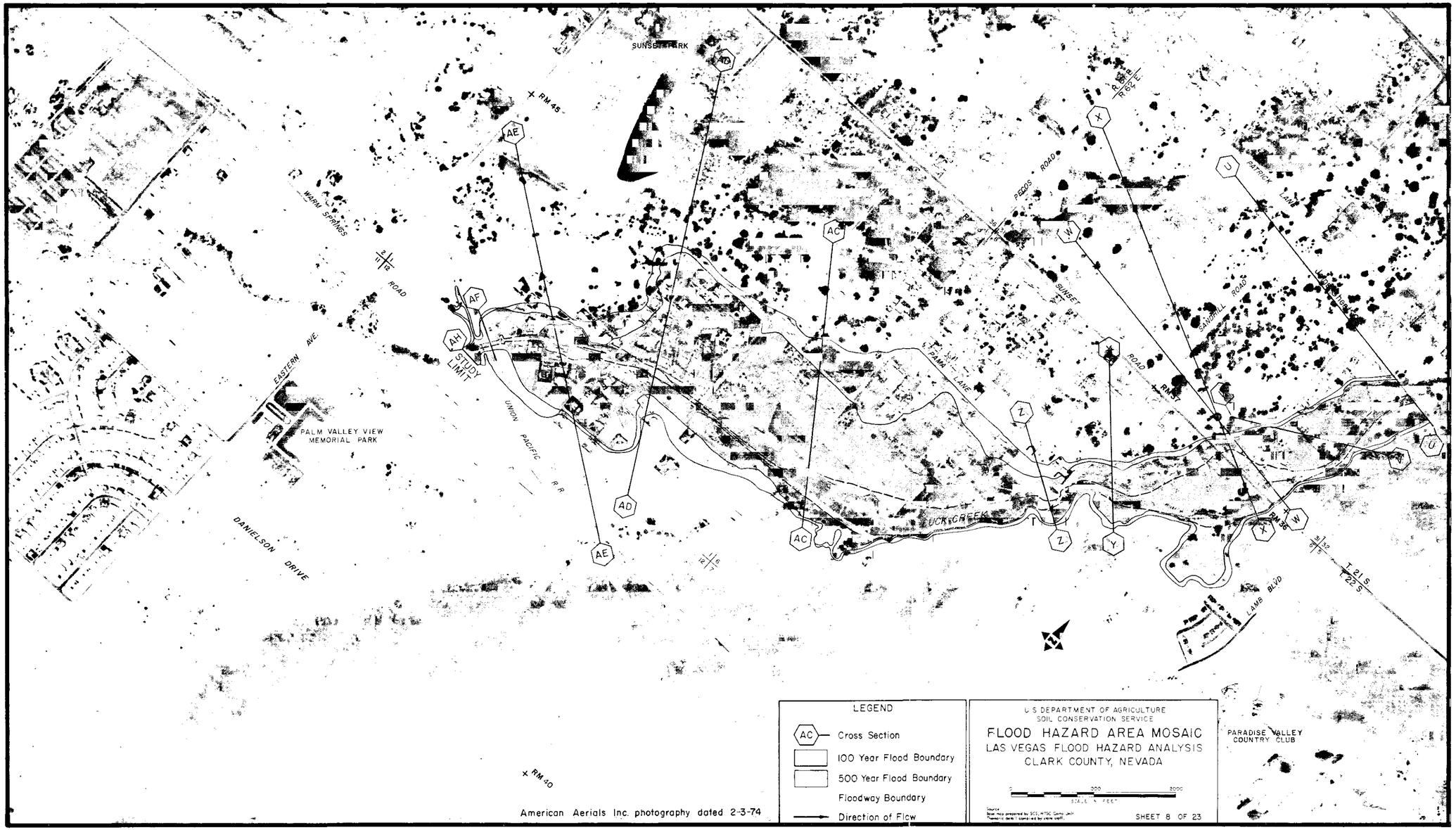

AL
Joins Sheet 2
AL
AM
AN
AO
AO
AP
STUDY LIMIT
AP
TROPICANA WASH
JONES BLVD
RAINBOW BLVD
W. SUNSET ROAD
R.60 E.
UNION PACIFIC R.R.
T.21 S.
T.22 S.
RM 91
RM 90
RM 85
LEGEND
AC
Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
American Aerials Inc. photography dated 2-3-74
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SHEET 1 OF 23

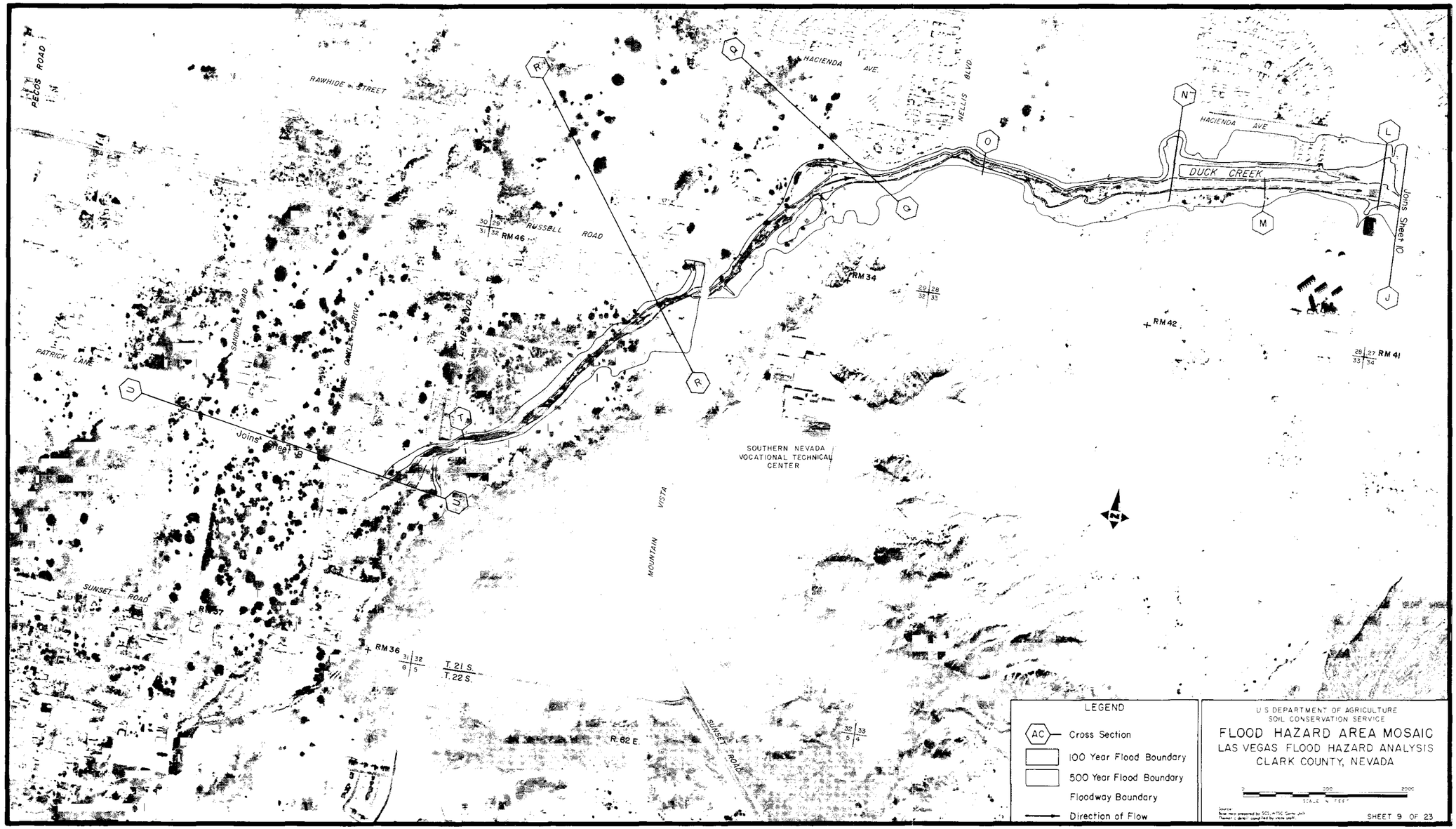

Joins Sheet 5
BR
BS
BV
BU
BV
BX
BX
BX
RAINBOW BLVD
W. FLAMINGO ROAD
RM 77
14 | 23
FLAMINGO WASH
BY
BY
STUDY LIMIT
RM 78
RM 95
27 | 26
34 | 35
R.60 E.
TROPICANA AVE.
RM 79
16 | 15
21 | 22
BUFFALO DRIVE
T.21S.
RM 80
21 | 22
28 | 27
LEGEND
AC
Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
American Aerials Inc. photography dated 2-3-74
SHEET 4 OF 23

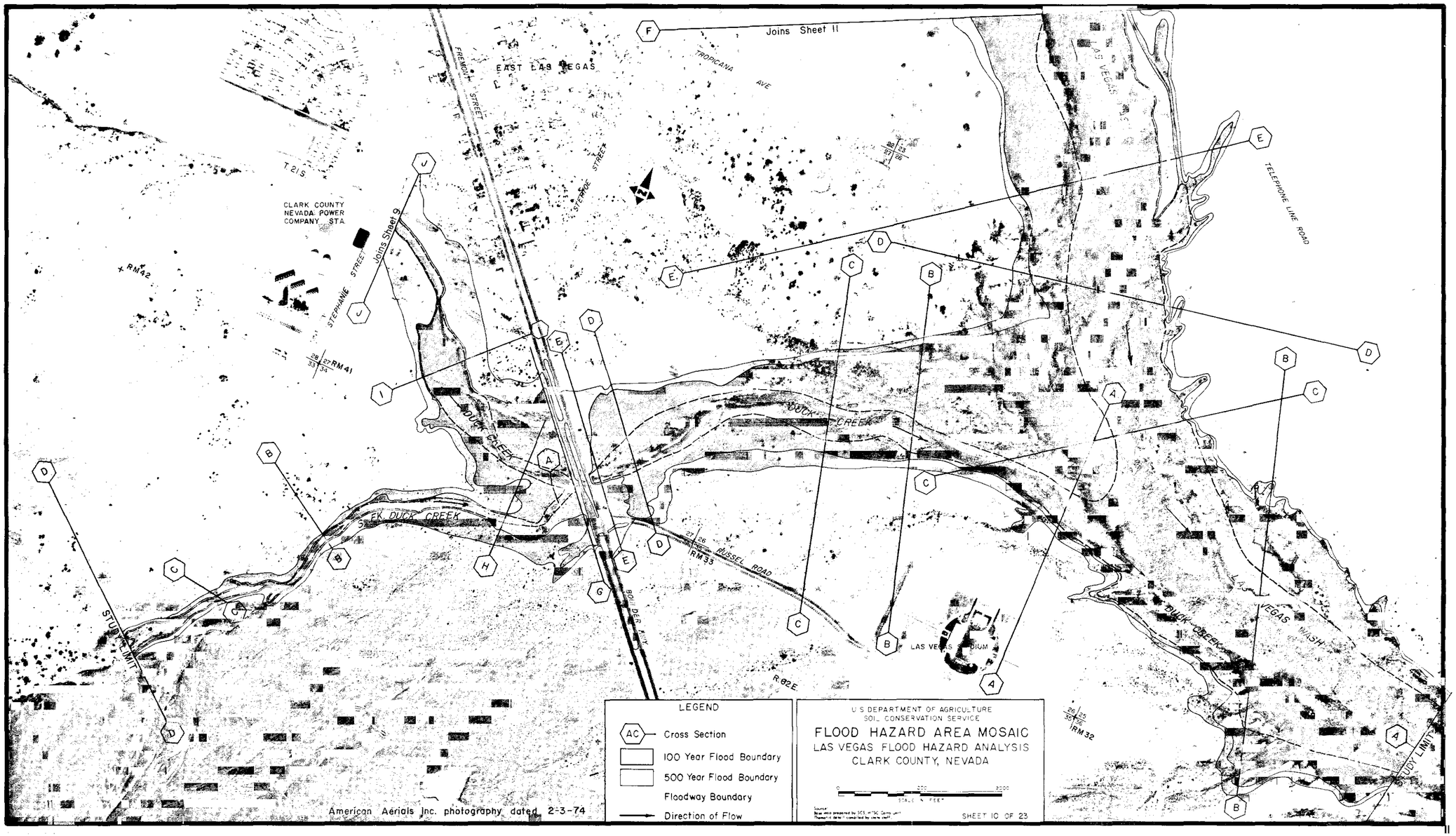

RM 75
R 60 E
R 61 E
RM 73
W FLAMINGO ROAD
VALLEY VIEW BLVD
HIGHLAND DRIVE
RM 71
Sheet 6
T. 21 S.
JONES BLVD
BQ
BP
BO
BN
BM
BL
BK
BJ
BI
BH
BG
BF
Joins Sheet 4
RM 76
FLAMINGO WASH
DECATUR BLVD
ARVILLE STREET
UNION PACIFIC RR
TROPICANA AVE
RM 72
RM 83
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
American Aerials Inc. photography dated 2-3-74
DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SHEET 5 OF 23

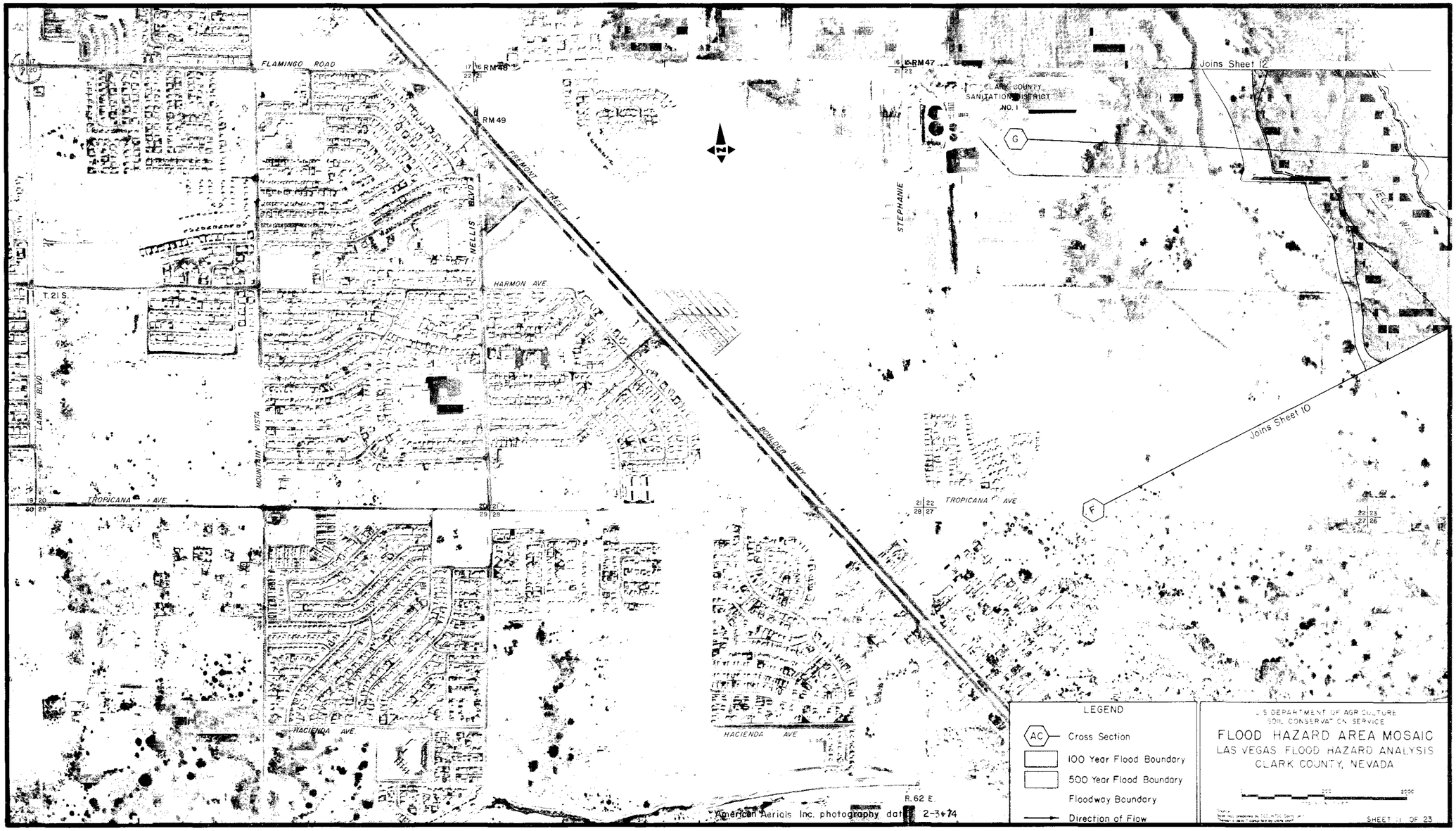

Joins Sheet 5
CAESARS PALACE
FLAMINGO WASH
FLAMINGO ROAD
TROPICANA WASH
TWAIN AVE.
MARYLAND PKWY.
HARMON AVE.
TROPICANA AVE.
KOVAL LANE
PARADISE ROAD
LAS VEGAS BLVD.
I-15
T.21S.
RM 69
RM 68
RM 66
RM 65
RM 64
RM 63
RM 62
R.61E.
Joins Sheet 3
Joins Sheet 7
American Aerials Inc. photography dated 2-3-74
LEGEND
Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U.S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 6 OF 23

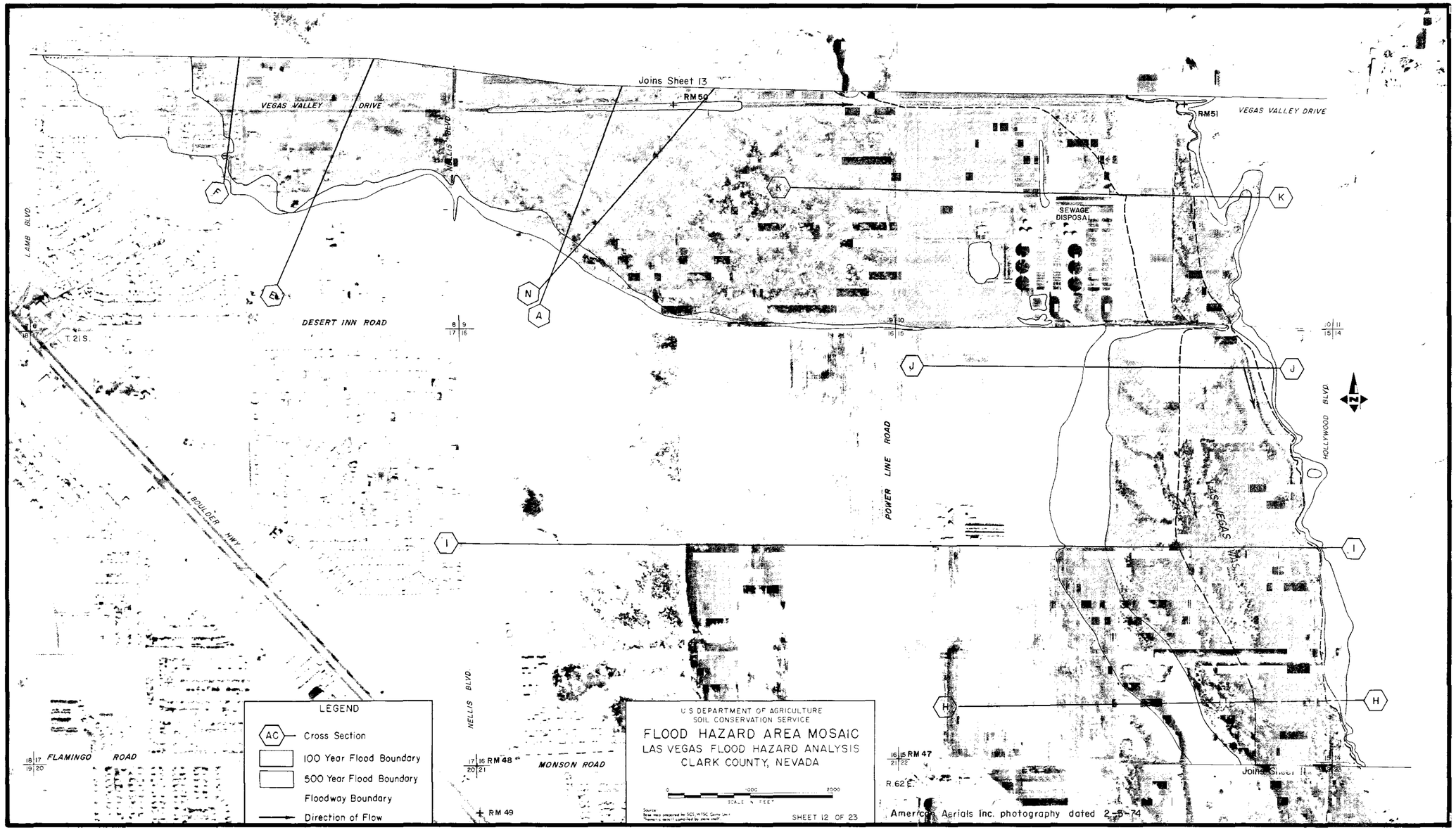

American Aerials Inc. photography dated 2-3-74
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 7 OF 23
Joins Sheet 6
Joins Sheet 20
MARYLAND PKWY.
EASTERN AVE.
DESERT INN ROAD
SAHARA AVE.
MOJAVE ROAD
FLAMINGO WASH
FLAMINGO ROAD
BOULDER HWY.
LAMB BLVD.
PECOS
RM 56
RM 57
RM 58
RM 60
T.21S.

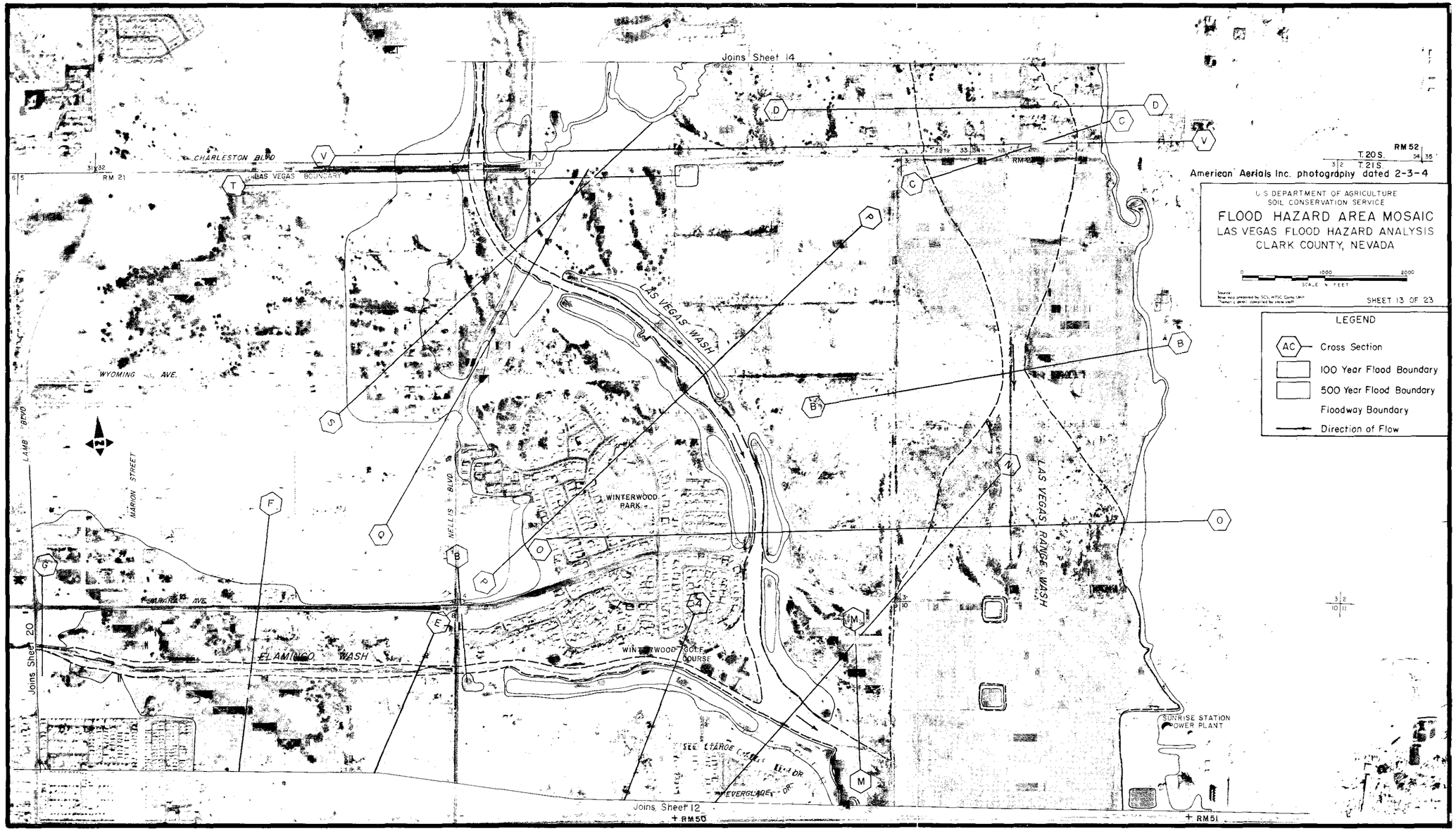

SUNSET PARK
RM 45
WARM SPRINGS ROAD
EASTERN AVE.
STUDY LIMIT
PALM VALLEY VIEW MEMORIAL PARK
UNION PACIFIC R.R.
DANIELSON DRIVE
RM 40
PECOS ROAD
SUNSET ROAD
FAMI LANE
LUCKY CREEK
PATRICK LANE
SANDHILL ROAD
RAINBOW BLVD
RM 95
LAMB BLVD
T 21 S
T 22 S
PARADISE VALLEY COUNTRY CLUB
AC
AD
AE
AF
AH
U
W
X
Y
Z
LEGEND
Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
American Aerials Inc. photography dated 2-3-74
U.S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 8 OF 23

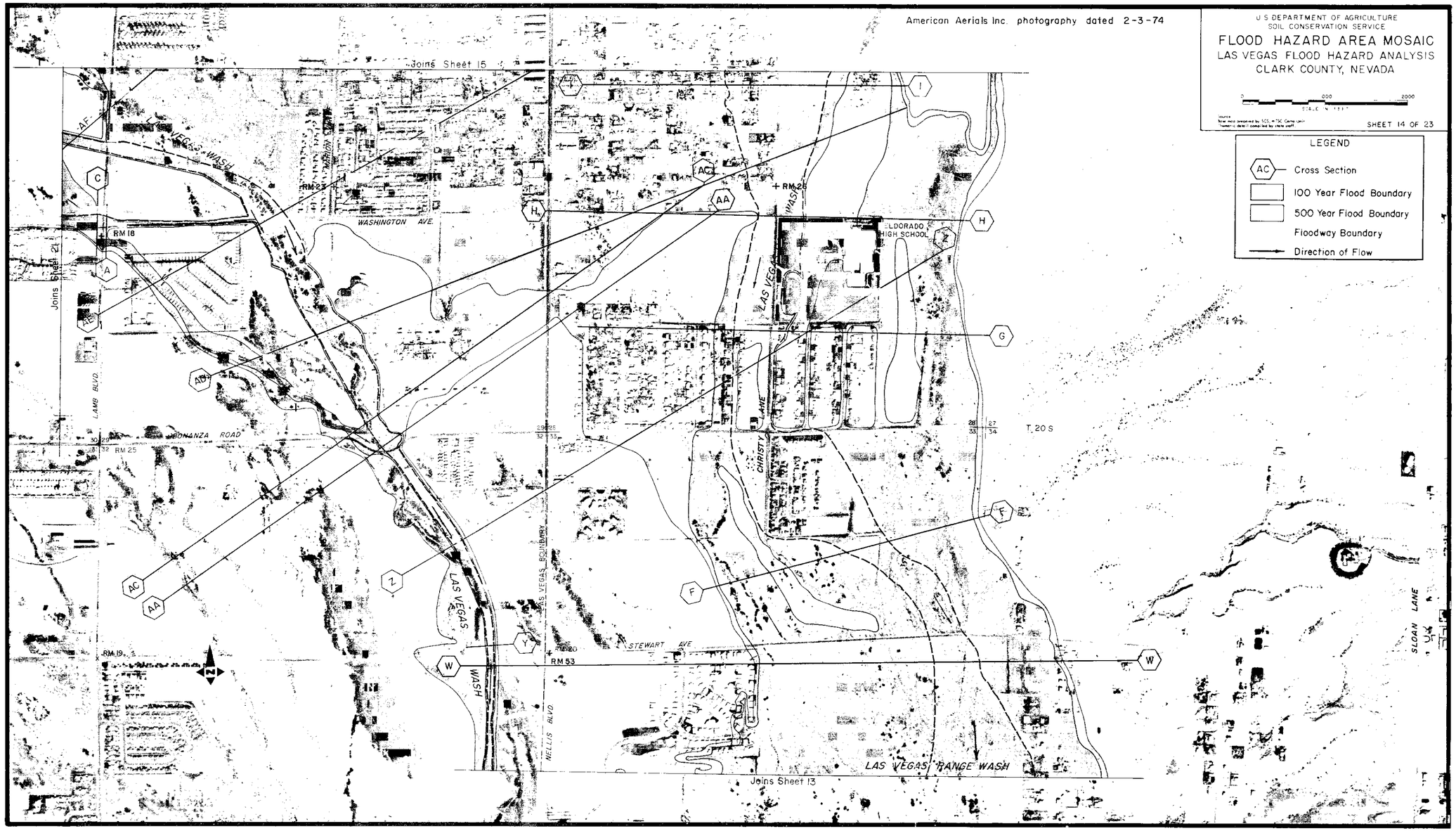

PECOS ROAD
RAWHIDE STREET
HACIENDA AVE.
NELLIS BLVD
HACIENDA AVE
DUCK CREEK
Joins Sheet 10
RUSSELL ROAD
RM 46
RM 34
RM 42
RM 41
PATRICK LANE
SANDHILL ROAD
ANNE OAKLEY DRIVE
I-515 BLVD
Joins Sheet 9
SOUTHERN NEVADA VOCATIONAL TECHNICAL CENTER
MOUNTAIN VISTA
SUNSET ROAD
RM 37
RM 36
T. 21 S.
T. 22 S.
R. 62 E.
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 9 OF 23

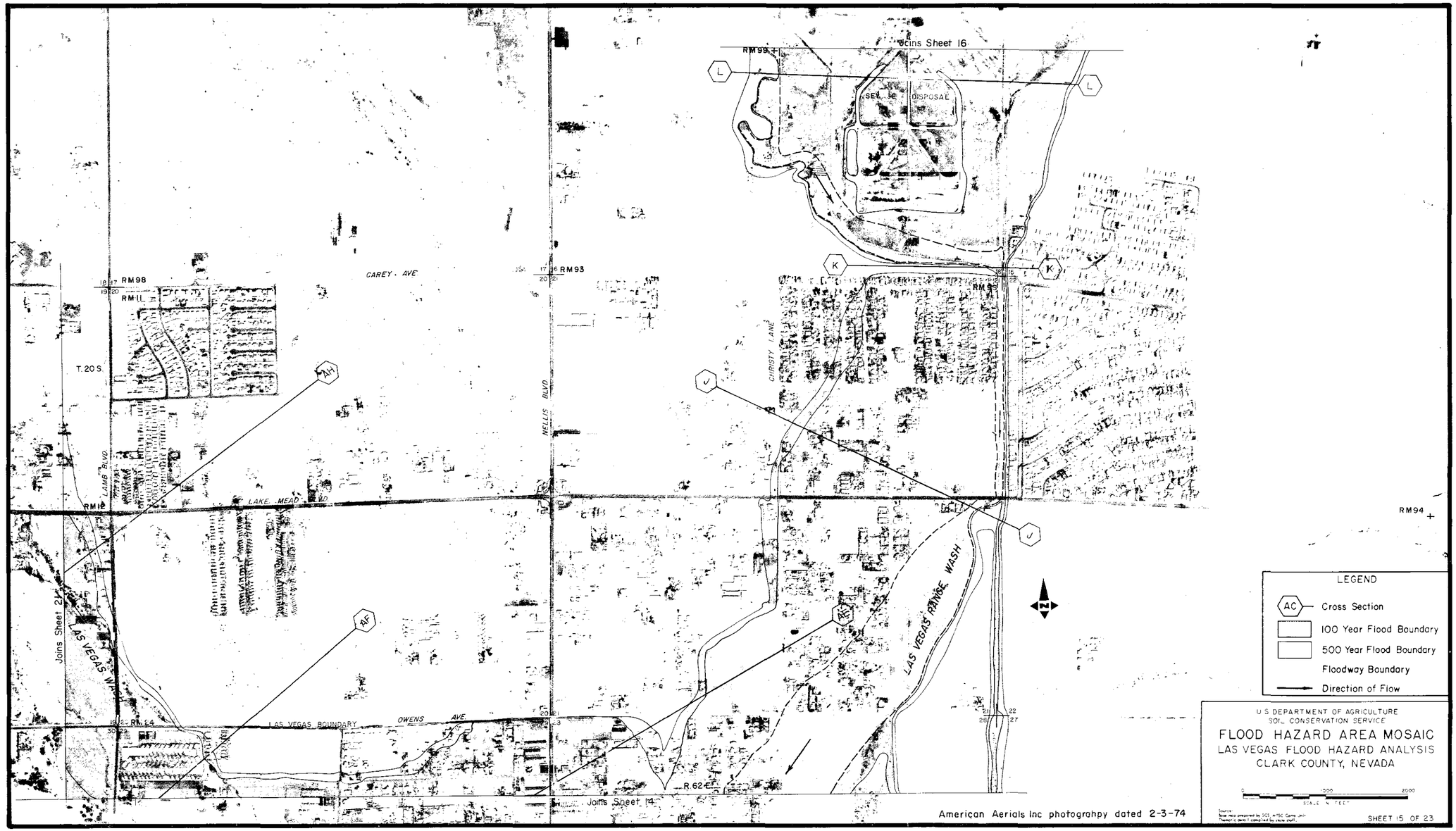

Joins Sheet 11
EAST LAS VEGAS
FREMONT STREET
STEWART STREET
TROPICANA AVE
LAS VEGAS
TELEPHONE LINE ROAD
T21S
CLARK COUNTY NEVADA POWER COMPANY STA.
RM42
STEPHANIE STREET
Joins Sheet 9
RM41
DUCK CREEK
S FK DUCK CREEK
RUSSEL ROAD
RM33
BOULDER HWY
R62E
LAS VEGAS WASH
RM32
STUDY LIMIT
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
American Aerials Inc. photography dated 2-3-74
U.S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 10 OF 23


FLAMINGO ROAD
RM 48
RM 47
RM 49
FREMONT STREET
BOULDER HWY
NELLIS BLVD
STEPHANIE
HARMON AVE
T. 21 S.
LAMB BLVD
MOUNTAIN VISTA
TROPICANA AVE
HACIENDA AVE
CLARK COUNTY SANITATION DISTRICT NO. 1
Joins Sheet 12
Joins Sheet 10
R. 62 E.
American Aerials Inc. photography dat 2-3-74
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SHEET 11 OF 23

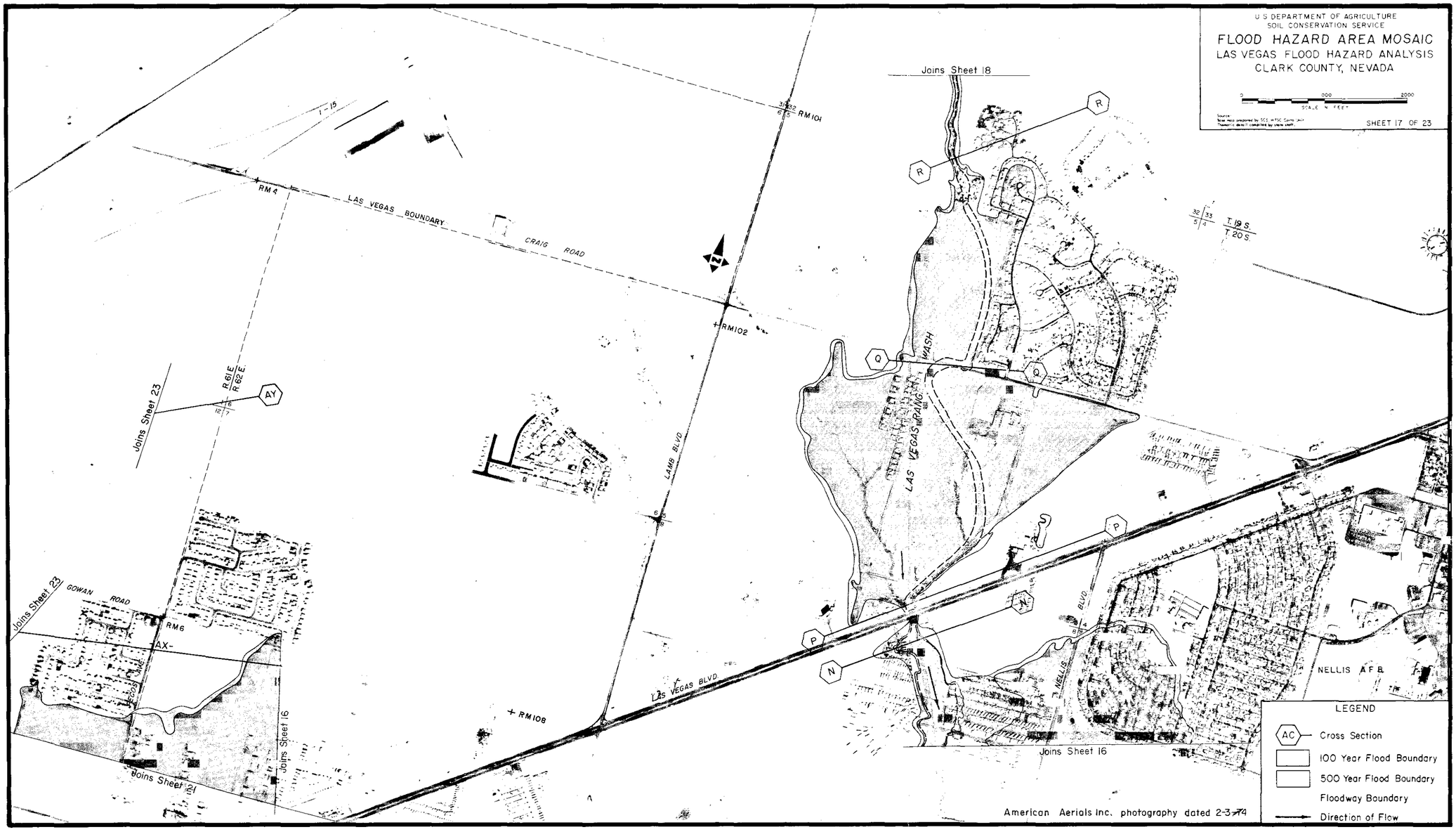

Joins Sheet 13
VEGAS VALLEY DRIVE
RM 50
RM 51
VEGAS VALLEY DRIVE
LAMB BLVD
NELLIS BLVD
SEWAGE DISPOSAL
DESERT INN ROAD
T 21 S.
POWER LINE ROAD
HOLLYWOOD BLVD
LAS VEGAS WASH
BOULDER HWY.
NELLIS BLVD
FLAMINGO ROAD
MONSON ROAD
RM 48
RM 49
RM 47
R 62 E.
Joins Sheet
A
E
F
H
I
J
K
N
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U.S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 12 OF 23
Aerial photography dated 2-5-74

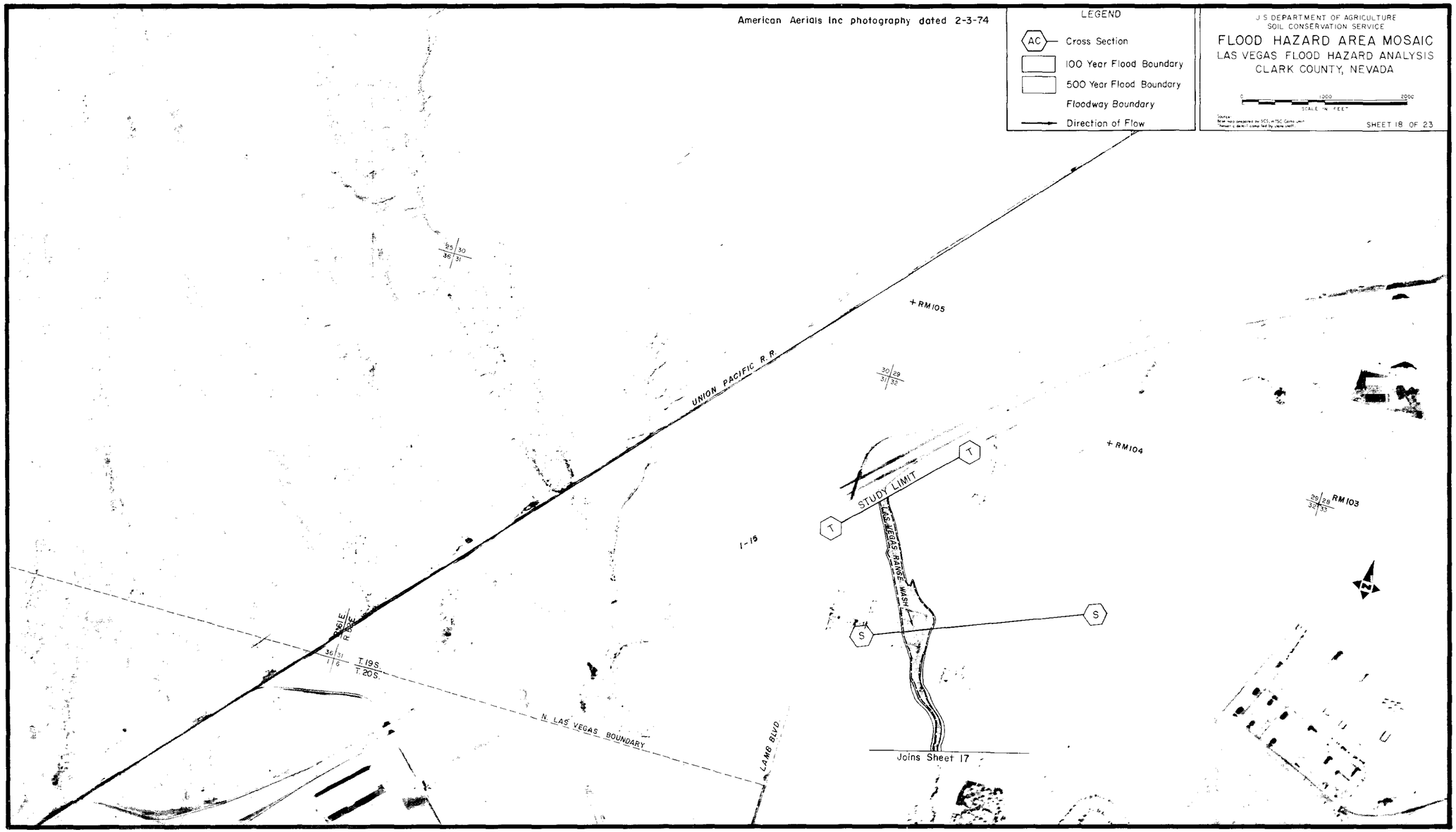

Joins Sheet 14
CHARLESTON BLVD.
LAS VEGAS BOUNDARY
RM 21
RM 52
T. 20 S.
T. 21 S.
American Aerials Inc. photography dated 2-3-4
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 13 OF 23
LEGEND
Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
WYOMING AVE.
LAMB BLVD.
MARION STREET
KELLIS BLVD.
LAS VEGAS WASH
LAS VEGAS PLUNGE WASH
WINTERWOOD PARK
WINTERWOOD GOLF COURSE
SUNRISE AVE.
FLAMINGO WASH
SUNRISE STATION POWER PLANT
EVERGLADES DR.
Joins Sheet 20
Joins Sheet 12
+ RM50
+ RM51

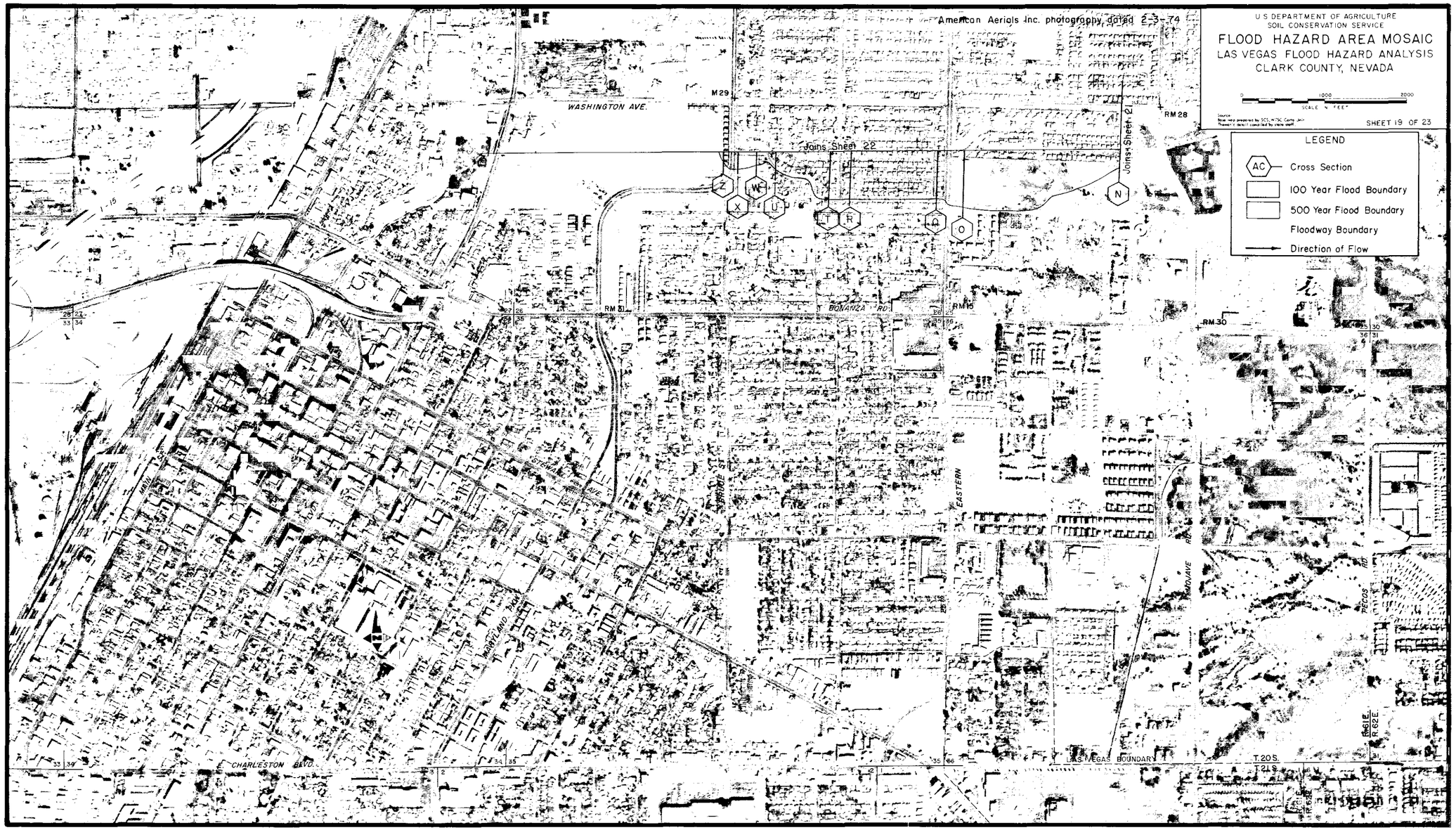

American Aerials Inc. photography dated 2-3-74
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SHEET 14 OF 23
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
Joins Sheet 15
Joins Sheet 21
Joins Sheet 13
LAS VEGAS WASH
WASHINGTON AVE.
RM 23
RM 18
RM 25
RM 19
RM 20
RM 53
RM 26
BONANZA ROAD
LAMB BLVD.
LAS VEGAS BOUNDARY
WELLS BLVD
STEWART AVE
CHRISTY LANE
SLOAN LANE
LAS VEGAS RANGE WASH
ELDORADO HIGH SCHOOL
T. 20 S
A
C
F
G
H
I
W
Y
Z
AA
AB
AC
AE
AF

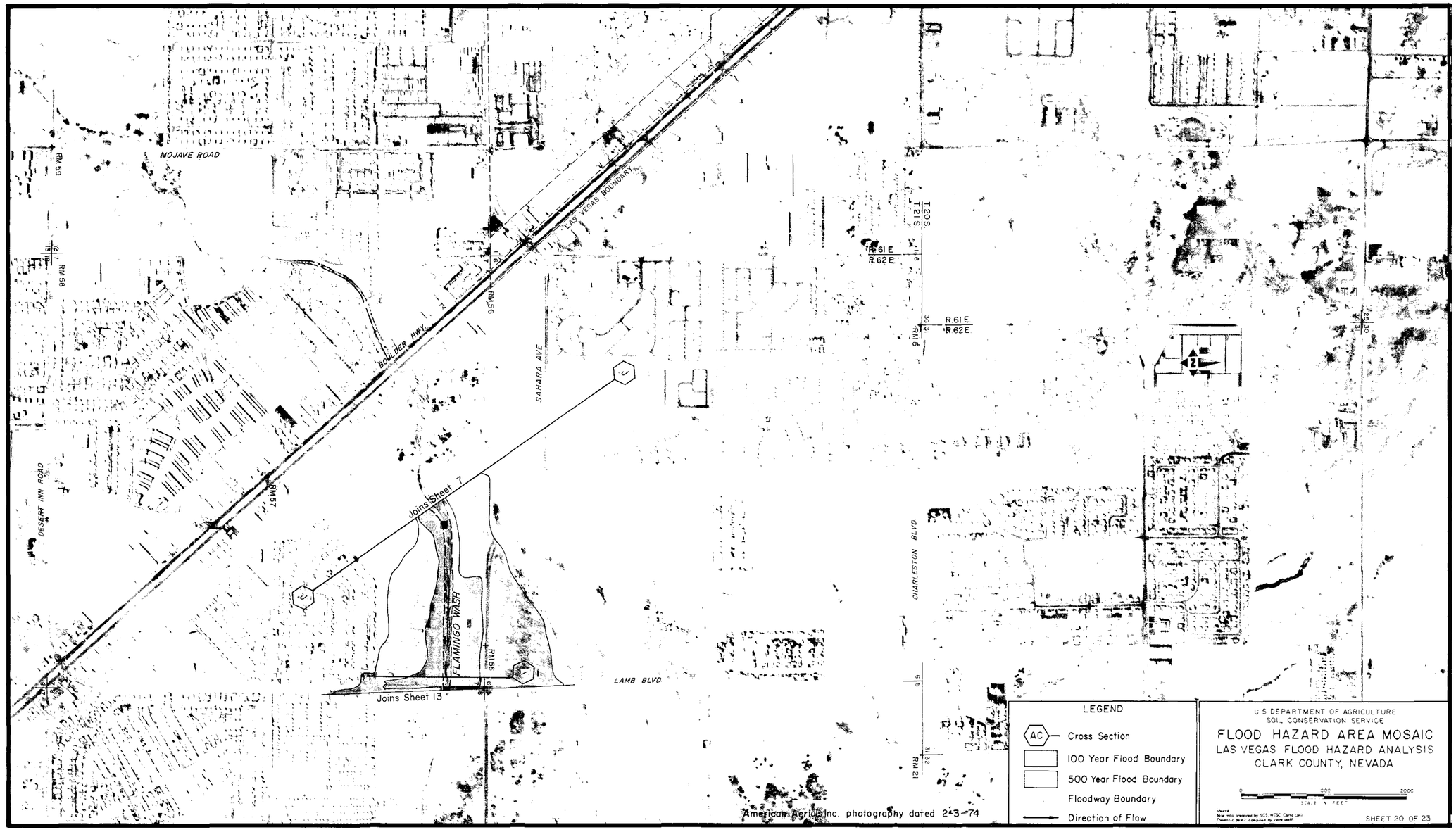

Joins Sheet 16
RM99
SEW. DE DISPOSAL
L
K
RM98
RM11
CAREY AVE
RM93
RM95
CHRISTY LANE
MELLIS BLVD
LAMB BLVD
T.20 S.
AH
V
RM18
LAKE MEAD BLVD
RM94
Joins Sheet 21
LAS VEGAS WASH
AF
LAS VEGAS RANGE WASH
RM64
LAS VEGAS BOUNDARY
OWENS AVE
R.62 E.
Joins Sheet 14
N
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
American Aerials Inc photograhpy dated 2-3-74
SHEET 15 OF 23

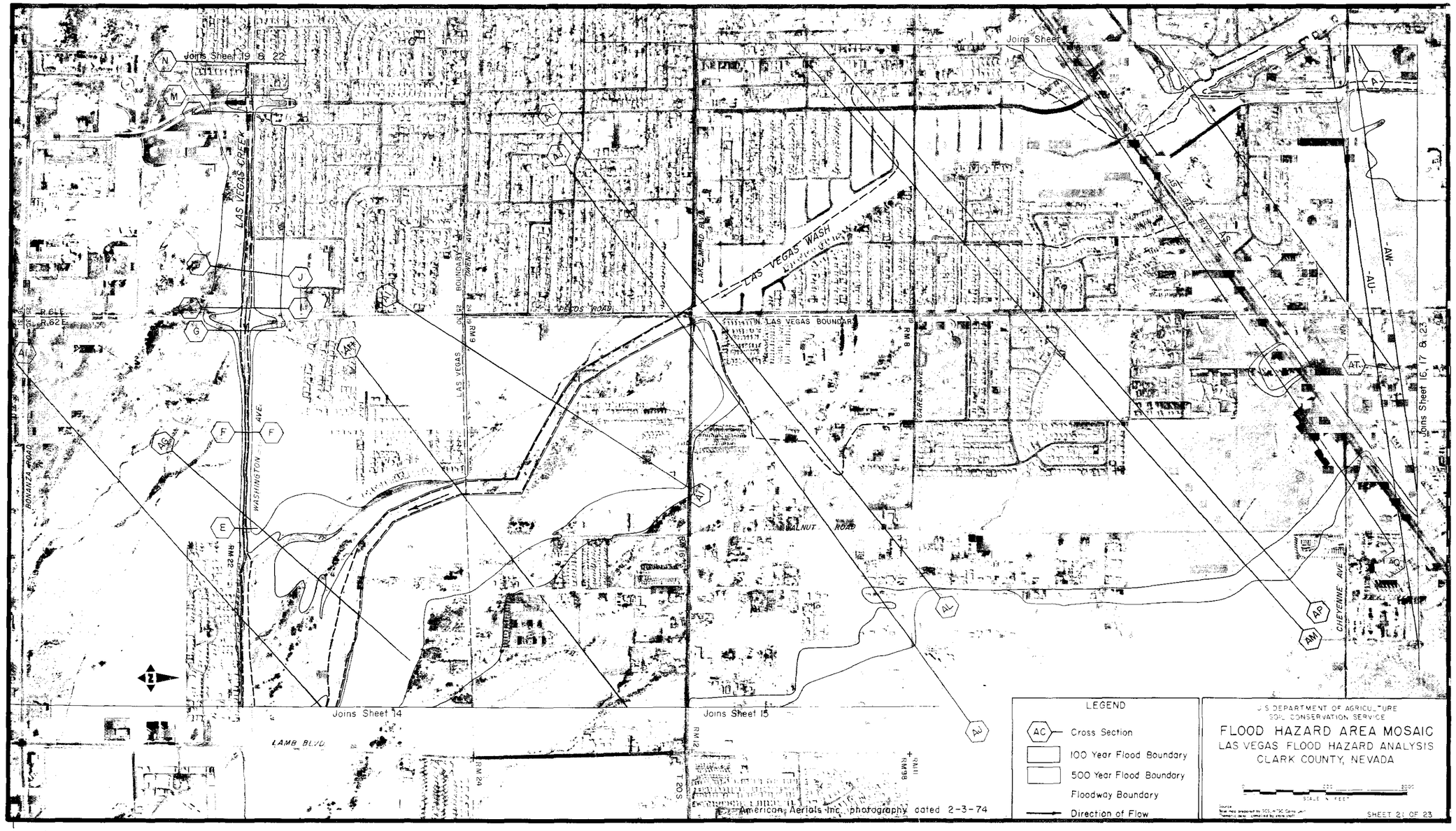

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SHEET 16 OF 23
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
AX
AS
AU
AW
AC
AB
AA
RM108
LAS VEGAS BLVD
CHEYENNE AVE
RM 10
RM98
RM99
LAMB BLVD
NELLIS BLVD
LAS VEGAS WASH
NELLIS A.F.B.
T.20 S.
R.62 E.
Joins Sheet 17
Joins Sheet 21
Joins Sheet 15

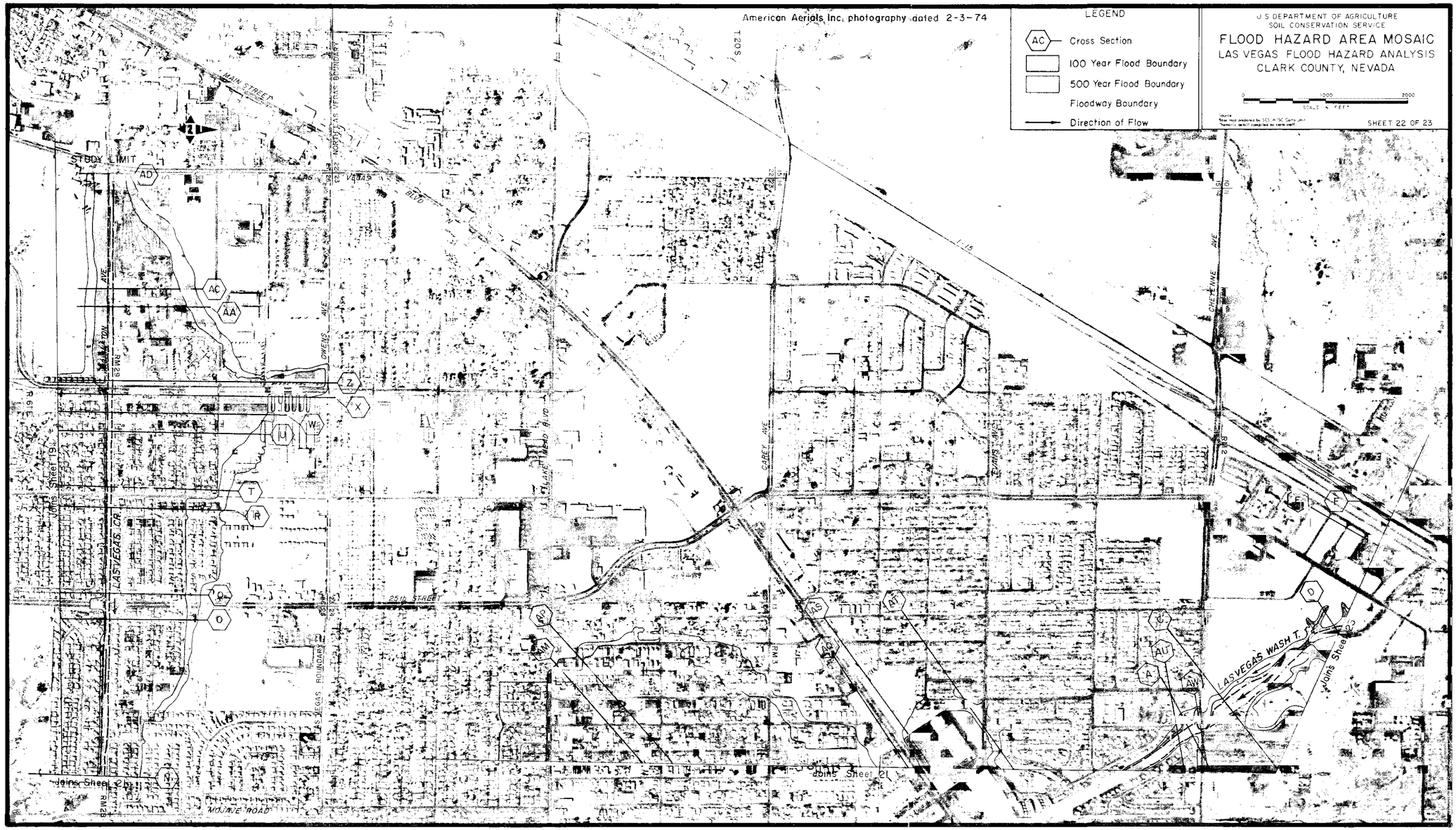

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 17 OF 23
Joins Sheet 18
RM101
RM4
LAS VEGAS BOUNDARY
CRAIG ROAD
RM102
T.19 S.
T.20 S.
R61E
R62E
Joins Sheet 23
AY
LAMB BLVD.
LAS VEGAS WASH
Joins Sheet 23
GOWAN ROAD
RM6
AX
RM108
LAS VEGAS BLVD.
NELLIS BLVD.
NELLIS A F B.
Joins Sheet 16
Joins Sheet 21
Joins Sheet 16
American Aerials Inc. photography dated 2-3-74
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow

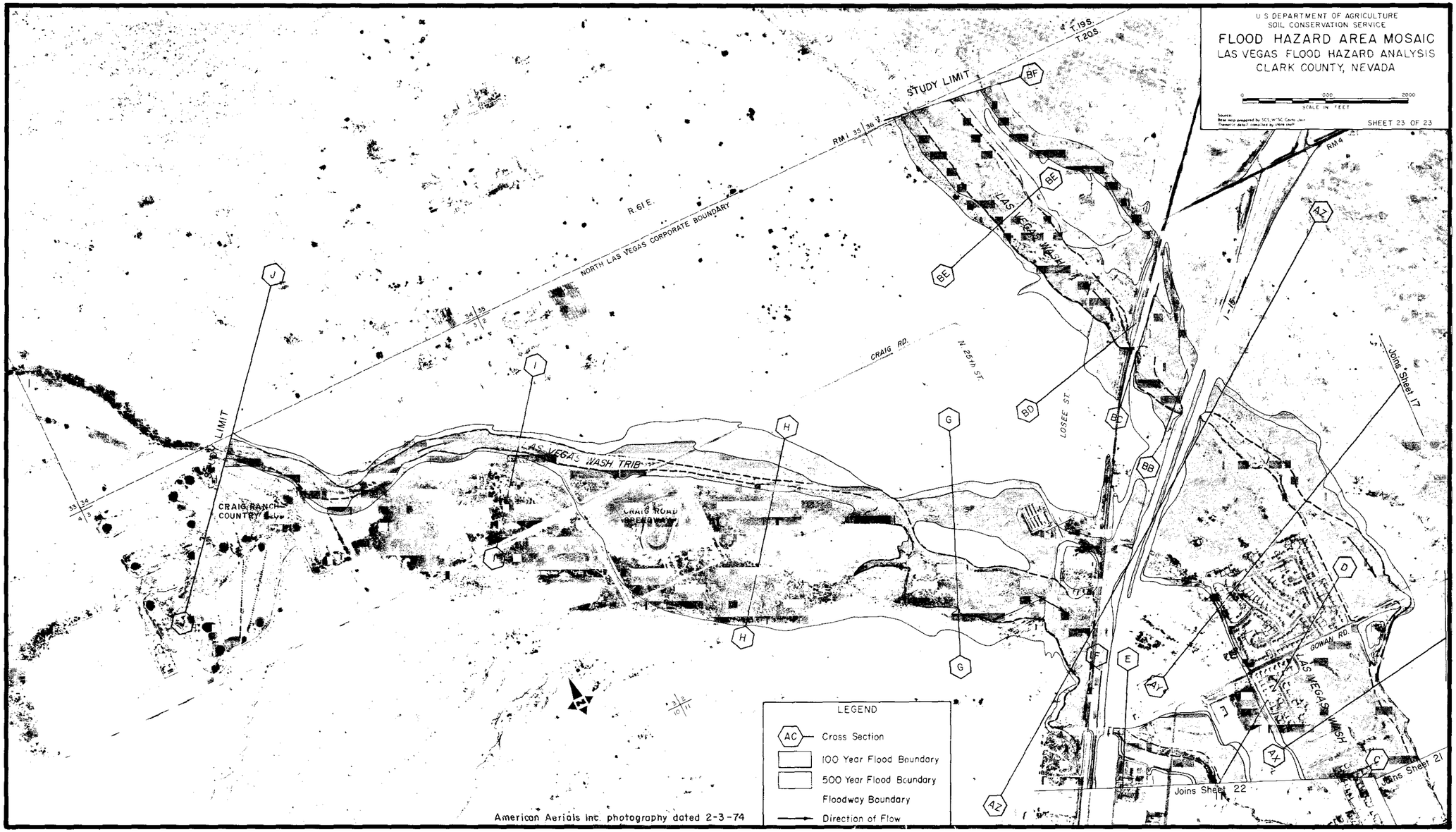

American Aerials Inc photography dated 2-3-74
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
0 1000 2000
SCALE IN FEET
SHEET 18 OF 23
UNION PACIFIC R.R.
+RM105
+RM104
RM103
I-15
STUDY LIMIT
LAS VEGAS RANGE WASH
LAMB BLVD
N. LAS VEGAS BOUNDARY
T.19S.
T.20S.
R.60E.
Joins Sheet 17

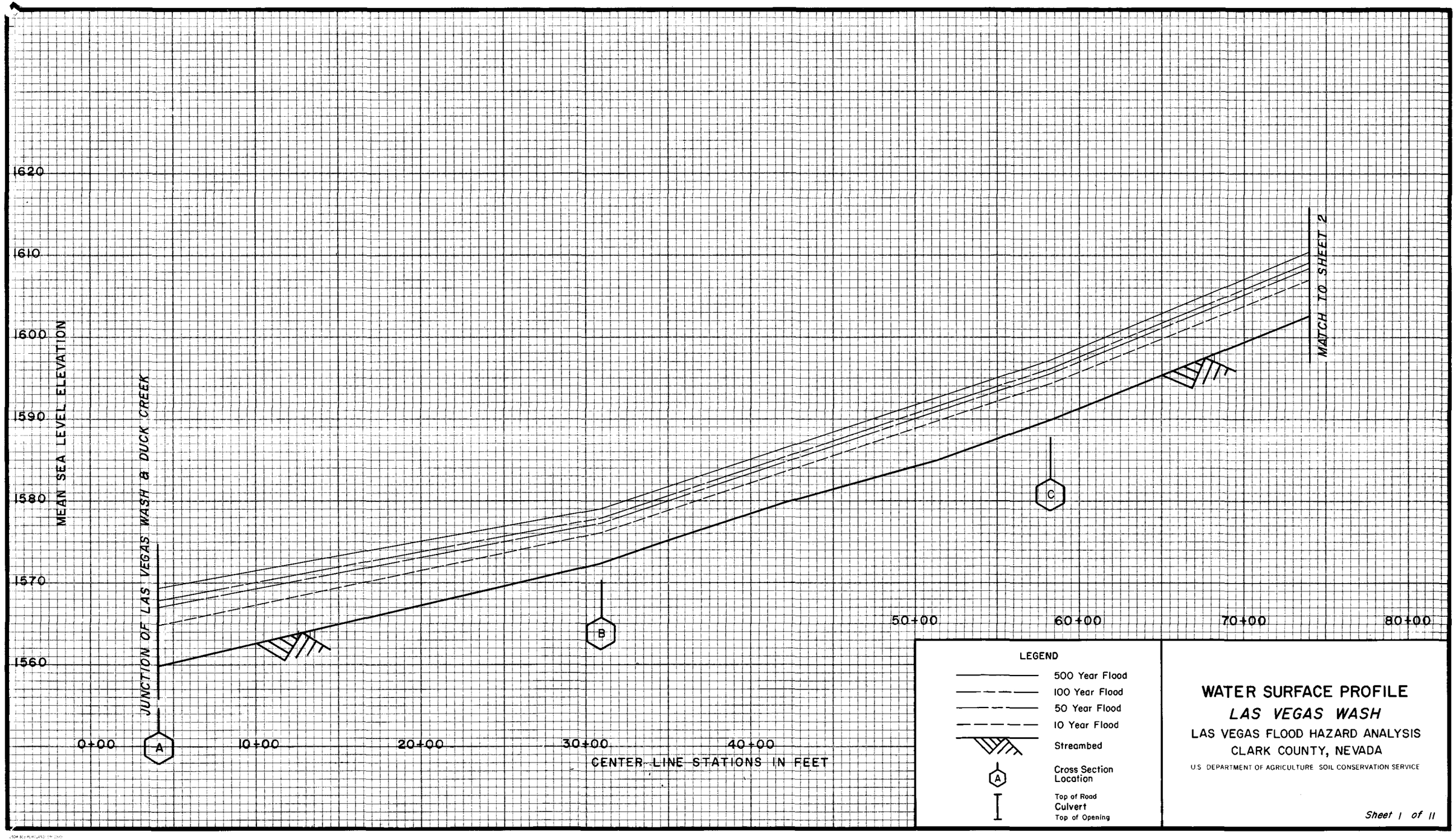

American Aerials Inc. photography dated 2-3-74
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 19 OF 23
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
WASHINGTON AVE.
Joins Sheet 22
Joins Sheet 20
BONANZA RD.
CHARLESTON BLVD.
LAS VEGAS BOUNDARY
EASTERN
MARYLAND PKWY
MAIN
RM 28
RM 29
RM 30
T.20S.
R.62E.


MOJAVE ROAD
RM 59
RM 58
RM 56
RM 57
RM 55
RM 5
RM 121
LAS VEGAS BOUNDARY
BOULDER HWY
SAHARA AVE
DESERT INN ROAD
CHARLESTON BLVD
LAMB BLVD
FLAMINGO WASH
T.20S.
T.21S.
R.61E
R.62E
Joins Sheet 7
Joins Sheet 13
American Aerials Inc. photography dated 2-3-74
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SHEET 20 OF 23


Joins Sheet 19 & 22
Joins Sheet
LAS VEGAS CREEK
LAS VEGAS WASH
LAKE MEAD BLVD.
LAST CHANCE
BOULDER HWY.
OWENS AVE.
VEGAS ROAD
WITHIN LAS VEGAS BOUNDARY
R.61E.
R.62E.
RANCHITA ROAD
WASHINGTON AVE.
LAS VEGAS BLVD.
GARY AVE.
WALNUT ROAD
CHEYENNE AVE.
Joins Sheet 16, 17 & 23
Joins Sheet 14
Joins Sheet 15
LAMB BLVD.
T.20S.
RM 22
RM 24
RM 8
RM 12
RM 11
RM 96
AC
AH
AL
AM
AP
AQ
AT
AU
AW
LEGEND
Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
American Aerials Inc. photography dated 2-3-74
SHEET 21 OF 23


American Aerials Inc. photography dated 2-3-74
LEGEND
AC Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SHEET 22 OF 23
STUDY LIMIT
MAIN STREET
LAS VEGAS BLVD
NORTH LAS VEGAS BOUNDARY
MANHATTON AVE
OWENS AVE
CAREY AVE
CHEYENNE AVE
LAS VEGAS WASH
LAS VEGAS CR
25TH STREET
LAS VEGAS BOUNDARY
MOJAVE ROAD
I-15
T20S
R61E
R62E
R63E
Joins Sheet 19
Joins Sheet 20
Joins Sheet 21
Joins Sheet 23

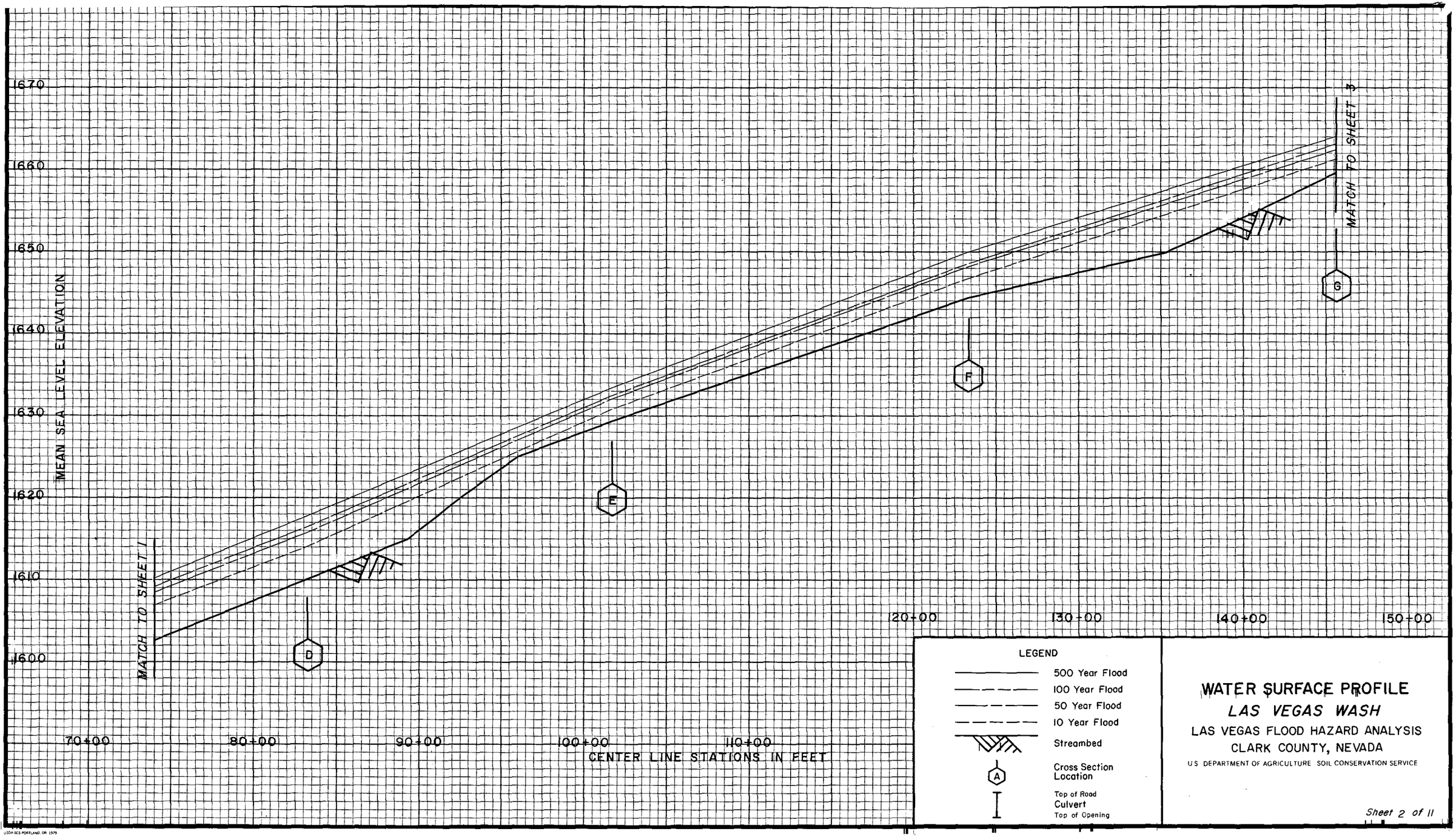

U S DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MOSAIC
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
SCALE IN FEET
SHEET 23 OF 23
T.19S.
T.20S.
R.61E.
STUDY LIMIT
NORTH LAS VEGAS CORPORATE BOUNDARY
RM1
RM4
LAS VEGAS WASH
LAS VEGAS WASH TRIB.
CRAIG RD.
N. 25TH ST.
LOSEE ST.
CRAIG RANCH COUNTRY CLUB
CRAIG ROAD SPEEDWAY
GOWAN RD.
Joins Sheet 17
Joins Sheet 21
Joins Sheet 22
LEGEND
Cross Section
100 Year Flood Boundary
500 Year Flood Boundary
Floodway Boundary
Direction of Flow
American Aerials Inc. photography dated 2-3-74



WATER SURFACE PROFILE
LAS VEGAS WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

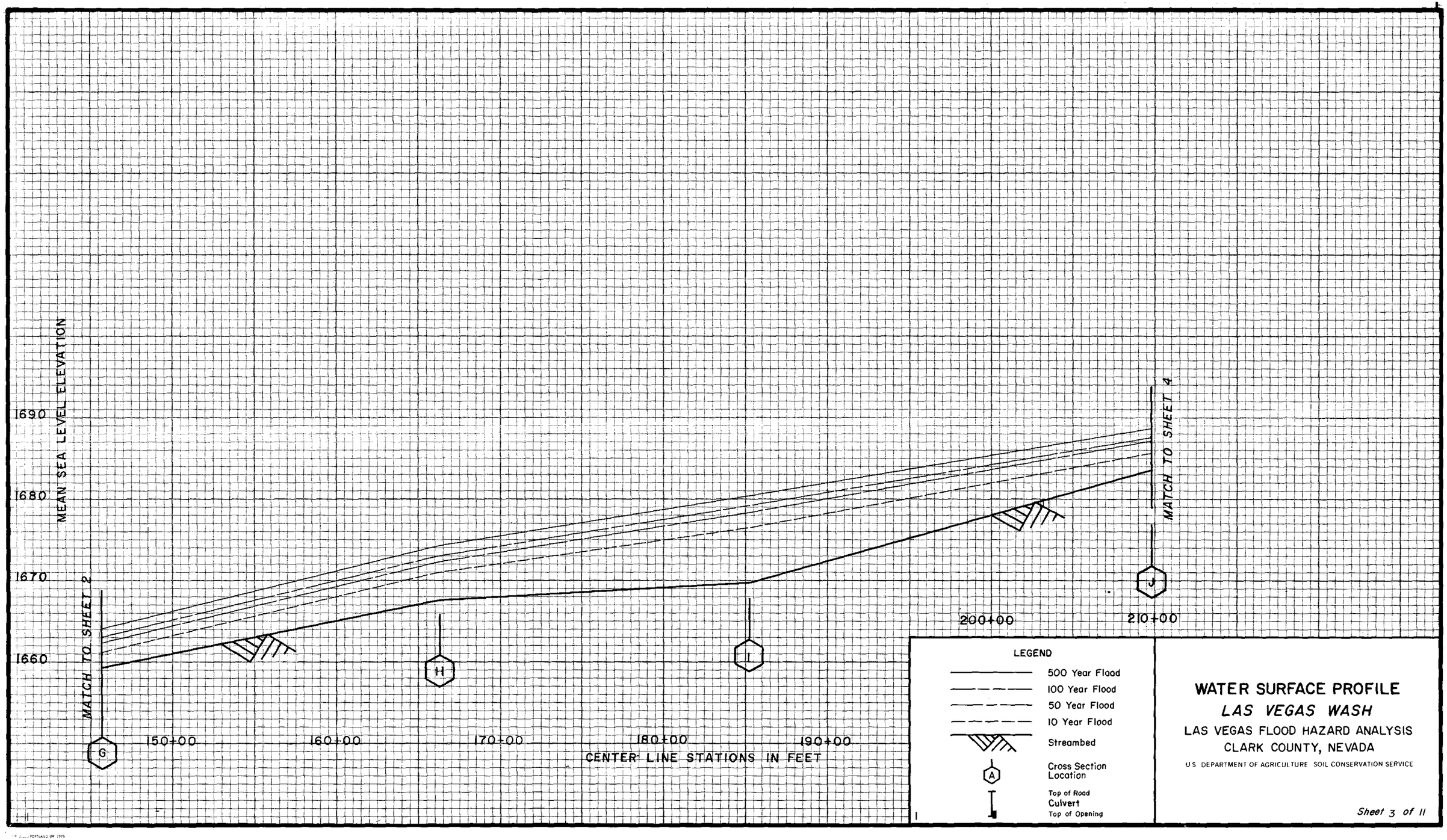
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 1 of 11



WATER SURFACE PROFILE
LAS VEGAS WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

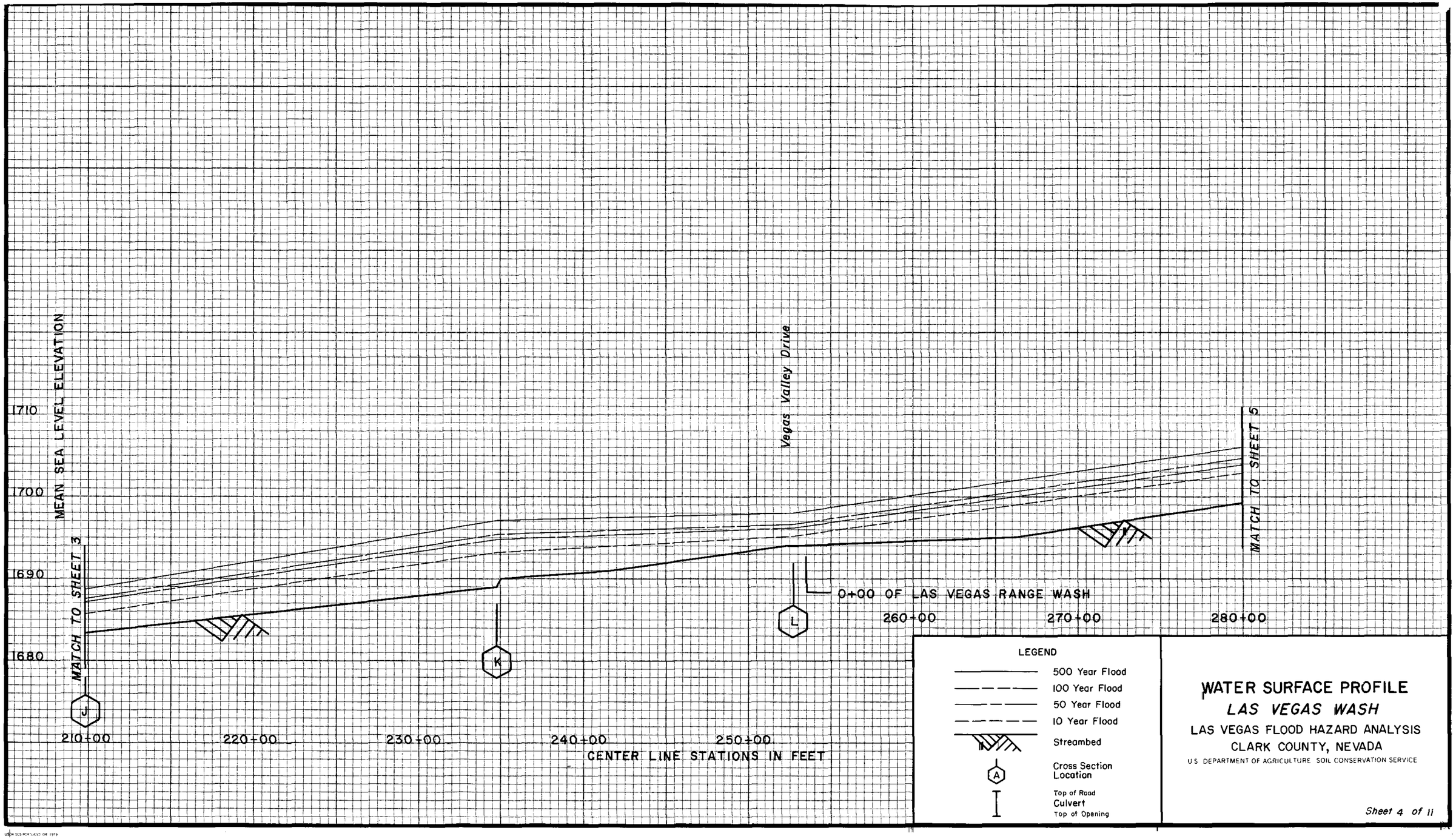
USDA SCS PORTLAND, OR 1979



WATER SURFACE PROFILE
LAS VEGAS WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

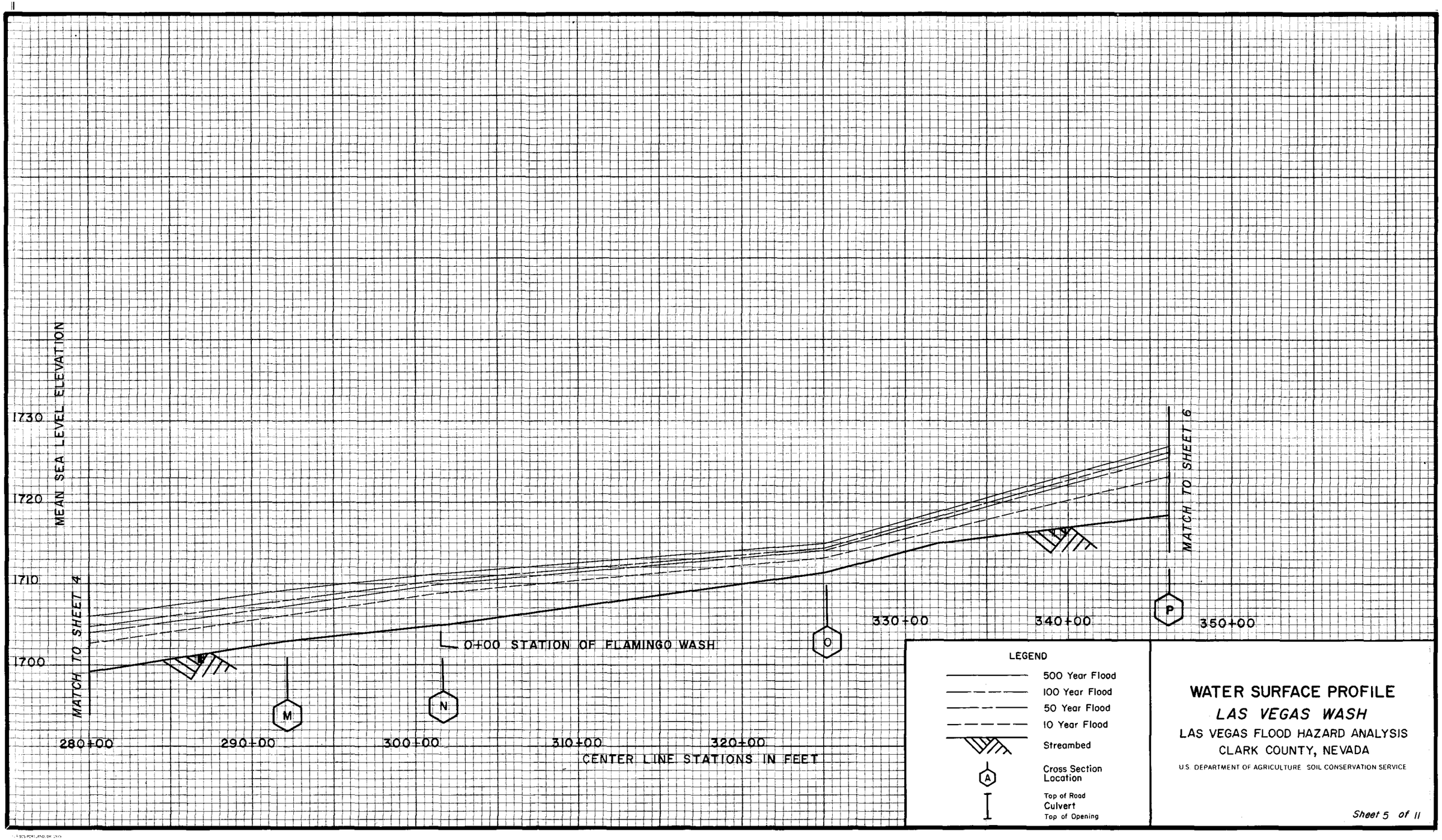
Sheet 3 of 11



WATER SURFACE PROFILE
LAS VEGAS WASH

LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

USDA SCS PORTLAND OR 1979



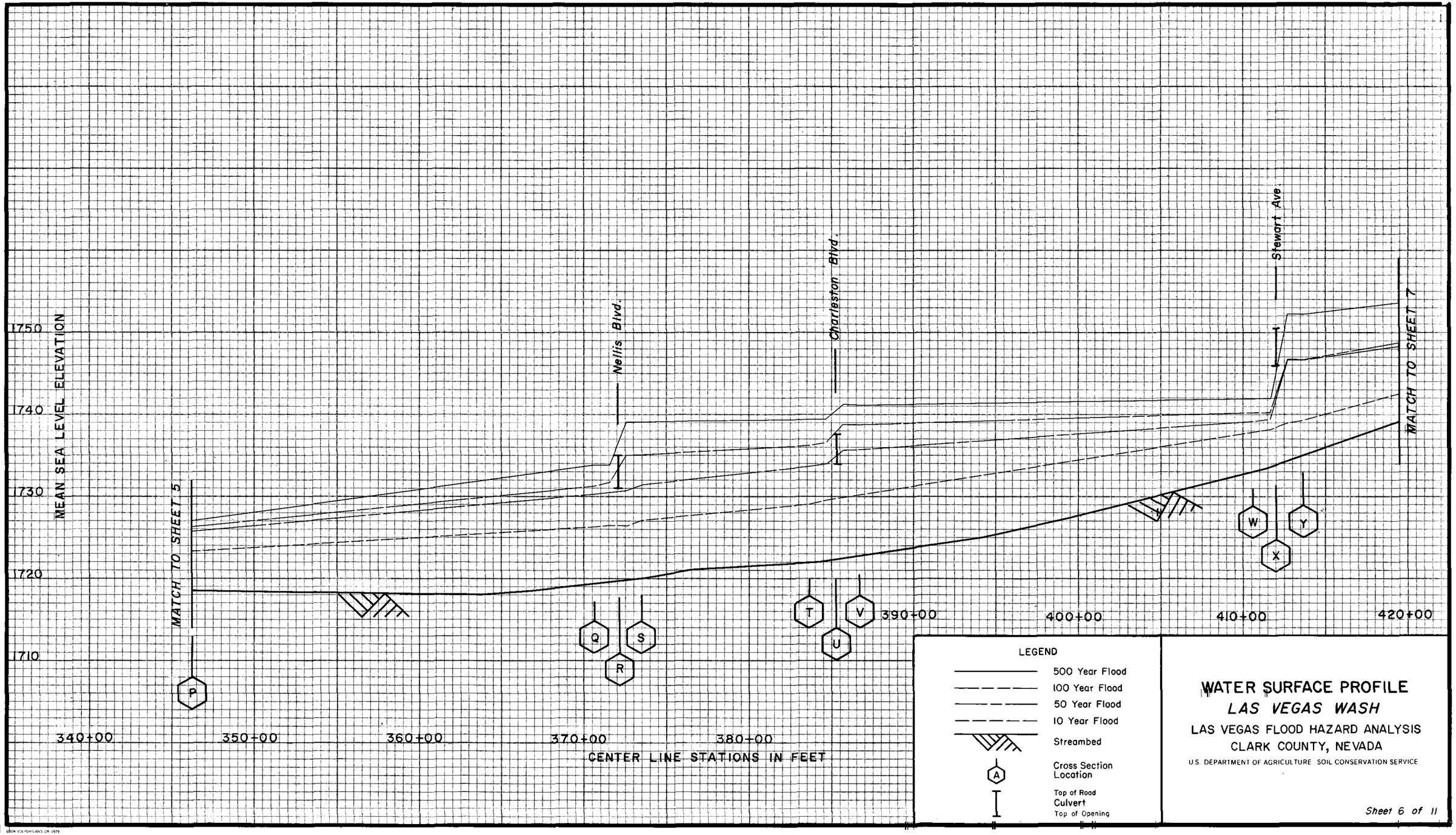
WATER SURFACE PROFILE

LAS VEGAS WASH

LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 5 of 11

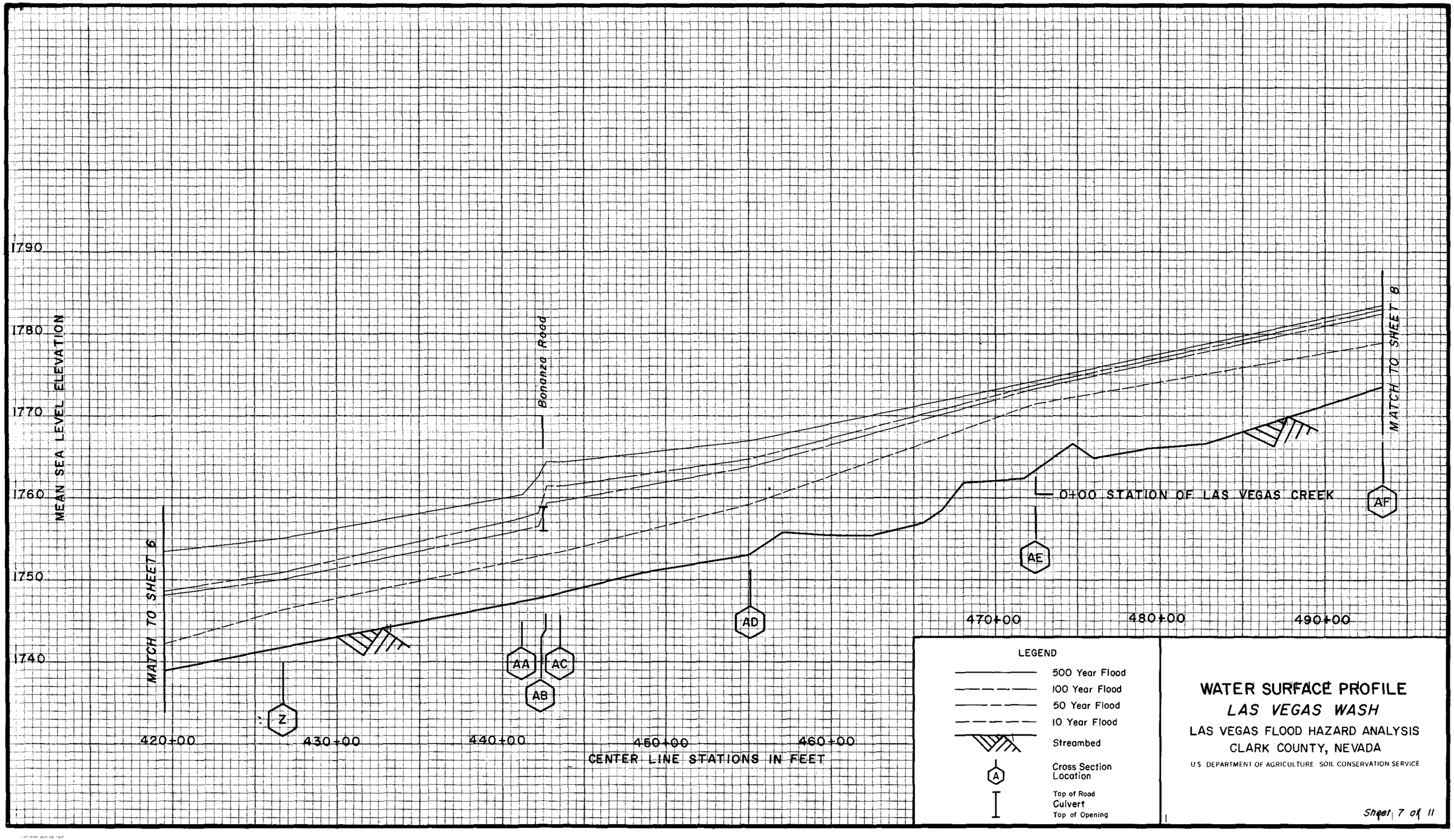


WATER SURFACE PROFILE
LAS VEGAS WASH

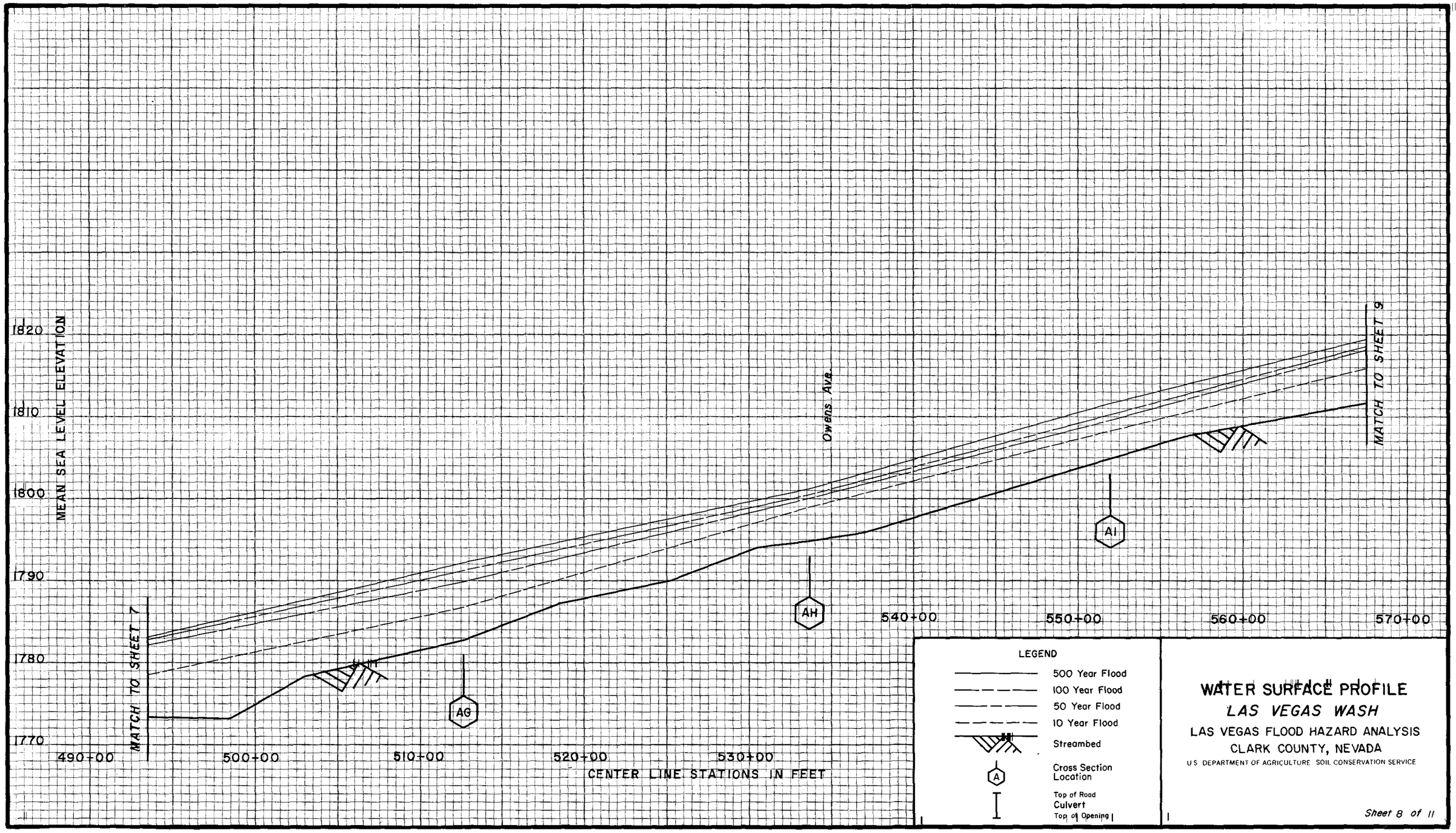
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

USDA-SCS-PORTLAND, OR 1979



WATER SURFACE PROFILE
LAS VEGAS WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



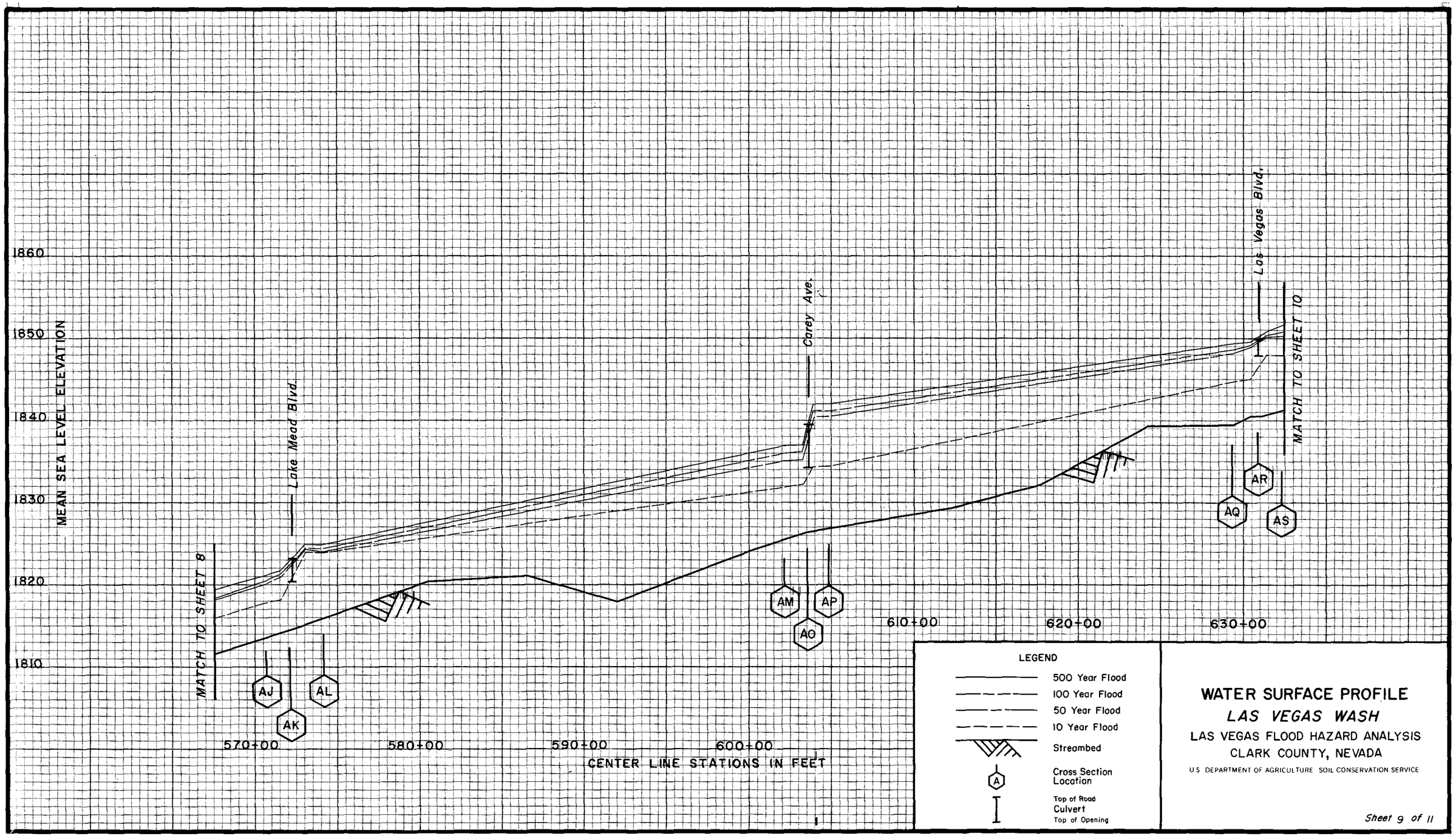
WATER SURFACE PROFILE

LAS VEGAS WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE

LAS VEGAS WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

1900
1890
1880
1870
1860
1850
1840

MEAN SEA LEVEL ELEVATION

Cheyenne Ave.

MATCH TO SHEET 9

MATCH TO SHEET 11

AT AU AV AW AX AY

630+00 640+00 650+00 660+00 670+00 680+00 690+00 700+00 710+00

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road
- Culvert
- Top of Opening

WATER SURFACE PROFILE

LAS VEGAS WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

USDA SCS PORTLAND, OR 1979

1940
1930
1920
1910
1900
1890
1880
1870

MEAN SEA LEVEL ELEVATION

MATCH TO SHEET 10

Interstate 15

AZ BB BC BD BE BF

LIMIT OF DETAIL STUDY

710+00 720+00 730+00 740+00 750+00 760+00 770+00 780+00

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road
  Culvert
  Top of Opening

WATER SURFACE PROFILE

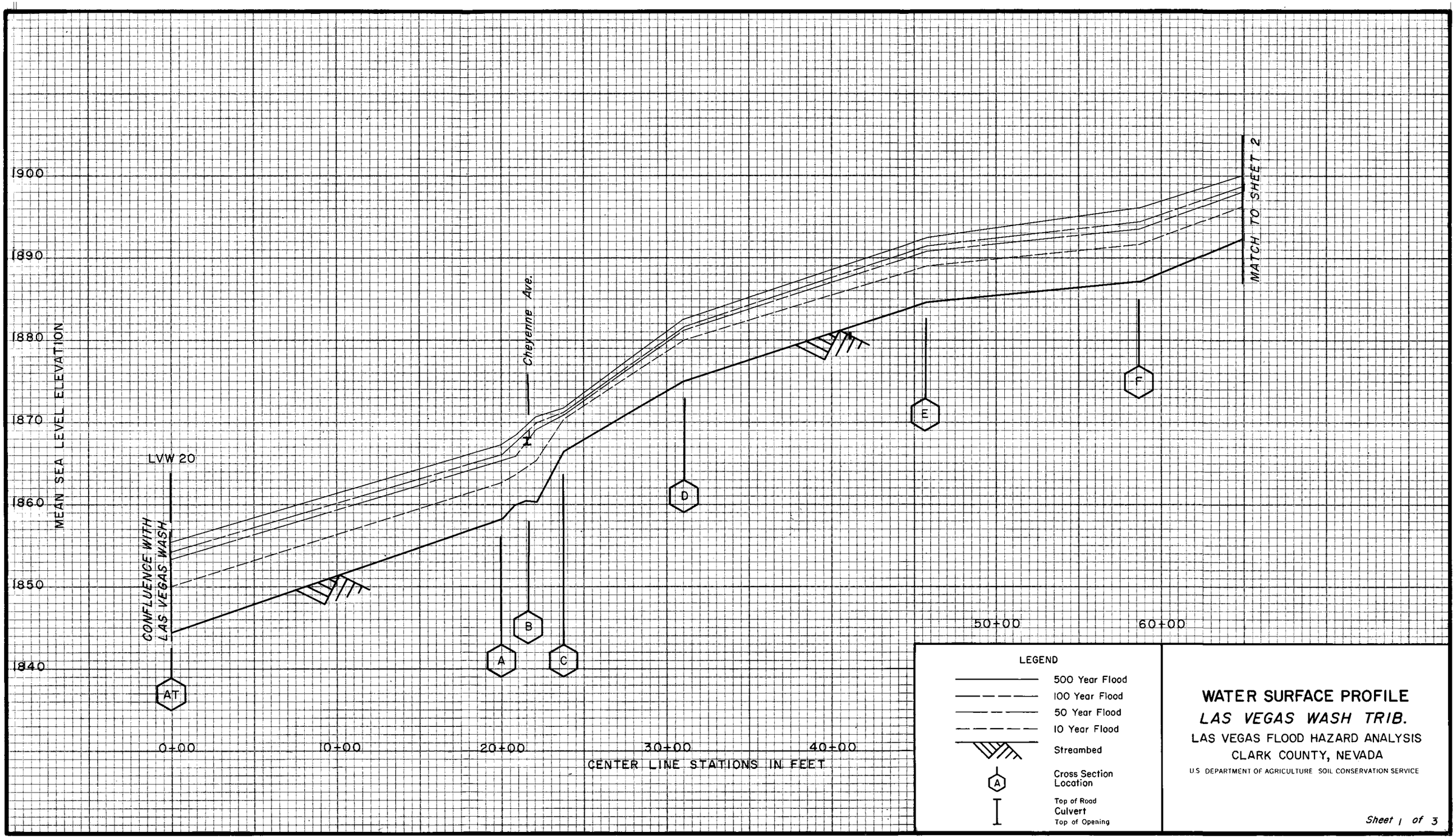
LAS VEGAS WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

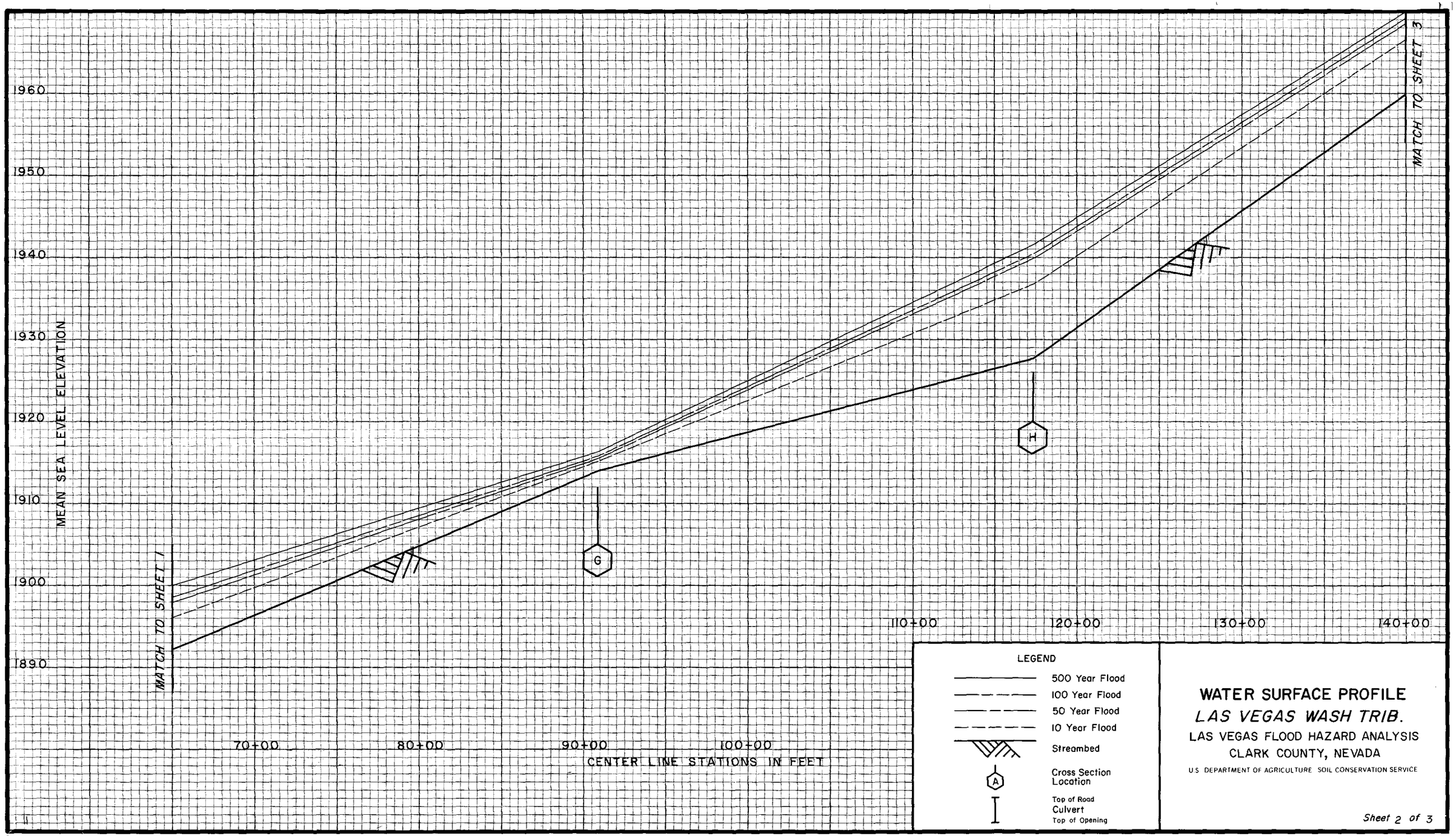
Sheet 11 of 11



WATER SURFACE PROFILE
LAS VEGAS WASH TRIB.

LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 1 of 3



WATER SURFACE PROFILE
LAS VEGAS WASH TRIB.

LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

END PROFILE

J

2020

2010

2000

1990

1980

1970

1960

1950

MEAN SEA LEVEL ELEVATION

MATCH TO SHEET 2

140+00 150+00 160+00 170+00 180+00 190+00 200+00

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location
- Top of Road
- Culvert
- Top of Opening

WATER SURFACE PROFILE

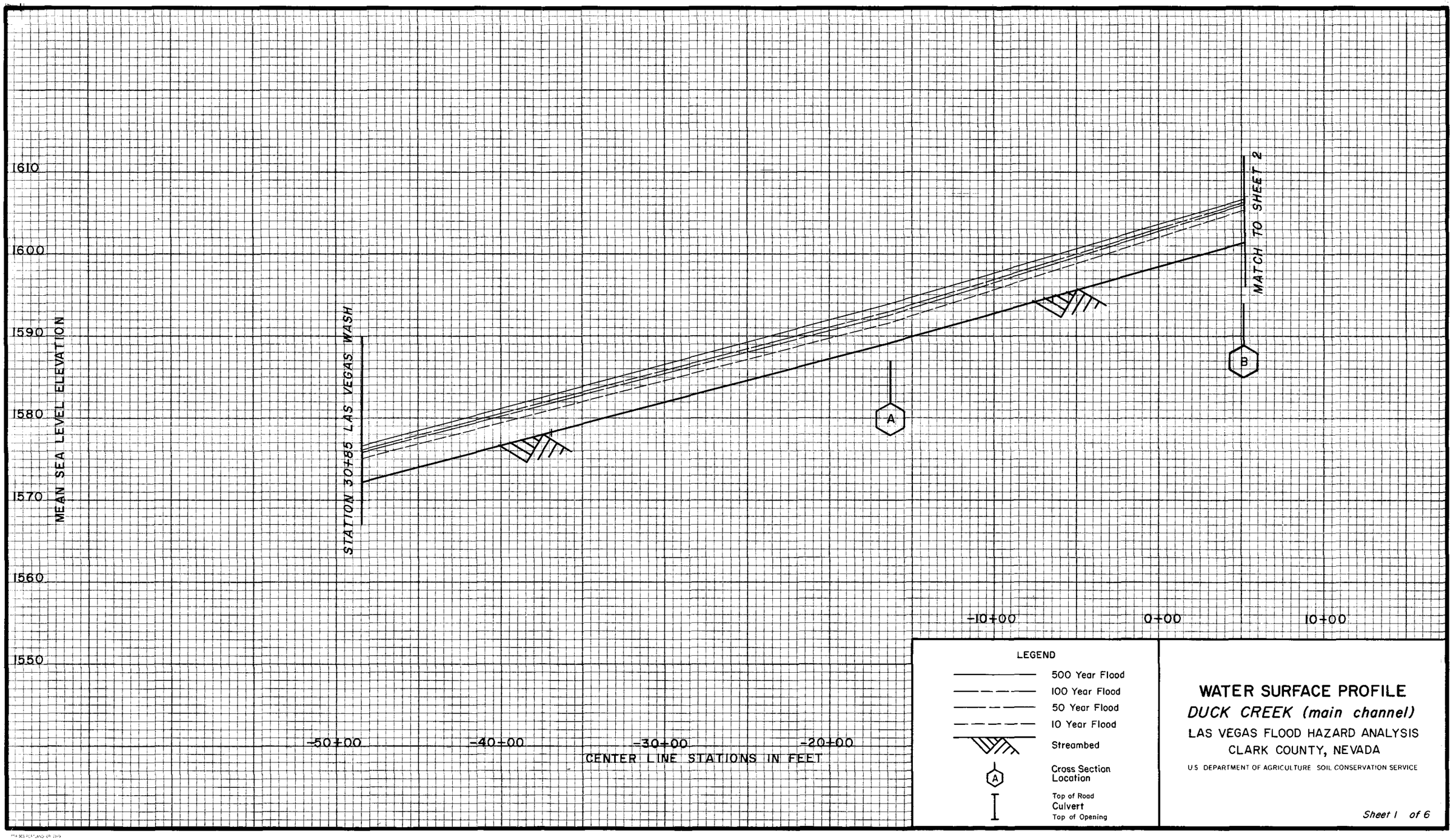
LAS VEGAS WASH TRIB.

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 3 of 3



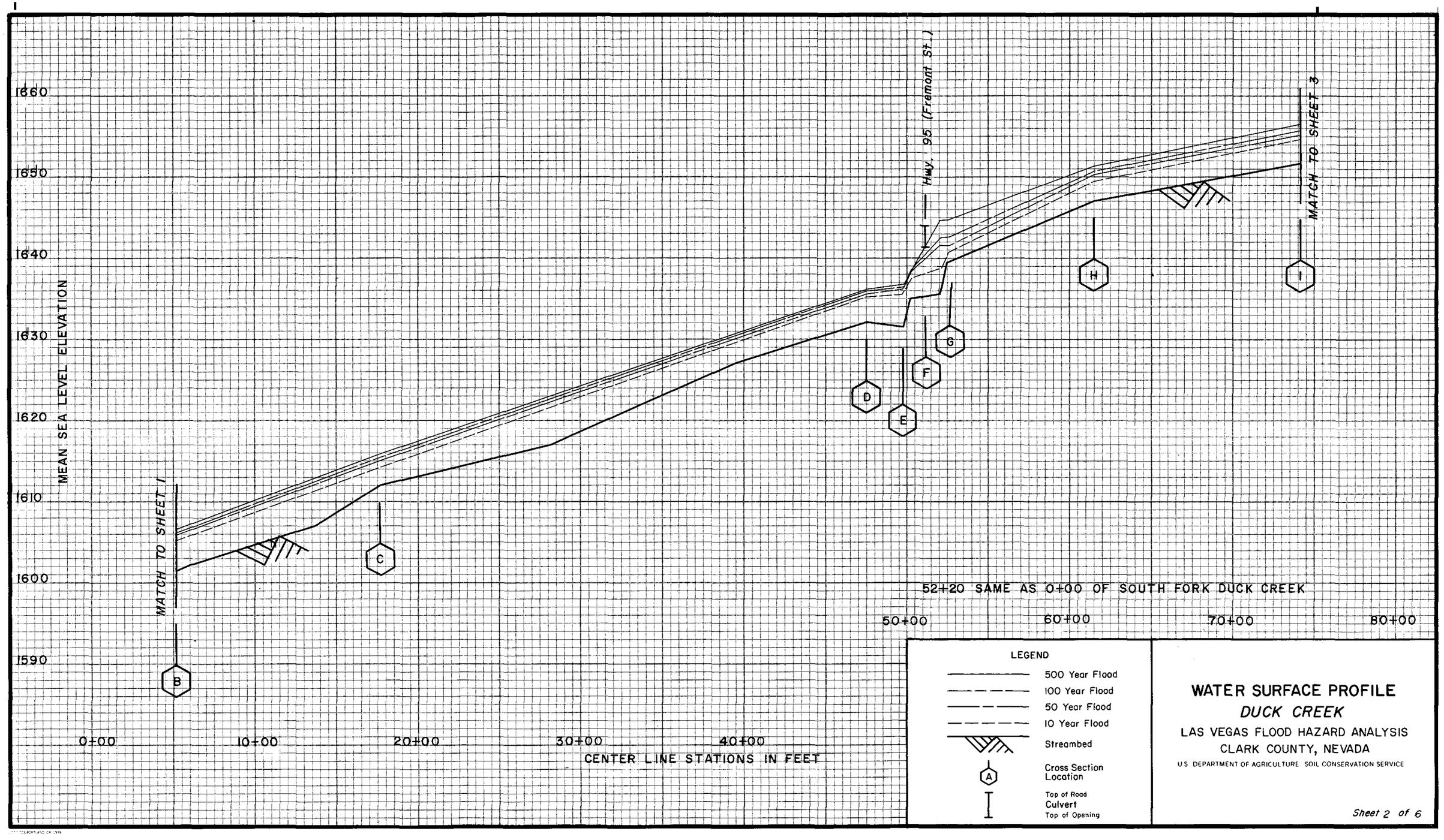
WATER SURFACE PROFILE

DUCK CREEK (main channel)

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



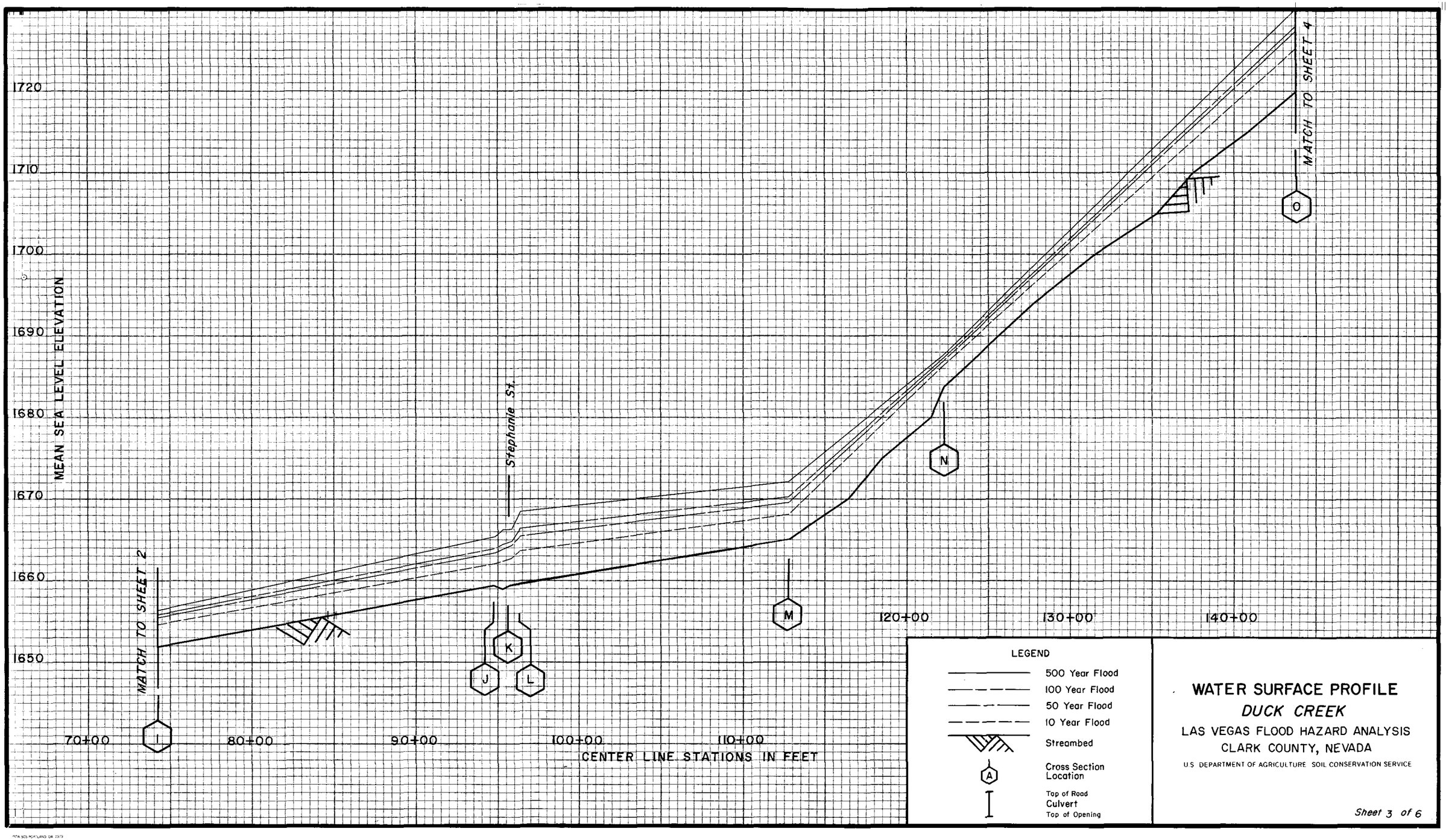
WATER SURFACE PROFILE

DUCK CREEK

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- A — Cross Section Location
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE

DUCK CREEK

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

SCS PORTLAND OR 1979

MEAN SEA LEVEL ELEVATION

1800
1790
1780
1770
1760
1750
1740
1730
1720

MATCH TO SHEET 3

150+00
160+00
170+00
180+00
190+00
200+00
210+00
220+00

1870
1860
1850
1840
1830
1820
1810
1800
1790

MATCH LINE

MATCH LINE

MATCH TO SHEET 5

Maple Ave.

CHANNEL BOTTOM

O
P
Q
R
S
T

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- A — Cross Section Location
- Top of Road / Culvert / Top of Opening

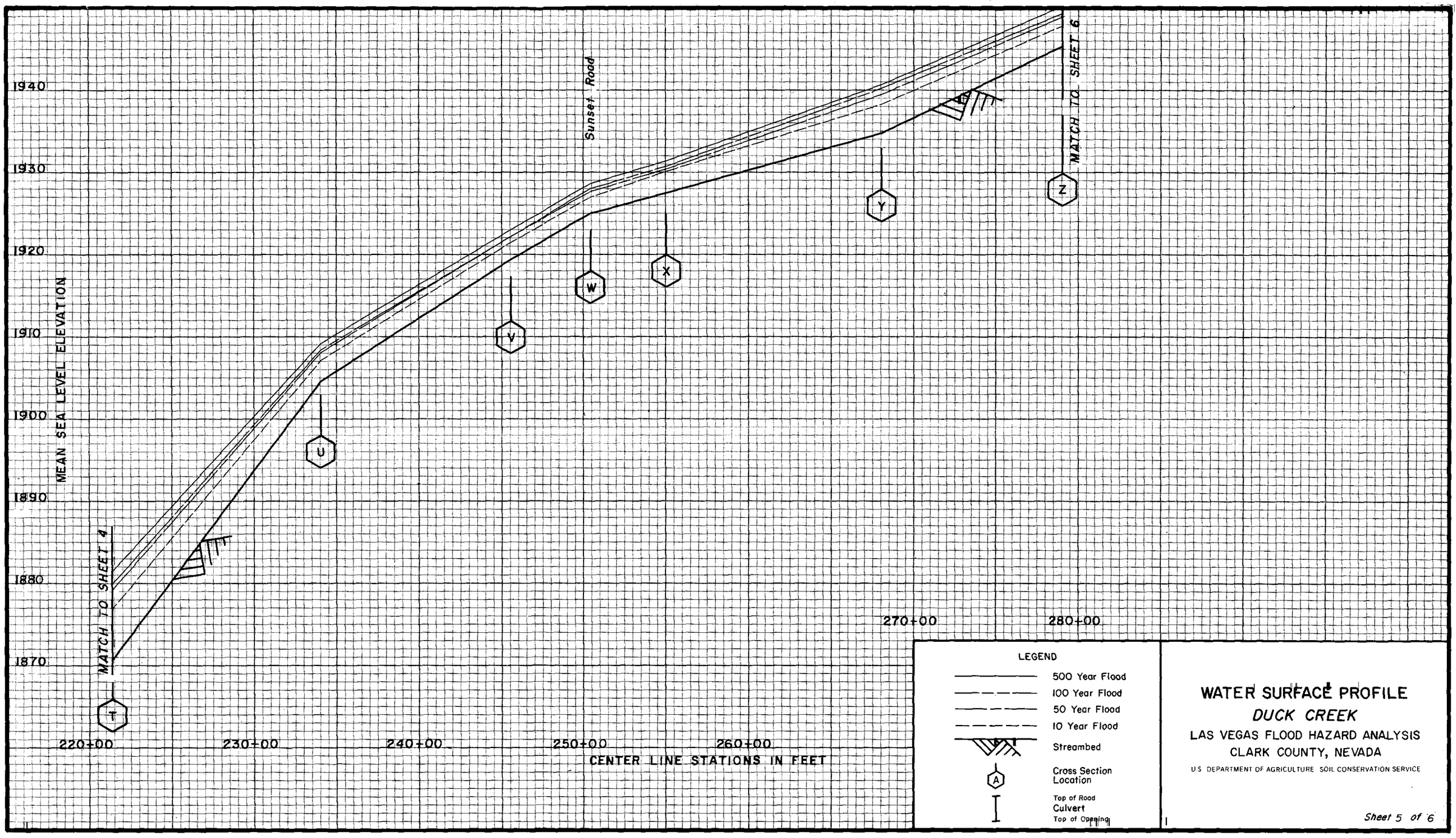
WATER SURFACE PROFILE

DUCK CREEK

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location
- Top of Road
- Culvert
- Top of Opening

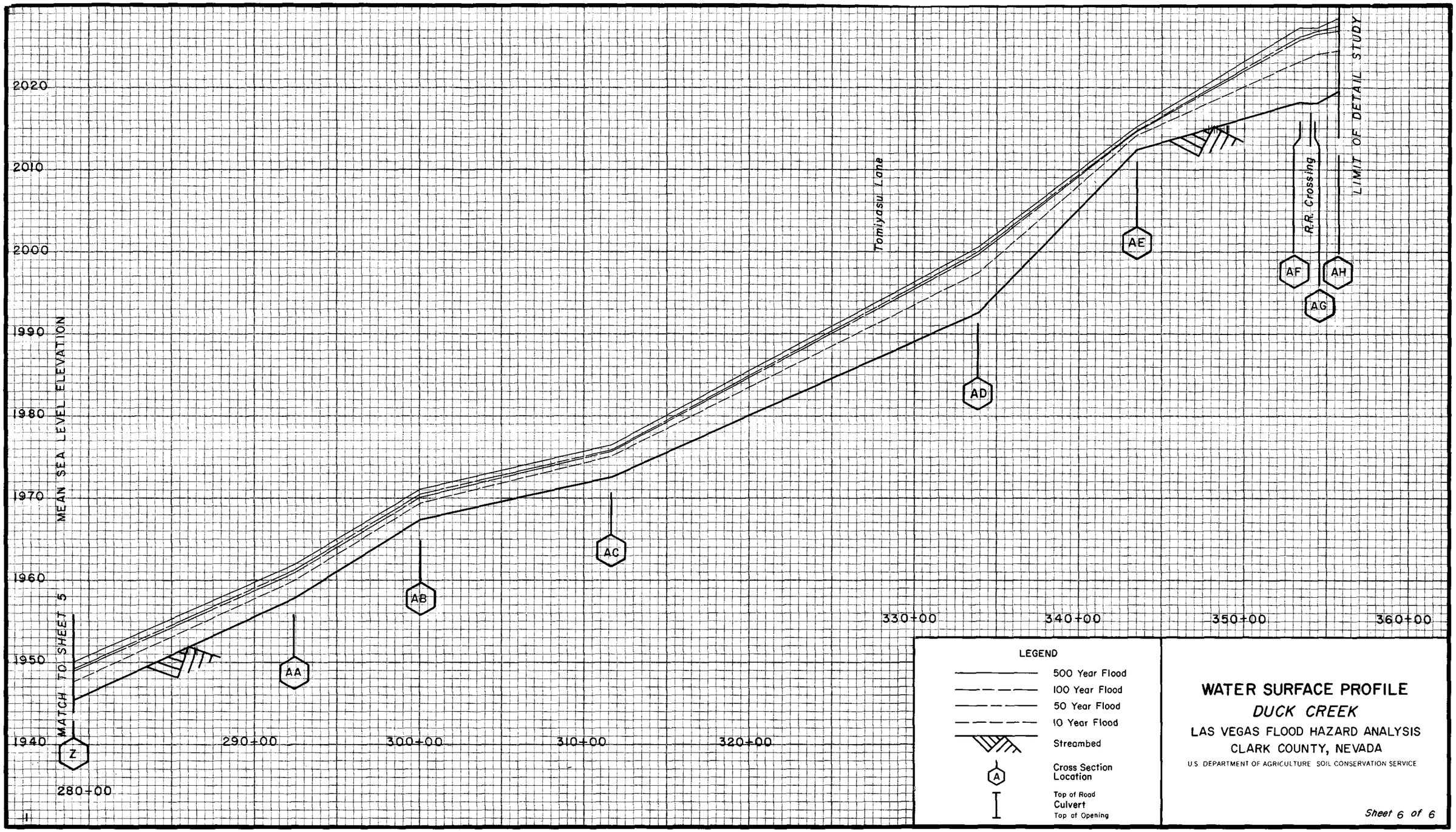
WATER SURFACE PROFILE

DUCK CREEK

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



WATER SURFACE PROFILE

DUCK CREEK

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 6 of 6

1690
1680
1670
1660
1650
1640
1630
1620

MEAN SEA LEVEL ELEVATION

STATION 52+20 ON DUCK CREEK

Stephanie St.

LIMIT OF DETAIL STUDY

A
B
C
D
G

0+00 10+00 20+00 30+00 40+00 50+00 60+00 70+00

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location
- Top of Road Culvert Top of Opening

WATER SURFACE PROFILE

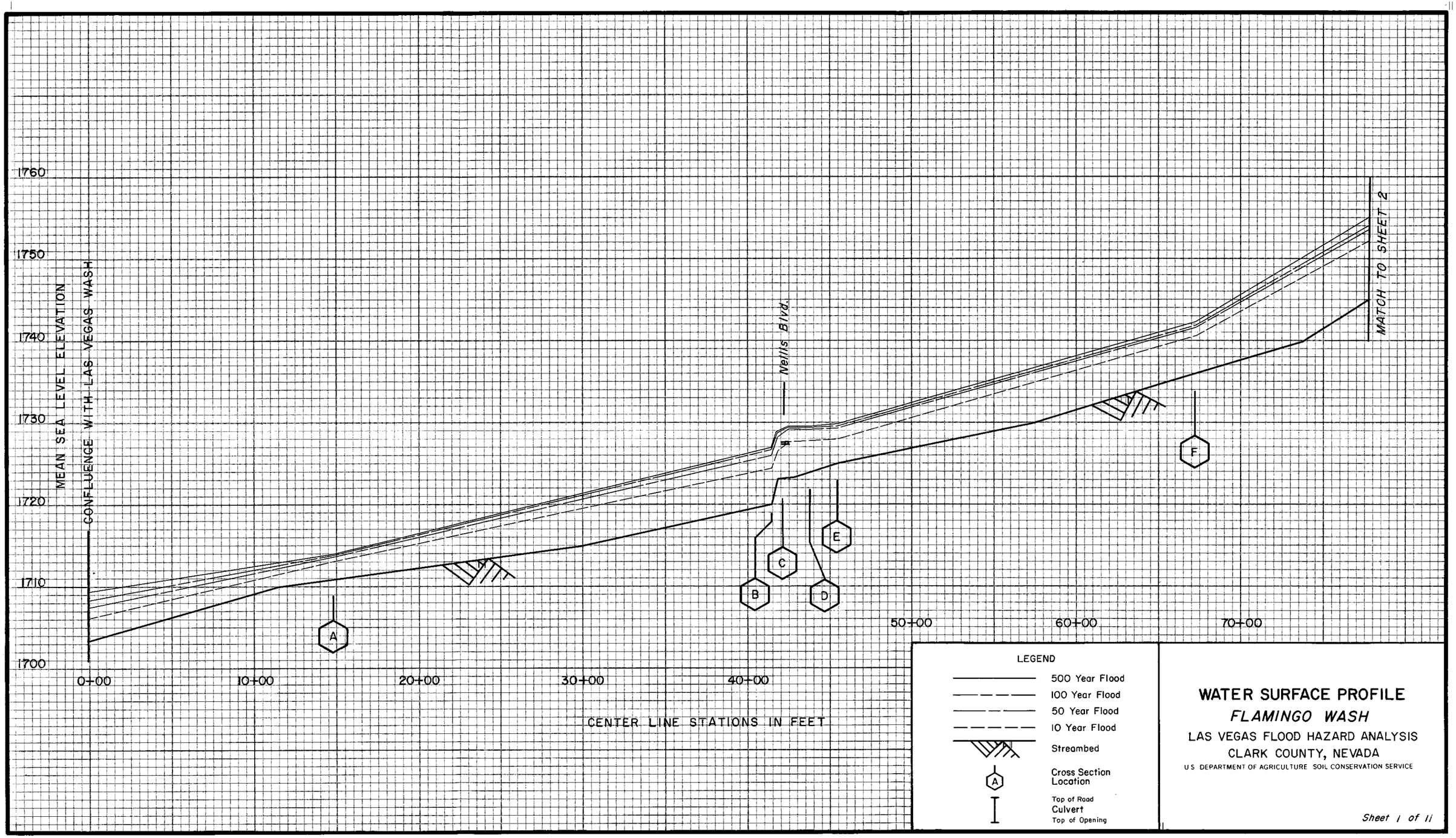
DUCK CREEK (South Fork)

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

US DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 1 of 1



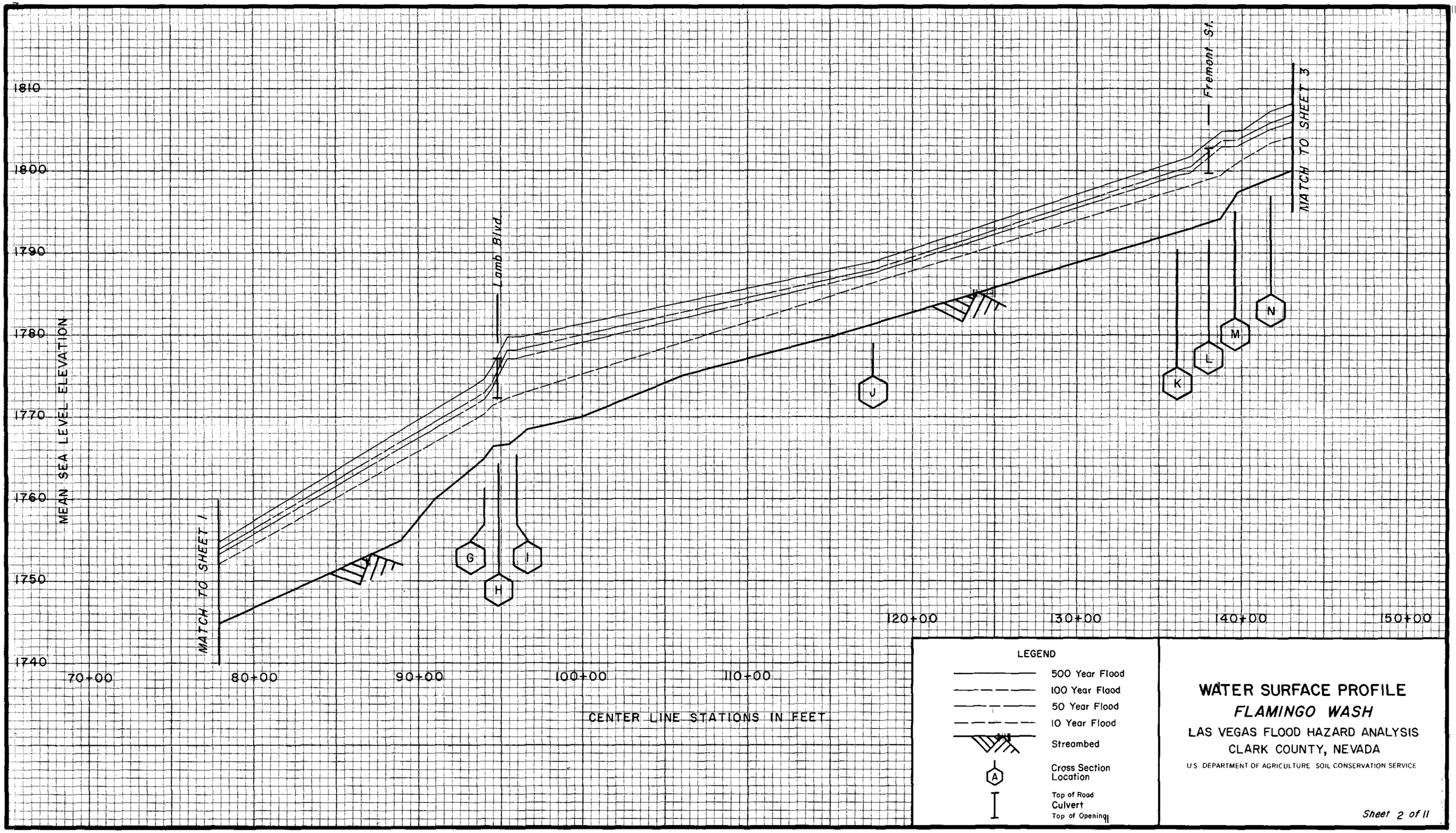
LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE
FLAMINGO WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 1 of 11

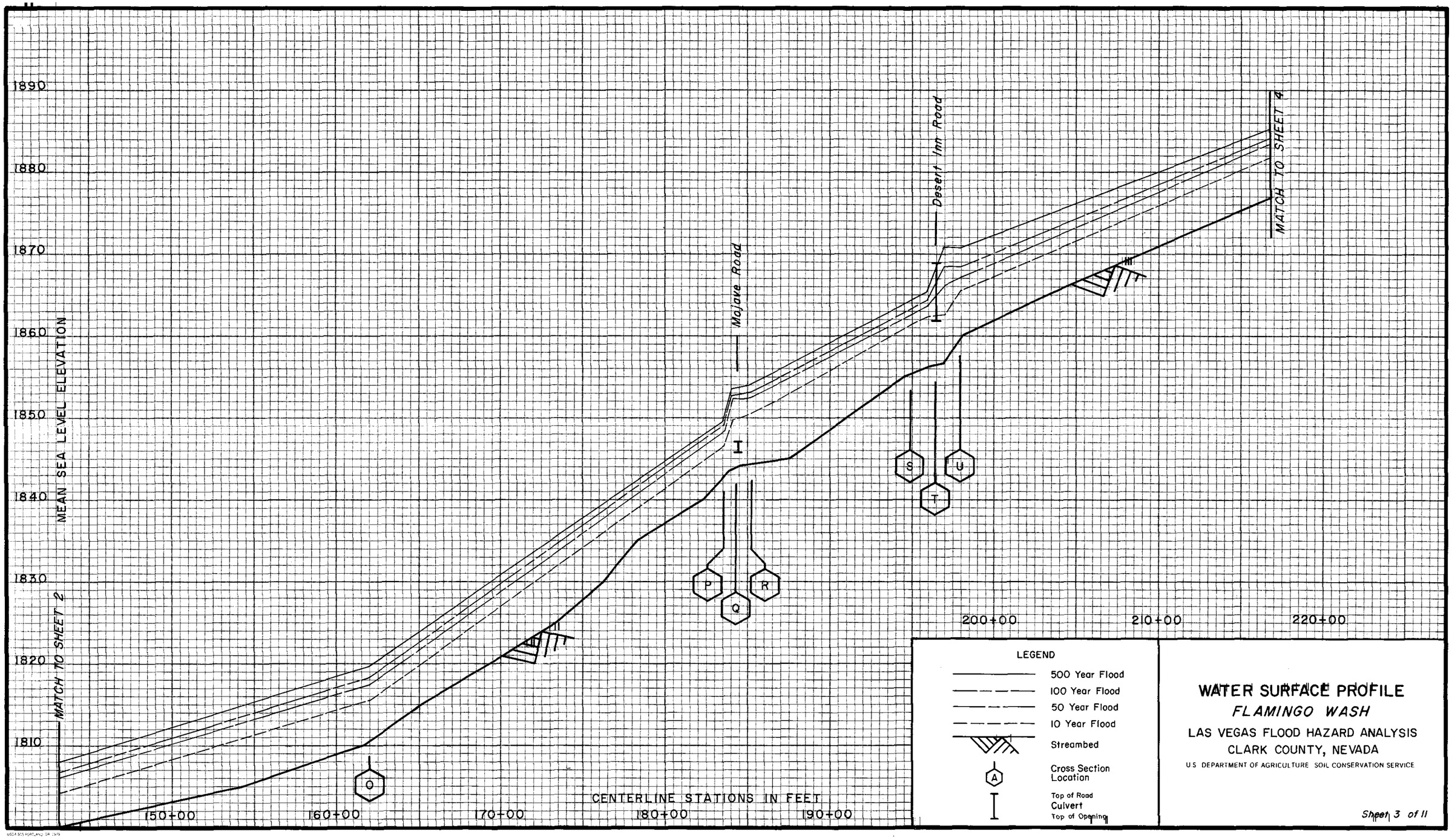
PORTLAND OR 7879



WATER SURFACE PROFILE
FLAMINGO WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

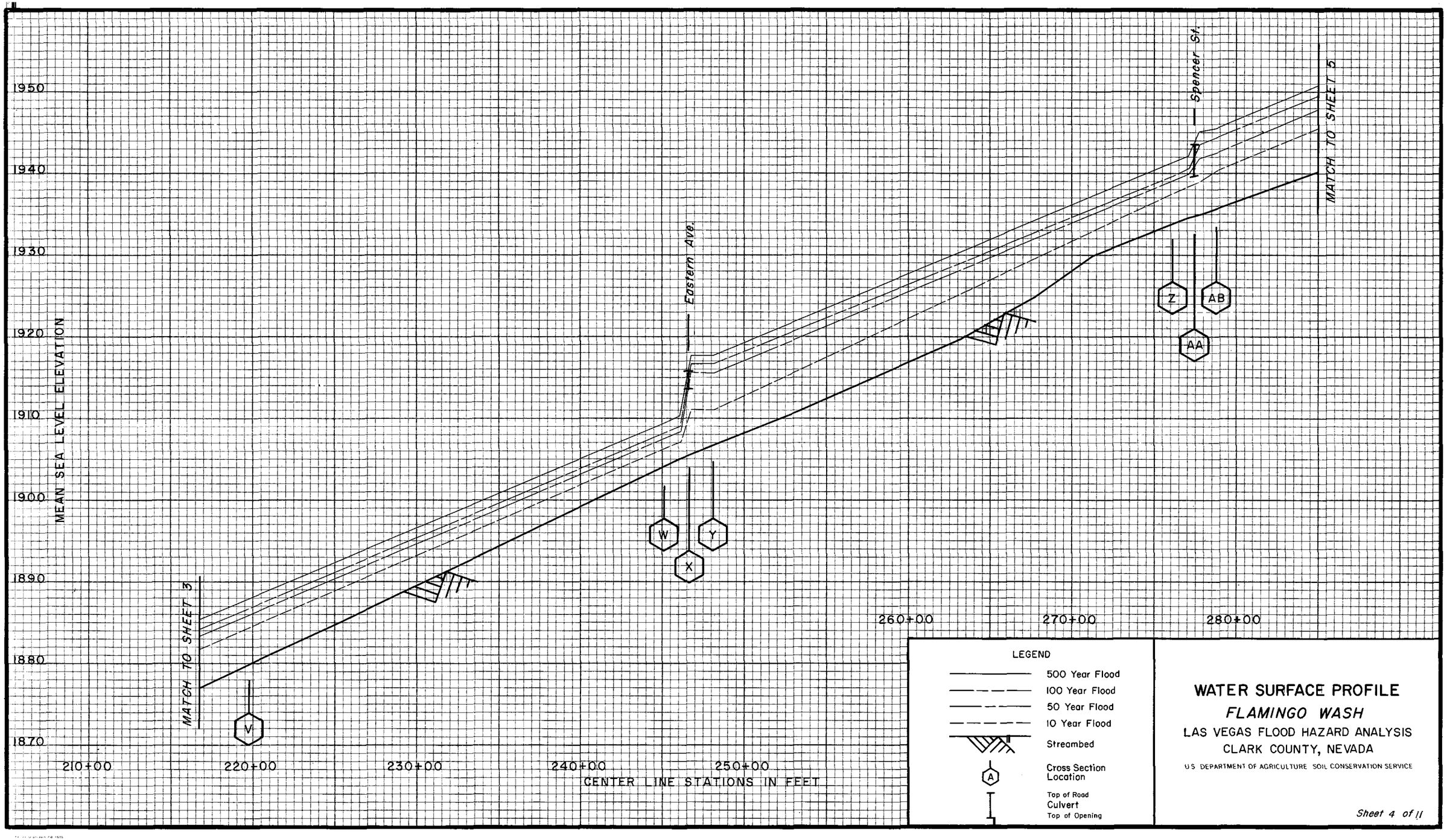
U.S DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 2 of 11



WATER SURFACE PROFILE
FLAMINGO WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

USDA SCS PORTLAND OR 1978



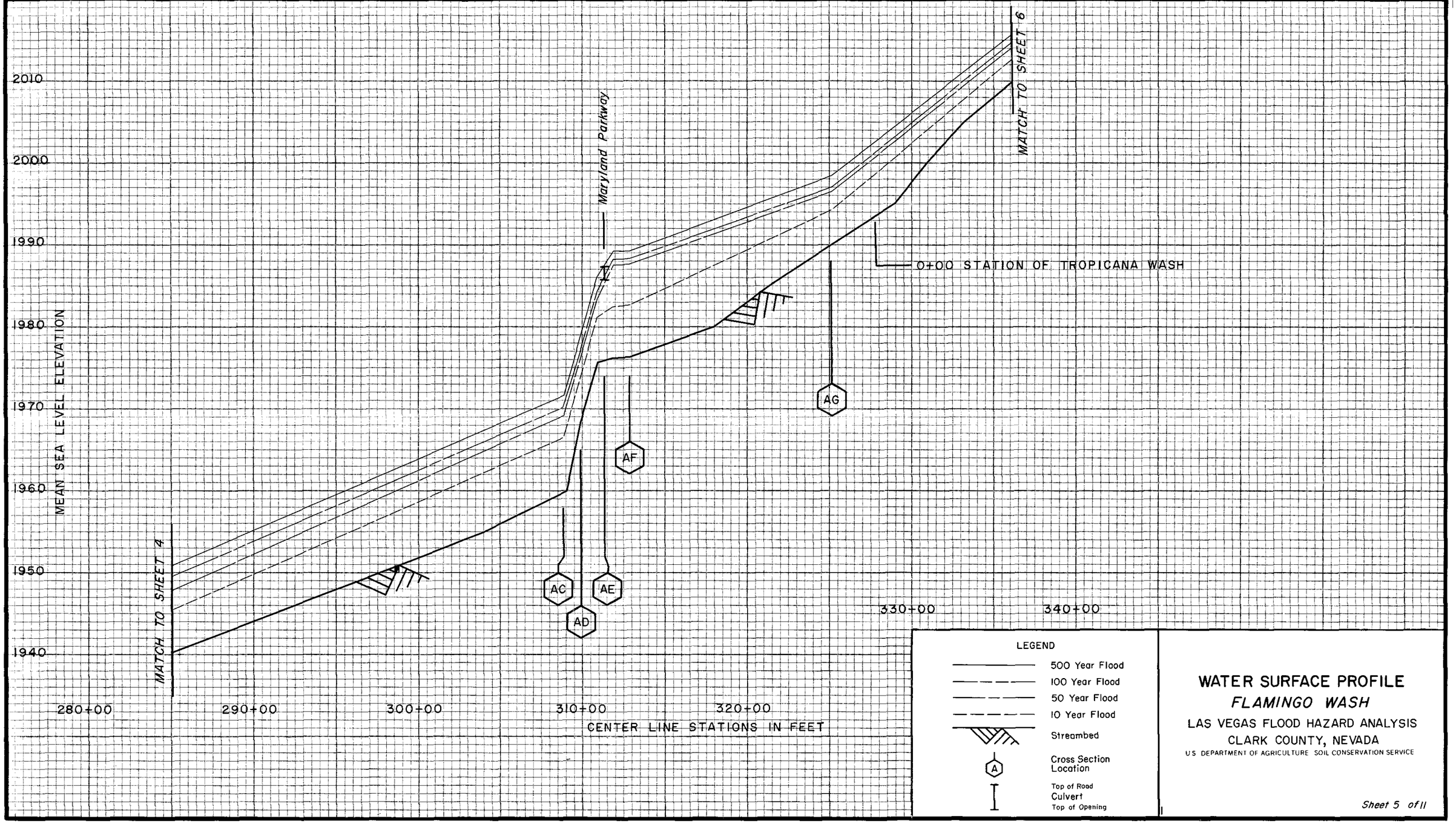
WATER SURFACE PROFILE

FLAMINGO WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

US DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road
- Culvert
- Top of Opening

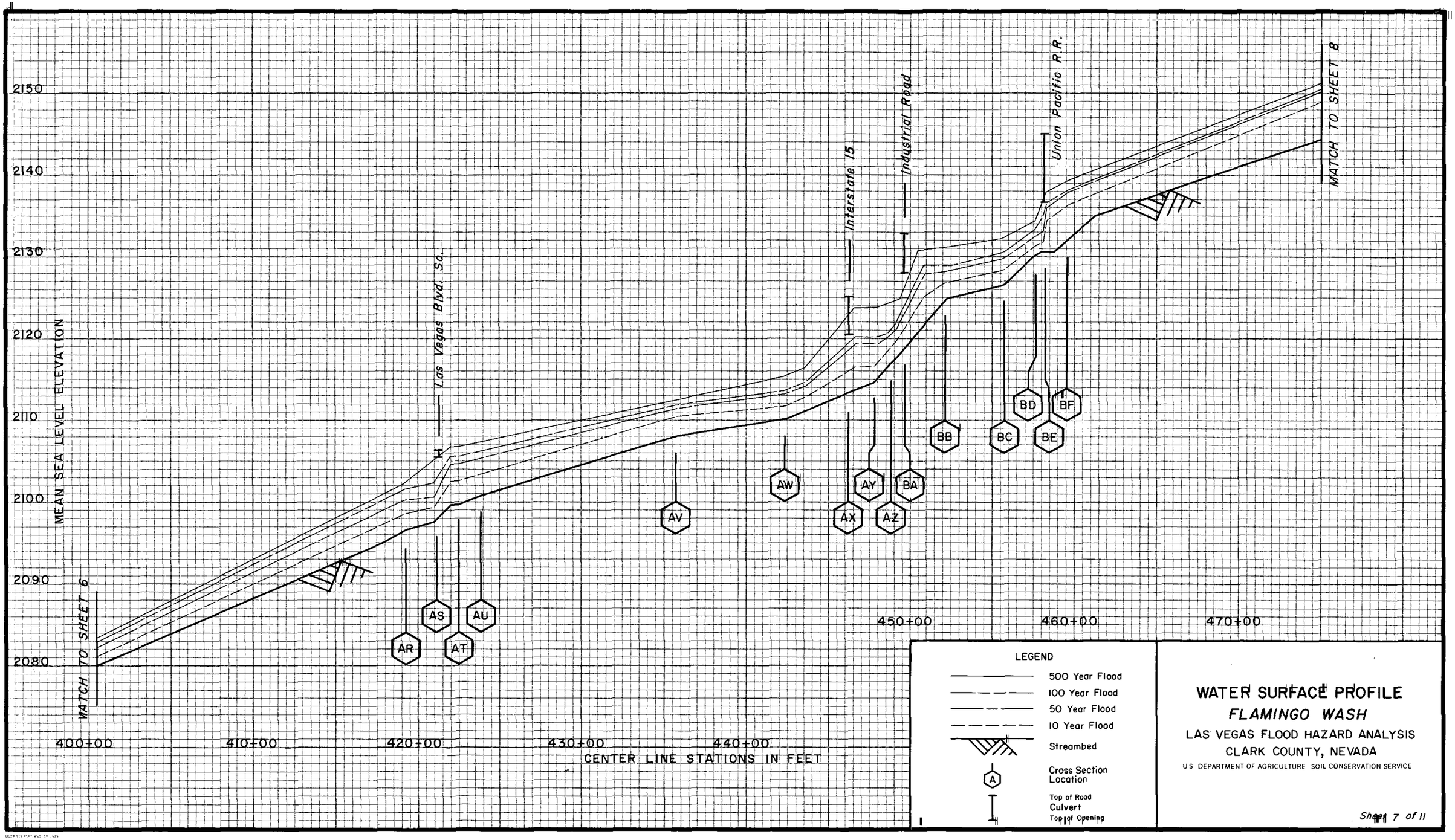
WATER SURFACE PROFILE

FLAMINGO WASH

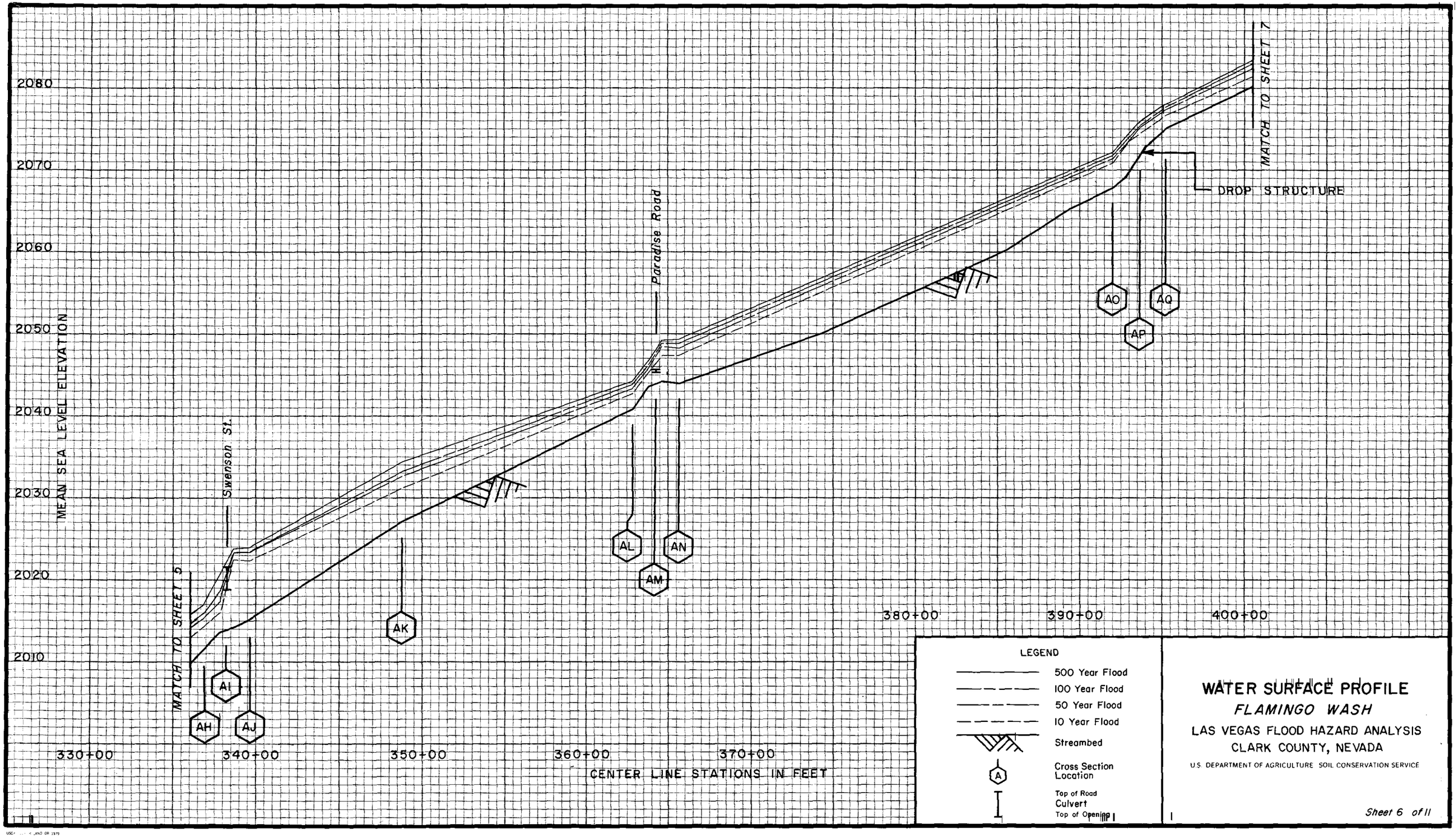
LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



WATER SURFACE PROFILE
FLAMINGO WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

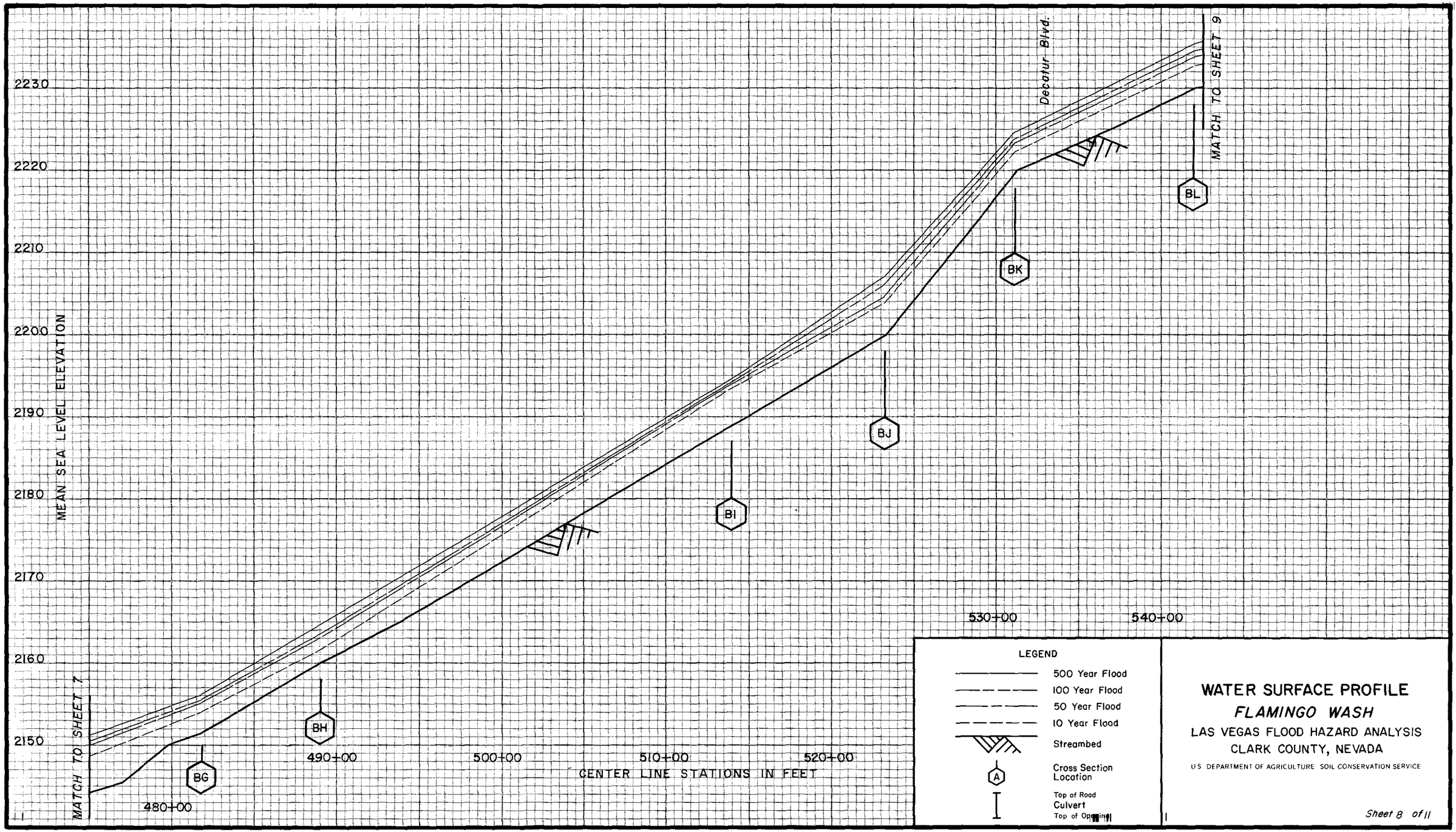


WATER SURFACE PROFILE

FLAMINGO WASH

LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



LEGEND

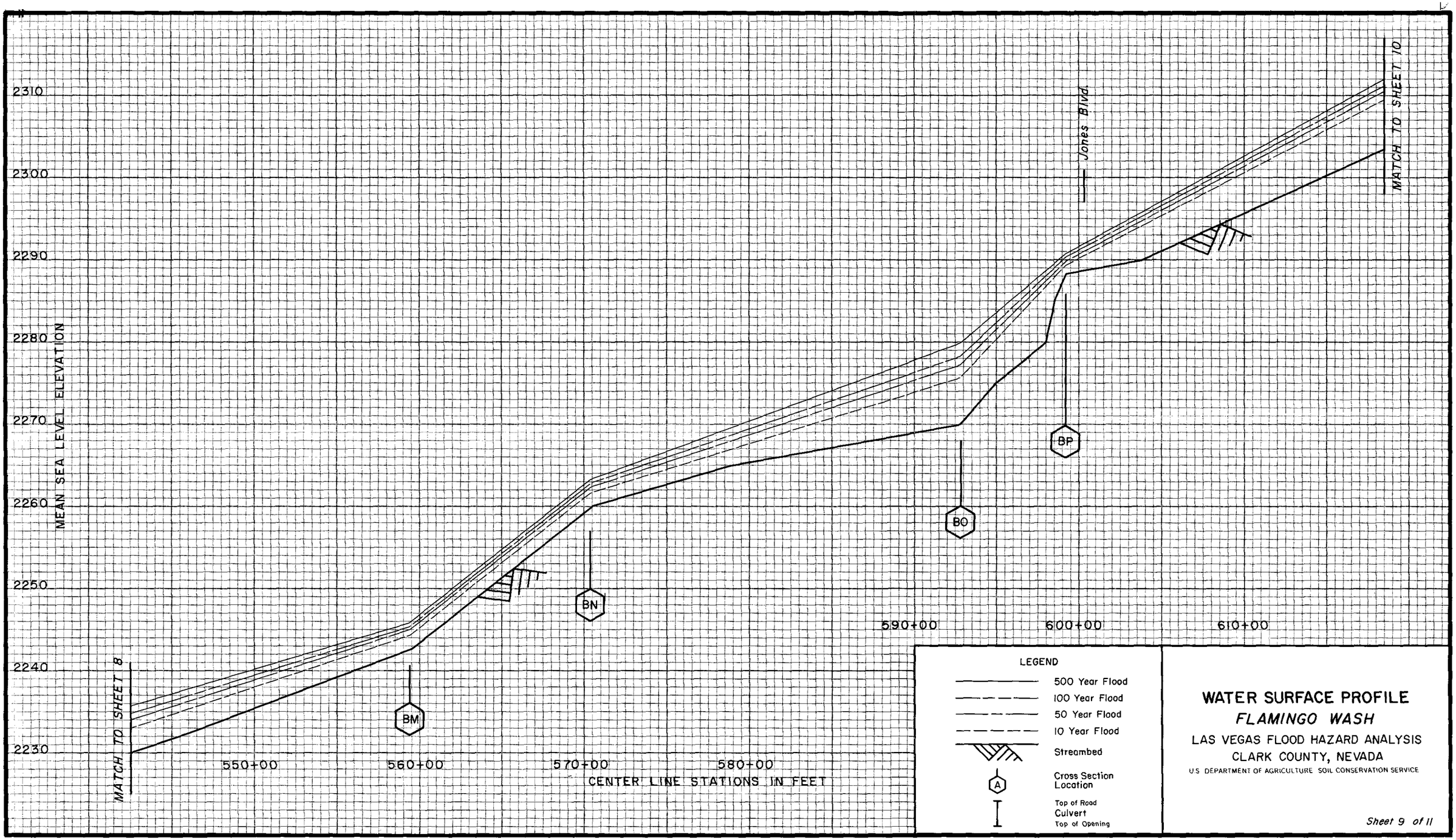
- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- A — Cross Section Location
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE

FLAMINGO WASH

LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

U S DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

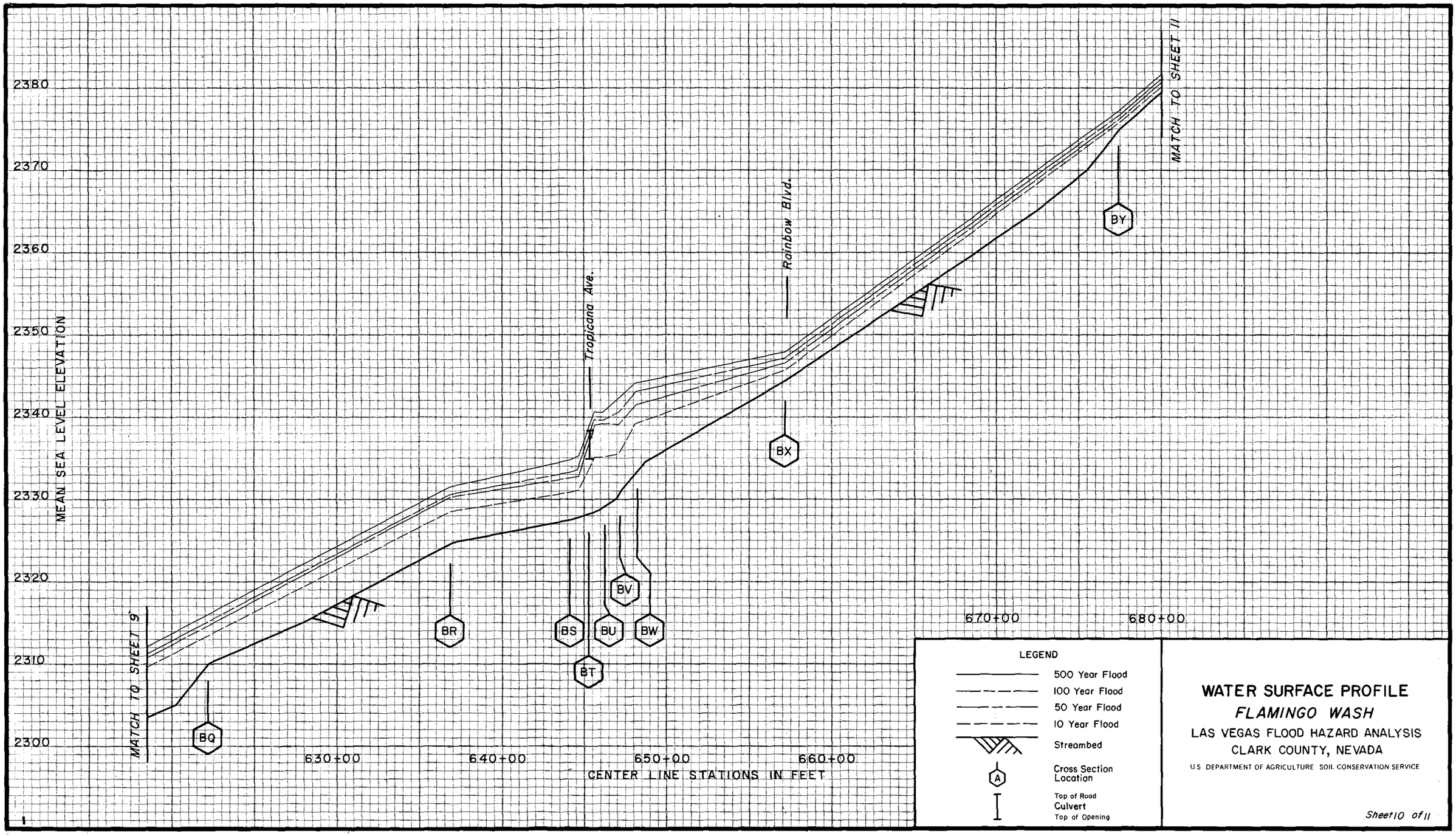


LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- A — Cross Section Location
- Top of Road / Culvert / Top of Opening

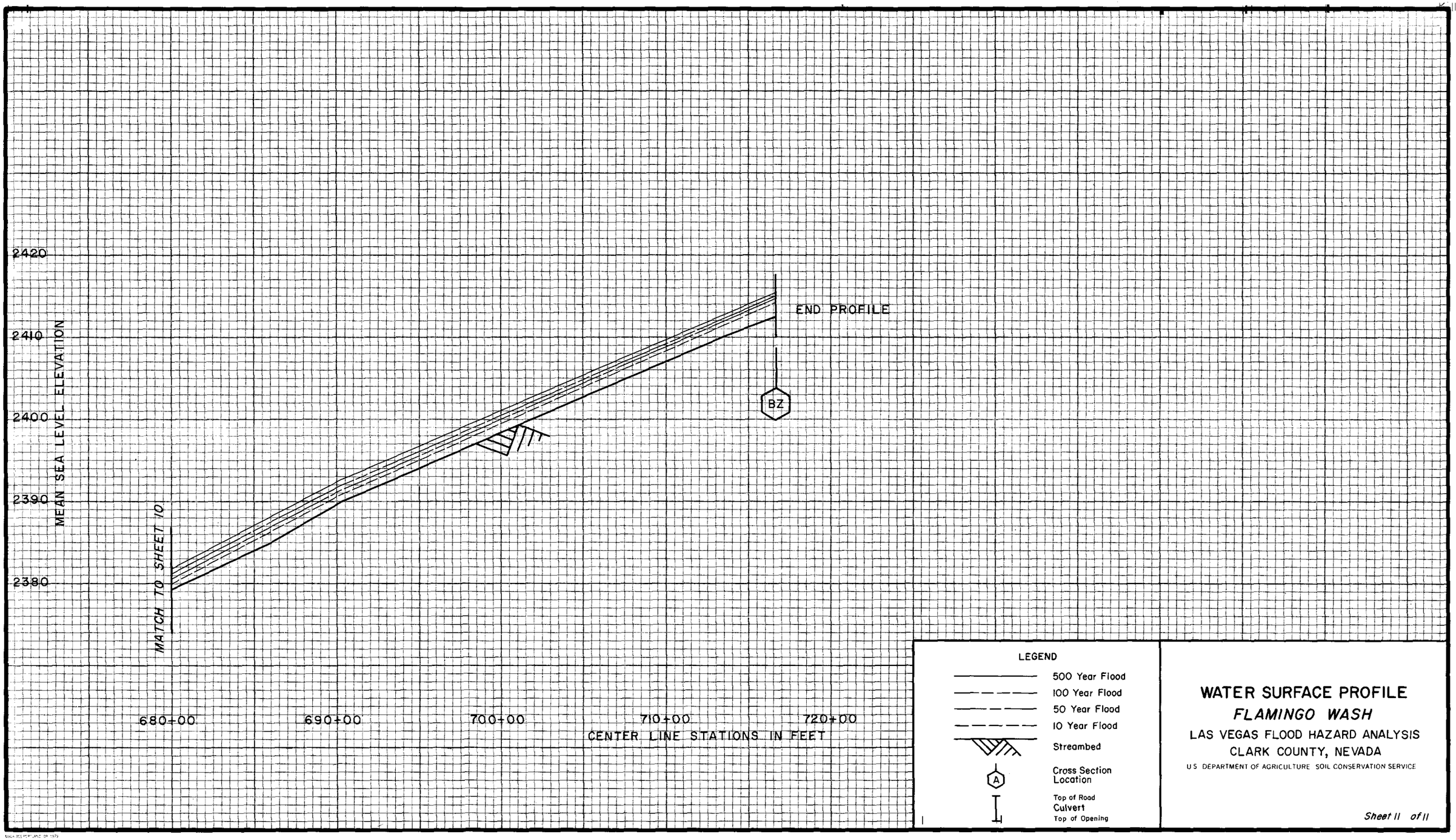
WATER SURFACE PROFILE
FLAMINGO WASH

LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



WATER SURFACE PROFILE
FLAMINGO WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 10 of 11



LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE

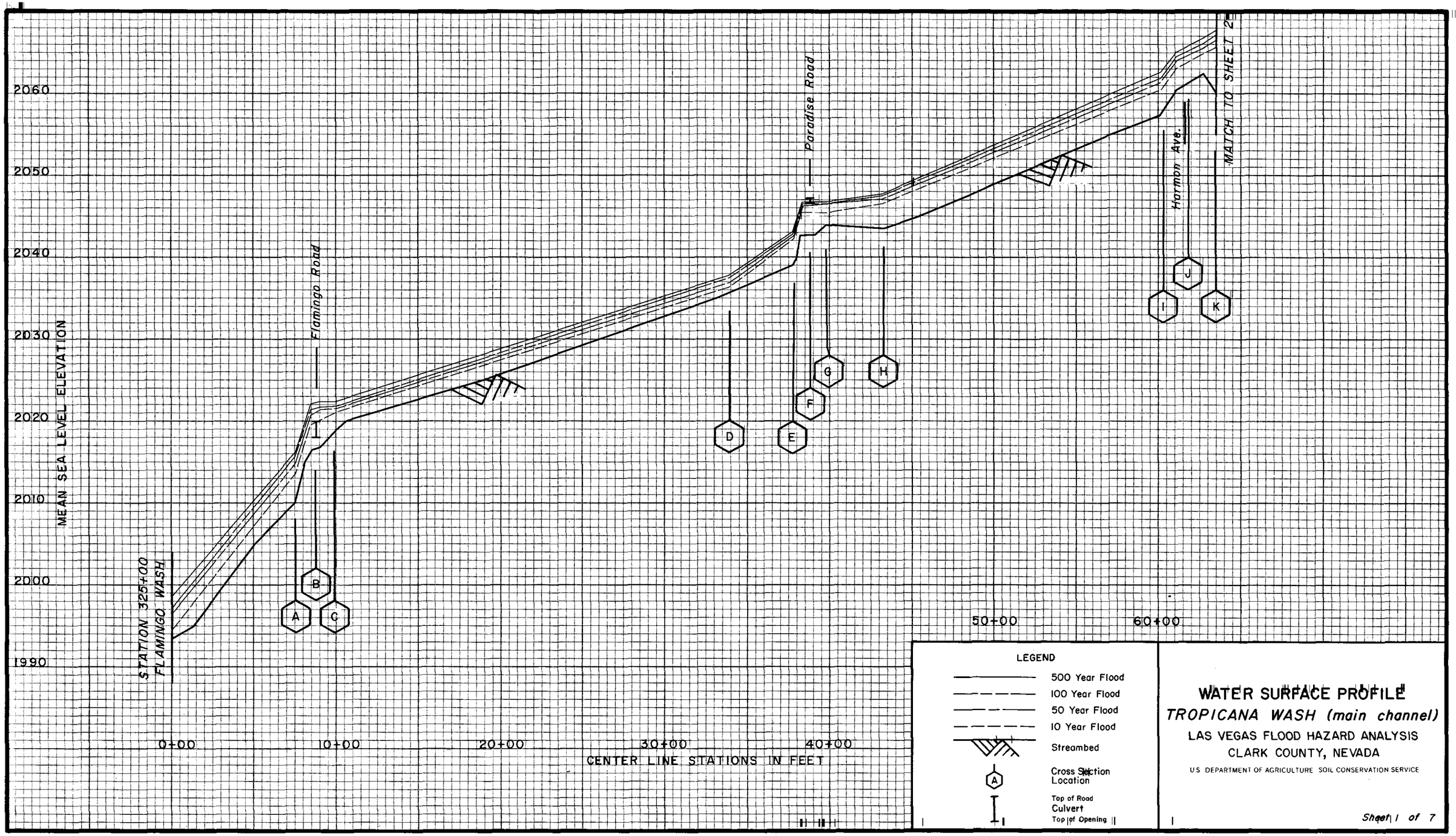
FLAMINGO WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U S DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 11 of 11



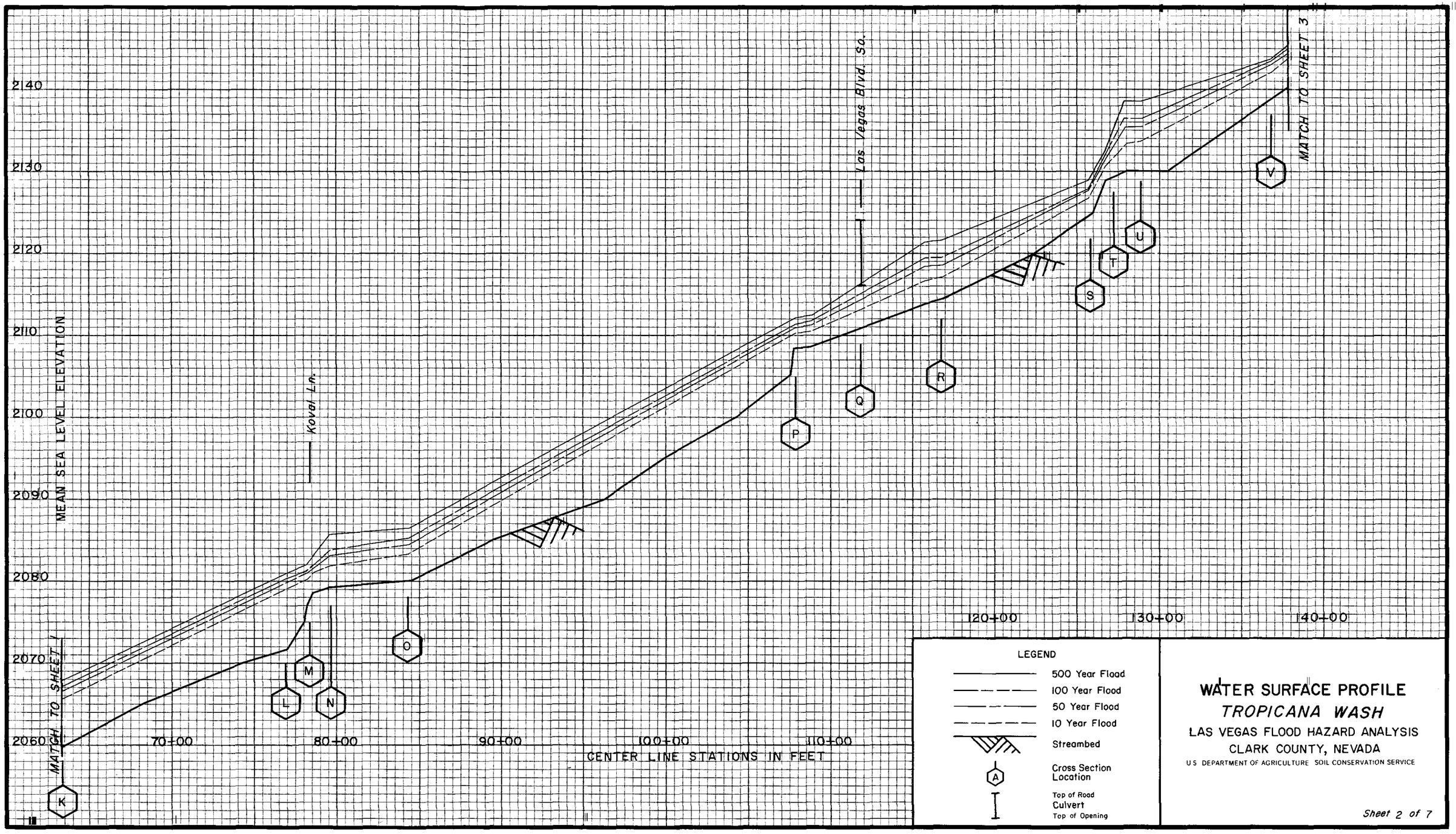
WATER SURFACE PROFILE

TROPICANA WASH (main channel)

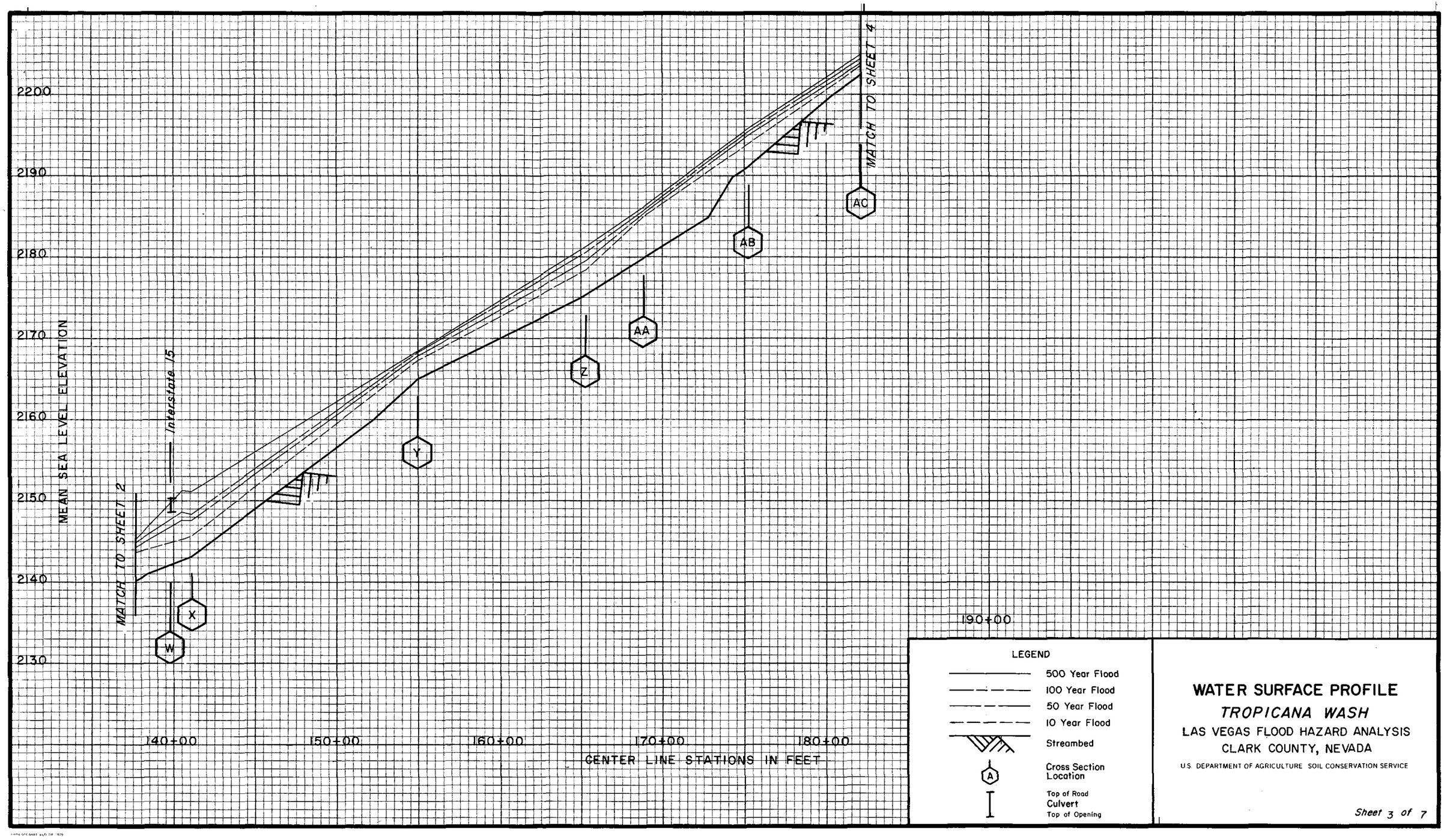
LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



WATER SURFACE PROFILE
TROPICANA WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U S DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



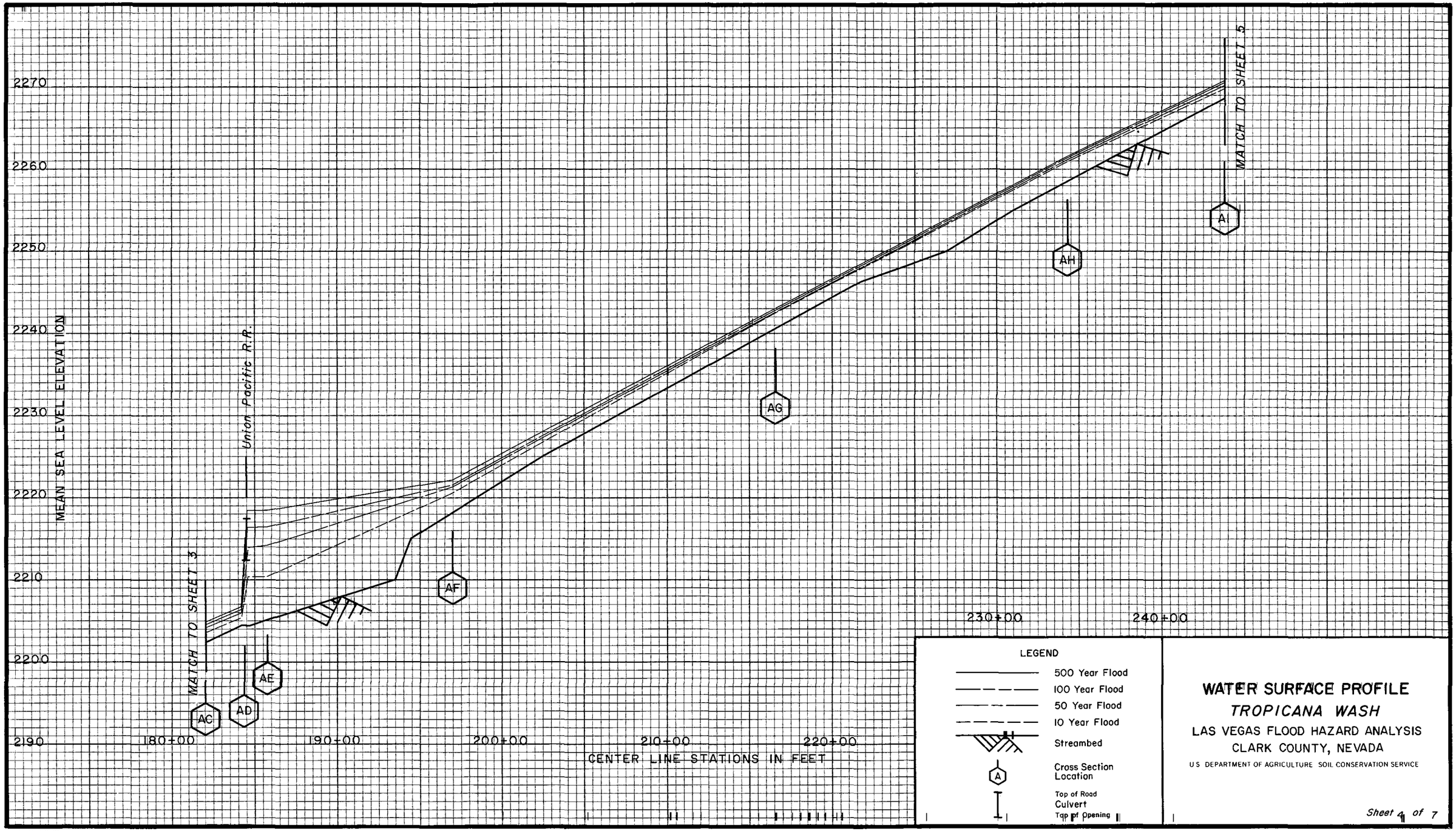
WATER SURFACE PROFILE

TROPICANA WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



WATER SURFACE PROFILE

TROPICANA WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

US DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

2340
2330
2320
2310
2300
2290
2280
2270

MEAN SEA LEVEL ELEVATION

Jones Blvd.

MATCH TO SHEET 6

MATCH TO SHEET 4

AL
AK
AJ
AI

240+00
250+00
260+00
270+00
280+00
290+00
300+00
310+00
320+00

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE

TROPICANA WASH

LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

U S DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

2410
2400
2390
2380
2370
2360
2350
2340

MEAN SEA LEVEL ELEVATION

MATCH TO SHEET 5

Rainbow Blvd.

MATCH TO SHEET 7

AM
AN
AO

320+00
330+00
340+00
350+00
360+00
370+00

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE

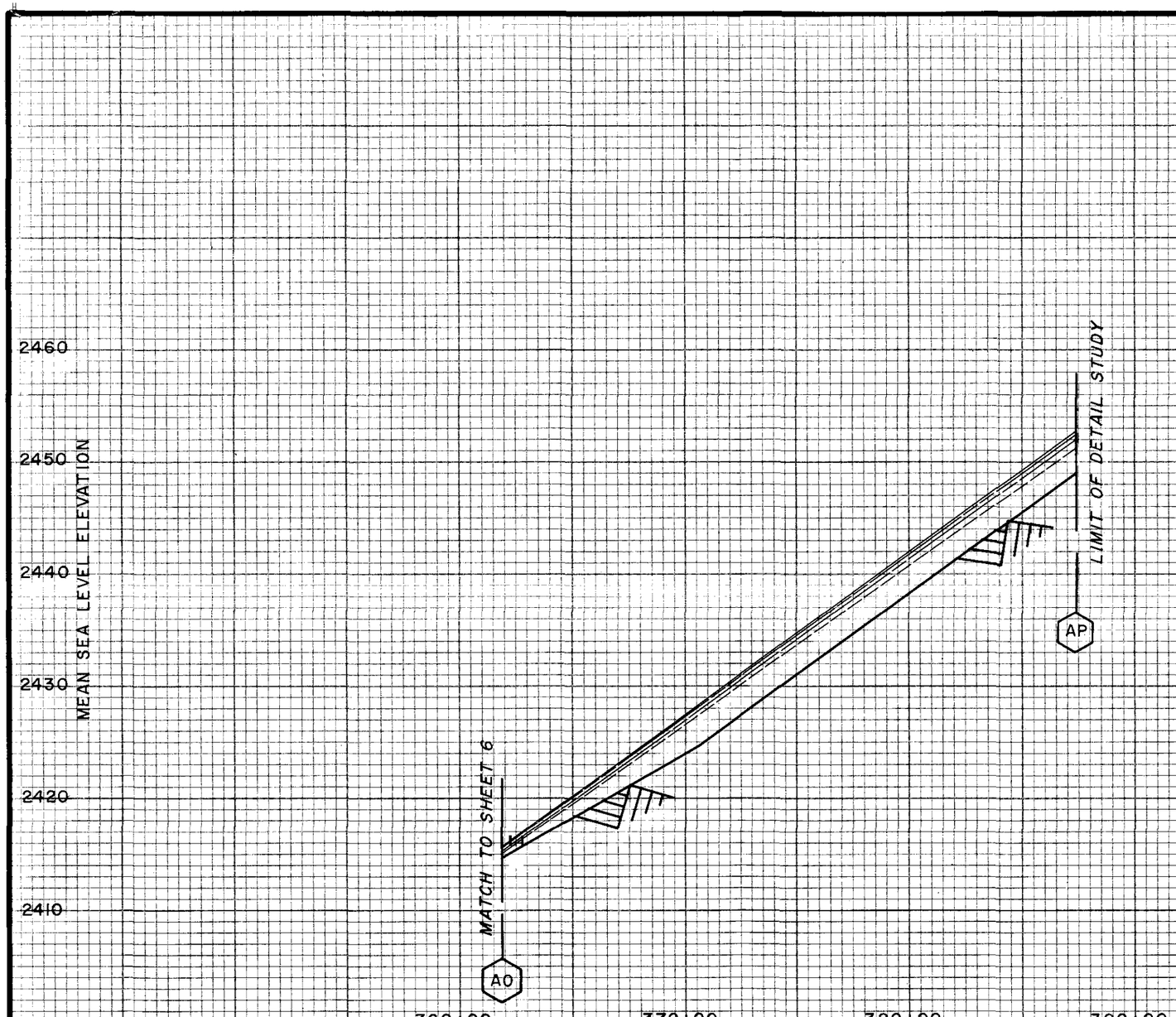
TROPICANA WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

USCA - PORTLAND OR 1979

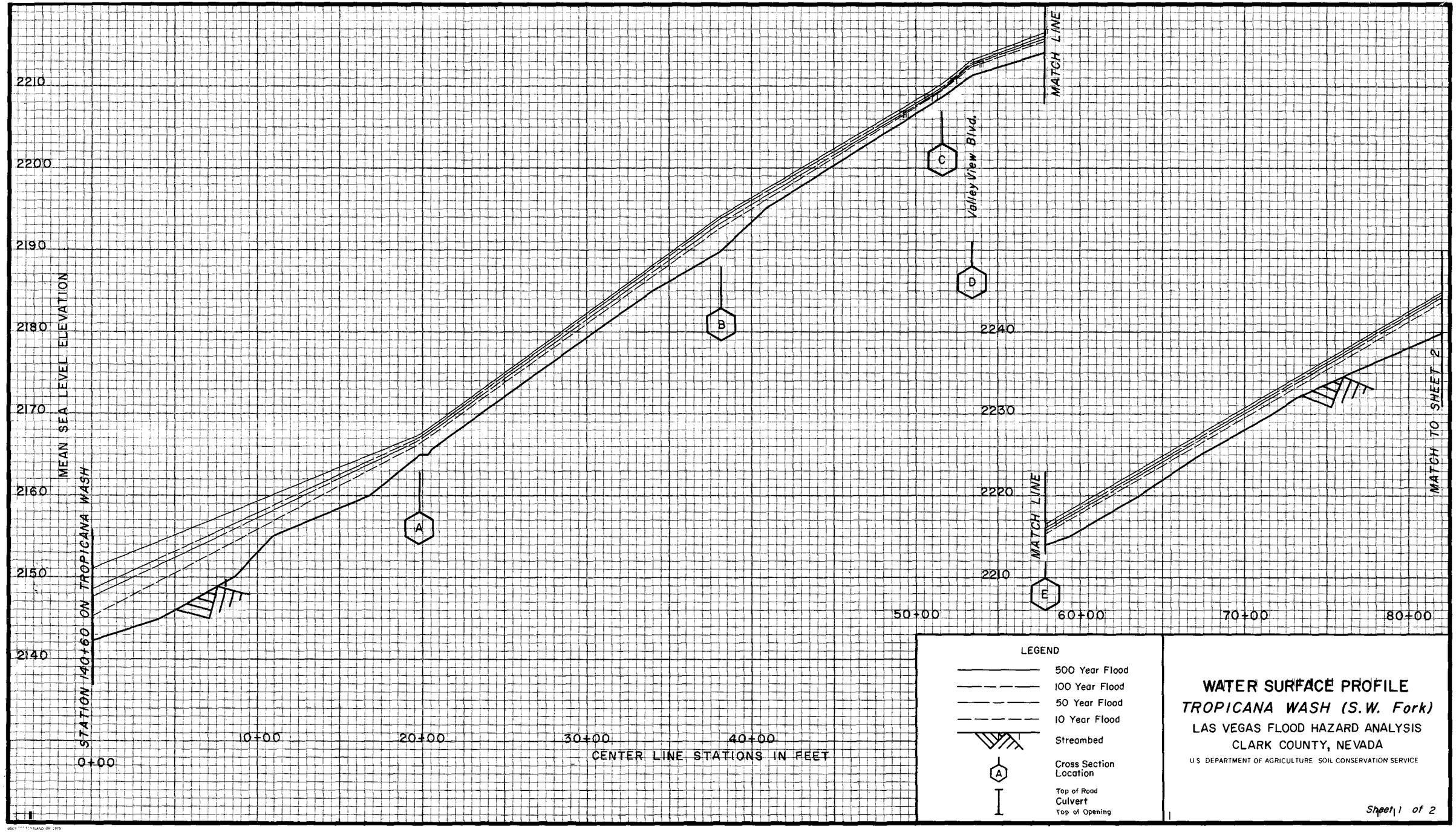


LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- A — Cross Section Location
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE
TROPICANA WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



WATER SURFACE PROFILE

TROPICANA WASH (S.W. Fork)

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U S DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

2310
2300
2290
2280
2270
2260
2250
2240

MEAN SEA LEVEL ELEVATION

Union Pacific R.R.

LIMIT OF DETAIL STUDY

MATCH TO SHEET 1

A
F
G
H
I
J
K
L

80+00
90+00
100+00
110+00
120+00
130+00

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location
- Top of Road
- Culvert
- Top of Opening

WATER SURFACE PROFILE

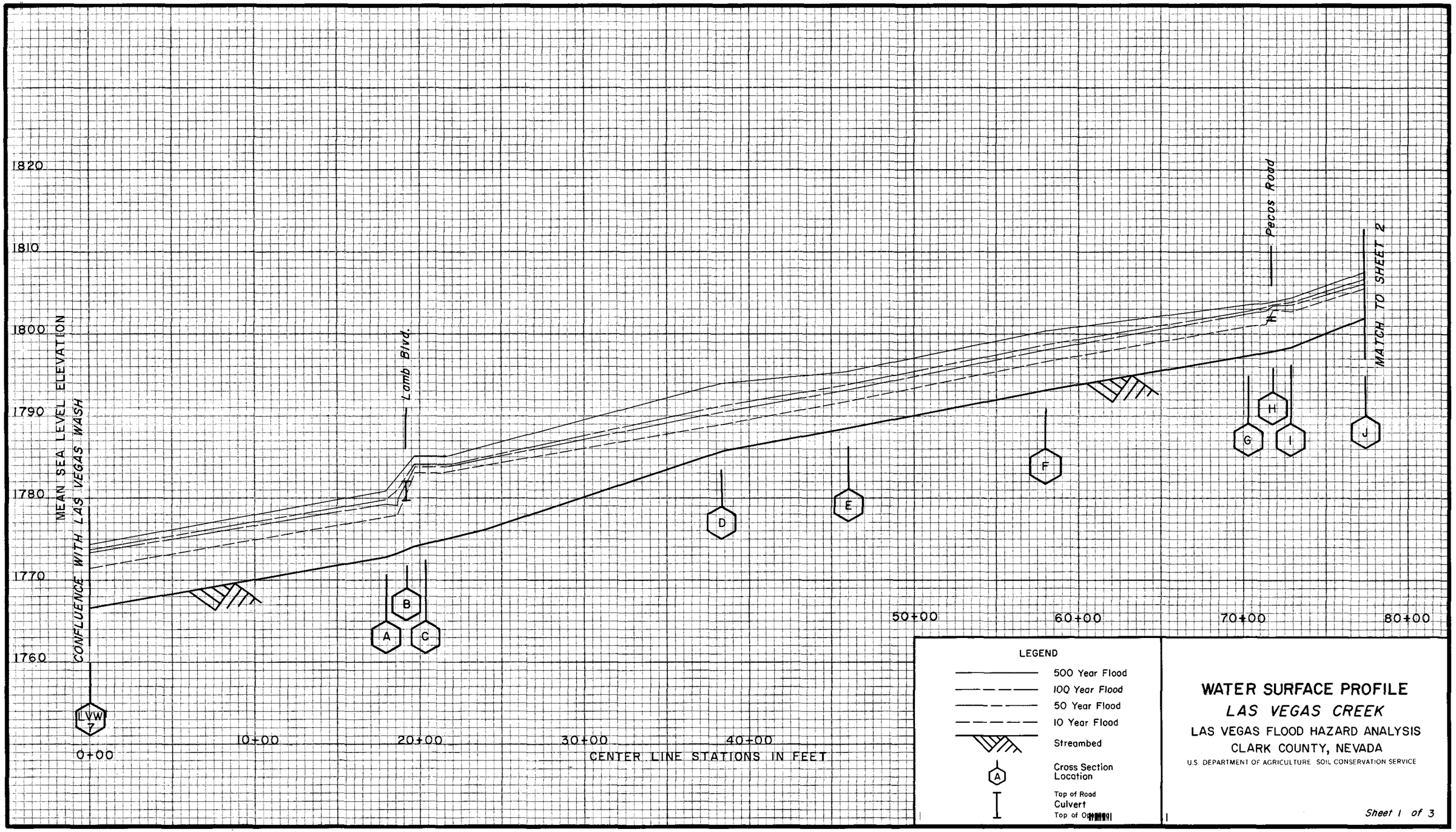
TROPICANA WASH (S.W. Fork)

LAS VEGAS FLOOD HAZARD ANALYSIS

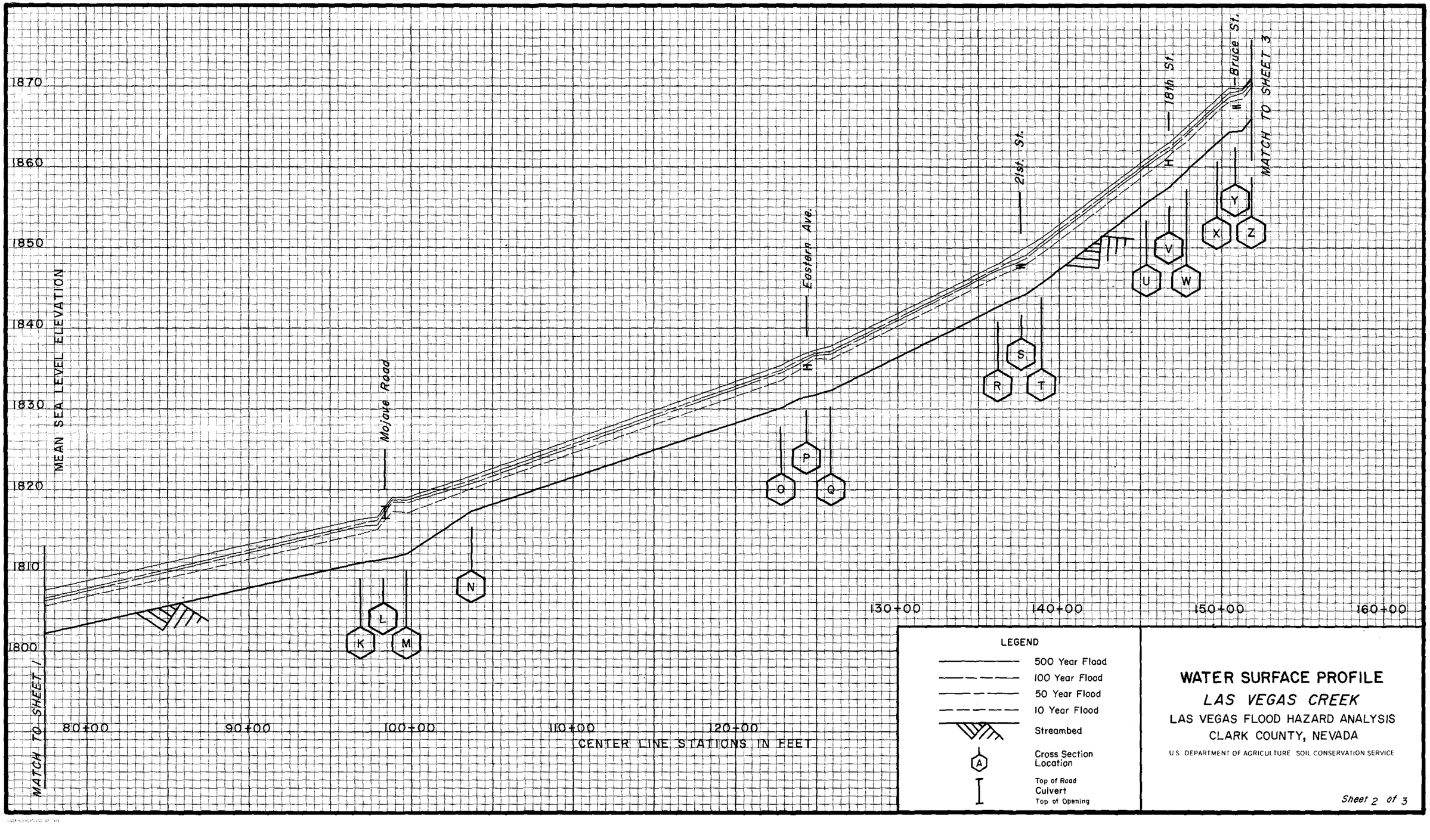
CLARK COUNTY, NEVADA

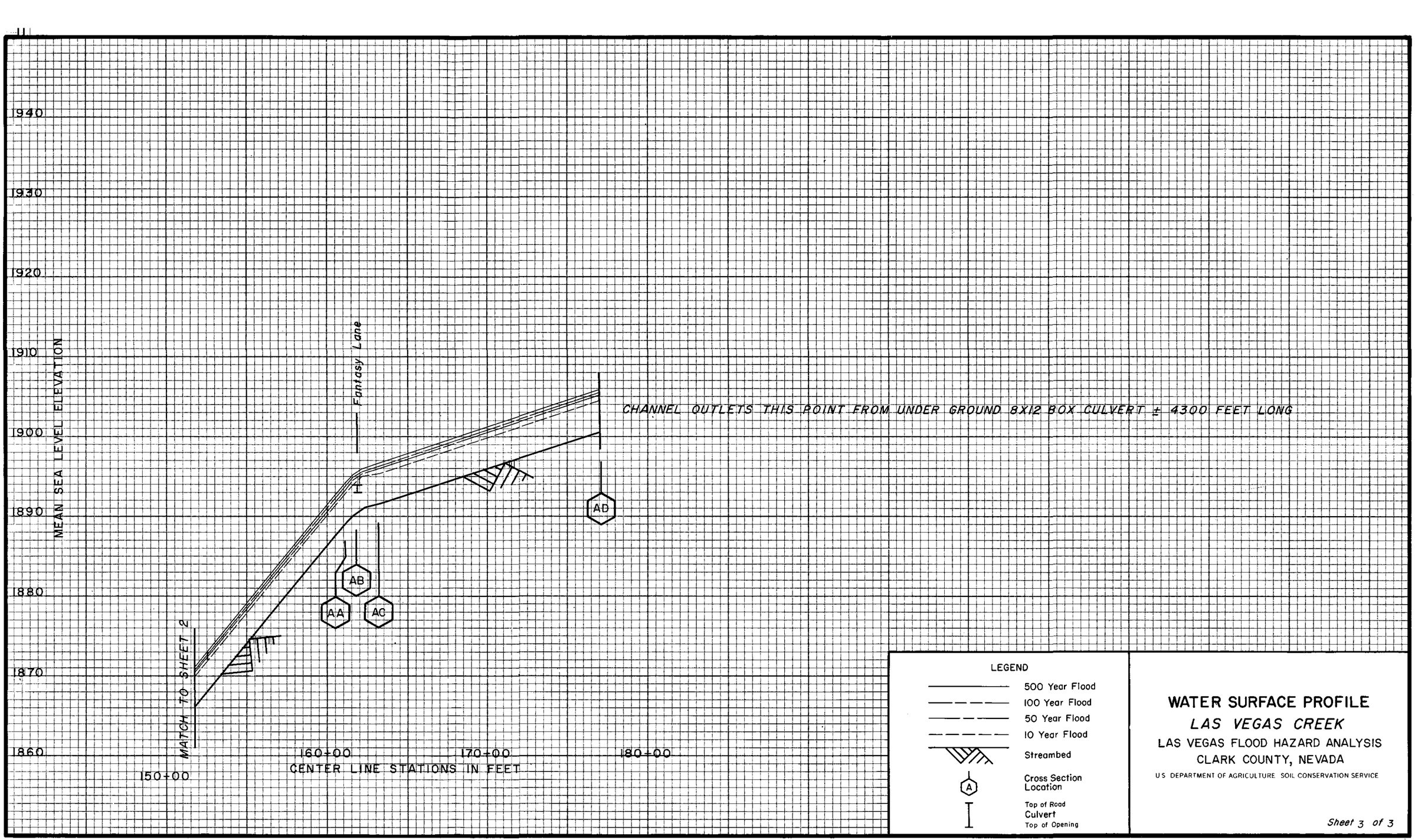
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 2 of 2



WATER SURFACE PROFILE
LAS VEGAS CREEK
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE


MEAN SEA LEVEL ELEVATION
1870
1860
1850
1840
1830
1820
1810
1800
MATCH TO SHEET 1
80+00
90+00
100+00
110+00
120+00
130+00
140+00
150+00
160+00
CENTER LINE STATIONS IN FEET
Mojave Road
Eastern Ave.
21st. St.
18th St.
Bruce St.
MATCH TO SHEET 3
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
LEGEND
500 Year Flood
100 Year Flood
50 Year Flood
10 Year Flood
Streambed
Cross Section Location
A
Top of Road
Culvert
Top of Opening
WATER SURFACE PROFILE
LAS VEGAS CREEK
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE
Sheet 2 of 3



LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- (A) Cross Section Location
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE

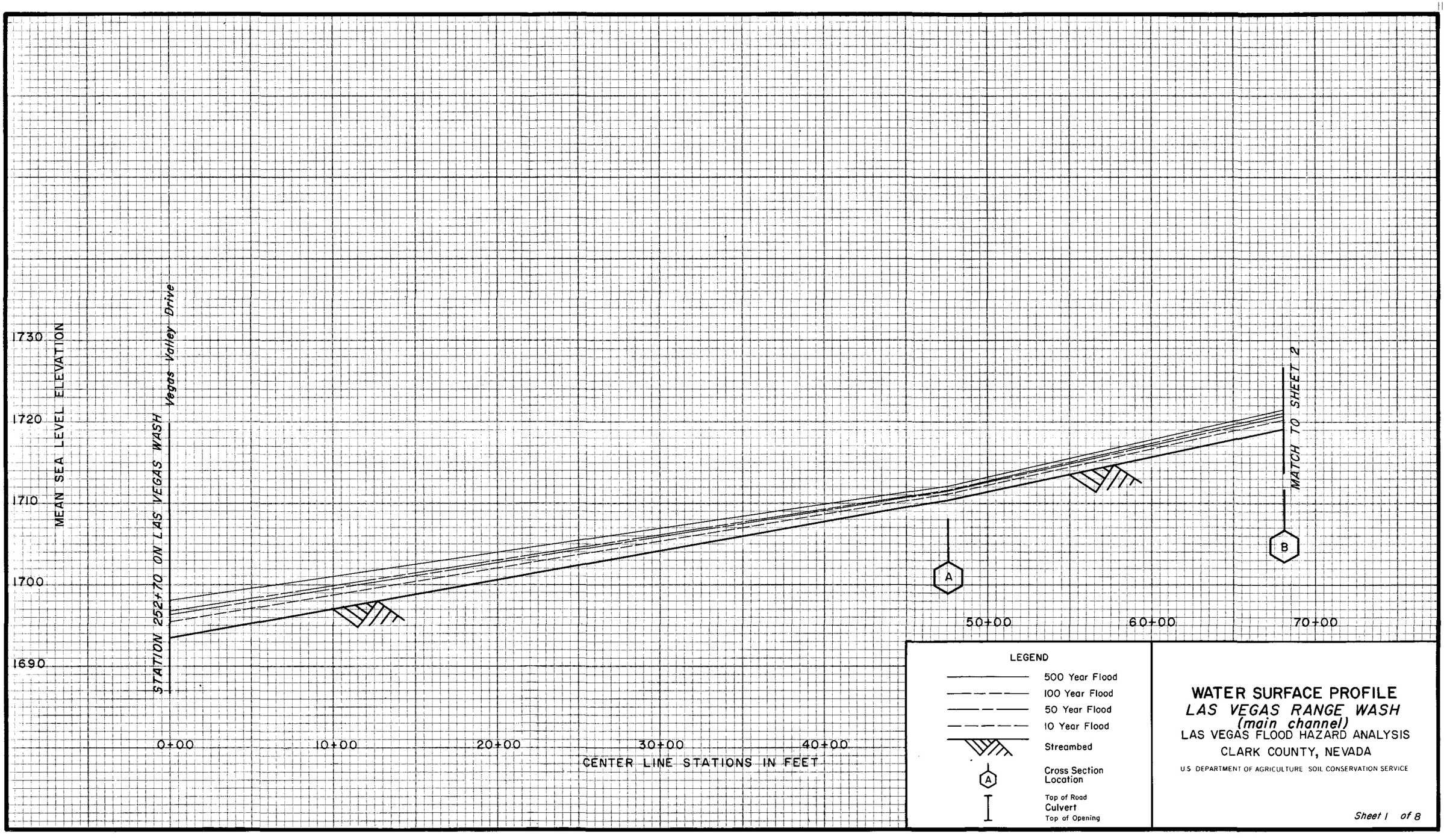
LAS VEGAS CREEK

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 3 of 3

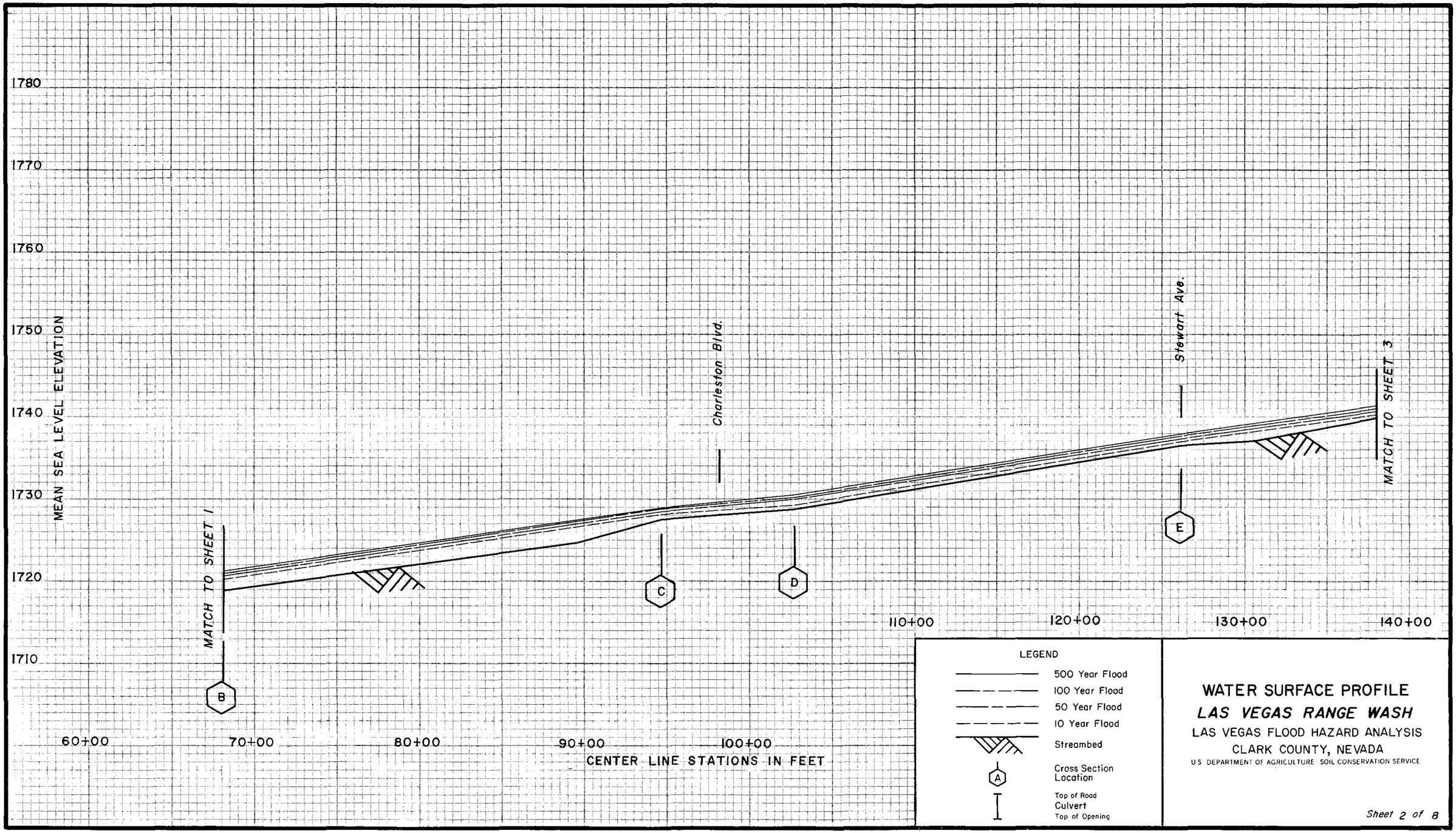


WATER SURFACE PROFILE
LAS VEGAS RANGE WASH
(main channel)

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road / Culvert / Top of Opening

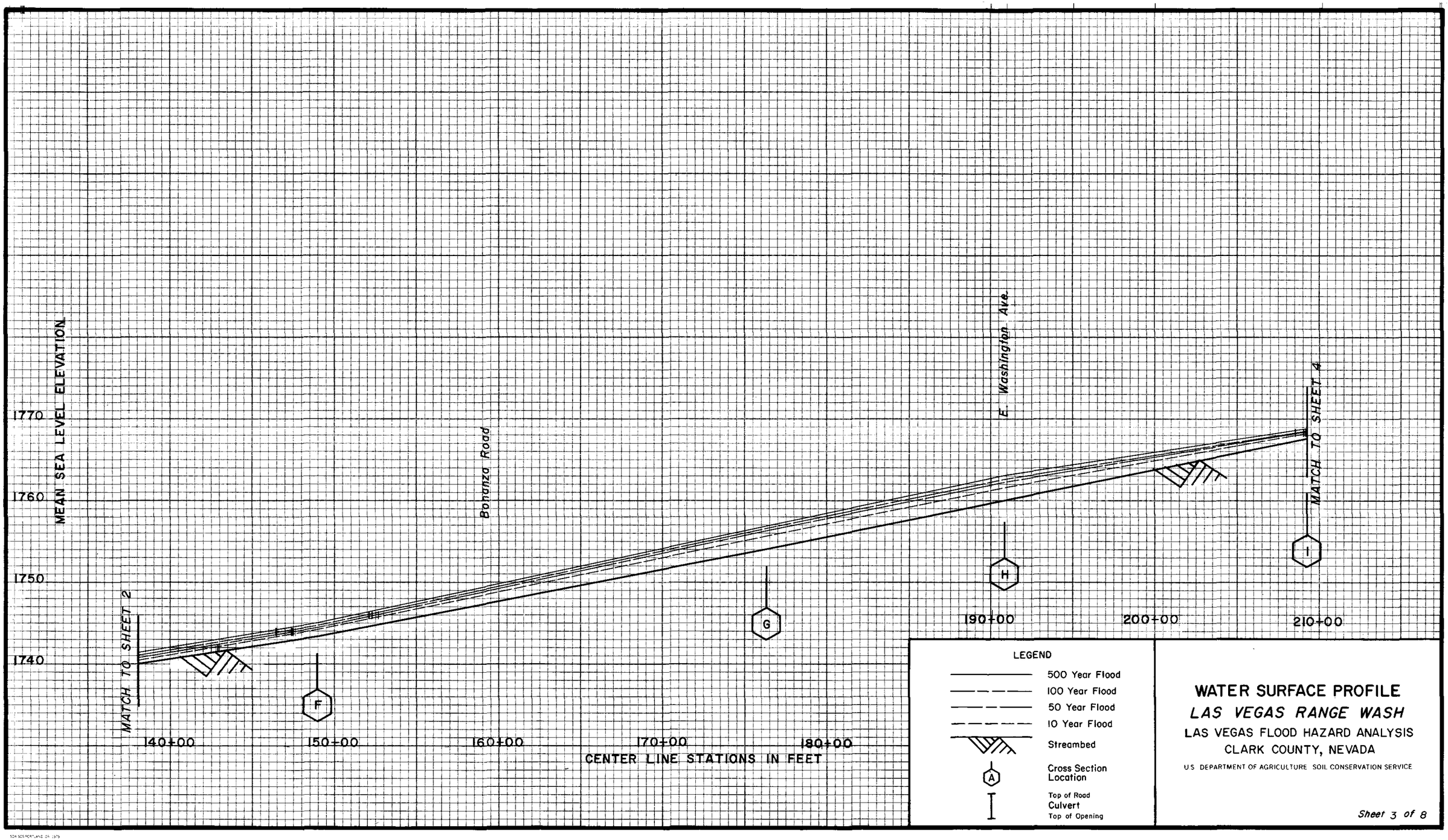
WATER SURFACE PROFILE

LAS VEGAS RANGE WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



WATER SURFACE PROFILE
LAS VEGAS RANGE WASH
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 3 of 8

504 SCS PORTLAND OR 1975

1790
1780
1770
1760

MEAN SEA LEVEL ELEVATION

MATCH TO SHEET 3

Owens Ave.

Lake Mead Blvd.

MATCH TO SHEET 5

I

J

K

210+00 220+00 230+00 240+00 250+00 260+00 270+00 280+00

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road / Culvert / Top of Opening

WATER SURFACE PROFILE

LAS VEGAS RANGE WASH

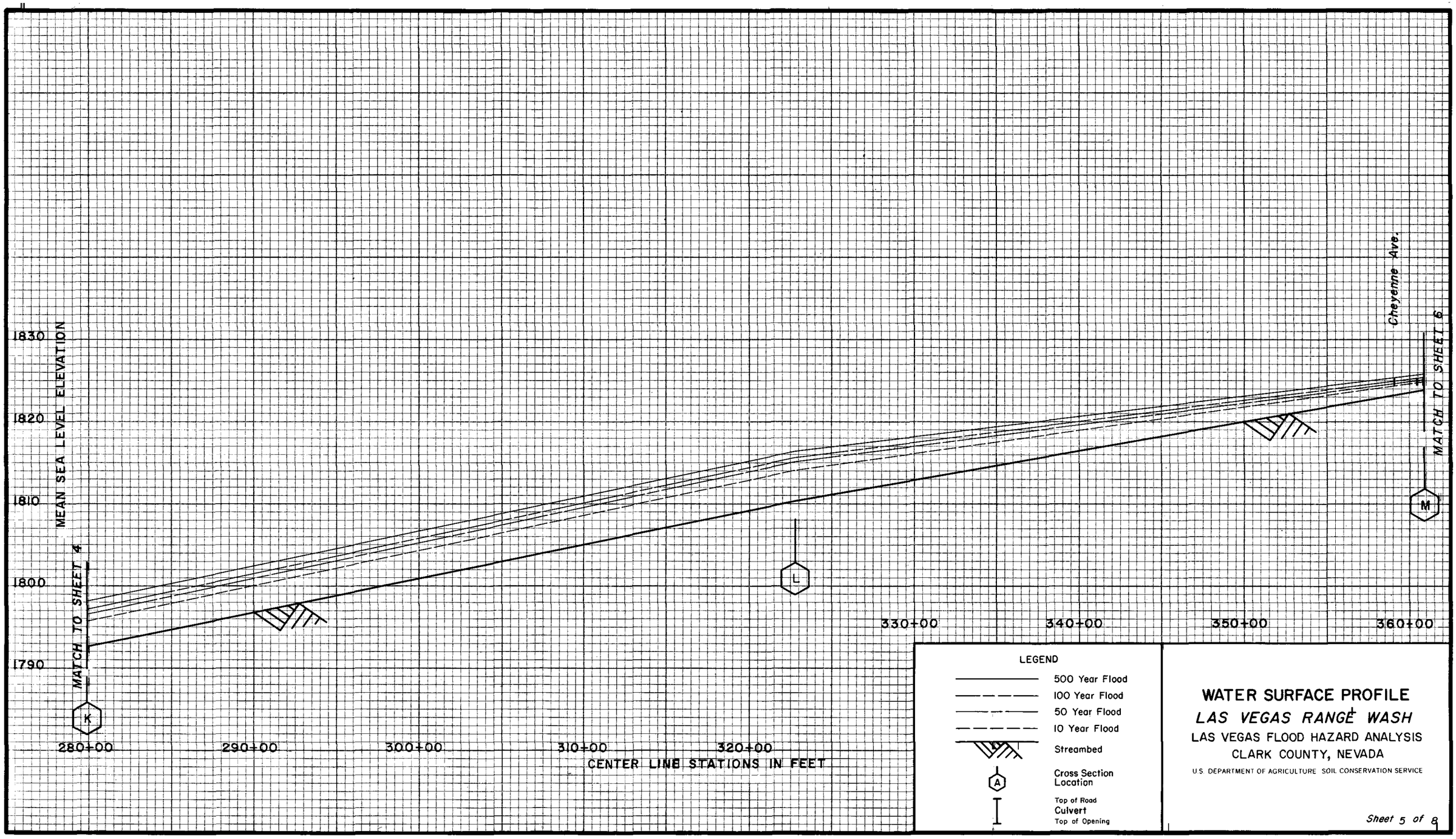
LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 14 of 81

GPO 905 907 AND OR 1976



LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location
- Top of Road / Culvert / Top of Opening

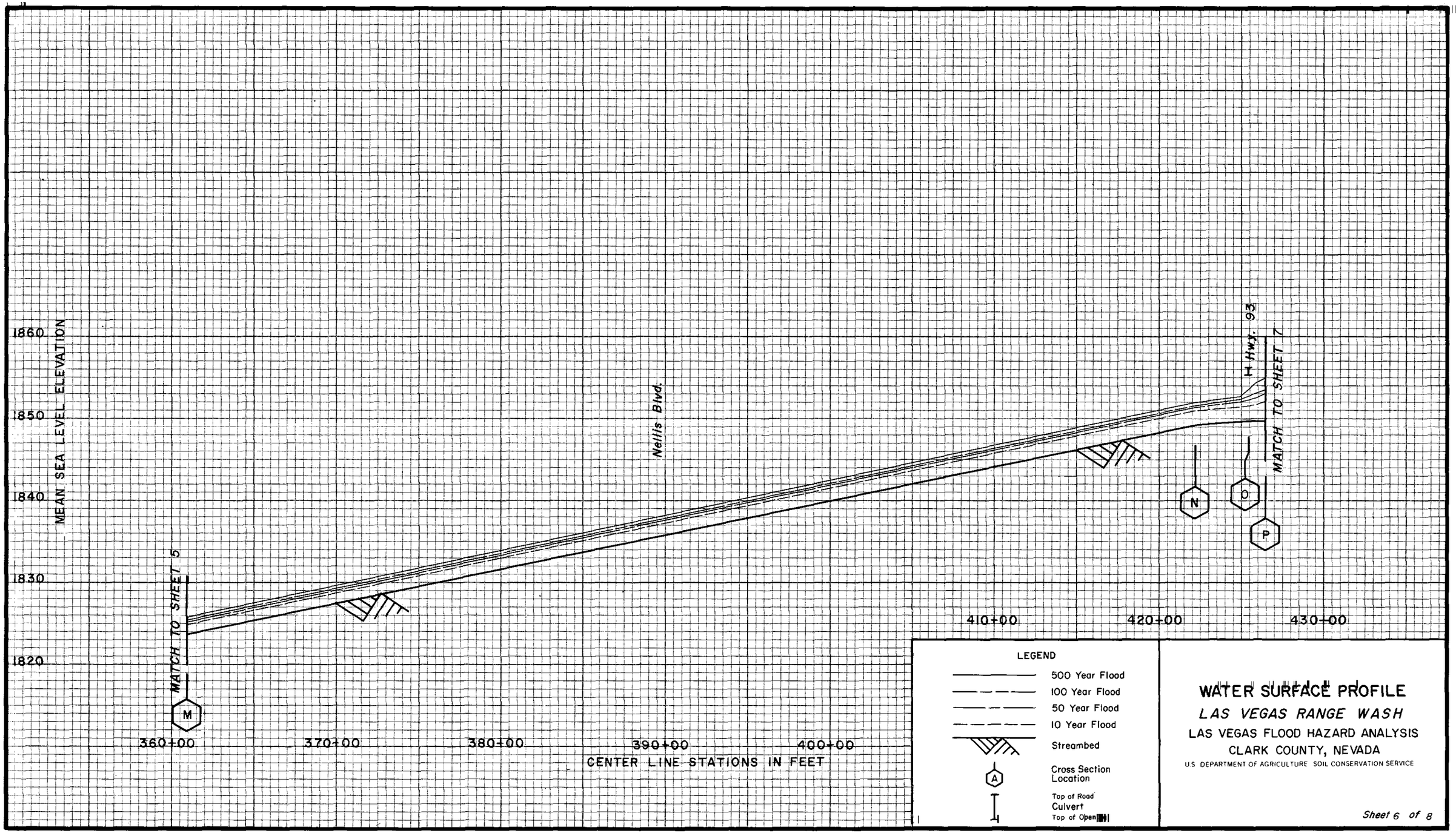
WATER SURFACE PROFILE

LAS VEGAS RANGE WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location (A)
- Top of Road / Culvert / Top of Open

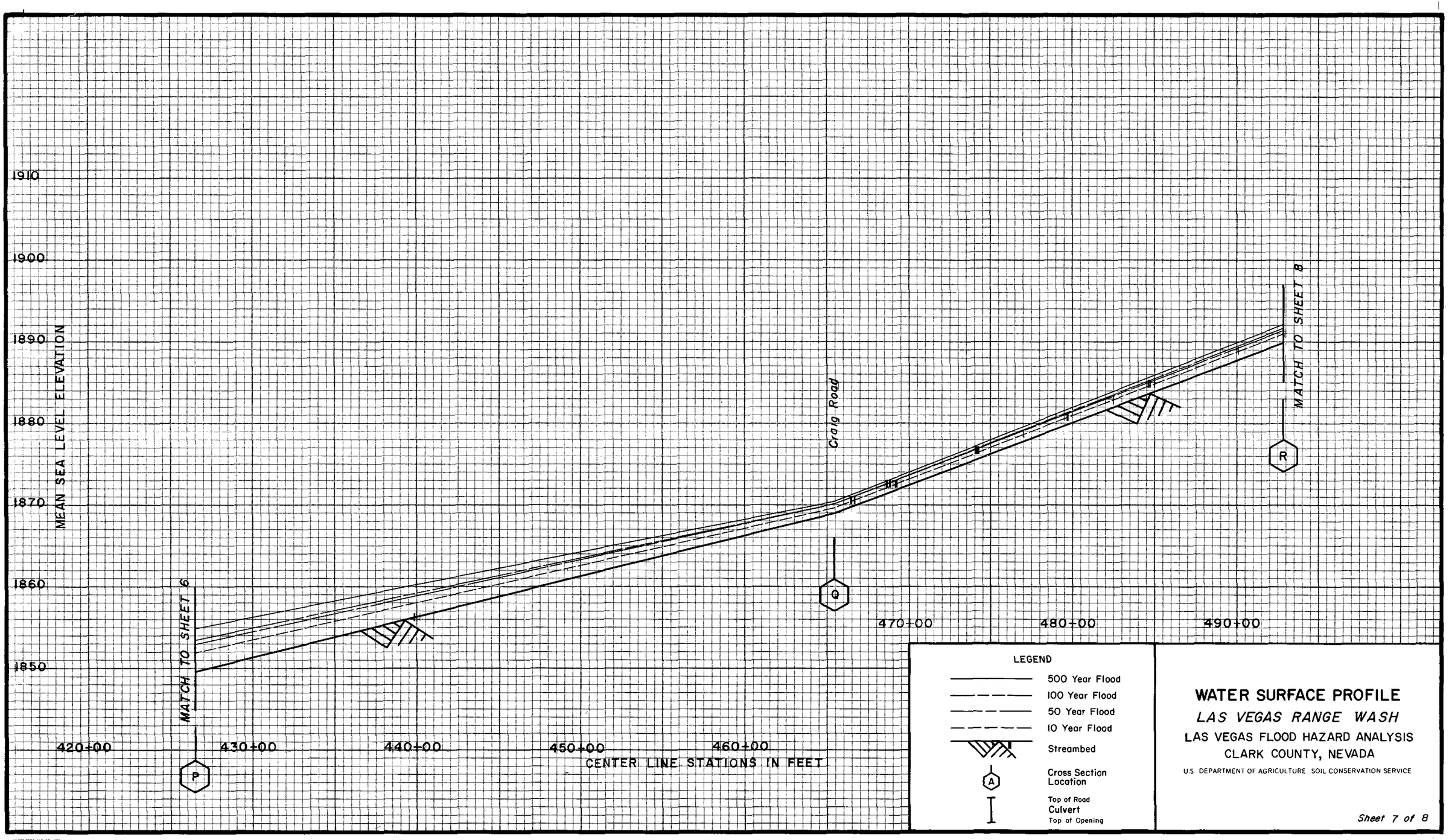
WATER SURFACE PROFILE

LAS VEGAS RANGE WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE



WATER SURFACE PROFILE

LAS VEGAS RANGE WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 7 of 8

USDA SCS PORT. AND GP. 1979

1950
1940
1930
1920
1910
1900
1890
1880
1870

MEAN SEA LEVEL ELEVATION

MATCH TO SHEET 9

R

S

T

LIMIT OF DETAIL STUDY

490+00 500+00 510+00 520+00 530+00 540+00

CENTER LINE STATIONS IN FEET

LEGEND

- 500 Year Flood
- 100 Year Flood
- 50 Year Flood
- 10 Year Flood
- Streambed
- Cross Section Location
- Top of Road
  Culvert
  Top of Opening

WATER SURFACE PROFILE

LAS VEGAS RANGE WASH

LAS VEGAS FLOOD HAZARD ANALYSIS

CLARK COUNTY, NEVADA

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Sheet 8 of 8

SCS PORTLAND OR 1979

FLOOD HAZARD ANALYSES

LAS VEGAS WASH

Table C-1 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)
A	Confluence w/Duck Cr 1-1/2 mi E. of LV Stadium	5,350	1565.0	14,500	1567.1	19,300	1568.0	35,000	1569.7
B	1-1/4 mile east of Las Vegas Stadium	4,200	1576.1	11,800	1577.5	15,900	1578.0	28,700	1579.2
C	1/2 mi. South of East Tropicana Avenue	4,200	1594.3	11,800	1595.8	15,900	1596.2	28,700	1597.4
D	300 feet south of east Tropicana Avenue	4,200	1614.1	11,800	1615.9	15,900	1616.5	28,700	1617.9
E	700 feet north of East Tropicana Avenue	4,200	1630.9	11,800	1632.1	15,900	1632.5	28,700	1633.5
F	500 feet south of East Harmon Avenue	4,200	1646.9	11,800	1648.2	15,900	1648.7	28,700	1650.0
G	900 ft. S. of E. Monson Rd @ Clark County Sewage Disposal Plant	4,200	1661.5	11,800	1662.6	15,900	1663.1	28,700	1664.2
H	700 feet north of East Monson Road	4,200	1671.0	11,800	1672.4	15,900	1673.1	28,700	1674.3
I	1/2 mi. N. of Monson Rd. @ LDS Farm	4,200	1676.7	11,800	1678.5	15,900	1679.1	28,700	1680.5
J	Approx. 1/2 mi. S. of Vegas Valley Drive	4,260	1685.8	12,000	1687.1	16,100	1687.5	28,700	1688.8
K	1,100 ft. South of Vegas Valley Drive @ Sewage Disposal Plant	4,260	1693.2	12,000	1694.9	16,100	1695.4	29,100	1697.0
L	At Vegas Valley Drive	4,260	1695.4	12,000	1696.4	16,100	1696.8	29,100	1698.1
M	Approximately 2,000'feet SE of Winterwood Golf Course Clubhouse	4,060	1706.2	11,200	1707.7	15,000	1708.3	27,000	1709.6
N	At confluence Las Vegas Wash and Flamingo Wash @ Winterwood	4,060	1709.0	11,200	1710.1	15,000	1710.6	27,000	1711.5
O	300 feet north of Sahara Avenue	3,200	1713.4	9,070	1714.2	12,200	1714.5	22,000	1715.2
P	Approximately 1/2 mile north of Sahara Avenue.	3,200	1723.3	9,070	1725.8	12,200	1726.3	22,000	1727.0
Q	100 feet d.s. Nellis Blvd. Bridge	3,200	1726.4	9,070	1730.3	12,200	1731.4	22,000	1733.9
RO	Outlet of Nellis Blvd. Bridge	3,200	1726.6	9,070	1730.5	12,200	1731.8	22,000	1734.9
R	Nellis Blvd. Bridge								
RI	Inlet of Nellis Blvd. Bridge	3,200	1726.6	9,070	1730.9	12,200	1735.1	22,000	1739.1
S	100 feet u.s. of Nellis Blvd. Bridge	3,200	1727.1	9,070	1731.5	12,200	1735.2	22,000	1739.1
T	100 feet d.s. of Charleston Blvd. Bridge	3,200	1729.2	9,070	1733.6	12,200	1736.2	22,000	1739.5
UO	Outlet of Charleston Blvd. Bridge	3,200	1729.5	9,070	1733.9	12,200	1736.4	22,000	1739.5
U	Charleston Blvd. Bridge								
UI	Inlet of Charleston Blvd. Bridge	3,200	1729.7	9,070	1735.7	12,200	1738.8	22,000	1741.1
V	100 feet u.s. of Charleston Blve. Bridge	3,200	1730.0	9,070	1735.7	12,200	1738.7	22,000	1741.1
W	100 feet d.s. of Stewart Avenue Bridge	3,180	1737.6	9,000	1739.1	12,100	1740.3	21,800	1741.9
XO	Outlet of Stewart Avenue Bridge	3,180	1738.1	9,000	1739.5	12,100	1740.3	21,800	1742.0
X	Stewart Avenue Bridge								
XI	Inlet of Stewart Avenue Bridge	3,180	1738.9	9,000	1746.3	12,100	1746.3	21,800	1752.2
Y	100 feet u.s. of Stewart Avenue Bridge	3,180	1739.2	9,000	1746.3	12,100	1746.3	21,800	1752.2
Z	Approximately 1/4 mile north of Stewart Avenue	3,180	1746.5	9,000	1750.1	12,100	1751.0	21,800	1755.1
AA	100 feet d.s. of Bonanza Road Bridge	3,180	1752.5	9,000	1756.2	12,100	1757.6	21,800	1760.6
ABO	Outlet of Bonanza Road Bridge	3,180	1753.0	9,000	1756.8	12,100	1758.2	21,800	1762.8
AB	Bonanza Road Bridge	3,100							
ABI	Inlet of Bonanza Road Bridge	3,180	1753.2	9,000	1759.6	12,100	1761.4	21,800	1764.5
AC	100 feet u.s. of Bonanza Road Bridge	3,180	1753.5	9,000	1759.7	12,100	1761.4	21,800	1764.4
AD	Approximately 1000' u.s. of Bonanza Road	3,180	1759.3	9,000	1763.9	12,100	1764.8	21,800	1766.0

USDA-SCS-PORTLAND, OR 1979

FLOOD HAZARD ANALYSES

LAS VEGAS WASH

Table C-1 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)
AE	Approx. 2000 feet East of Lamb Blvd. @ Confluence with Las Vegas Creek	3,180	1771.4	9,000	1773.3	12,100	1773.6	21,800	1774.2
AF	Las Vegas Wash at Lamb Blvd.	3,180	1778.8	9,000	1782.4	12,100	1782.9	21,800	1783.4
AG	Approximately 2000 feet u.s. of Lamb Blvd.	3,180	1786.8	9,000	1789.9	12,100	1791.1	21,800	1792.1
AH	200 feet d.s. of Owens Avenue	3,180	1799.0	9,000	1800.0	12,100	1800.4	21,800	1801.2
AI	Approximately 1500 feet u.s. of Owens Avenue	3,180	1808.2	9,000	1809.8	12,100	1810.4	21,800	1811.7
AJ	100' d.s. of Lake Mead Blvd. Bridge	3,060	1817.9	8,760	1820.0	11,800	1820.4	21,500	1821.1
AKO	Outlet of Lake Mead Blvd. Bridge	3,060	1818.4	8,760	1821.0	11,800	1821.2	21,500	1821.7
AK	Lake Mead Blvd. Bridge								
AKI	Inlet of Lake Mead Blvd. Bridge	3,060	1824.0	8,760	1824.3	11,800	1824.5	21,500	1824.8
AL	100 feet u.s. of Lake Mead Blvd. Culvert	3,060	1824.0	8,760	1824.3	11,800	1824.5	21,500	1824.8
AM	100 feet d.s. of Carey Avenue Culvert	3,060	1832.0	8,760	1835.2	11,800	1835.9	21,500	1837.0
AOO	Outlet of Carey Avenue Culvert	3,060	1832.3	8,760	1835.2	11,800	1836.2	21,500	1837.0
AO	Carey Avenue Culvert								
AOI	Inlet of Carey Avenue Culvert	3,060	1834.5	8,700	1840.7	11,800	1841.1	21,500	1842.0
AP	100 feet u.s. of Carey Avenue Culvert	3,060	1834.6	8,760	1840.7	11,800	1841.1	21,500	1842.0
AQ	100 feet d.s. of Las Vegas Blvd. Culvert	3,060	1844.8	8,760	1848.2	11,800	1848.6	21,500	1849.4
ARO	Outlet of Las Vegas Blvd. Culvert	3,060	1845.2	8,760	1849.0	11,800	1849.2	21,500	1849.8
AR	Las Vegas Boulevard Culvert								
ARI	Inlet of Las Vegas Blvd. Culvert	3,060	1848.0	8,760	1850.4	11,800	1850.5	21,500	1850.9
AS	100 feet u.s. of Las Vegas Blvd. Culvert	3,060	1848.0	8,760	1850.5	11,800	1850.8	21,500	1851.8
AT	1000' u.s. of Las Vegas Blvd. @ Confluence with Tributary	3,060	1850.1	8,760	1853.5	11,800	1854.4	21,500	1855.4
AU	100 feet d.s. of Cheyenne Avenue Culvert	2,370	1855.8	6,840	1856.6	9,240	1857.1	16,900	1858.1
AVO	Outlet of Cheyenne Avenue Culvert	2,370	1856.0	6,840	1856.8	9,240	1857.2	16,900	1858.2
AV	Cheyenne Avenue Culvert								
AVI	Inlet of Cheyenne Avenue Culvert	2,370	1864.2	6,840	1864.9	9,240	1864.9	16,900	1865.2
AW	100 feet u.s. of Cheyenne Avenue Culvert	2,370	1864.2	6,840	1864.9	9,240	1864.9	16,900	1865.2
AX	800 feet South of Gowan Road	2,370	1865.6	6,840	1866.6	9,240	1866.8	16,900	1867.6
AY	Approx. 1500" N. of Gowan Rd. nr Barr Ave. inNVL	2,370	1886.6	6,840	1889.0	9,240	1889.7	16,900	1890.8
AZ	100 feet d.s. I-15	2,370	1900.9	6,840	1901.7	9,240	1902.0	16,900	1902.7
BB	100 feet u.s. Interstate 15	2,370	1903.5	6,840	1906.8	9,240	1907.3	16,900	1908.4
BC	600 feet u.s. of Interstate 15	2,370	1905.8	6,840	1908.8	9,240	1909.6	16,900	1910.9
BD	Las Vegas Wash at Losee Street	2,370	1908.1	6,840	1911.0	9,240	1911.7	16,900	1912.8
BE	800 feet north of Craig Road	2,370	1921.1	6,840	1922.8	9,240	1923.4	16,900	1924.7
BF	Las Vegas Wash at Lone Mountain Road	2,370	1940.4	6,840	1941.1	9,240	1941.5	16,900	1942.2

USDA-SCS-PORTLAND, OR 1979

FLOOD HAZARD ANALYSES

LAS VEGAS WASH

Table C-1 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)
	LAS VEGAS WASH TRIBUTARY								
A	80 feet d.s. of Cheyenne Avenue on L.V.W. Trib.	1,490	1862.8	3,850	1865.5	5,130	1866.2	9,150	1867.4
BO	Outlet Cheyenne Avenue Culverts	1,490	1863.7	3,850	1866.0	5,130	1867.7	9,150	1868.6
B	Cheyenne Ave. Culverts on L. Vegas Wash Trib.								
BI	Inlet of Cheyenne Avenue Culverts	1,490	1865.6	3,850	1869.3	5,130	1870.1	9,150	1870.6
C	160' u.s. of Cheyenne Avenue Culverts	1,490	1870.6	3,850	1871.1	5,130	1871.5	9,150	1871.9
D	700 feet d.s. of Civic Center Drive	1,490	1880.0	3,850	1881.2	5,130	1881.7	9,150	1882.6
E	100 feet d.s. Interstate 15	1,490	1889.1	3,850	1891.0	5,130	1891.6	9,150	1892.7
F	100 feet u.s. Interstate 15	1,490	1891.8	3,850	1893.8	5,130	1894.5	9,150	1896.3
G	1200 feet u.s. Losee Street	1,490	1915.1	3,850	1915.6	5,130	1915.8	9,150	1916.3
H	1/4 mile Southeast of Craig Road	1,490	1936.9	3,850	1940.0	5,130	1940.5	9,150	1941.8
I	Approx. 300' Northwest of North Fifth Street	1,490	1979.1	3,850	1980.7	5,130	1981.1	9,150	1981.9
J	L. Vegas Wash Trib. @ Lone Mountain Road	1,490	2026.6	3,850	2027.6	5,130	2027.9	9,150	2028.5

USDA SCS-PORTLAND, OR 1979

FLOOD HAZARD ANALYSES

DUCK CREEK

Table C-2 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)
A	Approx. 200' E. of Las Vegas Stadium	1,140	1591.6	3,030	1592.7	3,770	1593.0	6,410	1593.9
B	Approx. 700' W. of Las Vegas Stadium	1,200	1605.4	3,040	1606.0	3,770	1606.2	6,440	1606.6
C	Approx. 3300' E. of Boulder Highway	1,200	1614.4	3,040	1615.1	3,770	1615.4	6,440	1615.9
D	Approx. 750' E. of Boulder Highway	1,200	1635.1	3,040	1635.7	3,770	1635.9	6,440	1636.2
E	50' D.S. Outlet of Boulder Highway Culverts	1,200	1635.6	3,040	1636.2	3,770	1636.4	6,440	1636.8
FO	Outlet of Boulder Highway Culverts	1,200	1637.6	3,040	1638.4	3,770	1638.6	6,440	1638.8
F	Boulder Highway (HGY 93, 95) Culvert								
FI	Inlet of Boulder Highway Culverts	1,200	1638.9	3,040	1641.5	3,770	1642.7	6,440	1644.7
G	50' U.S. of Boulder Highway culvert inlet	1,200	1640.8	3,040	1641.6	3,770	1642.7	6,440	1644.7
H	800' W. of Boulder Highway	1,310	1649.6	3,070	1650.3	3,810	1650.6	6,550	1651.2
I	2000' E. of Stephanie Street	1,310	1654.8	3,070	1655.6	3,810	1655.9	6,550	1656.5
J	50 feet d.s. of Stephanie Street	1,310	1662.1	3,070	1663.6	3,810	1664.0	6,550	1665.7
K	Stephanie Street road crossing								
L	50 ft. U.S. of Stephanie Street	1,310	1663.7	3,070	1665.6	3,810	1666.3	6,550	1668.7
M	1650 feet U.S. of Stephanie Street	1,310	1668.1	3,070	1669.7	3,810	1670.2	6,550	1672.1
N	Projection of Denning St. across Duck Creek	1,310	1686.5	3,070	1687.1	3,810	1687.4	6,550	1687.9
O	Approx. 300' E. of Nellis Blvd. extension	1,310	1725.3	3,070	1727.5	3,810	1728.1	6,550	1730.1
P	Approx. 2300' NE of Maple Ave (Russell Rd.)	1,310	1754.6	3,070	1756.8	3,810	1757.4	6,550	1759.4
Q	Approx. 2200' NE of Maple Ave (Russell Rd.)	1,310	1760.4	3,070	1762.6	3,810	1763.2	6,550	1765.2
R	Approx. 500' U.S. of Russell Rd.	1,310	1829.0	3,070	1830.0	3,810	1830.2	6,550	1830.7
S	Approx. ½ mile SE of Russell Rd.	1,310	1858.6	3,070	1859.2	3,810	1859.4	6,550	1860.0
T	At projection of Lamb Blvd. and Duck Creek	1,310	1876.9	3,070	1879.3	3,810	1880.0	6,550	1881.7
U	Approx. 350 ft. U.S. of Silvestri Lane	1,310	1907.1	3,080	1908.0	3,810	1908.3	6,490	1909.1
V	500' north of Sunset Road	1,310	1921.4	3,080	1922.1	3,810	1922.4	6,490	1923.0
W	150' north of Sunset Road	1,230	1926.7	3,120	1927.7	3,860	1927.9	6,550	1925.5
X	150' south of Sunset Road	1,230	1930.0	3,120	1930.5	3,860	1930.8	6,550	1931.3
Y	600' south of Happy Lane	1,230	1938.4	3,120	1939.7	3,860	1940.1	6,550	1940.8
Z	300' south of Pama Lane	1,230	1947.9	3,120	1949.0	3,860	1949.4	6,550	1950.1
AA	Approx. 500' south of Manle Ave.	1,230	1960.1	3,120	1961.0	3,860	1961.2	6,550	1962.0
AB	Approx. 2000' D.S. of Pecos Rd extension	1,230	1969.5	3,120	1970.3	3,860	1970.6	6,550	1971.2
AC	200' D.S. of Pecos Rd. extension	1,230	1975.1	3,120	1975.8	3,860	1976.0	6,550	1976.6
AD	700' U.S. of Tomiyasu Lane	1,230	1997.8	3,120	1999.8	3,860	2000.0	6,550	2000.7
AE	1000' D.S. of Warm Springs Rd.	1,230	2014.2	3,120	2014.8	3,860	2014.9	6,550	2015.3
AF	400' D.S. of Warm Springs Rd.	1,230	2023.3	3,120	2025.9	3,860	2026.2	6,550	2027.4
AG	Duck Creek @ Union Pacific RR tracks	1,230	2024.1	3,120	2026.7	3,860	2026.9	6,550	2027.4
AH	130' U.S. of Union Pacific RR tracks	1,230	2024.7	3,120	2027.1	3,860	2027.5	6,550	2028.6

USDA-SCS-PORTLAND, OR. 1979

FLOOD HAZARD ANALYSES

DUCK CREEK

Table C-2 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)
	DUCK CREEK TRIBUTARY								
A	200' U.S. of Boulder Highway culverts	400	1642.9	750	1643.3	920	1643.8	1,380	1645.1
B	3270' U.S. of Boulder Highway culverts	400	1667.2	750	1667.8	920	1668.0	1,380	1668.7
C	Stephanie St. @ Duck Creek Tributary	400	1682.9	750	1683.5	920	1683.9	1,380	1684.6
D	Approx. 1200' U.S. of Stephanie St.	400	1689.4	750	1689.7	920	1689.9	1,380	1690.2

USDA-SCS-PORTLAND, OR 1979

FLOOD HAZARD ANALYSES

FLAMINGO WASH

Table C-3 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)
A	1/2 mile E. of Nellis Blvd.	1,580	1712.1	3,670	1712.6	4,610	1712.7	7,690	1713.1
B	50' D.S. Nellis Blvd. culverts	1,580	1724.5	3,670	1726.0	4,610	1726.5	7,690	1727.8
CO	Outlet Nellis Blvd. culvert	1,580	1726.6	3,670	1728.2	4,610	1728.7	7,690	1730.1
C	Nellis Boulevard culverts								
CI	Inlet Nellis Blvd. culvert	1,580	1727.7	3,670	1729.1	4,610	1729.4	7,690	1730.5
D	100 feet U.S. Nellis Blvd.	1,580	1727.7	3,670	1729.1	4,610	1729.4	7,690	1730.5
E	280 feet U.S. Nellis Blvd.	1,580	1728.0	3,670	1729.2	4,610	1729.5	7,690	1730.6
F	1/2 mile West of Nellis Blvd.	1,580	1740.8	3,670	1741.6	4,610	1741.8	7,690	1742.4
G	50 feet east of Lamb Blvd.	1,580	1770.4	3,670	1772.2	4,610	1773.0	7,690	1774.7
HO	Outlet Lamb Blvd. culverts	1,580	1771.4	3,670	1773.4	4,610	1774.1	7,690	1776.0
H	Lamb Boulevard culverts								
HI	Inlet Lamb Blvd. culverts	1,580	1772.4	3,670	1777.1	4,610	1778.1	7,690	1779.9
I	50' West of Lamb Blvd.	1,580	1772.8	3,670	1777.1	4,610	1778.1	7,690	1779.9
J	0.4 mile W. of Lamb Blvd.	1,580	1786.6	3,670	1787.8	4,610	1788.1	7,690	1789.0
K	80 feet east of Boulder Highway	1,110	1798.0	2,610	1799.5	3,430	1800.0	5,810	1801.1
LO	Outlet of Boulder Highway bridge	1,110	1798.4	2,610	1799.9	3,430	1800.5	5,810	1801.6
L	Boulder Highway bridge								
LI	Inlet of Boulder Highway bridge	1,110	1799.4	2,610	1803.0	3,430	1803.7	5,810	1805.0
M	100 feet west of Boulder Highway	1,110	1801.1	2,610	1803.1	3,430	1803.7	5,810	1804.7
N	310 feet west of Boulder Highway	1,110	1803.5	2,610	1805.2	3,430	1806.0	5,810	1807.3
O	250 feet south of Vegas Valley Dr. projection	1,110	1815.5	2,610	1817.3	3,430	1818.1	5,810	1819.9
P	50 feet east of Mojave Road culverts	1,110	1846.6	2,610	1848.5	3,430	1849.0	5,810	1849.8
QO	Outlet of Mojave Road culverts	1,110	1849.8	2,610	1852.1	3,430	1852.6	5,810	1853.3
Q	Mojave Road culverts								
QI	Inlet Mojave Road culverts	1,110	1850.0	2,610	1852.2	3,430	1852.9	5,810	1853.7
R	50' U.S. of Mojave Rd.	1,110	1850.4	2,610	1852.4	3,430	1853.1	5,810	1853.9
S	100' north of Desert Inn Rd.	1,110	1861.1	2,610	1862.5	3,430	1863.1	5,810	1864.2
TO	Outlet of Desert Inn Rd. culverts	1,110	1862.1	2,610	1863.6	3,430	1864.1	5,810	1865.2
T	Desert Inn Road culverts								
TI	Inlet of Desert Inn Rd. culverts	1,110	1862.6	2,610	1866.0	3,430	1868.5	5,810	1870.8
U	100' south of Desert Inn Rd.	1,110	1865.4	2,610	1867.0	3,430	1868.5	5,810	1870.8
V	Approx. 350' s. of Emerson Ave.	1,110	1884.6	2,610	1886.1	3,430	1886.6	5,810	1887.8
W	100' east of Eastern Ave.	1,110	1906.5	2,610	1907.7	3,430	1908.2	5,810	1909.5
XO	Outlet of Eastern Ave. bridge	1,110	1907.3	2,610	1908.5	3,430	1909.0	5,810	1910.3
X	Eastern Avenue bridge								
XI	Inlet of Eastern Avenue bridge	1,110	1911.3	2,610	1915.8	3,430	1916.7	5,810	1917.7
Y	120 feet west of Eastern Ave.	1,110	1911.3	2,610	1915.8	3,430	1916.7	5,810	1917.7
Z	100 feet east of Spencer Street	1,110	1937.5	2,610	1939.1	3,430	1939.7	5,810	1940.9
AAO	Outlet of Spencer St. culverts	1,110	1938.5	2,610	1940.0	3,430	1940.6	5,810	1942.2
AA	Spencer Street culverts								
AAI	Inlet of Spencer St. culverts	1,110	1939.0	2,610	1942.0	3,430	1943.9	5,810	1945.1
AB	100 feet west of Spencer Street	1,110	1940.3	2,610	1942.6	3,430	1944.2	5,810	1945.6

USDA-SCS-PORTLAND, OR 1979

FLOOD HAZARD ANALYSES

FLAMINGO WASH

Table C-3 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)
AC	200 feet east of Maryland Parkway	1,110	1966.8	2,610	1969.2	3,430	1970.1	5,810	1971.8
AD	100 feet east of Maryland Parkway bridge	1,110	1973.7	2,770	1976.1	3,500	1976.8	5,930	1978.6
AEO	Outlet of Maryland Parkway bridge	1,110	1981.1	2,770	1983.5	3,500	1984.2	5,930	1986.0
AE	Maryland Parkway bridge								
AEI	Inlet of Maryland Parkway bridge	1,110	1982.7	2,770	1987.7	3,500	1988.3	5,930	1989.1
AF	115' west of Maryland Parkway	1,110	1982.8	2,770	1987.7	3,500	1988.3	5,930	1989.2
AG	Approx. 1/4 mile west of Maryland Parkway	1,110	1994.5	2,770	1996.6	3,500	1997.1	5,930	1998.7
AH	100' east of Swenson Street	1,110	2014.2	2,770	2015.4	3,500	2015.8	5,930	2017.0
AIO	Outlet of Swenson St. culverts	1,110	2016.0	2,770	2017.3	3,500	2017.7	5,930	2018.6
AI	Swenson Street culverts								
AII	Inlet of Swenson St. culverts	1,110	2022.5	2,770	2023.2	3,500	2023.4	5,930	2023.9
AJ	100' west of Swenson St.	1,110	2022.5	2,770	2023.2	3,500	2023.5	5,930	2023.9
AK	1/4 mile east of Paradise Rd.	1,110	2031.1	2,770	2032.6	3,500	2033.2	5,930	2034.2
AL	100' east of Paradise Rd. bridge	1,010	2042.7	2,540	2043.3	3,330	2043.6	5,590	2044.1
AMO	Outlet of Paradise Rd. bridge	1,010	2045.2	2,540	2045.8	3,330	2046.0	5,590	2046.5
AM	Paradise Road bridge								
AMI	Inlet of Paradise Rd. bridge	1,010	2047.3	2,540	2048.2	3,330	2048.6	5,590	2049.3
AN	100' west of Paradise Rd.	1,010	2047.3	2,540	2048.3	3,330	2048.6	5,590	2049.3
AO	75' east of Suzanne Rd.	1,010	2070.8	2,540	2071.3	3,330	2071.5	5,590	2072.0
AP	100' west of Suzanne Rd.	1,010	2074.4	2,540	2075.0	3,330	2075.2	5,590	2075.7
AQ	275' west of Suzanne Rd.	1,010	2076.5	2,540	2077.2	3,330	2077.3	5,590	2077.7
AR	167' east of Las Vegas Blvd.	1,010	2098.5	2,540	2100.1	3,330	2101.6	5,590	2102.3
ASO	Outlet of Las Vegas Blvd. bridge	1,010	2099.3	2,540	2100.8	3,330	2102.3	5,590	2103.0
AS	Las Vegas Boulevard bridge								
ASI	Inlet of Las Vegas Blvd. bridge	1,010	2102.2	2,540	2104.6	3,330	2105.5	5,590	2106.7
AT	50 feet west of Las Vegas Blvd.	1,010	2102.2	2,540	2104.6	3,330	2105.5	5,590	2106.7
AU	195 feet west of Las Vegas Blvd.	1,010	2102.5	2,540	2104.6	3,330	2105.5	5,590	2106.4
AV	At ds end of concrete channel	1,010	2110.4	2,540	2111.5	3,330	2111.8	5,590	2112.5
AW	108' east of I-15 in concrete channel	1,010	2111.7	2,540	2113.1	3,330	2113.6	5,590	2115.3
AXO	Outlet of Interstate 15 bridge	1,010	2112.8	2,540	2114.3	3,330	2114.8	5,590	2116.5
AX	Interstate 15 bridge								
AXI	Inlet of Interstate 15 bridge	1,010	2116.6	2,540	2119.2	3,330	2120.3	5,590	2123.9
AY	115' west of Interstate 15 bridge	1,010	2116.6	2,540	2119.2	3,330	2120.3	5,590	2123.9
AZ	46' east of Industrial Road	1,010	2118.7	2,540	2120.2	3,330	2120.8	5,590	2122.6
BAO	Outlet of Industrial Road culvert	1,010	2119.7	2,540	2121.3	3,330	2121.9	5,590	2123.6
BA	Industrial Road overpass								
BAI	Inlet of Industrial Road culvert	1,010	2125.0	2,540	2127.8	3,330	2128.8	5,590	2132.3
BB	124' west of Industrial Road	1,010	2126.7	2,540	2128.3	3,330	2128.8	5,590	2131.3
BC	185' east of Union Pacific railroad	1,010	2128.4	2,540	2129.9	3,330	2130.5	5,590	2132.3
BD	50' east of Union Pacific railroad	1,010	2131.4	2,540	2132.6	3,330	2133.1	5,590	2134.4
BEO	Outlet of Union Pacific RR culvert	1,010	2131.9	2,540	2133.1	3,330	2133.6	5,590	2134.9
BE	Union Pacific Railroad culvert								

USDA SCS-PORTLAND, OR. 1979

FLOOD HAZARD ANALYSES

FLAMINGO WASH

Table C-3 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)
BEI	Inlet of Union Pacific RR culvert	1,010	2134.7	2,540	2136.0	3,330	2136.5	5,590	2138.0
BF	125' west of Union Pacific RR	1,010	2136.5	2,540	2137.9	3,330	2138.3	5,590	2139.4
BG	Approx. 400' west of Valley View Blvd.	1,010	2154.0	2,540	2155.1	3,330	2155.4	5,590	2156.1
BH	Approx. 1/4 mi. west of Valley View Blvd.	1,010	2161.9	2,540	2162.7	3,330	2163.1	5,590	2163.8
BI	Flamingo Wash at Arville Street	1,010	2193.4	2,540	2193.9	3,330	2194.0	5,590	2194.5
BJ	1000' SW of Arville Street	1,010	2204.0	2,540	2204.5	3,330	2205.9	5,590	2207.0
BK	100' east of Cameron Street	1,010	2222.3	2,540	2223.3	3,330	2223.7	5,590	2224.6
BL	400' east of Decatur Blvd.	1,010	2232.8	2,540	2233.9	3,330	2234.3	5,590	2235.2
BM	1/4 mi. west of Decatur Blvd.	1,070	2244.4	2,490	2245.0	3,250	2245.3	5,510	2245.8
BN	1/2 mi. west of Decatur Blvd.	1,070	2261.7	2,490	2262.4	3,250	2262.7	5,510	2263.3
BO	650 feet east of Jones Blvd.	1,070	2275.6	2,490	2277.3	3,250	2278.2	5,510	2279.9
BP	Flamingo Wash at Jones Blvd.	1,070	2289.4	2,490	2290.0	3,250	2290.3	5,510	2290.9
BQ	2300' west of Jones Blvd.	1,070	2313.6	2,490	2314.8	3,250	2315.3	5,510	2316.2
BR	900' downstream of W. Tropicana Ave.	1,070	2328.5	2,490	2330.2	3,250	2330.5	5,510	2331.5
BS	50' downstream W. Tropicana Ave. culverts	1,070	2331.0	2,490	2332.7	3,250	2333.4	5,510	2334.9
BTO	Outlet Tropicana Ave. culverts	1,070	2331.1	2,490	2332.9	3,250	2333.6	5,510	2335.3
BT	Tropicana Avenue culverts								
BTI	Inlet Tropicana Ave. culverts	1,070	2335.1	2,490	2339.1	3,250	2339.6	5,510	2340.6
BU	70 feet SW of Tropicana Ave.	1,070	2335.1	2,490	2339.1	3,250	2339.7	5,510	2340.6
BV	150 feet SW of Tropicana Ave.	1,070	2335.5	2,490	2339.1	3,250	2339.7	5,510	2340.7
BW	900 feet east of Rainbow Blvd.	1,070	2339.1	2,490	2341.6	3,250	2343.1	5,510	2344.2
BX	Flamingo Wash at Rainbow Blvd.	1,080	2345.8	2,650	2346.6	3,400	2347.1	5,630	2347.9
BY	2000 feet west of Rainbow Blvd.	1,080	2375.9	2,650	2376.5	3,400	2376.6	5,630	2377.2

USDA SCS-PORTLAND, OR 1979

FLOOD HAZARD ANALYSES

TROPICANA WASH

Table C-4 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)
A	90' north of Flamingo Road	610	2013.7	1,220	2014.8	1,500	2015.3	2,330	2016.2
BO	Outlet of Flamingo Road culverts	610	2019.7	1,220	2020.8	1,500	2021.2	2,330	2022.1
B	Flamingo Road culverts								
BI	Inlet of Flamingo Road culverts	610	2020.9	1,220	2021.3	1,500	2021.5	2,330	2022.3
C	100' south of Flamingo Road	610	2021.0	1,220	2021.5	1,500	2021.7	2,330	2022.4
D	Approx. 500' east of Paradise Road	610	2036.4	1,220	2036.9	1,500	2037.2	2,330	2037.5
E	50 feet east of Paradise Road	610	2042.1	1,220	2042.5	1,500	2042.6	2,330	2043.0
FO	Outlet of Paradise Road culverts	610	2045.5	1,220	2046.2	1,500	2046.4	2,330	2046.7
F	Paradise Road culverts								
FI	Inlet of Paradise Road culverts	610	2045.5	1,220	2046.4	1,500	2046.7	2,330	2047.4
G	70 feet west of Paradise Road	610	2045.5	1,220	2046.4	1,500	2046.7	2,330	2047.4
H	Approx. 400' west of Paradise Road	610	2046.6	1,220	2047.1	1,500	2047.4	2,330	2047.9
I	100' north of Harmon Road	610	2060.7	1,220	2061.5	1,500	2062.0	2,330	2062.7
JO	Outlet of Harmon Road culverts	610	2063.1	1,220	2064.0	1.500	2064.3	2,330	2065.0
J	Harmon Road culverts								
JI	Inlet of Harmon Road culverts	610	2065.0	1,220	2065.8	1,500	2066.2	2,330	2066.8
K	75' south of Harmon Road	610	2065.7	1,220	2066.7	1,500	2067.1	2,330	2067.9
L	122' east of Koval Lane	610	2079.0	1,220	2079.9	1,500	2080.2	2,330	2080.9
MO	Outlet of Koval Lane bridge	610	2080.2	1,220	2081.0	1,500	2081.3	2,330	2082.0
M	Koval Lane bridge								
MI	Inlet of Koval Lane bridge	610	2081.1	1,220	2082.9	1,500	2083.6	2,330	2085.6
N	100' west of Koval Lane	610	2081.9	1,220	2083.3	1,500	2083.9	2,330	2085.7
O	Approx. 600' west of Koval Lane	610	2083.3	1,220	2084.6	1,500	2085.1	2,330	2086.5
P	100' east of Las Vegas Blvd.	630	2110.1	1,210	2110.9	1,520	2111.3	2,330	2112.1
QO	Outlet of Las Vegas Blvd. bridge	630	2110.4	1,210	2111.3	1,520	2111.7	2,330	2112.5
Q	Las Vegas Boulevard bridge								
QI	Inlet of Las Vegas Blvd. bridge	630	2116.8	1,210	2118.5	1,520	2119.4	2,330	2121.5
R	100' west of Las Vegas Blvd.	630	2117.1	1,210	2118.7	1,520	2119.5	2,330	2121.6
S	100' d. s. of Tropicana Ave. culverts	630	2126.8	1,210	2127.7	1,520	2128.0	2,330	2128.8
TO	Outlet of Tropicana Ave. culverts	630	2130.8	1,210	2131.5	1,520	2131.7	2,330	2132.3
T	Tropicana Avenue culverts								
TI	Inlet of Tropicana Ave. culverts	630	2133.4	1,210	2135.4	1,520	2136.3	2,330	2138.7
U	100' south of Tropicana Ave.	630	2133.9	1,210	2135.4	1,520	2136.3	2,330	2138.7
V	100' east of I-15	630	2142.2	1,210	2143.2	1,520	2143.5	2,330	2143.8
WO	Outlet of I-15 culverts	630	2143.9	1,210	2144.6	1,520	2145.1	2,330	2145.4
W	Interstate 15 culverts								
WI	Inlet of I-15 culverts	630	2145.7	1,210	2147.8	1,520	2148.7	2,330	2151.2
X	45 feet west of I-15	630	2145.9	1,210	2147.8	1,520	2148.7	2,330	2151.2
Y	Approx. 1500' west of I-15	510	2167.3	1,010	2168.0	1,280	2168.3	1,960	2168.9
Z	Approx. 200' east of Valley View Blvd.	510	2178.7	1,010	2179.8	1,280	2180.8	1,960	2181.4
AA	Tropicana Wash at Valley View Blvd.	510	2185.1	1,010	2185.6	1,280	2185.8	1,960	2186.2

USDA-SCS-PORTLAND, OR. 1979

FLOOD HAZARD ANALYSES

TROPICANA WASH

Table C-4 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)
AB	Approx. 650' west of Valley View Blvd.	510	2194.2	1,010	2195.1	1,280	2195.3	1,960	2195.8
AC	225' east of Union Pacific RR	510	2203.9	1,010	2204.3	1,280	2204.6	1,960	2205.0
ADO	Outlet of Union Pacific RR culvert	510	2205.7	1,010	2206.2	1,280	2206.5	1,960	2206.9
AD	Union Pacific Railroad culvert								
ADI	Inlet of Union Pacific RR culvert	510	2210.5	1,010	2214.2	1,280	2216.5	1,960	2218.5
AE	110' west of Union Pacific RR	510	2210.5	1,010	2214.2	1,280	2216.5	1,960	2218.5
AF	Approx. 1100' west of Union Pacific RR	510	2220.7	1,010	2221.3	1,280	2221.6	1,960	2222.2
AG	Tropicana Wash at Cameron Street	510	2242.6	1,010	2242.8	1,280	2242.9	1,960	2243.1
AH	1700' west of Cameron Stree	510	2261.0	1,010	2261.2	1,280	2261.3	1,960	2261.5
AI	1/2 mile west of Cameron Street	510	2269.9	1,010	2270.3	1,250	2270.5	1,910	2270.8
AJ	0.4 mile east of Jones Blvd.	510	2286.4	1,010	2286.9	1,250	2287.1	1,910	2287.6
AK	950' east of Jones Blvd.	510	2300.6	1,010	2301.2	1,250	2301.5	1,910	2301.9
AL	Approx. 1800' west of Jones Blvd.	510	2329.9	1,010	2330.8	1,250	2331.2	1,910	2331.9
AM	Approx. 1700' east of Rainbow Blvd.	510	2357.1	1,010	2358.2	1,250	2358.8	1,910	2359.6
AN	Tropicana Wash at West Russell Rd.	510	2387.1	1,010	2387.6	1,250	2388.0	1,910	2388.6
AO	Approx. 450' west of Rainbow Blvd.	460	2415.6	900	2415.7	1,100	2415.8	1,710	2416.0
AP	Approx. 4000' SW of Russell Rd. and Rainbow Bl.	460	2451.4	900	2452.1	1,100	2452.3	1,710	2452.8
	TROPICANA WASH TRIBUTARY								
A	Approx. 400' d.s. of Hacienda Ave.	80	2166.4	220	2166.8	280	2167.1	430	2167.4
B	Approx. 1/4 mi. NE of Valley View Bl & Russell	80	2192.6	220	2193.4	280	2193.9	430	2194.3
C	150' east of Valley View Blvd.	80	2209.6	220	2209.9	280	2210.1	430	2210.2
D	Tropicana Wash Trib. @ Valley View Blvd.	80	2212.6	220	2212.7	280	2212.9	430	2213.1
E	400' west of Valley View Blvd.	80	2215.5	220	2215.9	280	2216.2	430	2216.5
F	200' east of Union Pacific Railroad	80	2245.2	220	2245.6	280	2245.9	430	2246.2
G	50' east of Union Pacific RR culvert	80	2246.0	220	2246.5	280	2246.9	430	2247.2
HO	Outlet of Union Pacific RR culvert	80	2246.2	220	2246.7	280	2247.2	430	2247.5
H	Union Pacific Railroad culvert								
HI	Inlet of Union Pacific RR culvert	80	2246.4	220	2247.2	280	2247.8	430	2248.3
I	50' west of Union Pacific RR	100	2247.2	210	2247.7	260	2248.1	420	2248.5
J	Approx. 600' SW of Union Pacific RR culvert	100	2256.1	210	2256.5	260	2256.7	420	2257.0
K	Approx. 1800' SW of Union Pacific RR culvert	100	2271.3	210	2271.7	260	2272.0	420	2272.2
L	Approx. 3500' w. of U.P. RR and 2000' n. of W. Sunset Rd.	100	2313.6	210	2314.2	260	2314.7	420	2315.1

USDA-SCS-PORTLAND, OR. 1979

FLOOD HAZARD ANALYSES
LAS VEGAS CREEK

Table C-5 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)
A	71' east of Lamb Blvd.	660	1777.7	1,300	1779.2	1,600	1779.9	2,450	1780.9
BO	Outlet of Lamb Blvd. culvert	660	1777.9	1,300	1779.4	1,600	1780.0	2,450	1781.0
B	Lamb Boulevard culvert								
BI	Inlet of Lamb Blvd. culvert	660	1783.0	1,300	1783.9	1,600	1784.2	2,450	1785.1
C	78' west of Lamb Blvd.	660	1783.0	1,300	1783.9	1,600	1784.2	2,450	1785.1
D	1800' west of Lamb Blvd	660	1789.0	1,300	1790.5	1,600	1791.1	2,450	1794.0
E	Approx. 2550' west of Lamb Blvd.	660	1791.8	1,300	1793.2	1,600	1793.8	2,450	1795.4
F	Approx. 1230' east of Pecos Rd.	660	1796.6	1,300	1798.0	1,600	1798.6	2,450	1800.2
G	100' east of Pecos Rd.	660	1801.0	1,300	1802.5	1,600	1802.7	2,450	1803.6
HO	Outlet of Pecos Rd. culvert	660	1801.3	1,300	1802.9	1,600	1803.2	2,450	1803.8
H	Pecos Rd. culvert								
HI	Inlet of Pecos Rd. culvert	660	1803.0	1,300	1803.4	1,600	1803.5	2,450	1804.0
I	100' west of Pecos Rd.	660	1803.0	1,300	1803.5	1,600	1803.8	2,450	1804.4
J	Approx. 450' west of Pecos Rd.	660	1805.8	1,300	1806.6	1,600	1806.8	2,450	1807.5
K	100' east of Mojave Rd.	660	1814.6	1,300	1815.4	1,600	1815.6	2,450	1816.3
LO	Outlet of Mojave Rd. culverts	660	1815.0	1,300	1815.8	1,600	1816.1	2,450	1816.6
L	Mojave Road culverts								
LI	Inlet of Mojave Rd. culverts	660	1817.3	1,300	1818.5	1,600	1818.6	2,450	1819.0
M	100' west of Mojave Rd.	660	1817.3	1,300	1818.5	1,600	1818.6	2,450	1819.0
N	Approx. 390' west of Mojave Rd.	660	1821.1	1,300	1821.9	1,600	1822.1	2,450	1822.8
O	105' east of Eastern Ave.	660	1833.7	1,300	1834.5	1,600	1834.7	2,450	1835.4
PO	Outlet of Eastern Ave. culverts	660	1834.9	1,300	1835.7	1,600	1835.9	2,450	1836.5
P	Eastern Avenue culvert								
PI	Inlet of Eastern Ave. culvert	660	1836.2	1,300	1836.7	1,600	1836.8	2,450	1837.2
Q	100' west of Eastern Ave.	660	1836.2	1,300	1836.9	1,600	1837.1	2,450	1837.8
R	100' east of 21st Ave.	660	1846.5	1,300	1847.3	1,600	1847.5	2,450	1848.2
TO	Outlet of 21st Ave. culverts	660	1847.5	1,300	1848.3	1,600	1848.5	2,450	1849.1
S	21st Avenue culverts								
TI	Inlet of 21st Ave. culverts	660	1848.1	1,300	1848.7	1,600	1848.9	2,450	1849.5
T	100' west of 21st Ave.	660	1849.4	1,300	1850.2	1,600	1850.4	2,450	1851.1
U	100' east of 18th Ave.	660	1859.4	1,300	1860.2	1,600	1860.4	2,450	1861.1
VO	Outlet of 18th Ave. culverts	660	1860.9	1,300	1861.7	1,600	1862.0	2,450	1862.6
V	18th Ave. culverts								
VI	Inlet of 18th Ave. culverts	660	1861.8	1,300	1862.3	1,600	1862.6	2,450	1863.2
W	100' west of 18th Ave.	660	1863.4	1,300	1864.2	1,600	1864.4	2,450	1865.1
X	100' east of Bruce Ave.	660	1867.2	1,300	1868.0	1,600	1868.2	2,450	1868.9
YO	Outlet of Bruce Ave. culverts	660	1868.1	1,300	1868.9	1,600	1869.2	2,450	1869.8
Y	Bruce Avenue culverts								
YI	Inlet of Bruce Ave. culverts	660	1868.7	1,300	1869.2	1,600	1869.3	2,450	1869.8
Z	50' west of Bruce Ave.	660	1870.0	1,300	1870.5	1,600	1870.6	2,450	1871.0

USDA-SCS-PORTLAND, OR. 1979

FLOOD HAZARD ANALYSES

LAS VEGAS CREEK

Table C-5 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)	Discharge (CFS)	Elevation (NGVD)
AA	52' east of Fanatsy Lane	660	1893.0	1,300	1893.5	1,600	1893.6	2,450	1894.0
ABO	Outlet of Fanatsy Lane	660	1894.2	1,300	1894.7	1,600	1894.8	2,450	1895.2
AB	Fanatsy Lane culverts								
ABI	Inlet of Fanatsy Lane culverts	660	1895.0	1,300	1895.5	1,600	1895.6	2,450	1896.0
AC	132' west of Fanatsy Lane	660	1895.6	1,300	1896.1	1,600	1896.2	2,450	1896.6
AD	Outlet of 12 x 8 box culvert west of Las Vegas Blvd.	660	1904.7	1,300	1905.2	1,600	1905.3	2,450	1905.7

USDA-SCS-PORTLAND, OR. 1979

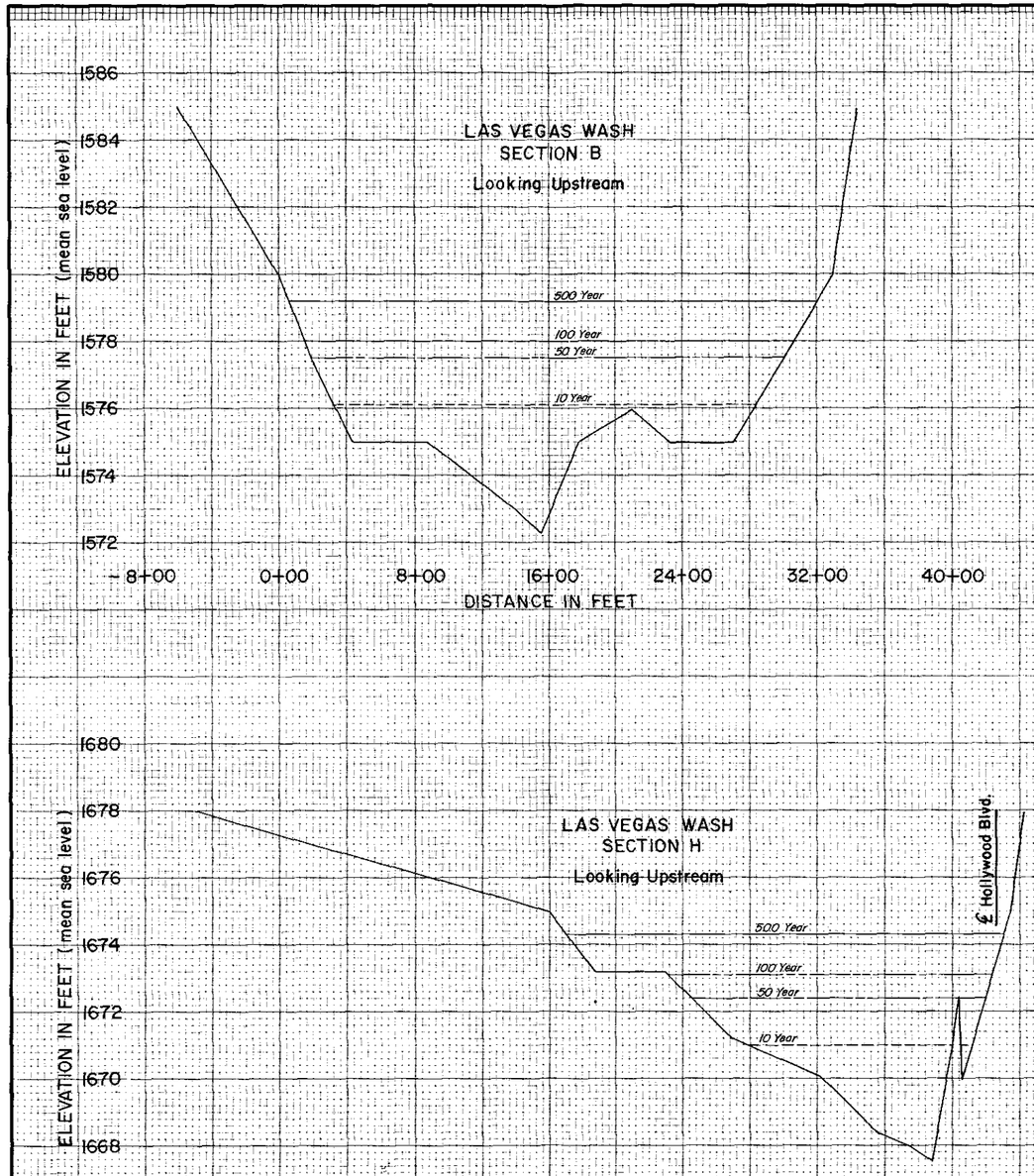
FLOOD HAZARD ANALYSES

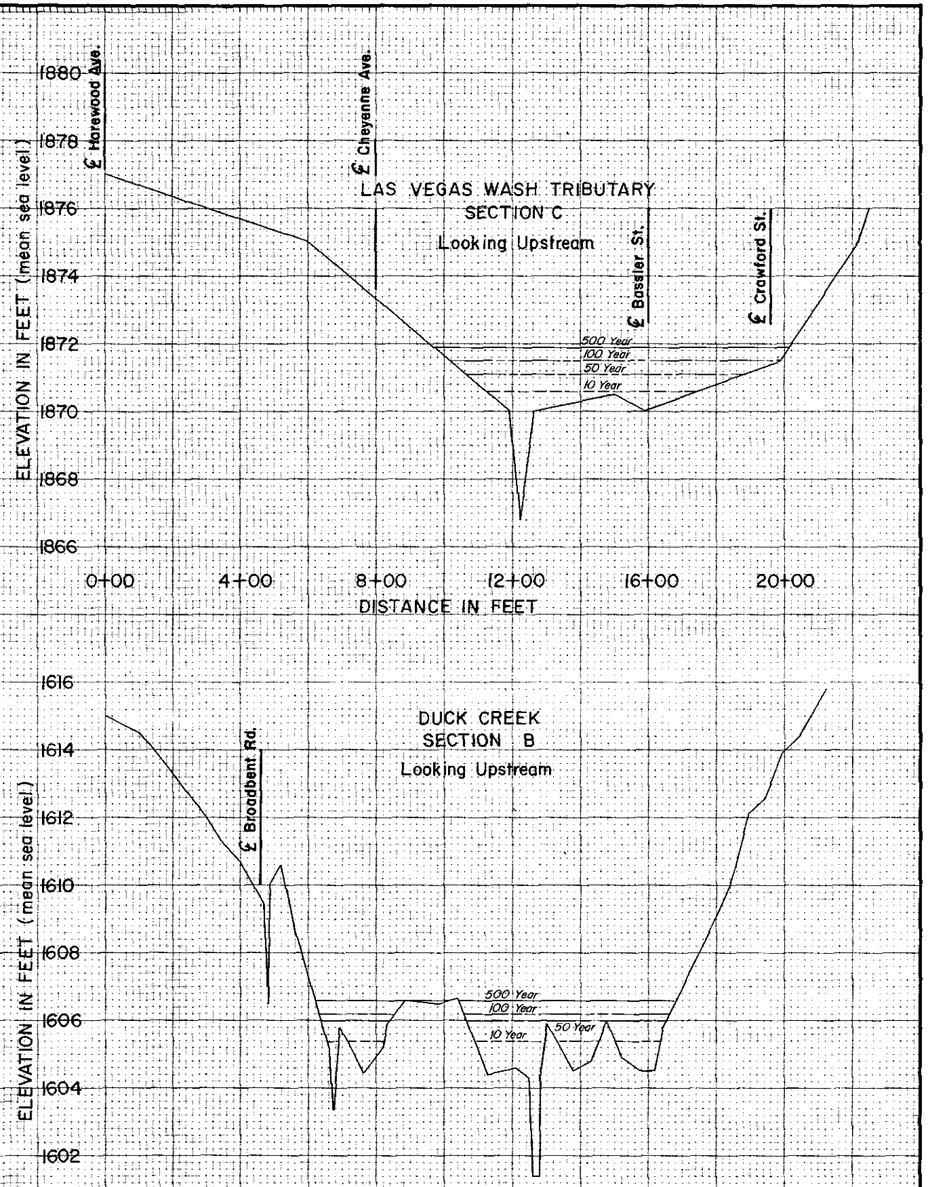
LAS VEGAS RANGE WASH

Table C-6 Water Surface Elevations and Discharges

Cross Section Number	Location	Flood Frequency — Existing Conditions							
		10 Year		50 Year		100 Year		500 Year	
		Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)	Discharge (cfs)	Elevation (NGVD)
A	Approx. 900' N. of E. Sahara extension	530	1711.4	1,500	1711.7	2,040	1711.8	3,930	1712.3
B	1/2 mi. S. of Charleston Blvd.	530	1720.5	1,500	1721.0	2,040	1721.1	3,930	1721.6
C	Las Vegas Range Wash @ Charleston Blvd.	530	1728.3	1,500	1728.6	2,040	1728.8	3,930	1729.1
D	600' N. of Charleston Blvd.	530	1729.6	1,500	1730.2	2,040	1730.3	3,930	1730.7
E	Las Vegas Range Wash @ Stewart Ave.	540	1737.2	1,530	1737.6	2,130	1737.8	4,040	1738.1
F	1100' N. of Stewart Ave.	540	1744.3	1,530	1744.7	2,130	1744.8	4,040	1745.2
G	100' S. of Harris Ave.	540	1755.8	1,530	1756.4	2,130	1756.6	4,040	1756.9
H	Las Vegas Range Wash at Washington Ave.	540	1761.7	1,530	1762.3	2,130	1762.5	4,040	1763.2
I	250' N. of Monroe Ave.	540	1768.3	1,530	1768.6	2,130	1768.6	4,040	1768.9
J	Approx. 300' S. of Lake Mead Blvd.	540	1786.6	1,530	1787.6	2,130	1787.8	4,040	1788.2
K	Las Vegas Range Wash at Carey Ave.	520	1795.8	1,070	1796.8	1,410	1797.2	2,240	1798.1
L	1/2 mile N. of Carey Ave.	520	1814.2	1,070	1815.4	1,410	1815.7	2,240	1816.5
M	Las Vegas Range Wash @ Cheyenne Ave.	520	1825.0	1,070	1825.3	1,410	1825.5	2,240	1825.9
N	180' S. of Las Vegas Blvd.	520	1851.1	1,070	1851.6	1,410	1851.7	2,240	1852.1
00	Outlet of Las Vegas Blvd. culverts	520	1851.6	1,070	1852.1	1,410	1852.3	2,240	1852.6
O	Las Vegas Boulevard culverts								
OI	Inlet of Las Vegas Blvd. culverts	520	1851.9	1,070	1852.8	1,410	1853.2	2,240	1854.5
P	50' N. of Las Vegas Blvd.	520	1852.2	1,070	1853.2	1,410	1853.7	2,240	1855.0
Q	Las Vegas Range Wash @ Craig Rd.	520	1869.8	1,070	1870.1	1,410	1870.1	2,240	1870.4
R	1/2 mile north of Craig Rd.	210	1890.9	500	1891.5	610	1891.6	1,020	1892.2
S	Approx. 1 mile north of Craig Rd.	210	1924.7	500	1925.0	610	1925.1	1,020	1925.3
T	1-1/3 mi. north of Craig Rd.	210	1943.9	500	1944.3	610	1944.6	1,020	1944.9

USDA-SCS-PORTLAND, OR 1979



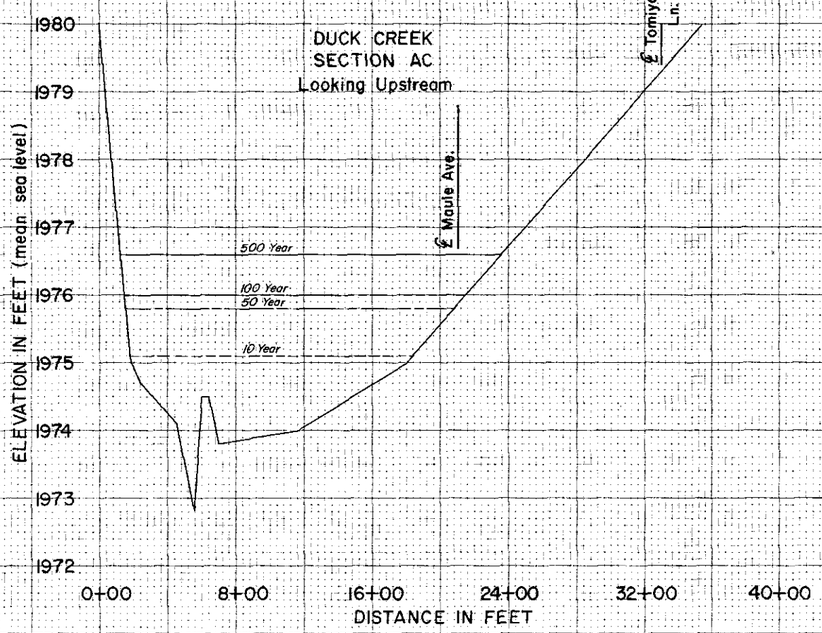


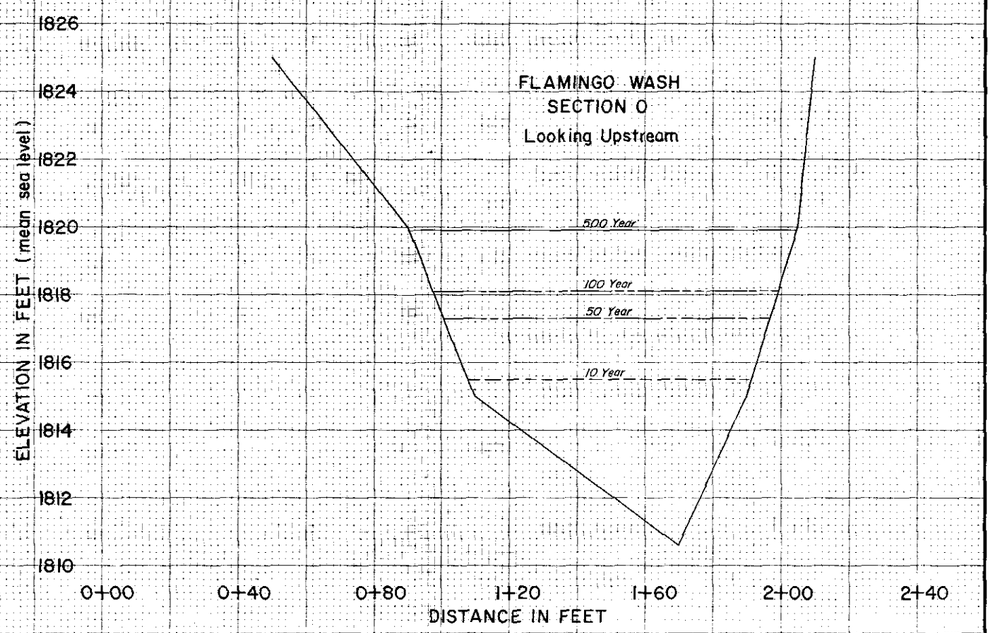
TYPICAL VALLEY CROSS SECTIONS

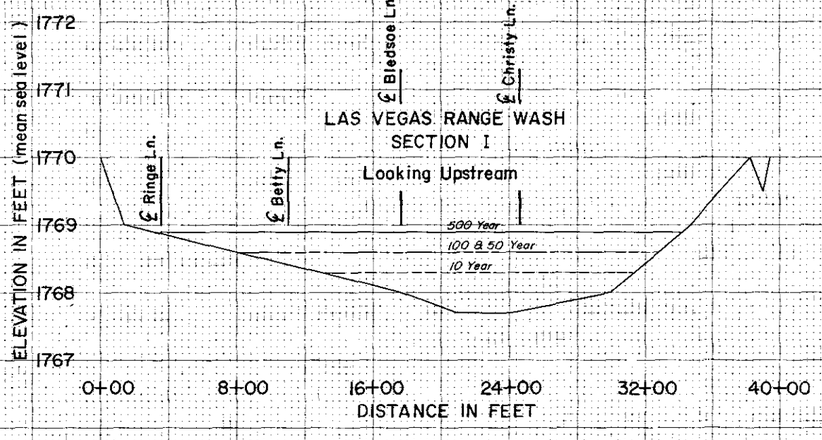
LAS VEGAS FLOOD HAZARD ANALYSIS

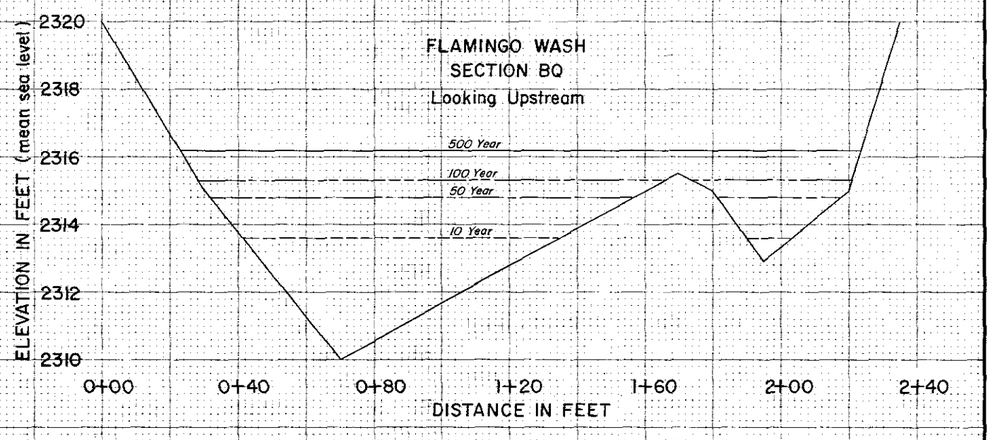
CLARK COUNTY, NEVADA

USDA Soil Conservation Service









TYPICAL VALLEY CROSS SECTIONS

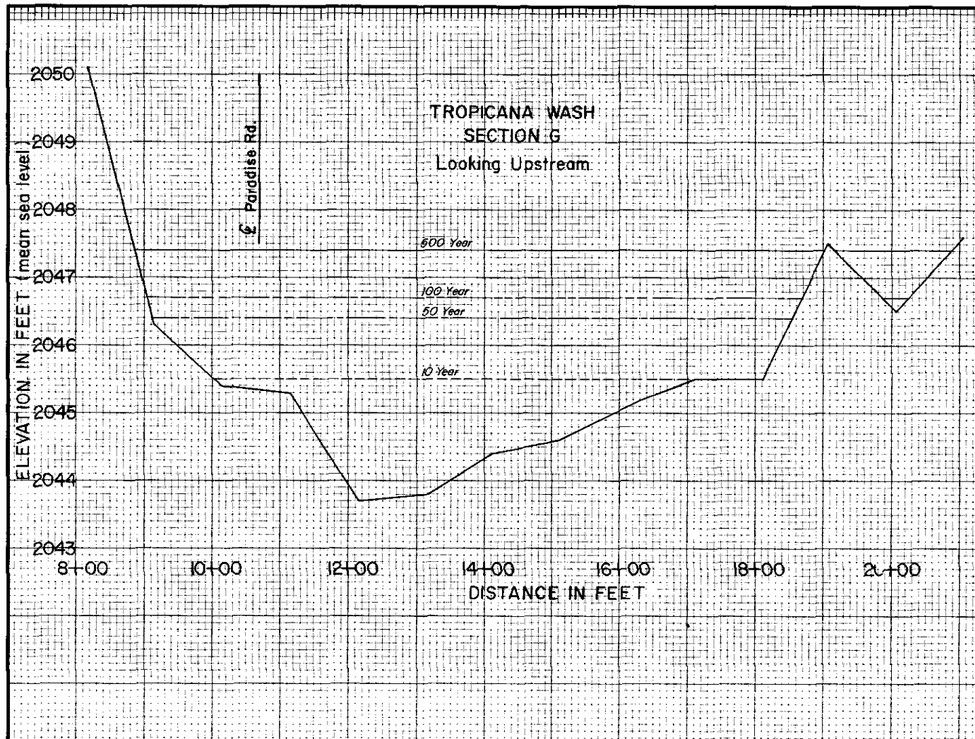
LAS VEGAS FLOOD HAZARD ANALYSIS

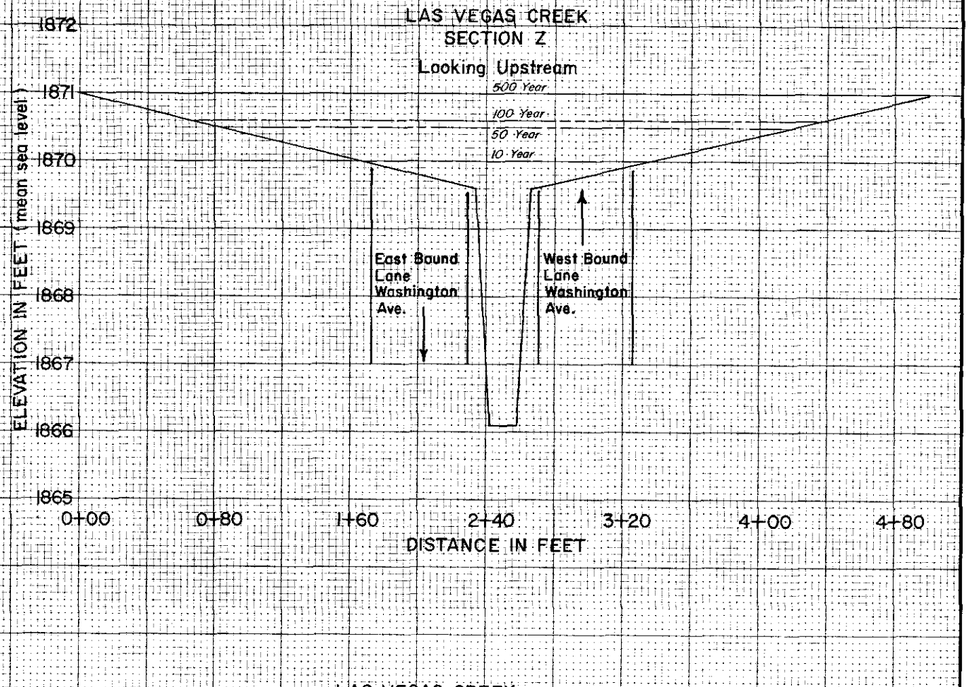
CLARK COUNTY, NEVADA

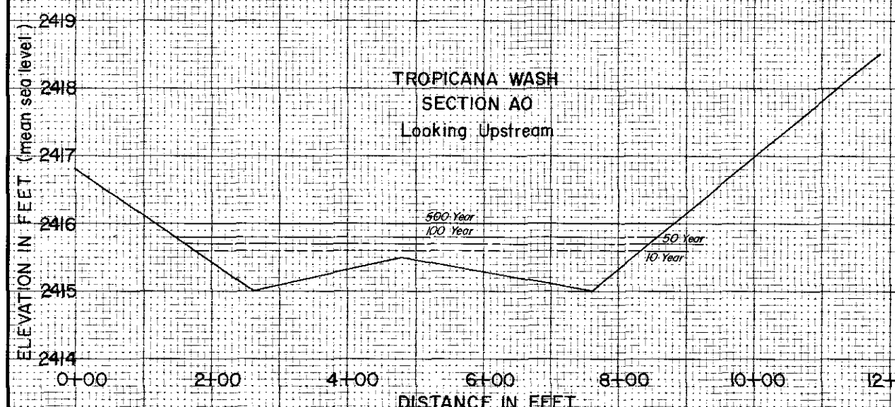
USDA Soil Conservation Service

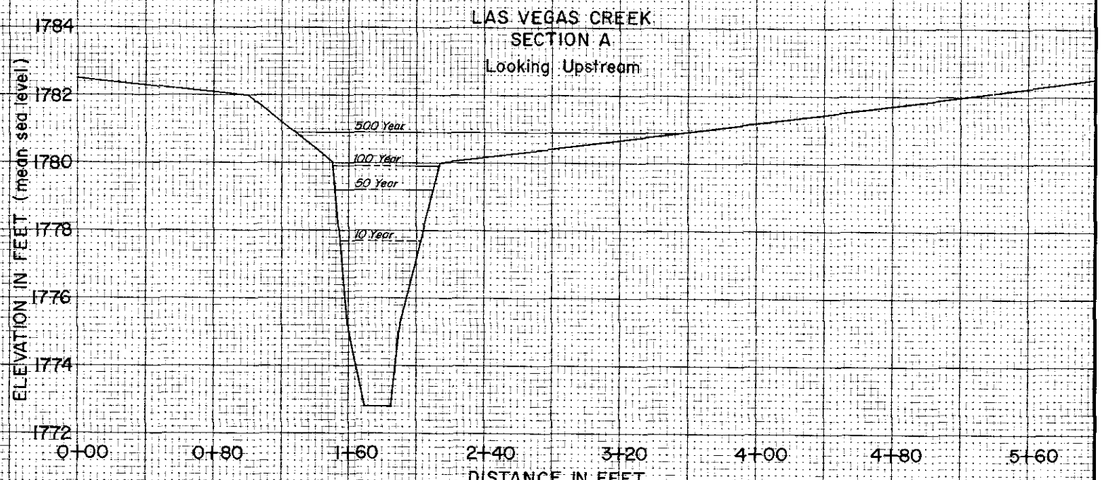
SHEET 2 OF 3

USDA SCS PORTLAND OR 1979









TYPICAL VALLEY CROSS SECTIONS
LAS VEGAS FLOOD HAZARD ANALYSIS
CLARK COUNTY, NEVADA

USDA Soil Conservation Service

SHEET 3 OF 3

USDA SCS-NORTH AND OR 1976