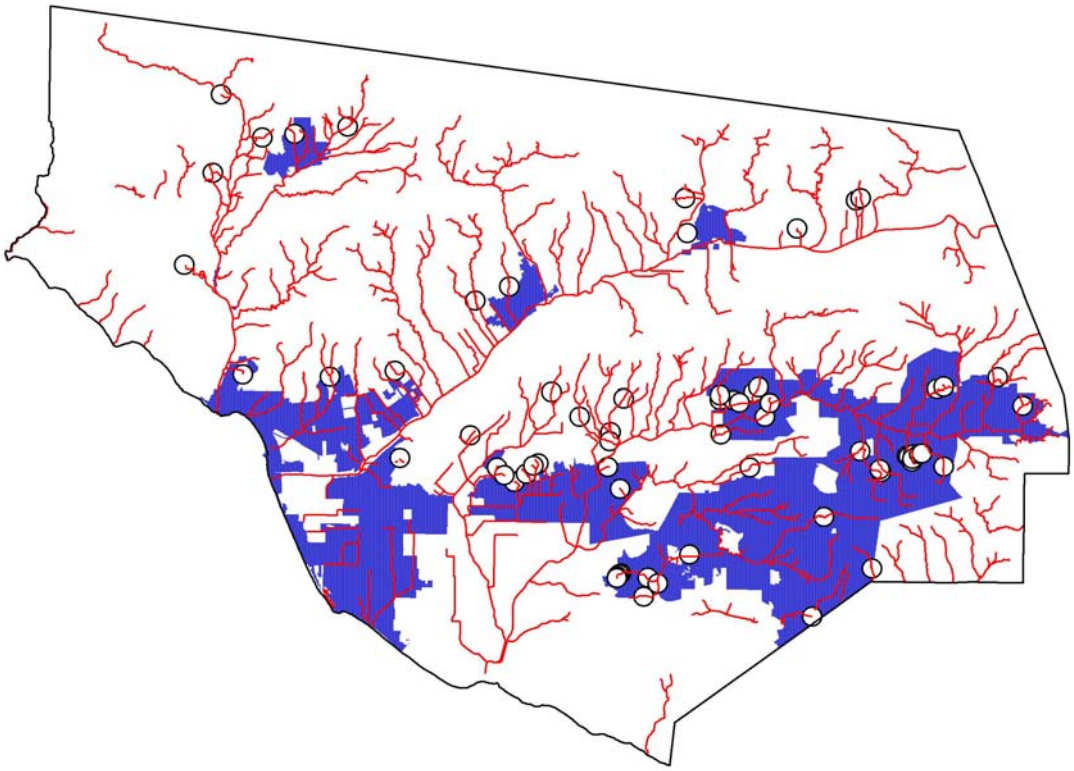
DEBRIS AND DETENTION BASINS



VENTURA COUNTY
WATERSHED PROTECTION DISTRICT
September, 2005

Acknowledgment

The District would like to express its appreciation for the work of Dolores Taylor, PE, the former manager of the Hydrology Section and Division Engineer. She was instrumental in developing the original versions of this Manual and many procedures used by the District. Her tireless efforts helped to protect the citizens of Ventura County from flood damage and other hazards for over 30 years. Although now retired, she continues to assist the District in many important ways. Thank you, DeDe!

Table of Contents

1.0 Introduction

Debris and detention basins play an important role in the control and attenuations of floodwaters and sediment in Ventura County. The Debris and Detention Basin Manual (Manual) provides an inventory of debris and detention basins in Ventura County owned and maintained by Ventura County Watershed Protection District (District). It provides a summary of the District and its basins, and summarizes the technical and hydrologic data for each basin. Basins have been grouped alphabetically in four sections corresponding to District Zones 1, 2, 3 and 4.

The information provided for each basin is as follows:

1. A summary of design data, construction data, and a list of reference drawing numbers including existing topographic maps of each basin.
2. Expected debris yields for design conditions and for six months after a watershed fire; capacity remaining at the time of the aerial surveys; date of any Presidentially-Declared Disasters due to flooding; basin debris removal dates and quantities; and Average Annual Debris Production (AADP) data.
3. Map with an aerial photo background showing the watershed area and land use at the date of the aerial photo (September 2004).
4. Street map showing a route to the maintenance access road for the basin.
5. Stage-discharge-capacity curve, which includes operational and emergency spillway flows, if available, up to flow rates expected in a 100-year event.

A summary of the detention and debris basin is provided in Table 1. The data provided in this Manual are not intended for use in hydrologic analyses to be submitted to the District for technical review. For these analyses, the Hydrology Section of the Planning and Regulatory Division of the District should be contacted to obtain the official reference information contained in their files.

VCWPD *Debris and Detention Basins*

Basin Name	Number	Year Constructed or Reconstructed	State Regulated Dam	Watershed Area	Flood Storage to Emergency Spillway	Expected Debris Production for 100-Year Storm	Emergency Spillway	Principal Spillway	Debris Bleeder
			(Y/N)	(acres)	(CY)	(CY)	(Y/N)	(Y/N)	(Y/N)
ZONE 1									
Dent Debris Basin	DB1-01	1981	N	19	4,100	1,624	Y	Y	N
Live Oak Diversion Dam	DD1-05	2002	N	794	45,527	20,952	Y	Y	N
McDonald Canyon Detention Basin	DD1-04	1998	N	573	32,393	20,179	Y	Y	Y
Stewart Canyon Creek Debris Basin	DB1-02	1963	Y	1,266	104,215	209,000	Y	Y	Y
ZONE 2									
Adams Barranca Debris Basin	DB2-07	1994	N	5,387	72,023	149,000	Y	N	Y
Arundell Barranca Detention Basin	DD2-06M	1995	Y	1,754	223,150	22,576	Y	Y	Y
Cavin Road Debris Basin	DB2-03	1933	N	90	4,100	13,413	N	Y	N
Fagan Canyon Debris Basin	DB2-08	1994	N	1,856	72,000	104,600	Y	N	Y
Franklin Barranca Debris Basin	DB2-01	1996	N	330	5,050	11,507	Y	Y	Y
Jepson Wash Debris Basin	DB2-02	1961	N	858	33,850	55,800	Y	N	Y
Real Wash Debris Basin	DB2-04	1964	N	160	22,000	11,500	Y	N	Y
Warring Canyon Debris Basin	DB2-05	2003	N	695	33,100	52,400	Y	Y	Y

VCWPD *Debris and Detention Basins*

Basin Name	Number	Year Constructed or Reconstructed	State Regulated Dam	Watershed Area	Flood Storage to Emergency Spillway	Expected Debris Production for 100-Year Storm	Emergency Spillway	Principal Spillway	Debris Bleeder
			(Y/N)	(acres)	(CY)	(CY)	(Y/N)	(Y/N)	(Y/N)
ZONE 3									
Castro Williams Debris Basin	DB3-06	2004	N	330	58,403	8,599	Y	Y	N
Coyote Canyon Debris Basin	DB3-15	1955	N	4,400	24,500	152,459	Y	N	Y
Crestview Debris Basin	DB3-10	1934	N	80	2,350	1,005	N	Y	N
Edgemore Debris Basin	DB3-11	1991	N	105	2,950	1,188	Y	N	Y
Erringer Road Debris Basin - Upper	DB3-12	1997	N	315	33,250	11,633	Y	Y	Y
Ferro Debris Basin	DB3-13	1985	Y	395	34,500	7,758	Y	Y	Y
Fox Barranca Debris Basin	DB3-14	1991	N	3,100	14,700	99,181	Y	N	Y
Gabbert Canyon Debris Basin	DB3-09	1963	N	2,350	16,300	56,900	Y	N	Y
Honda West Debris Basin	DB3-07	1955	N	740	10,350	55,662	Y	N	Y
Line "C" Arroyo Simi Detention Basin	DD3-30	1997	N	766	16,330	12,956	N	Y	Y
Lang Creek Debris Basin	DB3-31	2004	N	2,325	26,942	22,052	Y	N	Y
Lang Creek Detention Basin	DD3-31	2004	Y	2,325	425,270	0	Y	Y	N
Las Llajas Canyon Detention Dam	DD3-20	1980	Y	4,384	2,017,000	190,983	Y	Y	N
Las Posas Estates Detention Basin	DD3-08M	1992	N	168	24,684	1,018	Y	Y	Y

VCWPD *Debris and Detention Basins*

Basin Name	Number	Year Constructed or Reconstructed	State Regulated Dam	Watershed Area	Flood Storage to Emergency Spillway	Expected Debris Production for 100-Year Storm	Emergency Spillway	Principal Spillway	Debris Bleeder
			(Y/N)	(acres)	(CY)	(CY)	(Y/N)	(Y/N)	(Y/N)
Peach Hill Wash Retention Basin	DD3-23	1988	N	1,589	121,950	4,541	Y	Y	N
Ramona Detention Dam	DD3-16M	1992	N	254	41,230	3,732	Y	Y	Y
Runkle Canyon Detention Basin	DD3-17	1950	Y	958	161,000	41,613	Y	Y	Y
Santa Rosa Road Debris Basin No. 2	DB3-05	1957	N	1,101	49,000	12,505	Y	Y	Y
South Branch Arroyo Conejo Debris Basin	DB3-22	2003	N	2,542	50,417	100,850	Y	Y	Y
St. John's Debris Basin (To be transferred)	DB3-03	1957	N	240	50,000	2,849	Y	N	Y
Sycamore Canyon Dam	DD3-21	1981	Y	4,380	106,460	59,260	Y	Y	N
Tapo Hills No. 1 Detention Basin	DD3-18	1971	N	104	41,190	5,730	Y	N	Y
Tapo Hills No. 2 Debris Basin	DB3-19	1977	N	133	25,200	4,000	N	Y	Y
West Camarillo Hills East Branch Debris Basin	DB3-02	1955	N	92	1,840	1,432	Y	Y	Y
West Camarillo Hills West Branch Debris Basin	DB3-01	1986	N	74	5,250	1,268	Y	N	Y
ZONE 4									
Potrero Creek Sediment Control Basin	DB4-01	2002	N	1,541	5,628	10,340	Y	N	Y

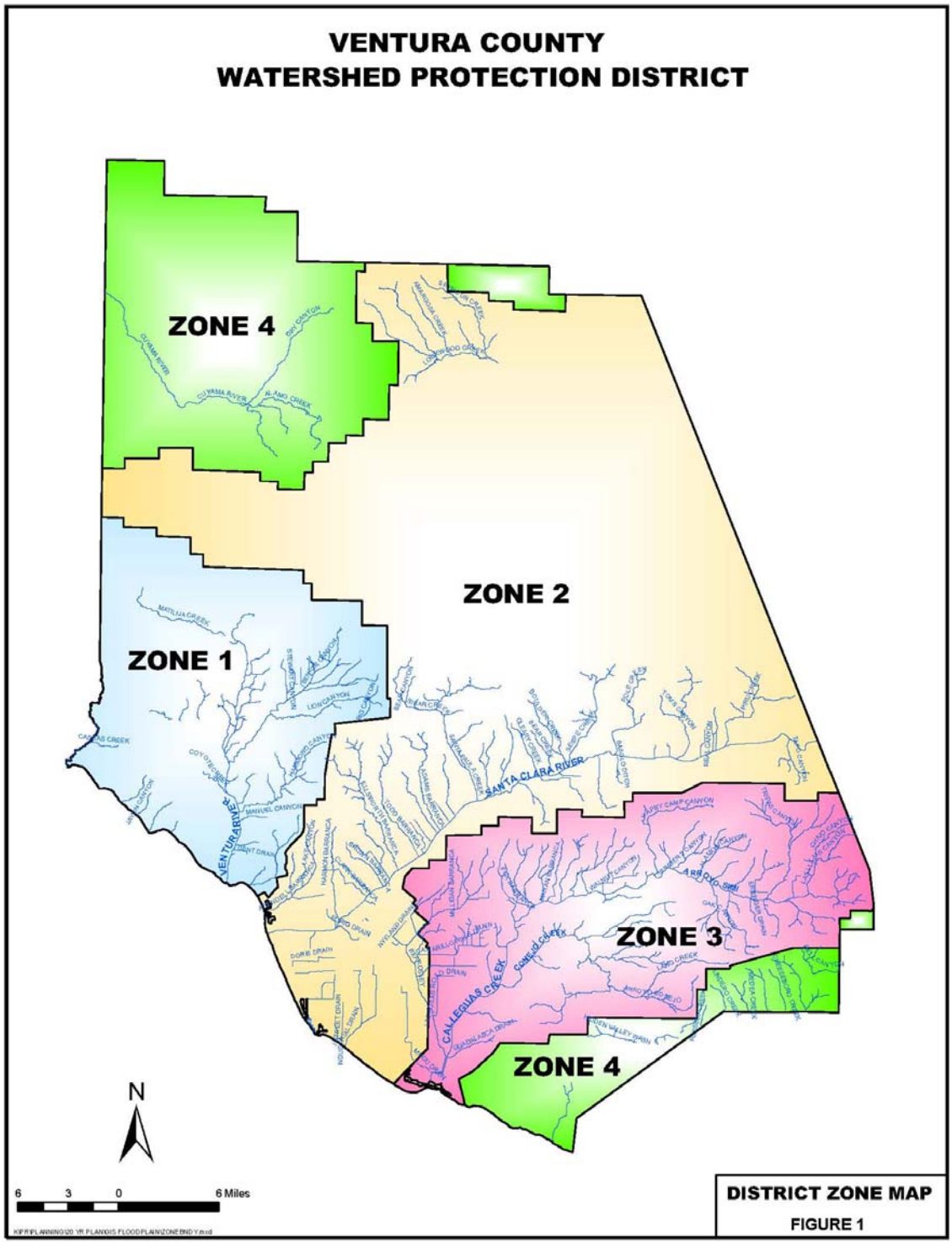
1.1 Watershed Protection District Description

The Ventura County Watershed Protection District (then known as the Ventura County Flood Control District) was formed on September 12, 1944, when the California State Legislature approved the Ventura County Flood Control Act. The District was formed, in part, to provide for the control and conservation of flood and storm waters and for the protection of watercourses, watersheds, public highways, life and property in the district from damage or destruction from these waters. On January 1, 2003, the name was changed to the Ventura County Watershed Protection District to reflect changes in community values, regulatory requirements, and funding opportunities. The name change also reflected the District's desire to emphasize integrated watershed management and solve flood control problems with environmentally sound approaches. The District's mission is to protect life, property, watercourses, watersheds, and public infrastructure from the dangers and damages associated with flood and stormwaters. Goals of the District include:

- Comprehensive, long range watershed planning
- Collaboration with watershed stakeholders
- Administration of adopted regulations, policies, and resolutions
- Responsible and accountable use of public resources
- Excellence in public service

The District's ongoing activities are funded through property taxes, benefit assessments, and land development fees. To facilitate management of revenues and projects, the District was divided into four zones, roughly corresponding to the major river systems in the county as shown in Figure 1. Zone 1 essentially follows the boundaries of the Ventura River Watershed and coastal drainages in the western part of the county. Zone 2 basically follows the boundaries of the Santa Clara River Watershed and local coastal drainages in the cities of San Buenaventura and Oxnard. Zone 3 essentially follows the boundaries of the Calleguas Creek Watershed and its tributaries. Zone 4 is a mixture of Malibu coastal drainages in the southern part of the county and the relatively undeveloped Cuyama River Watershed in the northern part of the county. Benefit assessment monies collected from each zone are dedicated to support operations and maintenance and NPDES (National Pollutant Discharge Elimination System) permit activities within that zone. Property tax monies raised within a zone are spent on construction projects and to support District planning studies within that zone.

The District's authority over its jurisdictional channels and basins is established through a number of ordinances and policies passed by its Board of Supervisors. The primary ordinance establishing District authority and the requirement to obtain permits for any encroachment into District jurisdictional channels, including rights-of-way, is Ordinance FC-18 ("An Ordinance Relating to the Protection and Regulation of Flood Control Facilities and Watercourses"), as amended by Ordinances FC-20, FC-21, FC-22, FC-23, and FC-27.


VENTURA COUNTY
WATERSHED PROTECTION DISTRICT
ZONE 4
ZONE 2
ZONE 1
ZONE 3
ZONE 4
SANTA CLARA RIVER
VENTURA RIVER
CALLEGUAS CREEK
N
6 3 0 6 Miles
DISTRICT ZONE MAP
FIGURE 1

1.2 Detention, Debris, and State-Size Basins

The District's basins play an important role in the control of floodwaters and sediment in Ventura County. The debris basins primarily capture sediment mobilized by stream and watershed erosion. Debris basins can also attenuate flood peaks if enough storage volume is available in the basin, depending on the design of the outlet works. Detention basins are primarily designed with outlet works and enough storage volume to significantly reduce flood peaks but can also capture sediment. If basin volumes or dam designs exceed certain state criteria, they are regulated as "State-Size" basins by the California State Division of Safety of Dams (DSOD). State-Size basins store more than 50 acre-feet of water or have dams that are more than 25-feet high and are inspected annually by DSOD. The District's State-Size basins include Matilija, Stewart, Lang Creek, Ferro, Sycamore and, Las Llajas Basins.

1.3 Sediment Equilibrium

Debris basins are designed to trap sediment that can deposit in channels during flow events. For example, during the storm event beginning January 8, 2005, the Pole Creek channel in the City of Fillmore was filled with sediment, leaving little or no capacity for runoff from the watershed and leading to channel overflow. The removal of the sediment from the flow in a debris basin would have decreased the overflow that occurred. However, sediment-reduced flow downstream of a debris basin has a greater sediment transport capacity, and can cause erosion in a downstream natural channel.

The observation of scour in natural channels downstream of debris basins has led to a better understanding of the concept of sediment equilibrium. Sediment equilibrium is reached when a natural channel has no net deposition or erosion, and when the sediment inflow to the reach equals the sediment outflow. Based on this, in some cases it may be better to design a channel with a slope that maintains the sediment balance than to provide a debris basin. Sediment transport models are designed to model the scour and deposition occurring in creek and river systems. The formulation of sediment transport models for Calleguas Creek and the Ventura River have led to a better understanding of the sediment equilibrium for these systems. A sediment transport model will be prepared for the Santa Clara River as part of the on-going Santa Clara Watershed Protection Plan.

1.4 Manual Updates

Technical data in this report will be updated periodically to reflect changes in storage capacity due to deposition, Average Annual Debris Production (AADP), basin clean-outs or structural modifications. Data regarding newly constructed debris basins will be added to the next manual revision following construction. Prior to their inclusion in this Manual, records for newly constructed basins will be available from the Hydrology Section files until an update is need. Updates are generally done following a storms leading to a Disaster Declaration, where debris basins are typically filled with sediment and require clean-out. Updates include debris dams that are upgraded to take advantage of detention potential. Updates also include basins that have been modified to provide adequate spillway capacity. Several such basins included in the

1999 update were Las Posas Estates, Ramona, and Arundell Barranca basins. The new basins included in this manual are the following:

Zone1
Live Oak Creek Diversion Dam
McDonald Canyon Detention Basin

Zone 2
None

Zone 3
Line "C" Arroyo Simi Detention Basin
Lang Ranch Dam- Debris and Detention Basins

Zone 4
Potrero Creek Sediment Control (Instream and Underwater Dike Structures)

The Castro-Williams Debris Basin has been added to the Manual after being deleted in 1980. The culvert outlet does not have sufficient capacity to pass the 100-yr flow and therefore canyon stores runoff during an extreme storm event. Analyses of the storm water runoff volume after the 2003 fire in the canyon led to the construction of a emergency spillway along the access road to provide for stormwater outflow from the canyon. San Antonio Creek Debris Basin has been destroyed and has been deleted from the Manual. St. John's Debris Basin has been modified from the design described in this manual as part of a developer project and responsibility for its operation and maintenance is being transferred to the developer.

Basins that have been constructed but have not yet been accepted for maintenance by the District are not included in this manual. These include Conejo Mountain Detention Basins 1 through 5, North Simi Drain Debris-Detention Basin, Oak Canyon Road Detention Basin, and Dos Vientos Detention Basin, Erringer Road (Covington) Basin, and Bridgegate Basin.

A recent study by GEI Consultants in 2004 entitled "Investigations of Detention Dams and Debris Basins" identified the basins that do not meet the District's design criteria and made recommendations for bringing them into compliance. Some of these recommendations have been incorporated as projects in the District's long-range capital facilities planning effort called the Integrated Watershed Protection Plan (Draft) first published in January, 2005.

2.0 Basin Data Summary

Many debris basins in the County were built by agencies other than the Watershed Protection District and topographic maps of the "as built" reservoir area initially were not available for computing design capacity. Because of Presidentially Declared Disasters, new topographical maps were produced following disaster debris removal to estimate basin volumes. Exceptions include basins where access has been blocked or the landowner has planted orchards in the access area. In Zone 2, Franklin Barranca is the only such basin. In Zone 3, an orchard has been planted in the Crestview Basin.

In Fiscal Years, 1969-1970, 1970-1971, and 1971-1972, aerial surveys were flown for topographic mapping of all debris basins except Dent, Ferro, Las Posas Estates, and Ramona. These maps served as a baseline to compare to other cleanout amounts and remaining capacities. In 1987, the method of calculating the remaining capacities was changed from an average-end area with 50-foot cross sections to the Digital Terrain Model (DTM) method that uses aerial topography data with a 5-foot resolution. The DTM method gives much higher accuracy for pay quantity estimates.

2.1 Basin Technical Data

The technical information included for each basin includes the following:

1. Whether a basin was designed to capture sediment (debris basin) or to attenuate storm inflow (detention basin). This information is included in the name of the basin.
2. Storage capacity based on a control of either the emergency spillway invert if one is present, or the top of the dam.
3. Operational and emergency spillway type and dimensions.
4. Dam length and elevation.
5. Watershed area and 100-year peak inflow based on hydrologic models of the watershed.
6. Construction data, including agency and year of construction.
7. Agency responsible for operation and maintenance.
8. Reference drawing numbers, including District as-built “Y-Drawing” numbers, Ventura County map numbers, and topographic drawing numbers where available. Copies of these maps are available from the Ventura County Survey and Mapping Counter.

2.2 Coordinates

The Lambert, NAD 27 California Zone 5 coordinates in feet of each debris dam are given for the longitudinal center-line of the spillway at the crest, (where a spillway exists). On dams without spillways the coordinates are for the midpoint on the centerline of the crest of the embankment. Spillway sizes and dam dimensions were field checked in 1982 for the basins constructed prior to that date.

2.3 Watershed and Access Maps

A map is provided for each basin showing the watershed boundary overlain on an aerial photo obtained in 2003. Watershed areas were previously delineated and planimetered on U.S. Geological Survey, 7-1/2

quadrangle maps. The current watershed boundaries were delineated as part of the effort to prepare a GIS watershed boundary shapefile for use in hydrologic analyses. The aerial photo shows the land uses in the watershed as of 2003. A street map is provided showing the best way to reach the basin for maintenance access and inspections.

2.4 Stage-Discharge-Storage Curves

To establish a consistent basis for discharge computations at each debris basin, stage-discharge curves were computed assuming all intake ports were flowing freely. Therefore, the stage-discharge curve shown represents the maximum potential discharge from each basin up to top of spillway (without freeboard). The stage-storage capacity curves published in this revised Manual are based on the latest DTM topography and debris slopes that were developed following the 1980 Disaster. The basin routing to estimate the peak outflow is done assuming the basin contains the debris design volume placed level in the basin at the beginning of the design storm.

2.5 Basin Outlet Design

Basin design has evolved over time to reflect better understanding of the issues associated with debris accumulation and blocking of outlet structures. Basins designed in the 1950s had perforated CMP pipe outlets to slowly drain ponded water and an emergency spillway to convey high flows through the basin. Newer designs provided operating spillways in the form of riser towers to increase flows out of the basin prior to inflow of the peak portion of the hydrograph. Grates were used to prevent trash and debris from blocking the risers and operating spillway inlets, and emergency spillways were reinforced with concrete to prevent possible dam erosion and failure during high flows. Subsequently, operating spillways were designed in a way to prevent vortices from limiting flow into the riser towers and provided with inclined grates to prevent trash from accumulating at the riser tower inlets and blocking the inflow. Newer emergency spillway design alternatives have included drop box inlets. The following figures show the various types of control structures used in District Basins.

Real Wash Debris Basin- Zone 2. Perforated CMP Debris Bleeder Riser Tower

Runkle Detention Basin-Zone 3. Operating Spillway- Perforated 48” RCP Riser with Grated Weir Inlet

Warring Canyon Debris Basin- Zone 2. Operating Spillway- Riser Tower with Debris Bleeder Orifice Inlets and Weir Inlet Top Protected with Inclined Trash Rack

Las Lllajas Detention Basin- Zone 3. Operating Spillway, Reinforced Concrete Riser Tower with Projecting Top and Side Inlets with Trash Rack

Real Wash Debris Basin- Zone 2. Emergency Spillway: Reinforced Concrete Rectangular Channel

Ferro Debris Basin- Zone 3. Emergency Spillway- Side Inlet Drop Box (riser tower in the background)

Adams Wash Debris Basin- Zone 2. Emergency Spillway, Three-Sided Drop Box Inlet (with attached perforated CMP debris bleeder)

2.6 Basin Label

Each basin has been assigned a label in one of the following formats: DBx-xx or DDx-xx. The first two letters indicate if the basin was designed primarily for debris capture (DB) or for detention (DD). The third character is the zone number, and the last two characters are the two digit numbers of the basins in each zone. The numbers are assigned based on the original basin construction date. If a basin has been reconstructed to provide additional storage volume or revise the outlet works, an "M" indicating that it has been modified is added to the name.

3.0 Debris

Debris design volumes for each basin are indicated as Level Capacity and Maximum Debris Capacity. Unless otherwise noted, both are calculated using the emergency spillway elevation (invert for rectangular channels and weir elevation for drop box inlets) as the control with the additional volume attainable with debris slope included in the Maximum Debris Capacity. If the basin does not have a spillway, the debris control point is assumed to be the top of the dam. Originally, maximum debris storage capacities were computed by assuming a debris slope extending upstream from the control elevation equal to 0.6 times the original streambed slope. Some basins are physically incapable of containing a sloped debris profile such as the Dent Debris Basin in Zone 1. For this basin, debris capacity is based assuming a debris slope of 0 percent. More recently, the basin maximum debris capacity has been calculated assuming that debris

could accumulate at a maximum slope of 2 percent based on field observations of full basins after Disasters.

3.1 Basin Debris Volume Design Criteria

Debris basins are designed to hold the 100-yr predicted design sediment volume if is sufficient land is available, but many debris basins could not be designed in this manner. Detention basins, designed to attenuate inflow peaks, are required to have sufficient volume for the 100-yr design sediment volume in order to ensure that they can provide detention. Current VCWPD detention basin design criteria for debris storage volumes are as follows:

1. For detention basins with tributary watersheds totaling less than five square miles, the volume required for debris storage is 125 percent of the debris volume expected from the 100-yr storm. This volume is assumed to be present in the basin at 0 percent slope prior to any flood routing.
2. For detentions basins with tributary watersheds totaling more than five square miles, the volume required for debris storage is the sum of 25-mean annual deposition volumes plus the design debris from one 100-yr storm prior to routing of the flood hydrograph.

Most of the detention basins were designed using Criterion 1 above. A number of the debris basins do not have sufficient storage for the 100-yr debris yield and therefore could possibly fill with sediment during extreme storm events. These basins are not expected to provide detention or attenuate peak flows except during relatively small storm events.

3.2 Debris Yield

Debris production rates are provided for the 100-year, 50-year, and 25-year storms assuming either design conditions (a fire has not occurred in the watershed for 4.5 years) or recent burn conditions (a complete burn occurred six months prior the design storm). Dr. Kevin Scott, USGS, published an extensive study of the transverse ranges in Ventura and Los Angeles Counties following the 1969 flood (Scott and Williams, 1974. “Erosion and Sediment Yields in the Mountain Watersheds of the Transverse Ranges, Ventura and Los Angeles Counties, California—Analysis of Rates and Processes). The study identified several parameters that affect the production rate including drainage area, 1-day rainfall, 10-day rainfall, slope failure areas contributing, fire factor, and watershed shape. A regression formula was developed with these parameters as follows:

$$SY = 17.54(A)^{0.828} \times (ER)^{1.382} \times (FF)^{0.251} \times (SF)^{0.375} \times (K)^{0.840}$$

The definitions of the various parameters are:

SY = Sediment Yield, cubic yards.

A = Area of the Watershed, square miles.

ER = Elongation Ratio. A ratio produced by dividing the diameter of a circle with an area equal to that of the watershed in square feet by the maximum watershed length measured in a straight line parallel to the main channel, also in feet.

FF = Fire Factor, The percentage of non-recovery of vegetative cover in the burned watershed. Values of the Fire Factor range from a maximum value of 100 immediately after the fire; to

a value of 88 six months after the fire; to a value of 20 4.5 years after the fire; to a value of 1 7.5 years after the fire. The approach assumes a watershed is completely recovered from a burn after 7.5 years.

SF = Slope Failures. The area of the watershed in acres that is prone to slipping divided by the drainage area in square miles. California State Division of Mines has developed a map of known landslides and potential slips on 1" = 6000' scale. The information has been transposed to USGS 7-1/2' Quad maps for easier interpretation.

K = Dimensionless Rainfall Factor, This varies for different storm frequencies and is the product of the square of the 1-day precipitation value and the 10-day precipitation value for a given storm frequency in inches. The 10-day precipitation value gives the measure of watershed saturation, while the 1-day value provides a measure of the rainfall intensity causing peak runoff and sediment erosion. The Ventura County Hydrology Manual contains maps of USGS 7-1/2' Quad overlaid with 50-year 24-hour rainfall isohyetals that can be converted to other frequencies using District precipitation multipliers.

The USGS study also concluded that the AADP is approximately 8 to 13 percent of the 50-year debris yield in Zones 1 and 2. Smaller watersheds (up to 5 square miles in area) have an AADP of 13 percent of the 50-yr yield while other watersheds greater than 5 - 10 square miles in area have AADP's on the order of 10 percent of the 50-yr yield. In Zone 3, the study author's concluded that due to the high percentage of fines in the soils there, only 3% of the 50-yr yield could be expected to occur on an average basis (Personal communication, Rhea Williams, USGS, November, 1976).

District records include up to thirty years of record for several of the basins. Disaster years were 1969, 1978, 1980, 1983, 1992, 1995, 1998, and possibly 2005. Some AADP values were agreed upon by the District and the Federal Emergency Management Agency (FEMA) following the Presidentially Declared Disasters. These values are marked in the tables of Basin Debris Removal History. The AADP is calculated by averaging the annual debris removal quantities for each basin, omitting debris quantities removed after disaster. With additional years of record, these values will be updated. Some basins have no history of debris removal quantities or a limited number of topographic analyses for basin volume changes based on aerial topography. For these, the Scott and Williams theoretical value has been tabulated as AADP as indicated in the Manual.

3.2.1 Debris Cleanout Elevation

The Manual also provides an estimate of the elevation related to the maximum debris volume that should be allowed to accumulate (assuming level storage) before the debris is excavated back to the design topography. Current VCWPD standard is to initiate cleanout of a detention basin if the deposition volume is close to or exceeds 25 percent of the debris design volume. Using this criterion, a detention basin would never lack enough capacity to store the debris volume from a 100-yr event and possibly fail to meet the design detention requirements of the basin.

For debris basins with enough volume to hold 125 percent of 100-year design sediment volume, the clean-out elevation is estimated following the detention basin criterion. Debris basins that have insufficient capacity for the 100-yr design sediment volume have clean-out elevations estimated by the following:

1. Elevation corresponding to the difference of the maximum storage volume minus the 100-yr design yield.
2. Elevation corresponding to 10 percent of the 100-yr design yield or the operating spillway (weir or invert) elevation, whichever is lower.

3.3 Basin Debris Removal History

All aerial topographic surveys and debris removal quantities are tabulated in chronological order. Annual field trips to the basins to estimate past storm season debris accumulations are used to determine if the aerial survey flight data should be obtained and digitized. If a basin did not appear to have significant debris accumulation from winter season storms, available aerial survey flight data for that basin were not digitized. Exact dates for some cleanouts were not available, but the assumption was made that cleanouts were completed just prior to the aerial survey. Small increases in capacity where no cleanout occurred are due to errors of survey.

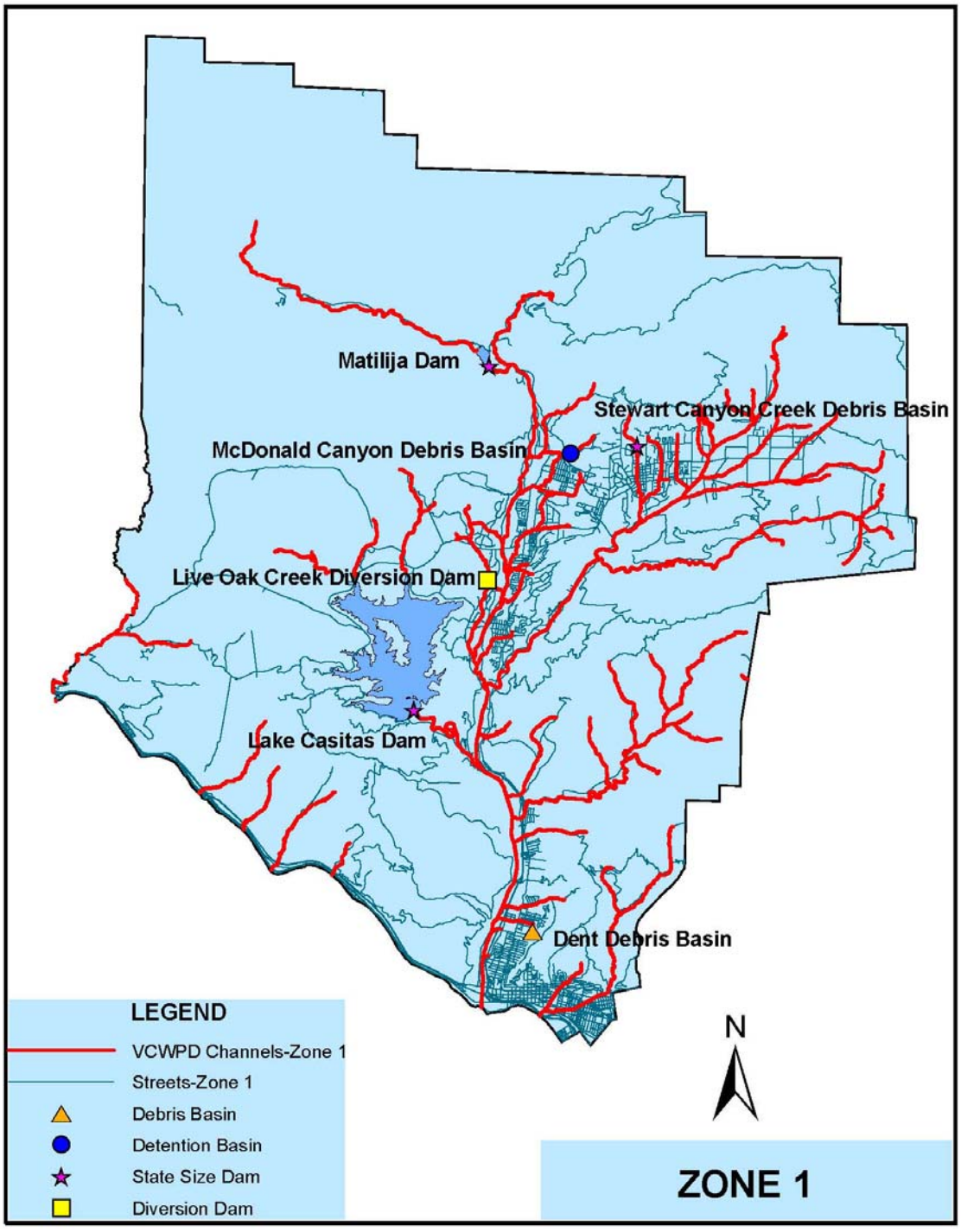
3.4 Channel Debris Removal History

Upper channel reaches of Ventura County streams generally have relatively steep slopes and convey sediment from undeveloped watersheds downstream to historic floodplain or fan areas with relatively flat slopes. As the velocities and sediment transport capacity of the flow decrease in the floodplain areas, the sediment is deposited in channels. This reduces the channel conveyance capacity and increases the potential for breakouts and flooding to occur. Streams subject to significant deposition requiring sediment removal include Pole Creek in the Santa Clara River watershed, a number of the creeks in the upper Arroyo Simi, the Arroyo Las Posas section of Calleguas Creek, and Calleguas Creek. VCWPD is required to remove sediment debris from these channels after storm events frequently enough so that the channels can be considered in-channel debris basins. Appendix A provides a summary of the annual sediment removal quantities for the channel reaches that require frequent cleaning.

4.0 Acronyms

CMP	Corrugated Metal Pipe	CMPA	Corrugated Metal Pipe- Arch
CSP	Corrugated Steel Pipe	GIS	Geographic Information System
RC	Reinforced Concrete	RCP	Reinforced Concrete Pipe
RCB	Reinforced Concrete Box		

Zone 1 Basins



DENT DEBRIS BASIN DB1-01

LOCATION: Ventura, behind (eastward) De Anza Junior High School
on Ventura Avenue, approximately 7,600 ft N from Main Street.
N 294,100; E 1,611,200 (Lambert Zone 5 Coordinates)
Ventura 7-1/2' Quadrangle Map

DESIGN DATA	(Elevations NGVD29)
Design Agency	Ventura County Watershed Protection District
Level Capacity	3,200 cy at emergency spillway, 2,700 cy at op. spillway
Maximum Debris Capacity	4,100 to top of dam (11-8-87 DTM)
Inflow and Outflow Rates	Q_{100}IN = 82 cfs, Q_{100}OUT=NA
Debris Cleanout Elevation	136 ft (1,075 cy) [provides 100-yr debris yield vol. below operating spillway]
EMERGENCY SPILLWAY	
Type	24-in CSP
Invert Elevation	143.4 ft
Spillway Length	NA
Capacity	40 cfs
PRINCIPAL SPILLWAY	
Type	3 ft x 3 ft Drop Box Inlet
RCB Weir Elevation	142 ft
Outlet Conduit	24 in CSP
DEBRIS BLEEDER/RISER	
Type	None
Top Elevation	NA
Outlet Conduit	NA
DAM	
Dam Type	Earthfill
Dam Crest Elevation	149 ft
Length	NA
Width at Crest	NA
Surface Area of Full Basin	0.18 ac
Watershed Area	19 ac from GIS Watershed Layer Shapefile
CONSTRUCTION DATA	
Construction Agency	Shell Oil Co. & VCWPD
Completion Date	1950, Reconstructed 1981
REFERENCE DRAWINGS	
Construction Drawings	33167 Obsolete, Y-1-411, Y-1-439-44
Topographic Drawings(pre-const)	33167 Fencing Y-1-43, T-246 (6-12-80), T-341 (12-8-85), 11-8-87 DTM, 10-16-89 DTM
Right-of-Way Drawings	109MR52 (Easement)

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	1,624	2,354
50-YEAR	1,255	1,820
25-YEAR	928	1,346

BASIN HISTORY: DENT DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
09-69	Cleanout		245	
09-70	Cleanout		1,993	
06-72	Aerial Survey	1,870		
05-74	Cleanout		1,039	
12-75	Cleanout		1,235	
03-78	Disaster Declaration			
02-80	Disaster Declaration			
06-80	Aerial Survey	930		
12-80	Cleanout		2,700	
12-80	Aerial Survey	3,150		
10-81	Aerial survey	Not Digitized		
03-83	Disaster Declaration			
09-83	Cleanout		2,195	
10-83	Aerial Survey	Not Digitized		
09-85	Cleanout		1,414	
12-85	Aerial Survey	3,346		
07-86	Aerial Survey	3,212		
07-86	Cleanout		475	
10-86	Aerial Survey	3,641		
11-87	Aerial Survey	4,062		
11-88	Aerial Survey	Not Digitized		
10-89	Aerial Survey	4,070		
09-90	Aerial Survey	Not Digitized		
05-91	Aerial Survey	2,887		
02-92	Disaster Declaration			263**
05-92	Aerial Survey	2,009		
06-92	Cleanout		878	
06-92	Aerial Survey	4,070		

BASIN HISTORY: DENT DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
07-93	Cleanout		704	
07-93	Aerial Survey	4,070		
01-95	Disaster Declaration			270
08-95	Cleanout		1,796	
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	2,900		
02-98	Disaster Declaration			270
07-98	Aerial Survey	755		
12-98	Cleanout		3,662	
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-01	Cleanout		787.5	
09-03	Cleanout		408	
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			231
07-05	Cleanout		1,054- Survey	

NOTES

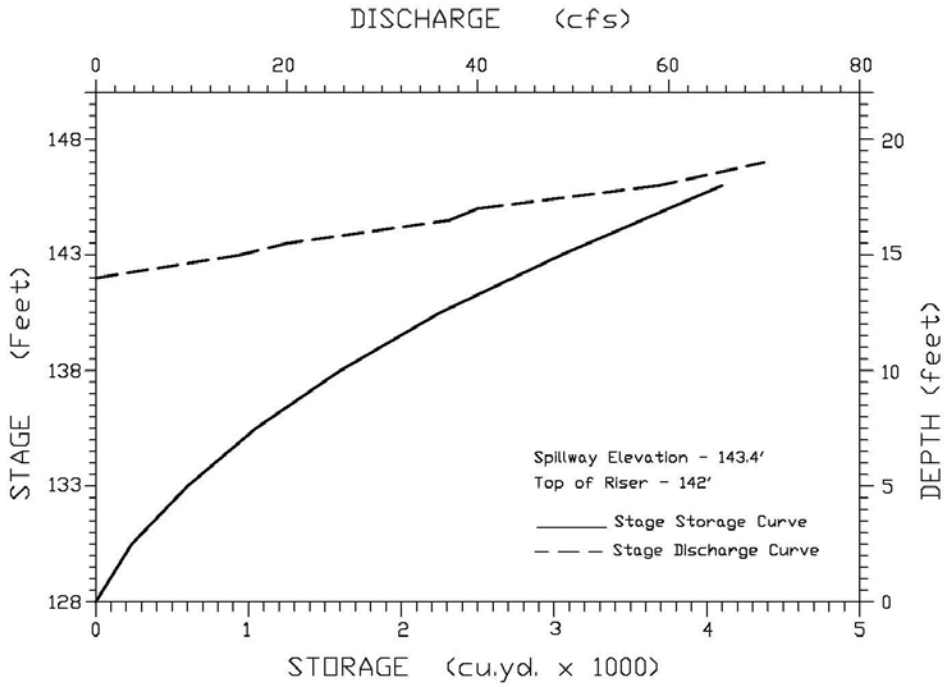
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

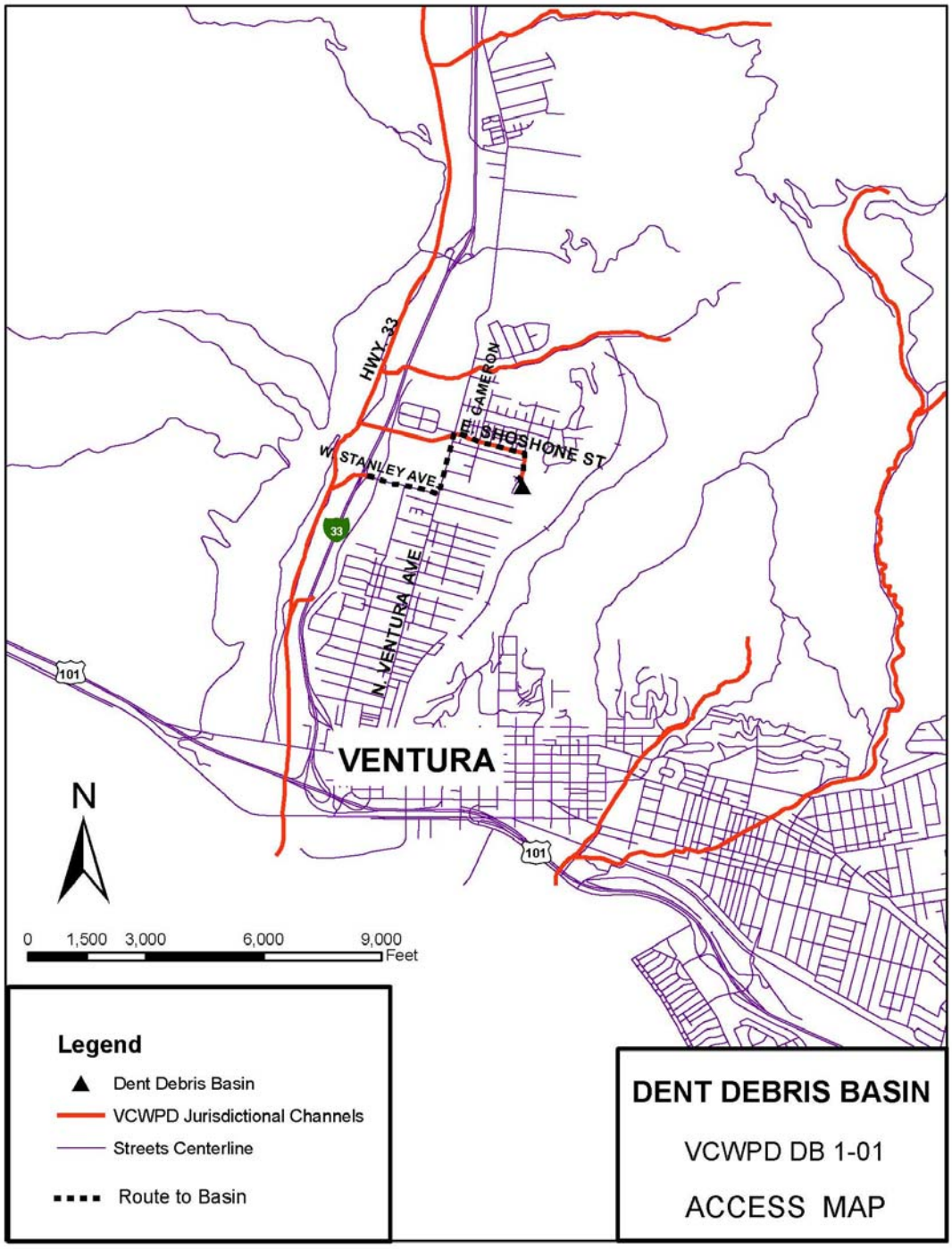
** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable


DENT DRAIN
N
0 200 400 800 1,200 1,600
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
DENT DEBRIS BASIN
VCWPD DB 1-01
WATERSHED MAP

DENT DEBRIS BASIN




HWY 33
E CAMERON
E SHOSHONE ST
W STANLEY AVE
N VENTURA AVE
33
101
101
VENTURA
N
0 1,500 3,000 6,000 9,000
Feet
Legend
Dent Debris Basin
VCWPD Jurisdictional Channels
Streets Centerline
Route to Basin
DENT DEBRIS BASIN
VCWPD DB 1-01
ACCESS MAP

LIVE OAK CREEK DIVERSION DD1-05

LOCATION: City of Ojai. From Santa Ana Blvd north to Riverside Rd.
Approximately 1500 ft north from the intersection Burnhan-Riverside
E 1,606,094.68, N 335,410 (Lambert Zone 5 Coordinates)
Matilija, 7 ½' Quadrangle Map

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Flood Storage Capacity	28.22 ac-ft or 45,527.3 cy assuming no debris accumulation in basin
100-Yr Inflow and Outflow Rates	Q_{100}IN = 1,305 cfs, Q_{100}OUT=807 cfs
Debris Cleanout Elevation	475 ft (5,238 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	18 in diameter cobbles with concrete
Invert/Weir Elevation	486 ft NGVD29
Capacity with Freeboard	1,190 cfs at elev. 491.0 ft
PRINCIPAL SPILLWAY	
Type	10 ft W x13 D ft RC Intake structure 17 ft H, 8 ft X8 ft low flow inlet, weir elevation 465 ft; 2-12 ft X4 ft high level inlets with trash racks, weir elevations 475 ft
Top Elevation	480.00 ft
Outlet Conduit	RC Box 8 ft x 6 ft
DEBRIS BLEEDER/RISER	
Type	None
Top Elevation	NA
Outlet Conduit	NA
DAM	
Dam Type	Earthfill
Dam Crest Elevation	494 ft
Length	318 ft
Surface Area of Full Basin	3.47 ac
Watershed Area	794 ac from GIS Watershed Layer Shapefile
Width at Crest	20 ft
CONSTRUCTION DATA	
Construction Agency	Gregg J. Harris Construction, Inc for VCWPD
Completion Date	2002
REFERENCE DRAWINGS	
Construction Drawings	Y-1-0584 – Y-1-0599
Right-of-Way Drawings	Y-1-0600 – Y-1-0601
Topographic Drawings	Y-1-0602

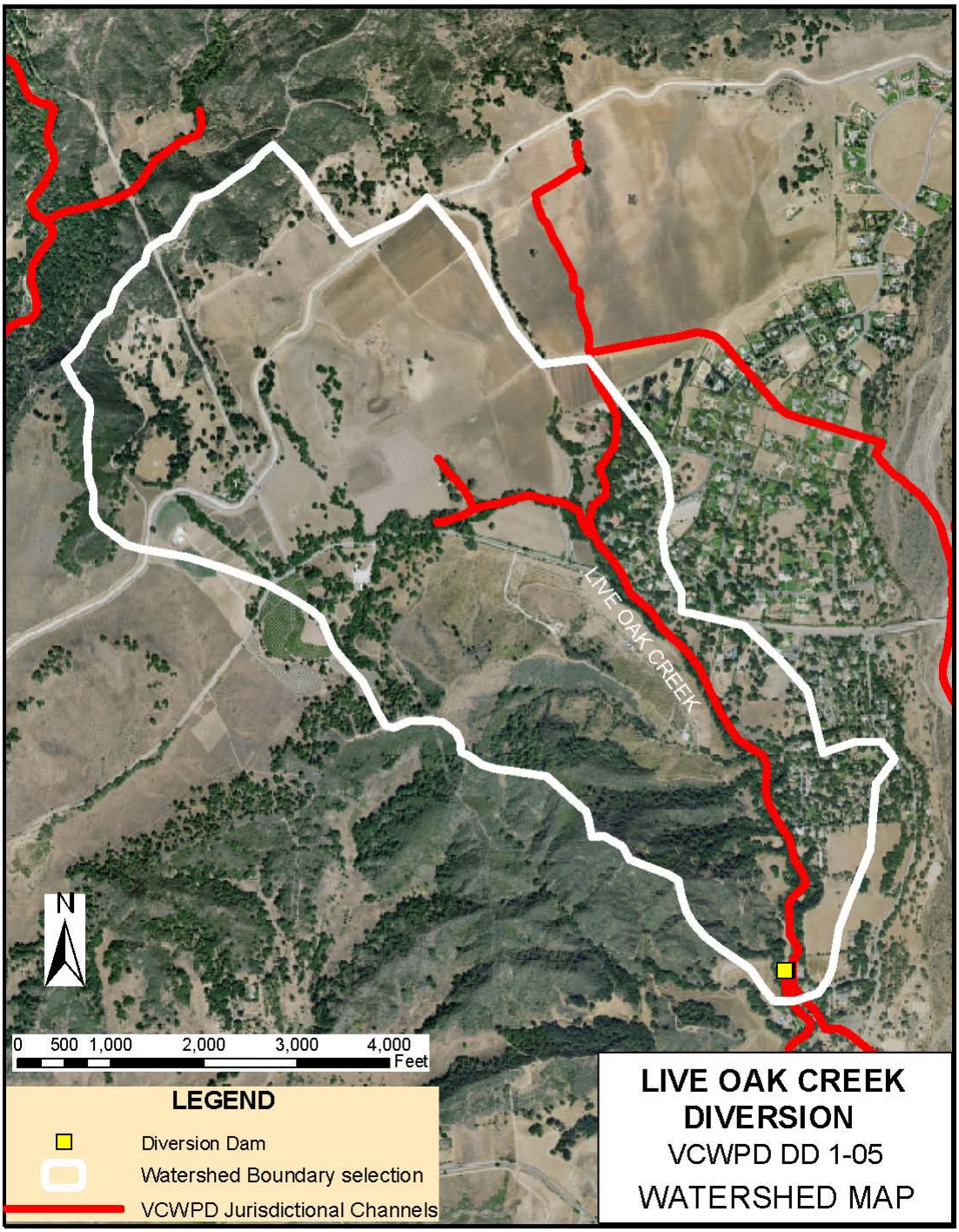
EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	20,952	16,825
50-YEAR	15,991	12,841
25-YEAR	9,012*	7,255*

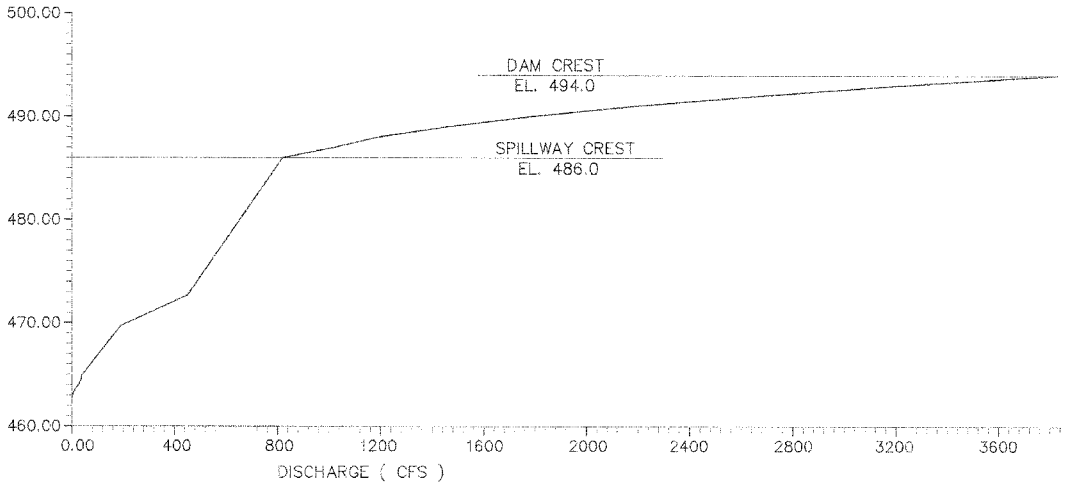
BASIN HISTORY: LIVE OAK CREEK DIVERSION

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
01-05	Disaster Declaration			1,600***

Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris
NA= Not Available / Not Applicable
*** Theoretical value from Scott and Williams (1978), 10% of 50-yr yield estimate.

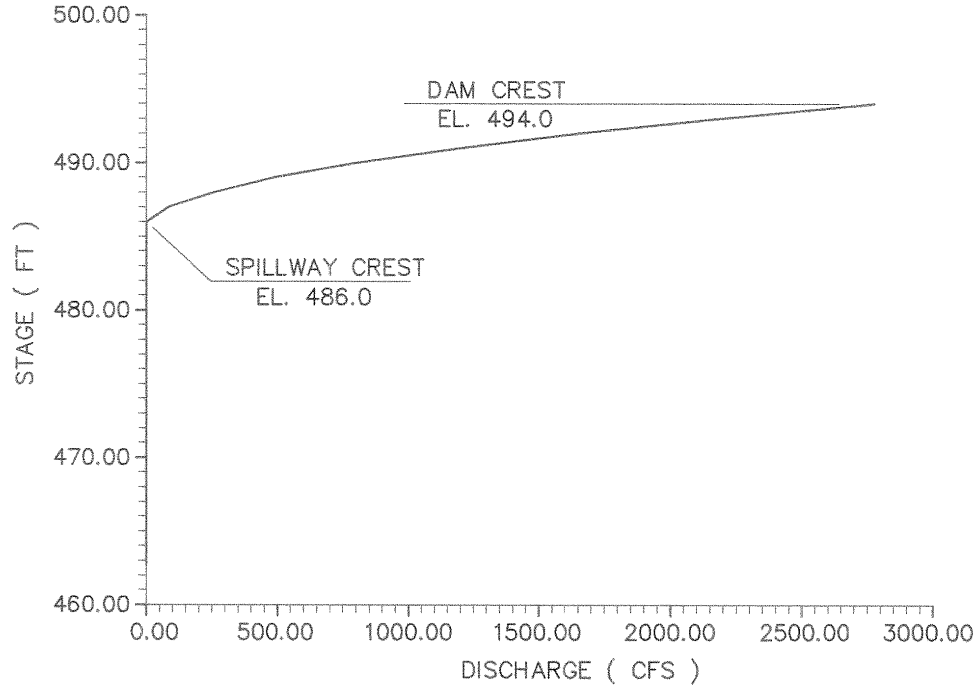

LIVE OAK CREEK
N
0 500 1,000 2,000 3,000 4,000
Feet
LEGEND
Diversion Dam
Watershed Boundary selection
VCWPD Jurisdictional Channels
LIVE OAK CREEK DIVERSION
VCWPD DD 1-05
WATERSHED MAP



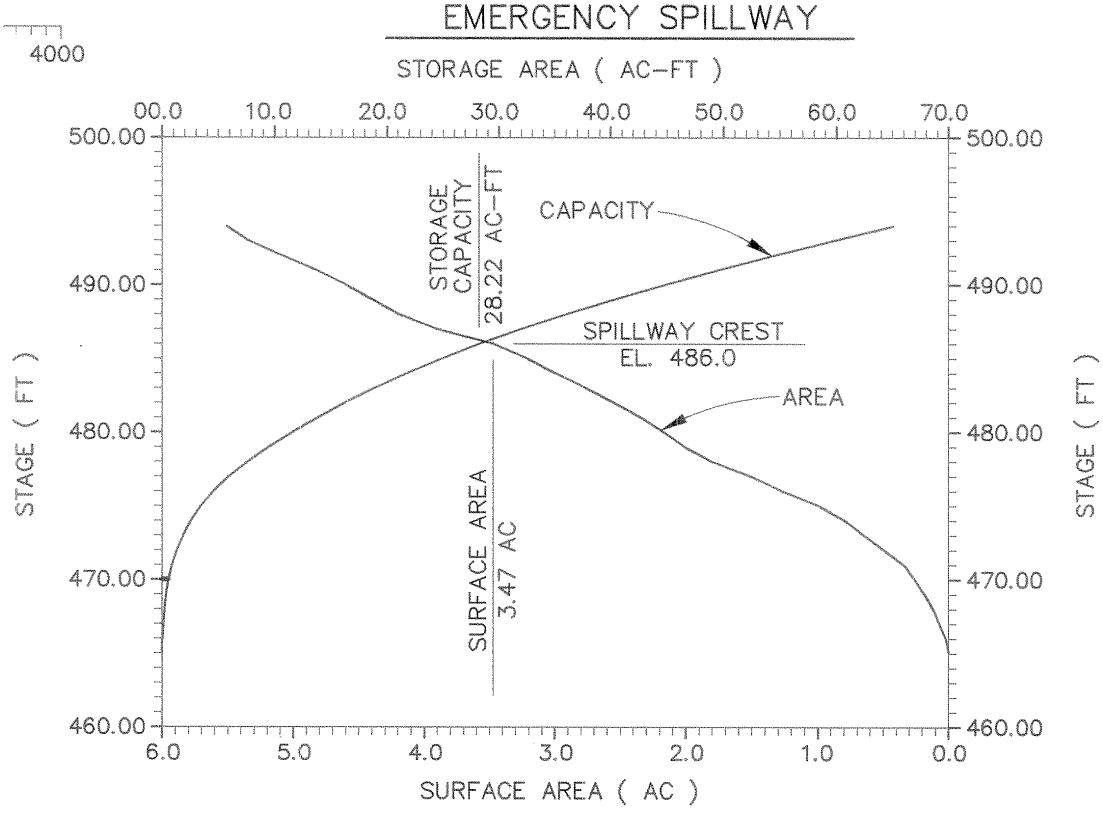
RC PIPE CONDUIT + RC LOW-FLOW PIPE+EMERGENCY SPILLWAY

STAGE DISCHARGE CURVES

Live Oak Creek Diversion

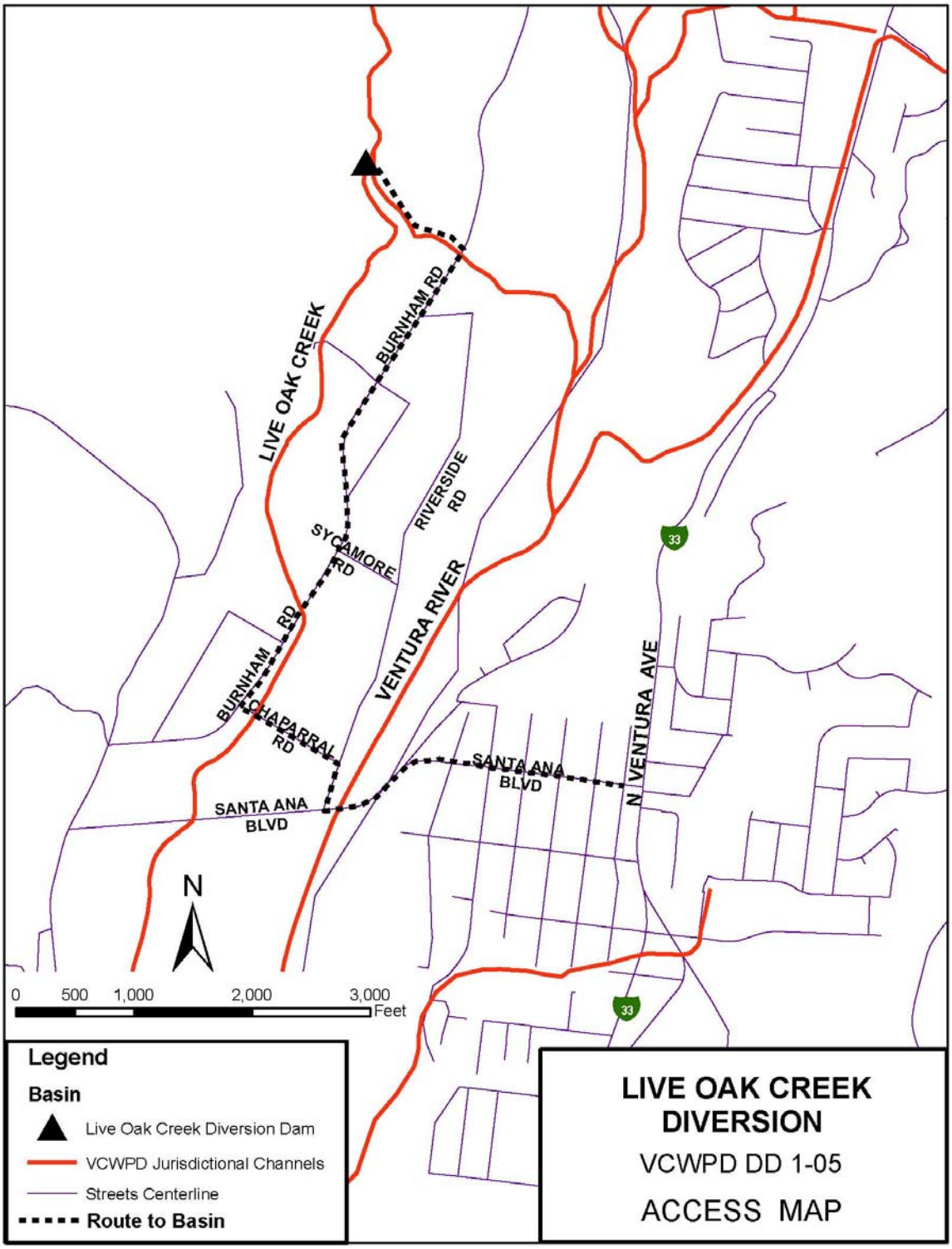


EMERGENCY SPILLWAY



AREA-CAPACITY CURVE

Live Oak Creek Diversion


LIVE OAK CREEK
BURNHAM RD
RIVERSIDE RD
SYCAMORE RD
BURNHAM RD
CHAPARRAL RD
VENTURA RIVER
SANTA ANA BLVD
SANTA ANA BLVD
N VENTURA AVE
33
33
N
0 500 1,000 2,000 3,000
Feet
Legend
Basin
Live Oak Creek Diversion Dam
VCWPD Jurisdictional Channels
Streets Centerline
Route to Basin
LIVE OAK CREEK DIVERSION
VCWPD DD 1-05
ACCESS MAP

MCDONALD CANYON DETENTION BASIN DD1-04

LOCATION: Approximately ¼ mile east of the junction of Highway 33 and Fairview Road, in the Meiners Oaks area in Ventura County
N 350,477 E 1,615,750. (Lambert Zone 5 Coordinates)
Matilija 7-1/2'Quad

DESIGN DATA	Basin has 78-in RCP bypass channel designed for Q100= 590cfs; (Elevations shown are NGVD29)
Design Agency	VCWPD
Flood Storage Capacity	14.5 ac-ft (23,393 cy) above debris storage volume
Maximum Debris Elevation	798.72 NGVD29
100-Yr Inflow and Outflow Rates	IN= 629 cfs; OUT=52 cfs from as-builts
Debris Cleanout Elevation	798.72 ft NGVD29 [Max. Debris Cap from As-Builts]
EMERGENCY SPILLWAY	
Type	RC Drop Box Inlet (30 ft Long x 10 ft wide)
Weir Elevation	813 ft NGVD29
Spillway Length	70 ft
Capacity w/o Freeboard	Q100=630 cfs
PRINCIPAL SPILLWAY	
Type	RC Riser Tower with Grated Inlet 12.25 ft H ft X 3 ft W
Bottom Weir/Top Elevation	801.00/814.00 ft NGVD29
Outlet Conduit	24 in RCP
DEBRIS BLEEDER/RISER	
Type	2 ft X2 ft low flow inlet in RC Riser Tower with Trash Rack
Top Elevation	799.00 NGVD29
Outlet Conduit	24-in RCP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	816 ft NGVD29
Length	Length 238 ft
Surface Area of Full Basin	2.63 ac
Watershed Area	573 ac from GIS Watershed Shapefile
Width at Crest	20 ft
CONSTRUCTION DATA	
Construction Agency	VCWPD
Completion Date	1998
REFERENCE DRAWINGS	
Construction Drawings	Y-1-560 thru Y-1-578
Topographic Drwgs(pre-const)	Y-1-57
Right-of-Way Drawings	Y-1-560 thru Y-1-561

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition (Note 1)**	**100% Burn**
100-YEAR	20,179 (3,974)	37,490 (5,765)
50-YEAR	15,396 (3,015)	28,603 (4,372)
25-YEAR	10,020 (1,833)	31,936 (2,658)

(Note 1) Basin designed so that majority of sediment bypasses basin. Only 46-ac of 573-ac watershed contribute sediment to basin, with yield estimates provided in ( ).

BASIN HISTORY: MCDONALD CANYON DETENTION BASIN

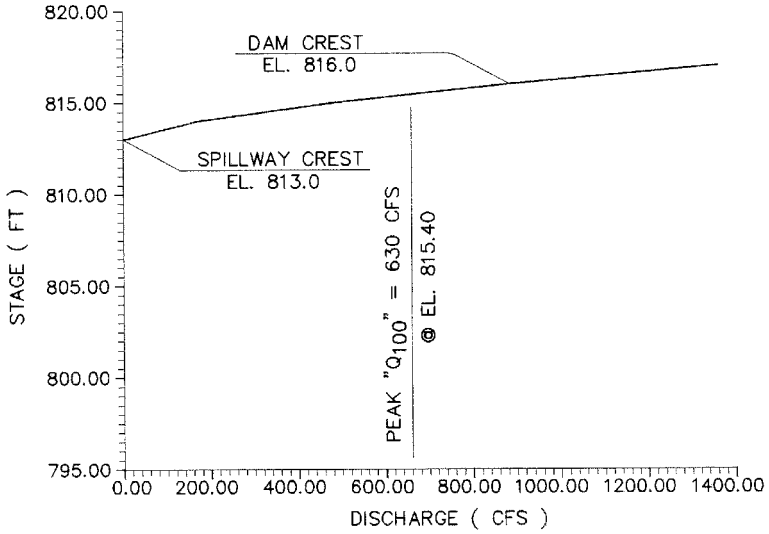
DATE	**ACTION**	**REMAINING CAPACITY (cy)**	**REMOVED (cy)**	**AADP* (cy)**
07-98	Cleanout		76	
01-05	Disaster Declaration			300***

Notes

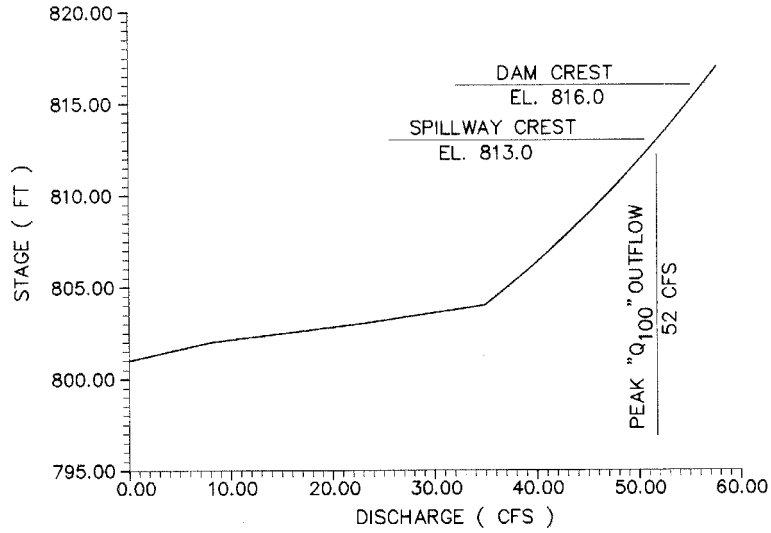
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

NA= Not Available / Not Applicable

*** Theoretical value from Scott and Williams (1978), 10% of 50-yr yield estimate.



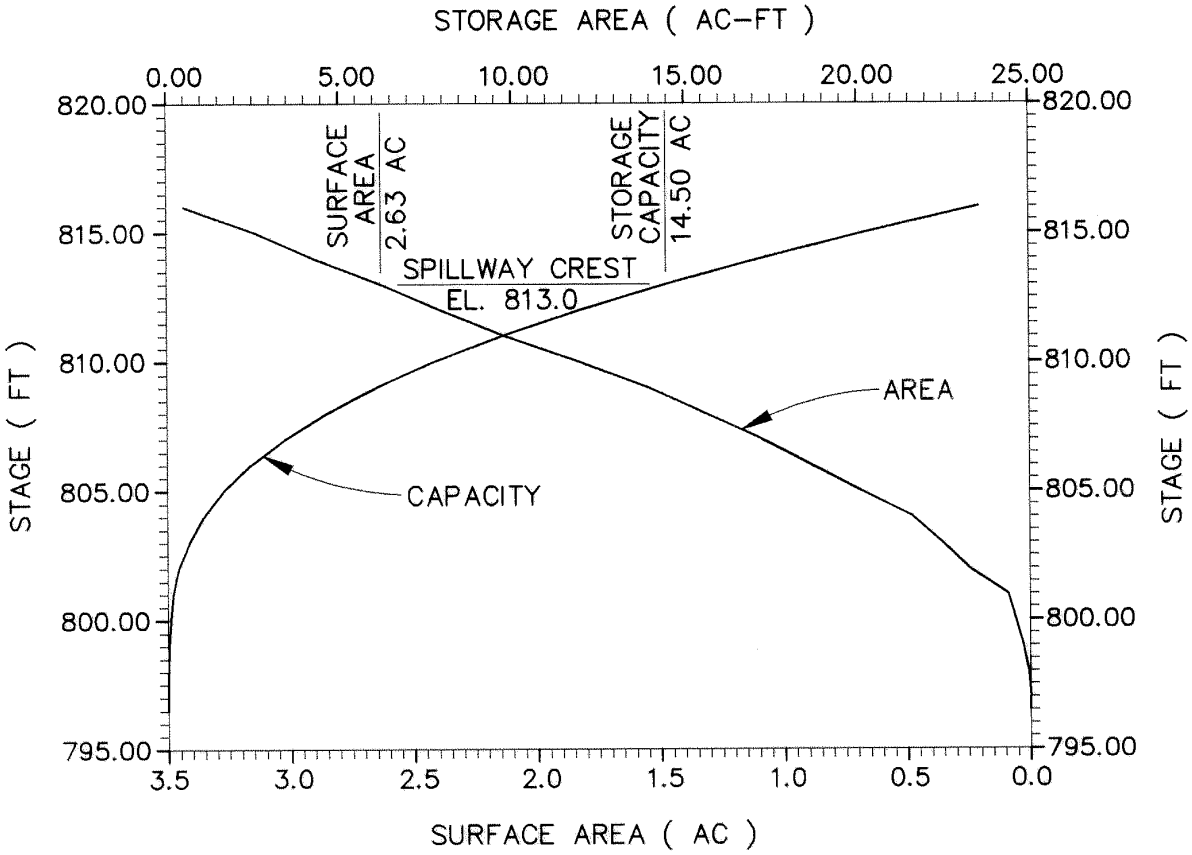
EMERGENCY SPILLWAY



OUTLET PIPE

STAGE DISCHARGE CURVES

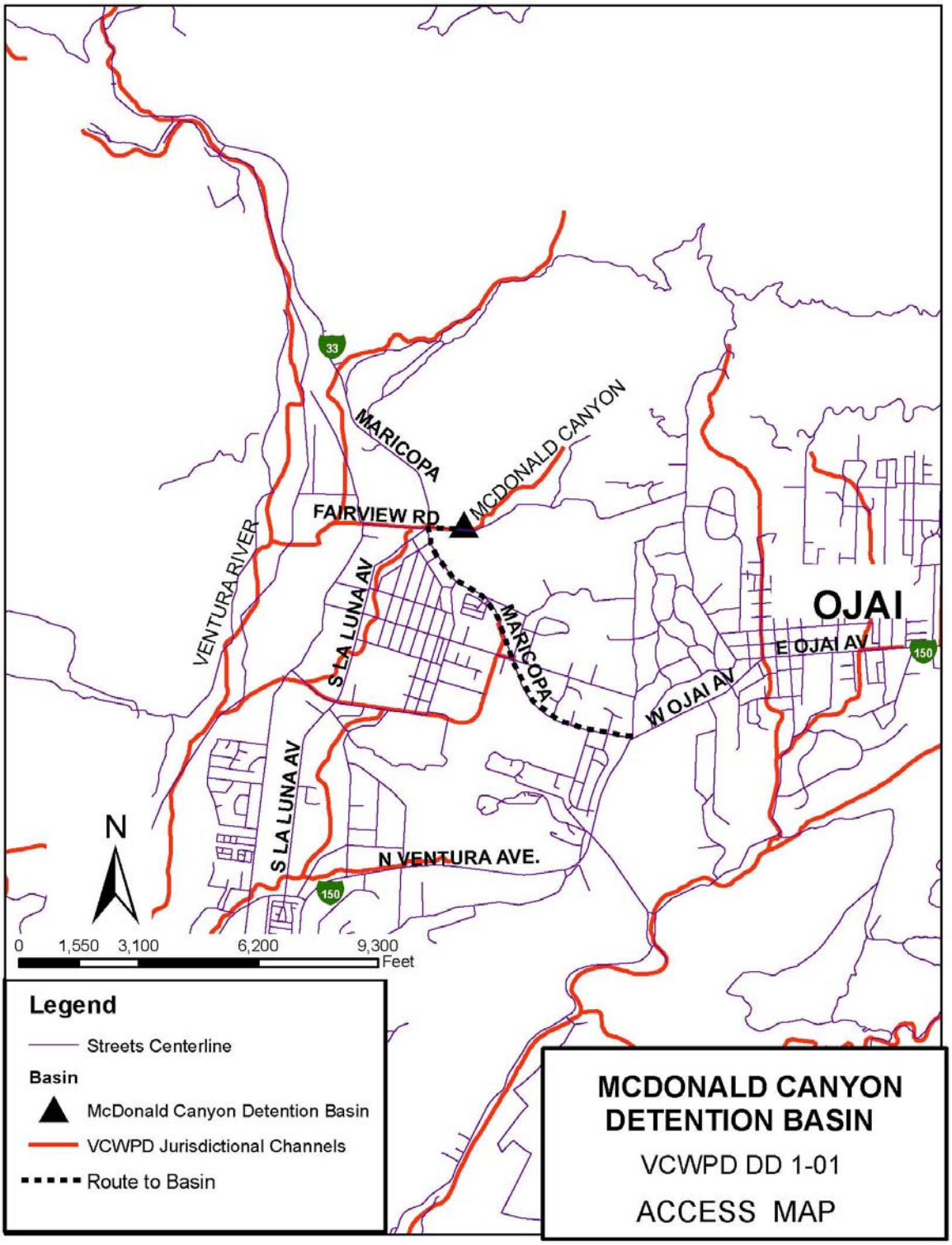
McDonald Canyon Detention Basin



AREA-CAPACITY CURVE

McDonald Canyon Detention Basin

(Appears to be flood storage only- does not show debris storage volume)


33
MARICOPA
MCDONALD CANYON
FAIRVIEW RD
VENTURA RIVER
S LA LUNA AV
MARICOPA
OJAI
E OJAI AV
150
W OJAI AV
S LA LUNA AV
N VENTURA AVE.
150
N
0 1,550 3,100 6,200 9,300
Feet
Legend
Streets Centerline
Basin
McDonald Canyon Detention Basin
VCWPD Jurisdictional Channels
Route to Basin
MCDONALD CANYON
DETENTION BASIN
VCWPD DD 1-01
ACCESS MAP

STEWART CANYON CREEK DEBRIS BASIN State Dam No: 86-009 DB1-02

LOCATION: Ojai, 2000 ft north end of Canada Street. Enter off Signal Street about 2400 ft north of Grand Avenue.
N 351,500; E 1,623,500 (Lambert Zone 5 Coordinates)
Ojai 7-1/2' Quadrangle Map

DESIGN DATA	(Elevations NGVD29)
Design Agency	US Army Corps of Engineers
Level Capacity	104,215 cy (7-10-89 DTM)
Maximum Debris Capacity	328,300 cy (12-18-85)
Inflow and Outflow Rates	Q_{100}IN = 2,642 cfs, Q_{100}OUT=NA
Debris Cleanout Elevation	914 ft NGVD29 (52,250 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	Rectangular Concrete Channel 80 ft wide x 14 ft high
Invert Elevation	920 ft NGVD29
Spillway Length	NA
Capacity	11,200 cfs (without freeboard)
PRINCIPAL SPILLWAY	
Type	4 ft x 4 ft Weir Inlet on Riser Tower 25.5 ft High (925.5 ft)
Weir Elevation	925.5 ft
Outlet Conduit	36 in RCP
DEBRIS BLEEDER/RISER	
Type	Orifices on Riser Tower to 23 ft above ground
Top Elevation	Same as principal spillway
Outlet Conduit	Same as principal spillway
DAM	
Dam Type	Earthfill
Dam Crest Elevation	934 ft
Length	1,300 ft
Width at Crest	NA
Surface Area of Full Basin	10 ac
Watershed Area	1,266 ac from Quad Map
CONSTRUCTION DATA	
Construction Agency	Corps of Engineers
Completion Date	1963
REFERENCE DRAWINGS	
Construction Drawings	Y-1-47A thru Z
Topographic Drwgs(pre-const)	T-63-10 (2-6-70), T-63-11 (2-6-70), T-273 (10-2-81), 11-8-87 DTM, 10-16-89 DTM
Right-of-Way Drawings	37547

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	209,000	300,000
50-YEAR	157,000	225,000
25-YEAR	112,000	161,000

BASIN HISTORY: STEWART CANYON CREEK DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
09-69	Cleanout		150,000	
02-70	Aerial Survey	314,500		
11-70	Aerial Survey	314,200		
05-71	Aerial Survey	314,200		
05-72	Cleanout		13,400	
05-72	Aerial Survey	327,619		
05-73	Aerial Survey	313,802		
10-75	Cleanout		2,900	
10-75	Aerial Survey	316,690		
03-78	Cleanout		2,950	
03-78	Disaster Declaration			
02-80	Disaster Declaration			
06-80	Aerial Survey	Not Digitized		
10-81	Aerial Survey	319,638		
03-83	Disaster Declaration			
08-85	Cleanout		6,365	
12-85	Aerial Survey	328,274		
07-86	Aerial Survey	324,882		
11-87	Aerial Survey	303,962		
10-89	Aerial Survey	302,425		
09-90	Aerial Survey	Not Digitized		
06-91	Aerial Survey	Not Digitized		
02-92	Disaster Declaration			2,781**
05-92	Aerial Survey	Not Digitized		
01-95	Disaster Declaration			2,781
08-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	319,154		
02-98	Disaster Declaration			2,781

BASIN HISTORY: STEWART CANYON CREEK DEBRIS BASIN

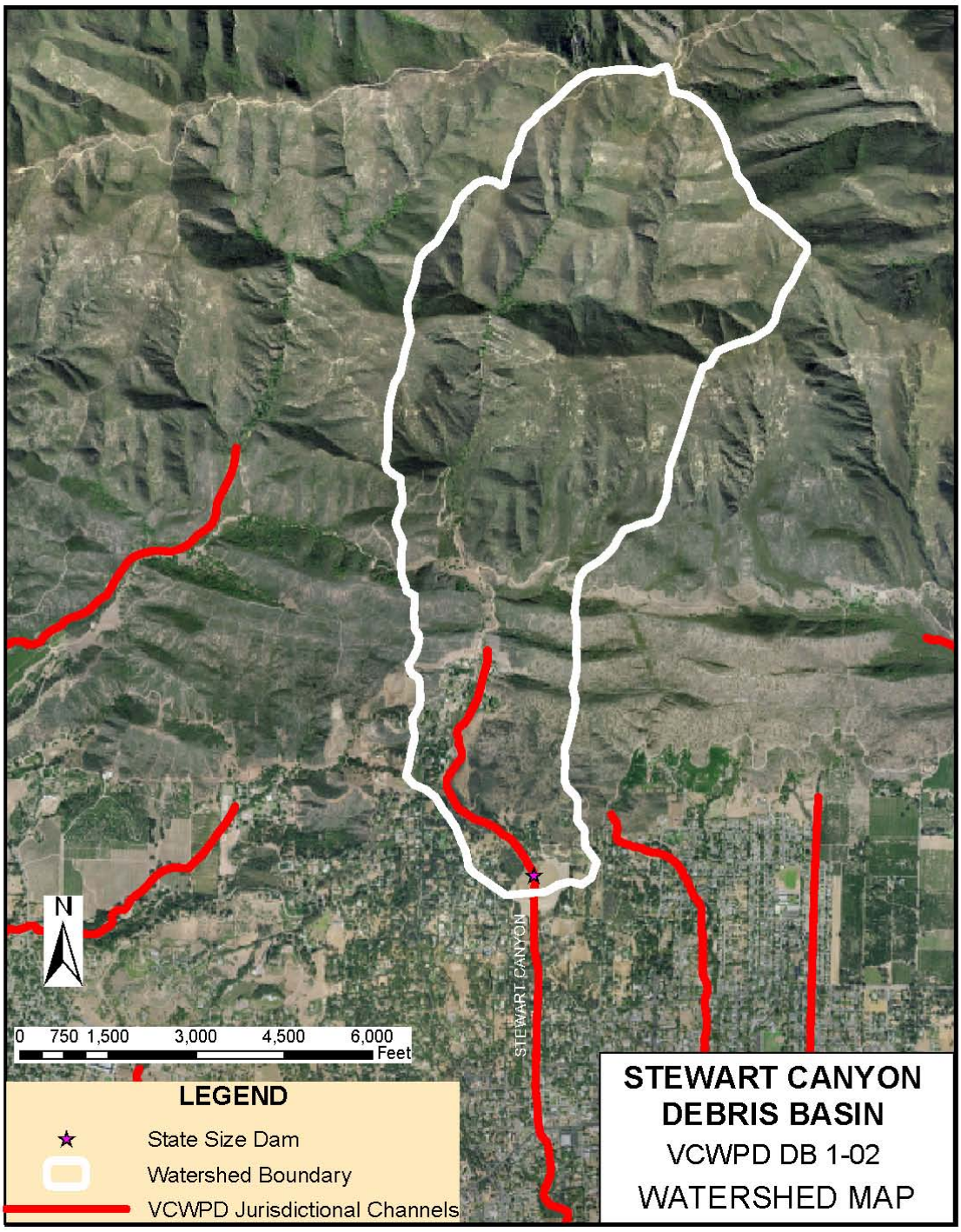
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
07-98	Aerial Survey	313,674		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-02	Aerial Survey	Not Digitized		
01-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			2,264

Notes

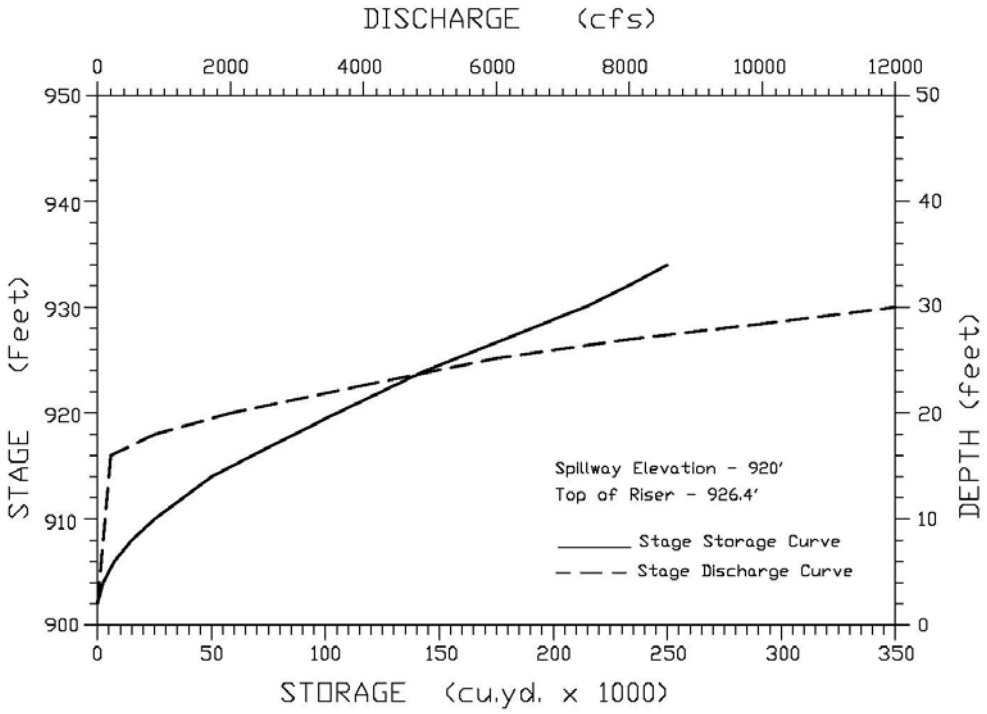
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

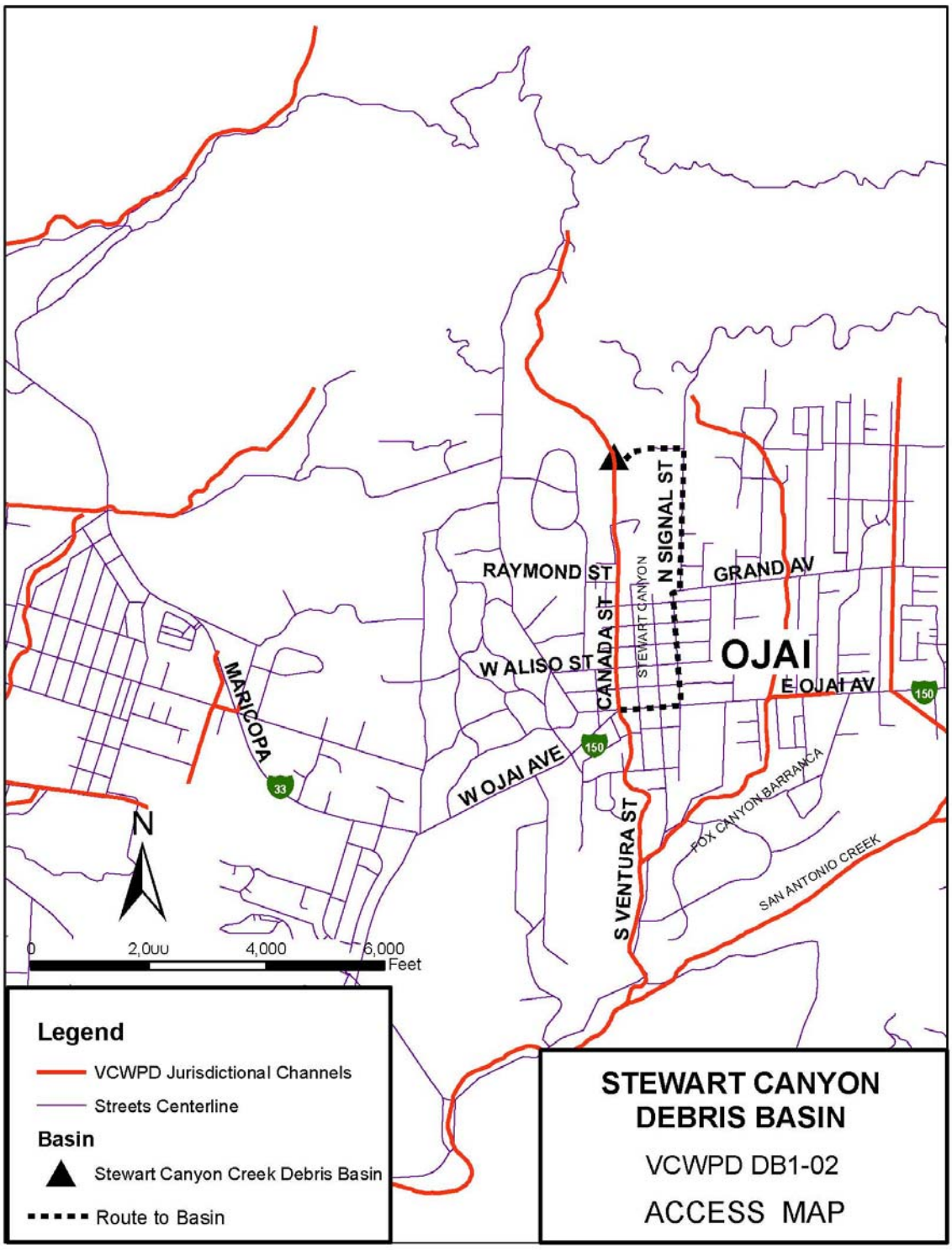
** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable

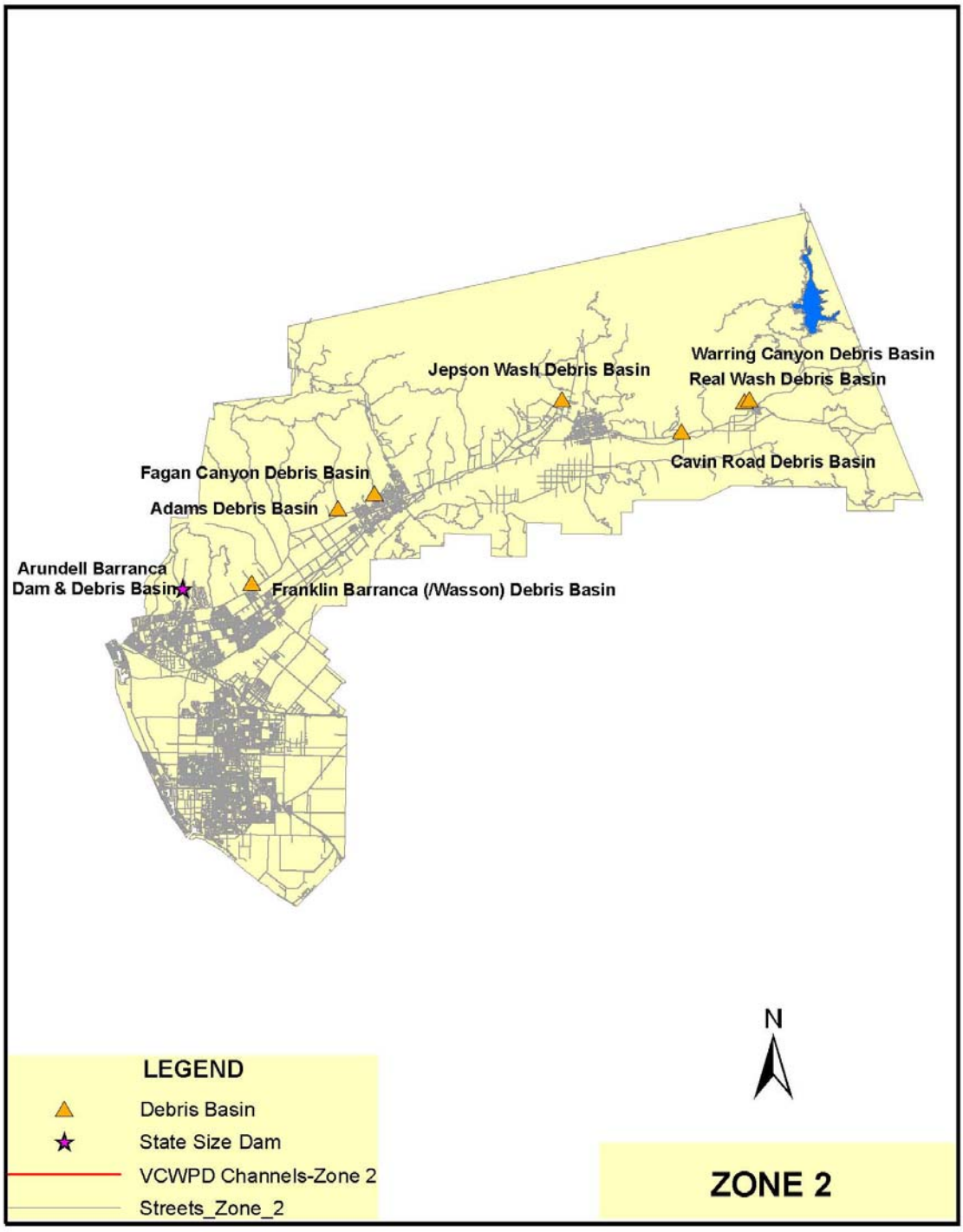

N
0 750 1,500 3,000 4,500 6,000
Feet
STEWART CANYON
LEGEND
State Size Dam
Watershed Boundary
VCWPD Jurisdictional Channels
STEWART CANYON
DEBRIS BASIN
VCWPD DB 1-02
WATERSHED MAP

STEWART CANYON DEBRIS BASIN




RAYMOND ST
N SIGNAL ST
GRAND AV
STEWART CANYON
CANADA ST
W ALISO ST
OJAI
E OJAI AV
150
MARICOPA
33
W OJAI AVE
150
S VENTURA ST
FOX CANYON BARRANCA
SAN ANTONIO CREEK
N
0
2,000
4,000
6,000
Feet
Legend
VCWPD Jurisdictional Channels
Streets Centerline
Basin
Stewart Canyon Creek Debris Basin
Route to Basin
STEWART CANYON
DEBRIS BASIN
VCWPD DB1-02
ACCESS MAP

Zone 2 Basins



ADAMS BARRANCA DEBRIS BASIN DB2-07

LOCATION: Santa Paula, W of boundary, between Peck & Briggs Rds, approx. 1/4 mi N of Foothill Rd,& E of Adams Cyn Rd ; N 311,350, E 1,667,237 (Est. Lambert Zone 5 Coordinates) ; Santa Paula 7-1/2' USGS Quadrangle

DESIGN DATA	(Elevations NGVD29)
Design Agency	Ventura County Watershed Protection District
Level Capacity	72,023 cy
Maximum Debris Capacity	84,600 cy (assumed slope of 0.6)
Inflow and Outflow Rates	Q_{100}IN = 3,700 cfs, Q_{100}OUT=3,700 cfs (Y-2-2235)
Debris Cleanout Elevation	340.5 ft (14,900 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	RC Drop Box Spillway 15 ft W x 18.5 ft H x 30 ft L
Weir Elevation	353 ft NGVD29
Spillway Weir Length	75 ft
Design Discharge	3,800 cfs
PRINCIPAL SPILLWAY	
Type	None
Top Elevation	NA
Size	NA
DEBRIS BLEEDER/RISER	
Type	Semi-Circular Perforated 36-in CSP
Top Elevation	351.75 ft NGVD29
Outlet Conduit	Connected to Emergency Spillway
DAM	
Dam Type	Earthfill
Dam Crest Elevation	364 NGVD29
Length	330 ft
Width at Crest	20 ft
Surface Area of Full Basin	3.3 ac
Watershed Area	5,387 ac from GIS Watershed Layer
CONSTRUCTION DATA	
Construction Agency	Ventura County Watershed Protection District
Completion Date	1994
REFERENCE DRAWINGS	
Construction Drawings	Y-2-2233 thru Y-2-2247
Topographic Drwgs(pre-const)	Y-3-3432; T-449-6 (1995); 12-21-95 DTM
Right-of-Way Drawings	Y-2-2234

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	149,000	221,650
50-YEAR	114,320	168,960
25-YEAR	50,410	74,500

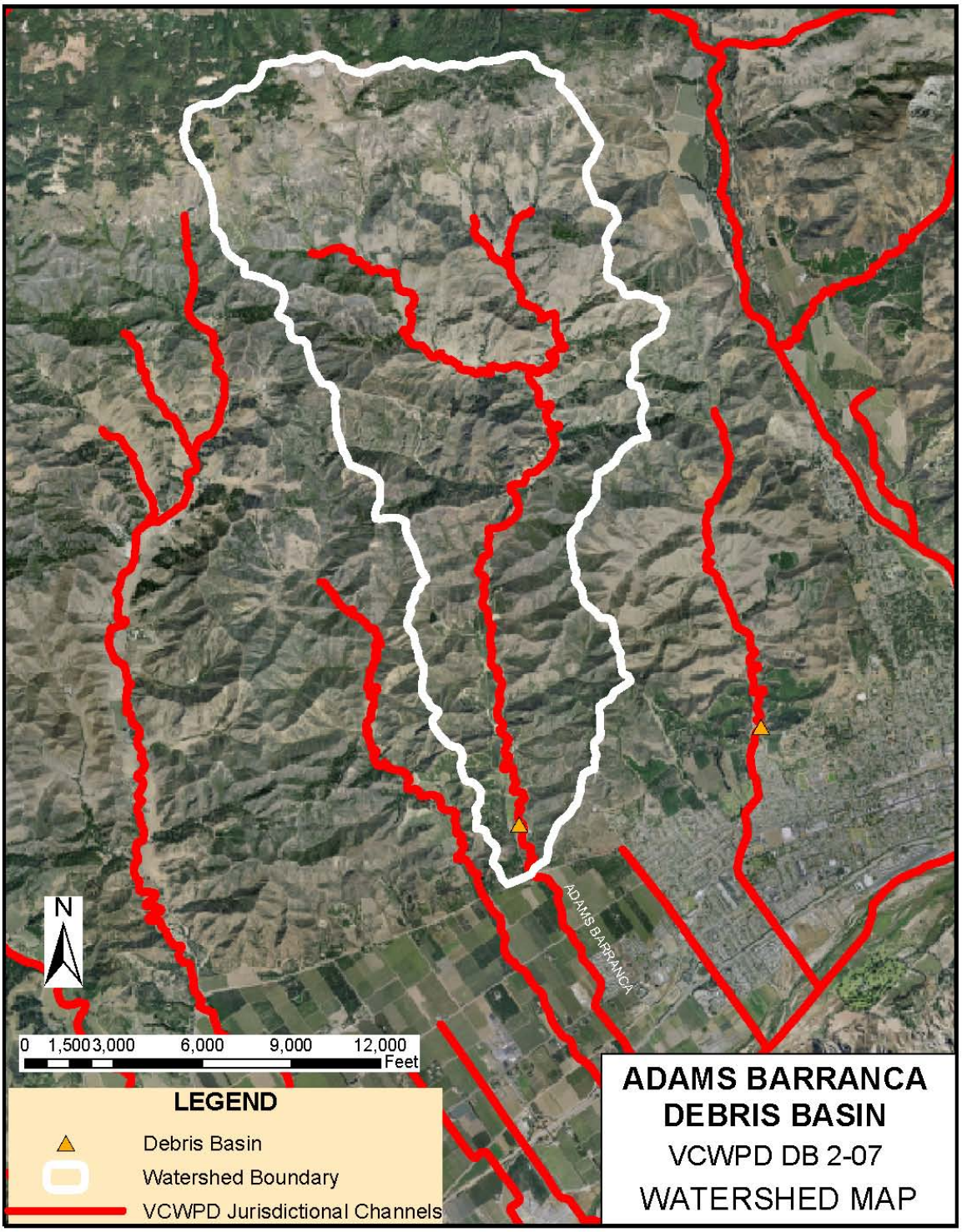
BASIN HISTORY: ADAMS BARRANCA DEBRIS BASIN

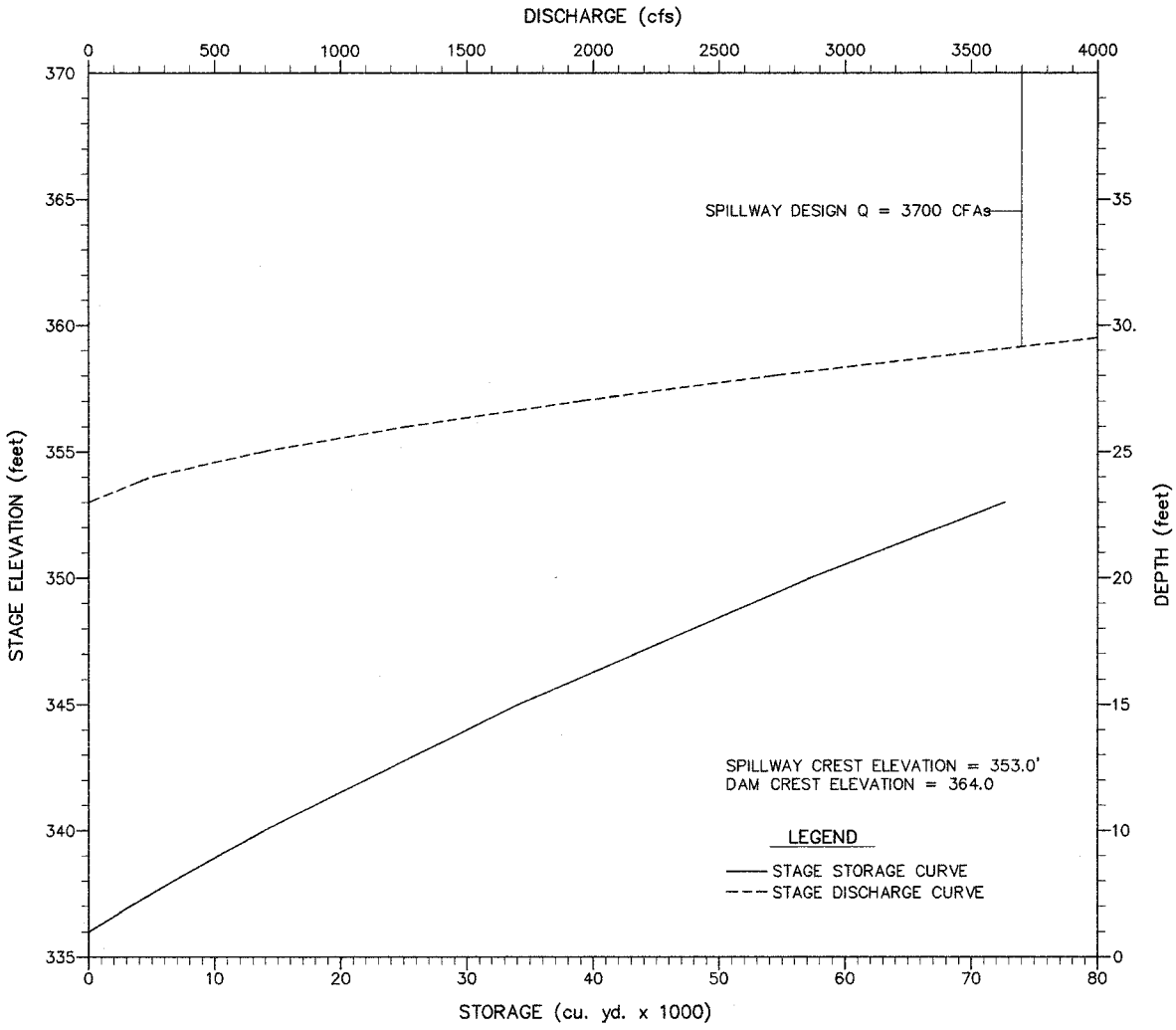
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
09-94	Aerial Survey	84,200		
01-95	Disaster Declaration			5,940
06-95	Aerial Survey	24,200		
12-95	Cleanout		61,505	
12-95	Aerial Survey	85,705		
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	78,080		
02-98	Disaster Declaration			3,510
07-98	Aerial Survey	4,330		
12-98	Cleanout		75,806	
12-98	Aerial Survey	80,135		
05-99	Cleanout		56	
12-99	Aerial survey	Not Digitized		
08-01	Aerial survey	Not Digitized		
11-02	Cleanout		448	
12-02	Aerial survey	Not Digitized		
11-03	Aerial survey	Not Digitized		
01-05	Disaster Declaration			982
07-05	Cleanout		112,089	

NOTES

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

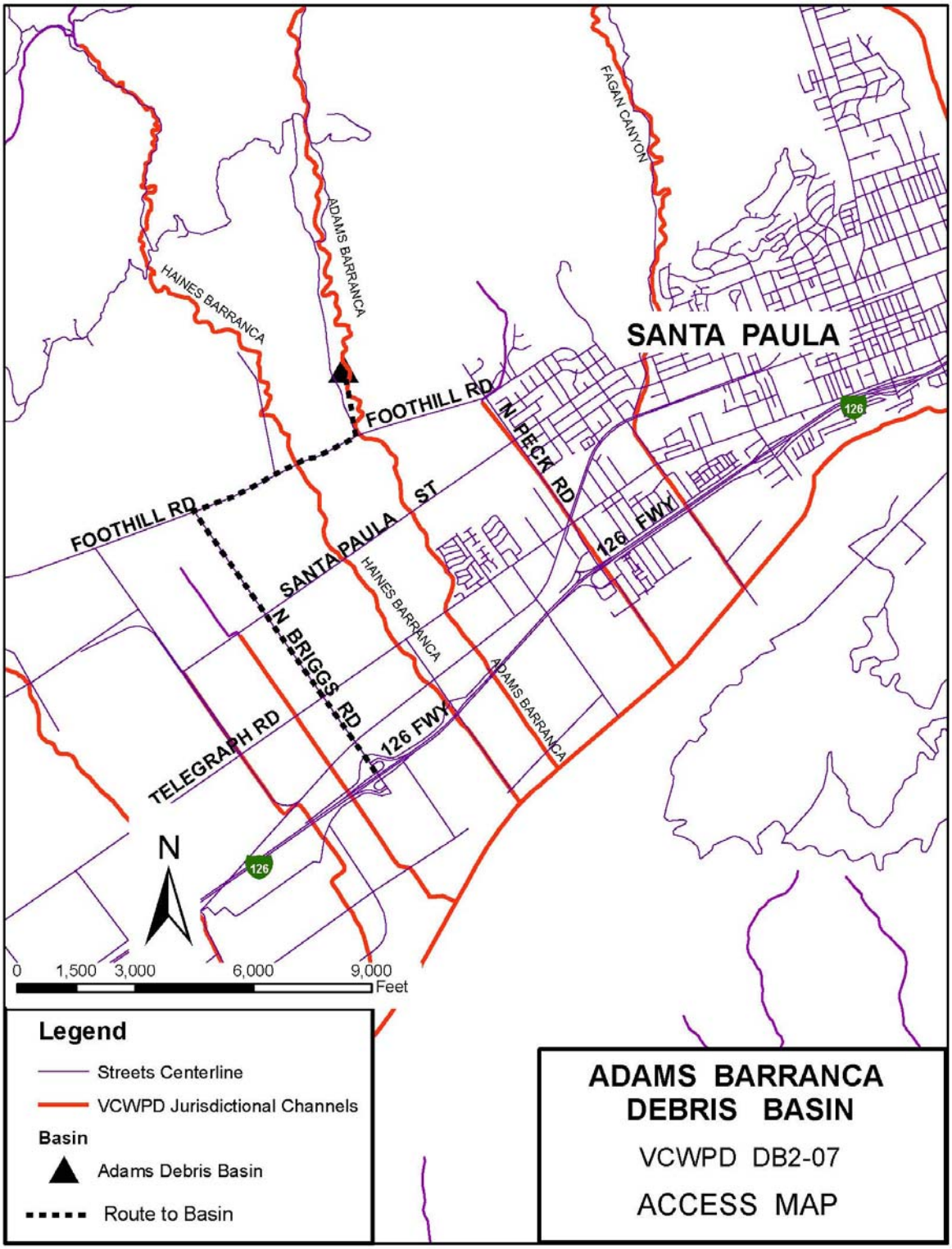
NA= Not Available / Not Applicable


N
0 1,500 3,000 6,000 9,000 12,000
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
ADAMS BARRANCA
ADAMS BARRANCA
DEBRIS BASIN
VCWPD DB 2-07
WATERSHED MAP



STAGE - STORAGE & DISCHARGE CURVES

Adams Debris Basin


SANTA PAULA
FAGAN CANYON
ADAMS BARRANCA
HAINES BARRANCA
FOOTHILL RD
N PECK RD
126 FWY
SANTA PAULA ST
FOOTHILL RD
HAINES BARRANCA
N BRIGGS RD
126 FWY
ADAMS BARRANCA
TELEGRAPH RD
126
N
0 1,500 3,000 6,000 9,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Adams Debris Basin
Route to Basin
ADAMS BARRANCA
DEBRIS BASIN
VCWPD DB2-07
ACCESS MAP

ARUNDELL BARRANCA DETENTION BASIN State Dam No: 86-010 DD2-06M

LOCATION: Ventura Foothills, approximately 5,500 ft N of Foothill Rd.
East of and adjacent to Sexton Cyn. Rd;
N 293,060, E 1,632,117 (Lambert Zone 5 Coordinates)
Saticoy 7-1/2'Quadrangle Map

DESIGN DATA

Design Agency	VCWPD
Level Capacity	138 ac-ft
Maximum Debris Capacity	28,266 cy at elev. 540 ft NGVD29 (125% of 100-yr Yield)
Inflow and Outflow Rates	IN:Q50=1,732 cfs, Q100=2,390 cfs OUT: Q100=360 cfs
Debris Cleanout Elevation	528 ft (5,644 cy) [25% of 100-yr debris yield.]
EMERGENCY SPILLWAY	
Type	Box Inlet Spillway 60 ft long x 20 ft wide
Weir Elevation	572 ft NGVD29
Spillway Length	140 ft (60 ft+20 ft+60 ft)
Capacity	9,400 cfs (without freeboard during PMF)
PRINCIPAL SPILLWAY	
Rectangular Tower with	4 ft W X 8 ft H Low Level Inlet with Trash Rack to Elev 548, 2-8
Catwalk; with Projecting	ft W x 3 ft H Tower Inlets Bottom Elev. 551 ft, Top Elev 554 ft
Pivoting Louver Trash Racks	
Tower Top Elevation	555 ft NGVD29
Outlet Conduit	48-in RCP
DEBRIS BLEEDER/RISER	
Type	Semi-Circular Perforated CSP on Riser Tower
Top Elevation	540 ft NGVD29
Outlet Conduit	Principal Spillway Outlet
DAM	
Dam Type	Earthfill
Dam Crest Elevation	580 ft NGVD29
Length	377 ft
Width at Crest	20 ft
Surface Area of Full Basin	5.9 ac
Watershed Area	1,754 ac
CONSTRUCTION DATA	
Construction Agency	VCWPD
Completion Date	Reconstructed 1995
REFERENCE DRAWINGS	
Construction Drawings	Y-2-2322 thru Y-2-2356
Topographic Drwgs(pre-const)	Y-2-2327 thru Y-2-2328
Right-of-Way Drawings	Y-2-2325

EXPECTED DEBRIS PRODUCTION (cy); Sexton Canyon Only, Assumes Lake Canyon Dam in Place		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	22,576	32,745
50-YEAR	17,259	25,033
25-YEAR	12,403	17,990

Designed to be in series with Lake Canyon Dam (not yet constructed) to operate as intended; (Elevations NGVD29)

BASIN HISTORY: ARUNDELL BARRANCA DETENTION BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
01-96	New Dam Completed			5,308**
01-96	Aerial Survey	64,800		
06-96	Aerial Survey	49,523		
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	48,420		
02-98	Disaster Declaration			5,308
07-98	Aerial Survey	45,570		
05-99	Cleanout		101,450	
05-99	Aerial Survey	64,800		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-02	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			6,419
	OLD BASIN DATA DB2-06			
02-69	Disaster Declaration			
10-70	Aerial Survey	36,100		
09-71	Cleanout		20,000	
01-72	Aerial Survey	35,900		
07-72	Cleanout		4,100	
05-73	Aerial Survey	25,225		
09-73	Cleanout		15,400	
11-73	Aerial Survey	39,650		
06-74	Aerial Survey	33,200		
10-75	Aerial Survey	25,606		
10-76	Aerial Survey	21,900		

BASIN HISTORY: ARUNDELL BARRANCA DETENTION BASIN

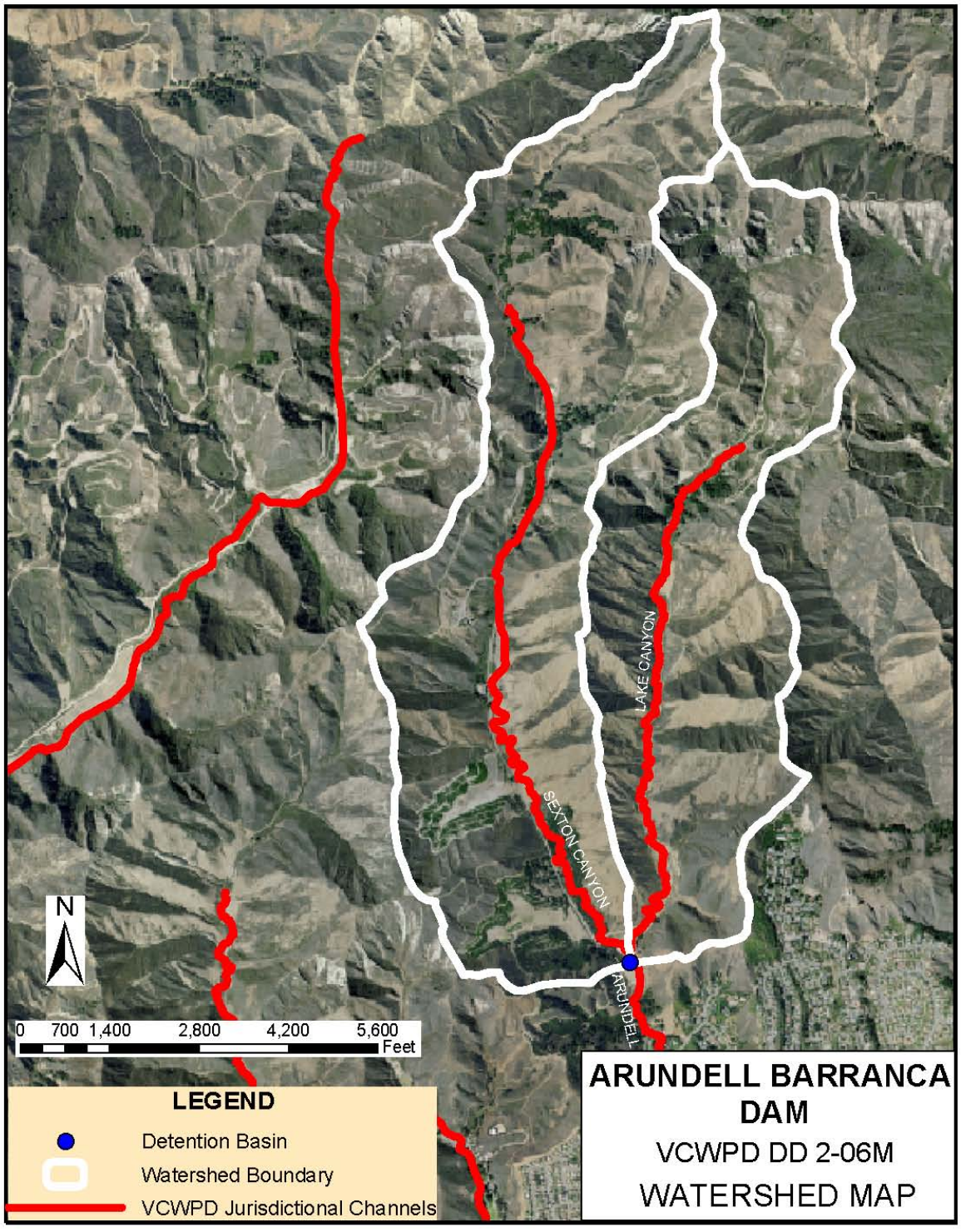
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
12-77	Aerial Survey	18,600		
03-78	Disaster Declaration			
11-78	Aerial Survey	3,905		
05-79	Cleanout		19,100	
06-79	Aerial Survey	20,100		
02-80	Disaster Declaration			5,643**
06-80	Aerial Survey	2,610		
12-80	Cleanout		21,000	
11-82	Aerial Survey	16,400		
03-83	Disaster Declaration			4,882**
04-83	Aerial Survey	8,960		
12-85	Cleanout		61,000	
12-85	Aerial Survey	58,380		
11-87	Aerial Survey	53,899		
02-89	Cleanout		4,200	
10-89	Aerial Survey	58,115		
03-90	Cleanout		5,000	5,260
10-90	Aerial Survey	64,800		
06-91	Aerial Survey	36,300		
12-91	Cleanout		36,000	
12-91	Aerial Survey	64,900		
02-92	Disaster Declaration			5,403**
05-92	Aerial Survey	37,400		
05-92	Cleanout		30,700	
12-92	Aerial Survey	68,100		
07-93	Aerial Survey	31,700		
01-94	Cleanout		33,800	
01-94	Aerial Survey	65,500		
01-95	Disaster Declaration			5,308
03-95	Disaster Declaration			5,308
05-95	Aerial Survey	Not Digitized		
06-95	Cleanout & Excavation		76,334	
06-95	Aerial Survey	76,330		
01-96	**New Dam Completed**			

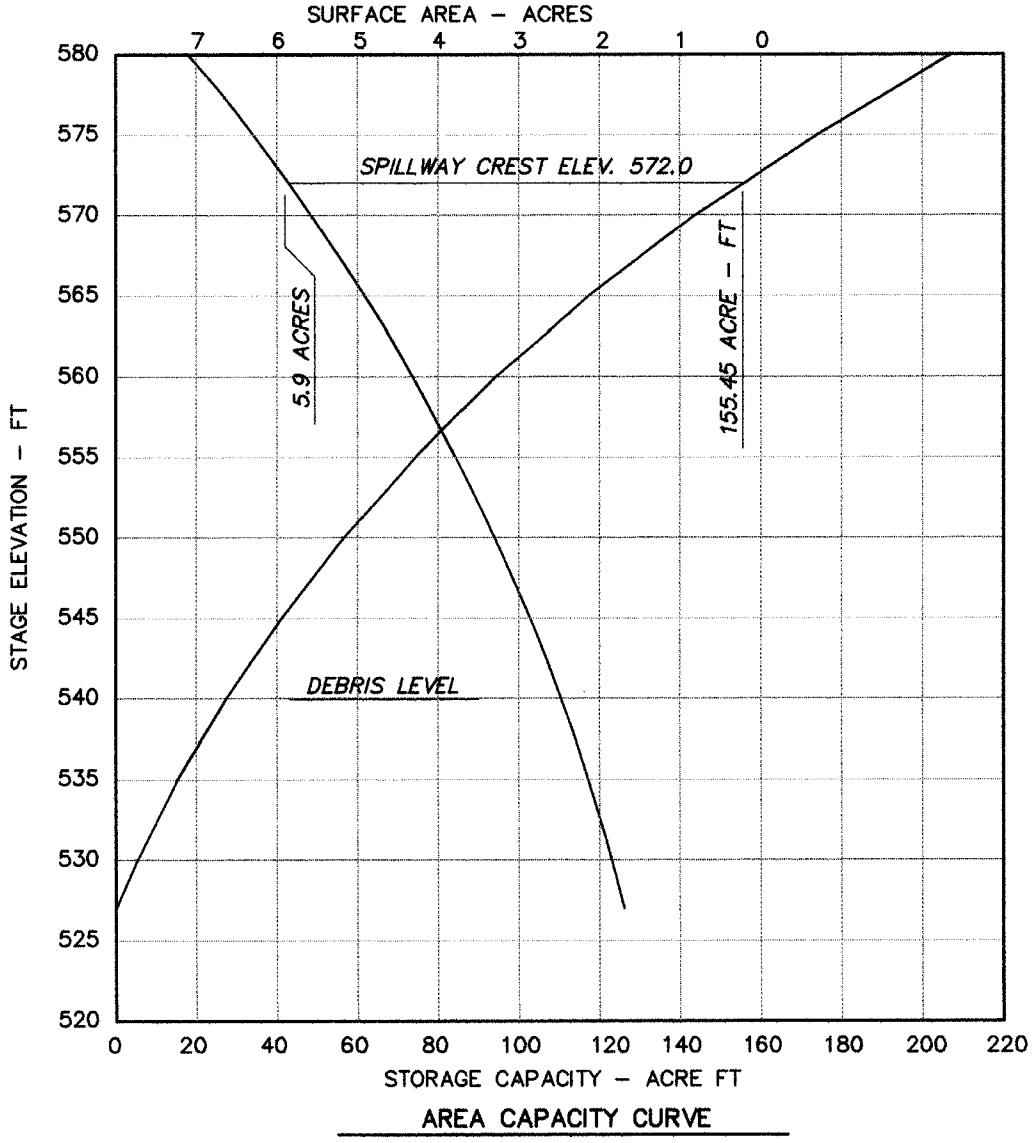
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

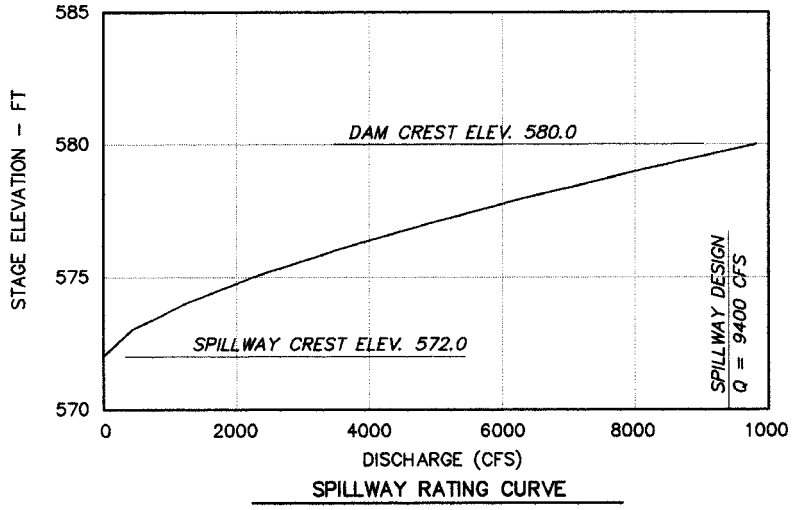
** From historical record of DB2-06

NA= Not Available / Not Applicable

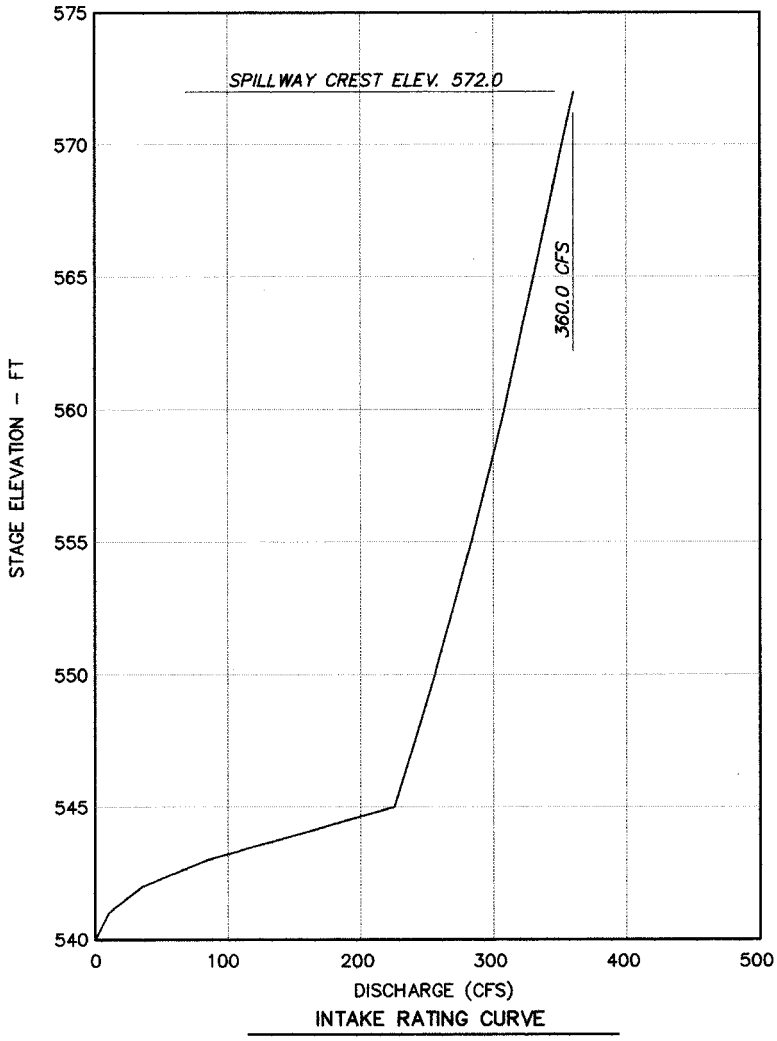

LAKE CANYON
SEXTON CANYON
ARUNDELL
N
0 700 1,400 2,800 4,200 5,600
Feet
LEGEND
Detention Basin
Watershed Boundary
VCWPD Jurisdictional Channels
ARUNDELL BARRANCA DAM
VCWPD DD 2-06M
WATERSHED MAP



Arundell Barranca Detention Basin

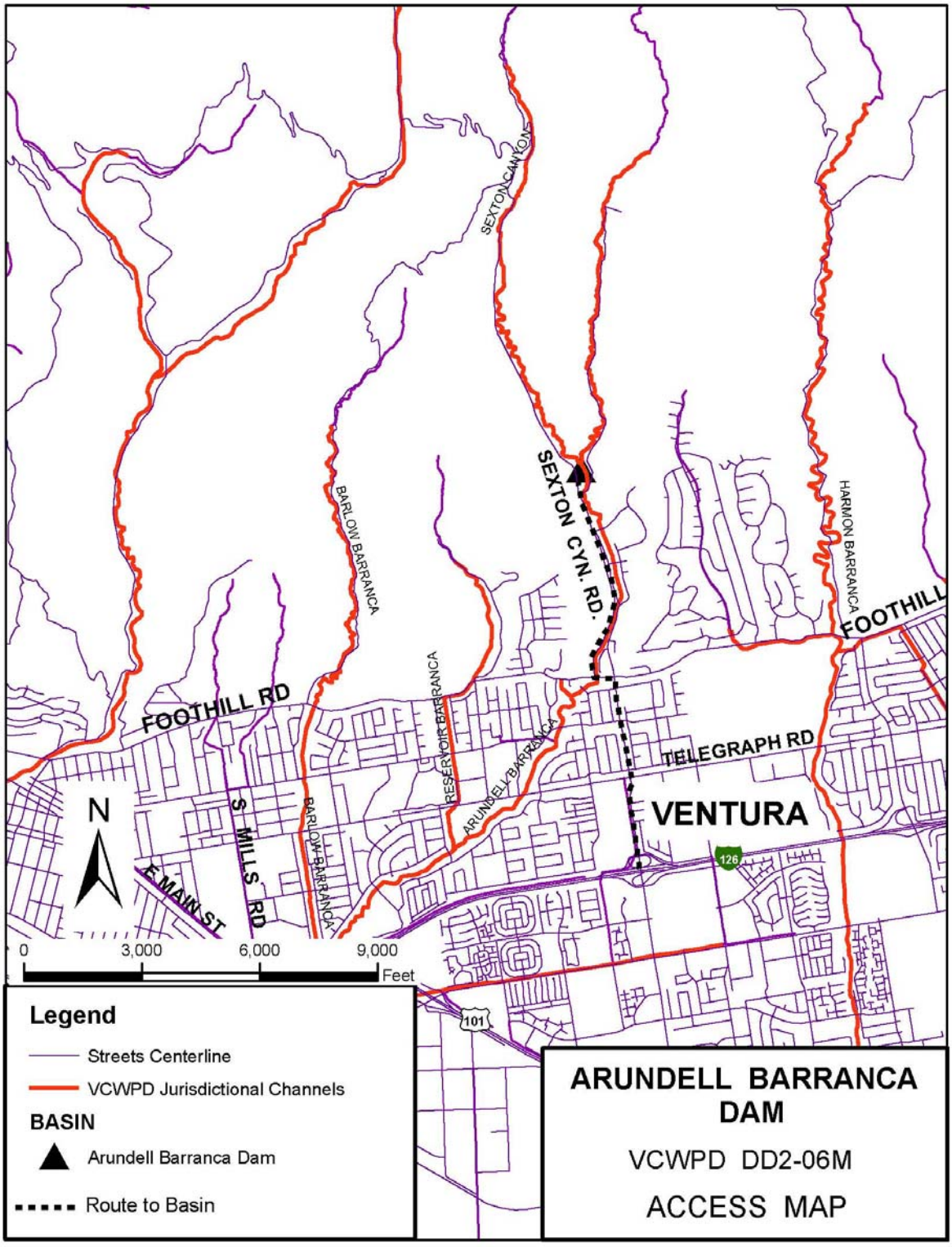


SPILLWAY RATING CURVE



INTAKE RATING CURVE

Arundell Barranca Detention Basin


SEXTON CANYON
SEXTON CYN. RD.
BARLOW BARRANCA
RESERVOIR BARRANCA
ARUNDELL BARRANCA
HARMON BARRANCA
FOOTHILL RD
FOOTHILL
TELEGRAPH RD
VENTURA
S MILLS RD
E MAIN ST
126
101
N
0
3,000
6,000
9,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
BASIN
Arundell Barranca Dam
Route to Basin
ARUNDELL BARRANCA DAM
VCWPD DD2-06M
ACCESS MAP

CAVIN ROAD DEBRIS BASIN DB2-03

LOCATION: Fillmore, 1/4 mile u/s from Telegraph Rd. at Cavin Rd.
Enter at Double H-N Ranch about 0.2 miles E of Cavin;
N 328.900, E 1,743,900 (Lambert Zone 5 Coordinates);
Piru 7 1/2' Quad.

DESIGN DATA	*Capacities Indicated are Based on a Top of Riser Elevation of 683.5 NGVD29; (Elevations NGVD29)
Design Agency	VCWPD
Level Capacity *	4,100 cy (11-8-87 DTM)
Maximum Debris Capacity *	8,700 cy (11-8-87 DTM)
Inflow and Outflow Rates	Q100in=99 cfs; Q100out=NA
Debris Cleanout Elevation	679 ft NGVD29 (1,341 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	None
Invert Elevation	NA
Spillway Length	NA
Capacity	NA
PRINCIPAL SPILLWAY	
Type	4.5 ft x 4.5 ft RC Tower 16 ft High with Top Weir Inlet
Weir Elevation	683.5 NGVD29
Outlet Conduit	48 in RCP
DEBRIS BLEEDER/RISER	
Type	None
Top Elevation	NA
Outlet Conduit	NA
DAM	
Dam Type	Earthfill
Dam Crest Elevation	691 NGVD29
Length	170 ft
Width at Crest	NA
Surface Area of Full Basin	0.4 ac
Watershed Area	90 ac from Quad Map
CONSTRUCTION DATA	
Construction Agency	Ventura County Flood Control District
Completion Date	1933
REFERENCE DRAWINGS	
Construction Drawings	31276 - 31277
Topographic Drwgs(pre-const)	312175, T-63-17 (10-29-71), T-63-17 12-13-85), 11-87 DTM, 5-31-91 DTM
Right-of-Way Drawings	31274

EXPECTED DEBRIS PRODUCTION (cy):		
StormFrequency	**DesignCondition**	**100% Burn**
100-YEAR	13,413	19,456
50-YEAR	7,062	10,244
25-YEAR	4,992	7,238

BASIN HISTORY: CAVIN ROAD DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
10-71	Aerial Survey	7,379		
03-78	Disaster Declaration			
10-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			
04-83	Aerial Survey	2,886		
04-84	Cleanout		5,640	470**
09-84	Aerial Survey	8,690		
12-85	Aerial Survey	8,681		
07-86	Aerial Survey	8,540		
11-87	Aerial Survey	8,716		
11-88	Aerial Survey	Not Digitized		
09-90	Aerial Survey	Not Digitized		
05-91	Aerial Survey	7,339		
02-92	Disaster Declaration			362**
05-92	Aerial Survey	Not Digitized		
06-92	Cleanout		4,283	
01-95	Disaster Declaration			
07-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey	8,841		
07-97	Aerial Survey	Not Digitized		
02-98	Disaster Declaration			362
07-98	Aerial Survey	4,100		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-02	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
11-03	Cleanout		1,736	
12-04	Cleanout		458	
01-05	Disaster Declaration			209

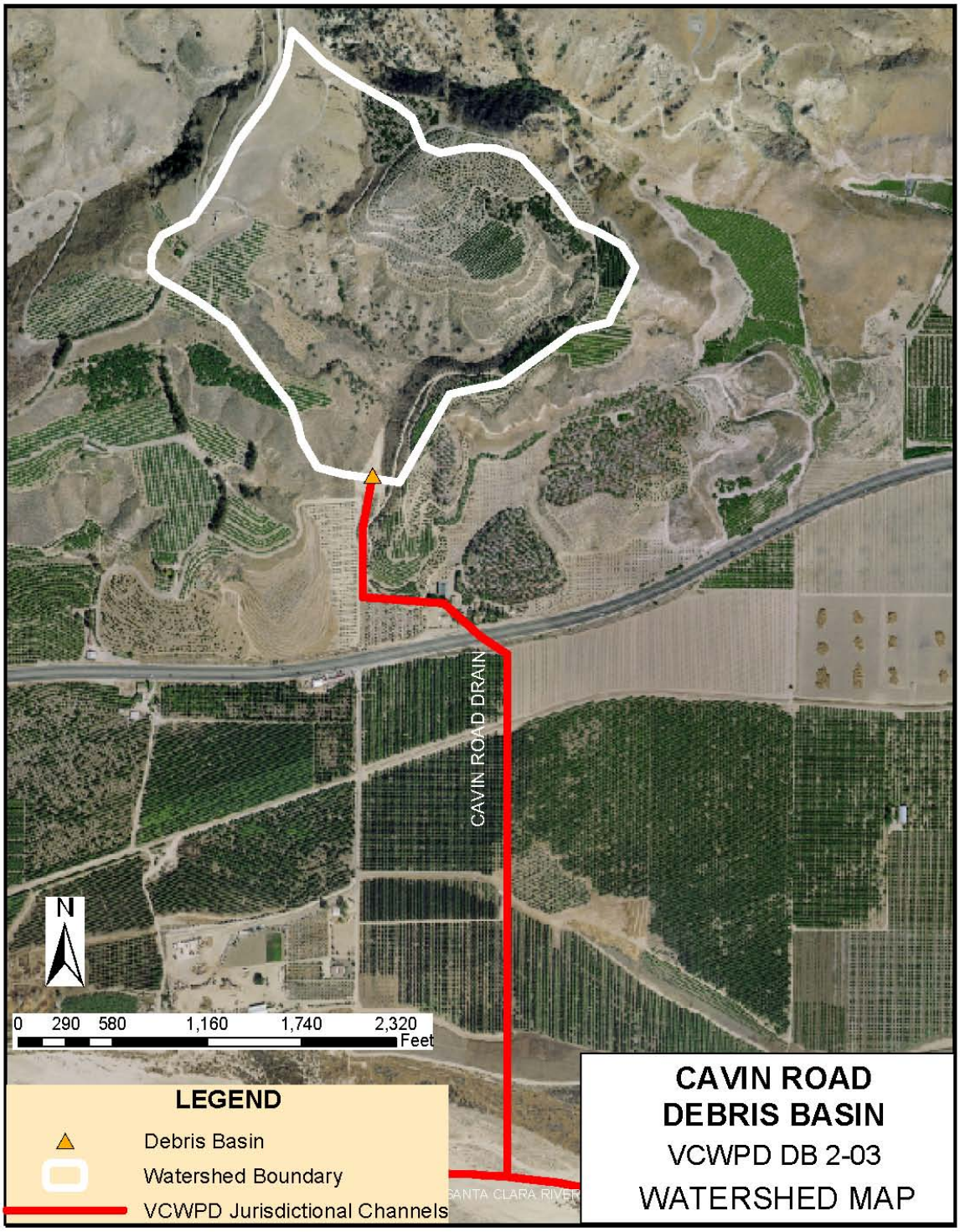
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

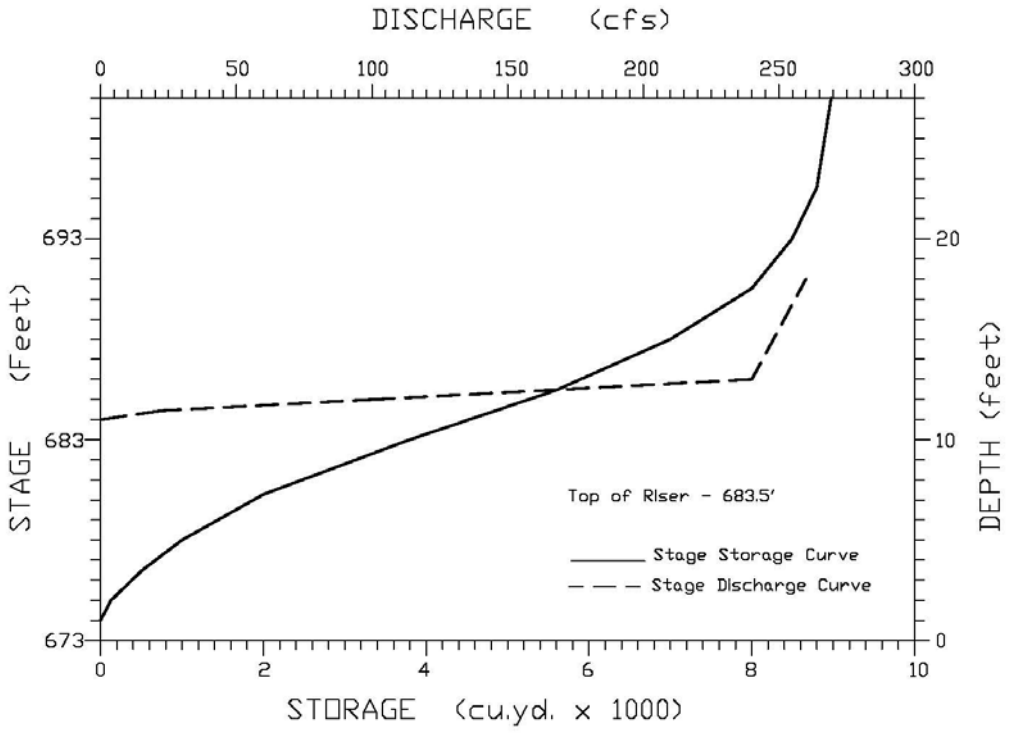
** FEMA Accepted Value for Disaster Declaration

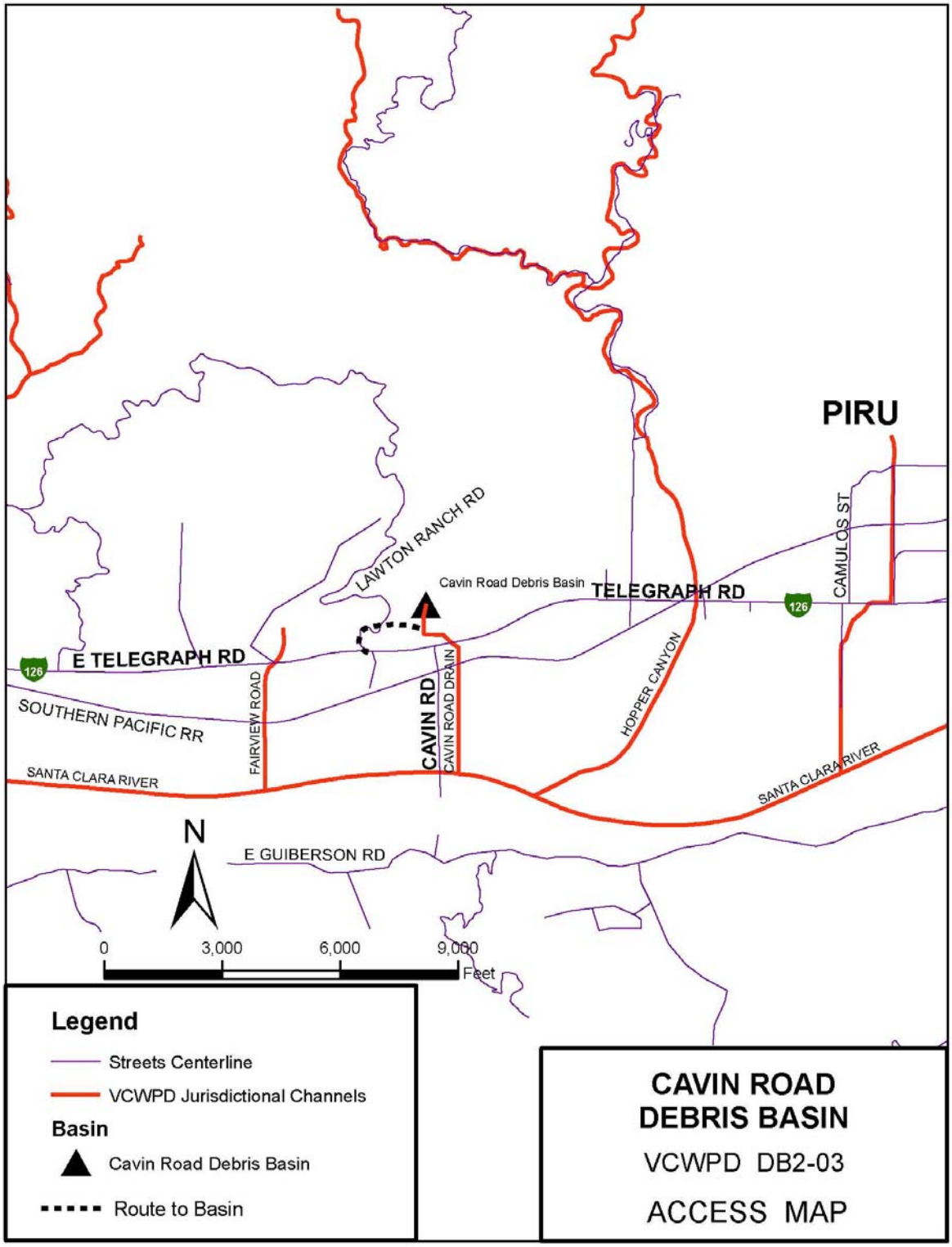
*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable


CAVIN ROAD DRAIN
N
0 290 580 1,160 1,740 2,320
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
SANTA CLARA RIVER
CAVIN ROAD
DEBRIS BASIN
VCWPD DB 2-03
WATERSHED MAP

CAVIN ROAD DEBRIS BASIN




PIRU
LAWTON RANCH RD
Cavin Road Debris Basin
TELEGRAPH RD
CAMULOS ST
126
E TELEGRAPH RD
126
SOUTHERN PACIFIC RR
FAIRVIEW ROAD
CAVIN RD
CAVIN ROAD DRAIN
HOPPER CANYON
SANTA CLARA RIVER
SANTA CLARA RIVER
N
E GUIBERSON RD
0
3,000
6,000
9,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Cavin Road Debris Basin
Route to Basin
CAVIN ROAD
DEBRIS BASIN
VCWPD DB2-03
ACCESS MAP

FAGAN CANYON DEBRIS BASIN DB2-08

LOCATION: Santa Paula, north boundary, approximately one-half mile north of Santa Paula Street, adjacent to and easterly of the extension of Cemetery Road. N 314,730, E 1,675,020 (Lambert Zone 5 Coordinates); Santa Paula 7-1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	Ventura County Watershed Protection District
Level Capacity	72,000 cy (09-27-94 DTM)
Maximum Debris Capacity	88,400 cy
Inflow and Outflow Rates	Q100in=2,100 cfs; Q100out=NA
Debris Cleanout Elevation	330 ft NGVD29 (10,685 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	15 ft W X 30 ft L X 21 ftD RC Drop Inlet
Weir Elevation	346.0 ft NGVD29
Spillway Length	75 ft
Capacity w/o freeboard	6,085 cfs
PRINCIPAL SPILLWAY	
Type	None
Invert Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	24-in slotted CSP with 36-in low level inlet at bottom
Top Elevation	346 ft NGVD29
Outlet Conduit	36-in RCP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	NA
Length	400 ft
Width at Crest	NA
Surface Area of Full Basin	3.22 ac
Watershed Area	1,856 ac from Quad Map
CONSTRUCTION DATA	
Construction Agency	VCWPD with NRCS
Completion Date	1994
REFERENCE DRAWINGS	
Construction Drawings	Y-2-2310 to Y-2-2321
Topographic Drawings	Y-2-2311; T-439 (9-27-94) DTM; Y-3-3397 (1995) T-499-7 (12-21-95)
Right-of-Way Drawings	Y-2-2311

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	104,600	154,000
50-YEAR	79,300	116,750
10-YEAR	21,300	31,400

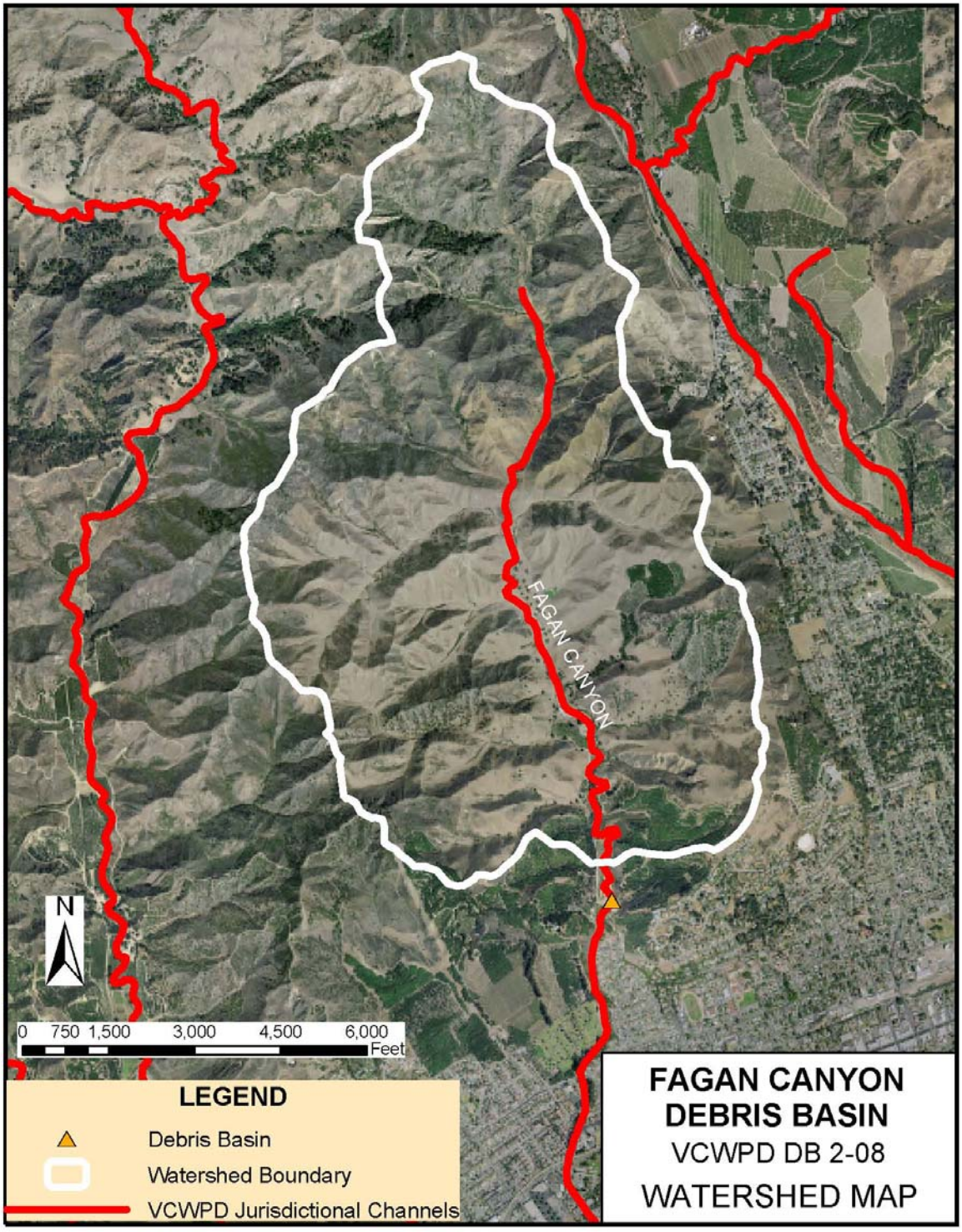
BASIN HISTORY: FAGAN CANYON DEBRIS BASIN

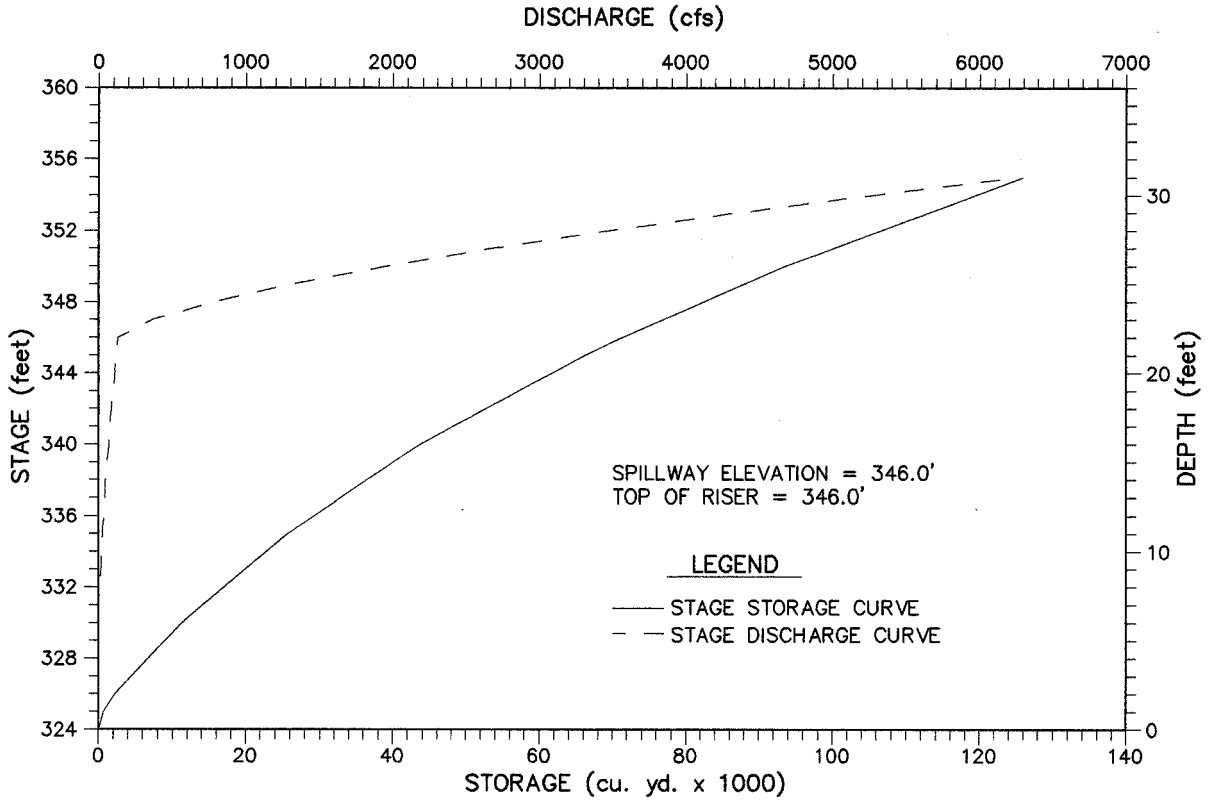
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
08-94	Basin Constructed			
09-94	Aerial Survey	88,400		
01-95	Cleanout		128	
01-95	Disaster Declaration			5,874
06-95	Aerial Survey	42,100		
10-95	Cleanout		42,850	
12-95	Aerial Survey	84,950		
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	81,470		
02-98	Disaster Declaration			2,203
07-98	Aerial Survey	38,170		
12-98	Cleanout		48,460	
12-98	Aerial Survey	86,630		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-02	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
02-04	Cleanout		582	
01-05	Disaster Declaration			2,200
07-05	Cleanout		53,812-Survey	

Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

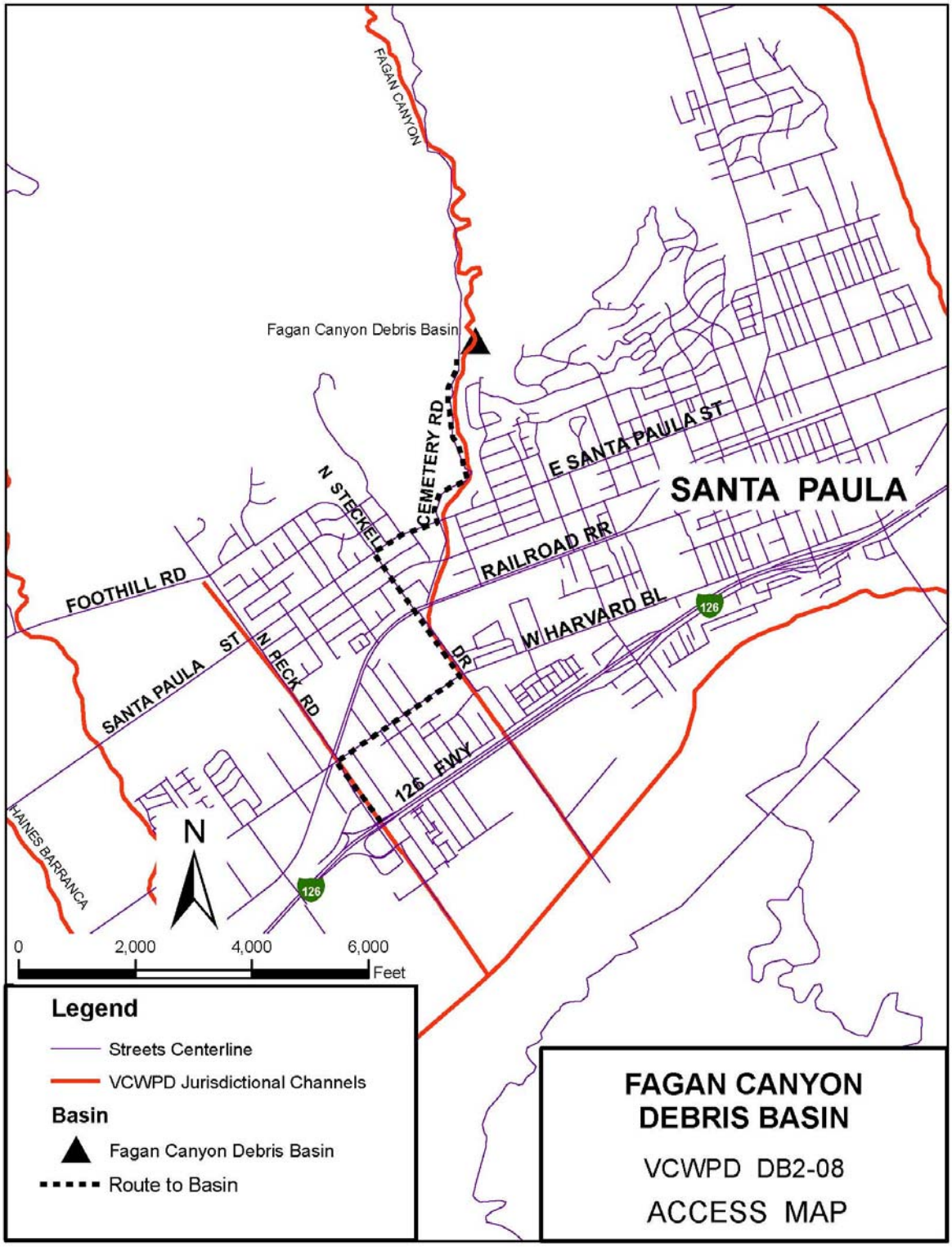
NA= Not Available / Not Applicable


FAGAN CANYON
N
0 750 1,500 3,000 4,500 6,000
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
FAGAN CANYON
DEBRIS BASIN
VCWPD DB 2-08
WATERSHED MAP



STAGE - STORAGE & DISCHARGE CURVES A

Fagan Canyon Debris Basin


FAGAN CANYON
Fagan Canyon Debris Basin
CEMETERY RD
N STECKEL
E SANTA PAULA ST
SANTA PAULA
RAILROAD RR
FOOTHILL RD
W HARVARD BL
126
SANTA PAULA ST
N PECK RD
DR
126 FWY
HAINES BARRANCA
N
126
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Fagan Canyon Debris Basin
Route to Basin
FAGAN CANYON
DEBRIS BASIN
VCWPD DB2-08
ACCESS MAP

FRANKLIN BARRANCA DEBRIS BASIN DB2-01

LOCATION: Saticoy, 1400 ft NW from Wells/Foothill Rd
Intersection, near Alto Mutual Reservoir;
N 294,800, E 1,647,400 (Lambert Zone 5 Coordinates);
Saticoy 7 1/2'Quad.

DESIGN DATA	(Avocado Orchard as of 5/2005; Elevations NGVD29)
Design Agency	Ventura County Watershed Protection District
Level Capacity	5,050 cy (10-29-71, T-63-16)
Maximum Debris Capacity	24,500 cy (10-29-71, T-63-16)
Inflow and Outflow Rates	Q100in=800 cfs; Q100out=290 cfs
Debris Cleanout Elevation	403.5 ft NGVD29 (2,250 cy) [cap. to op. spillway invert]
EMERGENCY SPILLWAY	
Type	4.25 ft x 2.7 ft CSPA
Invert Elevation	406.74 NGVD29
Spillway Length	NA
Capacity	NA
PRINCIPAL SPILLWAY	
Type	60 in Vertical CSP 39.1 ft High
Top Weir Elevation	403.5 NGVD29
Outlet Conduit	42 in RCP
DEBRIS BLEEDER/RISER	
Type	None
Top Weir Elevation	NA
Outlet Conduit	NA
DAM	
Dam Type	Earthfill (used as access road for house)
Dam Crest Elevation	413 NGVD29
Length	140 ft
Width at Crest	15 ft
Surface Area of Full Basin	1.1 ac
Watershed Area	330 ac from Quad Map
CONSTRUCTION DATA	
Construction Agency	Ventura County Watershed Protection District
Completion Date	1934, replaced riser 1996
REFERENCE DRAWINGS	
Construction Drawings	30898, Y-2-2373 thru 2377
Topographic Drawings	T-63-3 (2-6-70) 30897
Right-of-Way Drawings	Easement Deed #358 or 378

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	11,507	16,685
50-YEAR	8,856	12,845
25-YEAR	6,247	9,058

BASIN HISTORY: FRANKLIN BARRANCA DEBRIS BASIN

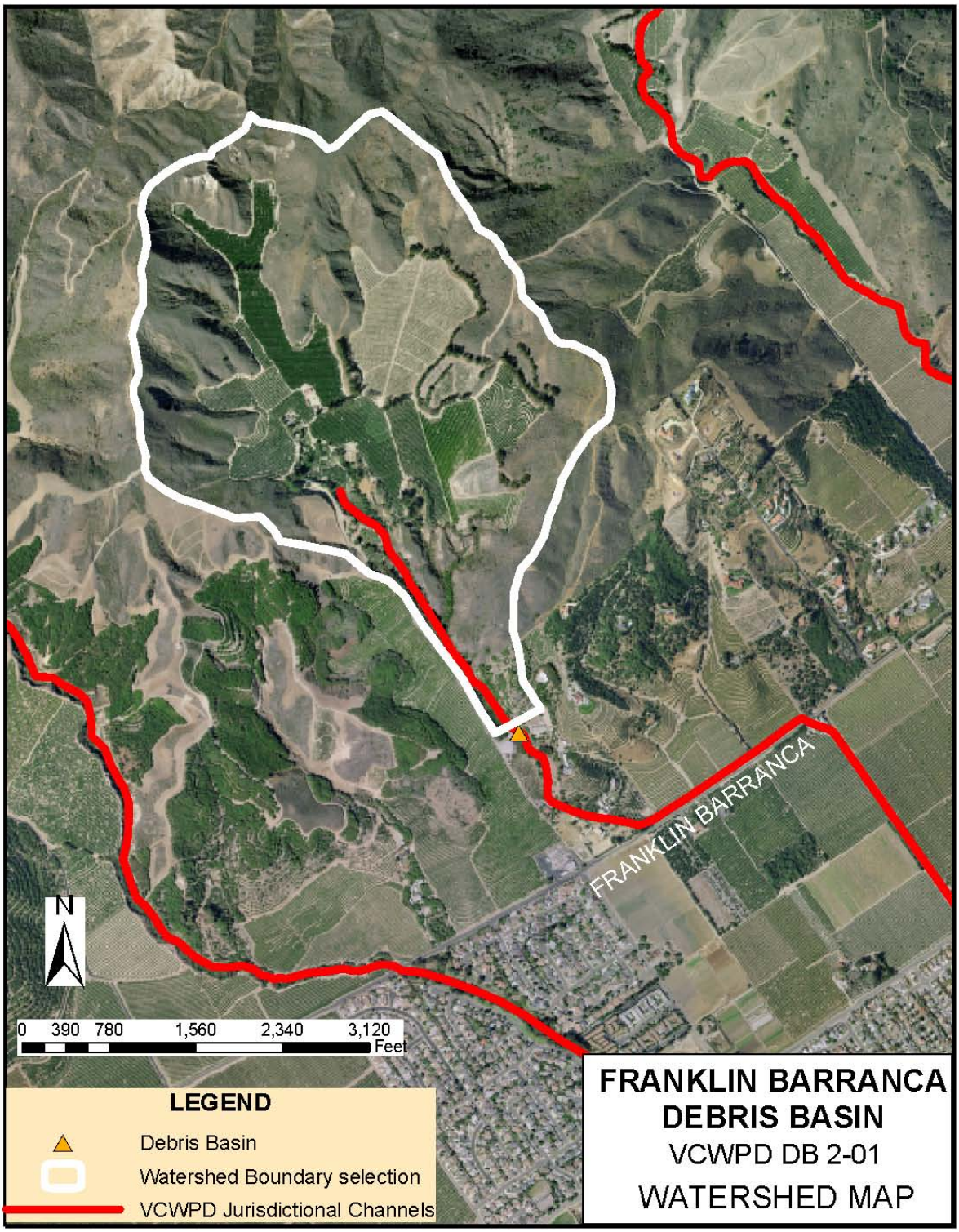
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
01-70	Aerial Survey	Not Digitized		
02-70	Aerial Survey	8,328		
11-70	Aerial Survey	8,128		
05-71	Aerial Survey	7,422		
05-72	Aerial Survey	Not Digitized		
05-73	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			
06-78	Aerial Survey	1,402		
10-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			890***
10-90	Aerial Survey	Not Digitized		
06-91	Aerial Survey	Not Digitized		
02-92	Disaster Declaration			890
05-92	Aerial Survey	Not Digitized		
01-95	Disaster Declaration			890
05-96	Outlet repaired/modified			
02-98	Disaster Declaration			890
01-05	Disaster Declaration			

Notes

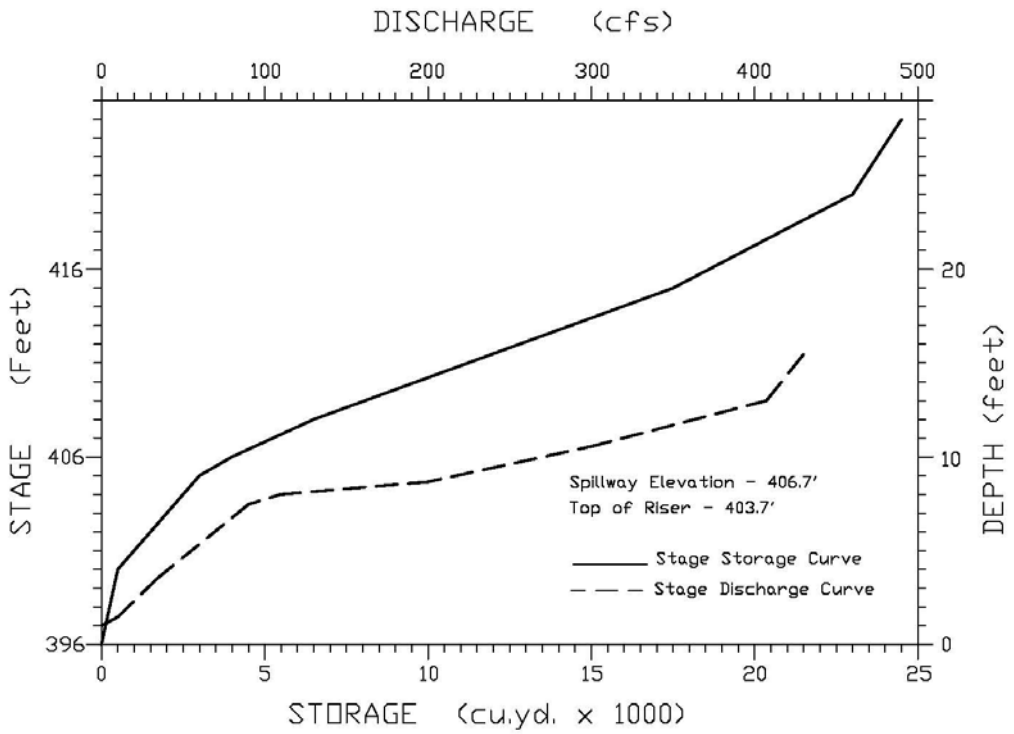
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

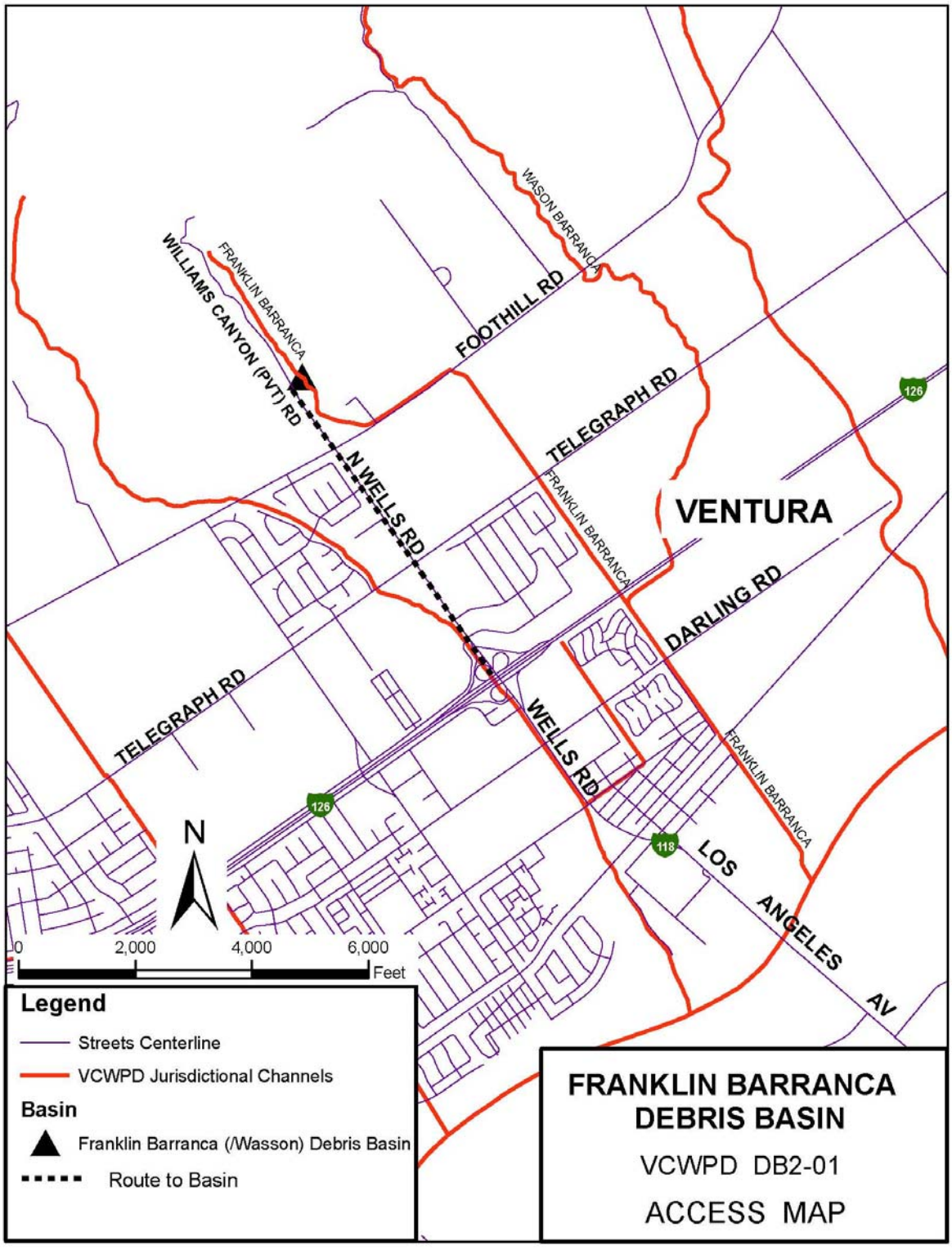
*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable


FRANKLIN BARRANCA
N
0 390 780 1,560 2,340 3,120
Feet
LEGEND
Debris Basin
Watershed Boundary selection
VCWPD Jurisdictional Channels
FRANKLIN BARRANCA
DEBRIS BASIN
VCWPD DB 2-01
WATERSHED MAP

FRANKLIN BARRANCA DEBRIS BASIN




WASON BARRANCA
FRANKLIN BARRANCA
WILLIAMS CANYON (PVT) RD
FOOTHILL RD
TELEGRAPH RD
N WELLS RD
FRANKLIN BARRANCA
VENTURA
DARLING RD
TELEGRAPH RD
WELLS RD
FRANKLIN BARRANCA
126
126
118
LOS ANGELES AV
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Franklin Barranca (/Wasson) Debris Basin
Route to Basin
FRANKLIN BARRANCA
DEBRIS BASIN
VCWPD DB2-01
ACCESS MAP

JEPSON WASH DEBRIS BASIN DB2-02

LOCATION: Fillmore, approximately 2000 ft u/s from Grand Ave.
Enter at end of Oak Ave
N 336,400, E 1,717,000 (Lambert Zone 5 Coordinates);
Fillmore 7 1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	33,850 cy (12-13-87 DTM)
Maximum Debris Capacity	54,750 cy (12-13-87 DTM)
Inflow and Outflow Rates	Q100in=1,624 cfs; Q100out=NA
Debris Cleanout Elevation	587 ft NGVD29 (5,550 cy) [10% of 100-yr debris yield)
EMERGENCY SPILLWAY	
Type	36 ft wide x 7.25 ft high Triple RCB
Invert Elevation	598.0 ft NGVD29
Spillway Length	NA
Capacity	1,482 cfs
PRINCIPAL SPILLWAY	
Type	None
Invert Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	Slotted 18 in CSP
Top Elevation	597.5 ft NGVD29
Outlet Conduit	18 in CSP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	604 NGVD29
Length	700 ft
Width at Crest	NA
Surface Area of Full Basin	2.7 ac
Watershed Area	858 ac from Quad Map
CONSTRUCTION DATA	
Construction Agency	Ventura County Flood Control District
Completion Date	1961
REFERENCE DRAWINGS	
Construction Drawings	Y-2-143 thru Y-2-146
Topographic Drawings	T-63-7 (2-6-70), T-33-2 (12-13-85), 12-23-87 DTM, 10-5-89 DTM
Right-of-Way Drawings	15907

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	55,800	80,100
50-YEAR	42,000	60,400
25-YEAR	29,900	43,000

BASIN HISTORY: JEPSON WASH DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
09-69	Cleanout		41,000	
02-70	Aerial Survey	43,088		
11-70	Aerial Survey	Not Digitized		
11-70	Aerial Survey	42,074		
12-70	Aerial Survey	40,337		
05-71	Aerial Survey	33,751		
08-71	Cleanout		1,800	
10-71	Aerial Survey	36,499		
01-72	Aerial Survey	33,101		
10-72	Cleanout		9,100	
11-72	Aerial Survey	42,059		
05-73	Aerial Survey	22,798		
08-73	Cleanout		27,000	
11-73	Aerial Survey	49,371		
06-74	Aerial Survey	43,204		
06-75	Aerial Survey	37,082		
10-75	Aerial Survey	38,460		
09-76	Cleanout		5,000	
10-76	Aerial Survey	44,087		
07-77	Cleanout		1,700	
12-77	Aerial Survey	44,174		
01-78	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			
06-78	Aerial Survey	11,137		
10-78	Cleanout		33,400	
10-78	Aerial Survey	45,582		
11-78	Aerial Survey	Not Digitized		
06-80	Aerial Survey	13,520		
02-80	Disaster Declaration			
12-80	Cleanout		41,720	

BASIN HISTORY: JEPSON WASH DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
12-80	Aerial Survey	53,010		6,664**
10-81	Aerial Survey	Not Digitized		
11-82	Aerial Survey	49,810		
03-83	Disaster Declaration			5,880**
04-83	Aerial Survey	17,781		
02-84	1st Cleanout		26,000	
02-84	Aerial Survey	43,803		
03-84	2nd Cleanout		7,400	
03-84	Aerial Survey	51,178		
07-85	Cleanout		4,291	
12-85	Aerial Survey	53,198		
07-86	Aerial Survey	39,955		
10-86	Cleanout		15,654	
10-86	Aerial Survey	55,027		
10-87	Aerial Survey	54,700		
10-88	Aerial Survey	Not Digitized		
10-89	Aerial Survey	53,858		4,034
09-90	Aerial Survey	Not Digitized		
05-91	Aerial Survey	49,865		4,031
02-92	Disaster Declaration			3,953**
05-92	Aerial Survey	38,880		
11-92	Cleanout		15,867	
11-92	Aerial Survey	54,750		
07-93	Aerial Survey	26,400		
10-93	Cleanout		28,700	
01-94	Aerial Survey	55,100		
01-95	Disaster Declaration			4,355
06-95	Aerial Survey	21,350		
09-95	Cleanout		33,250	
12-95	Aerial Survey	54,750		
07-96	Aerial Survey	Not Digitized		
08-96	Cleanout		3,540	
07-97	Aerial Survey	43,660		
02-98	Disaster Declaration			4,239
03-98	Field Survey	18,800		
07-98	Aerial Survey	16,400		
12-98	Cleanout		37,580	
12-98	Aerial Survey	53,980		
12-99	Aerial Survey	Not Digitized		

BASIN HISTORY: JEPSON WASH DEBRIS BASIN

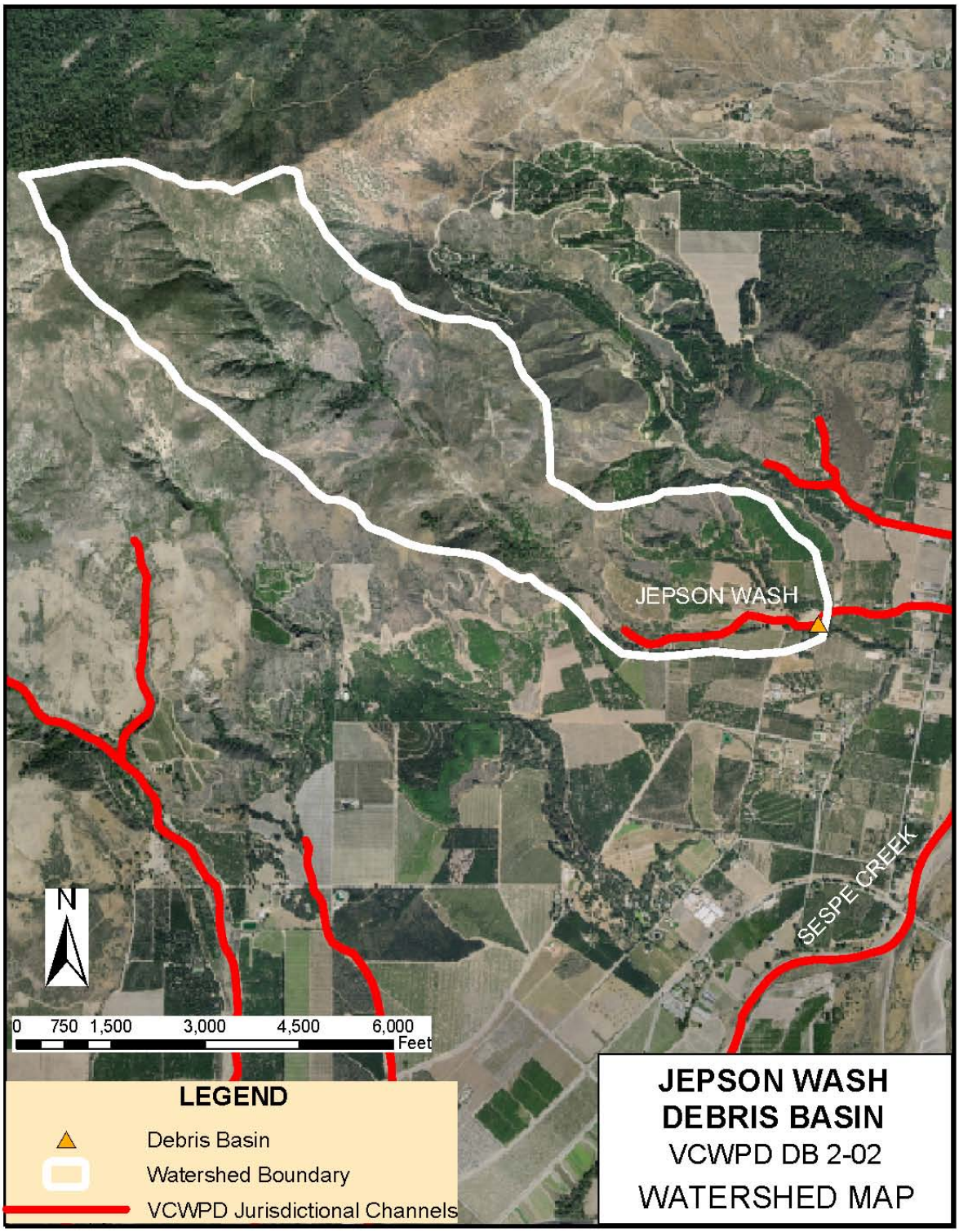
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
08-01	Aerial Survey	Not Digitized		
12-02	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
02-04	Cleanout		872	
08-04	Cleanout		6,768	
01-05	Disaster Declaration			3,556
07-05	Cleanout		42,918	
07-05	Cleanout		14,034-Survey	

Notes

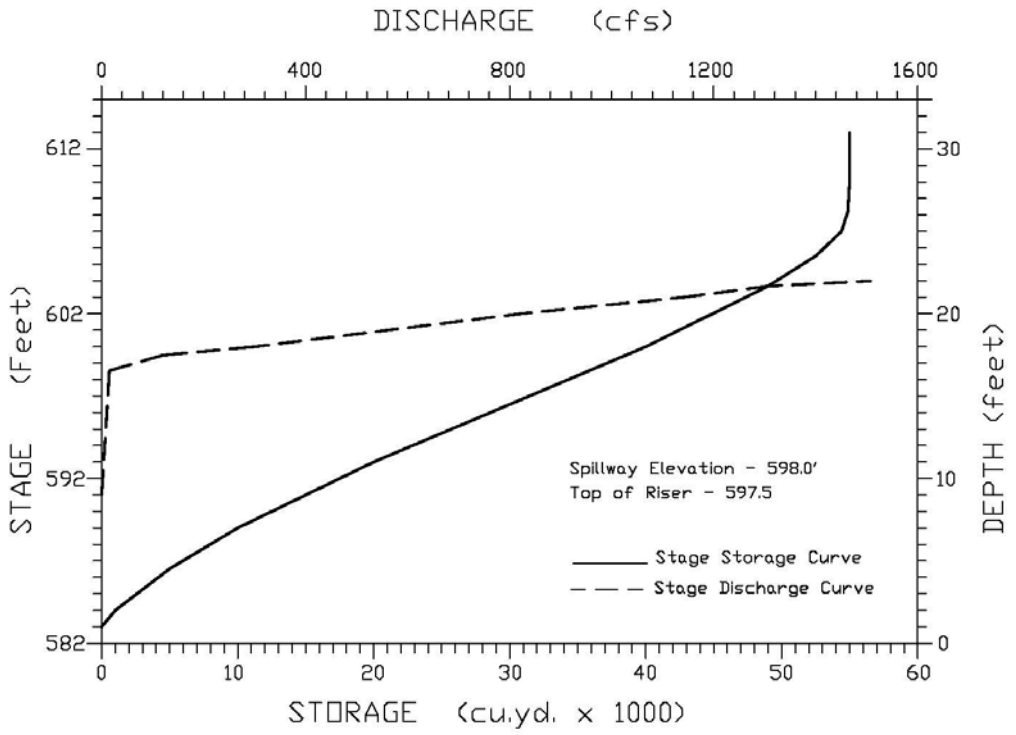
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

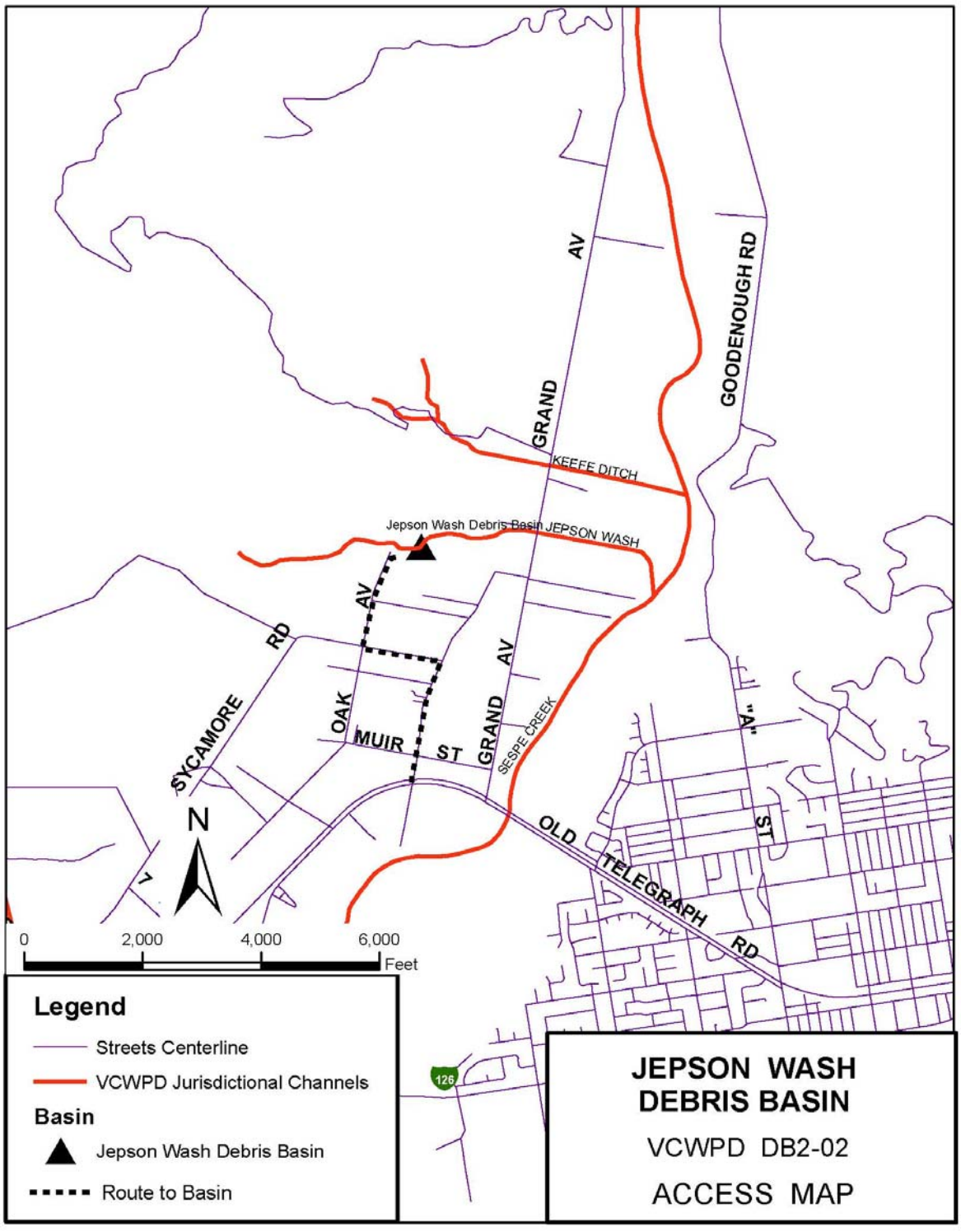
** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable


JEPSON WASH
SESPE CREEK
N
0 750 1,500 3,000 4,500 6,000
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
JEPSON WASH
DEBRIS BASIN
VCWPD DB 2-02
WATERSHED MAP

JEPSON WASH DEBRIS BASIN




AV
GOODENOUGH RD
GRAND
KEEFE DITCH
Jepson Wash Debris Basin
JEPSON WASH
AV
RD
SYCAMORE
OAK
MUIR
ST
GRAND
AV
SESPE CREEK
"A"
ST
OLD
TELEGRAPH
RD
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Jepson Wash Debris Basin
Route to Basin
126
JEPSON WASH
DEBRIS BASIN
VCWPD DB2-02
ACCESS MAP

REAL WASH DEBRIS BASIN DB2-04

LOCATION: Piru, 1900 ft upstream from Center Street, 2500 ft west of Main Street.
N 336,000, E 1,758,000 (Lambert Zone 5 Coordinates.)
Piru 7-1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	22,000 (10-5-89 DTM) 22,500 (11-91 DTM)
Maximum Debris Capacity	31,600 (10-5-89 DTM) 32,100 (11-91 DTM)
Inflow and Outflow Rates	Q100in=175 cfs; Q100out=NA
Debris Cleanout Elevation	857 ft (10,500 cy) [level cap.-100yr debris yield]
EMERGENCY SPILLWAY	
Type	12 ft wide x 6.75 ft high RC Channel
Invert Elevation	865.5 ft NGVD29
Spillway Length	NA
Capacity	459 cfs from as-builts
PRINCIPAL SPILLWAY	
Type	None
Invert Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	Slotted 18-in CSP 12.3 ft high
Top Elevation	858.8 ft
Outlet Conduit	18-in CSP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	872 ft
Length	330 ft
Width at Crest	NA
Surface Area of Full Basin	1.6 ac
Watershed Area	160 ac from Quad
CONSTRUCTION DATA	
Construction Agency	VCWPD with Storm Drain Maintenance District No.2
Completion Date	1964
REFERENCE DRAWINGS	
Construction Drawings	Y-2-310
Topographic Drawings	NA
Right-of-Way Drawings	T-63-8 (2-6-70) T-52-1 (10-7-67); T-256 (10-22-80) 12-23-87 DTM; 10-5-89 DTM, T-432 (10-19-94)

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	11,500	16,400
50-YEAR	8,500	12,200
25-YEAR	6,000	8,600

BASIN HISTORY: REAL WASH DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
10-67	Aerial Survey	Not Digitized		
02-69	Disaster Declaration			
09-69	Cleanout		19,300	
01-70	Aerial Survey	Not Digitized		
11-70	Aerial Survey	19,878		
12-70	Aerial Survey	17,175		
05-71	Aerial Survey	15,503		
05-72	Aerial Survey	11,875		
06-72	Cleanout		6,000	
11-72	Aerial Survey	19,926		
05-73	Aerial Survey	14,499		
09-73	Cleanout		6,500	
11-73	Aerial Survey	20,606		
06-74	Aerial Survey	19,755		
06-75	Aerial Survey	18,365		
10-75	Aerial Survey	18,260		
09-76	Cleanout		3,300	
10-76	Aerial Survey	22,251		
12-77	Aerial Survey	20,720		
01-78	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			
06-78	Aerial Survey	2,276		
11-78	Cleanout		18,400	
12-78	Aerial Survey	21,187		
02-80	Disaster Declaration			
06-80	Aerial Survey	7,026		
11-80	Cleanout		17,100	2,514**
11-80	Aerial Survey	23,920		
10-81	Aerial Survey	Not Digitized		
11-82	Aerial Survey	21,315		

BASIN HISTORY: REAL WASH DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
03-83	Disaster Declaration			
04-83	Aerial Survey	13,834		
09-84	Cleanout		25,070	2,507**
09-84	Aerial Survey	25,886		
12-85	Aerial Survey	25,947		
07-86	Aerial Survey	19,864		
10-86	Cleanout		13,500	
10-86	Aerial Survey	29,958		
12-87	Aerial Survey	29,402		
10-88	Aerial Survey	Not Digitized		
07-89	Cleanout		6,224	2,014
10-89	Aerial Survey	31,576		
09-90	Aerial Survey	Not Digitized		
05-91	Aerial Survey	26,877		
11-91	Cleanout		6,742	
11-91	Aerial Survey	32,106		
02-92	Disaster Declaration			2,573**
05-92	Aerial Survey	19,140		
11-92	Cleanout		13,500	
11-92	Aerial Survey	31,112		
06-94	Aerial Survey	11,488		
10-94	Aerial Survey	11,330		
12-94	Cleanout		23,590	
12-94	Aerial Survey	30,750		
01-95	Disaster Declaration			5,225**
02-95	Cleanout		22,160	
05-95	Aerial Survey	3,000		
12-95	Cleanout		28,250	
12-95	Aerial Survey	31,250		
07-96	Aerial Survey			
08-96	Aerial Survey	11,050		
01-97	Field Survey	2,950		
01-97	Cleanout		19,580	
04-97	Aerial Survey	22,530		
07-97	Aerial Survey	Not Digitized		
02-98	Disaster Declaration			3,709***
03-98	Field Survey	5,240		
06-98	Cleanout		25,470	
06-98	Aerial Survey	28,150		

BASIN HISTORY: REAL WASH DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
12-99	Aerial Survey	Not Digitized		
09-00	Cleanout		1,300	
08-01	Aerial Survey	Not Digitized		
10-02	Cleanout		8,916	
12-02	Aerial Survey	Not Digitized		
08-03	Cleanout		152	
09-03	Cleanout		5,962	
11-03	Aerial Survey	Not Digitized		
08-04	Cleanout		3,864	
09-04	Cleanout		5,177	
01-05	Disaster Declaration			4,124
07-05	Cleanout		**44,674**	
07-05	Cleanout		**2,644- Survey**	

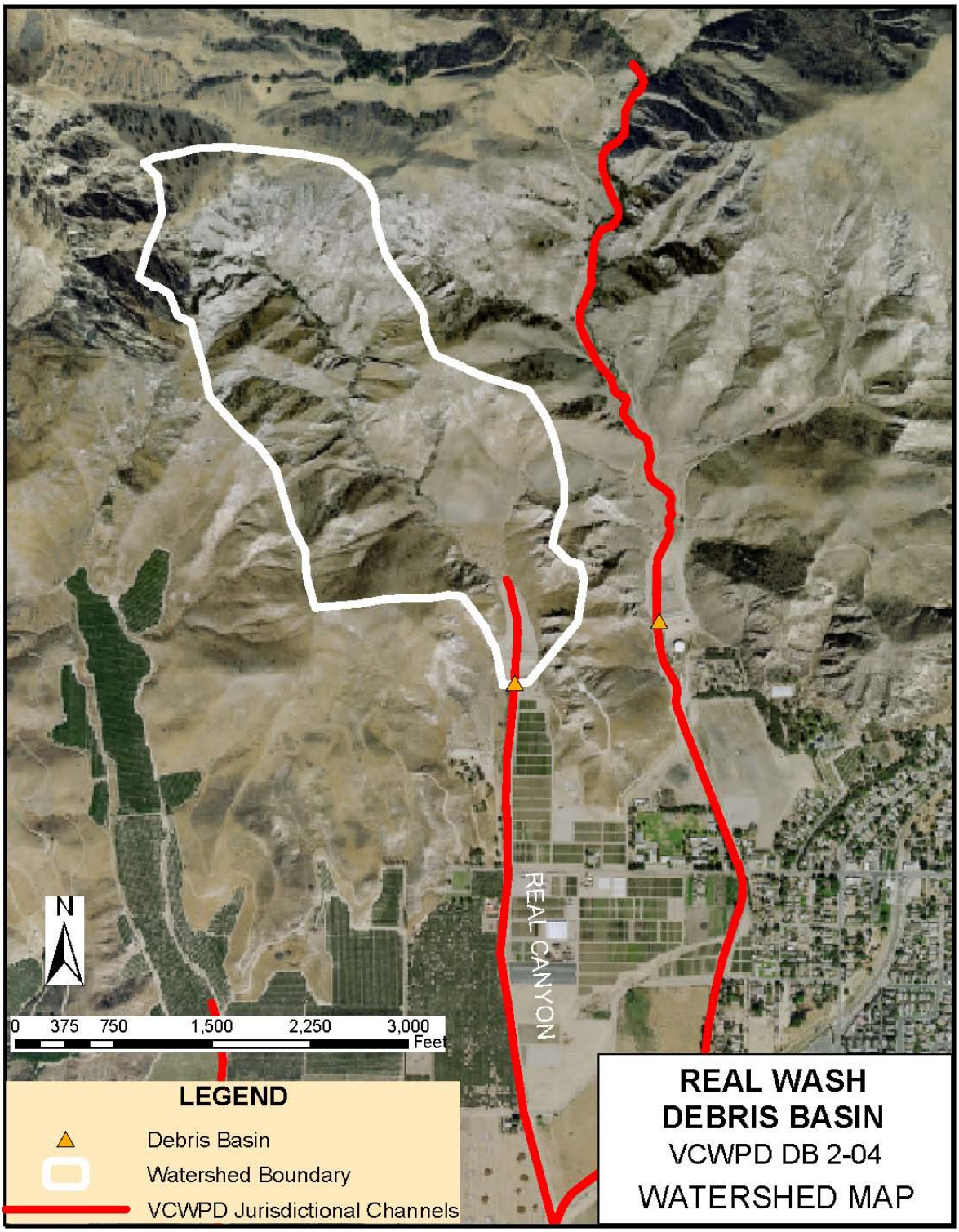
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

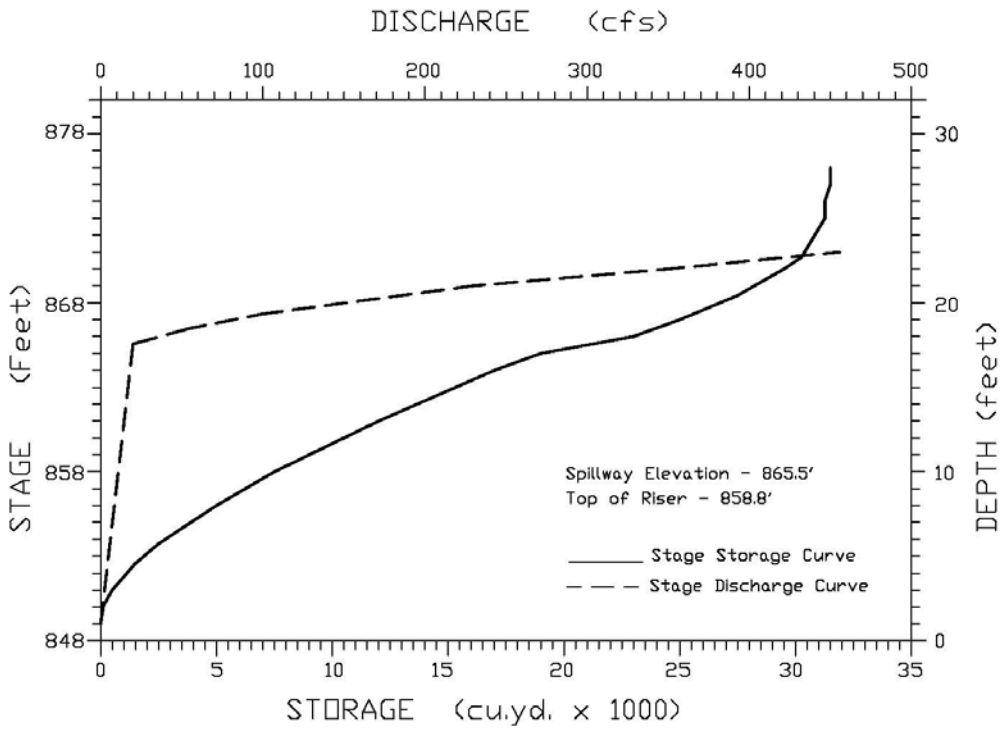
** FEMA Accepted Value for Disaster Declaration

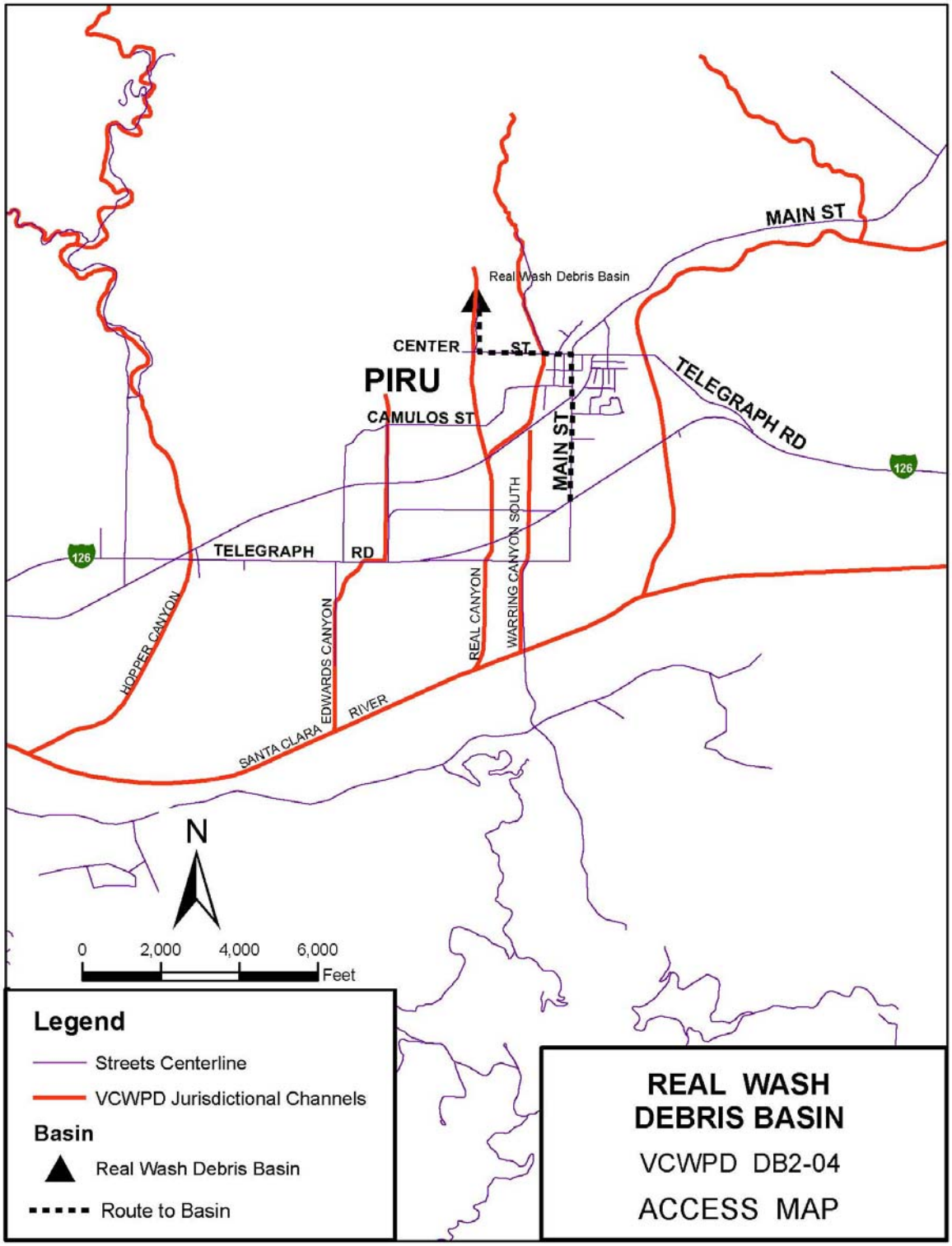
*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable


N
0 375 750 1,500 2,250 3,000
Feet
REAL CANYON
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
REAL WASH
DEBRIS BASIN
VCWPD DB 2-04
WATERSHED MAP

REAL WASH DEBRIS BASIN




MAIN ST
Real Wash Debris Basin
CENTER ST
PIRU
CAMULOS ST
MAIN ST
TELEGRAPH RD
126
TELEGRAPH RD
126
HOPPER CANYON
EDWARDS CANYON
REAL CANYON
WARRING CANYON SOUTH
SANTA CLARA RIVER
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Real Wash Debris Basin
Route to Basin
REAL WASH
DEBRIS BASIN
VCWPD DB2-04
ACCESS MAP

WARRING CANYON DEBRIS BASIN DB2-05

LOCATION: Piru, 2000 ft u/s from Center Street, 800 ft W from Main St;
N 336,000, E 1,759,000 (Lambert Zone 5 Coordinates);
Piru 7 1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	33,100 cy (10-30-86)
Maximum Debris Capacity	59,500 cy (10-30-86)
Inflow and Outflow Rates	Q100in=780 cfs; Q100out=NA
Debris Cleanout Elevation	837 ft (7,100 cy) [max. cap.-100yr debris yield]
EMERGENCY SPILLWAY	
Type	22 ft wide x 6 ft high RC Channel
Invert Elevation	850.6 ft NGVD29
Spillway Length	NA
Capacity	770 cfs
PRINCIPAL SPILLWAY	
Type	6.5 ft X10 ft RC Tower Weir Inlet
Weir Elevation	851.08 ft NGVD29
Outlet Conduit	48-in RCP
DEBRIS BLEEDER/RISER	
Type	Slots in Spillway Riser Tower
Top Elevation	851.08 ft NGVD29
Outlet Conduit	48-in RCP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	856 ft NGVD29
Length	320 ft
Width at Crest	NA
Surface Area of Full Basin	2.3 ac
Watershed Area	695 ac from Quad Map
CONSTRUCTION DATA	
Construction Agency	VCWPD with Storm Drain Maintenance District No.2
Completion Date	1952; Riser tower reconstructed in 2003
REFERENCE DRAWINGS	
Construction Drawings	31399c, 33183 thru 33184; Riser Tower Y-2-2737-2745
Topographic Drawings	T-52-2 (10-7-67), T-63-12 (2-6-70); T-63-13 (11-12-70) T-255 (10-22-80); T-335 (12-13-85) 12-23-87 DTM; 10-5-89 DTM, 10-5-90 DTM
Right-of-Way Drawings	15956

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	52,400	75,000
50-YEAR	38,800	55,600
25-YEAR	27,200	39,000

BASIN HISTORY: WARRING CANYON DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
10-67	Aerial Survey	Not Digitized		
02-69	Disaster Declaration			
06-6	Cleanout		27,100	
01-70	Cleanout		18,000	
02-70	Aerial Survey	Not Digitized		
10-70	Cleanout		11,300	
11-70	Aerial Survey	36,054		
12-70	Aerial Survey	32,054		
05-71	Cleanout		125	
05-71	Aerial Survey	32,174		
01-72	Aerial Survey	28,000		
09-72	Cleanout		9,400	
11-72	Aerial Survey	37,300		
05-73	Aerial Survey	23,406		
09-73	Cleanout		14,200	
10-73	Aerial Survey	37,034		
06-74	Aerial Survey	35,969		
10-75	Aerial Survey	33,247		
10-76	Cleanout		6,250	
10-76	Aerial Survey	39,288		
12-77	Aerial Survey	35,046		
01-78	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			
06-78	Aerial Survey	3,884		
11-78	Cleanout		30,700	8,143**
11-78	Aerial Survey	34,562		
06-80	Aerial Survey	2,628		
11-80	Cleanout		27,100	8,829**
11-80	Aerial Survey	32,196		
10-81	Aerial Survey	Not Digitized		

BASIN HISTORY: WARRING CANYON DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
08-82	Cleanout		7,200	
11-82	Aerial Survey	39,89		
03-83	Disaster Declaration			
04-83	Aerial Survey	16,478		
11-83	Aerial Survey	12,762		
01-84	Cleanout		24,940	
01-84	Aerial Survey	40,174		
09-84	Cleanout		12,904	
09-84	Aerial Survey	51,878		
12-85	Aerial Survey	49,922		
07-86	Aerial Survey	31,639		
10-86	Cleanout		27,036	
10-86	Aerial Survey	59,456		
10-87	Aerial Survey	Not Digitized		
12-87	Aerial Survey	53,952		
12-88	Aerial Survey	Not Digitized		
07-89	Cleanout		6,188	5,100
10-89	Aerial Survey	57,099		
09-90	Aerial Survey	58,326		
05-91	Aerial Survey	56,125		
06-91	Cleanout		5,664	
11-91	Aerial Survey	61,080		
02-92	Disaster Declaration			5,611**
05-92	Aerial Survey	30,890		
09-92	Cleanout		31,300	
09-92	Aerial Survey	62,820		
12-92	Aerial Survey	Not Digitized		
09-93	Aerial Survey	40,130		
02-94	Cleanout		22,200	
03-94	Aerial Survey	62,770		
01-95	Disaster Declaration			6,022
06-95	Aerial Survey	11,570		
11-95	Cleanout		50,650	
11-95	Aerial Survey	62,220		
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	52,500		
02-98	Disaster Declaration			5,049***
07-98	Aerial Survey	8,440		

BASIN HISTORY: WARRING CANYON DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
12-98	Cleanout		50,244	
12-98	Aerial Survey	58,690		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-02	Aerial Survey	Not Digitized		
04-02	Aerial Survey	53,375		
NA	Cleanout	Volume Unknown	NA	
03-03	Aerial Survey	62,314		
12-04	Cleanout		17,450	
01-05	Disaster Declaration			4,927
07-05	Cleanout		**85,687**	
07-05	Cleanout		**21,965-Survey**	

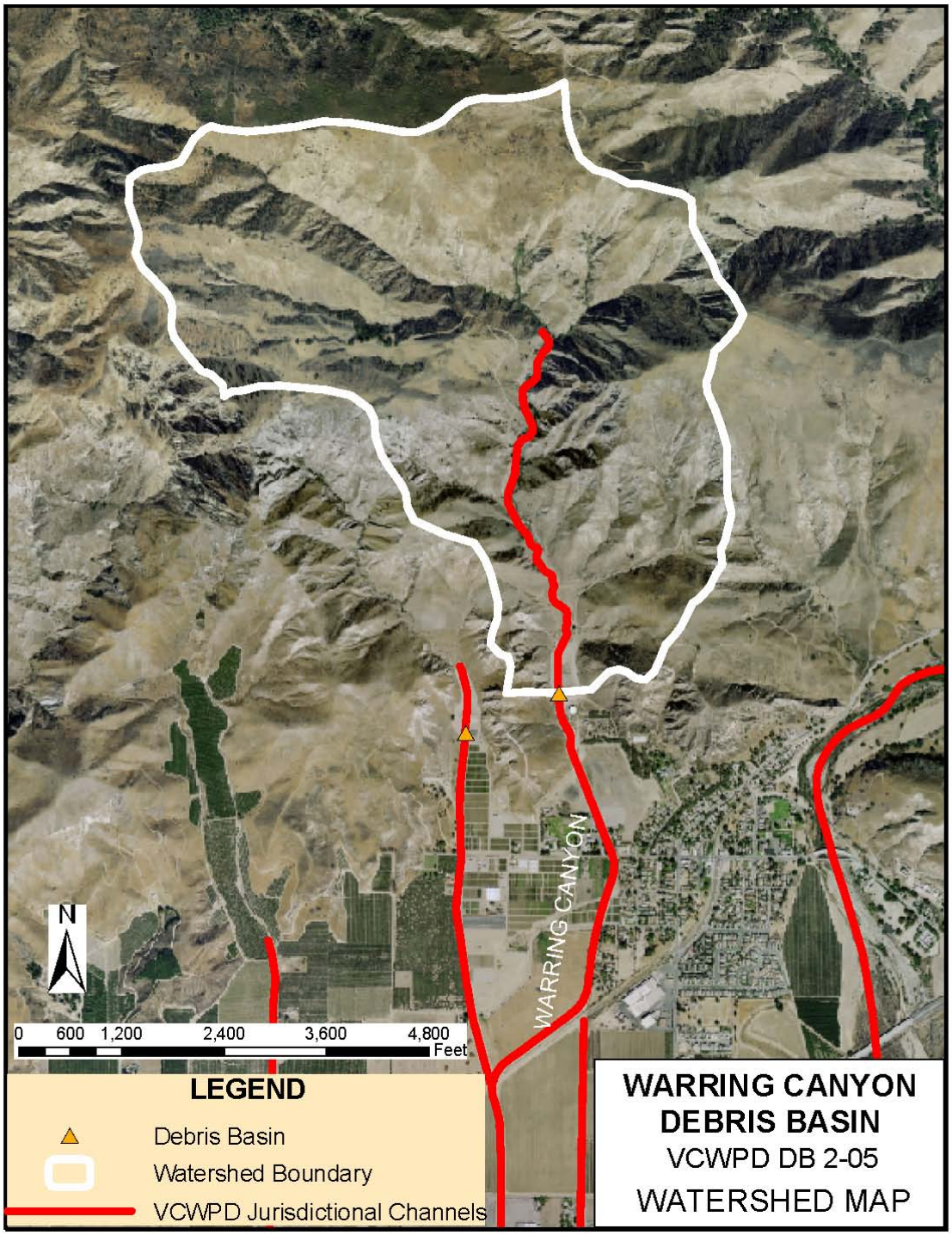
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

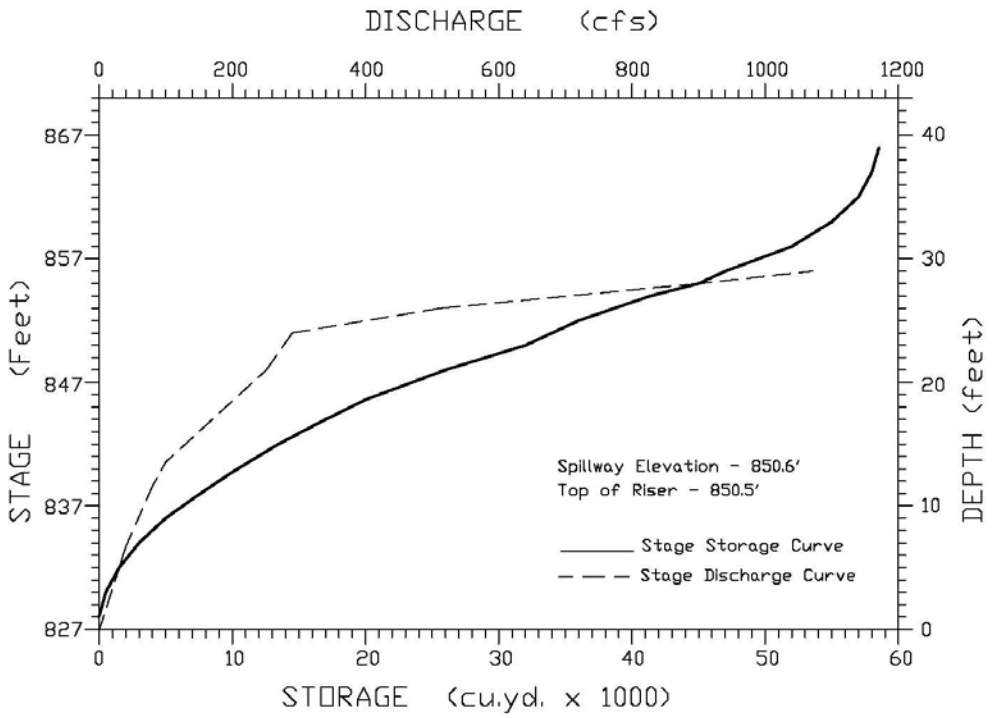
** FEMA Accepted Value for Disaster Declaration

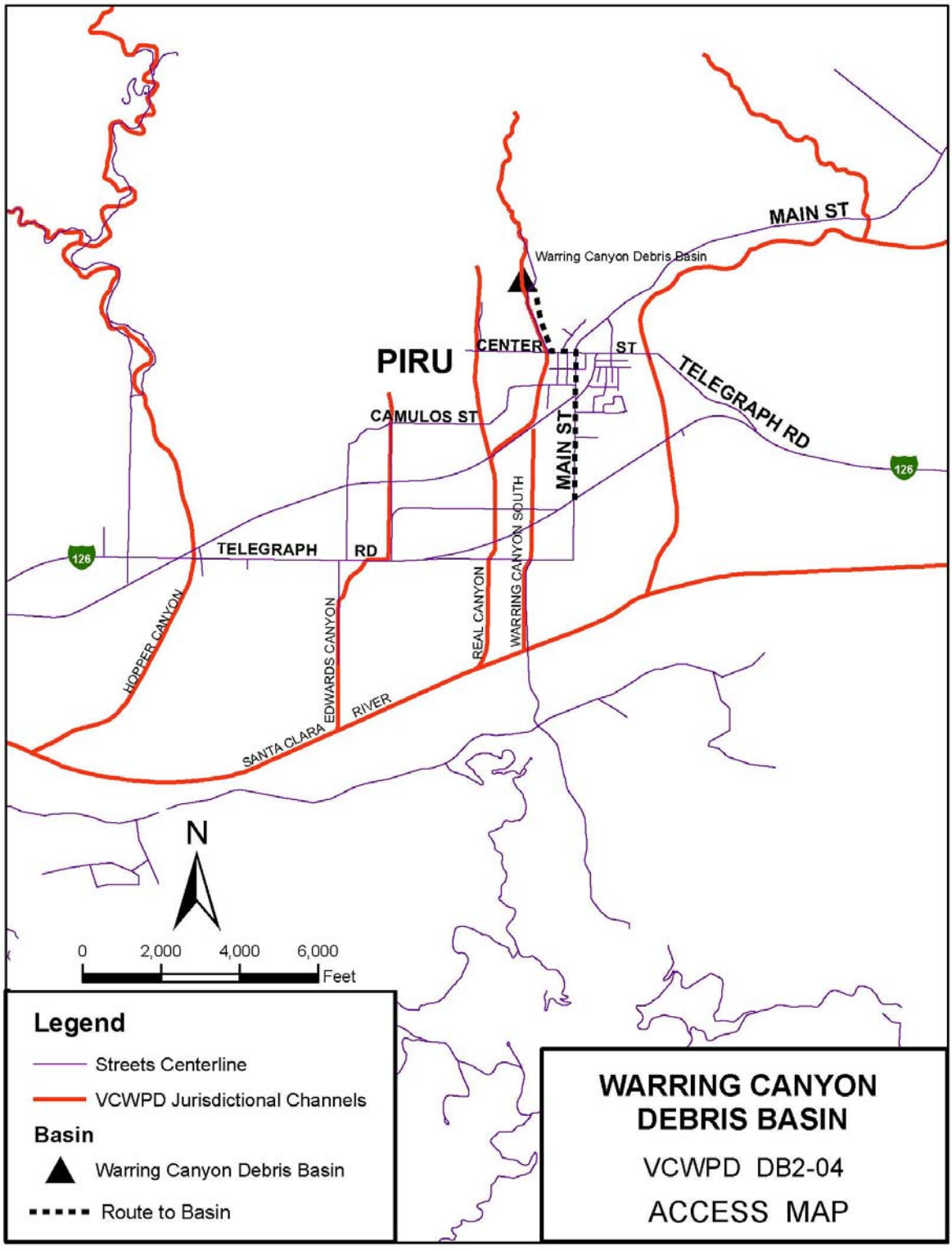
*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable

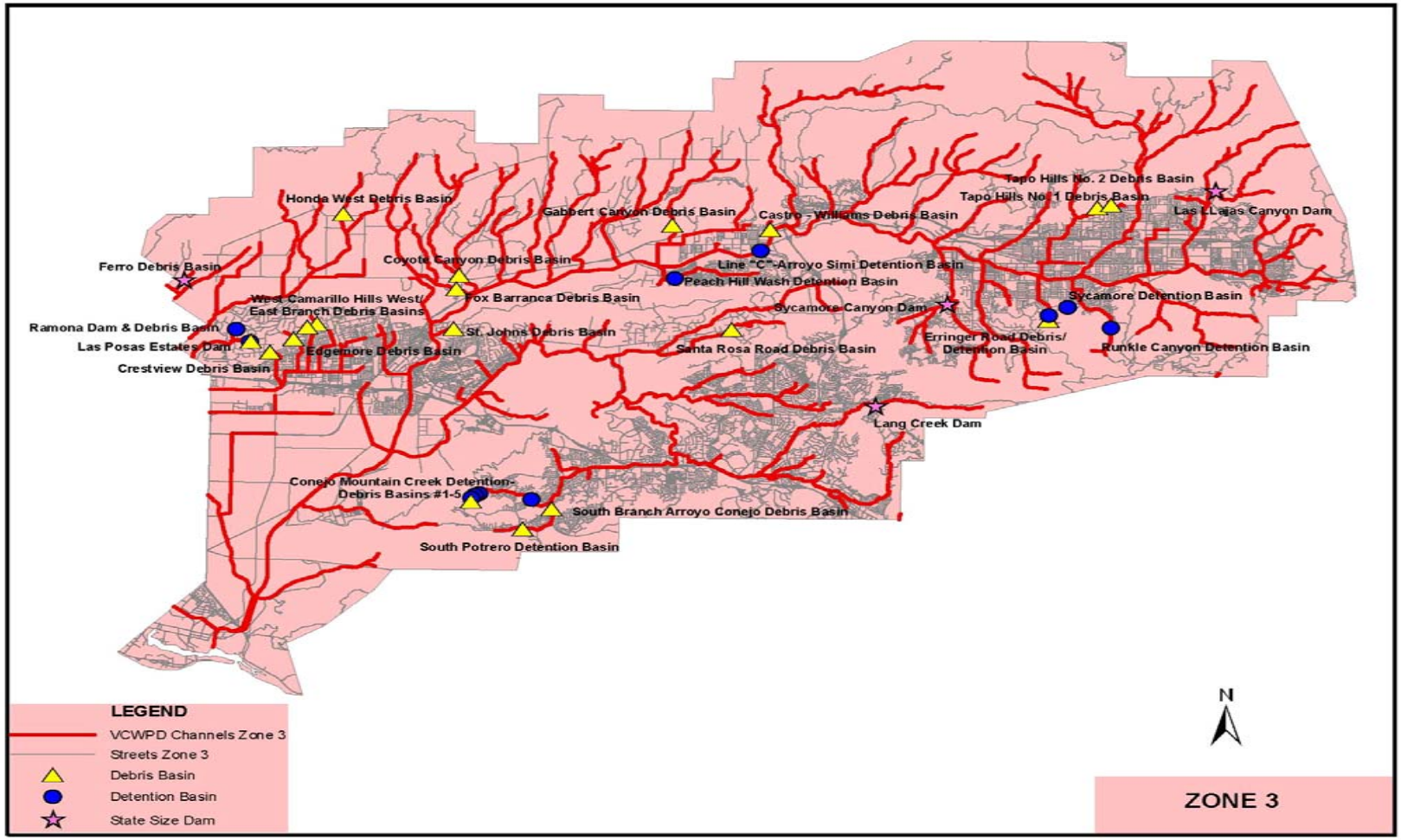

N
0 600 1,200 2,400 3,600 4,800
Feet
WARRING CANYON
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
WARRING CANYON
DEBRIS BASIN
VCWPD DB 2-05
WATERSHED MAP

WARRING CANYON DEBRIS BASIN




MAIN ST
Warring Canyon Debris Basin
PIRU
CENTER ST
TELEGRAPH RD
CAMULOS ST
MAIN ST
126
TELEGRAPH RD
WARRING CANYON SOUTH
126
HOPPER CANYON
EDWARDS CANYON
REAL CANYON
SANTA CLARA RIVER
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Warring Canyon Debris Basin
Route to Basin
WARRING CANYON
DEBRIS BASIN
VCWPD DB2-04
ACCESS MAP

VCWPD- Zone 3 Debris and Detention Basins



Zone 3 Basins

CASTRO-WILLIAMS DEBRIS BASIN DB3-06

LOCATION: Moorpark. 500 ft north of Los Angeles Ave., approximately 1000 ft East of Spring Street
N 287,600 E 1,736,600 (Lambert Zone 5 Coordinates)
Simi, 7 ½ Quad

DESIGN DATA	(Elevations NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	36.2 ac-ft or 58,403 cy excluding western subarea
Maximum Debris Capacity	NA
Inflow and Outflow Rate	Q100in=496 cfs from VCRAT model; Q100out=NA
Debris Cleanout Elevation	579 ft NGVD29 (860 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	10 ft W x 4 ft H Rectangular RC Channel along access rd
Invert Elevation	600 ft NGVD29
Spillway Length	110 ft
Capacity with freeboard	496 cfs
PRINCIPAL SPILLWAY	
Type	60-in RCP with Wingwalls and Trash Rack
Invert Elevation	580 ft (NGVD29)
Outlet Conduit	60-in RCP
DEBRIS BLEEDER/RISER	
Type	None
Top Elevation	NA
Outlet Conduit	NA
DAM	
Dam Type	Earthfill
Dam Crest Elevation	600 ft NGVD29
Length	520 ft.
Width at Crest	NA
Surface Area of Full Basin	2.6 ac
Watershed Area	330 ac
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service
Completion Date	1957; new- 2004
REFERENCE DRAWINGS	
Construction Drawings	37453-56
Topographic Drwgs (pre-const)	37457 t-92-1 (dated 4-13-71)
Right-of-Way Drawings	NA

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	8,599	12,473
50-YEAR	6,545	9,493
25-YEAR	4,689	6,802

BASIN HISTORY: CASTRO-WILLIAMS DEBRIS BASIN

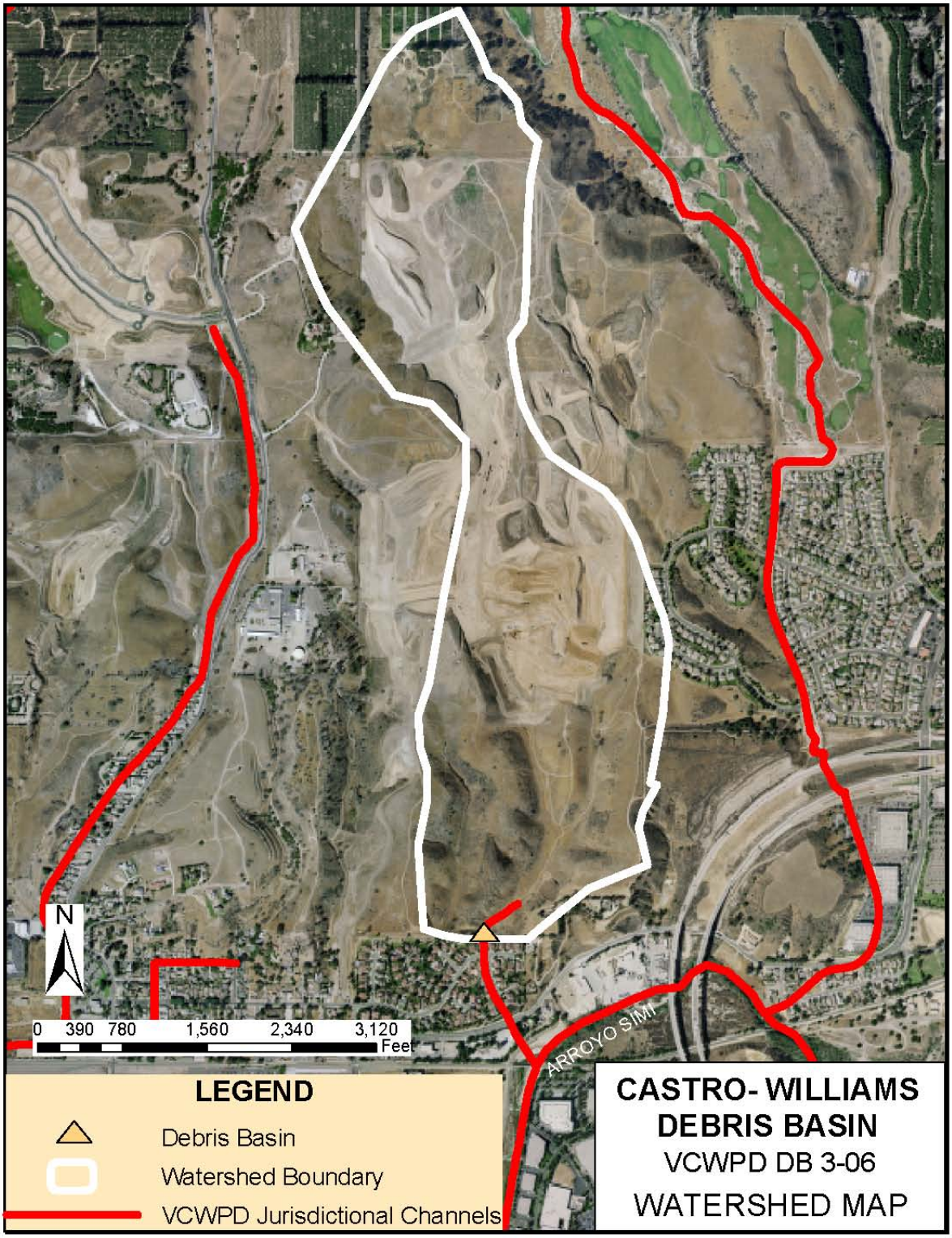
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
04-72	Aerial Survey	141,800		
01-05	Disaster Declaration			537***
07-05	Cleanout		5,526-Survey	

Notes

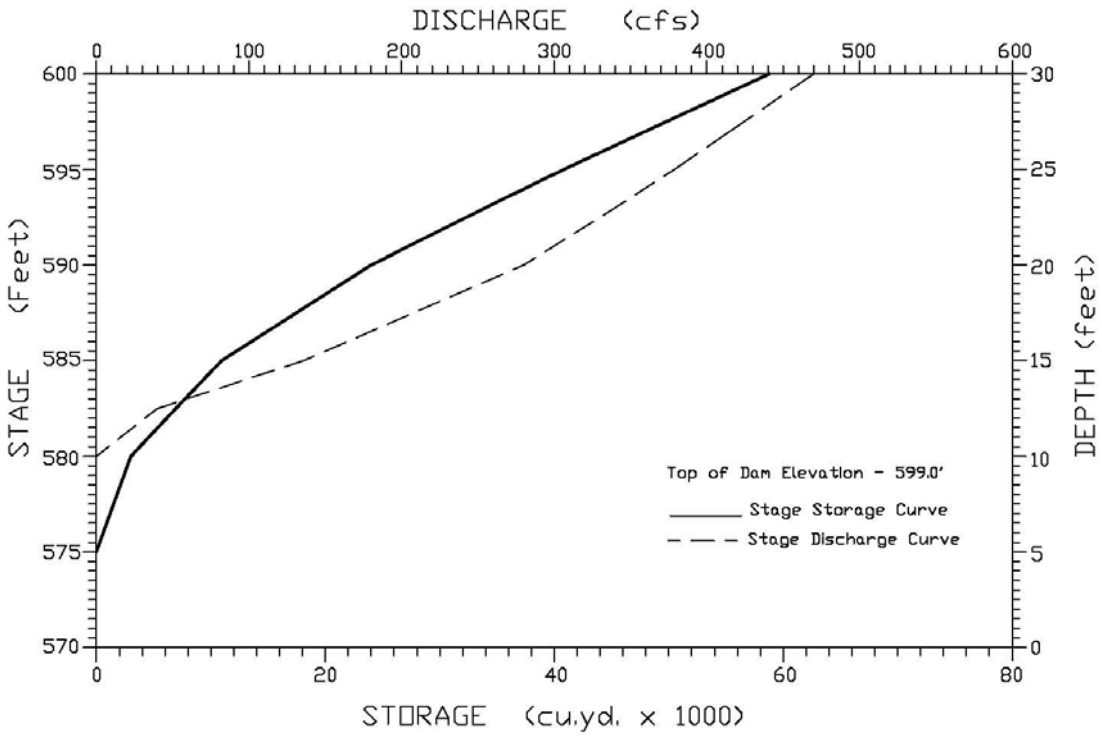
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

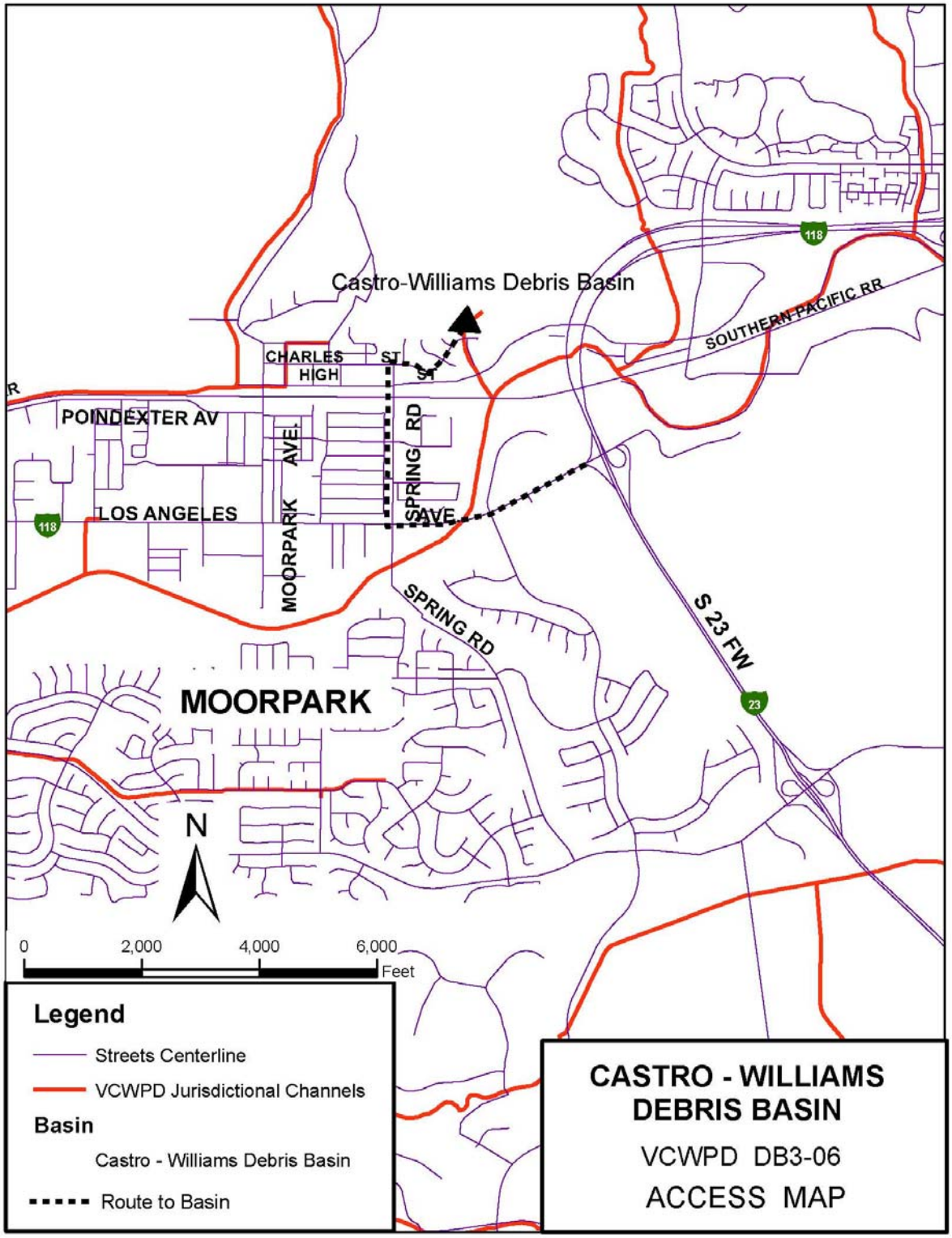
*** Theoretical Value from Kevin Scott Formula, 10% of 50-yr Sediment Yield per Las Llajas approach

NA= Not Available / Not Applicable


N
0 390 780 1,560 2,340 3,120
Feet
ARROYO SIMI
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
CASTRO- WILLIAMS
DEBRIS BASIN
VCWPD DB 3-06
WATERSHED MAP

CASTRO WILLIAMS DEBRIS BASIN




Castro-Williams Debris Basin
SOUTHERN PACIFIC RR
CHARLES HIGH ST
POINDEXTER AV
LOS ANGELES
MOORPARK AVE
SPRING RD
MOORPARK
SPRING RD
S 23 FW
118
23
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Castro - Williams Debris Basin
Route to Basin
CASTRO - WILLIAMS DEBRIS BASIN
VCWPD DB3-06
ACCESS MAP

COYOTE CANYON DEBRIS BASIN DB3-15

LOCATION: Somis, 650 ft north of Los Angeles Ave., W of Donlon Rd;
N 280,000 E 1,699,400(Lambert Zone 5 Coordinates);
Moorpark and Sta Paula 7 1/2' Quad

DESIGN DATA	(Elevations NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	24,500 cy (10-5-90 DTM)
Maximum Debris Capacity	25,300 cy (10-5-90 DTM)
Inflow and Outflow Rate	Q100in=4,300 cfs (VCRAT, 1999); Q100out=NA
Debris Cleanout Elevation	324 ft NGVD29 (15,250 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	40 ft wide x 6.5 ft high RC Rectangular Channel
Invert Elevation	328.5 NGVD29
Spillway Length	NA
Capacity w/o Freeboard	1,860 cfs
PRINCIPAL SPILLWAY	
Type	None
Invert Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	24-in Slotted CSP
Top Elevation	329 ft NGVD29
Outlet Conduit	18 in HDPE & 10 in Steel Pipe
DAM	
Dam Type	Earthfill
Dam Crest Elevation	335 ft NGVD29
Length	280 ft
Width at Crest	NA
Surface Area of Full Basin	1.5 ac
Watershed Area	4,400 ac from Quad Map
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service
Completion Date	1955
REFERENCE DRAWINGS	
Construction Drawings	Y-3-1055 thru Y-3-1056
Topographic Drwgs(pre-const)	T-63-1 (2-6-70), T-63-14 (11-2-71), T-263 (10-22-80), T-334 (12-13-85), 10-31-88DTM,10-16-89DTM,10-5-90DTM
Right-of-Way Drawings	15821

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	152,459	221,066
50-YEAR	114,365	165,829
25-YEAR	78,348	113,604

BASIN HISTORY: COYOTE CANYON DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
09-69	Cleanout		12,000	
02-70	Aerial Survey	Not Digitized		
11-71	Aerial Survey	21,352		
05-73	Aerial Survey	1,772		
10-73	Cleanout		14,800	
11-73	Aerial Survey	16,580		
06-75	Aerial Survey	6,672		
09-75	Cleanout		19,000	
10-75	Aerial Survey	25,715		
10-76	Aerial Survey	22,048		
12-77	Aerial Survey	19,700		
01-78	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			
06-78	Aerial Survey	800		
02-79	Cleanout		19,900	
02-79	Aerial Survey	19,162		
02-80	Disaster Declaration			
06-80	Aerial Survey	787		
12-80	Cleanout		21,800	6,610**
12-80	Aerial Survey	22,586		
10-81	Aerial Survey	Not Digitized		
11-82	Aerial Survey	14,298		
03-83	Disaster Declaration			
04-83	Aerial Survey	1,823		
08-84	Cleanout		450	
08-84	Aerial Survey	2,275		
10-84	1st Cleanout		17,150	
10-84	Aerial Survey	19,437		
11-84	2nd Cleanout		1,819	
11-84	Aerial Survey	21,256		
07-85	Cleanout		2,957	
12-85	Aerial Survey	21,582		
07-86	Aerial Survey	13,129		
08-86	Cleanout		9,311	
10-86	Aerial Survey	22,043		

BASIN HISTORY: COYOTE CANYON DEBRIS BASIN

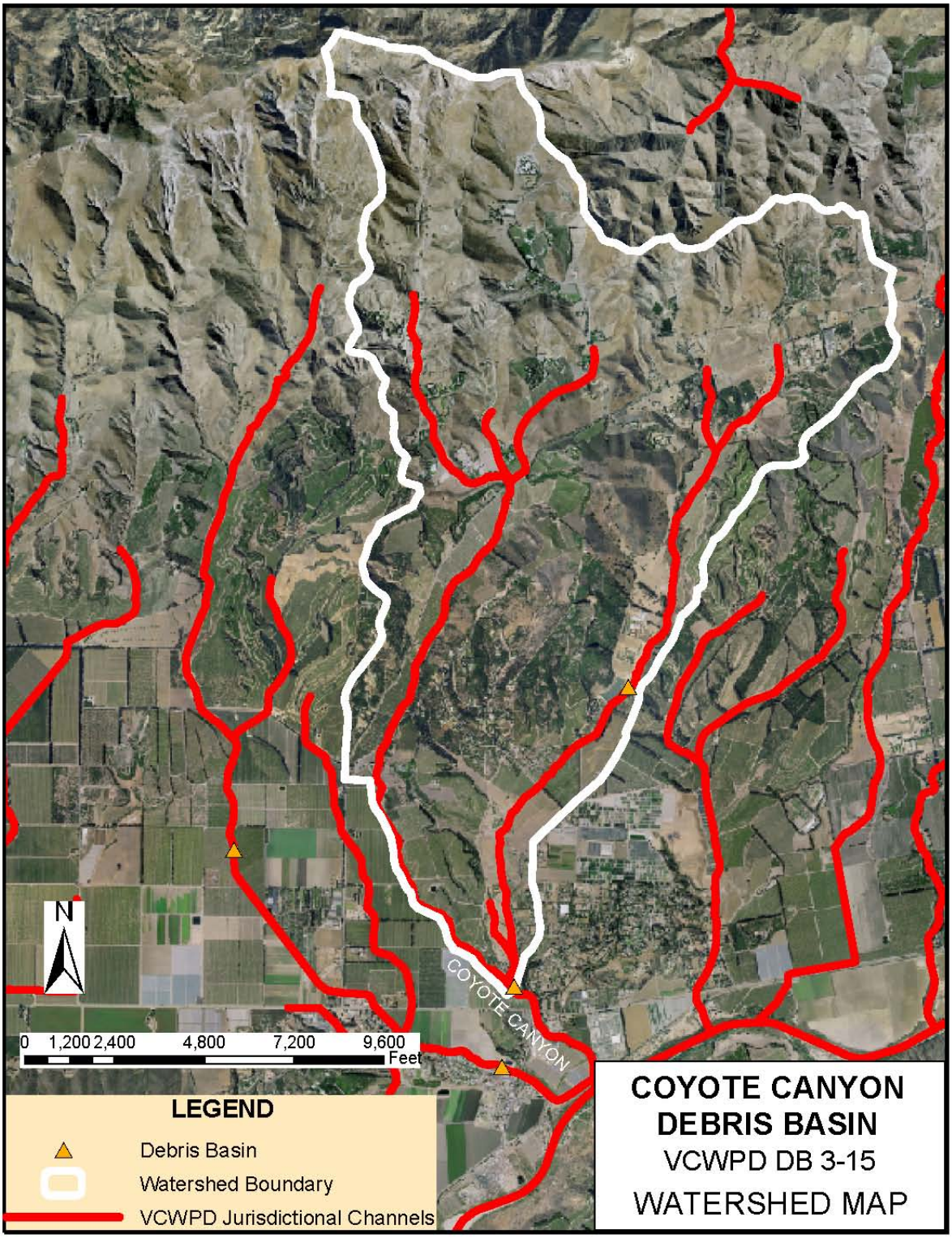
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
07-87	Cleanout		2,125	
10-87	Aerial Survey	Not Digitized		
10-88	Aerial Survey	23,324		
10-89	Aerial Survey	21,711		
06-90	Cleanout		2,292	3,158
09-90	Aerial Survey	25,336		
05-91	Aerial Survey	21,759		
07-91	Cleanout		3,978	
11-91	Aerial Survey	25,737		
02-92	Disaster Declaration			2,938**
05-92	Aerial Survey	18,640		
11-92	Cleanout		6,921	
11-92	Aerial Survey	25,672		
07-93	Aerial Survey	15,100		
12-93	Cleanout		10,640	
01-94	Aerial Survey	26,576		
07-94	Cleanout		620	
12-94	Aerial Survey	25,740		
01-95	Disaster Declaration			2,570
05-95	Aerial Survey	12,900		
11-95	Cleanout		12,570	
11-95	Aerial Survey	25,470		
07-96	Cleanout		1,216	
07-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey	19,730		
02-98	Disaster Declaration			3,213
07-98	Aerial Survey	880		
11-98	Cleanout		23,970	
11-98	Aerial Survey	24,850		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
11-03	Cleanout		1,863	
12-03	Cleanout		5,833	
12-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			2,831
07-05	Cleanout		**49,076**	

Notes

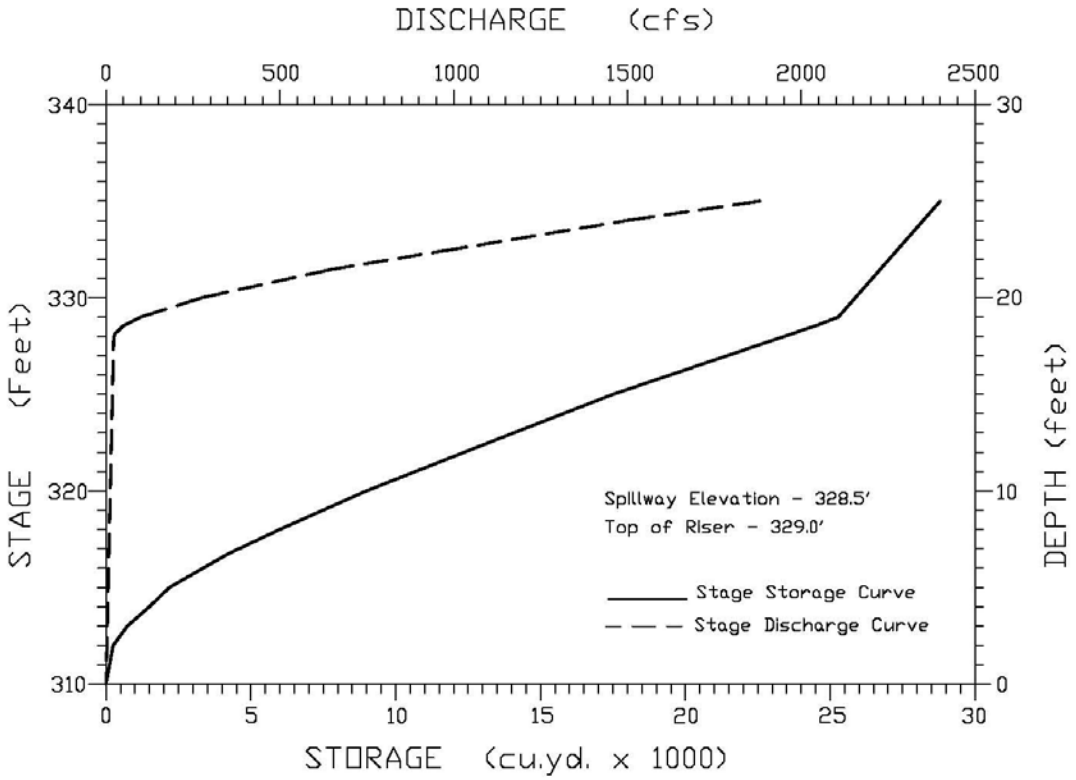
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

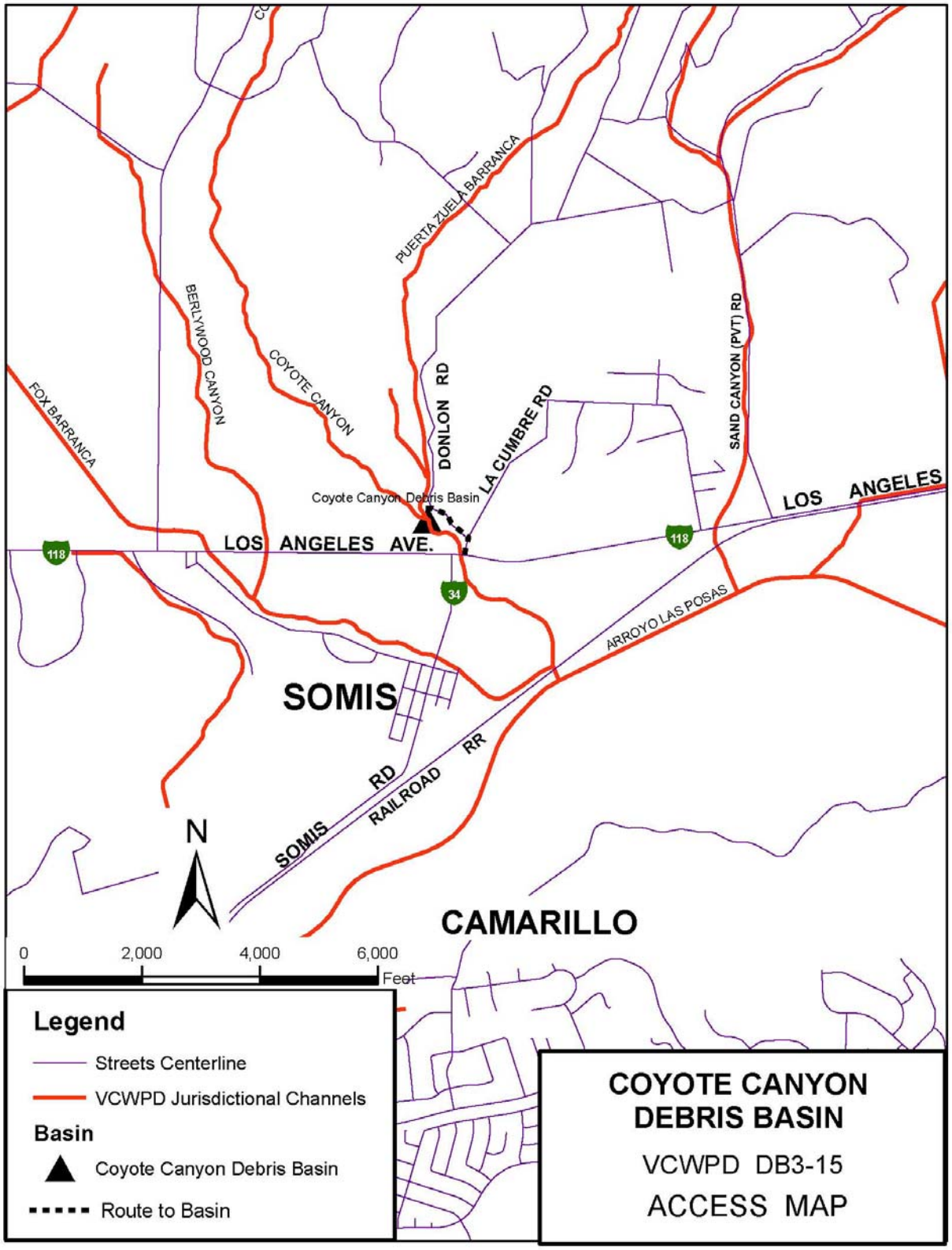
** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable


N
0 1,200 2,400 4,800 7,200 9,600
Feet
COYOTE CANYON
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
COYOTE CANYON
DEBRIS BASIN
VCWPD DB 3-15
WATERSHED MAP

COYOTE CANYON DEBRIS BASIN




PUERTA ZUELA BARRANCA
BERLYWOOD CANYON
COYOTE CANYON
FOX BARRANCA
DONLON RD
LA CUMBRE RD
SAND CANYON (PVT) RD
Coyote Canyon Debris Basin
LOS ANGELES AVE.
LOS ANGELES
118
34
ARROYO LAS POSAS
SOMIS
SOMIS RD
RAILROAD RR
N
CAMARILLO
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Coyote Canyon Debris Basin
Route to Basin
COYOTE CANYON
DEBRIS BASIN
VCWPD DB3-15
ACCESS MAP

CRESTVIEW DEBRIS BASIN DB3-10

LOCATION: City of Camarillo 2000 ft upstream from Las Posas Road adjacent to Crestview Avenue.
N 268,000, E 1,676,200 (Lambert Zone 5 Coordinates);
Camarillo 7-1/2' Quad.

DESIGN DATA	Avocado Orchard as of 2/2005; (Elevations NGVD29)
Design Agency	VC Watershed Protection District
Level Capacity	2,350 cy (10-29-71, T-63-16)
Maximum Debris Capacity	11,100 cy (10-29-71, T-63-16)
Inflow and Outflow Rate	Q100in=218 cfs; Q100out=NA
Debris Cleanout Elevation	197 ft NGVD29 (250 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	None
Invert Elevation	NA
Spillway Length	NA
Capacity	NA
PRINCIPAL SPILLWAY	
Type	4.5 ft x 4.5 ft RCB Weir Inlet, Tower 28 ft high
Weir Elevation	200 ft NGVD29
Outlet Conduit	48 in RCP to 36 in RCP
DEBRIS BLEEDER/RISER	
Type	None
Top Elevation	NA
Outlet Conduit	NA
DAM	
Dam Type	Earthfill
Dam Crest Elevation	204.5 ft
Length	100 ft
Width at Crest	NA
Surface Area of Full Basin	1.47 ac
Watershed Area	80 ac from Quad Map
CONSTRUCTION DATA	
Construction Agency	VC Flood Control District
Completion Date	1934
REFERENCE DRAWINGS	
Construction Drawings	31246 thru 31249 B
Topographic Drwgs(pre-const)	31247, T-63-16 (10-29-71)
Right-of-Way Drawings	31246

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	1,005	1,460
50-YEAR	770	1,126
25-YEAR	567	824

BASIN HISTORY: CRESTVIEW DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
10-71	Aerial Survey	11,100		
05-72	Aerial Survey	Not Digitized		
05-73	Aerial Survey	Not Digitized		
02-78	Disaster Declaration			
03-78	Disaster Declaration			
02-80	Disaster Declaration			
06-80	Aerial Survey	Not Digitized		
11-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			100***
10-90	Aerial Survey	Not Digizited		
06-91	Aerial Survey	Not Digitized		
02-92	Disaster Declaration			100***
05-92	Aerial Survey	Not Digitized		
01-95	Disaster Declaration			100***
02-98	Disaster Declaration			
01-05	Disaster Declaration			77***

Notes

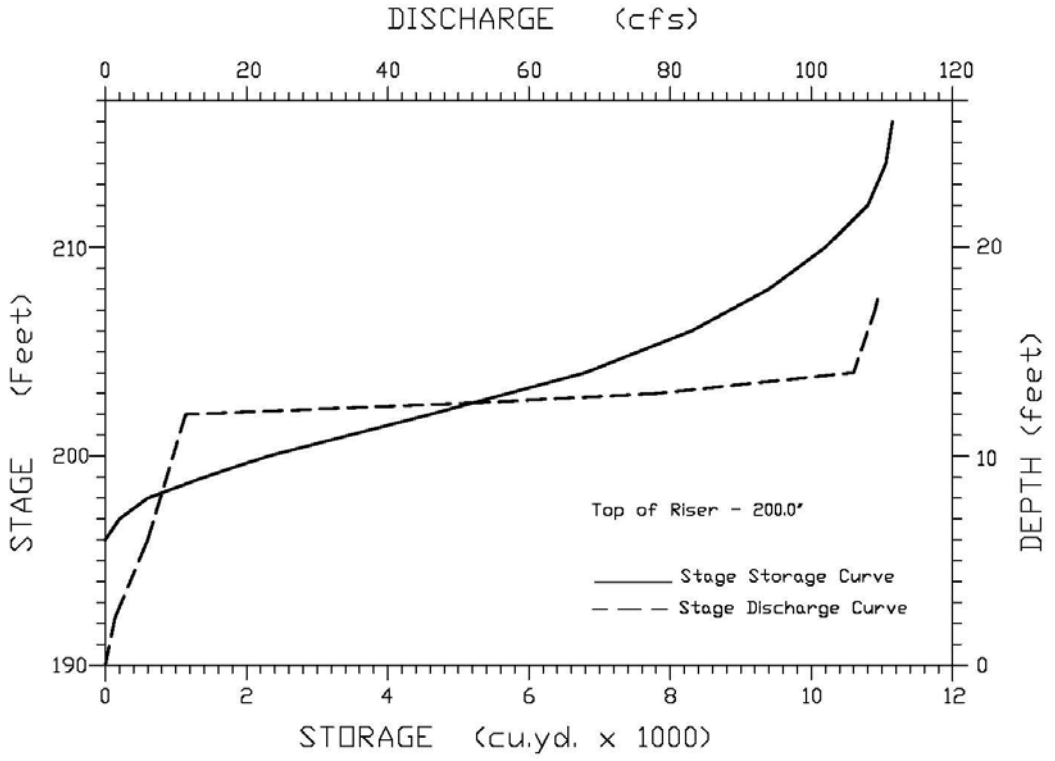
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

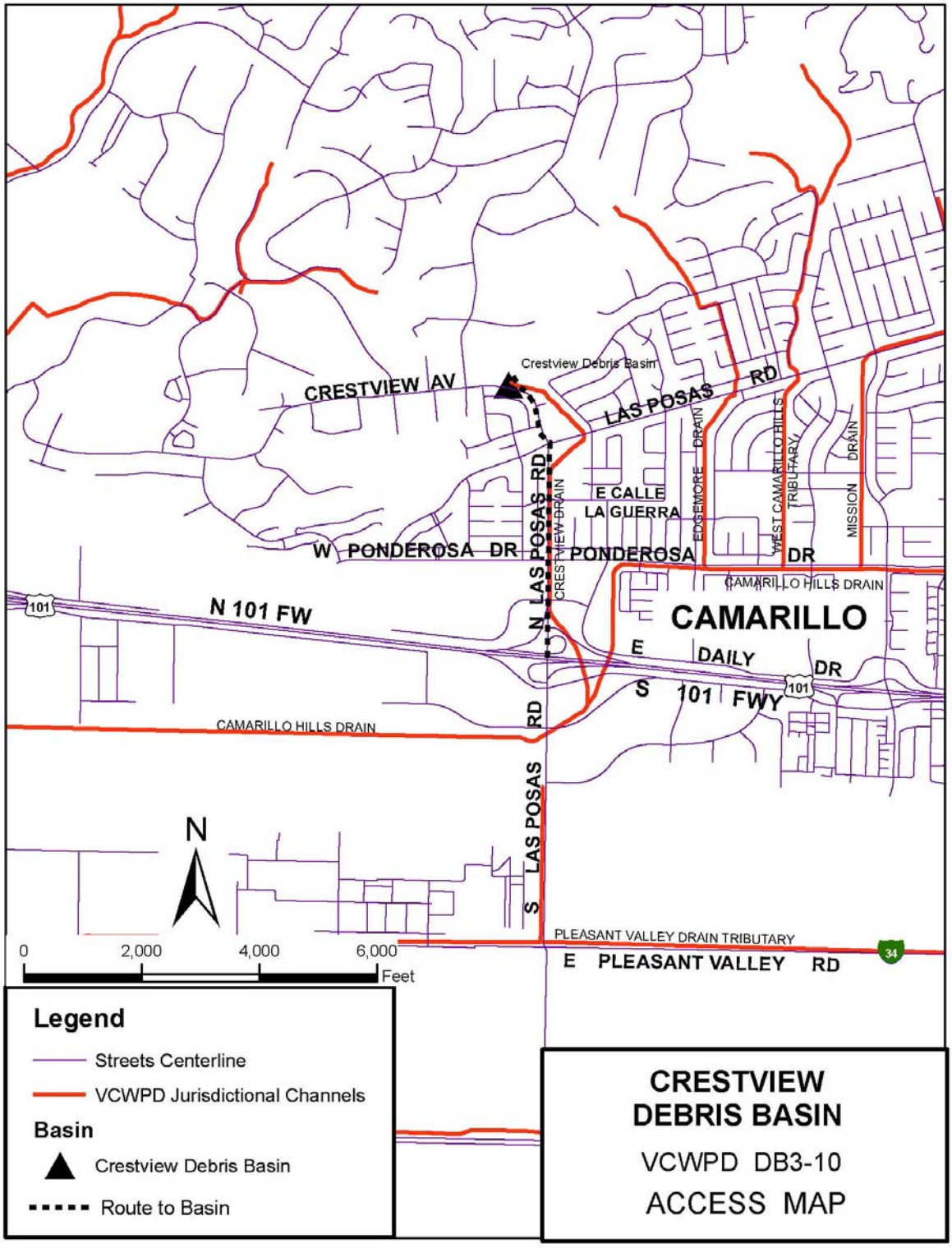
*** Theoretical Value, 10% of 50-yr sediment yield based on Scott and Williams, 1978

NA= Not Available / Not Applicable


CRESTVIEW DRAIN
CAMARILLO HILLS DRAIN
N
0 355 710 1,420 2,130 2,840
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
CRESTVIEW
DEBRIS BASIN
VCWPD DB 3-10
WATERSHED MAP

CRESTVIEW DEBRIS BASIN




Crestview Debris Basin
CRESTVIEW AV
LAS POSAS RD
E CALLE LA GUERRA
W PONDEROSA DR
PONDEROSA DR
N LAS POSAS RD
CRESTVIEW DRAIN
EDGEMORE DRAIN
WEST CAMARILLO HILLS TRIBUTARY
MISSION DRAIN
CAMARILLO HILLS DRAIN
101
N 101 FW
CAMARILLO
E DAILY DR
S 101 FWY
CAMARILLO HILLS DRAIN
S LAS POSAS RD
N
0 2,000 4,000 6,000 Feet
PLEASANT VALLEY DRAIN TRIBUTARY
E PLEASANT VALLEY RD
34
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Crestview Debris Basin
Route to Basin
CRESTVIEW DEBRIS BASIN
VCWPD DB3-10
ACCESS MAP

EDGEMORE DEBRIS BASIN DB3-11

LOCATION: Camarillo, 1/2 mile east from the intersection of Crestview Road and 1/2 mile north of Las Posas Road. N 270,000, E 1,678,600 (Lambert Zone 5 Coordinates); Camarillo 7-1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	2,950 cy (11-8-87 DTM)
Maximum Debris Capacity	4,000 cy (11-8-87 DTM)
Inflow and Outflow Rates	Q100in=250 cfs; Q100out=NA
Debris Cleanout Elevation	264 ft NGVD29 (1,760 cy) [level cap.-100yr debris yield]
EMERGENCY SPILLWAY	
Type	4 ft x 6 ft Drop Box Inlet
Weir Elevation	267 ft
Spillway Length	NA
Capacity w/o Freeboard	197 ft NGVD29 (250 cy) [25% of 100-yr vol.]
PRINCIPAL SPILLWAY	
Type	None
Invert Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	12 in Perforated CSP 22 ft High
Top Elevation	270.23 ft NGVD29
Outlet Conduit	10 in Steel Pipe
DAM	
Dam Type	Earthfill
Dam Crest Elevation	271 ft NGVD29
Length	80 ft
Width at Crest	NA
Surface Area of Full Basin	0.3 ac
Watershed Area	105 ac from Quad
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service
Completion Date	1955; Drop Box Spillway Reconstructed 1991
REFERENCE DRAWINGS	
Construction Drawings	Y-3-1093 thru 1098; Y-3-3072 through -3075
Topographic Drwgs(pre-const)	T-63-18 (10-29-71), T-254(10-22-30), 12-13-85, 11-8-87 DTM, 10-5-89 DTM, 10-5-90 DTM
Right-of-Way Drawings	72MR67, 91MR15

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	1,188	1,723
50-YEAR	905	1,313
25-YEAR	511	741

BASIN HISTORY: EDGEMORE DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
10-71	Aerial Survey	2,900		
05-72	Aerial Survey	Not Digitized		
05-73	Aerial Survey	Not Digitized		
06-75	Aerial Survey	1,494		
09-75	Cleanout		950	
10-75	Aerial Survey	3,508		
03-78	Disaster Declaration			
06-78	Aerial Survey	906		
10-78	Cleanout		2,500	
02-80	Disaster Declaration			
06-80	Aerial Survey	1,016		
10-80	Cleanout		2,350	538**
10-80	Aerial Survey	3,341		
11-81	Aerial Survey	Not Digitized		
11-82	Aerial Survey	2,910		
03-83	Disaster Declaration			
04-83	Aerial Survey	1,660		
12-83	Cleanout		1,575	430**
01-84	Aerial Survey	3,235		
01-84	Cleanout		105	
02-84	Aerial Survey	3,340		
06-85	Cleanout		519	
12-85	Aerial Survey	3,859		
07-86	Aerial Survey	3,684		
08-86	Cleanout		350	
10-86	Aerial Survey	4,034		
11-87	Aerial Survey	4,007		
11-88	Aerial Survey	Not Digitized		

BASIN HISTORY: EDGEMORE DEBRIS BASIN

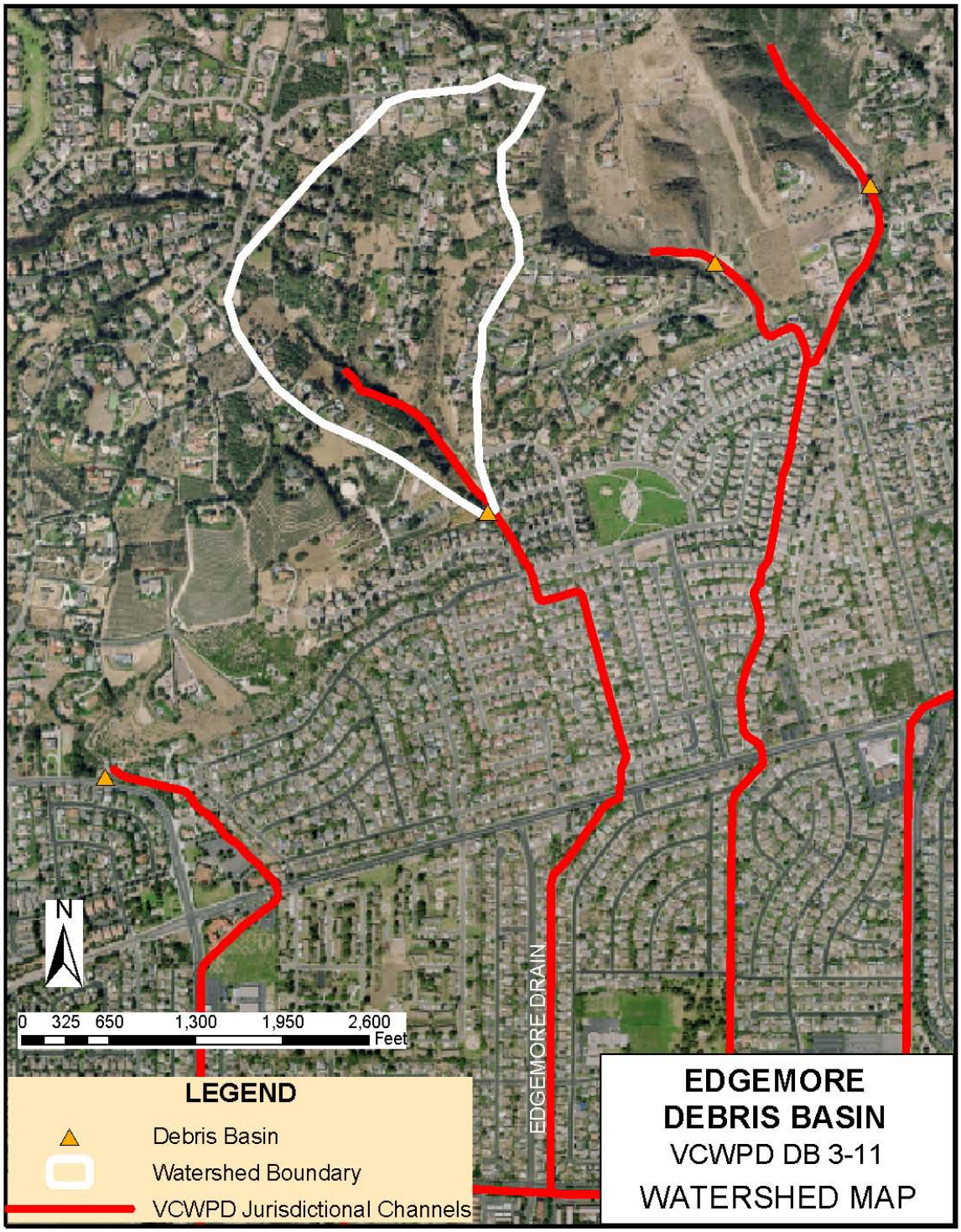
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
10-89	Aerial Survey	3,541		120
09-90	Aerial Survey	3,122		
05-91	Aerial Survey	3,169		
07-91	Cleanout		620	
11-91	Aerial Survey	3,789		
02-92	Disaster Declaration			276**
05-92	Aerial Survey	1,505		
05-92	Cleanout		2,495	
12-92	Aerial Survey	4,000		
07-93	Cleanout		160	
01-95	Disaster Declaration			256
07-95	Cleanout		1,326	
07-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey	3,898		
02-98	Disaster Declaration			158
07-98	Aerial Survey	1,870		
06-99	Cleanout		1,880	
06-99	Aerial Survey	3,750		
01-99	Aerial Survey	Not Digitized		
12-99	Aerial Survey	Not Digitized		
07-01	Aerial Survey	3,510		
05-02	Aerial Survey	3,200		
11-03	Aerial Survey	Not Digitized		
12-04	Cleanout		736	
01-05	Disaster Declaration			139
07-05	Cleanout		1,334- Survey	

Notes

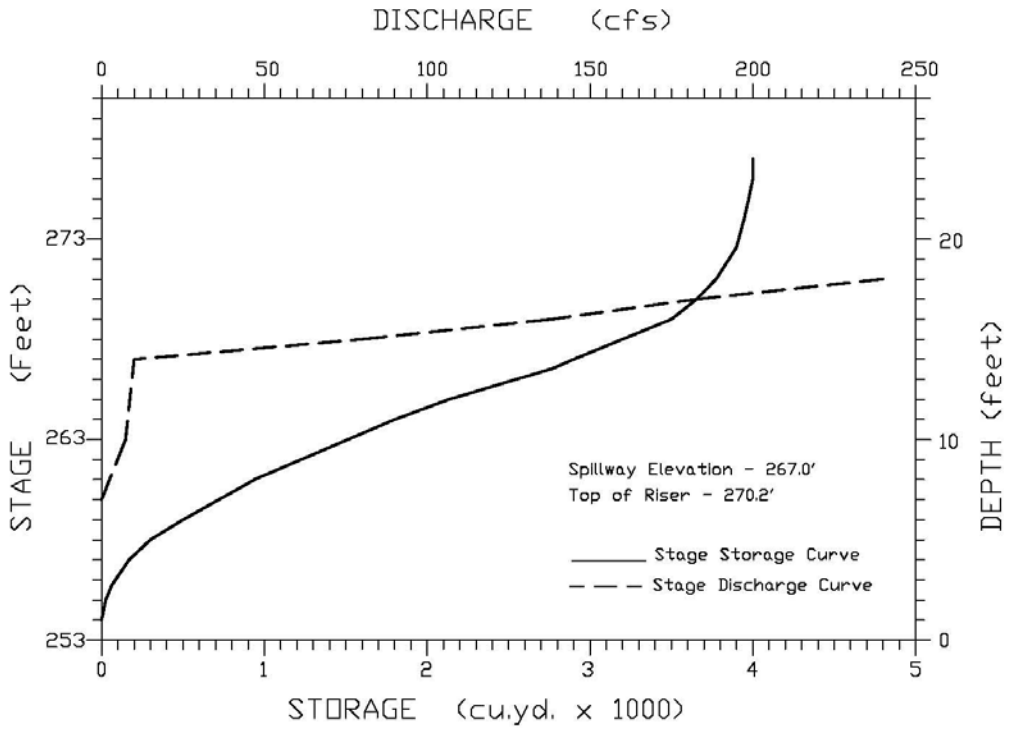
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

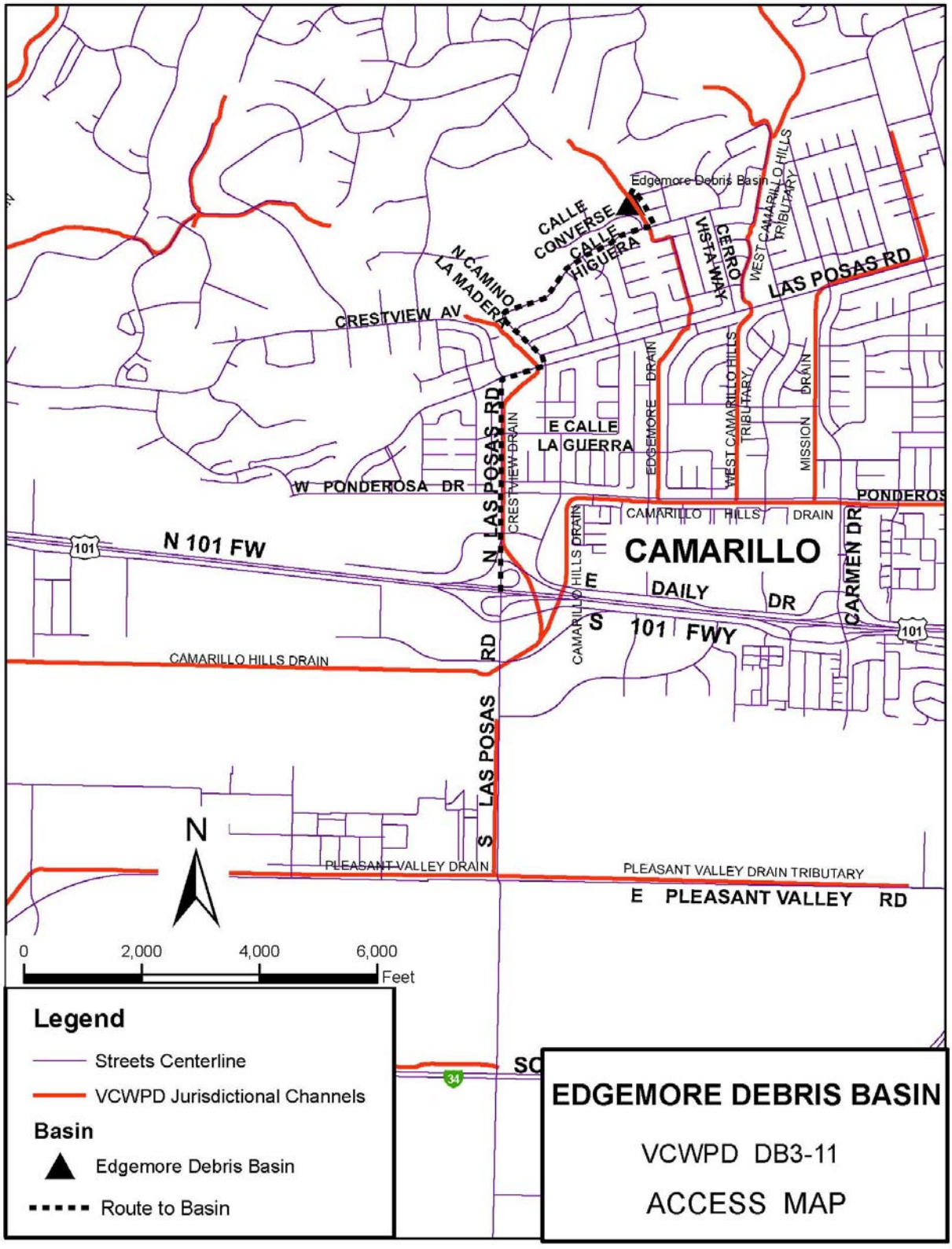
** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable


N
0 325 650 1,300 1,950 2,600
Feet
EDGEMORE DRAIN
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
EDGEMORE
DEBRIS BASIN
VCWPD DB 3-11
WATERSHED MAP

EDGEMORE DEBRIS BASIN




Edgemore Debris Basin
CALLE CONVERSE
CALLE HIGUERA
N CAMINO LA MADERA
CRESTVIEW AV
LAS POSAS RD
CERRO VISTA WAY
WEST CAMARILLO HILLS TRIBUTARY
MISSION DRAIN
EDGEMORE DRAIN
E CALLE LA GUERRA
W PONDEROSA DR
CRESTVIEW DRAIN
CAMARILLO HILLS DRAIN
CAMARILLO
N 101 FW
E DAILY DR
S 101 FWY
CARMEN DR
CAMARILLO HILLS DRAIN
S LAS POSAS RD
PLEASANT VALLEY DRAIN
PLEASANT VALLEY DRAIN TRIBUTARY
E PLEASANT VALLEY RD
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Edgemore Debris Basin
Route to Basin
EDGEMORE DEBRIS BASIN
VCWPD DB3-11
ACCESS MAP

ERRINGER ROAD DEBRIS BASIN DB3-12

LOCATION: Simi Valley, 3500 ft S of Fitzgerald Ave and 1000 ft E of Erringer Rd.;
N 273,000,E 1,771,500 (Lambert Zone 5 Coordinates);
Thousand Oaks 7 1/2' Quad.
Upstream of HOA-Maintained Erringer and Covington Detention Basins

DESIGN DATA	(Elevations NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	33,250 cy (10-29-71, T-63-19)
Maximum Debris Capacity	39,400 cy (10-29-71, T-63-19)
Inflow and Outflow Rates	Q100in=700 cfs; Q100out=89 cfs from 1997 as-builts
Debris Cleanout Elevation	939 ft (1,600 cy) [provides cap for 100-yr debris yield below operating spillway]
EMERGENCY SPILLWAY	
Type	24 ft wide x 5 ft high Grouted Rip-Rap Trap. Channel
Invert Elevation	955 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	425 cfs
PRINCIPAL SPILLWAY	
Type	4 ft Wx 6 ftD Concrete Riser Tower with 4 ft X5 ft Inlets on 3 Faces
Inlet Weir Elevation	948.7 ft NGVD29
Outlet Conduit	18 in RCP
DEBRIS BLEEDER/RISER	
Type	18-in Perforated CSP
Top Elevation	952 ft NGVD29
Outlet Conduit	Connects to Principal Spillway 18-in RCP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	960 ft NGVD29
Length	220 ft
Surface Area of Full Basin	0.3 ac
Watershed Area	315 ac from Quad Map
Width at Crest	15 ft
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service; VCWPD
Completion Date	1957; Outlet Works Modified 1997
REFERENCE DRAWINGS	
Construction Drawings	Y-3-1145-48; Y-3-3726-3745
Right-of-Way Drawings	NA
Topographic Drawings	T-63-19 (10-29-71)

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	11,633	16,874
50-YEAR	8,972	13,014
25-YEAR	6,506	9,437

BASIN HISTORY: ERRINGER ROAD DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			900***
10-71	Aerial Survey	39,400		
03-78	Disaster Declaration			900***
02-80	Disaster Declaration			900***
10-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			900***
10-90	Aerial Survey	Not Digitized		
06-91	Aerial Survey	Not Digitized		
02-92	Disaster Declaration			900***
05-92	Aerial Survey	Not Digitized		
01-95	Disaster Declaration			900***
02-98	Disaster Declaration			900***
01-05	Disaster Declaration			

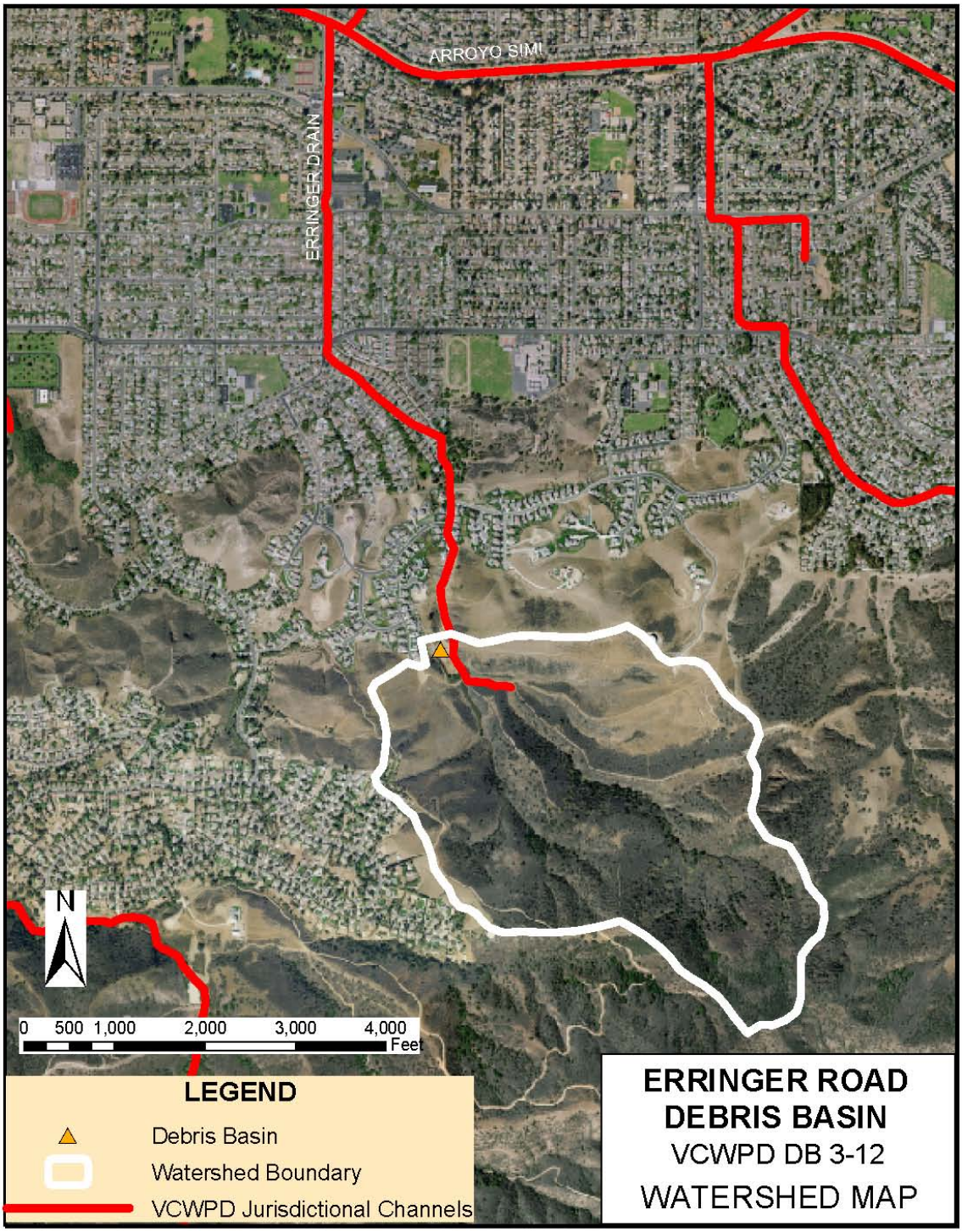
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable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ERRINGER DRAIN
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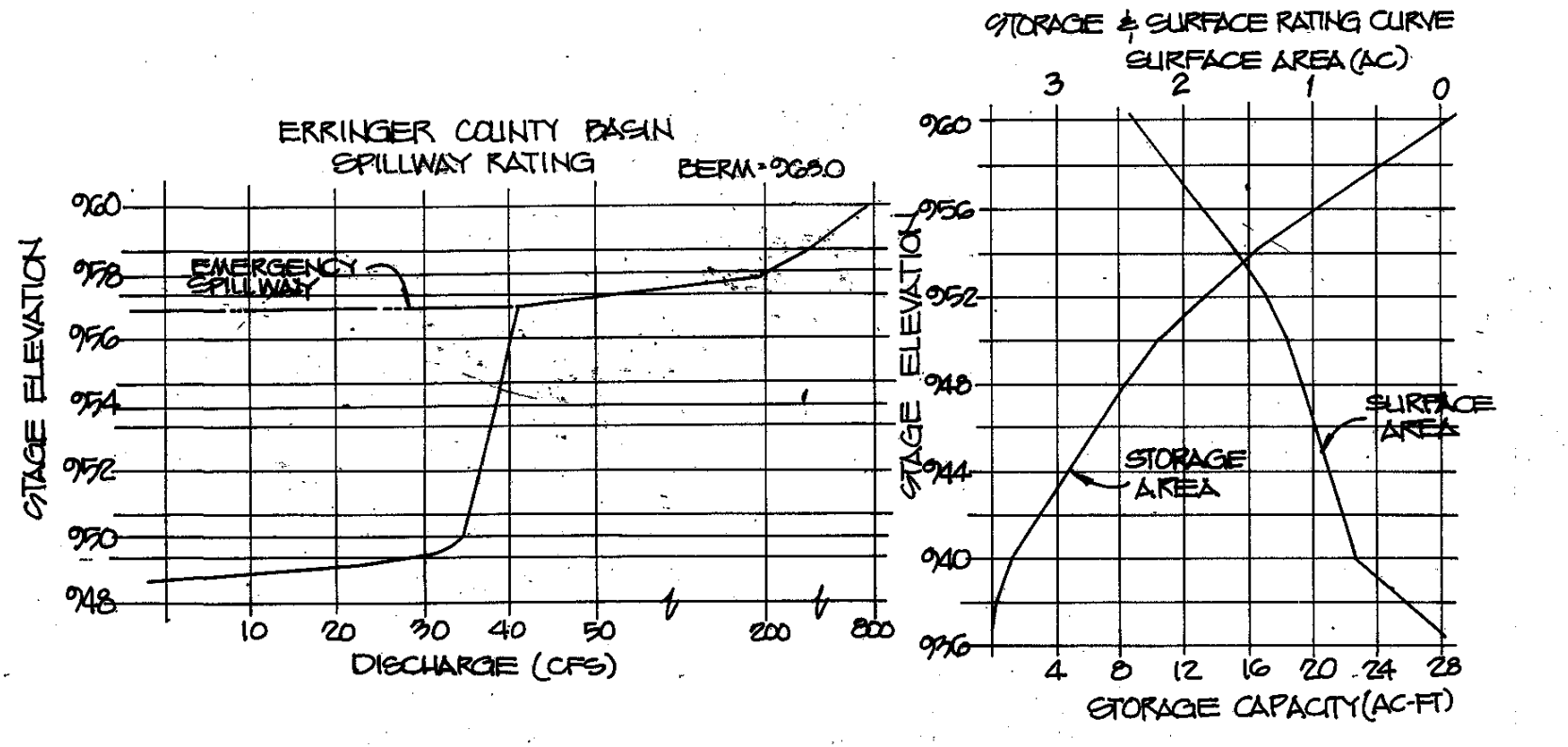
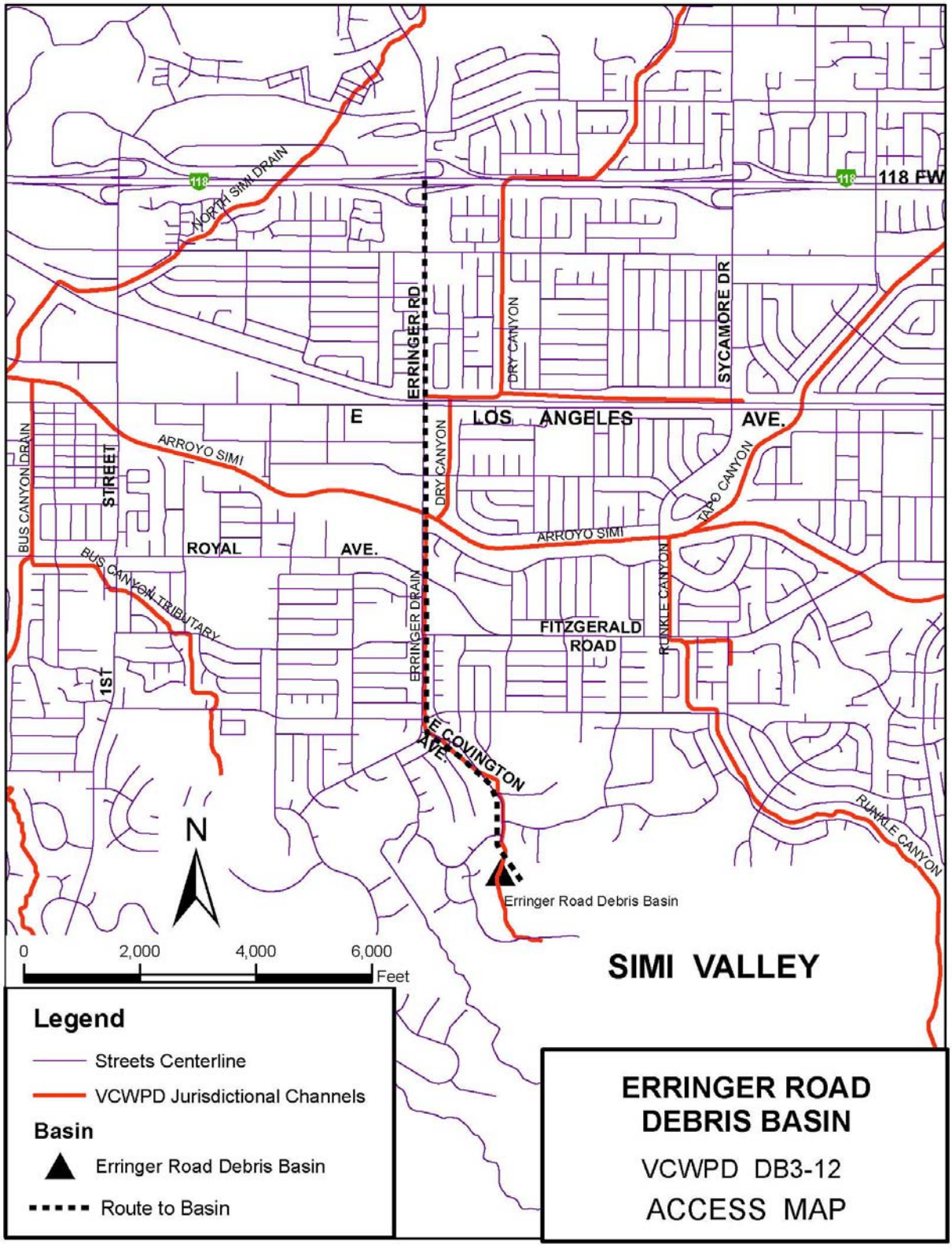
0 500 1,000 2,000 3,000 4,000
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
ERRINGER ROAD
DEBRIS BASIN
VCWPD DB 3-12
WATERSHED MAP



Erringer Road Debris Basin


118
118 FWY
NORTH SIMI DRAIN
ERRINGER RD
DRY CANYON
SYCAMORE DR
E LOS ANGELES AVE.
BUS CANYON DRAIN
1ST STREET
ARROYO SIMI
TAPO CANYON
ROYAL AVE.
BUS CANYON TRIBUTARY
ERRINGER DRAIN
RUNKLE CANYON
FITZGERALD ROAD
E COVINGTON AVE.
N
Erringer Road Debris Basin
0 2,000 4,000 6,000 Feet
SIMI VALLEY
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Erringer Road Debris Basin
Route to Basin
ERRINGER ROAD DEBRIS BASIN
VCWPD DB3-12
ACCESS MAP

FERRO DEBRIS BASIN State Dam No: 86-008 DB3-13

LOCATION: Saticoy, 2100 ft u/s from Los Angeles Ave. near
Santa Clara Ave and Saticoy Country Club;
N 279,500, E 1,665,800 (Lambert Zone5 Coordinates);
Santa Paula 7 1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	34,500 cy (10-16-89 DTM)
Maximum Debris Capacity	37,700 cy (10-16-89 DTM)
Inflow and Outflow Rates	Q100in=426 cfs; Q100out=NA
Debris Cleanout Elevation	168 ft (26,750 cy) [provides cap for 100-yr debris yield below emergency spillway]
EMERGENCY SPILLWAY	
Type	40 ft Weir to Side Channel Spillway, 8 ft High
Side Weir Elevation	172 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	2,600 cfs
PRINCIPAL SPILLWAY	
Type	Top of RC Riser Tower, 7.5 ft x 4.5 ft Weir Inlet
Weir Elevation	170.33 ft NGVD
Outlet Conduit	30-in RCP
DEBRIS BLEEDER/RISER	
Type	Orifice Holes in Principal Spillway Riser Tower
Top Elevation	170.33 ft NGVD
Outlet Conduit	Principal Spillway Outlet
DAM	
Dam Type	Earthfill
Dam Crest Elevation	180 ft NGVD29
Length	325 ft
Surface Area of Full Basin	1.63 ac
Watershed Area	395 ac from Quad Map
Width at Crest	20 ft
CONSTRUCTION DATA	
Construction Agency	VCWPD, Rebuilt in 1985 by Soil Conservation Service
Completion Date	1933, Rebuilt 1985
REFERENCE DRAWINGS	
Construction Drawings	SCS CA-E-23894, Sheets 1-98
Right-of-Way Drawings	17020
Topographic Drawings	T-337(06-23-78),Superceded by T-342 (12-18-85),11-08-87DTM,10-16-89DTM,

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	7,758	11,253
50-YEAR	5,919	8,585
25-YEAR	4,246	6,158

BASIN HISTORY: FERRO DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
08-75	Aerial Survey	3,087		
NA	Cleanout		4,813	
03-78	Disaster Declaration			
06-78	Aerial Survey	7,900		
04-79	Cleanout		2,800	
04-79	Aerial Survey	9,499		
02-8	Disaster Declaration			
06-80	Aerial Survey	25		
11-80	Cleanout		5,646	592**
11-80	Aerial Survey	3,985		
11-82	Aerial Survey	3,452		
03-83	Disaster Declaration			
04-83	Aerial Survey	175		
12-85+	Aerial Survey	38,642		
07-86	Aerial Survey	Not Digitized		
11-87	Aerial Survey	37,412		
11-88	Aerial Survey	Not Digitized		
10-89	Aerial Survey	37,676		
09-90	Aerial Survey	Not Digitized		
06-91	Aerial Survey	36,822		
02-92	Disaster Declaration			451**
05-92	Aerial Survey	32,750		
12-92	Cleanout		5,400	
12-92	Aerial Survey	37,700		
01-95	Disaster Declaration			581
06-95	Aerial Survey	33,340		
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	32,910		
02-98	Disaster Declaration			530

BASIN HISTORY: FERRO DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
07-98	Aerial Survey	26,870		
12-99	Aerial Survey	Not Digitized		
07-01	Aerial Survey	25,580		
12-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			1,112

Notes

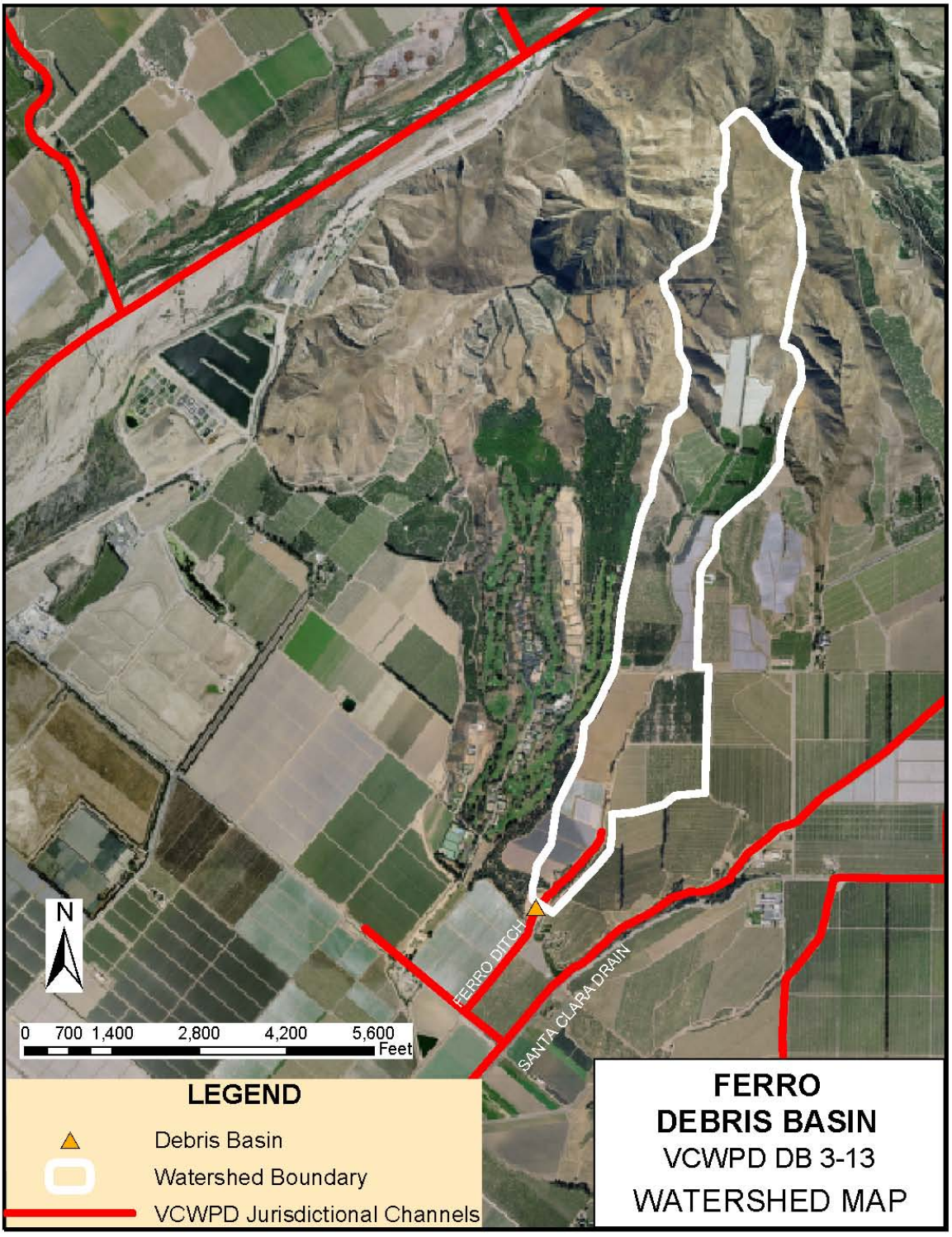
+New Dam Constructed

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable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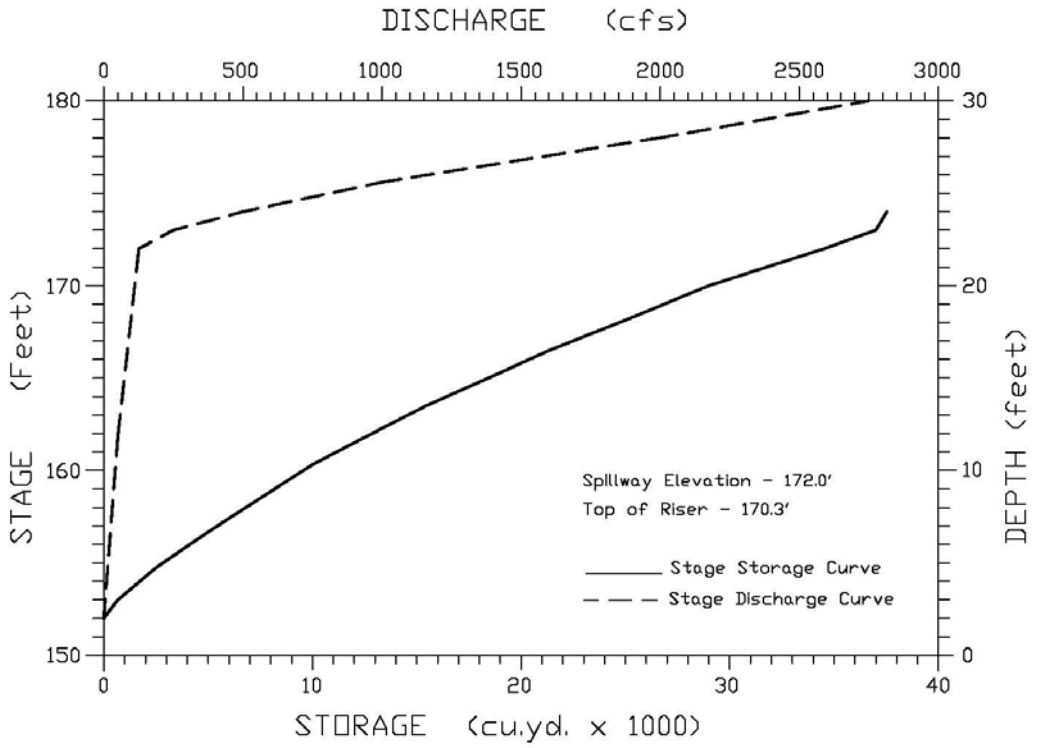
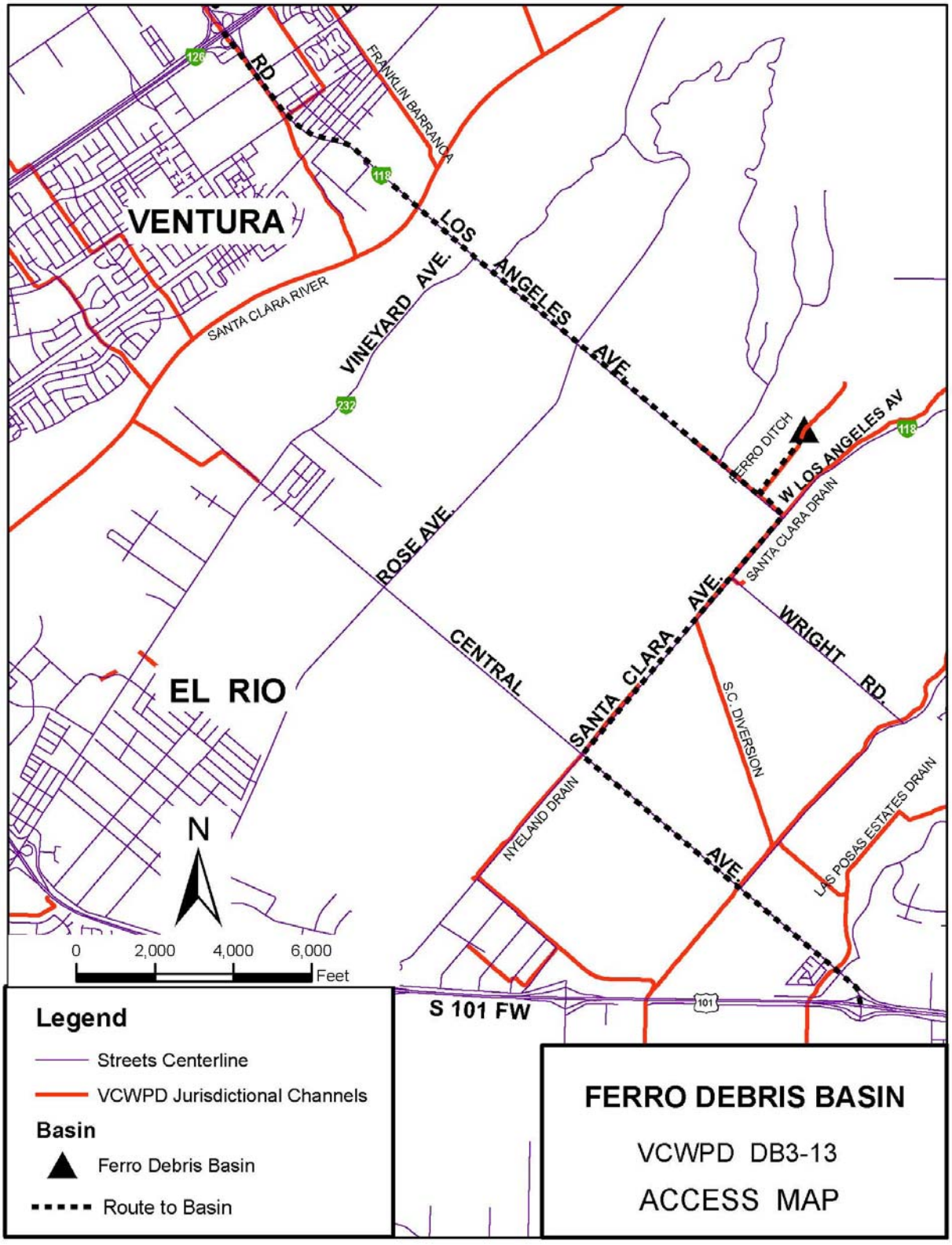
Feet
FERRO DITCH
SANTA CLARA DRAIN
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
FERRO
DEBRIS BASIN
VCWPD DB 3-13
WATERSHED MAP

FERRO DEBRIS BASIN




VENTURA
EL RIO
RD
FRANKLIN BARRANCA
SANTA CLARA RIVER
VINEYARD AVE.
LOS ANGELES AVE.
W LOS ANGELES AV
FERRO DITCH
ROSE AVE.
SANTA CLARA DRAIN
CENTRAL
SANTA CLARA AVE.
WRIGHT RD.
S.C. DIVERSION
NYELAND DRAIN
LAS POSAS ESTATES DRAIN
AVE.
S 101 FW
126
118
232
101
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Ferro Debris Basin
Route to Basin
FERRO DEBRIS BASIN
VCWPD DB3-13
ACCESS MAP

FOX BARRANCA DEBRIS BASIN DB3-14

LOCATION: Somis, 400 ft west of Somis Road; 1500 ft south of Los Angeles Avenue; N 277,900, E 1,699,000 (Lambert Zone 5 Coordinates); Moorpark 7 1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	14,700 cy (10-5-90 DTM)
Maximum Debris Capacity	19,300 cy (10-5-90 DTM)
Inflow and Outflow Rates	Q100in=2,600 cfs; Q100out=NA
Debris Cleanout Elevation	304 ft NGVD29 (9,900 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	20 ft Weir to Drop Box Inlet 6 ft Deep
Side Weir Elevation	306 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	1,400 cfs
PRINCIPAL SPILLWAY	
Type	None
Weir Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	12 in Slotted CSP 25 ft High with Catwalk
Top Elevation	305.5 ft NGVD29
Outlet Conduit	10 in Steel Pipe
DAM	
Dam Type	Earthfill
Dam Crest Elevation	312 ft NGVD29
Length	120 ft
Surface Area of Full Basin	1.4 ac
Watershed Area	3,100 ac from Quad
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service; VCWPD
Completion Date	1956; Outlet Works Modified 1991
REFERENCE DRAWINGS	
Construction Drawings	Y-3-1082 to 1085; Y-3-3081-3083
Topographic Drwgs(pre-const)	15812
Right-of-Way Drawings	T-632 (2-6-70), 10-31-88 DTM, 10-5-89 DTM, 10-5-90 DTM

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	99,181	143,858
50-YEAR	75,782	109,920
25-YEAR	54,329	78,803

BASIN HISTORY: FOX BARRANCA DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
02-70	Aerial Survey	12,923		
05-72	Aerial Survey	8,212		
05-73	Aerial Survey	5,045		
10-73	Cleanout		7,600	
11-73	Aerial Survey	12,923		
10-75	Aerial Survey	8,317		
10-76	Cleanout		16,000	
10-76	Aerial Survey	16,000		
12-77	Aerial Survey	15,962		
01-78	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			
06-78	Aerial Survey	1,607		
12-78	Cleanout		14,000	
12-78	Aerial Survey	12,813		
12-78	Cleanout		1,390	
01-79	Aerial Survey	14,203		
02-80	Disaster Declaration			
06-80	Aerial Survey	830		
12-80	Cleanout		12,026	3,536**
12-80	Aerial Survey	12,079		
10-81	Aerial Survey	Not Digitized		
11-82	Aerial Survey	7,882		
03-83	Disaster Declaration			
04-83	Aerial Survey	1,347		
08-84	Aerial Survey	1,163		
10-84	Cleanout	9,871		2,336**
10-84	Aerial Survey	11,034		
11-84	Cleanout		874	
11-84	Aerial Survey	11,908		

BASIN HISTORY: FOX BARRANCA DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
08-85	Cleanout		4,102	
12-85	Aerial Survey	13,721		
07-86	Aerial Survey	11,797		
09-86	Cleanout		10,400	
10-86	Aerial Survey	15,399		
10-87	Cleanout		1,391	
10-87	Aerial Survey	16,790		
08-88	Cleanout		6,580	
10-88	Aerial Survey	17,650		
05-89	Cleanout		1,320	
10-89	Aerial Survey	17,744		
05-90	Cleanout		2,100	3,032
09-90	Aerial Survey	19,263		
05-91	Aerial Survey	10,745		
09-91	Aerial Survey			
11-91	Cleanout		9,800	
11-91	Aerial Survey	20,563		
02-92	Disaster Declaration			3,060**
05-92	Aerial Survey	5,260		
10-92	Cleanout		15,117	
10-92	Aerial Survey	19,180		
11-92	Aerial Survey	19,300		
07-93	Aerial Survey	15,010		
10-93	Cleanout		8,650	
10-93	Aerial Survey	23,660		
12-93	Aerial Survey	Not Digitized		
05-94	Cleanout		1,816	
06-94	Aerial Survey	25,480		
01-95	Disaster Declaration			3,260
05-95	Aerial Survey	480		
11-95	Cleanout		15,550	
11-95	Aerial Survey	20,150		
07-96	Aerial Survey	15,140		
11-96	Cleanout		4,160	
11-96	Aerial Survey	19,300		
05-97	Aerial Survey	16,460		
02-98	Disaster Declaration			3,828
07-98	Aerial Survey	2,040		
01-99	Aerial Survey	Not Digitized		

BASIN HISTORY: FOX BARRANCA DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
06-99	Cleanout		16,270	
06-99	Aerial Survey	18,310		
12-99	Aerial Survey	Not Digitized		
07-01	Aerial Survey	6,818		
NA	Cleanout	Unknown	NA	
07-02	Aerial Survey	19,310		
11-03	Cleanout		2,444	
12-03	Cleanout		2,896	
12-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			3,030
07-05	Cleanout		12,018	

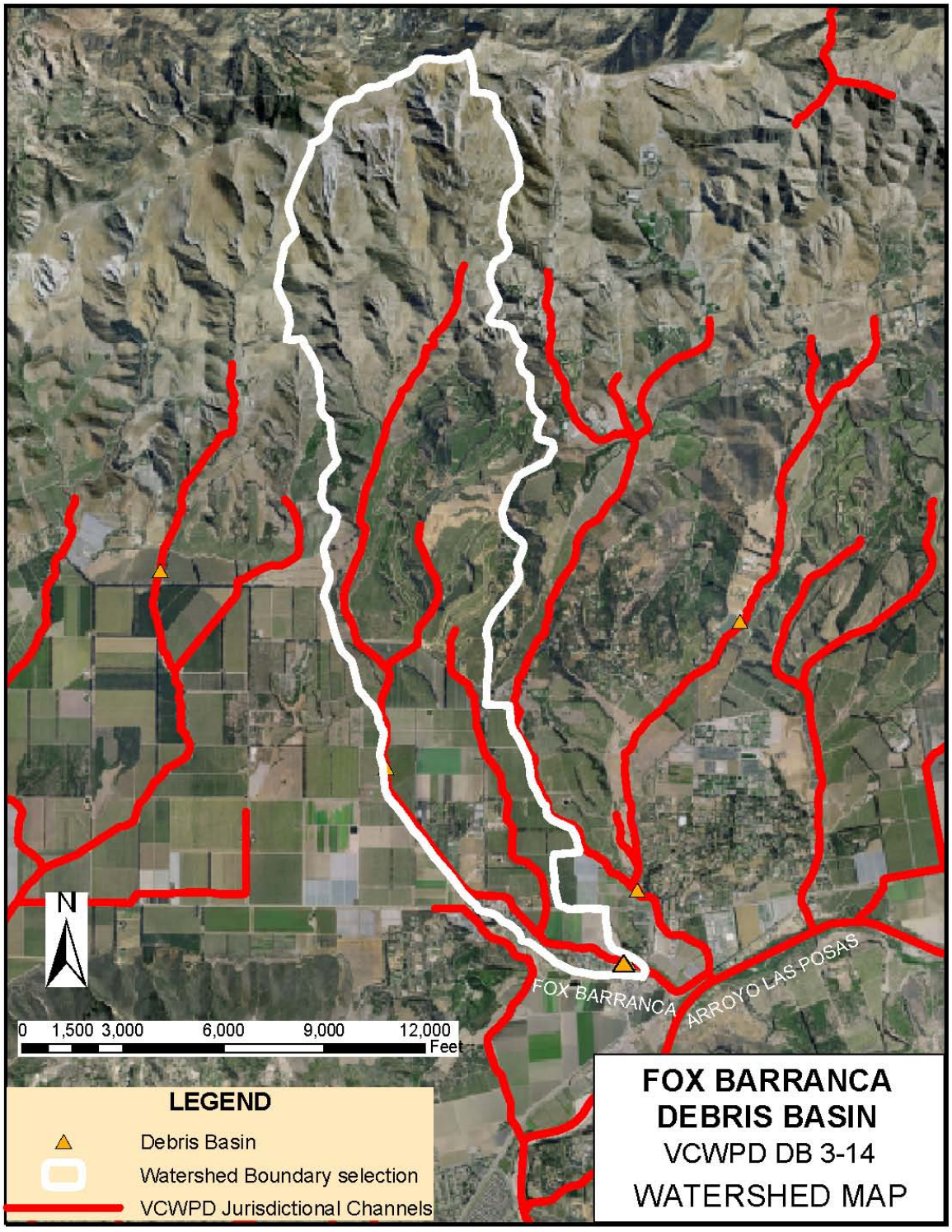
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable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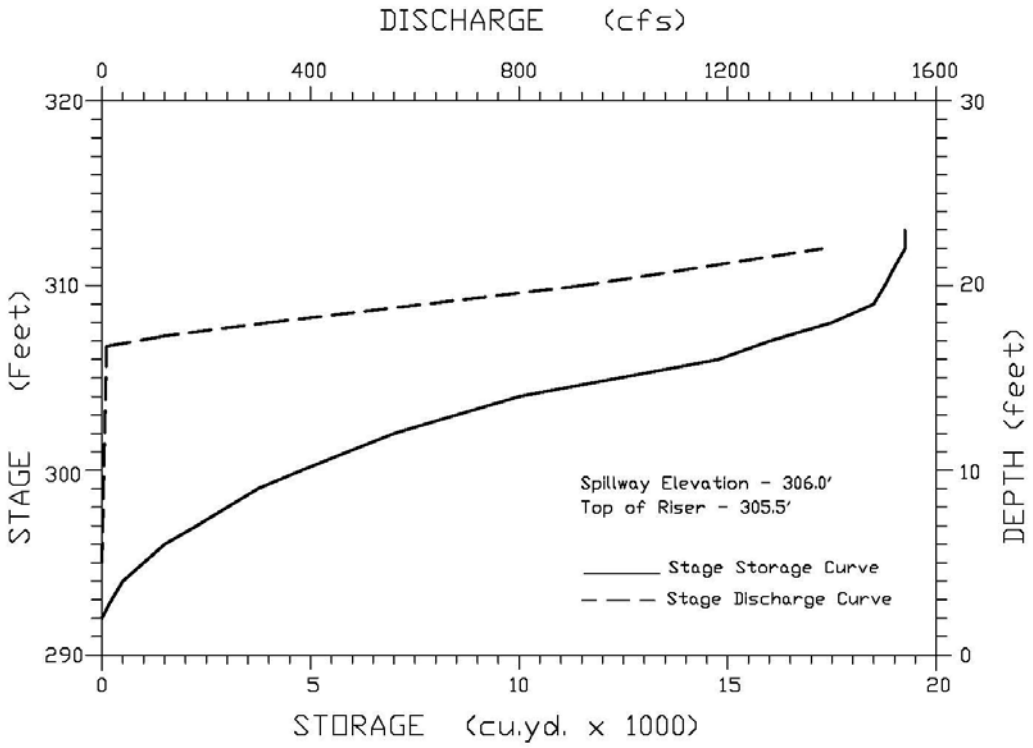
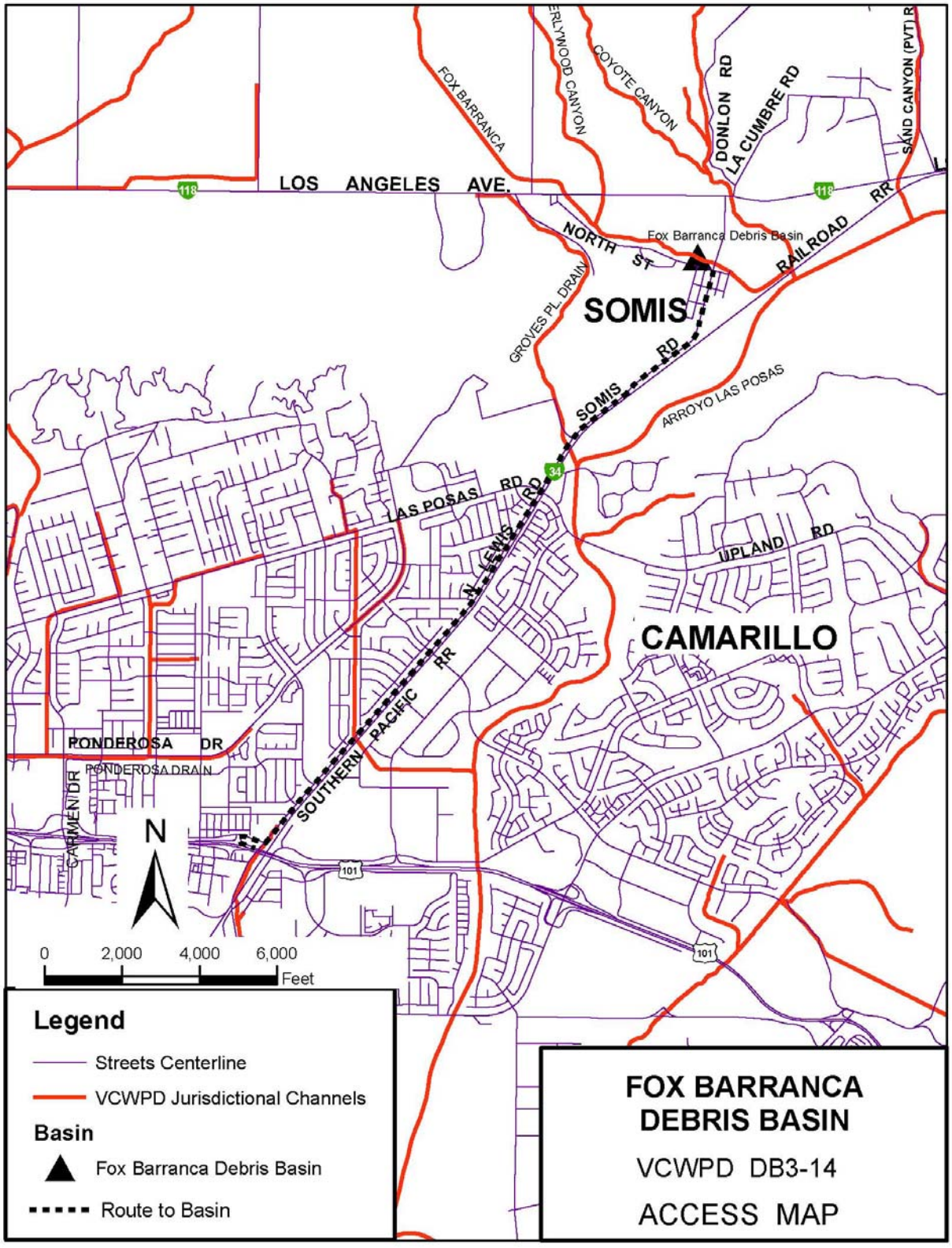
Feet
FOX BARRANCA
ARROYO LAS POSAS
LEGEND
Debris Basin
Watershed Boundary selection
VCWPD Jurisdictional Channels
FOX BARRANCA
DEBRIS BASIN
VCWPD DB 3-14
WATERSHED MAP

FOX BARRANCA DEBRIS BASIN

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FOX BARRANCA
VERDUGO CANYON
COYOTE CANYON
DONLON RD
LA CUMBRE RD
SAND CANYON (PVT) RD
RAILROAD
NORTH ST
Fox Barranca Debris Basin
SOMIS
GROVES PL DRAIN
SOMIS RD
ARROYO LAS POSAS
LAS POSAS RD
LEWIS RD
UPLAND RD
CAMARILLO
SOUTHERN PACIFIC RR
PONDEROSA DR
PONDEROSA DRAIN
CARMEN DR
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0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Fox Barranca Debris Basin
Route to Basin
FOX BARRANCA
DEBRIS BASIN
VCWPD DB3-14
ACCESS MAP

GABBERT CANYON DEBRIS BASIN DB3-09

LOCATION: 1.5 mi west of Moorpark, approximately 3,000 ft north of Los Angeles Ave., Latitude-34 17'11", Longitude-118 54'34".
N 287,400, E 1,725,300 (Lambert Zone 5 Coordinates);
Moorpark 7 1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	16,300 cy (12-9-87 DTM)
Maximum Debris Capacity	49,050 cy (12-9-87 DTM)
Inflow and Outflow Rates	Q100in=3,200 cfs; Q100out=NA
Debris Cleanout Elevation	510 ft NGVD29 (5,700 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	40 ft wide x 8 ft high RC Rectangular Channel
Side Weir Elevation	517 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	1,252 cfs (from GEI report 2004)
PRINCIPAL SPILLWAY	
Type	None
Weir Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	14-in Slotted CSP Riser 11-ft High with Catwalk
Top Elevation	517.48 ft NGVD29
Outlet Conduit	14 in CSP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	525 ft NGVD29
Length	800 ft
Surface Area of Full Basin	4.8 ac
Watershed Area	2,350 ac from Quad
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service VCWPD (Agency Number 12-10-040-327, Date 04-03-63
Completion Date	1963
REFERENCE DRAWINGS	
Construction Drawings	Y-2-291 thru 296; Y-3-192 thru 197
Right-of-Way Drawings	16050 and 16051
Topographic Drawings	T-63-4 (2-6-70), T-63-15 (11-2-71), T-259 (10-22-80), 12-9-87 DTM, 10-16-89 DTM

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	56,900	81,600
50-YEAR	42,700	61,200
25-YEAR	30,800	44,200

BASIN HISTORY: GABBERT CANYON DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
09-69	Cleanout		25,000	
11-70	Aerial Survey	53,689		
01-70	Aerial Survey	Not Digitized		
12-70	Aerial Survey	43,392		
05-71	Cleanout		1,500	
05-71	Aerial Survey	46,883		
09-71	Cleanout		5,400	
10-71	Aerial Survey	56,423		
07-72	Cleanout		13,300	
11-72	Aerial Survey	57,659		
05-73	Aerial Survey	42,122		
10-73	Cleanout		16,600	
10-73	Aerial Survey	58,708		
06-74	Aerial Survey	58,453		
06-75	Aerial Survey	55,584		
10-76	Cleanout		6,200	
10-76	Aerial Survey	62,281		
03-78	Disaster Declaration			
06-78	Aerial Survey	11,943		
10-78	Cleanout		48,400	
10-78	Cleanout		5,350	
11-78	Aerial Survey	55,425		
02-80	Disaster Declaration			
06-80	Aerial Survey	Not Digitized		
12-80	Cleanout		47,290	7,379**
12-80	Aerial Survey	54,453		
09-81	Aerial Survey	Not Digitized		
11-82	Cleanout		1,290	
11-82	Aerial Survey	55,743		
03-83	Disaster Declaration			
04-83	Aerial Survey	9,989		
10-83	Cleanout		6,774	

BASIN HISTORY: GABBERT CANYON DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
10-83	Aerial Survey	16,763		
12-83	Cleanout		36,900	
12-83	Aerial Survey	54,236		
12-85	Aerial Survey	51,623		
06-86	Aerial Survey	25,939		
08-86	Cleanout		29,770	
10-86	Aerial Survey	50,998		
10-87	Aerial Survey	Not Digitized		
12-87	Aerial Survey	49,042		
10-88	Aerial Survey	Not Digitized		4,253
10-89	Aerial Survey	Not Digitized		
09-90	Aerial Survey	Not Digitized		
05-91	Aerial Survey	38,432		
07-91	Cleanout		27,070	
11-91	Aerial Survey	56,885		
02-92	Disaster Declaration			4,742**
05-92	Aerial Survey	38,715		
10-92	Cleanout		21,650	
10-92	Aerial Survey	51,210		
07-93	Cleanout		28,345	
12-93	Aerial Survey	52,065		
01-94	Aerial Survey	Not Digitized		
01-95	Disaster Declaration			5,209
05-95	Aerial Survey	7,850		
12-95	Cleanout		41,900	
12-95	Aerial Survey	49,750		
07-96	Aerial Survey	Not Digitized		
05/97	Aerial Survey	37,640		
02-98	Disaster Declaration			6,450
03-98	Field Survey	5,050		
06-98	Cleanout		58,190	
06-98	Aerial Survey	53,150		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			6,114
07-05	Cleanout		81,059	
07-05	Cleanout		14,484-Survey	

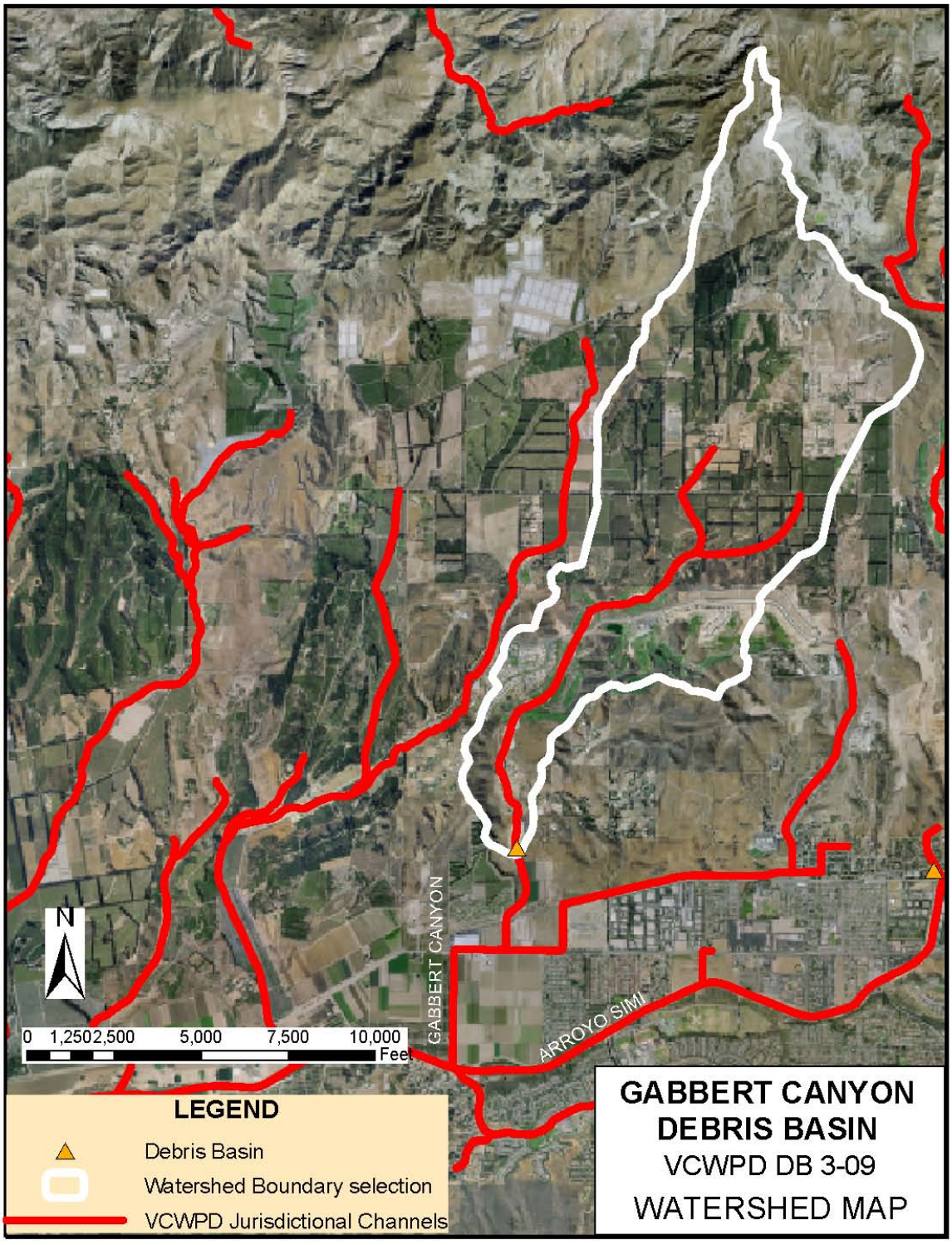
Notes

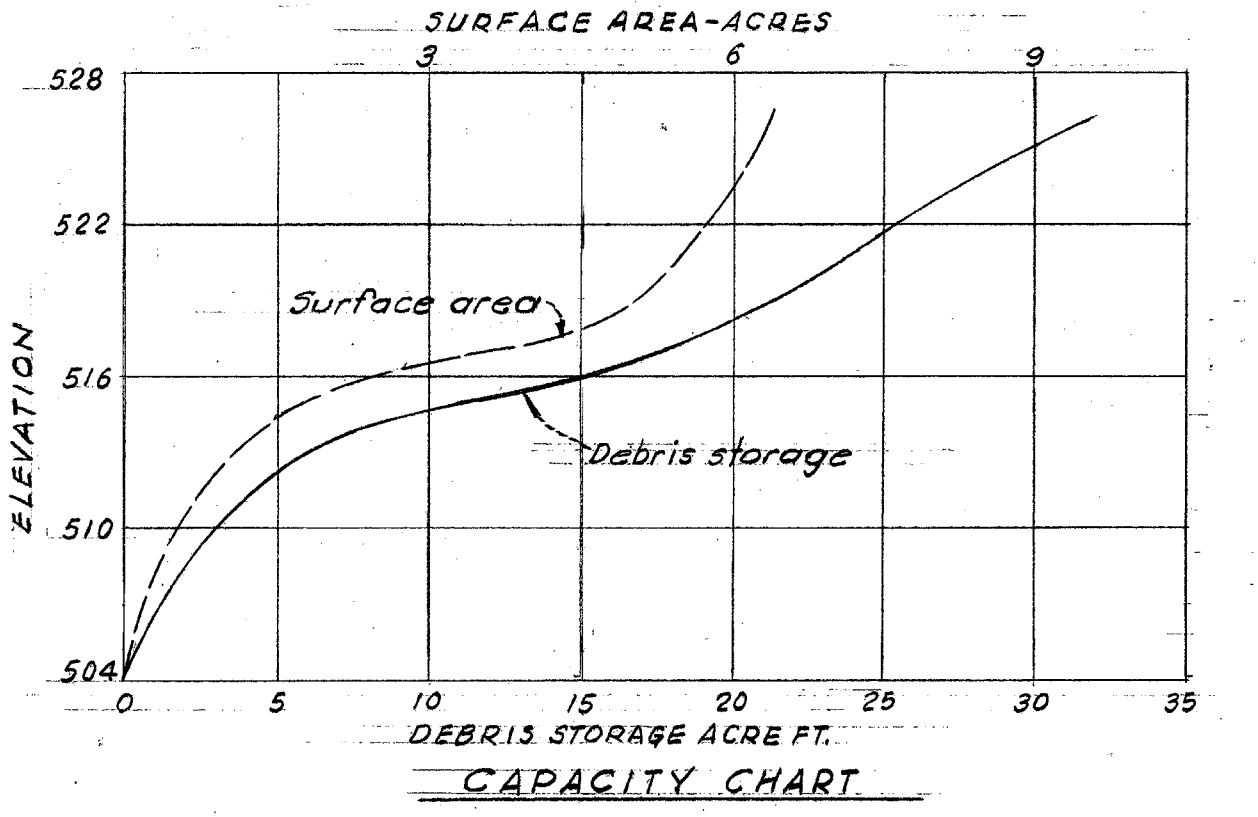
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

*** Theoretical Value from Kevin Scott Formula

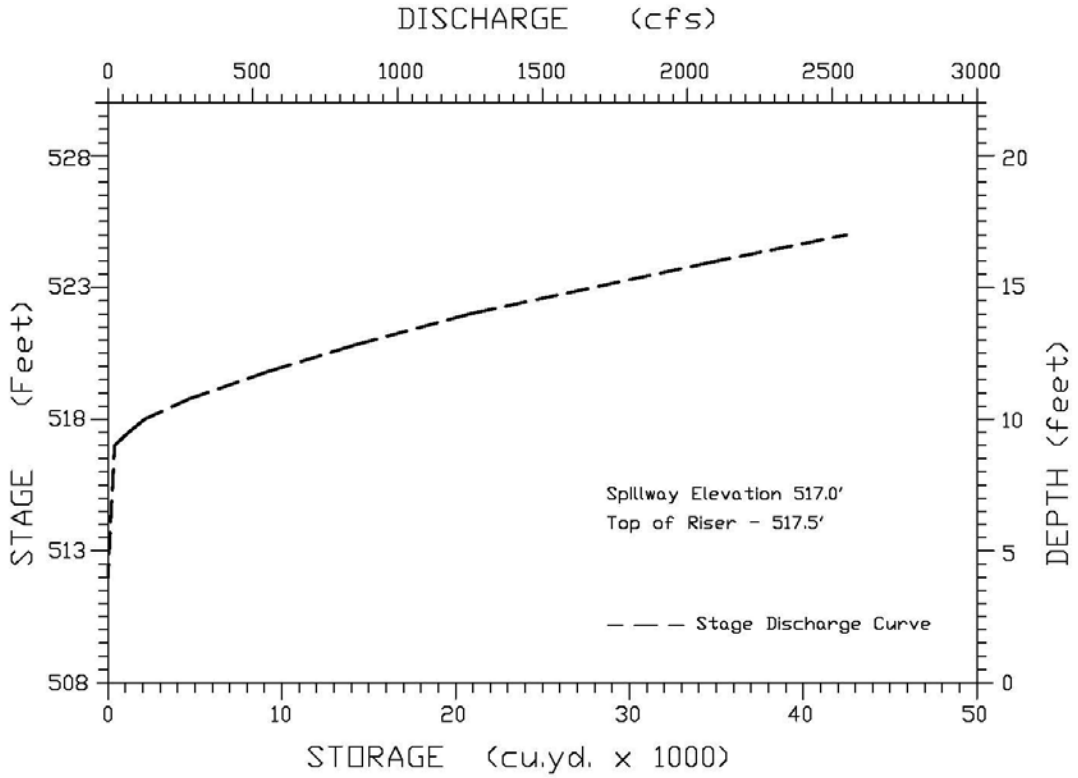
NA= Not Available / Not Applicable

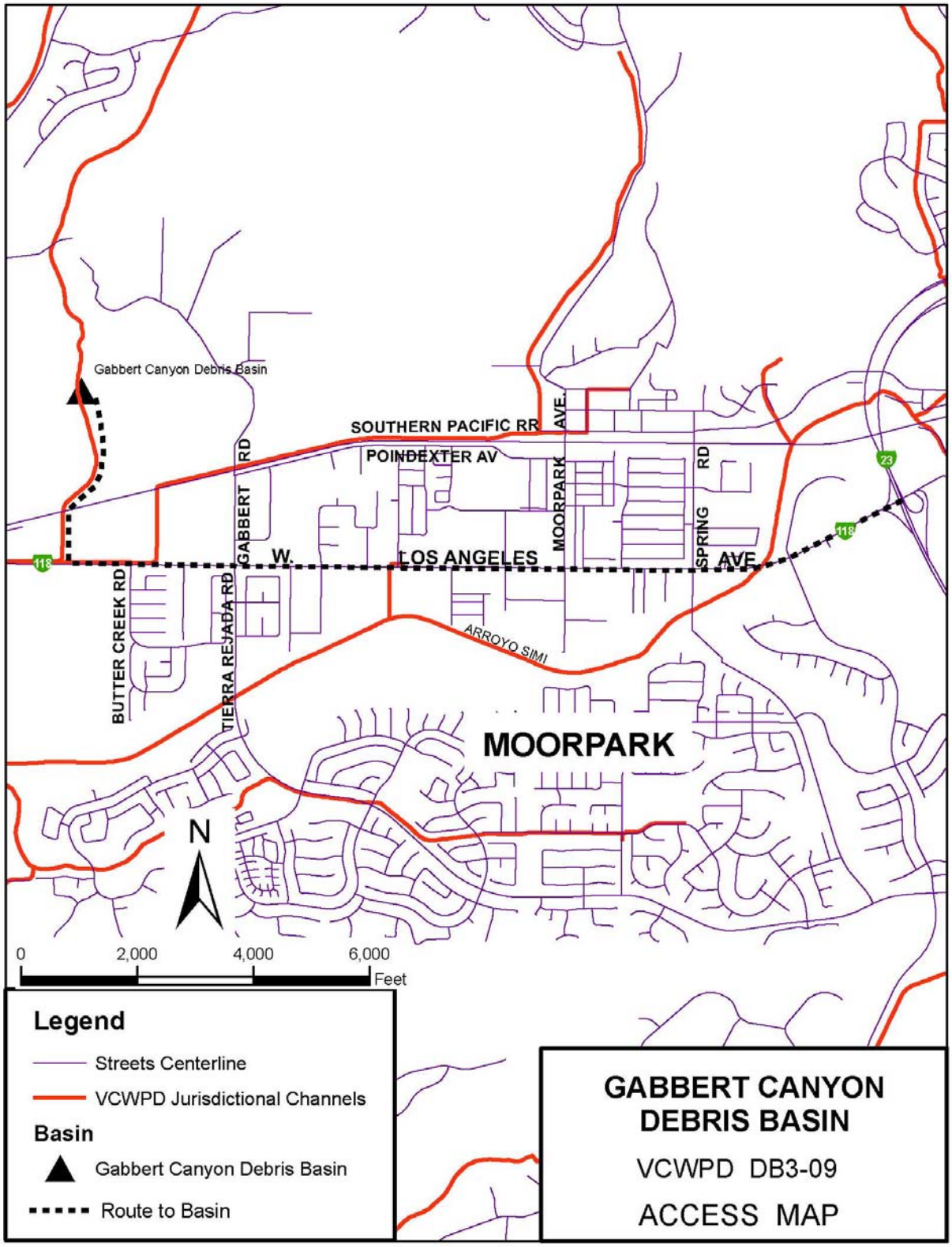

N
0 1,250 2,500 5,000 7,500 10,000
Feet
GABBERT CANYON
ARROYO SIMI
LEGEND
Debris Basin
Watershed Boundary selection
VCWPD Jurisdictional Channels
GABBERT CANYON
DEBRIS BASIN
VCWPD DB 3-09
WATERSHED MAP



Gabbert Canyon Debris Basin

GABBERT CANYON DEBRIS BASIN




Gabbert Canyon Debris Basin
SOUTHERN PACIFIC RR
POINDEXTER AV
GABBERT RD
MOORPARK AVE.
SPRING RD
W. LOS ANGELES AVE
BUTTER CREEK RD
TIERRA REJADA RD
ARROYO SIMI
MOORPARK
118
23
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Gabbert Canyon Debris Basin
Route to Basin
GABBERT CANYON DEBRIS BASIN
VCWPD DB3-09
ACCESS MAP

HONDA WEST DEBRIS BASIN DB3-07

LOCATION: About 500 ft north of Berylwood Road, approx. 2000 ft east of Price Rd.
Latitude 34 17'28" Longitude-119 02'33"
N 289,500, E 1,685,100(Lambert Zone 5 Cordinates);
Santa Paula 7-1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	10,350 cy (10-16-89 DTM)
Maximum Debris Capacity	14,300 cy (10-16-89 DTM)
Inflow and Outflow Rates	Q100in=820 cfs; Q100out=NA
Debris Cleanout Elevation	576 ft NGVD29 (5,600 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	22 ft W x 5 ft H RC Rectangular Channel with Wingwalls
Invert Elevation	578.5 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	690 cfs
PRINCIPAL SPILLWAY	
Type	None
Weir Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	14 in Slotted CSP 22 ft High
Top Elevation	581.33 ft NGVD29
Outlet Conduit	14-in CSP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	583.5 ft NGVD29
Length	150 ft
Surface Area of Full Basin	1.5 ac
Watershed Area	740 ac from Quad Map
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service
Completion Date	1955
REFERENCE DRAWINGS	
Construction Drawings	Y-3-1032-1037
Right-of-Way Drawings	17189-90
Topographic Drawings	T-63-6 (2-6-70), T-258 (11-14-80), 11-8-87 DTM, 10-16-89 DTM

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	55,662	80,736
50-YEAR	42,486	61,625
25-YEAR	30,473	44,200

BASIN HISTORY: HONDA WEST DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
01-70	Aerial Survey	Not Digitized		
02-70	Aerial Survey	4,150		
01-72	Aerial Survey	Not Digitized		
08-77	Cleanout		9,000	
12-77	Aerial Survey	13,200		
01-78	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			
06-78	Aerial Survey	1,850		
05-79	Cleanout		10,500	
02-80	Disaster Declaration			
06-80	Aerial Survey	Not Digitized		
11-80	Aerial Survey	11,304		795**
10-81	Aerial Survey	Not Digitized		
11-82	Aerial Survey	11,997		
03-83	Disaster Declaration			
04-83	Aerial Survey	Not Digitized		
11-83	Aerial Survey	9,013		
04-84	Cleanout		5,377	100**
10-84	Aerial Survey	14,266		
12-85	Aerial Survey	14,441		
07-86	Aerial Survey	12,985		
11-86	Aerial Survey	Not Digitized		
11-87	Aerial Survey	13,040		
10-89	Aerial Survey	13,798		562
09-90	Aerial Survey	Not Digitized		
06-91	Aerial Survey	13,050		
02-92	Disaster Declaration			129**
05-92	Aerial Survey	11,950		
07-92	Cleanout		1,102	

BASIN HISTORY: HONDA WEST DEBRIS BASIN

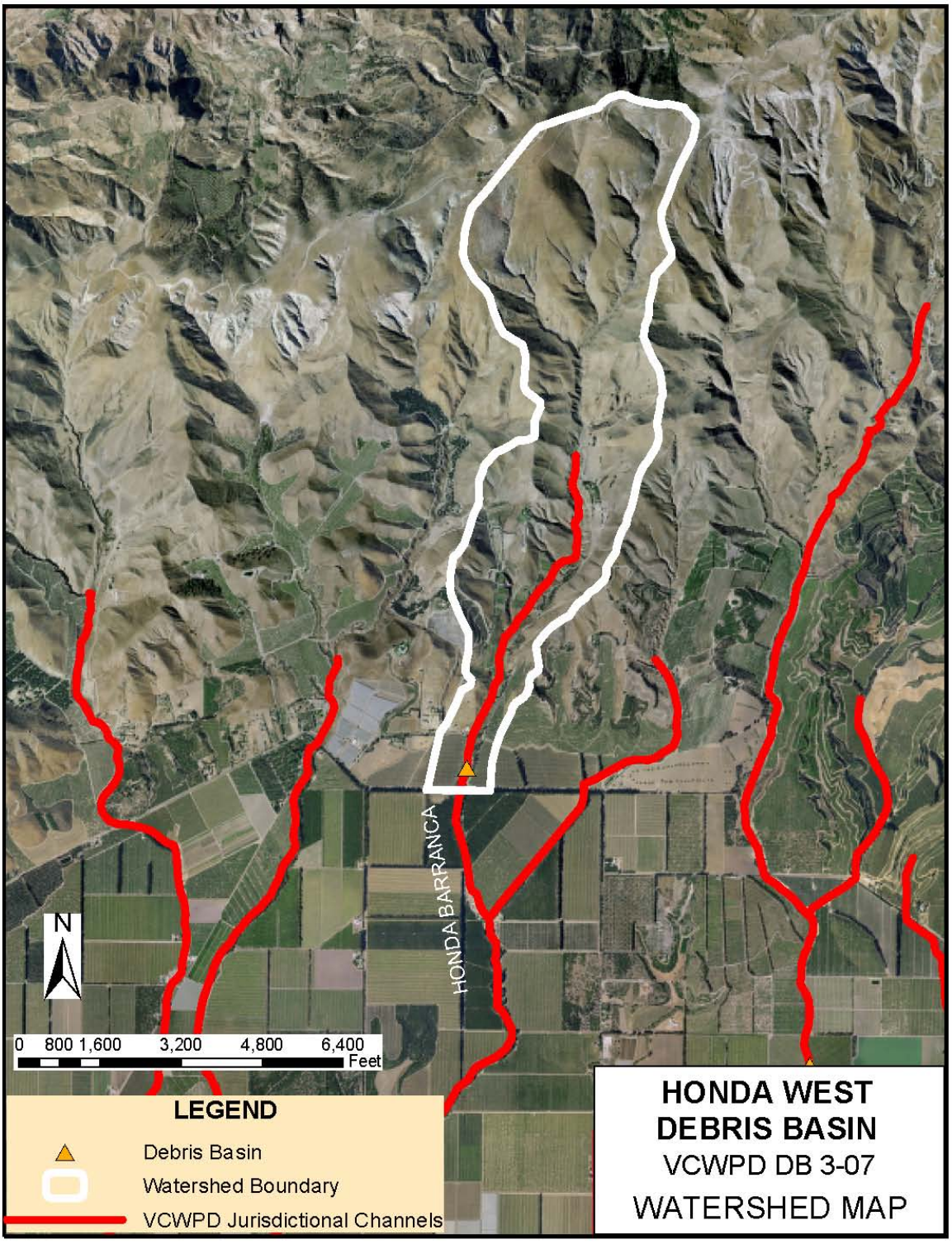
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
07-92	Aerial Survey	13,052		
09-93	Cleanout		968	
01-95	Disaster Declaration			164
05-96	Cleanout		1,292	
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	12,884		
02-98	Disaster Declaration			488
07-98	Aerial Survey	11,020		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
11-03	Cleanout		945	
12-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			112
07-05	Cleanout		10,872-Survey	

Notes

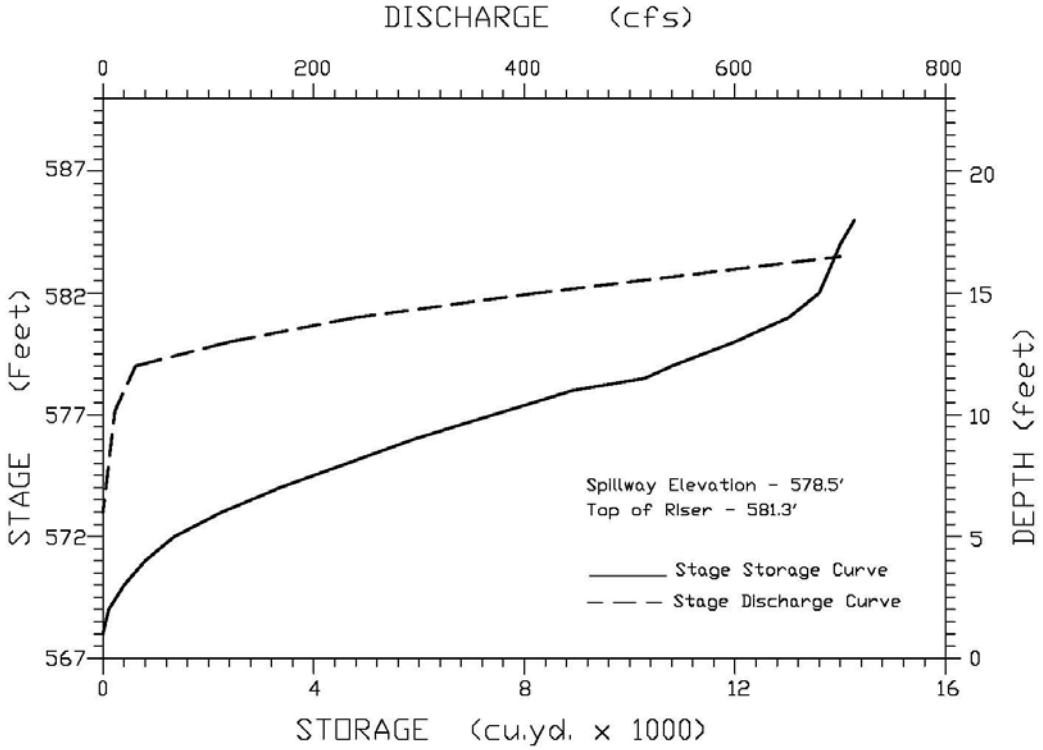
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

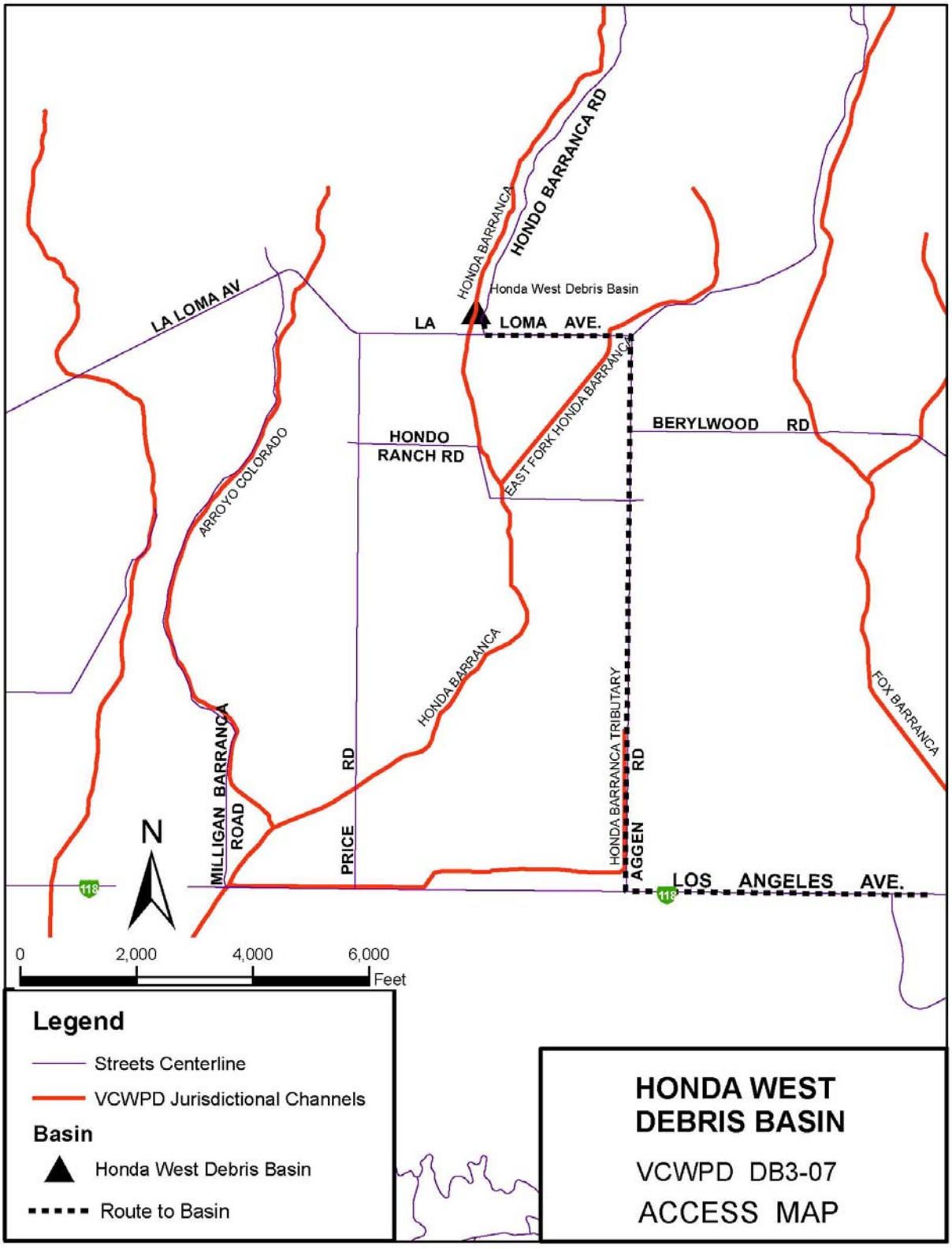
** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable


HONDA BARRANCA
N
0 800 1,600 3,200 4,800 6,400
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
HONDA WEST
DEBRIS BASIN
VCWPD DB 3-07
WATERSHED MAP

HONDA WEST DEBRIS BASIN




HONDO BARRANCA RD
HONDA BARRANCA
Honda West Debris Basin
LA LOMA AV
LA LOMA AVE.
BERYLWOOD RD
HONDO RANCH RD
EAST FORK HONDA BARRANCA
ARROYO COLORADO
HONDA BARRANCA
HONDA BARRANCA TRIBUTARY
FOX BARRANCA
MILLIGAN BARRANCA
ROAD
PRICE RD
AGGEN RD
LOS ANGELES AVE.
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Honda West Debris Basin
Route to Basin
HONDA WEST
DEBRIS BASIN
VCWPD DB3-07
ACCESS MAP

LANG CREEK DEBRIS BASIN DB3-31

LOCATION: City of Thousand Oaks, Located at Westlake Blvd and Lang Ranch
N 259,660, E 1,751,001 (Lambert Zone 5 Coordinates)
Thousand Oaks Quad Map

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	16.7 ac-ft or 26,942 cy
Design Debris Capacity	15 ac-ft (24,195 cy) at 1,040 ft NGVD29 fm as-built
Inflow and Outflow Rates	Q100in= 2,906 cfs at 1,046.1 ft NGVD29; Q100out=NA
Debris Cleanout Elevation	1033 ft NGVD29 (5,500 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	Drop Box Inlet 12 ft W x 42.3 ft L RC, Bott. 1020.36 ft NGVD29
Weir Elevation	1041 ft NGVD29
Outlet Conduit	12 ft Wx12 ft H RCB
Capacity w/o Freeboard	NA
PRINCIPAL SPILLWAY	
Type	None
RCB Weir Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	½ inx10 in slots in Drop Box Inlet Upstream Face beginning at 1025 ft NGVD29
Top Elevation	1040.36 ft NGVD29
Outlet Conduit	Emergency Spillway
DAM	
Dam Type	Earthfill
Dam Crest Elevation	1049 ft NGVD29 (Westlake Blvd)
Length	NA
Width at Crest	NA
Surface Area of Full Basin	2.3 ac
Watershed Area	2,234 ac from GIS Watershed Layer Shapefile
CONSTRUCTION DATA	
Construction Agency	VCWPD with City of Thousand Oaks
Completion Date	2004
REFERENCE DRAWINGS	
Construction Drawings	Y-3-4049 – Y-3-4094
Right-of-Way Drawings	17625 - 17626
Topographic Drawings	NA

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	22,052	37,830
50-YEAR	16,806	28,831
25-YEAR	12,857	21,911

BASIN HISTORY: LANG CREEK DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
01-05	Disaster Declaration			1,680***
07-05	Cleanout		1,535-Survey	

Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

*** Theoretical Value from Scott and Williams (1978), 10% of 50-yr Design Yield

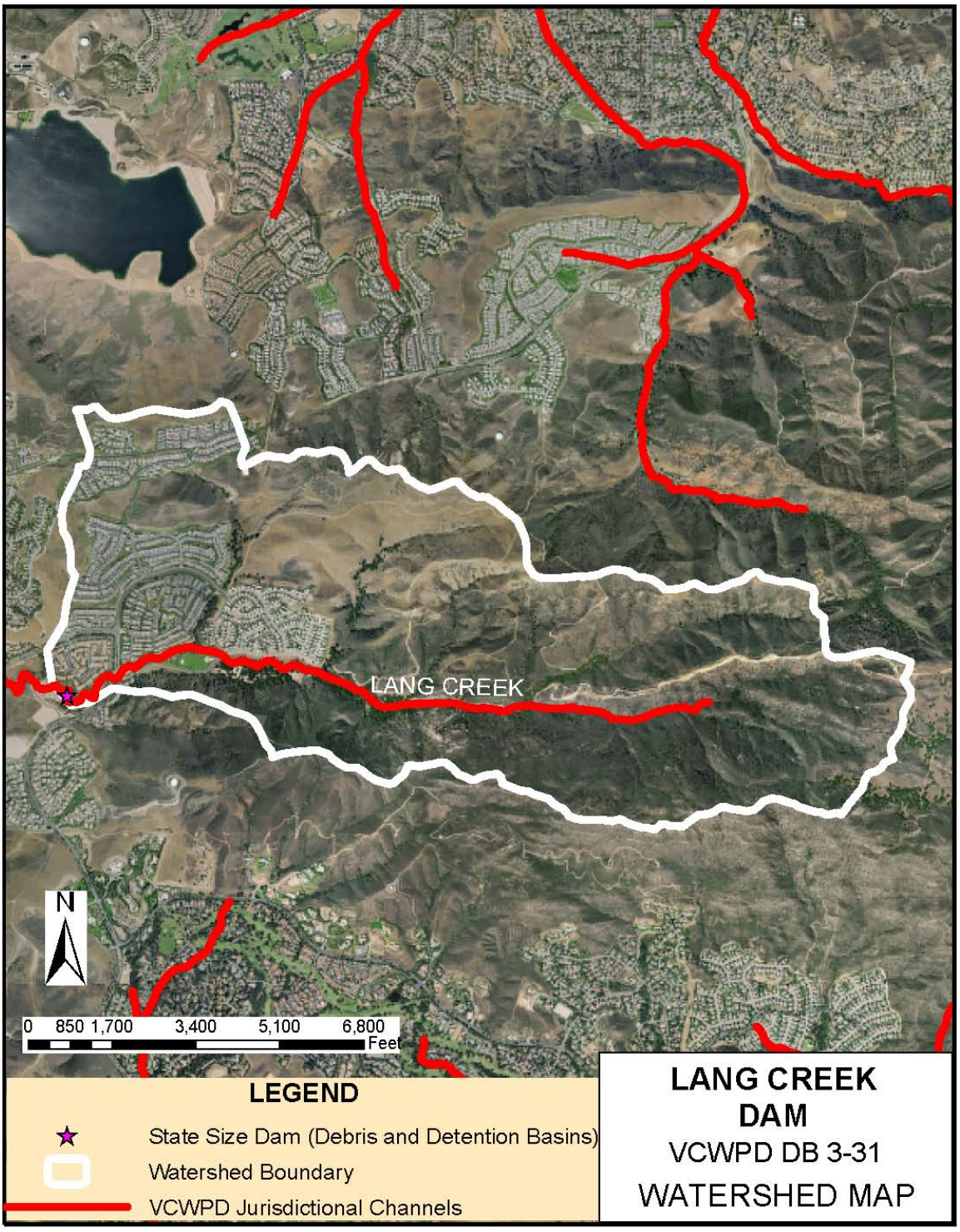
NA= Not Available / Not Applicable

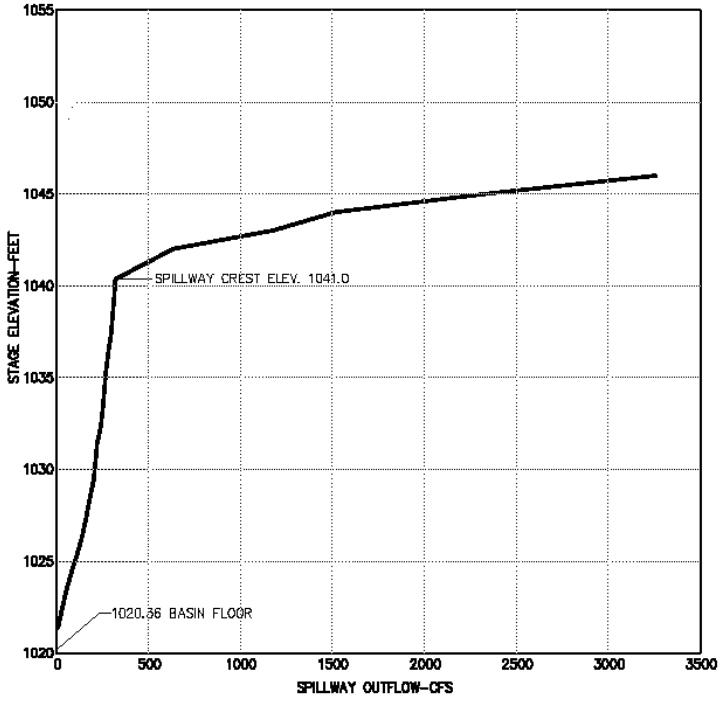
LANG CREEK DETENTION BASIN DD3-31

LOCATION: City of Thousand Oaks, Located downstream of Westlake Blvd.,
Near Lang Ranch
N 259,653, E 1,750,084 (Lambert Zone 5 Coordinates)
Thousand Oaks Quad Map

DESIGN DATA

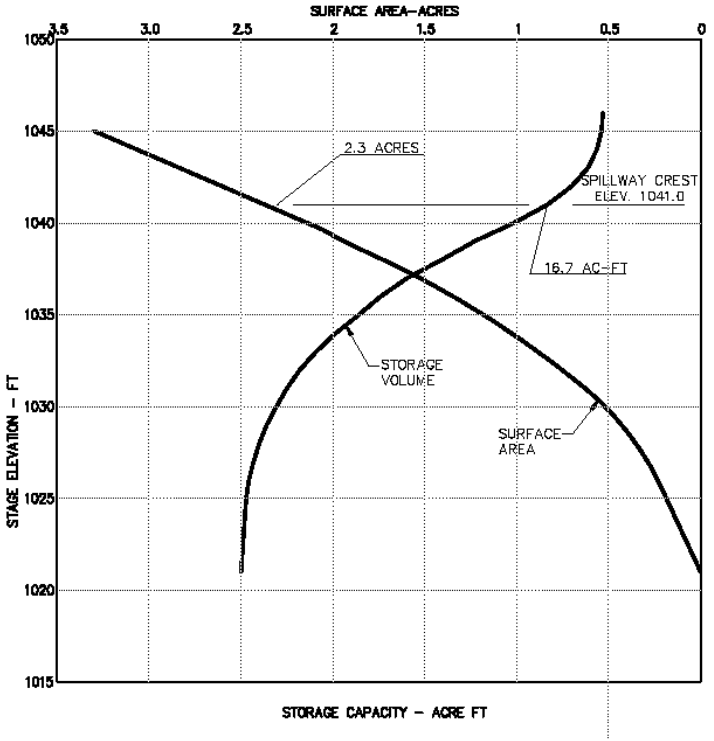
Design Agency	VCWPD
Level Capacity	263 ac-ft
Maximum Debris Capacity	None- Debris Basin Intercepts
Inflow Rates	Q50=2,476 cfs, Q100=2,906 cfs
Outflow Rates	Q50=608 cfs, Q100=653 cfs at 1035 ft NGVD29 at 1,035 ft NGVD29
EMERGENCY SPILLWAY	
Type	Drop Box Inlet, 17 ft (W) x 94 ft (L)
Weir Elevation	1034 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	7,127 cfs
PRINCIPAL SPILLWAY	
Type	RC Intake Tower 29 ft High with Catwalk
Top Elevation	1014 ft;
Outlet Conduit	60 in RCP
Low Level Inlet	5 ft X5 ft low level inlet at 985 ft NGVD29 with sloped trash rack
Top Elevation	High Stage Inlet 10 ft Wx5 ft H at 1,008 ft NGVD29
DEBRIS BLEEDER/RISER	None
DAM	
Dam Type	Earthfill
Dam Crest Elevation	1040.8 ft NGVD29
Length	345 ft
Surface Area of Full Basin	12 ac
Watershed Area	2,325 ac from GIS Watershed Layer Shapefile
Width at Crest	20 ft
CONSTRUCTION DATA	
Construction Agency	VCWPD with City of Thousand Oaks
Completion Date	2004
REFERENCE DRAWINGS	
Construction Drawings	Y-3-4049 – Y-3-4094
Right-of-Way Drawings	17625 - 17626
Topographic Drawings	NA


LANG CREEK
N
0 850 1,700 3,400 5,100 6,800
Feet
LEGEND
State Size Dam (Debris and Detention Basins)
Watershed Boundary
VCWPD Jurisdictional Channels
LANG CREEK
DAM
VCWPD DB 3-31
WATERSHED MAP



SPILLWAY RATING CURVE

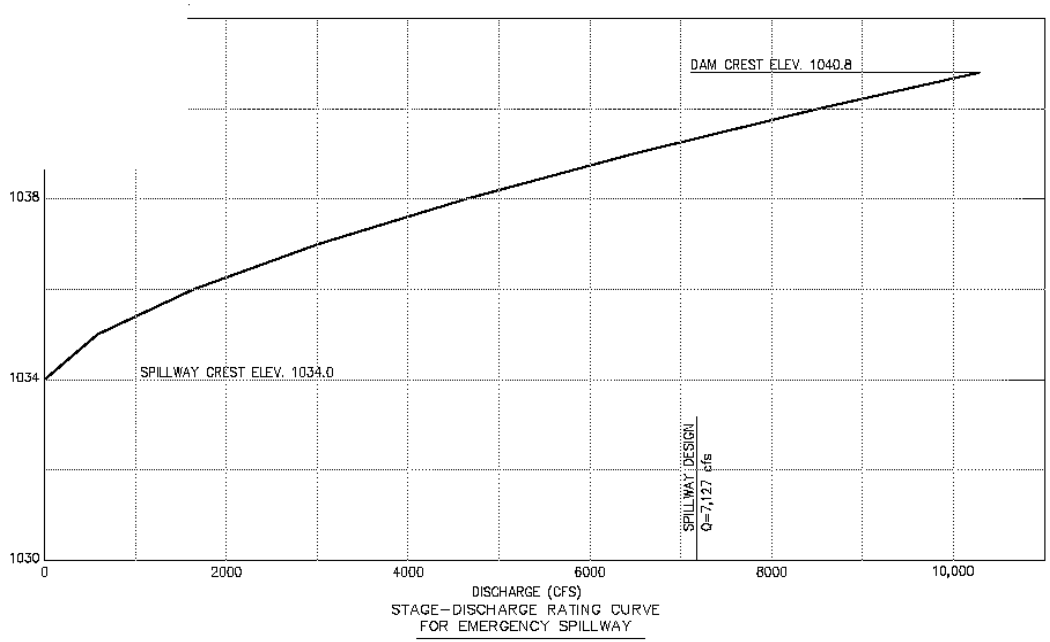
SCALE: HORIZ 1"=500 CFS
VERT 1"=5'

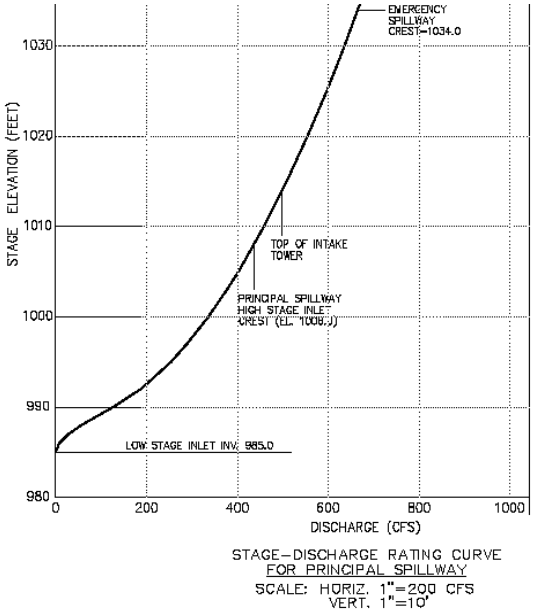


AREA-CAPACITY CURVES

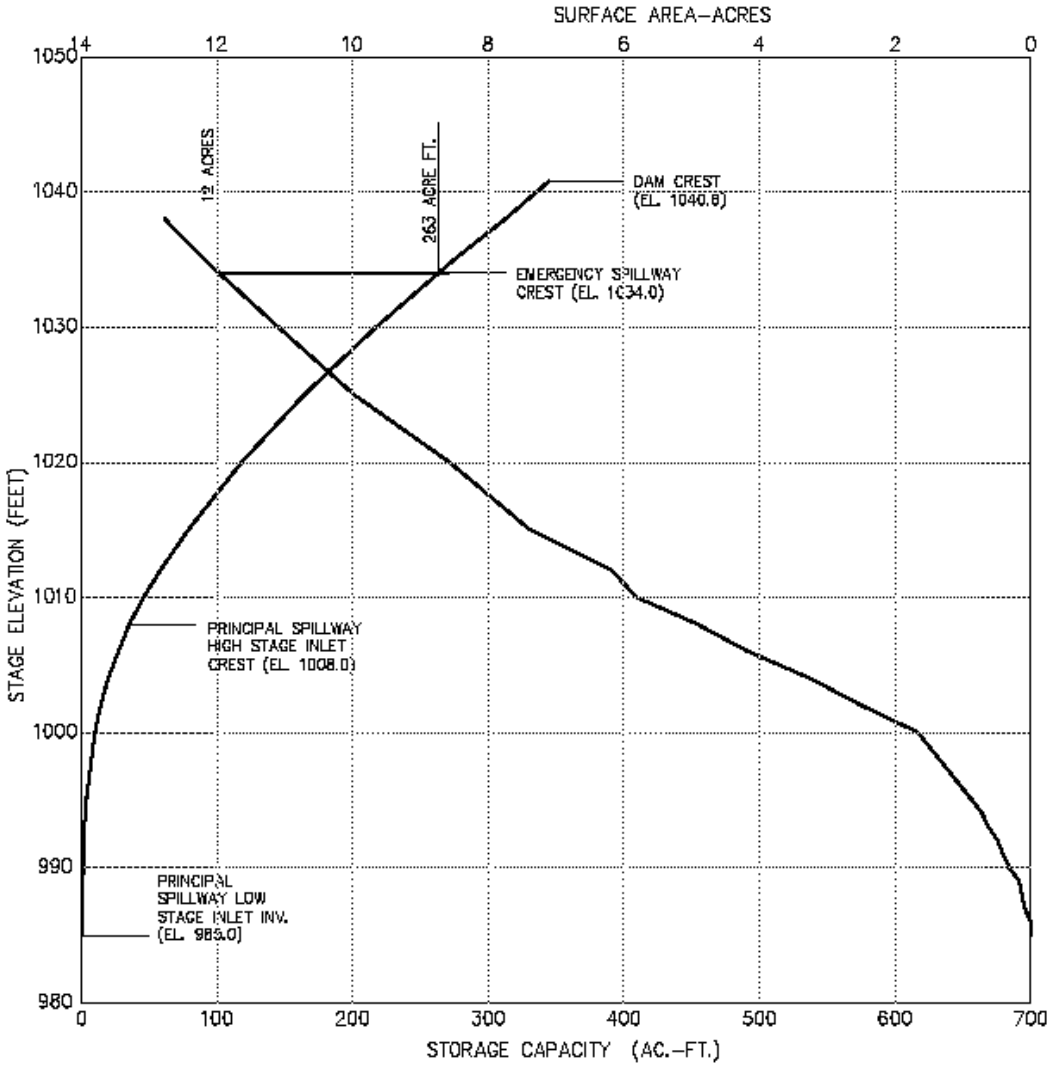
SCALE: HORIZ 1"=5 AC-FT OR 1"=0.5 ACRES
VERT 1"=5'

Lang Creek Debris Basin



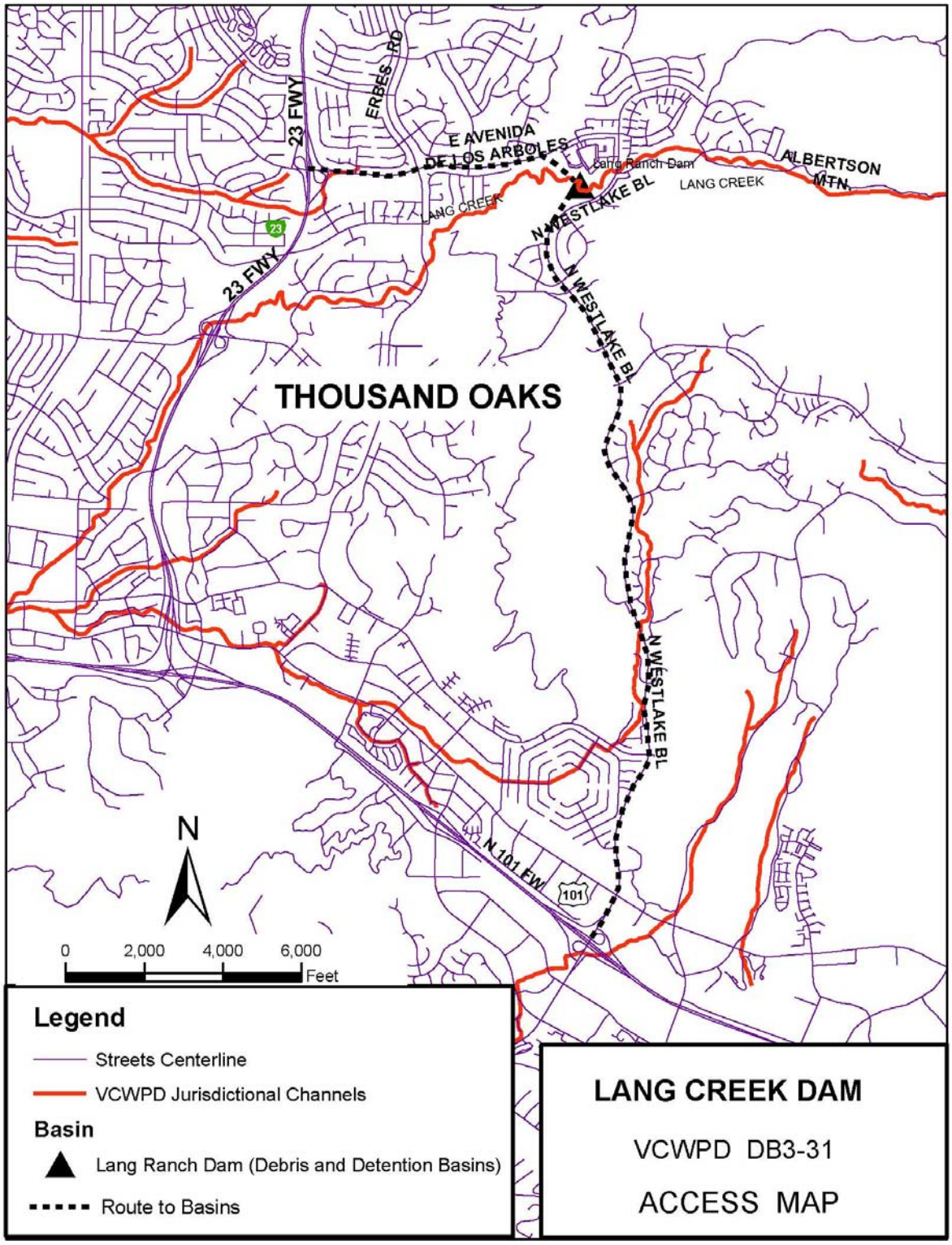


Lang Creek Detention Basin



STAGE–STORAGE CAPACITY–SURFACE AREA CURVES
SCALE: HORIZ. 1"=100 ACRE–FEET OR 1"= 2 ACRE
VERT. 1"=10'

Lang Creek Detention Basin


23 FWY
ERBES RD
E AVENIDA DE LOS ARBOLES
Lang Ranch Dam
LANG CREEK
ALBERTSON MTN.
N WESTLAKE BL
THOUSAND OAKS
N 101 FWY
101
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Lang Ranch Dam (Debris and Detention Basins)
Route to Basins
LANG CREEK DAM
VCWPD DB3-31
ACCESS MAP

LAS LLAJAS CANYON DETENTION DAM State Dam No. 86-005 DD3-20

LOCATION: Simi Valley, approx. 1 mi. N of Alamo St and west of the extension of Stearns St;
N 292,560, E 1,792,140 (Lambert Zone 5 Coordinates);
Santa Susana 7 1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Flood Storage Capacity	1,250 ac-ft (2,017,000 cy) with no debris storage
Design Debris Capacity	187.5 ac-ft (302,500 cy) at 1192 ft NGVD29
Inflow and Outflow Rates	Q100in=6,000 cfs; Q100out=600 cfs
Debris Cleanout Elevation	1180 ft (111,500 cy) [Design capacity-100yr debris yield]
EMERGENCY SPILLWAY	
Type	Earthen Trap Channel with Concrete Sill Channel Stabilizer 120-ft Wide x 20-ft High
Invert Elevation	1,227.5 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	7,600 cfs
PRINCIPAL SPILLWAY	
Type	10 ft x 5 ft RC Rectangular Intake Tower with Side Inlets and Projecting Top
Top and Flowline Elevations	1194.25 ft NGVD29; 1157.25 ft NGVD29
Outlet Conduit	54 in RCP
DEBRIS BLEEDER/RISER	
Type	None
Top Elevation	NA
Outlet Conduit	NA
DAM	
Dam Type	Earthfill, 80 ft High
Dam Crest Elevation	1,240 ft NGVD29
Length	640 ft
Surface Area of Full Basin	45.4 ac
Watershed Area	4,384 ac from Quad
Width at Crest	20 ft
CONSTRUCTION DATA	
Construction Agency	VCWPD
Completion Date	1980
REFERENCE DRAWINGS	
Construction Drawings	Y-3-2134 to Y-3-2155
Right-of-Way Drawings	17015 - 17019
Topographic Drawings	Y-3-2135; T-154 and T-271

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	190,983	277,014
50-YEAR	142,477	206,657
25-YEAR	63,512	92,121

Design debris capacity based on 25*Mean Annual Deposition + 100-Yr Design Volume rounded to nearest

BASIN HISTORY: LAS LLAJAS CANYON DETENTION DAM

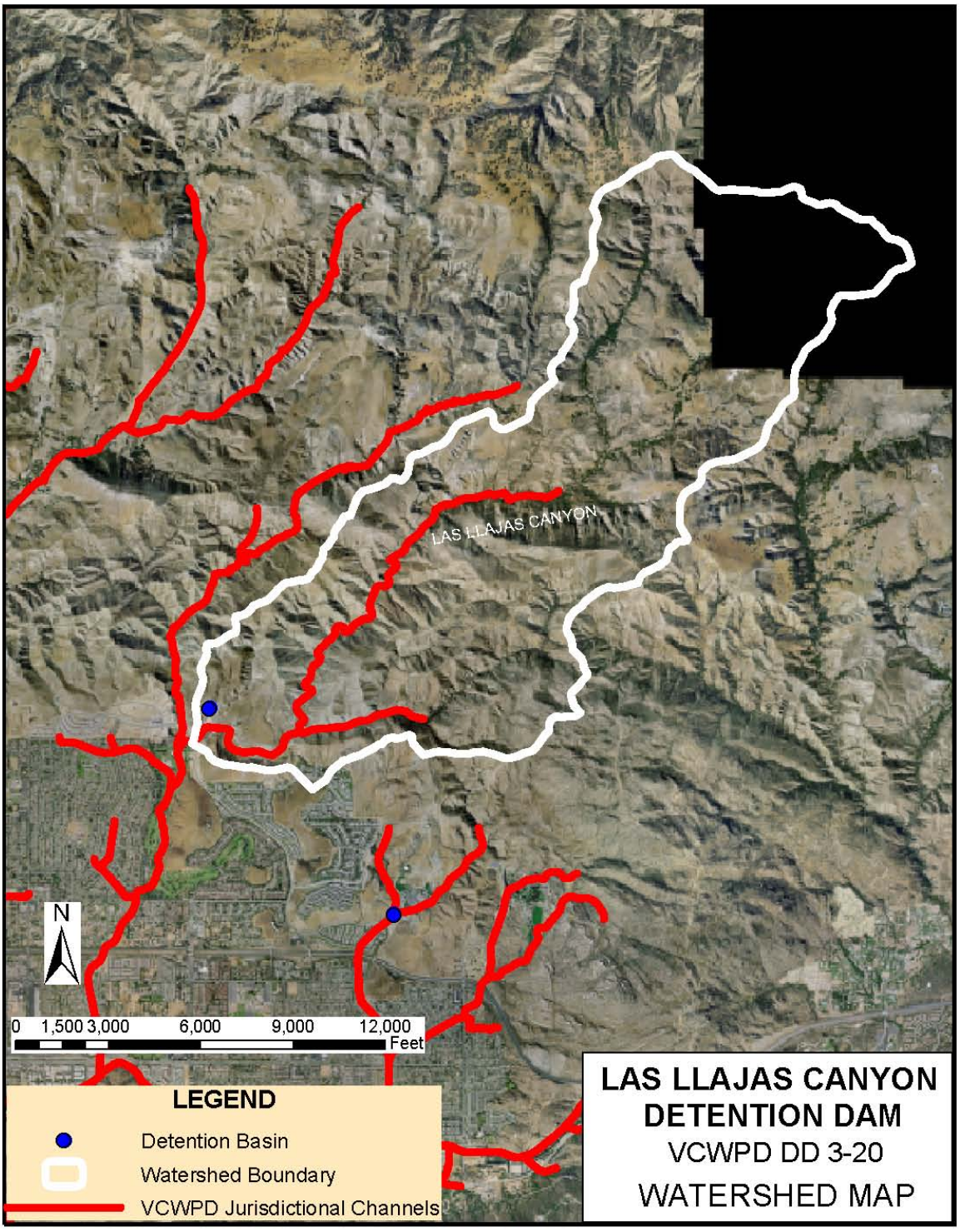
DATE	ACTION	REMAINING CAPACITY (ac-ft)	REMOVED (cy)	AADP* (cy)
01-80	Dam Constructed			
11-81	As Built Survey	933.70 (ac-ft)		
03-83	Disaster Declaration			4,500***
12-85	Aerial Survey	Not Digitized		
02-92	Disaster Declaration			4,500***
08-93	Cleanout		4,009	
01-95	Disaster Declaration			4,500***
08-96	Aerial Survey	Not Digitized		
02-98	Disaster Declaration			4,500***
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			4,300***
10-05	Cleanout		**42,791**	

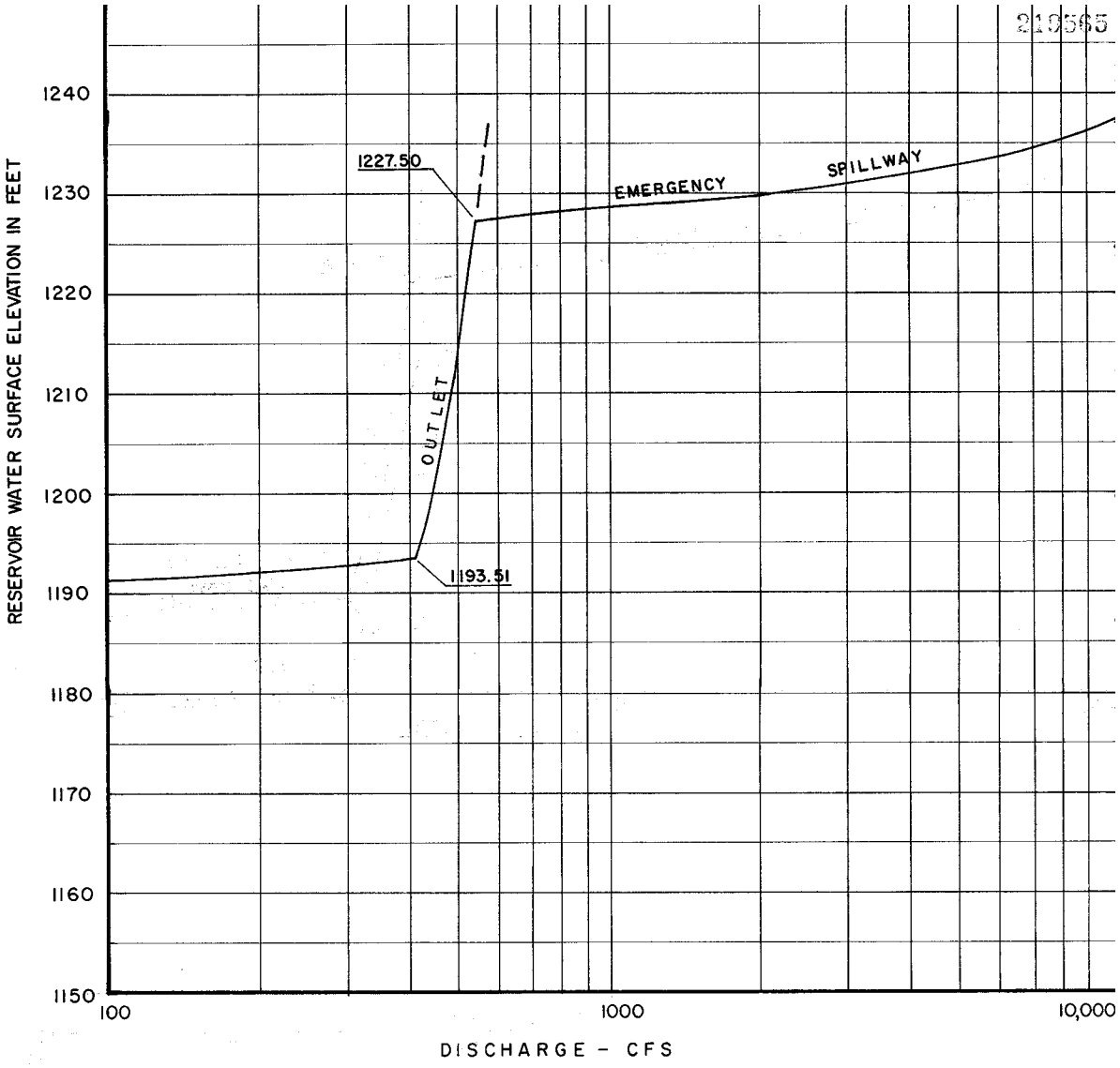
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

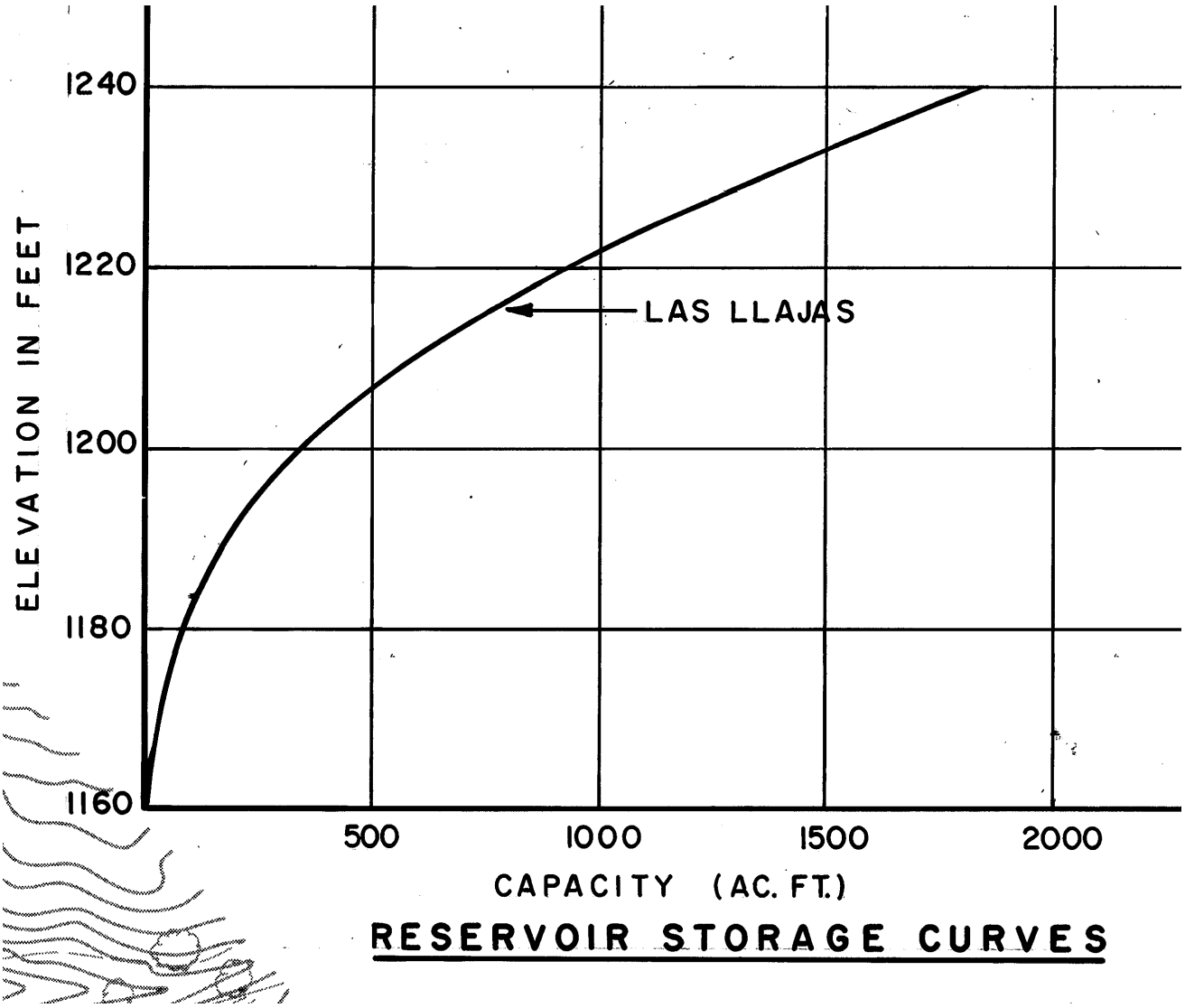
*** Theoretical Value from Kevin Scott Formula; ~3% of Sediment Yield from 50-yr storm, Updated 7/2005

NA= Not Available / Not Applicable

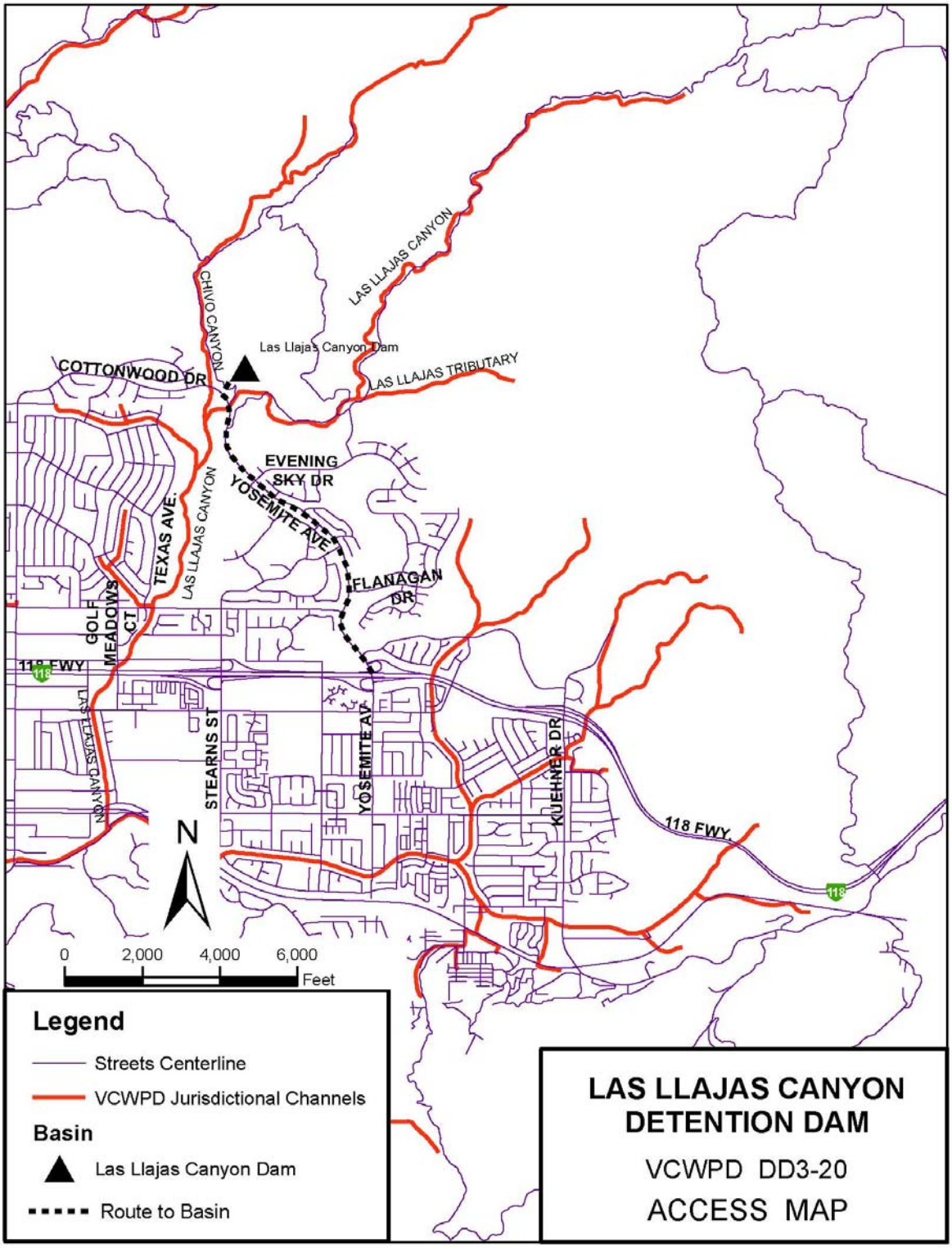

LAS LLAJAS CANYON
N
0 1,500 3,000 6,000 9,000 12,000
Feet
LEGEND
Detention Basin
Watershed Boundary
VCWPD Jurisdictional Channels
LAS LLAJAS CANYON
DETENTION DAM
VCWPD DD 3-20
WATERSHED MAP



Las Llajas Detention Basin



RESERVOIR STORAGE CURVES


LAS LLAJAS CANYON
CHIVO CANYON
Las Llajas Canyon Dam
COTTONWOOD DR
LAS LLAJAS TRIBUTARY
EVENING SKY DR
YOSEMITE AVE
TEXAS AVE.
LAS LLAJAS CANYON
FLANAGAN DR
GOLF MEADOWS CT
118 FWY
LAS LLAJAS CANYON
STEARNS ST
YOSEMITE AV
KUEHNER DR
118 FWY
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Las Llajas Canyon Dam
Route to Basin
LAS LLAJAS CANYON DETENTION DAM
VCWPD DD3-20
ACCESS MAP

LAS POSAS ESTATES DETENTION BASIN DD3-08M

LOCATION: Camarillo Hills, NW of City of Camarillo, at the southerly terminus of Ramona Pl; N 269,600, E 1,673,700(Lambert Zone 5 Coordinates);. Camarillo7-1/2' Quad

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Flood Storage Capacity	15.30 ac-ft (24,684 cy) abv debris storage, 16.8 ac-ft total
Design Debris Storage	1.5 ac-ft (2,423 cy) at 153.75 ft NGVD29 fm as-built
Maximum Debris Storage	Design Debris Storage (125% of 100-Yr Yield)
Inflow and Outflow Rates	Q50in=421 cfs, Q100in=507 cfs; Qout=NA
Debris Cleanout Elevation	152 ft (485 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	RC Drop Box Inlet 8.67 ft L X 6.5 ft W X 5.5 ft H
Drop Box Weir Elevation	167 ft NGVD29
Spillway Weir Length	23.85 ft
Capacity w/o Freeboard	729 cfs
PRINCIPAL SPILLWAY	
Type	3 ft x 5 ft RC Rectangular Tower with Side Inlet
Minimum Inlet and Maximum Tower Elevation	153 ft NGVD29; 163.67 ft NGVD29
Outlet Conduit	24-in RCP
DEBRIS BLEEDER/RISER	
Type	18-in Perforated CSP
Top Elevation	156 ft NGVD29
Outlet Conduit	18 in CSP
DAM	
Dam Type	Earthfill 22.5 ft High
Dam Crest Elevation	174.5 ft NGVD29
Length	260 ft
Surface Area of Full Basin	1.48 ac
Watershed Area	168 ac
Width at Crest	17 ft
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service, Reconstructed by VCWPD
Completion Date	1956, 1992
REFERENCE DRAWINGS	
Construction Drawings	Y-3-11, Y-3-12; Y-3-3101, to Y-3-3117
Right-of-Way Drawings	17,028 & 17,029
Topographic Drawings	11-6-92 (DTM)

EXPECTED DEBRIS PRODUCTION (cy)		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	1,938	2,798
50-YEAR	1,486	2,146
25-YEAR	1,073	1,549

BASIN HISTORY: LAS POSAS ESTATES DETENTION BASIN

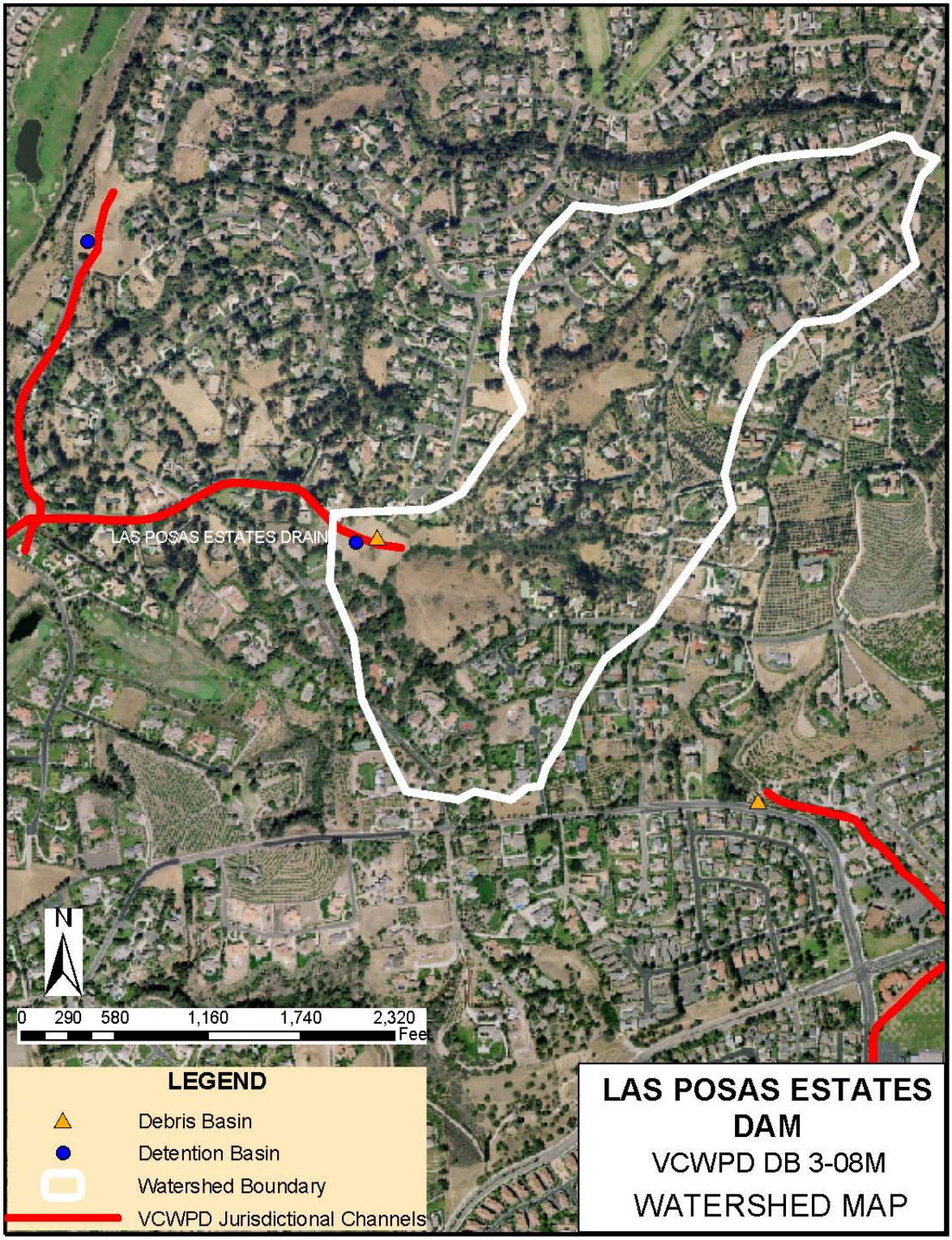
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
11-92	**New Basin Completed**			
11-92	Aerial Survey	2,423 debris storage, 24,684 flood		720
02-94	Cleanout		4,009	
01-95	Disaster Declaration			
08-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey	Not Digitized		
02-98	Disaster Declaration			590
07-98	Aerial Survey	-196 cy debris storage (over max debris cap)		
03-99	Cleanout		1,184	
12-99	Aerial Survey			
04-99	Cleanout		728	
08-01	Aerial Survey	Not Digitized		
12-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			881
		OLD DEBRIS BASIN DB3-08		
02-69	Disaster Declaration			
07-75	Cleanout		11,250	
07-75	Aerial Survey	8,500 out of 15,200 max		
03-78	Disaster Declaration			
04-78	Aerial Survey	14,844		100***
02-80	Disaster Declaration			
11-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			
12-85	Aerial Survey	15,200		
08-86	Cleanout		270	
02-91	Aerial Survey	12,384		
02-92	Disaster Declaration			720
11-92		**NEW BASIN COMPLETED**		

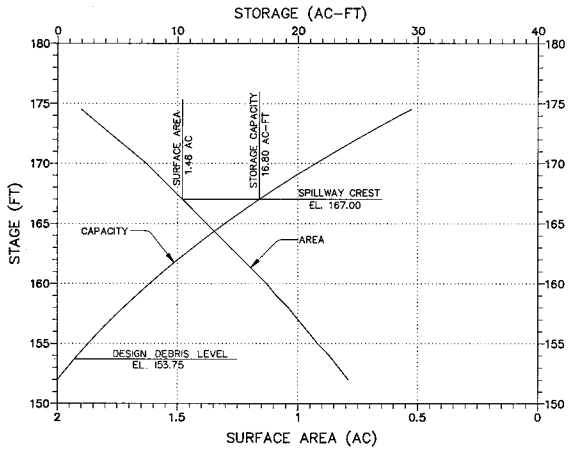
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

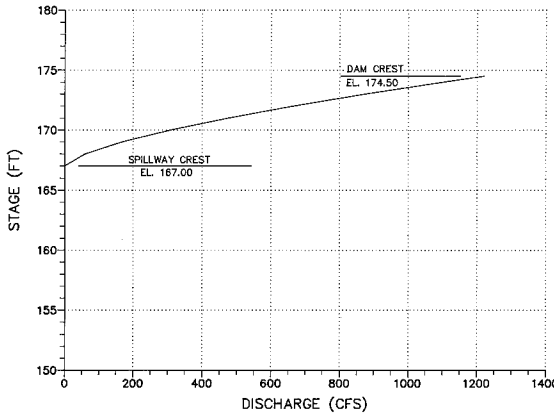
*** Theoretical Value Scott and Williams (1978) (10% of 50-yr yield for old basin

NA= Not Available / Not Applicable

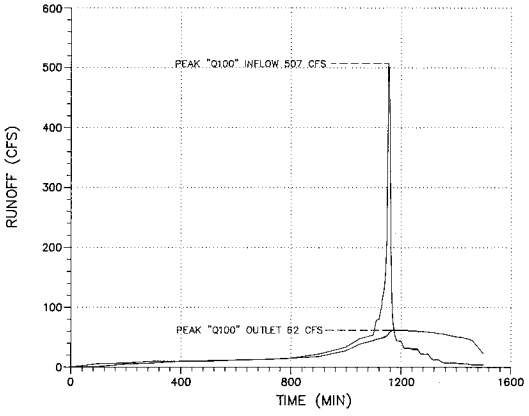

LAS POSAS ESTATES DRAIN
N
0 290 580 1,160 1,740 2,320
Feet
LEGEND
Debris Basin
Detention Basin
Watershed Boundary
VCWPD Jurisdictional Channels
LAS POSAS ESTATES DAM
VCWPD DB 3-08M
WATERSHED MAP



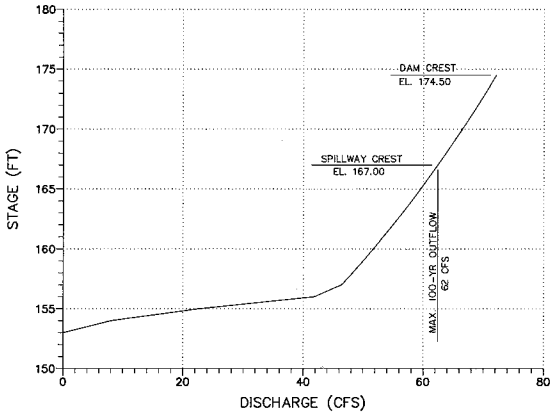
AREA–CAPACITY CURVE



STAGE–DISCHARGE CURVE
EMERGENCY SPILLWAY

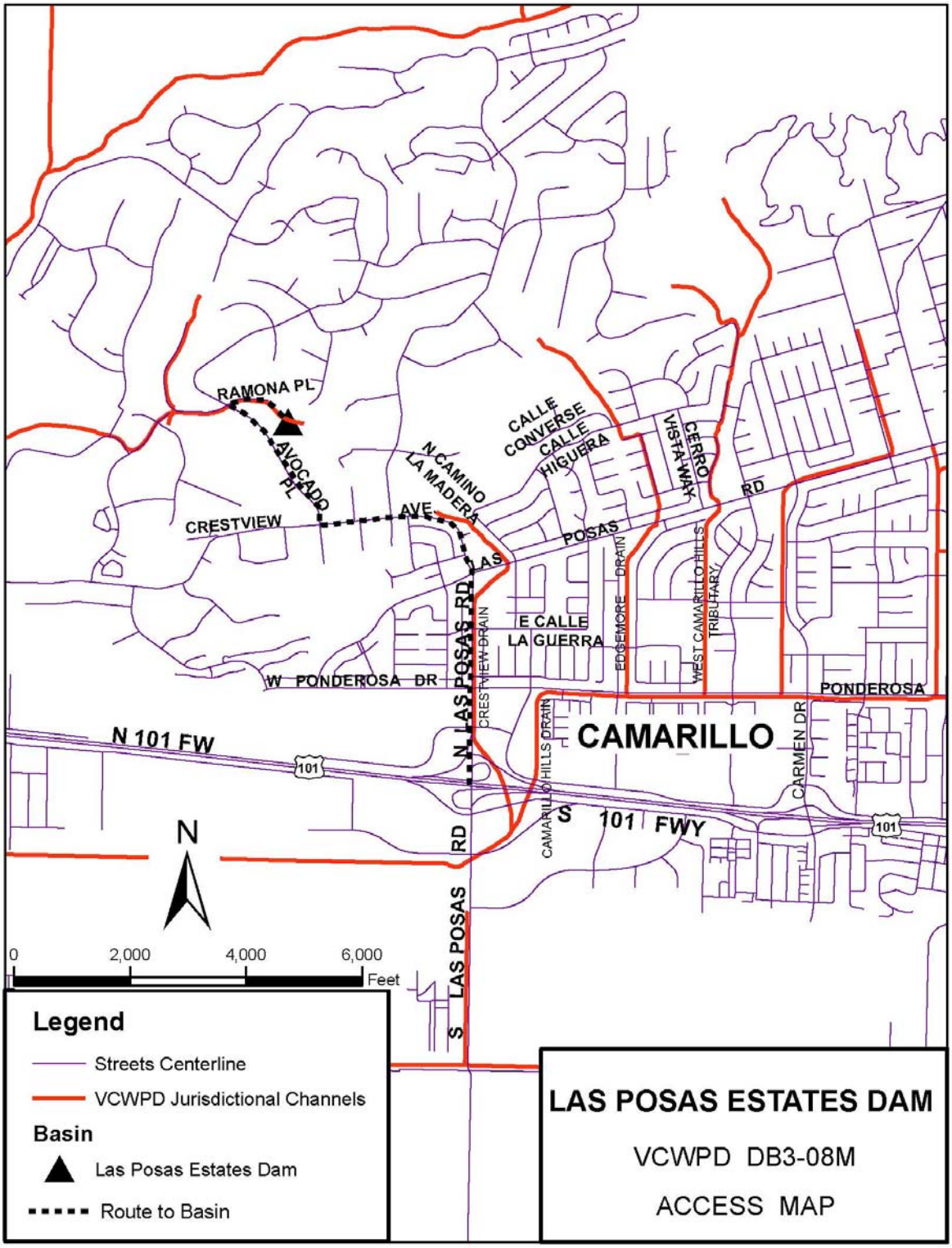


DESIGN STORM HYDROGRAPH



STAGE–DISCHARGE CURVE
OUTLET PIPE

Las Posas Estates Detention Basin


RAMONA PL
AVOCADO PL
CRESTVIEW AVE
N CAMINO LA MADERA
CALLE CONVERSE
CALLE HIGUERA
CERRO VISTA WAY
RD
POSAS
AS
N LAS POSAS RD
CRESTVIEW DRAIN
E CALLE LA GUERRA
EDGEMORE DRAIN
WEST CAMARILLO HILLS TRIBUTARY
W PONDEROSA DR
PONDEROSA
CAMARILLO
CARMEN DR
N 101 FW
101
CAMARILLO HILLS DRAIN
S 101 FWY
RD
S LAS POSAS
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Las Posas Estates Dam
Route to Basin
LAS POSAS ESTATES DAM
VCWPD DB3-08M
ACCESS MAP

LINE "C" ARROYO SIMI DETENTION BASIN DD3-30

LOCATION: City of Moorpark, near Spring Road and
N 283,730 E 1,736,280 (Lambert Zone 5 Coordinates)
Moorpark 7 1/2 Quad

DESIGN DATA	(Elevations NGVD29)
Design Agency	Ramseyer and Associates, Inc
Level Capacity	10.1 ac-ft at Q100 elev 524.6 ft NGVD29 fm as-builts
Maximum Debris Capacity	NA
Inflow and Outflow Rates	Q50,Q100IN=347,389 cfs; OUT=154,254 ft (wsel 524.6 ft)
Debris Cleanout Elevation	517.5 ft (3,240 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	None
Invert/Weir Elevation	NA
Spillway Length	NA
Capacity	NA
PRINCIPAL SPILLWAY	
Type	8 ft W 11 ft Deep x 17 ft Tall Riser Tower with Catwalk
High Level Inlet Data	9 ft W x8 ft H opening with weir at 521.4 ft NGVD29
Outlet Conduit and Capacity	8 ft W x 5 ft H RC Box 92 ft long; Q100=254.2 cfs
DEBRIS BLEEDER/RISER	
Type	2.5 ft tall 48 in Perforated Semi-Circular CSP below 3.0 ft tall trash rack covering 3 ft W x 4.5 ft H low level opening in Riser Tower
Low Level Inlet Elevations	Bottom 513 ft; Top 517.5 NGVD29
Outlet Conduit	Principal Spillway Outlet
DAM	
Dam Type	Earthfill with Soil Cement
Dam Crest Elevation	530 ft NGVD29
Length	NA
Width at Crest	NA
Surface Area of Full Basin	NA
Watershed Area	635 ac
CONSTRUCTION DATA	
Construction Agency	Ramseyer and Associates
Completion Date	8/1997
REFERENCE DRAWINGS	
Construction Drawings	Y3-3655 – Y3-3673
Topographic Drwgs(pre-const)	NA
Right-of-Way Drawings	NA

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	12,956	18,793
50-YEAR	9,878	14,328
25-YEAR	6,390	1,010

BASIN HISTORY: LINE "C" DETENTION BASIN

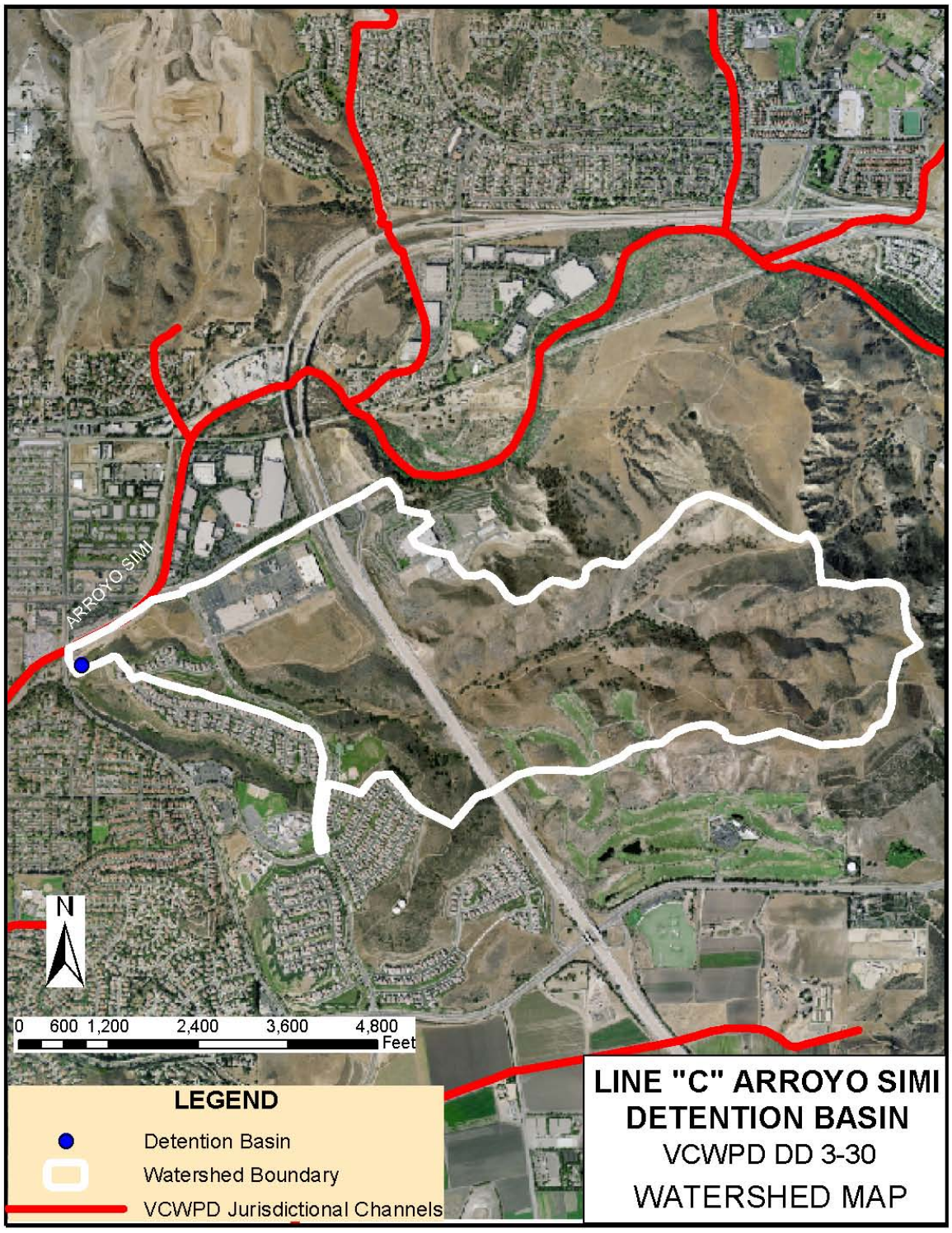
DATE	**ACTION**	**REMAINING CAPACITY (cy)**	**REMOVED (cy)**	**AADP* (cy)**
01-05	Disaster Declaration			990***

Notes

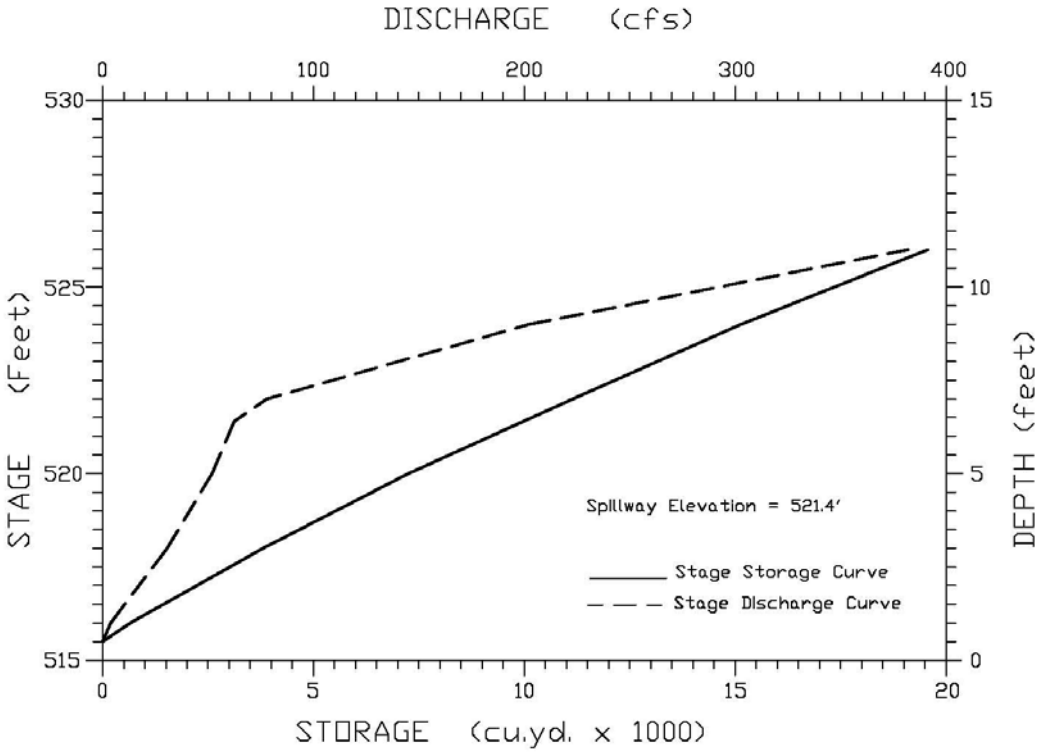
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

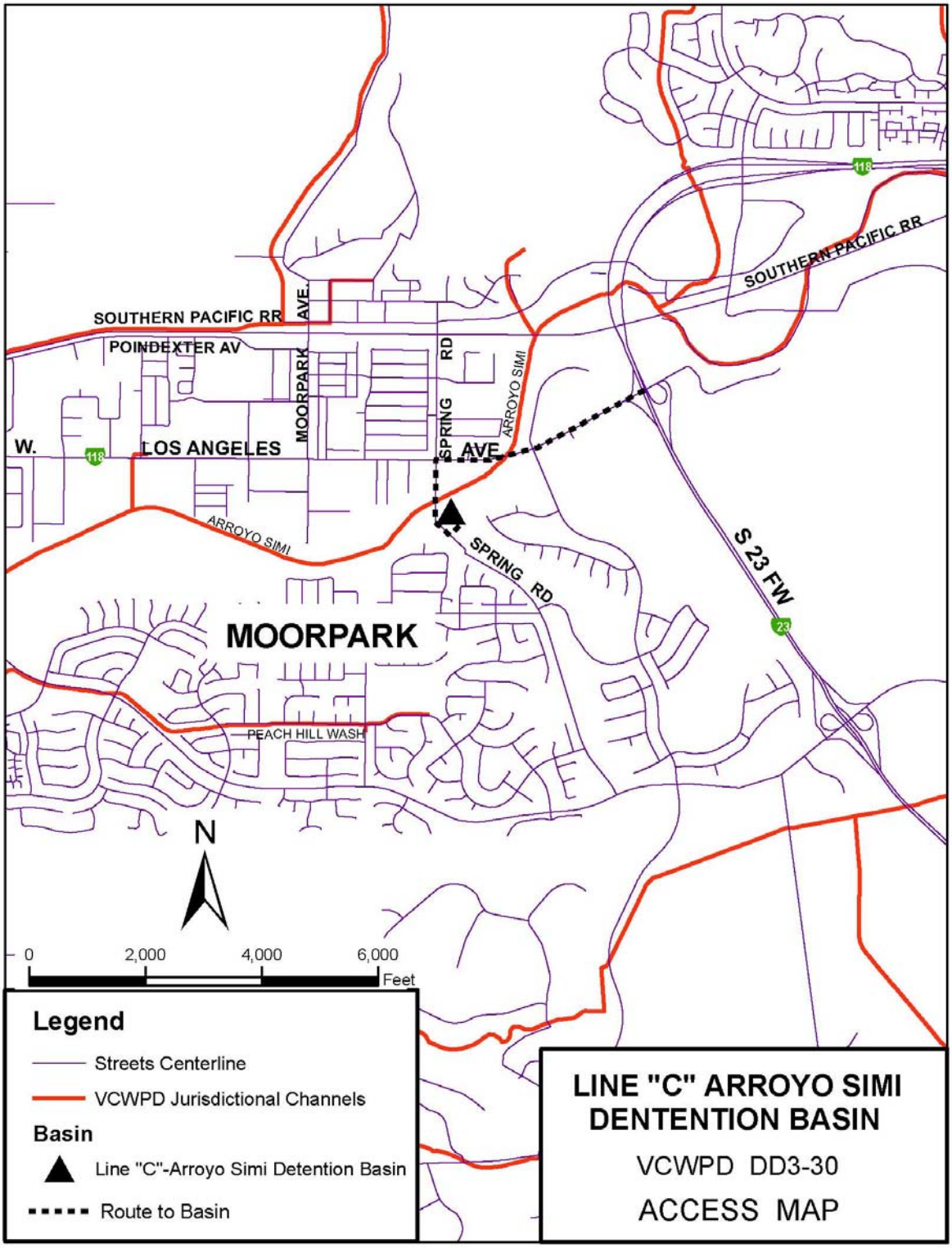
*** Theoretical Value from Scott and Williams (1978) 10% of 50-Yr Design Sediment Yield

NA= Not Available / Not Applicable


ARROYO SIMI
N
0 600 1,200 2,400 3,600 4,800
Feet
LEGEND
Detention Basin
Watershed Boundary
VCWPD Jurisdictional Channels
LINE "C" ARROYO SIMI
DETENTION BASIN
VCWPD DD 3-30
WATERSHED MAP

LINE "C" ARROYO SIMI DETENTION BASIN




SOUTHERN PACIFIC RR
POINDEXTER AV
MOORPARK AVE.
SPRING RD
ARROYO SIMI
W. LOS ANGELES AVE
SOUTHERN PACIFIC RR
ARROYO SIMI
SPRING RD
S 23 FW
MOORPARK
PEACH HILL WASH
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Line "C"-Arroyo Simi Detention Basin
Route to Basin
LINE "C" ARROYO SIMI
DENTENTION BASIN
VCWPD DD3-30
ACCESS MAP

PEACH HILL WASH RETENTION BASIN DD3-23

LOCATION: Moorpark, approx.1 mi. W of Tierra Rejada Rd., adjacent to Mountain Trail St. in Mt Meadows development; N 279,433 E 1,725,776 (Lambert Zone 5 Cordinates); Moorpark 7 1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	DMJM
Flood Storage Capacity	75.6 ac-ft (121,968 cy)
Design Debris Capacity	5,676 cy At Elevation 461.62 (NGVD29)
Inflow and Outflow Rates	Q50,Q100IN=2100, 2,523 cfs; OUT=893, 911 cfs
Debris Cleanout Elevation	459 ft (1,135 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	16 ft W X 8 ft H RC Box Culvert with Wing Walls
Invert Elevation	470 NGVD29
Spillway Length	NA
Capacity w/o Freeboard	2,523 cfs
PRINCIPAL SPILLWAY	
Type	10 ft W X 6 ft H RCB Culvert with Wing Walls
Weir Elevation	456 ft NGVD29
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	None
Top Elevation	NA
Outlet Conduit	NA
DAM	
Dam Type	Earthfill , 24 ft
Dam Crest Elevation	480 ft NGVD29
Length	240 ft
Surface Area of Full Basin	3.0 ac
Watershed Area	1,589 ac from Quad
Width at Crest	40 ft
CONSTRUCTION DATA	
Construction Agency	Private Developer in City of Moorpark
Completion Date	1985 (Dam/Spillway) 1988 (Basin Improv.)
REFERENCE DRAWINGS	
Construction Drawings	Y-3-2540 thru Y-3-2551
Right-of-Way Drawings	118MR16
Topographic Drawings	1870 - L1A (City of Moorpark)

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	4,541	6,587
50-YEAR	3,466	5,027
25-YEAR	2,486	3,606

BASIN HISTORY: PEACH HILL WASH RETENTION BASIN

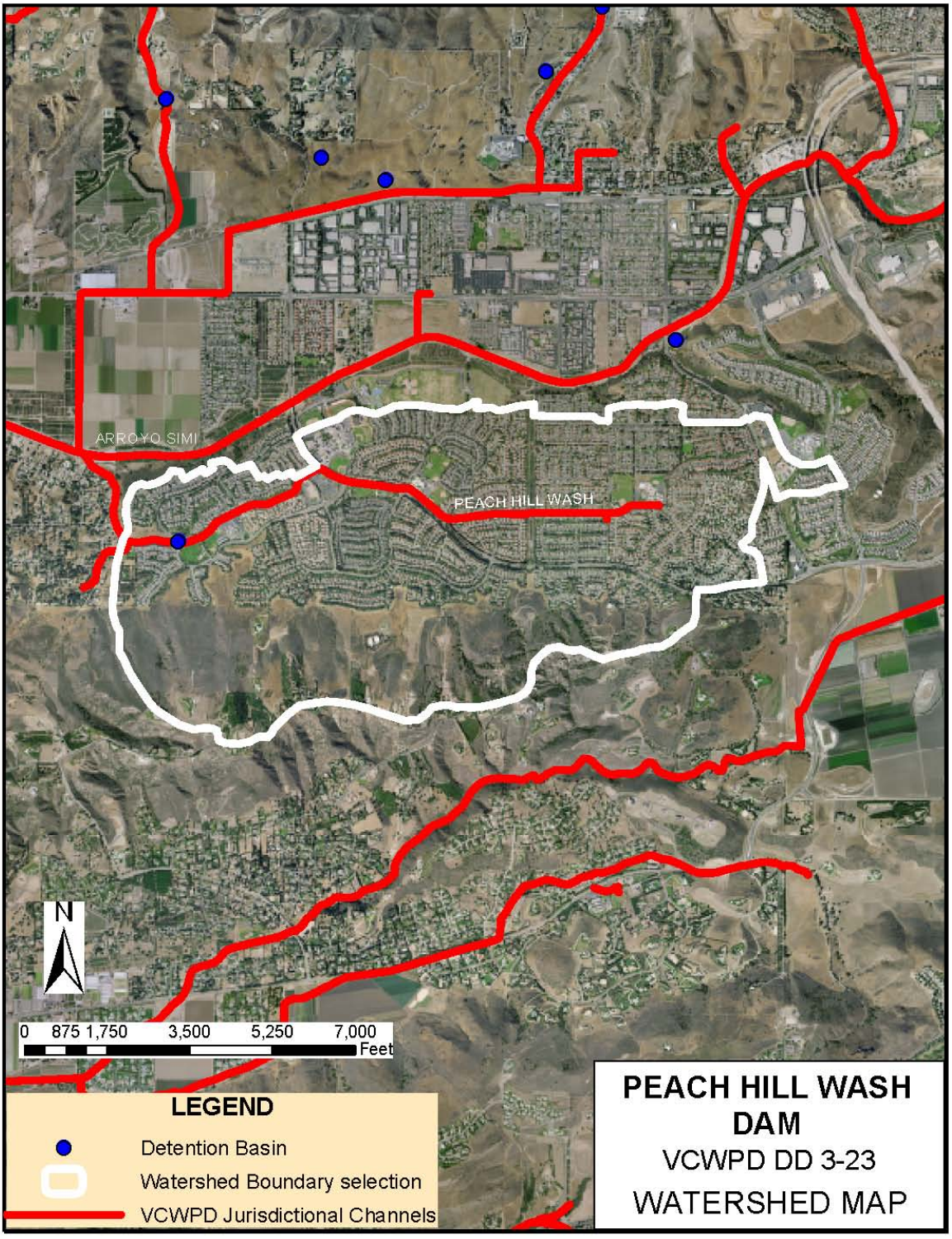
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
01-85	Dam Constructed			350***
02-92	Disaster Declaration			350***
01-95	Disaster Declaration			350***
02-98	Disaster Declaration			350***
01-05	Disaster Declaration			350***

Notes

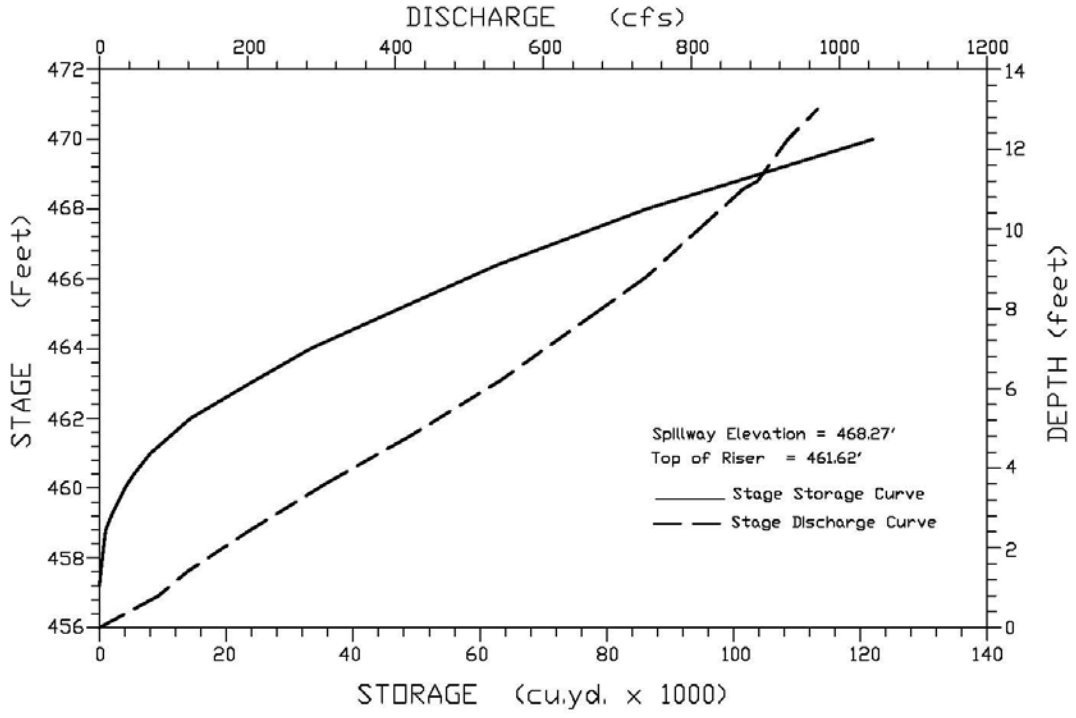
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

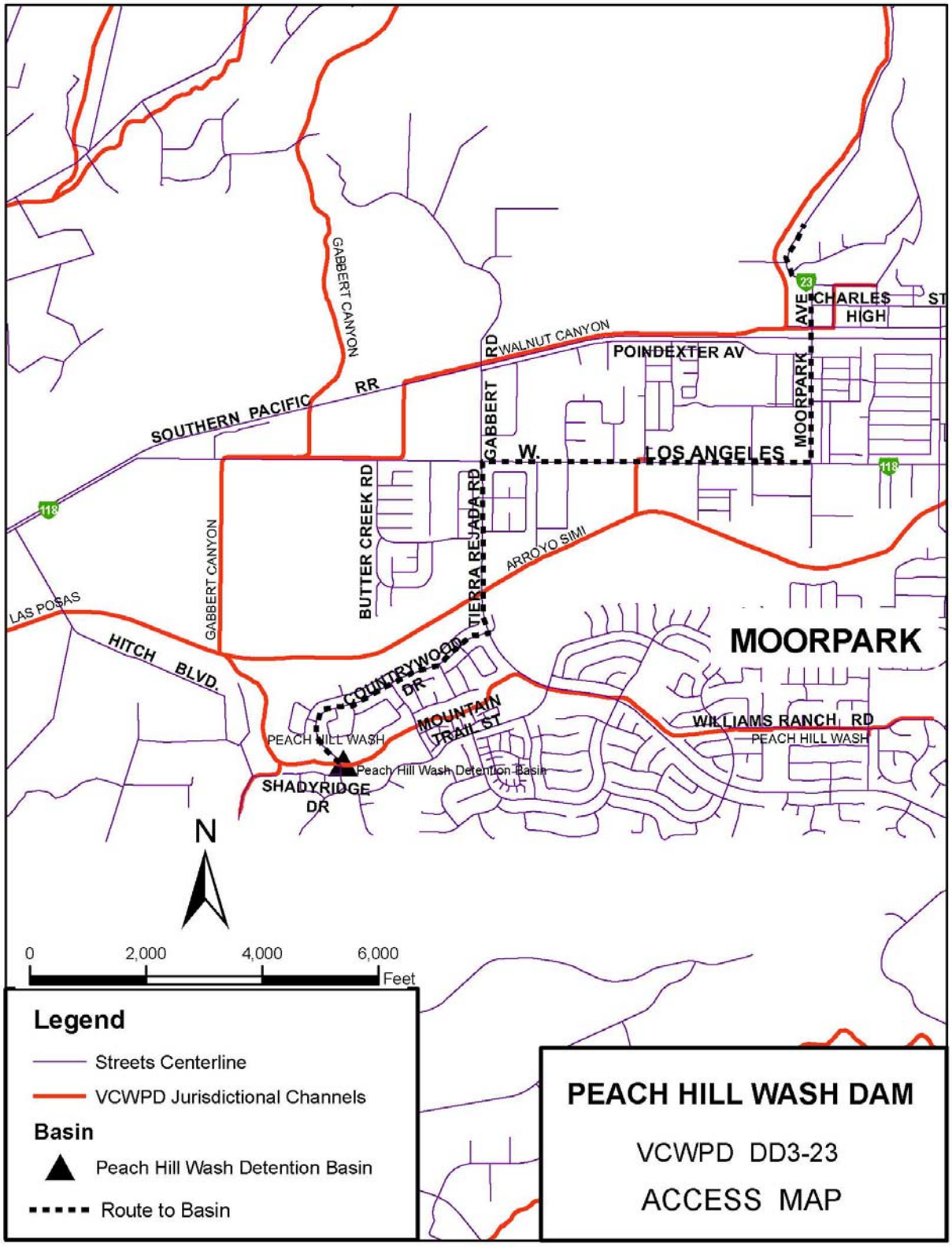
*** Theoretical Value from Scott and Williams (1978), 10% of 50-Yr Sediment Yield

NA= Not Available / Not Applicable


ARROYO SIMI
PEACH HILL WASH
N
0 875 1,750 3,500 5,250 7,000
Feet
LEGEND
Detention Basin
Watershed Boundary selection
VCWPD Jurisdictional Channels
PEACH HILL WASH DAM
VCWPD DD 3-23
WATERSHED MAP

PEACH HILL WASH DAM




GABBERT CANYON
SOUTHERN PACIFIC RR
WALNUT CANYON RD
POINDEXTER AV
CHARLES HIGH ST
MOORPARK AVE
GABBERT RD
W. LOS ANGELES
BUTTER CREEK RD
TIERRA REJADA RD
ARROYO SIMI
LAS POSAS
HITCH BLVD.
GABBERT CANYON
COUNTRYWOOD DR
MOUNTAIN TRAIL ST
PEACH HILL WASH
Peach Hill Wash Detention Basin
SHADYRIDGE DR
WILLIAMS RANCH RD
PEACH HILL WASH
MOORPARK
118
23
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Peach Hill Wash Detention Basin
Route to Basin
PEACH HILL WASH DAM
VCWPD DD3-23
ACCESS MAP

RAMONA DETENTION DAM DD3-16M

LOCATION: Camarillo Hills, NW of Camarillo, at northerly terminus of Ramona Pl;

N 271,555 E 1,672,195 (Lambert Zone5 Coordinates);
Camarillo 7-1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Flood Storage Capacity	25.56 ac-ft above debris storage of 2.89 ac-ft
Design Debris Capacity	4,665 cy (2.89 ac-ft) at 153.5 ft (NGVD29)
Inflow and Outflow Rates	Q_{100}IN= 583 cfs, Q_{100}OUT= 131 cfs
Debris Cleanout Elevation	151 ft (930 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	RC Drop Box Inlet Spillway
Weir Elevation	170 ft NGVD29
Weir Length	50 ft
Design Discharge	1,187 cfs
PRINCIPAL SPILLWAY	
Type and Top Elevation	4 ft X 3 ft RC Rectangular Tower with Side Inlet and Catwalk, Top Elev. 165.67 ft NGVD29
Side Inlet Bottom Elevation	154 ft NGVD29
Outlet Conduit	36 in RCP
DEBRIS BLEEDER/RISER	
Type	18 in Perforated CSP
Top Elevation	155 ft NGVD29
Outlet Conduit	18 in CSP
DAM	
Dam Type	Earthfill 29 ft High
Dam Crest Elevation	176 ft NGVD29
Length	255 ft
Surface Area of Full Basin	2.27 ac
Watershed Area	254 ac from Quad Map
Width at Crest	17 ft
CONSTRUCTION DATA	
Construction Agency	SCS; VCWPD
Completion Date	1961; Basin Reconstructed in 1992
REFERENCE DRAWINGS	
Construction Drawings	Y-3-3118 thru Y-3-3134
Right-of-Way Drawings	;Y-3-3121
Topographic Drawings	NA

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	3,732	5,422
50-YEAR	2,763	4,014
25-YEAR	2,038	2,961

BASIN HISTORY: RAMONA DETENTION DAM

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
11-92	**New Dam Completed**	**DEBRIS CAP 4,665 cy**		273**
11-92	Aerial Survey	4,665 debris storage		
01-95	Disaster Declaration			284***
07-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey	4,825 debris storage		
02-98	Disaster Declaration			284***
07-98	Aerial Survey	1,236 out of 4,665		
12-99	Aerial survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			271
	OLD BASIN DB3-16	**DEBRIS CAP 5,500 cy**		
02-69	Disaster Declaration			
10-69	Cleanout		2,500	
06-75	Aerial Survey	1,851		
03-78	Disaster Declaration			
04-78	Aerial Survey	15		
02-80	Disaster Declaration			
11-81	Cleanout		4,110	
12-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			
04-83	Aerial Survey	773		284***
07-83	Cleanout		2,214	
12-85	Aerial Survey	2,397		
07-86	Cleanout		223	
07-86	Aerial Survey	2,620		
07-86	Cleanout		2,900	
11-87	Aerial Survey	5,549		
11-88	Aerial Survey	Not Digitized		

BASIN HISTORY: RAMONA DETENTION DAM

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
10-89	Aerial Survey	4,707		
09-90	Aerial Survey	Not Digitized		
06-91	Aerial Survey	4,640		
02-92	Disaster Declaration			273**
11-92	**New Dam Constructed**			

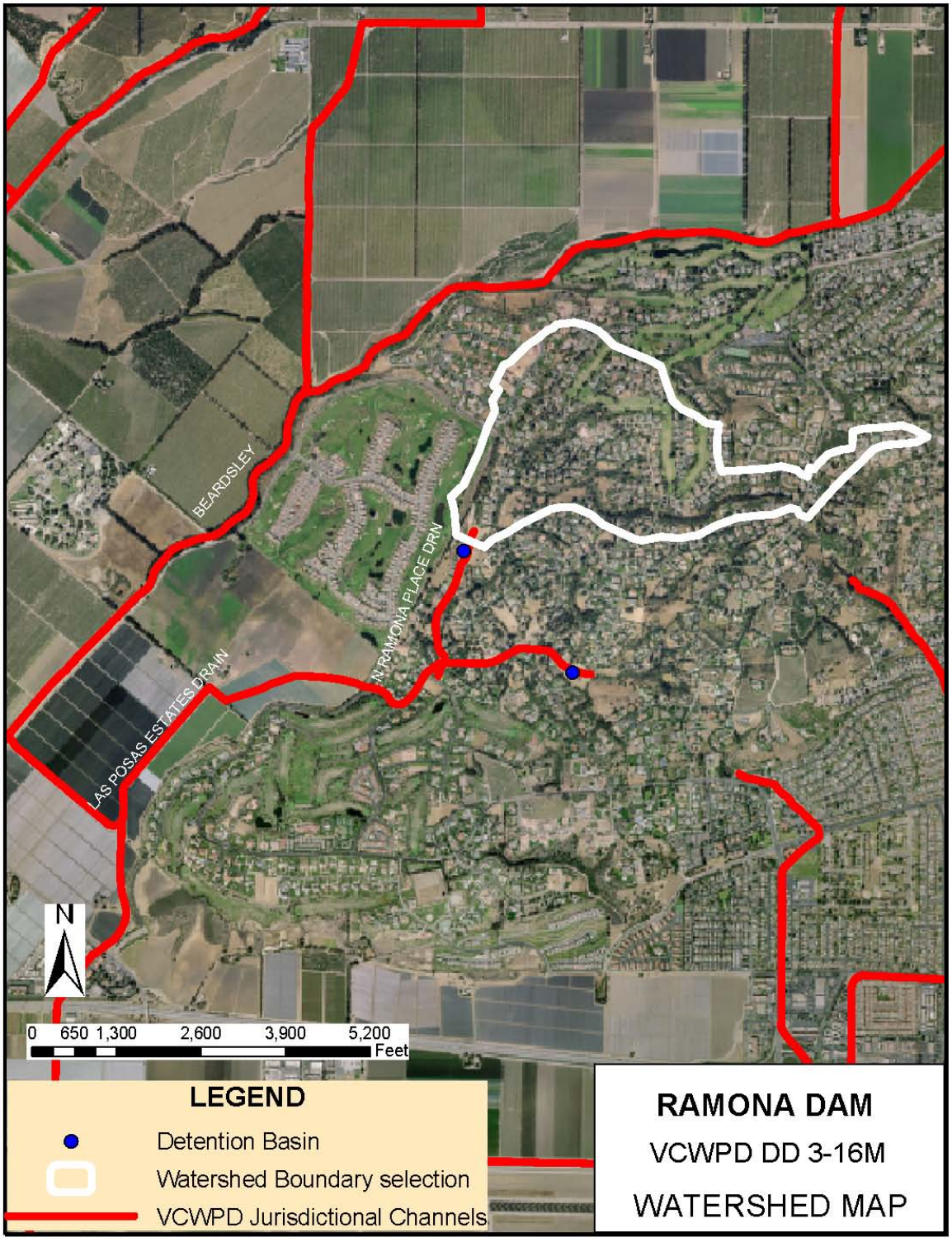
Notes

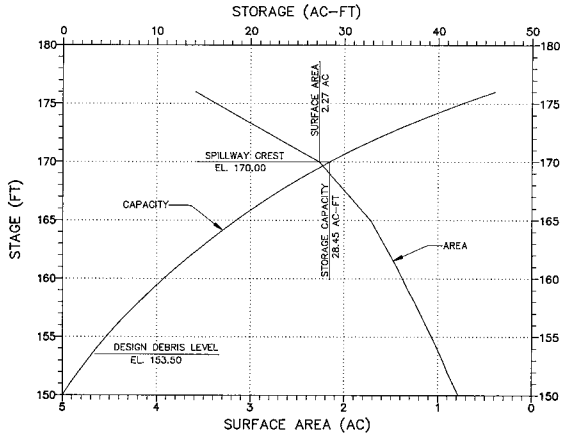
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

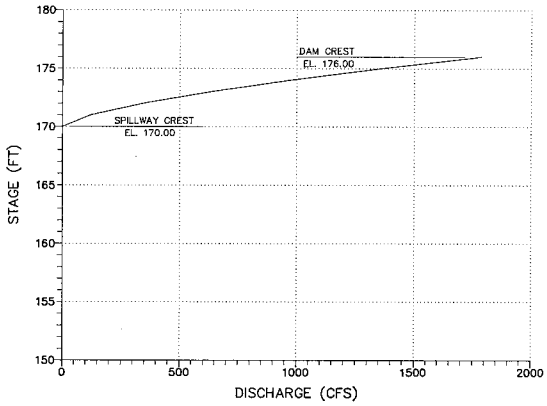
*** Theoretical Value from Scott and Williams (1978) 10% of 50-Yr Debris Yield for old basin

NA= Not Available / Not Applicable

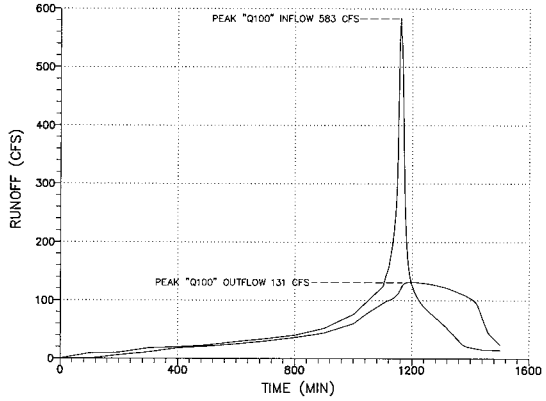

BEARDSLEY
N RAMONA PLACE DRN
LAS POSAS ESTATES DRAIN
N
0 650 1,300 2,600 3,900 5,200
Feet
LEGEND
Detention Basin
Watershed Boundary selection
VCWPD Jurisdictional Channels
RAMONA DAM
VCWPD DD 3-16M
WATERSHED MAP



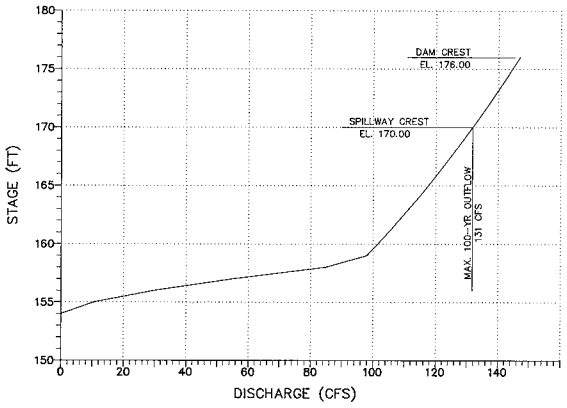
AREA–CAPACITY CURVE



STAGE–DISCHARGE CURVE
EMERGENCY SPILLWAY

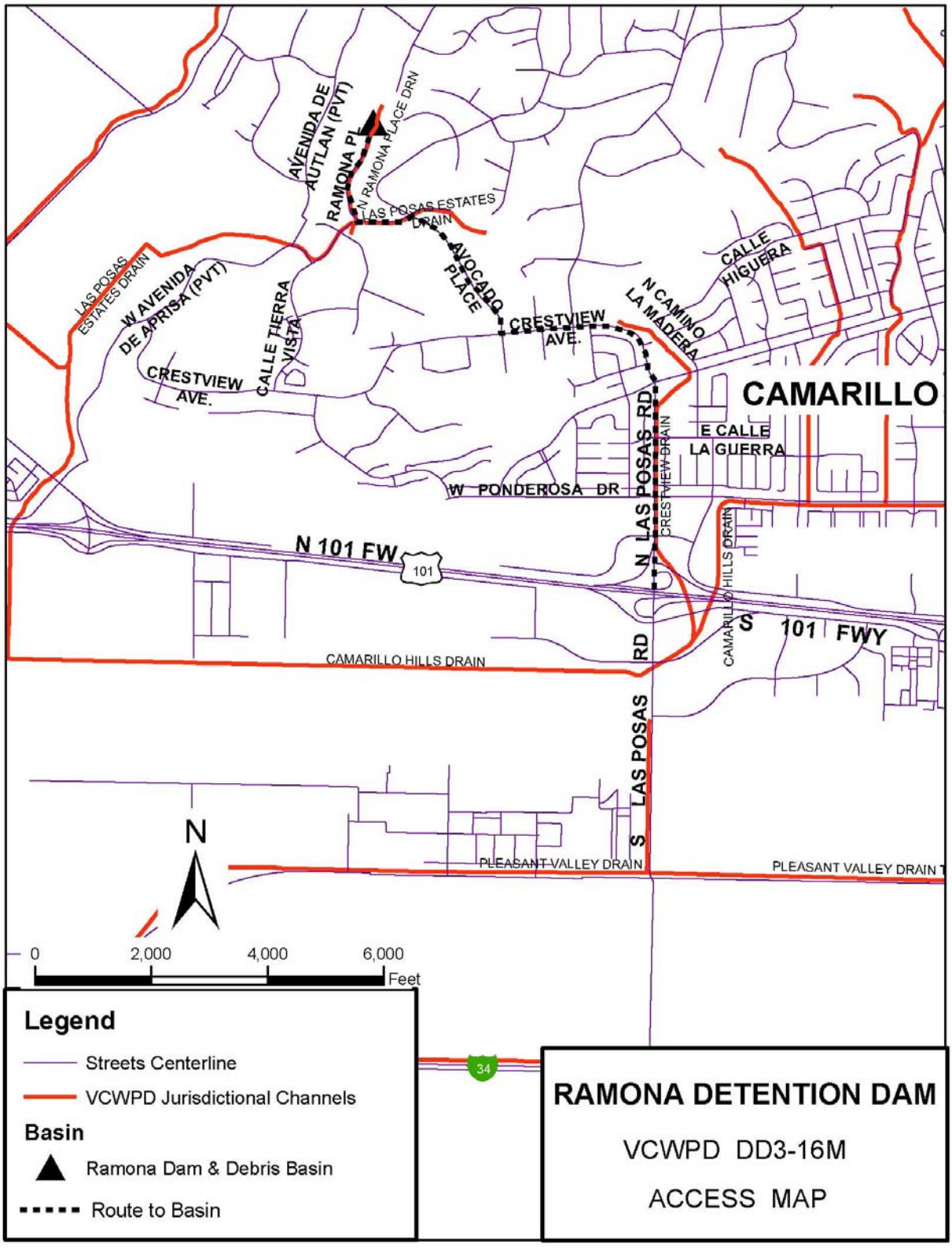


DESIGN STORM HYDROGRAPH



STAGE–DISCHARGE CURVE
OUTLET PIPE

Ramona Detention Basin


AVENIDA DE AUTLAN (PVT)
RAMONA PL
N RAMONA PLACE DRN
LAS POSAS ESTATES DRAIN
AVOCADO PLACE
CRESTVIEW AVE.
N CAMINO LA MADERA
CALLE HIGUERA
LAS POSAS ESTATES DRAIN
W AVENIDA DE APRISA (PVT)
CALLE TIERRA VISTA
CRESTVIEW AVE.
CAMARILLO
E CALLE LA GUERRA
W PONDEROSA DR
N LAS POSAS RD
CRESTVIEW DRAIN
N 101 FW
101
CAMARILLO HILLS DRAIN
S 101 FWY
CAMARILLO HILLS DRAIN
S LAS POSAS RD
PLEASANT VALLEY DRAIN
PLEASANT VALLEY DRAIN
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Ramona Dam & Debris Basin
Route to Basin
34
RAMONA DETENTION DAM
VCWPD DD3-16M
ACCESS MAP

RUNKLE CANYON DETENTION BASIN State Dam No. 86-003 DD3-17

LOCATION: City of Simi Valley, 7000 ft south of Royal Avenue;
N 271,000 - E 1,779,000 (Lambert Zone 5 Coordinates);
Calabasas 7-1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	99.8 ac-ft (161,000 cy 2-6-70, T-63-9)
Max. Expected Debris Capacity	32.2 ac-ft (52,015 cy) [125%of 100-Yr Debris Yield]
100-Yr Inflow and Outflow Rates	IN=2,200 cfs, OUT=1,300 cfs (2003 VCWPD Study)
Debris Cleanout Elevation	1,060 ft (10,400 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	40 ft wide (at entrance) x 10 ft high Trapezoidal RC Channel
Invert Elevation	1,086.5 ft
Spillway Length	NA
Capacity w/o Freeboard	3,875 cfs
PRINCIPAL SPILLWAY	
Type	48 in RCP Vertical Riser Tower, Open Top, 14 ft High
Weir Elevation	1,072.8 ft
Outlet Conduit	24 in Steel Pipe Outlet
DEBRIS BLEEDER/RISER	
Type	Perforations in Principal Spillway Riser Tower
Top Elevation	1,072.8 ft
Outlet Conduit	Principal Spillway Outlet
DAM	
Dam Type	Earthfill
Dam Crest Elevation	1,096 ft
Length	295 ft
Surface Area of Full Basin	5.7 ac
Watershed Area	958 ac from Quad Map
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	VCWPD
Completion Date	1950
REFERENCE DRAWINGS	
Construction Drawings	FC 3000
Right-of-Way Drawings	FC 3003
Topographic Drawings	FC 3000,3004, T-63-9 (2-6-70), 486-19 (7-3-97)

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	41,613	59,907

50-YEAR	32,000	46,068
25-YEAR	23,186	33,379

BASIN HISTORY: RUNKLE CANYON DETENTION BASIN

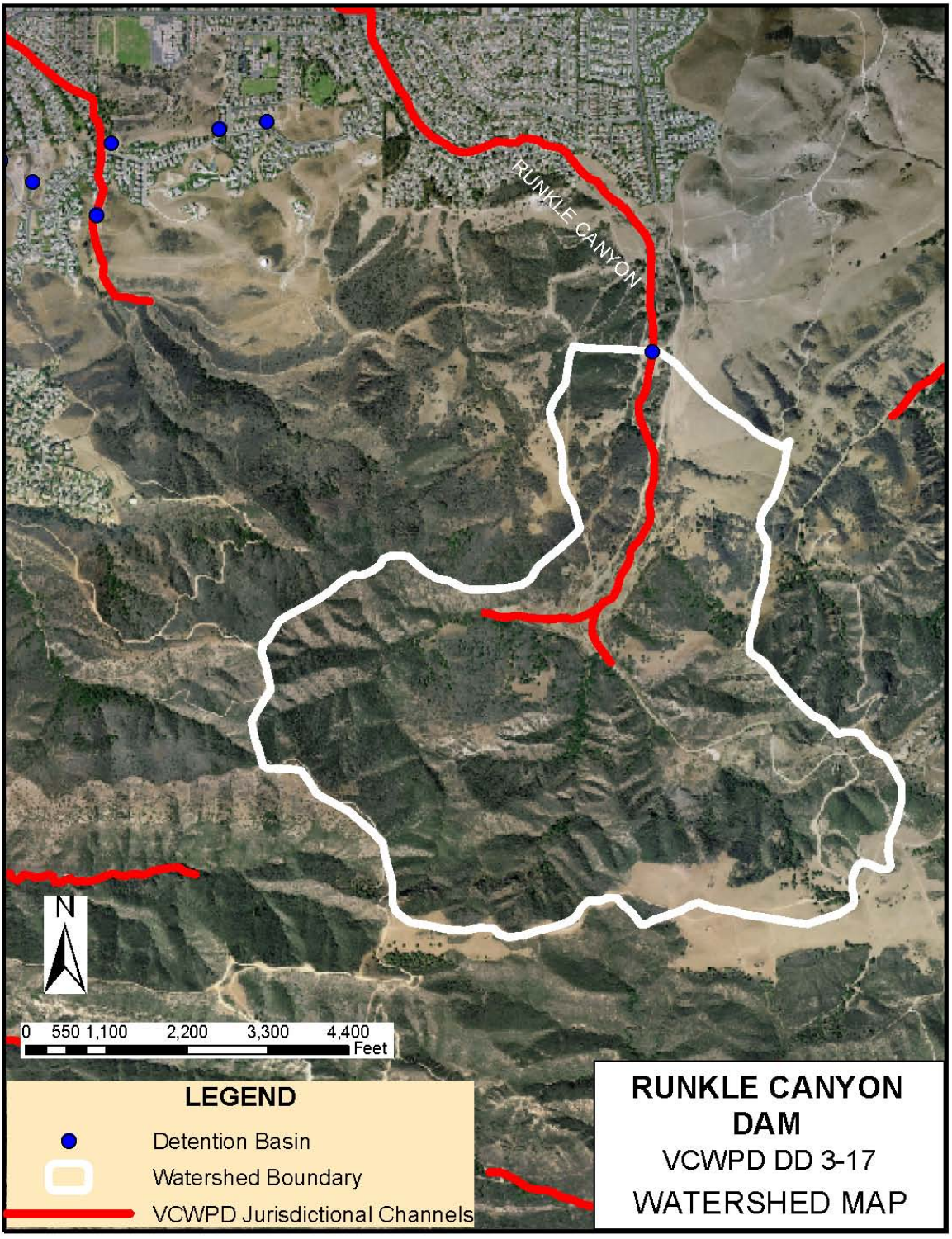
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
02-70	Aerial Survey	161,000		
11-70	Aerial Survey	Not Digitized		
12-70	Aerial Survey	150,200		
10-71	Aerial Survey	Not Digitized		
05-72	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			3,200***
02-80	Disaster Declaration			3,200***
09-81	Aerial Survey	Not Digitized		
09-82	Cleanout		126,150	
11-82	Aerial Survey	140,844		
03-83	Disaster Declaration			3,200***
10-90	Aerial Survey	Not Digitized		
06-91	Aerial Survey	Not Digitized		
02-92	Disaster Declaration			3,200***
05-92	Aerial Survey	131,000+		
09-94	Cleanout		7,600	
01-95	Disaster Declaration			3,200***
06-95	Aerial Survey	89,350		
10-95	Cleanout		5,600	
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	94,950		
02-98	Disaster Declaration			3,200***
05-98	Aerial Survey	80,500		
03-99	Aerial Survey	82,690		
06-99	Cleanout		12,080	
06-99	Aerial Survey	94,770		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			
07-05	Cleanout		11,412-Survey	

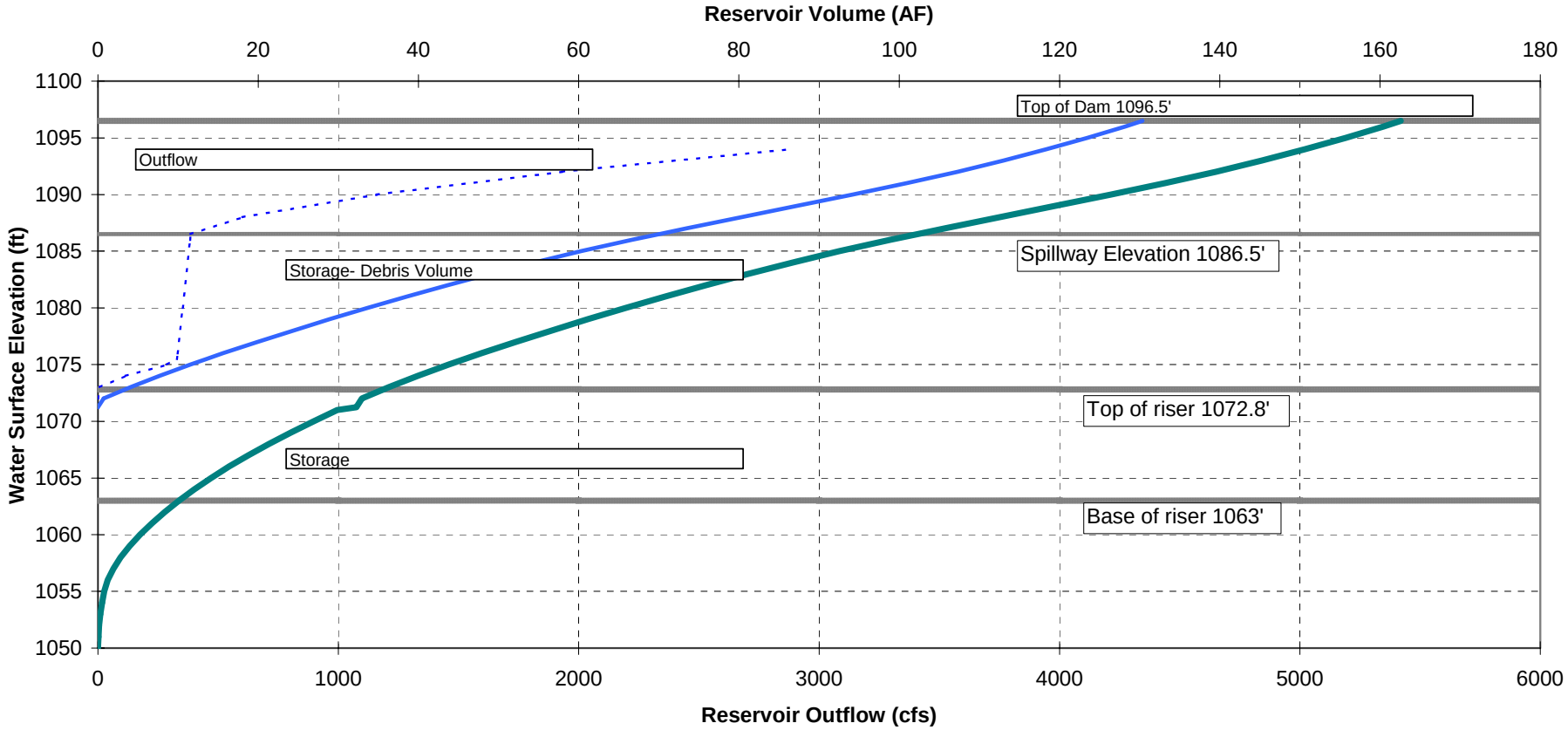
Notes

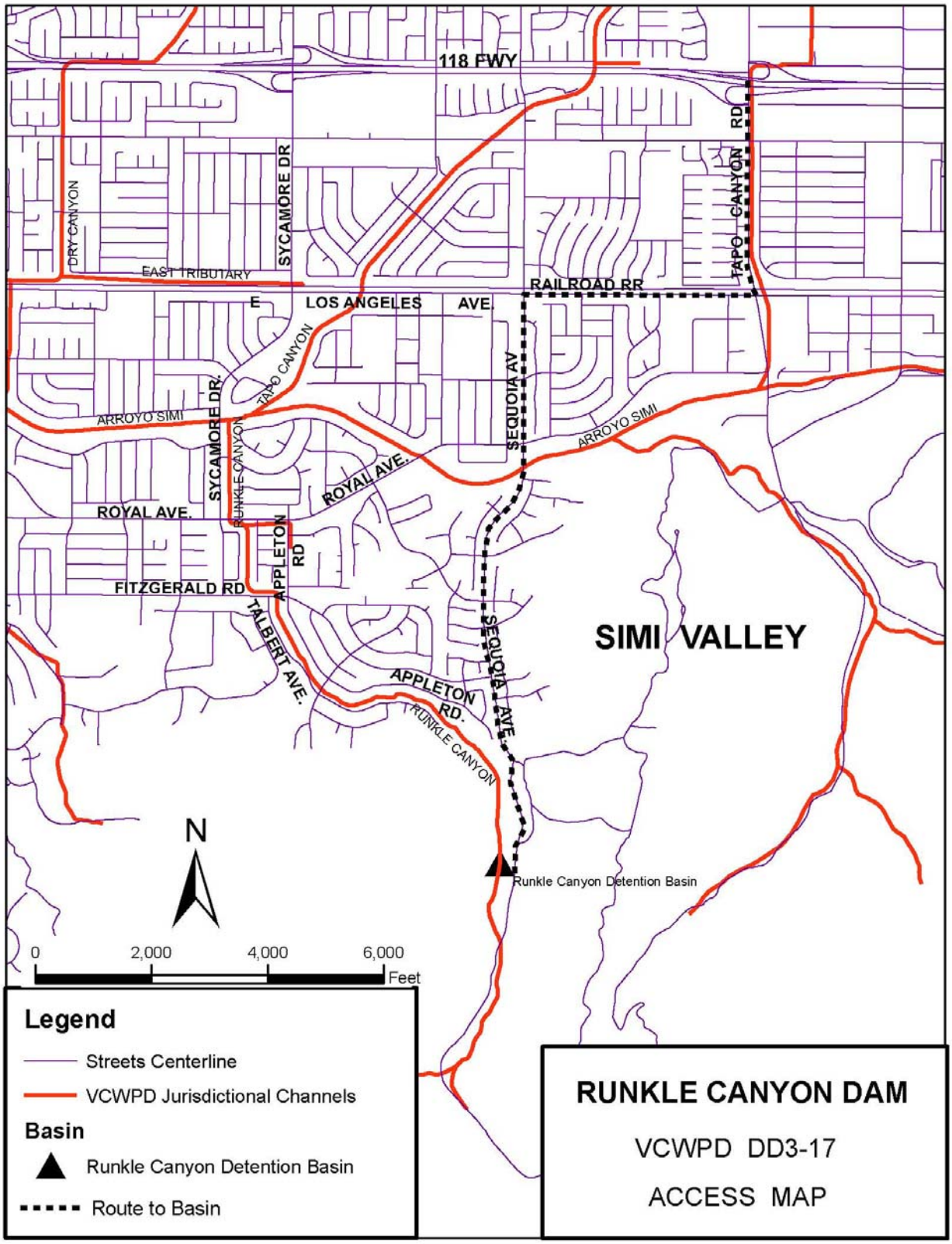
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

*** Theoretical Value from Scott and Williams (1978); 10% of 50-Yr Design Debris Volume

NA= Not Available / Not Applicable


RUNKLE CANYON
N
0 550 1,100 2,200 3,300 4,400
Feet
LEGEND
Detention Basin
Watershed Boundary
VCWPD Jurisdictional Channels
RUNKLE CANYON DAM
VCWPD DD 3-17
WATERSHED MAP


Reservoir Volume (AF)
0
20
40
60
80
100
120
140
160
180
Water Surface Elevation (ft)
1100
1095
1090
1085
1080
1075
1070
1065
1060
1055
1050
Top of Dam 1096.5'
Outflow
Spillway Elevation 1086.5'
Storage- Debris Volume
Top of riser 1072.8'
Storage
Base of riser 1063'
0
1000
2000
3000
4000
5000
6000
Reservoir Outflow (cfs)


118 FWY
DRY CANYON
SYCAMORE DR
EAST TRIBUTARY
TAPO CANYON RD
RAILROAD RR
E LOS ANGELES AVE
TAPO CANYON
SEQUOIA AV
ARROYO SIMI
SYCAMORE DR.
RUNKLE CANYON
ROYAL AVE.
APPLETON RD
FITZGERALD RD
TALBERT AVE.
SIMI VALLEY
APPLETON RD.
SEQUOIA AVE.
RUNKLE CANYON
N
Runkle Canyon Detention Basin
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Runkle Canyon Detention Basin
Route to Basin
RUNKLE CANYON DAM
VCWPD DD3-17
ACCESS MAP

SANTA ROSA ROAD DEBRIS BASIN DB3-05

LOCATION: Santa Rosa Valley, 100 ft north of Santa Rosa Road, approx.1.3 miles westerly from Moorpark Road, 2000 ft west from Timber School
N 271,500, E 1,732,700, (Lambert Zone 5 Coordinates);
Newbury Park 7-1/2' Quad

DESIGN DATA	*Capacities Indicated Are Based on a Top Of Riser Elevation of 387.0 ft.; (All Elevations NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	7,300* cy (12-12-90 DTM)
Maximum Debris Capacity	15,000* cy (12-12-90 DTM); 0.013 slope from top of riser
Inflow and Outflow Rates	Q_{100}IN= 1,600 cfs, Q_{100}OUT= NA
Debris Cleanout Elevation	381 ft (1,250 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	12 ft x 5 ft high Trapezoidal Earth Channel
Invert Elevation	396.0 ft
Spillway Length	NA
Capacity w/o Freeboard	610 cfs
PRINCIPAL SPILLWAY	
Type	Top of Vertical 36-in RCP 14.8 ft High
Weir Elevation	387 ft NGVD29
Outlet Conduit	24-in RCP
DEBRIS BLEEDER/RISER	
Type	Perforated 10-in steel pipe 14.8 ft High
Top Elevation	387 ft
Outlet Conduit	Connected to Principal Spillway Outlet
DAM	
Dam Type	Earthfill
Dam Crest Elevation	401 ft
Length	160 ft
Surface Area of Full Basin	3.3 ac
Watershed Area	1,101 ac from Quad Map
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service
Completion Date	1957
REFERENCE DRAWINGS	
Construction Drawings	Y-3-1191 & 92
Right-of-Way Drawings	NA
Topographic Drawings	T-22-11 (10-29-71), Western Aerial, (9-15-80 DTM)(12-12-90 DTM)

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	12,505	18,135
50-YEAR	9,536	13,837
25-YEAR	6,834	9,900

BASIN HISTORY: SANTA ROSA ROAD DEBRIS BASIN

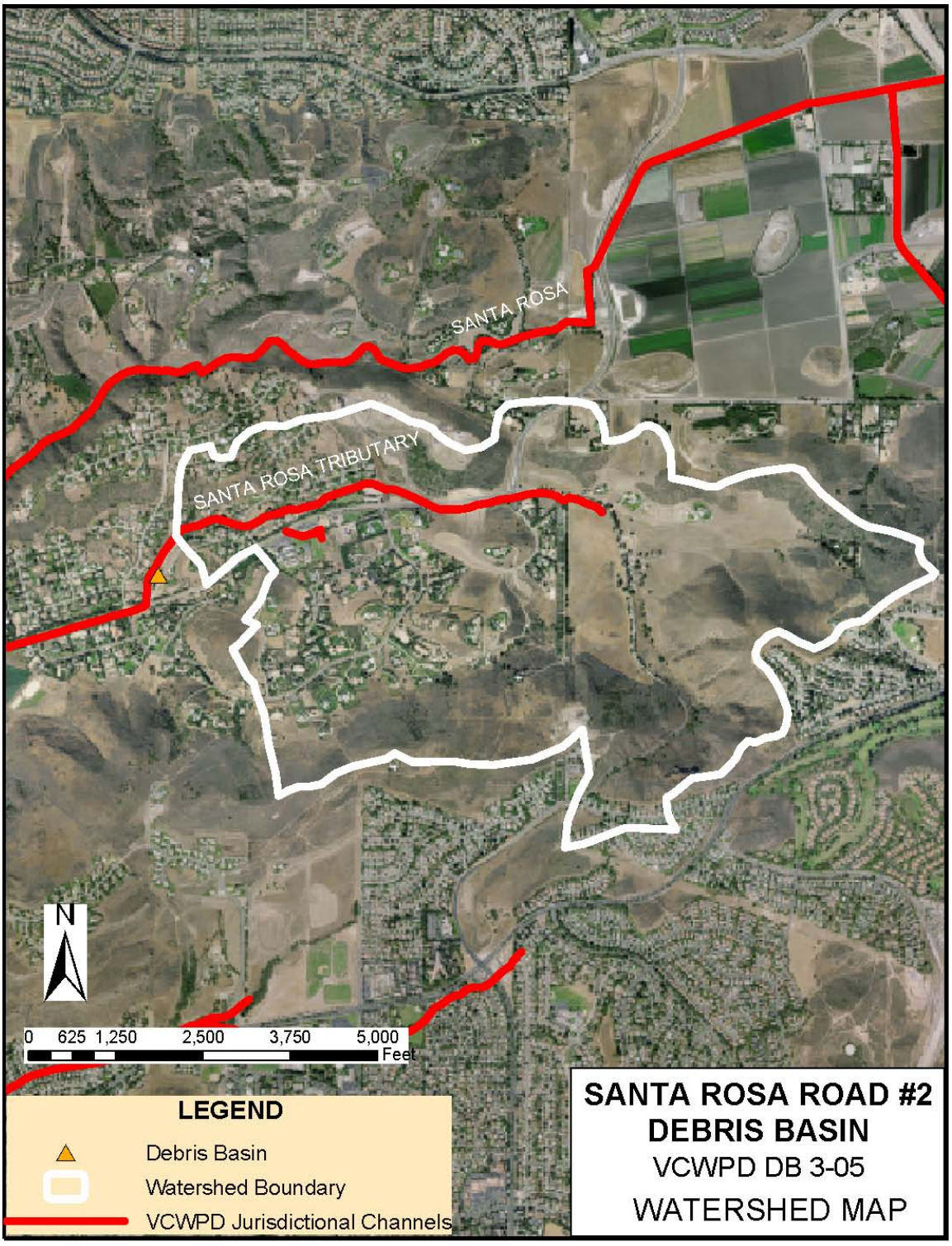
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			950***
10-71	Aerial Survey	6,614		
03-78	Disaster Declaration			950***
02-80	Disaster Declaration			950***
09-80	Cleanout		2,600	950***
09-80	Aerial Survey	9,200		
07-81	Aerial Survey	Not Digitized		
10-81	Aerial Survey	Not Digitized		
11-82	Aerial Survey	10,914		
03-83	Disaster Declaration			552
08-90	Cleanout		7,700	
10-90	Aerial Survey			
12-90	Aerial Survey	14,957		
06-91	Aerial Survey			
08-91	Aerial Survey	14,889		
02-92	Disaster Declaration			598
05-92	Aerial Survey	13,350		
07-92	Cleanout		1,650	
07-93	Cleanout		2,290	
07-93	Aerial Survey	15,000		
07-94	Cleanout		288	
01-95	Disaster Declaration			646
07-95	Cleanout		1573	
07-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey	13,900		
02-98	Disaster Declaration			652
07-98	Aerial Survey	12,500		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			

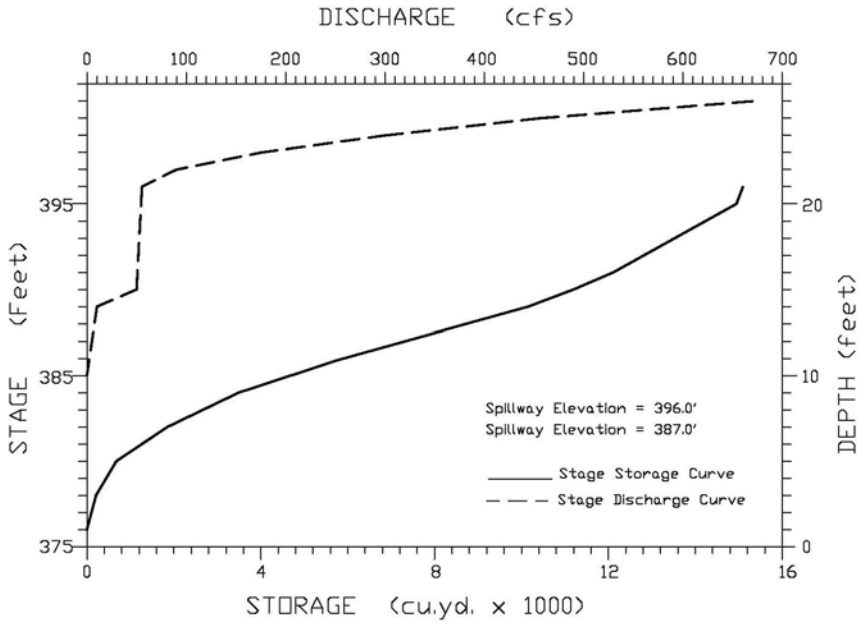
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

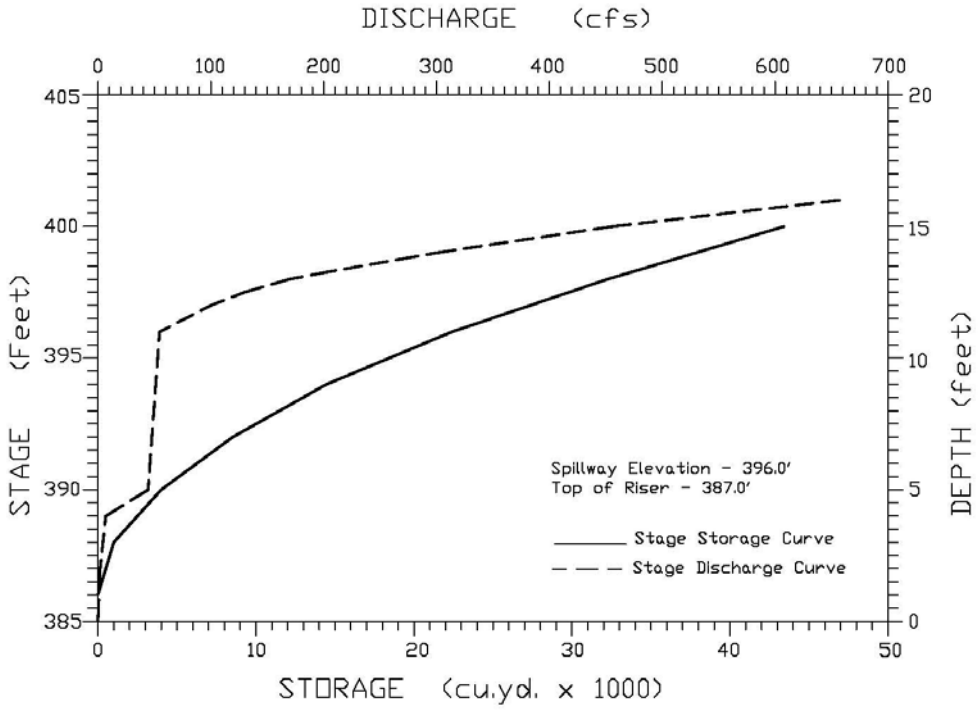
*** Theoretical Value from Scott and Williams (1978); 10% of 50-Yr Design Yield

NA= Not Available / Not Applicable

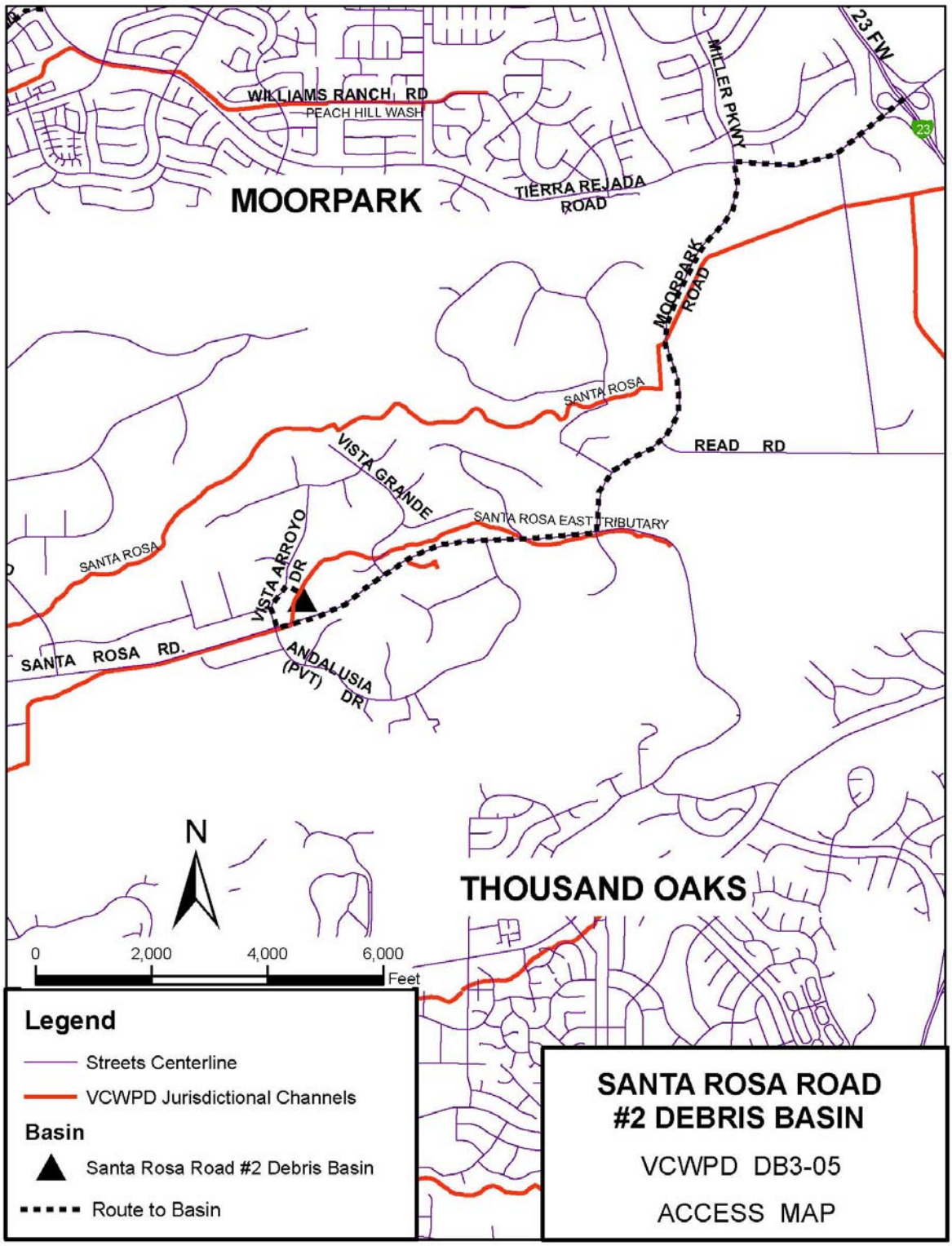

SANTA ROSA
SANTA ROSA TRIBUTARY
N
0 625 1,250 2,500 3,750 5,000
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
SANTA ROSA ROAD #2
DEBRIS BASIN
VCWPD DB 3-05
WATERSHED MAP



Santa Rosa Basin- Storage Curve of Debris Storage Only, Debris Slope=0.013



Santa Rosa Basin- Stage-Storage Curve for Flood Storage


WILLIAMS RANCH RD
PEACH HILL WASH
MOORPARK
TIERRA REJADA ROAD
MILLER PKWY
23 FWY
MOORPARK ROAD
SANTA ROSA
READ RD
VISTA GRANDE
SANTA ROSA EAST TRIBUTARY
SANTA ROSA
VISTA ARROYO DR
SANTA ROSA RD.
ANDALUSIA (PVT) DR
THOUSAND OAKS
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Santa Rosa Road #2 Debris Basin
Route to Basin
SANTA ROSA ROAD
#2 DEBRIS BASIN
VCWPD DB3-05
ACCESS MAP

SOUTH BRANCH ARROYO CONEJO DEBRIS BASIN DB3-22

LOCATION: In Newbury Park westerly of and adjacent to Reino Road,
2,000 ft north of Kimber Drive,
N 243,790 E 1,710580 (Lamber Zone 5 Coordinates)
Newbury Park 7-1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	50,417 cy
Maximum Debris Capacity	NA
100-Yr Inflow and Outflow Rates	IN: 3,609 cfs; OUT:2,433 cfs
Debris Cleanout Elevation	707 ft (10,100 cy) [10% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	140 ft W x 3.3 ft High Trapezoidal Grouted Rip-Rap
Invert Elevation	722.00 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	2,300 cfs
PRINCIPAL SPILLWAY	
Type	36-in Horizonal CMP
Invert Elevation	701.56 ft NGVD29
Outlet Conduit	36-in CMP
DEBRIS BLEEDER/RISER	
Type	24-in Slotted CMP Riser, Closed Top
Top Elevation	711.50
Outlet Conduit	Principal Spillway Outlet
DAM	
Dam Type	Earthfill
Dam Crest Elevation	725.3 ft NGVD29
Length	350 ft
Surface Area of Full Basin	2.07 ac
Watershed Area	2,209 ac
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	VCWPD with SCS
Completion Date	August, 2003
REFERENCE DRAWINGS	
Construction Drawings	Y-3-3330 thru Y-3-3337C; Y-3-4139 thru Y-3-4149
Right-of-Way Drawings	N/A
Topographic Drawings	NA

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	100,850	129,030
50-YEAR	77,100	98,670
25-YEAR	54,450	69,670

BASIN HISTORY: SOUTH BRANCH ARROYO CONEJO DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
	OLD DEBRIS BASIN			
01-95	Disaster Declaration			10,000***
02-95	Construction Completed	29,750 y		
05-95	Sounding Survey	21,750**		
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	Not Digitized		
02-98	Disaster Declaration			10,000***
06-99	Final Cleanout planned prior to modification and construction of a detention basin on this site			
12-99	Aerial Survey	Not Digitized		
08-03	NEW BASIN CONSTRUCTED			
01-05	Disaster Declaration			

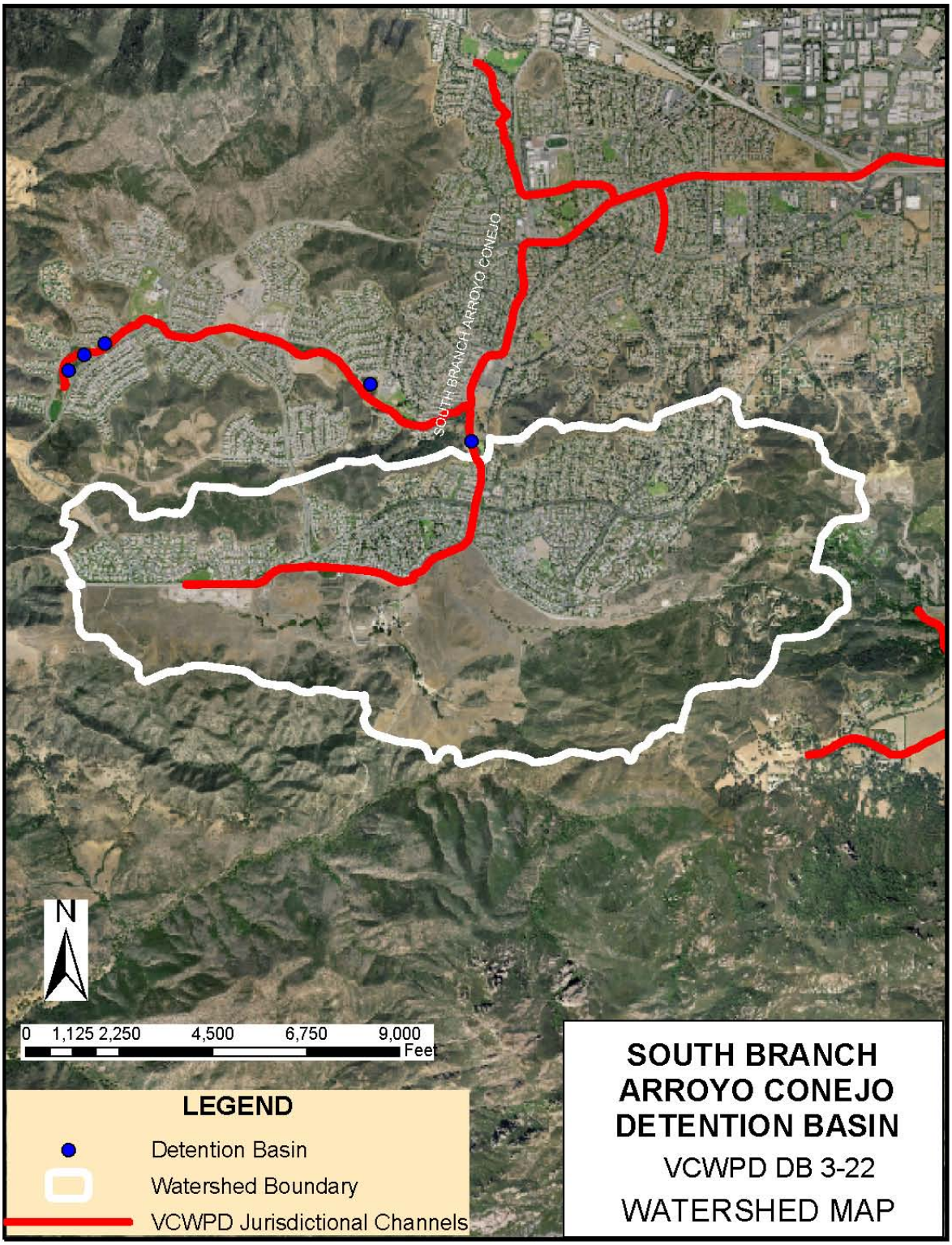
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

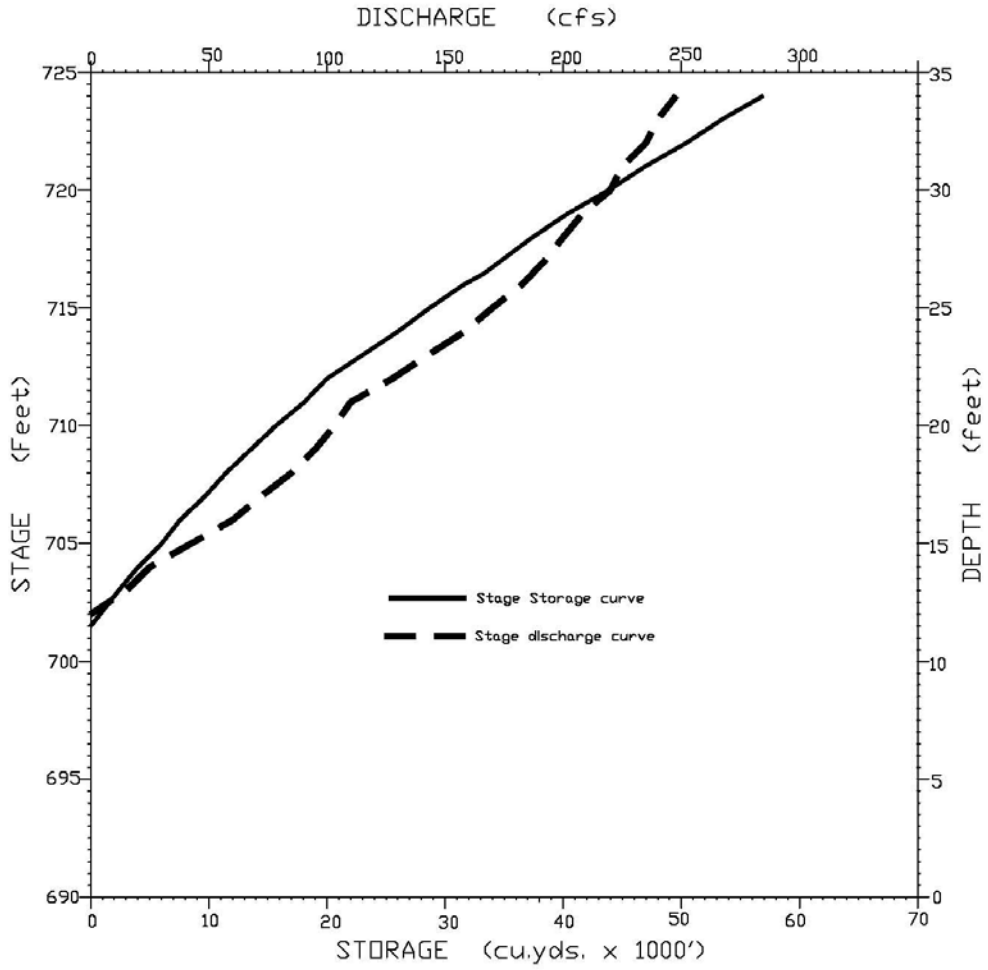
** Estimated from sounding survey

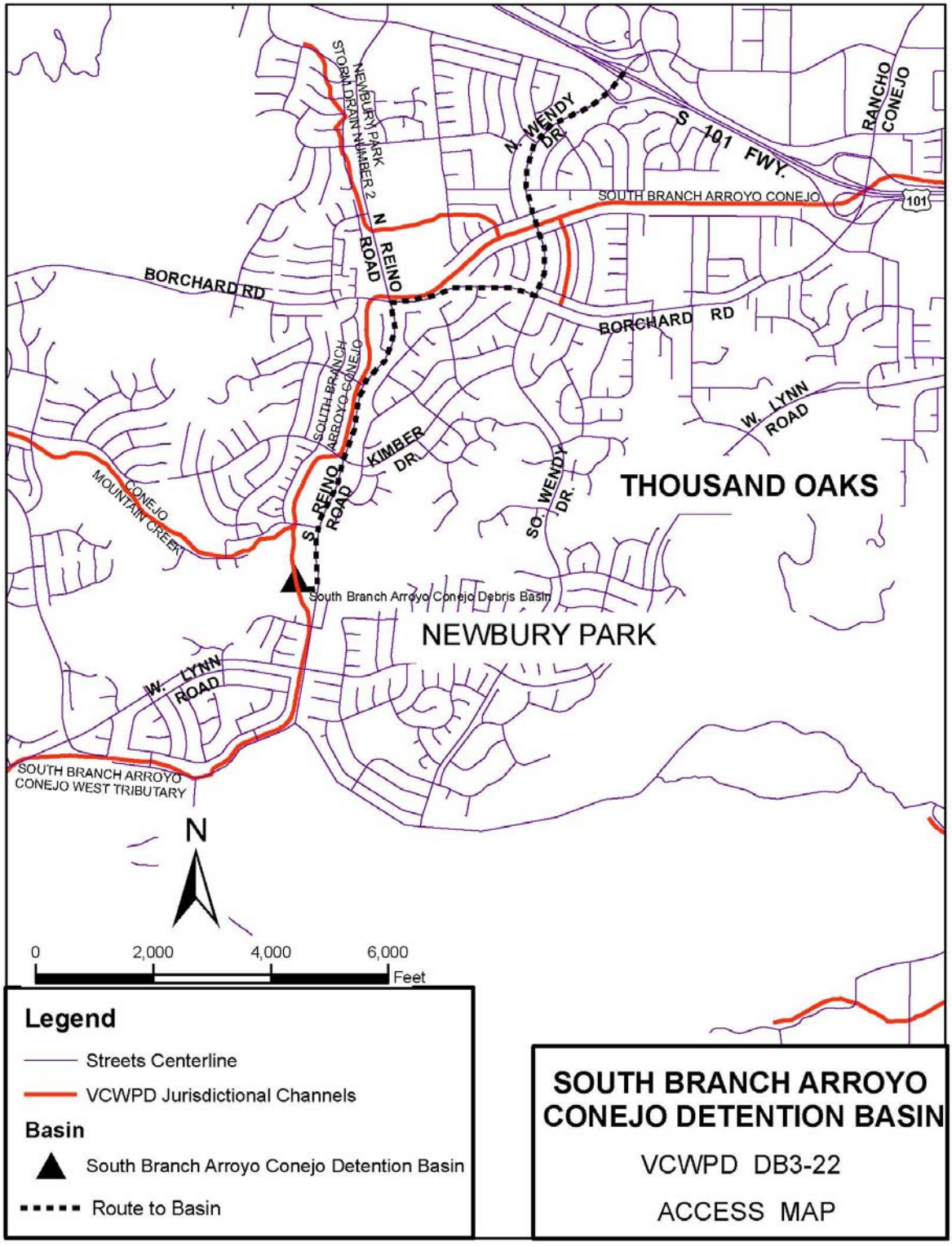
*** Theoretical Value from Scott and Williams (1978); 10% of 50-Yr Debris Yield

NA= Not Available / Not Applicable


SOUTH BRANCH ARROYO CONEJO
N
0 1,125 2,250 4,500 6,750 9,000
Feet
LEGEND
Detention Basin
Watershed Boundary
VCWPD Jurisdictional Channels
SOUTH BRANCH
ARROYO CONEJO
DETENTION BASIN
VCWPD DB 3-22
WATERSHED MAP

SOUTH BRANCH ARROYO CONEJO




NEWBURY PARK STORM DRAIN NUMBER 2
N. WENDY DR.
S 101 FWY.
RANCHO CONEJO
SOUTH BRANCH ARROYO CONEJO
101
N REINO ROAD
BORCHARD RD
BORCHARD RD
SOUTH BRANCH ARROYO CONEJO
KIMBER DR.
W. LYNN ROAD
THOUSAND OAKS
CONEJO MOUNTAIN CREEK
S. REINO ROAD
SO. WENDY DR.
South Branch Arroyo Conejo Debris Basin
NEWBURY PARK
W. LYNN ROAD
SOUTH BRANCH ARROYO CONEJO WEST TRIBUTARY
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
South Branch Arroyo Conejo Detention Basin
Route to Basin
SOUTH BRANCH ARROYO CONEJO DETENTION BASIN
VCWPD DB3-22
ACCESS MAP

SOUTH POTRERO (DOS VIENTOS TRACT) DETENTION BASIN DD3-24

LOCATION: Located between Lynn Rd. and Potrero Rd., Newbury Park.
N: 240,580 E: 1,707,398 (Lambert Zone 5 Coordinates); Newbury Pk 7 ½ minute Quad

DETENTION BASIN DESIGN DATA (has upstream debris basin)	84-in RCP bypasses debris basin and outlets into detention basin; (Elevations are NGVD29)
Design Agency	VTN WEST, INC
Level Capacity	34.74 ac-ft from contour data on Y-3-3380
Maximum Debris Capacity	Debris Basin Intercepts All Debris
100-Yr Inflow and Outflow Rates	In=1,178 cfs; Out= 325 cfs (Calleguas Pres. Cond. Mod.)
Debris Cleanout Elevation	797 ft NGVD29 (3,475 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	18 ft W x 3 ft H Rectangular RC Channel
Invert Elevation	811.7 ft NGVD29
Spillway Length	NA
Capacity	NA
PRINCIPAL SPILLWAY	
Type	16 ft Wx11 ft Lx21 ft H RC Riser Tower with Projecting Top and Catwalk; Bottom 787 ft, top 808 ft NGVD29
High Level Inlet	7.25 ft H x 10 ft W inlet with rotating slats, bottom at 800 ft
Low Level Inlet	6 ft H x 10 ft W Grated inlet; bottom at 794 ft NGVD29
Outlet Conduit	48-in RCP
DEBRIS BLEEDER/RISER	
Type	24-in Slotted CSP
Top Elevation	795 ft NGVD29
Outlet Conduit	Principal Spillway Outlet
DAM	
Dam Type	Earthfill
Dam Crest Elevation	815 ft NGVD29
Length	NA
Width at Crest	20 ft
Surface Area of Full Basin	NA
Watershed Area	359 ac from GIS Watershed Layer Shapefile
CONSTRUCTION DATA	
Construction Agency	VTN West
Completion Date	1995
REFERENCE DRAWINGS	
Construction Drawings	Y-3-3378 to Y-3-3389D
Topographic Drawings(pre-const)	NA
Right-of-Way Drawings	NA

EXPECTED DEBRIS PRODUCTION (cu. yd.):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	13,900	20,162
50-YEAR	10,609	15,387
25-YEAR	7,617	11,048

BASIN HISTORY: DOS VIENTOS DETENTION BASIN

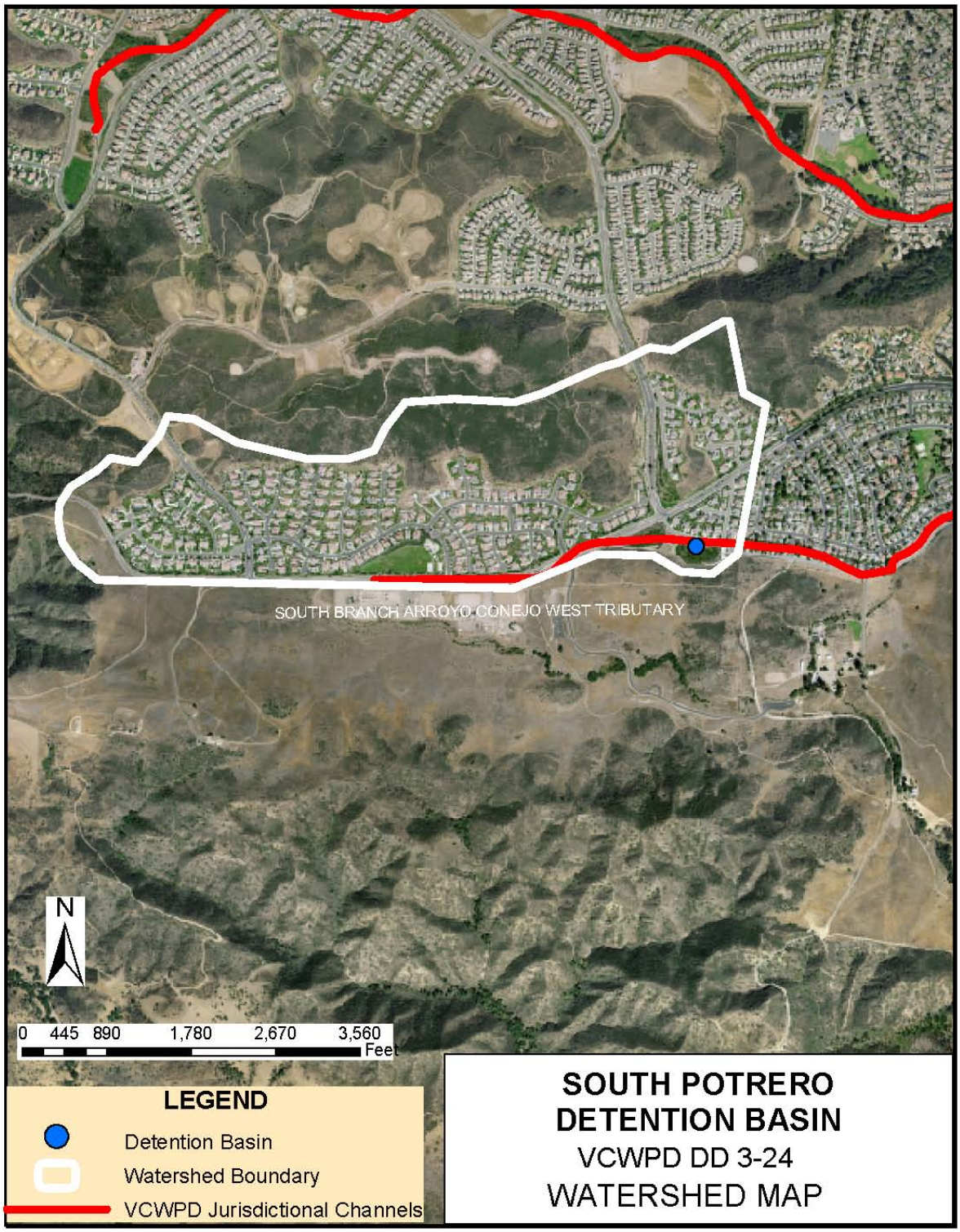
DATE	**ACTION**	**REMAINING CAPACITY (cy)**	**REMOVED (cy)**	**AADP* (cy)**
01-05	Disaster Declaration			1,060***

Notes

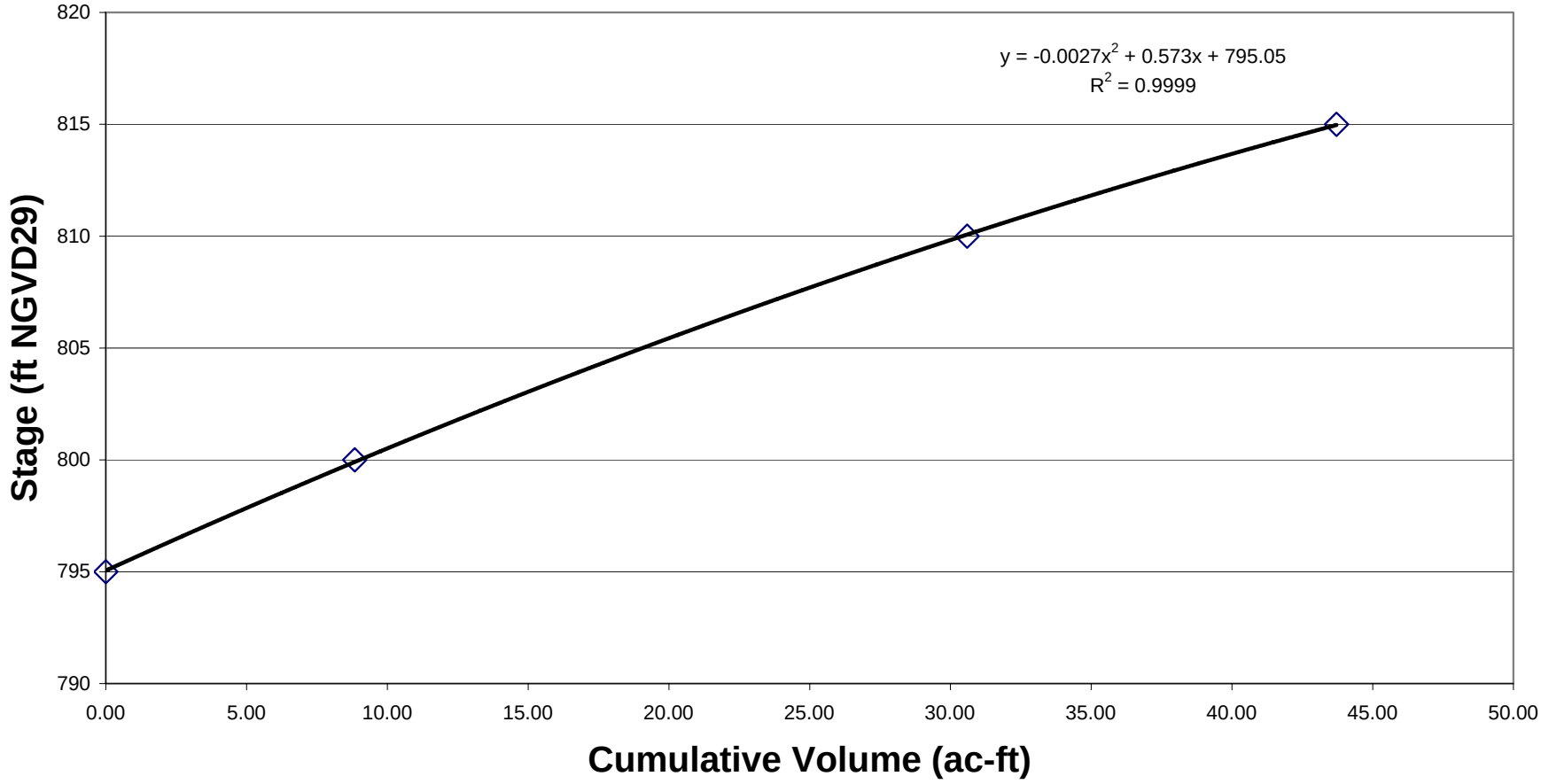
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

*** Theoretical Value, 10% of 50-Yr Yield per Scott and Williams (1978)

NA= Not Available / Not Applicable

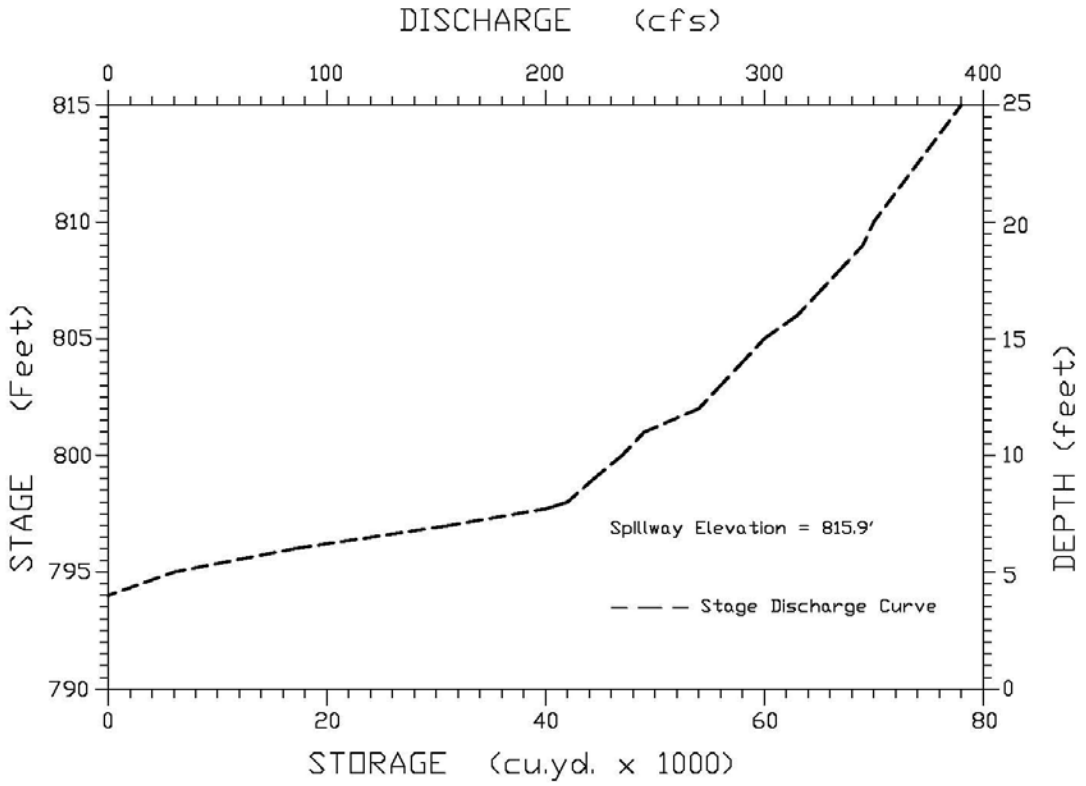

SOUTH BRANCH ARROYO CONEJO WEST TRIBUTARY
N
0 445 890 1,780 2,670 3,560
Feet
LEGEND
Detention Basin
Watershed Boundary
VCWPD Jurisdictional Channels
SOUTH POTRERO
DETENTION BASIN
VCWPD DD 3-24
WATERSHED MAP

Detention Basin Stage-Storage Data

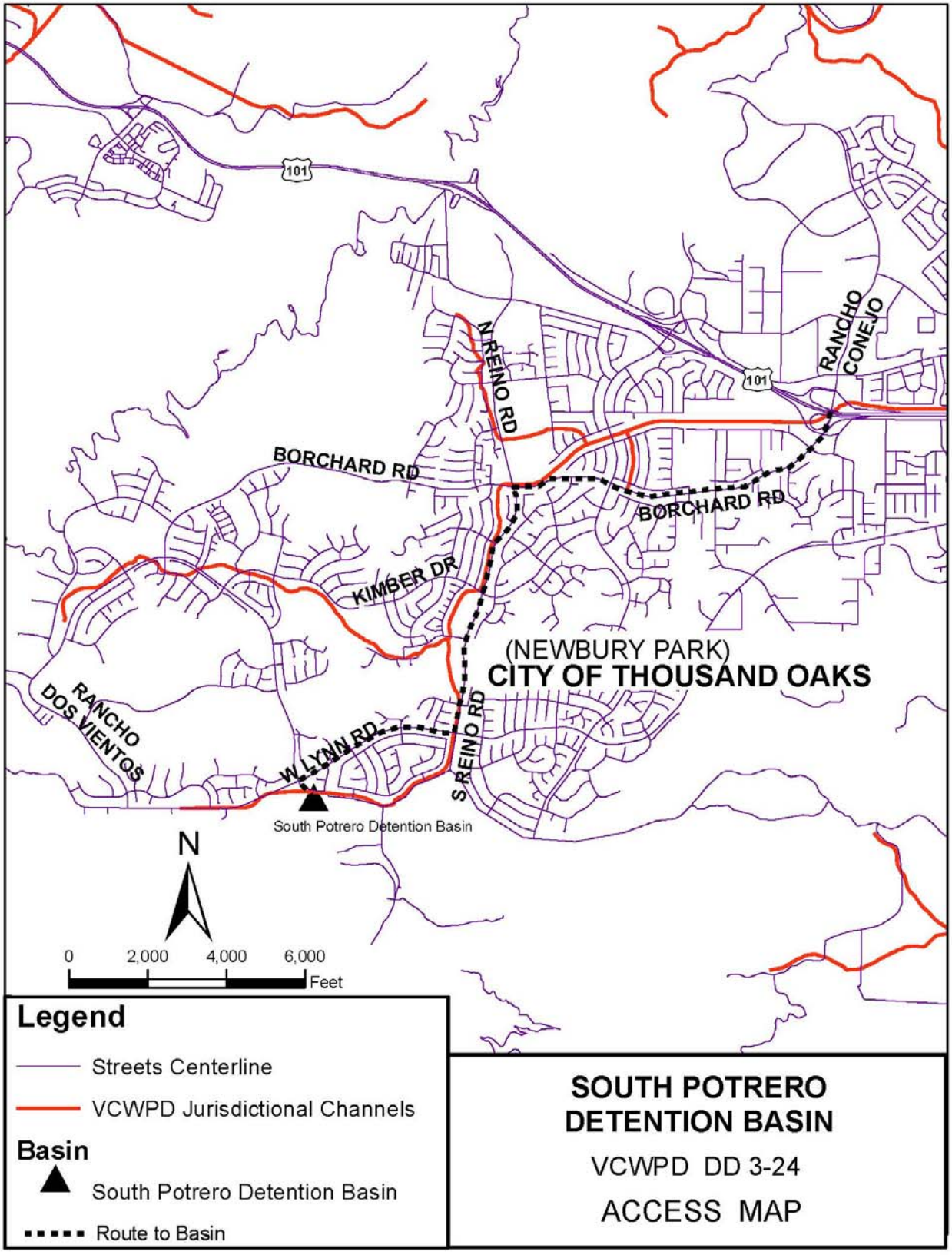


South Potrero (Dos Vientos Tract) Detention Basin (Planimetered using Contours on Y-3-3380)

SOUTH POTRERO (DOS VIENTOS) DETENTION BASIN



Note: The discharge-storage numbers are from the VCRAT-Calleguas-Present


101
N REINO RD
RANCHO CONEJO
101
BORCHARD RD
BORCHARD RD
KIMBER DR
(NEWBURY PARK)
CITY OF THOUSAND OAKS
RANCHO DOS VIENTOS
W LYNN RD
S REINO RD
South Potrero Detention Basin
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
South Potrero Detention Basin
Route to Basin
SOUTH POTRERO
DETENTION BASIN
VCWPD DD 3-24
ACCESS MAP

ST. JOHNS DEBRIS BASIN DB3-03 (Data may not be accurate)

LOCATION: Camarillo, approximately 1.5 miles north of Santa Rosa Road; east from Somis Road behind St. John's Seminary; N 271,600, E 1,698,000 (Lambert Zone 5Coordinates); Newbury Park 7-1/2' Quad

DESIGN DATA before recent revisions	Maintenance to be assumed by developer; (Elevations are NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	50,000 cy (10-29-71) T-22-11
Maximum Debris Capacity	87,600 cy (11-16-88 DTM)
100-Yr Inflow and Outflow Rates	IN:=500 cfs; OUT=NA
Debris Cleanout Elevation	277 ft [Top of debris riser before basin reconstruction]
EMERGENCY SPILLWAY	
Type	10 ft W x 5 ft H
Invert Elevation	286 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	313 cfs
PRINCIPAL SPILLWAY	
Type	None
Weir Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	Perforated 10 in Steel Pipe 13.8 ft High
Top Elevation	277 ft NGVD29
Outlet Conduit	10 in Steel Pipe
DAM	
Dam Type	Earthfill
Dam Crest Elevation	292 ft NGVD29
Length	400 ft
Surface Area of Full Basin	4.1 ac
Watershed Area	240 ac from Quad Map
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service
Completion Date	1957
REFERENCE DRAWINGS	
Construction Drawings	SCS 7-E-15512 (C-13-1J)
Right-of-Way Drawings	10196.1 Easement
Topographic Drawings	T-63-20 (11-2-71), 11-16-88 DTM

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	2,849	4,134
50-YEAR	2,181	3,164
25-YEAR	1,565	2,271

BASIN HISTORY: ST. JOHNS DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
10-71	Aerial Survey	50,000		284***
03-78	Disaster Declaration			
02-80	Disaster Declaration			
10-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			
08-88	Cleanout		3,936	
11-88	Aerial Survey	32,700		
10-90	Aerial Survey	Not Digitized		
06-91	Aerial Survey	70,430		
02-92	Disaster Declaration			273**
01-95	Disaster Declaration			284
05-96	Cleanout		2,260	
07-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey			
02-98	Disaster Declaration			248****
07-98	Aerial Survey	64,350		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			

Notes

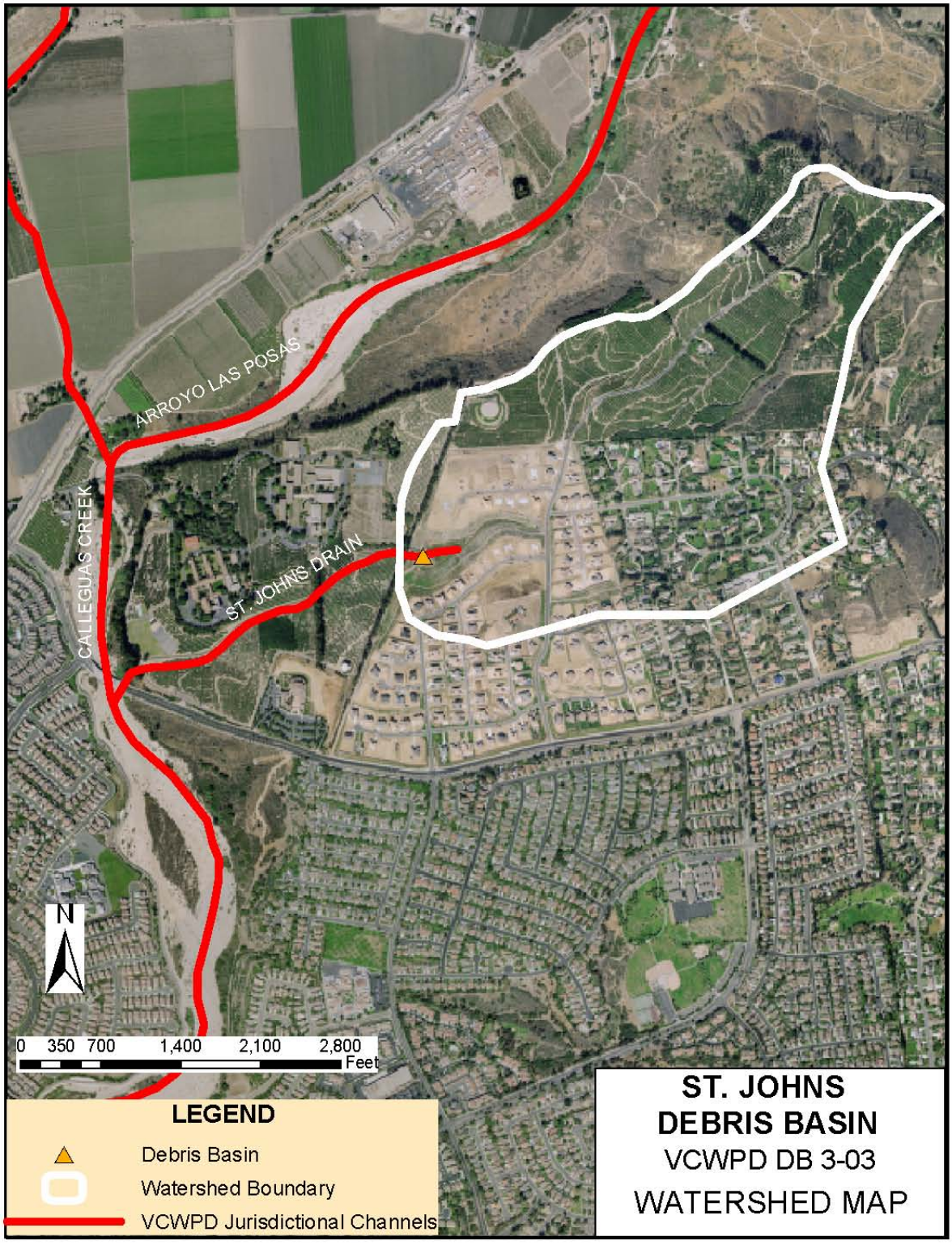
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

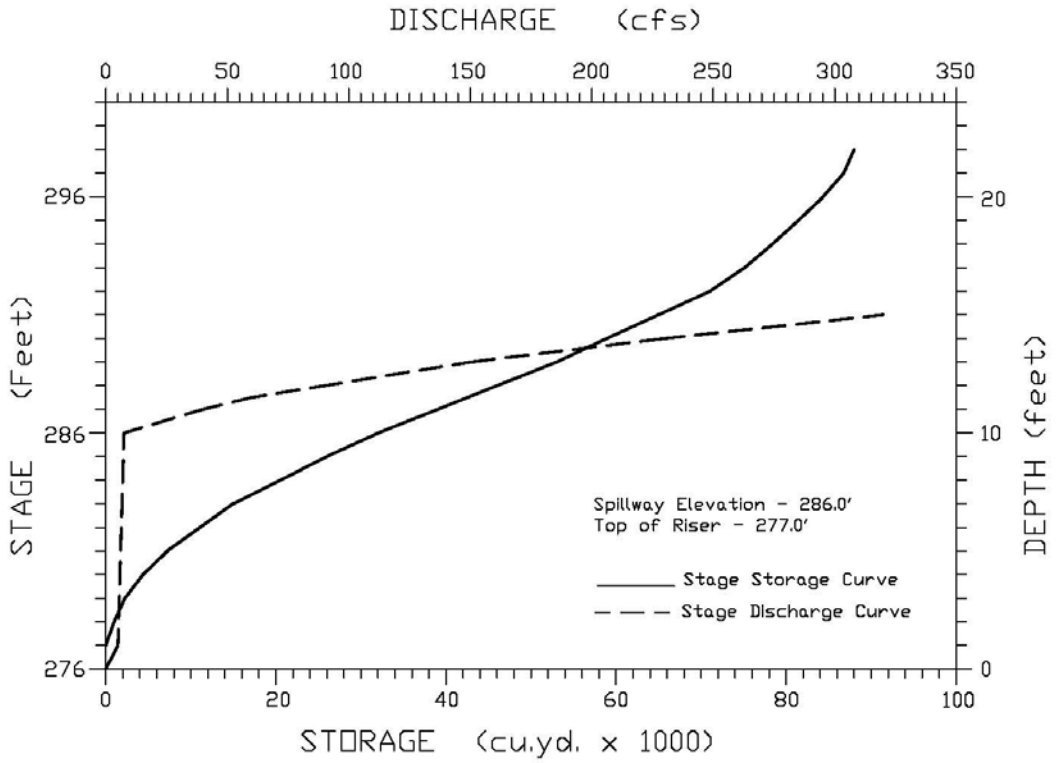
*** Theoretical Value from Kevin Scott Formula

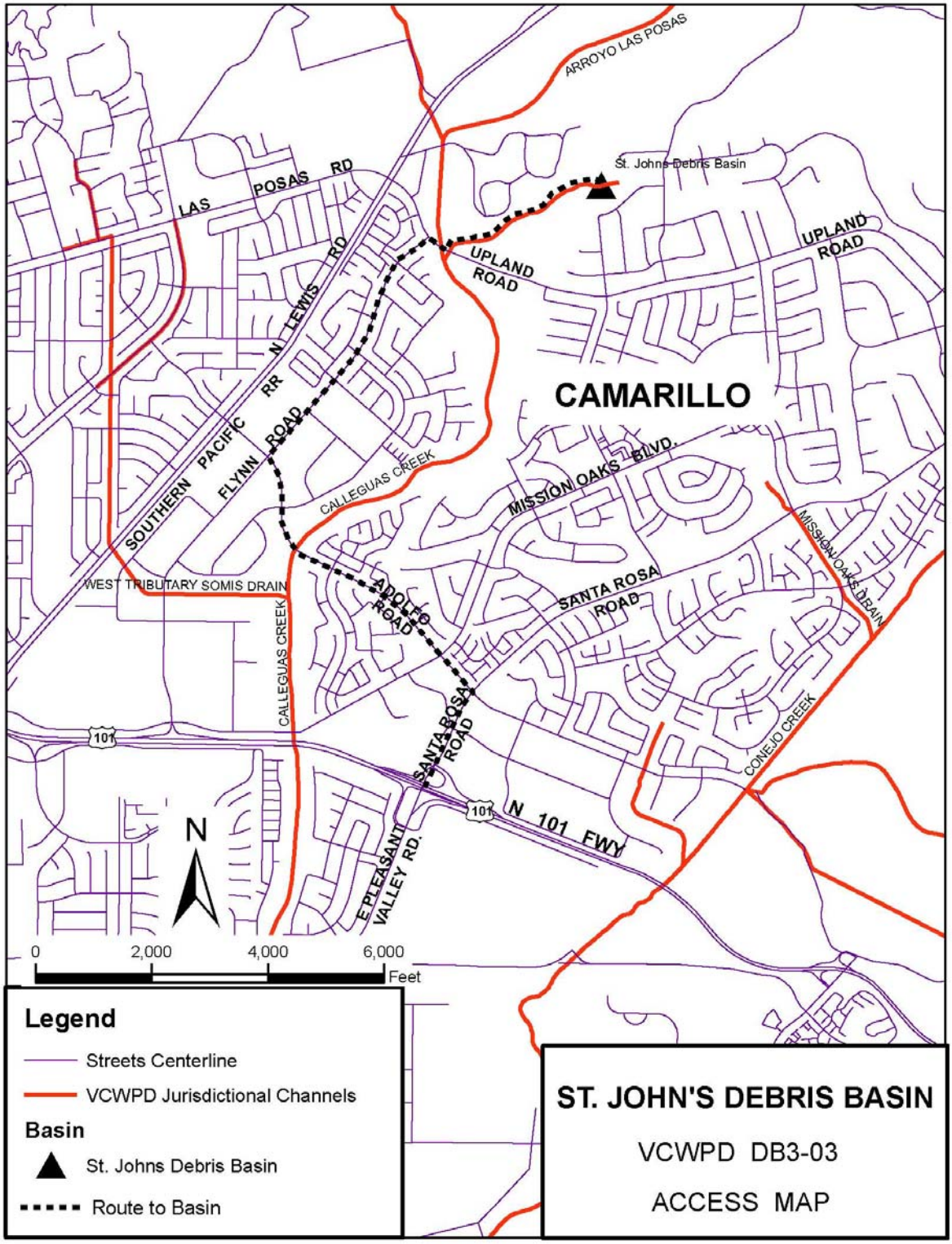
****Based on FEMA Method

NA= Not Available / Not Applicable


ARROYO LAS POSAS
CALLEGUAS CREEK
ST. JOHNS DRAIN
N
0 350 700 1,400 2,100 2,800
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
ST. JOHNS
DEBRIS BASIN
VCWPD DB 3-03
WATERSHED MAP

ST. JOHN DEBRIS BASIN




ARROYO LAS POSAS
St. Johns Debris Basin
LAS POSAS RD
N LEWIS RD
UPLAND ROAD
UPLAND ROAD
CAMARILLO
SOUTHERN PACIFIC RR
FLYNN ROAD
CALLEGUAS CREEK
MISSION OAKS BLVD.
MISSION OAKS DRAIN
WEST TRIBUTARY SOMIS DRAIN
ADOLFO ROAD
SANTA ROSA ROAD
CALLEGUAS CREEK
SANTA ROSA ROAD
CONEJO CREEK
101
101
N 101 FWY
E PLEASANT VALLEY RD.
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
St. Johns Debris Basin
Route to Basin
ST. JOHN'S DEBRIS BASIN
VCWPD DB3-03
ACCESS MAP

SYCAMORE CANYON DAM State Dam No. 86-006 DD3-21

LOCATION: Simi Valley, approximately 1.0 mile south of
Los Angeles Avenue, just east of Madera Road.
N 275,357, E 1,759,401 (Lambert Zone 5 Ca. Coordinates),
Simi Valley 7-1/2' Quad.

DESIGN DATA	Flood storage assumes debris storage full (above 780 ft); (All Elevations NGVD29)
Design Agency	VCWPD
Flood Storage Capacity	660 ac ft above 780 ft (890 ac-ft per State Dam Book)
Maximum Debris Storage	172,500 cy or 107 ac-ft @ 780 ft (25*Mean Annual+100Yr Debris Yield)
Q50:Q100 Inflow and Outflow Rates	IN=4,117: 4,900 cfs; OUT=178: 190 cfs
Debris Cleanout Elevation	780 ft (172,500 cy) [Max. debris storage level] (storage curve below 780 ft not available)
EMERGENCY SPILLWAY	
Type	Rectangular RC Weir 80 ft Wide
Invert Weir Elevation	797 ft NGVD29
Capacity w/o Freeboard	12,000 cfs
PRINCIPAL SPILLWAY	
Type	4 ft x 6 ft RC Tower with Flared Top and Sidewall Inlets
Weir Elevation	789.33 ft NGVD29
Outlet Conduit	48 in RCP
DEBRIS BLEEDER/RISER	
Type	None
Top Elevation	NA
Outlet Conduit	NA
DAM	
Dam Type	Earthfill
Dam Crest Elevation	810 ft NGVD29
Length	1520 ft
Surface Area of Full Basin	70 ac at spillway invert per as-built
Watershed Area	4,380 ac from Quad Map and GIS Shapefile
Width at Crest	20 ft
CONSTRUCTION DATA	
Construction Agency	VCWPD
Completion Date	1981
REFERENCE DRAWINGS	
Construction Drawings	Y-3-2109 to Y-3-2133
Right-of-Way Drawings	Y-3-2110
Topographic Drawings	Y-3-2110

EXPECTED DEBRIS PRODUCTION (cu. yd.):		
Storm Frequency	**Design Condition (Note 1)**	**100% Burn**
100-YEAR	59,260 (32,135)	80,200
50-YEAR	45,290 (24,560)	61,310
25-YEAR	32,560 (16,660)	44,080

(Note 1) Debris production re-evaluated in 2005 to account for developed watershed areas that do not contribute sediment to dam- total area reduced from 6.8 to 4.7 sq. mi. yielding debris production estimates shown in ( ).

BASIN HISTORY: SYCAMORE CANYON DAM

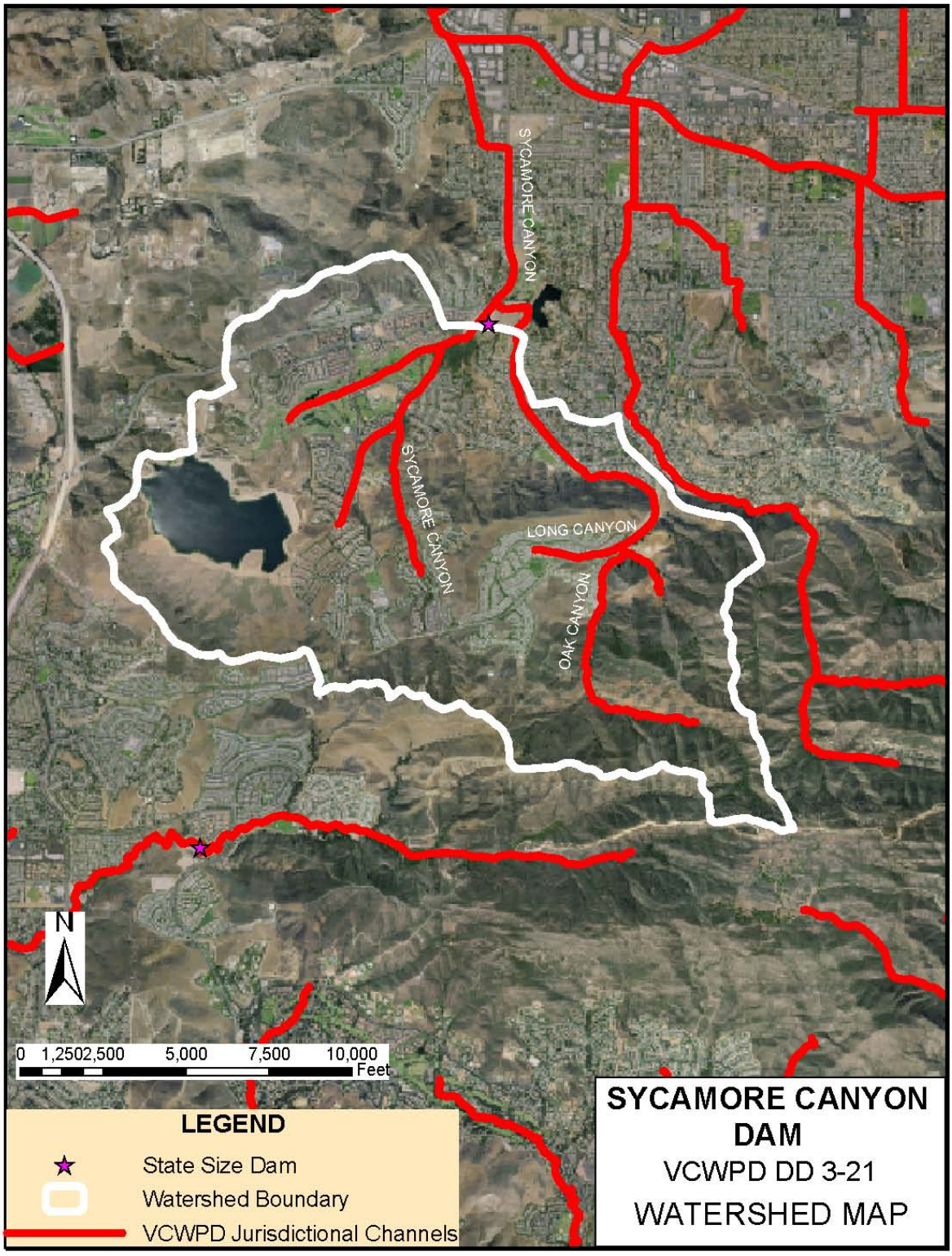
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
01-81	Dam Constructed	1,064,800 (660ac-ft)		
03-83	Disaster Declaration			4,530***
08-96	Aerial Survey	Not Digitized		
02-92	Disaster Declaration			4,530***
01-95	Disaster Declaration			4,530***
08-96	Aerial Survey	Not Digitized		
02-98	Disaster Declaration			4,530***
07-98	Aerial Survey	Digitized but not evaluated		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
12-02	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			2,460***

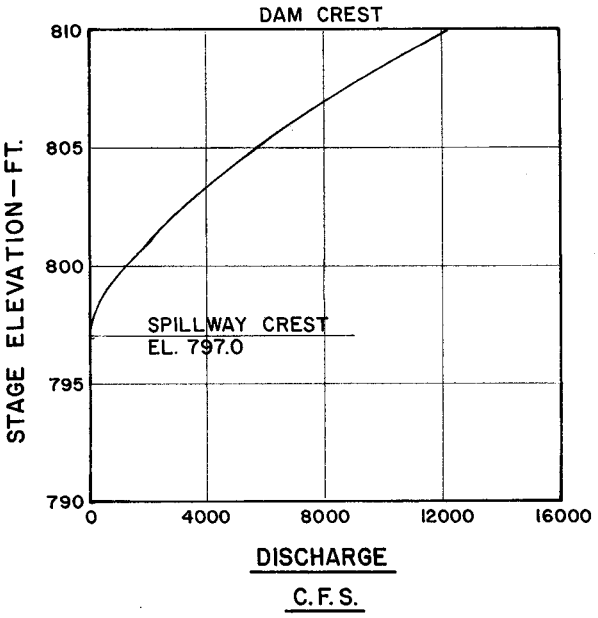
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

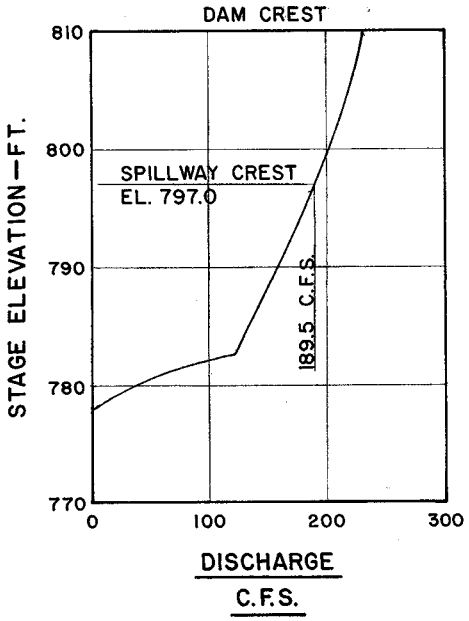
*** Theoretical Value from Scott and Williams (1978); 10% of 50-Yr Design Yield

NA= Not Available / Not Applicable

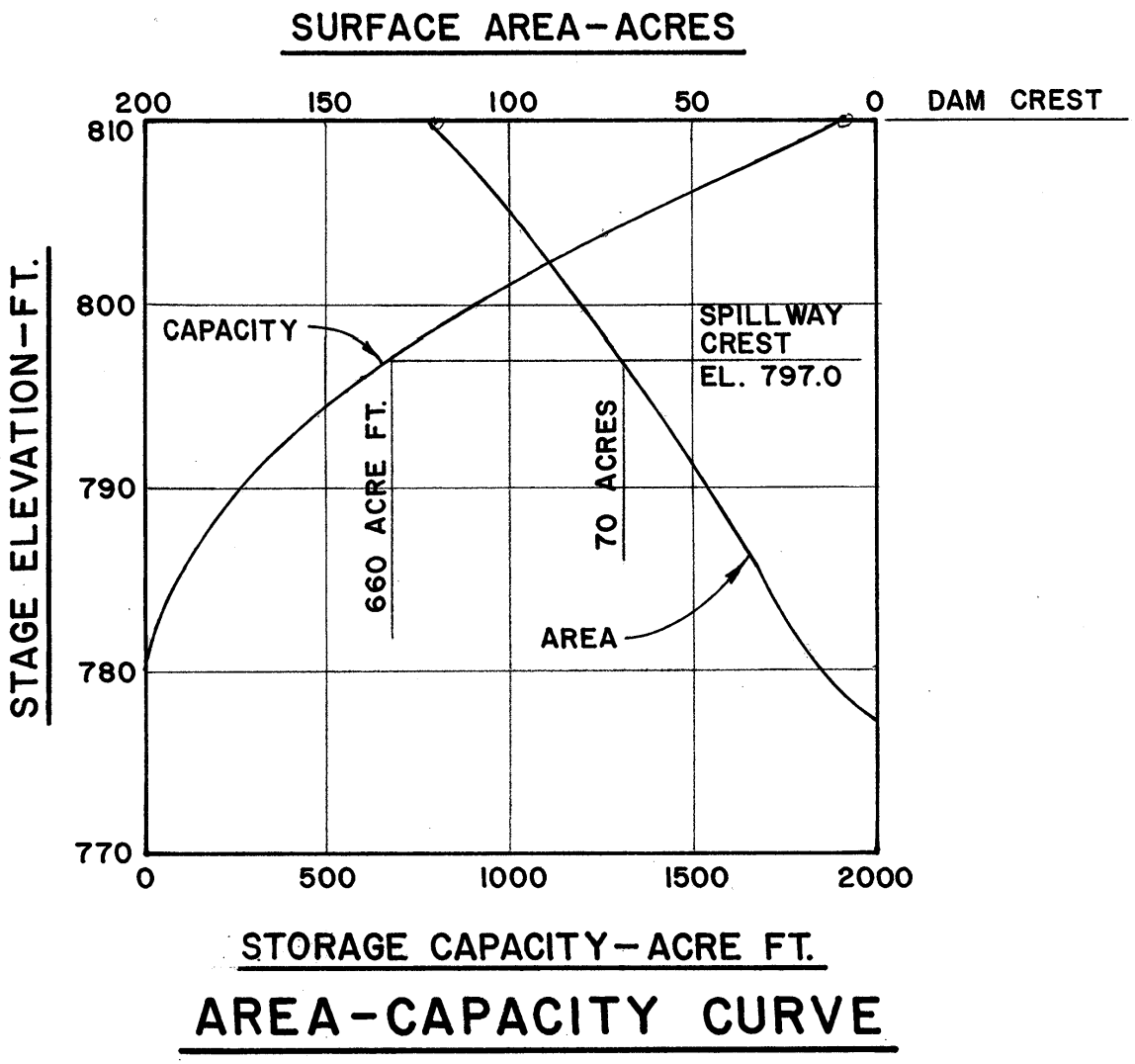

SYCAMORE CANYON
SYCAMORE CANYON
LONG CANYON
OAK CANYON
N
0 1,2502,500 5,000 7,500 10,000
Feet
LEGEND
State Size Dam
Watershed Boundary
VCWPD Jurisdictional Channels
SYCAMORE CANYON DAM
VCWPD DD 3-21
WATERSHED MAP



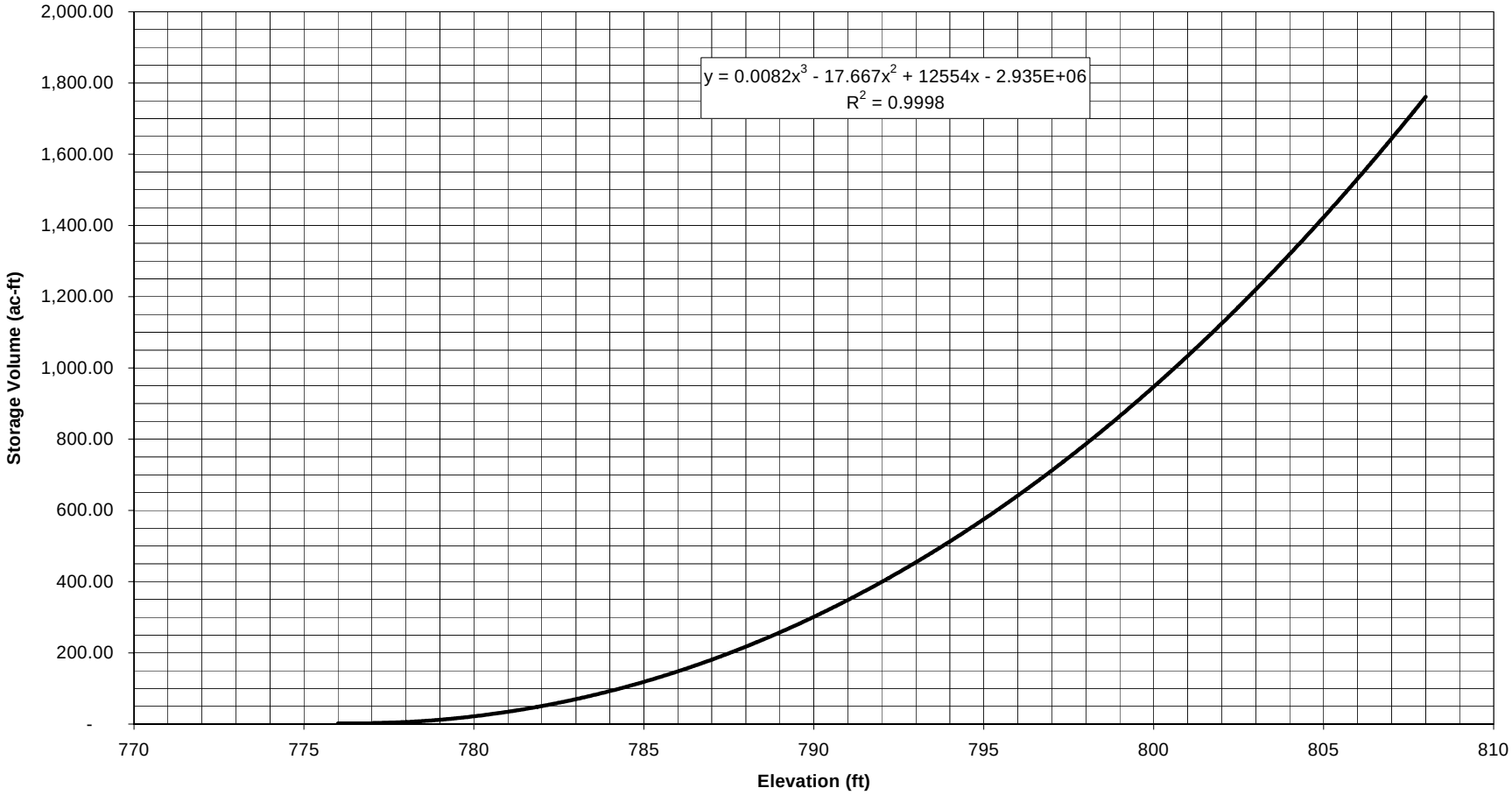
SPILLWAY RATING CURVE



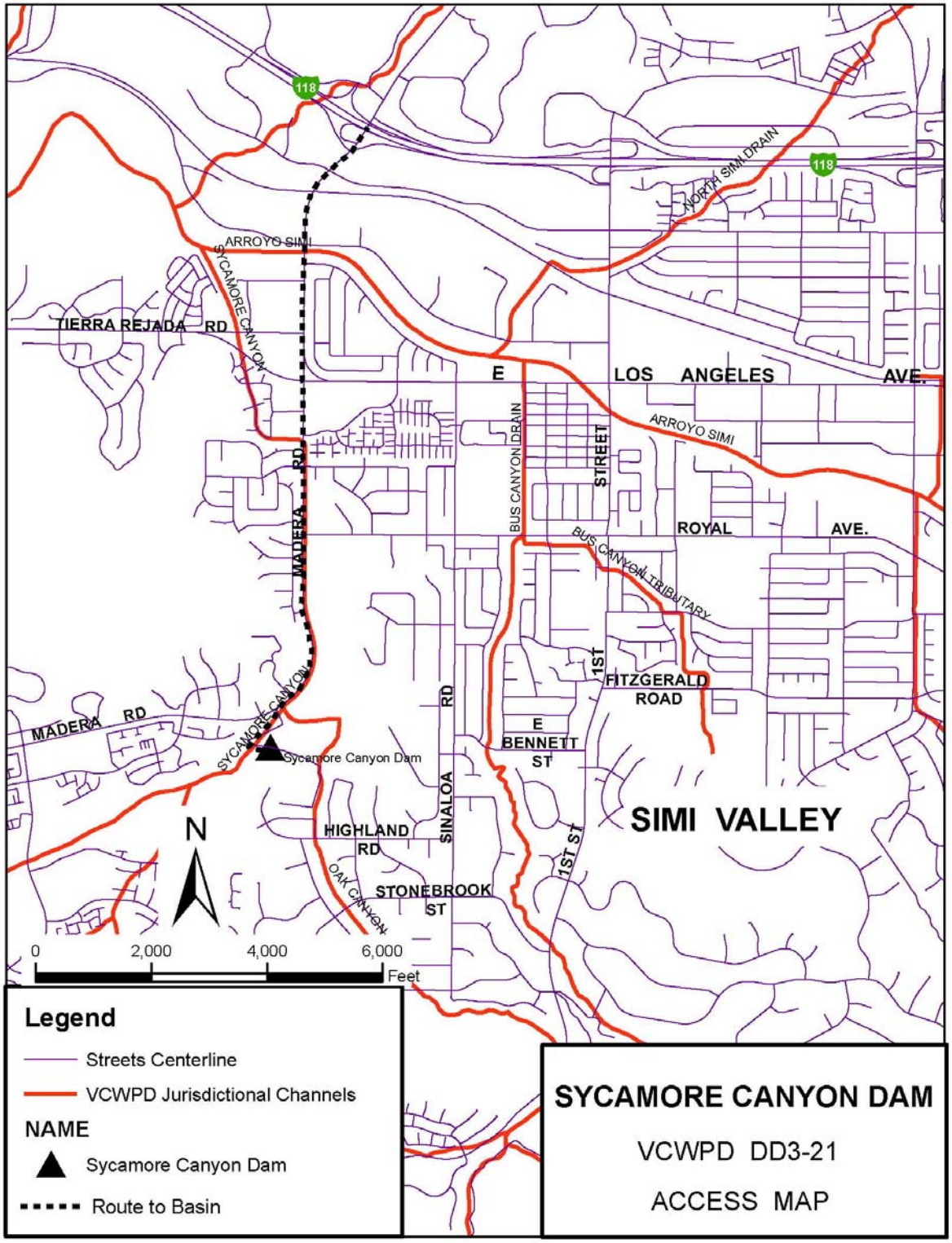
Sycamore Detention Basin



Sycamore Detention Basin Capacity Above Debris Storage



Sycamore Detention Basin Capacity Including Debris Storage (Elev. 776-781 planimetered from as-builts)


118
NORTH SIMI DRAIN
ARROYO SIMI
SYCAMORE CANYON
TIERRA REJADA RD
E LOS ANGELES AVE.
ARROYO SIMI
BUS CANYON DRAIN
STREET
ROYAL AVE.
BUS CANYON TRIBUTARY
MADERA RD
1ST
FITZGERALD ROAD
E BENNETT ST
SINALOA RD
Sycamore Canyon Dam
HIGHLAND RD
STONEBROOK ST
OAK CANYON
1ST ST
SIMI VALLEY
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
NAME
Sycamore Canyon Dam
Route to Basin
SYCAMORE CANYON DAM
VCWPD DD3-21
ACCESS MAP

TAPO HILLS NO. 1 DEBRIS BASIN DB3-18

LOCATION: Simi Valley, between Dry Canyon and Tapo Canyon
About 1000 ft north of Township Avenue.
N290400, E1777800 (Lambert Zone 5 Coordinates)
Santa Susana 7.5' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	41,190 cu.yds. (T-245) 7-8-80
Maximum Debris Capacity	51,820 cu.yds. (T-245) 7-8-80
100-Yr Inflow and Outflow Rates	IN:290 cfs; OUT:42.7 cfs at 1,148 ft NGVD29 (Y-3-1726)
Debris Cleanout Elevation	1135.6 ft (4,030 cy) [capacity at bleeder top]
EMERGENCY SPILLWAY	
Type	20 ft Long x 5.5 ft Deep Side Channel Inlet
Invert Weir Elevation	1,150 ft NGVD29
Spillway Weir Length	20 ft
Capacity w/o Freeboard	800 cfs
PRINCIPAL SPILLWAY	
Type	None
Weir Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	30 in CSP 19 ft High
Top Elevation	1135.6 ft NGVD29
Outlet Conduit	24 in RCP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	355 ft NGVD29
Length	250 ft
Surface Area of Full Basin	2.2 ac
Watershed Area	104 ac
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	VCWPD
Completion Date	1971
REFERENCE DRAWINGS	
Construction Drawings	Y-3-1008-1018, Y-3-1726 (Hydrology)
Right-of-Way Drawings	T-75-3 (2-11-71)
Topographic Drawings	T-75-5-(2-11-71), T-245 (07-08-80)

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	5,730 (1)	8,310
50-YEAR	4,380	6,350
25-YEAR	3,150	1,580

(1) Design debris capacity based on as-builts is approximately 4,000 cy.

BASIN HISTORY: TAPO HILLS NO. 1 DEBRIS BASIN

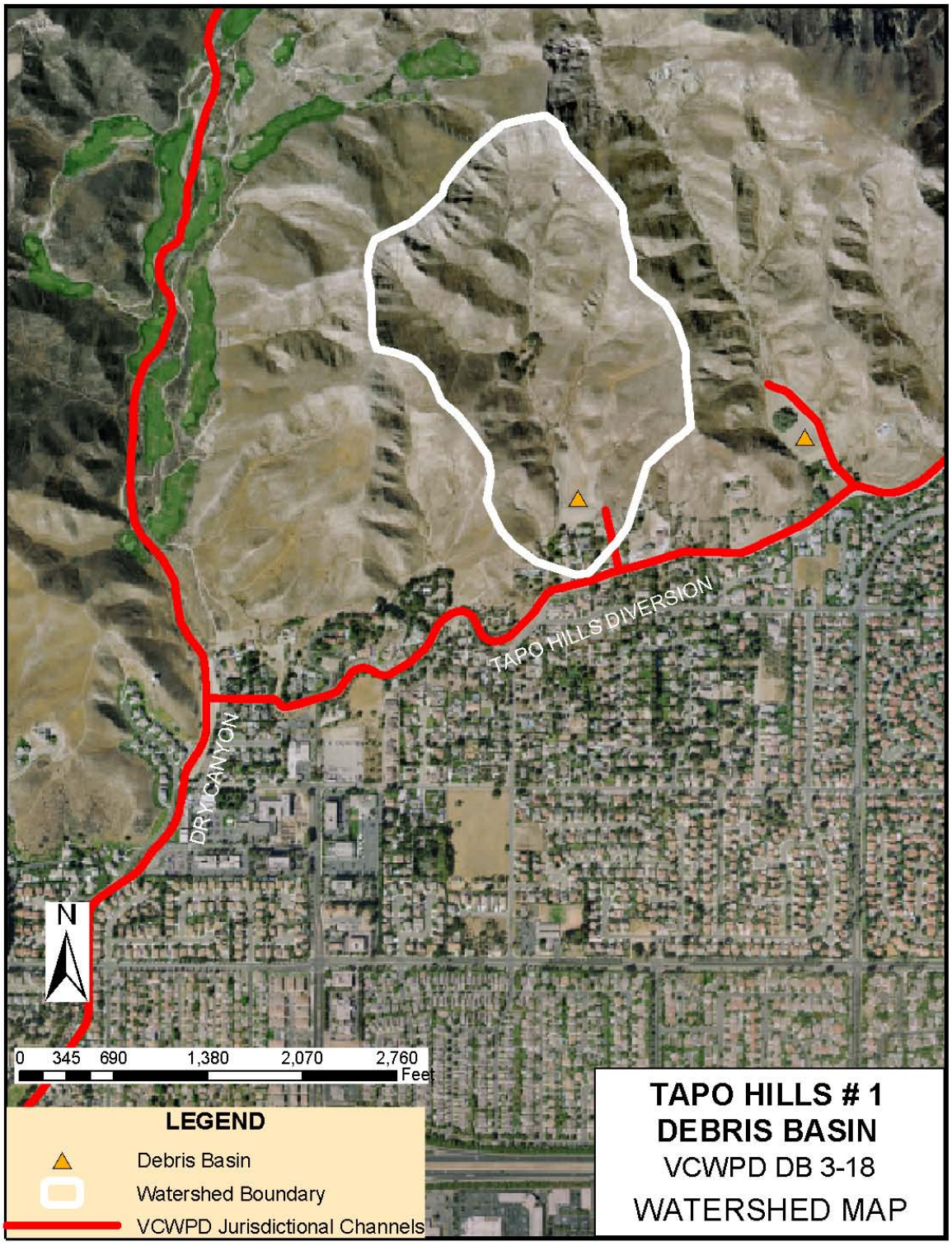
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
10-70	Construction			
02-71	Aerial Survey	75,000		
05-72	Aerial Survey	Not Digitized		
05-73	Aerial Survey			
02-75	Aerial Survey	72,970		
10-75	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			440***
02-80	Disaster Declaration			440***
07-80	Cleanout			
09-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			440***
12-85	Aerial Survey	58,900		
02-92	Disaster Declaration			440***
01-95	Disaster Declaration			440***
08-96	Aerial Survey	Not Digitized		
08-98	Disaster Declaration			
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			440***
07-05	Cleanout		**4,353-Survey**	

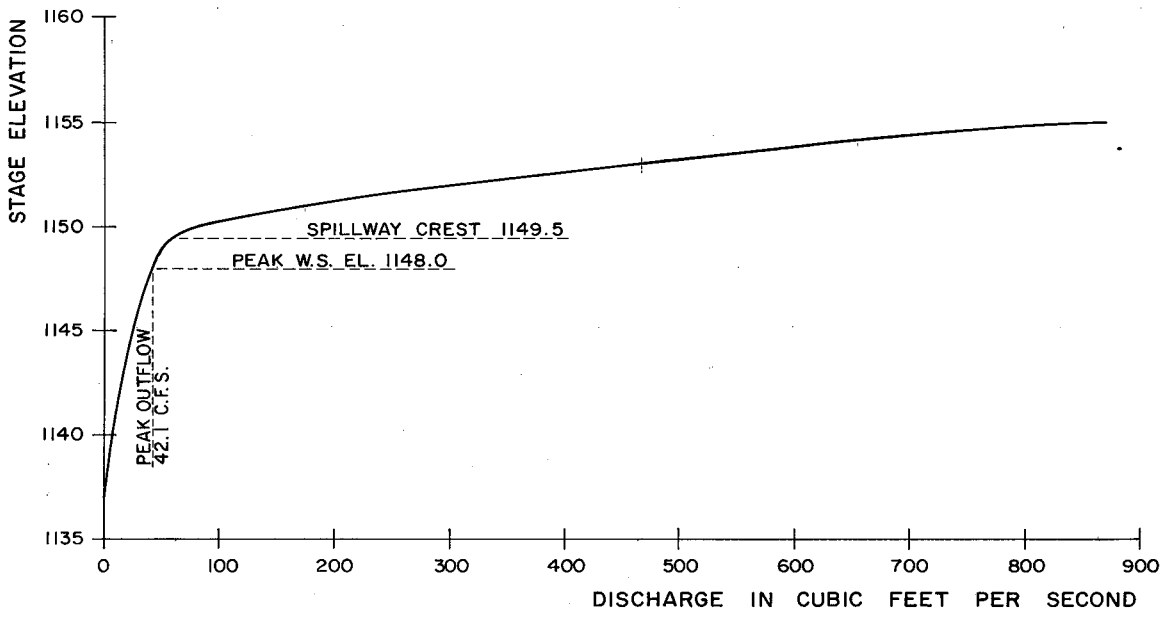
Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

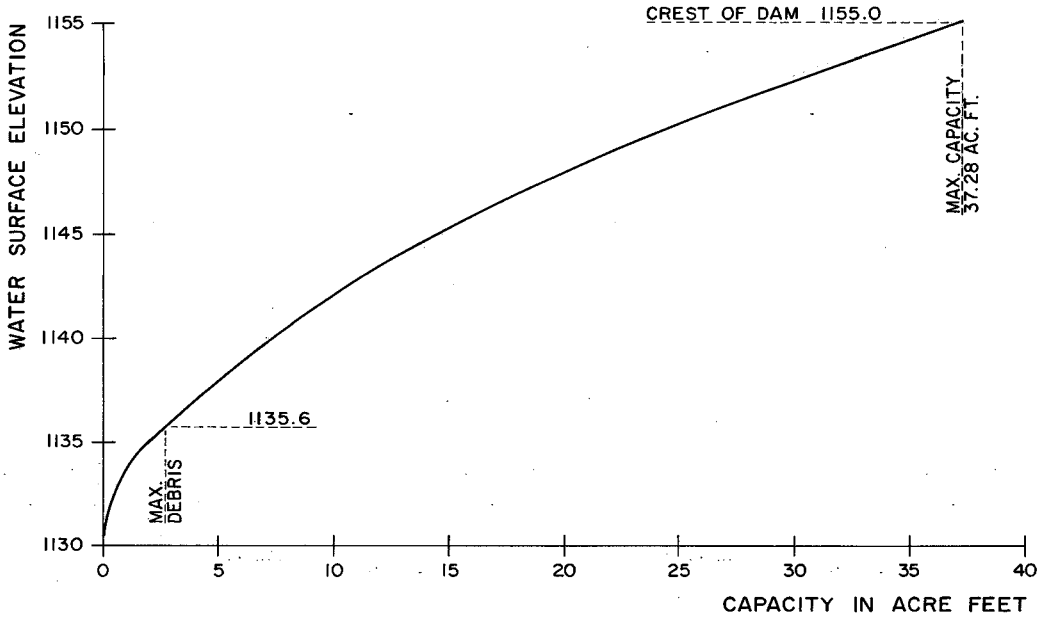
*** Theoretical Value from Scott and Williams (1978)- 10% of 50-Yr Design Debris Production

NA= Not Available / Not Applicable

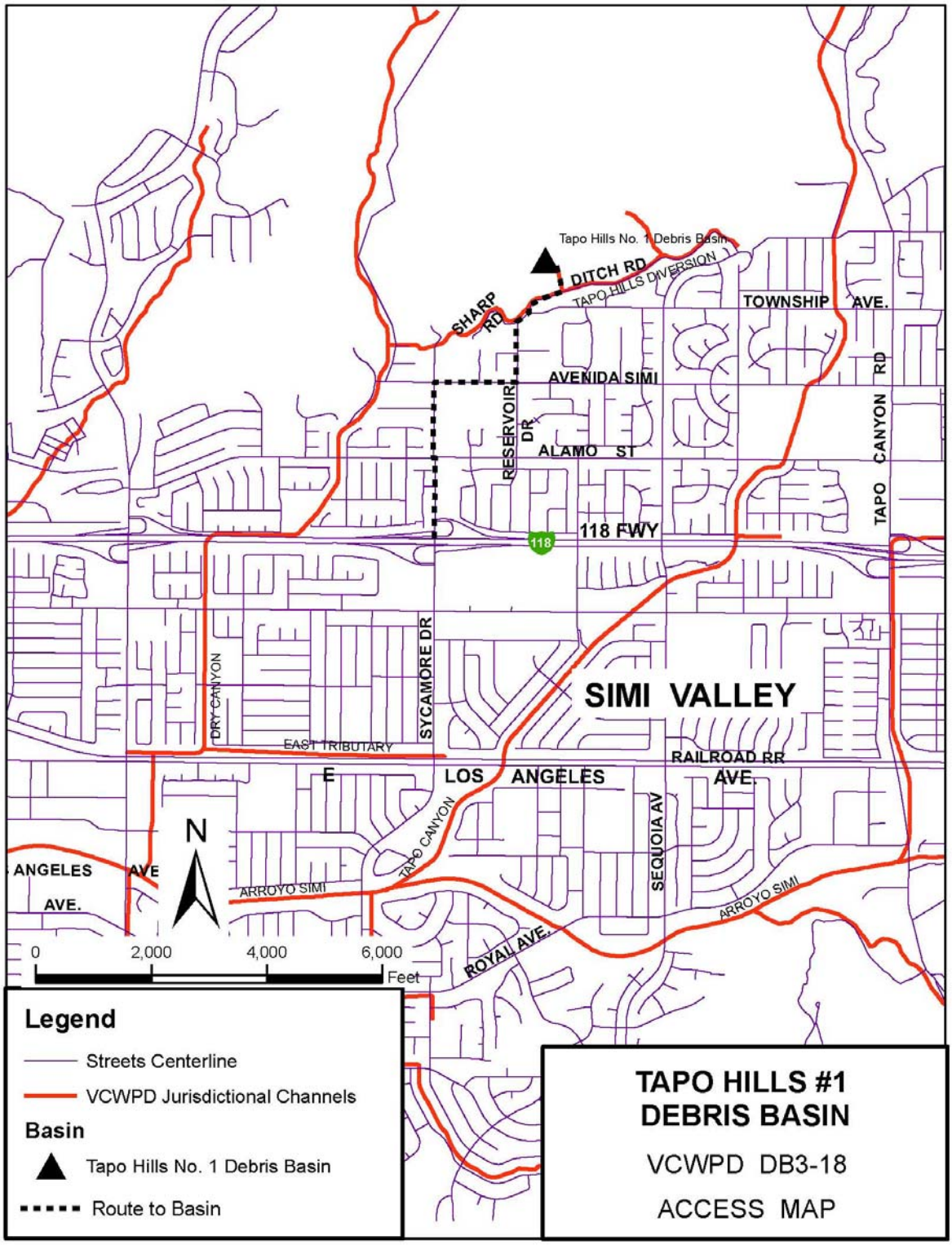

TAPO HILLS DIVERSION
DRY CANYON
N
0 345 690 1,380 2,070 2,760
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
TAPO HILLS # 1
DEBRIS BASIN
VCWPD DB 3-18
WATERSHED MAP



STAGE - DISCHARGE CURVE
WEST DAM



Tapo Hills Debris Basin No. 1


Tapo Hills No. 1 Debris Basin
DITCH RD
TAPO HILLS DIVERSION
SHARP RD
TOWNSHIP AVE.
AVENIDA SIMI
RESERVOIR DR
ALAMO ST
TAPO CANYON RD
118 FWY
118
SYCAMORE DR
DRY CANYON
SIMI VALLEY
EAST TRIBUTARY
RAILROAD RR
E LOS ANGELES AVE.
TAPO CANYON
SEQUOIA AV
ANGELES AVE
AVE.
ARROYO SIMI
ARROYO SIMI
ROYAL AVE.
N
0 2,000 4,000 6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Tapo Hills No. 1 Debris Basin
Route to Basin
TAPO HILLS #1
DEBRIS BASIN
VCWPD DB3-18
ACCESS MAP

TAPO HILLS NO. 2 DEBRIS BASIN DB3-19

LOCATION: Simi Valley, between Dry Canyon and Tapo Canyon
About 1200 ft north of Township Avenue.
N290,508, E1,779,514 (Lambert Zone 5 Coordinates)
Santa Susanna 7.5' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	25,200 cu.yds. (Y-3-1716) at 100-Yr Operating Water Surface of 1150.9 ft NGVD29
Maximum Debris Capacity	56,000 cu.yds. T-245 (dated 7-8-80)
100-Yr Inflow and Outflow Rates	IN:380 cfs; OUT: 79.7 cfs at 1,150 ft NGVD29
Debris Cleanout Elevation	1,140 ft (2,400 cy) [Max. debris capacity from as-builts]
EMERGENCY SPILLWAY	
Type	None
Invert Weir Elevation	NA
Spillway Length	NA
Capacity w/o Freeboard	NA
PRINCIPAL SPILLWAY	
Type	6 ft x 4 ft RC Tower 23 ft High with Flared Top and Sidewall Inlets Max. Capacity 210 cfs
Top Elevation	1,153 ft NGVD29
Outlet Conduit	36-in RCP
DEBRIS BLEEDER/RISER	
Type	36-in Perforated CMP
Top Elevation	1,140 ft NGVD29
Outlet Conduit	24-in CMP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	1,155 ft NGVD29
Length	240 ft
Surface Area of Full Basin	1.33 ac
Watershed Area	133 ac
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	VCWPD
Completion Date	1977
REFERENCE DRAWINGS	
Construction Drawings	Y-3-1713 thru Y-3-1726
Right-of-Way Drawings	Y-3-1715
Topographic Drawings	T-245 (7-8-80)

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	4,000 (1)	5,803
50-YEAR	3,049	4,422
25-YEAR	2,184	3,167

(1) Design debris capacity based on as-builts 2,400 cy

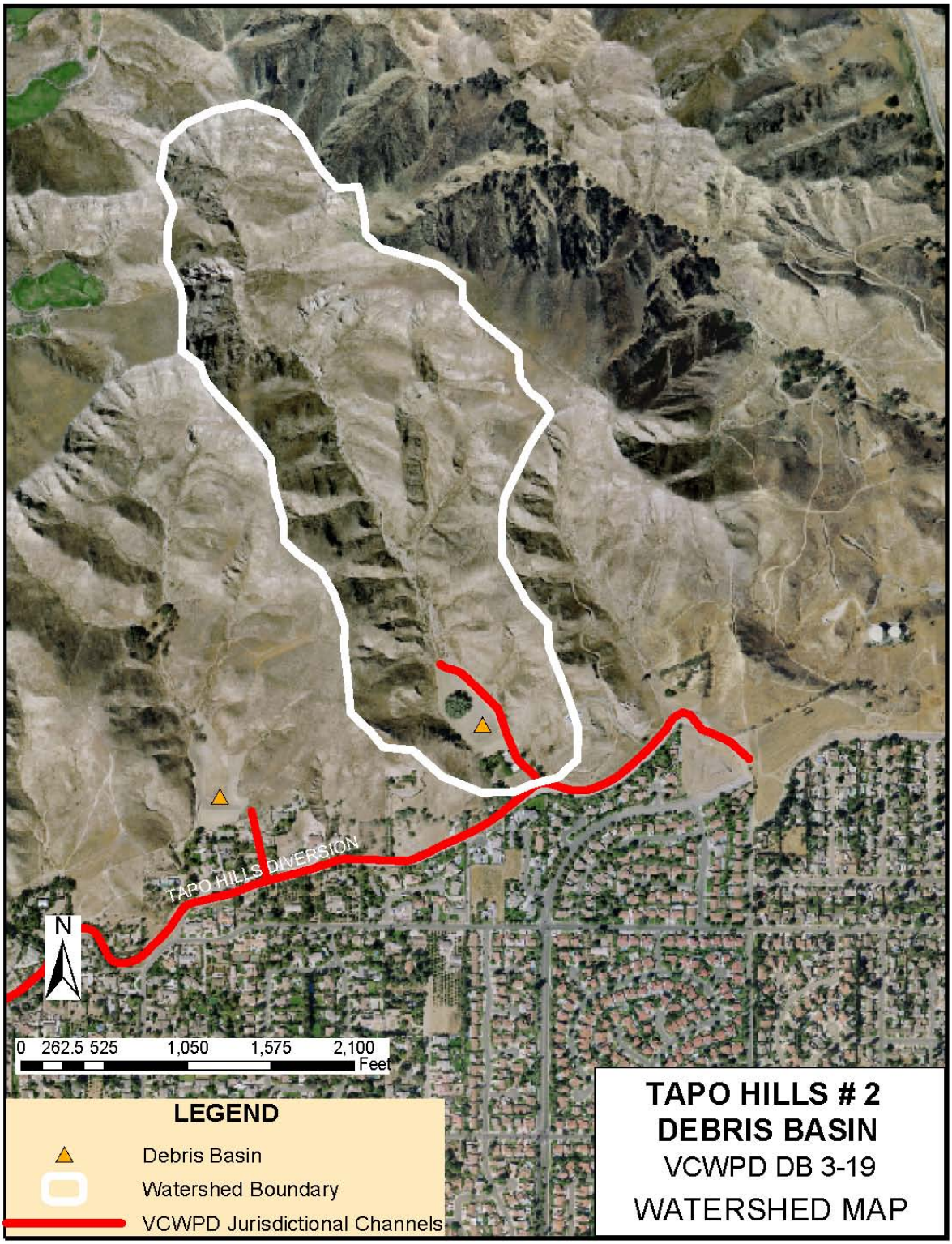
BASIN HISTORY: TAPO HILLS NO. 2 DEBRIS BASIN

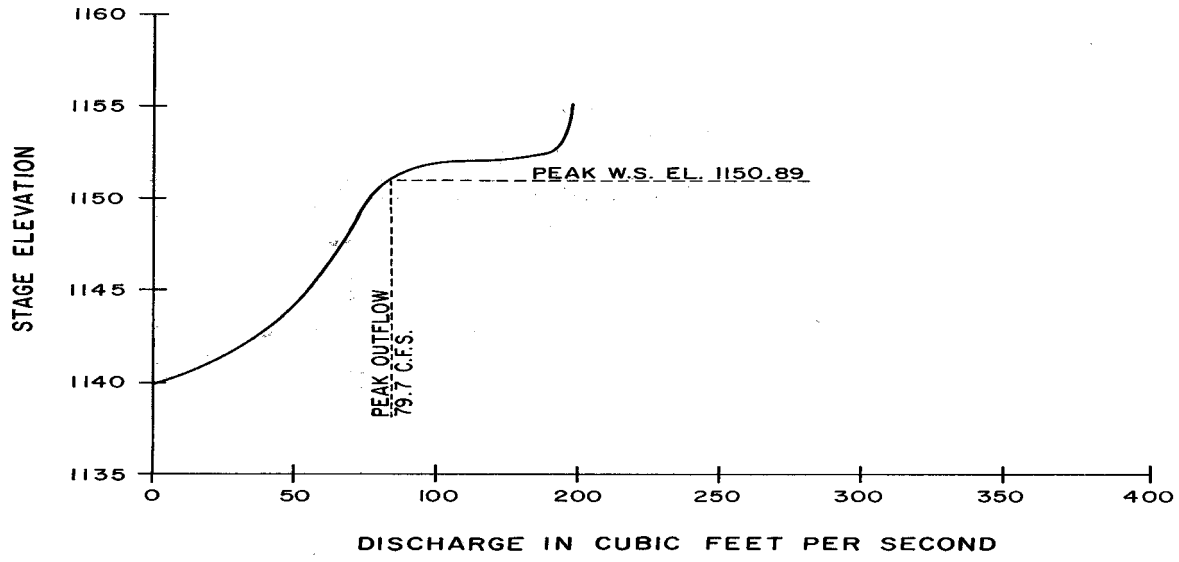
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
09-78	Construction	51,040		
06-80	Aerial Survey	44,580		
07-80	Aerial Survey	52,370		
11-85	Cleanout		6,500	
12-85	Aerial Survey	54,150		
08-91	Cleanout		4,262	
02-92	Disaster Declaration			
01-95	Disaster Declaration			
08-96	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			928
07-05	Cleanout		18,152	

Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

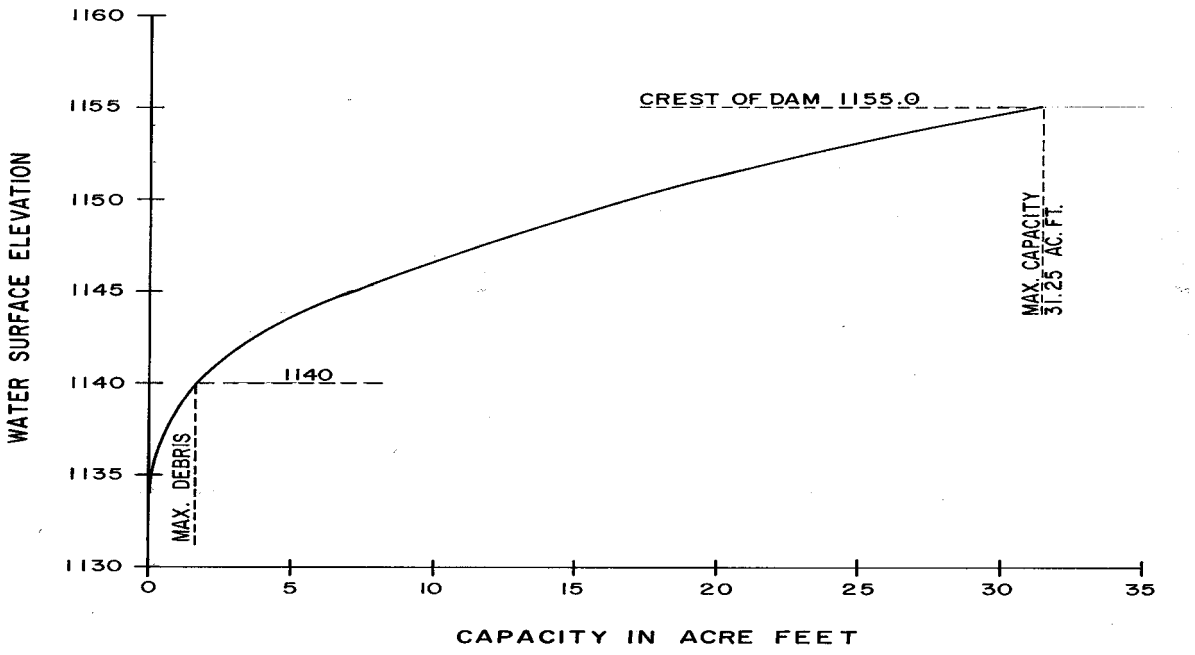
NA= Not Available / Not Applicable


TAPO HILLS DIVERSION
N
0 262.5 525 1,050 1,575 2,100
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
TAPO HILLS # 2
DEBRIS BASIN
VCWPD DB 3-19
WATERSHED MAP



STAGE-DISCHARGE CURVE

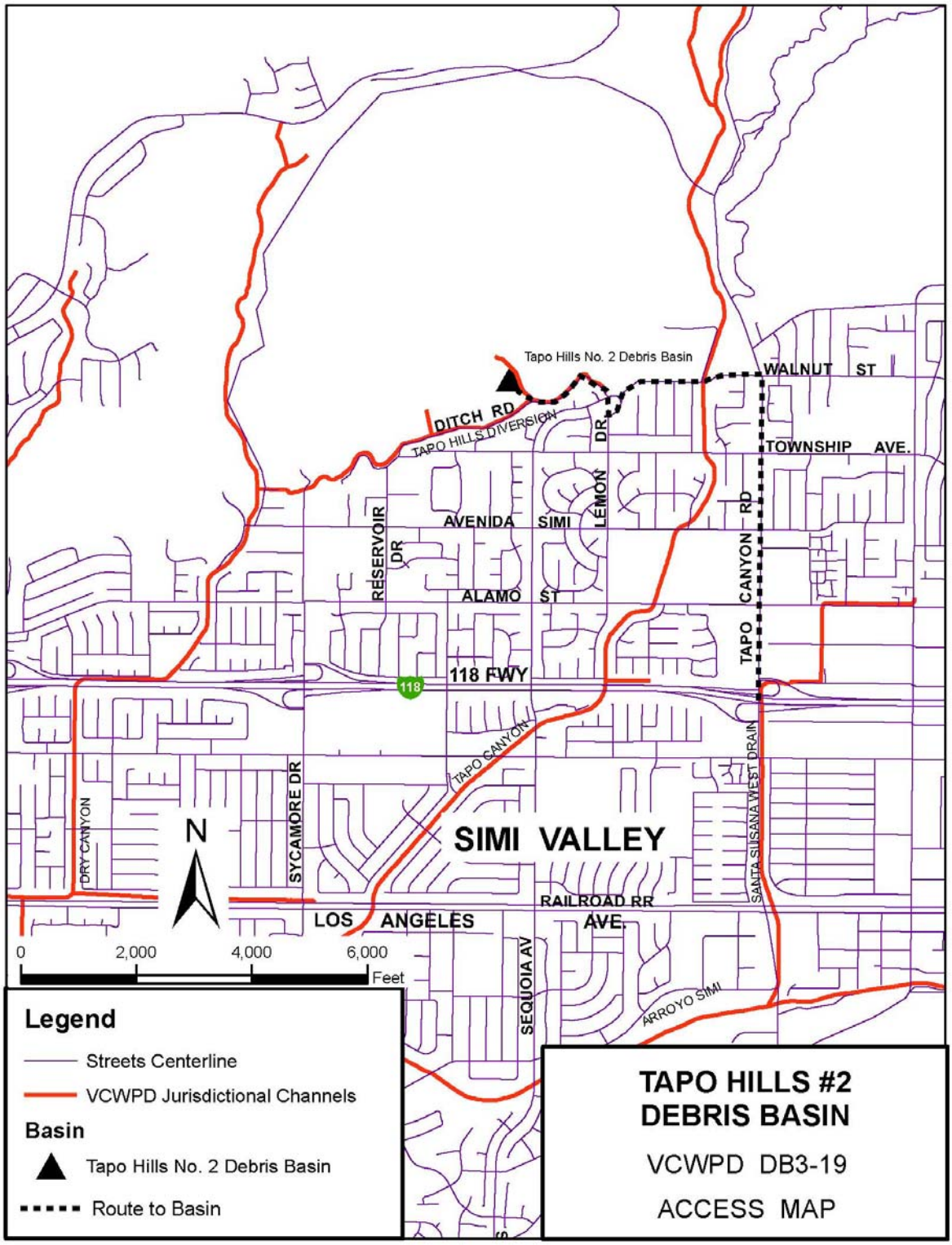
EAST DAM



RESERVOIR CAPACITY CURVE

EAST DAM

Tapo Hills Debris Basin No. 2


Tapo Hills No. 2 Debris Basin
WALNUT ST
DITCH RD
TAPO HILLS DIVERSION
DR
TOWNSHIP AVE.
AVENIDA SIMI
LEMON
RD
RESERVOIR DR
CANYON
ALAMO ST
TAPO
118 FWY
118
TAPO CANYON
SANTA SUSANA WEST DRAIN
SYCAMORE DR
DRY CANYON
N
SIMI VALLEY
RAILROAD RR
LOS ANGELES AVE.
0 2,000 4,000 6,000
Feet
SEQUOIA AV
ARROYO SIMI
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Tapo Hills No. 2 Debris Basin
Route to Basin
TAPO HILLS #2
DEBRIS BASIN
VCWPD DB3-19
ACCESS MAP

WEST CAMARILLO HILLS EAST BRANCH DEBRIS BASIN DB3-02

LOCATION: Camarillo, 4,000 ft north of Las Posas Road,
near end of Camarillo Drive behind nursery.
N 272,500, E 1,681,400(Lambert Zone 5 Coordinates);
Camarillo 7-1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	Soil Conservation Services
Level Capacity	1,840 cu.yds. (11-8-87 DTM)
Maximum Debris Capacity	4,800 cu.yds. (11-8-87 DTM)
100-Yr Inflow and Outflow Rates	IN=285 cfs (scaled from West Branch DB3-01); OUT=NA
Debris Cleanout Elevation	313 ft (360 cy) [25% of 100-yr debris yield]
EMERGENCY SPILLWAY	
Type	10 ft W X 1 ft H Grouted Trap Channel
Invert Elevation	324.5 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	NA
PRINCIPAL SPILLWAY	
Type	60 in CMP not functional due to landslide
Invert Elevation	318.10 ft NGVD29
Outlet Conduit	60 in CMP
DEBRIS BLEEDER/RISER	
Type	Vertical 36-in CMP 25 ft High
Top Elevation	316 ft NGVD29
Outlet Conduit	36-in RCP
DAM	
Dam Type	Earthfill
Dam Crest Elevation	324.5 ft NGVD29
Length	120 ft
Surface Area of Full Basin	0.5 ac
Watershed Area	92 ac
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	SCS
Completion Date	1955
REFERENCE DRAWINGS	
Construction Drawings	Y-3-7
Right-of-Way Drawings	10,169
Topographic Drawings	T-75-1-(11-12-70), 11-8-87 DTM, 10-16-89 DTM

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	1,432	2,077
50-YEAR	1,095	1,588
25-YEAR	618	897

BASIN HISTORY: WEST CAMARILLO HILLS EAST BRANCH DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
11-70	Aerial Survey	3,601		
05-71	Aerial Survey	3,351		
05-72	Aerial Survey	3,374		
05-73	Aerial Survey	2,544		
06-75	Cleanout		350	
06-75	Aerial Survey	2,967		
03-78	Disaster Declaration			
09-78	Cleanout		1,360	
09-78	Aerial Survey	2,110		
02-80	Disaster Declaration			
06-80	Aerial Survey	224		
08-80	Cleanout		2,554	310**
10-80	Cleanout		1,450	
10-80	Aerial Survey	3,198		
11-81	Aerial Survey	Not Digitized		
11-82	Aerial Survey	3,626		
03-83	Disaster Declaration			
04-83	Aerial Survey	2,735		
01-84	Cleanout		1,668	
01-84	Aerial Survey	4,353		
02-84	Aerial Survey	4,664		
12-85	Aerial Survey	4,524		
07-86	Aerial Survey	4,151		
09-86	Cleanout		420	
10-86	Aerial Survey	4,825		
11-87	Aerial Survey	4,770		
11-88	Aerial Survey	Not Digitized		
10-89	Aerial Survey	4,720		
09-90	Aerial Survey	Not Digitized		

BASIN HISTORY: WEST CAMARILLO HILLS EAST BRANCH DEBRIS BASIN

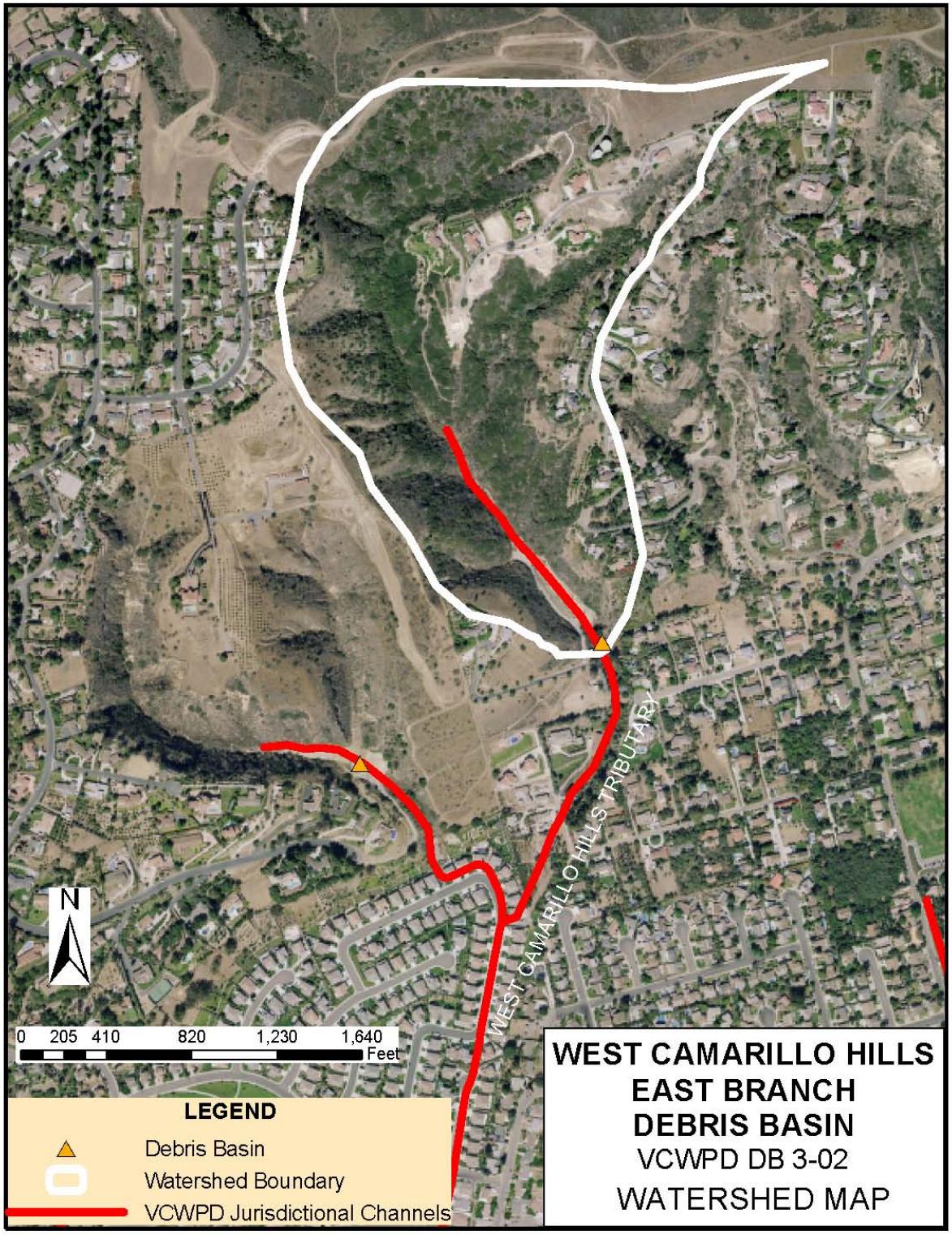
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
05-91	Aerial Survey			
06-91	Aerial Survey	4,388		
02-92	Disaster Declaration			183**
05-92	Aerial Survey	3,650		
12-92	Cleanout		1,150	
12-92	Aerial Survey	4,800		
07-93	Aerial Survey	4,590		
01-95	Disaster Declaration			179
08-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey	Not Digitized		
02-98	Disaster Declaration			136
07-98	Aerial Survey	1,900		
12-99	Aerial Survey	Digitized but not evaluated		
03-00	Aerial Survey	4,300		
08-01	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			83

Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

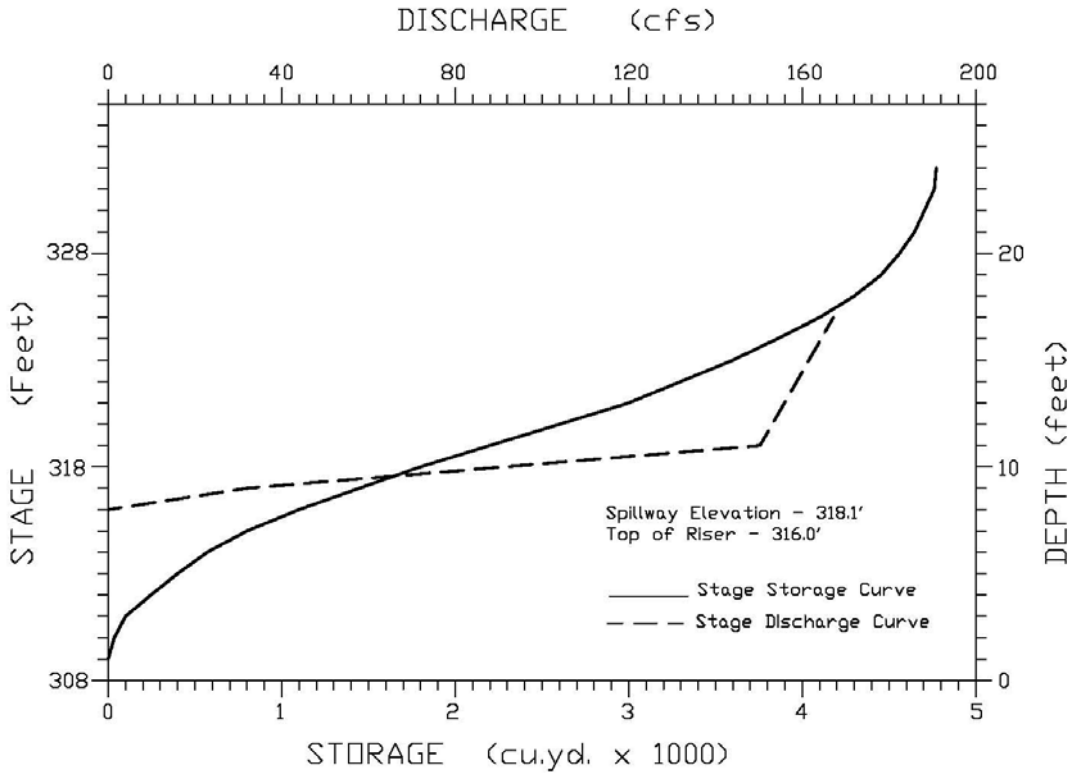
** FEMA Accepted Value for Disaster Declaration

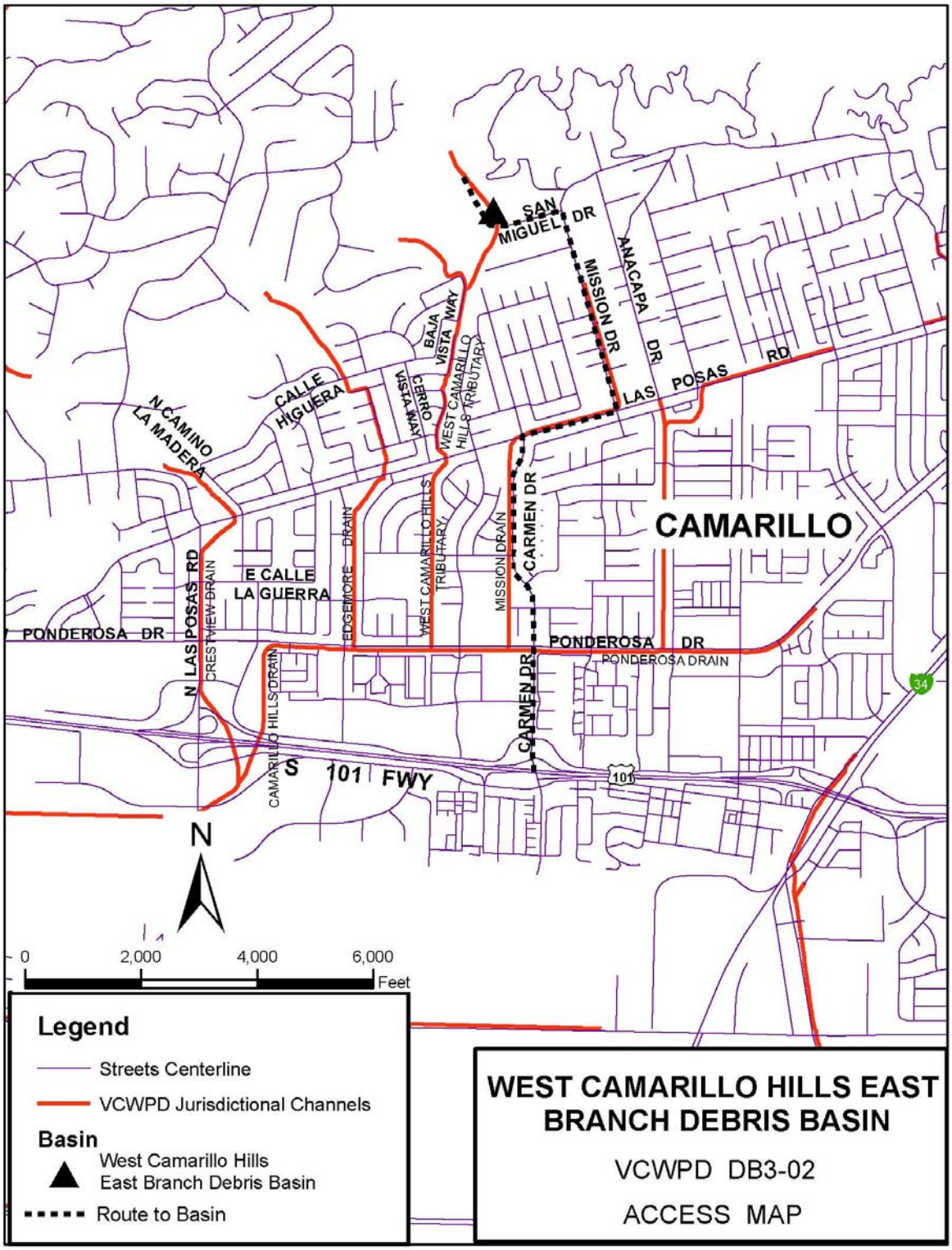
NA= Not Available / Not Applicable


WEST CAMARILLO HILLS TRIBUTARY
N
0 205 410 820 1,230 1,640
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
WEST CAMARILLO HILLS
EAST BRANCH
DEBRIS BASIN
VCWPD DB 3-02
WATERSHED MAP

WEST CAMARILLO HILLS

EAST BRANCH DEBRIS BASIN




SAN MIGUEL DR
MISSION DR
ANACAPA DR
LAS POSAS RD
BAJA VISTA WAY
CERRO VISTA WAY
WEST CAMARILLO HILLS TRIBUTARY
CALLE HIGUERA
N CAMINO LA MADERA
CAMARILLO
CARMEN DR
MISSION DRAIN
EDGEMORE DRAIN
E CALLE LA GUERRA
N LAS POSAS RD
CRESTVIEW DRAIN
PONDEROSA DR
PONDEROSA DRAIN
CAMARILLO HILLS DRAIN
S 101 FWY
101
34
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
West Camarillo Hills East Branch Debris Basin
Route to Basin
WEST CAMARILLO HILLS EAST BRANCH DEBRIS BASIN
VCWPD DB3-02
ACCESS MAP

WEST CAMARILLO HILLS WEST BRANCH DEBRIS BASIN DB3-01

LOCATION: Camarillo, approximately 500 ft from the end of Esteban Drive along equestrian trail.
N 271, 700, E 1,680,000 (Lambert Zone 5 Coordinates);
Camarillo 7-1/2' Quad.

DESIGN DATA	(Elevations NGVD29)
Design Agency	Soil Conservation Service
Level Capacity	5,250 cy (10-5-89 DTM); 5,300 (06-91 DTM)
Maximum Debris Capacity	21,500 cy (10-5-89 DTM); 22,500 (06-91 DTM)
100-Yr Inflow and Outflow Rates	IN=229 cfs from Pres. Cond. Calleguas Ck VCRAT Model; OUT=NA
Debris Cleanout Elevation	324 ft (4,000 cy) [provides 100-yr debris yield below emergency spillway]
EMERGENCY SPILLWAY	
Type	6 ft x 8 ft Drop Box Inlet and Rectangular RC Channel
Weir Elevation	325 ft NGVD29
Spillway Length	NA
Capacity w/o Freeboard	280 cfs
PRINCIPAL SPILLWAY	
Type	None
Weir Elevation	NA
Outlet Conduit	NA
DEBRIS BLEEDER/RISER	
Type	12-in Perforated CSP 22 ft High
Top Elevation	329 ft NGVD29
Outlet Conduit	10 in steel pipe
DAM	
Dam Type	Earthfill
Dam Crest Elevation	329 ft
Length	140 ft
Surface Area of Full Basin	1.6 ac
Watershed Area	74 ac from Quad Map
Width at Crest	NA
CONSTRUCTION DATA	
Construction Agency	Soil Conservation Service
Completion Date	1955; Spillway Modified 1986
REFERENCE DRAWINGS	
Construction Drawings	Y-3-1031; Y-3-1049; Y-3-2627 to -2630
Right-of-Way Drawings	16372
Topographic Drawings	T-75-2 (11-12-70), T-254 (10-22-80); 11-8-87 DTM 10-5-89 DTM

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	1,268	1,839
50-YEAR	970	1,406
25-YEAR	547	794

BASIN HISTORY: WEST CAMARILLO HILLS WEST BRANCH DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
11-70	Aerial Survey	17,465		
05-71	Aerial Survey	17,150		
05-72	Aerial Survey	15,818		
05-73	Aerial Survey	13,799		
06-75	Aerial Survey	11,823		
12-77	Aerial Survey	10,103		
01-78	Aerial Survey	Not Digitized		
03-78	Disaster Declaration			
06-78	Aerial Survey	9,291		
09-79	Aerial Survey	8,293		
09-79	Cleanout		1,850	
02-80	Disaster Declaration			
06-80	Aerial Survey	1,496		
10-80	Cleanout		12,790	1,103**
10-80	Aerial Survey	15,925		
11-81	Aerial Survey	Not Digitized		
11-82	Aerial Survey	9,620		
03-83	Disaster Declaration			
04-83	Aerial Survey	5,470		
12-83	Cleanout		15,900	
12-83	Aerial Survey	21,349		
07-85	Cleanout		1,018	
12-85	Aerial Survey	17,044		
07-86	Aerial Survey	17,013		
10-86	Cleanout		3,500	
10-86	Aerial Survey	20,530		
11-87	Aerial Survey	21,241		
11-88	Aerial Survey	Not Digitized		
10-89	Aerial Survey	21,519		1,770

BASIN HISTORY: WEST CAMARILLO HILLS WEST BRANCH DEBRIS BASIN

DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
06-91	Aerial Survey	22,504		
02-92	Disaster Declaration			1,384
05-92	Aerial Survey	18,475		
10-92	Cleanout		3,025	
10-92	Aerial Survey	21,500		
01-95	Disaster Declaration			1,048
08-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey			
02-98	Disaster Declaration			702
07-98	Aerial Survey	14,350		
03-99	Aerial Survey	Not Digitized		
06-99	Cleanout		6,875	
06-99	Aerial Survey	21,225		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			

Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

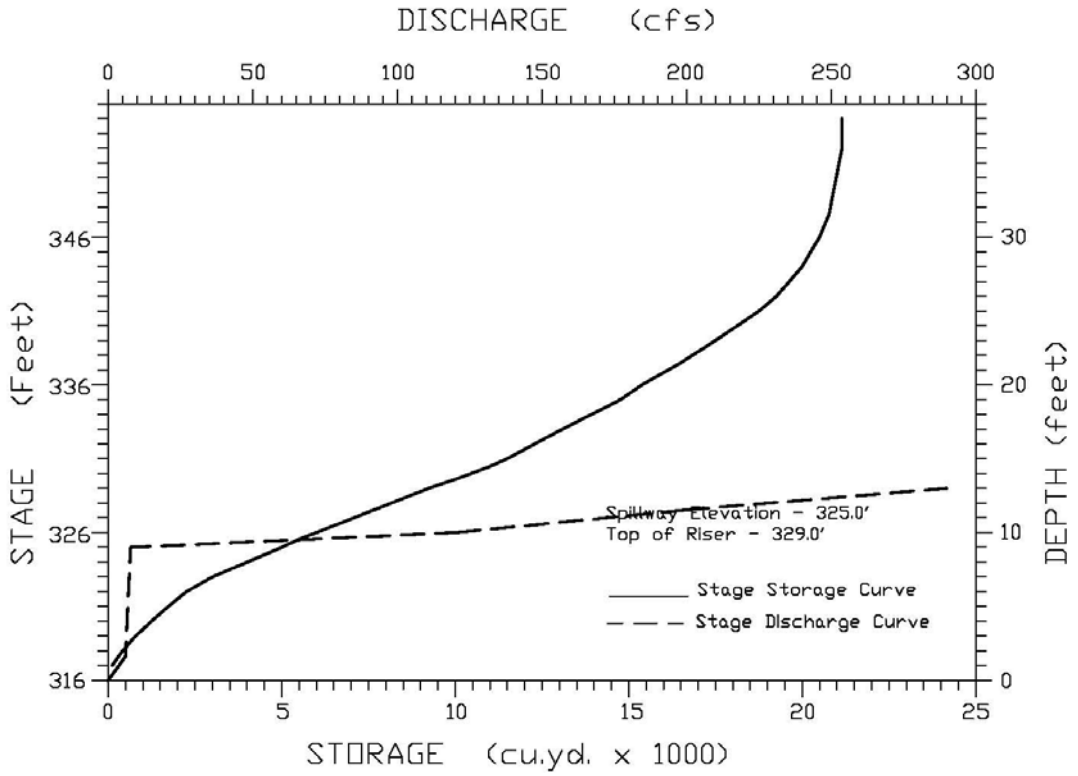
** FEMA Accepted Value for Disaster Declaration

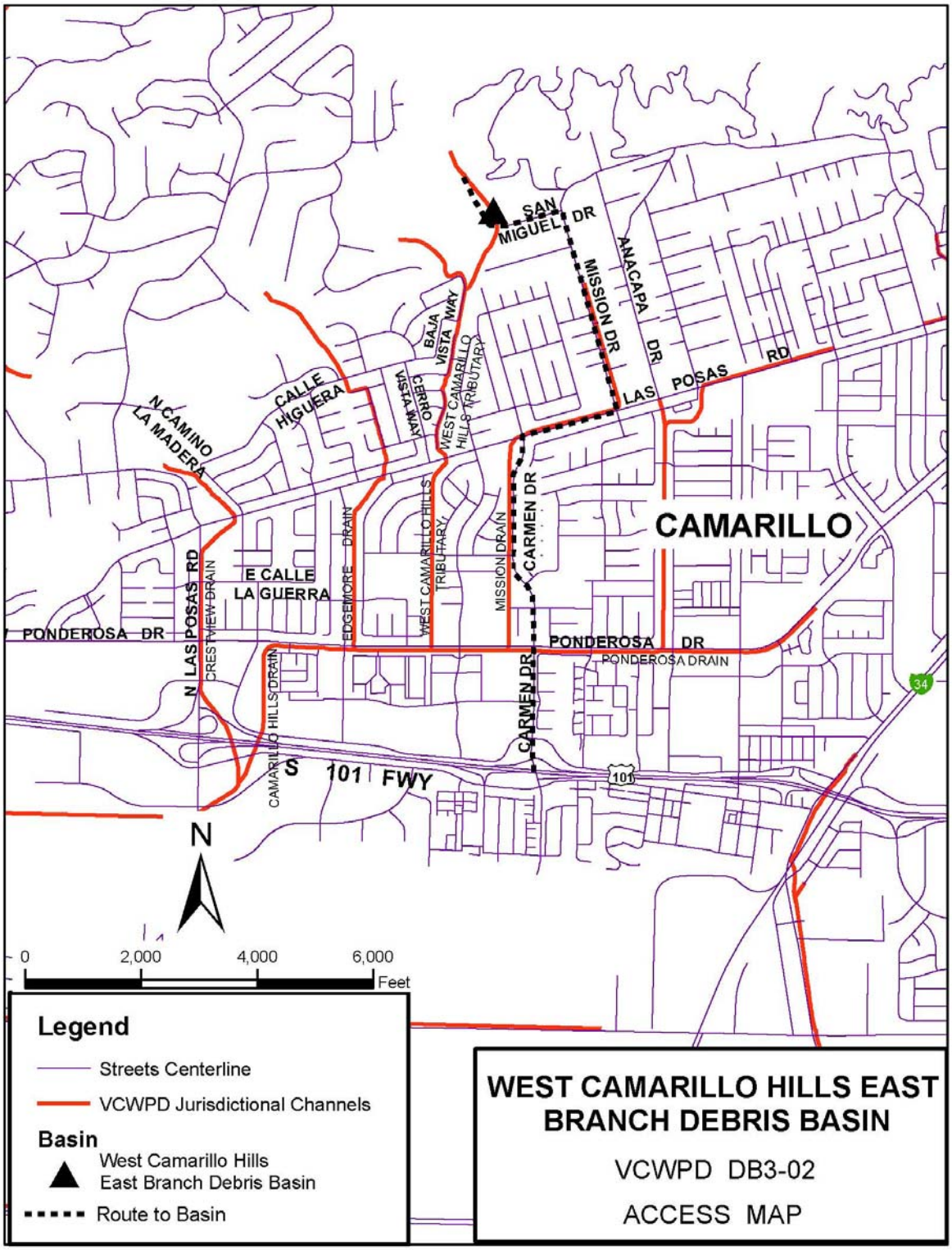
NA= Not Available / Not Applicable


WEST CAMARILLO HILLS TRIBUTARY
N
0 225 450 900 1,350 1,800
Feet
LEGEND
Debris Basin
Watershed Boundary
VCWPD Jurisdictional Channels
WEST CAMARILLO HILLS
WEST BRANCH
DEBRIS BASIN
VCWPD DB 3-01
WATERSHED MAP

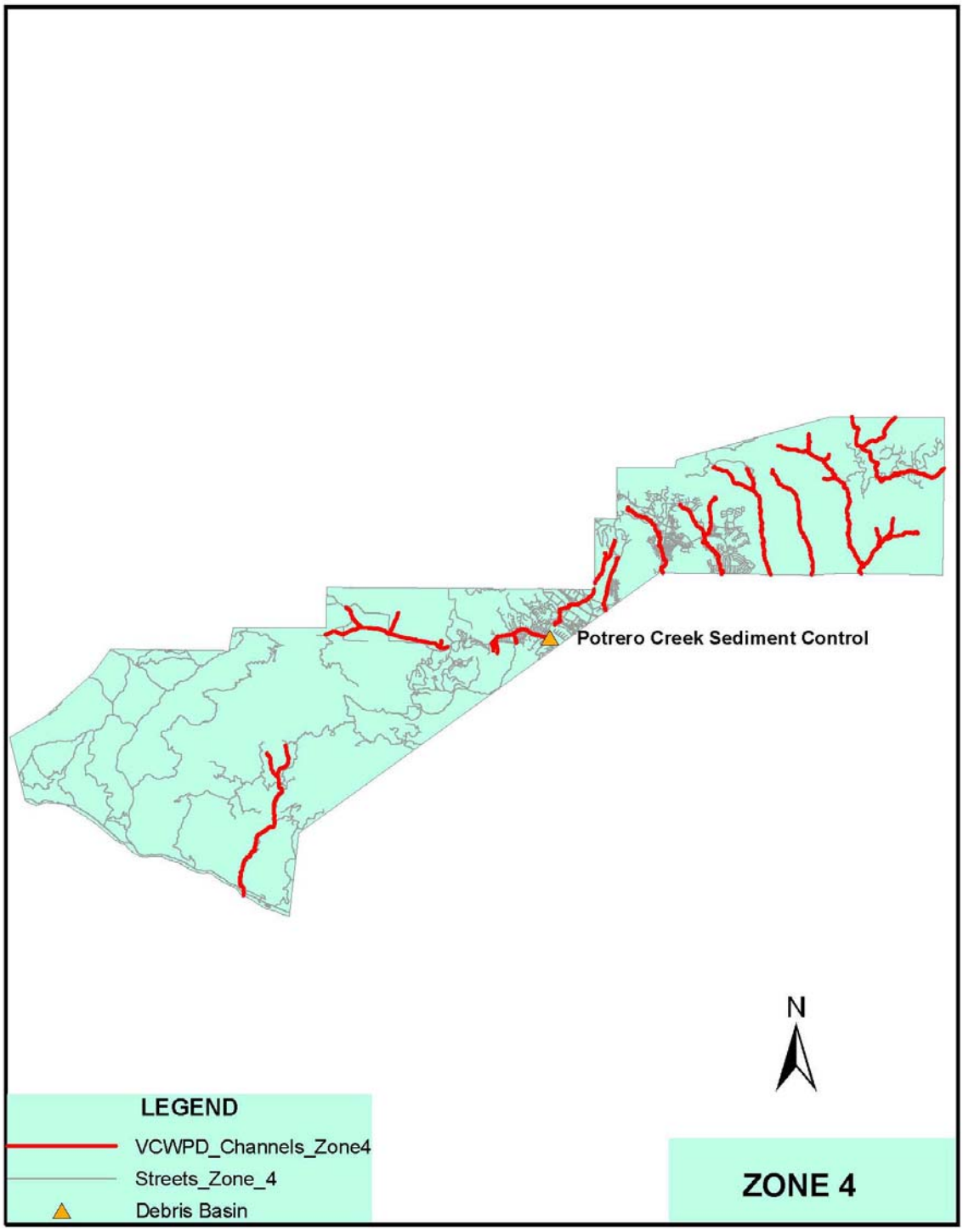
WEST CAMARILLO HILLS

WEST BRANCH DEBRIS BASIN




SAN MIGUEL DR
MISSION DR
ANACAPA DR
LAS POSAS RD
BAJA VISTA WAY
CERRO VISTA WAY
WEST CAMARILLO HILLS TRIBUTARY
CALLE HIGUERA
N CAMINO LA MADERA
CARMEN DR
CAMARILLO
MISSION DRAIN
E CALLE LA GUERRA
EDGEMORE DRAIN
N LAS POSAS RD
CRESTVIEW DRAIN
PONDEROSA DR
PONDEROSA DRAIN
CAMARILLO HILLS DRAIN
S 101 FWY
101
34
N
0
2,000
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
West Camarillo Hills East Branch Debris Basin
Route to Basin
WEST CAMARILLO HILLS EAST BRANCH DEBRIS BASIN
VCWPD DB3-02
ACCESS MAP

Zone 4 Basins



POTRERO CREEK SEDIMENT CONTROL DB4-01

LOCATION: Triunfo Canyon Rd. bridge on Potrero Creek, Thousand Oaks,
N:1,876,229.36 E:6,309,164.75 (CA Lambert Zone 5 Coordinates)

DESIGN DATA	(Elevations NGVD29)
Design Agency	VCWPD
Level Capacity	NA
100-Yr Inflow and Outflow Rates	10,340 cfs
INSTREAM BASIN	1,170 ft long, 40 ft bottom width with 2:1 H:V rip-rap sideslopes, 4 ft below existing channel invert
Spillway	Concrete Weir at Elev. 874.5 ft NGVD29
Length of Weir	80 ft
Instream Basin Bleeders	24-in Perforated CSPs (3), top elev. 875 ft NGVD29
Surface Area of Full Basin	1.7 ac
Maximum Debris Volume	11,245 cy at 874.5 ft NGVD29
Debris Cleanout Elevation	XXX ft (1,125 cy) [10% of maximum debris volume]
UNDERWATER DIKE	
Dam Type	420 ft long rip-rap covered berm with crest elevation 869 ft NGVD29
Spillway	Broadcrested Earthen Weir 50 ft wide, 200 ft long at 865 ft
Maximum Debris Volume	5,628 cy at elev. 865 ft NGVD29
Debris Cleanout Elevation	XXX ft (565 cy) [10% of maximum debris volume]
Surface Area of Full Basin	Approx. 1 ac
Watershed Area	1,541 ac downstream of Lake Sherwood
CONSTRUCTION DATA	
Construction Agency	VCWPD
Completion Date	January, 2002
REFERENCE DRAWINGS	
Construction Drawings	Y4-49 – Y4-59
Topographic Drwgs	T-489-06.08,09,10
Right-of-Way Drawings	Y4-59

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	**Design Condition**	**100% Burn**
100-YEAR	10,340	NA
50-YEAR	7,586	NA
10-YEAR	2,790	NA

BASIN HISTORY: POTRERO CREEK SEDIMENT CONTROL/INSTREAM BASIN

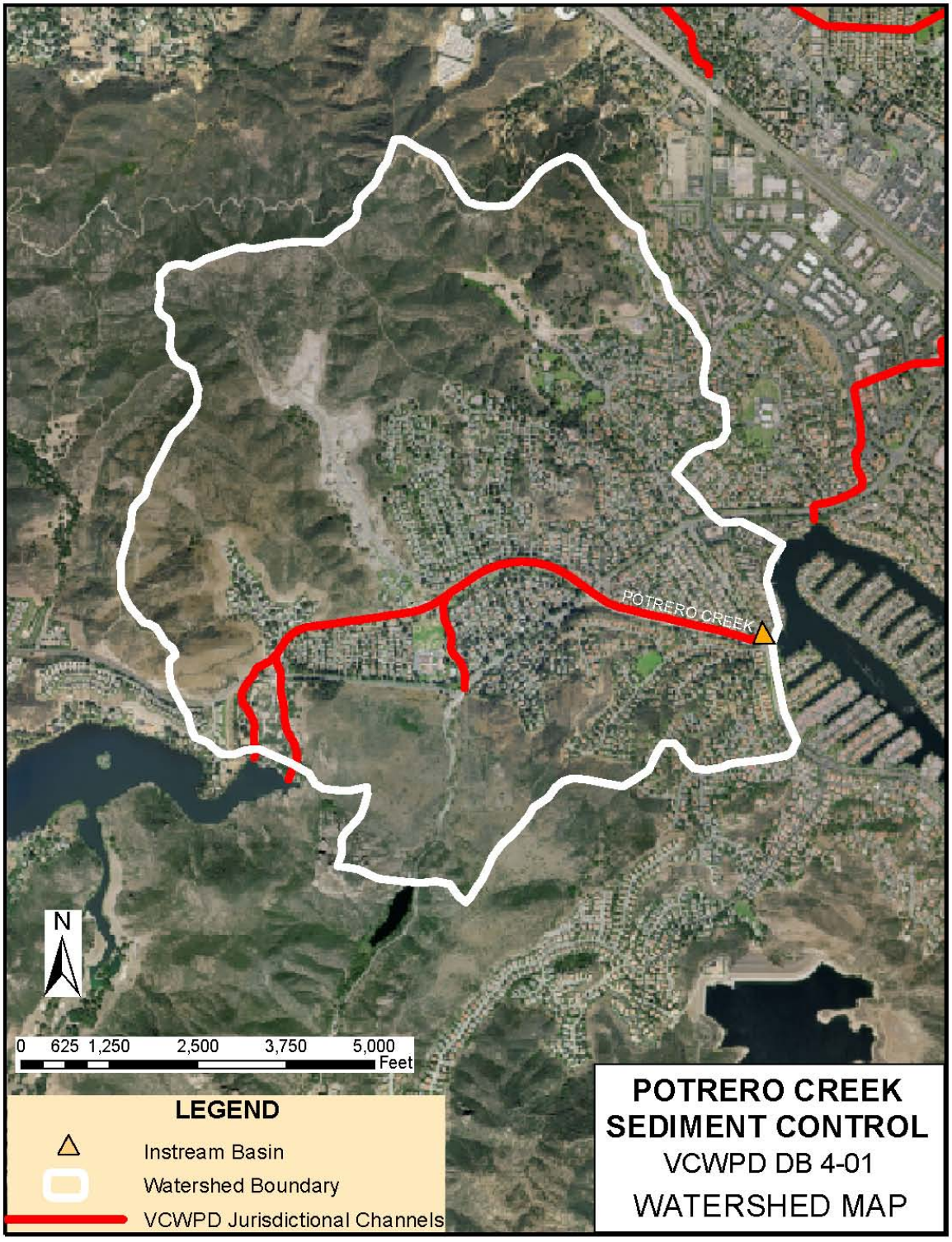
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
	None			760***

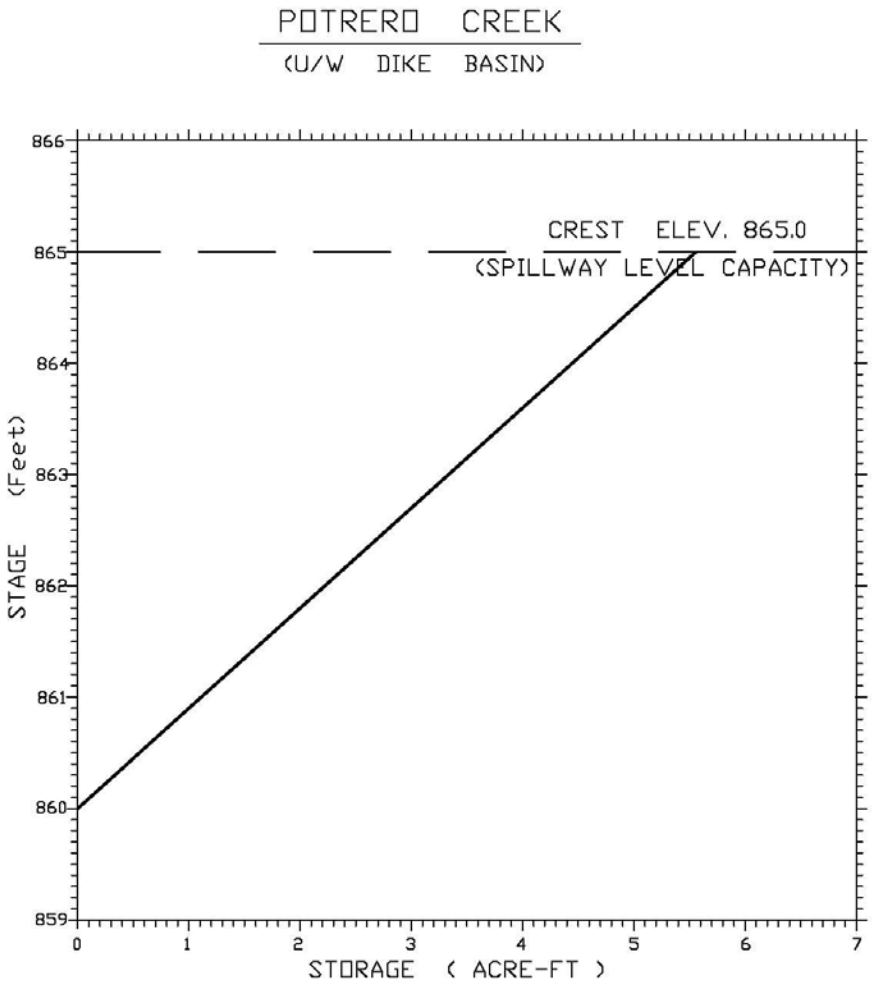
Notes

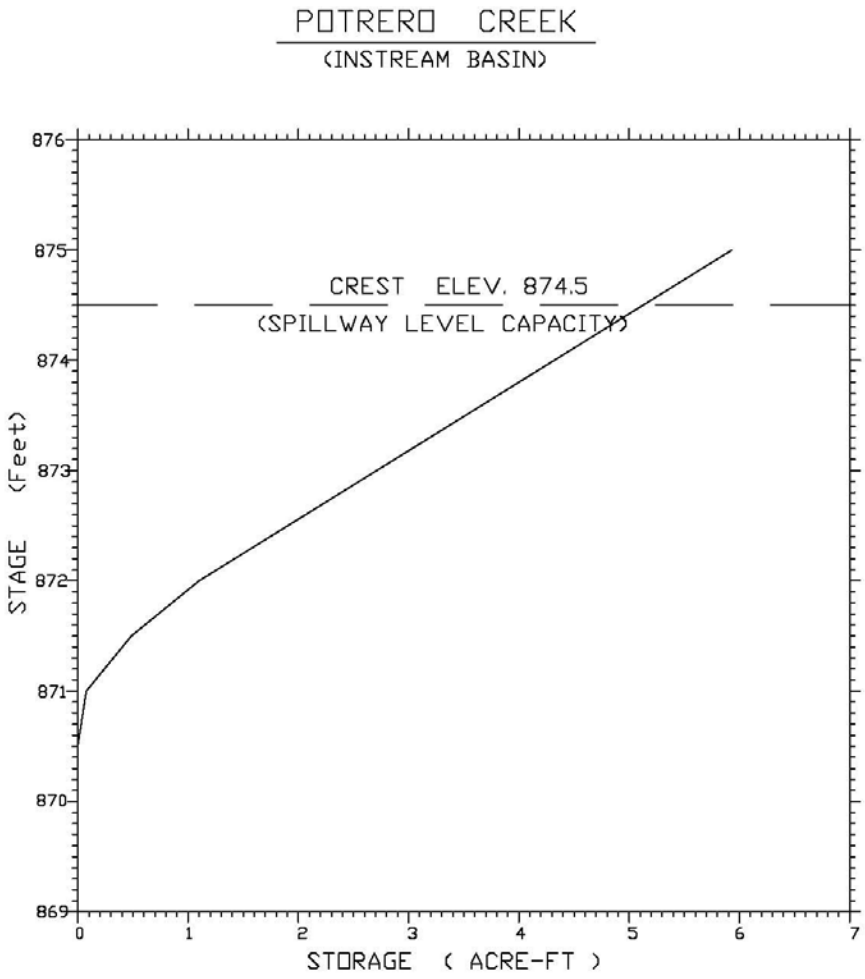
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

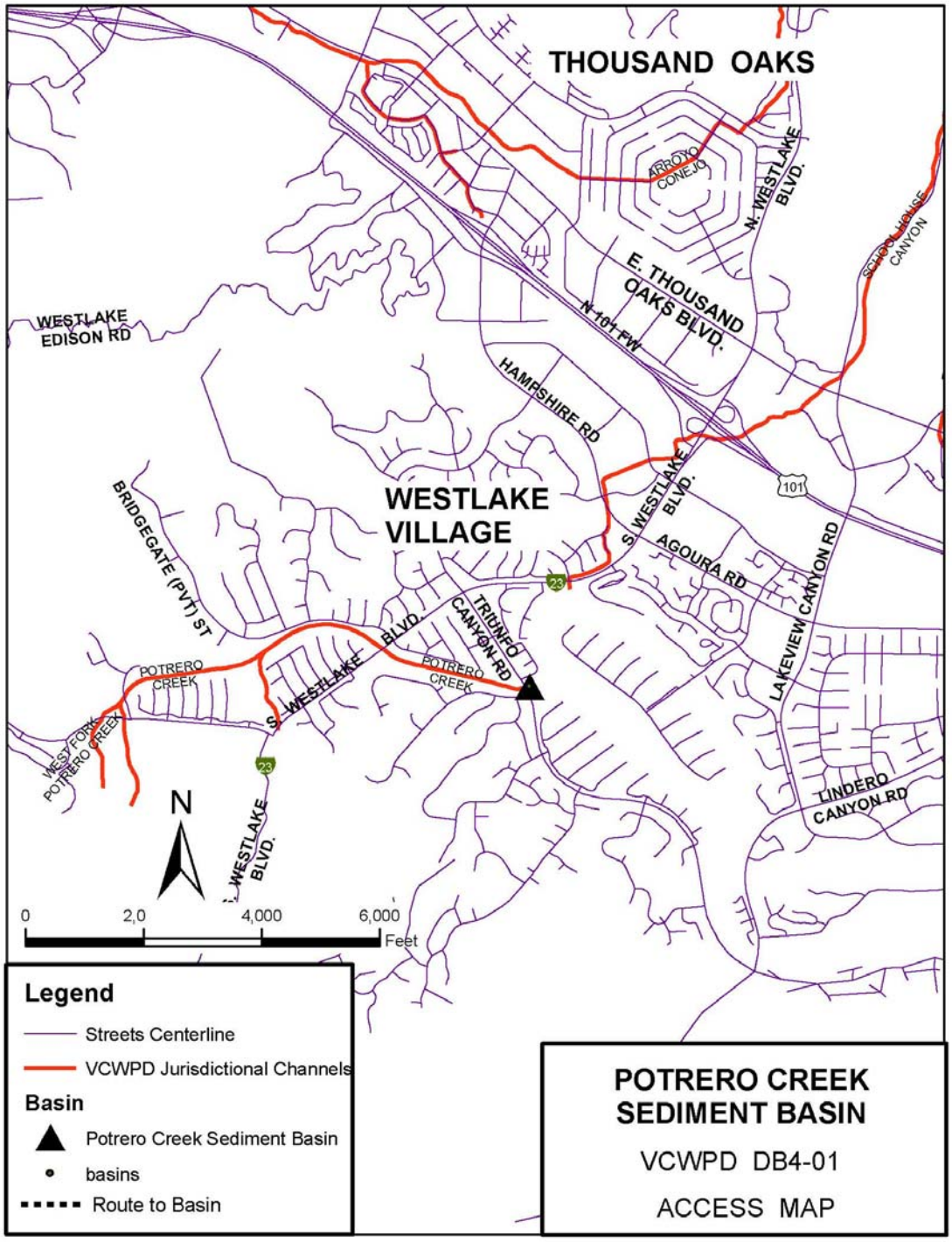
*** Theoretical Value from Scott and Williams (1978); 10% of 50-yr debris yield

NA= Not Available / Not Applicable


POTRERO CREEK
N
0 625 1,250 2,500 3,750 5,000
Feet
LEGEND
Instream Basin
Watershed Boundary
VCWPD Jurisdictional Channels
POTRERO CREEK
SEDIMENT CONTROL
VCWPD DB 4-01
WATERSHED MAP


POTRERO CREEK
(U/W DIKE BASIN)
CREST ELEV. 865.0
(SPILLWAY LEVEL CAPACITY)
STAGE (Feet)
866
865
864
863
862
861
860
859
0
1
2
3
4
5
6
7
STORAGE (ACRE-FT)


POTRERO CREEK
(INSTREAM BASIN)
CREST ELEV. 874.5
(SPILLWAY LEVEL CAPACITY)
STAGE (Feet)
876
875
874
873
872
871
870
869
0
1
2
3
4
5
6
7
STORAGE (ACRE-FT)


THOUSAND OAKS
ARROYO CONEJO
N. WESTLAKE BLVD.
SCHOOL HOUSE CANYON
E. THOUSAND OAKS BLVD.
N 101 FW
WESTLAKE EDISON RD
HAMPSHIRE RD
WESTLAKE VILLAGE
S. WESTLAKE BLVD.
101
AGOURA RD
LAKEVIEW CANYON RD
BRIDGEGATE (PVT) ST
TRIUNFO CANYON RD
POTRERO CREEK
WEST FORK POTRERO CREEK
LINDERO CANYON RD
N
0
2,0
4,000
6,000
Feet
Legend
Streets Centerline
VCWPD Jurisdictional Channels
Basin
Potrero Creek Sediment Basin
basins
Route to Basin
POTRERO CREEK SEDIMENT BASIN
VCWPD DB4-01
ACCESS MAP

APPENDIX A – Channel Debris Removal Data

Calleguas Creek from Highway 1 to Hueneme Road

CHANNEL HISTORY:

Time Period	Actual Reported Sediment Removal (cy)	Sediment Removal Adjusted for Breakout Flow (cy)	Source
9/69 to 12/69	419,800	419,800	West, 1998
7/75 to 10/75	205,000	205,000	West, 1998
8/78 to 4/79	683,958	683,958	West, 1998
10/80 to 1/81	304,977	506,600	West, 1998
10/83 to 2/84	272,653	854,400	West, 1998
11/88 to 3/89	194,875	194,875	West, 1998
11/92 to 6/93	171,270	171,270	Contractor Invoice, 6/93
11/95 to 5/96	438,997	438,997	West, 1998
2/99 to 6/99	299,800	Not Applicable	Pay Estimate to Calex Eng 6/99

Notes: West Consultants, Inc., 1998. Sediment Transport Modeling of Calleguas Creek and Arroyo Las Posas, Table 4.

Pole Creek (City of Fillmore)

CHANNEL HISTORY: Debris Removal Quantities (cy)

Calendar Year	Reach 43202 (Lined Section to Highway 126)	Reach 43201 (Santa Clara River to Lined Section)	Total
2002	40	0	40
2001	3,500	3,500	7,000
2000	55	0	55
1999	364	0	364
1998	0	40,000	40,000
1997	0	0	0
1996	0	0	0
1995	100,000	40,000	140,000
1994	0	0	0
1993	0	0	0
1992	0	22,000	22,000

Dry Canyon (City of Simi Valley)

CHANNEL HISTORY: Debris Removal Quantities (cy)

Calendar Year	Channel 47386 Avenida Simi to Tapo Hills Diversion	Channel 47387 Upstream of Tapo Hills Diversion	Total
2003	432	0	3,932
2002	0	0	0
2001	1,112	0	1,112
2000	315	0	315
1999	0	0	0
1998	904	0	904
1997	0	0	0
1996	0	0	0
1995	1,243	392	1,635
1994	0	0	0
1993	0	0	0

North Simi Drain (City of Simi Valley)

CHANNEL HISTORY: Debris Removal Quantities (cy)

Calendar Year	Reach 47345 Caldwell St to HWY 118
2003	1,056
2002	2,072
2001	1,830
2000	294
1999	0
1998	4,328
1997	272
1996	0
1995	3,047
1994	0
1993	2,664

Tapo Canyon (City of Simi Valley)

CHANNEL HISTORY: Debris Removal Quantities (cy)

Calendar Year	Reach 47423 Cochran to Avenida Simi	Reach 47424 Avenida Simi to Walnut	Reach 47425 Upstream of Walnut	Total
2003	0	0	0	0
2002	0	0	0	0
2001	0	0	0	0
2000	44	292	0	336
1999	248	136	0	384
1998	2,184	5,528	0	7,712
1997	0	0	0	0
1996	136	1,008	32	1,176
1995	1,342	1,369	379	3,087
1994	216	776	0	992
1993	539	3,309	320	4,168

APPENDIX B – State-Size Dam Emergency Procedures

1. DIVISION OF SAFETY OF DAMS.
   EMERGENCY PROCEDURES FOR DAMS:
   - MATILIJA DAM
   - RUNKLE DAM
   - LAS LLAJAS DAM
   - SYCAMORE CANYON DAM
   - FERRO DEBRIS DAM
   - STEWART CANYON DB DAM
   - ARUNDELL BARRANCA DAM
   - LANG CREEK DETENTION BASIN DAM

STATE OF CALIFORNIA -- THE RESOURCES AGENCY
ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF WATER RESOURCES
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SACRAMENTO, CA 942360001
(916) 653-5791

RECEIVED
JUN 0 1 2005
WATERSHED PROTECTION DIST.

DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

MATILIJA DAM, NO. 86
VENTURA COUNTY

Section 6101 of Division 3 of the California Water Code requires owners of dams or reservoirs or their agents to advise the Department of Water Resources fully and promptly of any sudden or unprecedented flood or unusual or alarming circumstance or occurrence affecting the dam or reservoir.

In the event of an emergency involving your dam or reservoir (in addition to notifying local authorities) please notify the following:

1. **During Working Hours:**

   Frederick J. Sage
   Field Engineering Branch Chief
   Division of Safety of Dams
   2200 "X" Street, Suite 200
   Sacramento, CA 95818
   (916) 227-4667

2. **After Working Hours and on Weekends and Holidays:**

   Area 9 Engineer:

   Rick Draeger
   (209) 748-5606

   If the engineer is not reachable, contact:

   Southern Regional Engineer:

   Mutaz Mihyar
   (916) 961-2440
   Pager (916) 948-0313
   Cell (916) 799-3055

3. If neither the Area Engineer nor the Regional Engineer can be reached, please call the **Governor's Office of Emergency Services Warning Center at (916) 845-8911.**

   THIS NOTICE MUST BE KEPT IN A CONVENIENT PLACE (Preferably near the telephone to be used in case of emergency at or near the dam site).

Revised 5/10/2005

STATE OF CALIFORNIA -- THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 942360001
(916) 653-5791

DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

RUNKLE DAM, NO. 86-3
VENTURA COUNTY

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In the event of an emergency involving your dam or reservoir (in addition to notifying local authorities) please notify the following:

1. **During Working Hours:**

   Frederick J. Sage
   Field Engineering Branch Chief
   Division of Safety of Dams
   2200 "X" Street, Suite 200
   Sacramento, CA 95818
   (916) 227-4667

2. **After Working Hours and on Weekends and Holidays:**

   Area 9 Engineer:

   Rick Draeger
   (209) 748-5606

   If the engineer is not reachable, contact:

   Southern Regional Engineer:

   Mutaz Mihyar
   (916) 961-2440
   Pager (916) 948-0313
   Cell (916) 799-3055

3. If neither the Area Engineer nor the Regional Engineer can be reached, please call the **Governor's Office of Emergency Services Warning Center at (916) 845-8911.**

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Revised 5/10/2005

STATE OF CALIFORNIA -- THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

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1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 942360001
(916) 653-5791

DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

LAS LLAJAS DAM, NO. 86-5
VENTURA COUNTY

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   Division of Safety of Dams
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   Sacramento, CA 95818
   (916) 227-4667

2. **After Working Hours and on Weekends and Holidays:**

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   (209) 748-5606

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   Southern Regional Engineer:

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   Pager (916) 948-0313
   Cell (916) 799-3055

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Revised 5/10/2005

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ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 942360001
(916) 653-5791

DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

SYCAMORE CANYON DAM, NO. 86-6
VENTURA COUNTY

Section 6101 of Division 3 of the California Water Code requires owners of dams or reservoirs or their agents to advise the Department of Water Resources fully and promptly of any sudden or unprecedented flood or unusual or alarming circumstance or occurrence affecting the dam or reservoir.

In the event of an emergency involving your dam or reservoir (in addition to notifying local authorities) please notify the following:

1. **During Working Hours:**

   Frederick J. Sage
   Field Engineering Branch Chief
   Division of Safety of Dams
   2200 "X" Street, Suite 200
   Sacramento, CA 95818
   (916) 227-4667

2. **After Working Hours and on Weekends and Holidays:**

   Area 9 Engineer:

   Rick Draeger
   (209) 748-5606

   If the engineer is not reachable, contact:

   Southern Regional Engineer:

   Mutaz Mihyar
   (916) 961-2440
   Pager (916) 948-0313
   Cell (916) 799-3055

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Revised 5/10/2005

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1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 942360001
(916) 653-5791

DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

FERRO DEBRIS DAM, NO. 86-8
VENTURA COUNTY

Section 6101 of Division 3 of the California Water Code requires owners of dams or reservoirs or their agents to advise the Department of Water Resources fully and promptly of any sudden or unprecedented flood or unusual or alarming circumstance or occurrence affecting the dam or reservoir.

In the event of an emergency involving your dam or reservoir (in addition to notifying local authorities) please notify the following:

1. **During Working Hours:**

   Frederick J. Sage
   Field Engineering Branch Chief
   Division of Safety of Dams
   2200 "X" Street, Suite 200
   Sacramento, CA 95818
   (916) 227-4667

2. **After Working Hours and on Weekends and Holidays:**

   Area 9 Engineer:

   Rick Draeger
   (209) 748-5606

   If the engineer is not reachable, contact:

   Southern Regional Engineer:

   Mutaz Mihyar
   (916) 961-2440
   Pager (916) 948-0313
   Cell (916) 799-3055

3. If neither the Area Engineer nor the Regional Engineer can be reached, please call the **Governor's Office of Emergency Services Warning Center at (916) 845-8911.**

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Revised 5/10/2005

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DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

STEWART CAN DB DAM, NO. 86-9
VENTURA COUNTY

Section 6101 of Division 3 of the California Water Code requires owners of dams or reservoirs or their agents to advise the Department of Water Resources fully and promptly of any sudden or unprecedented flood or unusual or alarming circumstance or occurrence affecting the dam or reservoir.

In the event of an emergency involving your dam or reservoir (in addition to notifying local authorities) please notify the following:

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   Frederick J. Sage
   Field Engineering Branch Chief
   Division of Safety of Dams
   2200 "X" Street, Suite 200
   Sacramento, CA 95818
   (916) 227-4667

2. **After Working Hours and on Weekends and Holidays:**

   Area 9 Engineer:

   Rick Draeger
   (209) 748-5606

   If the engineer is not reachable, contact:

   Southern Regional Engineer:

   Mutaz Mihyar
   (916) 961-2440
   Pager (916) 948-0313
   Cell (916) 799-3055

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Revised 5/10/2005

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DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

ARUNDELL BARRANCA DAM, NO. 86-10
VENTURA COUNTY

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1. **During Working Hours:**

   Frederick J. Sage
   Field Engineering Branch Chief
   Division of Safety of Dams
   2200 "X" Street, Suite 200
   Sacramento, CA 95818
   (916) 227-4667

2. **After Working Hours and on Weekends and Holidays:**

   Area 9 Engineer:

   Rick Draeger
   (209) 748-5606

   If the engineer is not reachable, contact:

   Southern Regional Engineer:

   Mutaz Mihyar
   (916) 961-2440
   Pager (916) 948-0313
   Cell (916) 799-3055

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Revised 5/10/2005

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SACRAMENTO, CA 942360001
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DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

LANG CREEK DETENTION BASIN DAM, NO. 86-11
VENTURA COUNTY

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   Field Engineering Branch Chief
   Division of Safety of Dams
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   Sacramento, CA 95818
   (916) 227-4667

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   (209) 748-5606

   If the engineer is not reachable, contact:

   Southern Regional Engineer:

   Mutaz Mihyar
   (916) 961-2440
   Pager (916) 948-0313
   Cell (916) 799-3055

3. If neither the Area Engineer nor the Regional Engineer can be reached, please call the **Governor's Office of Emergency Services Warning Center at (916) 845-8911.**

   THIS NOTICE MUST BE KEPT IN A CONVENIENT PLACE (Preferably near the telephone to be used in case of emergency at or near the dam site).

Revised 5/10/2005

APPENDIX C – VCWPD and USACOE Agreements

1. Adams Canyon Debris Basin Cooperative Agreement
2. Fagan Canyon Debris Basin Cooperative Agreement
3. Live Oak Creek Diversion Dam Cooperative Agreement
4. McDonald Canyon Detention Basin Cooperative Agreement
5. Arundell Barranca Detention Basin Landscape Planting Plan

COOPERATIVE AGREEMENT FOR THE CONSERVATION AND RETENTION OF MITIGATION AREAS WITHIN ADAMS CANYON DEBRIS BASIN, VENTURA COUNTY
AGREEMENT NO. WP-2-2003-08

This Agreement is entered into by and between the Ventura County Watershed Protection District (VCWPD) and the United States Army Corps of Engineers (USACOE), hereinafter referred to as the PARTIES.

WHEREAS, both PARTIES are governmental entities having interest in Adams Canyon Debris Basin located 0.6 miles west of the Santa Paula City limits, 0.3 miles north of Foothill Road, and approximately 100 feet east of Adams Canyon Road, in Ventura County, California, as shown in Exhibit A; and

WHEREAS, USACOE, pursuant to Section 404 of the Clean Water Act, has jurisdiction over waters of the United States, including wetlands; and

WHEREAS, VCWPD constructed the Adams Canyon Debris Basin and associated facilities within Adams Canyon Creek pursuant to VCWPD-approved drawings Y-2-2233 through Y-2-2247 and Y-2-2493 and in accordance with USACOE Section 404 Permit No. 945013100; and

WHEREAS, VCWPD will operate and maintain for flood control purposes Adams Canyon Debris Basin, which consists of an 8-acre debris basin with capacity to store 80,700 cubic yards of debris, access road and ramps, dam inlet and outlet, and Adams Canyon Creek, as illustrated on Exhibit B; and

WHEREAS, VCWPD has eradicated non-native plant species and planted native trees and shrubs along both sides of Adams Canyon Creek paralleling the west side of the Adams Canyon Debris Basin and downstream of the dam face to the VCWPD Right-of-Way line, collectively known as MITIGATION AREAS, and as depicted on Exhibit B, to compensate for impacts to waters of the United States, associated with construction of said improvements pursuant to USACOE Section 404 Permit No. 945013100, and agreed to maintain and monitor planted native vegetation and eradicate non-native plants for a period of five years from time of planting; and

WHEREAS, USACOE considers the eradication of non-native vegetation and the planting of native trees and shrubs within the MITIGATION AREAS as mitigating impacts to waters of the United States, so that in-kind maintenance of these areas, which would be limited to in-kind replacement of native vegetation and eradication of non-native plants per Exhibit C, would be exempt from 404 permit requirements pursuant to 33 CFR 323.4(a)(2); and

WHEREAS, VCWPD acknowledges that activities exempt from Section 404 permit requirements or not regulated by the USACOE may still require authorization from the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board; and

WHEREAS, both PARTIES desire to retain the MITIGATION AREAS depicted on Exhibit B as naturally functioning riparian habitat; and

WHEREAS, this Agreement between the PARTIES would ensure long-term viability, management, and protection of the MITIGATION AREAS.

NOW, THEREFORE, the PARTIES hereto agree that:

1. The MITIGATION AREAS shown on Exhibit B shall be maintained and managed as riparian mitigation sites.

2. The use of MITIGATION AREAS is limited in accordance with the following conditions, which may be changed, modified, or revoked only upon written approval of both PARTIES:

   a. The only activities that will occur in the MITIGATION AREAS will be those set forth in Exhibit C, attached hereto.

   b. Removing, destroying, or cutting of native trees, shrubs, or other native vegetation is prohibited, except as required by law for (1) fire abatement, (2) use of existing access roads and ramps, (3) prevention or treatment of disease, and as provided for in Exhibit C.

   c. There shall be no activities, actions, or uses detrimental or adverse to the conservation of water quality, soil, and/or fish and wildlife habitat, including mowing, draining, burning, plowing or tilling, except as set forth in Exhibit C.

   d. Use of herbicides, rodenticide, or weed abatement activities, and any and all other uses which may adversely affect purposes of this Agreement are prohibited, except as set forth in Exhibit C.

   e. Use of off-road vehicles or other means of motorized access, except for vehicles that are required for work relating to maintenance activities by the VCWPD relating to flood control facilities or mitigation maintenance, is prohibited.

   f. There shall be no grazing or surface entry for exploration or extraction of minerals.

   g. Erecting of any building, billboard, or sign is prohibited.

   h. Depositing of soil, trash, ashes, garbage, waste, bio-solids or any other material is prohibited, except as permitted in subsection i. below.

   i. Excavating, dredging, or removing of loam, gravel, soil, rock, sand, or other materials is prohibited, unless said work is required as part of drainage and flood control or mitigation-related maintenance activities, flood prevention activities, and/or activities related to the maintenance of

flood control facilities, as provided for in Exhibit C.

j. Otherwise altering the topography of the property, including building of new roads, is prohibited.

3. Removal of accumulated sediments or debris from the Adams Canyon Debris Basin is not authorized nor prohibited under this Cooperative Agreement. VCWPD acknowledges that such work may require USACOE authorization pursuant to Section 404 of the Clean Water Act, Los Angeles Regional Water Quality Control Act authorization pursuant to Section 401 of the Clean Water Act, and/or California Department of Fish and Game authorization pursuant to Section 1601 of the Fish and Game Code.

4. Representatives of the USACOE shall have access, at reasonable times and in a reasonable manner, to the MITIGATION AREAS, to monitor VCWPD's continued maintenance of the MITIGATION AREAS. When such representatives desire access for monitoring purposes, written notice via facsimile, letter, or E-mail shall be given to the current Operations and Maintenance Division Engineer of the VCWPD, or his/her equivalent, a minimum of one week in advance of site visit.

5. These terms, conditions, and restrictions shall run with the land and shall be inserted by VCWPD in any subsequent deed, or other legal instrument, by which it divests itself of either the fee simple title to or its possessory interest in the MITIGATION AREAS.

6. The VCWPD expressly reserves for itself, its successors and assigns, the right to continue use of the MITIGATION AREAS for all purposes consistent with this Agreement.

7. This Agreement does not have a legal precedential application to any other areas of Adams Canyon Creek or to other lands, resources, situations or circumstances between the PARTIES.

8. This Agreement shall become effective 30 days following the signature of both PARTIES.

9. VCWPD shall hold harmless, protect and indemnify USACOE and its directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each an "Indemnified Party" and, collectively, "Indemnified Parties") from and against any and all liabilities, penalties, costs, losses, damages, expenses (including, without limitation, reasonable attorneys' fees and experts' fees), causes of action, claims, demands, orders, liens or judgments (each a "Claim" and, collectively, "Claims"), arising from or in any way connected with: (1) injury to or the death of any person, or physical damage to any property, resulting from any act, omission, condition, or other matter related to or occurring on or about the MITIGATION AREAS, regardless of cause, unless due in whole or in part to the negligence of USACOE or any of its employees; (2) the existence or

administration of this Cooperative Agreement, except to the extent caused by USACOE's negligence or willful misconduct. If any action or proceeding is brought against any of the Indemnified Parties by reason of any such Claim, DECLARANT shall, at the election of and upon written notice from USACOE, defend such action or proceeding by counsel reasonably acceptable to the Indemnified Party or reimburse USACOE for all charges incurred for services of the Attorney General in defending the action or proceeding.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Agreement.

VENTURA COUNTY WATERSHED PROTECTION DISTRICT

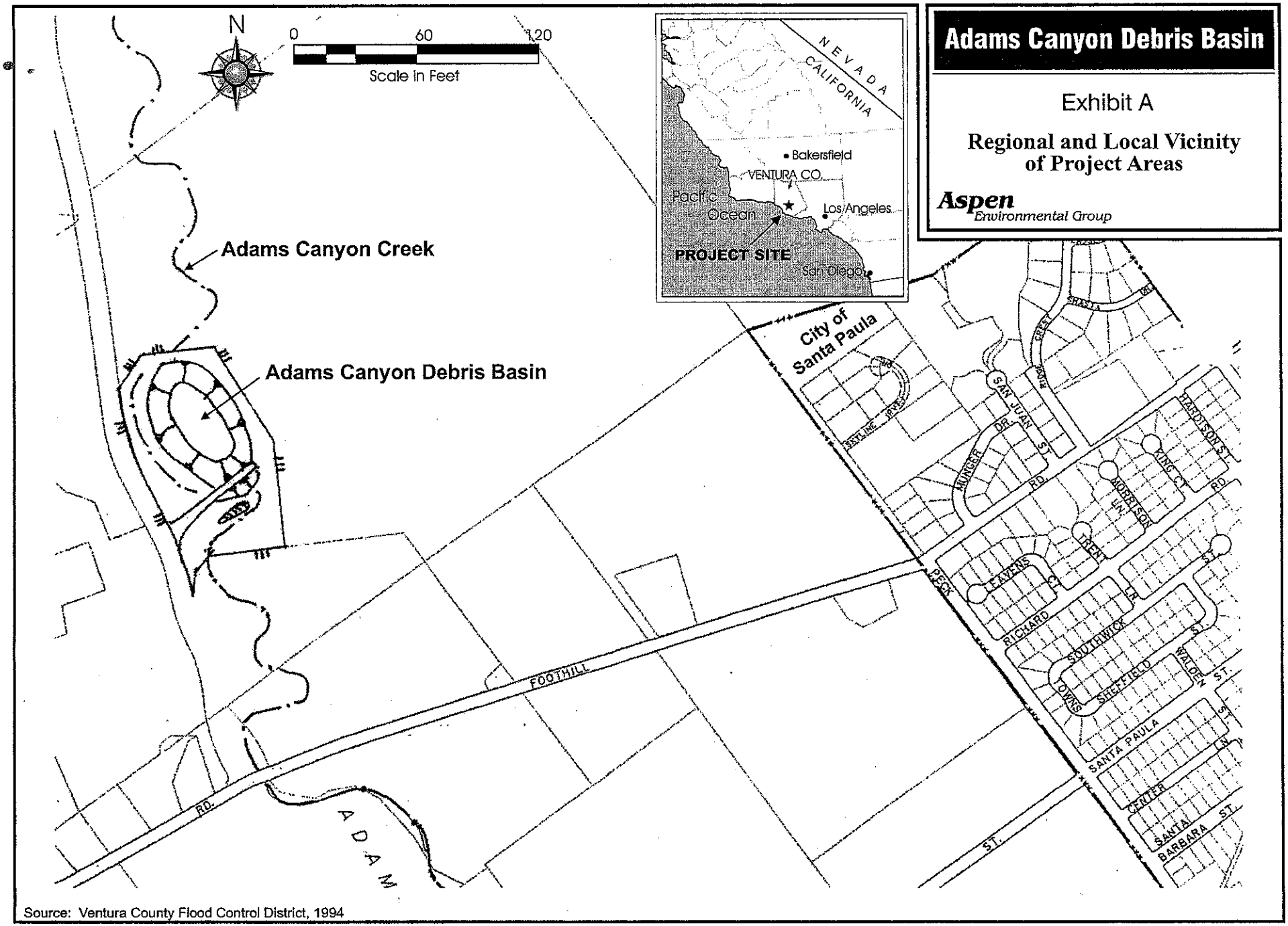
Dated: FEB 2 4 2004

By: _____
Chair, Board of Supervisors

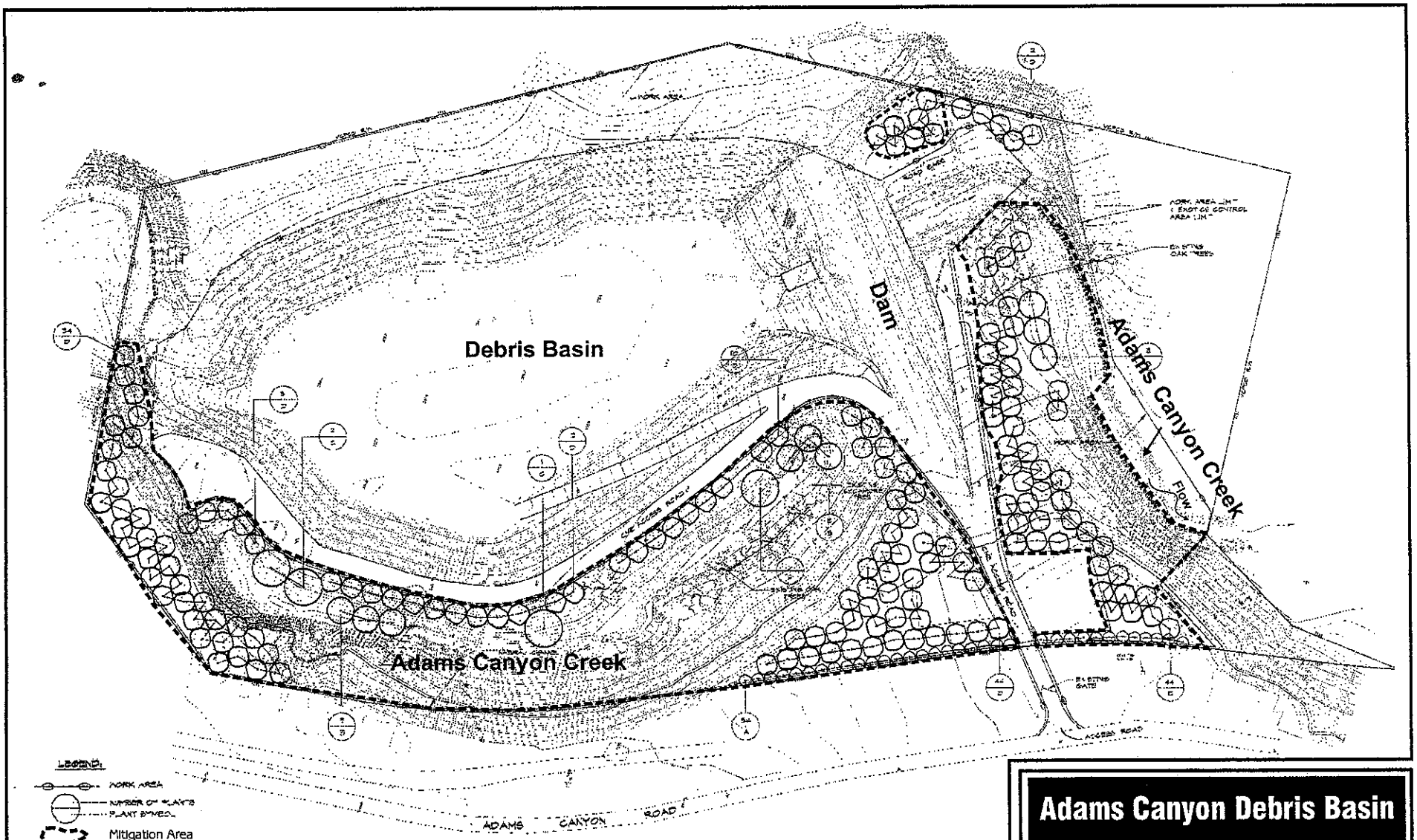
UNITED STATES ARMY CORPS OF ENGINEERS

Dated: 1-28-04

By: _____
North Coast Section Chief, Regulatory Branch



Source: Ventura County Flood Control District, 1994



PLANT LIST

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	O.C.	NO.	COMMENTS
A	HETEROMELES ARBUTIFOLIA	TOYON CHRISTMAS BERRY	1 GAL.	15'	34	
B	PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	5 GAL.	25'	6	
C	POPULUS TRICOCARPA	BLACK COTTONWOOD	5 GAL.	35'	4	
D	QUERCUS AGRIFOLIA	COAST LIVE OAK	*	20'	61	* FROM ROOTED ACORNS
[illegible]	SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	6'	100 (MIN)	SINGLE ROW

Source: Ventura County Flood Control District, 2000

N

0 160 320

Scale in Feet

Adams Canyon Debris Basin

Exhibit B

Landscape Planting Plan

Aspen Environmental Group

EXHIBIT C

VENTURA COUNTY WATERSHED PROTECTION DISTRICT

MAINTENANCE OF THE ADAMS CANYON DEBRIS BASIN MITIGATION AREAS

POLICIES AND PROCEDURES

Routine Maintenance of Mitigation Areas

1. The need for maintenance will be determined by the Ventura County Watershed Protection District (VCWPD), based on field inspection. VCWPD shall provide written notification via facsimile, letter, or E-mail to the United States Army Corps of Engineers (USACOE) prior to initiation of any maintenance activities within the MITIGATION AREAS, except those Routine Maintenance activities discussed below. Notification shall include a description of the maintenance activities, and an estimate of the linear distance/acreage of waters/wetlands that would be affected. In-kind maintenance of the banks, which would be limited to replanting of native vegetation and other activities not resulting in a discharge of dredged or fill material would be exempt from USACOE Section 404 permit requirements pursuant to 33 CFR 323.4(a)(2). Non-exempt activities may not proceed until issuance of a Section 404 permit.

2. VCWPD retains the authority to remove or periodically clear a 10-foot-wide strip of established vegetation upstream, downstream, and at the toe/base of any permanent structure (culvert, debris basin inlet or outlet, wingwall, rock riprap, etc.) in order to accomplish routine inspection for potential damage of those structures. In addition, VCWPD retains the authority to remove or periodically clear a 3-foot-wide strip of established vegetation adjacent to both sides of any access road, ramp, or concrete v-ditch. Moreover, in the MITIGATION AREA downstream of the dam face on the west side of Adams Canyon Creek, VCWPD retains the authority to trim lower tree branches to access their facilities and to conduct flood control activities consistent with Exhibit C. Vegetation cutting, mowing, whipping, or removal associated with pure excavation are not regulated by the USACOE and do not require authorization under Section 404 of the Clean Water Act. Vegetation removal activities resulting in more than incidental fallback of excavated or dredged material may be regulated by the USACOE and require authorization pursuant to Section 404 of the Clean Water Act.

3. VCWPD retains the authority to remove non-native vegetation and/or selectively spray non-native plants in MITIGATION AREAS as needed to comply with permit conditions. Only herbicides approved for aquatic use shall be applied when working within the MITIGATION AREAS, in proximity to Adams Canyon Creek, or within Adams Canyon Debris Basin, regardless of flowing or standing water. If surfactants are required, they too shall be restricted to those approved for aquatic use. Herbicide application and plant maintenance shall be conducted or supervised onsite by personnel or individuals capable of differentiating between native and non-native plant species and who are certified by the Department of Pesticide Regulation, State of California, in applying herbicides.

4. Post-emergent herbicides may be periodically applied to the gravel surface of flood control maintenance roads in a manner that does not result in those chemicals being conveyed into the MITIGATION AREAS, Adams Canyon Creek, or Adams Canyon Debris Basin. No pre-emergent herbicides shall be applied within the MITIGATION AREAS or Adams Canyon Debris Basin.

5. Subject to restrictions or requirements imposed by the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board, rodenticides may be applied on an as-needed basis only.

6. VCWPD acknowledges that activities exempt from Section 404 permit requirements or not regulated by the USACOE may still require authorization from the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board.

Non-Emergency Repairs, Reconstruction Work, and Sediment-Removal Activities Within the Mitigation Areas

1. For non-emergency repairs or reconstruction work within the MITIGATION AREAS (i.e., those not qualifying as an emergency pursuant to 33 CFR325.2(e)(4)), the VCWPD shall provide written notification to the USACOE prior to initiation of any streambed or bank repair or reconstruction activities, or any activities involving disturbance of the streambed, bank, or associated native vegetation, within the MITIGATION AREAS. Notification shall include a description of the activities and an estimate of the linear distance/acreage of waters/wetlands affected. Photographs of the area to be repaired or reconstructed shall be included with the written notification. Work shall not proceed until authorized by the Corps or specifically determined to be exempt from Section 404 permit requirements.

2. VCWPD retains the authority to remove established vegetation within 50 feet of any culvert, debris basin inlet, or outlet, wing-wall, or rip-rap structure, in the event these structures are damaged or are threatened with damage, or as necessary to repair said structures. VCWPD shall be responsible for the reestablishment of native vegetation only within the outer-most 40 feet of the 50-foot temporary impact zone. Any method suitable to achieve revegetation goals may be applied.

3. For non-emergency repairs or reconstruction work in the MITIGATION AREAS, these activities shall not include replacement of native vegetation lost during storm events, but need include replacement of native vegetation that has been damaged or destroyed as a result of this restoration work. Maintenance to ensure survival and growth of planted native vegetation and to selectively remove non-native vegetation in the restored area(s) shall be conducted for a period of two years following restoration work, or longer, if the PARTIES determine more time is necessary to ensure the revegetation approximates the established condition prior to damage (i.e., equivalent type, density, and maturity of vegetation).

4. To maintain proper flow conditions, VCWPD retains the authority to remove accumulated sediments from below the Ordinary High Water Mark of Adams Canyon Creek. Incidental removal of vegetation may occur during sediment removal, but adverse

effects to vegetation shall be minimized by limiting the native vegetation affected to the minimum necessary and cutting native vegetation to the base to the maximum extent feasible. If adverse effects are minimized, re-establishment of native vegetation will not be required following sediment-removal activities.

Emergency Repairs Within the Mitigation Areas

1. VCWPD shall provide written notification to the USACOE in accordance with the most current Regional General Permit for emergency actions prior to initiation of emergency repairs within the MITIGATION AREAS. Notification shall include a description of the activities and an estimate of the linear distance/acreage of waters/wetlands affected. Photographs of the area to be repaired shall be provided within two weeks of written notification.

2. VCWPD shall not be responsible for replacing native vegetation lost during storm events, but shall replace native vegetation that has been damaged or destroyed as a result of the emergency repair work. Maintenance of planted native vegetation and selective removal of non-native vegetation in repaired area(s) shall be conducted for a period of two years following emergency repair work, or longer, if the PARTIES determine more time is necessary to ensure revegetation approximates the established condition prior to damage (i.e., equivalent type, density, and maturity of vegetation).

3. VCWPD acknowledges that activities exempt from Section 404 permit requirements or not regulated by the USACOE may still require authorization from the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board.

COOPERATIVE AGREEMENT FOR THE CONSERVATION AND RETENTION OF MITIGATION AREAS IN THE FAGAN CANYON DEBRIS BASIN IN VENTURA COUNTY

This agreement is entered into by and between the Ventura County Flood Control District (VCFCD), and the United States Army Corps of Engineers (USACOE), herein after referred to as PARTIES.

WHEREAS, both PARTIES are governmental entities having interest in the Fagan Canyon Debris Basin located near the City of Santa Paula approximately three quarters of a mile upstream of Santa Paula Street near the Santa Paula Cemetery in Ventura County, California; and

WHEREAS, certain improvements were constructed in Fagan Canyon pursuant to VCFCD drawings Y-2-2310 through Y-2-2321 generally located northerly of Lots 23, 24, 25 and 26 of Rancho Santa Paula y Saticoy, partly within the City of Santa Paula and partly within the unincorporated territory, County of Ventura, of Tract No. 1461; and shown on Exhibit 1, attached hereto; and

WHEREAS, USACOE, pursuant to Section 404 of the Federal Clean Water Act, has jurisdiction over waters of the United States, including wetlands; and

WHEREAS, VCFCD proposes to operate and maintain the Fagan Canyon Debris Basin, for sediment control purposes, which consists of an eight acre debris basin with capacity to store 72,000 cubic yards of debris, access road, dam inlet and outlet as illustrated in Exhibit 1; and

WHEREAS, the MITIGATION AREA was a requirement of USACOE Permit No. 94-131-MJ, which authorized the construction of a debris basin, dam, and access road within waters of the US in Fagan Canyon; and

WHEREAS, both PARTIES desire to retain the MITIGATION AREA shown in Exhibit 1 as a naturally functioning riparian/oak woodland; and

WHEREAS, this Agreement between the PARTIES would ensure long-term viability, management and protection of the MITIGATION AREA.

NOW, THEREFORE, the PARTIES hereto agree that:

1. The MITIGATION AREA shown in Exhibit 1 shall be maintained and managed as a riparian/oak woodland mitigation site.

2. The use of the MITIGATION AREA is limited in accordance with the following conditions, which may be changed, modified or revoked only upon written approval of the USACOE:

    a. The only activities which will occur in the MITIGATION AREA will be the requirements which are set forth in Exhibit 2, attached hereto.

    b. There shall be no vegetation removal, destruction, or cutting of trees, shrubs, or other vegetation except as provided for in Exhibit 2.

c. There shall be no activities, actions, or uses detrimental or adverse to the conservation of water quality, soil and/or fish and wildlife habitat, including mowing, draining, burning, plowing or filling.

d. Use of herbicides, rodenticide, or weed abatement activities, and any and all other land uses or construction activities which may adversely affect purposes of this Agreement are prohibited, except as set forth in Exhibit 2.

e. Use of off-road vehicles or other means of motorized access, except for vehicles which are required for work relating to maintenance activities by the VCFCD relating to flood control facilities, is prohibited.

f. Depositing of soil, trash, ashes, garbage, waste, bio-solids or any other material is prohibited, except as permitted in subsection g. below.

g. Excavating, dredging, or removing of loam, gravel, soil, rock, sand, or other materials is prohibited, unless as provided for in Exhibit 2, said work is required as part of drainage and flood control related maintenance activities, flood prevention activities and/or activities related to the maintenance of flood control facilities.

h. Otherwise altering the topography of the property, including building of new roads, is prohibited.

i. Removing, destroying, or cutting of trees, shrubs, or other vegetation is prohibited, except as required by law for (1) fire abatement, (2) use of existing access roads and ramps, (3) prevention or treatment of disease, and as provided for in Exhibit 2.

3. Removal of accumulated sediments from the basin is neither authorized nor prohibited under this Cooperative Agreement. Such work may require USACOE authorization pursuant to Section 404 of the Clean Water Act.

4. Representatives of the USACOE shall have access, at reasonable times and in a reasonable manner, to the MITIGATION AREA, to inspect VCFCD's maintenance of the MITIGATION AREA until success criteria have been met.

Upon completion of the required monitoring, any site visit shall be for informational purposes only, not for compliance inspections and determinations.

When such representatives desire access for the above purposes, written notice via facsimile shall be given to VCFCD one week in advance of site visit.

5. These terms, conditions and restrictions shall run with the land and shall be inserted by VCFCD in any subsequent deed, or other legal instrument, by which it divests itself of either the fee simple title to or its possessory interest in the MITIGATION AREA.

6. The VCFCD expressly reserves for itself, its successors and assigns, the right to continue use of the MITIGATION AREA for all purposes consistent with this Agreement.

7. This Agreement does not have a legal precedential application to any other areas of Fagan Canyon or to other lands, resources, situations or circumstances between the PARTIES.

8. This Agreement shall become effective 30 days following the signature of all parties.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Agreement.

VENTURA COUNTY FLOOD CONTROL DISTRICT

Dated: March 13, 2001 By: _____
Chair, Board of Supervisors

UNITED STATES ARMY CORPS OF ENGINEERS

Dated: Jan. 24, 2001 By: _____

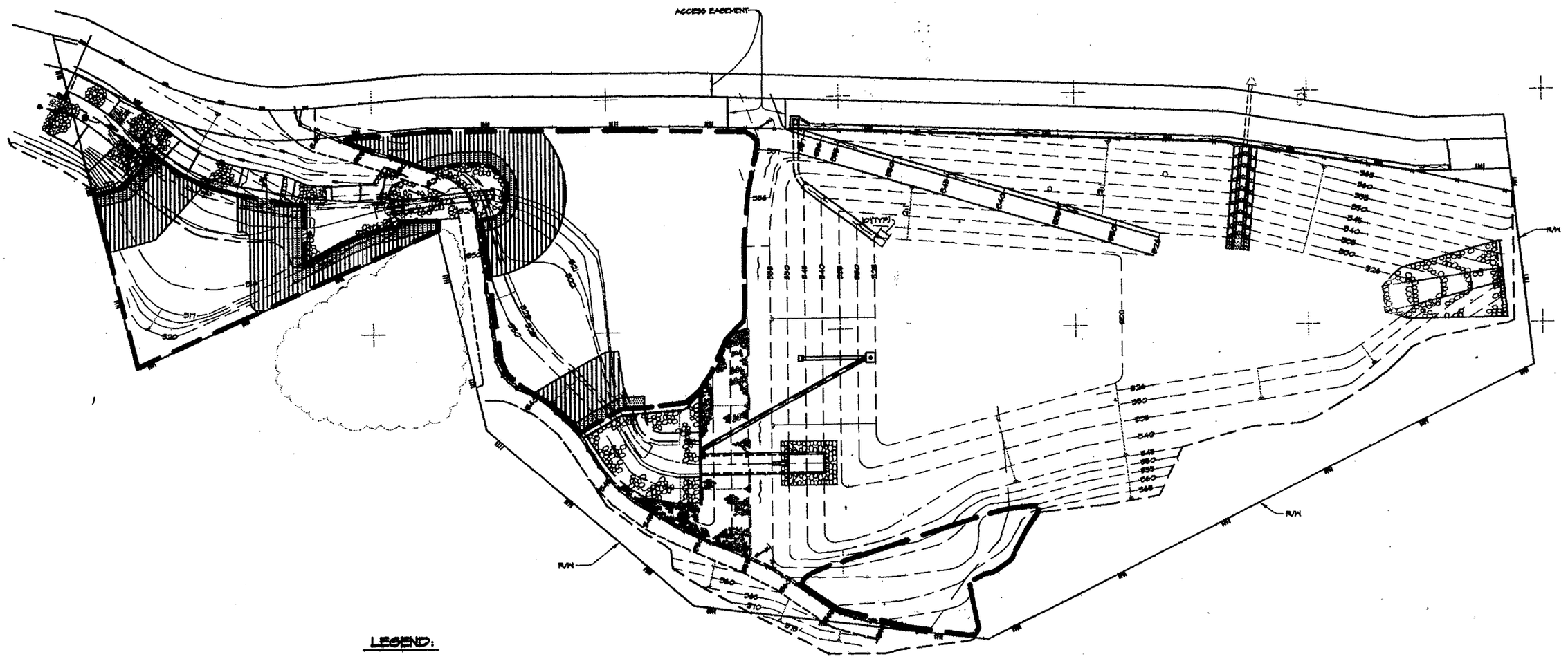


EXHIBIT 1
PERMANENT MITIGATION AREAS
RE: ACOE PERMIT NO. 94-131-MJ; CDFG PERMIT NO. 5-769-93

DESIGNED | DRAWN PGL | CHECKED
PROJ. ENG. | RECOMMENDED
REG. NO. | DATE | APPROVED

COUNTY OF VENTURA - PUBLIC WORKS AGENCY
VENTURA COUNTY FLOOD CONTROL DISTRICT

SPEC. NO.
PROJ. NO.

FAGAN CANYON DEBRIS BASIN

SHEET 1
OF
DRAWING NO.

EXHIBIT 2

VENTURA COUNTY FLOOD CONTROL DISTRICT

BASIN MAINTENANCE REQUIREMENTS

FAGAN CANYON DEBRIS BASIN MITIGATION AREAS

Routine Maintenance of Mitigation Areas

- The need for maintenance will be determined by the Ventura County Flood Control District's (VCFCD) mitigation staff, based on field inspection.

- VCFCD may remove non-native vegetation and/or selectively spray non-natives in mitigation areas as needed to comply with permit conditions. Native plant species not indigenous to the mitigation areas may be selectively sprayed or removed where such species may pose a threat to defined mitigation species. All non-native removal shall be conducted or supervised on-site by personnel or individuals capable of differentiating between native and non-native plant species.

- Herbicides applied periodically in the course of Operations and Maintenance activities adjacent to mitigation areas shall be applied in a manner that does not result in those herbicides being conveyed into mitigation areas.

- VCFCD may apply wood-fiber mulches to mitigation areas to enhance soil nutrient content, retain soil moisture and inhibit growth of non-native plants. Mulches shall be applied periodically through the plant establishment period. Once vegetation is established, natural understory plants will be allowed to grow.

- VCFCD may weed-whip mitigation areas annually or semi-annually through the plant establishment period only to help control competition with installed vegetation. Once vegetation is established, VCFCD may weed-whip only to control exotics or provide access for mitigation equipment.

- VCFCD may conduct repairs to mitigation facilities and installations, including, but not limited to, tree wells and irrigation components, as needed.

- VCFCD shall provide irrigation of installed vegetation in mitigation areas only long enough to establish plants and trees and meet success criteria.

- VCFCD shall replace dead or unhealthy vegetation in mitigation areas as needed to meet success criteria.

- VCFCD shall prohibit any activity or equipment not specifically related to mitigation from encroaching on the mitigation area (except for Emergency Repairs as indicated below).

Emergency Repair and Restoration

- VCFCD retains the authority to remove established vegetation within 50 feet of any permanent structure (bridge, inlet, outlet, wing-wall, riprap structure, etc.), as shown on Exhibit 1, in the event they are damaged or are threatened with damage, or as necessary to repair said structures.

- VCFCD shall provide verbal notification to the USACOE prior to initiation of emergency repairs and/or bank restoration activities. Notification shall include a description of the activities and an estimate of the linear distance/acreage of waters/wetlands affected. Photographs of the area to be repaired/restored shall be provided within two weeks of verbal notification.

Maintenance of Mitigation Areas that Overlap with Existing Facilities

- VCFCD retains the authority to remove a 10-foot strip of established vegetation upstream and downstream of existing structures, as shown on Exhibit 1, in order to accomplish routine inspection for potential damage of those structures.

- All other maintenance shall be accomplished by mitigation staff or their representatives as indicated above.

COOPERATIVE AGREEMENT FOR THE CONSERVATION AND RETENTION OF THE LIVE OAK CREEK DIVERSION CHANNEL MITIGATION AREA, VENTURA COUNTY AGREEMENT NO. WP-1-2004-10

This Agreement is entered into by and between the Ventura County Watershed Protection District (VCWPD) and the United States Army Corps of Engineers (USACOE), hereinafter referred to as the PARTIES.

WHEREAS, both PARTIES are governmental entities having interest in Live Oak Creek Diversion Channel located 1 mile north of the Santa Ana Boulevard Bridge and 0.75 miles south of Baldwin Road, between Burnham Road and the Ventura River, in the community of Live Oak Acres, in Ventura County, California, as shown in Exhibit A; and

WHEREAS, USACOE, pursuant to Section 404 of the Clean Water Act, has jurisdiction over waters of the United States, including wetlands; and

WHEREAS, VCWPD constructed the Live Oak Creek Diversion Channel and associated flood control facilities within Live Oak Creek pursuant to VCWPD-approved drawings Y-1-0584 through Y-1-0602 and in accordance with USACOE Section 404 Permit No. 985032500; and

WHEREAS, VCWPD will operate and maintain for flood control purposes the 880-foot-long Live Oak Diversion Channel, which consists of a reinforced concrete box conduit and adjoining rock riprap splash pad, a 10-foot-deep trapezoidal earth channel with a base width of 20 feet and 4:1 side slopes, and concreted rock riprap in the vicinity of the outlet/confluence with the Ventura River, as illustrated on Exhibit B; and

WHEREAS, VCWPD has eradicated certain non-native plant species and planted native species adjacent to and within the Live Oak Creek Diversion Channel, known as the MITIGATION AREA, and as depicted on Exhibit B, to compensate for impacts to waters of the United States, associated with construction of said improvements pursuant to USACOE Section 404 Permit No. 985032500, and agreed to maintain and monitor planted native vegetation and eradicate certain non-native plants for a period of five years from time of planting; and

WHEREAS, USACOE considers the eradication of non-native vegetation and the planting of native trees and shrubs within the MITIGATION AREA as mitigating impacts to waters of the United States, so that in-kind maintenance of the area, which would be limited to in-kind replacement of native vegetation and eradication of non-native plants per Exhibit C, would be exempt from 404 permit requirements pursuant to 33 CFR 323.4(a)(2); and

WHEREAS, VCWPD acknowledges that activities exempt from Section 404 permit requirements or not regulated by the USACOE may still require authorization from the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board; and

WHEREAS, both PARTIES desire to retain the MITIGATION AREA depicted on Exhibit B as naturally functioning transitional riparian habitat; and

WHEREAS, this Agreement between the PARTIES would ensure long-term viability, management, and protection of the MITIGATION AREA.

NOW, THEREFORE, the PARTIES hereto agree that:

1. The MITIGATION AREA shown on Exhibit B shall be maintained and managed as transitional riparian habitat in perpetuity.

2. The use of the MITIGATION AREA is limited in accordance with the following conditions, which may be changed, modified, or revoked only upon written approval of both PARTIES:

    a. The only activities that will occur in the MITIGATION AREA will be those set forth in Exhibit C, attached hereto.

    b. Removing, destroying, or cutting of native trees, shrubs, or other native vegetation is prohibited, except as required by law for (1) fire abatement, (2) use of existing access roads and ramps, (3) prevention or treatment of disease, and as provided for in Exhibit C.

    c. There shall be no activities, actions, or uses detrimental or adverse to the conservation of water quality, soil, and/or fish and wildlife habitat, including mowing, draining, burning, plowing or tilling, except as set forth in Exhibit C.

    d. Use of herbicides or weed abatement activities, and any and all other uses which may adversely affect purposes of this Agreement are prohibited, except as set forth in Exhibit C.

    e. Use of off-road vehicles or other means of motorized access, except for vehicles that are required for work relating to maintenance activities by the VCWPD relating to flood control facilities or mitigation maintenance, is prohibited.

    f. There shall be no livestock grazing or surface entry for exploration or extraction of minerals.

    g. Erecting of any building, billboard, or sign is prohibited.

    h. Depositing of soil, trash, ashes, garbage, waste, bio-solids or any other material is prohibited, except as permitted in subsection i. below.

    i. Excavating, dredging, or removing of loam, gravel, soil, rock, sand, or other materials is prohibited, unless said work is required as part of drainage and flood control or mitigation-related maintenance activities, flood prevention activities, and/or activities related to the maintenance of flood control facilities, as provided for in Exhibit C.

j. Otherwise altering the topography of the property, including building of new roads, is prohibited.

3. Removal of accumulated sediments or debris from the Live Oak Creek Diversion Channel bottom is not authorized nor prohibited under this Cooperative Agreement. VCWPD acknowledges that such work may require USACOE authorization pursuant to Section 404 of the Clean Water Act, Los Angeles Regional Water Quality Control Act authorization pursuant to Section 401 of the Clean Water Act, and/or California Department of Fish and Game authorization pursuant to Section 1602 of the Fish and Game Code.

4. Representatives of the USACOE shall have access, at reasonable times and in a reasonable manner, to the MITIGATION AREA, to monitor VCWPD's continued maintenance of the MITIGATION AREA. When such representatives desire access for monitoring purposes, written notice via facsimile, letter, or E-mail shall be given to the current Restoration Coordinator of the VCWPD, or his/her equivalent, a minimum of one week in advance of site visit.

5. These terms, conditions, and restrictions shall run with the land and shall be inserted by VCWPD in any subsequent deed, or other legal instrument, by which it divests itself of either the fee simple title to or its possessory interest in the MITIGATION AREA.

6. The VCWPD expressly reserves for itself, its successors and assigns, the right to continue use of the MITIGATION AREA for all purposes consistent with this Agreement.

7. This Agreement does not have a legal precedential application to any other areas of Live Oak Creek or the Ventura River or to other lands, resources, situations or circumstances between the PARTIES.

8. This Agreement shall become effective 30 days following the signature of both PARTIES.

9. VCWPD shall hold harmless, protect and indemnify USACOE and its directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each an "Indemnified Party" and, collectively, "Indemnified Parties") from and against any and all liabilities, penalties, costs, losses, damages, expenses (including, without limitation, reasonable attorneys' fees and experts' fees), causes of action, claims, demands, orders, liens or judgments (each a "Claim" and, collectively, "Claims"), arising from or in any way connected with: (1) injury to or the death of any person, or physical damage to any property, resulting from any act, omission, condition, or other matter related to or occurring on or about the MITIGATION AREA, regardless of cause, unless due in whole or in part to the negligence of USACOE or any of its employees; (2) the existence or administration of this Cooperative Agreement, except to the extent caused by USACOE's negligence or willful misconduct. If any action or proceeding is brought against any of the Indemnified Parties by reason of any such Claim,

DECLARANT shall, at the election of and upon written notice from USACOE, defend such action or proceeding by counsel reasonably acceptable to the Indemnified Party or reimburse USACOE for all charges incurred for services of the Attorney General in defending the action or proceeding.

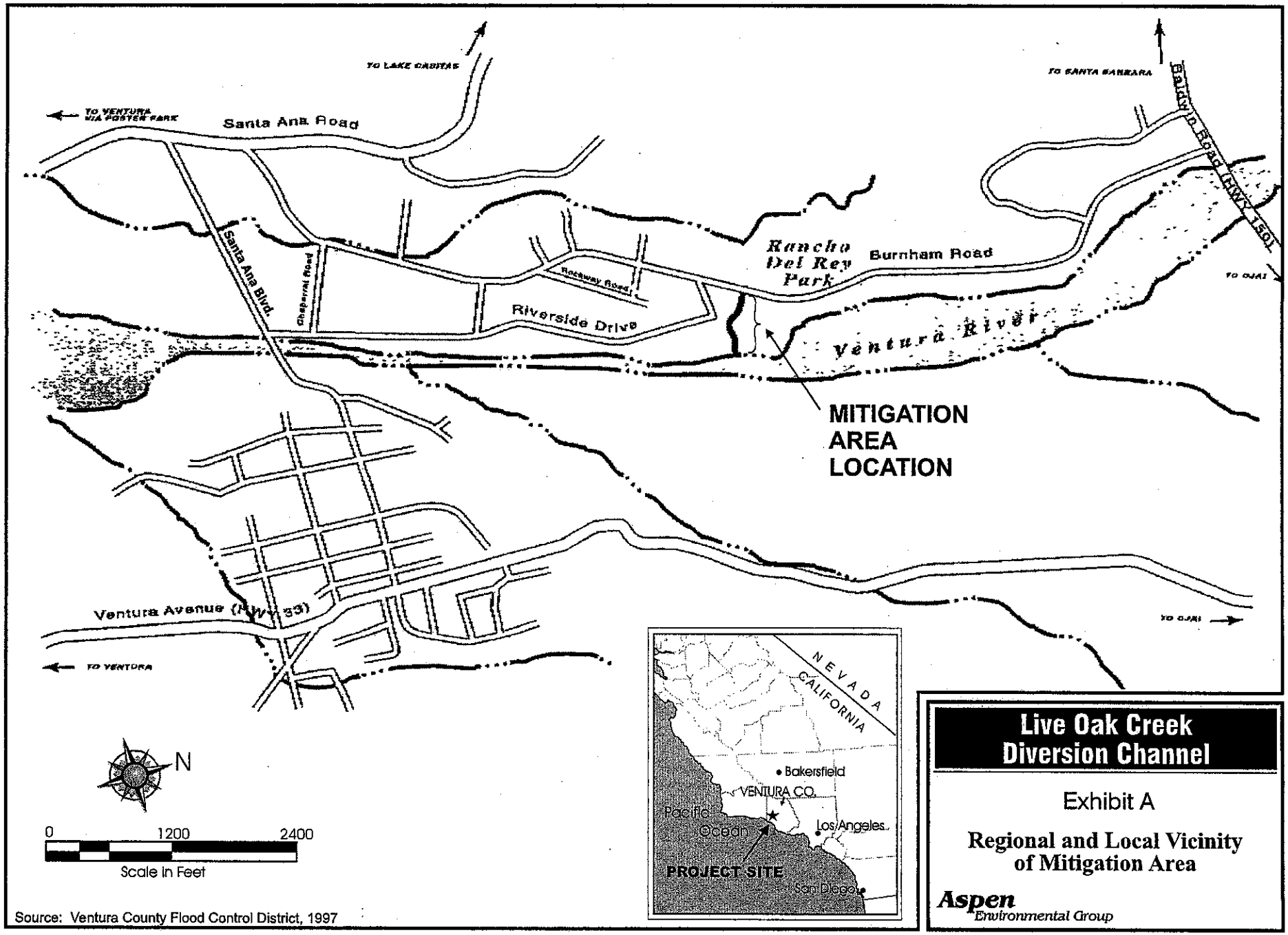
IN WITNESS WHEREOF, the PARTIES hereto have executed this Agreement.

VENTURA COUNTY WATERSHED PROTECTION DISTRICT

Dated: 9/14/04 By: _____
Chair, Board of Supervisors

UNITED STATES ARMY CORPS OF ENGINEERS

Dated: 7-19-04 By: _____
North Coast Section Chief, Regulatory Branch



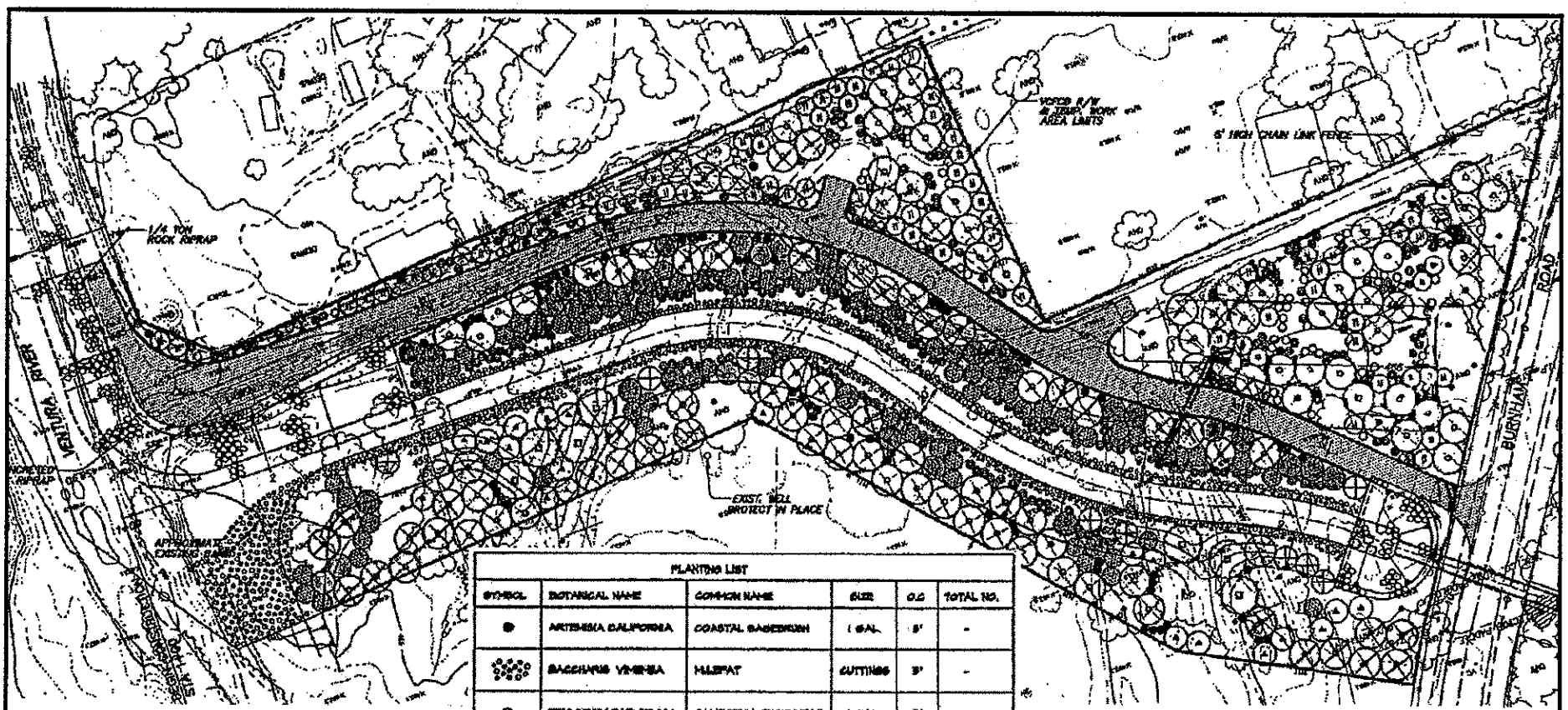
Source: Ventura County Flood Control District, 1997

Live Oak Creek Diversion Channel

Exhibit A

Regional and Local Vicinity of Mitigation Area

Aspen Environmental Group



PLANTING LIST					
SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	O.C.	TOTAL NO.
	ARTEMISIA CALIFORNICA	COASTAL SAGEBRUSH	1 GAL.	5'	-
	BACCHARIS VIMINEA	MULEFAT	CUTTINGS	5'	-
	ERIOGONUM PARVIFLIUM	CALIFORNIA BUCKWHEAT	1 GAL	3'	-
	HETEROMELES ARBUTIFOLIA	TOYON	1 GAL	8'	-
	JUGLANS CALIFORNICA	CALIFORNIA BLACK WALNUT	1 GAL	8'	-
	MALOSMA LAURINA	LAUREL SUMAC	1 GAL	12'	-
	PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	5 GAL	25'	-
	PRUNUS ILICIFOLIA	HOLLEY LEAF CHERRY	1 GAL	12'	-
	QUERCUS AGRIFOLIA	COST LIVE OAK	1 GAL	20'	-
	ROSA CALIFORNICA	CALIFORNIA WILDROSE	1 GAL	5'	-
	SALVIA LEUCOPHYLLA	PURPLE SAGE	1 GAL	5'	-
	SAMBUCUS MEXICANA	BLUE ELDERBERRY	1 GAL	15'	-

HYDROSEEDING

N

0 80 160

Scale In Feet

Source: Ventura County Flood Control District, 1997

Live Oak Creek Diversion Channel

Exhibit B

Mitigation Area Planting Plan

Aspen Environmental Group

EXHIBIT C

VENTURA COUNTY WATERSHED PROTECTION DISTRICT

MAINTENANCE OF THE LIVE OAK CREEK DIVERSION CHANNEL

MITIGATION AREA

POLICIES AND PROCEDURES

Routine Maintenance of the Mitigation Area

1. The need for maintenance will be determined by the Ventura County Watershed Protection District (VCWPD), based on field inspection. VCWPD shall provide written notification via facsimile, letter, or E-mail to the United States Army Corps of Engineers (USACOE) prior to initiation of any maintenance activities within the MITIGATION AREA, except those Routine Maintenance activities discussed below. Notification shall include a description of the maintenance activities, and an estimate of the linear distance/acreage of waters/wetlands that would be affected. In-kind maintenance of the banks, which would be limited to replanting of native vegetation and eradication of non-native plants, would not be regulated by Section 404 of the Clean Water Act. Regulated and non-exempt activities may not proceed until issuance of a Section 404 permit.

2. VCWPD retains the authority to remove or periodically clear a 10-foot-wide strip of established vegetation upstream, downstream, and at the toe/base of any permanent structure (box culvert, rock riprap) in order to accomplish routine inspection for potential damage of those structures. In addition, VCWPD retains the authority to remove or periodically clear a 3-foot-wide strip of established vegetation adjacent to both sides of any access road, ramp, or concrete v-ditch. Vegetation cutting, mowing, whipping, or removal associated with pure excavation are not regulated by the USACOE and do not require authorization under Section 404 of the Clean Water Act. Vegetation removal activities resulting in more than incidental fallback of excavated or dredged material may be regulated by the USACOE and require authorization pursuant to Section 404 of the Clean Water Act.

3. VCWPD retains the authority to remove non-native vegetation and/or selectively spray non-native plants in MITIGATION AREA as needed to comply with permit conditions. Only herbicides approved for aquatic use shall be applied when working within the MITIGATION AREA, in proximity to Live Oak Creek Diversion Channel, or the Ventura River, regardless of flowing or standing water. If surfactants are required, they too shall be restricted to those approved for aquatic use. Herbicide application and plant maintenance shall be conducted or supervised onsite by personnel or individuals capable of differentiating between native and non-native plant species and who are certified by the Department of Pesticide Regulation, State of California, in applying herbicides.

4. Post-emergent and/or pre-emergent herbicides may be periodically applied to the gravel surface of flood control maintenance roads in a manner that does not result in those chemicals being conveyed into the MITIGATION AREA, Live Oak Creek Diversion Channel, or the Ventura River. No pre-emergent herbicides shall be applied within the MITIGATION AREA or Live Oak Creek Diversion Channel or in a manner that results in conveyance of such herbicides to the MITIGATION AREA, Live Oak Creek Diversion Channel, or the Ventura River.

5. Subject to restrictions or requirements imposed by the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board, rodenticides may be applied on an as-needed basis only.

6. VCWPD acknowledges that activities exempt from Section 404 permit requirements or not regulated by the USACOE may still require authorization from the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board.

7. To maintain adequate flood capacity, VCWPD retains the authority to remove any woody vegetation from the bottom of the Live Oak Creek Diversion Channel. Native herbaceous species shall not be removed. Any native vegetation on the banks of the Live Oak Creek Diversion Channel damaged during these activities shall be replaced and maintained for two years following restoration, or longer, if the PARTIES determine more time is necessary to ensure the revegetation approximates the established condition prior to damage (i.e., equivalent type, density, and maturity of vegetation).

Non-Emergency Repairs, Reconstruction Work, and Sediment-Removal Activities Within the Mitigation Area

1. For non-emergency repairs or reconstruction work within the MITIGATION AREA (i.e., those not qualifying as an emergency pursuant to 33 CFR325.2(e)(4) or the most current Regional General Permit for emergency actions), the VCWPD shall provide written notification to the USACOE prior to initiation of any streambed or bank repair or reconstruction activities, or any activities involving disturbance of the streambed, bank, or associated native vegetation, within the MITIGATION AREA. Notification shall include a description of the activities and an estimate of the linear distance/acreage of waters/wetlands affected. Photographs of the area to be repaired or reconstructed shall be included with the written notification. Work shall not proceed until authorized by the Corps or specifically determined to be exempt from Section 404 permit requirements.

2. VCWPD retains the authority to remove established vegetation within 50 feet of the box culvert or rock riprap, in the event these structures are damaged or are threatened with damage, or as necessary to repair said structures. VCWPD shall be responsible for the reestablishment of native vegetation only within the outer-most 40 feet of the 50-foot temporary impact zone. Any method suitable to achieve revegetation goals may be applied.

3. For non-emergency repairs or reconstruction work in the MITIGATION AREA, VCWPD shall not be responsible for replacing native vegetation lost during storm events, but shall replace native vegetation that has been damaged or destroyed as a result of this restoration work. Maintenance to ensure survival and growth of planted native vegetation and to selectively remove non-native vegetation in the restored area(s) shall be conducted for a period of two years following restoration work, or longer, if the PARTIES determine more time is necessary to ensure the revegetation approximates the established condition prior to damage (i.e., equivalent type, density, and maturity of vegetation).

Emergency Repairs Within the Mitigation Area

1. VCWPD shall provide written notification to the USACOE in accordance with either 33CFR Part 325.2(e)(4) or the most current Regional General Permit for emergency actions prior to initiation of emergency repairs within the MITIGATION AREA should such repairs entail the discharge of dredged or fill material. Notification shall include a description of the activities and an estimate of the linear distance/acreage of waters/wetlands affected. Photographs of the area to be repaired shall be provided within two weeks of written notification.

2. VCWPD shall not be responsible for replacing native vegetation lost during storm events, but shall replace native vegetation that has been damaged or destroyed as a result of the emergency repair work. Maintenance of planted native vegetation and selective removal of non-native vegetation in repaired area(s) shall be conducted for a period of two years following emergency repair work, or longer, if the PARTIES determine more time is necessary to ensure revegetation approximates the established condition prior to damage (i.e., equivalent type, density, and maturity of vegetation).

3. VCWPD acknowledges that activities exempt from Section 404 permit requirements or not regulated by the USACOE may still require authorization from the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board.

COOPERATIVE AGREEMENT FOR THE CONSERVATION AND RETENTION OF MITIGATION AREAS WITHIN MCDONALD CANYON DETENTION BASIN, VENTURA COUNTY
AGREEMENT NO. WP-1-2004-08

This Agreement is entered into by and between the Ventura County Watershed Protection District (VCWPD) and the United States Army Corps of Engineers (USACOE), hereinafter referred to as the PARTIES.

WHEREAS, both PARTIES are governmental entities having interest in McDonald Canyon Detention Basin located approximately 0.2 mile east of Highway 33 and immediately north of Fairview Road, near the community of Meiners Oaks, in Ventura County, California, as shown in Exhibit A; and

WHEREAS, USACOE, pursuant to Section 404 of the Clean Water Act, has jurisdiction over waters of the United States, including wetlands; and

WHEREAS, VCWPD constructed the McDonald Canyon Detention Basin and associated facilities within and around McDonald Canyon Creek pursuant to VCWPD-approved drawings Y-1-0557 through Y-1-0578 and Y-1-0620 through Y-1-0622 and in accordance with USACOE Section 404 Permit No. 955004700; and

WHEREAS, VCWPD will operate and maintain for flood control purposes McDonald Canyon Detention Basin, which consists of access roads and ramps, a grouted rock riprap barrier and earthen inlet channel, a by-pass pipeline, dam, and inlet and outlet structures, as illustrated on Exhibits B.1 and B.2; and

WHEREAS, VCWPD has eradicated certain non-native plant species and planted native species within and adjacent to McDonald Canyon Detention Basin, known as the MITIGATION AREAS, as depicted on Exhibits B.1 and B.2, to compensate for impacts to waters of the United States associated with construction of said improvements pursuant to USACOE Section 404 Permit No. 955004700, and agreed to maintain and monitor planted native vegetation and eradicate certain non-native plants for a period of five years from the time of planting or initial removal; and

WHEREAS, USACOE considers the eradication of non-native vegetation and the planting of native species within the MITIGATION AREAS as mitigating impacts to waters of the United States, so that in-kind maintenance of these areas, which would be limited to in-kind replacement of native vegetation and eradication of non-native plants per Exhibit C, would be exempt from 404 permit requirements pursuant to 33 CFR 323.4(a)(2); and

WHEREAS, VCWPD acknowledges that activities exempt from Section 404 permit requirements or not regulated by the USACOE may still require authorization from the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board; and

WHEREAS, both PARTIES desire to retain the MITIGATION AREAS depicted on Exhibits B.1 and B.2 as naturally functioning riparian habitat; and

WHEREAS, this Agreement between the PARTIES would ensure long-term viability, management, and protection of the MITIGATION AREAS.

NOW, THEREFORE, the PARTIES hereto agree that:

1. The MITIGATION AREAS shown on Exhibits B.1 and B.2 shall be maintained and managed as riparian habitat in perpetuity.

2. The use of MITIGATION AREAS is limited in accordance with the following conditions, which may be changed, modified, or revoked only upon written approval of both PARTIES:

   a. The only activities that will occur in the MITIGATION AREAS will be those set forth in Exhibit C, attached hereto.

   b. Removing, destroying, or cutting of native trees, shrubs, or other native vegetation is prohibited, except as required by law for (1) fire abatement, (2) use of existing access roads and ramps, (3) prevention or treatment of disease, and/or as provided for in Exhibit C.

   c. There shall be no activities, actions, or uses detrimental or adverse to the conservation of water quality, soil, and/or fish and wildlife habitat, including mowing, draining, burning, plowing or tilling, except as set forth in Exhibit C.

   d. Use of herbicides, rodenticide, or weed abatement activities, and any and all other uses which may adversely affect purposes of this Agreement are prohibited, except as set forth in Exhibit C.

   e. Use of off-road vehicles or other means of motorized access, except for vehicles that are required for work relating to maintenance activities by the VCWPD relating to flood control facilities or mitigation maintenance, is prohibited.

   f. There shall be no grazing or surface entry for exploration or extraction of minerals.

   g. Erecting of any building, billboard, or sign is prohibited.

   h. Depositing of soil, trash, ashes, garbage, waste, bio-solids or any other material is prohibited, except as permitted in subsection i. below.

   i. Excavating, dredging, or removing of loam, gravel, soil, rock, sand, or other materials is prohibited, unless said work is required as part of drainage and flood control or mitigation-related maintenance activities, flood prevention activities, and/or activities related to the maintenance of flood control facilities, as provided for in Exhibit C.

j. Otherwise altering the topography of the property, including building of new roads, is prohibited.

3. Removal of accumulated sediments or debris from the McDonald Canyon Detention Basin is not authorized nor prohibited under this Cooperative Agreement. VCWPD acknowledges that such work may require USACOE authorization pursuant to Section 404 of the Clean Water Act, Los Angeles Regional Water Quality Control Act authorization pursuant to Section 401 of the Clean Water Act, and/or California Department of Fish and Game authorization pursuant to Section 1601 of the Fish and Game Code.

4. Representatives of the USACOE shall have access, at reasonable times and in a reasonable manner, to the MITIGATION AREAS, to monitor VCWPD's continued maintenance of the MITIGATION AREAS. When such representatives desire access for monitoring purposes, written notice via facsimile, letter, or E-mail shall be given to the current Restoration Coordinator of the VCWPD, or his/her equivalent, a minimum of one week in advance of site visit.

5. These terms, conditions, and restrictions shall run with the land and shall be inserted by VCWPD in any subsequent deed, or other legal instrument, by which it divests itself of either the fee simple title to or its possessory interest in the MITIGATION AREAS.

6. The VCWPD expressly reserves for itself, its successors and assigns the right to continue use of the MITIGATION AREAS for all purposes consistent with this Agreement.

7. This Agreement does not have a legal precedential application to any other areas of McDonald Canyon Creek or to other lands, resources, situations or circumstances between the PARTIES.

8. This Agreement shall become effective 30 days following the signature of both PARTIES.

9. VCWPD shall hold harmless, protect and indemnify USACOE and its directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each an "Indemnified Party" and, collectively, "Indemnified Parties") from and against any and all liabilities, penalties, costs, losses, damages, expenses (including, without limitation, reasonable attorneys' fees and experts' fees), causes of action, claims, demands, orders, liens or judgments (each a "Claim" and, collectively, "Claims"), arising from or in any way connected with: (1) injury to or the death of any person, or physical damage to any property, resulting from any act, omission, condition, or other matter related to or occurring on or about the MITIGATION AREAS, regardless of cause, unless due in whole or in part to the negligence of USACOE or any of its employees; (2) the existence or administration of this Cooperative Agreement, except to the extent caused by USACOE's negligence or willful misconduct. If any action or proceeding is

brought against any of the Indemnified Parties by reason of any such Claim, DECLARANT shall, at the election of and upon written notice from USACOE, defend such action or proceeding by counsel reasonably acceptable to the Indemnified Party or reimburse USACOE for all charges incurred for services of the Attorney General in defending the action or proceeding.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Agreement.

VENTURA COUNTY WATERSHED PROTECTION DISTRICT

Dated: July 20, 2004 By: _____
Chair, Board of Supervisors

UNITED STATES ARMY CORPS OF ENGINEERS

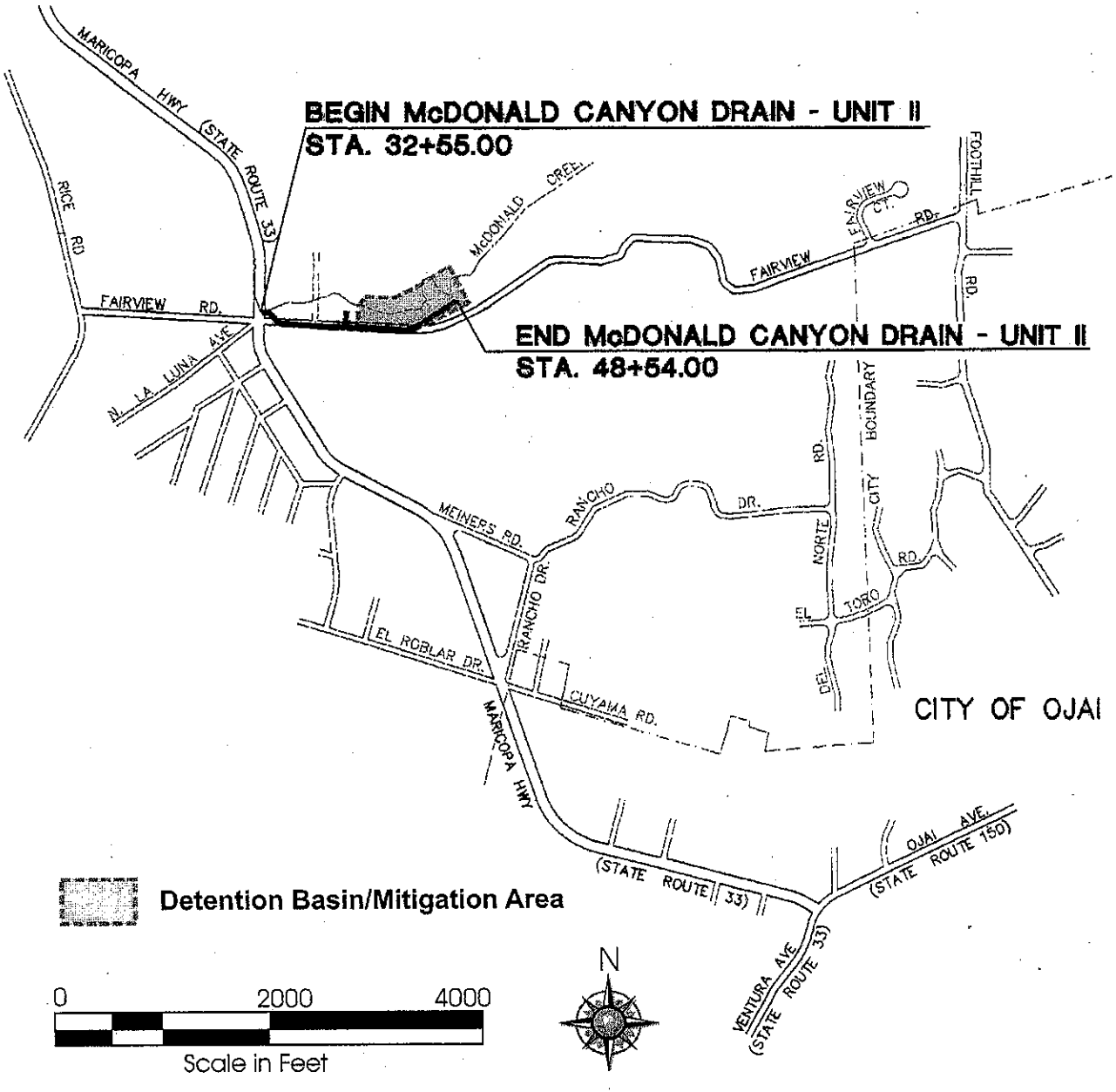
Dated: 6/15/04 By: _____
North Coast Section Chief, Regulatory Branch

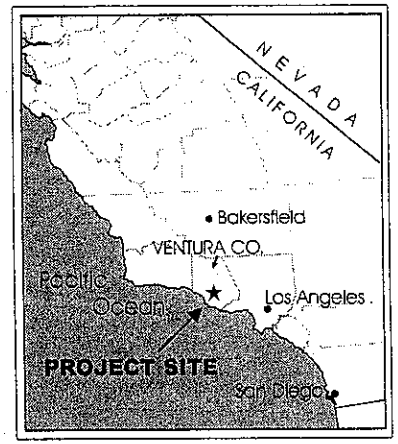
McDonald Canyon Detention Basin

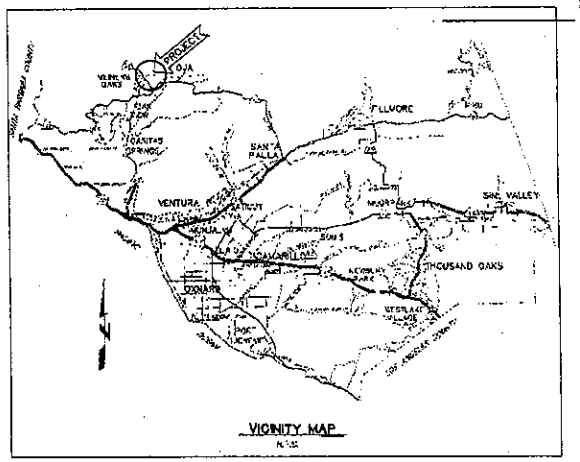
Exhibit A

Regional and Local Vicinity of Project Area

Aspen Environmental Group







Source: Ventura County Flood Control District, 1994

McDonald Canyon Detention Basin

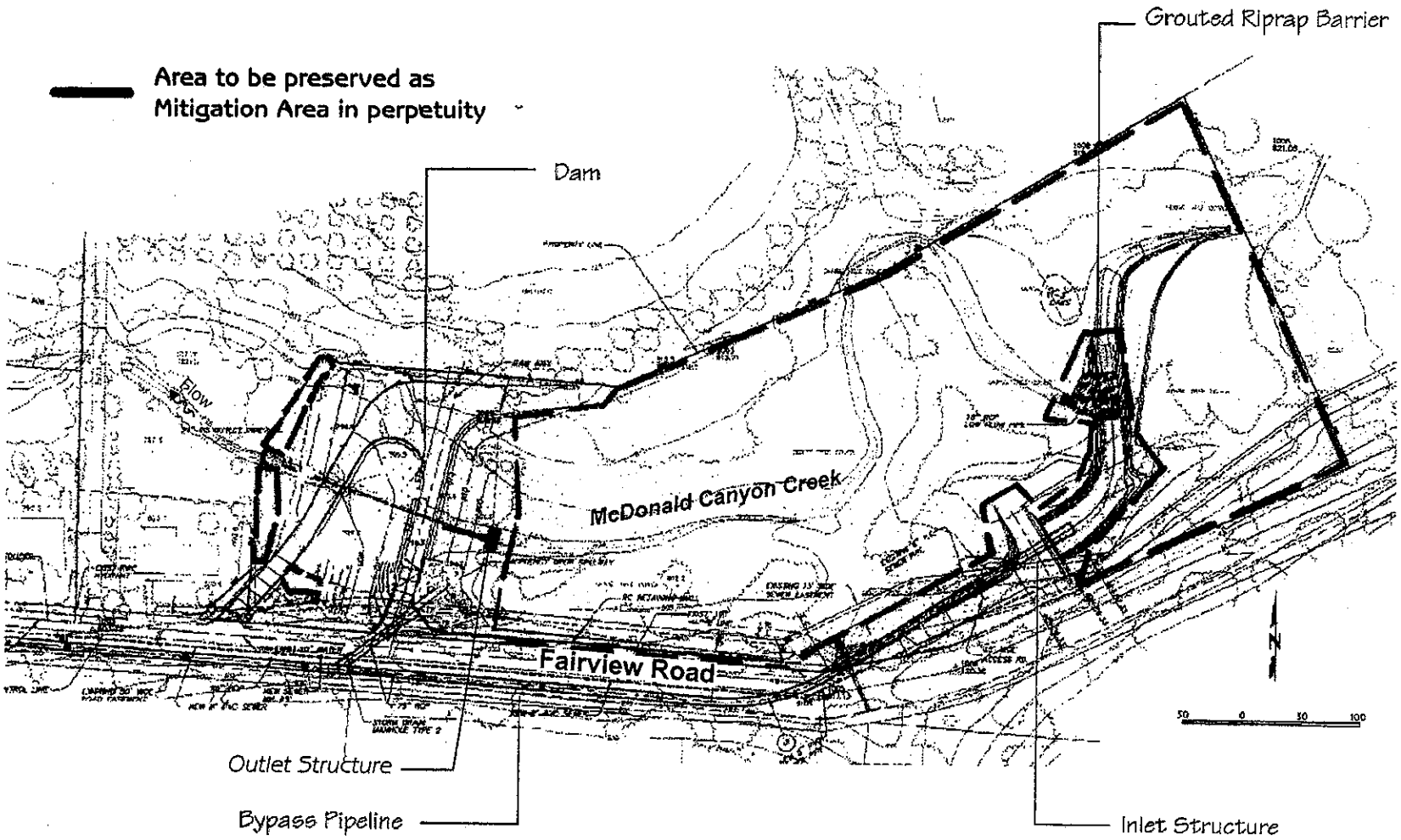


Exhibit A

Note: The temporary access corridor for cleanouts is not shown in this exhibit but is shown in Exhibit B.2

0 100 200
Scale in Feet

N

Source: Ventura County Flood Control District, June 10, 1996

McDonald Canyon Detention Basin

Exhibit B.1

Site Plan with Delineated Mitigation Areas

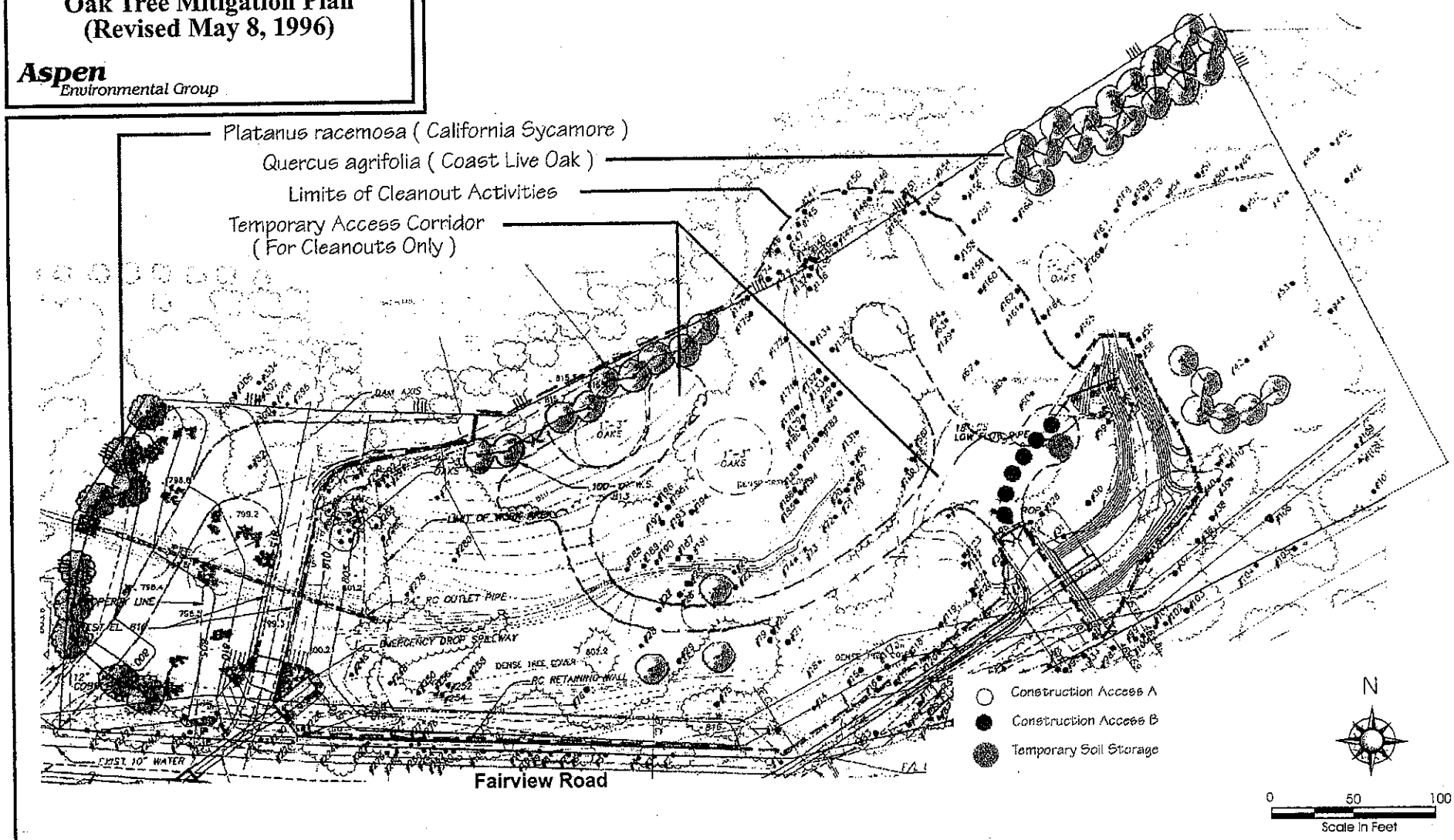
Aspen Environmental Group

McDonald Canyon Detention Basin

Exhibit B.2

Oak Tree Mitigation Plan (Revised May 8, 1996)

Aspen Environmental Group



Source: Ventura County Flood Control District, May 8, 1996

EXHIBIT C

VENTURA COUNTY WATERSHED PROTECTION DISTRICT

MAINTENANCE OF THE MCDONALD CANYON DETENTION BASIN MITIGATION AREAS

POLICIES AND PROCEDURES

Routine Maintenance of Mitigation Areas

1. The need for maintenance will be determined by the Ventura County Watershed Protection District (VCWPD), based on field inspection. VCWPD shall provide written notification via facsimile, letter, or E-mail to the United States Army Corps of Engineers (USACOE) prior to initiation of any maintenance activities within the MITIGATION AREAS, except those Routine Maintenance activities discussed below. Notification shall include a description of the maintenance activities, and an estimate of the linear distance/acreage of waters/wetlands that would be affected. In-kind maintenance of the MITIGATION AREAS, which would be limited to replanting and maintenance of native vegetation and eradication of non-native plants, would not be regulated by Section 404 of the Clean Water Act. Regulated and non-exempt activities may not proceed until issuance of a Section 404 permit.

2. VCWPD retains the authority to remove or periodically clear a 10-foot-wide strip of established vegetation upstream, downstream, and at the toe/base of any permanent structure (culvert, detention basin inlet or outlet, wingwall, headwall, or rock riprap structure) in order to accomplish routine inspection for potential damage of those structures. In addition, VCWPD retains the authority to remove or periodically clear a 3-foot-wide strip of established vegetation adjacent to both sides of any permanent access road, ramp, or concrete v-ditch. Vegetation cutting, mowing, whipping, or removal associated with pure excavation are not regulated by the USACOE and do not require authorization under Section 404 of the Clean Water Act. Vegetation removal activities resulting in more than incidental fallback of excavated or dredged material may be regulated by the USACOE and require authorization pursuant to Section 404 of the Clean Water Act.

3. VCWPD retains the authority to remove non-native vegetation and/or selectively spray non-native plants in MITIGATION AREAS as needed to comply with permit conditions. Only herbicides approved for aquatic use shall be applied when working within the MITIGATION AREAS, in proximity to McDonald Canyon Creek, or within McDonald Canyon Detention Basin, regardless of flowing or standing water. If surfactants are required, they too shall be restricted to those approved for aquatic use. Plant maintenance shall be conducted or supervised onsite by personnel or individuals capable of differentiating between native and non-native plant species. Herbicide application shall be conducted and supervised by personnel who are certified by the Department of Pesticide Regulation, State of California, in applying herbicides.

4. Post-emergent herbicides may be periodically applied to the gravel surface of flood control maintenance roads in a manner that does not result in those chemicals being conveyed into the MITIGATION AREAS, McDonald Canyon Creek, or McDonald Canyon Detention Basin. No pre-emergent herbicides shall be applied within the MITIGATION AREAS or McDonald Canyon Detention Basin.

5. Subject to restrictions or requirements imposed by the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board, rodenticides may be applied on an as-needed basis only.

6. VCWPD acknowledges that activities exempt from Section 404 permit requirements or not regulated by the USACOE may still require authorization from the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board.

Non-Emergency Repairs, Reconstruction Work, and Sediment-Removal Activities Within the Mitigation Areas

1. For non-emergency repairs or reconstruction work within the MITIGATION AREAS (i.e., those not qualifying as an emergency pursuant to 33 CFR325.2(e)(4) or the most current Regional General Permit for emergency Actions), the VCWPD shall provide written notification to the USACOE prior to initiation of any repair or reconstruction activities, or any activities involving disturbance of the streambed, bank, or native vegetation, within the MITIGATION AREAS. Notification shall include a description of the activities and an estimate of the linear distance/acreage of waters/wetlands affected. Photographs of the area to be repaired or reconstructed shall be included with the written notification. Work shall not proceed until authorized by the Corps or specifically determined to be exempt from Section 404 permit requirements.

2. VCWPD retains the authority to remove established vegetation within 50 feet of any culvert, inlet or outlet, wingwall, headwall, or rock rip-rap structure, in the event these structures are damaged or are threatened with damage, or as necessary to repair said structures. VCWPD shall be responsible for the reestablishment of native vegetation only within the outer-most 40 feet of the 50-foot temporary impact zone at a 1:1 ratio. Any method suitable to achieve revegetation goals may be applied.

3. For non-emergency repairs or reconstruction work in the MITIGATION AREAS, these activities shall not include replacement of native vegetation lost during storm events or fire, but shall include replacement of native vegetation that has been damaged or destroyed as a result of this restoration work. Maintenance to ensure survival and growth of planted native vegetation and to selectively remove non-native vegetation in the restored area(s) shall be conducted for a period of two years following restoration work, or longer, if the PARTIES determine more time is necessary to ensure the revegetation approximates the established condition prior to damage (i.e., equivalent type, density, and maturity of vegetation).

4. To ensure the continued health of the oak trees and the flood capacity of the McDonald Canyon Detention Basin, VCWPD retains the authority to remove accumulated sediments and/or debris in designated clean-out areas within the Basin, pursuant to a

precise map agreed to by the USACOE, CDFG, a qualified arborist contracted by the VCWPD, and the VCWPD during or after an on-site meeting. Such sediment and/or debris removal activities are estimated to occur every 10 years or less frequently (i.e., after large storm events). Deposited materials within 6 feet of the trunks of oak trees in designated clean-out areas shall be removed by hand. All other materials shall be removed by small, rubber-tired "Kubota"-type skip loaders or similar equipment approved by the USACOE. Larger equipment, such as dump trucks, may be used only in the temporary access corridor depicted in Exhibit B.2. In addition, all vegetation disturbed by these sediment and/or debris removal activities shall be replaced at a 1:1 ratio; pursuant to the VCPWD's *Final Mitigation Plan, McDonald Canyon Detention Basin*, dated June 15, 1995, as amended.

Emergency Repairs Within the Mitigation Areas

1. VCWPD shall provide written notification to the USACOE in accordance with either 33CFR Part 325.2(e)(4) or the most current Regional General Permit for emergency actions prior to initiation of emergency repairs within the MITIGATION AREAS. Notification shall include a description of the activities and an estimate of the linear distance/acreage of waters/wetlands affected. Photographs of the area to be repaired shall be provided within two weeks of written notification.

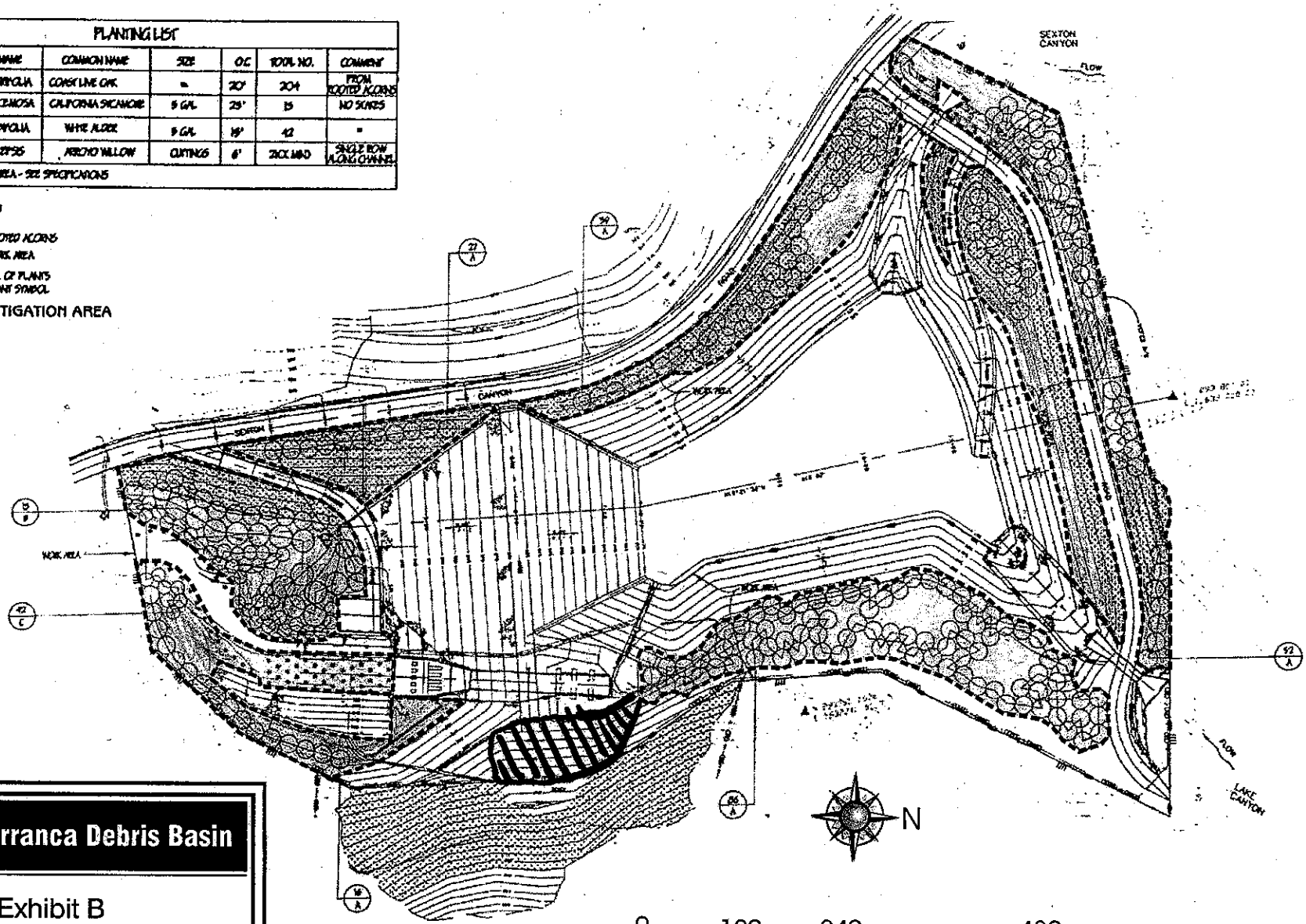
2. VCWPD shall not be responsible for replacing native vegetation lost during storm events or fire, but shall replace native vegetation that has been damaged or destroyed as a result of the emergency repair work at a 1:1 ratio. Maintenance of planted native vegetation and selective removal of non-native vegetation in repaired area(s) shall be conducted for a period of two years following emergency repair work, or longer, if the PARTIES determine more time is necessary to ensure revegetation approximates the established condition prior to damage (i.e., equivalent type, density, and maturity of vegetation).

3. VCWPD acknowledges that activities exempt from Section 404 permit requirements or not regulated by the USACOE may still require authorization from the California Department of Fish and Game and/or the Los Angeles Regional Water Quality Control Board.

PLANTING LIST						
SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	O.C.	TOTAL NO.	COMMENT
A	QUERCUS AGRIFOLIA	COAST LIVE OAK	ACORN	20'	204	FROM ROOTED ACORNS
P	PLATANUS RACEMOSA	CALIFORNIA SYCAMORE	5 GAL.	25'	15	NO SUCKS
C	ALNUS RHOMBIFOLIA	WHITE ALDER	5 GAL.	15'	42	"
• • •	SALIX LASIOLEPIS	ARROYO WILLOW	CUTTINGS	6'	2100 LINEAR	SINGLE ROW ALONG CHANNEL
⁘⁘⁘	HYDROSEED AREA - SEE SPECIFICATIONS					

LEGEND

- ROOTED ACORNS
- WORK AREA
- NO. OF PLANTS / PLANT SYMBOL
- MITIGATION AREA



Arundell Barranca Debris Basin

Exhibit B

Landscape Planting Plan

Aspen Environmental Group

Source: Ventura County Flood Control District, 1997