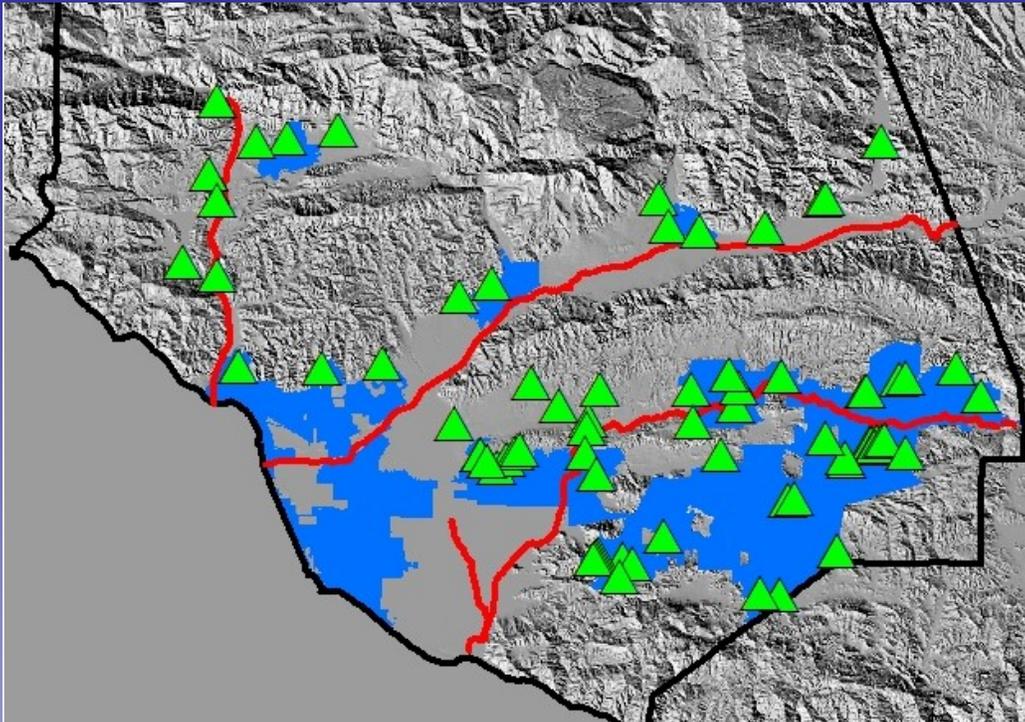
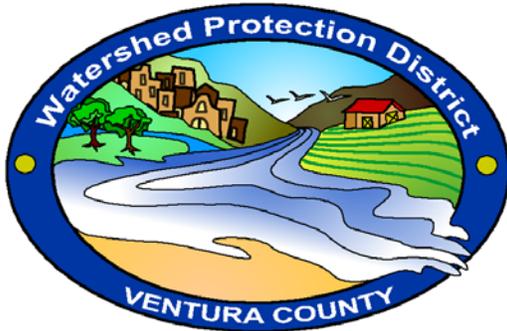


Debris and Detention Basin Manual

March 2019 Draft



Hydrology Section, Watershed Resources and Technology Division
Ventura County Watershed Protection District



Ventura County
Watershed Protection District
Hydrology Section
Project 80440

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1. 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's basins, and 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.

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)	(AC.)	(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
Fresno Canyon Debris Trap	DB1-04	2005	N	866	2,760	53,900	N	Y	N
Live Oak Diversion Dam	DD1-05	2002	N	794	45,527	20,952	Y	Y	N
Matilija Dam	86-000	1947	Y	34,940	810,000	NA	Y	Y	N
McDonald Canyon Detention Basin	DD1-04	1998	N	573	32,393	3,974	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	42,290	Y	Y	Y
Cavin Road Debris Basin	DB2-03	1933	N	90	4,100	2,943	N	Y	N
Fagan Canyon Debris Basin	DB2-08	1994	N	1,856	72,000	104,600	Y	N	Y
Jepson Wash Debris Basin	DB2-02	2011	N	858	33,850	55,800	Y	N	Y
Pole Creek Debris Basin	DB2-09	2009	N	5,532	440,440	361,700	Y	Y	Y

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)	(AC.)	(CY)	(CY)	(Y/N)	(Y/N)	(Y/N)
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
ZONE 3									
Arielle NPDES and Detention Basin	DD3-26	2002	N	42	5,080	378	Y	Y	N
Canyon No. 2 Debris Basin	DB3-39	2004	N	3,900	99,832	79,170	Y	Y	N
Castro Williams Debris Basin	DB3-06	2004	N	330	58,403	8,599	Y	Y	N
Conejo Mtn Creek Detention Basin No. 1	DD3-33	2001	N	1,537	77,100	1,065	Y	Y	Y
Conejo Mtn Creek Detention Basin No. 2	DD3-34	2004	N	498	6,275	165	Y	Y	Y
Conejo Mtn Creek Detention Basin No. 3	DD3-35	2004	N	443	53,400	2,994	Y	Y	Y
Conejo Mtn Creek Detention Basin No. 4	DD3-36	2004	N	250	13,450	642	Y	Y	Y
Conejo Mtn Creek Debris Basin No. 5	DB3-37	2004	N	212	11,680	3,204	Y	Y	Y
Coyote Canyon Debris Basin	DB3-15	1955	N	4,400	24,500	152,459	Y	N	Y
Covington Detention Basin	DD3-27	1997	N	47	5,020	0	Y	Y	Y
Crosby (Rudolph) Detention Basin	DD3-28	1997	N	55	6,450	0	Y	Y	Y
Edgemore Debris Basin	DB3-11	1991	N	105	2,950	1,188	Y	N	Y

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)	(AC.)	(CY)	(CY)	(Y/N)	(Y/N)	(Y/N)
Erringer Road Debris Basin	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
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 Lajas 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	1,938	Y	Y	Y
Line "C" Arroyo Simi Detention Basin	DD3-30	1997	N	635	16,330	12,956	N	Y	Y
Muirfield Detention Basin	DD3-25	2002	N	24	2,300	442	Y	Y	Y
N. Simi Drain Debris Basin	DB3-32	2003	N	704	14,582	8,700	Y	Y	Y
N. Simi Drain Detention Basin	DD3-32	2004	N	704	61,630	0	Y	Y	Y
Peach Hill Wash Retention Basin	DD3-23	1988	N	1,589	121,970	4,541	Y	Y	N
Ramona Detention Dam	DD3-16M	1992	N	254	41,230	3,732	Y	Y	Y

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)	(AC.)	(CY)	(CY)	(Y/N)	(Y/N)	(Y/N)
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	5,420	Y	Y	Y
South Branch Arroyo Conejo Debris Basin	DB3-22	2003	N	2,542	50,417	100,850	Y	Y	Y
South Potrero (Dos Vientos) Debris Basin	DB3-24	1995	N	359	17,500	13,900	Y	Y	Y
South Potrero (Dos Vientos) Detention Basin	DD3-24	1995	N	359	56,000	0	Y	Y	Y
Sycamore Canyon Dam	DD3-21	1981	Y	4,380	106,460	59,260	Y	Y	N
Sycamore Park Detention Basin	DD3-29	1997	N	33	6,450	1,473	Y	Y	N
Tapo Hills No. 1 Detention Basin (West)	DD3-18	1971	N	104	36,140	5,730	Y	N	Y
Tapo Hills No. 2 Detention Basin (East)	DB3-19	1977	N	133	41,190	4,000	N	Y	Y
Walnut Canyon- Basin 0	DD3-37	2005	N	338	36,950	12,680	Y	Y	Y
West Camarillo Hills West Branch Debris Basin	DB3-01	1986	N	74	5,250	1,268	Y	N	Y
ZONE 4									
Bridgegate Debris Basin	DB4-02	2004	N	262	12,936	4,517	Y	Y	Y
Potrero Creek Sediment Control Basin	DB4-01	2002	N	1,541	11,245	10,340	Y	N	Y

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)	(AC.)	(CY)	(CY)	(Y/N)	(Y/N)	(Y/N)
Obsolete Basins									
Franklin Barranca Debris Basin (Transferred to homeowner)	DB2-01	1996	N	330	5,050	11,507	Y	Y	Y
St. John's Debris Basin (Transferred to HOA)	DB3-03	1957	N	240	50,000	2,849	Y	N	Y
San Antonio Debris Basin (Destroyed by flood)	DB1-03	1986	N	6,280	14,600	455,700	Weir	N	N
Santa Rosa Rd No. 1 Debris Basin (Destroyed in 1978)	DB#-04	-	-	-	-	-	-	-	-
West Camarillo Hills East Branch Debris Basin (No easement access after landslide)	DB3-02	1955	N	92	1,840	1,432	Y	Y	Y
Non-Functional Basins									
Crestview Debris Basin	DB3-10	1934	N	80	2,350	1,005	N	Y	N
Not Accepted Basins									
Erringer Road Detention Basin	DD3-								

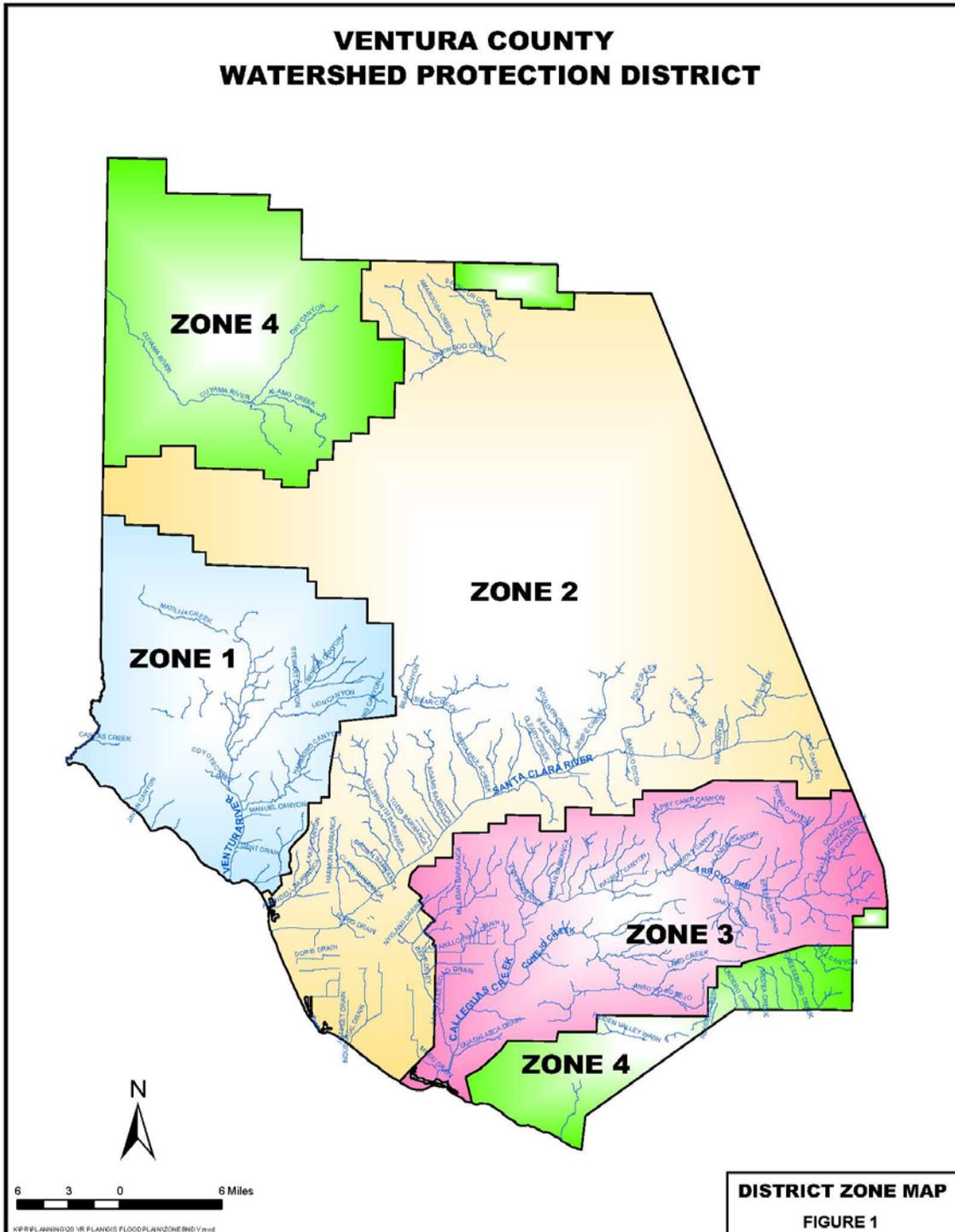
1.1 Watershed Protection District Description

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.



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 and recurrence interval of the storm. Debris basins are expected to discharge through the emergency spillway in the 100-yr storm.

Detention basins are designed with outlet works and enough storage to capture the expected 100-yr sediment volume and significantly reduce the 100-yr inflow flood peaks through the principal outlet. Emergency spillways are designed to convey flow out of the basin if the principal outlet becomes blocked. The District's policy is that debris basins cannot be used to attenuate design storm inflow peaks in hydrology models due to the difficulties in evaluating the rapidly varying flow over the emergency spillways. The only exception to this policy is the Runkle Detention Dam which is included in hydrology studies even though it is expected to spill over the emergency spillway during the 100-yr storm.

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 generally can store more than 50 acre-feet of water during a storm or have dams that are more than 25-feet high. They are inspected annually by DSOD. The District's State-Size debris basins include Stewart and Ferro Basins. The State-Size detention basins are Arundell, Matilija, Lang Creek, Runkle, Sycamore Dam and Las Lajas 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, flow downstream of a debris basin can have 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 ongoing 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 or detention 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 needed. Updates are generally done following a storm 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 increased spillway capacity. Several such basins included in the 1999 update were Las Posas Estates, Ramona, and Arundell Barranca basins. The new basins included in the 2005 manual update were the following:

Zone 1

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 additional basins included in this Manual update are the following:

Zone 1

Matilija Dam

Zone 2

Pole Creek Debris Basin

Zone 3

Arielle NPDES & Detention Basin
Covington Detention Basin
Conejo Mountain Creek Basins 1 through 5
Crosby(Rudolph) Detention Basin

Erringer Road Detention Basin
Muirfield NPDES & Detention Basin
North Simi Drain Debris and Detention Basins
Sycamore Park Detention Basin

Zone 4

Bridgegate Debris Basin

Basins that are no longer being maintained by the District are the following:

Zone 1

Franklin Debris Basin – Filled with sediment and planted with an orchard, it was no longer functional and ownership was transferred to the adjacent homeowner who uses the dam as an access road to their house.

Zone 3

St. John's Debris Basin – This historical debris basin was reconstructed as a homeowner detention basin to mitigate the increased flow from an upstream development and ownership was transferred to the HOA.

West Camarillo Hills Drain East Branch Debris Basin – This basin was no longer maintained by the District after a landslide occurred in the early 2000s and it was determined that we did not have an easement to use for access.

As of January, 2016, Crestview Debris Basin in Zone 3 is no longer functional due to having an orchard planted in it and the District is evaluating it for removal. Santa Rosa Road Basin in Zone 3 is being studied by a consultant for the District to determine if it should be removed or reconstructed. Cavin Road Basin in Zone 2 has been studied by the District and the preferred alternative is to reconstruct the outlet tower to pass more fine sediment through the basin but continue to capture sand and gravel sized sediment.

Most of the larger basins designed to provide flood water detention across the County belong to the District. There are numerous smaller HOA detention basins in the various cities that are not maintained by the District and are not included in this manual. One of the bigger HOA basins that is not maintained by the District is located in the eastern end of the City of Simi Valley- Mt. Sinai Basin. This basin is included in the District's official hydrology models of this area.

There are a number of relatively large reservoirs in the County that are primarily used for water storage but provide some peak stormflow attenuation. These include: Las Casitas Dam owned by the US Bureau of Reclamation (USBR) in Zone 1, Pyramid Dam owned by the United Water Conservation District (UWCD) in Zone 2, Lake Bard owned by the Calleguas Municipal Water District in Zone 3, and Lake Sherwood owned by the Lake Sherwood Association that drains to the Pacific Ocean in Zone 4.

2. Basin Data Summary

Many of the smaller and older debris basins in the County were built by other agencies and then ownership was transferred to the District. The NRCS (then SCS) built many basins to limit the damage from flooding after fires. Collecting the data included in this manual has entailed contacting these agencies and obtaining the design information, as-builts and topographic surveys, and any sediment removal data.

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 State Plane Zone V coordinates in feet of each basin 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 Basin Volume Data

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 wet years with large volumes of sediment deposited in the basins.

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. As new basins were constructed their design topographic maps were used to evaluate the basin capacities.

2.5 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 for basins that were constructed prior to that year. The detention basin routing to estimate the peak outflow is done assuming the basin contains 125% of the 100-yr design debris volume placed level in the basin at the beginning of the design storm. If a stage-storage-discharge curve has been developed for use in a hydrology model, the reference to the model and data are provided.

2.6 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.

2.7 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.



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 Two-Way 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)

3. Debris Data

3.1 Basin Debris Volume Design Criteria

Debris basins are sometimes designed to hold the 100-yr predicted design sediment volume, but many debris basins were built after fires and have less than the 100-yr design volume. 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. Debris basins are not included in design hydrology models.

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 to the design storm). The conceptual model supporting the fire factor is that most fires occur in the late summer or early fall. Therefore, by the time most of the rainfall has occurred at the end of March of the next year, 0.5 of a season has elapsed. 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. The USGS published this value for a number of watersheds in Ventura County based on field surveys. If a study area is near one of these watersheds, these values should be used. If a study area is not near one of the USGS watersheds, the 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. This map is used to develop a SF value.
- 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 for the 10-, 25-, 50-, and 100-yr 24-hour rainfall isohyets that can be used to establish the average 24-hr value for a watershed. The District's Pearson III analyses of historic rainfall data from their rain gage network are then used to obtain the n-yr 10-day values for the calculation.

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 disasters. 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.

In 2009 the District evaluated the basin removal data available since 1969. The results were documented in a draft report "Sediment Yield Method Update" dated December, 2009. The evaluation results were consistent with other studies by the USGS (2009) and Army Corps of Engineers (2000) which showed that some other parameters correlated better with removal quantities than those identified in the 1973 study. Relief ratio (RR) provided better results than elongation ratio, and slope failure did not improve the regression to the removal data. For small watersheds (less than 1.6 sq mi), maximum hourly rainfall intensities improved the regression compared with longer duration rain data. For large watersheds, the 1-day and 10-day rain values were highly cross-correlated. Testing of both data sets in the regressions found better results with the use of the 10-day rainfall.

The evaluation resulted in two regression equations to be used for large watersheds depending on whether they had been burned in the last seven years. The report recommended another equation to be used for Zone 1 and 2 small watersheds and a fourth equation to be used for small watersheds in Zone 3. The use of the recommended equations to evaluate the District's basins shows design quantities that are much more consistent with the largest historical removal volumes that obtained through the other methods. The equations were also used in an evaluation of the Pole Creek Debris Basin and were found to provide reasonable results. Until the report is finalized, the draft report must be requested from the District and any proposed use of its equations must be approved in advance by the District.

3.3 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.

3.4 Basin Debris Removal History

The debris removal volumes are provided in a basin history table. The data in the table includes the date, action, remaining capacity, volume removed, and Average Annual Debris Production (AADP). Standard practice is to collect aerial survey data after the winter season to provide topography on pre-cleanout conditions. If the debris level in a basin exceeded the elevation requiring a clean-out, another aerial or field survey was done after the clean-out to determine the removed volume. The removal volumes and remaining capacity values with marked as result from aerial surveys in the history table.

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 remaining capacity where no cleanout occurred are due to errors of survey. Increases in remaining capacity from one aerial survey to the next are due to differences in the excavation limits.

The digitized topographic information has been evaluated in several different ways. When the District's Hydrology Section did the analysis, they used a planimeter to measure the areas enclosed by each contour level on the topographic map for the contour integration method. They then calculated the incremental volume between contour levels using the conic equation and summed them to find the total excavation volume. When the District's Design and Construction Division took over responsibility for evaluating removal volumes, they used an average-end method with cross-sections on a 50-ft spacing. In 1987, the method was changed to using a Digital Terrain Model (DTM) that used aerial topography data with a 5-foot resolution. The DTM method was thought to give much higher accuracy for pay quantity estimates. Currently the Operations and Maintenance Division converts the pre- and post-cleanout topographic maps to Triangulated Irregular Network (TIN) surfaces and uses AutoCAD to subtract the surfaces and find the excavated volume.

A 2008 study done by the District on pre- and post-cleanout topographical data for Gabbert Debris Basin performed the various volume calculation methods and found that the results differed by only 1%. Using the post-cleanout data to evaluate the remaining capacity of Gabbert resulted in similar results except that the contour integration method differed by about 2%.

In 2005 O&M started reporting the excavation volumes for smaller basins using the truck counts contained on the contractor pay sheets. A volume generated in this way is marked as a "Truck Count" in the history table. A 2015 study by the District showed that the truck count volumes could differ from the topographical evaluation results. For larger basins where significant quantities of debris are removed, the volumes continue to be analyzed with aerial survey data and AutoCAD analyses.

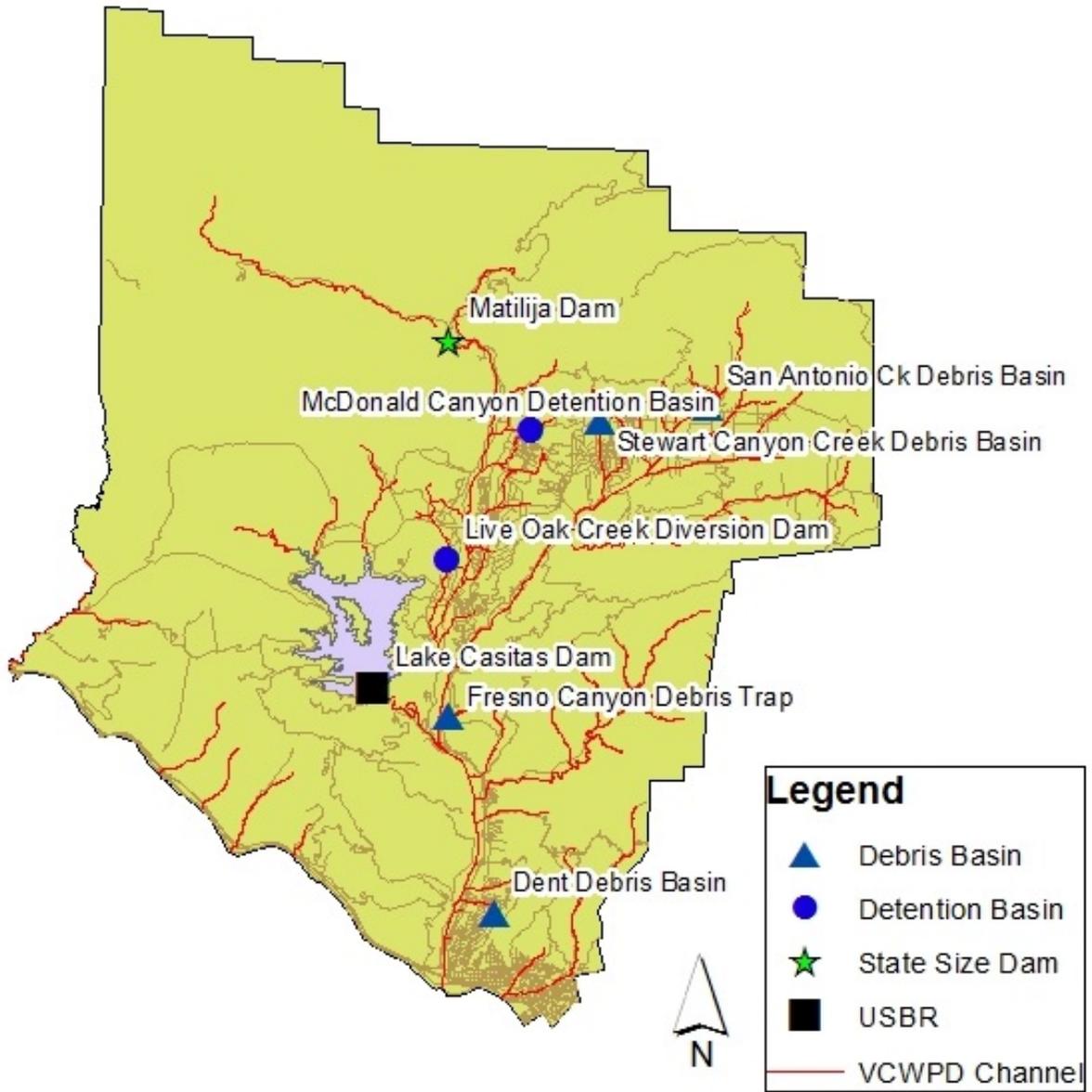
3.4 Channel Debris Removal History

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. Acronyms

AADP	Average Annual Debris Production	CMPA	Corrugated Metal Pipe- Arch
CMP	Corrugated Metal Pipe	GIS	Geographic Information System
CSP	Corrugated Steel Pipe	NAVD	North American Vertical Datum
NAD	North American Datum	NRCS	Natural Resources Conservation Service
NGVD	National Geodetic Vertical Datum	RCP	Reinforced Concrete Pipe
RC	Reinforced Concrete	SCS	Soil Conservation Service
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 Q₁₀₀IN = 82 cfs, Q₁₀₀OUT=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
Historic 100-YEAR	1,624	2,354
Historic 50-YEAR	1,255	1,820
Historic 25-YEAR	928	1,346
Updated 100-YEAR	1,270	1,842
Updated 50-YEAR	970	1,406
Updated 25-YEAR	719	1,043

Updated with NOAA Rainfall in 2017 Hydrology Manual

BASIN HISTORY: DENT DEBRIS BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		

VCWPD- Zone 1**Debris and Detention Basins****BASIN HISTORY: DENT DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
02-92	Disaster Declaration			263**
05-92	Aerial Survey	2,009		
06-92	Cleanout		878	
06-92	Aerial Survey	4,070		
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
09-05	Cleanout		1,054- Survey	
08-05	TIN volume to Elev29 142 ft	1,834 to Elev 142 ft		
11-05	TIN volume to Elev29 142 ft	2,844 to Elev 142 ft	1,010	

NOTES

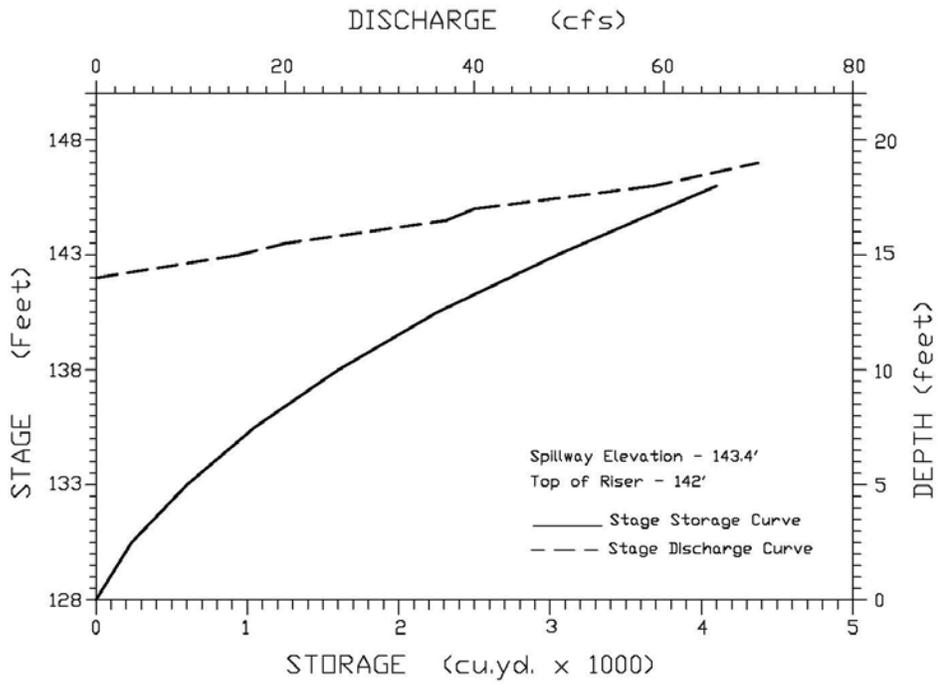
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable

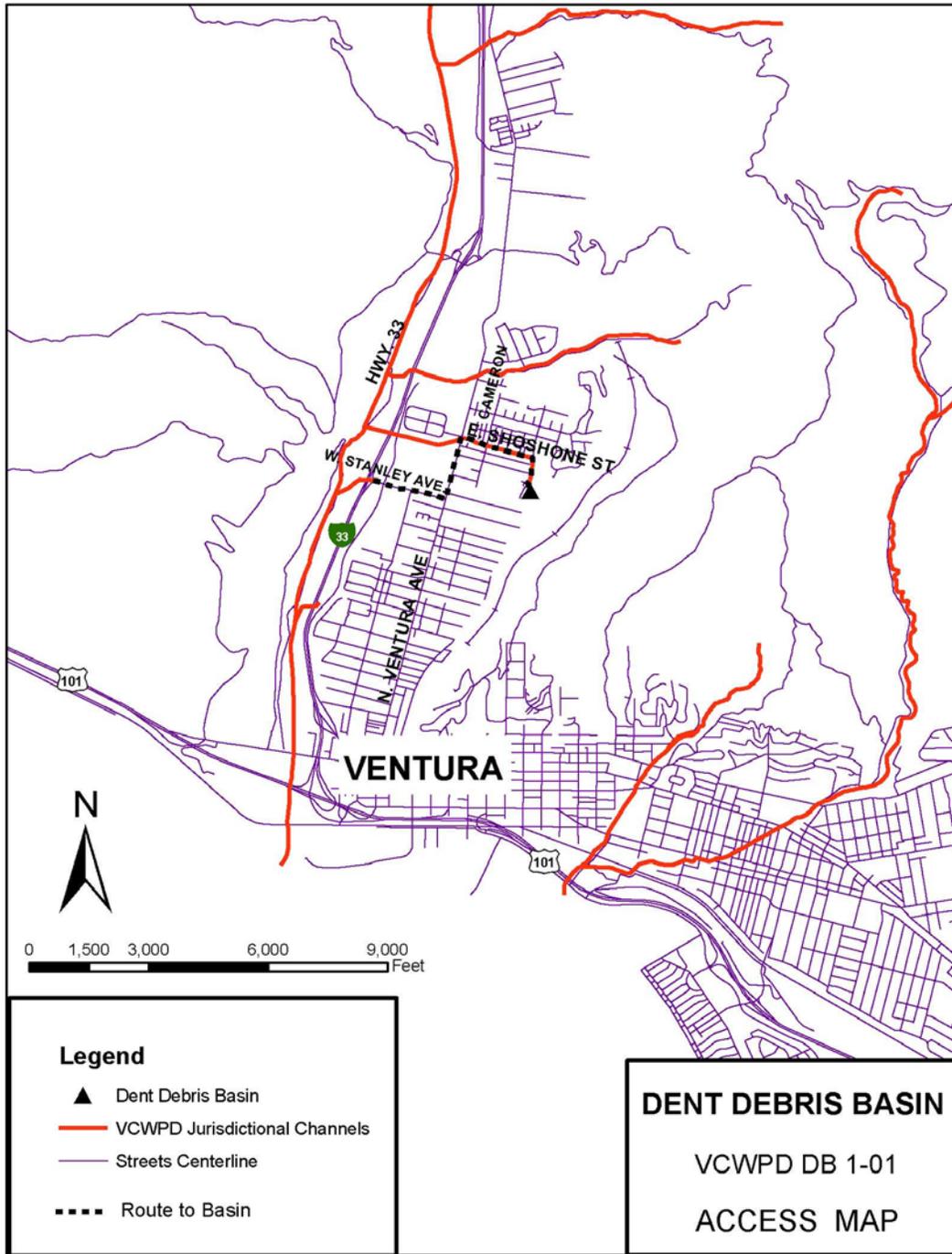


DENT DEBRIS BASIN



2005 Volumes After Cleanout

Elev. Ft 29	
126	-
127	27.0
128	98.9
129	193.3
130	306.4
131	434.8
132	577.0
133	733.4
134	904.5
135	1,095.9
136	1,302.8
137	1,519.4
138	1,751.5
139	1,999.2
140	2,263.0
141	2,543.4
142	2,840.9
143	3,156.1
144	3,489.3
145	3,841.2
146	4,212.2
147	4,603.3



FRESNO CANYON DEBRIS TRAP DB1-04

LOCATION: Next to Highway 33 in Casitas Springs, Ventura County
N 316,830 E 1,605,830. (Lambert Zone 5 Coordinates)
Ventura East 7-1/2' Quad

DESIGN DATA

Design Agency	<u>VCWPD O&M Division</u>
Maximum Debris Capacity	<u>2,760 cy at 280 ft NAVD88</u>
Maximum Debris Elevation	<u>280 ft NAVD88</u>
100-Yr Inflow and Outflow Rates	<u>IN= 1,673 cfs; OUT=Similar due to lack of storage</u>
Debris Cleanout Elevation	<u>Annual cleanouts due to small capacity</u>

EMERGENCY SPILLWAY

Type	<u>None</u>
Weir Elevation	=
Spillway Length	=
Capacity w/o Freeboard	=

PRINCIPAL SPILLWAY

Type	<u>54-in RCP</u>
Bottom Weir/Top Elevation	<u>271.91 ft NAVD88</u>
Outlet Conduit	<u>54 in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>None</u>
Top Elevation	=
Outlet Conduit	=

DAM

Dam Type	<u>Hwy33 Road Bed</u>
Dam Crest Elevation	<u>~280 ft NAVD88</u>
Length	<u>NA</u>
Surface Area of Full Basin	<u>~9,700 sf at elev. 280 ft NAVD88</u>
Watershed Area	<u>866 ac</u>
Width at Crest	<u>NA</u>

CONSTRUCTION DATA

Construction Agency	<u>VCWPD O&M Division</u>
Completion Date	<u>10-2005</u>

REFERENCE DRAWINGS

Construction Drawings	<u>X-1-xxxx thru X-1-xxxx (Not in Facilities Database)</u>
Topographic Drwgs(as-built)	<u>X-1-0667 (10-2005 cleanout)</u>
Right-of-Way Drawings	

VCWPD- Zone 1**Debris and Detention Basins**

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	53,932	78,226
50-YEAR	40,872	59,284
10-YEAR	17,487	25,364

BASIN HISTORY:

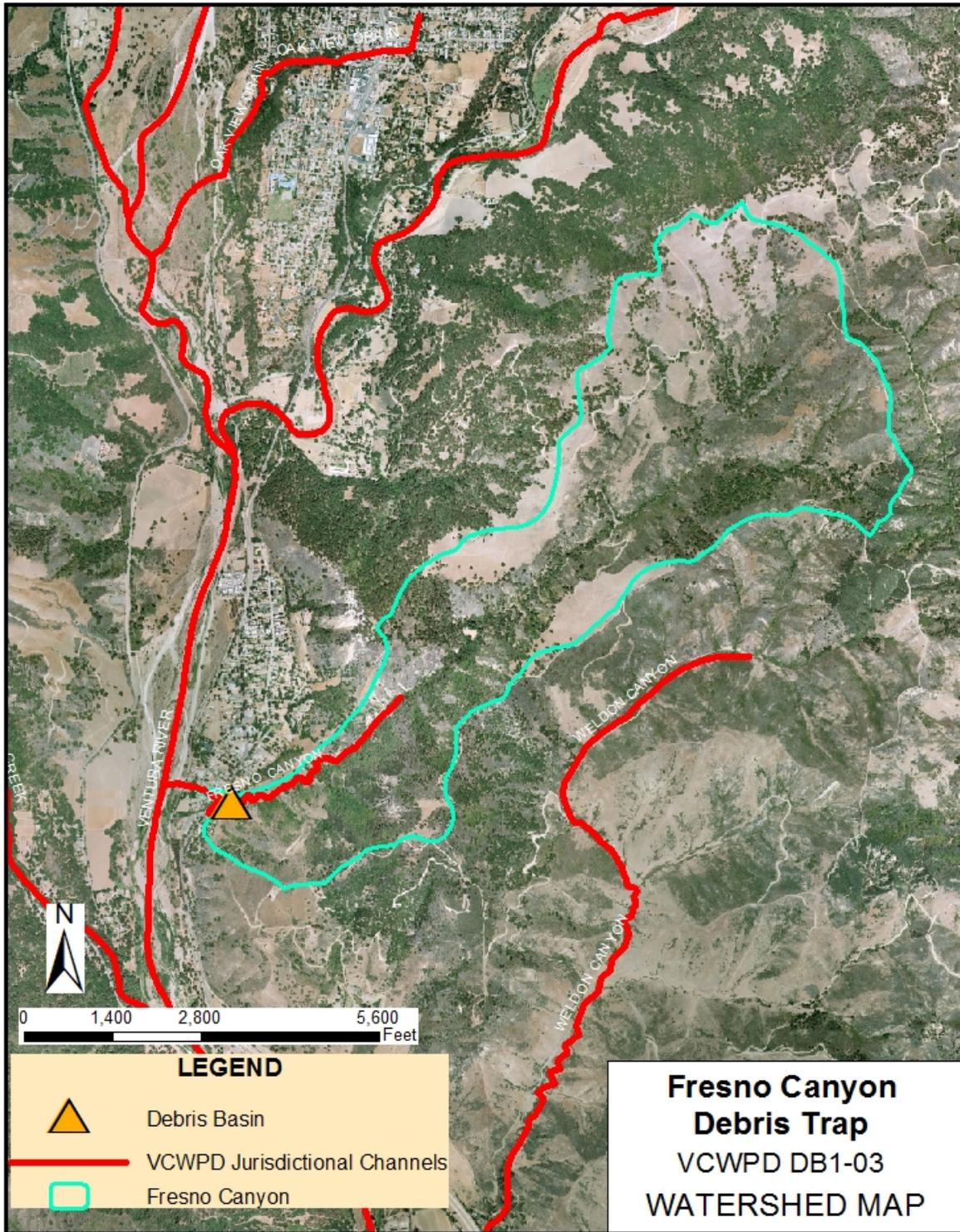
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
<u>10-05</u>	<u>Basin Excavated to Design Dimension</u>	<u>2,760 below elev. 280 ft NAVD88</u>		<u>NA</u>
<u>2009</u>	<u>Cleanout- Truck Count</u>	<u>Not surveyed</u>	<u>160</u>	<u>NA</u>
<u>2010</u>	<u>Cleanout- Truck Count</u>	<u>Not surveyed</u>	<u>8</u>	<u>NA</u>

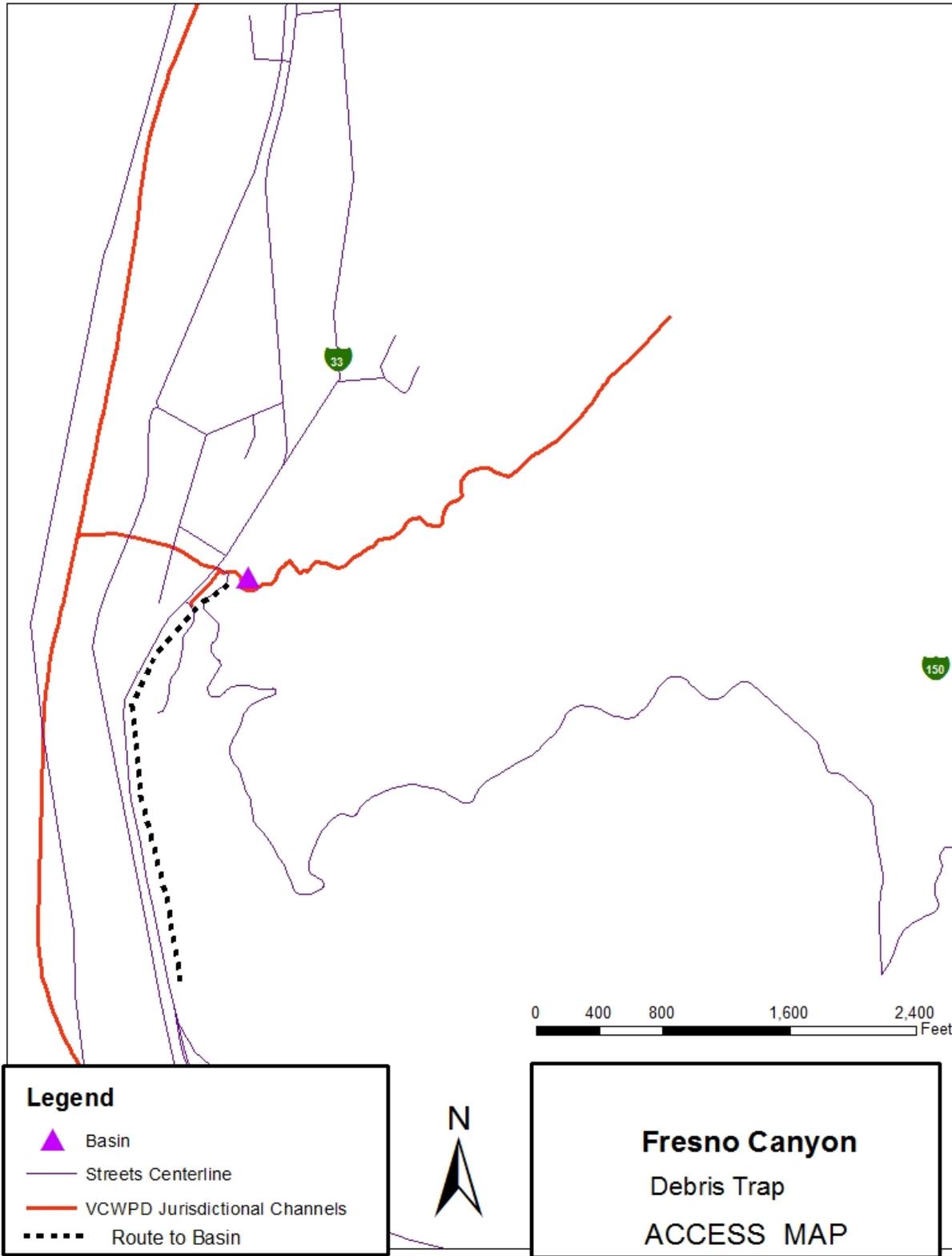
Notes

* 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 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 Q₁₀₀IN = 1,305 cfs, Q₁₀₀OUT=807 cfs from as-builts
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

VCWPD- Zone 1**Debris and Detention Basins**

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

BASIN HISTORY: LIVE OAK CREEK DIVERSION

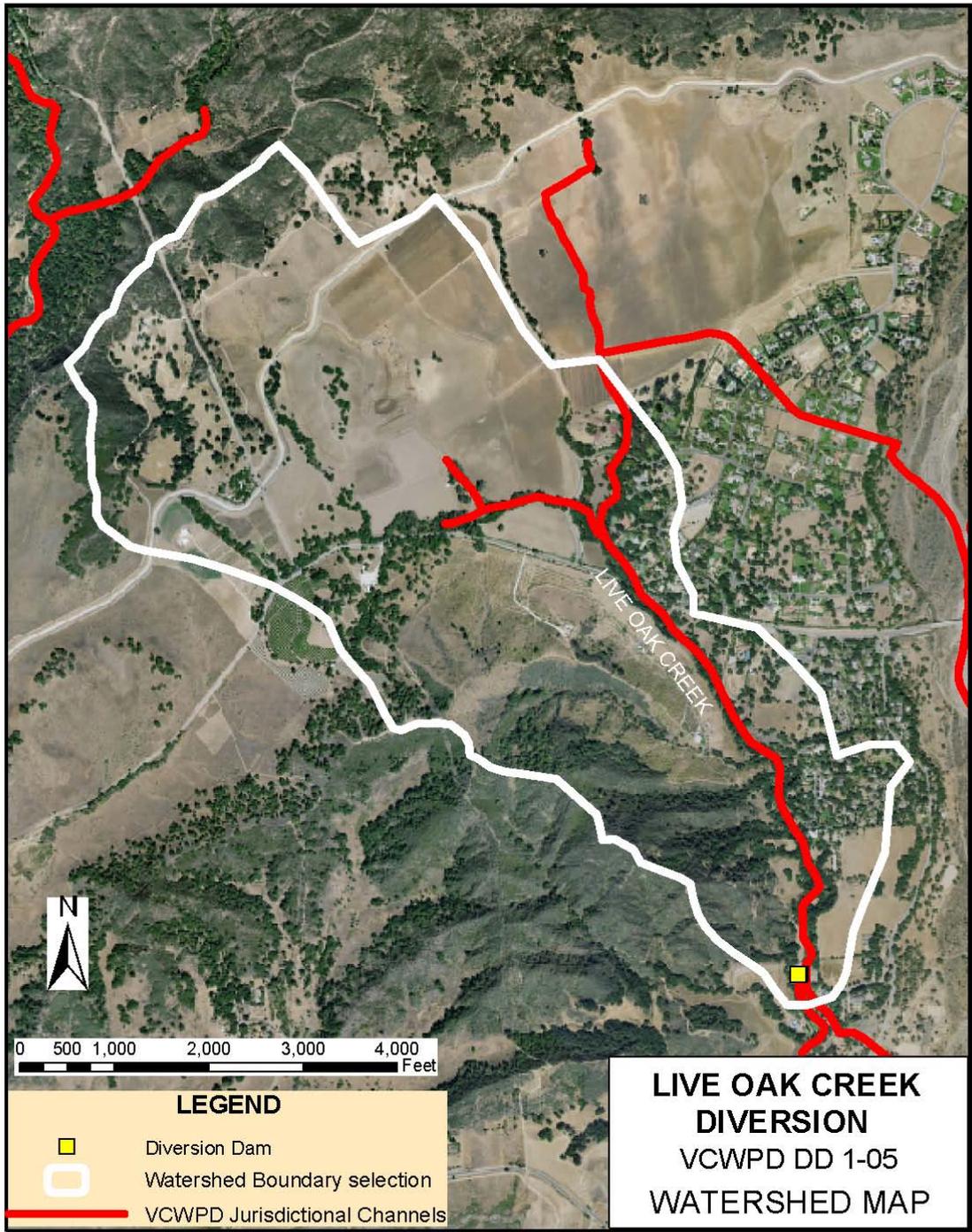
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
01-05	Disaster Declaration			1,600***

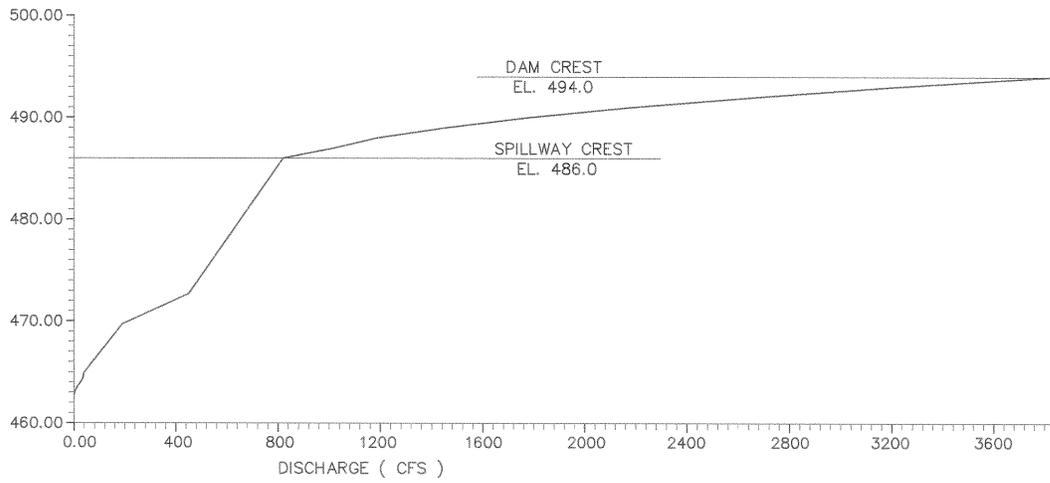
Notes

* 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.

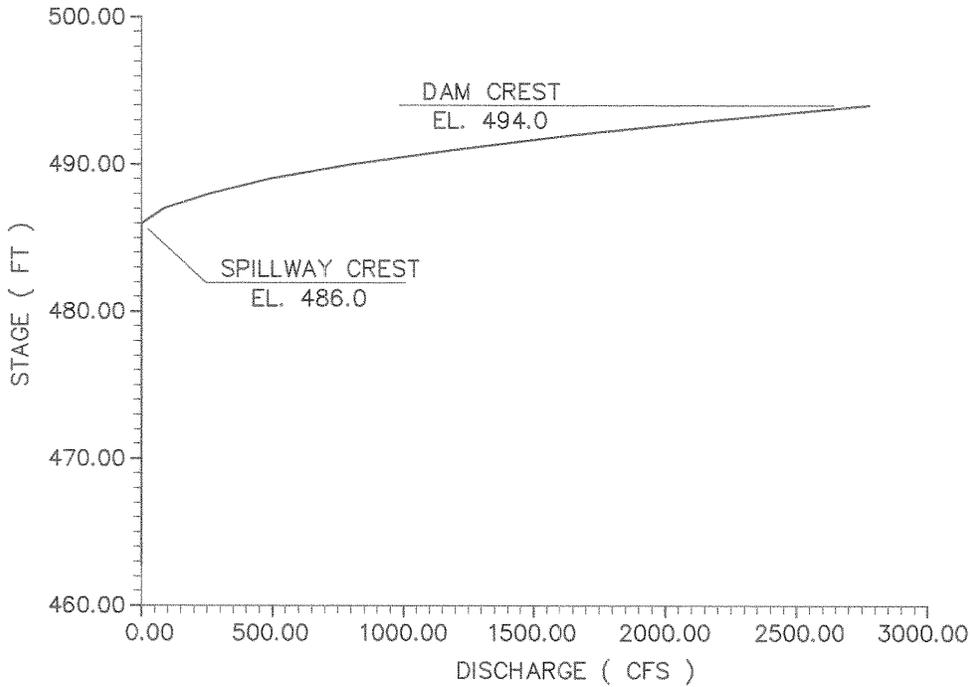




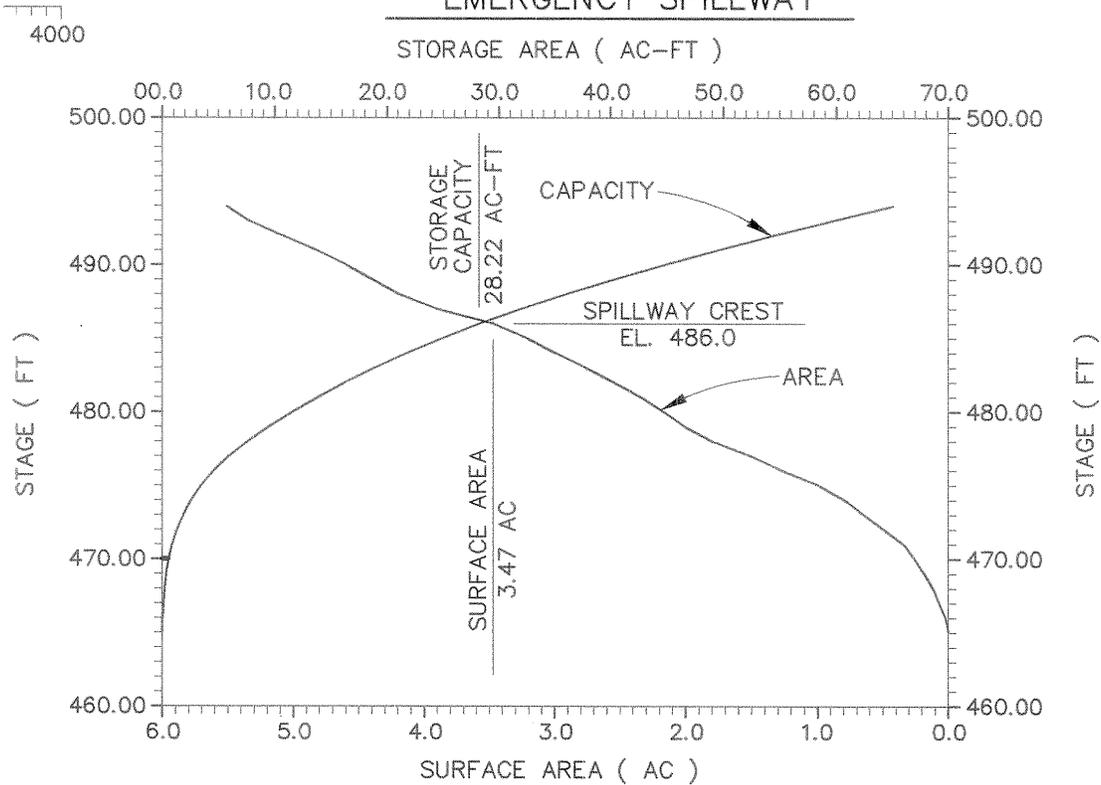
RC PIPE CONDUIT + RC LOW-FLOW PIPE+EMERGENCY SPILLWAY

STAGE DISCHARGE CURVES

Live Oak Creek Diversion



EMERGENCY SPILLWAY



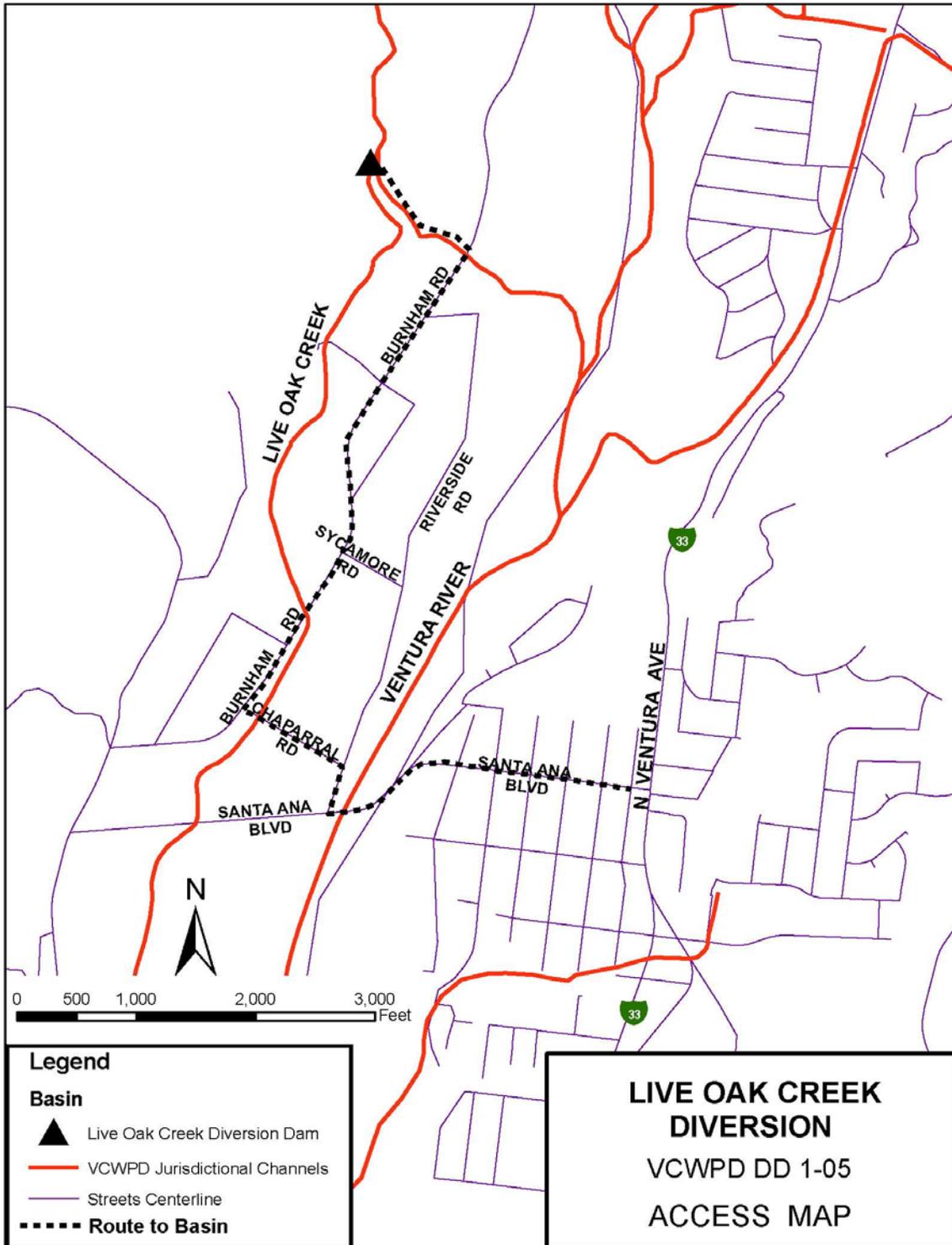
AREA-CAPACITY CURVE

Live Oak Creek Diversion

Live Oak Stage Storage Discharge Design Data

Elevation	Design Volume	Design Volume	Pipe & Low Flow Outlet	Emergency Spillway	Total Discharge
Ft. NGVD29	Cu. Yds	Ac-Ft	Cfs	Cfs	Cfs
462	-	0.000	-	-	-
464	32.0	0.020	25	-	25
466	94.0	0.058	70	-	70
468	245.0	0.152	135	-	135
470	838.0	0.519	215	-	215
472	1,985.0	1.230	390	-	390
474	4,055.0	2.513	485	-	485
476	7,303.0	4.527	550	-	550
478	12,199.0	7.561	600	-	600
480	18,626.0	11.545	652	-	652
482	26,199.0	16.239	707	-	707
484	35,124.0	21.771	762	-	762
486	45,525.0	28.218	818	-	818
488	58,011.0	35.957	937	250	1,187
490	72,195.0	44.749	980	800	1,780
492	87,803.0	54.423	1,023	1,640	2,663
494	104,985.0	65.073	1,059	2,770	3,829

Note: Volumes do not include design sediment accumulation



MATILIJA DAM State Dam No. 86-000

LOCATION: Dam approximately 1,200 ft west of Highway 33 north of Meiners Oaks area in Ventura County
N 360,900 E 1,606,000. (Lambert Zone 5 Coordinates)
Matilija 7-1/2'Quad

DESIGN DATA

Design Agency	<u>VCWPD</u>
Flood Storage Capacity	<u>7,018 ac-ft design, 500 ac-ft current</u>
Maximum Debris Elevation	<u>1097.6 ft NAVD88- notch in dam</u>
100-Yr Inflow and Outflow Rates	<u>IN= 21,600 cfs; OUT=Similar due to lack of storage</u>
Debris Cleanout Elevation	<u>None</u>

EMERGENCY SPILLWAY

Type	<u>Weir flow over top of dam- dam notched in 1965</u>
Weir Elevation	<u>1097.6 ft NAVD88</u>
Spillway Length	<u>=</u>
Capacity w/o Freeboard	<u>=</u>

PRINCIPAL SPILLWAY

Type	<u>36-in relief valve, max Q=250 cfs</u>
Bottom Weir/Top Elevation	
Outlet Conduit	<u>36 in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>None</u>
Top Elevation	<u>=</u>
Outlet Conduit	<u>=</u>

DAM

Dam Type	<u>Concrete Arch Dam</u>
Dam Crest Elevation; Height	<u>1097.6 ft NAVD88 at 1965 Notch; 116 ft</u>
Length	<u>620 ft</u>
Surface Area of Full Basin	<u>NA</u>
Watershed Area	<u>54.6 sq mi, 34,945 ac</u>
Width at Crest	<u>20 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>VCWPD</u>
Completion Date	<u>1947</u>

REFERENCE DRAWINGS

Construction Drawings	<u>X-1-0001 thru X-1-0027</u>
Topographic Drwgs(as-built)	<u>X-1-0001</u>
Right-of-Way Drawings	

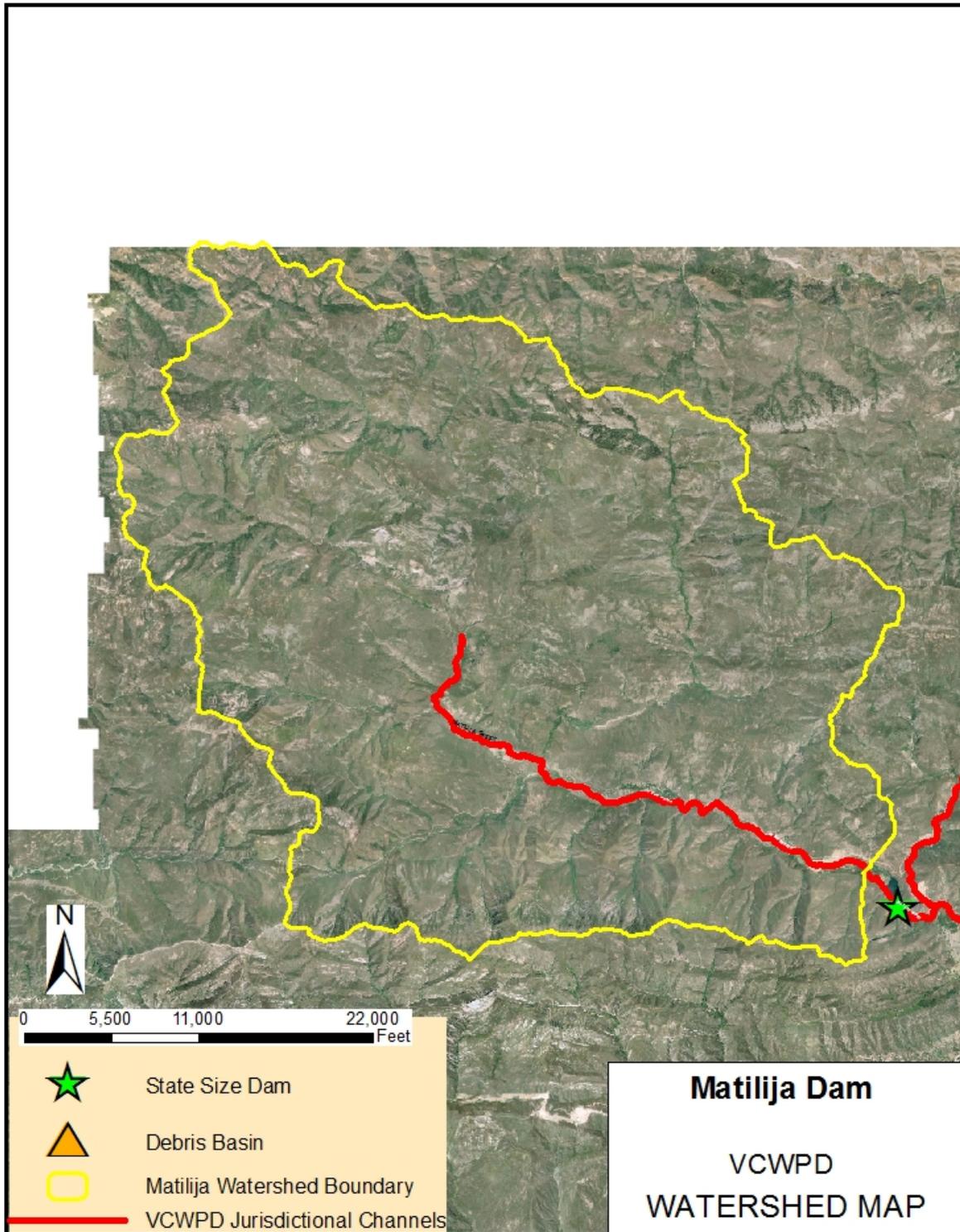
Based on the estimated 6.0 million cubic yards (3,719 acre-ft) of sediment deposited behind Matilija dam since its construction, and using trap efficiencies as presented in USBR Table 0.1, the sediment yield is estimated to be 1.92 acre-ft/mi²/yr (0.79 mm/yr) or 105 acre-ft/yr upstream of Matilija Dam. (USBR, 2003, Draft)

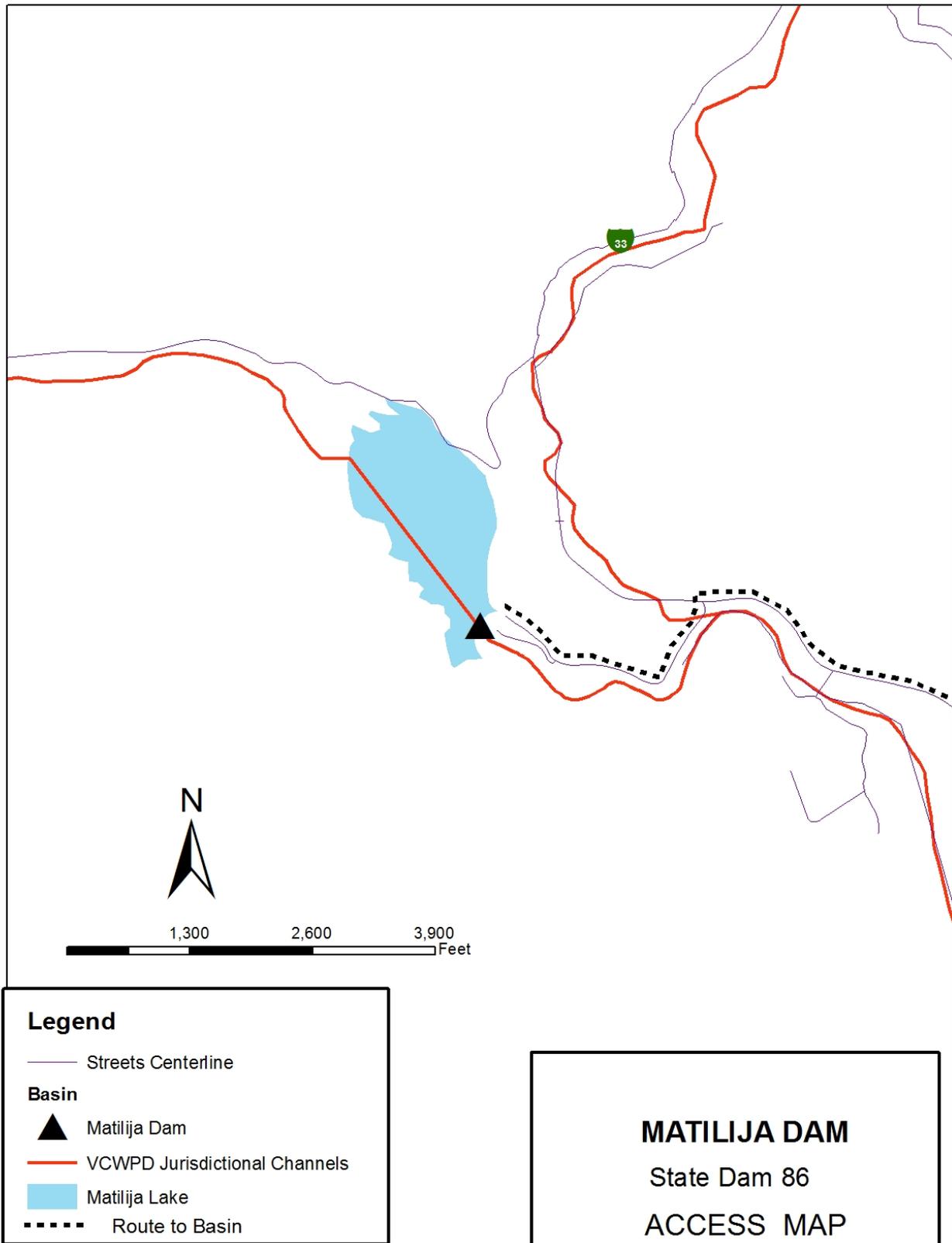
USBR Table 0.1. Historical Reservoir deposition.

Elevation (NAVD 88)	Active Storage Volume (ac-ft) USBR				WPD (1)
	1970	1983	1994	2002 est.*	2018
1042.6	14.2	0	0	0	0
1047.6	93	0	0	0	0
1052.6	219	0	0	0	0
1057.6	367	0	0	0	0
1062.6	533	57	0	0	0
1067.6	724	172	0	0	0
1072.6	947	305	39	0	0
1077.6	1199	468	153	0	0
1082.6	1479	662	283	0	0
1087.6	1789	906	447	24	0.35
1092.6	2121	1190	666	250	112
1097.6	2473	1480	930	500	260
* 2002 was estimated based on a 500 acre-ft total capacity and zero capacity at elevation of 1087 feet					

Reference: Hydrology, Hydraulics and Sediment Studies of Alternatives for the Matilija Dam Ecosystem Restoration Project, Ventura CA. US Department of the Interior, Bureau of Reclamation, Technical Service Center, Sedimentation and River Hydraulics Group. Draft dated December 18, 2003

Note(1): Data estimated from bathymetric surveys by WPD in 2018.





McDONALD DETENTION BASIN DD1-06

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 801 ft NGVD29, 125% of 100-yr debris volume
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)

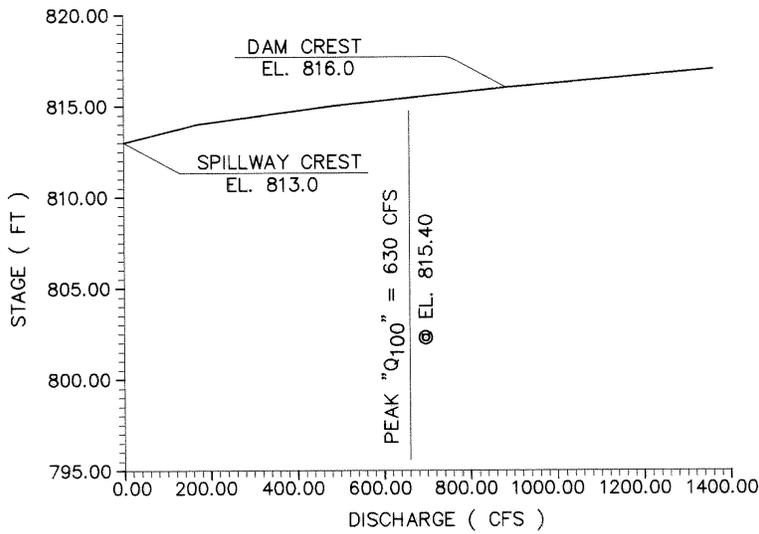
(Note 1) Basin designed so that majority of sediment bypasses basin. Only 46-ac of 573-ac watershed contribute sediment to basin, with yield estimates provided in ().

BASIN HISTORY: MCDONALD CANYON DETENTION BASIN

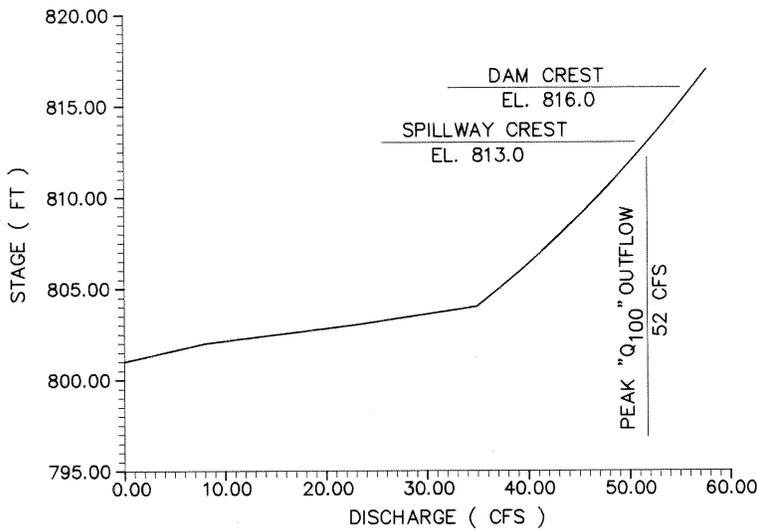
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
07-98	Cleanout		76	
01-05	Disaster Declaration			300***

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.



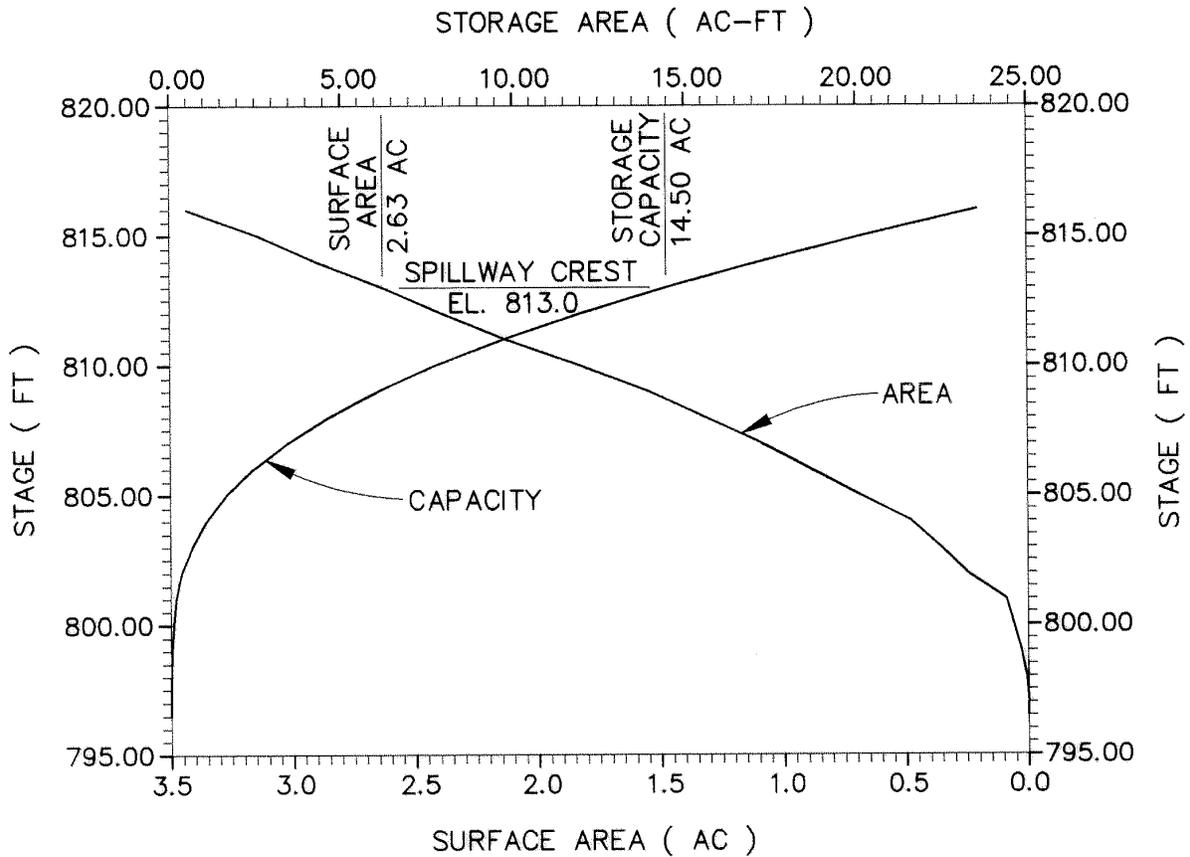
EMERGENCY SPILLWAY



OUTLET PIPE

STAGE DISCHARGE CURVES

McDonald Canyon Detention Basin



AREA-CAPACITY CURVE

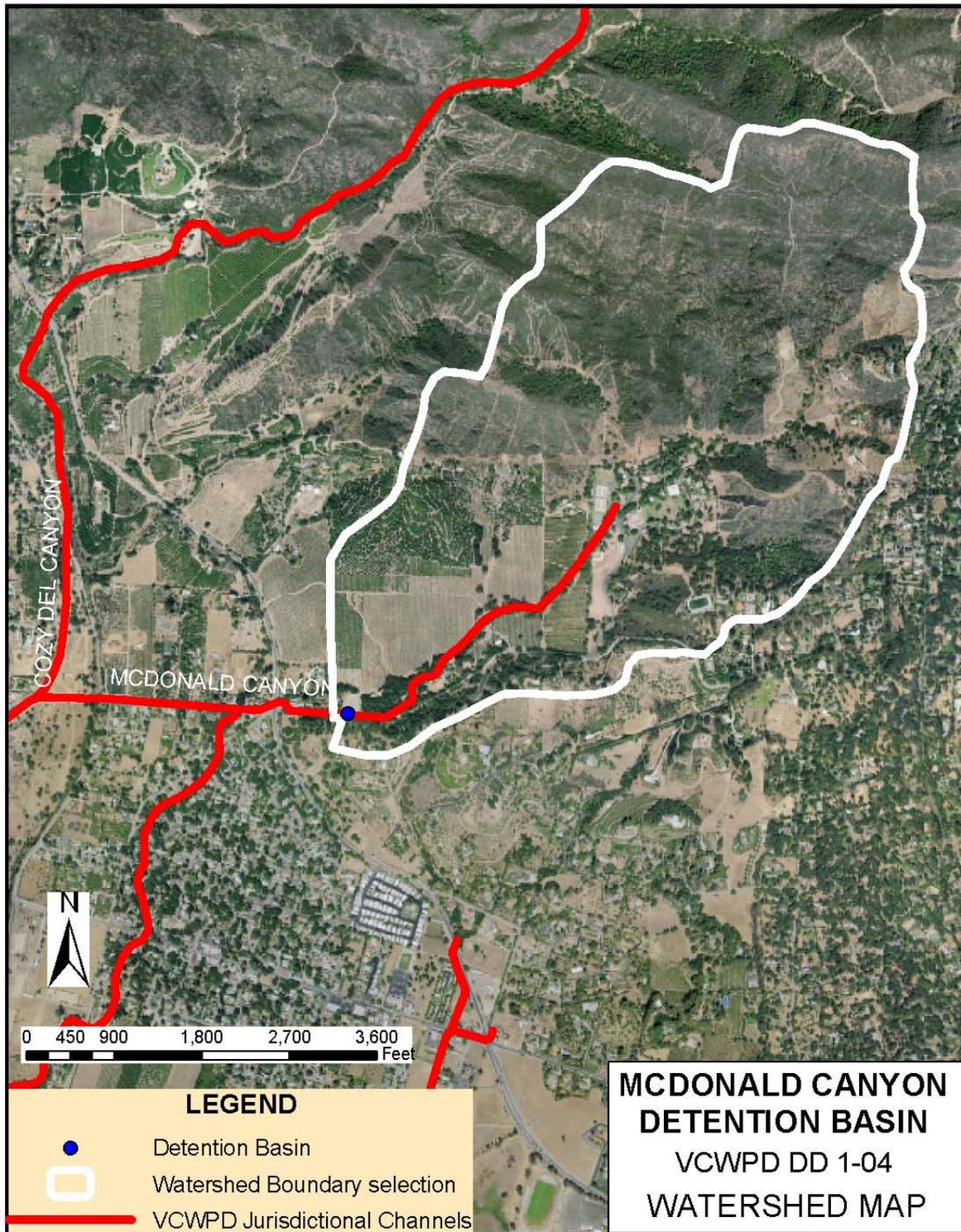
McDonald Canyon Detention Basin

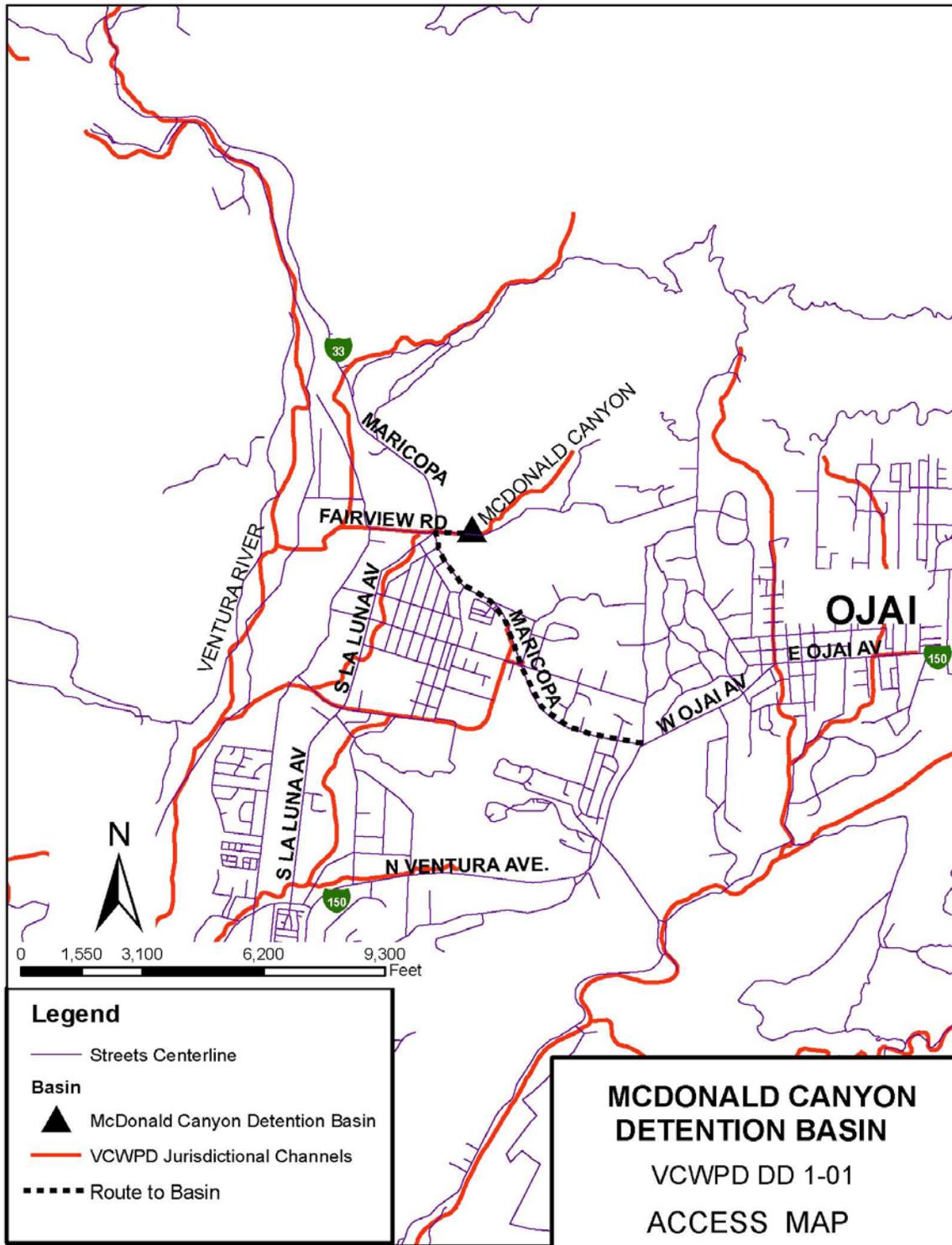
(Appears to be flood storage only- does not show debris storage volume)

Stage-Storage-Discharge Data

Elevation	Volume	Outlet Pipe	Emer. Spillway	Total Disch.
Ft NGVD29	Cu. Yds	Cfs	Cfs	Cfs
795	-	-		-
796	-	-		-
797	-	-		-
798	-	-		-
800	-	-		-
801	403	-		-
802	807	8.0		8.0
803	968	22.9		22.9
804	1,613	35.0		35.0
805	2,581	37.0		37.0
806	3,872	39.0		39.0
807	5,485	41.2		41.2
808	7,341	43.0		43.0
809	9,680	45.0		45.0
810	12,422	47.0		47.0
811	15,810	48.0		48.0
812	19,360	50.0		50.0
813	23,393	52.0	-	52.0
814	28,233	53.2	170.0	223.2
815	32,669	55.0	480.0	535.0
816	37,913	56.2	881.0	937.2

Note: Net volume above design debris level





SAN ANTONIO CREEK DEBRIS BASIN DB1-03 (Obsolete)

LOCATION: Ojai Valley, 800 ft northwest of Carne and Thacher Rds; N 353,209; E 1,636,282
(Lambert Zone 5 Coordinates)
Ojai 7-1/2'Quad

DESIGN DATA Built in response to fire, destroyed by flood
Design Agency VCWPD (VCFCD)
Flood Storage Capacity 14,600 cy (12-12-90 DTM)
Maximum Debris Capacity 30,000 cy (12-12-90 DTM)
100-Yr Inflow and Outflow Rates IN= 5,800 cfs; OUT=same
Basin Type In-Line Channel Basin

EMERGENCY SPILLWAY
Type Berm Across Channel
Weir Elevation 970 ft NGVD29
Spillway Length 112 ft wide x 5 ft high
Capacity w/o Freeboard 6,400 cfs

PRINCIPAL SPILLWAY
Type None
Bottom Weir/Top Elevation =
Outlet Conduit =

DEBRIS BLEEDER/RISER
Type None
Top Elevation =
Outlet Conduit =

DAM
Dam Type Earthen
Dam Crest Elevation 970 ft NGVD29
Length 170 ft
Surface Area of Full Basin 1.6 ac level, 3.7 ac at max. debris cap.
Watershed Area 6,280 ac from 1999 Basin Manual
Width at Crest =

CONSTRUCTION DATA
Construction Agency VCFCD
Completion Date 1986

REFERENCE DRAWINGS
Construction Drawings FC 8609, pages 49-52
Topographic Drwgs(pre-const) T-439 (9-86), 12-12-90 DTM, T440 (9-94)
Right-of-Way Drawings Fee 88-114290 Deed 10164.1

VCWPD- Zone 1**Debris and Detention Basins**

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition)	100% Burn
100-YEAR	455,660	660,919
50-YEAR	348,022	504,793
25-YEAR	249,693	362,170

BASIN HISTORY:

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY</u>	<u>REMOVED</u>	<u>AADP*</u>
Jul-86	Aerial Survey	3,400		
Nov-86	Cleanout		26,600	34,800***
Oct-90	Aerial Survey	Not Digitized		
Dec-90	Aerial Survey	30,000		
Jun-91	Aerial Survey	Not Digitized		
Feb-92	Disaster Declaration			4,586**
May-92	Aerial Survey	9,400		
Dec-92	Cleanout		20,600	
Jan-93	Aerial Survey	30,000		
Sep-94	Aerial Survey	18,000		
Jan-95	Disaster Declaration			3,325
Jan-95	Aerial Survey	1,800		
Jul-96	Aerial Survey	Not Digitized		
Jul-97	Aerial Survey	2,640		3,881
Feb-98	Disaster Declaration	Berm Destroyed by Storm, Not Reconstructed		

Notes

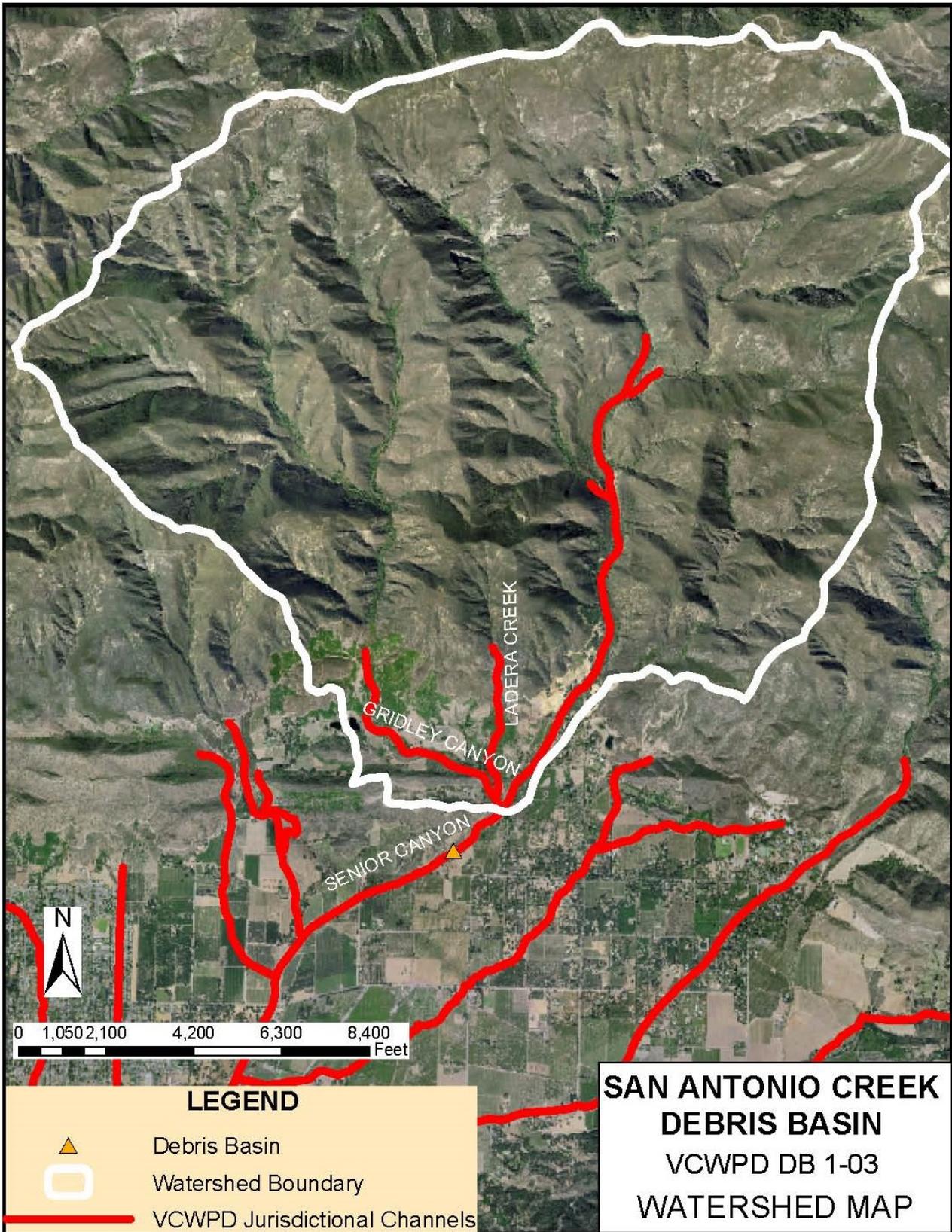
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

NA= Not Available / Not Applicable

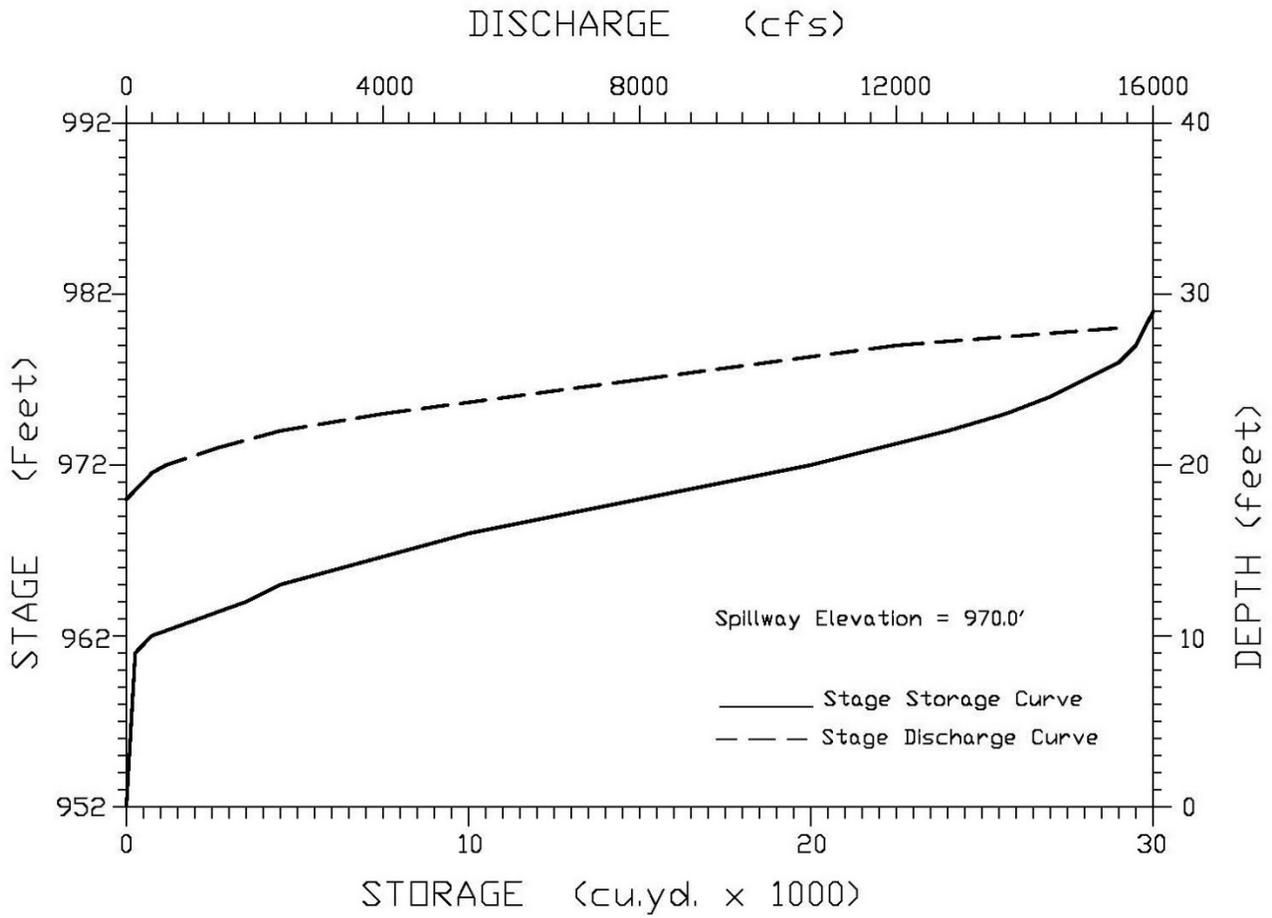
*** Theoretical value from Scott and Williams (1978), 10% of 50-yr yield estimate.

** FEMA Accepted Value





SAN ANTONIO CREEK DEBRIS BASIN



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) at 920 ft
Maximum Debris Capacity 328,300 cy (12-18-85)
Inflow and Outflow Rates Q₁₀₀IN = 2,642 cfs, Q₁₀₀OUT=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 but 36: RCP controls
Outlet Conduit 36 in RCP

DEBRIS BLEEDER/RISER
Type 7 sets of 12 4"x12" Orifices on Riser Tower to 23 ft above ground, beginning at elev. 903 ft
Top Elevation Same as principal spillway
Outlet Conduit Same as principal spillway

DAM
Dam Type Earthfill
Dam Crest Elevation; Height 934 ft; 60 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

VCWPD- Zone 1

Debris and Detention Basins

EXPECTED DEBRIS PRODUCTION (cy): Note 1:		
Storm Frequency	Design Condition	100% Burn
100-YEAR	144,510	209,610
50-YEAR	105,355	152,810
25-YEAR	73,380	106,430
10-YEAR	41,100	59,615

Note 1: Some developed area just upstream of debris basin reduces sediment inflow.

EXPECTED DEBRIS PRODUCTION 1973 (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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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**

VCWPD- Zone 1**Debris and Detention Basins****BASIN HISTORY: STEWART CANYON CREEK DEBRIS BASIN**

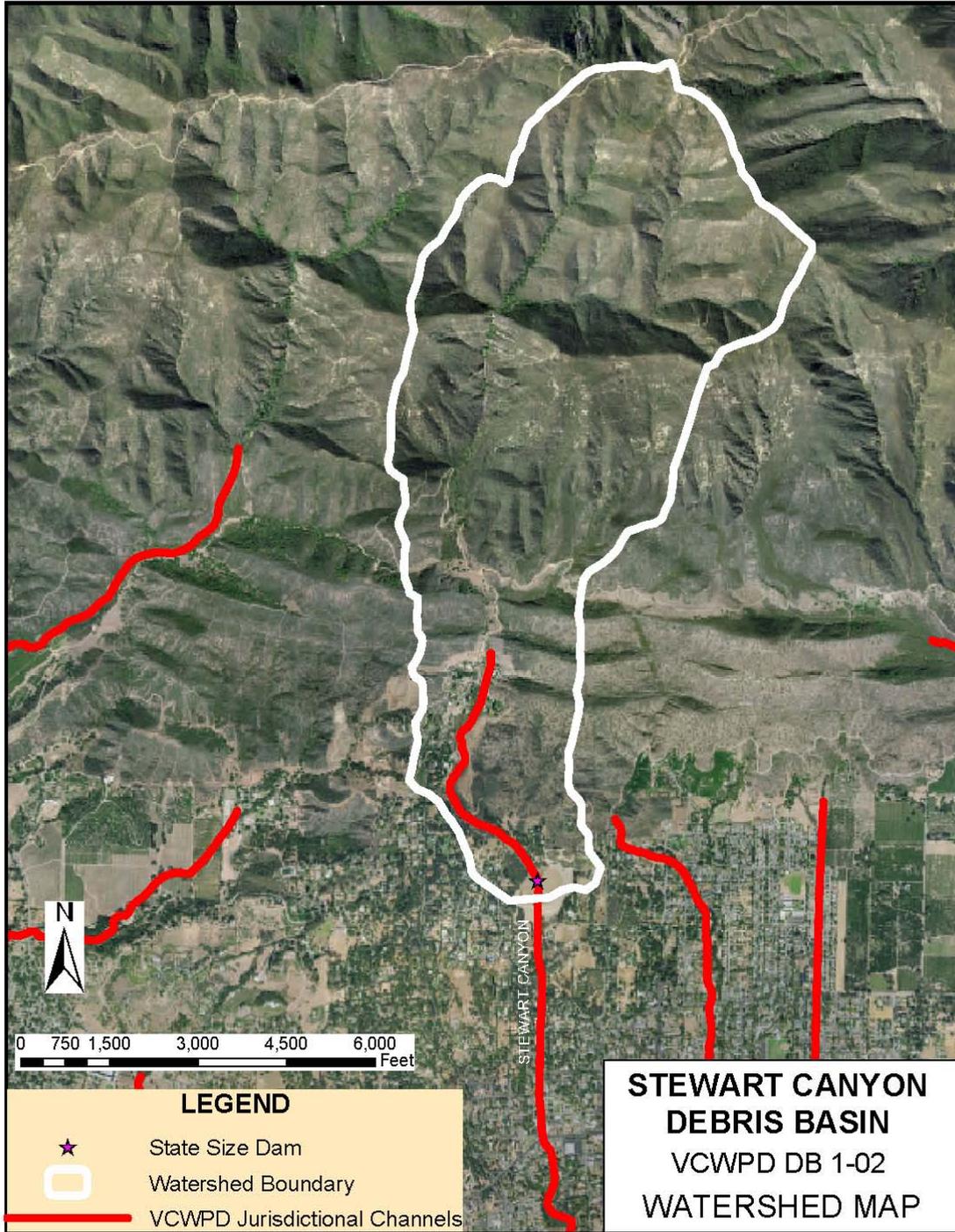
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
05-92	Aerial Survey	Not Digitized		
01-95	Disaster Declaration			2,781
08-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	319,154		
02-98	Disaster Declaration			2,781
07-98	Aerial Survey	313,674		
12-99	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

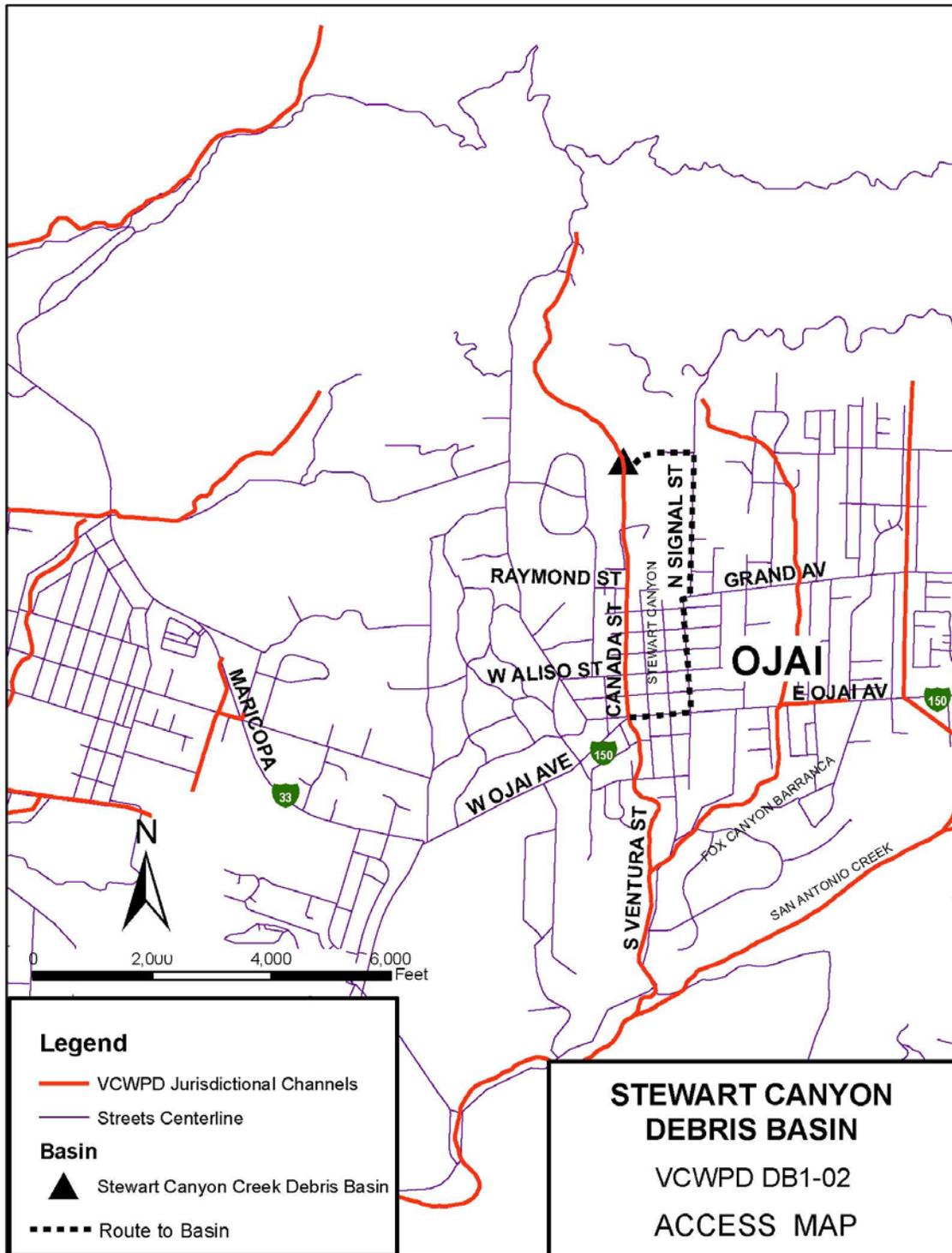
NA= Not Available / Not Applicable



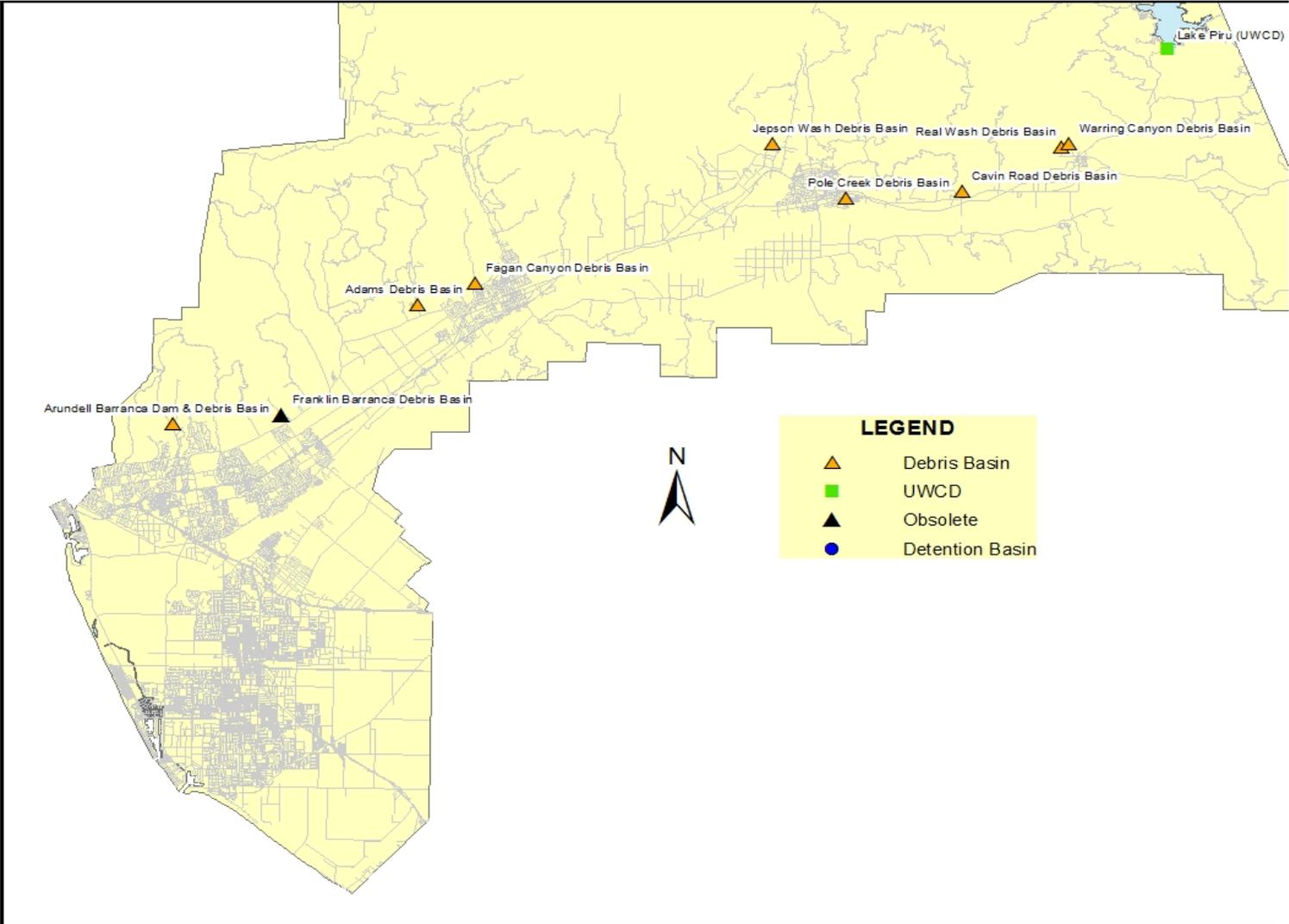
Stage-Storage-Discharge Data Summary

		Feb-1975	Nov-2005
Elev. Ft NGVD29	Total Disch. Cfs	Cum. Vol. af	Cum. Vol. af
900	-	0	
902	-	1.30	0.00
904	6.7	3.71	0.06
906	15.1	7.02	0.33
908	43.7	11.55	1.83
910	78.5	17.89	6.15
912	103.0	25.40	12.51
914	118.5	33.80	20.33
916	143.0	43.47	29.62
918	149.0	54.30	40.27
920	155.0	66.29	52.21
922	793.0	79.27	NA
924	1,958.0	92.82	NA
926	3,464.0	106.53	NA
928	5,245.0	119.86	NA
930	7,264.0	132.53	NA
932	9,498.0	144.30	NA
934	11,924.0	154.84	NA

NA= Not analyzed



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 (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
Inflow and Outflow Rates Q₁₀₀IN = 3,800 cfs, Q₁₀₀OUT=3,800 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 VCWPD with NRCS after fire
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

VCWPD- Zone 2

Debris and Detention Basins

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

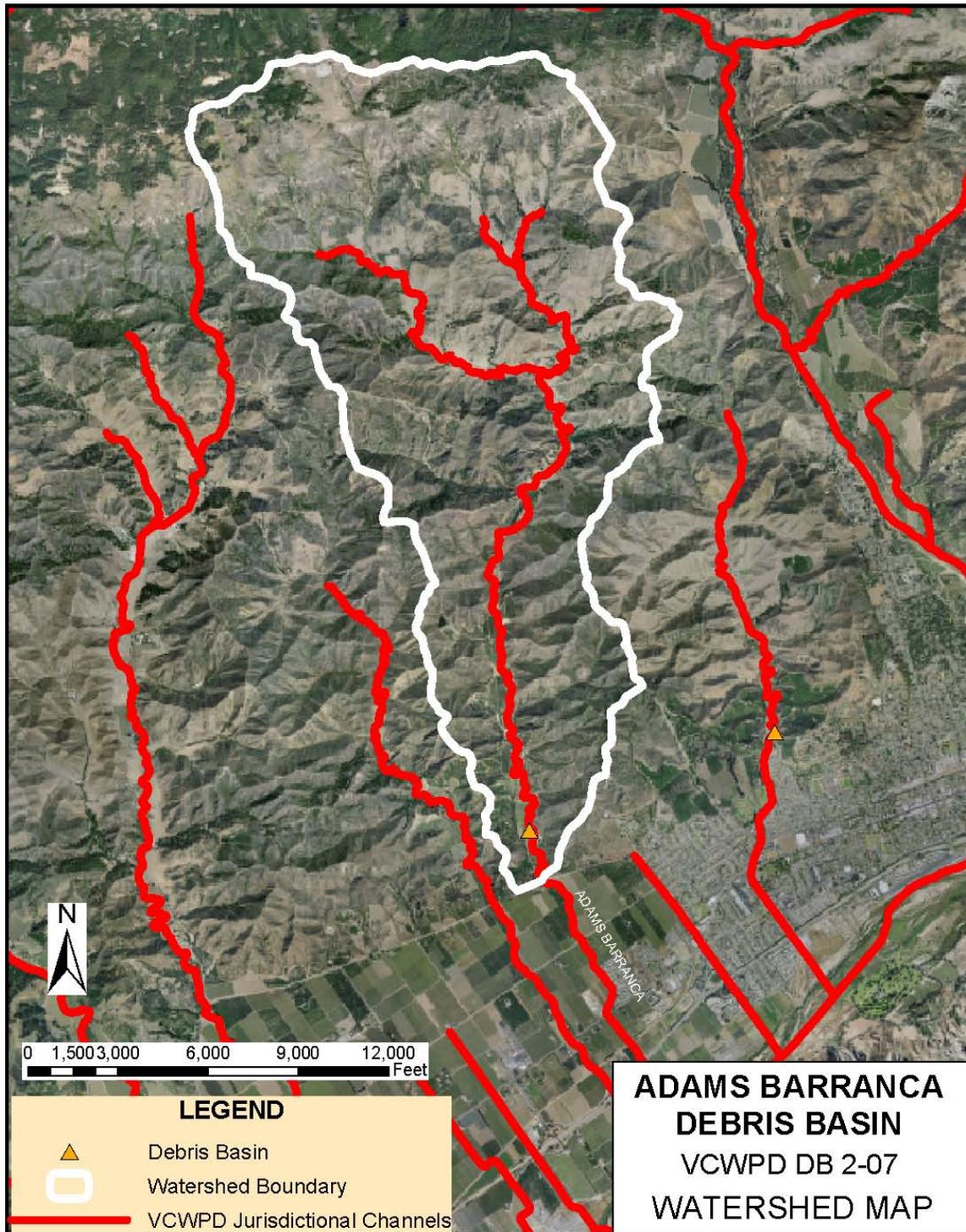
BASIN HISTORY: ADAMS BARRANCA DEBRIS BASIN

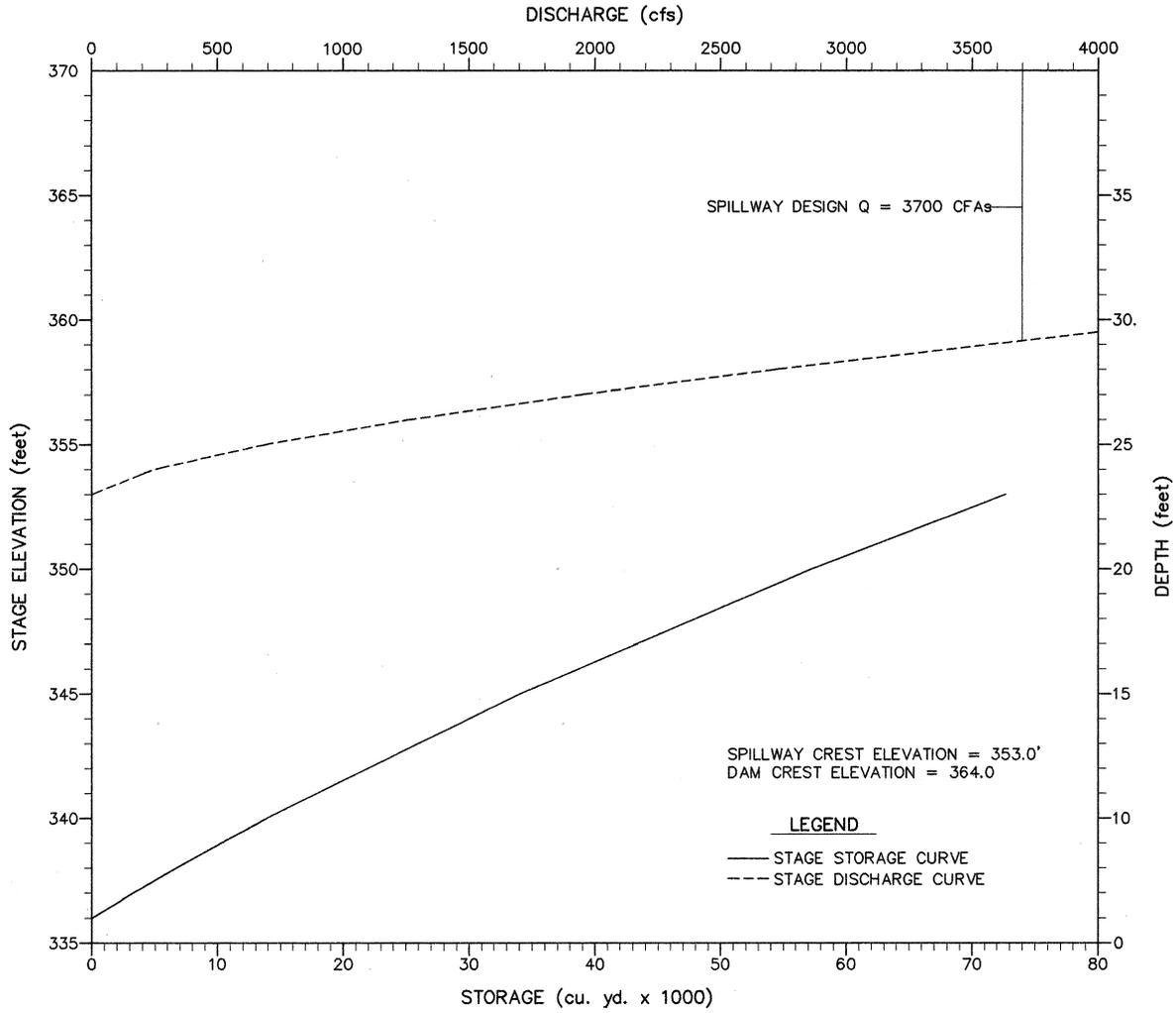
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
09-94	Aerial Survey	84,200		
01-95	Disaster Declaration			5,940
06-95	Aerial Survey	24,200		
12-95	Cleanout		61,505	
12-95	Aerial Survey	85,705		
07-96	Aerial Survey	Not Digitized		
07-97	Aerial Survey	78,080		
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	Multiple Cleanouts		112,089	
12-05	Aerial Survey	62,594 cy to elev 353 ft		
05-08	Aerial Survey	40,226 cy to elev 353 ft		
05-08	TIN analysis up to elev 364 ft Top of Dam	Cut vol 7,281 cy Fill vol 29,481 cy		
05-08	O&M Records		30,626	
09-08	Aerial Survey	70,262 cy to elev 353 ft	30,036	

NOTES

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

NA= Not Available / Not Applicable





STAGE - STORAGE & DISCHARGE CURVES

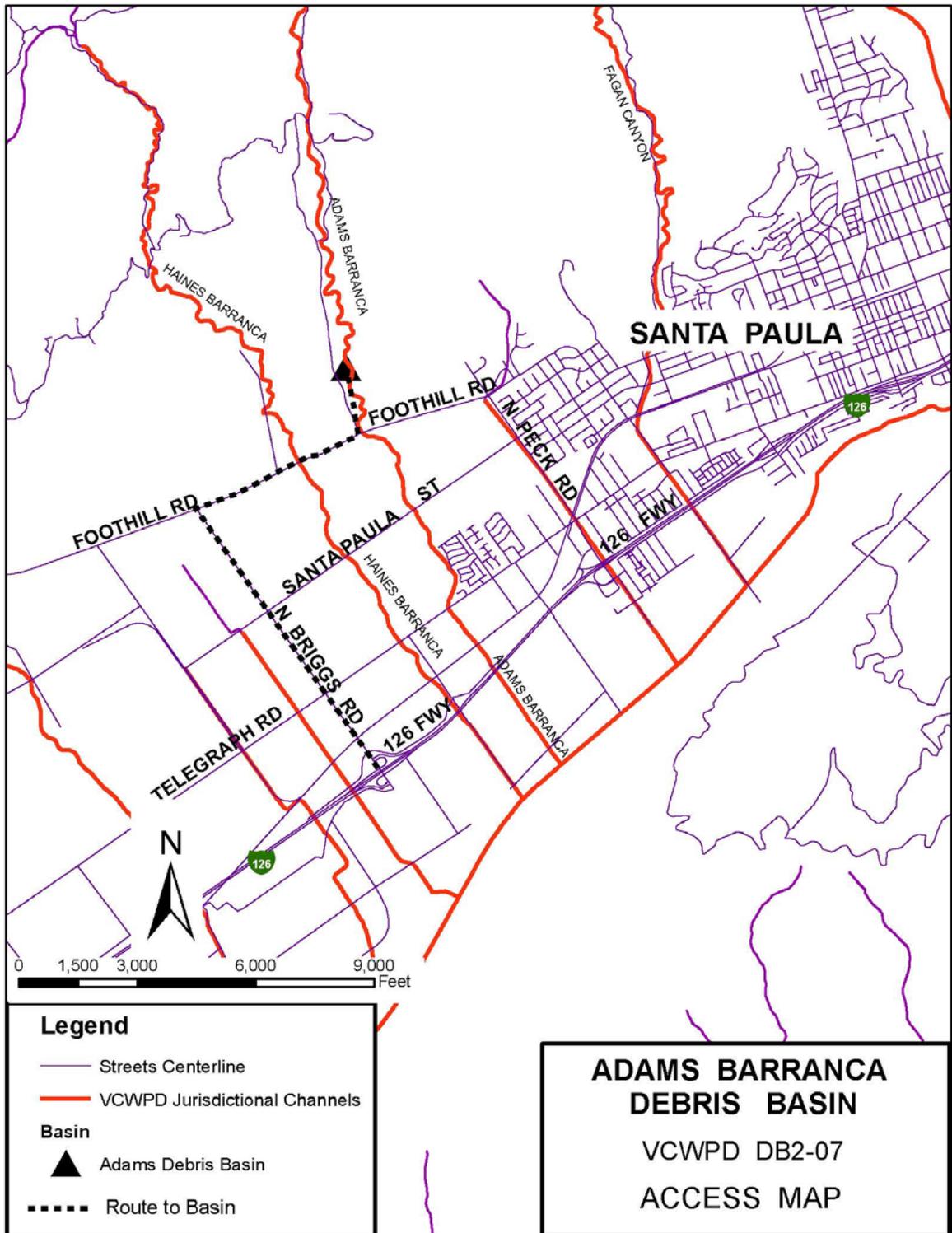
Adams Debris Basin

Stage Storage Discharge Data Summary

Elevation	Design Vol.	Emergency Spillway Discharge	Sep- 2008 Vol.
Ft. NGVD29	Cu. Yds	Cfs	Cu. Yds
335	-		-
336	-		898
337	3,000		3,556
338	6,700		6,735
339	10,200		10,057
340	14,000		13,514
341	18,000		17,096
342	22,000		20,803
343	26,000		24,636
344	30,000		28,595
345	34,200		32,683
346	38,700		36,899
347	43,300		41,247
348	48,000		45,726
349	52,500		50,339
350	57,000		55,089
351	62,300		59,976
352	67,500		65,001
353	72,700	-	70,165
354	NA	243	NA
355	NA	688	NA
356	NA	1,264	NA
357	NA	1,946	NA
358	NA	2,720	NA
359	NA	3,575	NA
360	NA	4,505	NA
361	NA	5,504	NA
362	NA	6,568	NA
363	NA	7,692	NA
364	NA	8,875	NA

Note: Sep-2008 volume from conic analysis using post cleanout Autocad dwg

NA= Not Analyzed



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	<u>VCWPD</u>
Level Capacity	<u>138 ac-ft</u>
Maximum Debris Capacity	<u>52,863 cy at elev. 541.8 ft NGVD29 (125% of 100-yr Yield)</u>
Inflow and Outflow Rates	<u>Q10=1,006 cfs; Q100=2,390 cfs OUT: Q100=1,820 cfs</u>
Debris Cleanout Elevation	<u>530.7 ft (10,573 cy) [25% of 1-dam 100-yr debris yield.]</u>

EMERGENCY SPILLWAY

Type	<u>Box Inlet Spillway 60 ft long x 20 ft wide</u>
Weir Elevation	<u>572 ft NGVD29</u>
Spillway Length	<u>140 ft (60 ft+20 ft+60 ft)</u>
Capacity	<u>9,400 cfs (without freeboard during PMF)</u>

PRINCIPAL SPILLWAY

Rectangular Tower with Catwalk; with Projecting Pivoting Louver Trash Racks	<u>4 ft W X 8 ft H Low Level Inlet with Trash Rack to Elev 548, 2-8 ft W x 3 ft H Tower Inlets Bottom Elev. 551 ft, Top Elev 554 ft</u>
Tower Top Elevation	<u>555 ft NGVD29</u>
Outlet Conduit	<u>48-in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>Semi-Circular Perforated CSP on Riser Tower</u>
Top Elevation	<u>540 ft NGVD29</u>
Outlet Conduit	<u>Principal Spillway Outlet</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation; Height	<u>580 ft NGVD29; 42 ft</u>
Length	<u>377 ft</u>
Width at Crest	<u>20 ft</u>
Surface Area of Full Basin	<u>5.9 ac</u>
Watershed Area	<u>1,754 ac</u>

CONSTRUCTION DATA

Construction Agency	<u>VCWPD</u>
Completion Date	<u>Reconstructed 1995</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-2-2322 thru Y-2-2356</u>
Topographic Drwgs(pre-const)	<u>Y-2-2327 thru Y-2-2328</u>
Right-of-Way Drawings	<u>Y-2-2325</u>

VCWPD- Zone 2

Debris and Detention Basins

EXPECTED DEBRIS PRODUCTION (cy); Note 1		
Storm Frequency	Design Condition	100% Burn
100-YEAR	22,576 (42,290)	32,745 (60,470)
50-YEAR	17,259 (31,610)	25,033 (45,350)
25-YEAR	12,403 (23,150)	17,990 (33,200)

Note 1: Sexton Canyon Only, Assumes Lake Canyon Dam in Place. Quantities without Lake Canyon in ().

BASIN HISTORY: ARUNDELL BARRANCA DETENTION BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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
05-05	Aerial Survey	148,664 to elev 572 ft		
01-06	Aerial Survey	239,441 to elev 572 ft	91,000 D&C (O&M 91,403)	
07-11	O&M Truck Count		19,667	
05-12	Aerial Survey WR&T TIN analysis	233,332 to elev 572 ft 138,553 to elev 560 ft		
05-15	Upper portion of basin reconfigured for spillway work			
05-17	Aerial Survey WR&T TIN analysis	113,808 to elev 560 ft 24,745 deposited since 2012		
	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		

VCWPD- Zone 2**Debris and Detention Basins****BASIN HISTORY: ARUNDELL BARRANCA DETENTION BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
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

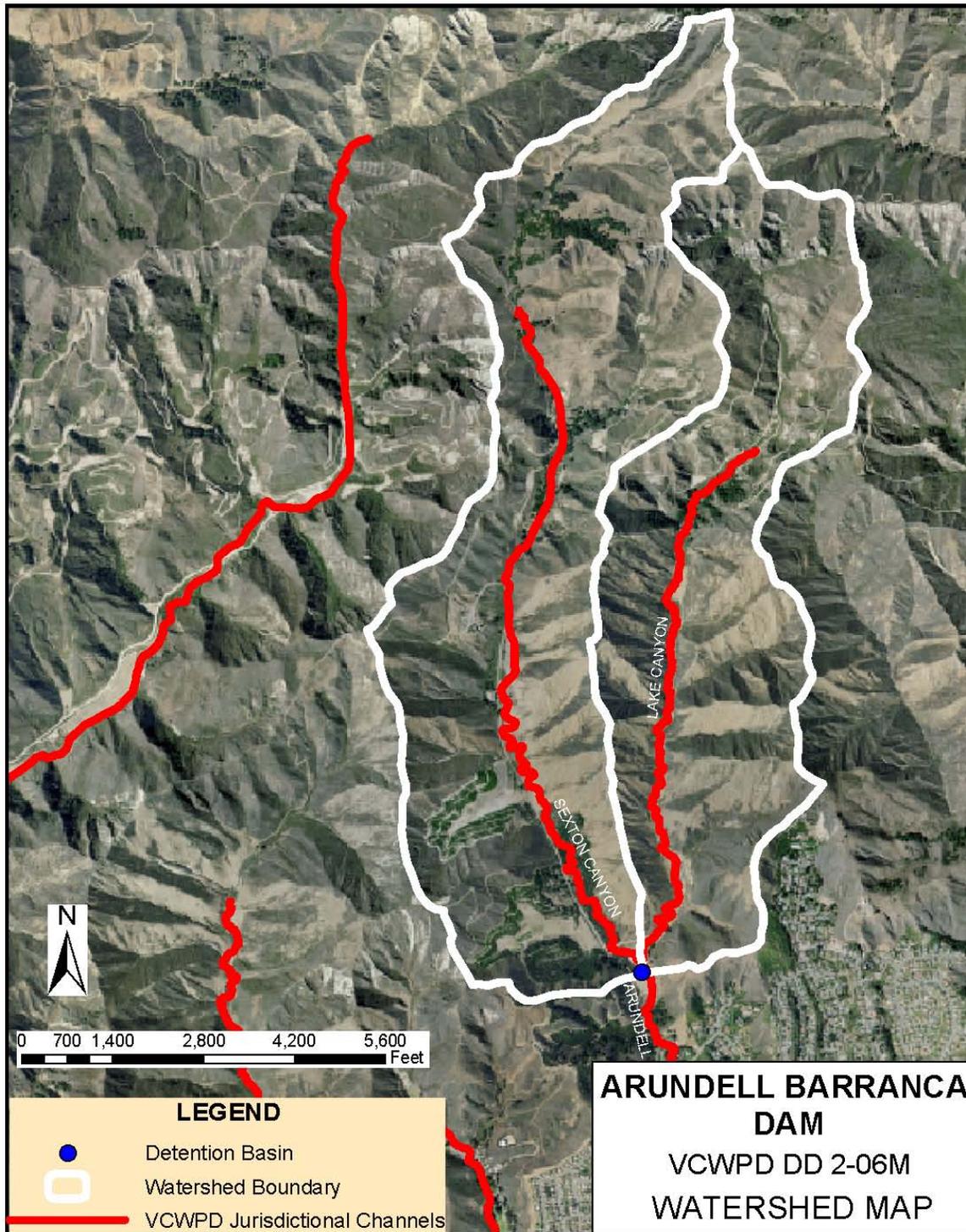
History

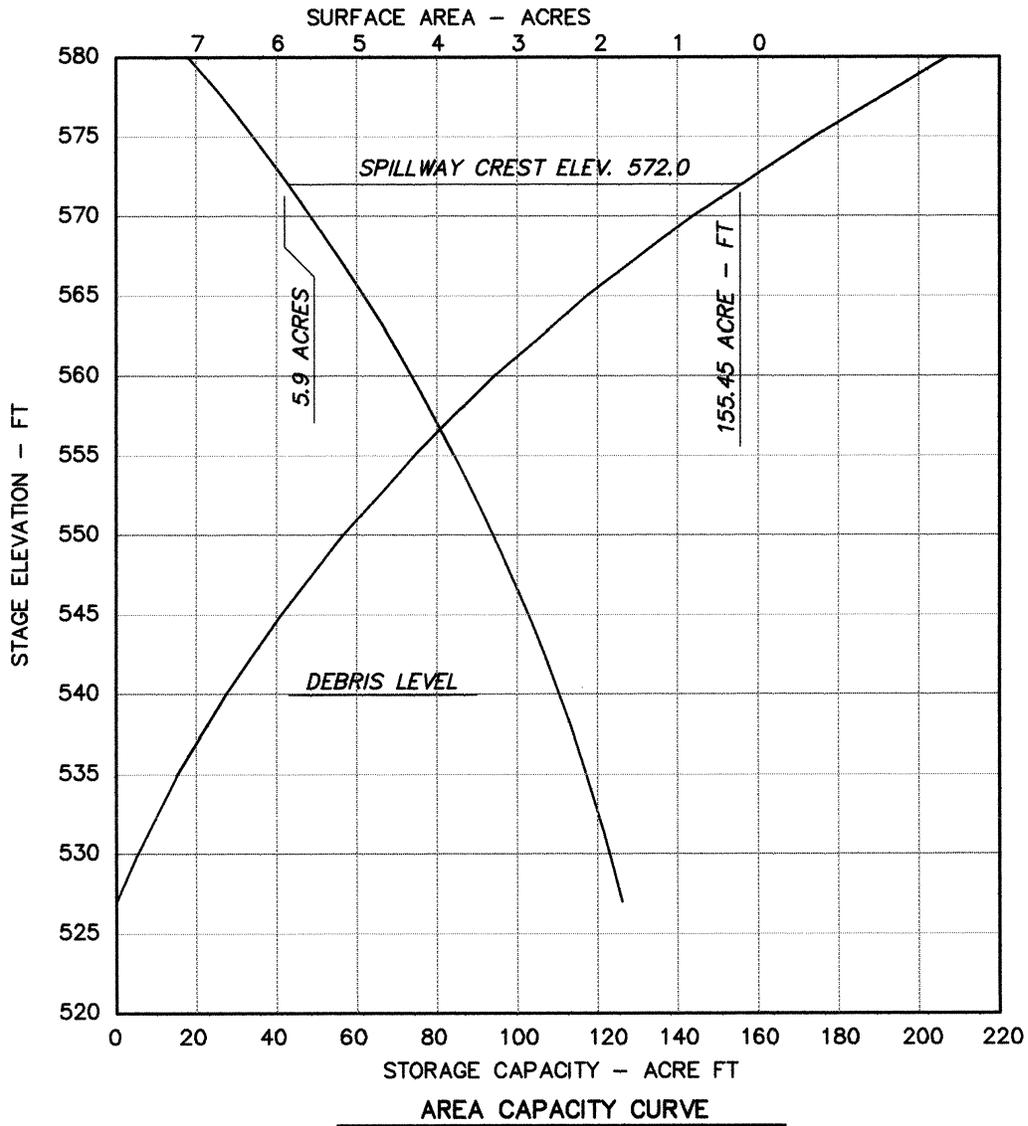
Replaces DB2-06 from 1999 Manual. DB had level capacity of 52,600 cy, and max capacity of 64,800 cy. Basin 100-yr inflow rate was 2,770 cfs; spillway had capacity of 2,600 cfs.

Constructed in 1970 by VCFCD. Drawings Y-2-651-655. ROW 17172.

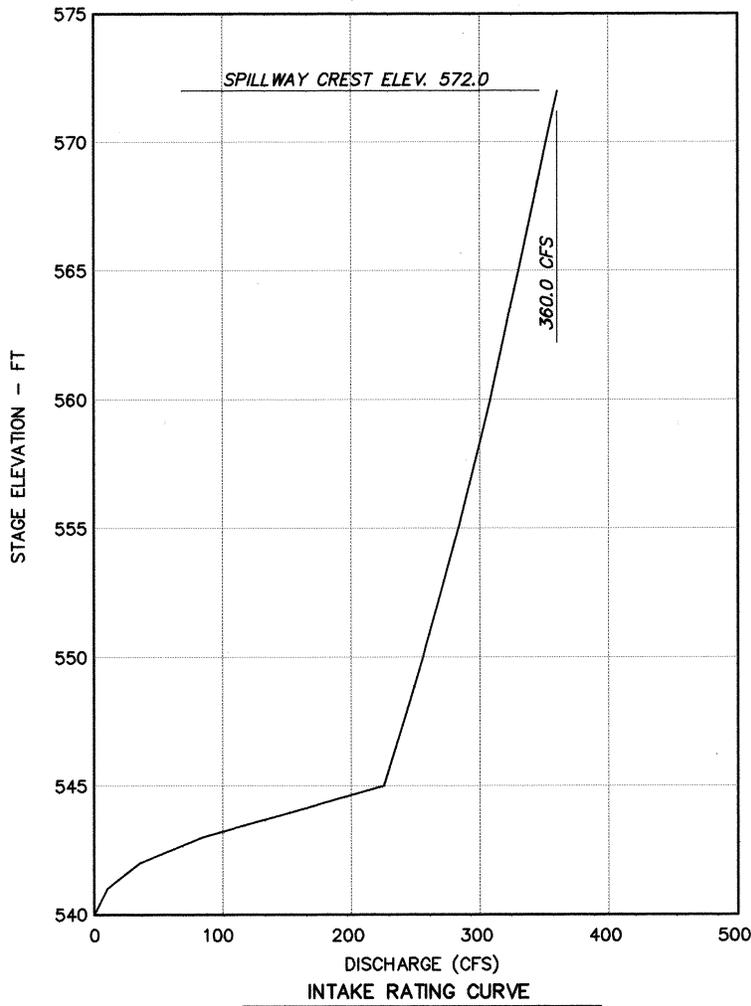
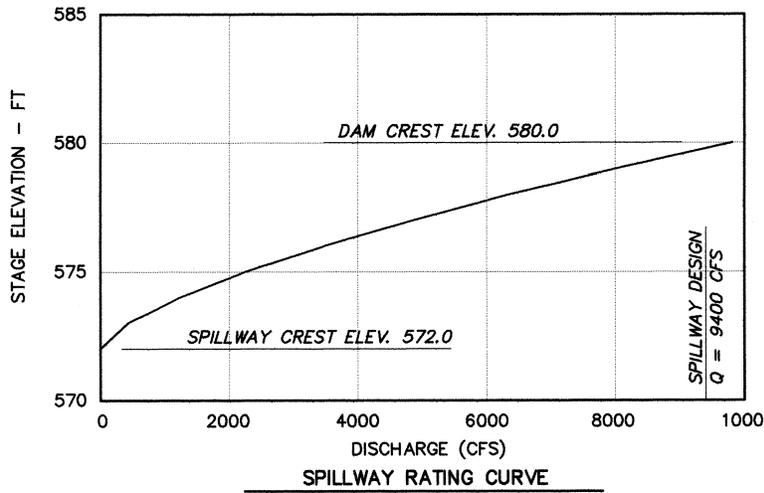
Debris Basin Production Data (cy)

Storm Frequency	Design Conditions	100% Burn
100-yr	42,290	60,470
50-yr	31,610	45,350
25-yr	23,150	33,200





Arundell Barranca Detention Basin
Note: Debris level shown is for 2 basin design



Arundell Barranca Detention Basin

Note: Emergency Spillway Rating Revised by NHC, 2013

NHC 2013 Emergency Spillway Rating Curves. Current is Alt 6A

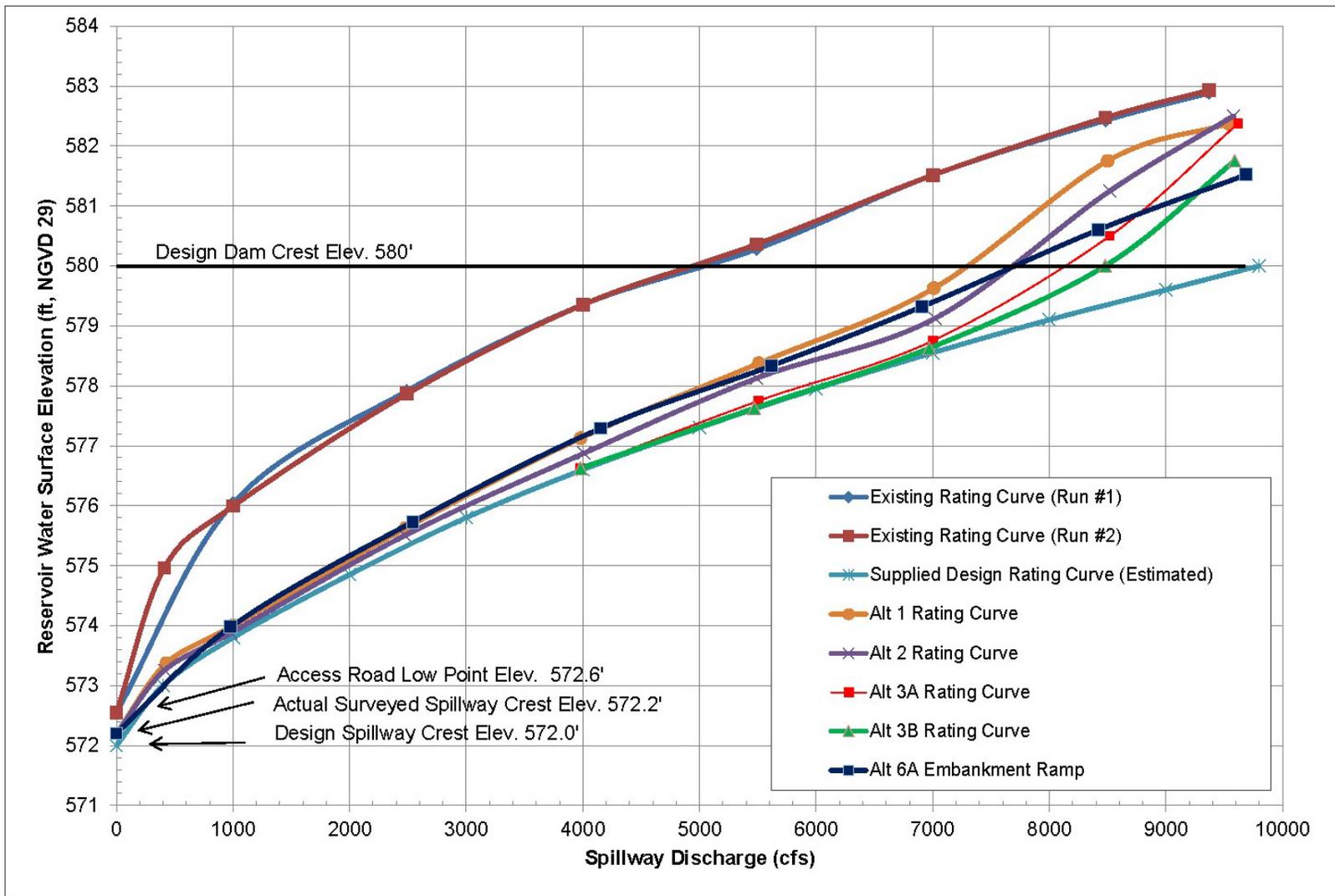


Figure 4-1: Alternative 6 rating curve compared to existing conditions and other model tests

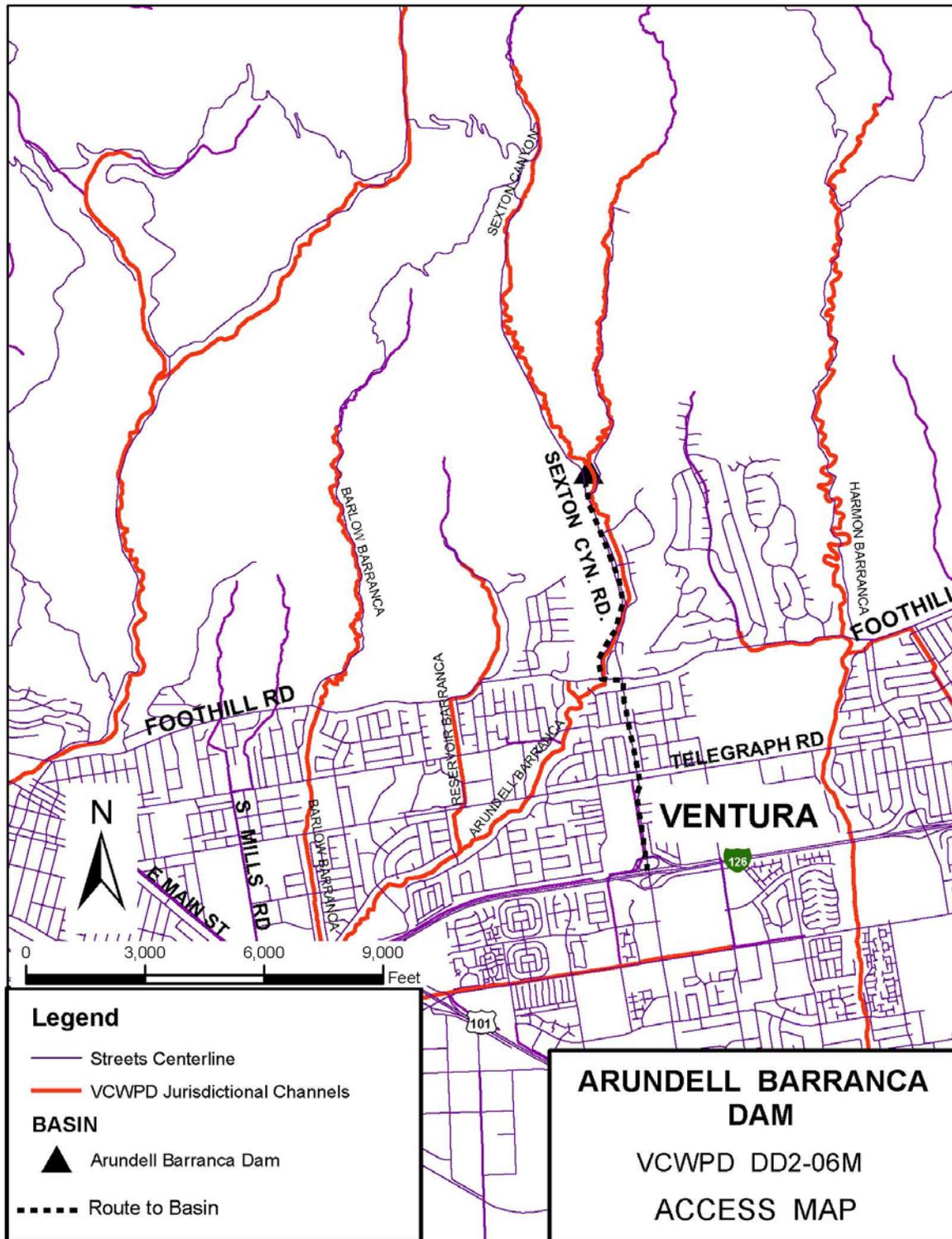
Hydrology Model Routing Data, 2017

Design Data		10-Yr Burn		100-Yr Design		100-Yr Burn	
Elev ft NGVD29	Vol. (af)	Vol. (af)	Disch. (cfs)	Vol. (af)	Disch. (cfs)	Vol. (af)	Disch. (cfs)
527.30	0.00						
530.00	5.20						
532.26	9.99	0.00	0.00				
535.00	16.20	6.21	0.00				
538.00	23.20	13.21	0.00				
540.00	28.20	18.21	0.00				
541.00	30.70	20.71	11.00				
541.80	32.77	22.78	32.00	0.00	-		
543.00	36.10	26.11	85.00	3.33	11.00		
543.53	37.48	27.49	122.00	4.71	25.00	0.00	0.00
545.00	41.60	31.61	225.69	8.83	32.00	4.12	22.78
547.00	47.40	37.41	236.00	14.63	225.69	9.92	81.19
549.00	53.50	43.51	249.00	20.73	236.00	16.02	156.25
550.00	57.00	47.01	255.91	24.23	242.91	19.52	178.67
555.00	74.10	64.11	282.91	41.33	269.91	36.62	282.10
560.00	94.60	84.61	307.56	61.83	294.56	57.12	307.56
565.00	118.50	108.51	330.37	85.73	317.37	81.02	330.37
570.00	146.30	136.31	351.71	113.53	338.71	108.82	351.71
572.00	155.45	145.46	359.89	122.68	346.89	117.97	359.89
573.00	161.25	151.26	760.0	128.48	760.0	123.77	760.0
574.00	167.45	157.46	1,340.0	134.68	1,340.0	129.97	1,340.0
575.00	174.00	164.01	2,190.0	141.23	2,190.0	136.52	2,190.0
576.00	180.80	170.81	3,180.0	148.03	3,180.0	143.32	3,181.0
580.00	207.50	197.51	8,040.0	174.73	8,040.0	170.02	8,040.0

Notes: Discharge Data based on Mori Seyedan calculations, 2005.
Volume data adjusted to reflect sediment volumes.

NHC 2013 Emergency Spillway Rating Table.

Elev. ft NGVD29	572.2	573	574	575	576	577	578	579	580	581	581.5
Disch. cfs	-	400	980	1,830	2,820	3,800	5,100	6,480	7,680	8,980	9,370



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 677 ft NGVD29 (736 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 RC Tower 16 ft High with Top Weir Inlet
Weir Elevation 683.5 NGVD29
Outlet Conduit 48 in RCP

DEBRIS BLEEDER/RISER
Type None

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

Note: Basin studied by WP&P Division. The Final Report dated 10/2015 concluded that the basin provides significant benefit and recommended improving the outlet.

VCWPD- Zone 2

Debris and Detention Basins

EXPECTED DEBRIS PRODUCTION (cy):		
StormFrequency	DesignCondition	100% Burn
100-YEAR	13,413 (2,943)	19,456(4,269)
50-YEAR	7,062(2,139)	10,244(3,102)
25-YEAR	4,992(1,560)	7,23(2,263)8

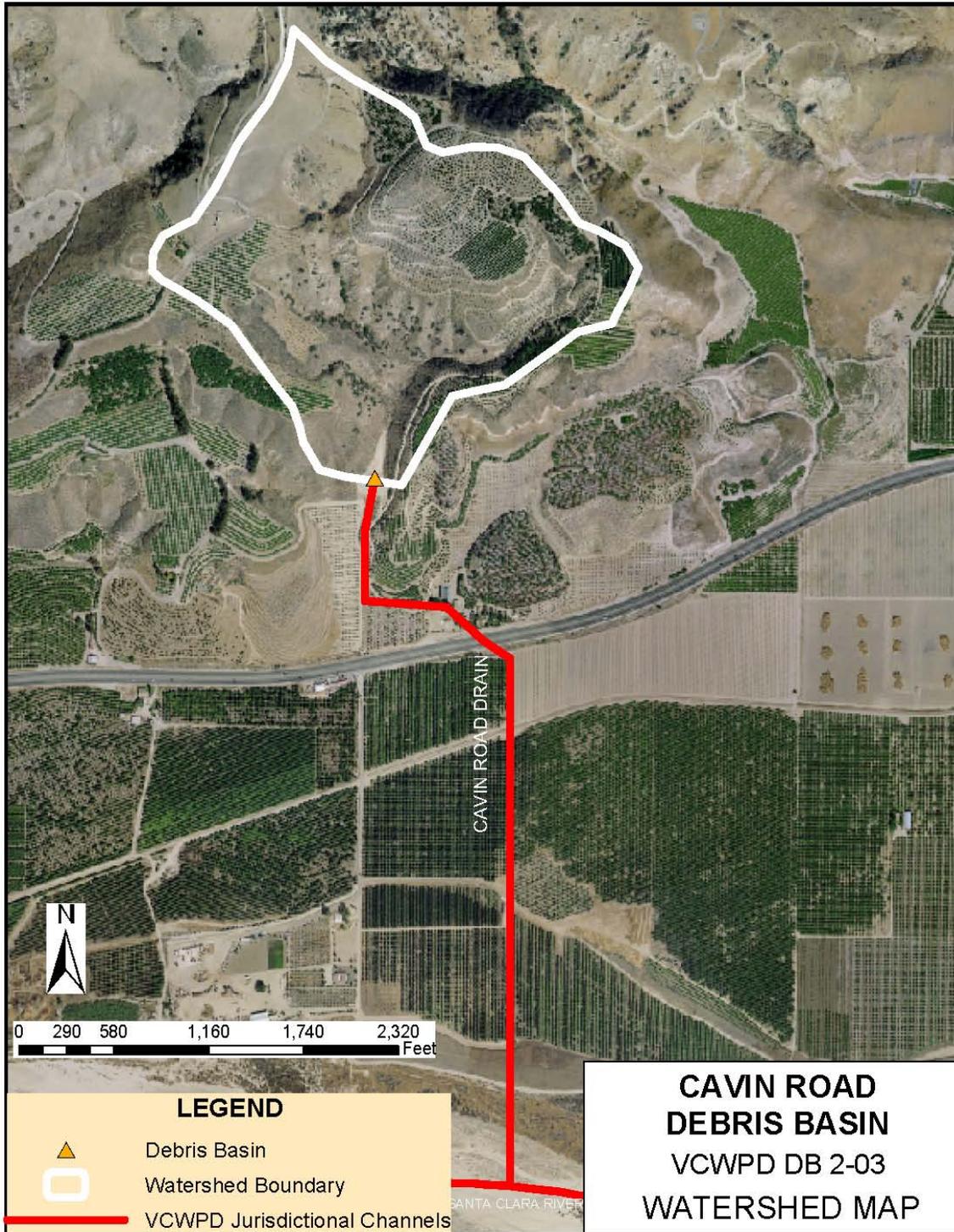
Note: () is updated sediment yield due to orchards in watershed, only 33 ac undeveloped.

BASIN HISTORY: CAVIN ROAD DEBRIS BASIN

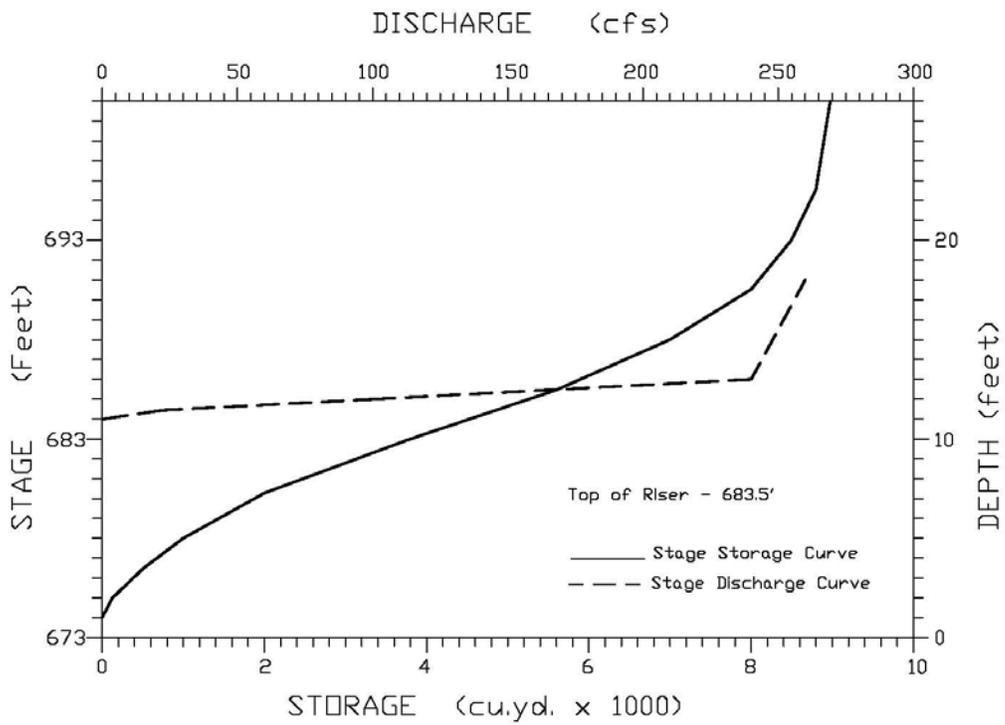
DATE	ACTION	REMAINING CAPACITY (cy)	REMOVED (cy)	AADP* (cy)
02-69	Disaster Declaration			
10-71	Aerial Survey	7,379		
03-78	Disaster Declaration			
10-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			
04-83	Aerial Survey	2,886		
04-84	Cleanout		5,640	470**
09-84	Aerial Survey	8,690		
12-85	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	Watershed partially Burned by Piru Fire			
11-03	Cleanout		1,736	
12-04	Cleanout		458	
01-05	Disaster Declaration			209
08-05	Aerial Survey	900 to elev 683.5 ft		
11-05	Aerial Survey	4,458 to elev 683.5 ft		
11-05	O&M Autocad Analysis		4,341	
11-05	WR&T TIN vol. analysis		4,539	

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

** FEMA Accepted Value for Disaster Declaration



CAVIN ROAD DEBRIS BASIN

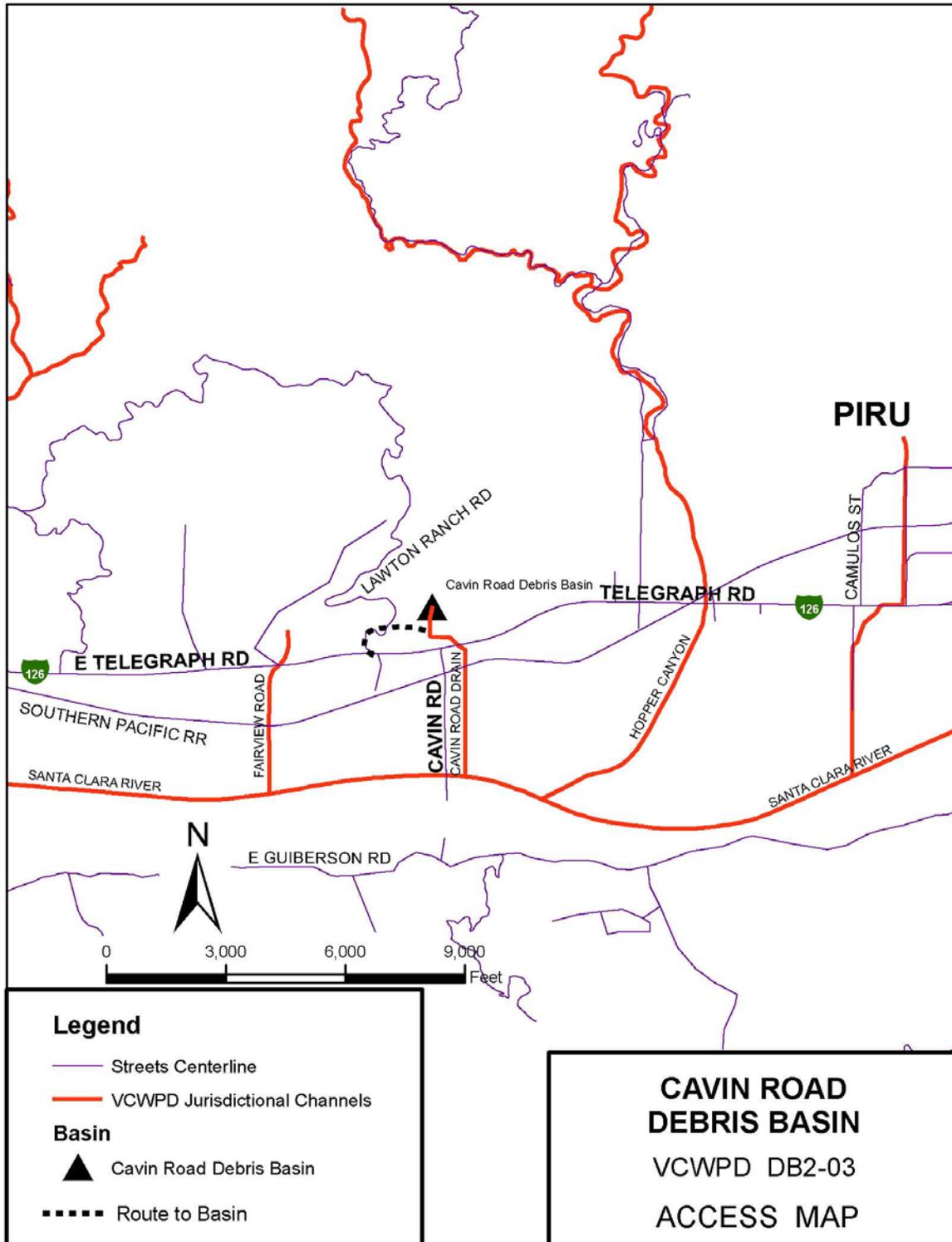


Summary of Discharge Data, 2015 Pre-Design Report

Elevation (ft, NGVD29)	Depth (ft)	Outflow Discharge (cfs)		Remarks
		Existing	Updated	
683.5	0	0	0	Weir Flow
684	0.5	0	18	
684.5	1.0	30	50	
685	1.5	90	93	
685.5	2.0	170	143	
686	2.5	240	199	
687	3.5	244	240	Orifice Flow
688	4.5	248	246	
689	5.5	251	251	
690	6.5	256	257	
691	7.5	260	262	

Stage-Storage Data, 11-05 Cleanout Volume

Elevation Ft. NGVD29	11-05 Cleanout CY
674	-
675	141
676	392
677	723
678	1,123
679	1,587
680	2,113
681	2,697
683.5	4,403



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 (10,460 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 350 ft NGVD29
 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 after fire
 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

VCWPD- Zone 2**Debris and Detention Basins**

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

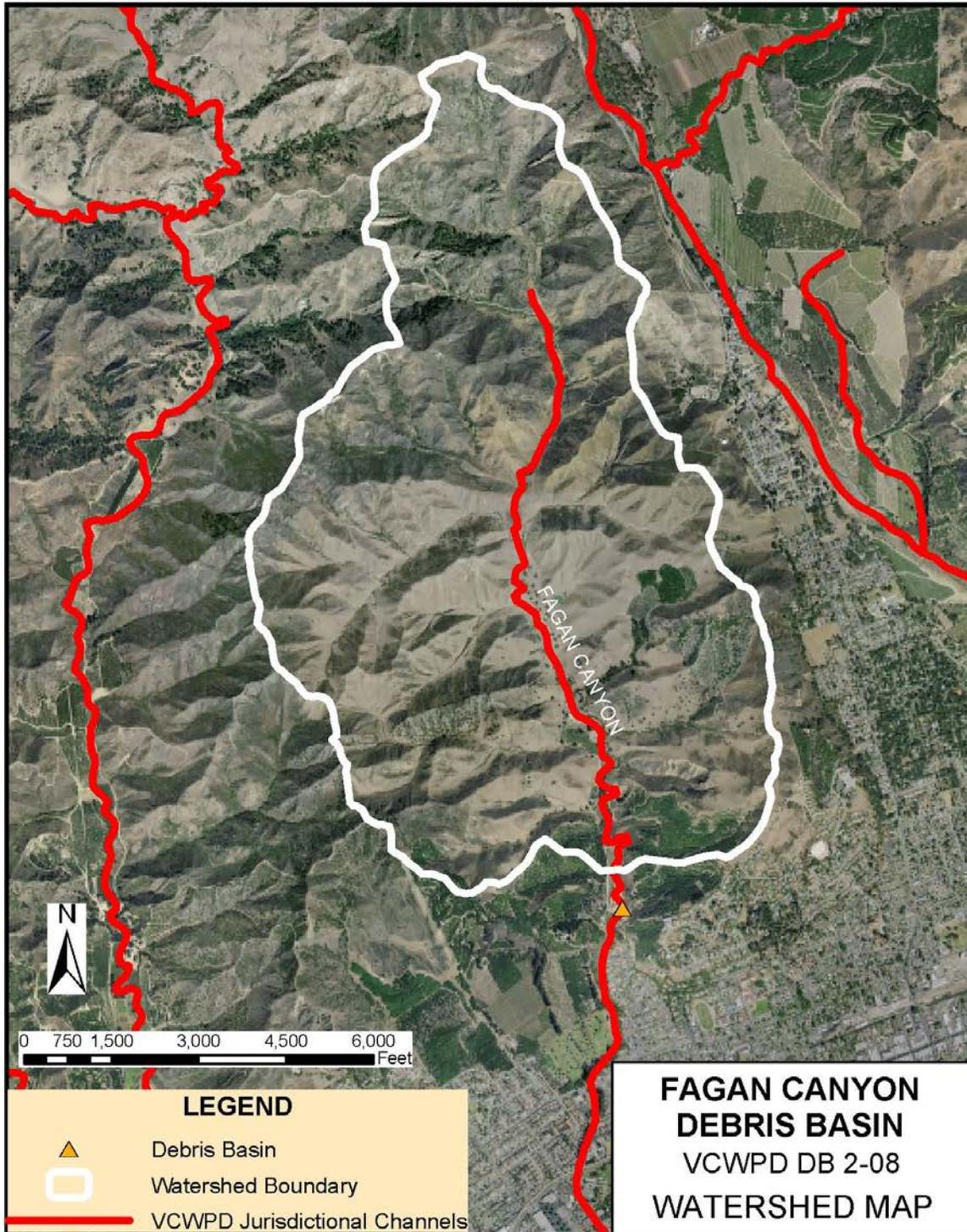
BASIN HISTORY: FAGAN CANYON DEBRIS BASIN

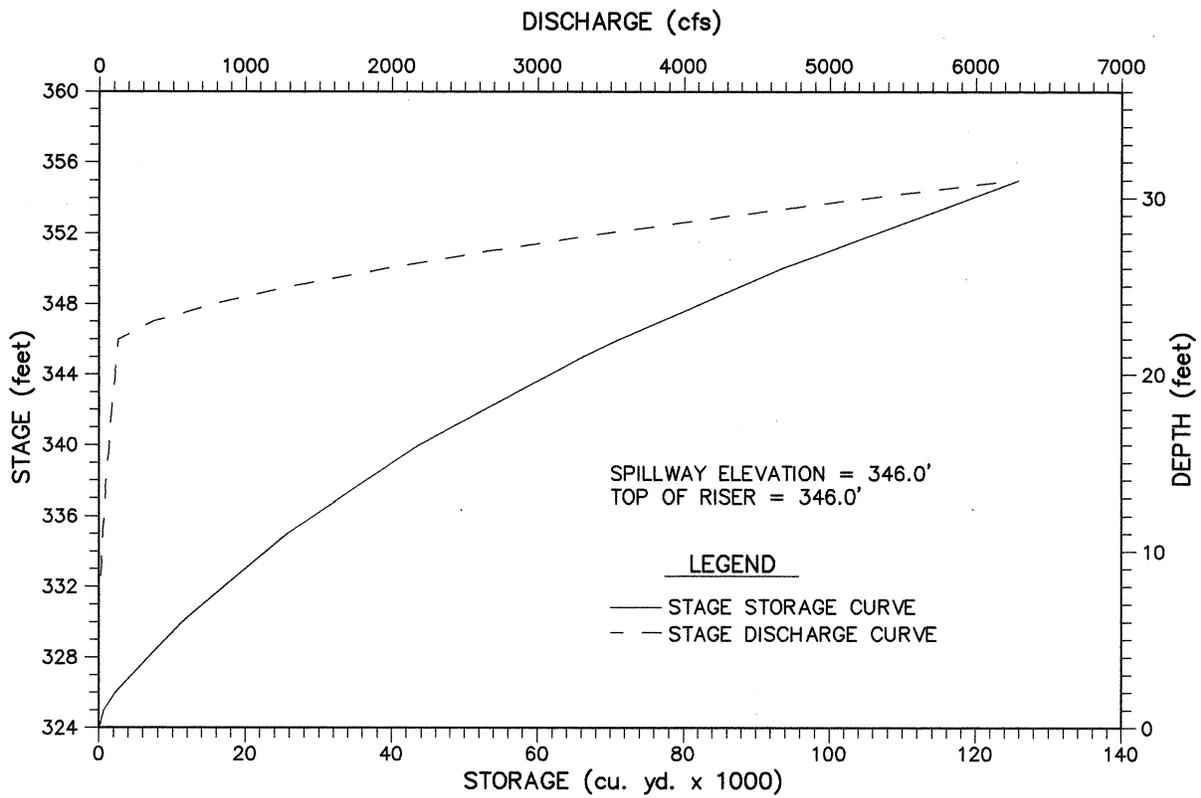
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
08-94	Basin Constructed			
09-94	Aerial Survey	88,400		
01-95	Cleanout		128	
01-95	Disaster Declaration			5,874
06-95	Aerial Survey	42,100		
10-95	Cleanout		42,850	
12-95	Aerial Survey	84,950		
07-96	Aerial 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	Aerial Survey Analysis by O&M		53,512	
09-05	Pre- and post-cleanout TIN volume analysis by WR&T	09-05 TIN did not extend to spillway elevation 346 contour for capacity analysis	55,627	

Notes

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

NA= Not Available / Not Applicable





STAGE - STORAGE & DISCHARGE CURVES

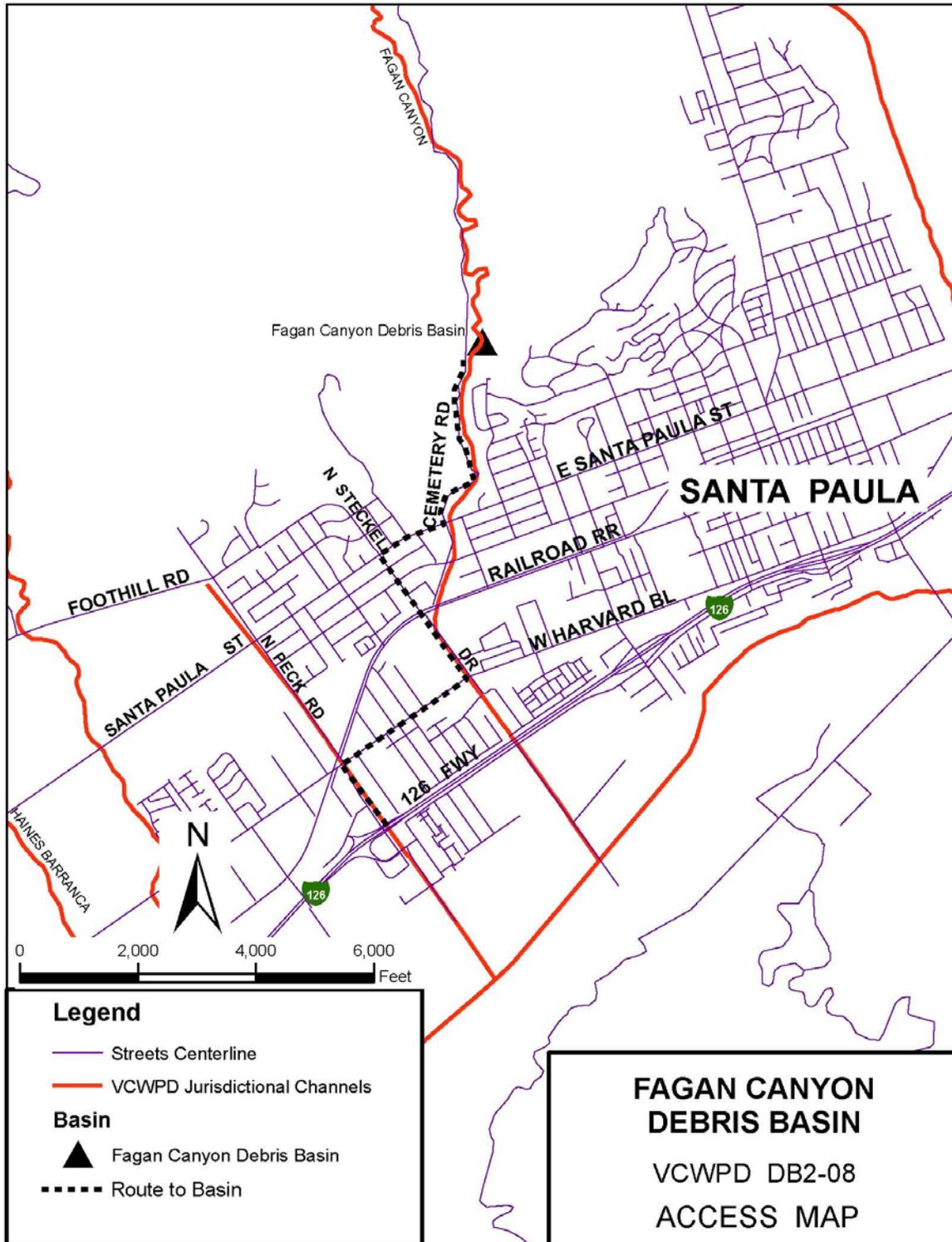


Fagan Canyon Debris Basin

Stage-Storage-Discharge Data Summary

Elevation	Design Vol.	Riser Disch.	Spillway Disch.	2005 Vol. (1)
Ft. NGVD29	Cu. Yds		Cfs	Cu. Yds
324	0			-
325	622			579
326	2,214			2,054
327				4,059
328				6,224
329				8,533
330	11,185	-		10,973
331		2.60		13,541
332		7.87		16,235
333				19,056
334		17.42		22,006
335	25,646			25,085
336		32.91		28,296
337				31,639
338		47.33		35,117
339				38,731
340	43,695	67.69		42,483
341				NA
342		85.74		NA
343				NA
344		109.98		NA
345	66,144			NA
346	71,242	131.07	-	NA
347		145.12	225	NA
348		148.24	638	NA
349		151.30	1,171	NA
350	93,525	154.30	1,803	NA
351		157.24	2,520	NA
352		160.12	3,313	NA
353		162.96	4,174	NA
354		165.74	5,100	NA
355	125,850	168.48	6,086	NA

Note (1): 2005 data from AutoCAD TIN analysis after September cleanout
 NA- Not Analyzed



FRANKLIN BARRANCA DEBRIS BASIN DB2-01 (Obsolete)

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 (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

Avocado trees planted in basin as of 5/2005, no record of basin cleanout since 1978, basin ownership transferred to homeowner using dam as access to house.

VCWPD- Zone 2

Debris and Detention Basins

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

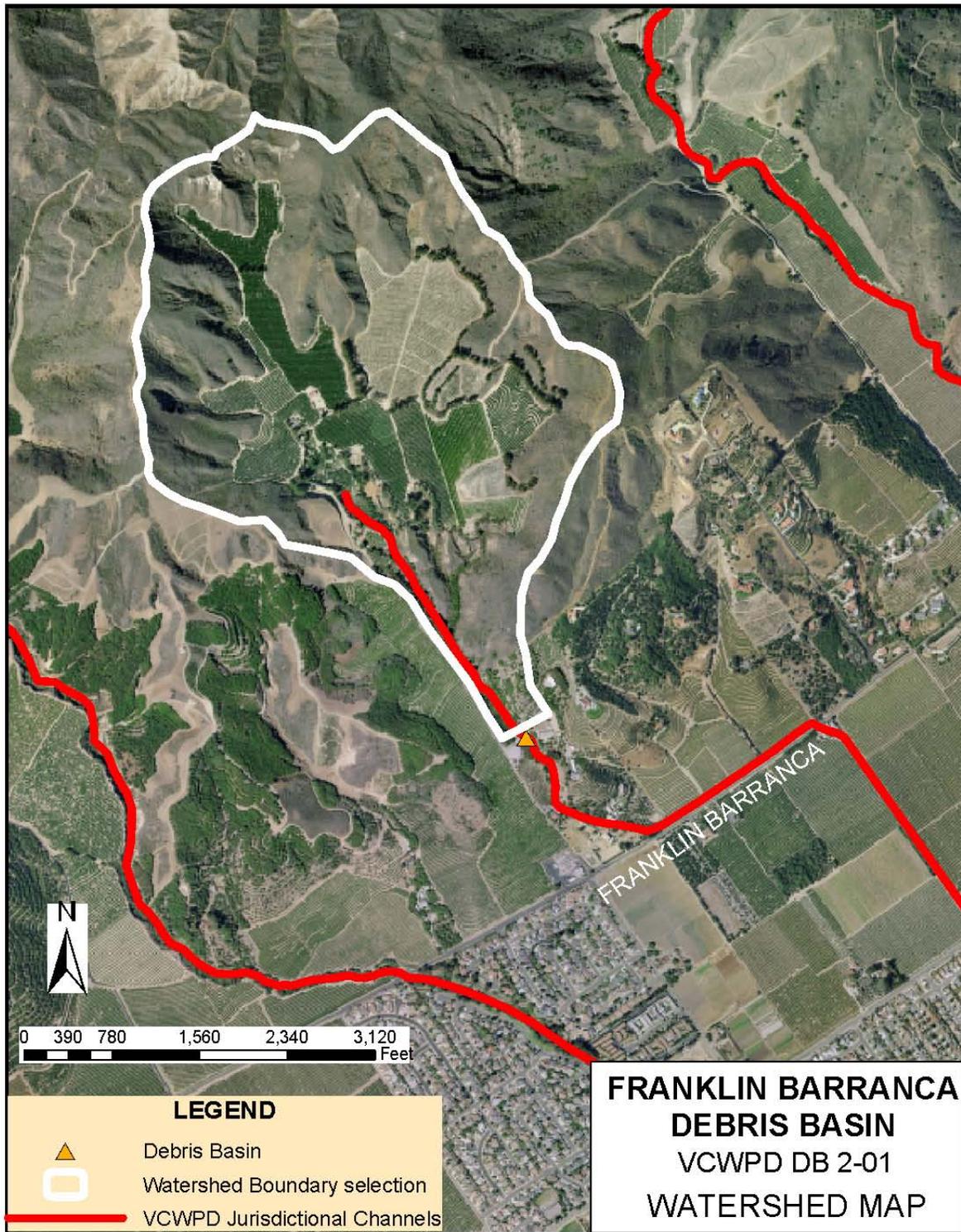
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
02-69	Disaster Declaration			
01-70	Aerial Survey	Not Digitized		
02-70	Aerial Survey	8,328		
11-70	Aerial Survey	8,128		
05-71	Aerial Survey	7,422		
05-72	Aerial Survey	Not Digitized		
05-73	Aerial Survey	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

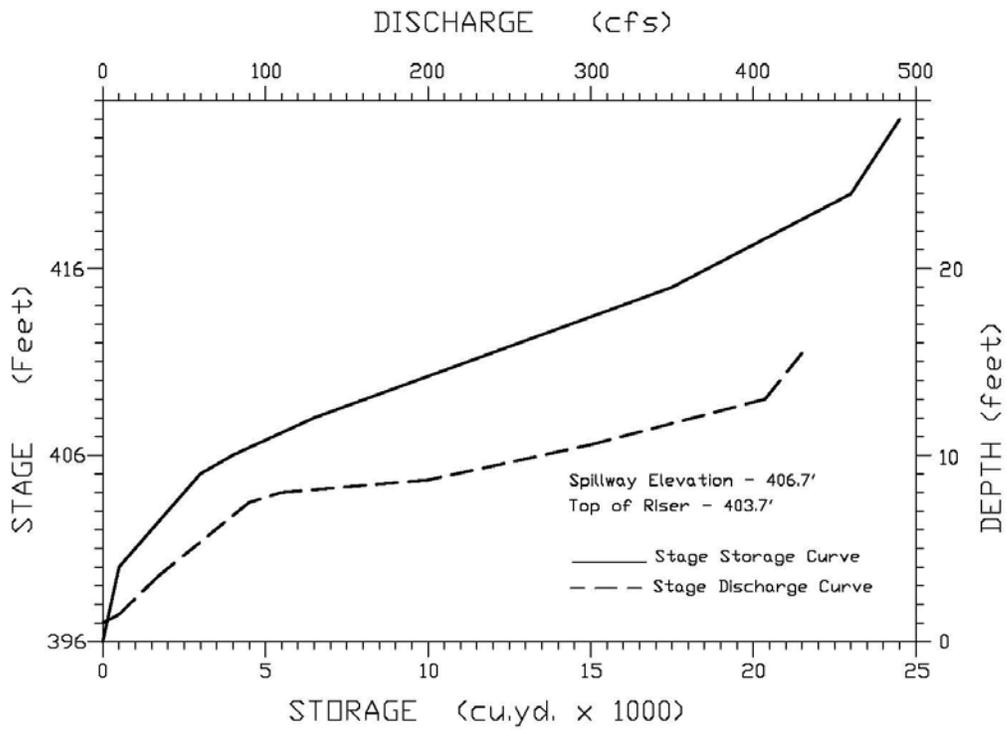
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

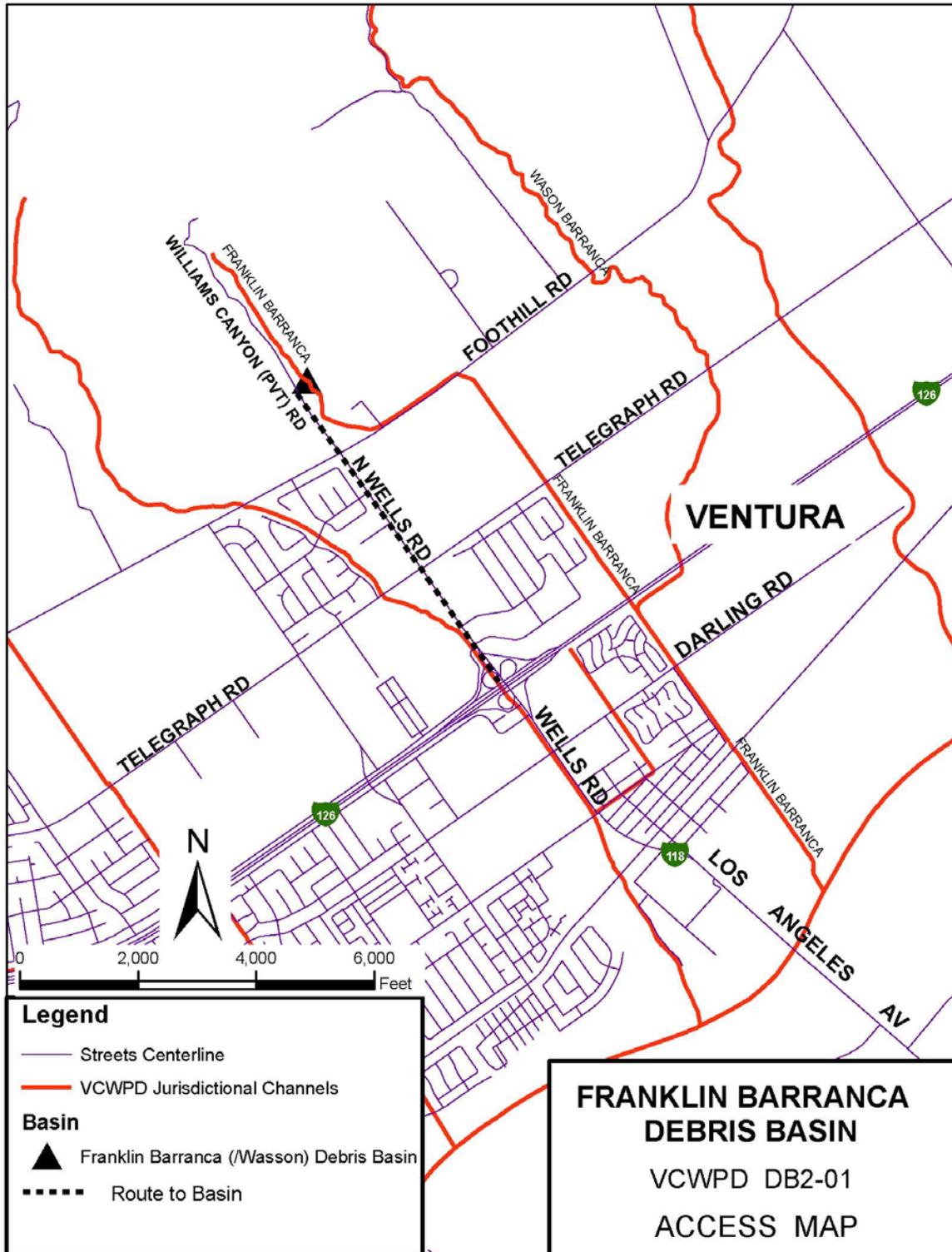
*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable



FRANKLIN BARRANCA DEBRIS BASIN





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 Reconstructed 2011
Type 14 ft wide x 25 ft long drop inlet spillway
Weir Elevation 597.5 ft NGVD29
Spillway Length NA
Capacity 3,950 cfs

PRINCIPAL SPILLWAY
Type None

DEBRIS BLEEDER/RISER Reconstructed 2011
Type ½ 48 in Slotted CMP, invert elev. 580 ft
Low Level Inlet Bottom 5' of CMP with trash rack
Slots 4 slots/row spaced ~1 ft apart; rows spaced 1 ft
Slot Elevation Extend 585 to 596.25 ft,
Outlet Conduit Discharges to drop inlet spillway

DAM
Dam Type Earthfill
Dam Crest Elevation 605 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; Spillway reconstructed in 2011

REFERENCE DRAWINGS
Construction Drawings Y-2-3458 to Y-2-3468 Spillway Redesign
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

JEPSON WASH DEBRIS BASIN (Superseded)

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 (5,580 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; Spillway reconstructed in 2012

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

VCWPD- Zone 2

Debris and Detention Basins

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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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	
12-80	Aerial Survey	53,010		6,664**

VCWPD- Zone 2**Debris and Detention Basins****BASIN HISTORY: JEPSON WASH DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
08-01	Aerial Survey	Not Digitized		

VCWPD- Zone 2**Debris and Detention Basins****BASIN HISTORY: JEPSON WASH DEBRIS BASIN**

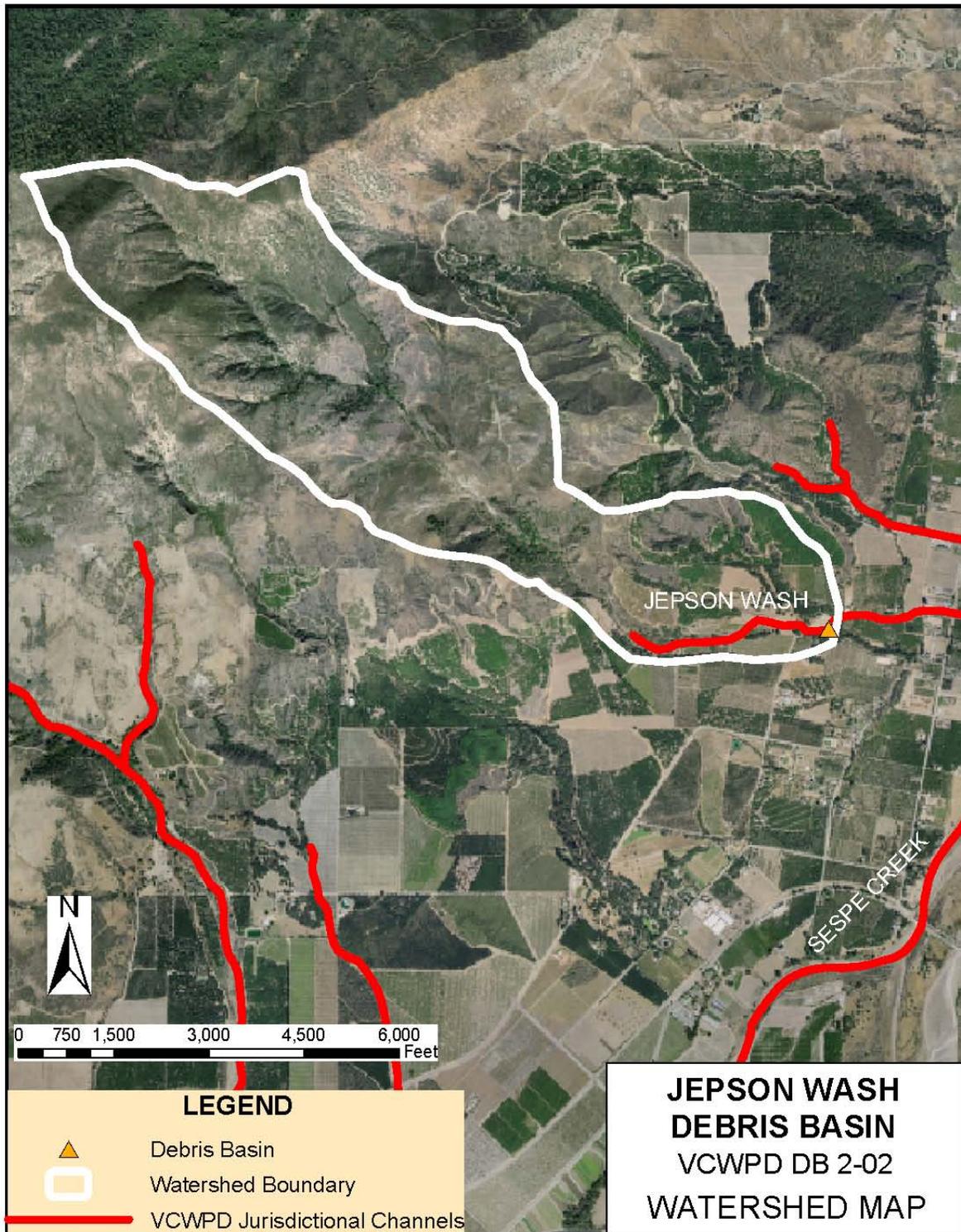
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
12-02	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
02-04	Cleanout		872	
08-04	Cleanout		6,768	
01-05	Disaster Declaration			3,556
07-05	Cleanout- Aerial Survey Analysis by O&M		56,952 fm O&M analysis	
09-05	Aerial Survey analysis by WR&T	34,066 to elev 598 ft spillway		
09-06	Cleanout- Truck Count		248	
10-06	WR&T Aerial Survey Analysis	1,781 net vol change		
05-08	WR&T Aerial Survey Analysis	23,902 to elev 598 spillway, 8,385 net vol change fm 2006		
08-08	Cleanout- Aerial Survey Analysis by O&M		11,282	
08-08	WR&T Aerial Survey Analysis	34,361 to elev 598 spillway		
01-12	WR&T Aerial Survey Analysis	25,088 to elev 598 spillway		

Notes

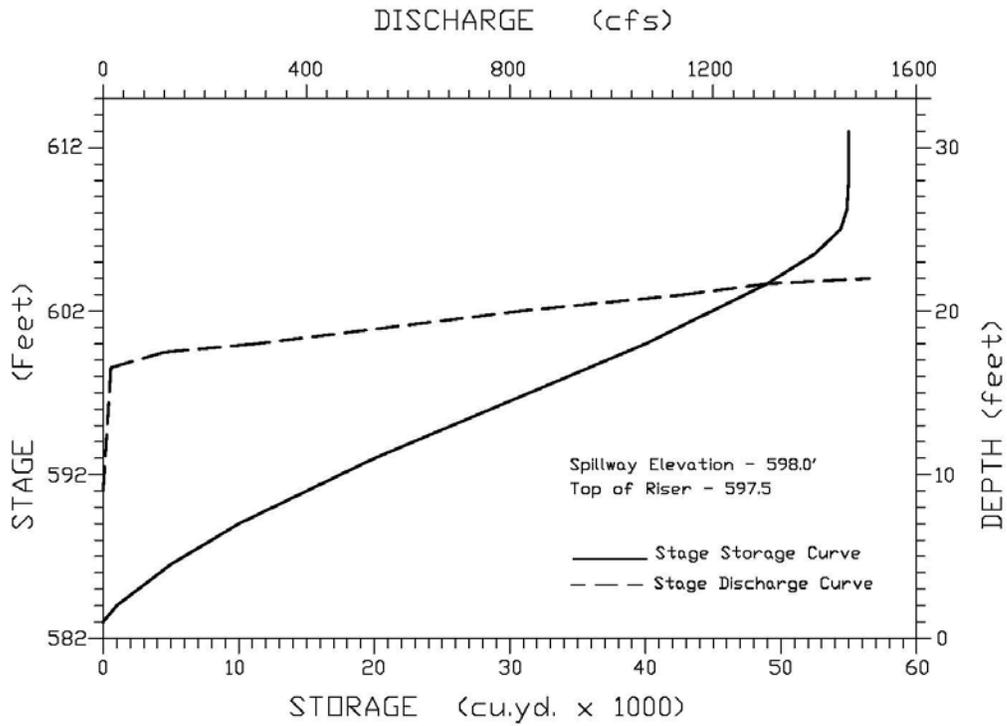
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable



JEPSON WASH DEBRIS BASIN



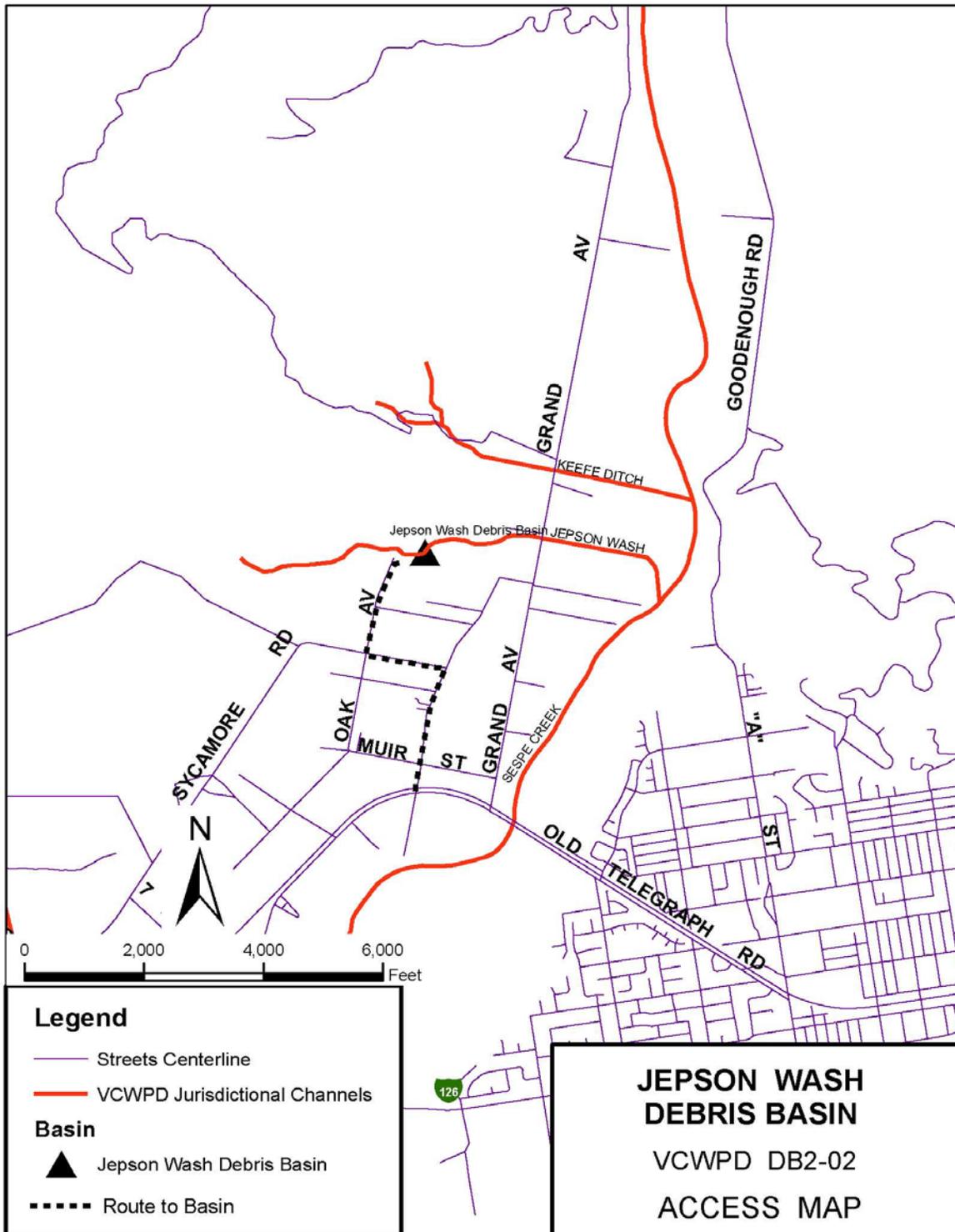
Historic Stage-Storage Discharge Data

Stage-Storage-Discharge Data Summary

Elevation	1970 Vol.	1961 Riser Disch.	2011 Riser Disch.	2011 Spillway Disch.	2012 Vol.
Ft. NGVD29	Cu. Yds	Note (1)	Not Available	Cfs	Cu. Yds
580					-
581					9
582					21
583					47
584					106
585	-				592
586	1,000				1,697
587	2,000				2,884
588	3,200	-			4,151
589	4,600	0.50			5,501
590	6,200	1.30			6,959
591	8,200	2.50			8,569
592	10,500	3.90			10,350
593	13,300	5.75			12,300
594	16,300	7.75			14,419
595	20,000	9.75			16,711
596	24,000	11.75			19,177
597	28,200	14.00			21,804
597.5	32,500	15.25		-	
598		16.50		100	24,580
599				340	27,496
600				840	30,538
601				1,380	NA
601.4				1,624	NA
602				2,000	NA
602.5				2,400	NA
603				2,800	NA
603.75				3,430	NA
604				3,680	NA

Note (1) Historic Riser removed as part of Spillway Reconstruction in 2011

NA= Not Analyzed



POLE CREEK DEBRIS BASIN DB2-09

LOCATION: Fillmore, Between Heritage Valley and El Dorado Mobile Homes Adj to Hwy 126
N 327,782,E 1,727,542 (Lambert Zone 5 Coordinates);
Fillmore 7 1/2' Quad.

DESIGN DATA

Elevations in NAVD88

Design Agency	<u>Pace Engineering</u>
Level Capacity	<u>440,440 cy (273 af) at spillway invert</u>
Debris Cleanout Elev.	<u>466.5 ft NAVD88 at upstream end of basin</u>
100-Yr Inflow Rate	<u>7,370 cfs.</u>
Outflow Rate	<u>Assumed same as inflow for design hydrology modeling</u>
Cleanout Elevation	<u>20% of 100-yr Volume (72,340cy) Elev. 441.75 ft</u>

EMERGENCY SPILLWAY

Type	<u>Soil Cement End Sill</u>
Crest Elevation	<u>441.7 ft NAVD29</u>
Spillway Length	<u>337.9 ft</u>
Capacity w/o Freeboard	<u>NA</u>

PRINCIPAL SPILLWAY

Type	<u>Slotted RC Riser Tower with 3.5 ftW x 4ft H inlet</u>
Top Elevation	<u>448 ft NAVD88</u>
Outlet	<u>36-in RCP</u>

DEBRIS BLEEDER

Type None

BYPASS CHANNEL

Bypass Flow 37 cfs

DAM

Dam Type	<u>Soil Cement End Sill</u>
Dam Crest Elevation	<u>441.7 ft NAVD29</u>
Length	<u>337.9 ft</u>
Surface Area of Full Basin	<u>15 ac</u>
Watershed Area	<u>8.645 sq mi from GIS/Watersheds.shp file</u>
Width at Crest	<u>20 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>VCWPD</u>
Completion Date	<u>2009</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-2-3060 to 3094E</u>
Right-of-Way Drawings	<u>Y-2-3084</u>
Topographic Drawings	<u>Y-2-3065 to 3067</u>

VCWPD- Zone 2

Debris and Detention Basins

EXPECTED DEBRIS PRODUCTION (cy): Note 1		
Storm Frequency	Design Condition	100% Burn
100-YEAR	361,700	524,600
50-YEAR	276,000	400,300
25-YEAR	200,800	291,200
10-YEAR	121,600	176,400
2-YEAR	29,400	42,700

Note 1: Design 100-yr debris production equivalent to ~0.5 in of soil across entire watershed. Large amount is due to estimate of slope failure area from DMG 1972 landslide map of 80 ac/sq mi. Scott and Williams (1978) found Sf=6 ac/sq mi during their field investigations. Re-evaluations of VCWPD removal data have resulted in design 100-yr yields ranging from 70,000 to 289,000 cy.

*

BASIN HISTORY: Pole Creek Basin

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	<u>Channel cleanout data prior to basin provided in Appendix A.</u>	<u>Channel removal quantities range from 22,000 cy in 1992 to 140,000cy in 1995.</u>		
<u>Jan-05</u>	<u>Channel cleanout after storm prior to basin construction</u>	<u>Estimated at 72,200 cy by PACE (2010)</u>		

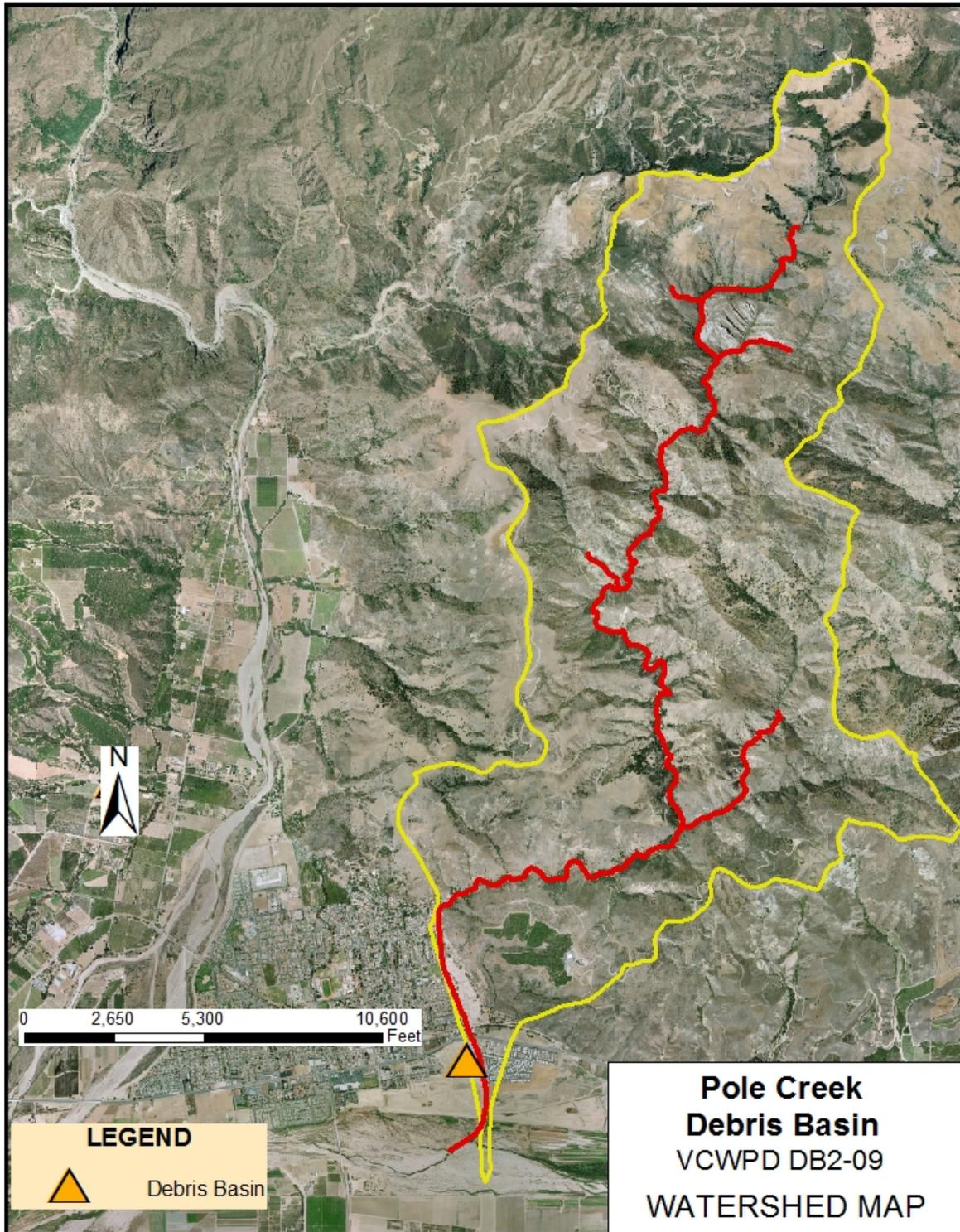
PACE,2010. Pole Creek Sediment Yield Study.

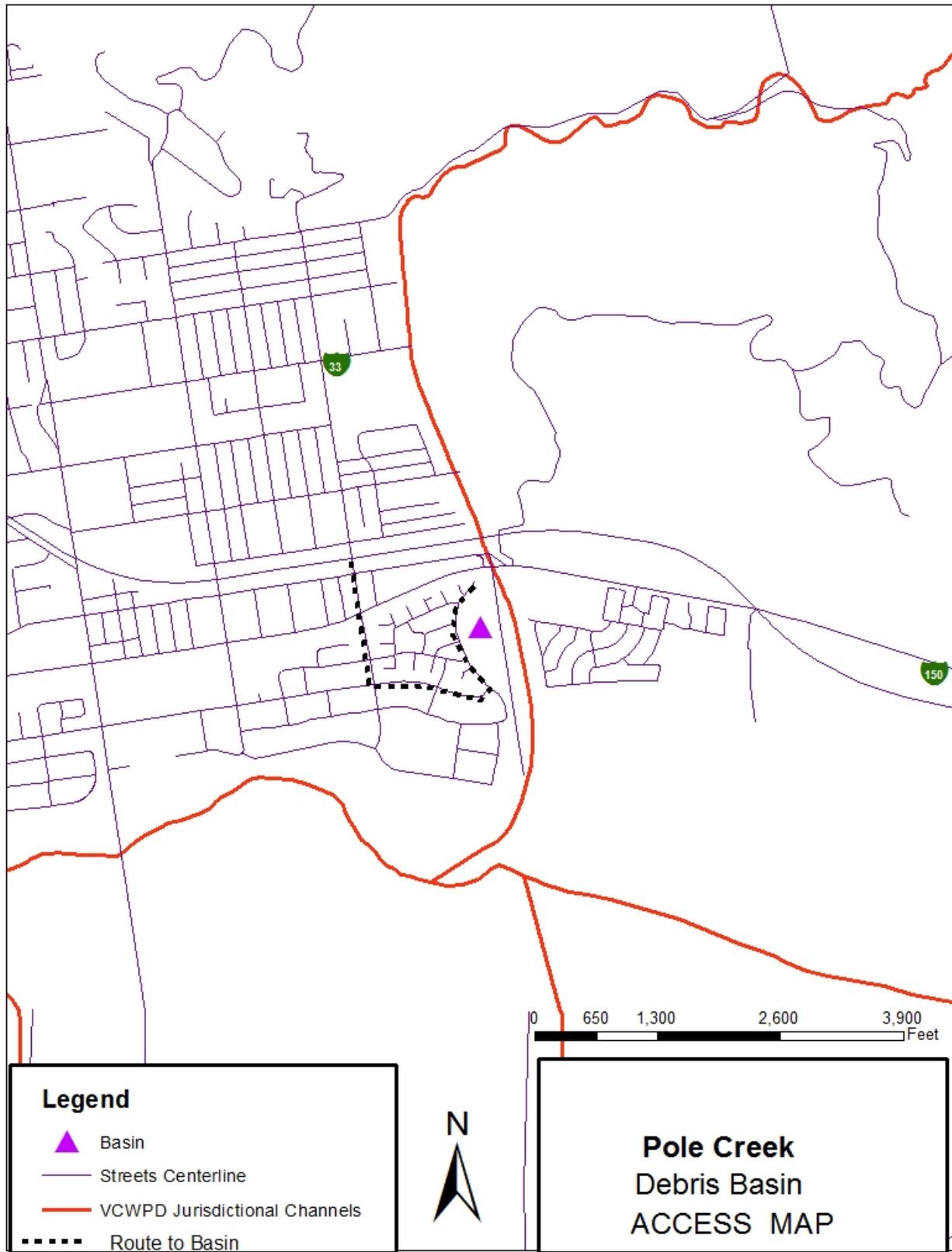
Notes

- * 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

Pole Creek Debris Basin Stage-Storage

Elevation (ft) NAVD 88	Area (ac)	Total Volume (ac-ft)
438.00	11.76	0.00
439.00	11.96	11.86
440.00	12.17	23.93
441.00	12.38	36.20
442.00	12.59	48.69
443.00	12.80	61.38
444.00	13.01	74.29
445.00	13.22	87.40
446.00	13.42	100.72
447.00	13.63	114.25
448.00	13.84	127.98
449.00	14.04	141.92
450.00	14.26	156.07
451.00	14.47	170.44
452.00	14.82	185.08
453.00	14.47	199.72
454.00	13.56	213.74
455.00	12.43	226.73
456.00	10.99	238.45
457.00	9.30	248.59
458.00	7.52	257.00
459.00	5.61	263.57
460.00	3.86	268.31
461.00	2.17	271.32
462.00	0.73	272.77





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=375 cfs on Y-2-308; Q100out=same
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

Reconstructed in 2010

Type Slotted 24-in CSP 12.3 ft high; 31-in high collar added
In 2010 with 5-in openings to increase sediment outflow
Elevations 858.8 ft top; 847 ft bottom of collar and riser
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-2-308 and Y-2-310; Spec WP11-02(I) for riser mod.
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)

VCWPD- Zone 2

Debris and Detention Basins

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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
03-83	Disaster Declaration			

VCWPD- Zone 2**Debris and Detention Basins****BASIN HISTORY: REAL WASH DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
12-99	Aerial Survey	Not Digitized		

VCWPD- Zone 2

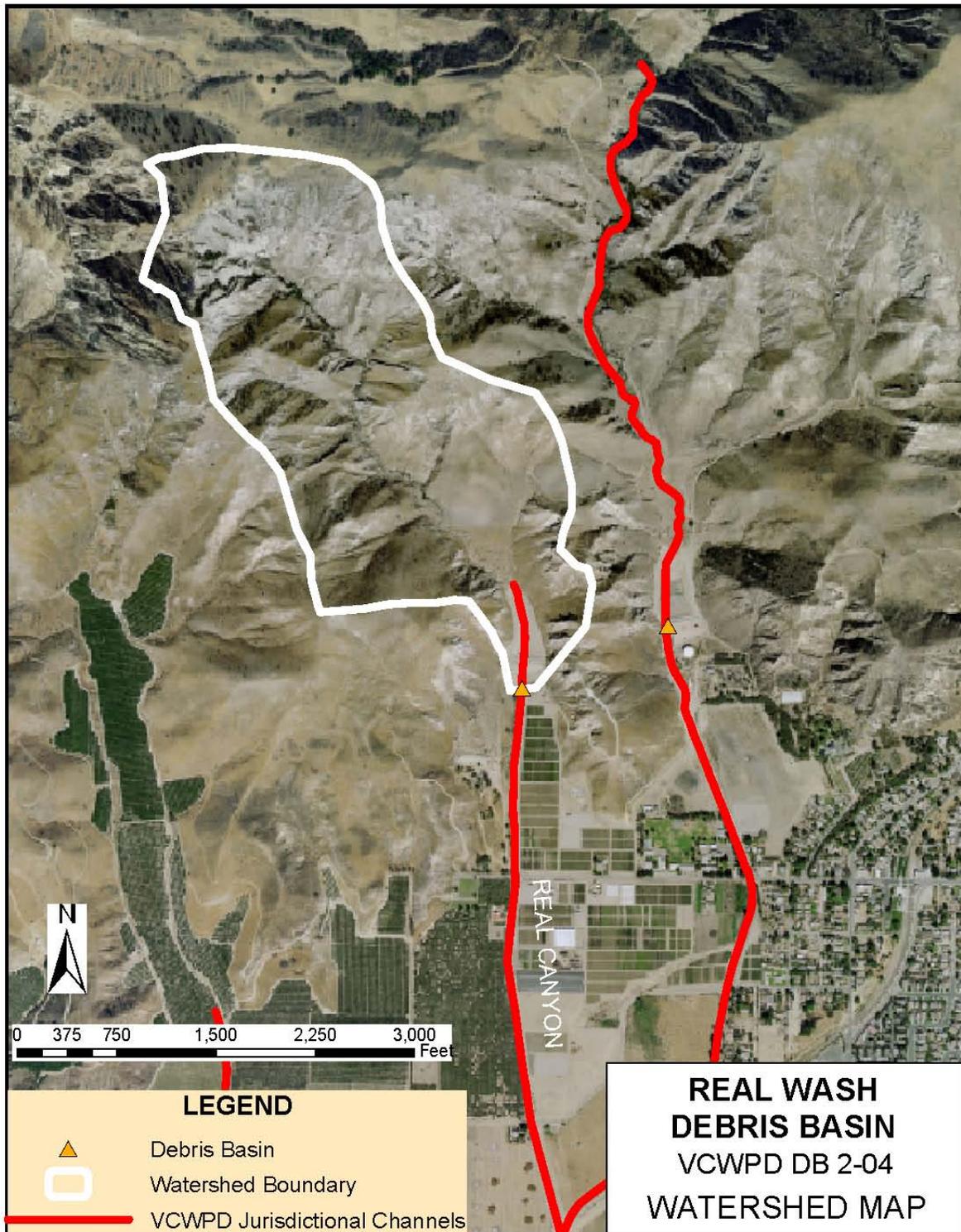
Debris and Detention Basins

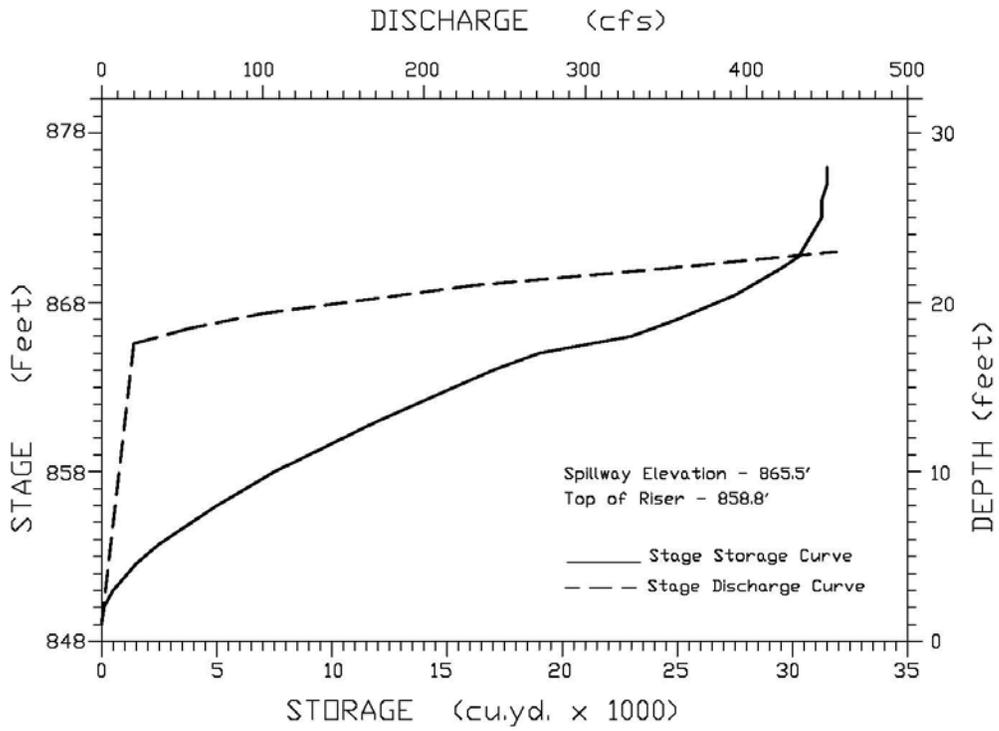
BASIN HISTORY: REAL WASH DEBRIS BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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 O&M Analysis		47,318	
08-05	WR&T TIN analysis	25,068 up to elev 865.5 ft		
10-06	Cleanout O&M Analysis		21,291	
Oct-06	WR&T TIN analysis	22,995 up to elev 865.5 ft		
Sep-08	WR&T TIN analysis	22,815 up to elev 865.5 ft		
May-10	WR&T TIN analysis	7,152 up to elev 865.5 ft		
May-11	WR&T TIN analysis	7,781 up to elev 865.5 ft		
May-11	WR&T TIN analysis	16,393 accumulated from 10-06		
Jul-11	Cleanout- O&M Truck Count		14,365	
Jun-12	WR&T TIN analysis	19,405 up to elev 865.5 ft		
Jun-15	Cleanout- O&M Truck Count		7,410	
05-17	WR&T TIN analysis	7,013 up to elev 865.5 ft 12,392 cy net deposit fm 6-12		
07-17	Cleanout- Truck Count		3,388	

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

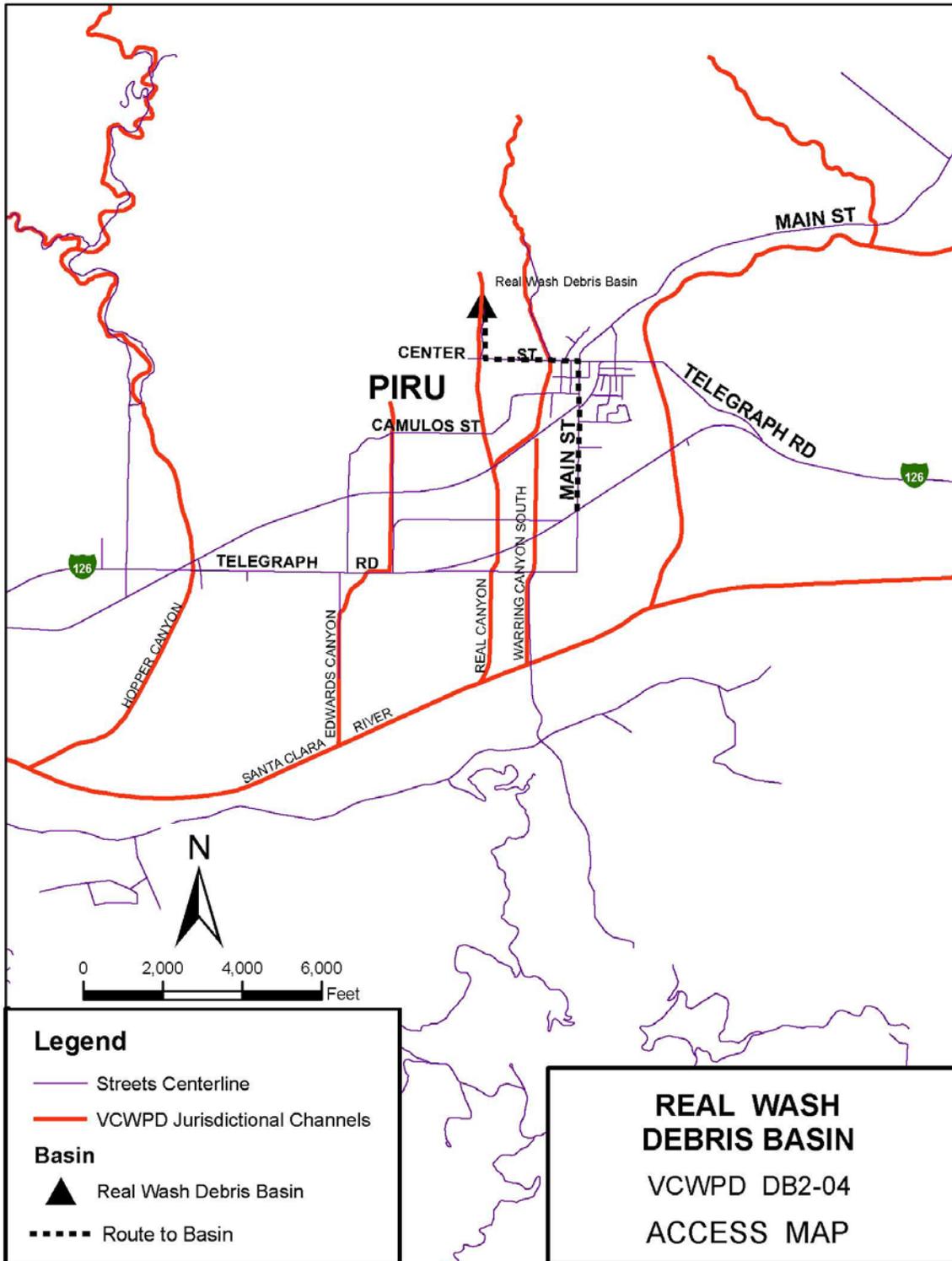




Stage-Storage-Discharge Data Summary

Elevation	1982 Vol	Riser Disch.	Spill Disch.	2008 Vol.
Ft. NGVD29	Cu. Yds	1972	Cfs	Cu. Yds
847	65			0
848	277	0.00		42
849	628	0.14		294
850	1,097	0.74		853
851	1,659	1.58		1,603
852	2,299	2.62		2,488
853	3,025	3.82		3,481
854	3,840	5.16		4,564
855	4,734	6.62		5,727
856	5,706	8.20		6,970
857	6,757	9.90		8,292
858	7,878	11.30		9,692
859	9,075	12.60		11,174
860	10,350	13.40		12,736
861	11,697	14.30		14,379
862	13,142	16.10		16,103
863	14,664	17.20		17,910
864	16,322	17.60		19,800
865	18,068	18.00		21,774
865.5	19,999	18.20	-	22,792
866.5	22,025		53	-
867.5	23,935		114	-
868.5	25,478		194	-
869.5	26,604		289	-
870.5	27,299		396	-
871	27,875		453	-

Note: Low Flow Riser Modified in 2010, Flow Values not recalculated



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) based on original spillway at 851.5 ft
Maximum Debris Capacity 59,500 cy (10-30-86)
Inflow and Outflow Rates Q100in=1,217 cfs; Q100out=NA, (2007 VCRat Study)
Debris Cleanout Elevation 837 ft (7,100 cy) [max. cap.-100yr debris yield]

EMERGENCY SPILLWAY

Type 44 ft wide inlet to 26 ft wide x 9.75 ft high RC Channel
Invert Elevation 851.7 ft NGVD29
Spillway Length 69 ft at 0.05 slope to dam face
Capacity Has 3 ft freeboard for Q100 cfs.

PRINCIPAL SPILLWAY

Type 6.5 ft X10 ft RC Tower Weir Inlet with Trash Rack
Weir Elevation 851.08 ft NGVD29
Outlet Conduit 48-in RCP invert elev. 823.75 ft

DEBRIS BLEEDER/RISER

Type Slots in Spillway Riser Tower 5"x9", 21" on center, 6/row
Elevations 78 slots from 827.5 to 850 ft
Subgrade 4 slots below grade, lowest at 824. 6 ft 18" on center

DAM

Dam Type Earthfill
Dam Crest Elevation 860 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 1952; Riser tower reconstructed in 2003
Completion Date Spillway reconstructed 2014

REFERENCE DRAWINGS

Construction Drawings 31399c, 33183 thru 33184; Riser Tower Y-2-2737-2745
Y-2-3759-3767, Revised emergency spillway.
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

VCWPD- Zone 2

Debris and Detention Basins

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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
08-82	Cleanout		7,200	
11-82	Aerial Survey	39,890		

VCWPD- Zone 2**Debris and Detention Basins****BASIN HISTORY: WARRING CANYON DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
12-98	Cleanout		50,244	
12-98	Aerial Survey	58,690		
12-99	Aerial Survey	Not Digitized		

VCWPD- Zone 2**Debris and Detention Basins****BASIN HISTORY: WARRING CANYON DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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- O&M Analysis		17,450	
12-04	WR&T TIN analysis	37,068 to elev 850.5 ft		
01-05	Disaster Declaration			4,927
07-05	Cleanout- O&M analysis		85,687	
07-05	Cleanout- O&M analysis		21,965-Survey	
09-05	WR&T TIN analysis	38,955 to elev 850.5 ft		
10-06	Cleanout- O&M analysis		6,890	
10-06	WR&T TIN analysis	36,102 to elev 850.5 ft		
10-10	WR&T TIN analysis	33,593 to elev 850.5 ft		
07-11	Cleanout- O&M Truck Count		3,582	
05-17	WR&T TIN analysis	16,334 to elev 850.5 ft 17,259 net deposit fm 2010		

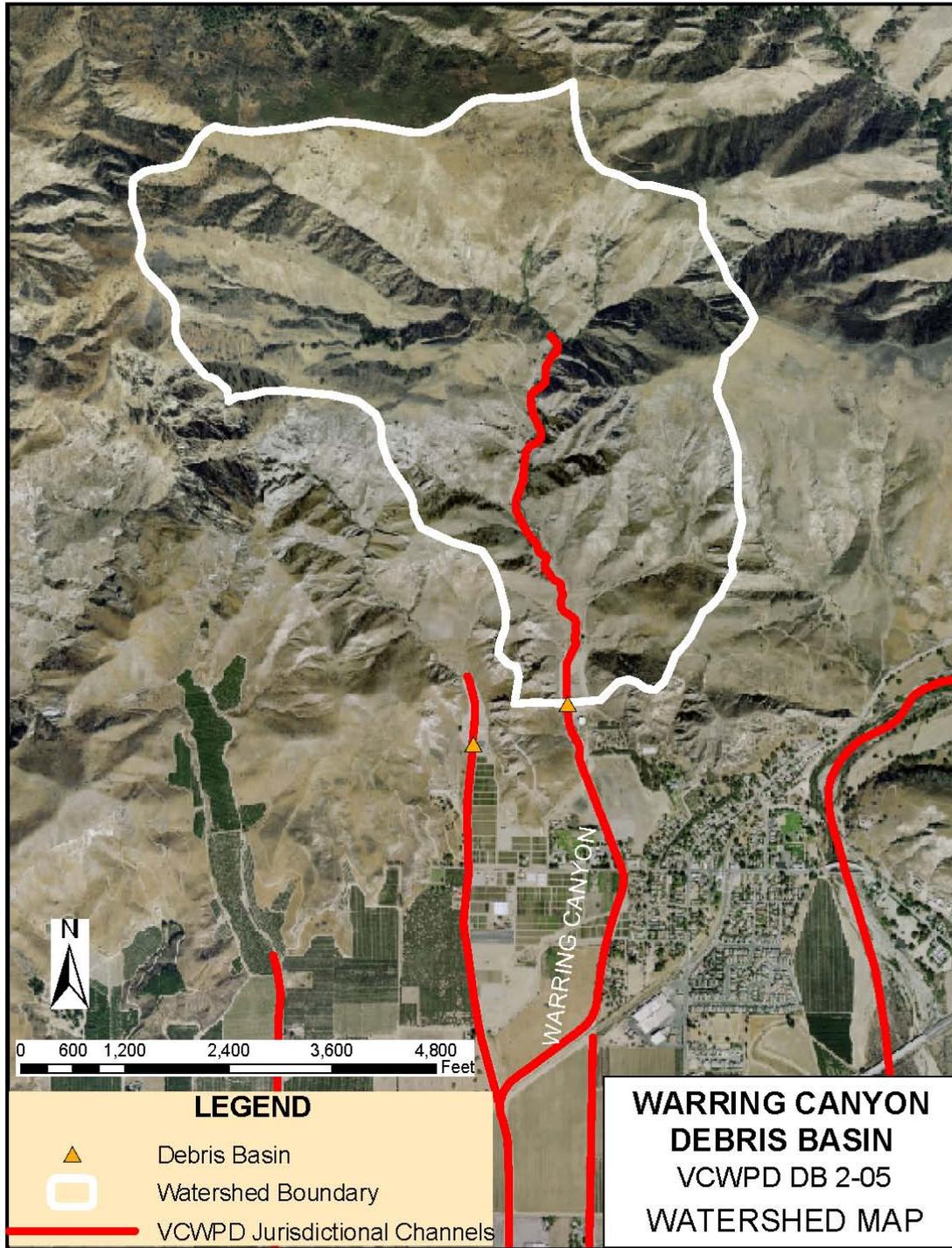
Notes

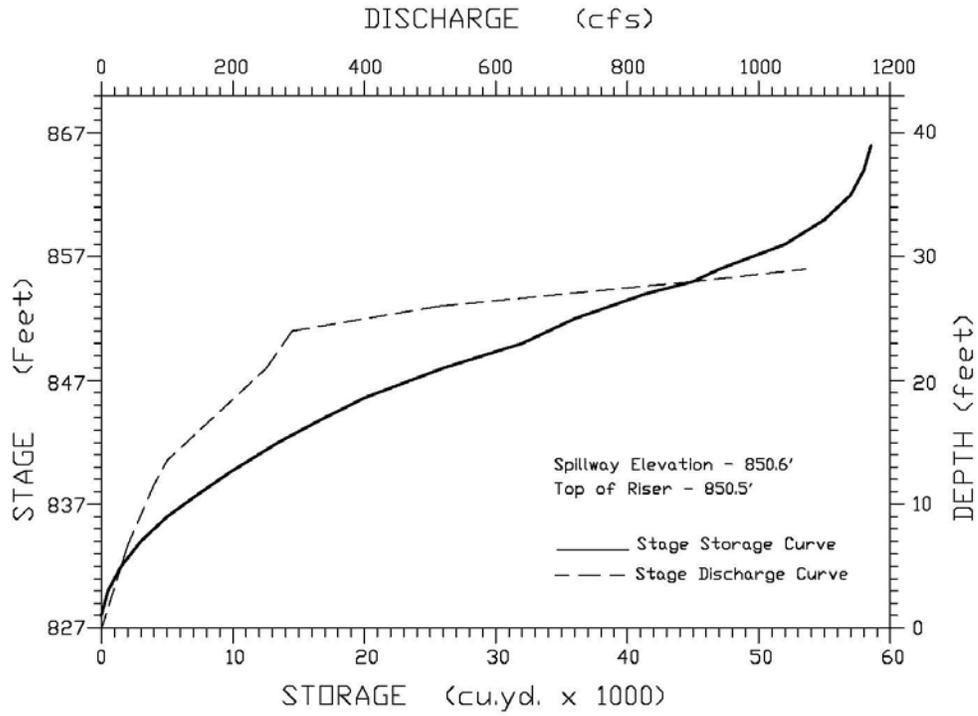
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable



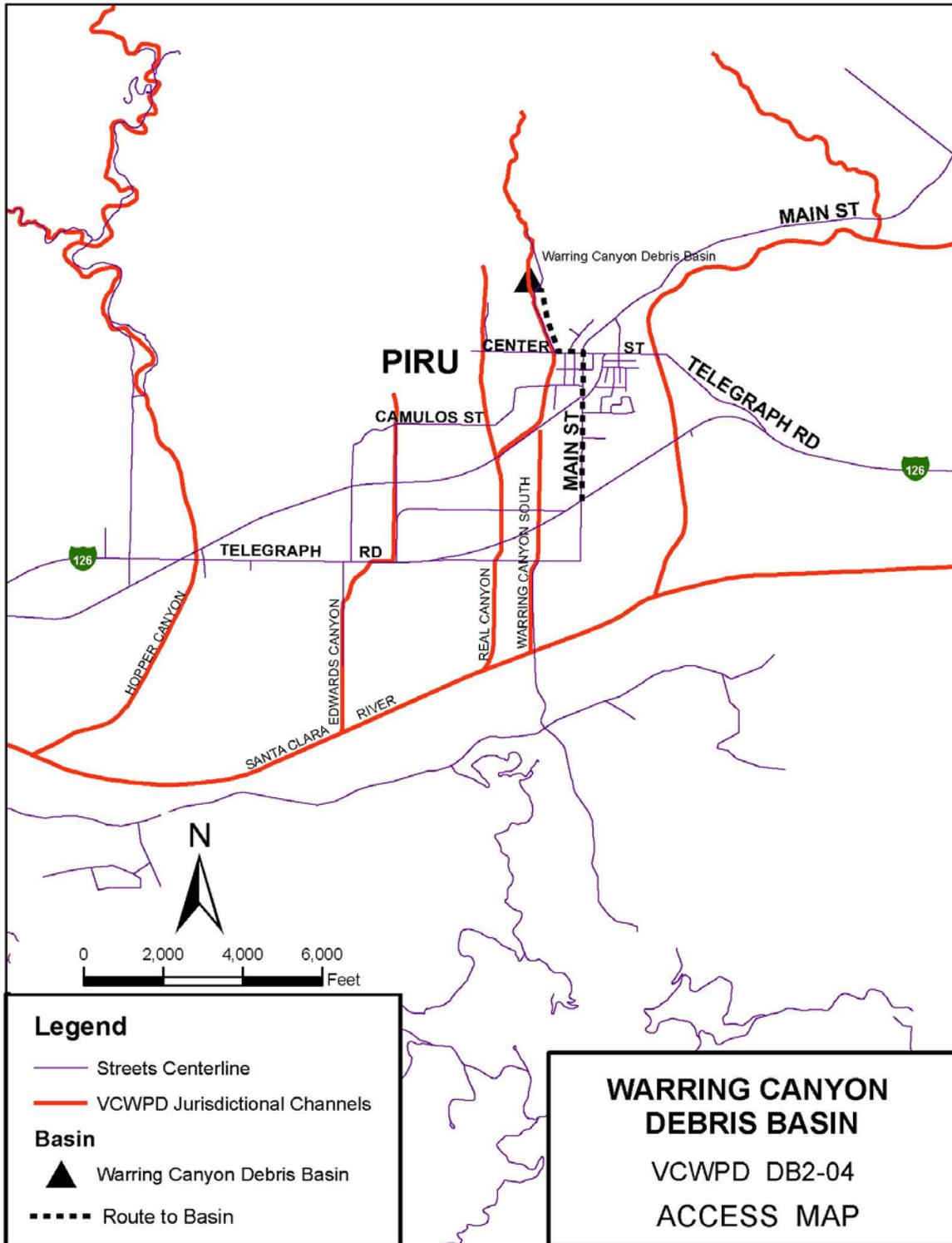


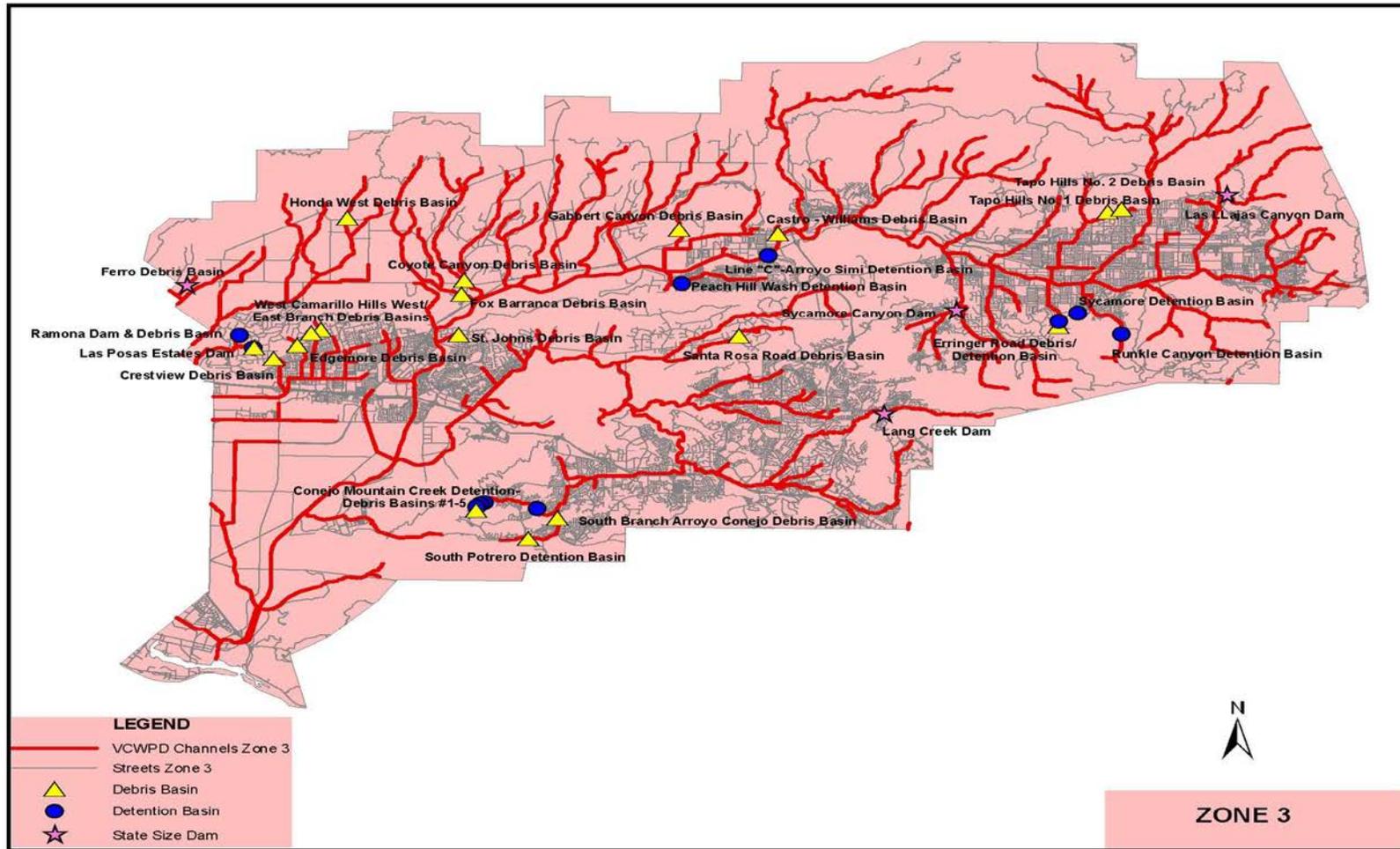
Superseded Stage-Storage-Discharge Data

Stage-Storage-Discharge Table

Elevation	10-06 Vol.	Elevation	Riser Tower	Elevation	Emergency Spillway
Ft. NGVD29	Cu. Yds	Ft. NGVD29	(1) Cfs	Ft. NGVD29	(2) Cfs
826	0	824.00	0.00		
827	10	825.17	9.91		
828	100	826.67	17.97		
829	350	828.83	27.02		
830	752	830.58	35.84		
831	1,304	832.33	44.57		
832	1,990	834.08	53.26		
833	2,803	835.83	61.91		
834	3,735	837.58	70.55		
835	4,774	839.33	79.18		
836	5,915	841.08	87.80		
837	7,159	842.83	95.65		
838	8,508	844.58	98.85		
839	9,968	846.33	101.95		
840	11,546	848.08	104.96		
841	13,249	849.83	107.88		
842	15,090	851.00	110.73	851.7	0
843	17,076	852.00	128.20	852	62.5(3)
844	19,199	853.00	162.80	853	286.5(3)
845	21,454	854.00	200.12	854	534.2(3)
846	23,841	855.00	235.89	855	805.7(3)
847	26,352	856.00	279.44	855.6	980(4)
848	28,981	857.00	307.75	857	1,420(4)
849	31,731	858.00	314.22		
850	34,600	859.00	319.99		
850.5	36,079	860.00	325.66		
851.5	39,126				

- (1) Riser Tower modified 2006
- (2) Emergency Spillway modified 2014
- (3) Interpolated from Alden Study results 2014
- (4) Alden Study 3-D Model Results, 2014





Zone 3 Basins

ARIELLE NPDES & DETENTION BASIN DD3-26

LOCATION: Simi Valley, Between Erringer and Bus Canyon Tributaries off Arielle Drive
 N 274,100,E 1,770,700 (Lambert Zone 5 Coordinates);
 Simi 7 1/2' Quad.

DESIGN DATA

	<u>Elevations ft NGVD29</u>
Design Agency	<u>Crosby Mead Benton</u>
Level Capacity	<u>5,080 cy at spillway invert (Y-3-3837) NPDES + Det.</u>
Maximum Debris Capacity	<u>None</u>
100-Yr Inflow Rate	<u>111 cfs</u>
Outflow Rate	<u>14.7 cfs at emergency spillway invert</u>
Debris Cleanout Elevation	<u>95 cy, Elev. 899 ft (25% of 100-yr Volume)</u>

EMERGENCY SPILLWAY

Type	<u>Top of Tower Adj. to Principal Spillway, 4 x 6 ft drop inlet</u>
Invert Elevation	<u>910.7 ft NGVD29</u>
Design Elevation	<u>Q100=111 cfs at elev 912.2</u>
Capacity w/o Freeboard	<u>250 cfs at dam crest of 913.2</u>

PRINCIPAL SPILLWAY

Type	<u>4 ft x 4 ft Rect. Tower w/ 2 4x5' openings protected by trash rack</u>
Inlet Weir Elevations	<u>904.1 ft NGVD29</u>
Outlet Conduit	<u>36 in RCP</u>
Outflow Rates	<u>14.7 cfs at Em. Spill. Invert of 910.7</u>

DEBRIS BLEEDER

Type	<u>None</u>
------	-------------

DAM

Dam Type	<u>Earthfill topped by roadbed</u>
Dam Crest Elevation	<u>913.2 ft NGVD29</u>
Length	<u>115 ft from GIS</u>
Surface Area of Full Basin	<u>0.46 ac</u>
Watershed Area	<u>42 ac from Simi Valley MDP Update (Draft as of 2015)</u>
Width at Crest	<u>20 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>Crosby Mead Benton</u>
Completion Date	<u>2002</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-3836 to 3848</u>
Right-of-Way Drawings	<u>NA</u>
Topographic Drawings	<u>NA</u>

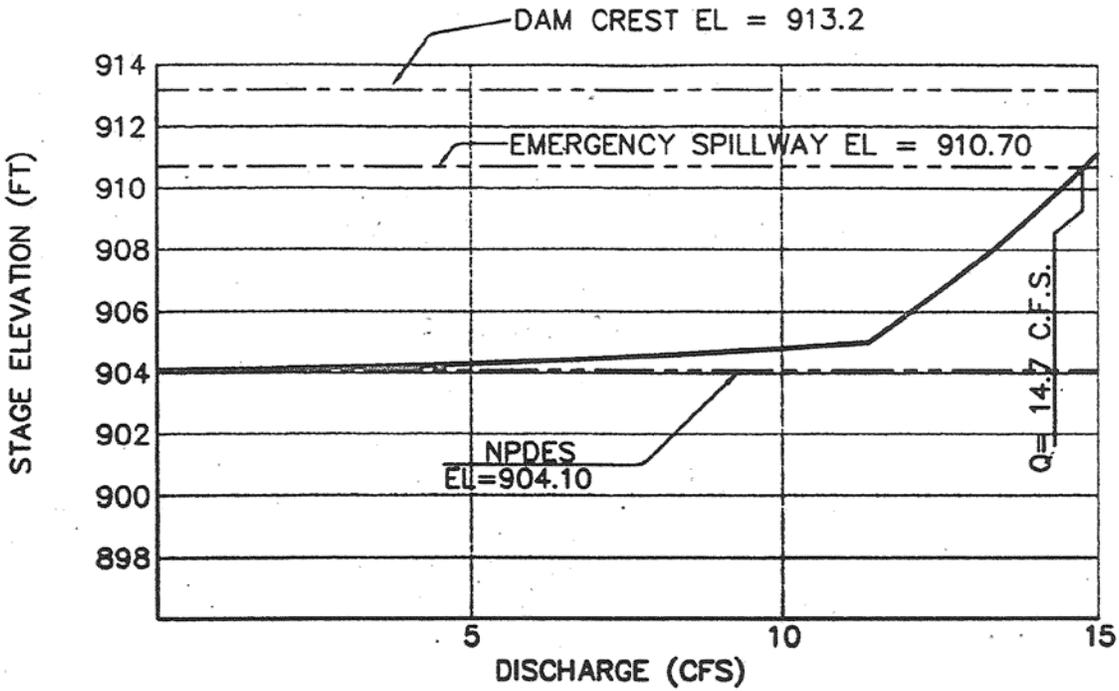
EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	378	548
50-YEAR	310	450
25-YEAR	219	317
10-YEAR	121	175

Note: Basin is surrounded by developed area and sediment would have to traverse the local drainage system to reach Arielle. Only small amounts of sediment expected to impact the basin.

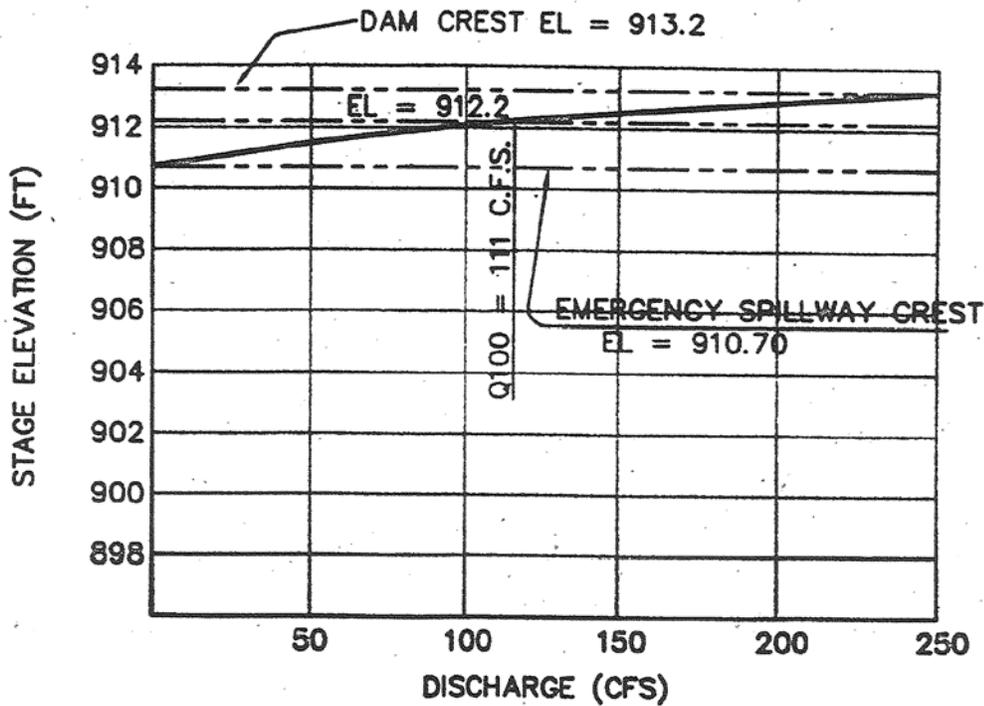
*

BASIN HISTORY:

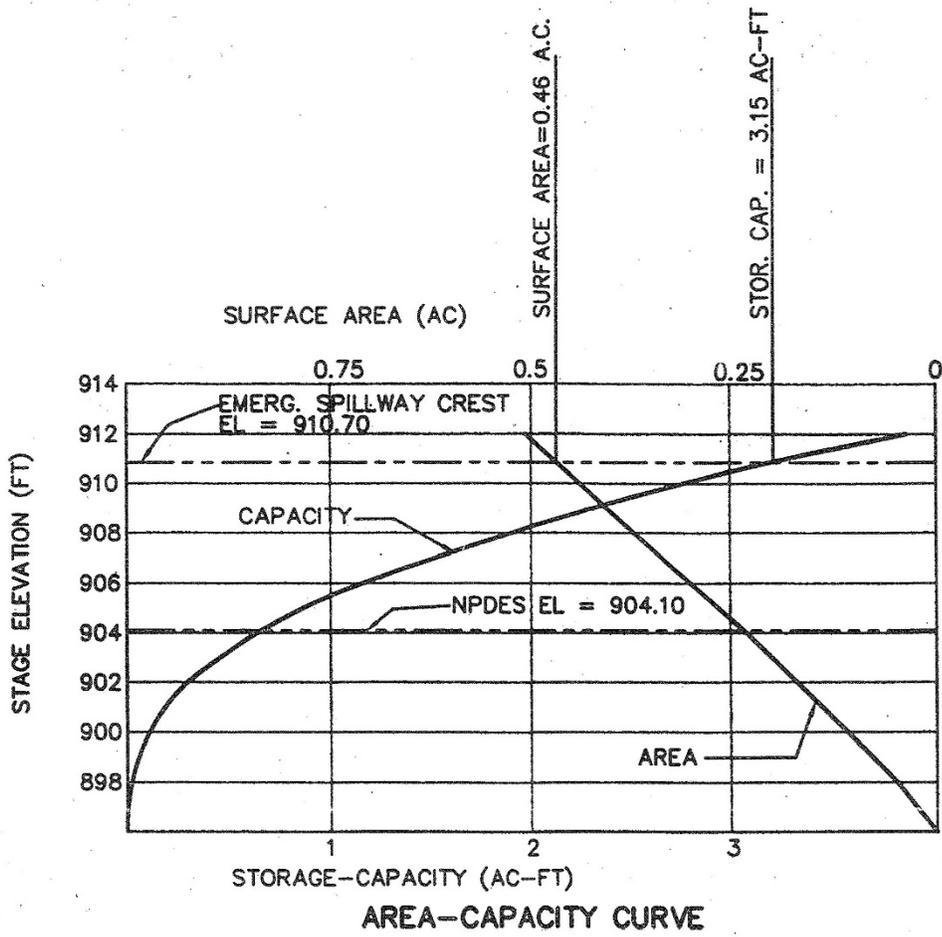
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	<u>No removal data reported by O&M</u>			



**STAGE-DISCHARGE CURVE
OUTLET PIPE**

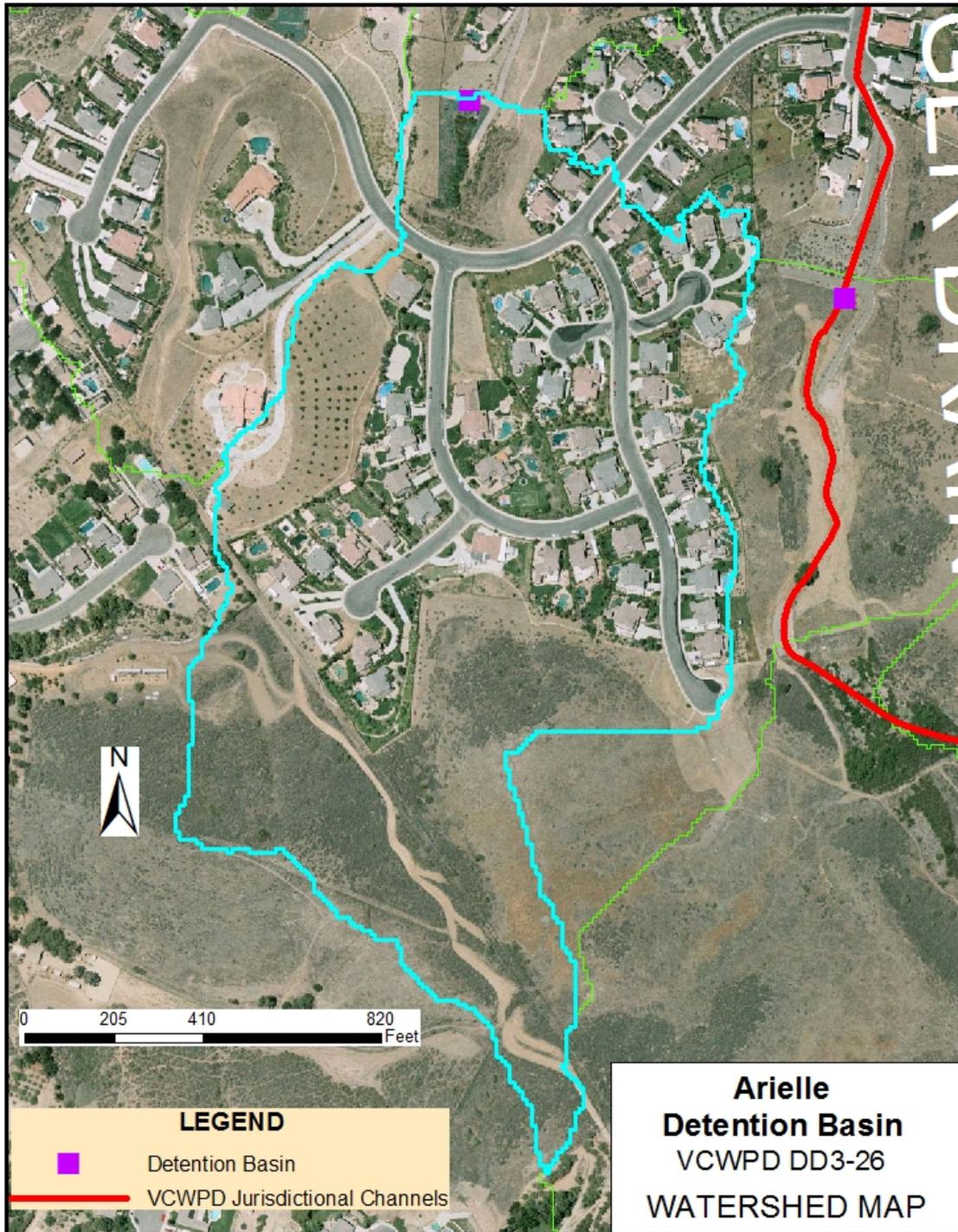


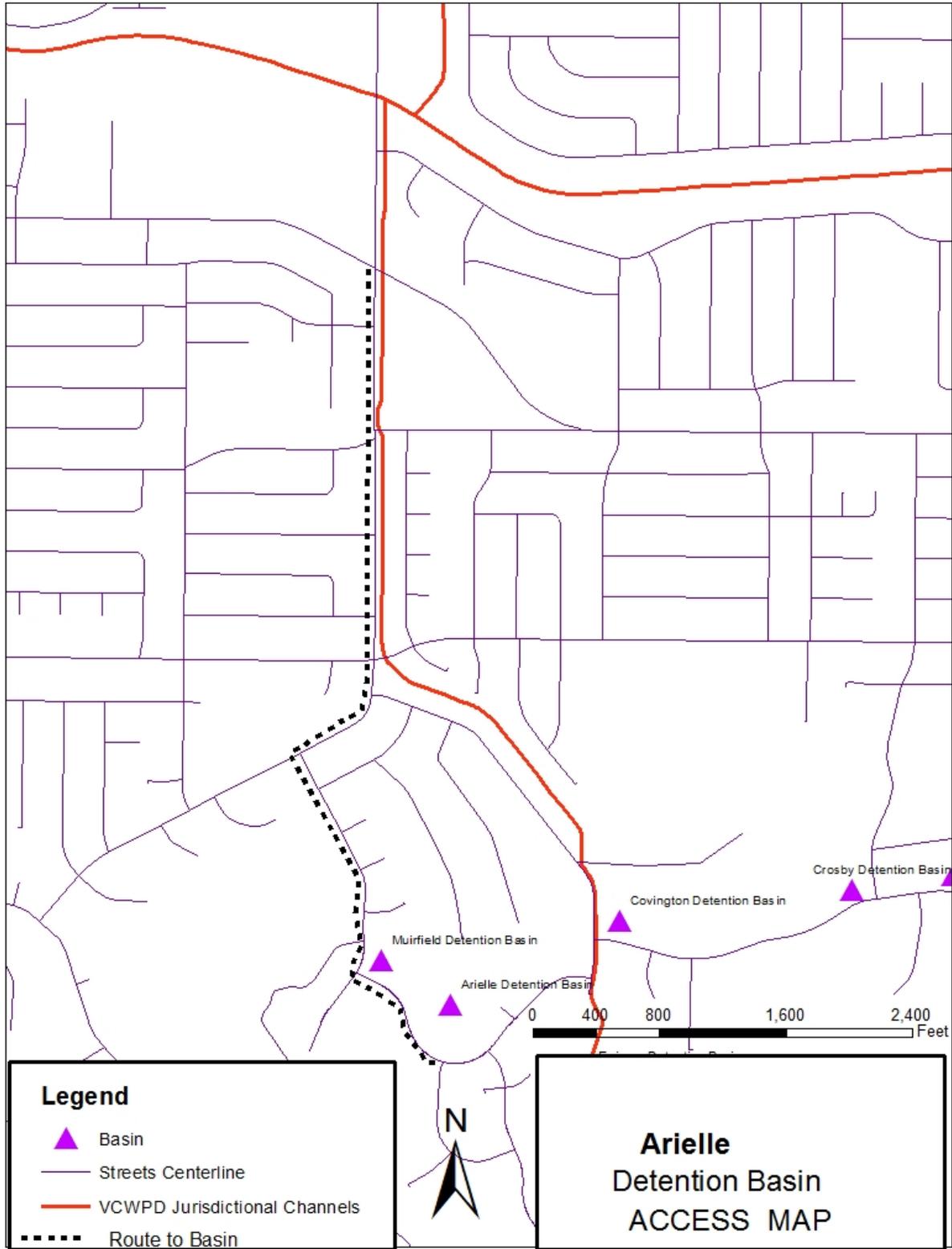
**STAGE-DISCHARGE CURVE
EMERGENCY SPILLWAY**



Stage-Storage-Discharge Data

Elevation	Design Vol	Riser Disch.	Spill Disch.	10-11 Vol.
Ft. NGVD29	Cu. Yds	cfs	cfs	Cu. Yds
896	-			
897				
898	50			
899				
900	174			0
901				55
902	471			135
903				252
904	1,068	-		419
905		11.25		644
906	1,886	12.00		932
907				1,280
908	3,028	13.20		1,693
909				2,173
910	4,417	14.20		2,719
910.7	5,082	14.70	-	
911			15	3,330
912	6,205		100	4,005
913			240	4,745





CANYON NO. 2 DEBRIS BASIN DB3-39

LOCATION: Moorpark , adjacent to Moorpark College
 N 291,115,E 1,748,085 (Lambert Zone 5 Coordinates);
 Moorpark 7 1/2' Quad.

DESIGN DATA

Design Agency	<u>VCWPD</u>
Level Capacity	<u>99,832 cy at Elev. 636 ft</u>
Maximum Debris Capacity	<u>NA</u>
10 and 100-Yr Inflow Rate	<u>1,349 cfs, 3,607 cfs; 10-yr bulked rate 1,970 cfs</u>
Outflow Rate	<u>NA</u>
Debris Cleanout Elevation	<u>Elev 630 ft, 20,660 cy (Level Cap. – 100-yr design vol.)</u>

EMERGENCY SPILLWAY

Type	<u>Concreted Rip Rap- Trapezoidal Shape</u>
Invert Elevation	<u>636 ft</u>
Spillway Width	<u>100 ft Base; 180 ft Top Width, Variable Side Slopes</u>
Capacity w/o Freeboard	<u>NA</u>

PRINCIPAL SPILLWAY

Type	<u>12 ft high RC slotted tower with 9.5 ft x 6 ft xsec,</u>
Inlet Weir Elevations	<u>RC tower top at 634 ft NGVD29, topped by trash rack</u>
Outlet Conduit	<u>48-in RCP with invert elev 622 ft</u>
Outflow Rates	<u>NA</u>

DEBRIS BLEEDERNone**DAM**

Dam Type	<u>Earthfill Dam Topped by concreted rip rap spillway</u>
Dam Crest Elevation	<u>636 ft invert to 643 ft top of bank</u>
Length	<u>180 ft</u>
Surface Area of Full Basin	<u>NA</u>
Watershed Area	<u>3,900 ac based on 2000 Condition VCRat Model</u>

CONSTRUCTION DATA

Construction Agency	<u>VCWPD with NRCS to provide 10-yr protection</u>
Completion Date	<u>Plans Dated 7/1/2004</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-4235 to 4251</u>
Right-of-Way Drawings	<u>Same</u>
Topographic Drawings	<u>Same</u>

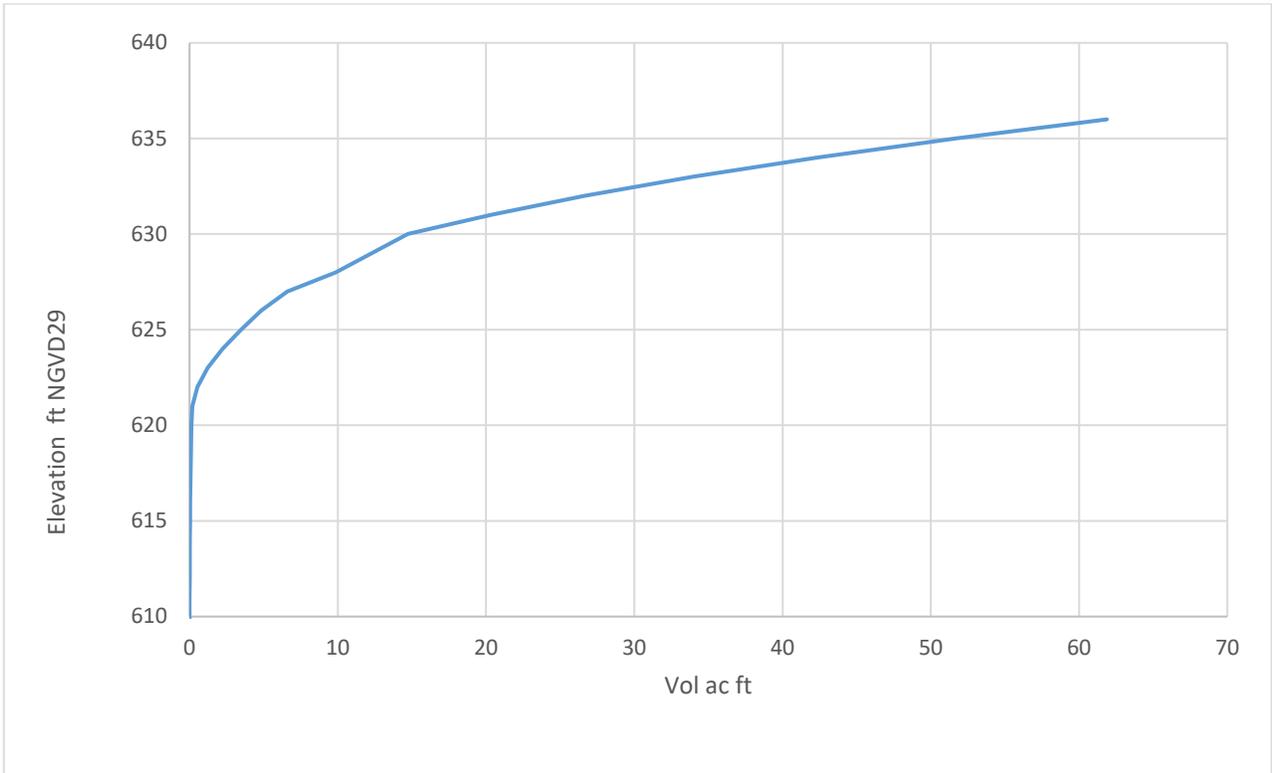
EXPECTED DEBRIS PRODUCTION (cy):			
Storm Frequency	Unburned Condition FF=1	Design Condition FF=20	100% Burn FF=88
100-YEAR	37,326	79,171	113,184
50-YEAR	28,452	60,349	86,276
25-YEAR	20,419	43,311	61,918
10-YEAR	12,510	26,535	37,934

Note: Design records do not show that Design Condition data were calculated in 2003, only unburned and burned conditions.

BASIN HISTORY:

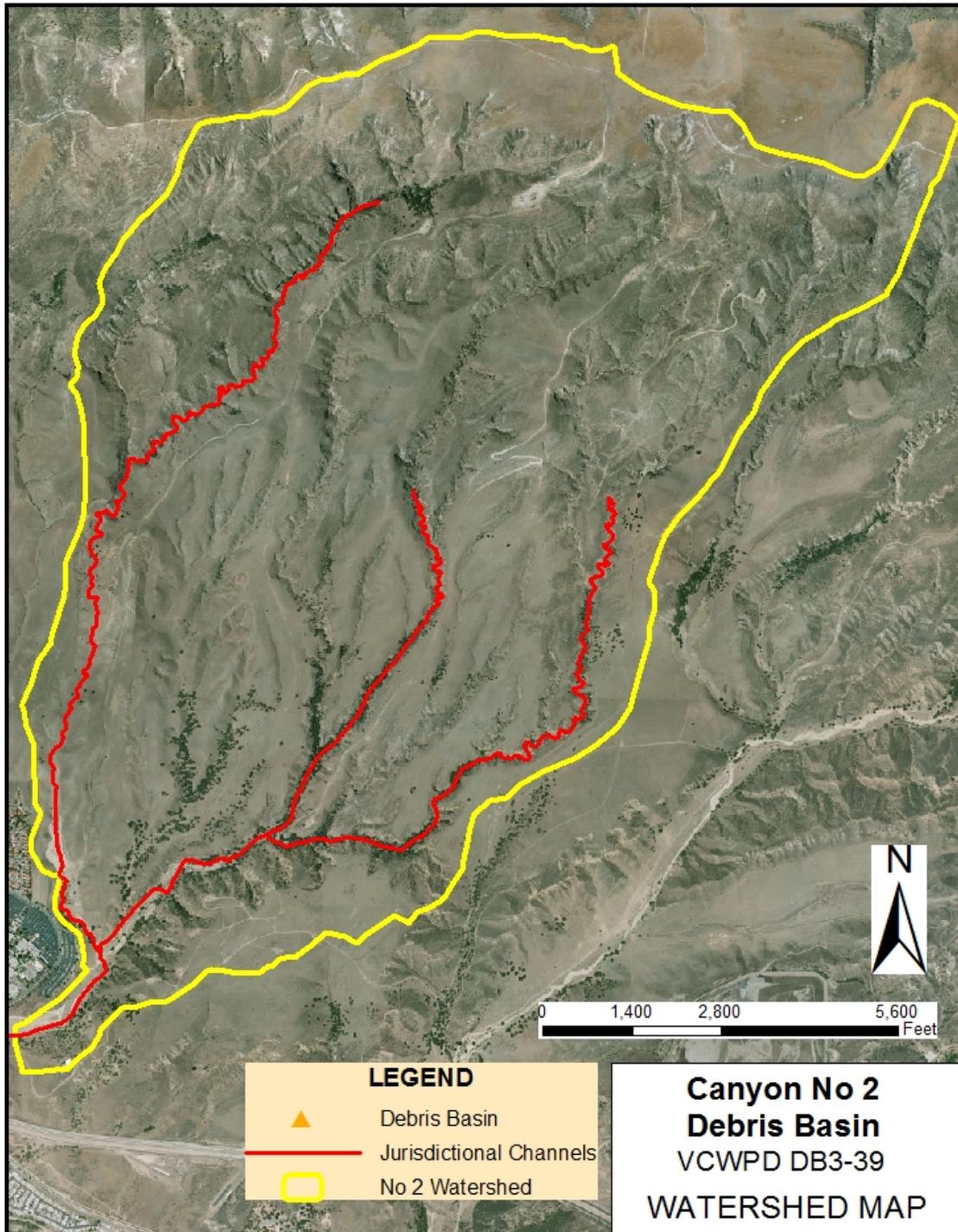
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	<u>No removal data reported by O&M</u>			

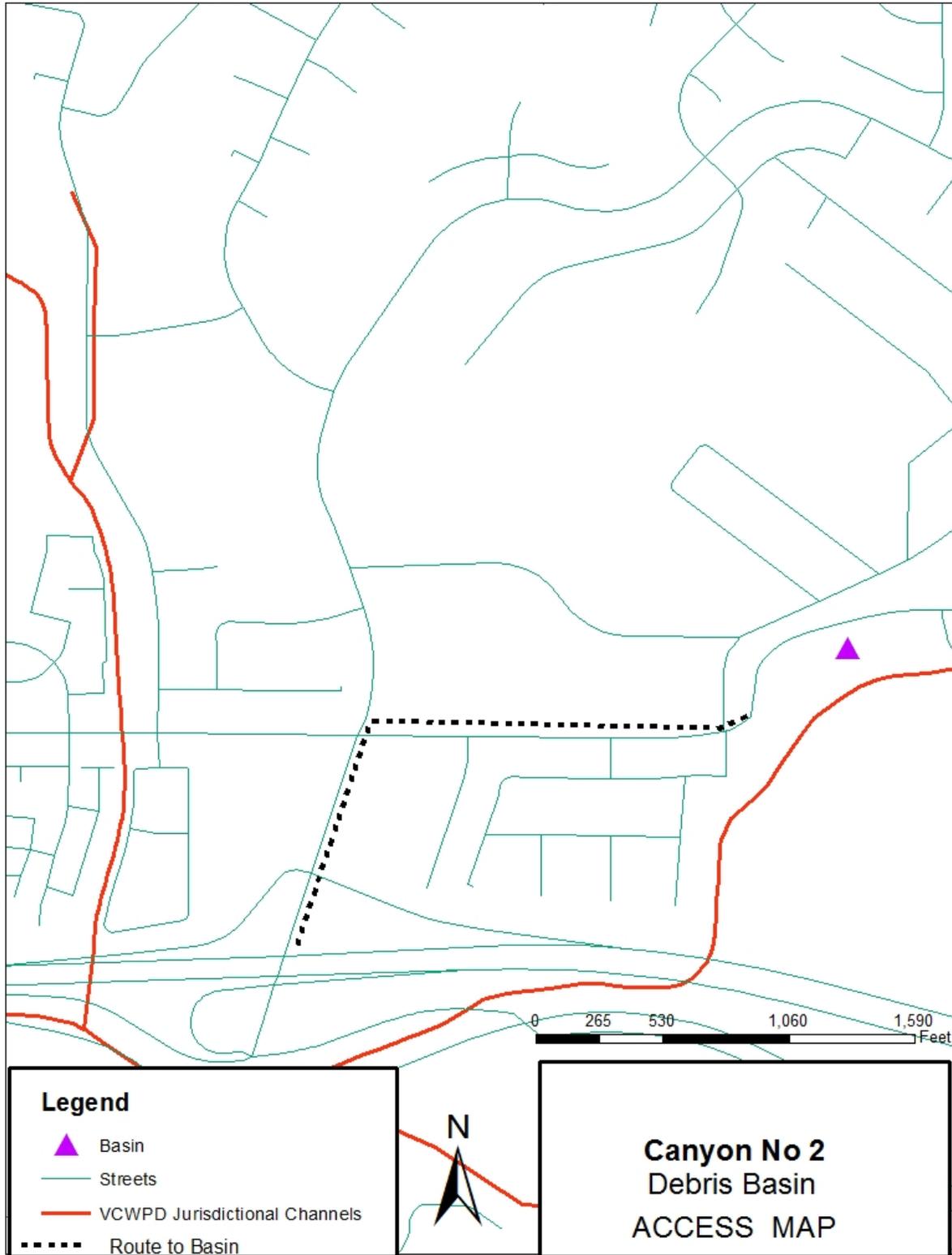
Stage Storage Data from AutoCAD Analysis of Feb 2004 TIN



Stage-Storage Data from 2004 TIN Analysis

Elev. ft NGVD29	Feb04 Vol. CY
608	-
609	1
610	4
611	8
612	15
613	25
614	37
615	54
616	73
617	97
618	124
619	156
620	194
621	320
622	848
623	1,968
624	3,600
625	5,608
626	7,776
627	10,630
628	15,882
630	23,778
631	32,807
632	43,025
633	54,822
634	68,281
635	83,337
636	99,822





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

	<u>(Elevations NGVD29)</u>
Design Agency	<u>Soil Conservation Service</u>
Level Capacity	<u>36.2 ac-ft or 58,403 cy excluding western subarea</u>
Maximum Debris Capacity	<u>NA</u>
100-Yr Inflow and Outflow	<u>Q100in=496 cfs from VCRAT model; Q100out=NA</u>
Debris Cleanout Elevation	<u>579 ft NGVD29 (2,150 cy) [25% of 100-yr debris yield]</u>

EMERGENCY SPILLWAY

Type	<u>10 ft W x 4 ft H Rectangular RC Channel along access rd</u>
Invert Elevation	<u>600 ft NGVD29</u>
Spillway Length	<u>110 ft</u>
Capacity with freeboard	<u>496 cfs</u>

PRINCIPAL SPILLWAY

Type	<u>60-in RCP with Wingwalls and Trash Rack</u>
Invert Elevation	<u>580 ft (NGVD29)</u>
Outlet Conduit	<u>60-in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>None</u>
Top Elevation	<u>NA</u>
Outlet Conduit	<u>NA</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>600 ft NGVD29</u>
Length	<u>520 ft.</u>
Width at Crest	<u>NA</u>
Surface Area of Full Basin	<u>2.6 ac</u>
Watershed Area	<u>330 ac</u>

CONSTRUCTION DATA

Construction Agency	<u>Soil Conservation Service</u>
Completion Date	<u>1957; new emergency spillway- 2004</u>

REFERENCE DRAWINGS

Construction Drawings	<u>37453-56; Y-3-4225</u>
Topographic Drwgs (pre-const)	<u>37457 t-92-1 (dated 4-13-71)</u>
Right-of-Way Drawings	<u>NA</u>

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

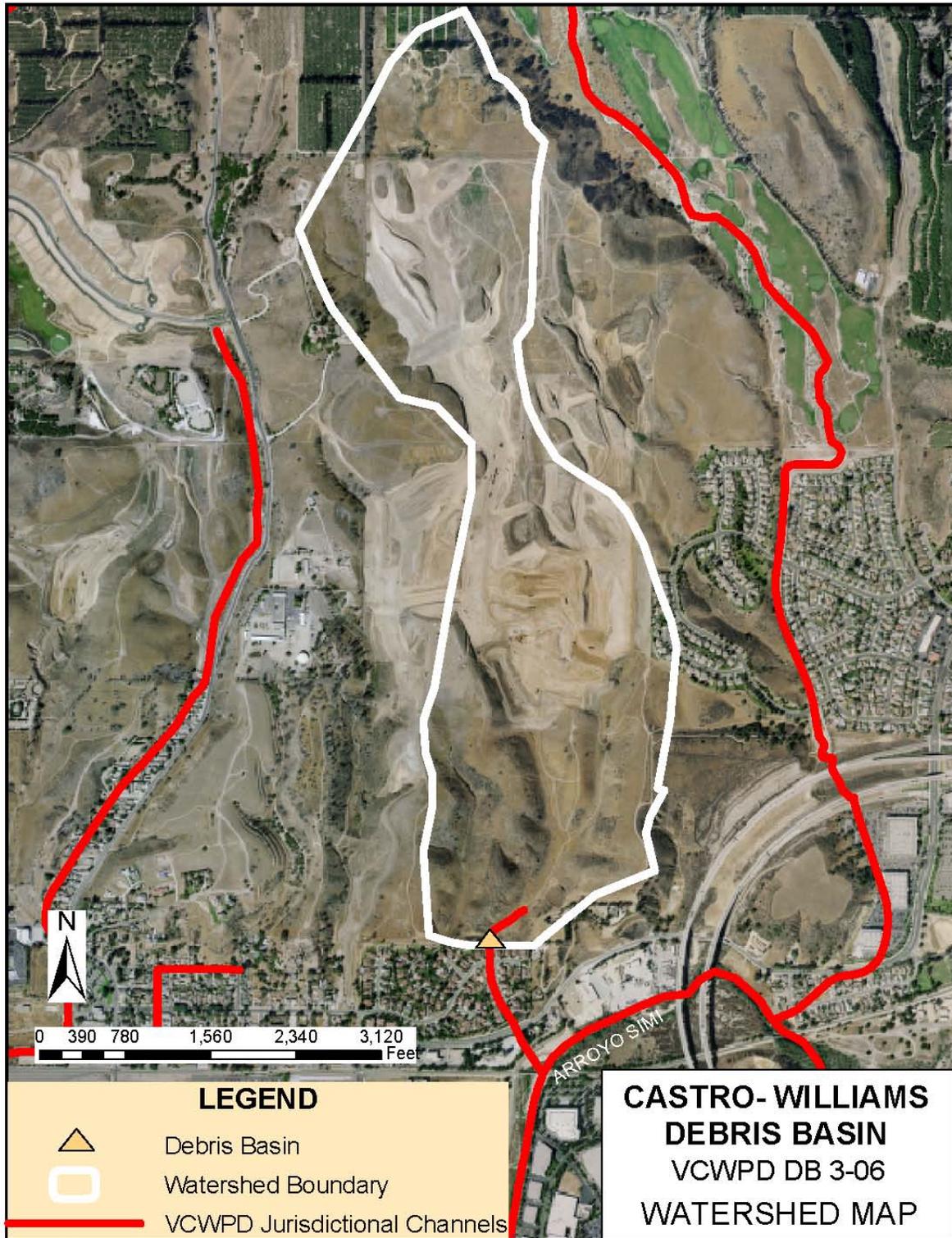
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
04-72	Aerial Survey	141,800		
01-05	Disaster Declaration			537***
07-05	Cleanout		5,526-Survey	

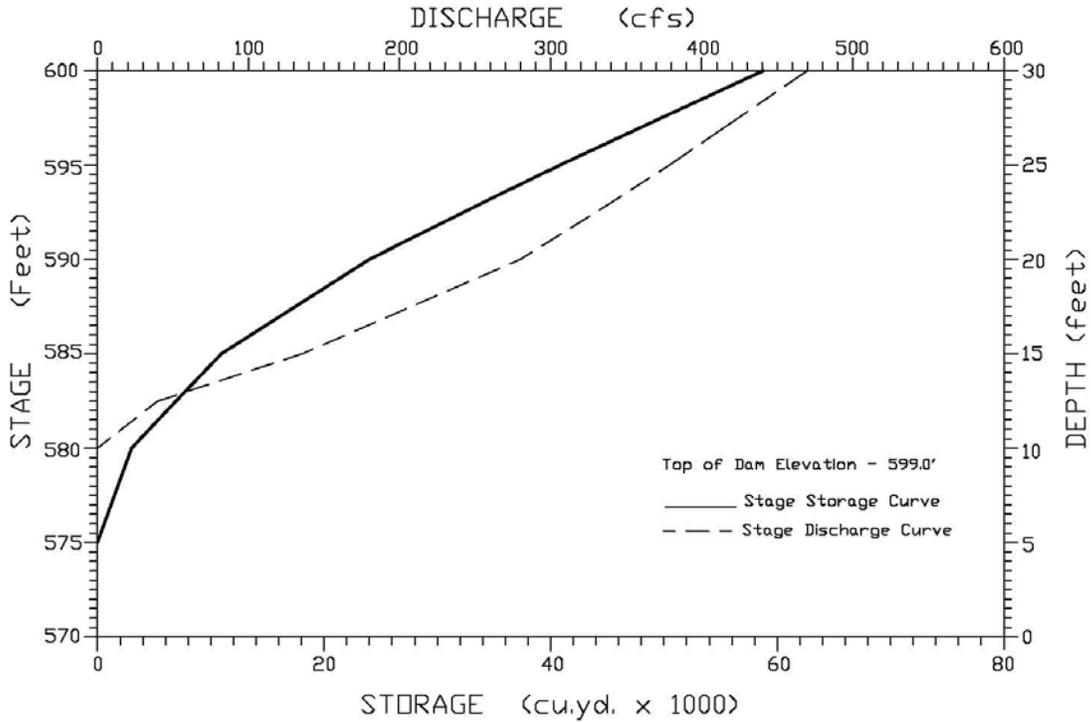
Notes

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

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

NA= Not Available / Not Applicable



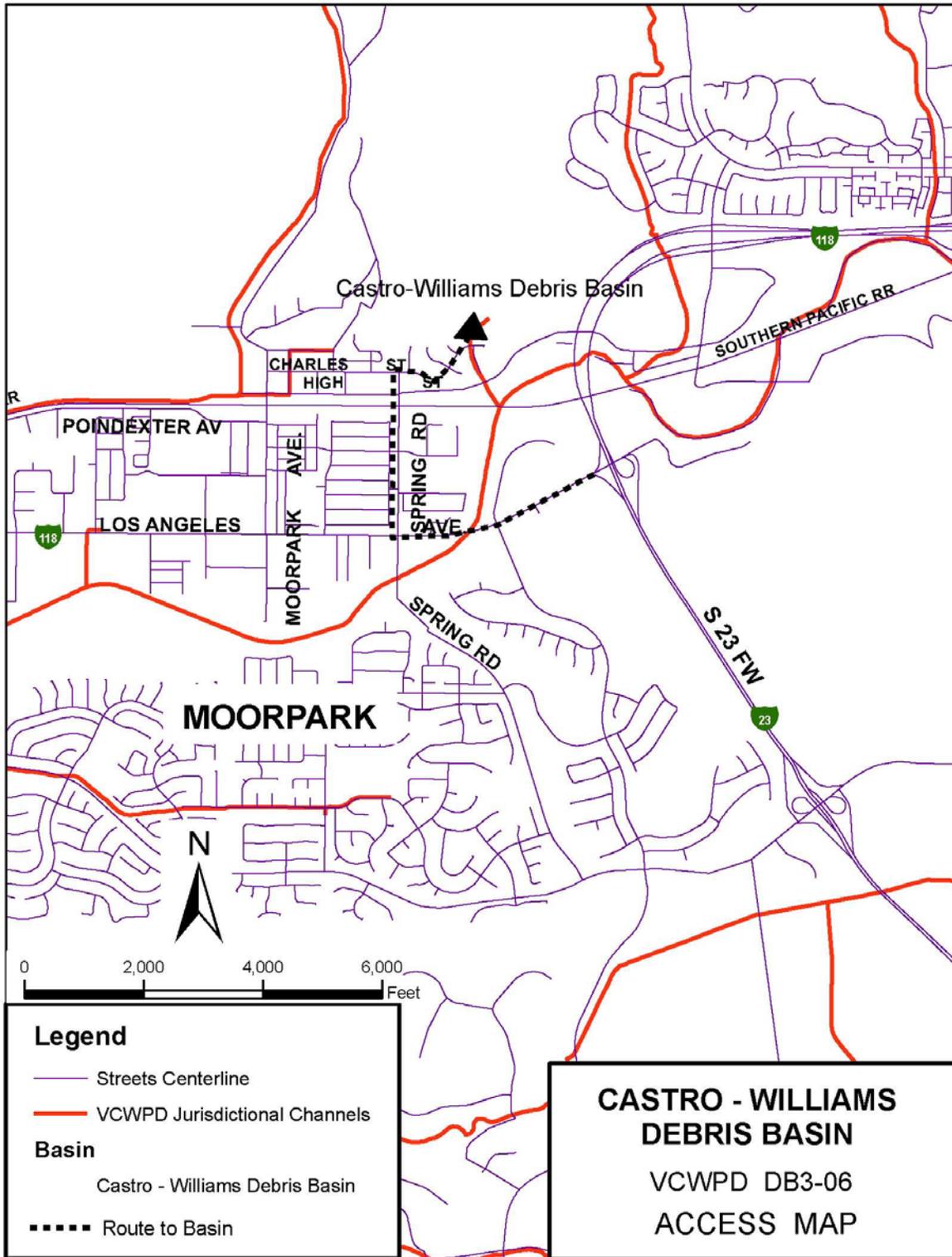


Historic Stage-Storage Discharge Data

Updated Stage-Storage-Discharge Data, 2003

Elevation	RCP cfs	Spillway cfs	Total Discharge	Storage AF 1972	Storage (cu.yd) 1972
575.0	-	-	-	-	-
580.0	-	-	-	1.925	3,106
582.5	41	-	41	4.458	7,191
585.0	135	-	135	6.990	11,277
590.0	280	-	280	15.155	24,450
593.0	340	-	340	21.452	34,609
595.0	380	-	380	25.922	41,820
597.0	416	-	416	30.138	48,622
600.0	470	-	470	36.249	58,481
601.0	480	30	510	NA	NA
602.0	490	85	575	NA	NA
603.0	500	156	656	NA	NA
604.0	510	240	750	NA	NA
605.0	520	335	855	NA	NA

NA= Not Analyzed



CONEJO MOUNTAIN CREEK DETENTION BASIN NO.1 DD3-33

LOCATION: City of Thousand Oaks, at Via Rio and E.Kimber Drive
 N: 244,746 E: 1,708,278 (Lambert Zone 5 Coordinates)
 Newbury Park, 7 1/2 Quad

DESIGN DATA

	<u>Elevations NGVD29 ft</u>
Design Agency	<u>HAALAND GROUP</u>
Level Capacity	<u>47.7 ac-ft or 77,100 cy at elev. 737 ft NGVD29</u>
Maximum Debris Capacity	<u>None</u>
100-Yr Inflow Rate	<u>1,517 cfs over bypass spillway, 940 cfs to bypass</u>
Outflow Rate	<u>940 cfs fm bypass, 12 cfs from det basin, 952 cfs total</u>
Debris Cleanout Elevation	<u>Elev 726 ft, 265 cy (25% of 100-yr design debris vol.</u>

EMERGENCY SPILLWAY

Type	<u>2 13'8"Wx16'H Drop Box Inlet Spillway</u>
Weir Elevation	<u>737.0 ft NGVD29</u>
Max. Capacity	<u>2,459 cfs at elev.741.5 ft</u>

UPSTREAM BYPASS SPILLWAY

<u>Diversion Dam</u>	<u>120' long, Elev. 742.4 to 744.3 ft west to east</u>
<u>Bypass Channel</u>	<u>8' Wx 7.5'H RCB connected to Emergency Spillway</u>
<u>Channel Design Flow Rate</u>	<u>Q100=940 cfs</u>

OPERATIONAL OUTLET

Type	<u>24" RCP</u>
Invert Elevation	<u>723.0 ft</u>

DEBRIS BLEEDER/RISER FOR BYPASS

Type	<u>24" semi circular vertical CMP w/ 3"x9" slots</u>
Top and Bottom Elevation	<u>744.0 and 737.75 ft</u>
Outlet Conduit	<u>24" RCP</u>

DETENTION BASIN DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>Max. 745 ft</u>
Length	<u>780 ft</u>
Surface Area of Full Basin	<u>5.06 ac</u>
Watershed Area	<u>1,537 ac (GIS acreage=1535 ac, Conejo Mountain Creek)</u>

CONSTRUCTION DATA

Construction Agency	<u>GrayStone Homes</u>
Completion Date	<u>2001</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-3687 thru Y-3-3703</u>
Topographic Drwgs(pre-const)	<u>NA</u>
Right-of-Way Drawings	<u>NA</u>

EXPECTED DEBRIS PRODUCTION (cy):		
Limited sediment from adjacent undeveloped hillsides expected to reach facilities through local culverts		
Storm Frequency	Design Condition Upstream Bypass Basin	100% Burn Upstream Bypass Basin
100-YEAR	1,065	1,544
50-YEAR	794	1,152
10-YEAR	338	490
Storm Frequency	Design Condition Detention Basin	100% Burn Detention Basin
100-YEAR	195	283
50-YEAR	145	211
10-YEAR	62	90

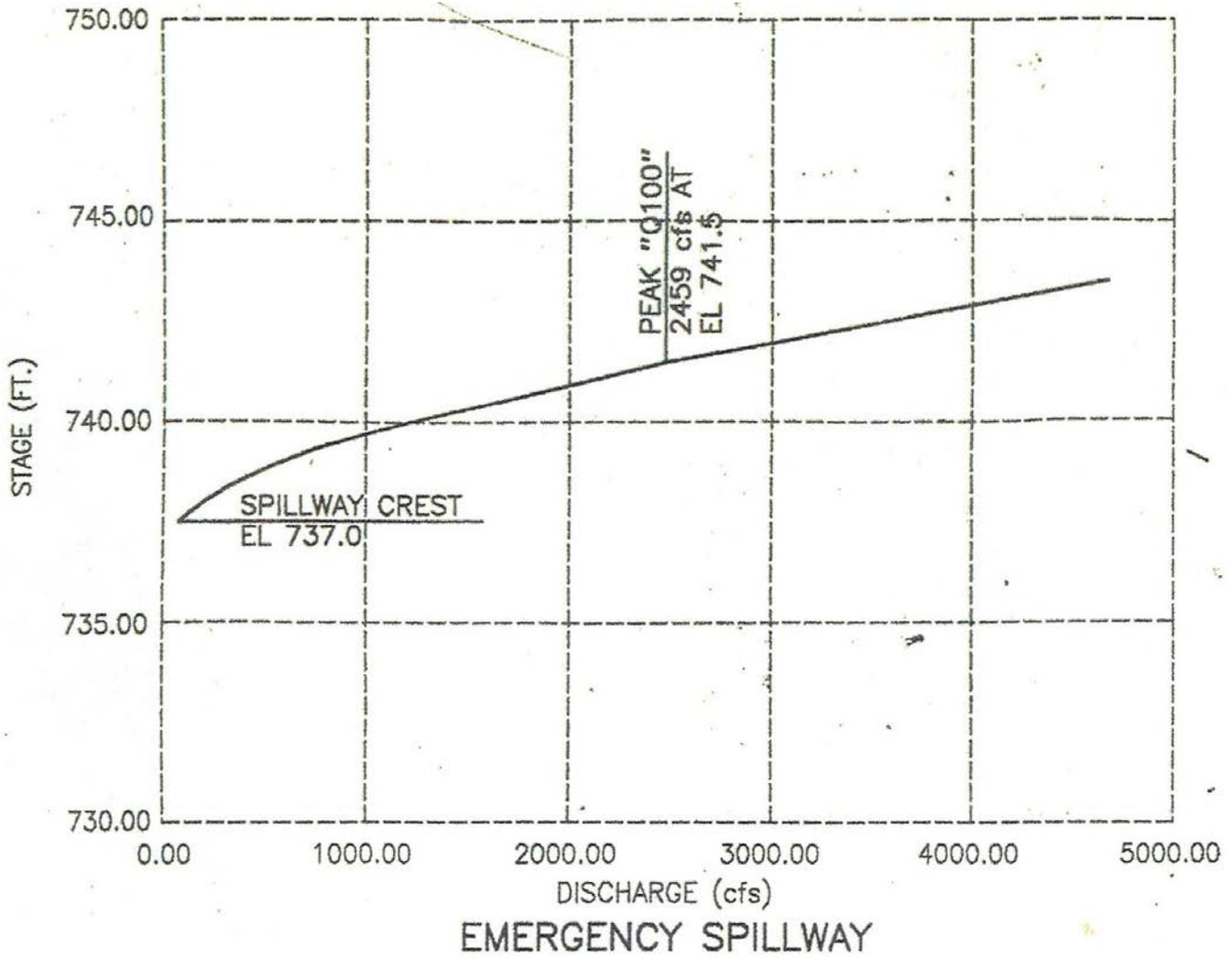
BASIN HISTORY: CONEJO MOUNTAIN CREEK DETENTION BASIN NO.1

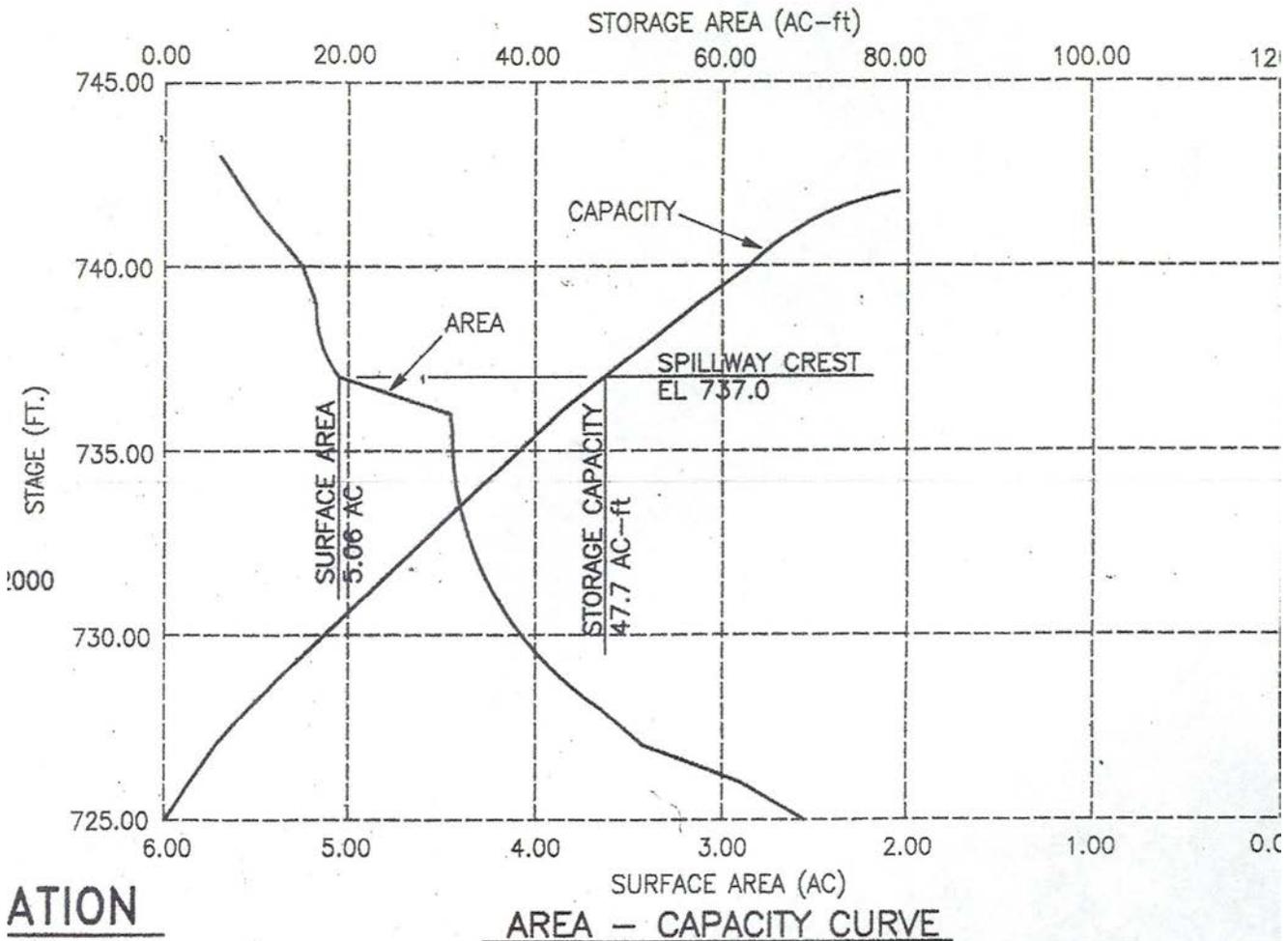
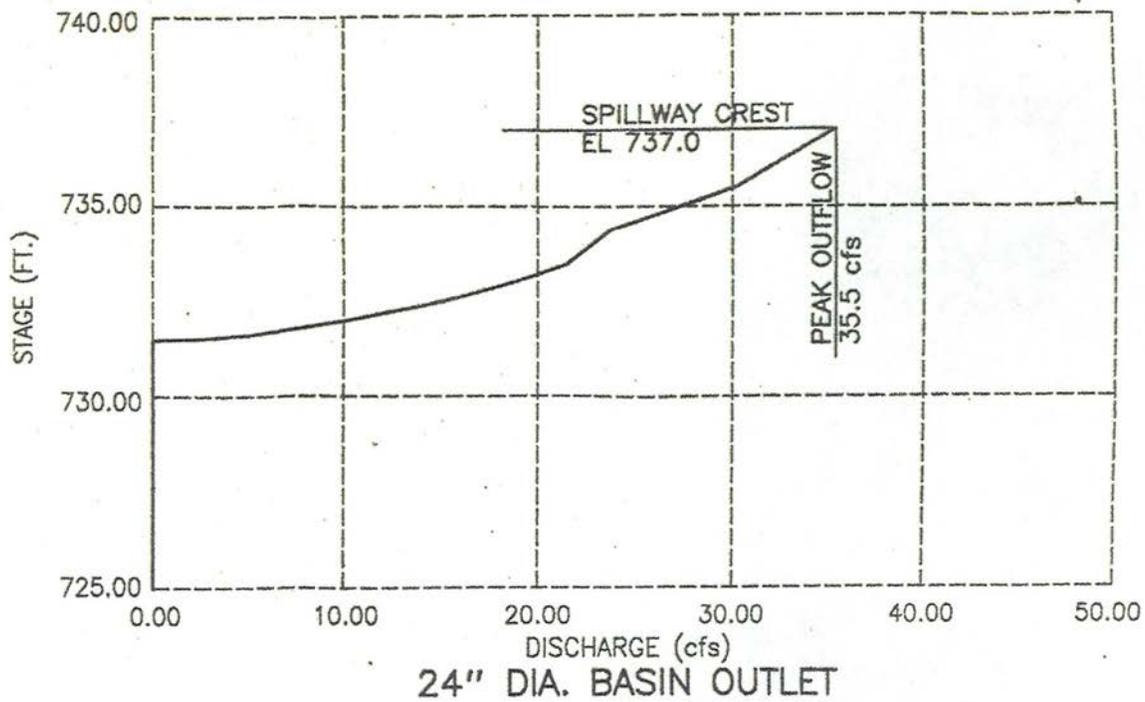
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	No cleanouts reported as of 2015			
<u>Oct-2011</u>	<u>TIN analysis by WR&T</u>	<u>55,211 to elevation 737 ft</u>		

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

Original Design Data from Plans





ATION

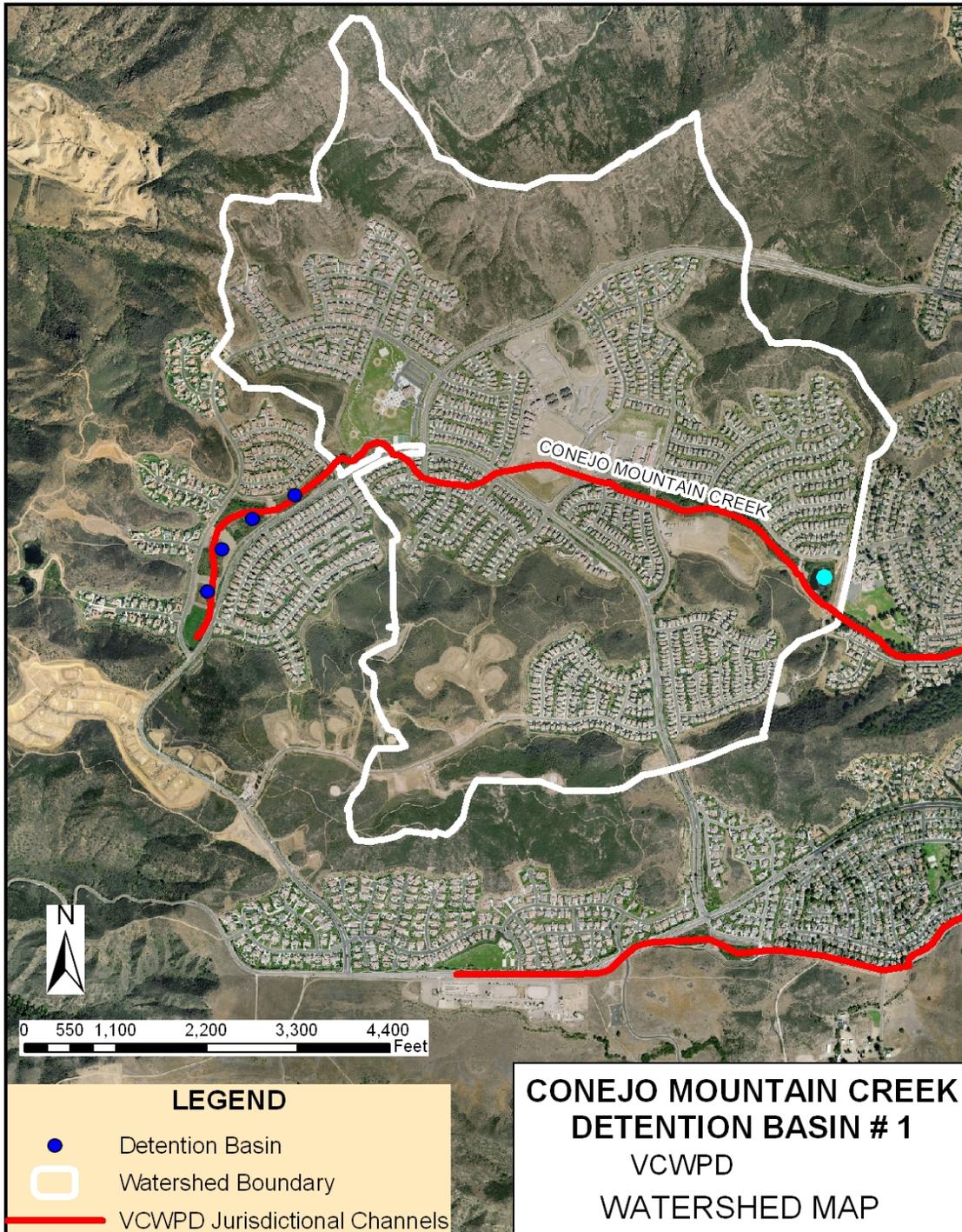
Stage Storage Discharge Data Summary for Detention Basin

Elev ft	12" Opening	24" Opening	Spillway Overflow	Total Outflow	Storage Volume
NGVD29	cfs	cfs	cfs	cfs	Ac-Ft
723	-			-	-
724.5	3.50			3.50	0.01
725	3.50			3.50	1.17
726	3.50			3.50	3.84
728	3.50			3.50	10.13
730	5.00	-		5.00	17.19
732	5.90	13.44		19.34	25.07
734	6.80	25.26		32.06	33.74
736	7.70	33.09		40.79	42.95
737	8.20	36.38	-	44.58	47.72
738	8.60	39.40	227	275.00	52.66
739	9.00	42.20	731	782.20	57.60
740	NA	NA	1,213	NA	62.80
741	NA	NA	2,045	NA	68.40
741.5	NA	NA	2,459	NA	71.40
742	NA	NA	3,028	NA	78.40

Data up to 739 from Haaland Rept. 2008

Additional data interpolated from design drawings

NA= Not available





CONEJO MOUNTAIN CREEK DETENTION BASIN NO.2 DD3-34

LOCATION: City of Thousand Oaks, at Rancho Dos Vientos Drive and Via Rincon
N:246,340 E:1,702,250 (Lambert Zone 5 Coordinates)
Newbury Park, 7 1/2 Quad

DESIGN DATA

Design Agency VTN, INC
Level Capacity Below Spillway 3.95 ac-ft or 6,275 cu.yds
Design Water Surface Elev. 838.73 ft NGVD29
100-Yr Inflow Rate Q100=348 cfs
Outflow Rate Q100=193 cfs at 838.73 ft NGVD29
Debris Cleanout Elevation

EMERGENCY SPILLWAY

Type 22 ft x 45 ft Drop Box Inlet to 20 ft W x 6 ft H RC Box
Weir Elevation 839.84 ft
Max. Capacity 1,575 cfs

PRINCIPAL SPILLWAY

Type 10 ft x 9 ft Plan View – Tower Intake structure, RCP
Tower Bottom and Top Elevation 832 and 839.3 ft
Outlet Conduit 54 in RCP

DEBRIS BLEEDER/RISER

Type Trash Rack on front of Principal Spillway Tower
Top Elevation Same as Principal
Outlet Conduit Same as Principal

DAM

Dam Type Earthfill
Dam Crest Elevation 846.3 ft min. elev.
Length 100 ft
Surface Area of Full Basin 1.6 ac
Watershed Area 498 ac (2006 Thousand Oaks MDP VCRat Model)

CONSTRUCTION DATA

Construction Agency Operating Engineers
Completion Date 2004

REFERENCE DRAWINGS

Construction Drawings Y-3-3619 thru Y-3-3639
Topographic Drwgs(pre-const)
Right-of-Way Drawings

EXPECTED DEBRIS PRODUCTION (cy): Limited sediment expected to reach facility through local culverts		
Storm Frequency	Design Condition	100% Burn
100-YEAR	165	240
50-YEAR	123	179
10-YEAR	53	76

BASIN HISTORY: CONEJO MOUNTAIN CREEK DETENTION BASIN NO. 2

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	No cleanouts reported as of 2015			

Notes

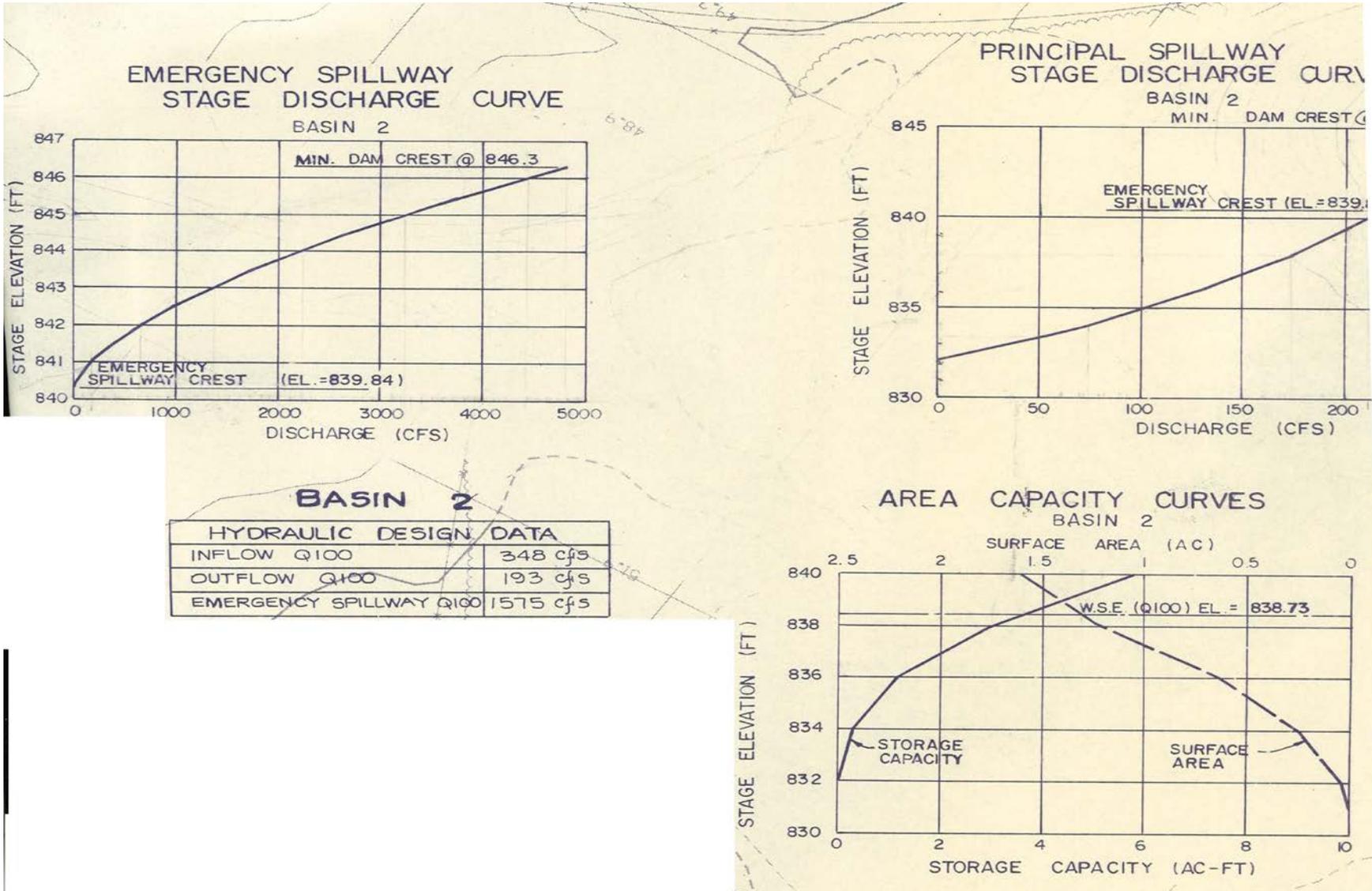
- * AADP (Average Annual Debris Production) Computed Excluding Disaster Debris
- ** FEMA Accepted Value for Disaster Declaration
- *** Theoretical Value from Kevin Scott Formula
- NA= Not Available / Not Applicable

ACCESS MAP AND WATERSHED MAP

SEE MAPS FOR CONEJO MOUNTAIN CREEK BASIN 5

Stage storage discharge data for VCRat input file format 2017 conditions, no design sed vol in basins; Uses 2018 discharge data calculated following Arundell basin approach

Basin 2									
STAGE	1	833.00	834.00	834.55	835.00	836.00	836.56	837.00	838.00
STORAGE	1	0.000	0.005	0.014	0.036	0.124	0.220	0.295	0.579
OUTFLOW	1	0.00	0.00	0.00	9.36	54.13	54.91	55.51	101.23
STAGE	9	839.00	840.00	841.00	842.00	842.39	843.00	844.00	845.00
STORAGE	9	1.051	1.783	2.753	3.957	4.543	5.396	6.964	8.774
OUTFLOW	9	131.97	156.79	178.18	197.27	204.05	317.93	673.54	1276.00
STAGE	17	846.00	847.00	848.00	849.00				
STORAGE	17	10.786	13.007	15.445	18.066				
OUTFLOW	17	2019.03	2328.22	2435.58	2538.40				



Original Design Data from Plans

CONEJO MOUNTAIN CREEK DETENTION BASIN NO.3 DD3-35

LOCATION: City of Thousand Oaks, at Rancho Dos Vientos Drive and Via Ricardo
N:245,865 E:1,701,475 (Lambert Zone 5 Coordinates)
Newbury Park, 7 1/2 Quad

DESIGN DATA

Design Agency	<u>VTN, INC</u>
Level Capacity	<u>33.1 ac-ft or 53,400 cy</u>
Maximum Debris Capacity	<u>NA</u>
100-Yr Inflow Rate	<u>Q100=834 cfs</u>
Outflow Rate	<u>Q100=147 cfs at 861.77 ft</u>
Debris Cleanout Elevation	

EMERGENCY SPILLWAY

Type	<u>42.5 ft x 26 ft Drop Box Inlet to 12 ft W x 7 ft H RC Box</u>
Weir Elevation	<u>862.64 ft</u>
Max Capacity	<u>1,443 cfs</u>

PRINCIPAL SPILLWAY

Type	<u>10 ft x 7 ft Intake Tower Structure, RCP</u>
Bottom and Top Inlet Elevations	<u>848 and 862 ft</u>
Outlet Type	<u>36" RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>Trash Rack on front of Principal Spillway Tower</u>
Top Elevation	<u>Same as Principal</u>
Outlet Conduit	<u>Same as Principal</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>Min. 868.5 ft NGVD29</u>
Length	<u>240 ft</u>
Surface Area of Full Basin	<u>4.5 ac</u>
Watershed Area	<u>443 ac (2006 Thousand Oaks MDP VCRat Model)</u>
Width at Crest	<u>NA</u>

CONSTRUCTION DATA

Construction Agency	<u>Operating Engineers</u>
Completion Date	<u>2004</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-3619 thru Y-3-3639</u>
Topographic Drwgs(pre-const)	<u>NA</u>
Right-of-Way Drawings	<u>NA</u>

EXPECTED DEBRIS PRODUCTION (cy):		
Limited sediment expected to reach facility through local culverts; Historic debris basins also capture sediment before reaching basin		
Storm Frequency	Design Condition	100% Burn
100-YEAR	2,994	4,343
50-YEAR	2,233	3,239
10-YEAR	951	1,379

BASIN HISTORY: CONEJO MOUNTAIN CREEK DETENTION BASIN NO. 3

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	No removal data reported by O&M as of 2015			

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

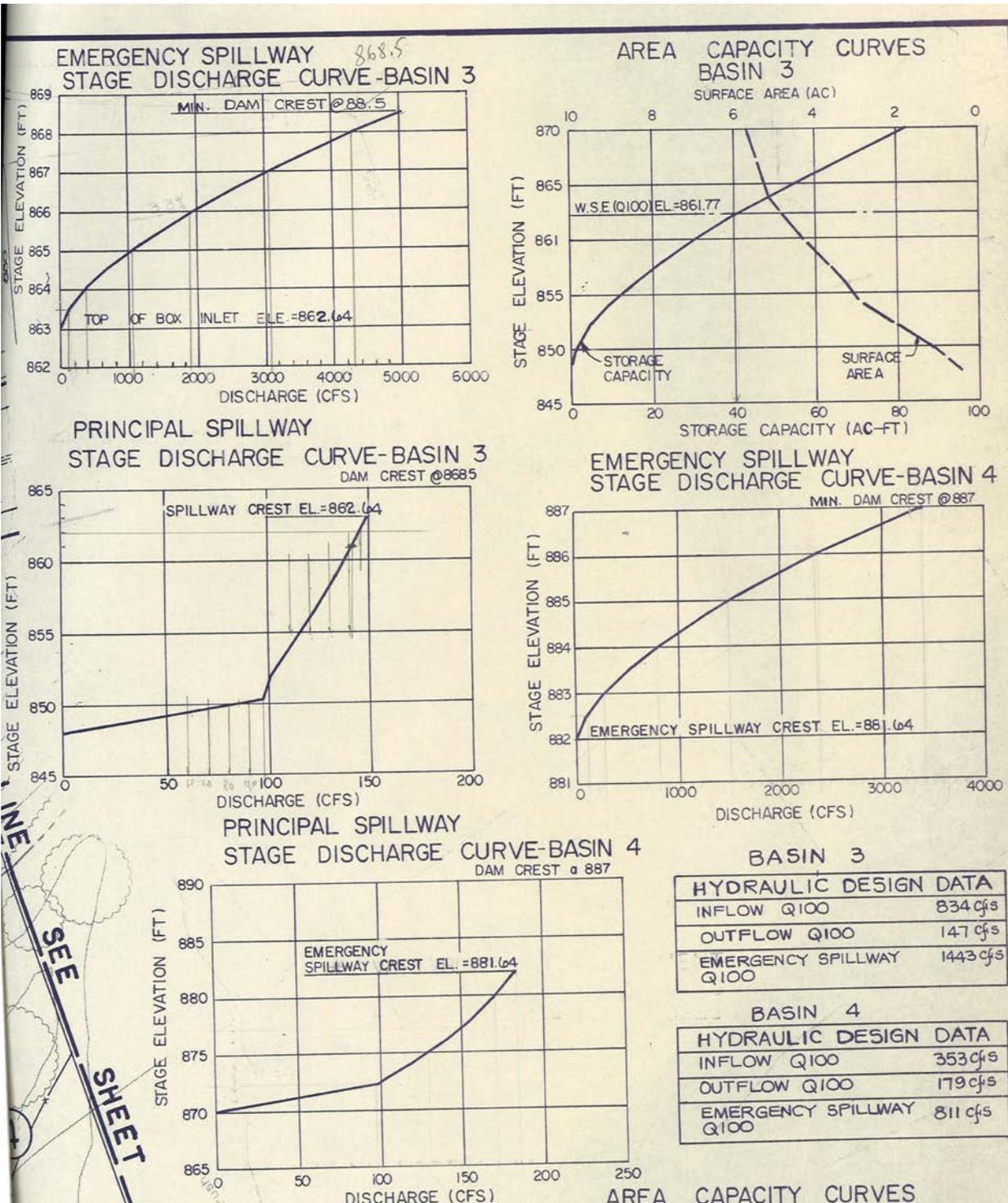
ACCESS MAP AND WATERSHED MAP

SEE MAPS FOR CONEJO MOUNTAIN CREEK BASIN 5

Stage storage discharge data for VCRat input file format 2017 conditions, no design sed vol in basins; Uses 2018 discharge data calculated following Arundell basin approach

Basin 3									
STAGE	1	850.00	850.55	851.00	852.00	853.00	854.00	854.22	855.00
STORAGE	1	0.000	0.007	0.016	0.181	0.826	1.978	2.320	3.515
OUTFLOW	1	0.00	0.00	9.36	54.13	89.73	95.96	97.30	101.82
STAGE	9	856.00	857.00	858.00	859.00	860.00	861.00	862.00	863.00
STORAGE	9	5.427	7.698	10.251	13.083	16.193	19.590	23.303	27.315
OUTFLOW	9	107.36	112.62	117.65	122.48	127.11	131.54	135.82	139.97
STAGE	17	864.00	865.00	865.19	866.00	867.00	868.00	869.00	870.00
STORAGE	17	31.603	36.129	37.278	40.912	45.763	50.836	56.072	61.464
OUTFLOW	17	144.01	147.93	148.66	340.21	892.91	1672.57	2160.05	2214.41

Original Design Data from Plans



CONEJO MOUNTAIN CREEK DETENTION BASIN NO.4 DD3-36

LOCATION: City of Thousand Oaks, at Rancho Dos Vientos Drive and Via Ricardo
 N: 244,940 E: 1,700,940 (Lambert Zone 5 Coordinates)
 Newbury Park, 7 1/2 Quad

DESIGN DATA

Design Agency	<u>VTN, INC</u>
Level Capacity	<u>8.34 ac-ft or 13,450cy</u>
Maximum Debris Capacity	<u>NA</u>
100-Yr Inflow Rate	<u>Q100=353 cfs</u>
Outflow Rate	<u>Q100=179 cfs at 881.08 ft NGVD29</u>
Debris Cleanout Elevation	

EMERGENCY SPILLWAY

Type	<u>33 ft x 18 ft Drop Box Inlet to 8 ft x 6 ft RC Box</u>
Weir Elevation	<u>881.64 ft NGVD29</u>
Max. Capacity	<u>811 cfs</u>

PRINCIPAL SPILLWAY

Type	<u>10 ft x 7 ft Intake Tower Structure with Trash Rack</u>
Bottom and Top Elevation	<u>872.24 and 882.24 ft</u>
Outlet Conduit	<u>42 in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>Trash Rack on front of Principal Spillway Tower</u>
Top Elevation	<u>Same as Principal</u>
Outlet Conduit	<u>Same as Principal</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>Min. 887.0 ft NGVD29</u>
Length	<u>NA</u>
Surface Area of Full Basin	<u>1.9 ac</u>
Watershed Area	<u>250 ac (2006 Thousand Oaks MDP VCRat Model)</u>
Width at Crest	<u>NA</u>

CONSTRUCTION DATA

Construction Agency	<u>Operating Engineers</u>
Completion Date	<u>2004</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-3619 thru Y-3-3639</u>
Topographic Drwgs(pre-const)	
Right-of-Way Drawings	

EXPECTED DEBRIS PRODUCTION (cy):		
Limited sediment expected to reach facility through local culverts; Historic debris basins also capture sediment		
Storm Frequency	Design Condition	100% Burn
100-YEAR	642	932
50-YEAR	479	695
10-YEAR	204	296

BASIN HISTORY: CONEJO MOUNTAIN CREEK DETENTION BASIN NO.4

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	No removal data reported by O&M as of 2015			

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

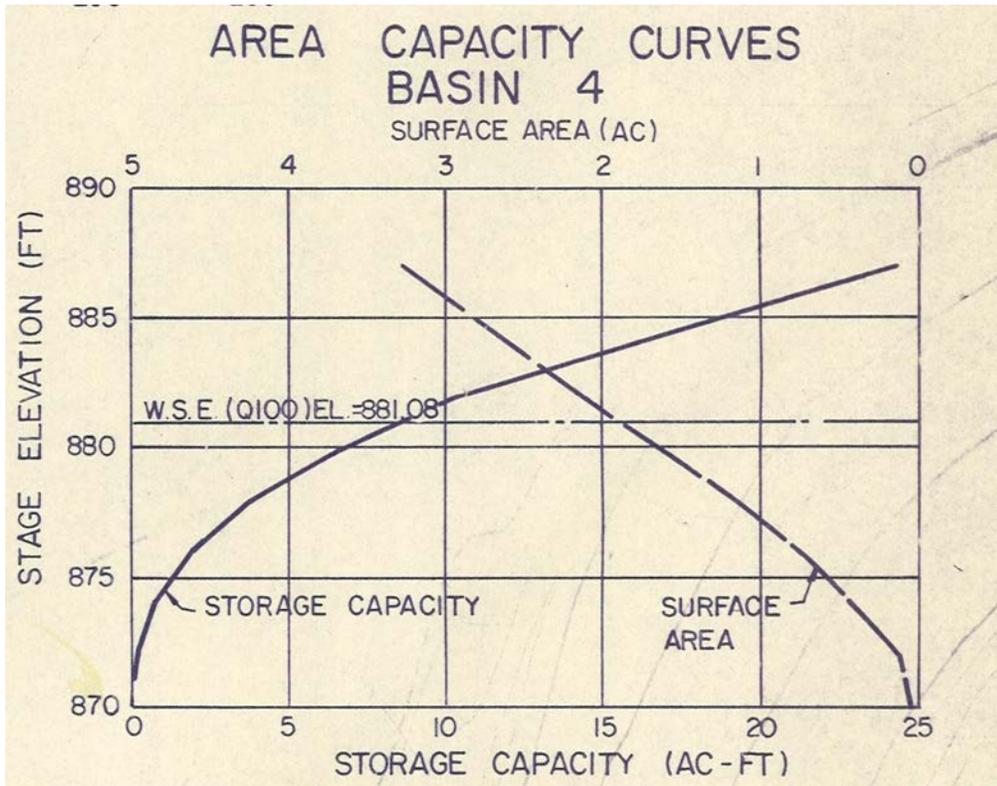
ACCESS MAP AND WATERSHED MAP

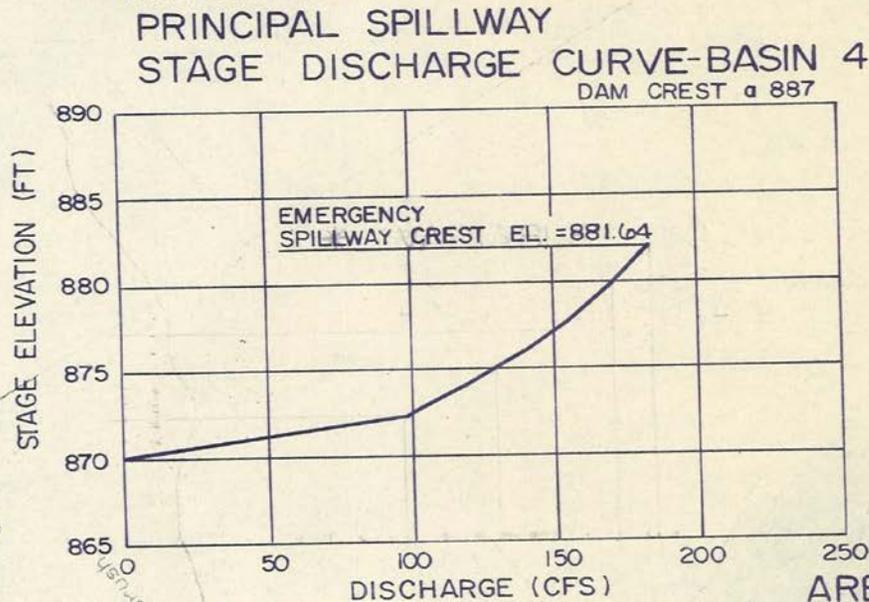
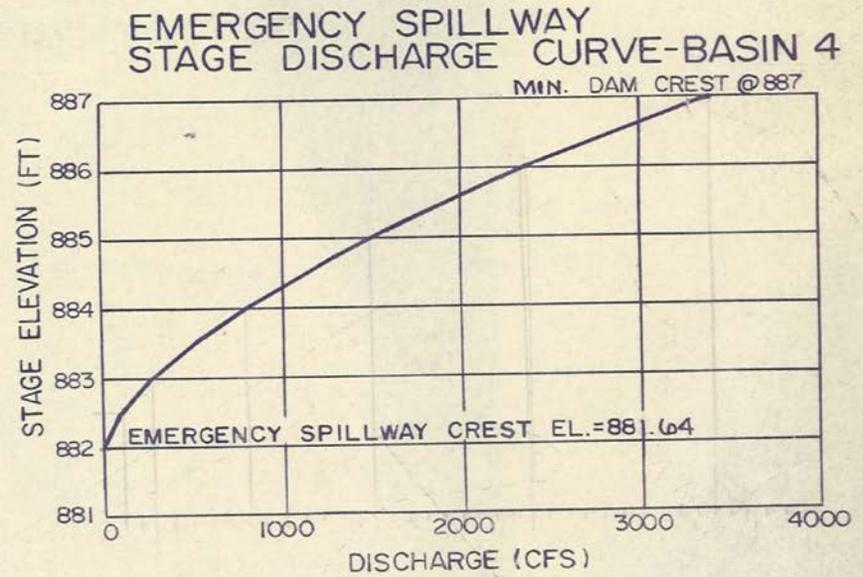
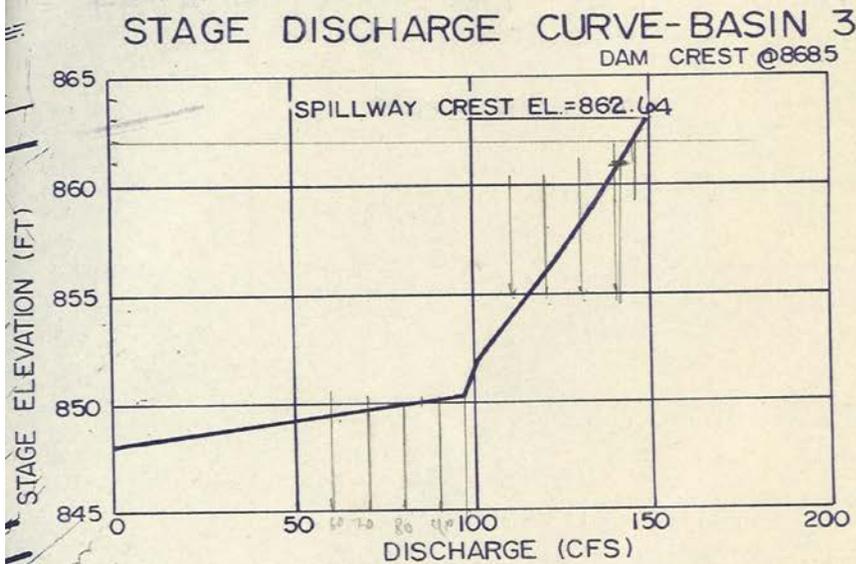
SEE MAPS FOR CONEJO MOUNTAIN CREEK BASIN 5

Stage storage discharge data for VCRat input file format 2017 conditions, no design sediment in basins; Uses 2018 discharge data calculated following Arundell basin approach

		Basin 4							
STAGE	1	874.00	874.55	875.00	876.00	876.90	877.00	878.00	879.00
STORAGE	1	0.000	0.009	0.040	0.205	0.498	0.532	1.039	1.737
OUTFLOW	1	0.00	0.00	9.36	54.13	110.97	118.65	127.37	135.54
STAGE	9	880.00	881.00	882.00	883.00	884.00	884.19	885.00	886.00
STORAGE	9	2.656	3.807	5.192	6.833	8.724	9.223	10.864	13.161
OUTFLOW	9	143.23	150.54	157.51	164.18	170.59	171.76	338.46	762.86
STAGE	17	887.00	888.00	889.00					
STORAGE	17	15.655	18.279	21.013					
OUTFLOW	17	1260.25	1295.61	1330.04					

Original Design Data from Plans





BASIN 3

HYDRAULIC DESIGN DATA	
INFLOW Q100	834 cfs
OUTFLOW Q100	147 cfs
EMERGENCY SPILLWAY Q100	1443 cfs

BASIN 4

HYDRAULIC DESIGN DATA	
INFLOW Q100	353 cfs
OUTFLOW Q100	179 cfs
EMERGENCY SPILLWAY Q100	811 cfs

SEE SHEET

AREA CAPACITY CURVES

CONEJO MOUNTAIN CREEK DETENTION BASIN NO.5 DD3-37

LOCATION: City of Thousand Oaks, at Rancho Dos Vientos Drive and Via Ricardo
N: 244,940 E: 1,700,765 (Lambert Zone 5 Coordinates)
Newbury Park, 7 1/2 Quad

DESIGN DATA

Design Agency VTN, INC
Level Capacity Below Spillway 7.24 af or 11,680 cy
Maximum Debris Capacity 2.5 af; 125% of 100-yr capacity
100-Yr Inflow Rate Q100=612 cfs
Outflow Rate Q100=213 cfs at 899.7 ft NGVD29
Debris Cleanout Elevation

EMERGENCY SPILLWAY

Type 32 ft x 15 ft Drop Box Inlet to 7x6.25 ft RC Box
Weir Elevation 899.87 ft NGVD29
Max. Capacity 678 cfs for Q100 or 2,900 cfs at top of dam

PRINCIPAL SPILLWAY

Type 10 ft x 8 ft Intake Tower Structure with Trash Rack
Bottom and Top Elevations 892 and 899.7 ft
Outlet Conduit 42 in RCP

DEBRIS BLEEDER/RISER

Type Trash Rack on front of Principal Spillway Tower
Top Elevation Same as Principal
Outlet Conduit Same as Principal

DAM

Dam Type Earthfill
Dam Crest Elevation NA
Length 240 ft
Surface Area of Full Basin NA
Watershed Area 212 ac (2006 Thousand Oaks MDP VCRat Model)
Width at Crest NA

CONSTRUCTION DATA

Construction Agency Operating Engineers
Completion Date 2004

REFERENCE DRAWINGS

Construction Drawings Y-3-3619 thru Y-3-3639
Topographic Drwgs(pre-const)
Right-of-Way Drawings

VCWPD- Zone 3

Debris and Detention Basin Manual

EXPECTED DEBRIS PRODUCTION (cy):			
Storm Frequency	1995 Design Condition	2013 Design Yield	100% Burn
100-YEAR	3,876	3,204	4,647
50-YEAR	2,979	2,390	3,466
10-YEAR	1,348	1,017	1,476

Note: 1995 Design Condition includes developed area but reduces design fire factor accordingly. 2013 Design Yield only evaluates undeveloped area tributary to basin. 1995 Study decreased inflow to basin by 1192 due to now defunct debris basin in the watershed, so the 100-yr design volume was 3,876-1,192=2,684. Required volume was therefore 1.25*2,684 or about 2.1 af as shown on the design plans.

BASIN HISTORY: CONEJO MOUNTAIN CREEK DETENTION BASIN NO.5

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	No removal data reported by O&M as of 2015			

Notes

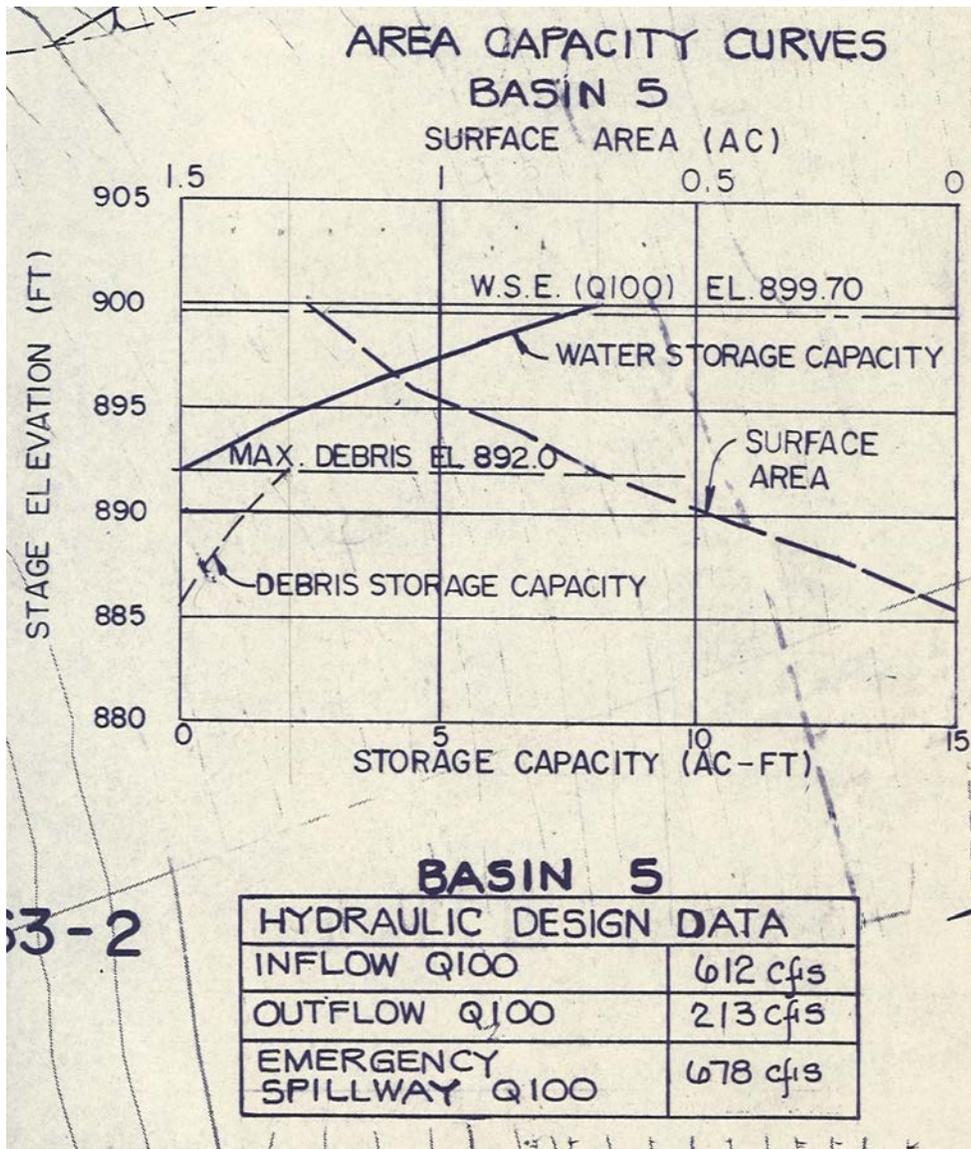
- * AADP (Average Annual Debris Production) Computed Excluding Disaster Debris
- ** FEMA Accepted Value for Disaster Declaration
- *** Theoretical Value from Kevin Scott Formula

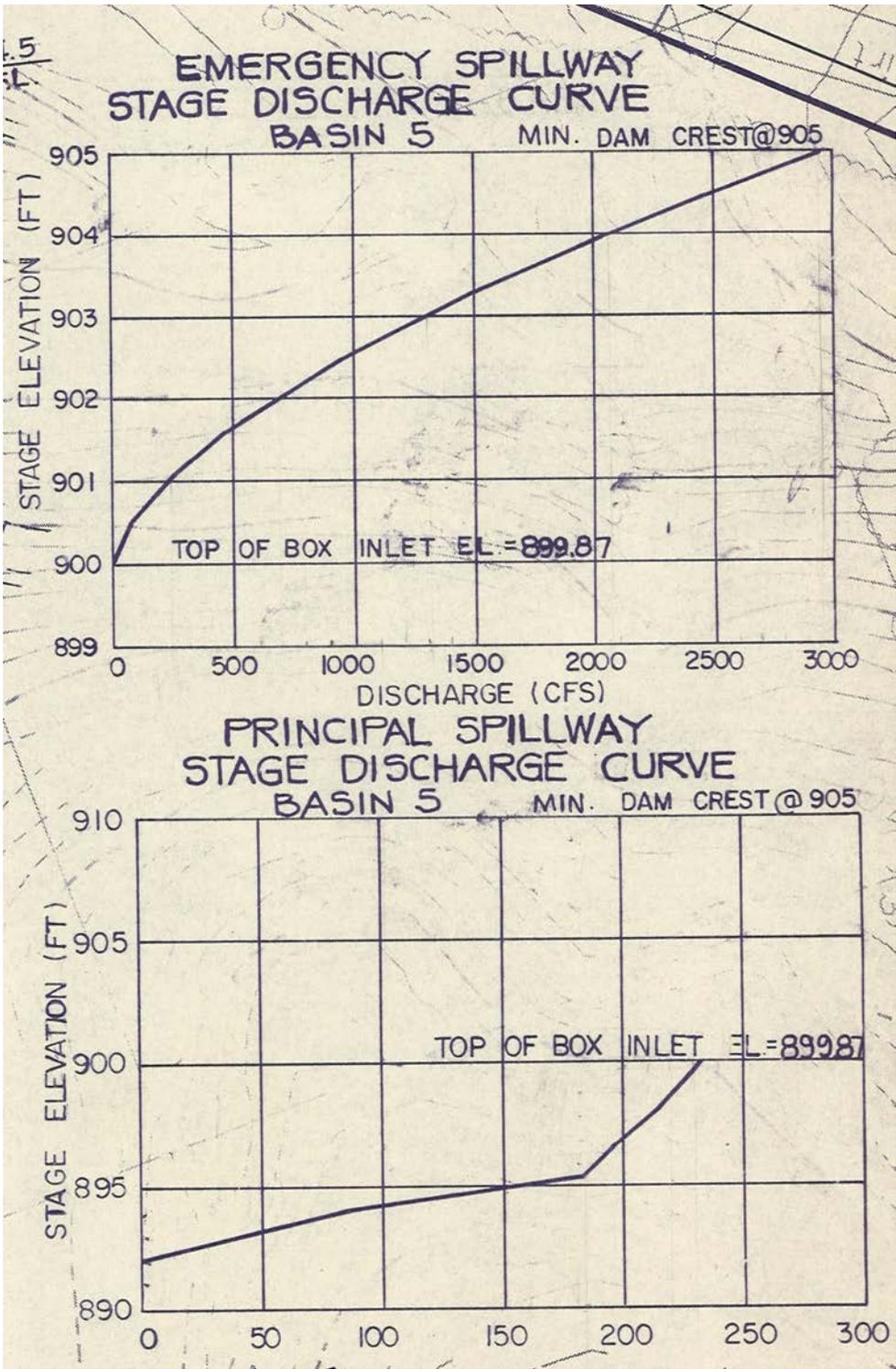
NA= Not Available / Not Applicable

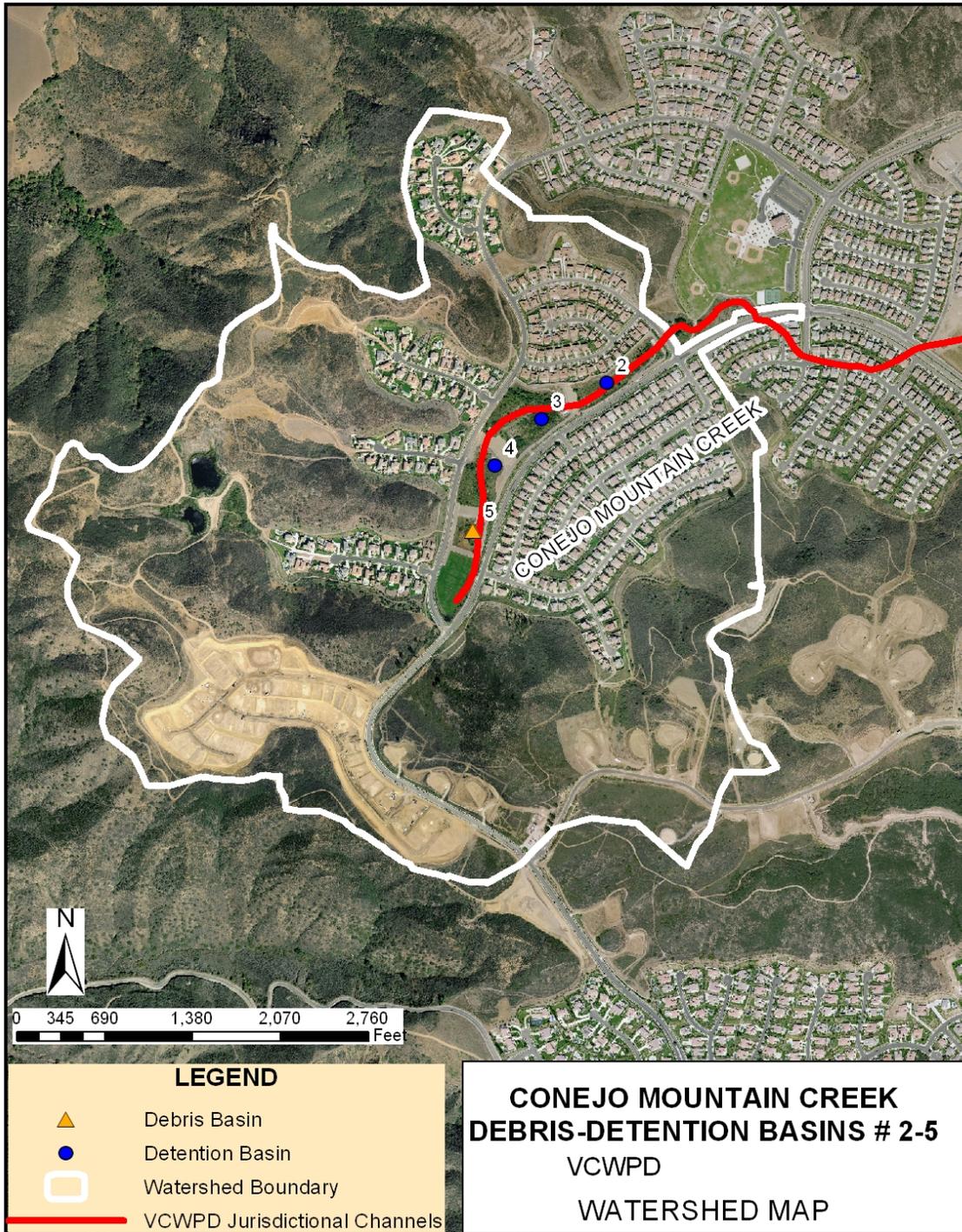
Stage storage discharge data for VCRat input file format 2017 conditions, no design sed vol in basins; Uses 2018 discharge data calculated following Arundell basin approach

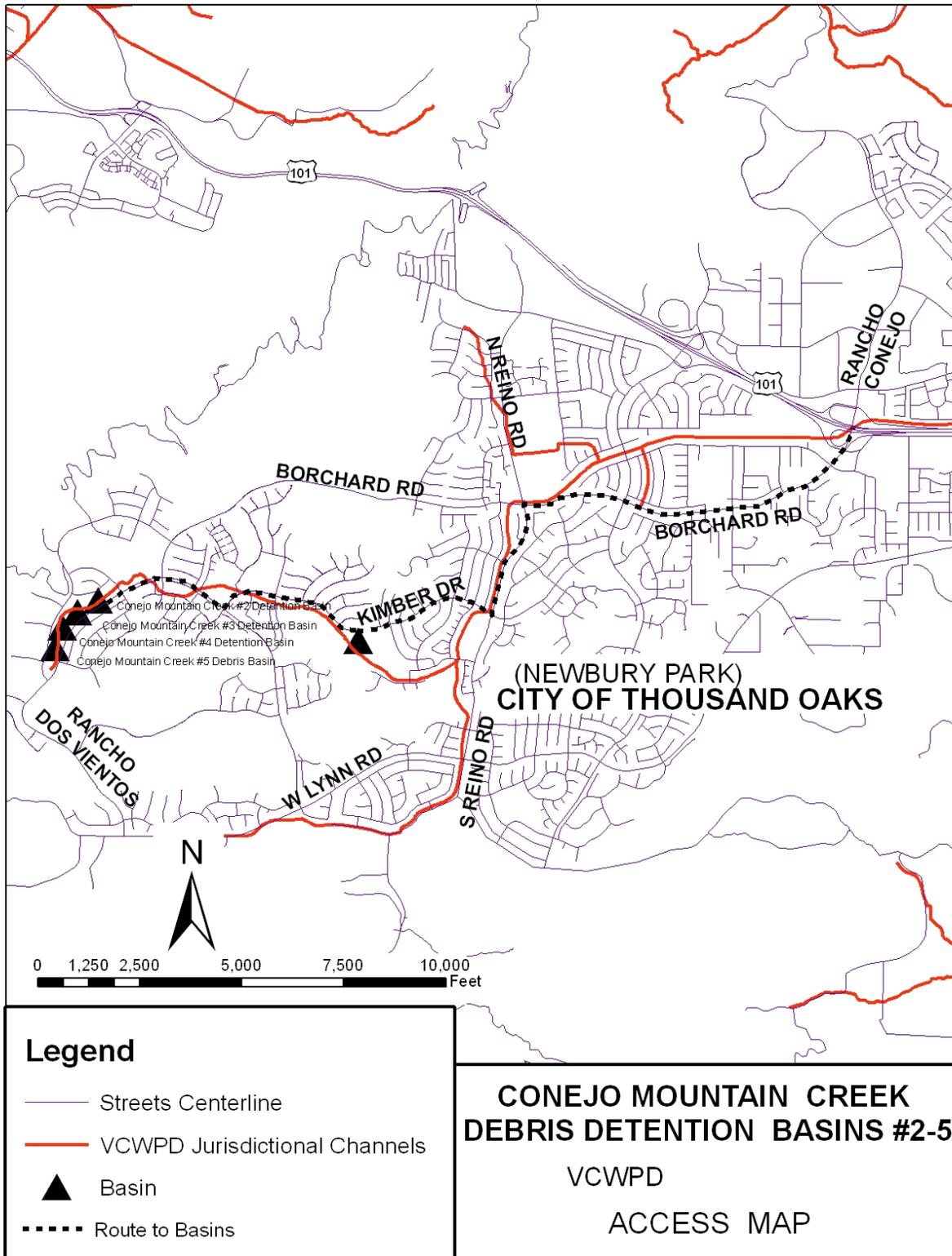
Basin 5									
STAGE	1	889.00	892.00	894.55	895.00	896.00	896.43	897.00	898.00
STORAGE	1	0.000	0.384	1.601	1.930	2.667	3.031	3.507	4.438
OUTFLOW	1	0.00	0.00	0.00	9.36	54.13	78.71	118.88	175.89
STAGE	9	899.00	900.00	901.00	902.00	902.41	903.00	904.00	905.00
STORAGE	9	5.434	6.480	7.573	8.715	9.185	9.905	11.145	12.436
OUTFLOW	9	186.00	195.60	204.74	213.50	216.94	301.53	680.09	1120.99
STAGE	17	906.00	907.00						
STORAGE	17	13.778	15.172						
OUTFLOW	17	1158.71	1195.25						

Original Design Data from Plans









COVINGTON DETENTION BASIN DD3-27

LOCATION: Simi Valley, 3000 ft S of Fitzgerald Ave and 1000 ft E of Erringer Rd.;
N 274,625,E 1,771,800 (Lambert Zone 5 Coordinates);
Simi 7 1/2' Quad.

DESIGN DATA

Design Agency	<u>Crosby-Mead-Benton</u>
Level Capacity	<u>5,020 cy at spillway invert (Y-3-3732)</u>
Maximum Debris Capacity	<u>0 cy (upstream development removes sediment)</u>
100-Yr Inflow Rate	<u>158 cfs</u>
Outflow Rate	<u>48 cfs at 888.54 ft NGVD29</u>
Debris Cleanout Elevation	<u>No debris expected to reach basin</u>

EMERGENCY SPILLWAY

Type	<u>36-in RCP Vertical Pipe</u>
Crest Elevation	<u>888.6 ft NGVD29</u>
Spillway Length	<u>NA</u>
Capacity w/o Freeboard	<u>53 cfs</u>

PRINCIPAL SPILLWAY

Type	<u>6 ft x 6 ft Concrete Riser Tower, Top Elev 891.6 ft</u>
Inlet Weir Elevations	<u>883 ft NGVD29</u>
Outlet Conduit	<u>24 to 36 in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>6-in Perforated Pipe Laid at 1% Min. Grade w/ Gravel</u>
Start Elevation	<u>873 ft NGVD29, Length Approx. 80 ft</u>
Outlet Conduit	<u>Connects to Principal Spillway</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>891.6 ft NGVD29</u>
Length	<u>~300 ft</u>
Surface Area of Full Basin	<u>0.5 ac</u>
Watershed Area	<u>47 ac from Simi Valley Master Plan Update Subareas</u>
Width at Crest	<u>15 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>Centex</u>
Completion Date	<u>1997</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-3726-3745</u>
Right-of-Way Drawings	<u>NA</u>
Topographic Drawings	<u>NA</u>

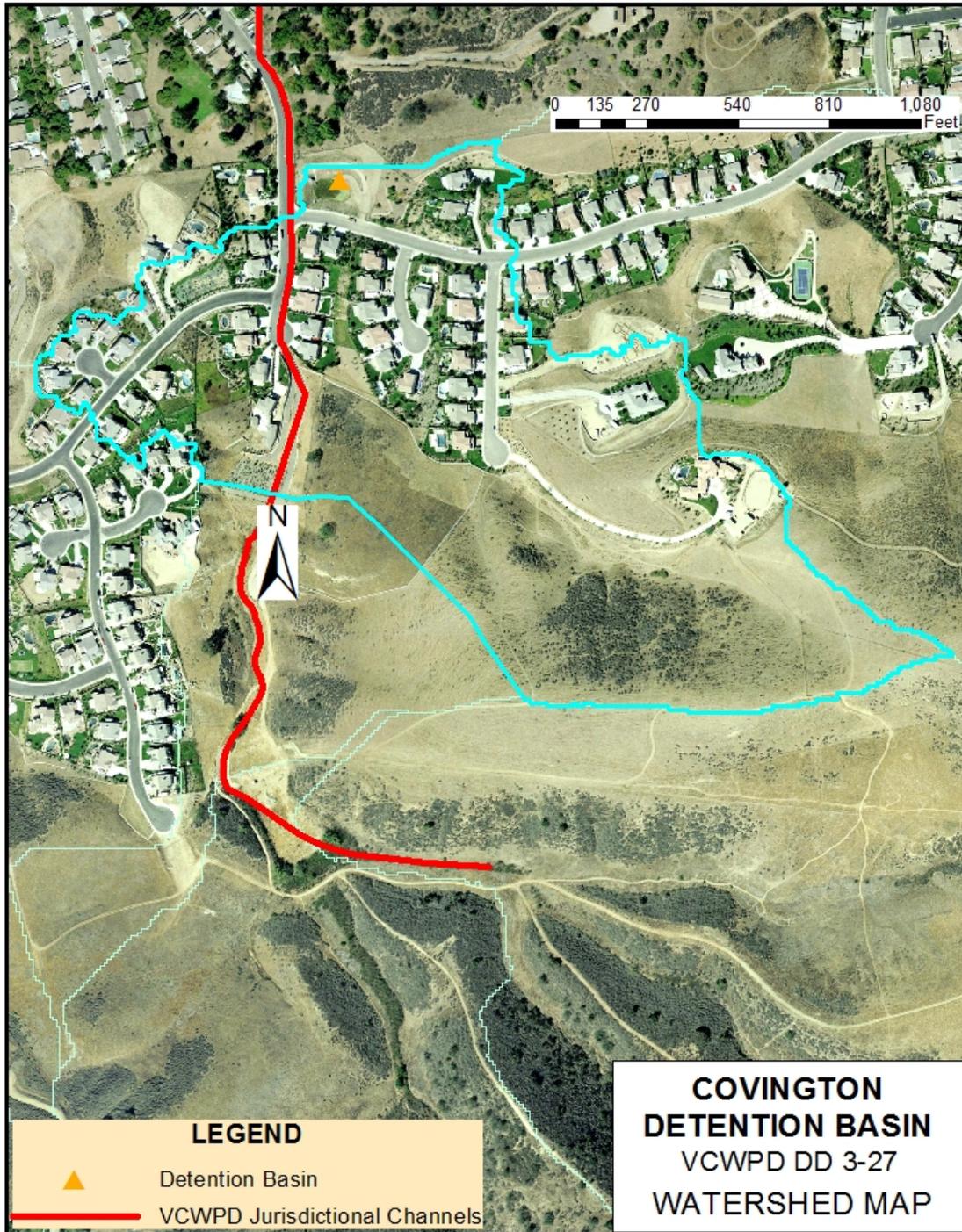
EXPECTED DEBRIS PRODUCTION (cy): Surrounded by development that prevents undeveloped area sediment from reaching basin		
Storm Frequency	Design Condition	100% Burn
100-YEAR	0	0
50-YEAR	0	0
25-YEAR	0	0

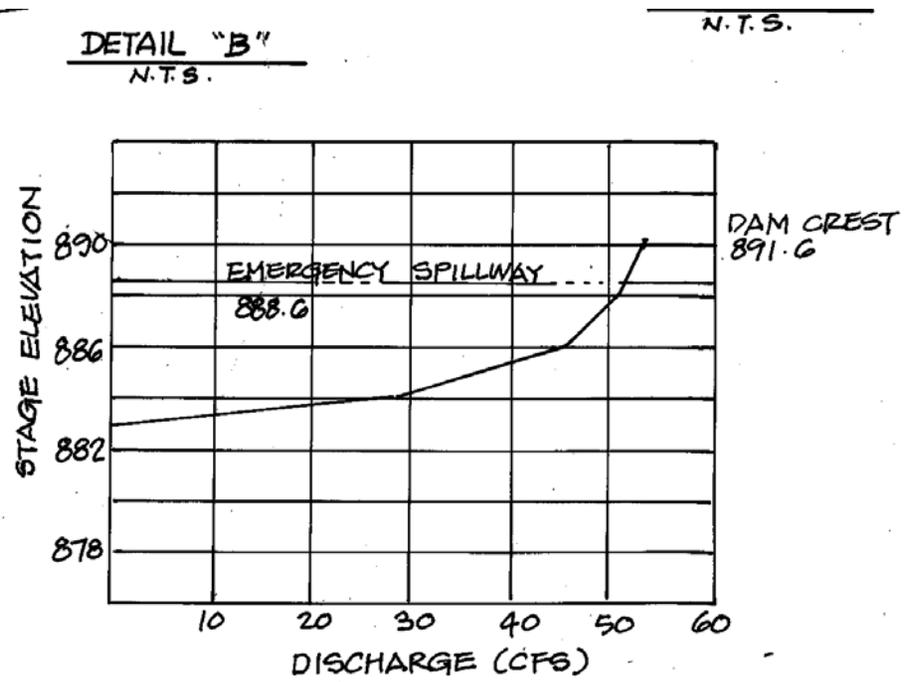
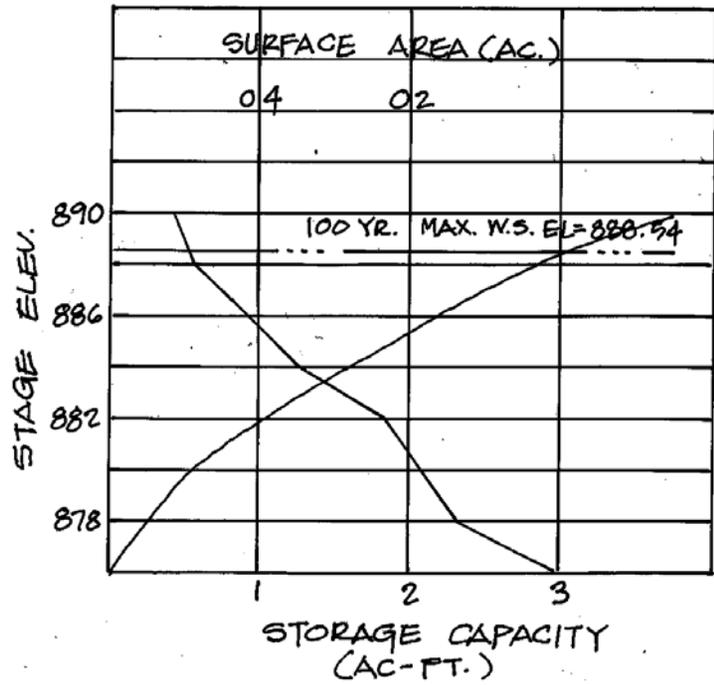
BASIN HISTORY: COVINGTON BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	<u>No cleanouts reported by O&M</u>			

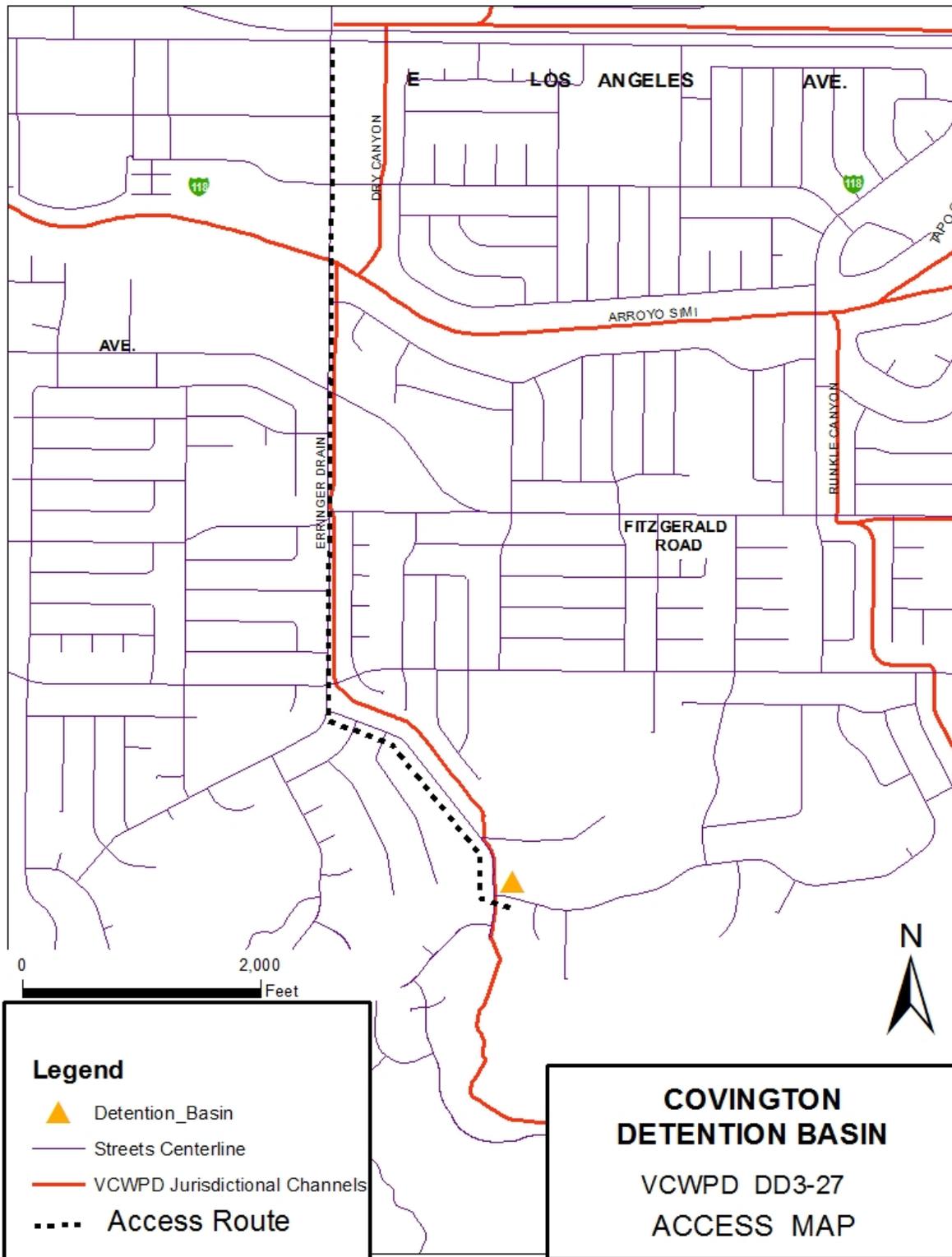
Notes

- * 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





Covington Detention Basin



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=3,490 cfs (VCRAT, 2003); 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 2,400 cfs at dam crest

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 2018 (cy): Note 1		
Storm Frequency	Design Condition	100% Burn
100-YEAR	90,455	131,200
50-YEAR	65,185	94,550
25-YEAR	45,015	65,295
10-YEAR	25,210	36,570

Note 1: Revised calculation includes undeveloped lands only, channel length for undeveloped areas only, sediment has to traverse up to 3 miles of channel to reach basin.

EXPECTED DEBRIS PRODUCTION 1973 (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		

VCWPD- Zone 3**Debris and Detention Basin Manual****BASIN HISTORY: COYOTE CANYON DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
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	Multiple Cleanouts-	Truck Count	49,076	
11-05	TIN analysis by WR&T	24,257 to elev. 328.5 ft		

VCWPD- Zone 3**Debris and Detention Basin Manual****BASIN HISTORY: COYOTE CANYON DEBRIS BASIN**

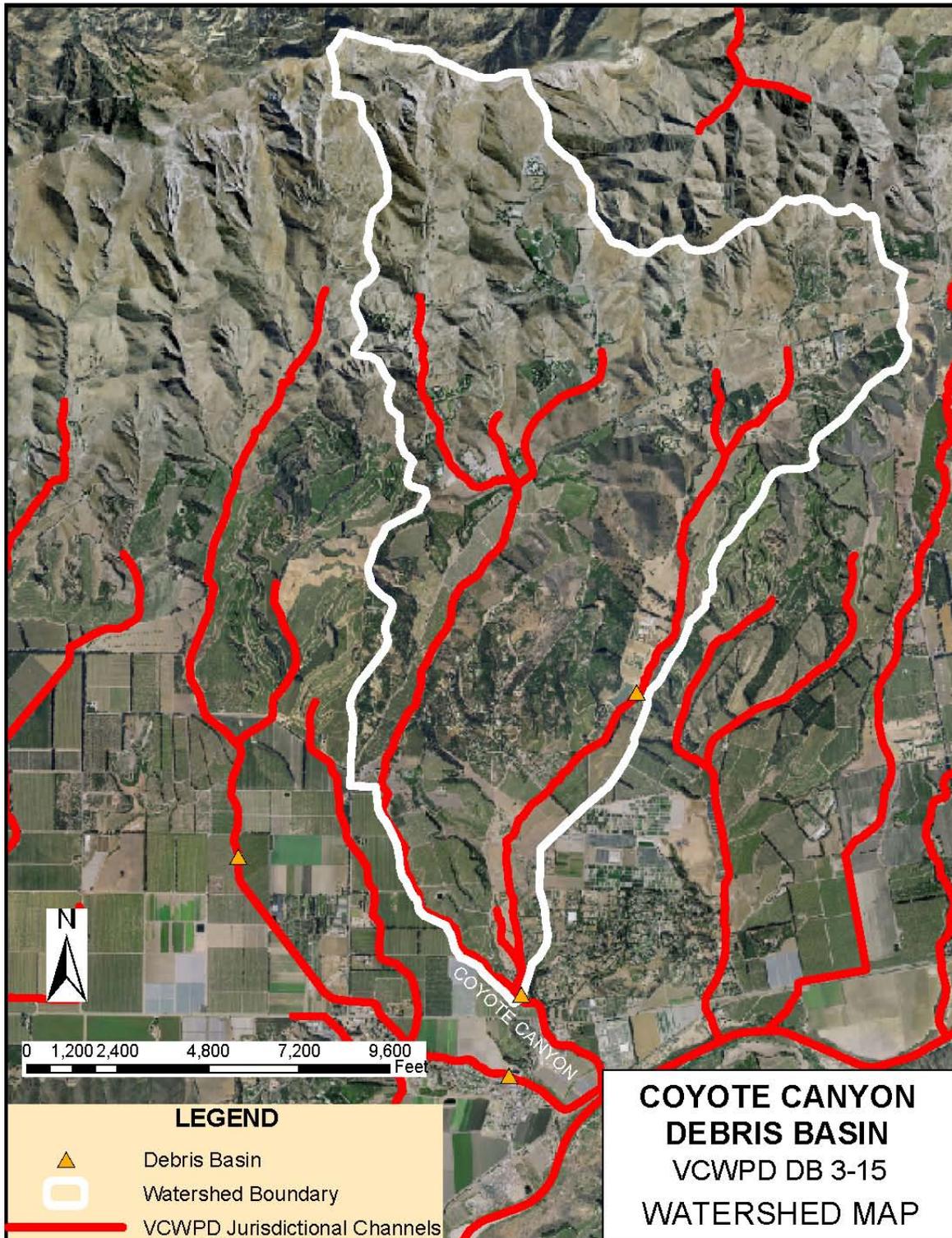
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
07-08	Cleanout by O&M	Truck Count	10,680	
12-08	TIN analysis by WR&T	23,921 to elev. 328.5 ft		
12-08	TIN analysis 05 vs 08		Cut vol 2,246 Fill vol 3,561	
07-10	Cleanout by O&M	Truck Count	9,452	
05-11	TIN analysis by WR&T	17,728 to elev. 328.5 ft		
05-11	TIN analysis 11 vs 08		Cut vol 223 Fill vol 6,679	
06-12	TIN analysis by WR&T	18,017 to elev. 328.5 ft		
07-12	Cleanout by O&M	Truck Count	8,712	
10-12	TIN analysis by WR&T	24,412 to elev. 328.5 ft	6,393	
10-14	TIN analysis by WR&T	23,356 to elev. 328.5 ft 1,054 deposit since 10-12		
05-17	TIN analysis by WR&T	17,689 to elev. 328.5 ft 5,667 deposit since 10-14		
07-17	Cleanout by O&M	Truck Count	7,812	

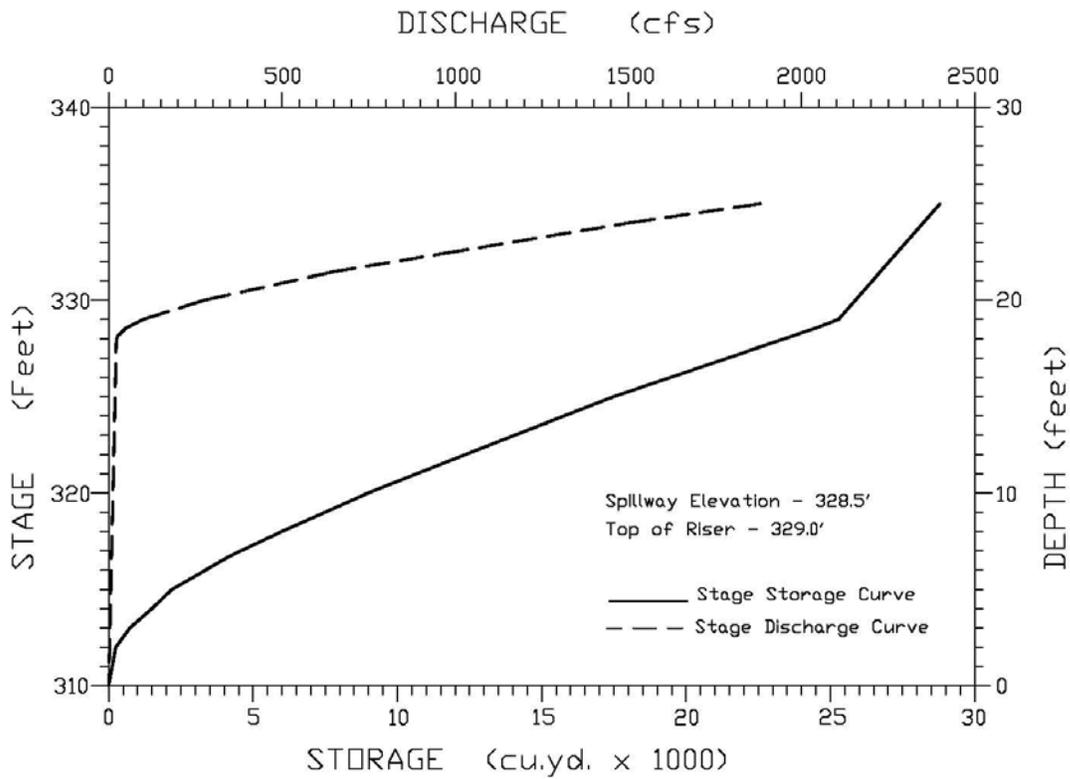
Notes

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

** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable

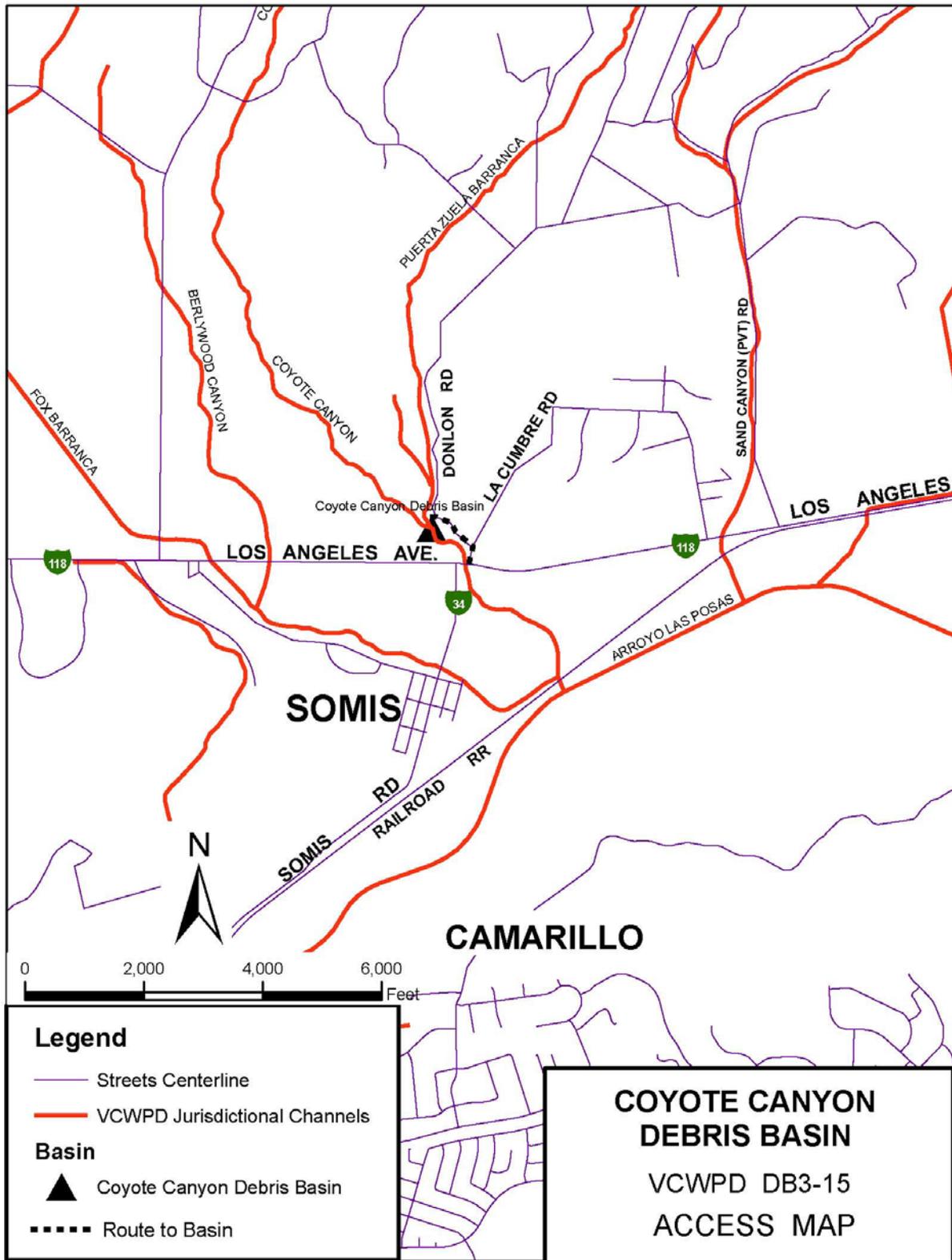




Stage-Storage-Discharge Data

Elevation	Spill Disch.	10-2012 TIN Vol.
Ft. NGVD29	cfs	Cu. Yds
307.5		0
308		25
309		221
310		646
311		1,255
312		1,981
313		2,794
314		3,680
315		4,628
316		5,633
317		6,691
318		7,809
319		9,011
320		10,302
321		11,665
322		13,102

Elevation	Spill Disch.	10-2012 TIN Vol.
Ft. NGVD29	cfs	Cu. Yds
323		14,615
324		16,207
325		17,876
326		19,625
327		21,455
328		23,372
328.5	-	24,365
329	40	
330	200	
331	445	
332	730	
333	1,070	
334	1,445	
335	1,860	



CRESTVIEW DEBRIS BASIN DB3-10 (Nonfunctional)

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

Due to avocado orchard in basin, District may give up ownership of basin.

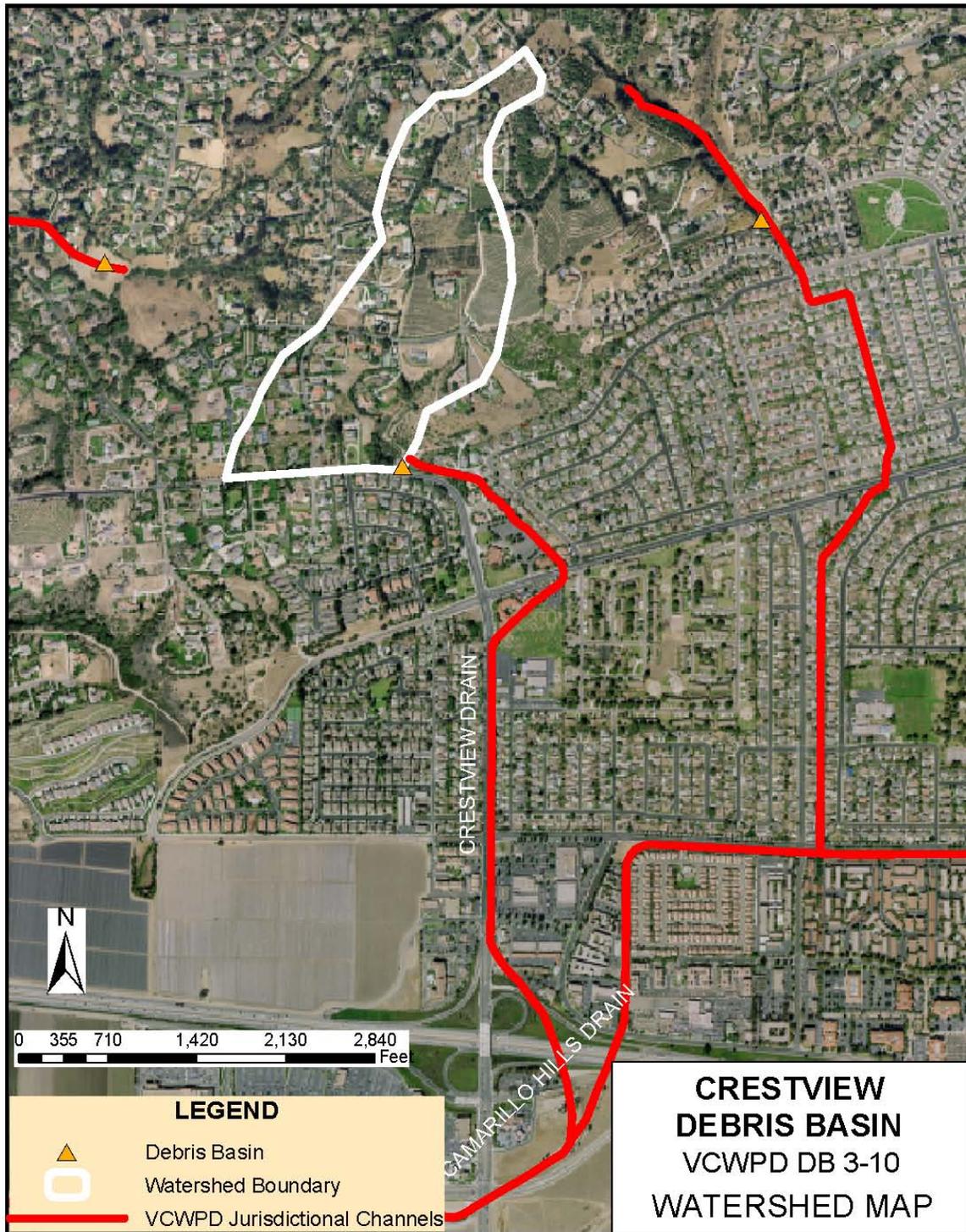
EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	1,005	1,460
50-YEAR	770	1,126
25-YEAR	567	824

BASIN HISTORY: CRESTVIEW DEBRIS BASIN

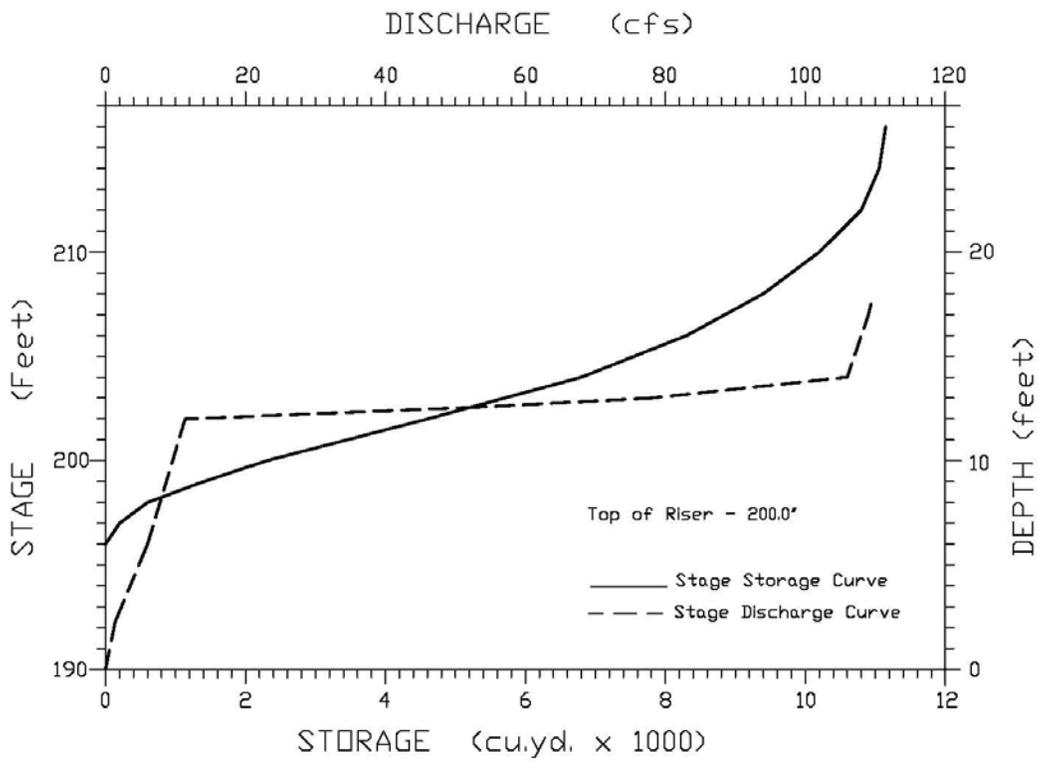
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
02-69	Disaster Declaration			
10-71	Aerial Survey	11,100		
05-72	Aerial Survey	Not Digitized		
05-73	Aerial Survey	Not Digitized		
02-78	Disaster Declaration			
03-78	Disaster Declaration			
02-80	Disaster Declaration			
06-80	Aerial Survey	Not Digitized		
11-81	Aerial Survey	Not Digitized		
03-83	Disaster Declaration			100***
10-90	Aerial Survey	Not Digitized		
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			
06-03	Basin planted with orchard	Not being maintained by O&M		
01-05	Disaster Declaration			77***

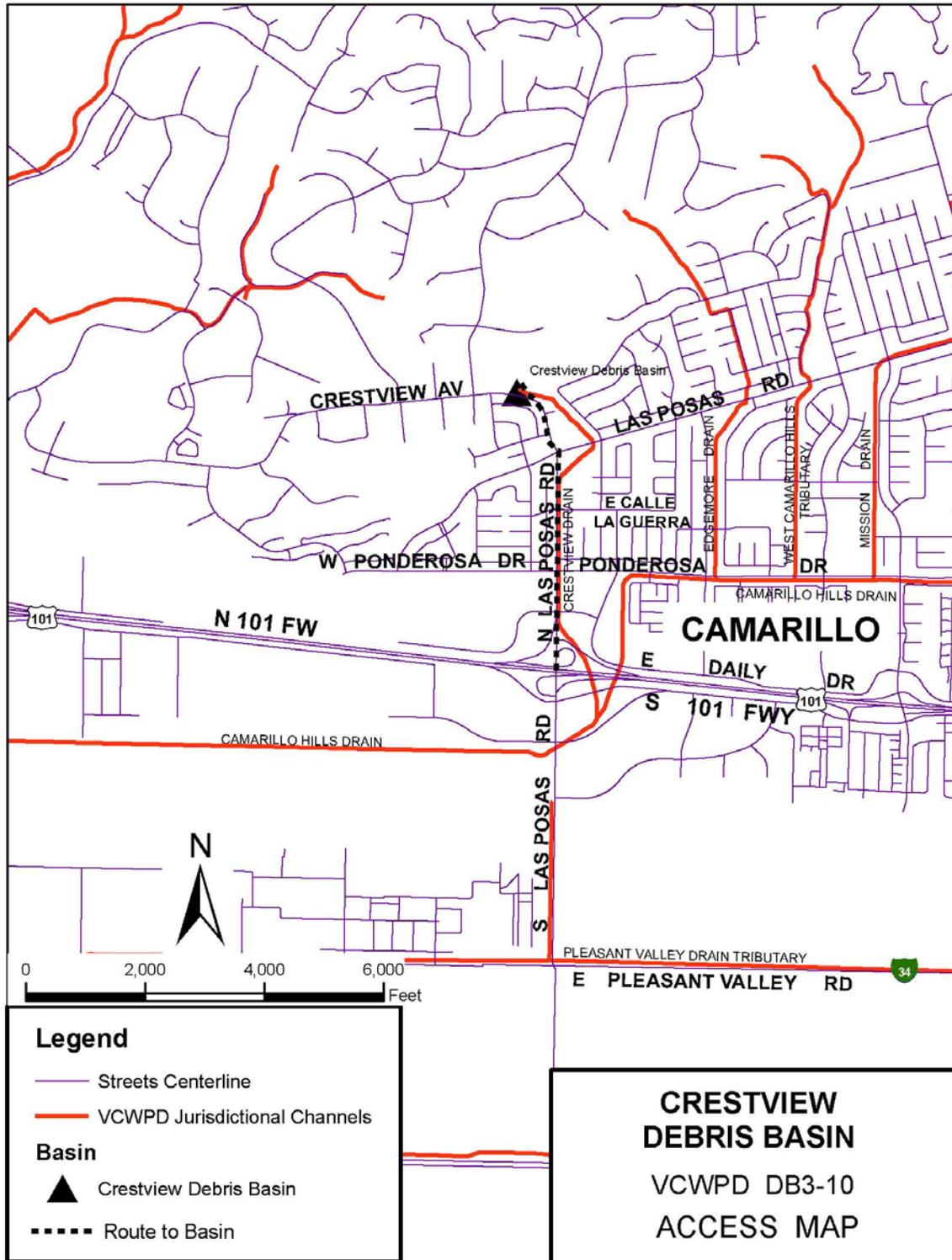
Notes

- * 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 DEBRIS BASIN





CROSBY (RUDOLPH) DETENTION BASIN DD3-28

LOCATION: Simi Valley, Intersection of Crosby and Rudolph Sts
 N 274,800,E 1,773,265 (Lambert Zone 5 Coordinates);
 Simi 7 1/2' Quad.

DESIGN DATA

Design Agency	<u>Crosby-Mead-Benton</u>
Level Capacity	<u>6,450 cy at spillway invert (Y-3-3733)</u>
Maximum Debris Capacity	<u>0 cy (upstream development removes sediment)</u>
100-Yr Inflow Rate	<u>167 cfs, (10-yr 140.3 cfs)</u>
Outflow Rate	<u>60 cfs at 889.74 ft NGVD29, 10-yr 55 cfs</u>
Debris Cleanout Elevation	<u>No debris expected to reach basin</u>

EMERGENCY SPILLWAY

Type	<u>36-in RCP Vertical Pipe</u>
Crest Elevation	<u>896.8 ft NGVD29</u>
Spillway Length	<u>NA</u>
Capacity w/o Freeboard	<u>61 cfs</u>

PRINCIPAL SPILLWAY

Type	<u>6 ft x 6 ft Concrete Riser Tower, Top Elev 900.0 ft</u>
Inlet Weir Elevations	<u>883 ft NGVD29</u>
Outlet Conduit	<u>24 to 36 in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>6-in Perforated Pipe Laid at 1% Min. Grade w/ Gravel</u>
Start Elevation	<u>880 ft NGVD29, Length Approx. 140 ft</u>
Outlet Conduit	<u>Connects to Principal Spillway</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>900 ft NGVD29</u>
Length	<u>~300 ft on 3 sides of basin</u>
Surface Area of Full Basin	<u>~0.5 ac</u>
Watershed Area	<u>55 ac from Simi Valley MDP (draft)</u>
Width at Crest	<u>15 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>Centex</u>
Completion Date	<u>1997 (Called Rudolph on Y drawings)</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-3726-3745</u>
Right-of-Way Drawings	<u>NA</u>
Topographic Drawings	<u>NA</u>

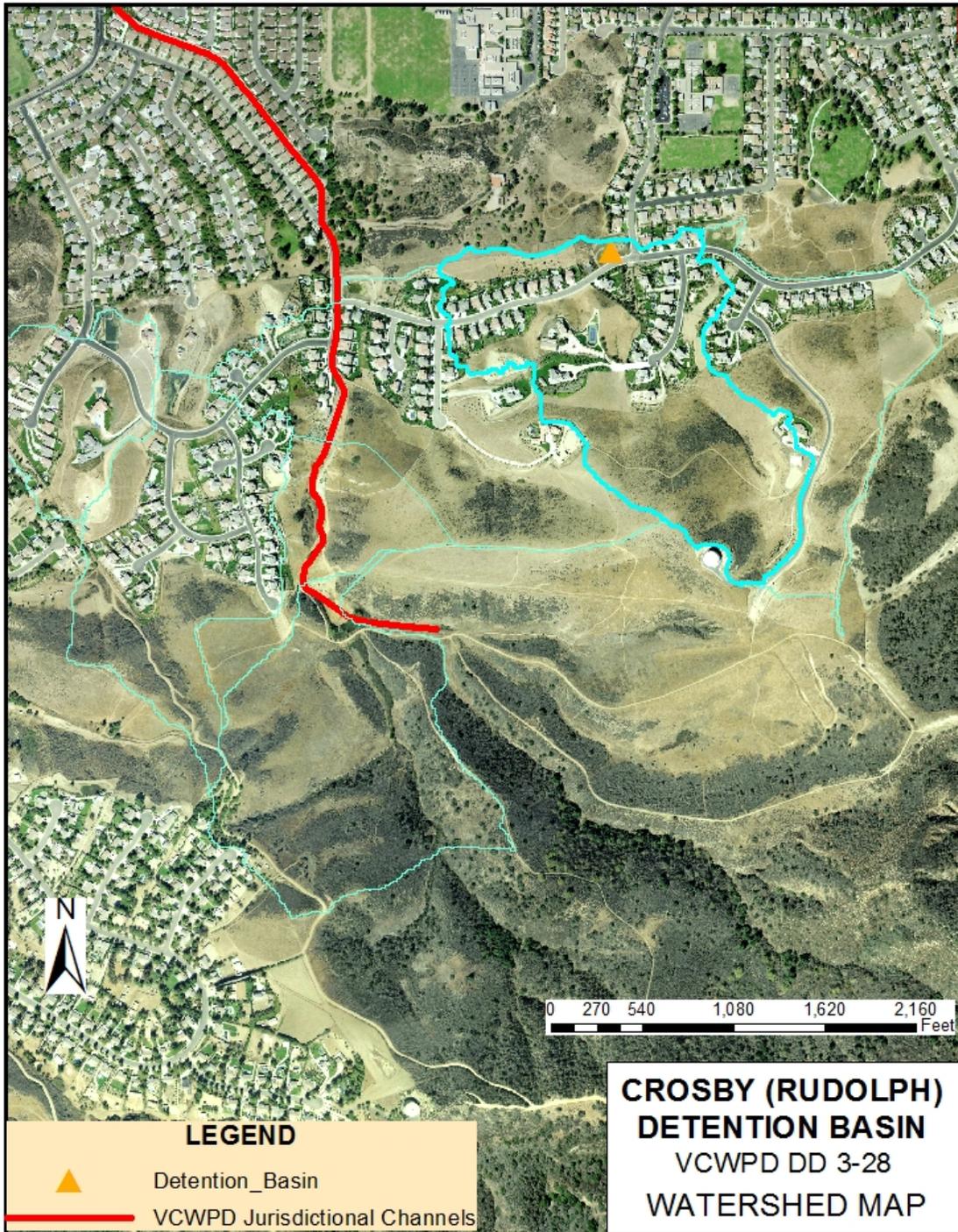
EXPECTED DEBRIS PRODUCTION (cy): Surrounded by development that keeps sediment from basin		
Storm Frequency	Design Condition	100% Burn
100-YEAR	0	0
50-YEAR	0	0
25-YEAR	0	0

BASIN HISTORY: CROSBY BASIN

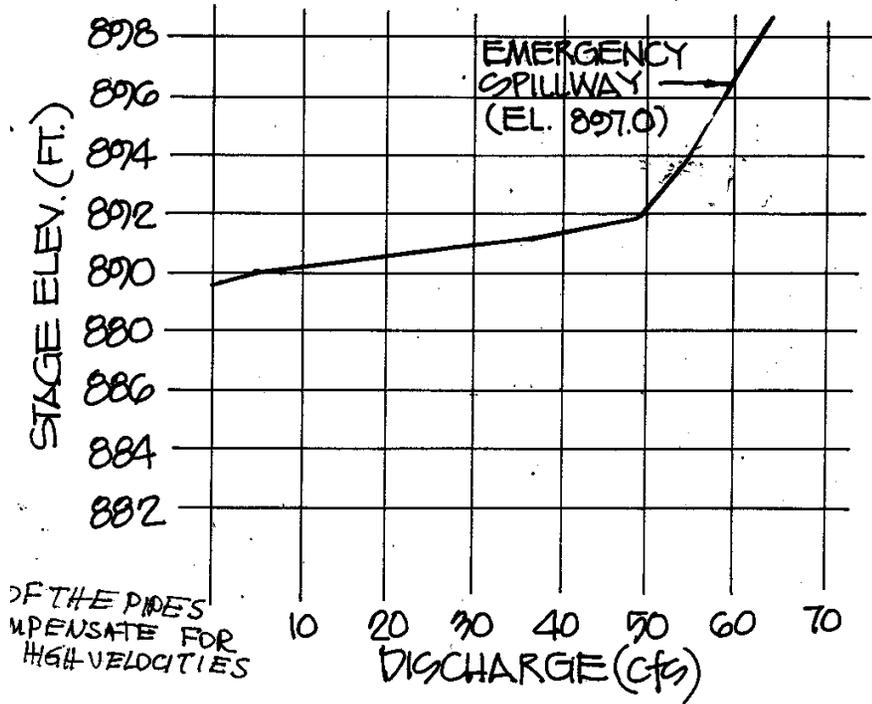
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	No cleanout data reported by O&M			

Notes

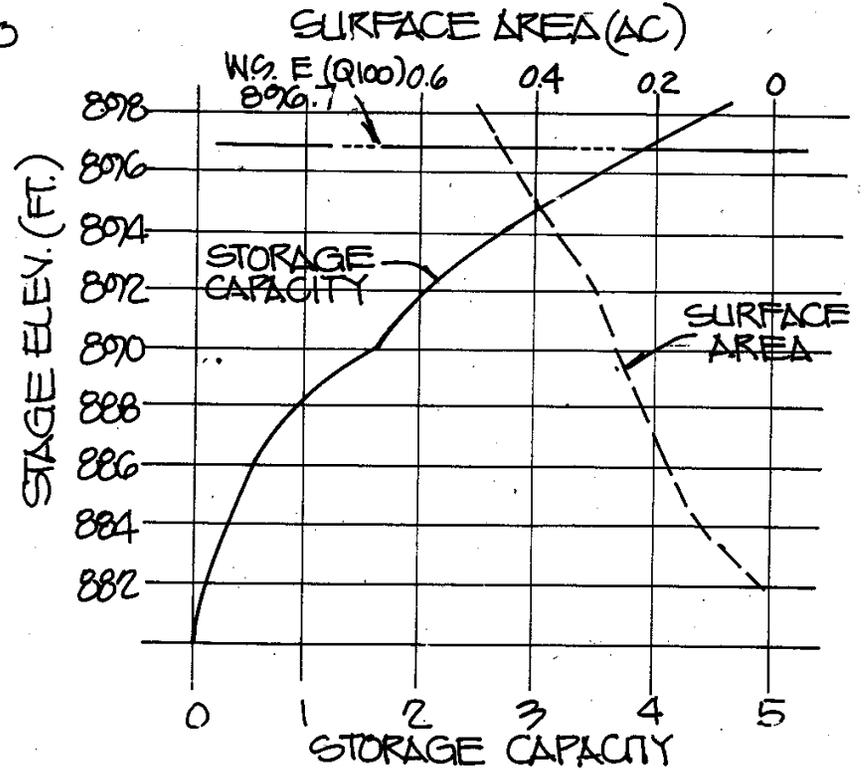
- * AADP (Average Annual Debris Production) Computed Excluding Disaster Debris
- ** FEMA Accepted Value for Disaster Declaration
- *** Theoretical Value from Kevin Scott Formula
- NA= Not Available / Not Applicable



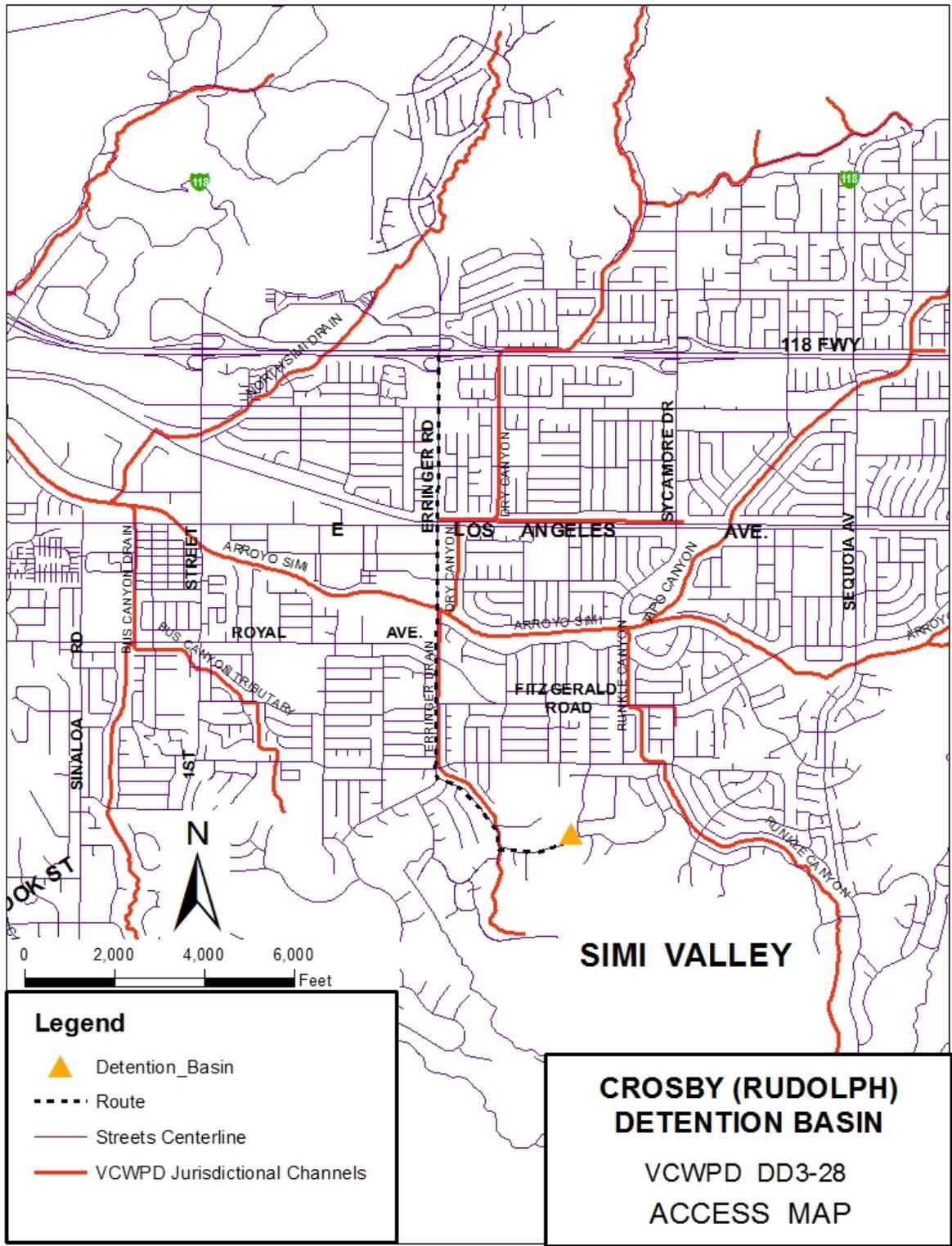
AUTUMN DETENTION BASIN
 SPILLWAY RATING CURVE
 DAM CREST 900



STORAGE & SURFACE RATING CURVES



Crosby Detention Basin Stage Storage Data



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=300 cfs; Q100out=NA
Debris Cleanout Elevation 264 ft NGVD29 (1,760 cy) [level cap.-100yr debris yield]

EMERGENCY SPILLWAY
Type 14 ft x 6 ft Drop Box Inlet
Weir Elevation 264.93 ft fm as-builts
Spillway Length NA
Capacity with Freeboard 300 cfs

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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
10-89	Aerial Survey	3,541		120
09-90	Aerial Survey	3,122		

VCWPD- Zone 3**Debris and Detention Basin Manual****BASIN HISTORY: EDGEMORE DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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
08-05	Cleanout- Survey analysis by O&M		1,334- Survey	
08-05	TIN analysis by WR&T	1,423 to elev 265		
10-05	TIN analysis by WR&T		1,387 fill vol 52 cut vol	
06-06	TIN analysis by WR&T	284 to elev 265		
06-06	TIN analyses by WR&T 06-06 Vs 10-05 TINs		1,300 fill vol 86 cut vol	
07-06	CAD analysis by O&M		1519	
10-06	TIN analysis by WR&T	1,591 to elev 265		
10-06	TIN analyses by WR&T 10-06 Vs 06-06 TINs		1,485 fill vol 37 cut vol	
07-08	Cleanout by O&M	Truck count	864	
09-08	TIN analysis by WR&T	1,738 to elev 265		
09-08	TIN analyses by WR&T 09-08 Vs 10-06 TINs		249 fill vol 39 cut vol	

VCWPD- Zone 3**Debris and Detention Basin Manual****BASIN HISTORY: EDGEMORE DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
07-09	Cleanout by O&M	Truck count	600	
05-10	TIN analysis by WR&T	1,178 to elev 265		
07-10	Cleanout by O&M	Truck count	517	
05-11	TIN analysis by WR&T	333 to elev 265		
07-11	Cleanout by O&M	Truck count	1,582	
06-12	TIN analysis by WR&T	1,535 to elev 265		
08-12	Cleanout by O&M	Truck count	514	
10-12	TIN analysis by WR&T	1,742 to elev 265		
10-14	TIN file corrupted			
07-15	Cleanout by O&M	Truck count	524	

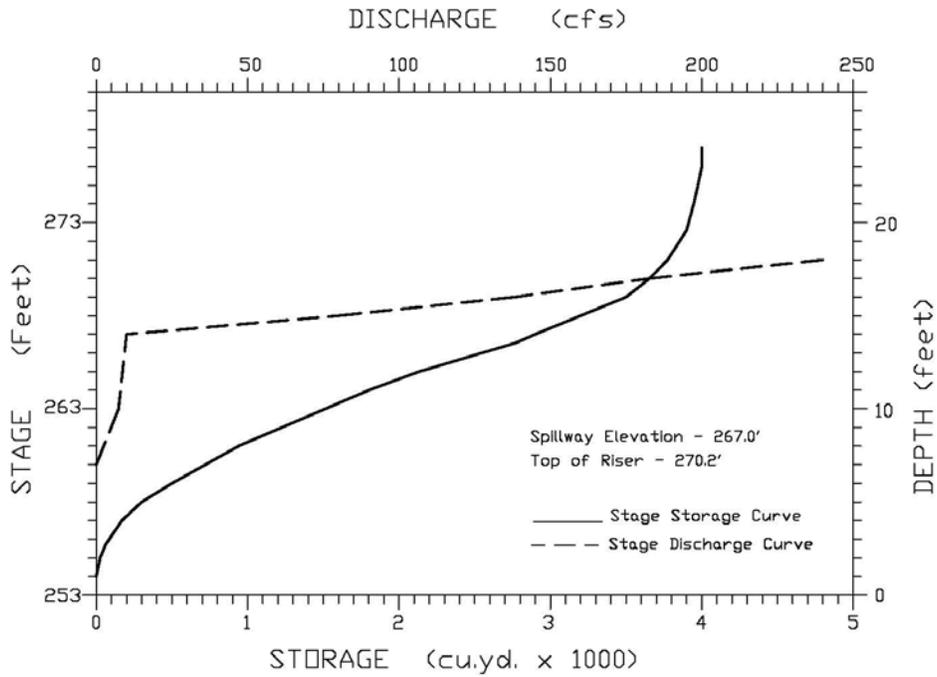
Notes

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

** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable

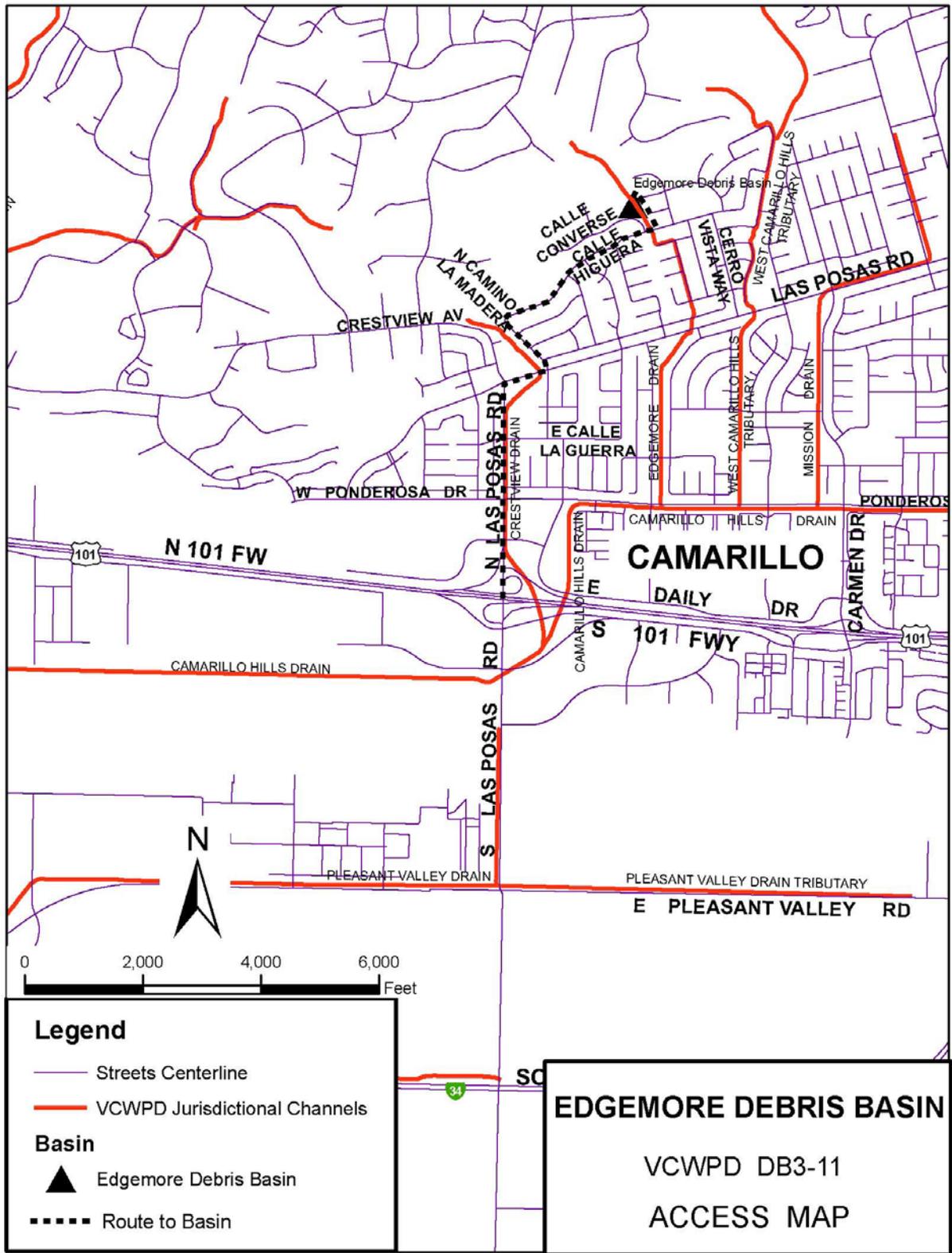




Superseded Stage Storage Discharge Data

Stage Storage Discharge Data, Revised Spillway

Elevation	Riser Disch.	Spill Disch.	10-12 Vol.
Ft. NGVD29	cfs	cfs	Cu. Yds
253			0
254			18
255			77
256			154
257			248
258			358
259			487
260			633
261			800
262			990
263	0.00		1,210
264	9.80		1,463
265	10.00		1,753
266	10.20	-	NA
267	10.40	101	NA
268	10.60	305	NA
269	10.80	569	NA
270	11.00	881	NA



EDGEMORE DEBRIS BASIN
 VCWPD DB3-11
 ACCESS MAP

ERRINGER ROAD DEBRIS BASIN DB3-12 (Not maintained by WPD)

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

Design Agency	<u>Soil Conservation Service, CMB for Tract 3045</u>
Level Capacity	<u>33,250 cy (10-29-71, T-63-19)</u>
Maximum Debris Capacity	<u>39,400 cy (10-29-71, T-63-19)</u>
Design Debris Level @ 948.7 ft	<u>14,540 cy (125% of 100yr design debris vol.)</u>
100-Yr Inflow Rate	<u>700 cfs</u>
Outflow Rate	<u>No attenuation of design peak from Debris Basin but 100-yr outflow 654 cfs if attenuation is modeled</u>

EMERGENCY SPILLWAY

Type	<u>24 ft wide x 5 ft high Grouted Rip-Rap Trap. Channel</u>
Invert Elevation	<u>955 ft NGVD29</u>
Spillway Length	<u>NA</u>
Capacity w/o Freeboard	<u>800 cfs at top of dam elev. 960 ft</u>

PRINCIPAL SPILLWAY

Type	<u>4 ft Wx 6 ftD Concrete Riser Tower with 4 ft X5 ft Inlets on 3 Faces</u>
Inlet Weir Elevations	<u>948.7 ft NGVD29</u>
Outlet Conduit	<u>18 in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>18-in Perforated CSP</u>
Top Elevation	<u>952 ft NGVD29</u>
Outlet Conduit	<u>Connects to Principal Spillway 18-in RCP</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>960 ft NGVD29</u>
Length	<u>220 ft</u>
Surface Area of Full Basin	<u>0.3 ac</u>
Watershed Area	<u>315 ac from Quad Map</u>
Width at Crest	<u>15 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>Soil Conservation Service; VCWPD</u>
Completion Date	<u>1957; Outlet Works Modified 1997</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-1145-48; Y-3-3726-3745</u>
Right-of-Way Drawings	<u>NA</u>
Topographic Drawings	<u>T-63-19 (10-29-71)</u>

Historic WPD Basin but modified by TR3045 project and not accepted back as of 2018

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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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			
	No cleanouts reported by O&M			

Notes

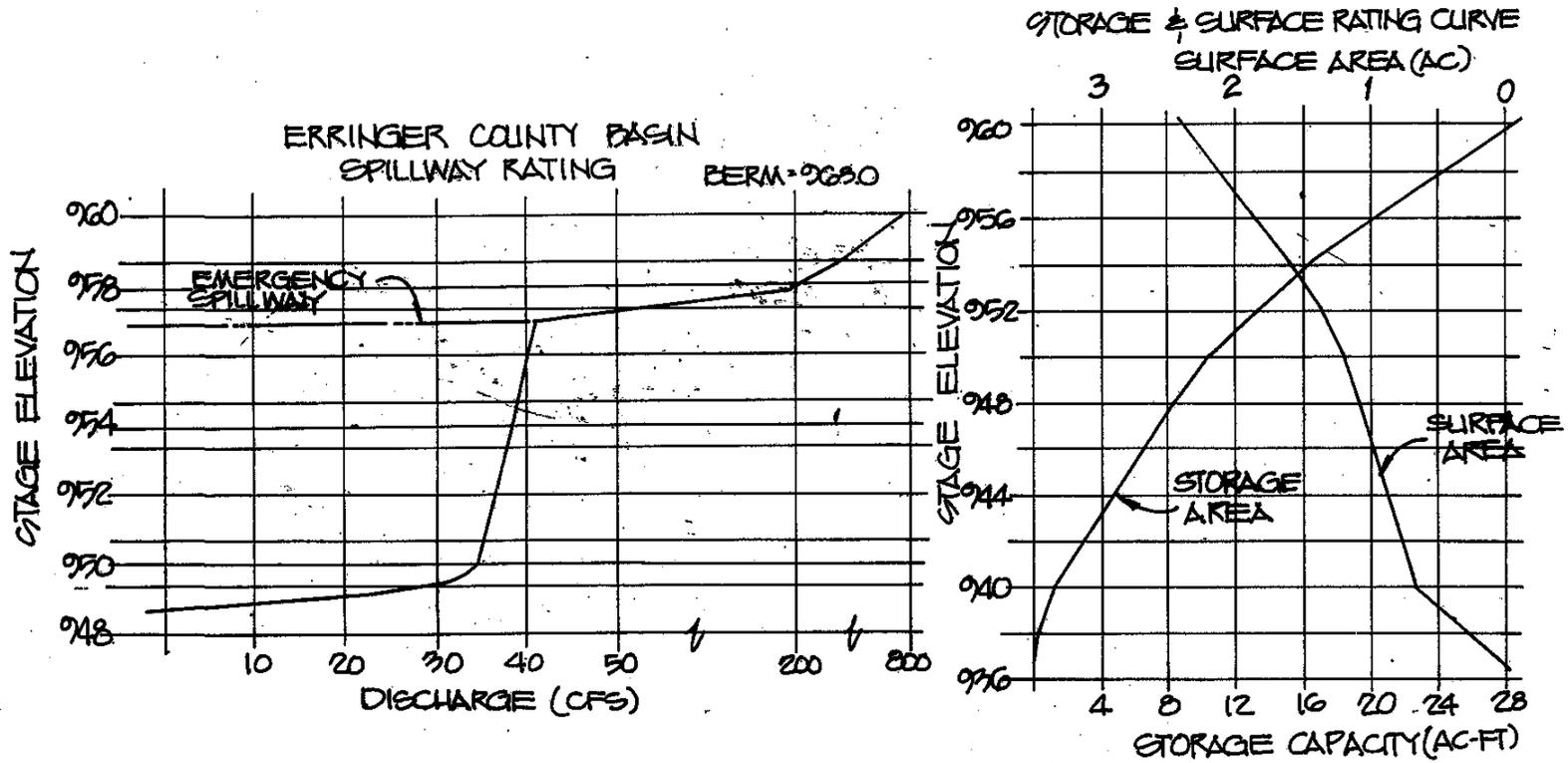
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

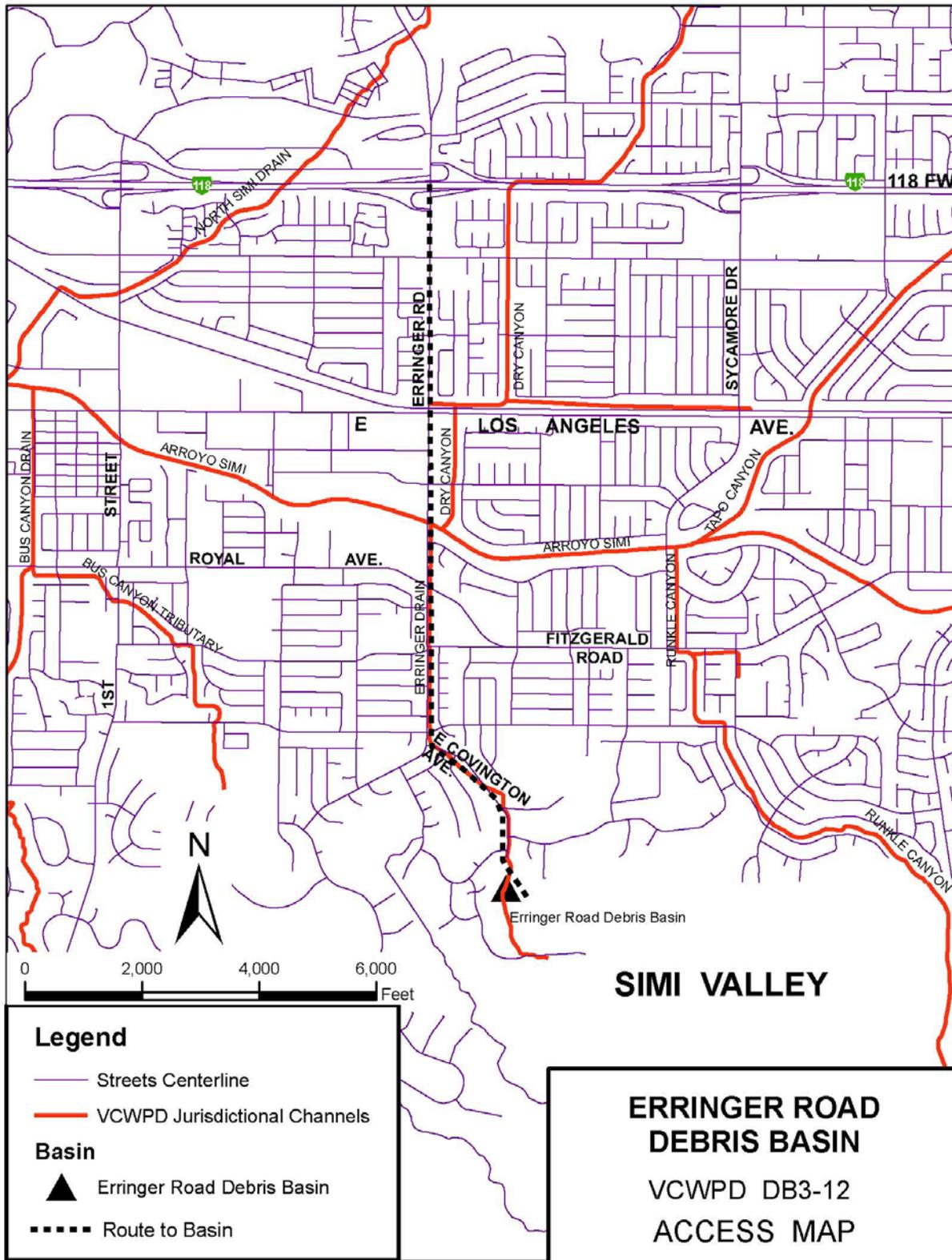
*** Theoretical Value from Kevin Scott Formula

NA= Not Available / Not Applicable





Erringer Road Debris Basin



ERRINGER ROAD DETENTION BASIN DD3-XX (Not Accepted by WPD)

LOCATION: Simi Valley, 3000 ft S of Fitzgerald Ave and 1000 ft E of Erringer Rd.;
 N 273,650,E 1,771,570 (Lambert Zone 5 Coordinates);
 Simi 7 1/2' Quad.
 Upstream of Covington Detention Basin

DESIGN DATA

Design Agency	<u>Crosby-Mead-Benton</u>
Level Capacity	<u>50,500 cy at spillway invert (Y-3-3728)</u>
Maximum Debris Capacity	<u>0 cy (upstream debris basin removes sediment)</u>
100-Yr Inflow Rate	<u>700 cfs if debris basin does not attenuate peak</u>
Outflow Rate	<u>89 cfs at 935.8 ft NGVD29</u>

EMERGENCY SPILLWAY

Type	<u>10 ft wide x 6 ft drop box inlet to 72-in RCP</u>
Crest Elevation	<u>936 ft NGVD29</u>
Spillway Length	<u>NA</u>
Capacity w/o Freeboard	<u>Q100=654 cfs if Princ. Spillway blocked; assumed attenuated flow from debris basin as inflow</u>

PRINCIPAL SPILLWAY

Type	<u>6 ft x 6 ft Concrete Riser Tower, Top Elev 920.0 ft</u>
Inlet Weir Elevations	<u>911 ft NGVD29</u>
Outlet Conduit	<u>36 in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>24-in Vertical Perforated CSP</u>
Top Elevation	<u>911 ft NGVD29</u>
Outlet Conduit	<u>Connects to Principal Spillway</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>944 ft NGVD29</u>
Length	<u>220 ft</u>
Surface Area of Full Basin	<u>0.3 ac</u>
Watershed Area	<u>315 ac from Quad Map</u>
Width at Crest	<u>15 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>Centex</u>
Completion Date	<u>1997</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-3726-3745</u>
Right-of-Way Drawings	<u>NA</u>
Topographic Drawings	<u>NA</u>

Part of TR3045 project but not accepted by WPD as of 2018

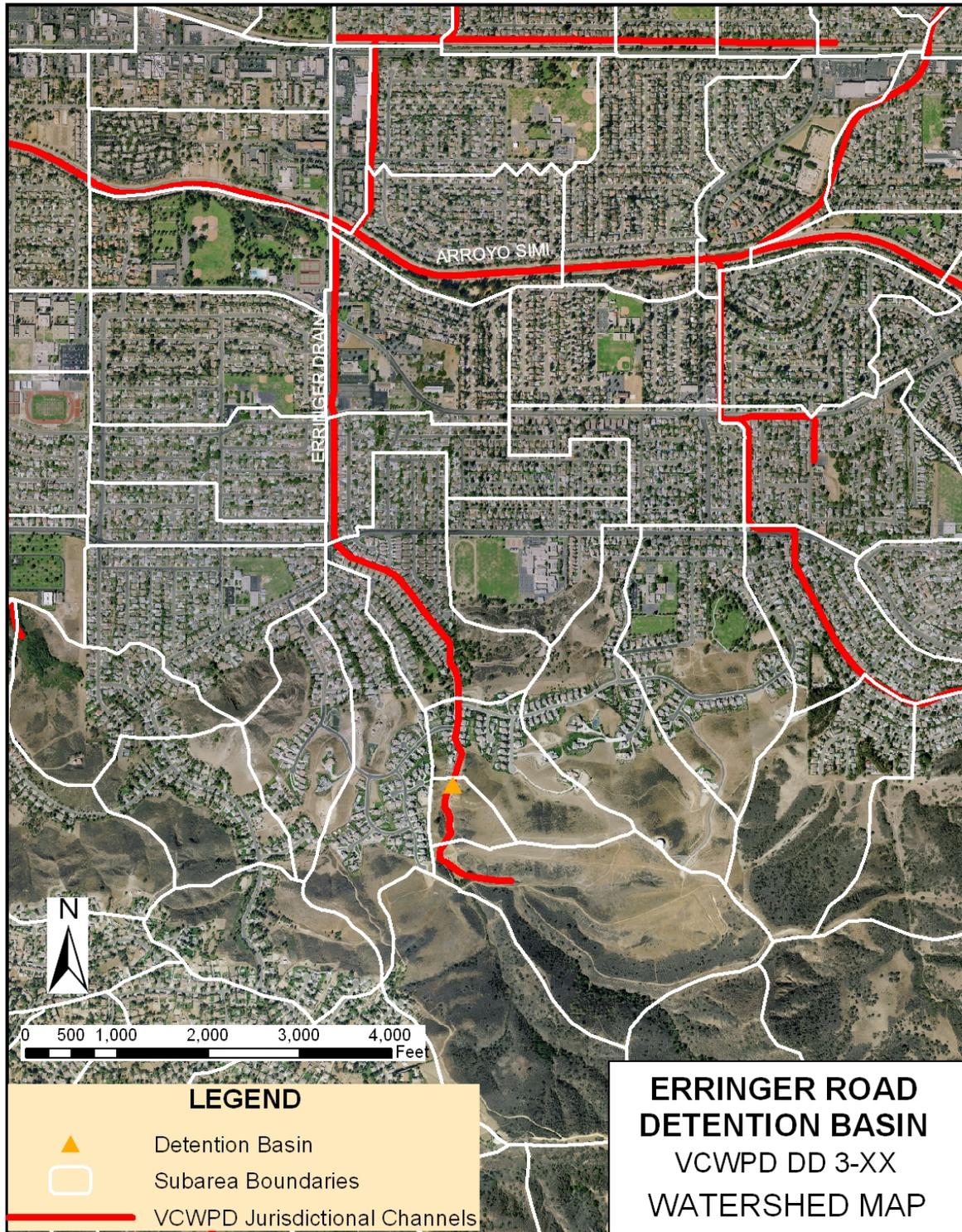
EXPECTED DEBRIS PRODUCTION (cy): Debris Basin intercepts sediment		
Storm Frequency	Design Condition	100% Burn
100-YEAR	0	0
50-YEAR	0	0
25-YEAR	0	0

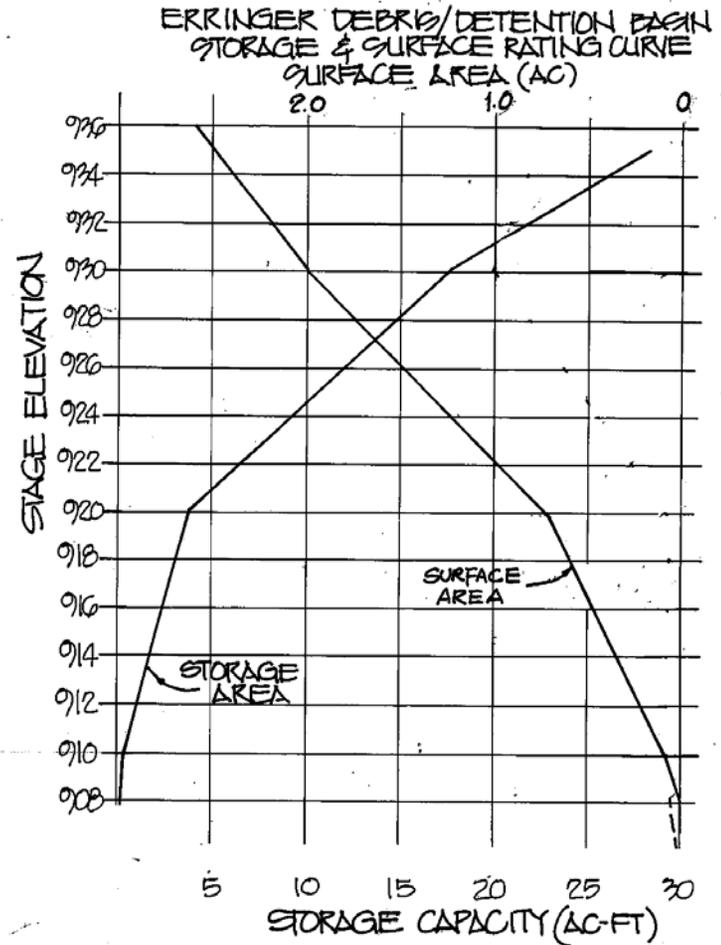
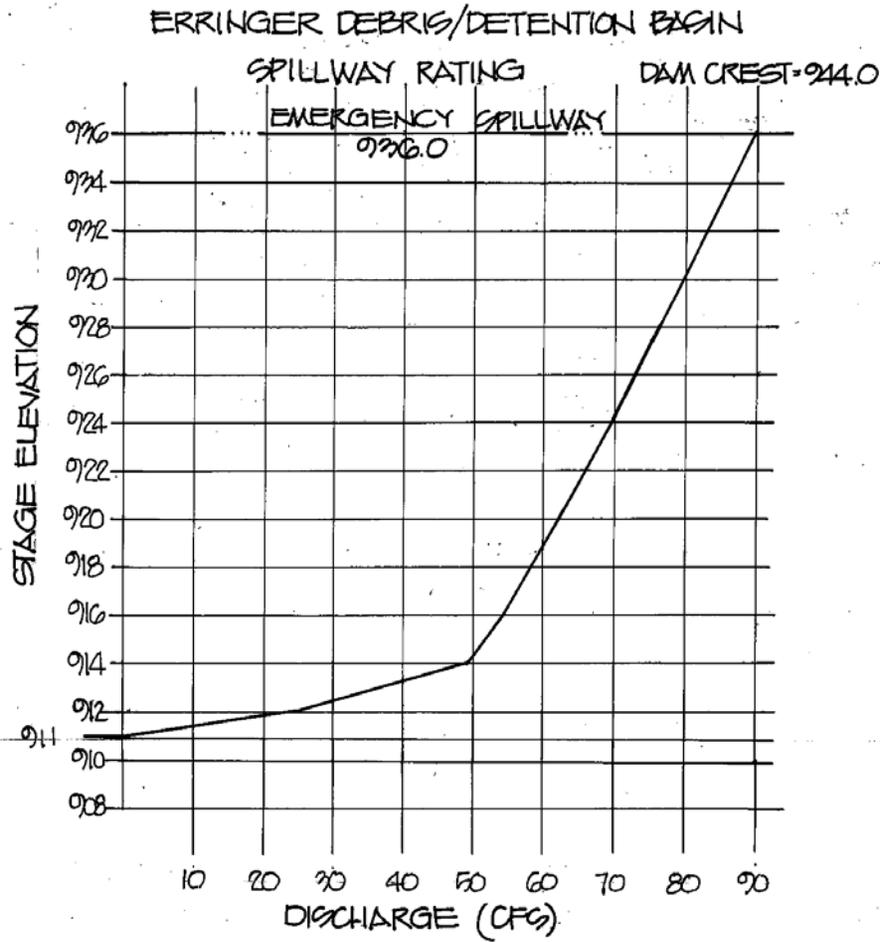
BASIN HISTORY: ERRINGER ROAD DETENTION BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	<u>No cleanout data available</u>			

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





Erringer Road Detention Basin



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; Height 180 ft NGVD29; 42 ft
 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 ; Y-2-3360-3457
 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 2018 (cy): Note 1		
Storm Frequency	Design Condition	100% Burn
100-YEAR	4,595	6,660
50-YEAR	3,550	5,145
25-YEAR	2,550	3,700
10-YEAR	1,570	2,280

Note 1: Recalculated to account for development in watershed. Sediment from upstream undeveloped area must traverse channel to reach basin.

EXPECTED DEBRIS PRODUCTION 1991 (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

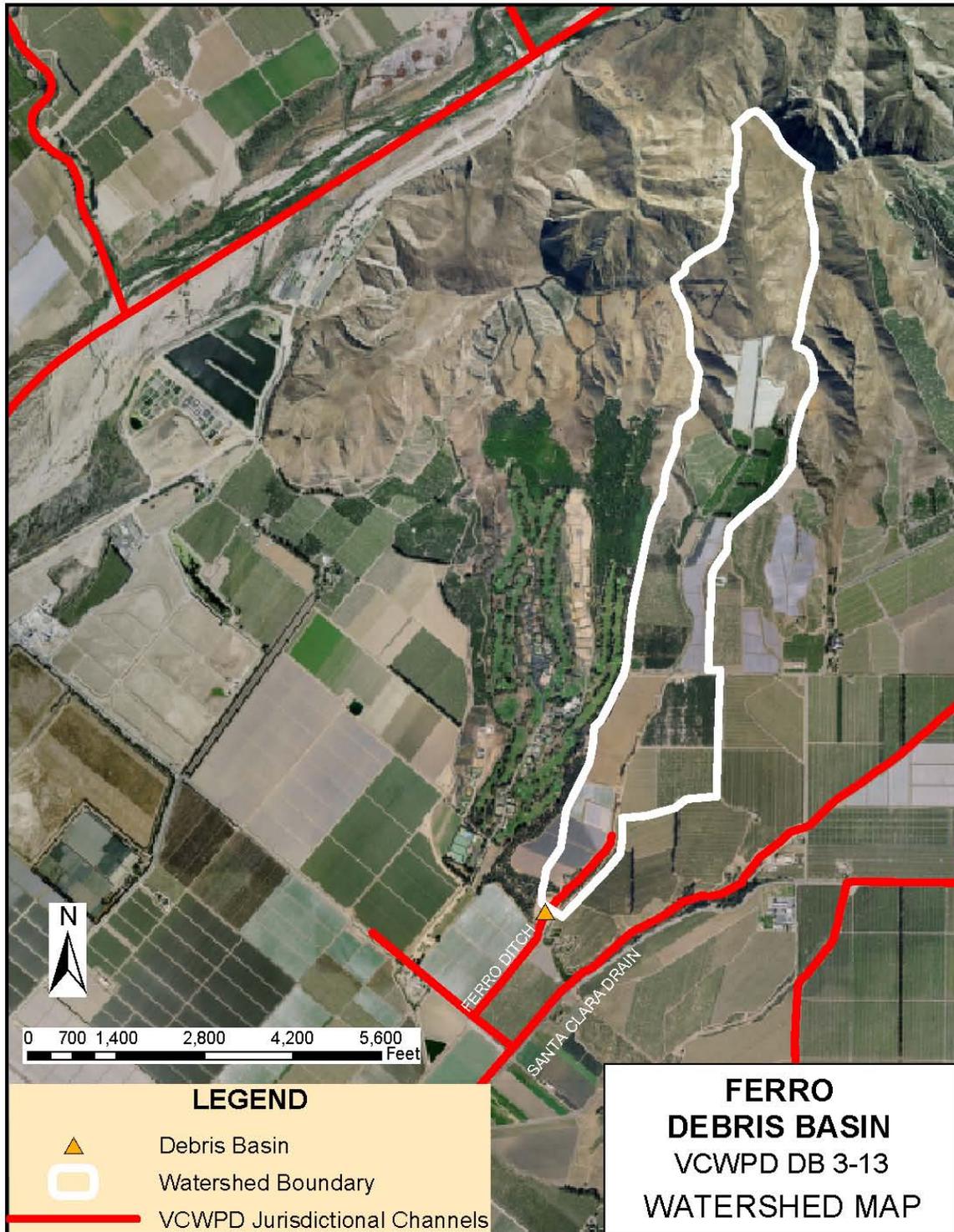
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
02-69	Disaster Declaration			
08-75	Aerial Survey	3,087		
NA	Cleanout		4,813	
03-78	Disaster Declaration			
06-78	Aerial Survey	7,900		
04-79	Cleanout		2,800	
04-79	Aerial Survey	9,499		
02-8	Disaster Declaration			
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		

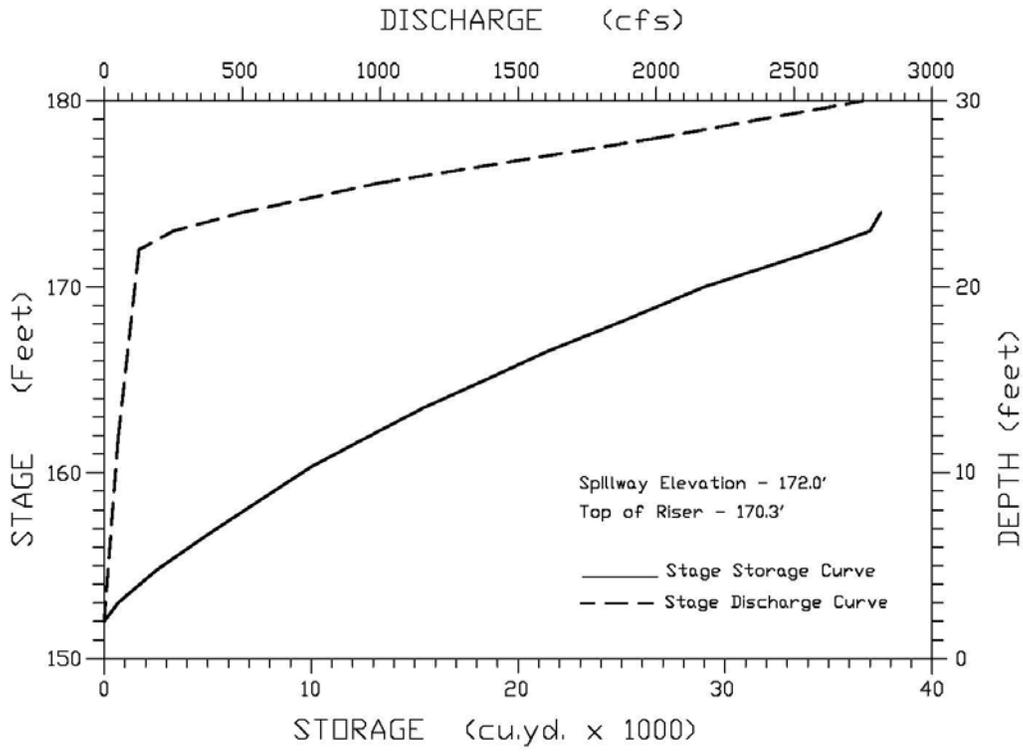
BASIN HISTORY: FERRO DEBRIS BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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
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
06-06	TIN analysis by WR&T	22,370 at elev 172		
06-07	TIN analysis by WR&T	31,436 at elev 172		
06-07	O&M Survey Data Analysis After cleanout		13,016	
06-07	TIN analysis by WR&T 06 vs 07 TIN	07 TIN after cleanout	10,627 fill vol 48 cut vol	

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

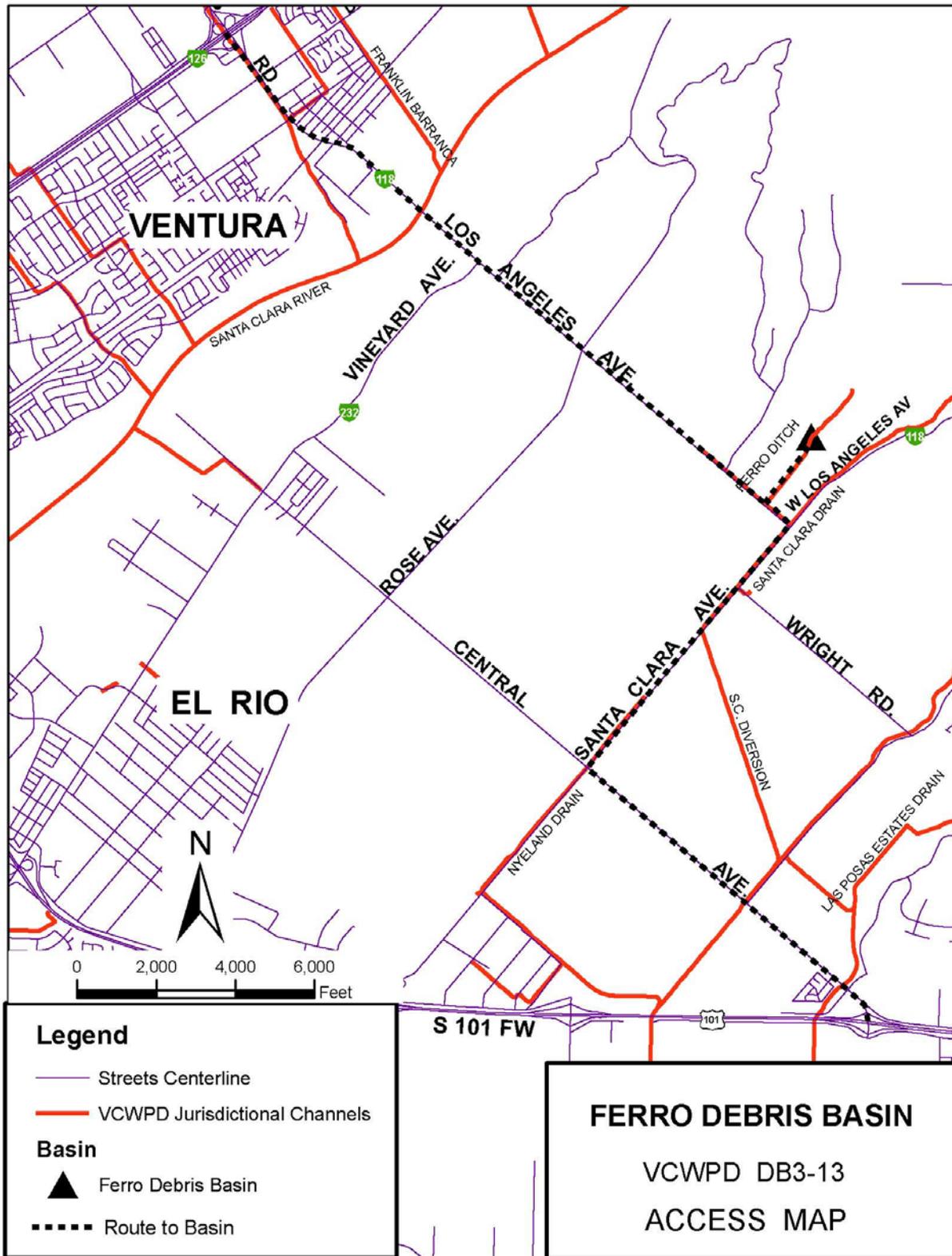




Stage Storage Discharge Curves from 1985 Reconstruction

Stage Storage Discharge Table

Elevation	Stage	Riser Disch. Fm 1999 Manual	Spillway Disch.	06-07 Vol.	Design Storm	
					10-Yr Net Vol.	100-Yr Net Vol.
Ft. NGVD29	ft	cfs	cfs	Cu. Yds	Cu. Yds	Cu. Yds
150	0	0		0		
151		1		15		
152	2	2		74		
152.63	2.63	3.9		NA	-	
153				381		
154	4	8.0		1,187	1,315	
155				2,303		
155.30	5.30	13.2		NA		0
156	6	16		3,490	3,936	911
157				4,746		
158	8	25		6,072	6,760	3,735
159				7,468		
160	10	36		8,936	9,785	6,760
161				10,479		
162	12	47		NA	13,415	10,390
163				NA		
164	14	62		NA	16,641	13,616
165				NA		
166	16	76		NA	20,876	17,851
167				NA		
168	18	92		NA	25,515	22,490
170	20	110		NA	30,657	27,632
172	22	121	-	NA	36,354	33,329
173	23	122.5	150	NA	38,976	35,951
174	24	124	400	NA	41,749	38,724
176	26	127	1,000	NA	47,194	44,169
178	28	129	1,850	NA	52,840	49,815
180	30	132	2,600	NA	59,899	56,874
Interpolated		NA= Not Available, 10- and 100-yr net volumes based on 2018 design volumes + 25% of 100-yr volume used for detention basin design				



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	<u>(Elevations NGVD29)</u>
Design Agency	<u>Soil Conservation Service</u>
Level Capacity	<u>14,700 cy (10-5-90 DTM)</u>
Maximum Debris Capacity	<u>19,300 cy (10-5-90 DTM)</u>
Inflow and Outflow Rates	<u>Q100in=2,600 cfs; Q100out=NA</u>
Debris Cleanout Elevation	<u>304 ft NGVD29 (9,900 cy) [10% of 100-yr debris yield]</u>

<u>EMERGENCY SPILLWAY</u>	
Type	<u>20 ft Weir to Drop Box Inlet 6 ft Deep</u>
Side Weir Elevation	<u>306 ft NGVD29</u>
Spillway Length	<u>NA</u>
Capacity w/o Freeboard	<u>1,400 cfs</u>

<u>PRINCIPAL SPILLWAY</u>	
Type	<u>None</u>
Weir Elevation	<u>NA</u>
Outlet Conduit	<u>NA</u>

<u>DEBRIS BLEEDER/RISER</u>	
Type	<u>12 in Slotted CSP 25 ft High with Catwalk</u>
Top Elevation	<u>305.5 ft NGVD29</u>
Outlet Conduit	<u>10 in Steel Pipe</u>

<u>DAM</u>	
Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>312 ft NGVD29</u>
Length	<u>120 ft</u>
Surface Area of Full Basin	<u>1.4 ac</u>
Watershed Area	<u>3,100 ac from Quad</u>
Width at Crest	<u>NA</u>

<u>CONSTRUCTION DATA</u>	
Construction Agency	<u>Soil Conservation Service; VCWPD</u>
Completion Date	<u>1956; Outlet Works Modified 1991</u>

<u>REFERENCE DRAWINGS</u>	
Construction Drawings	<u>Y-3-1082 to 1085; Y-3-3081-3083</u>
Topographic Drwgs(pre-const)	<u>15812</u>
Right-of-Way Drawings	<u>T-632 (2-6-70), 10-31-88 DTM, 10-5-89 DTM, 10-5-90 DTM</u>

EXPECTED DEBRIS PRODUCTION 2018 (cy): Note 1		
Storm Frequency	Design Condition	100% Burn
100-YEAR	64,515	95,025
50-YEAR	47,645	69,110
25-YEAR	33,335	48,350
10 YEAR	18,680	27,095

Note 1: Development and channel constraints limit debris conveyed to basin. Sediment production based on undeveloped acreage and length of channel through that area.

EXPECTED DEBRIS PRODUCTION 1991 (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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		

VCWPD- Zone 3**Debris and Detention Basin Manual****BASIN HISTORY: FOX BARRANCA DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
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		

VCWPD- Zone 3

Debris and Detention Basin Manual

BASIN HISTORY: FOX BARRANCA DEBRIS BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
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	Survey Analysis by O&M after cleanout		12,018	
11-05	TIN analysis by WR&T	16,661 to elev 306		
06-06	TIN analysis by WR&T 06 vs 05		6,053 Fill vol 108 Cut vol	
06-06	TIN analysis by WR&T	11,522 to elev 306		
07-07	Cleanout by O&M	Truck Count	8,076	
07-07	TIN analysis by WR&T	14,783 to elev 306		
05-08	Cleanout by O&M	Truck Count	3,257	
05-08	TIN analysis by WR&T	11,744 to elev 306		
05-10	Cleanout by O&M	Truck Count	3,603	
05-10	TIN analysis by WR&T	11,181 to elev 306		
05-11	Cleanout by O&M	Truck Count	3,604	
05-11	TIN analysis by WR&T	11,874 to elev 306		
07-15	Cleanout by O&M	Truck Count	5,088	
05-17	TIN analysis by WR&T	10,204 to elev 306 ft 1,604 net deposit since 05-11 6,457 net deposit since 11-05		
07-17	Cleanout by O&M	Truck Count	6,284	

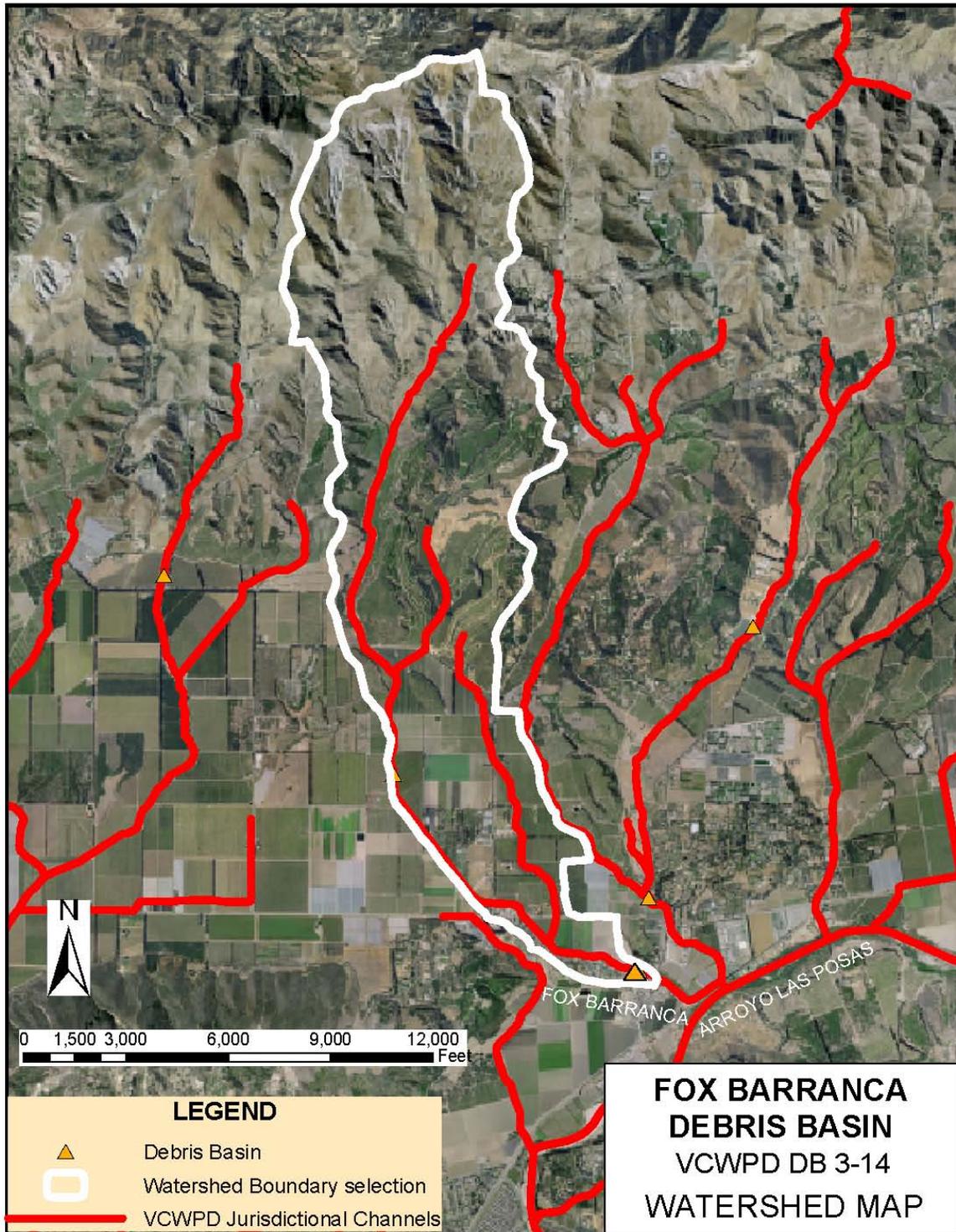
Notes

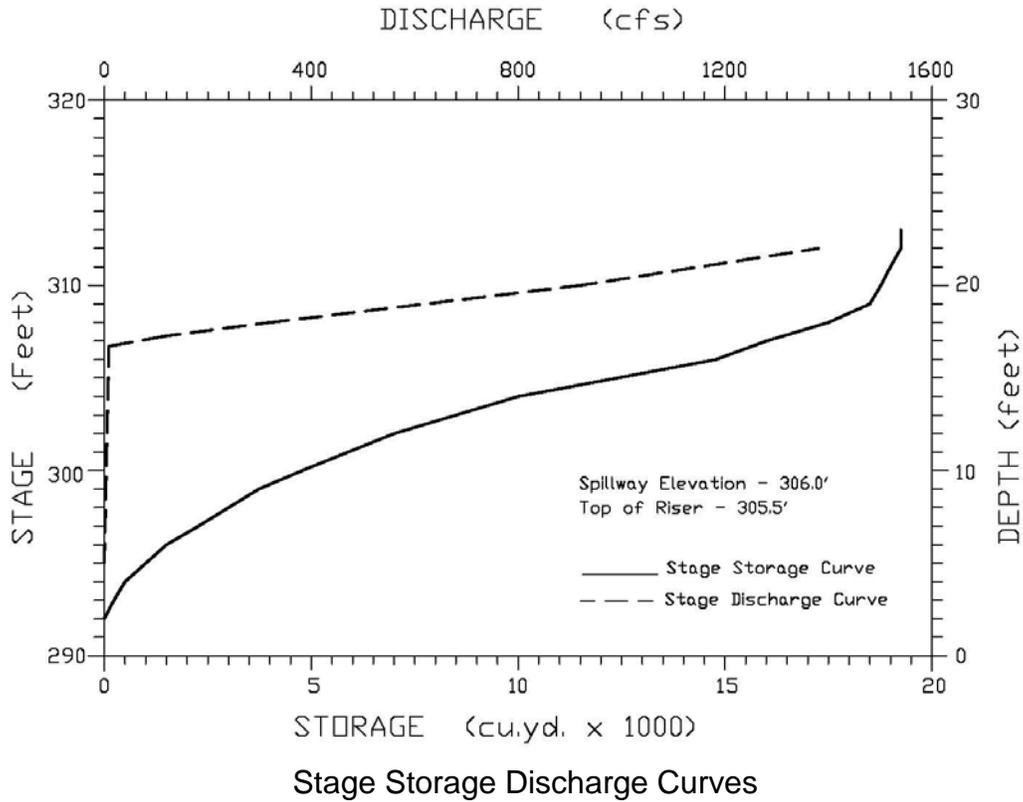
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

*** Theoretical Value from Kevin Scott Formula

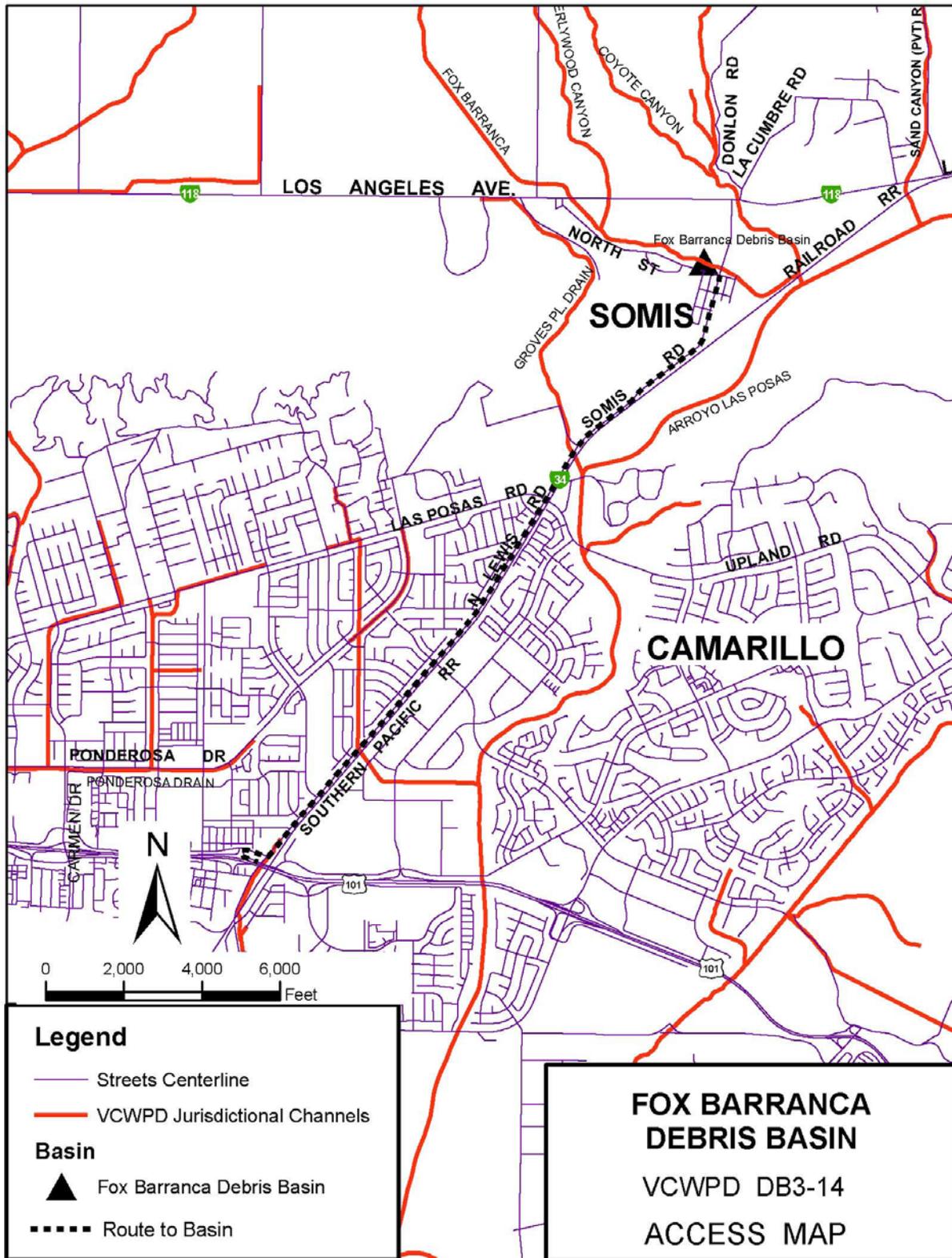
NA= Not Available / Not Applicable





Stage Storage Discharge Table

Elevation	Riser Discharge	Spillway Discharge	11-05 Vol.
Ft. NGVD29	cfs	cfs	Cu. Yds
289			0
290			107
291			275
292			518
293			858
294			1,312
295	0.0		1,884
296	0.7		2,598
297	1.9		3,476
298	3.4		4,509
299	5.2		5,678
300	5.6		6,965
301			8,353
302	6.0		9,830
303			11,392
304	6.3		13,039
305			14,773
306	6.6	-	NA
307	6.8	90	NA
308	6.9	312	NA
309	7.0	641	NA
310	7.1	939	NA
311	7.2	1,160	NA
312	7.3	1,397	NA



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=1,894 (Calleguas 2003) 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
Side Weir Elevation 517 ft NGVD29
Spillway Length NA
Capacity w/o Freeboard 1,252 cfs (from GEI report 2004); 2,500 cfs from Q-Elev Curve. Downstream channel capacity Q100=925 cfs

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

Basin being studied by District for possible upgrade.

EXPECTED DEBRIS PRODUCTION 2018 (cy): Note 1		
Storm Frequency	Design Condition	100% Burn
100-YEAR	31,215	45,275
50-YEAR	22,610	32,795
25-YEAR	15,910	23,080
10-YEAR	9,620	13,955

Note 1: 1,808 ac of watershed developed with orchards, golf course, and residences. Primary undeveloped area is in upper portion of watershed and sediment has to traverse channel and culverts to reach basin. Most of primary slope failure area on geology maps is located in golf course.

EXPECTED DEBRIS PRODUCTION 1972 (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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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	

BASIN HISTORY: GABBERT CANYON DEBRIS BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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	
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	

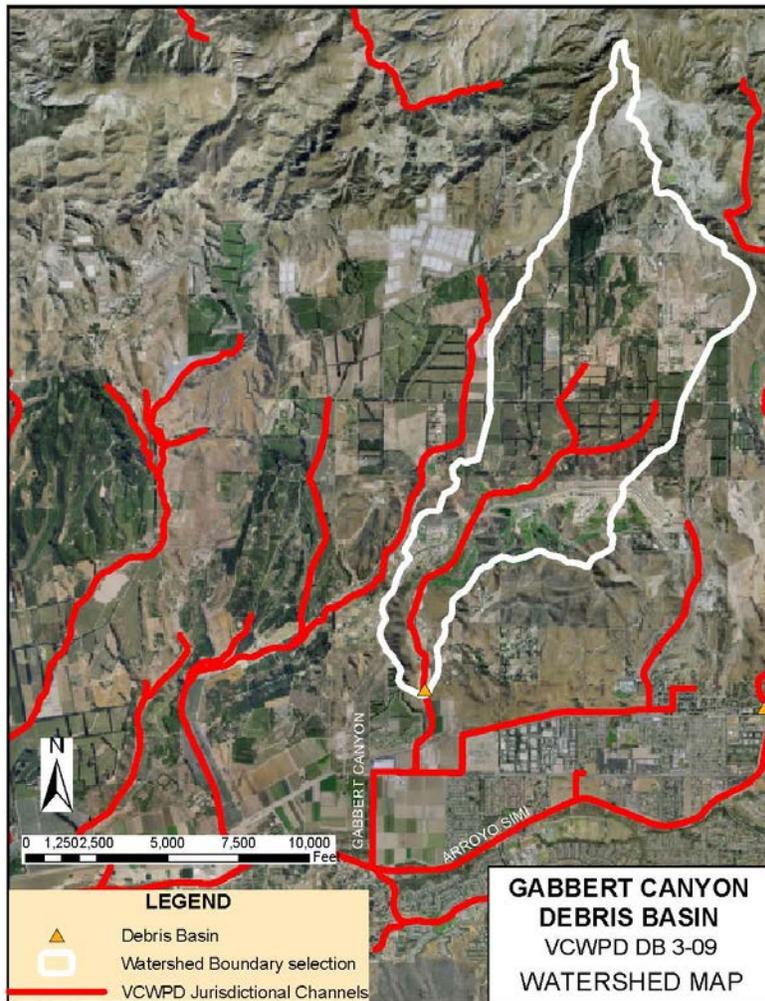
BASIN HISTORY: GABBERT CANYON DEBRIS BASIN

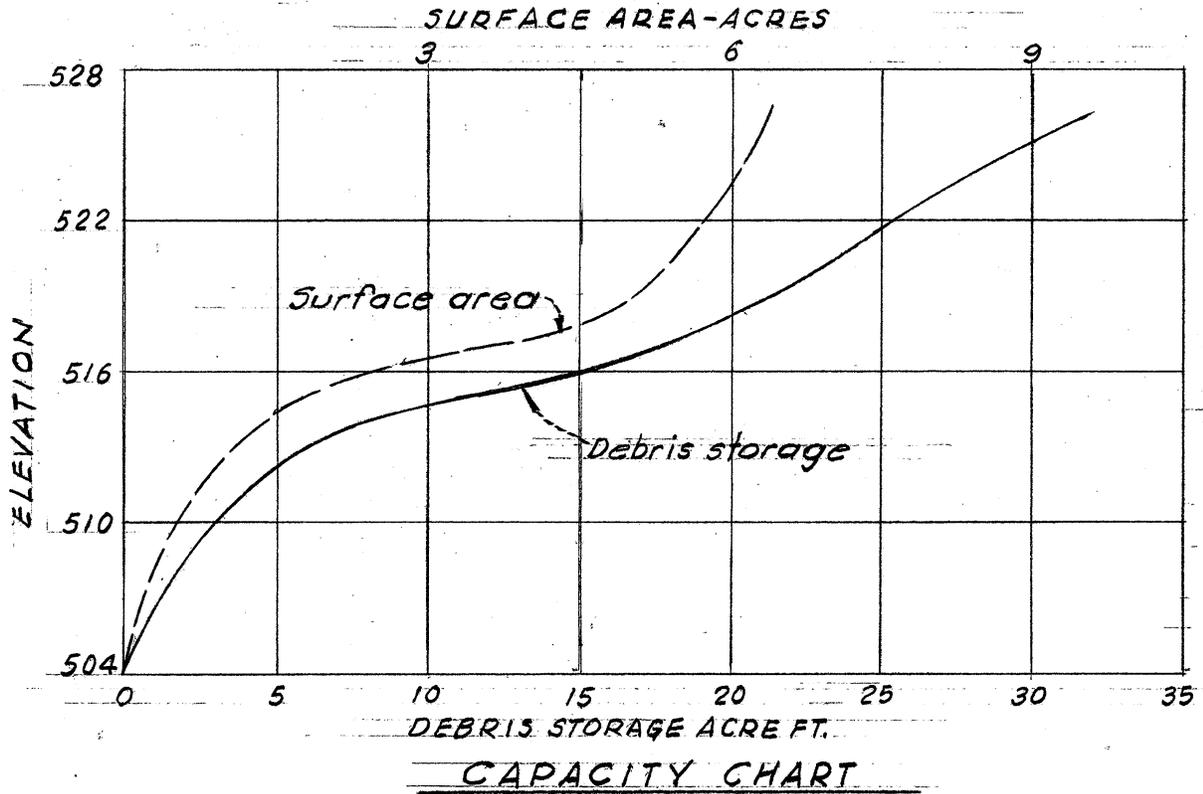
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
06-98	Aerial Survey	53,150		
12-99	Aerial Survey	Not Digitized		
08-01	Aerial Survey	Not Digitized		
11-03	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			6,114
07-05	Multiple Cleanouts by O&M		81,059	
07-05	Cleanout		14,484-Survey	
09-05	TIN analysis by O&M	19,897 to elev. 517		
07-10	Cleanout by O&M	Truck Count	29,680	

Notes

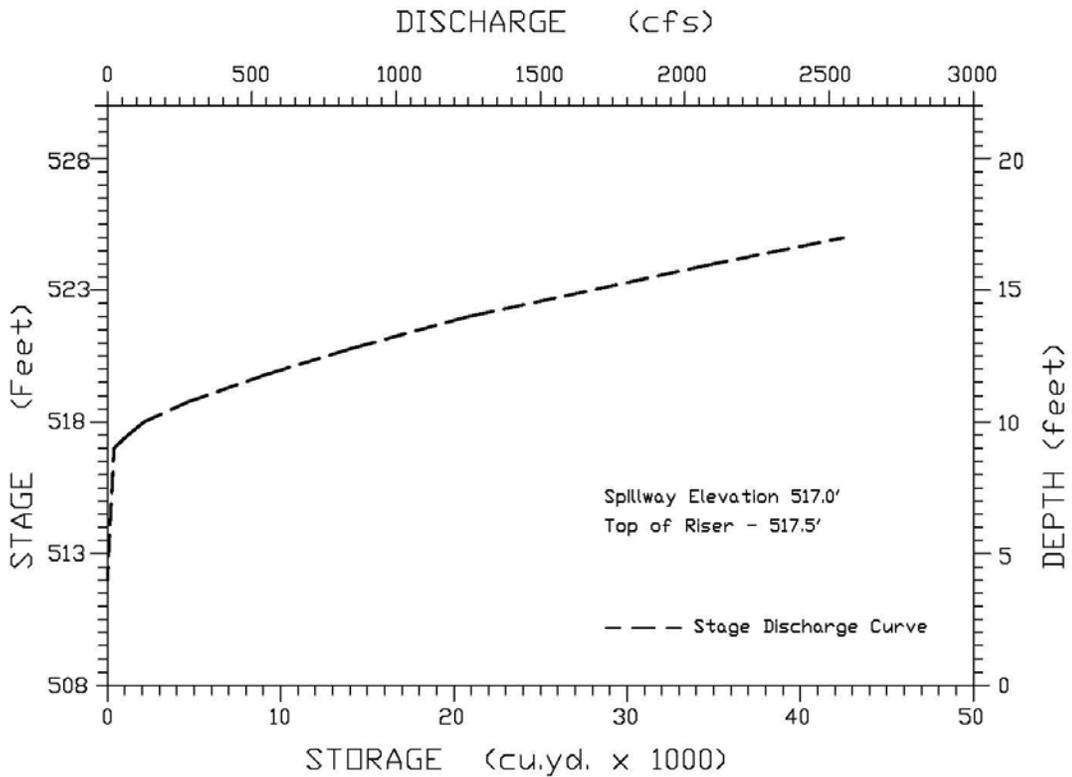
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration





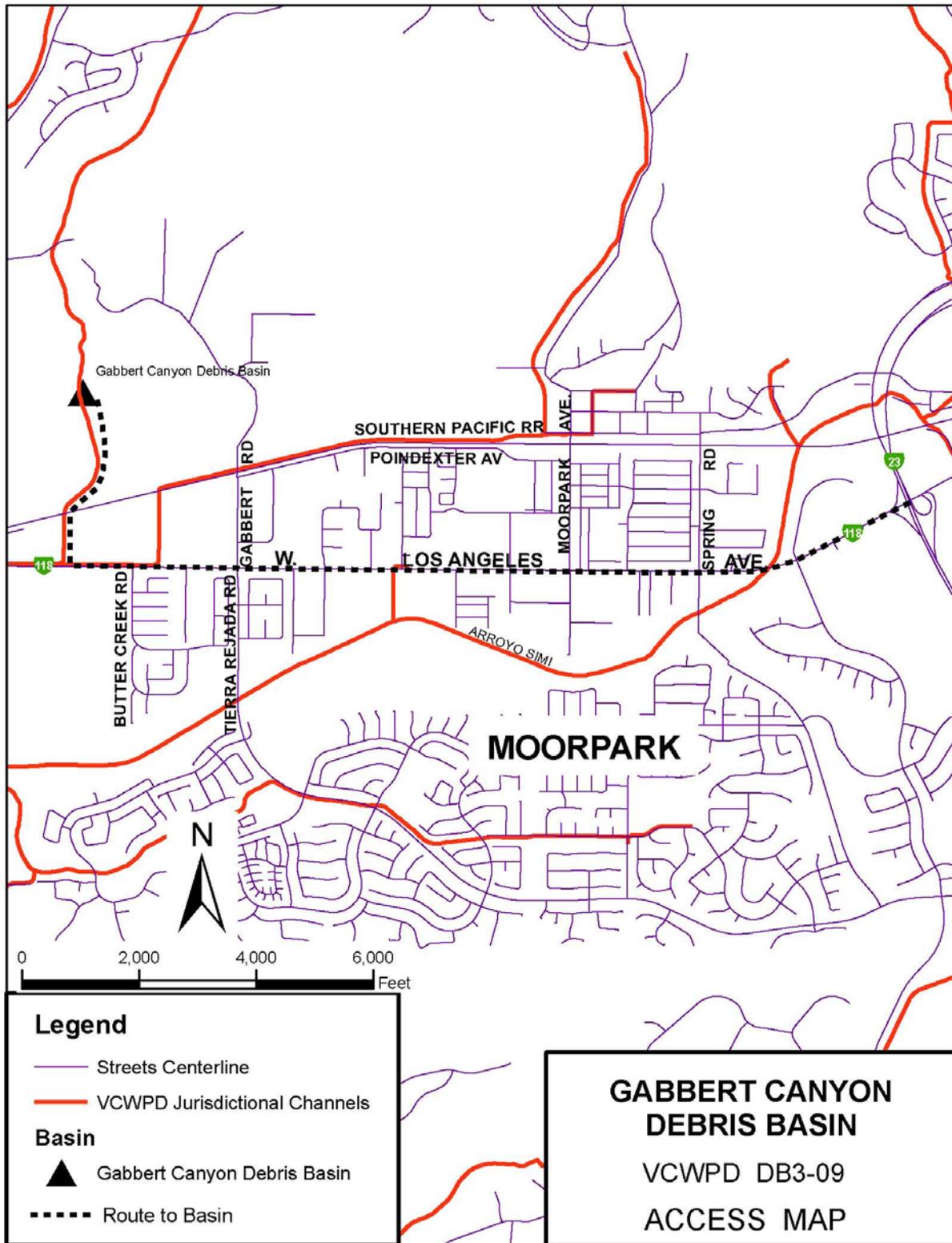
Gabbert Canyon Debris Basin



Stage Storage Discharge Table

Elevation	Riser Disch.	Spillway Disch.	11-05 Vol.
Ft. NGVD29	cfs	cfs	Cu. Yds
510	0		0
511	0.7		372
512	2.5		1,447
513	4.8		3,319
514	7.6		6,172
515	9.6		9,967
516	10.4		14,545
517	11.1	-	19,795
518	11.8	112	25,480
519	12.7	315	NA
520	13.2	580	NA
521	13.6	895	NA
522	14.0	1,250	NA
523	14.4	1,650	NA
524	14.8	2,070	NA
525	15.2	2,530	NA

NA=Not Analyzed



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 Coordinates);
 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): Note 1		
Storm Frequency	Design Condition	100% Burn
100-YEAR	19,970	28,965
50-YEAR	15,275	22,155
25-YEAR	10,555	15,310
10-YEAR	6,505	9,435

Note 1: Yield estimates reduced due to ag activities in watershed and use of longer watercourse length in calculation.

EXPECTED DEBRIS PRODUCTION 1991 (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		

BASIN HISTORY: HONDA WEST DEBRIS BASIN

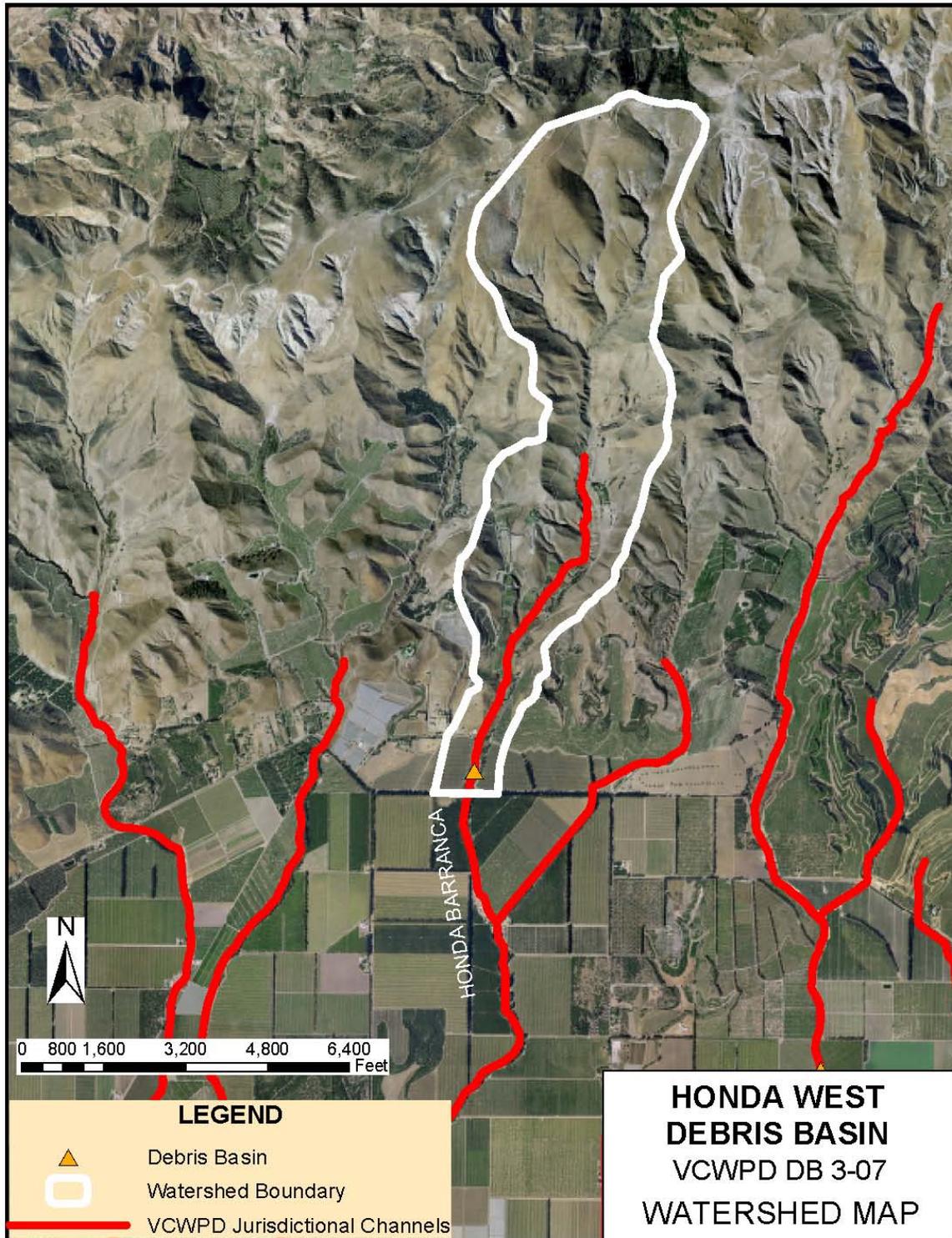
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
11-87	Aerial Survey	13,040		
10-89	Aerial Survey	13,798		562
09-90	Aerial Survey	Not Digitized		
06-91	Aerial Survey	13,050		
02-92	Disaster Declaration			129**
05-92	Aerial Survey	11,950		
07-92	Cleanout		1,102	
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 by O&M	Survey Analysis	10,872	
11-05	TIN analysis by WR&T	9,415 to elev 578		
11-05	TIN analysis by WR&T- 11-05 vs 05-05		11,323 Fill vol 127 Cut vol	
05-17	TIN analysis by WR&T- 11-05 vs 05-17	No cleanouts reported since 2005	2,387 Fill vol 64 Cut Vol	

Notes

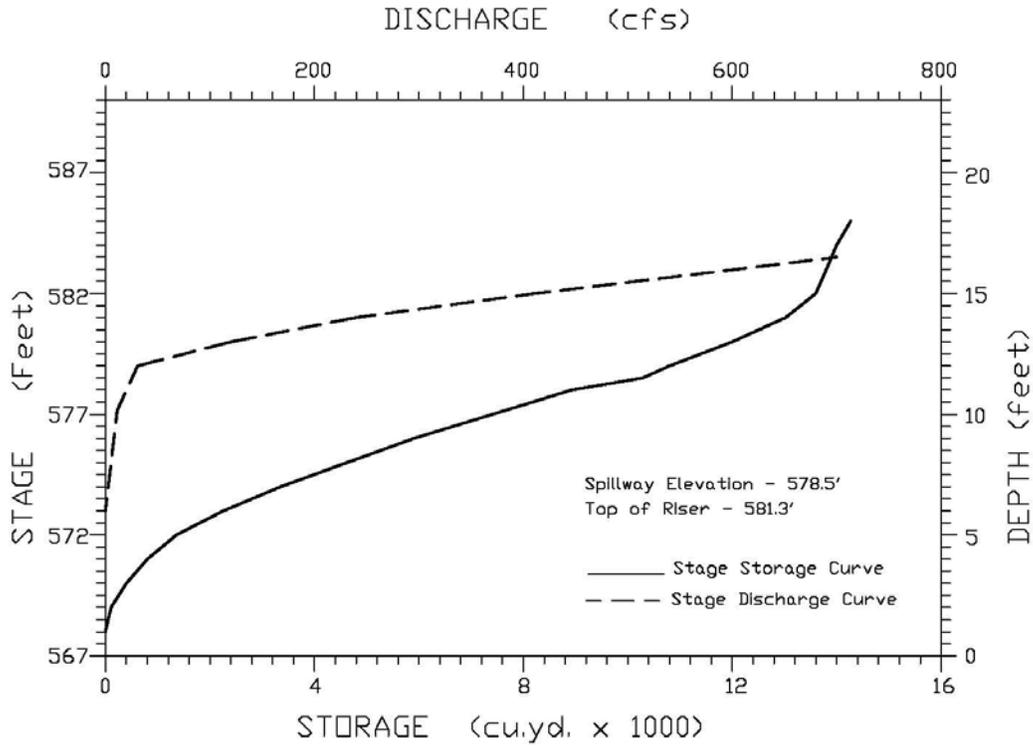
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable

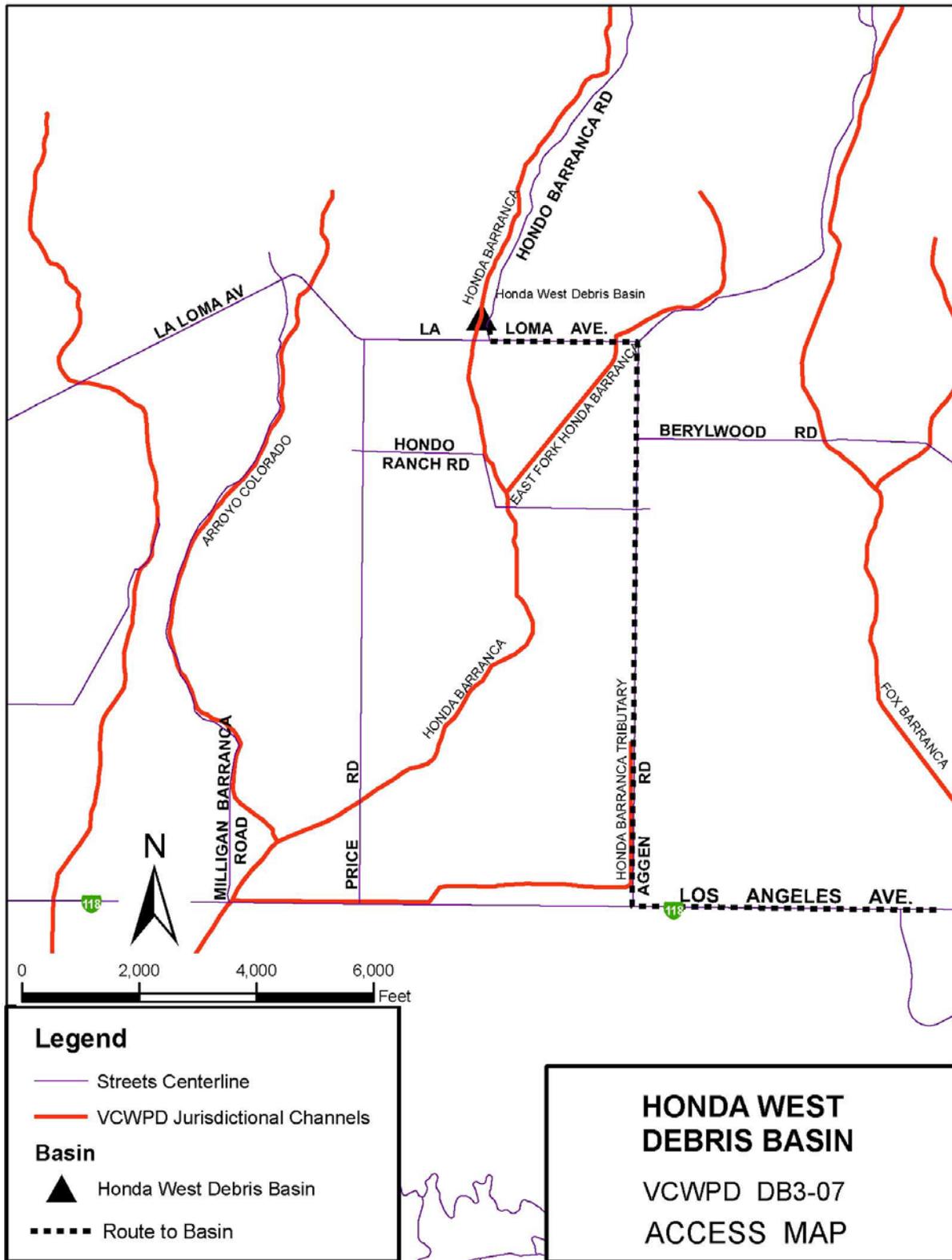


HONDA WEST DEBRIS BASIN



Honda West TIN Volume Analysis, 11-2005 After Cleanout

		Cumulative	Cumulative
Stage	Elev.	Volume	Volume
		Conic	Conic
(ft)	(ft NGVD29)	(cu. ft)	(Cu. Yds)
0	568	-	-
0.5	568.5	7,302	270
1	569	15,175	562
1.5	569.5	21,575	799
2	570	40,319	1,493
2.5	570.5	57,804	2,141
3	571	67,357	2,495
3.5	571.5	73,304	2,715
4	572	86,998	3,222
4.5	572.5	99,438	3,683
5	573	105,435	3,905
5.5	573.5	113,039	4,187
6	574	122,102	4,522
6.5	574.5	130,227	4,823
7	575	136,652	5,061
7.5	575.5	139,778	5,177
8	576	144,515	5,352
8.5	576.5	148,000	5,481
9	577	150,393	5,570
9.5	577.5	151,692	5,618
10	578	151,996	5,629



LANG CREEK DEBRIS BASIN DB3-31 State Size Dam

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 3,250 cfs based on as-builts

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)
 Height 33 ft (Road surface to spillway outlet)
 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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
01-05	Disaster Declaration			1,680***
07-05	Survey analysis by O&M after cleanout		1,535-Survey	
11-05	TIN analysis by WR&T 11-05 vs 08-05		1,505 Fill vol 26 Cut vol	

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 State Size Dam 86-11

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	<u>VCWPD</u>
Level Capacity	<u>263 ac-ft at Spillway</u>
Maximum Debris Capacity	<u>None- Debris Basin Intercepts</u>
Inflow Rates	<u>Q50=2,476 cfs, Q100=2,906 cfs</u>
Outflow Rates	<u>Q50=608 cfs, Q100=647 cfs at 1031.7 ft NGVD29</u>

EMERGENCY SPILLWAY

Type	<u>Drop Box Inlet, 17 ft (W) x 94 ft (L)</u>
Weir Elevation	<u>1034 ft NGVD29</u>
Spillway Length	<u>NA</u>
Capacity w/o Freeboard	<u>7,127 cfs</u>

PRINCIPAL SPILLWAY

Type	<u>RC Intake Tower 29 ft High with Catwalk</u>
Top Elevation	<u>1014 ft;</u>
Outlet Conduit	<u>60 in RCP</u>
Low Level Inlet	<u>5 ft X5 ft low level inlet at 985 ft NGVD29 with sloped trash rack</u>
Top Elevation	<u>High Stage Inlet 10 ft Wx5 ft H at 1,008 ft NGVD29</u>

DEBRIS BLEEDER/RISERNone**DAM**

Dam Type	<u>Earthfill</u>
Dam Crest Elevation; Height	<u>1040.8 ft NGVD29; 56 ft</u>
Length	<u>345 ft</u>
Surface Area of Full Basin	<u>12 ac</u>
Watershed Area	<u>2,325 ac from GIS Watershed Layer Shapefile</u>
Width at Crest	<u>20 ft</u>

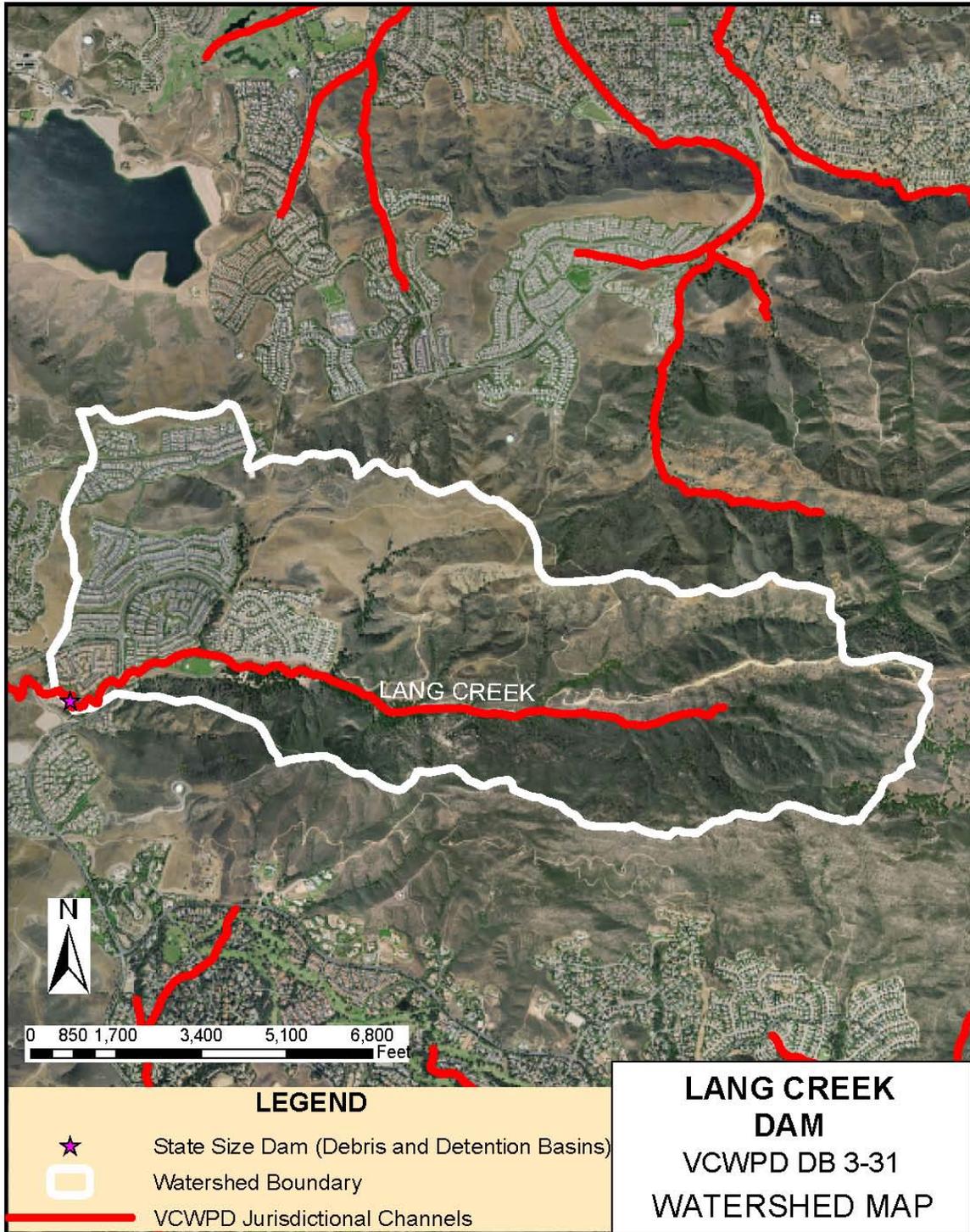
CONSTRUCTION DATA

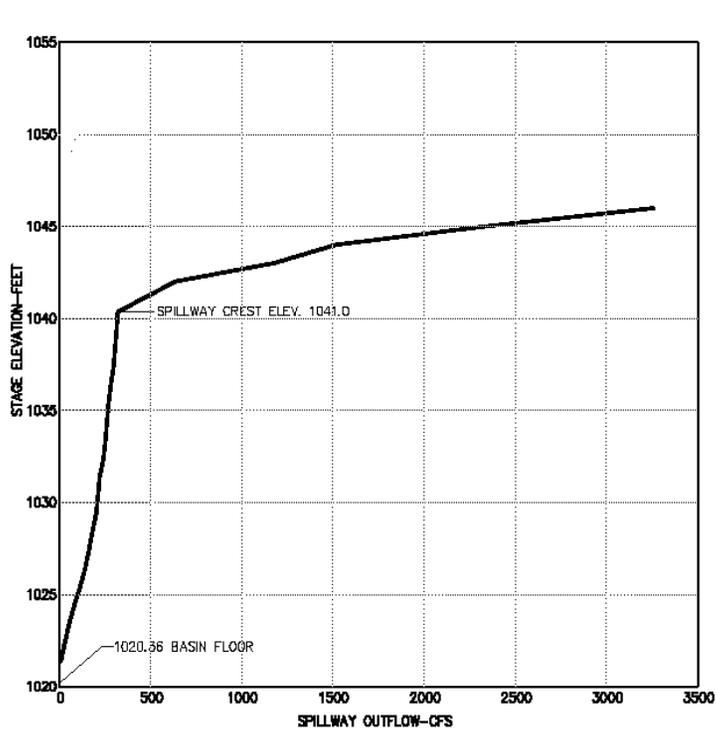
Construction Agency	<u>VCWPD with City of Thousand Oaks</u>
Completion Date	<u>2004</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-4049 – Y-3-4094</u>
Right-of-Way Drawings	<u>17625 - 17626</u>
Topographic Drawings	<u>NA</u>

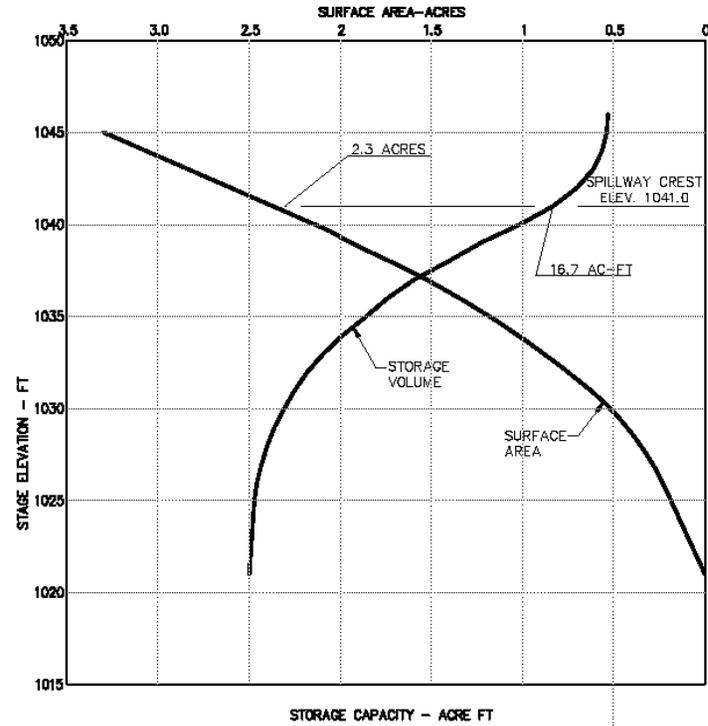
Sediment Yield and Debris Removal Information- refer to Lang Creek Debris Basin





SPILLWAY RATING CURVE

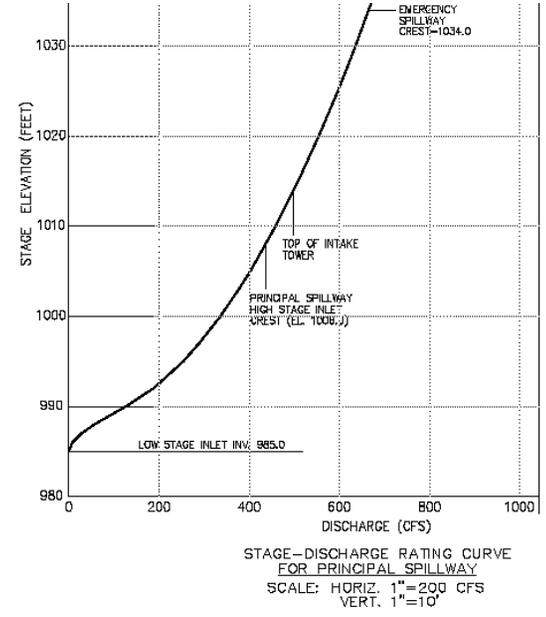
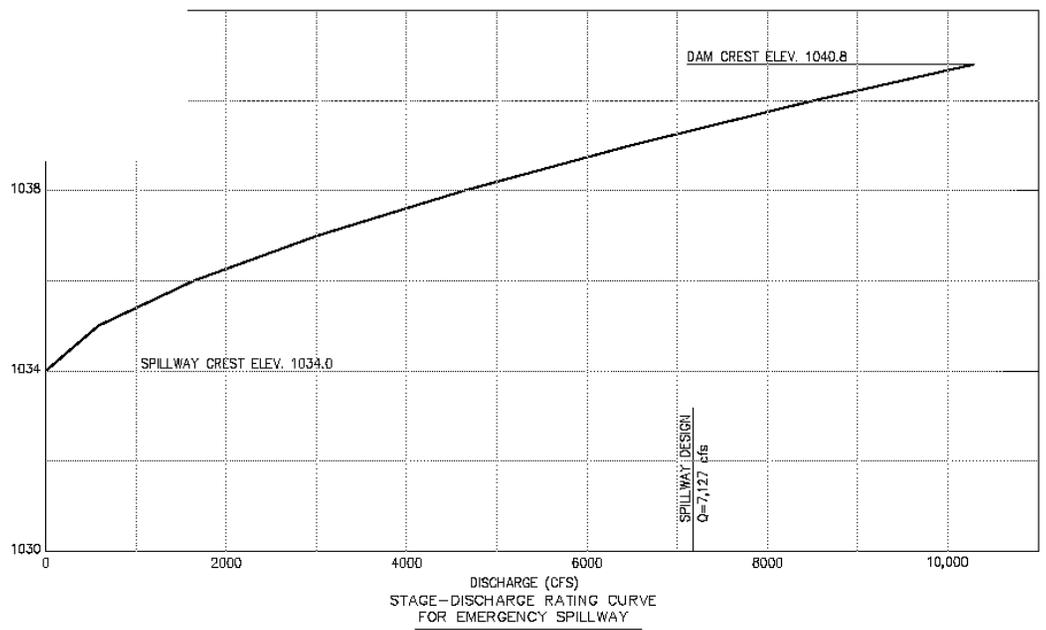
SCALE: HORIZ 1"=500 CFS
VERT 1"=5'



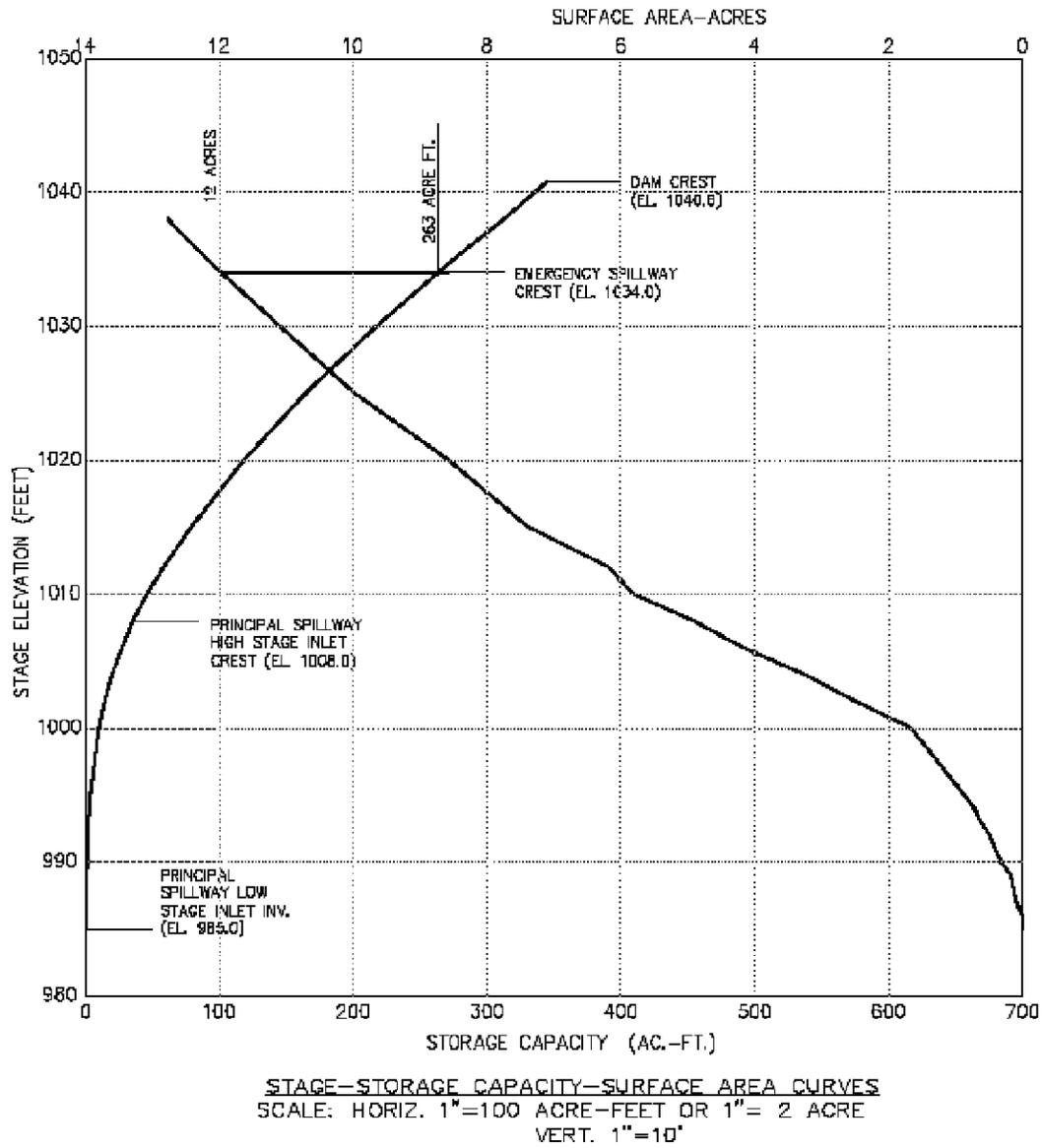
AREA-CAPACITY CURVES

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

Lang Creek Debris Basin



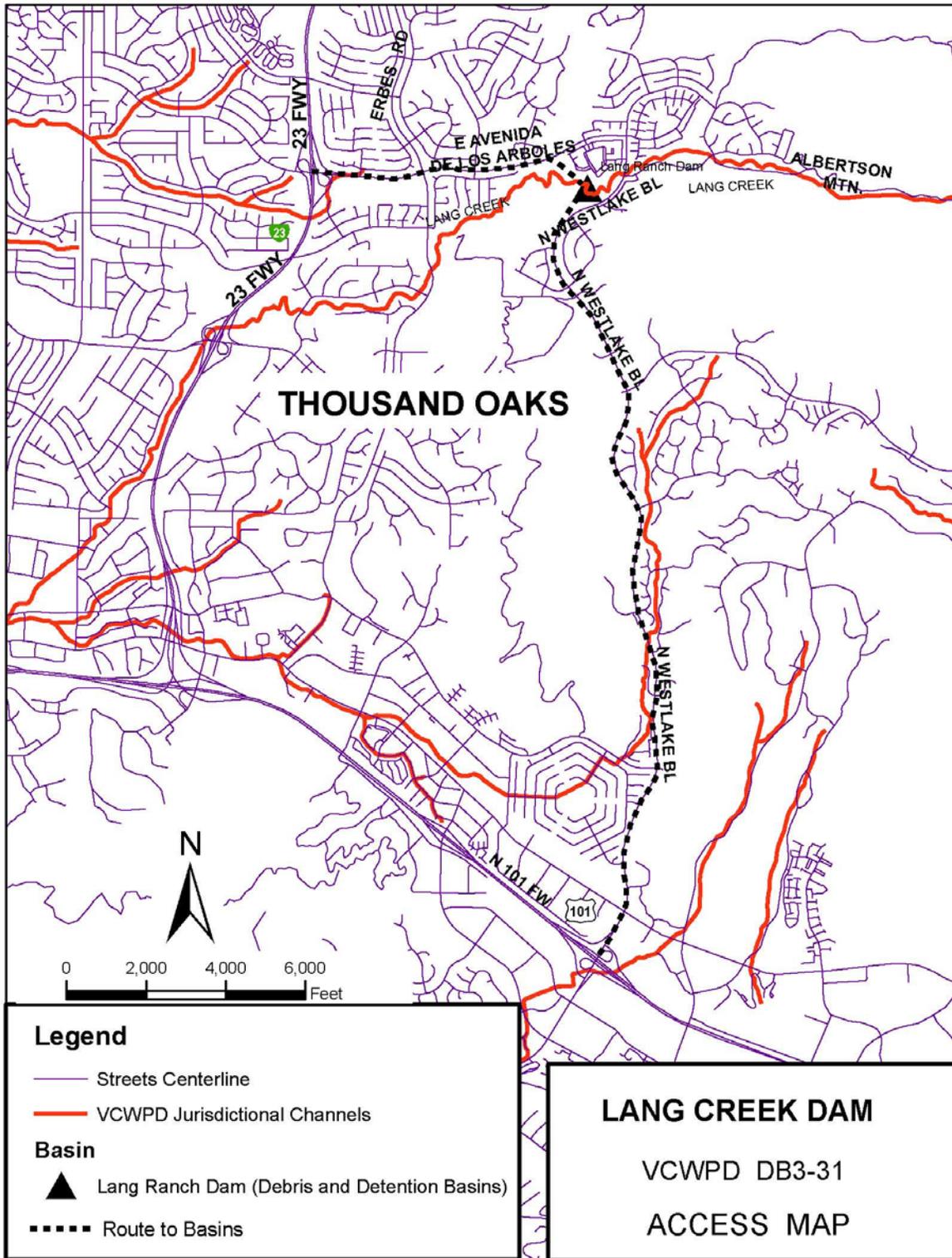
Lang Creek Detention Basin



Lang Creek Detention Basin

Lang Detention Stage-Storage-Discharge Data Estimated from As-Builts

Elevation	As-Built	Riser	Spillway	Total
Ft. NGVD29	Ac-Ft	Cfs	Cfs	Cfs
985	0	0		-
986		8		8
987		28		28
988		56		56
989		90		90
990	0.7	134		134
992	2.0	184		184
994	3.0	234		234
996	5.0	272		272
998	7.0	308		308
1000	10.0	334		334
1002	14.0	366		366
1004	20.0	390		390
1006	28.0	412		412
1008	36.0	432		432
1010	47.0	456		456
1012	60.0	480		480
1014	72.0	496		496
1016	86.0	518		518
1018	102.0	534		534
1020	119.0	556		556
1022	138.0	572		572
1024	154.0	588		588
1026	174.0	604		604
1028	195.0	620		620
1030	216.0	636		636
1032	240.0	652		652
1034	263.0	668	0	668
1035	275.5	675	590	1,265
1036	288.0	682	1,470	2,152
1037	301.0	691	3,000	3,691
1038	314.0	700	4,660	5,360
1039	325.0	704	6,370	7,074
1040	336.0	708	8,500	9,208



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; Height 1,240 ft NGVD29; 90 ft
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

BASIN HISTORY: LAS LLAJAS CANYON DETENTION DAM

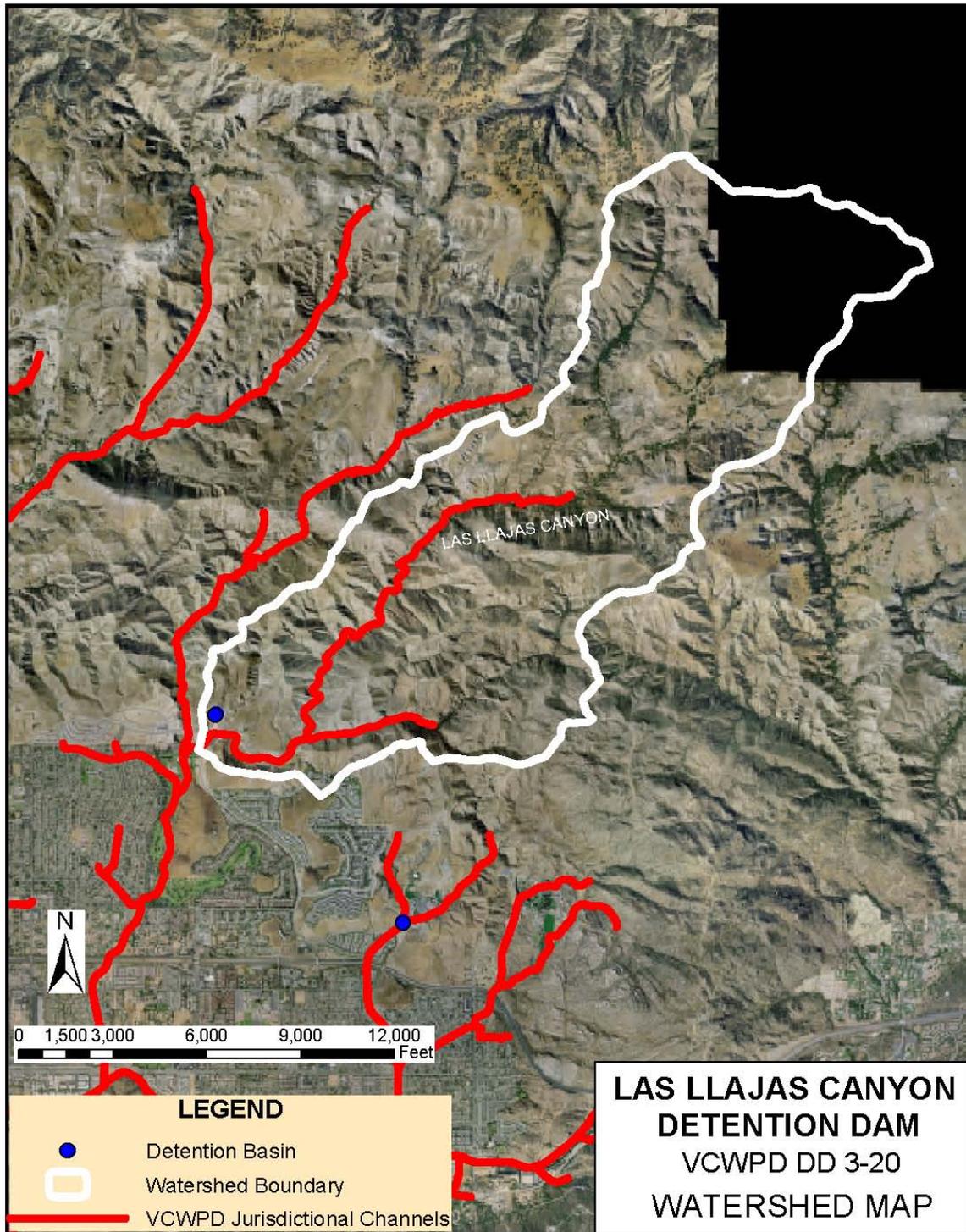
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (ac-ft)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
01-80	Dam Constructed			
11-81	As Built Survey	933.70 (ac-ft)		
03-83	Disaster Declaration			4,500***
12-85	Aerial Survey	Not Digitized		
02-92	Disaster Declaration			4,500***
08-93	Cleanout		4,009	
01-95	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		
11-04	Cleanout by O&M	Aerial Survey Analysis	159,336	
11-04	TIN analysis by WR&T 11-04 vs 07-04		25,109 Fill vol 38,621 Cut vol	
01-05	Disaster Declaration			4,300***
10-05	Cleanout by O&M	Aerial Survey Analysis	66,907	
04-05	TIN analysis by WR&T 04-05 vs 11-04		226,531 Fill vol 22,361 Cut vol	
12-05	TIN analysis by WR&T 12-05 vs 11-04		122,844 Fill vol 153,643 Cut vol	
08-06	TIN analysis by WR&T 08-06 vs 12-05		106,875 Fill vol 9,523 Cut vol	

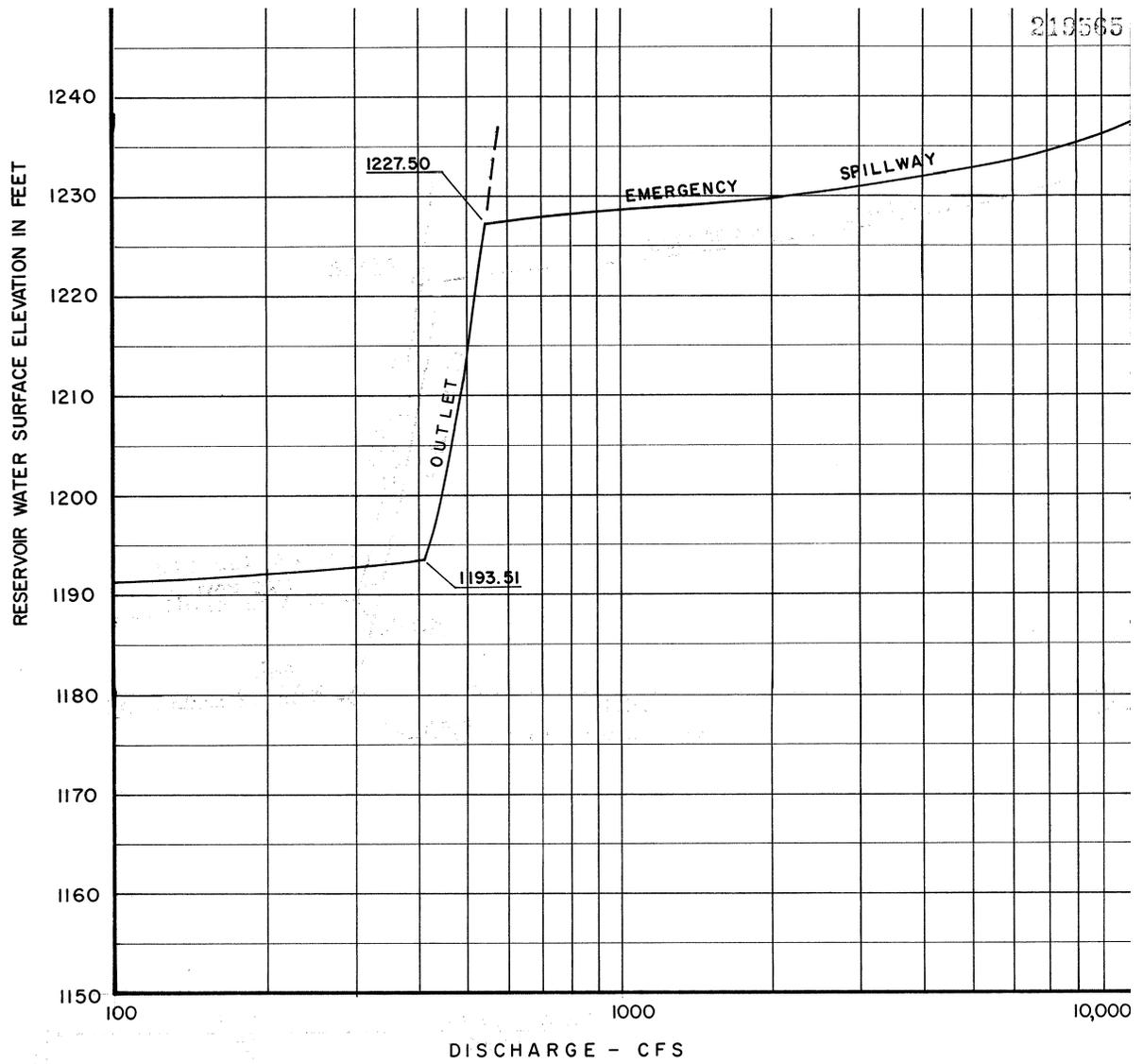
Notes

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

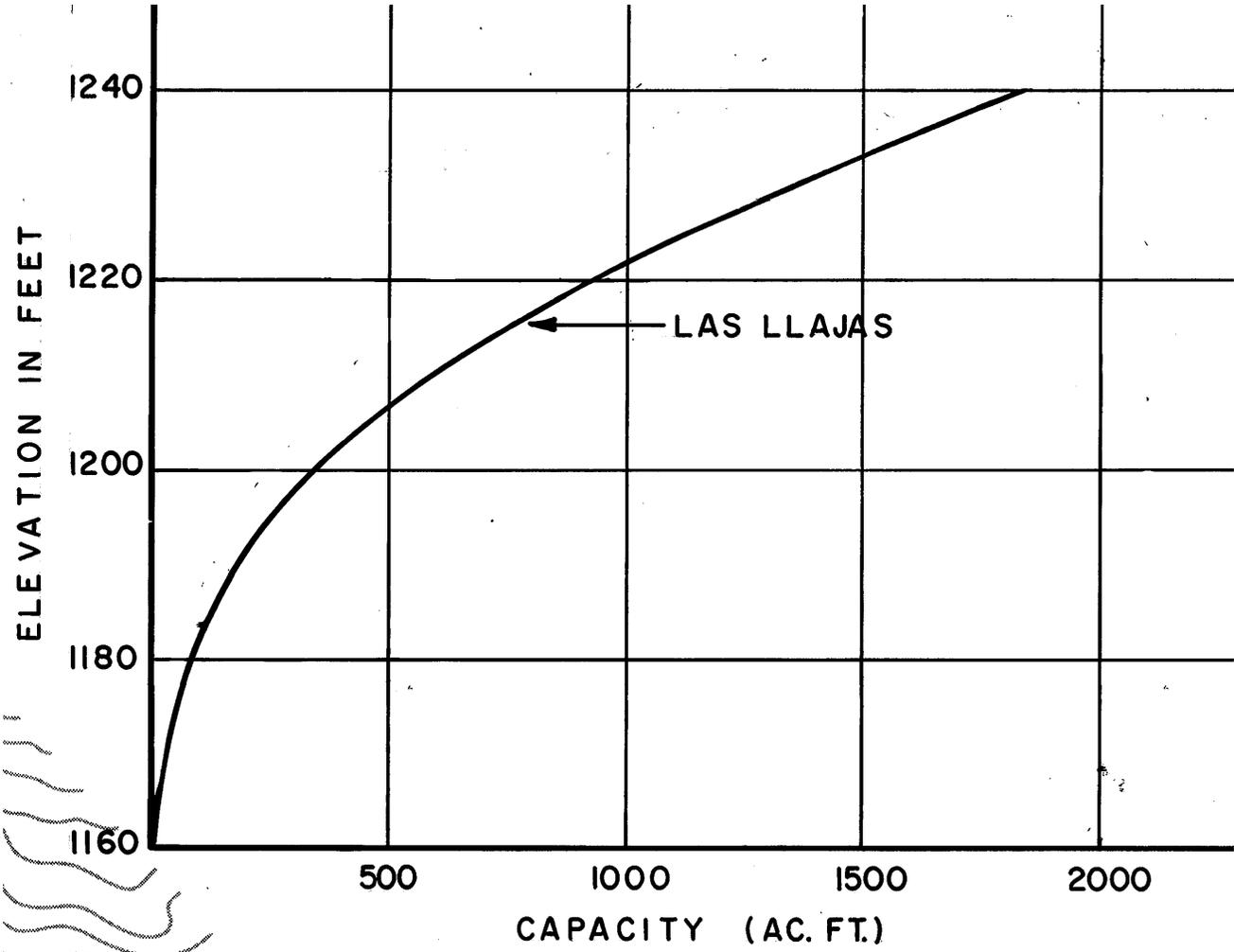
*** Theoretical Value from Kevin Scott Formula; ~3% of Sediment Yield from 50-yr storm, Updated 7/2005

NA= Not Available / Not Applicable





Las Lajas Detention Basin



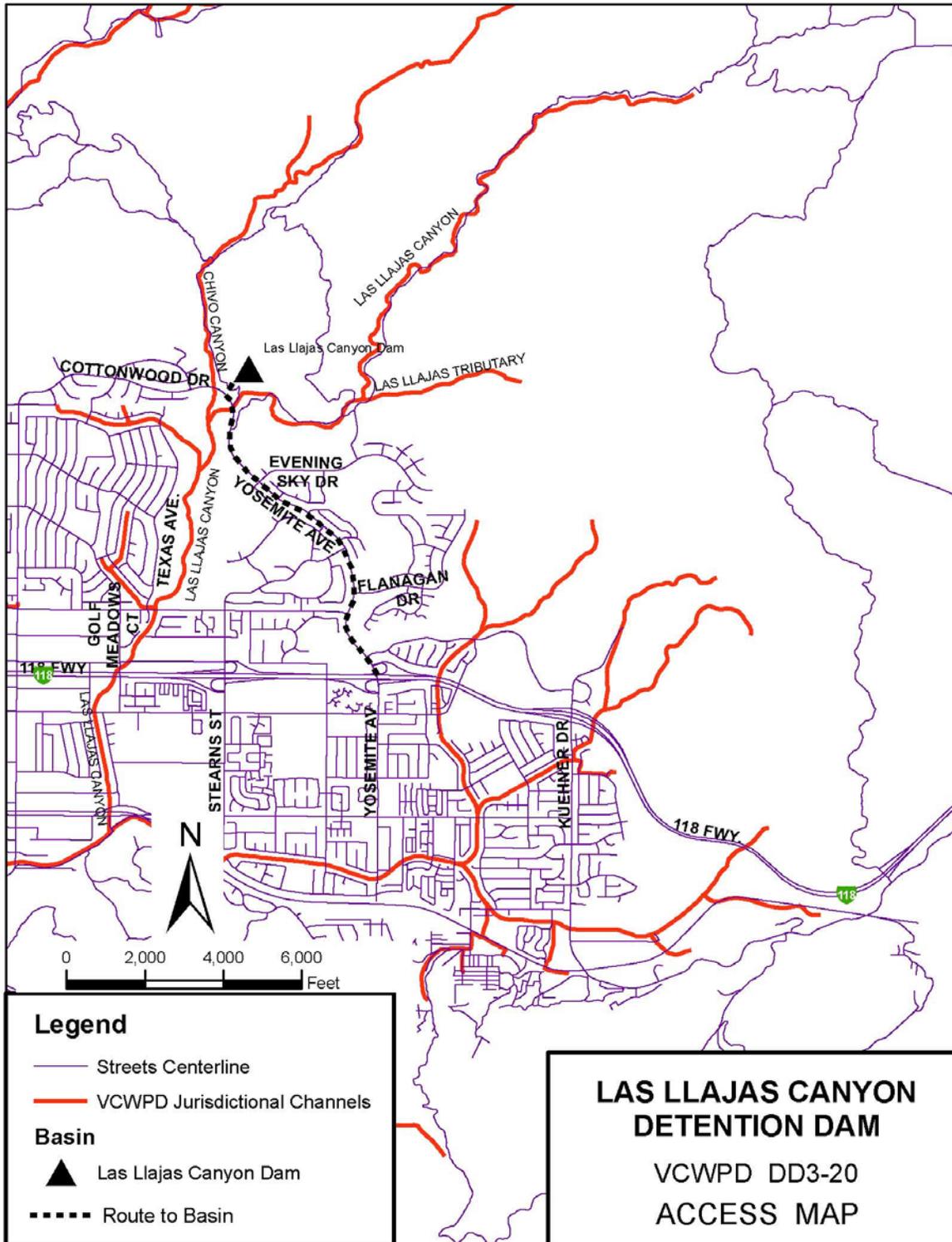
RESERVOIR STORAGE CURVES

Stage Storage Discharge Data

		VCRat Design Model Data			
Elevation	As-Built Vol.	10/05 TIN Vol.	Elevation	Net Vol.	Total Q
Ft. NGVD29	Ac-Ft	Ac-Ft	Ft. NGVD29	Ac-Ft	Cfs
1162	-	-			
1164		0.285			
1166	17.50	1.109			
1168	27.50	2.203			
1170	35.00	3.523			
1172	40.00	5.052			
1174	50.00	6.952			
1176	60.00	9.324			
1178	70.00	12.094			
1180	85.00	15.538			
1182	100.00	19.768			
1184	110.00	24.620			
1186	130.00	31.743			
1188	155.00	42.441			
1190	175.00	56.137	1190	0	0
1192	200.00	72.589	1191	17	46
1194	230.00	93.689	1192	33	129
1196	260.00	120.592	1193	50	236
1198	300.00	151.640	1194	67	364
1200	340.00	186.821	1194.6	75	418
1202	380.00	226.553	1200	170	460
1204	425.00	270.655			
1206	475.00	318.719			
1208	525.00	370.943			
1210	580.00	427.516	1210	428	500
1212	650.00	488.342			
1214	700.00	552.838			
1216	760.00	621.528			
1218	850.00	694.575			
1220	930.00	770.950	1220	788	538
1222	1,010.00	NA	1225	965	554
1224	1,080.00	NA			
1226	1,165.00	NA			
1228	1,260.00	NA	1228	1,093	664.8

			VCRat Design Model Data		
Elevation	As-Built Vol.	10/05 TIN Vol.	Elevation	Net Vol.	Total Q
Ft. NGVD29	Ac-Ft	Ac-Ft	Ft. NGVD29	Ac-Ft	Cfs
1230	1,360.00	NA	1229	1,129	1,148.4
1232	1,450.00	NA	1230	1,175	2,102.0
1234	1,560.00	NA	1231	1,218	3,455.4
1236	1,650.00	NA	1232	1,260	4,438.8
1238	1,740.00	NA	1235	1,428	8,189.0
1240	1,825.00	NA	1235.38	1,444	8,338.3

NA= Not Analyzed



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; Q100out=62 cfs
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

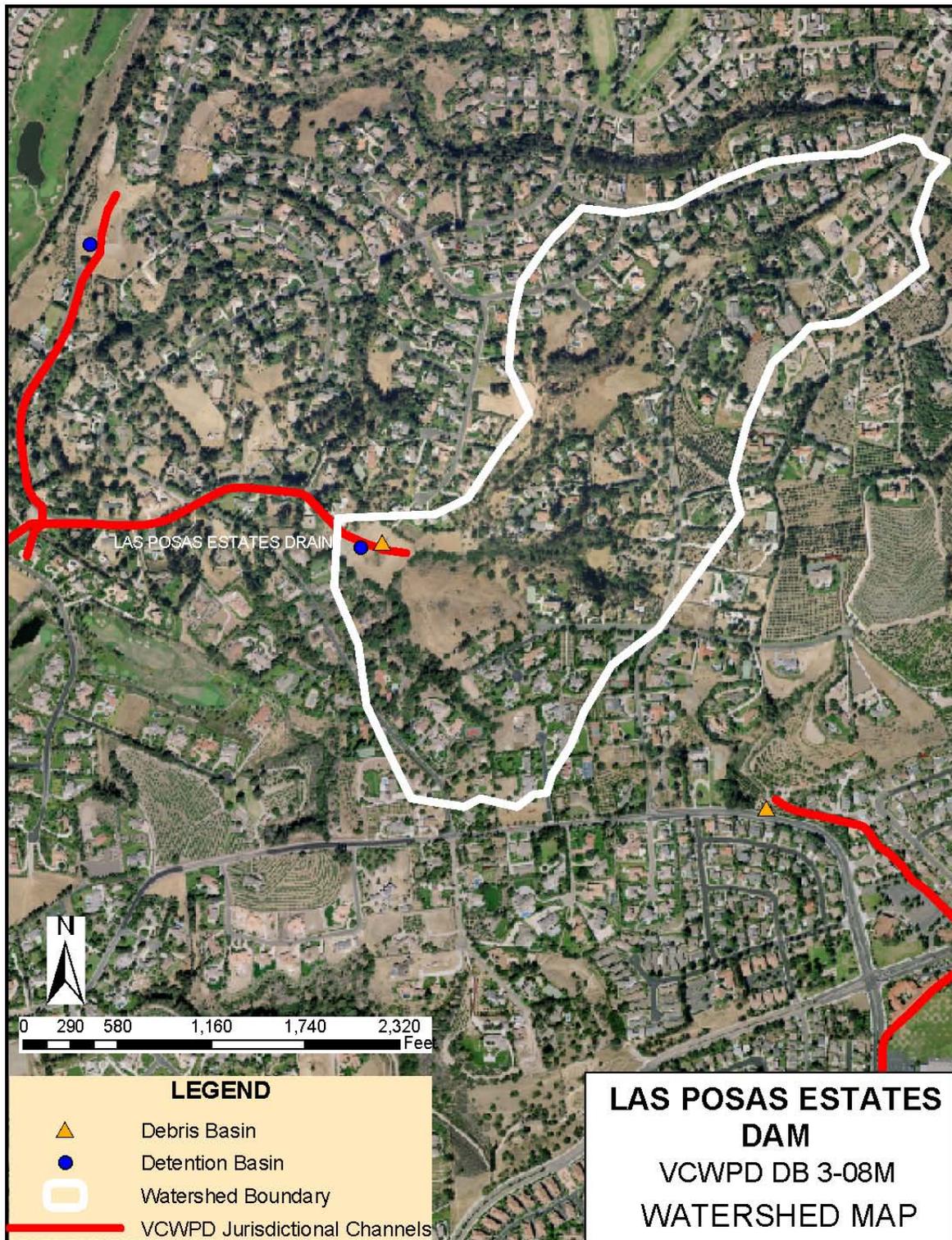
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
11-92	New Basin Completed			
11-92	Aerial Survey	2,423 debris storage, 24,684 flood		720
02-94	Cleanout		4,009	
01-95	Disaster Declaration			
08-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey	Not Digitized		
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
		<u>OLD DEBRIS BASIN DB3-08</u>		
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		<u>NEW BASIN COMPLETED</u>		

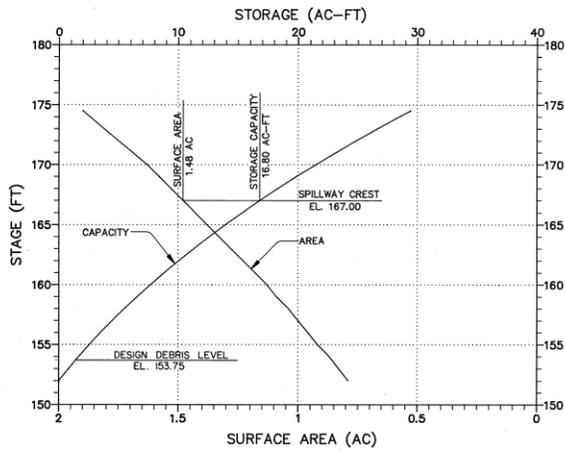
Notes

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

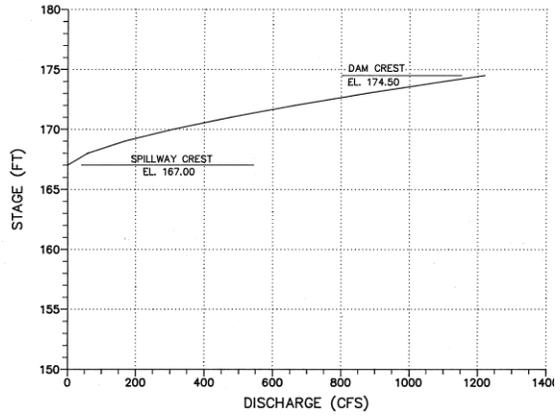
*** Theoretical Value Scott and Williams (1978) (10% of 50-yr yield for old basin)

NA= Not Available / Not Applicable

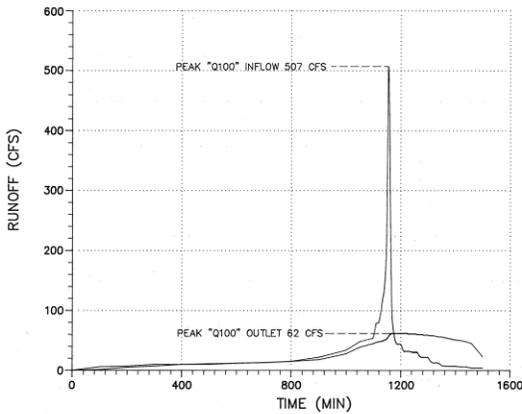




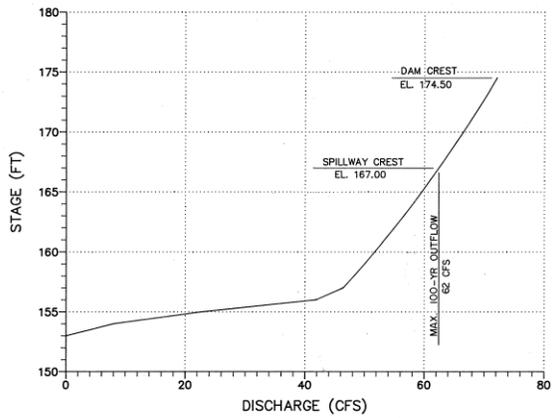
AREA-CAPACITY CURVE



STAGE-DISCHARGE CURVE
EMERGENCY SPILLWAY



DESIGN STORM HYDROGRAPH

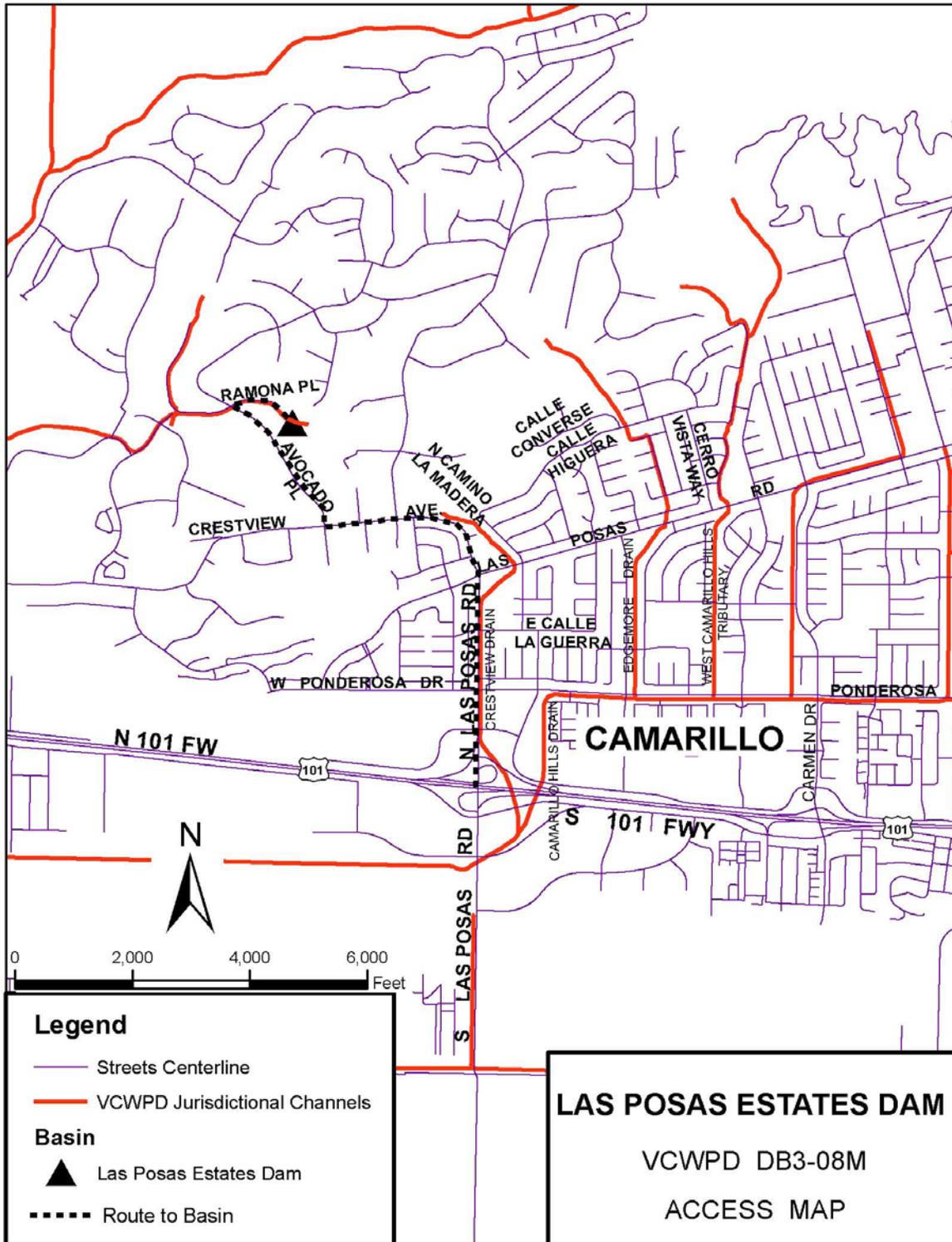


STAGE-DISCHARGE CURVE
OUTLET PIPE



Las Posas Estates Detention Basin

Elevation	1997 Data Net Vol.	As-Built	Riser	Spillway	Total
Ft. NGVD29	Ac-Ft	Ac-Ft	Cfs	Cfs	Cfs
152	-	-	0.0		-
153	-	0.8	0.0		-
154	0.170	1.6	8.1		8.1
155	1.060	2.5	22.8		22.8
156	2.000	3.5	41.8		41.8
157	2.980	4.4	46.4		46.4
158	4.000	5.6	48.2		48.2
159	5.070	6.1	50.0		50.0
160	6.180	7.1	51.7		51.7
161	7.330	8.8	53.3		53.3
162	8.540	10.0	55.0		55.0
163	9.790	11.3	56.5		56.5
164	11.090	12.7	58.0		58.0
165	12.440	13.9	59.5		59.5
166	13.850	15.3	61.0		61.0
167	15.300	16.8	62.4	-	62.4
168	16.810	18.3	63.7	59.4	123.2
169	18.360	20.0	65.0	168.1	233.1
170	19.970	21.5	66.3	308.8	375.1
171	21.640	23.2	67.5	405.3	472.9
172	23.360	24.8	68.7	491.5	560.2
173	25.140	26.6	69.8	582.9	652.8
174	26.980	28.9	70.9	679.6	750.5
174.5	28.890	29.5	71.4	729.7	801.1



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 Arroyo Simi Bank Protection
Topographic Drwgs(pre-const) NA
Right-of-Way Drawings NA

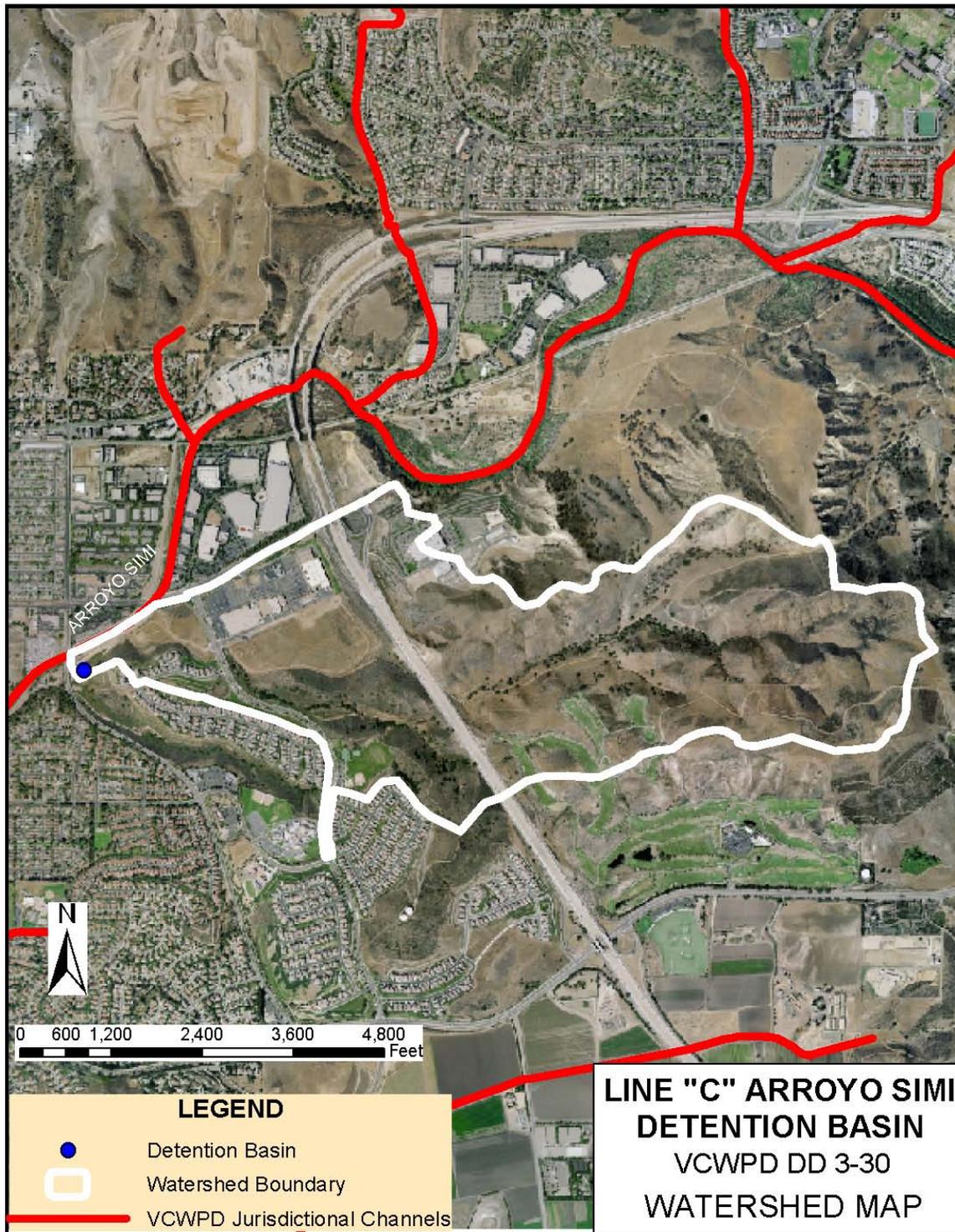
EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	12,956	18,793
50-YEAR	9,878	14,328
25-YEAR	6,390	1,010

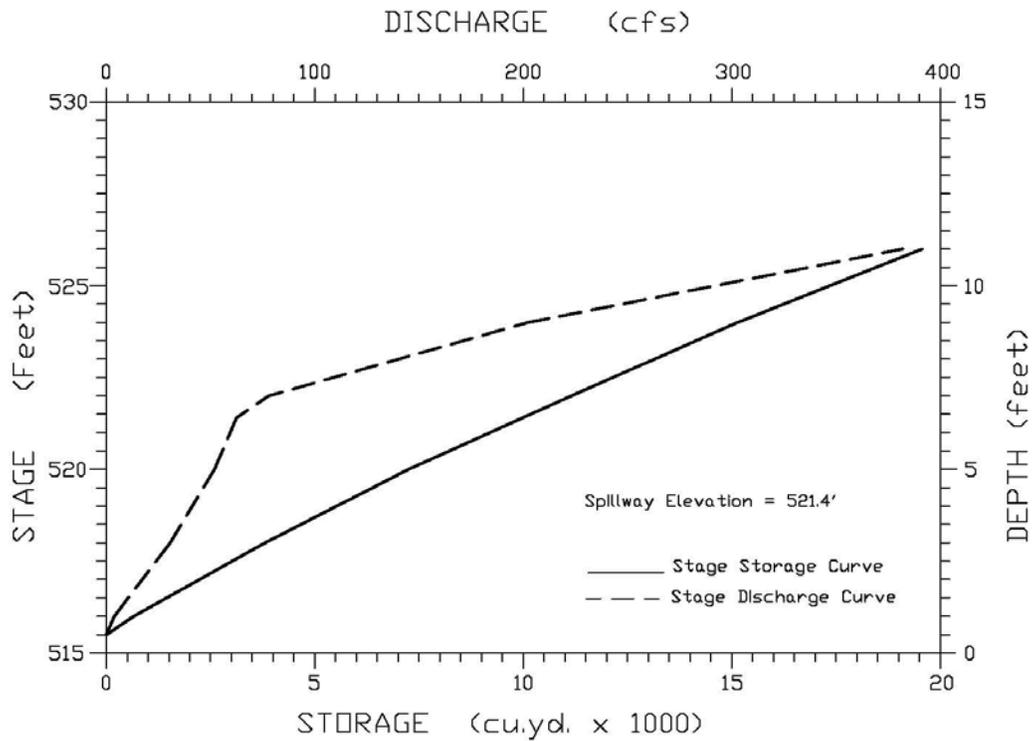
BASIN HISTORY: LINE "C" DETENTION BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
01-05	Disaster Declaration	No cleanout data reported by O&M		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

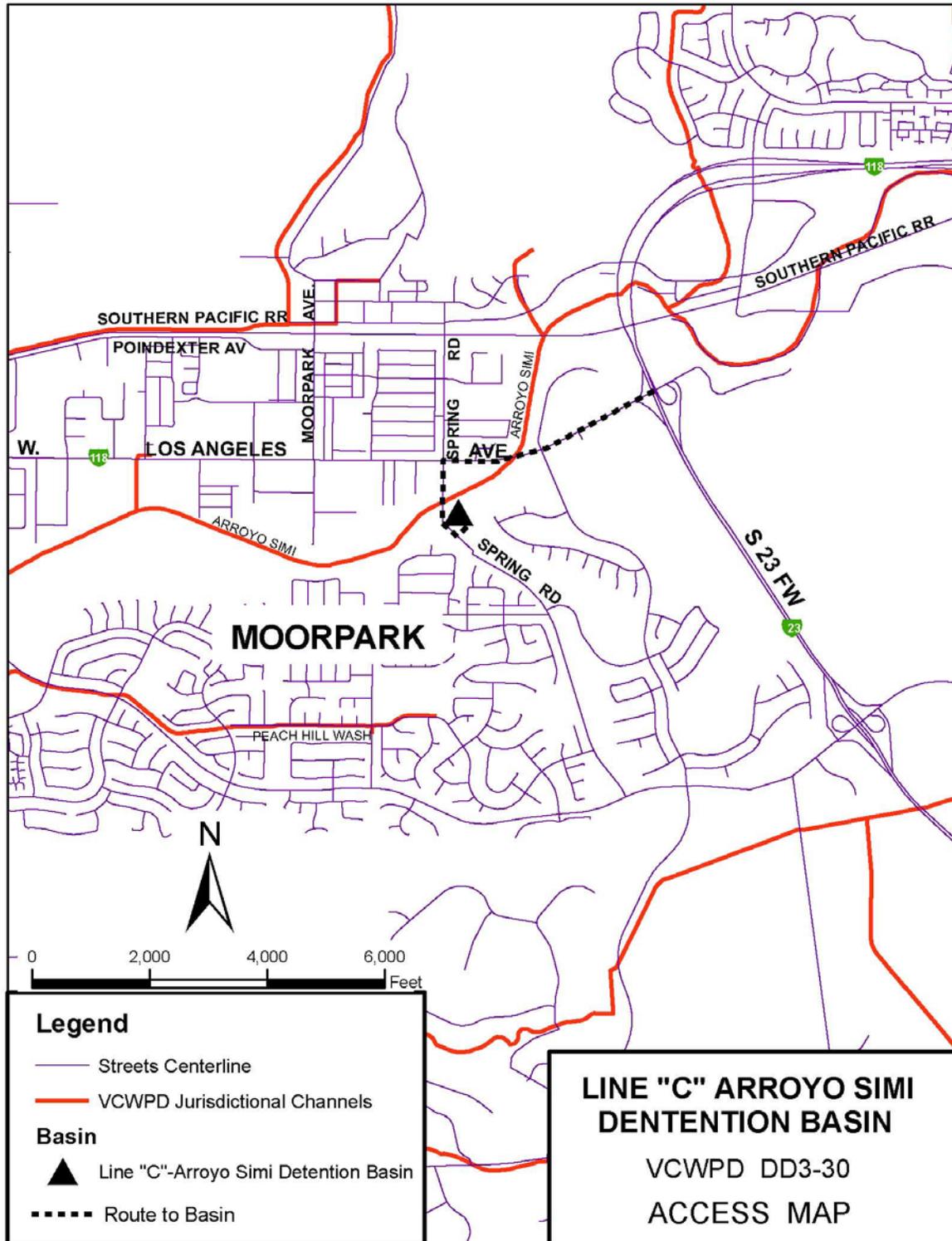




Stage Storage Discharge Data

Elevation Ft. NGVD29	Volume Ac-Ft	Discharge cfs
515.5	-	-
516.0	0.40	3.8
518.0	2.34	30.6
520.0	4.51	51.9
521.4	6.14	62.4
522.0	6.84	77.8
524.0	9.32	202.4
526.0	12.05	382.0

Source: VCRat Model Data supplied by Ramseyer (design engineer)



MUIRFIELD NPDES & DETENTION BASINS DD3-25

LOCATION: Simi Valley, Between Erringer and Bus Canyon Tributaries nr Muirfield Drive
 N 274,390,E 1,770,270 (Lambert Zone 5 Coordinates);
 Simi 7 1/2' Quad.

DESIGN DATA

(Elevations ft NGVD29)

Design Agency Crosby Mead Benton
 Level Capacity 2,300 cy at spillway invert (Y-3-3837)
 Maximum Debris Capacity 125% of 100-yr Volume
 100-Yr Inflow Rate 78 cfs
 Outflow Rate 23 cfs at emergency spillway invert
 Debris Cleanout Elevation Elev. 885 ft 110 cy (25% of 100-yr sediment volume)

EMERGENCY SPILLWAY

Type Top of Tower Adj. to Principal Spillway, 4 x 6 ft drop inlet
 Crest Elevation 892 ft NGVD29
 Spillway Length 16 ft
 Capacity w/o Freeboard 190 cfs

PRINCIPAL SPILLWAY

Type 4 ft x 4 ft Rect. Tower w/ 2 4x5' openings protected by trash rack
 Inlet Weir Elevations 887.5 ft NGVD29
 Outlet Conduit 36 in RCP
 Outflow Rates 23 cfs w/ full basin

DEBRIS BLEEDER

Type None

DAM

Dam Type Earthfill topped by roadbed
 Dam Crest Elevation 894.2 ft NGVD29
 Length NA
 Surface Area of Full Basin 0.27 ac
 Watershed Area 24 ac Simi Valley MDP (draft)
 Width at Crest 20 ft

CONSTRUCTION DATA

Construction Agency Crosby Mead Benton
 Completion Date 2002

REFERENCE DRAWINGS

Construction Drawings Y-3-3836 to 3848 "Arielle and Muirfield Detention Basins"
 Right-of-Way Drawings NA
 Topographic Drawings NA

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	442	640
50-YEAR	363	526
25-YEAR	256	371
10-YEAR	141	205

Note, undeveloped areas drain to basin through culverts and pipes which are expected to decrease the amount of sediment arriving at the basin

*

BASIN HISTORY:

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
		No cleanout data reported by O&M		

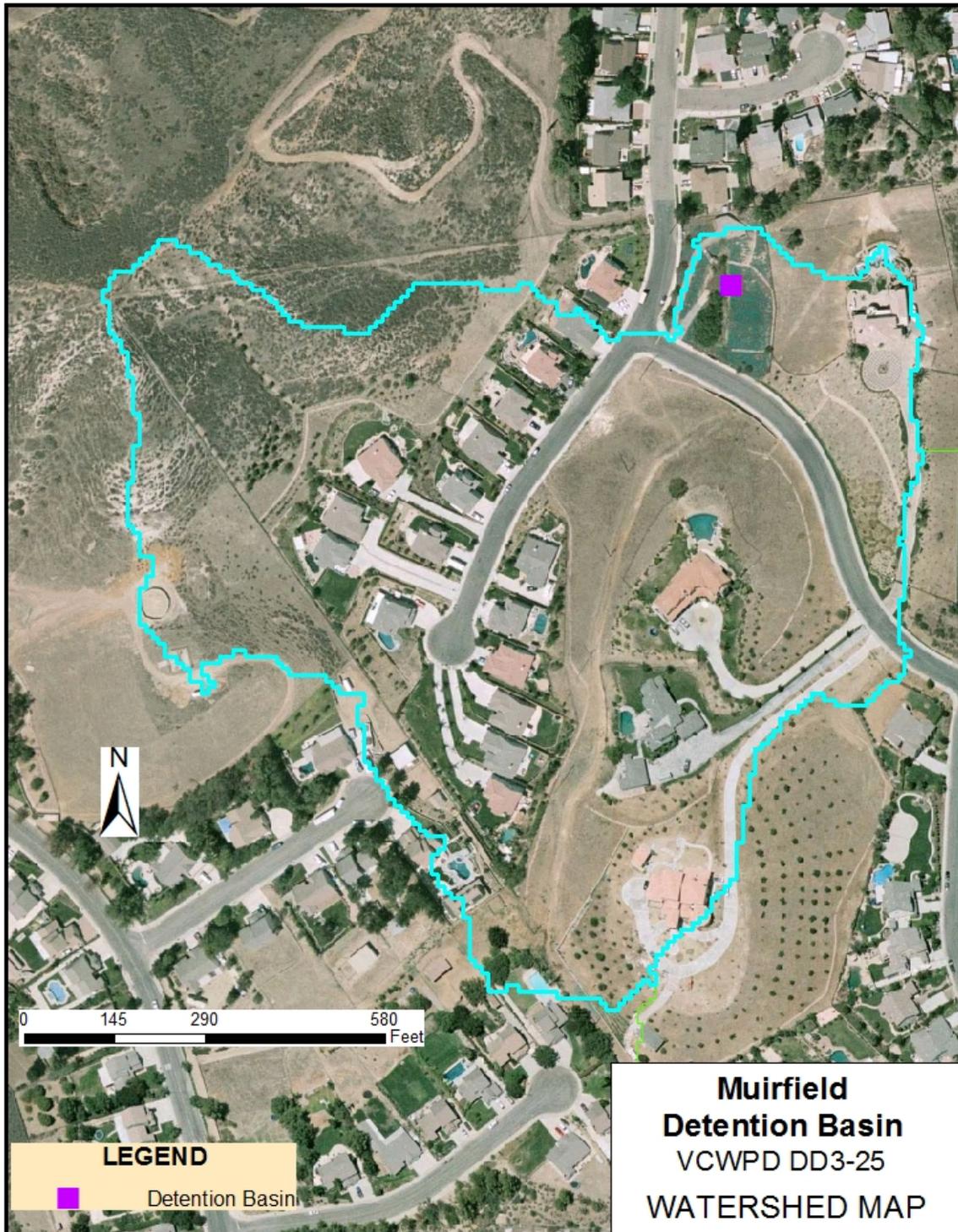
Notes

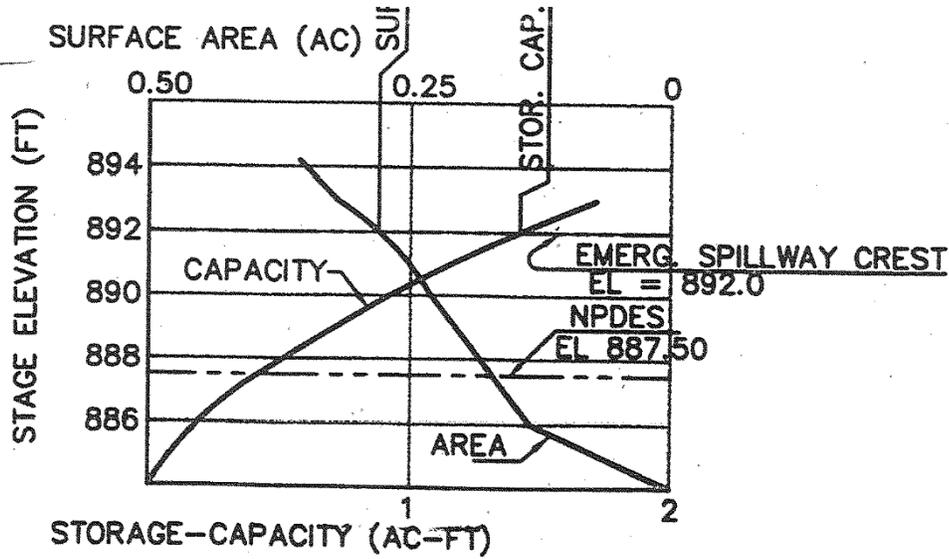
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

*** Theoretical Value from Kevin Scott Formula

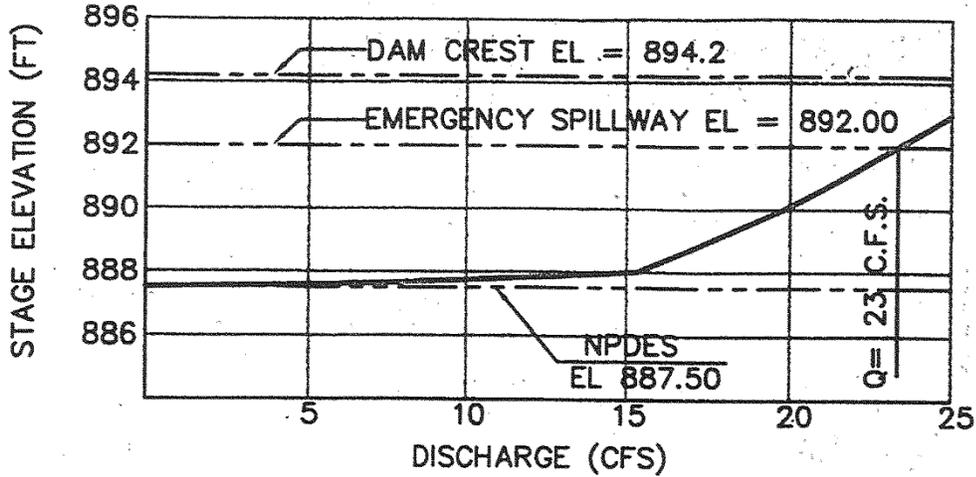
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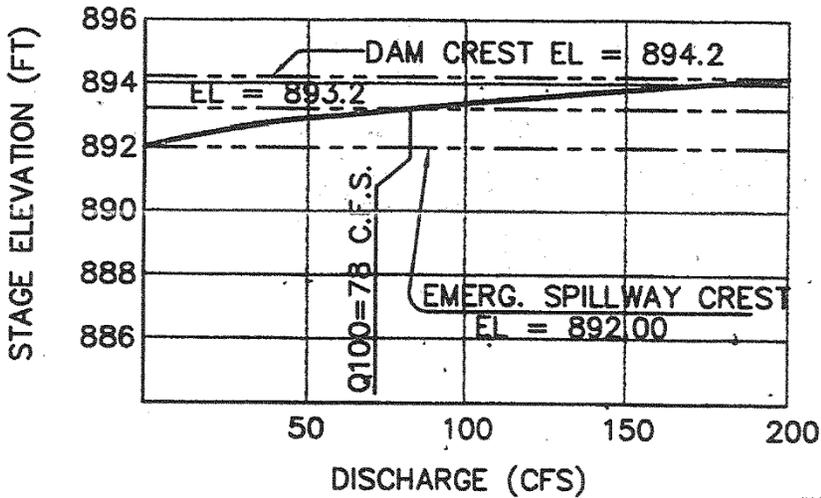


Stage Storage Discharge Data From As-Builts

Elevation	As-Built Vol	10/2011 TIN Vol	Riser Disch.	Spillway Disch.	Total Q
Ft. NGVD29	Ac-Ft	Ac-Ft	CFS	CFS	CFS
884	-				
885	0.077				
886	0.182	-			
887	0.327	0.003			
887.5	0.414	NA	-		-
888	0.518	0.037	15.0		15.0
889	0.695	0.131	17.5		17.5
890	0.914	0.270	19.8		19.8
891	1.145	0.435	21.4		21.4
892	1.420	0.623	23.0	-	23.0
893	1.700	0.834	25.0	62.2	87.2
893.2	NA	NA	25.1	78.0	103.1
894	NA	1.068	NA	NA	NA
895	NA	1.325	NA	NA	NA
896	NA	1.606	NA	NA	NA

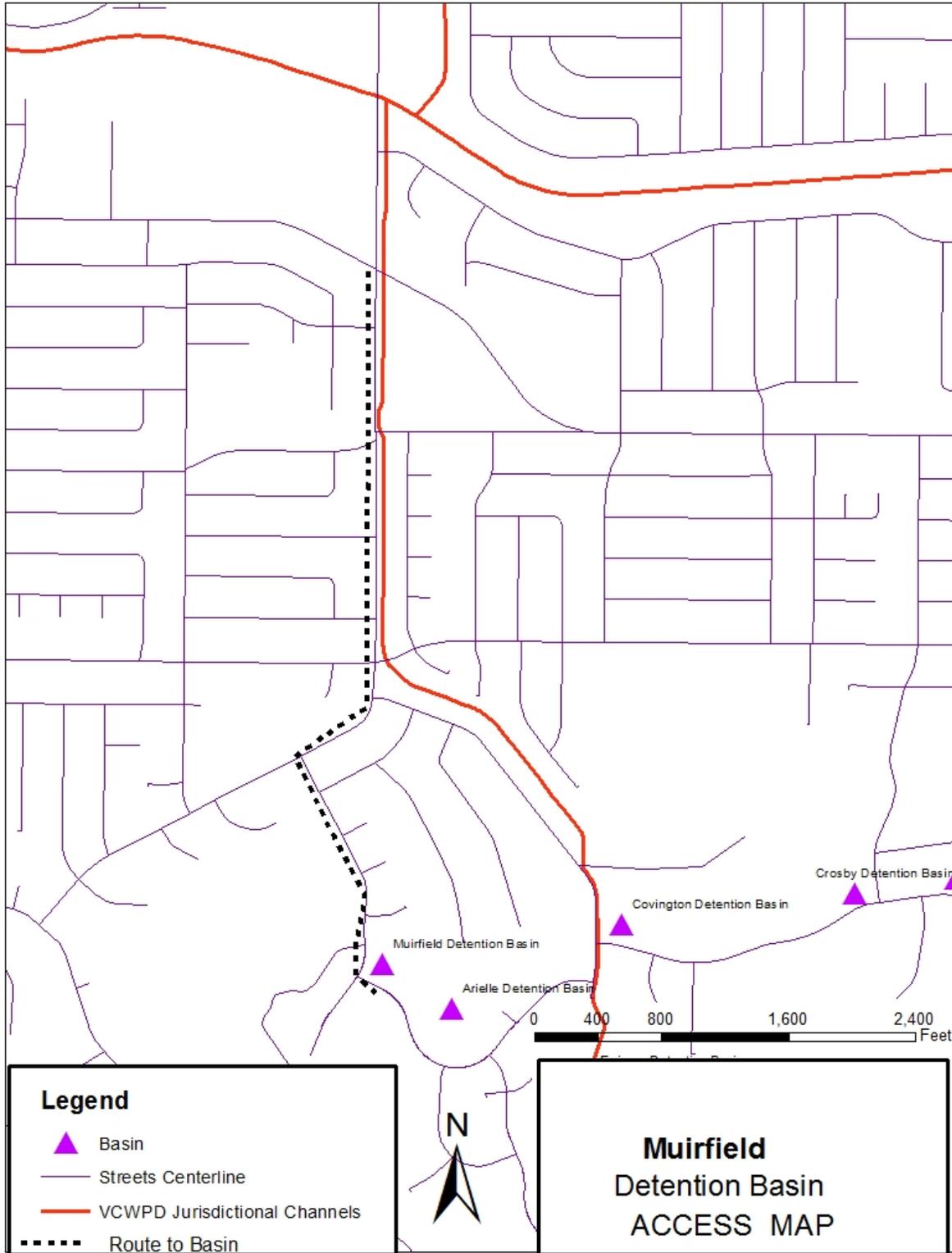


STAGE-DISCHARGE CURVE
OUTLET PIPE



STAGE-DISCHARGE CURVE
EMERGENCY SPILLWAY

____ R
DATE PROJECT CC



NORTH SIMI DRAIN DEBRIS BASIN DB3-32

LOCATION: City of Simi Valley, North of Alamo St on Erringer Road
N: 287,664 E: 1,769,444 (Lambert Zone 5 Coordinates)
Simi Valley, Quad Map

DESIGN DATA

Design Agency	<u>VTN WEST, INC</u>
Level Capacity	<u>9.04 ac-ft</u>
Maximum Debris Capacity	<u>9.04 ac-ft or 14,582 cu.yd- assumed same as level capacity</u>
Design Debris Volume	<u>4.3 ac-ft or 6,937 cu.yd at 983.6 ft NGVD29 fm as-builts</u>
Inflow Rate	<u>Q100=1,404 cfs, outflow assumed same for modeling</u>
Outflow Rate	<u>Q100 Water Surface Elev 989.14 ft NGVD29</u>
Debris Cleanout Elevation	<u>Elev. 981 ft, 1,390 cy (25% of 100-yr sediment volume)</u>

EMERGENCY SPILLWAY

Type	<u>120 ft W x 4 ft H Rectangular RC Spillway</u>
Weir Elevation	<u>987 ftNGVD29</u>
Spillway Length	<u>137 ft</u>
Capacity with and w/o Freeboard	<u>4,300 cfs from stage discharge curve on as-builts</u>

PRINCIPAL SPILLWAY

Type	<u>4 ft W X 7.5 ftD Riser RC Tower Bottom 978.8 ft with Inclined Trash Rack from 986 to 991 ft NGVD29</u>
Inlet Weir Elevations	<u>986 ft NGVD29</u>
Outlet Conduit	<u>24-in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>5 inx9 in Slots in Riser Tower to 986 ft NGVD29</u>
Top Elevation	<u>NA</u>
Outlet Conduit	<u>Principal Spillway Outlet</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>992.5 ft NGVD29</u>
Length	<u>NA</u>
Surface Area of Full Basin	<u>1.54 ac</u>
Watershed Area	<u>704 ac from GIS; 291 developed</u>
Width at Crest	<u>20 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>VCWPD</u>
Completion Date	<u>2003</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y3-3915-3943</u>
Right-of-Way Drawings	<u>NA</u>
Topographic Drawings	<u>NA</u>

EXPECTED DEBRIS PRODUCTION (cy): 2017 Calcs		
Storm Frequency	Design Condition	100% Burn
100-YEAR	8,700 (5,550)	12,615
50-YEAR	5,080	7,370
25-YEAR	3,760	5,455
10-YEAR	2,275	3,300

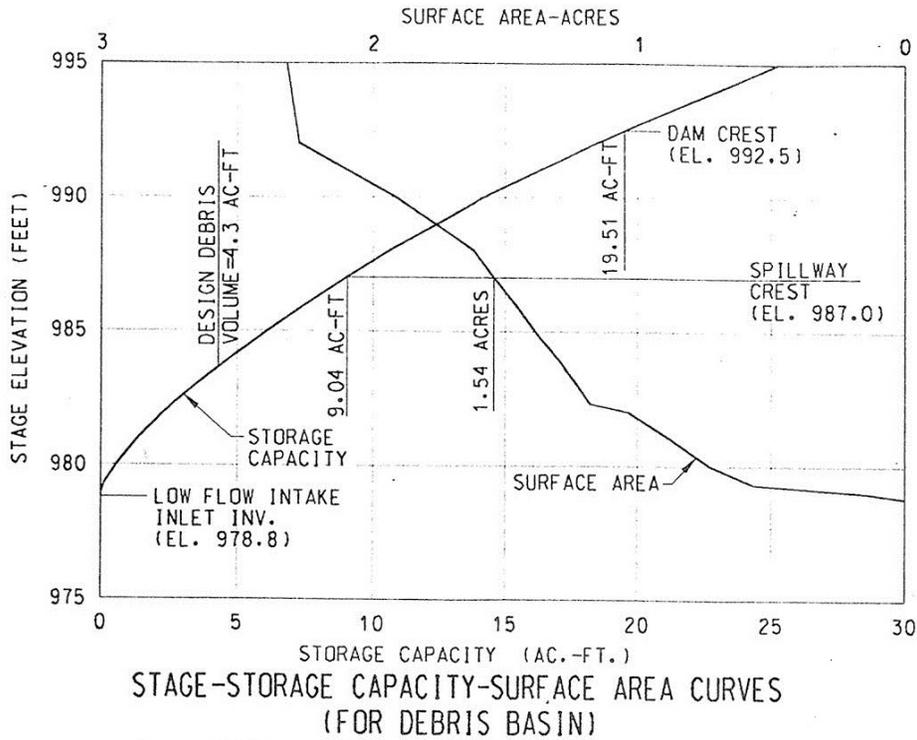
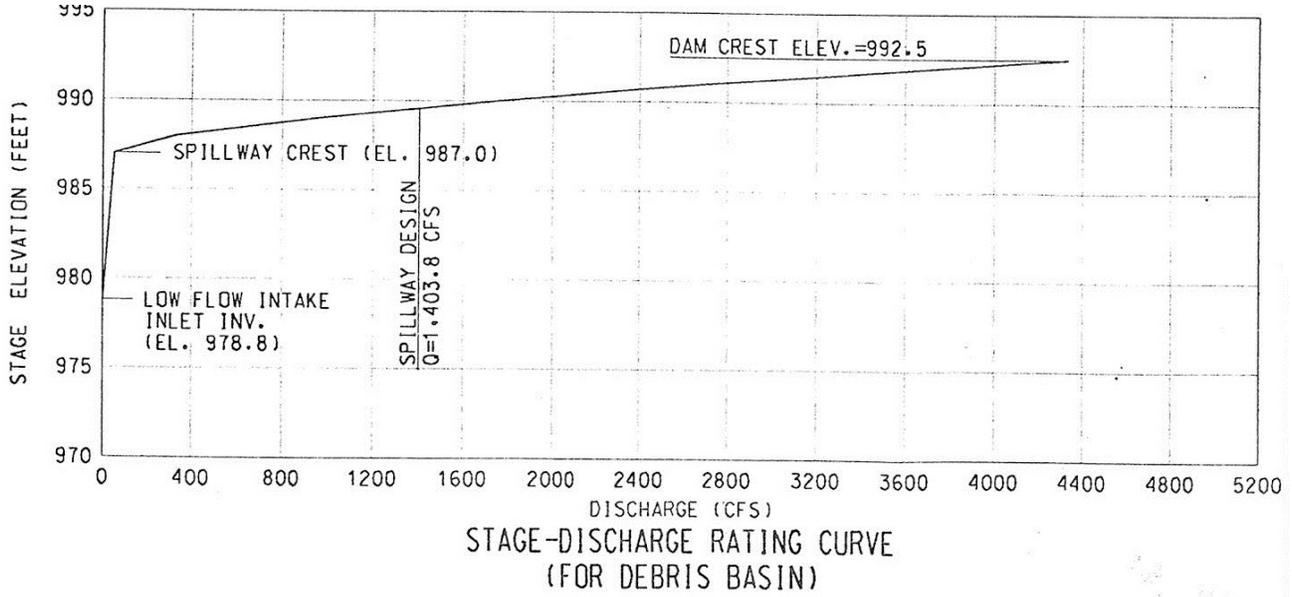
Note: Most sediment traverses ditches and culverts before reaching basin. Sediment may be trapped in system before reaching basin. Design 100-yr Vol of 5,550 cy calculated assuming 4.3 ac-ft shown on plans is 125% of design data.

BASIN HISTORY: NORTH SIMI DRAIN DETENTION BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
01-05	Disaster Declaration			
		No data reported by O&M		

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



Watershed and Access Maps Same as Detention Basin DD3-32

NORTH SIMI DRAIN DETENTION BASIN DD3-32

LOCATION: City of Simi Valley, North of Alamo St on Erringer Road
 N: 287,664 E:1,769,444 (Lambert Zone 5 Coordinates)
 Simi Valley, Quad Map

DESIGN DATA

Design Agency	<u>RBF</u>
Level Capacity	<u>38.2 ac-ft (61,630 cy)</u>
Maximum Debris Capacity	<u>None- Debris Basin Intercepts Sediment</u>
100-Yr Water Surface Elev.	<u>970.9 ft NGVD29</u>
100-Yr Inflow Rate	<u>1,404 cfs assuming no attenuation in debris basin</u>
100-Yr Outflow	<u>684 cfs from plans</u>

EMERGENCY SPILLWAY

Type	<u>40 ft L X 15 ft W Drop Box Inlet Spillway</u>
Weir Elevation	<u>971.9 ft NGVD29</u>
Spillway Length	<u>95 ft</u>
Capacity w/o Freeboard	<u>1,194 cfs w/ blocked Princ. Spillway, 3,600 cfs at dam crest</u>

PRINCIPAL SPILLWAY

Type	<u>13 ft X 11.5 ft Riser RC Tower with Low and High Level Inlets and Catwalk, Grated Top at 967 ft NGVD29</u>
Inlet Weir Elevations	<u>962 ft for 6 ft Wx4 ft H High Level Inlet; 955 ft for 6 ft Wx4 ft H Low Level</u>
Outlet Conduit	<u>84-in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>None</u>
Top Elevation	<u>NA</u>
Outlet Conduit	<u>NA</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>977.0 ft NGVD29</u>
Length	<u>~500 ft from as-builts</u>
Surface Area of Full Basin	<u>4.7 ac</u>
Watershed Area	<u>704 ac (GIS acreage=704 ac, Upper North Simi Drain)</u>
Width at Crest	<u>20 ft</u>

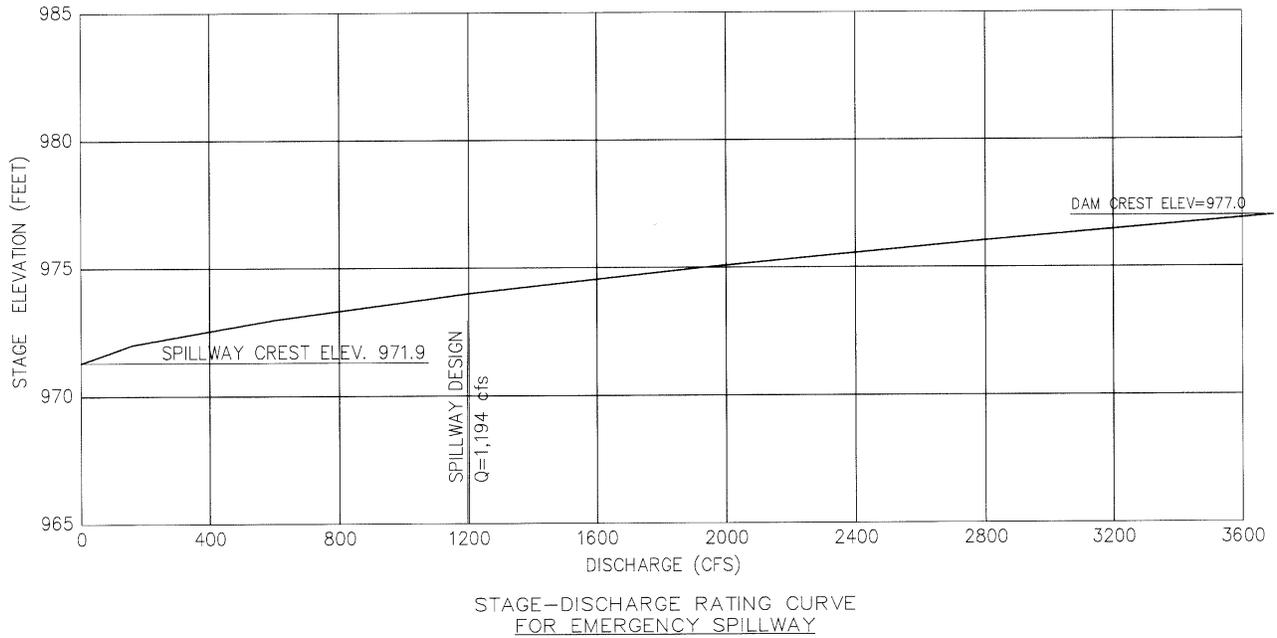
CONSTRUCTION DATA

Construction Agency	<u>VCWPD</u>
Completion Date	<u>2004</u>

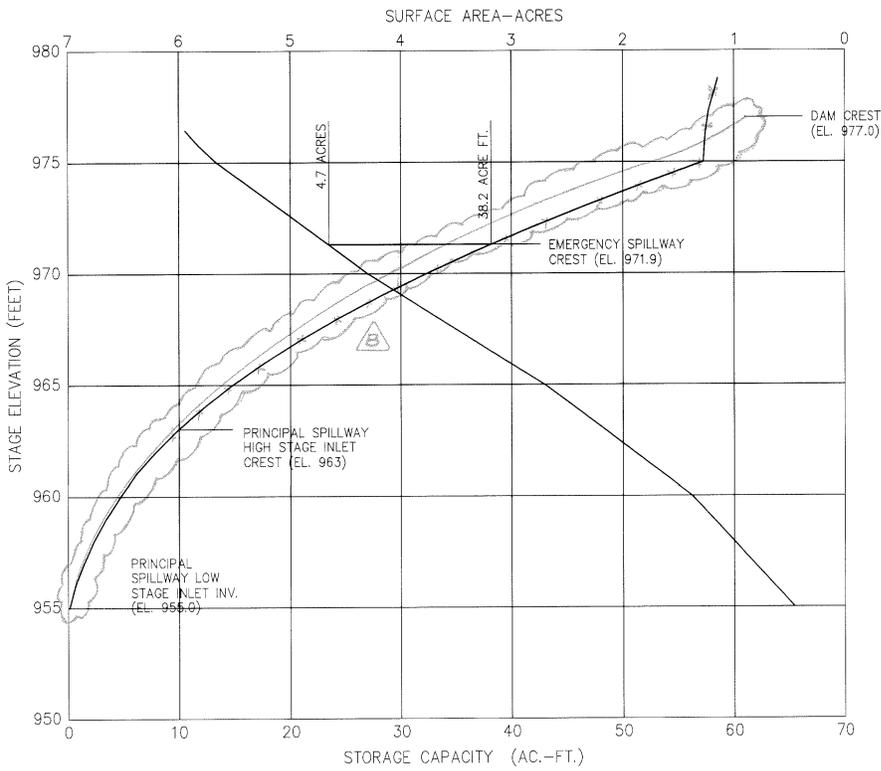
REFERENCE DRAWINGS

Construction Drawings	<u>Y3-3915- 3943</u>
Right-of-Way Drawings	<u>NA</u>
Topographic Drawings	<u>NA</u>

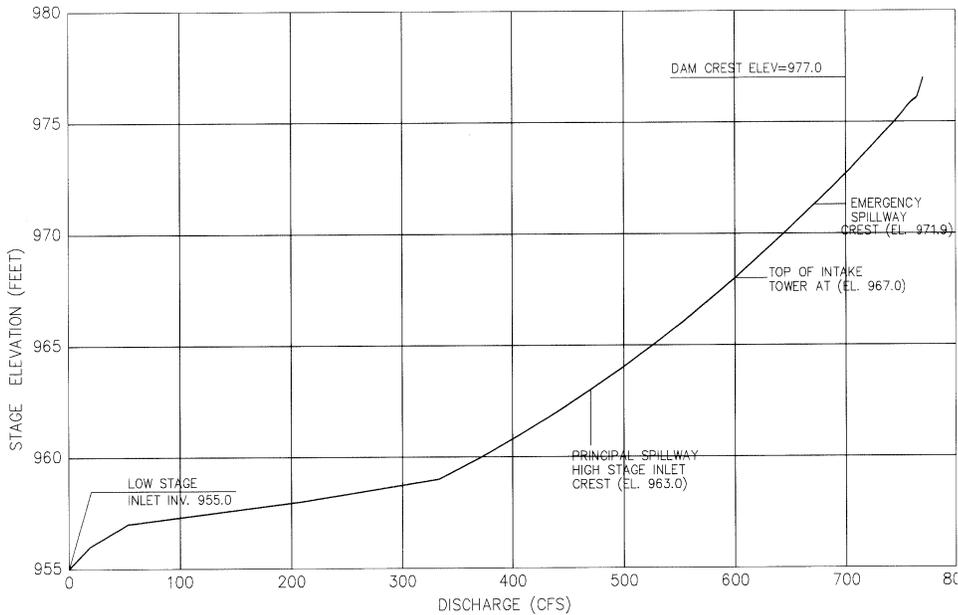




North Simi Drain Detention Basin



STAGE-STORAGE CAPACITY-SURFACE AREA CURVES
 SCALE: HORIZ. 1"=100 ACRE-FEET OR 1"=1 ACRE
 VERT. 1"=5'

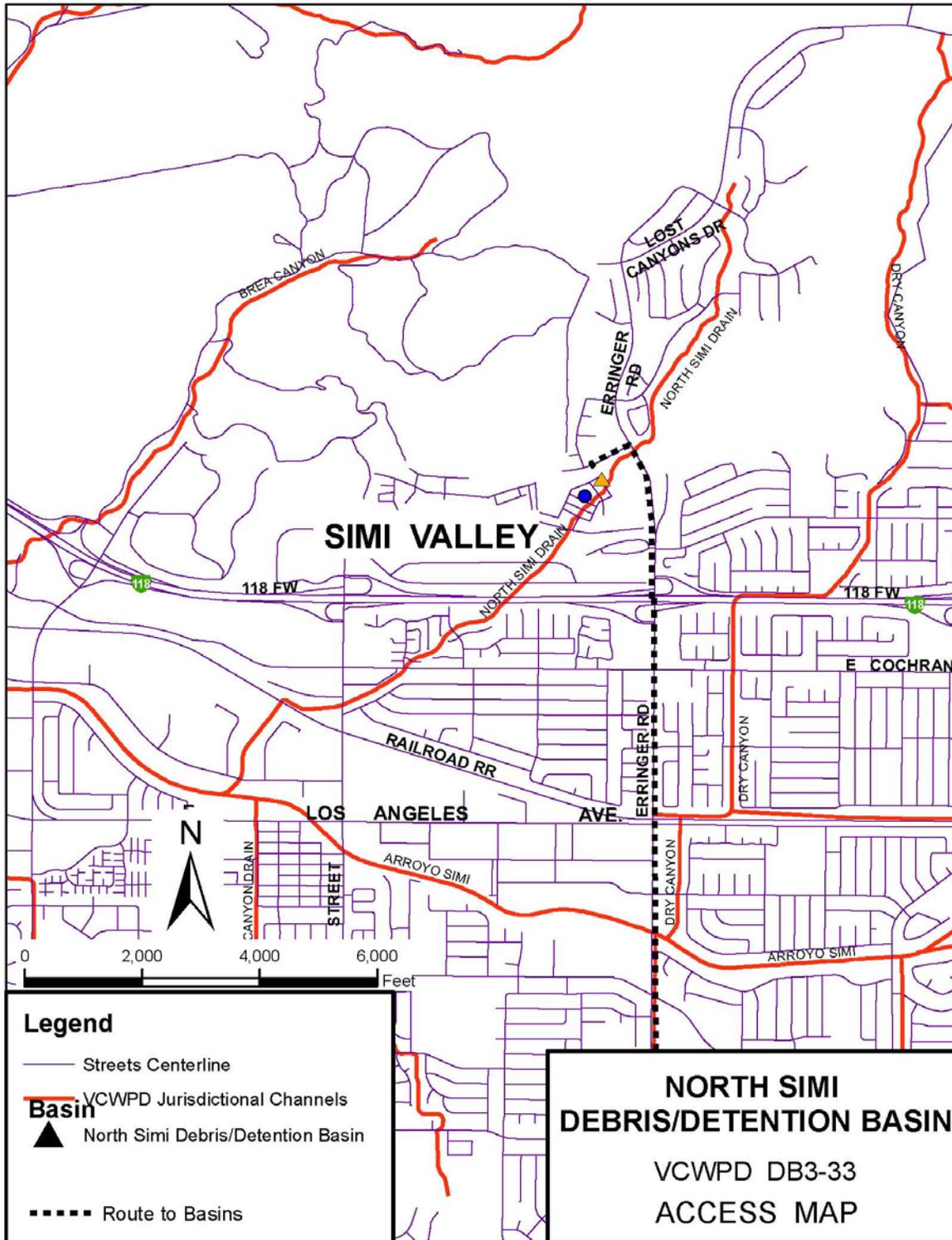


STAGE-DISCHARGE RATING CURVE
 FOR PRINCIPAL SPILLWAY
 SCALE: HORIZ. 1"=100 CFS

North Simi Drain Detention Basin

Stage Storage Discharge Data from As-Builts

Elevation	Vol	Riser Disch.	Spill Disch.	Total Disch.
Ft. NGVD29	Ac-ft	cfs	cfs	cfs
955	-	-		-
956	0.6	18.5		18.5
957	1.4	52.0		52.0
958	2.3	208.0		208.0
959	3.4	337.0		337.0
960	4.8	372.0		372.0
961	6.2	405.0		405.0
962	7.8	440.0		440.0
963	9.4	470.0		470.0
964	11.6	500.0		500.0
965	13.8	527.0		527.0
966	16.4	546.0		546.0
967	19.0	576.0		576.0
968	22.0	600.0		600.0
969	25.2	622.0		622.0
970	29.0	645.0		645.0
971	32.6	665.0	-	665.0
972	37.0	684.0	160	844.0
973	41.4	706.0	612	1,318.0
974	47.0	724.0	1,194	1,918.0
975	52.6	745.0	1,940	2,685.0
976	57.4	762.0	2,684	3,446.0
977	61.0	770.0	3,696	4,466.0



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)

Basin is maintained by City, District is responsible for Dam Maintenance Only

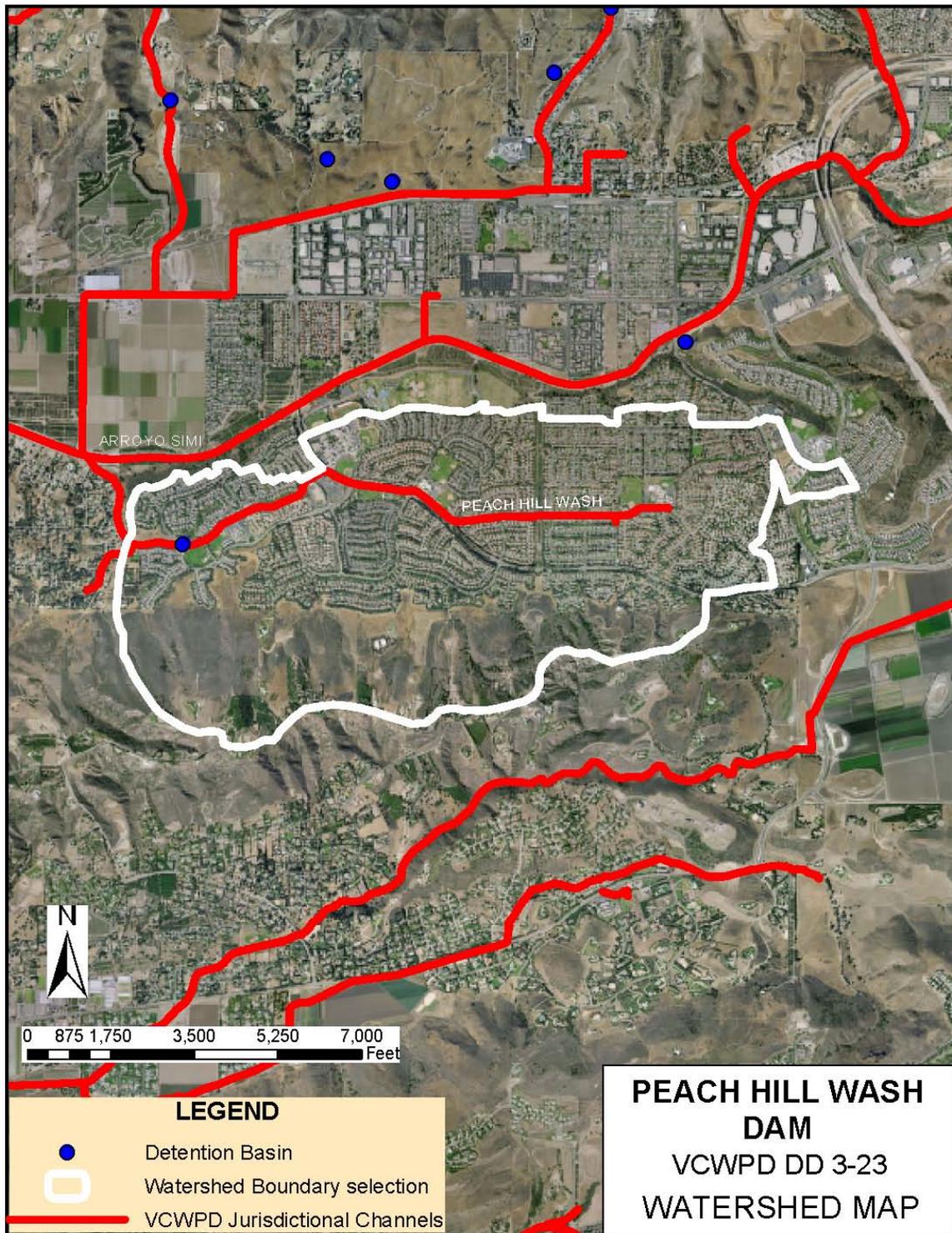
EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	4,541	6,587
50-YEAR	3,466	5,027
25-YEAR	2,486	3,606

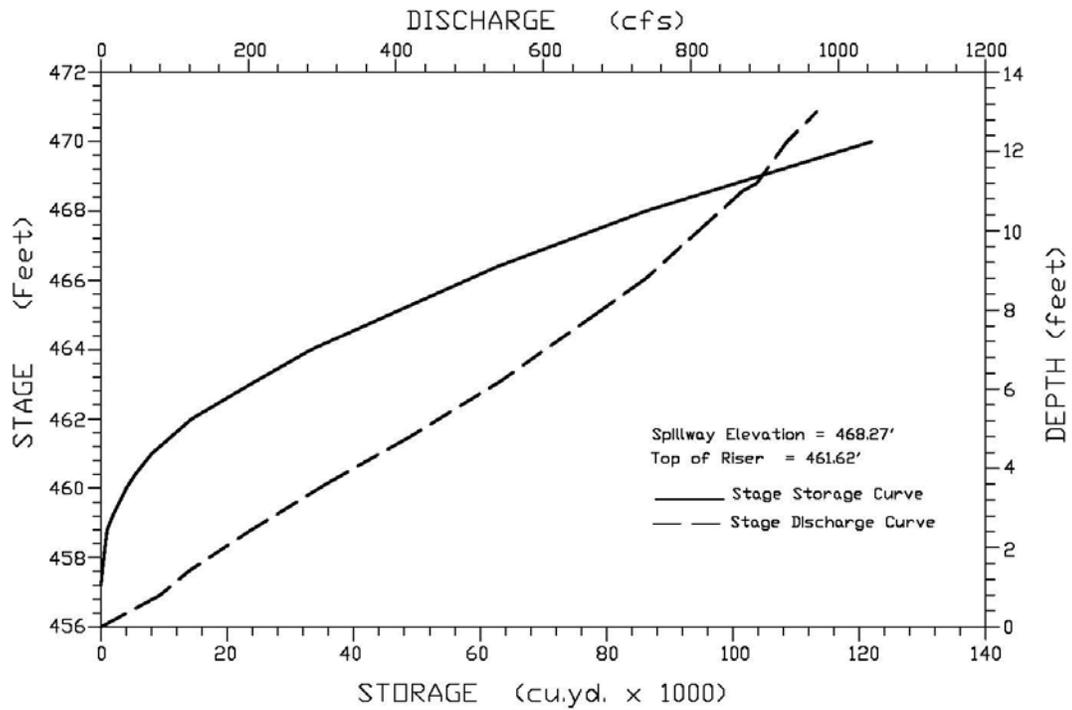
BASIN HISTORY: PEACH HILL WASH RETENTION BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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***
	O&M does not do cleanouts on basin, only has dam maintenance responsibility.			

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

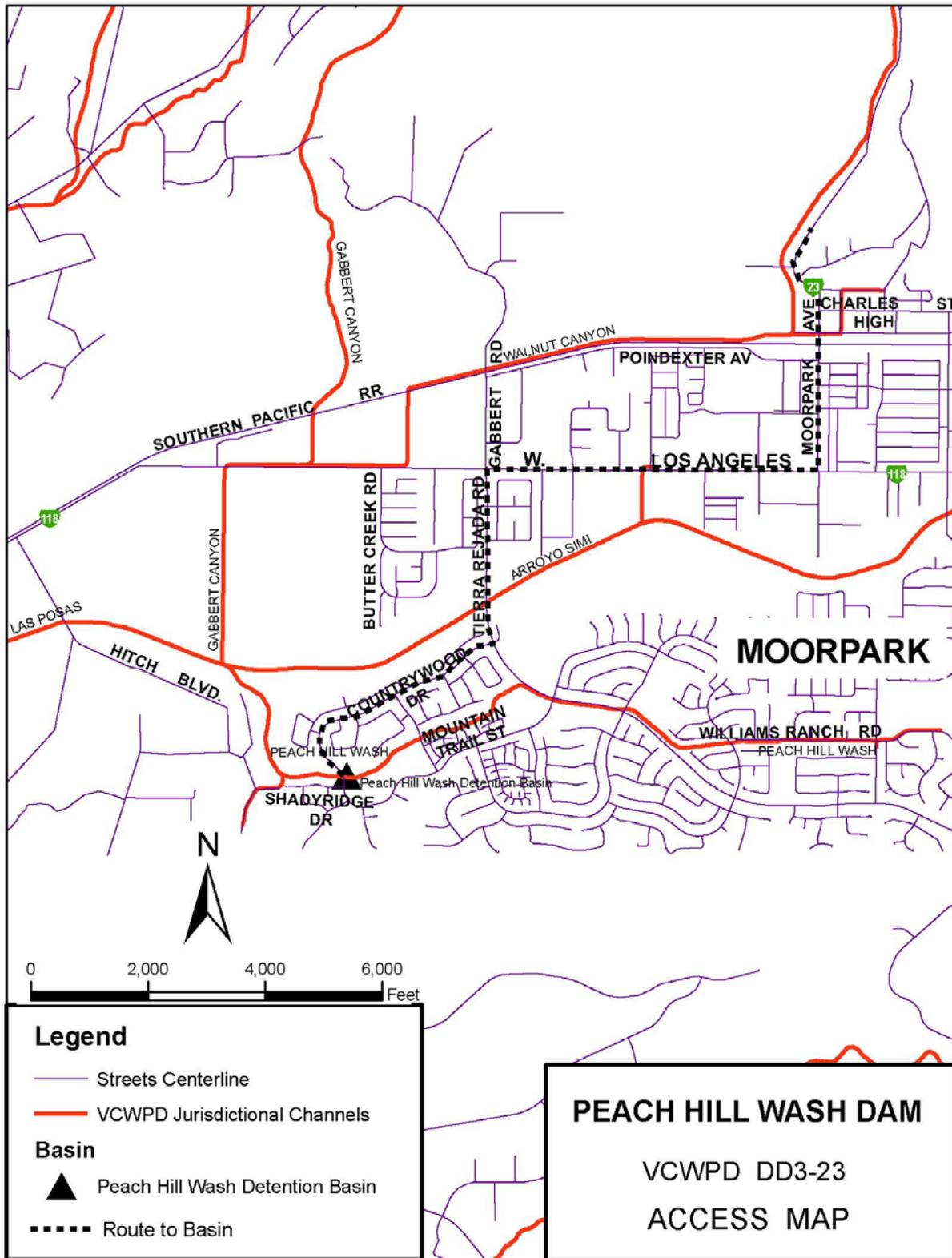




Net Stage Storage Discharge Routing Data from 2003 Calleguas VCRat Model

Elevation	VCRat Vol	VCRat Total Disch.
Ft. NGVD29	Ac-ft	cfs
456.00	-	-
457.00	-	-
458.00	-	-
459.00	-	-
460.00	1.75	240
461.00	5.77	330
462.00	10.07	430
463.00	14.57	520
464.00	19.17	600
465.00	24.07	680
466.00	32.17	750
467.00	41.07	810
468.00	50.77	880
469.00	61.17	920
470.00	72.07	970
471.00	80.27	1,010
472.00	95.87	2,523

Note: Appears to account for 25% of 100-yr debris volume
 Does not account for 125% of 100-yr volume.



RAMONA DETENTION DAM DD3-16M

LOCATION: Camarillo Hills, NW of Camarillo, at northerly terminus of Ramona PI;
 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 Q₁₀₀IN= 583 cfs, Q₁₀₀OUT= 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

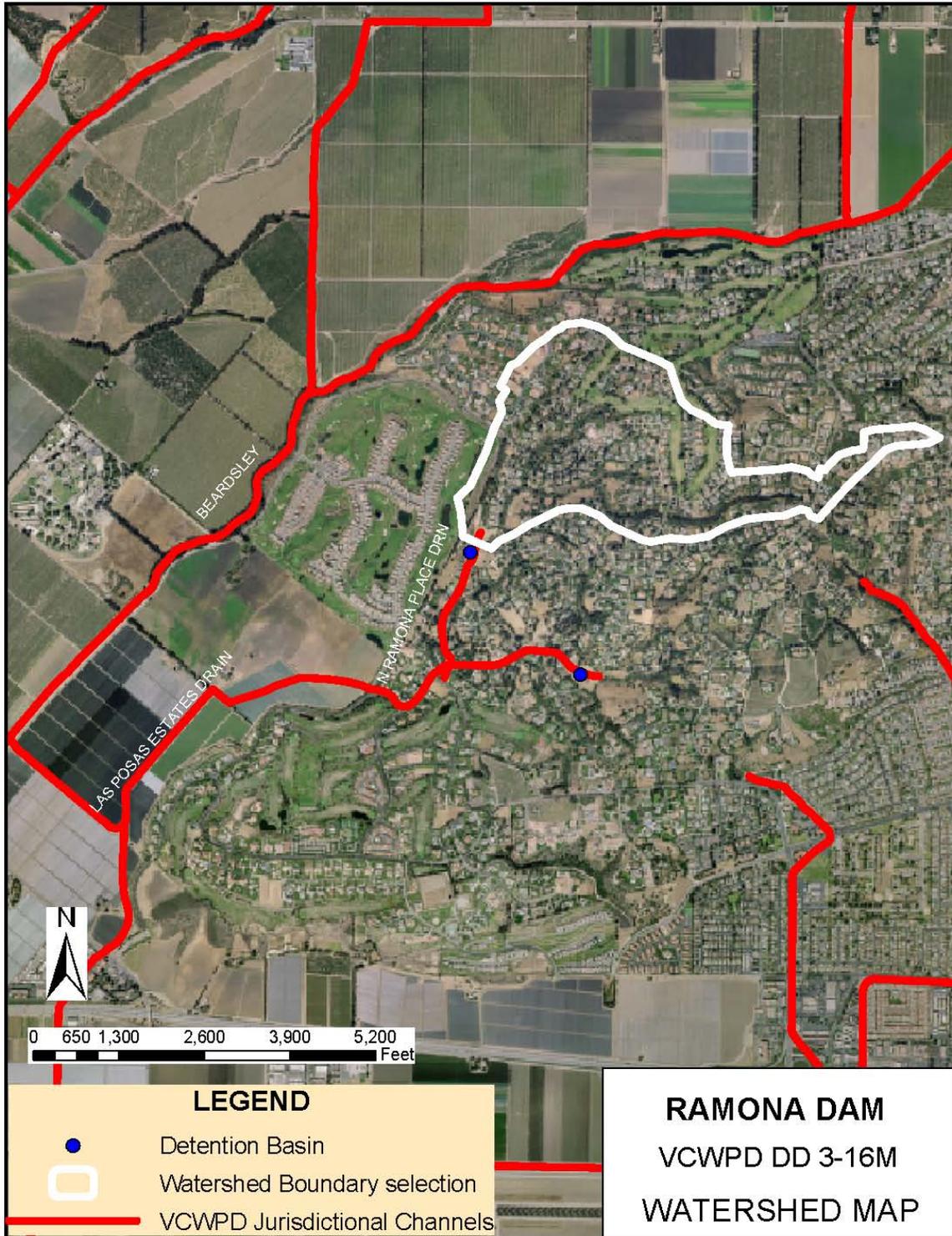
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
11-92	New Dam Completed	DEBRIS CAP 4,665 cy		273**
11-92	Aerial Survey	4,665 debris storage		
01-95	Disaster Declaration			284***
07-96	Aerial Survey	Not Digitized		
05-97	Aerial Survey	4,825 debris storage		
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
05-17	WR&T TIN analysis	21,824 at elev 165 ft Design storage approx. 22,665 at elev 165 ft		
	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	

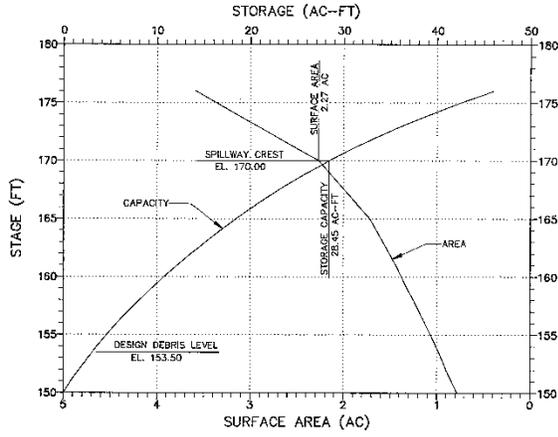
BASIN HISTORY: RAMONA DETENTION DAM

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
07-86	Aerial Survey	2,620		
07-86	Cleanout		2,900	
11-87	Aerial Survey	5,549		
11-88	Aerial Survey	Not Digitized		
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			

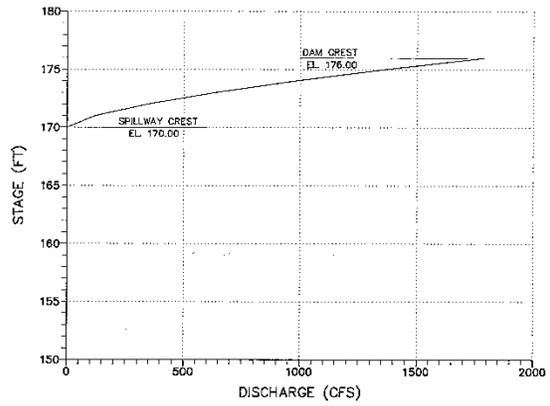
Notes

- * 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

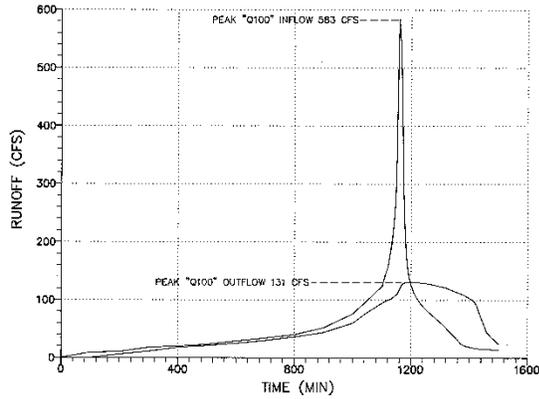




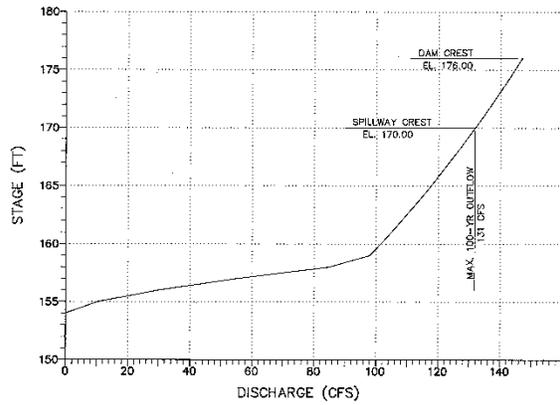
AREA-CAPACITY CURVE



STAGE-DISCHARGE CURVE
EMERGENCY SPILLWAY



DESIGN STORM HYDROGRAPH



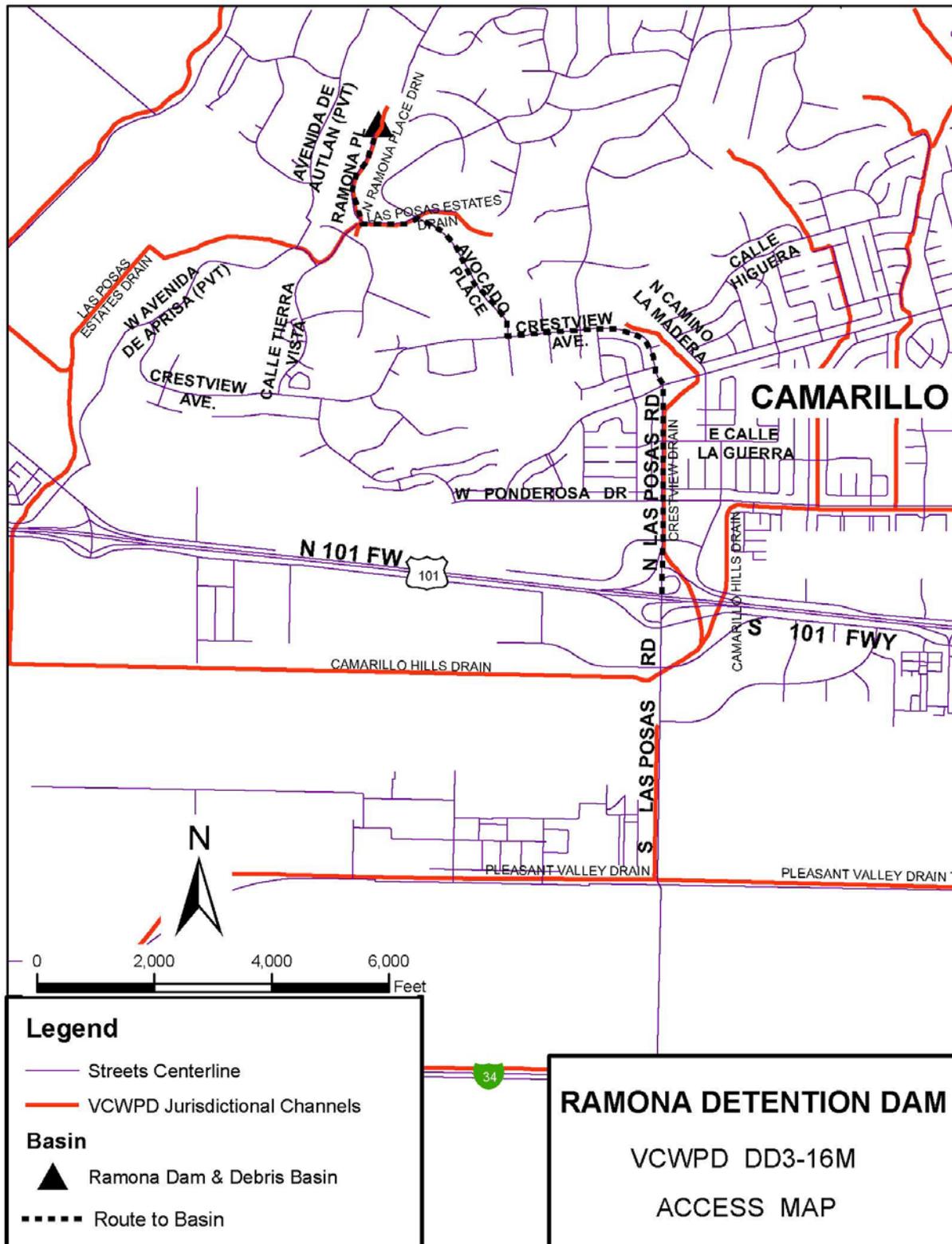
STAGE-DISCHARGE CURVE
OUTLET PIPE

Ramona Detention Basin- Emergency Spillway Data Superseded

Stage Storage Discharge Data Summary

Elevation	1998 TIN Vol.	As-Built Vol.	Riser	Emergency Spillway	Total
Ft. NGVD29	Ac-Ft	Ac-Ft	Cfs	Cfs	Cfs
150	-	-	0.0		-
151	-	0.8	0.0		-
152	-	1.6	0.0		-
153	0.023	2.6	0.0		-
154	0.173	3.5	0.0		-
155	0.616	4.7	10.6		10.6
156	1.448	5.6	30.0		30.0
157	2.533	6.9	55.1		55.1
158	3.734	8.2	84.9		84.9
159	5.011	9.4	97.9		97.9
160	6.352	10.7	101.4		101.4
161	7.759	12.2	104.8		104.8
162	9.232	13.6	108.2		108.2
163	10.773	15.2	111.4		111.4
164	12.382	16.6	114.5		114.5
165	14.072	18.4	117.5		117.5
166	15.851	20.3	120.5		120.5
167	17.722	22.0	123.4		123.4
168	19.689	24.0	126.2		126.2
169	21.772	26.2	129.0		129.0
170	24.007	28.5	131.7	-	131.7
171	26.458	30.8	134.3	121.5	255.8
172	NA	33.3	136.9	343.7	480.6
173	NA	36.0	139.5	631.3	770.8
174	NA	39.0	142.0	895.0	1,037.0
175	NA	42.3	144.5	1,187.0	1,331.5
176	NA	46.0	146.9	NA	NA

NA=Not Analyzed



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; Height 1,096 ft; 44 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

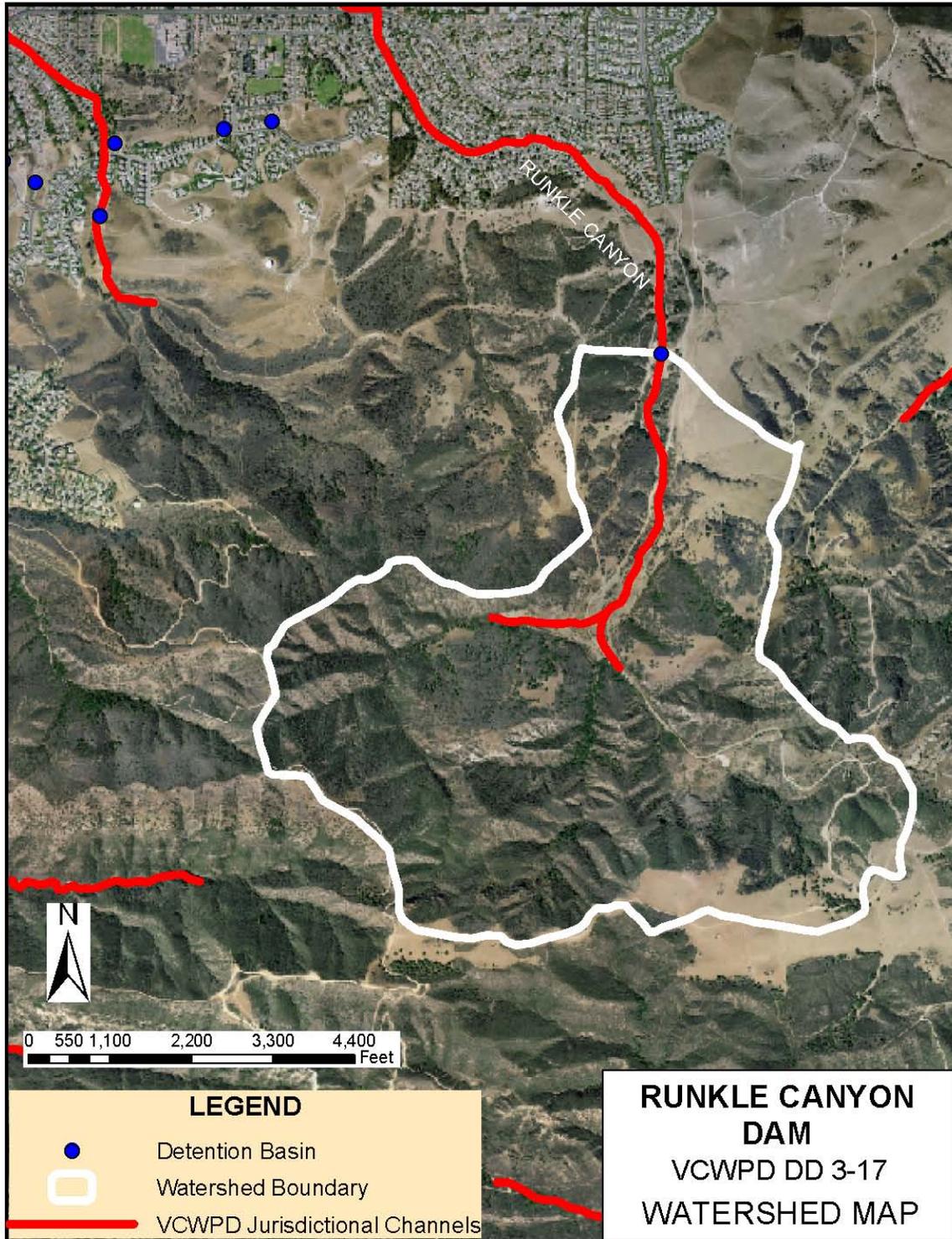
Construction Drawings FC 3000
Right-of-Way Drawings FC 3003
Topographic Drawings FC 3000,3004, T-63-9 (2-6-70), 486-19 (7-3-97)

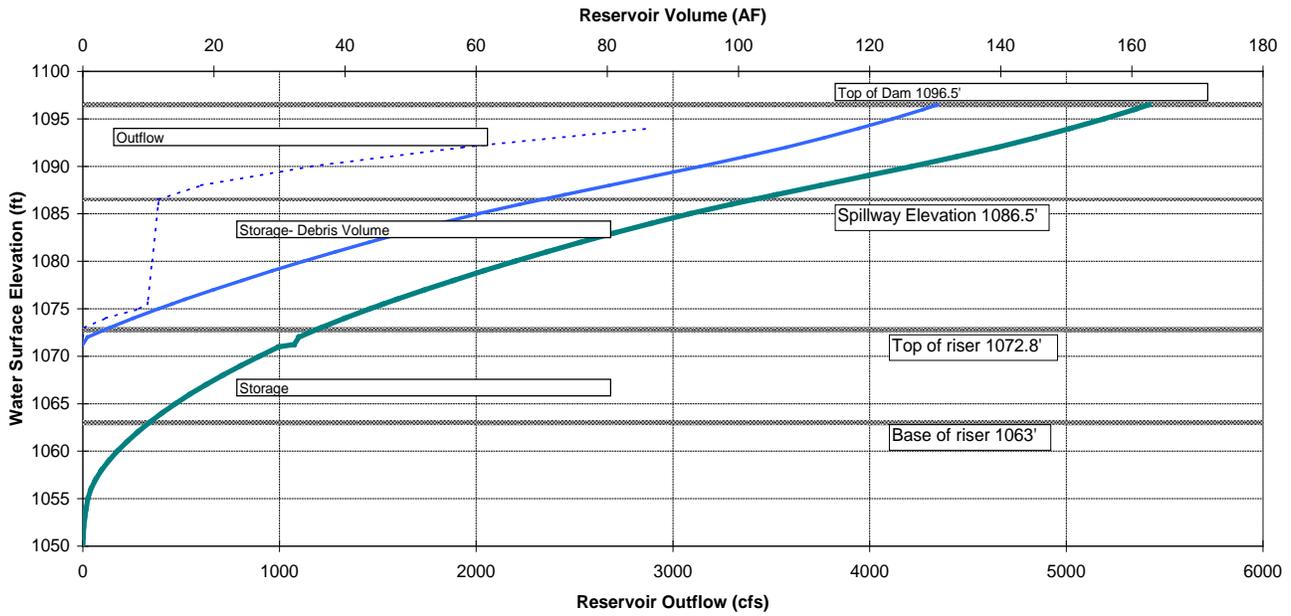
EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	41,613	59,907
50-YEAR	32,000	46,068
25-YEAR	23,186	33,379

BASIN HISTORY: RUNKLE CANYON DETENTION BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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	Survey analysis by O&M		11,412	
11-05	TIN analysis by WR&T 08-05 vs 11-05		10,737 Fill vol 142 Cut vol	

Notes _____ * AADP (Average Annual Debris Production) Computed Excluding Disaster Debris
 *** Theoretical Value from Scott and Williams (1978); 10% of 50-Yr Design Debris Volume





Stage Storage Discharge Summary- 2003 Calleguas VCRat Model

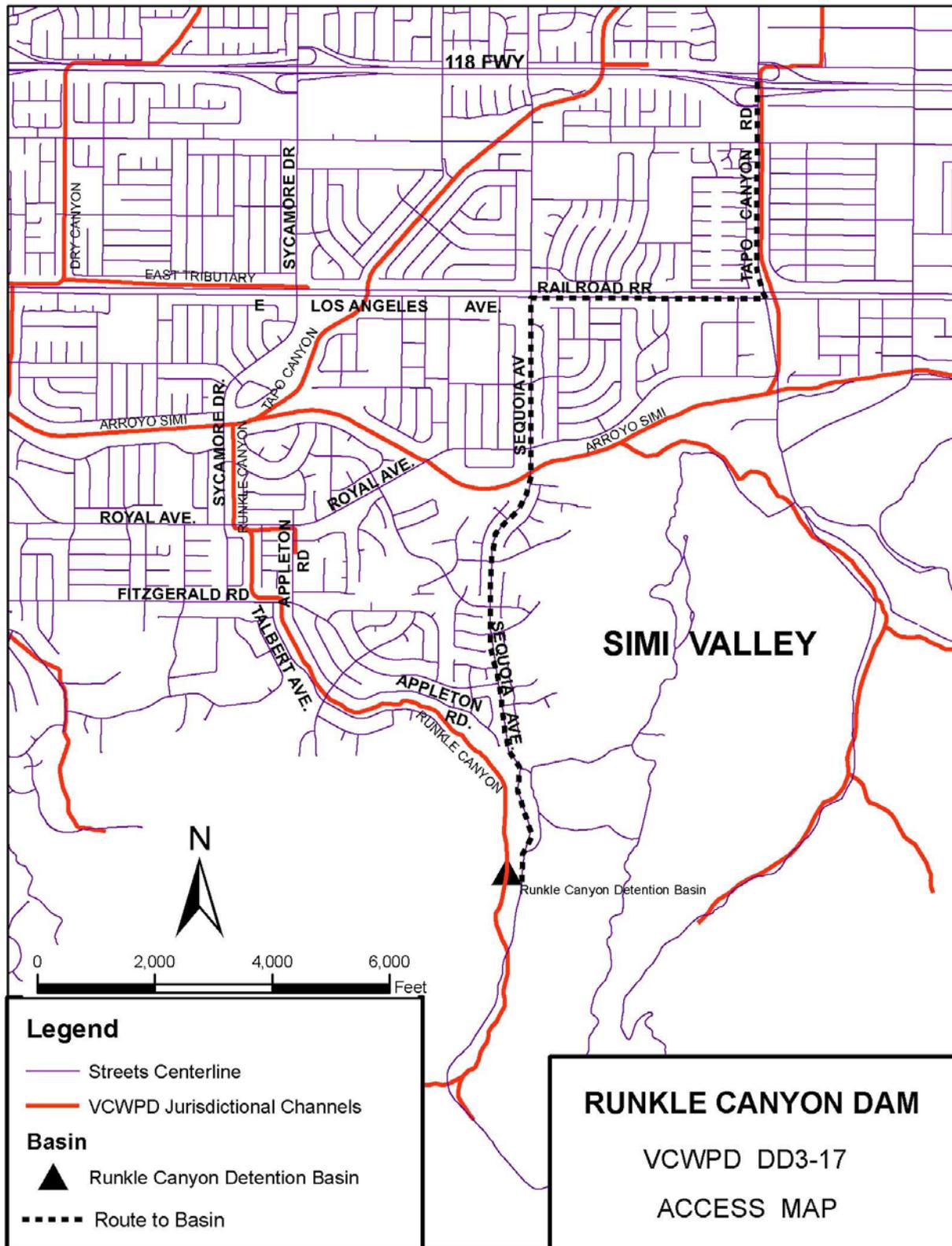
Elevation	Vol.	Total Disch.
Ft. NGVD29	Ac-Ft	Cfs
1071.75	0	-
1072.00	0.73	-
1073.00	4.09	3.9
1074.00	7.72	51.0
1075.00	11.54	52.0
1080.00	33.67	56.0
1086.00	66.96	61.0
1088.00	80.32	386.0
1090.00	94.22	994.0
1092.00	107.31	1,805.0
1094.00	118.42	2,792.0
1096.00	128.22	3,942.0

Note: Discharge Calculations assumed emergency spillway invert of 1086 ft.

Stage Storage Discharge Summary- Detailed Calculations

Elevation	1970 Topo Vol.	Net Vol.	Riser	Spillway	Total
Ft. NGVD29	Ac-Ft	Ac-Ft	Cfs	Cfs	Cfs
1049.4					-
1050	0.008				-
1051	0.050				-
1052	0.138				-
1053	0.288				-
1054	0.499				-
1055	0.772				-
1056	1.213				-
1057	1.909				-
1058	2.834				-
1059	3.952				-
1060	5.245				-
1061	6.716				-
1062	8.335		-		-
1063	10.100		-		-
1064	12.020		-		-
1065	14.106		-		-
1066	16.359		-		-
1067	18.770		-		-
1068	21.336		-		-
1069	24.053		-		-
1070	26.917		-		-
1071	29.872		-		-
1071.23	32.241	-	-		-
1072	32.950	0.709	-		-
1073	36.309	4.068	3.9		3.9
1074	39.945	7.704	51.0		51.0
1075	43.775	11.534	52.0		52.0
1076	47.831	15.590	52.9		52.9
1077	52.101	19.860	53.8		53.8
1078	56.551	24.310	54.7		54.7
1079	61.156	28.915	55.6		55.6
1080	65.889	33.648	56.4		56.4
1081	70.780	38.539	57.3		57.3
1082	75.852	43.611	58.1		58.1
1083	81.099	48.858	58.9		58.9

Elevation	1970 Topo Vol.	Net Vol.	Riser	Spillway	Total
Ft. NGVD29	Ac-Ft	Ac-Ft	Cfs	Cfs	Cfs
1084	86.636	54.395	59.8		59.8
1085	92.562	60.321	60.6		60.6
1086	98.896	66.655	61.3		61.3
1086.5	102.261	70.020	61.7	-	61.7
1087	105.626	73.385	62.1	39.8	101.9
1088	112.533	80.292	62.9	208.7	271.5
1089	119.460	87.219	63.7	453.1	516.8
1090	126.429	94.188	64.4	757.4	821.8
1091	133.197	100.956	65.2	1,114.3	1,179.4
1092	139.516	107.275	65.9	1,519.1	1,585.0
1093	145.272	113.031	66.6	1,969.1	2,035.8
1094	150.630	118.389	67.3	2,462.2	2,529.5
1095	155.724	123.483	68.1	2,996.7	3,064.8
1096	160.434	128.193	68.8	3,571.5	3,640.3
1096.5	162.609	130.368	69.1	3,873.8	3,942.9
1097	164.783	132.542	69.5	4,185.8	4,255.2
1098	168.765	136.524	70.2	4,838.7	4,908.9
1099	172.327	140.086	70.8	5,529.8	5,600.6
1100	175.420	143.179	71.5	6,258.6	6,330.1



SANTA ROSA ROAD #2 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) at top of riser
 Maximum Debris Capacity 15,000* cy (12-12-90 DTM); 0.013 slope from top of riser
 Inflow and Outflow Rates Q₁₀₀IN= 1,600 cfs, Q₁₀₀OUT= 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)

Basin planned for removal as a result of recent study.

EXPECTED DEBRIS PRODUCTION (cy):*		
Storm Frequency	Design Condition	100% Burn
100-YEAR	12,505 [5,420]	18,135 [7,870]
50-YEAR	9,536 [4,400]	13,837 [6,390]
25-YEAR	6,834 [3,500]	9,900 [5,080]

[]*Calculations updated in 2015 to account for development in watershed

BASIN HISTORY: SANTA ROSA ROAD DEBRIS BASIN

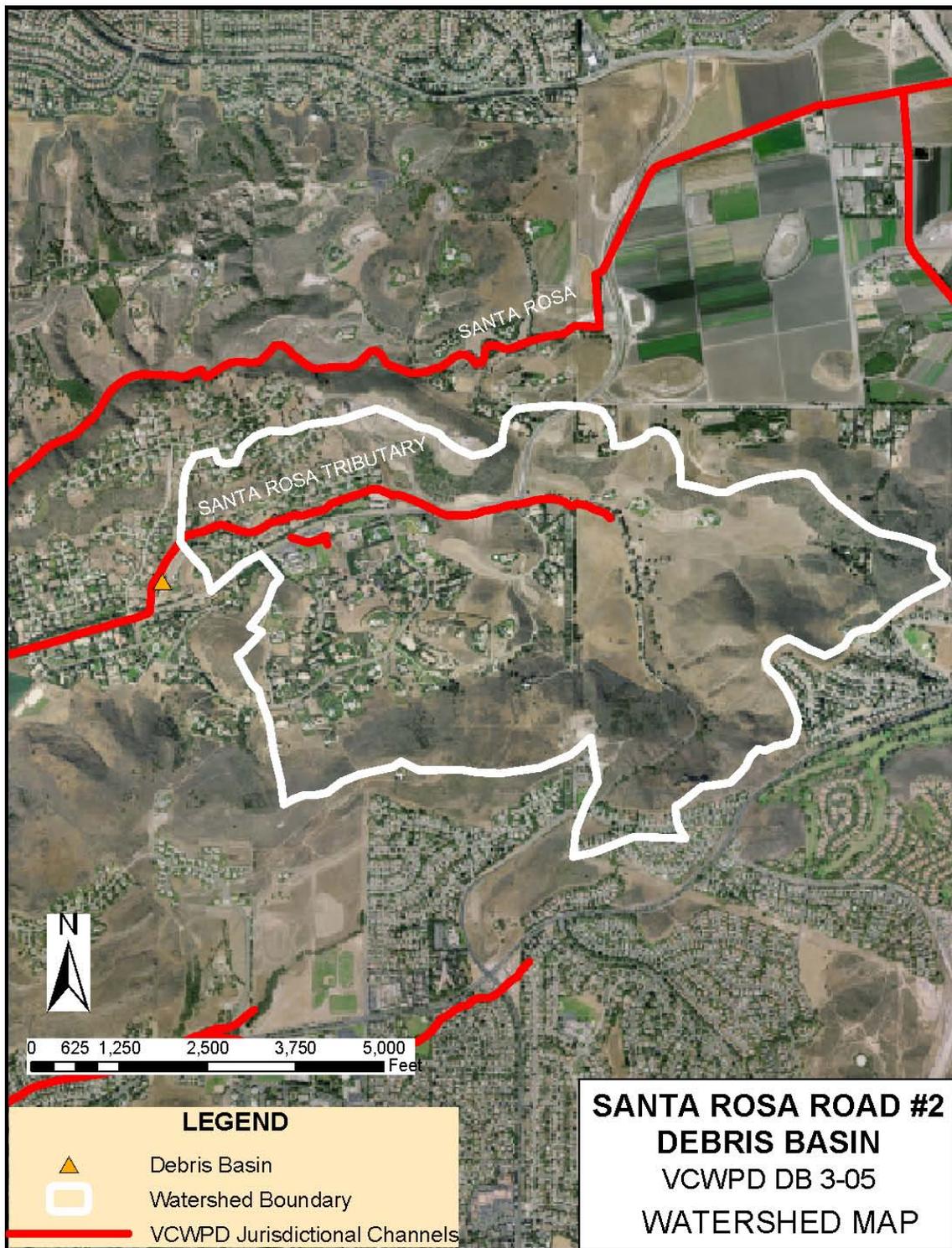
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
02-69	Disaster Declaration			950***
10-71	Aerial Survey	6,614		
03-78	Disaster Declaration			950***
02-80	Disaster Declaration			950***
09-80	Cleanout		2,600	950***
09-80	Aerial Survey	9,200		
07-81	Aerial 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			

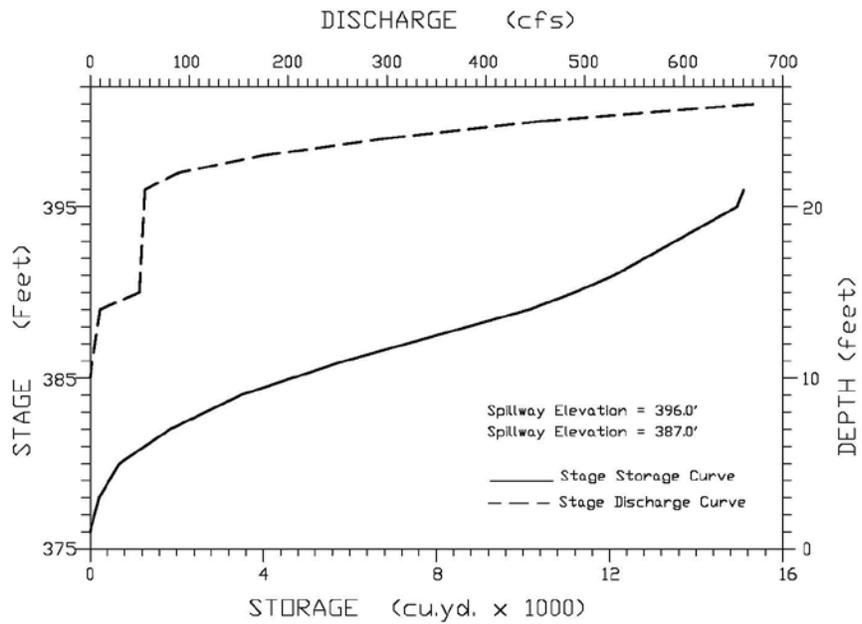
Notes

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

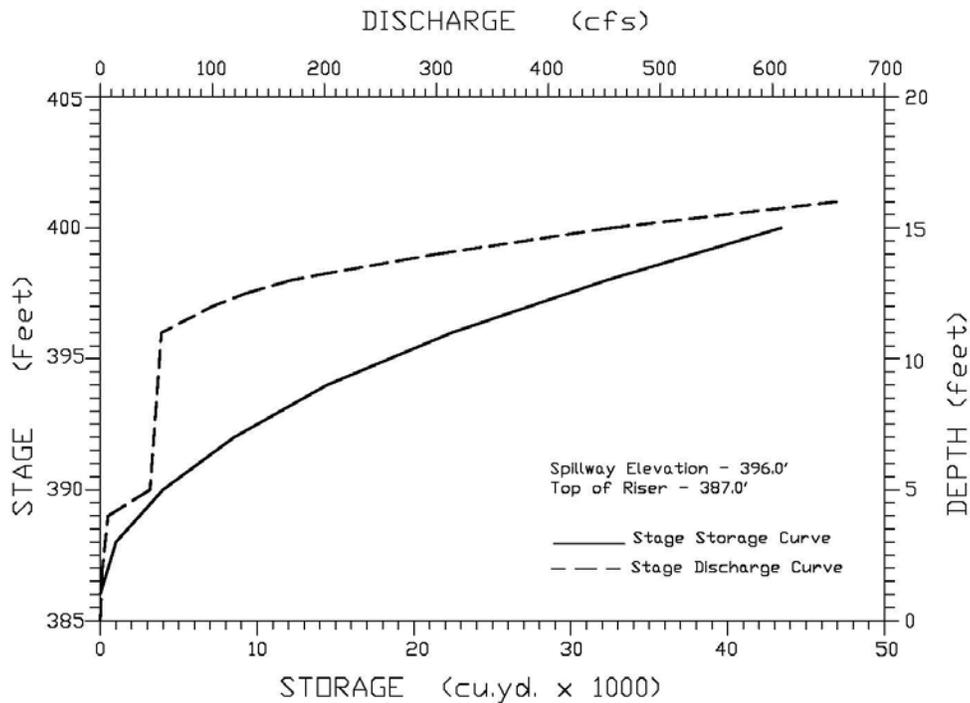
*** Theoretical Value from Scott and Williams (1978); 10% of 50-Yr Design Yield

NA= Not Available / Not Applicable





Stage- Debris Storage Curve of Assuming Sloped Debris Cone Begins at Elev 387 (Top of Riser), Slope=0.013, 1991 Manual

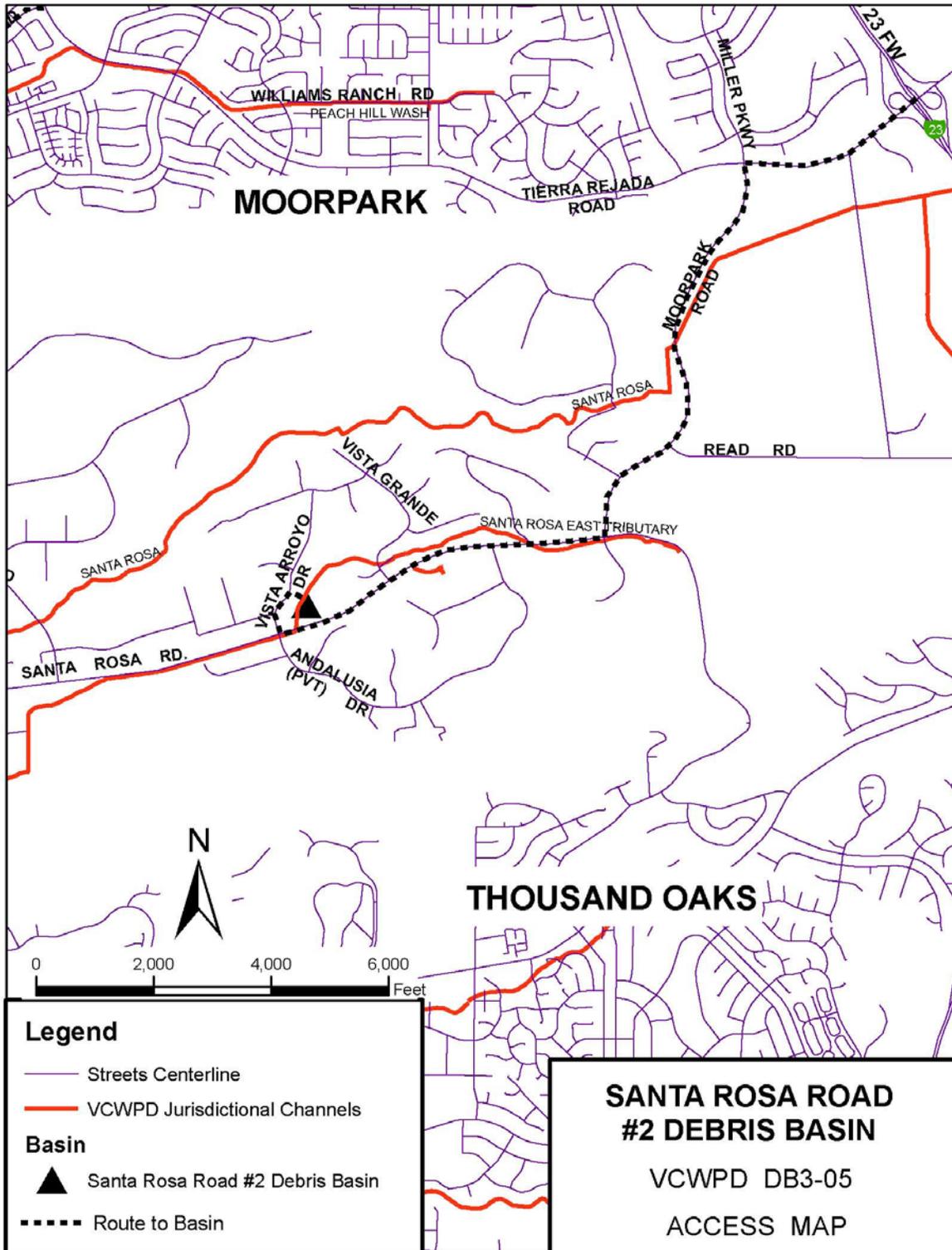


Stage-Debris Storage Curve Assuming Sloped Debris Cone Begins at Elev396 (Spillway Invert) from 1999 Manual, Slope=0.013

Stage Storage Discharge Data

Elevation	Debris Vol. 387 Datum	Debris Vol. 396 Datum	Riser Disch.	Spill Disch.	Total Disch.
Ft. NGVD29	Cu. Yds	Cu. Yds	Cfs	Cfs	Cfs
376	-	-	-		-
378	133	133	-		-
380	719	719	-		-
382	1,892	1,892	-		-
384	3,554	3,554	0.5		0.5
386	5,836	5,836	1.5		1.5
387	7,272	7,272	2.1		2.1
388	8,754	8,908	5.7		5.7
390	10,088	12,787	47.0		47.0
391	11,210	15,042	48.0		48.0
392	12,119	17,623	50.0		50.0
393	12,867	20,632	51.0		51.0
394	13,560	24,103	52.0		52.0
395	14,264	28,093	54.0		54.0
396	14,958	30,344	55.0	-	55.0
397	NA	37,619	56.0	37.8	93.8
398	NA	42,553	57.0	119.0	176.0
399	NA	47,305	58.0	240.0	298.0
400	NA	51,738	59	403.0	462.0

Note: Debris volumes calculated assuming cone with slope of 0.013 begins at datum elevation



SOUTH BRANCH ARROYO CONEJO DEBRIS BASIN (BYPASS) DB3-22

LOCATION: Adjacent to Reino Road, 2,000 ft north of Kimber Drive,
N 243,790 E 1,710580 (Lambert 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: 3,600 cfs; 2,200 cfs bypassed downstream;
Remainder diverted to basin, basin outflow=187 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 Horizontal 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

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

Basin rebuilt in 2003 to bypass sediment

2018 EXPECTED DEBRIS PRODUCTION (cy): Note 1		
Storm Frequency	Design Condition	100% Burn
100-YEAR	17,675	25,635
50-YEAR	12,535	18,180
25-YEAR	8,785	12,740

Note 1: Volumes recalculated in 2018 to account for significant development in watershed. Volume will bypass basin due to system of orifices diverting flow into basin. Volumes not expected to reach channel because it has to traverse a system of culvert inlets and improved channels upstream of the basin.

EXPECTED DEBRIS PRODUCTION 1995 (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			

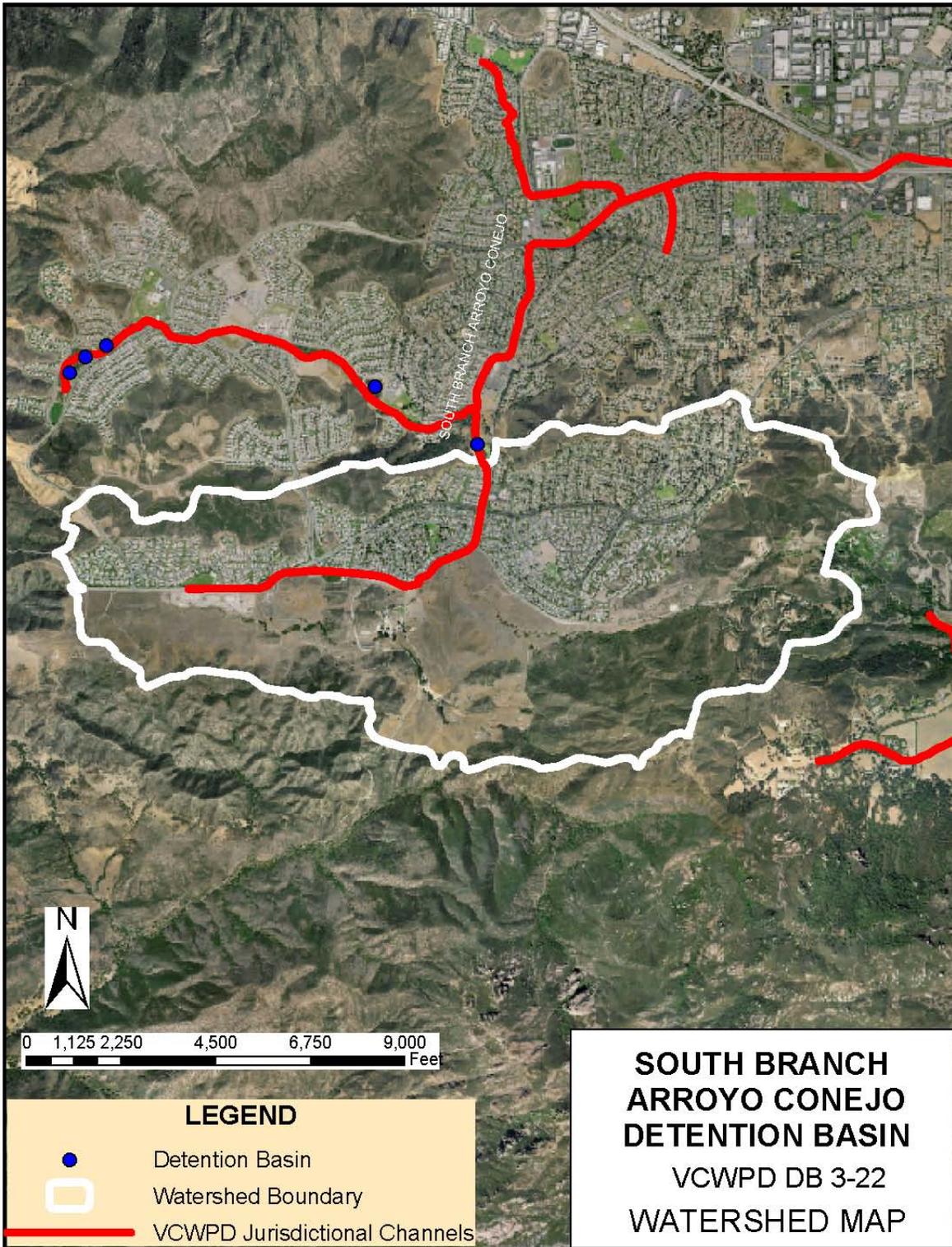
Notes

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

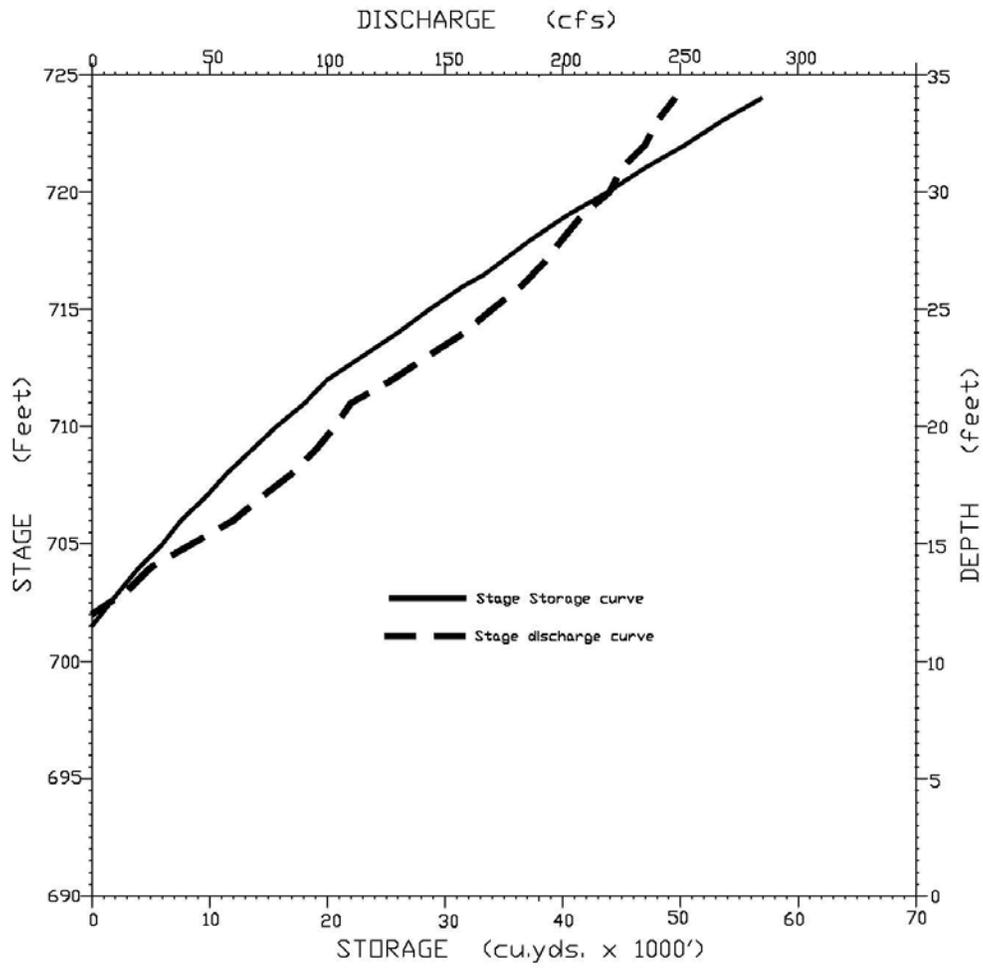
** Estimated from sounding survey

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

NA= Not Available / Not Applicable



SOUTH BRANCH ARROYO CONEJO



South Branch Bypass Basin Stage Storage Discharge Curve

Design Binder Bypass Basin Stage Storage Discharge Curve

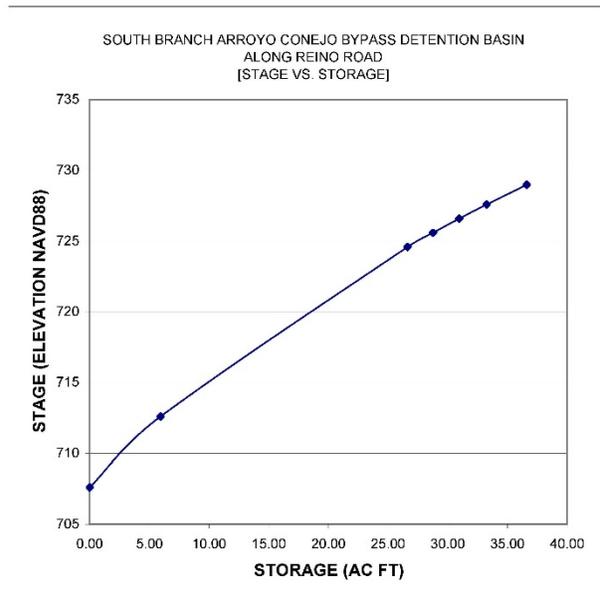
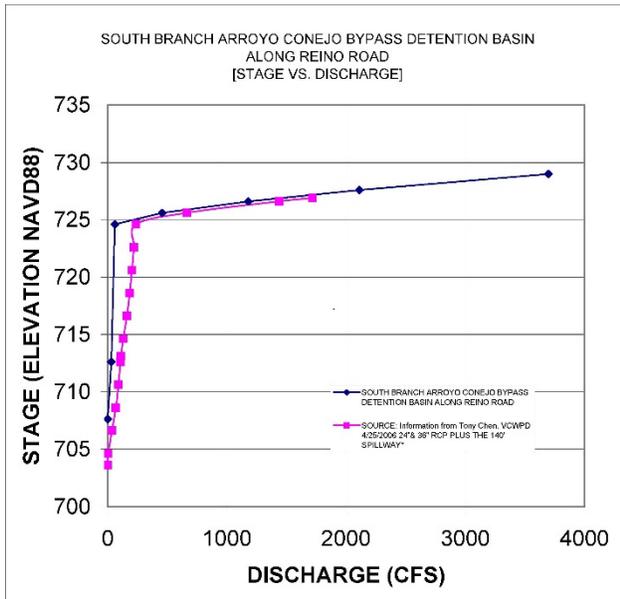
Elevation	Design Vol.	Outlet Disch.
Ft. NGVD29	Cu. Yds	Cfs
701.56	-	-
702	694	1.0
703	2,364	13.5
704	4,033	25.9
705	5,824	43.9
706	7,614	61.8
707	9,551	73.5
708	11,487	85.1
709	13,536	94.6
710	15,649	103.3
711	18,029	115.1
712	20,408	126.9
713	23,022	144.3
714	25,700	158.5
715	28,475	170.6
716	31,330	181.5
717	34,267	191.6
718	37,316	200.9
719	40,494	208.9
720	43,769	217.2
721	47,092	225.2
722	50,416	232.8
723	53,755	240.2
724	57,095	247.3

SOUTH BRANCH ARROYO CONEJO BYPASS DETENTION BASIN ALONG REINO ROAD		
SOURCE: Information from Tony Chen, VCWPD 4/25/2006 24"& 36" RCP PLUS THE 140' SPILLWAY*		
ELEVATION NGVD29	ELEVATION NAVD88	DISCHARGE
701	703.6	0
702	704.6	5
704	706.6	36
706	708.6	69
708	710.6	90
710	712.6	107
710.5	713.1	112
712	714.6	130
714	716.6	162
716	718.6	185
718	720.6	204
720	722.6	221
722	724.6	237
723	725.6	665
724	726.6	1439
724.3	726.9	1718
* 24" RCP INVERT AT ELEV 710, 36" RCP INVERT AT ELEV 700, 140' LONG WEIR SPILLWAY WITH C=3.0 AT ELEV 722 (NGVD29)		

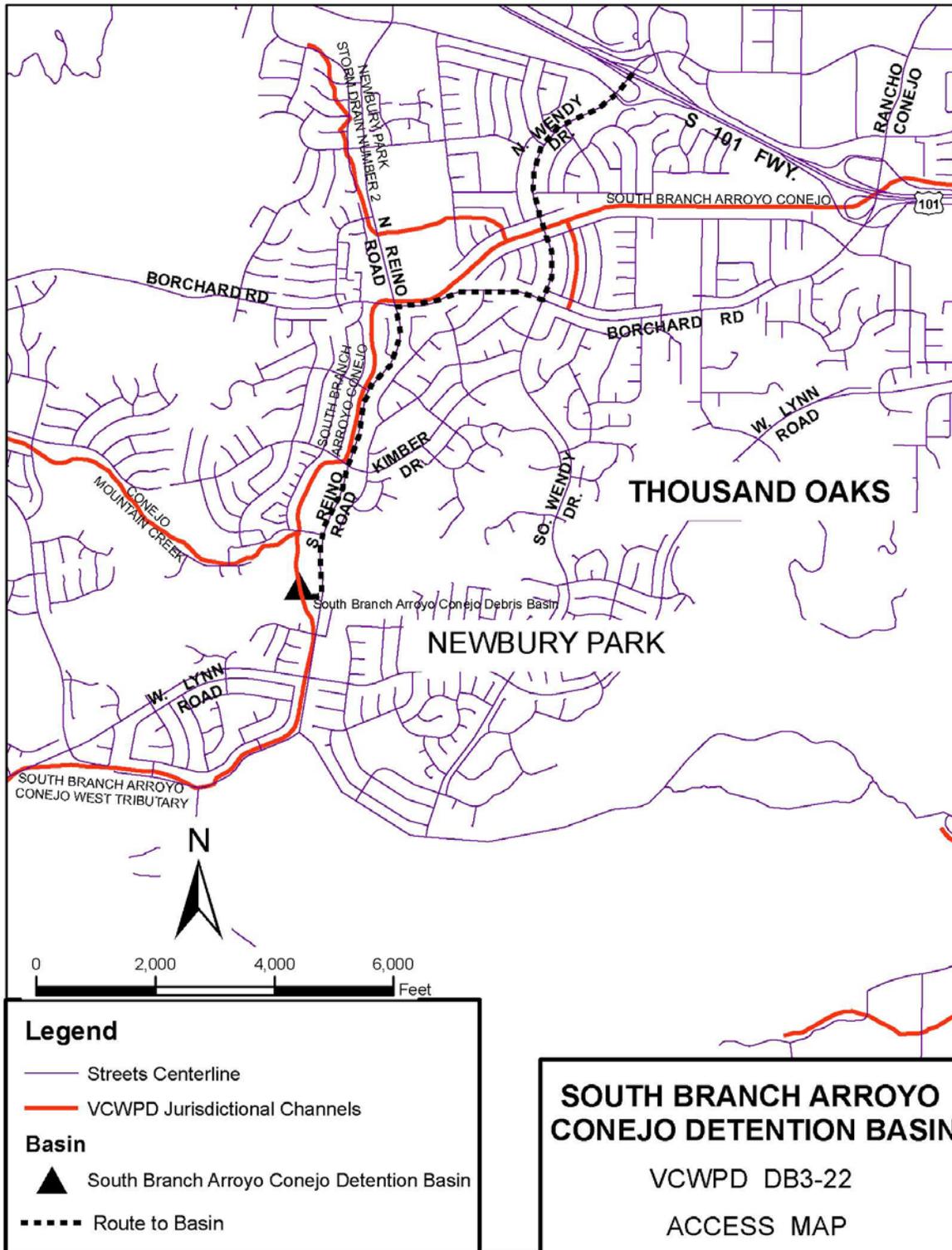
Ref: Kasraie Consulting, 2006. City of Thousand Oaks Storm Drain System Master Plan Detention Basin Manual. October.

2006 T.O. SDSMP VCRAT NODE# 468F
 Owned/Maintained By: VCWPD

SOUTH BRANCH ARROYO CONEJO BYPASS DETENTION BASIN ALONG REINO ROAD											USED	
BYPASS FLOW:		2200 CFS									NOT USED	VCWPD*
SPILLWAY: 140' LONG, WEIR COEFFICIENT=2.8												
ELEV	ELEV-NAVD88	DEPTH	ACRES	AVG_AC	INCR_VOL	TOT_VOL	INLET_DEPTH	HWD (24")	Q24"	WEIR FLOW	OUTFLOW	DISCHARGE
705	707.6	0	1.02	0.00	0.00	0.00	0	0	0	0	0	0
710	712.6	5	1.35	1.19	5.93	5.93	5	2.5	30	0	30	107
722	724.6	12	2.10	1.73	20.70	26.63	17	8.5	60	0	60	237
723	725.6	1	2.17	2.14	2.14	28.76	18	9	65	392	457	665
724	726.6	1	2.20	2.19	2.19	30.95	19	9.5	70	1109	1179	1439
725	727.6	1	2.40	2.30	2.30	33.25	20	10	75	2037	2112	2370
726.4	729	1.4	2.40	2.40	3.36	36.60	21.4	10.7	80	3618	3698	3700



Ref: Kasraie Consulting, 2006. City of Thousand Oaks Storm Drain System Master Plan Detention Basin Manual. October.



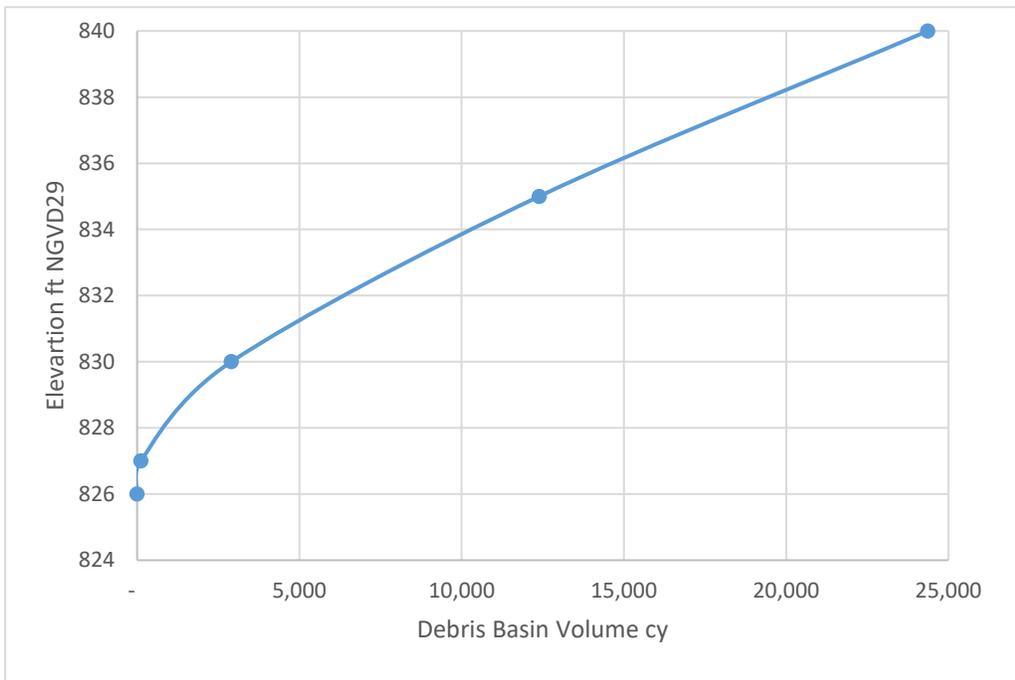
EXPECTED DEBRIS PRODUCTION (cu. yd.):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	13,900	20,162
50-YEAR	10,609	15,387
25-YEAR	7,617	11,048

BASIN HISTORY: DOS VIENTOS DETENTION BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
01-05	Disaster Declaration			1,060***
	No cleanout data reported by O&M			

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



S. Potrero Debris Basin Elev vs Volume Based on As-Built Contours

SOUTH POTRERO (DOS VIENTOS) 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 with low level outlet into debris basin for sediment bypasses debris basin and outlets into detention basin;
 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=1,121 cfs; Out= 369 cfs from as-builts
 Debris Cleanout Elevation None as debris basin intercepts all debris

EMERGENCY SPILLWAY

Type 60 ft W x 4.5 ft H Rectangular RC Channel
 Invert Elevation 811.7 ft NGVD29 at upstream face of dam
 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 "Dos Vientos South Potrero Basin"
 Topographic Drawings(pre-const) NA
 Right-of-Way Drawings NA

EXPECTED DEBRIS PRODUCTION (cu. yd.): None, debris basin expected to receive most of sediment		
Storm Frequency	Design Condition	100% Burn
100-YEAR	0	0
50-YEAR	0	0
25-YEAR	0	0

BASIN HISTORY: DOS VIENTOS DETENTION BASIN

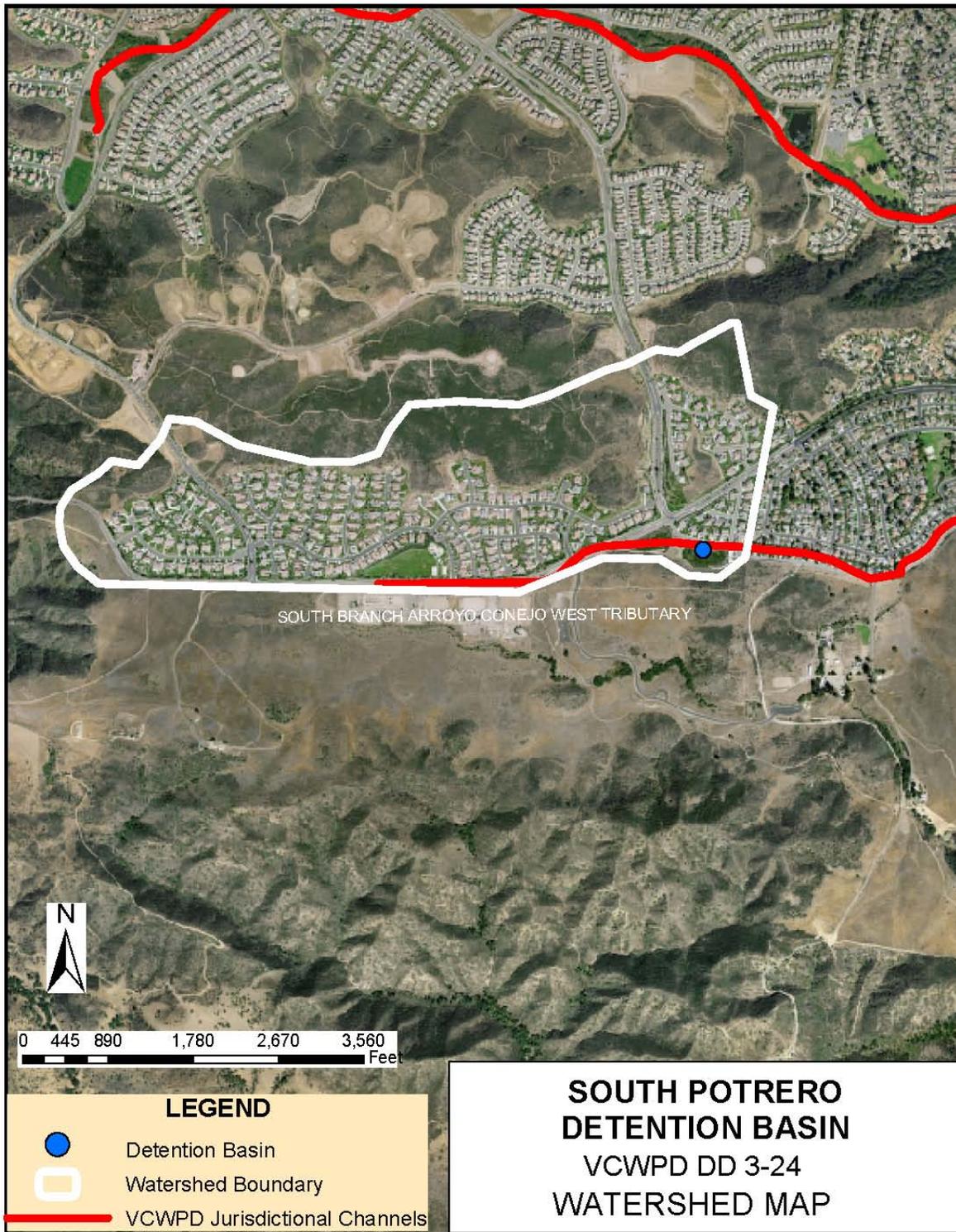
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
01-05	Disaster Declaration			1,060***
	No cleanout data reported by O&M			

Notes

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

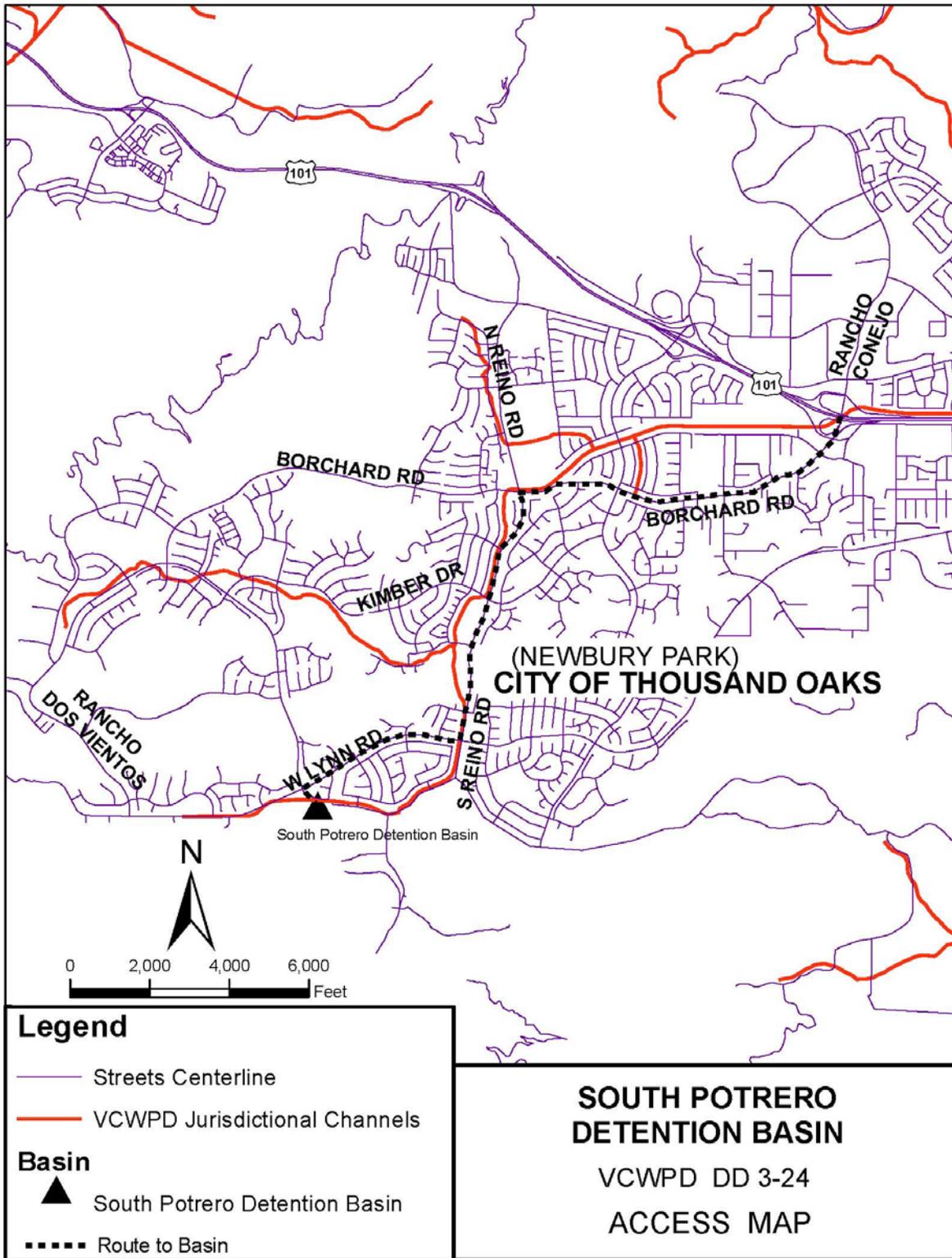
*** Theoretical Value, 10% of 50-Yr Yield per Scott and Williams (1978)

NA= Not Available / Not Applicable



Stage Storage Discharge Table, VCRat Routing Data, Calleguas 2003 Model

Elevation	Design Vol.	Outlet Disch.	Spillway Disch.	Total Disch.
Ft. NGVD29	Ac-Ft	Cfs	Cfs	Cfs
794	-	-		-
795	1.64	30.0		30.0
796	3.55	84.9		84.9
797	5.46	155.9		155.9
797.71	6.82	200.0		200.0
798	7.37	210.0		210.0
799	9.28	222.0		222.0
800	11.19	235.0		235.0
801	13.37	245.0		245.0
802	15.56	270.0		270.0
803	17.75	280.0		280.0
804	19.94	290.0		290.0
805	22.12	300.0		300.0
806	24.61	315.0		315.0
807	27.09	325.0		325.0
808	29.58	335.0		335.0
809	32.06	345.0		345.0
810	34.55	350.0		350.0
811	37.35	358.0		358.0
811.7	39.32	363.6	-	363.6
812	40.16	366.0	27.6	393.6
813	42.96	374.0	249.0	623.0
814	45.77	382.0	586.0	968.0
815	48.57	390.0	1,007.1	1,397.1
Interpolated				



ST. JOHNS DEBRIS BASIN DB3-03 (Obsolete)

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

District transferred basin to developer in 2006, basin redesigned and HOA maintained

DESIGN DATA

Design Agency	<u>Soil Conservation Service</u>
Level Capacity	<u>50,000 cy (10-29-71) T-22-11</u>
Maximum Debris Capacity	<u>87,600 cy (11-16-88 DTM)</u>
100-Yr Inflow Rate	<u>500 cfs</u>
Outflow Rate	<u>Assumed same for hydrology models</u>

EMERGENCY SPILLWAY

Type	<u>10 ft W x 5 ft H</u>
Invert Elevation	<u>286 ft NGVD29</u>
Spillway Length	<u>NA</u>
Capacity w/o Freeboard	<u>313 cfs</u>

PRINCIPAL SPILLWAY

Type	<u>None</u>
Weir Elevation	<u>NA</u>
Outlet Conduit	<u>NA</u>

DEBRIS BLEEDER/RISER

Type	<u>Perforated 10 in Steel Pipe 13.8 ft High</u>
Top Elevation	<u>277 ft NGVD29</u>
Outlet Conduit	<u>10 in Steel Pipe</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>292 ft NGVD29</u>
Length	<u>400 ft</u>
Surface Area of Full Basin	<u>4.1 ac</u>
Watershed Area	<u>240 ac from Quad Map</u>
Width at Crest	<u>NA</u>

CONSTRUCTION DATA

Construction Agency	<u>Soil Conservation Service</u>
Completion Date	<u>1957</u>

REFERENCE DRAWINGS

Construction Drawings	<u>SCS 7-E-15512 (C-13-1J)</u>
Right-of-Way Drawings	<u>10196.1 Easement</u>
Topographic Drawings	<u>T-63-20 (11-2-71), 11-16-88 DTM</u>

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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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****
12-99	Aerial Survey	Not Digitized		
01-05	Disaster Declaration			

Notes

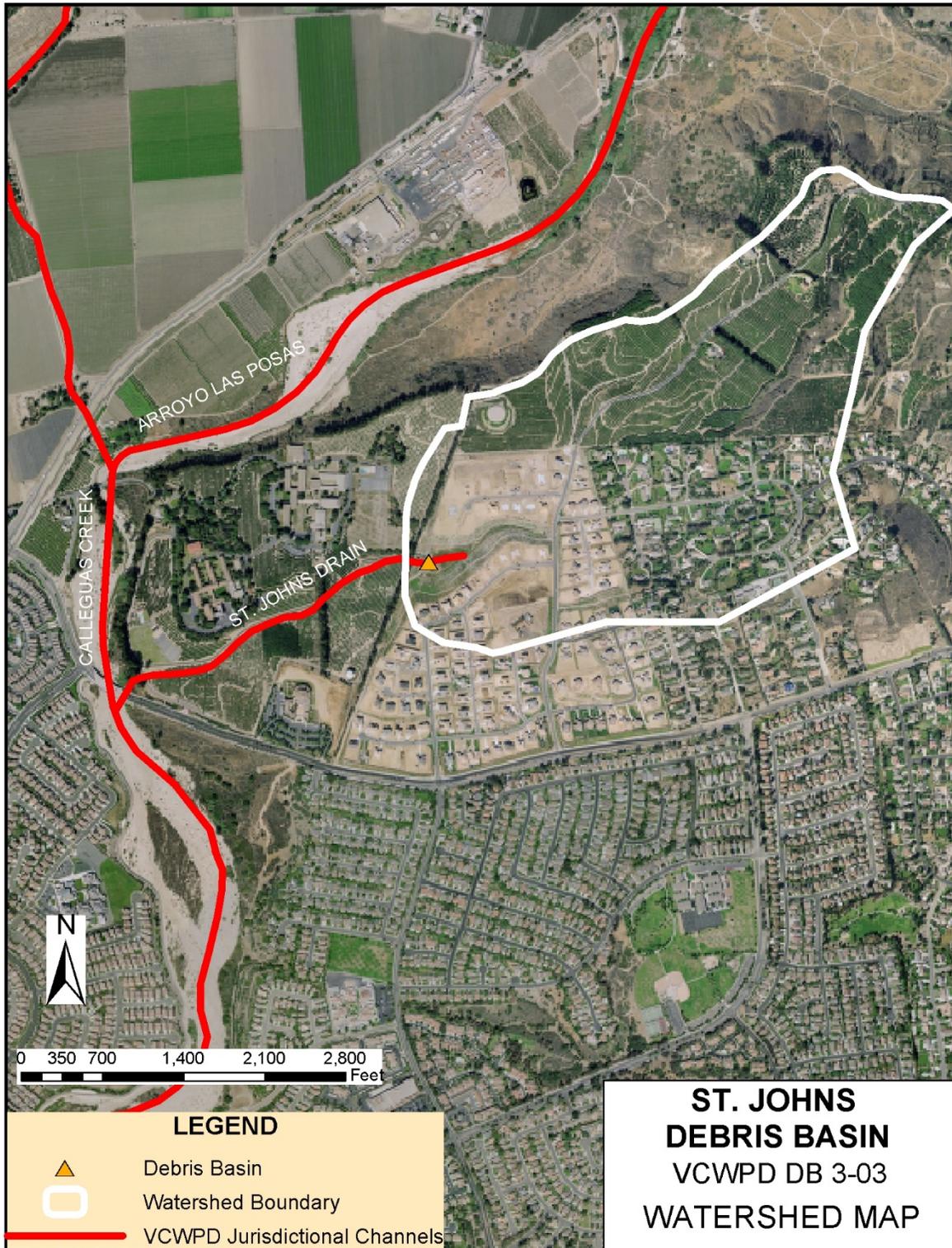
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

** FEMA Accepted Value for Disaster Declaration

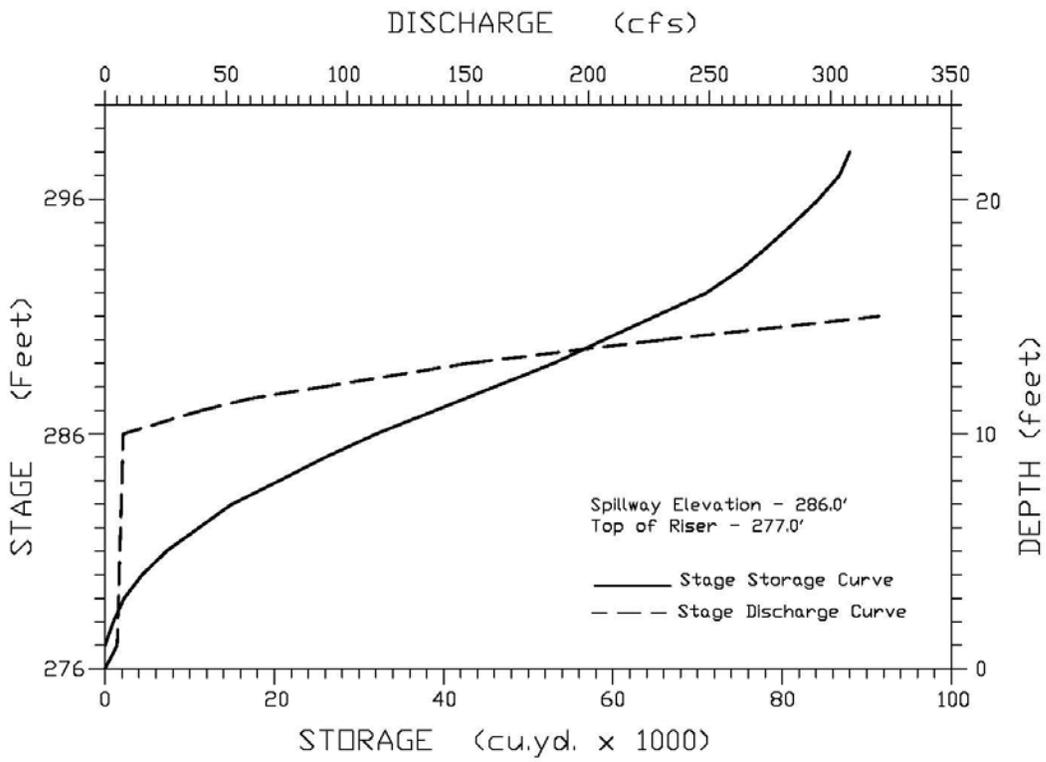
*** Theoretical Value from Kevin Scott Formula

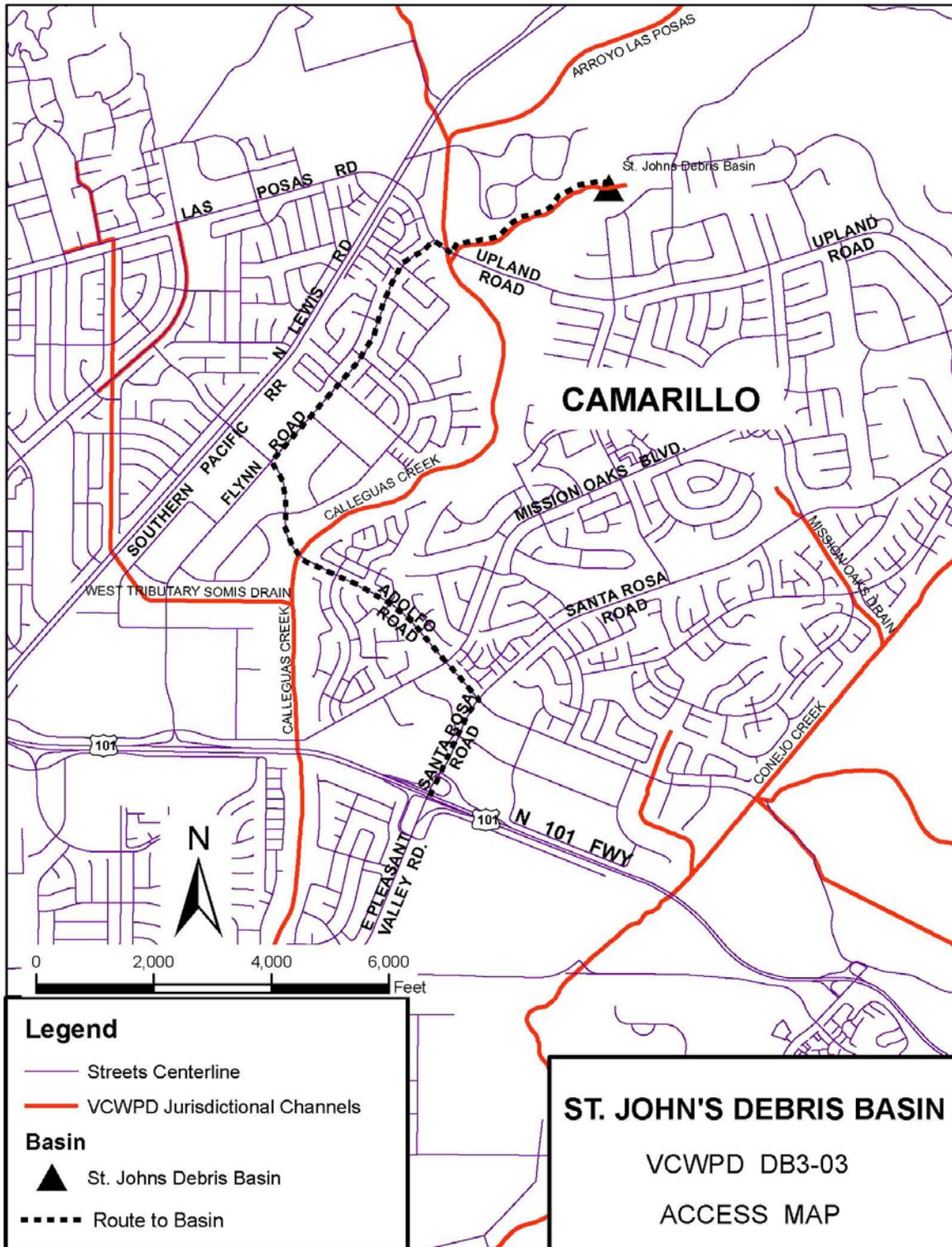
****Based on FEMA Method

NA= Not Available / Not Applicable



ST. JOHN DEBRIS BASIN





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	<u>VCWPD</u>
Flood Storage Capacity	<u>660 ac ft above 780 ft (890 ac-ft per State Dam Book)</u>
Maximum Debris Storage	<u>172,500 cy or 107 ac-ft @ 780 ft (25*Mean Annual+100Yr Debris Yield)</u>
Q50:Q100 Inflow and Outflow Rates	<u>IN=4,117: 4,900 cfs; OUT=178: 190 cfs as designed</u>
Q100 Outflow	<u>QUIT=376 cfs using HSPF model and revised storage</u>
Debris Cleanout Elevation	<u>780 ft (172,500 cy) [Max. debris storage level] (storage curve below 780 ft not available) based on as-built</u>

EMERGENCY SPILLWAY

Type	<u>Rectangular RC Weir 80 ft Wide</u>
Invert Weir Elevation	<u>797 ft NGVD29</u>
Capacity w/o Freeboard	<u>12,000 cfs</u>

PRINCIPAL SPILLWAY

Type	<u>4 ft x 6 ft RC Tower with Flared Top and Sidewall Inlets</u>
Weir Elevation	<u>789.33 ft NGVD29</u>
Outlet Conduit	<u>48 in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>None</u>
Top Elevation	<u>NA</u>
Outlet Conduit	<u>NA</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation; Height	<u>810 ft NGVD29; ~24 ft</u>
Length	<u>1520 ft</u>
Surface Area of Full Basin	<u>70 ac at spillway invert per as-built</u>
Watershed Area	<u>4,380 ac from Quad Map and GIS Shapefile</u>
Width at Crest	<u>20 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>VCWPD</u>
Completion Date	<u>1981</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-2109 to Y-3-2133</u>
Right-of-Way Drawings	<u>Y-3-2110</u>
Topographic Drawings	<u>Y-3-2110</u>

EXPECTED DEBRIS PRODUCTION (cu. yd.):		
Storm Frequency	Design Condition (Note 1)	100% Burn
100-YEAR	59,260 (32,135) [17,900]	80,200
50-YEAR	45,290 (24,560) [14,500]	61,310
25-YEAR	32,560 (16,660) [11,500]	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 (). In 2013 sediment re-evaluated based on development and yields reduced as shown in [].

BASIN HISTORY: SYCAMORE CANYON DAM

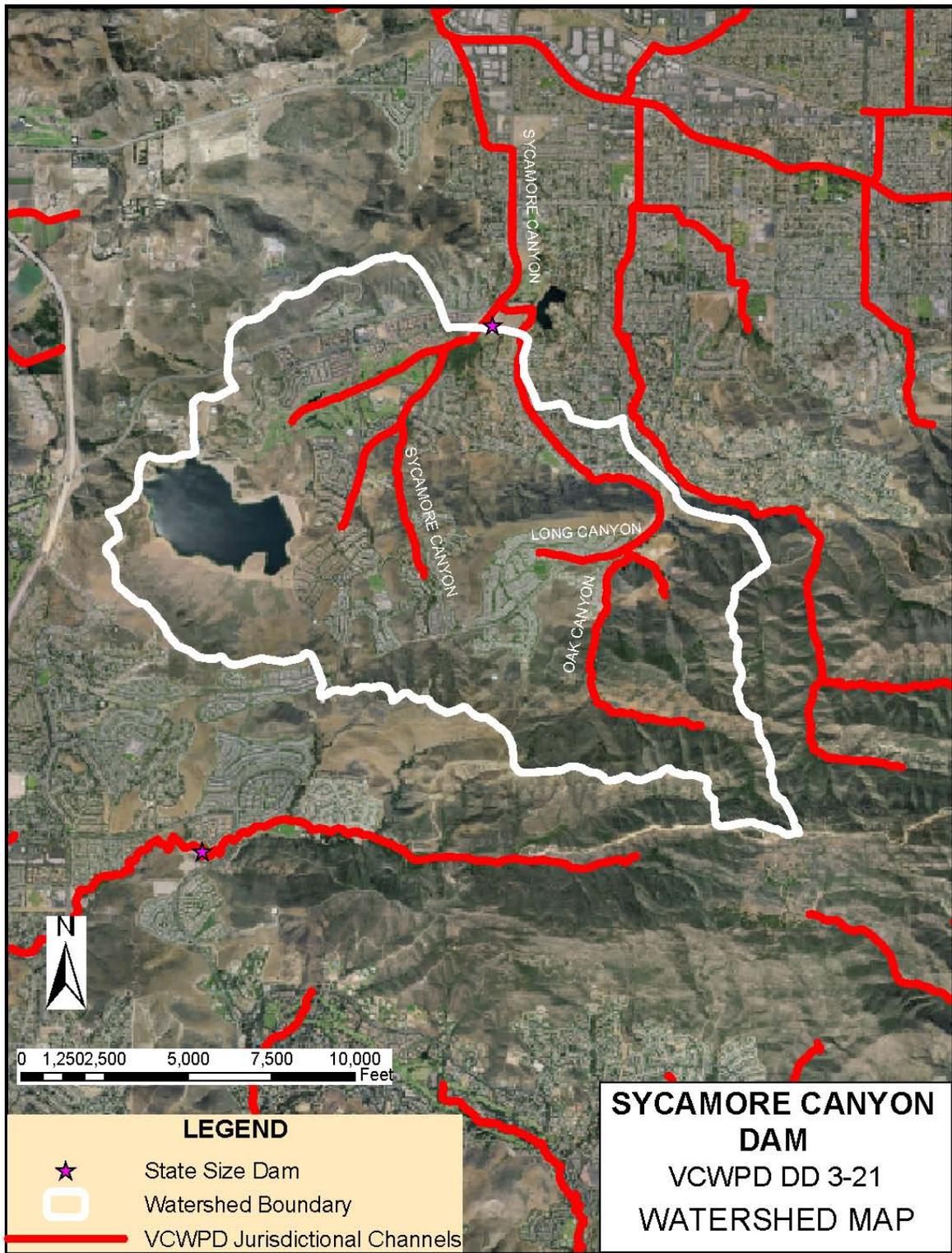
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
01-81	Dam Constructed	1,064,800 (660ac-ft)		
03-83	Disaster Declaration			4,530***
08-96	Aerial Survey	Not Digitized		
02-92	Disaster Declaration			4,530***
01-95	Disaster Declaration			4,530***
08-96	Aerial 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***
	No clean out data reported by O&M.			
08-06	WR&T analysis with 08-06 and 05-05 TINs using overlapping areas		9,401 Fill vol 43,6952 Cut vol	

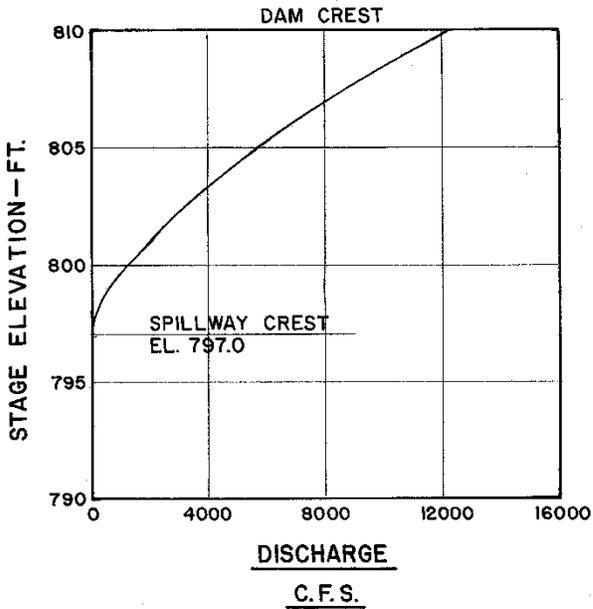
Notes

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

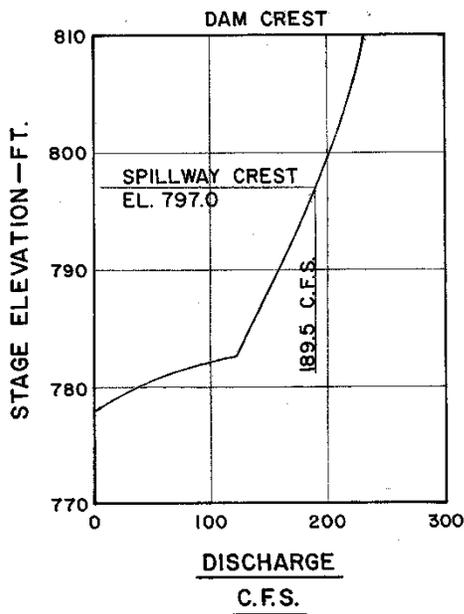
*** Theoretical Value from Scott and Williams (1978); 10% of 50-Yr Design Yield

NA= Not Available / Not Applicable

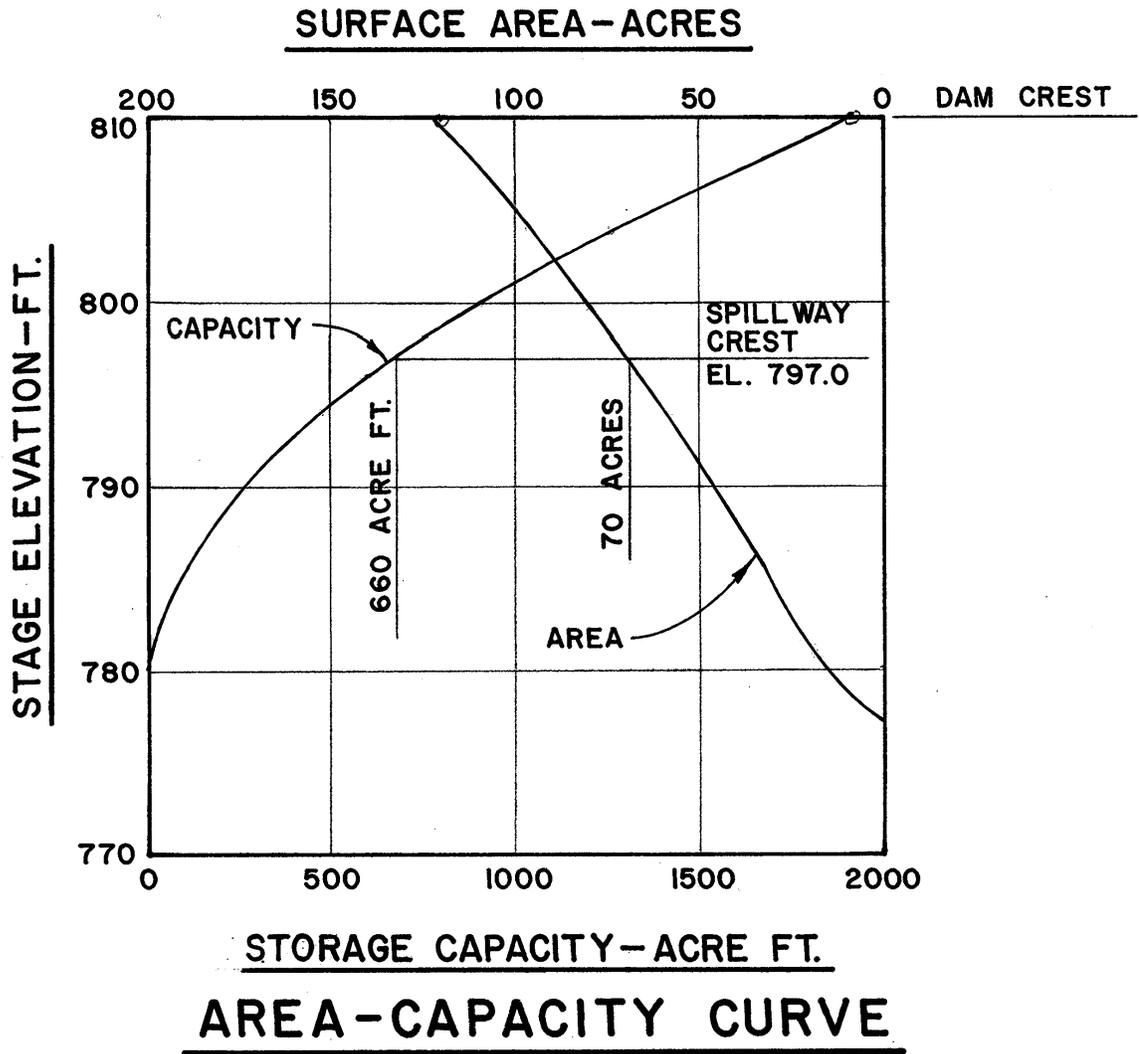




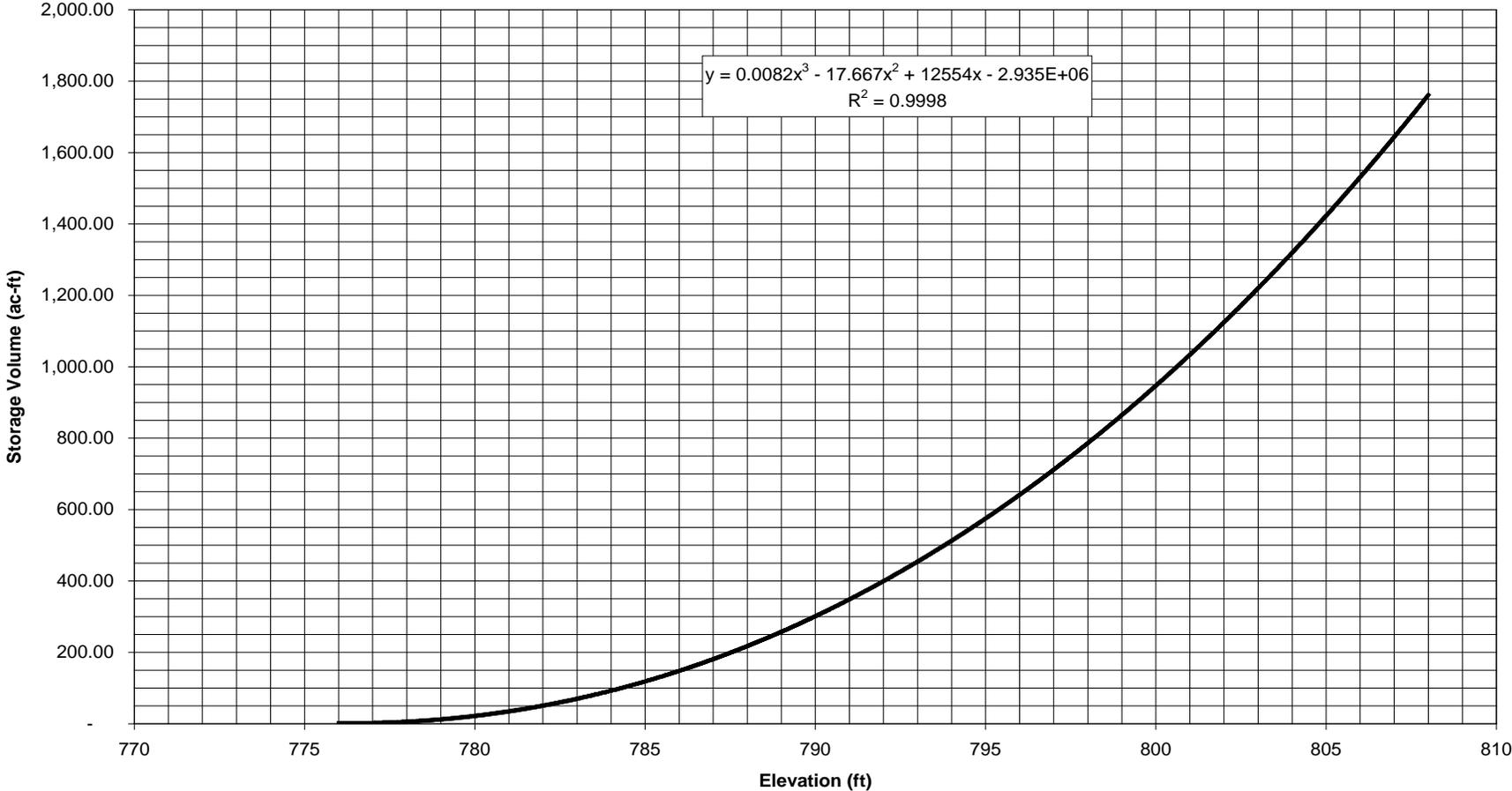
SPILLWAY RATING CURVE



Sycamore Detention Basin



Sycamore Detention Basin Capacity Above Debris Storage



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

Data from 2013 Sycamore Dam Hydrology Update Report

Elev. ft NAVD88	Elev. ft NGVD 29	Depth ft	Net Vol. minus Veg. ac-ft	Net Flood Storage ac-ft	Emerg. Spillway Flow cfs	Outlet Tower Flow cfs	Outflow Sum cfs	Surface Area ac.
780.00	777.39	0.00	-	-	-	0.0	-	0.00
782.00	779.39	2.00	0.716	-	-	17.0	17.0	0.36
784.00	781.39	4.00	14.524	-	-	72.0	72.0	6.90
785.21	782.60	5.21	33.561	0	0	120.0	120.0	10.23
786.00	783.39	6.00	45.945	12.39	0	125.0	125.0	15.71
788.00	785.39	8.00	88.254	54.69	0	135.0	135.0	21.15
790.00	787.39	10.00	138.514	104.95	0	145.0	145.0	25.13
792.00	789.39	12.00	200.502	166.94	0	156.0	156.0	30.99
794.00	791.39	14.00	270.170	236.61	0	167.0	167.0	34.83
796.00	793.39	16.00	348.214	314.65	0	175.0	175.0	39.02
798.00	795.39	18.00	438.587	405.03	0	184.0	184.0	45.19
799.61	797.00	19.61	523.664	490.10	0	189.5	189.5	51.35
800.00	797.39	20.00	544.272	510.71	100	193.0	293.0	52.84
801.00	798.39	21.00	605.561	572.00	300	197.0	497.0	57.07
802.00	799.39	22.00	666.849	633.29	800	200.0	1,000	61.29
804.00	801.39	24.00	803.114	769.55	2,300	209.0	2,509	68.13
806.00	803.39	26.00	960.175	926.62	4,050	218.0	4,268	78.53
808.00	805.39	28.00	1,130.787	1,097.2	5,800	224.0	6,024	85.31
810.00	807.39	30.00	1,316.528	1,283.0	8,600	229.0	8,829	92.87
812.00	809.39	32.00	1,445.291	1,411.7	11,600	234.0	11,834	100.00

Note: Veg. volume = 10.0 ac-ft; 100-yr design debris volume + storage = 33.56 ac-ft



SYCAMORE PARK DETENTION BASIN DD3-29

LOCATION: Simi Valley, On Rudolph upstream of Crosby St
 N 273,860,E 1,774,900 (Lambert Zone 5 Coordinates);
 Simi 7 1/2' Quad.

DESIGN DATA

Design Agency	<u>Crosby-Mead-Benton</u>
Level Capacity	<u>6,450 cy at spillway invert (Y-3-3734)</u>
Maximum Debris Capacity	<u>NA</u>
100-Yr Inflow Rate	<u>109 cfs</u>
Outflow Rate	<u>38 cfs at 911.3 ft NGVD29, 10-yr 25 cfs</u>
Debris Cleanout Elevation	<u>903 ft 370 cy (25% of 100-yr sediment volume)</u>

EMERGENCY SPILLWAY

Type	<u>36-in RCP Vertical Pipe</u>
Crest Elevation	<u>911.3 ft NGVD29</u>
Spillway Length	<u>NA</u>
Capacity w/o Freeboard	<u>38 cfs</u>

PRINCIPAL SPILLWAY

Type	<u>6 ft x 6 ft Concrete Riser Tower, Top Elev 910.0 ft</u>
Inlet Weir Elevations	<u>906.8 ft NGVD29</u>
Outlet Conduit	<u>24 to 36 in RCP</u>

DEBRIS BLEEDER/RISER

Type	<u>6-in Perforated Pipe Laid at 1% Min. Grade w/ Gravel</u>
Start Elevation	<u>901 ft NGVD29, Length Approx. 100 ft</u>
Outlet Conduit	<u>Connects to Principal Spillway</u>

DAM

Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>914 ft NGVD29</u>
Length	<u>~230 ft on 2 sides of basin</u>
Surface Area of Full Basin	<u>~0.4 ac</u>
Watershed Area	<u>33 ac from Simi Valley MDP (draft)</u>
Width at Crest	<u>15 ft</u>

CONSTRUCTION DATA

Construction Agency	<u>Centex</u>
Completion Date	<u>1997</u>

REFERENCE DRAWINGS

Construction Drawings	<u>Y-3-3726-3745</u>
Right-of-Way Drawings	<u>NA</u>
Topographic Drawings	<u>NA</u>

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	1,473	2,137
50-YEAR	1,210	1,755
25-YEAR	854	1,238
10-YEAR	470	682

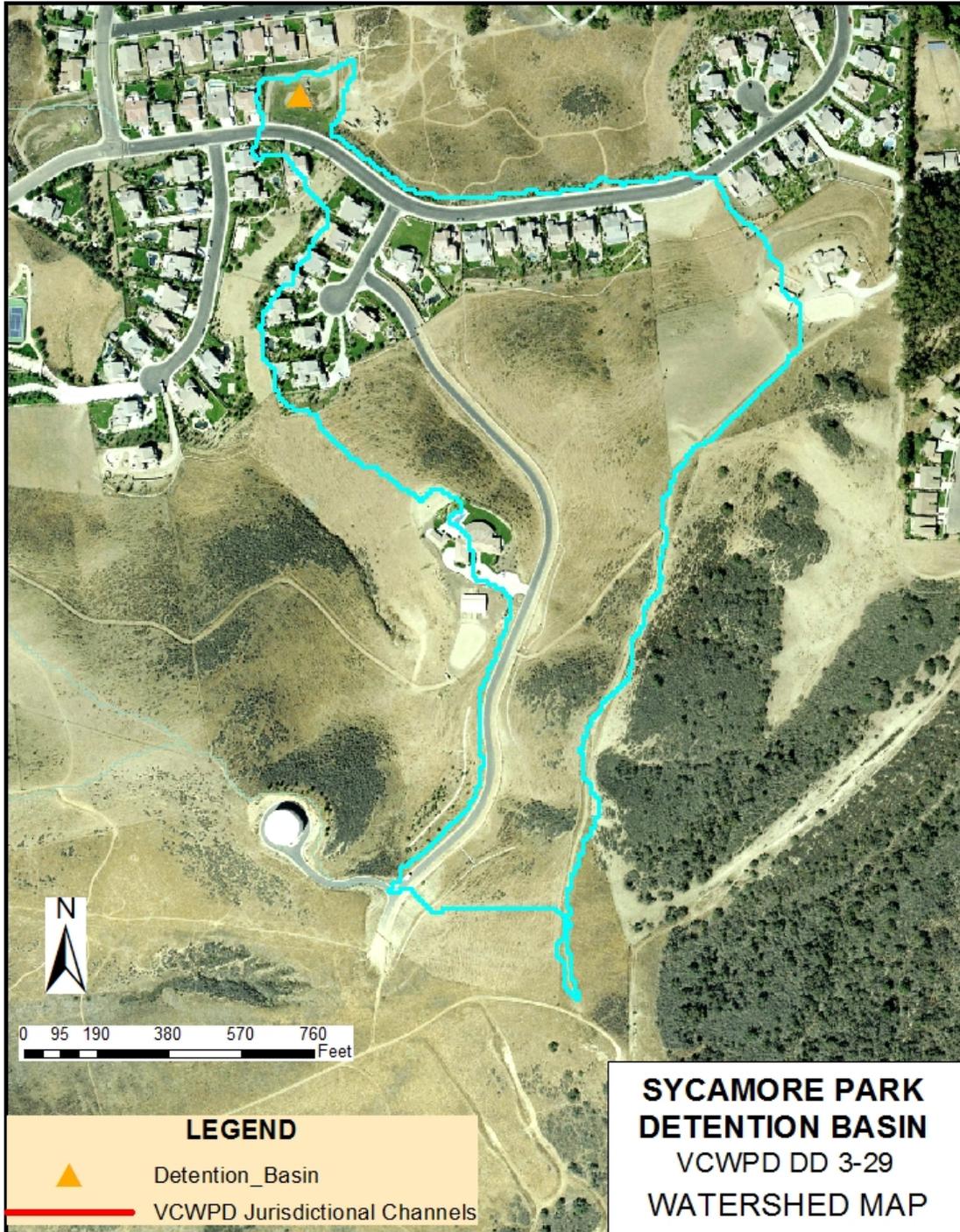
Note: Development between basin and undeveloped area expected to minimize sediment inflow to basin

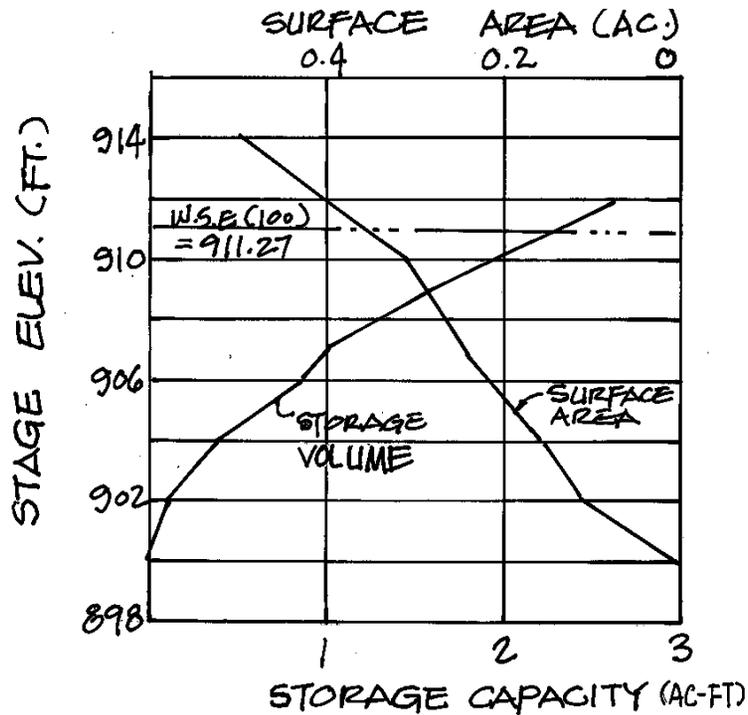
BASIN HISTORY: SYCAMORE PARK BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	<u>No cleanout data reported by O&M</u>			

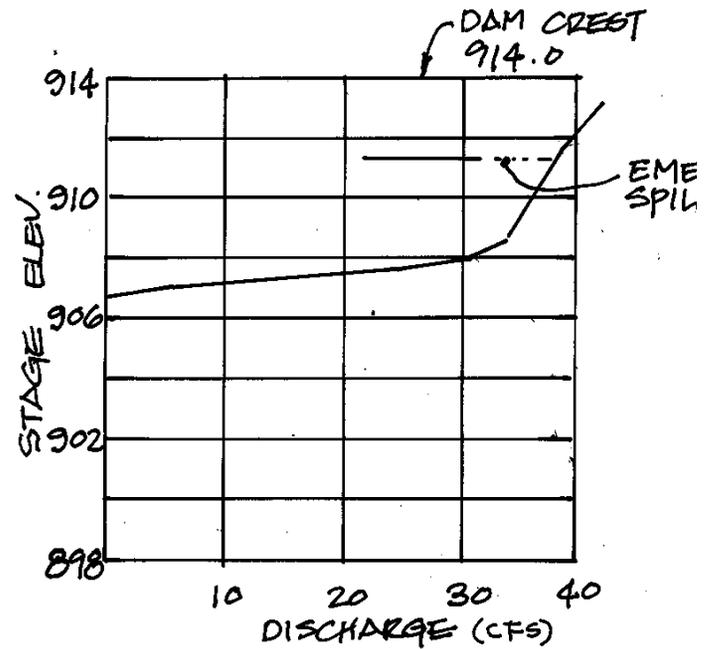
Notes

- * 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



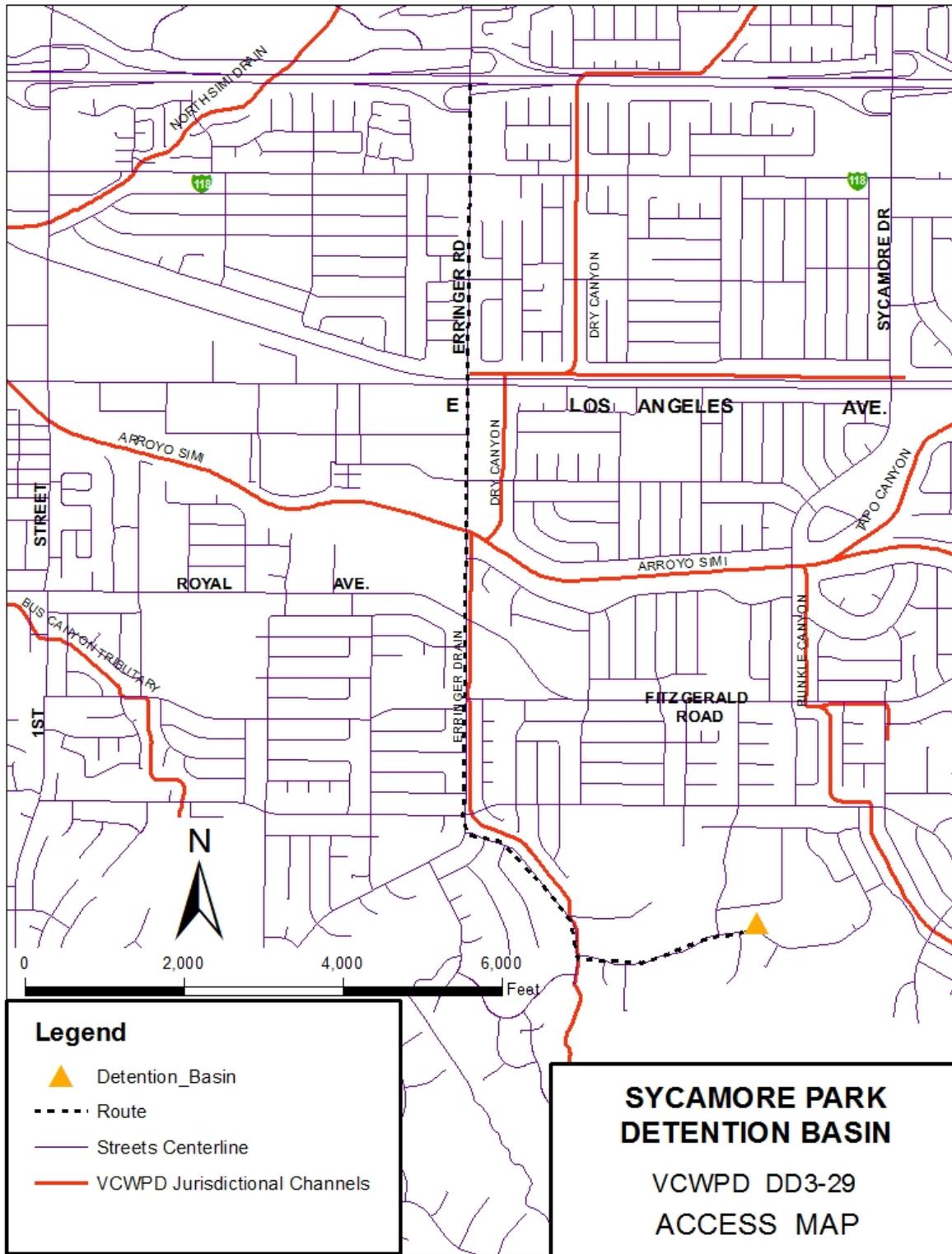


STORAGE AND SURFACE RATING CURVE



SPILLWAY RATING CURVE

Sycamore Park Detention Basin



TAPO HILLS NO. 1 (WEST) DETENTION BASIN DD3-18

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 36,140 cu.yds. at Spillway Weir Elev of 1149.5 ft NGVD29
 Maximum Debris Capacity 56,000 cu.yds. level T-245 (7-8-80); 75,000 cy sloped
 100-Yr Inflow and Outflow Rates IN:290 cfs; OUT:42.1 cfs at 1,148 ft NGVD29 (Y-3-1726)
 Debris Cleanout Elevation 1133.5 ft (1,430 cy) (25% of 100-yr vol)

EMERGENCY SPILLWAY
 Type 20 ft Long x 12 ft Wide x 5.5 ft Deep Side Channel Inlet
 Invert Weir Elevation 1,149.5 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 1147.5 ft NGVD29
 Outlet Conduit 24 in RCP

DAM
 Dam Type Earthfill
 Dam Crest Elevation 1,155 ft NGVD29
 Length 250 ft
 Surface Area of Full Basin 2.2 ac
 Watershed Area 104 ac
 Width at Crest 20 ft

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)

Basin designed as debris basin but riser modified by Y3-1713 Schedule II project to function as detention basin. Basin included in District's official Calleguas model 2003.

EXPECTED DEBRIS PRODUCTION (cy): 1990 and [1973] values		
Storm Frequency	Design Condition	100% Burn
100-YEAR	5,730 (1) [5,450]	8,310
50-YEAR	4,380 [4,150]	6,350
25-YEAR	3,150 [2,975]	1,580

(1) Design Binder (1974) used 50-yr sediment yield of about 4,200 cy for design volume as shown on as-builts. Scott and Williams estimated 50-yr yield of 4,150 cy. 25- and 100-yr values estimated using rainfall ratios. Current basin design value would be 5,730*1.25= 7,160 cy.

BASIN HISTORY: TAPO HILLS NO. 1 WEST BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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 – Survey analysis by O&M		4,353	
10-05	TIN analysis by WR&T 10-05 vs 05-05 TINs		3,599 Fill vol 1,039 Cut vol	
10-05	TIN analysis by WR&T	26,073 to elev 1,150 ft NGVD29		

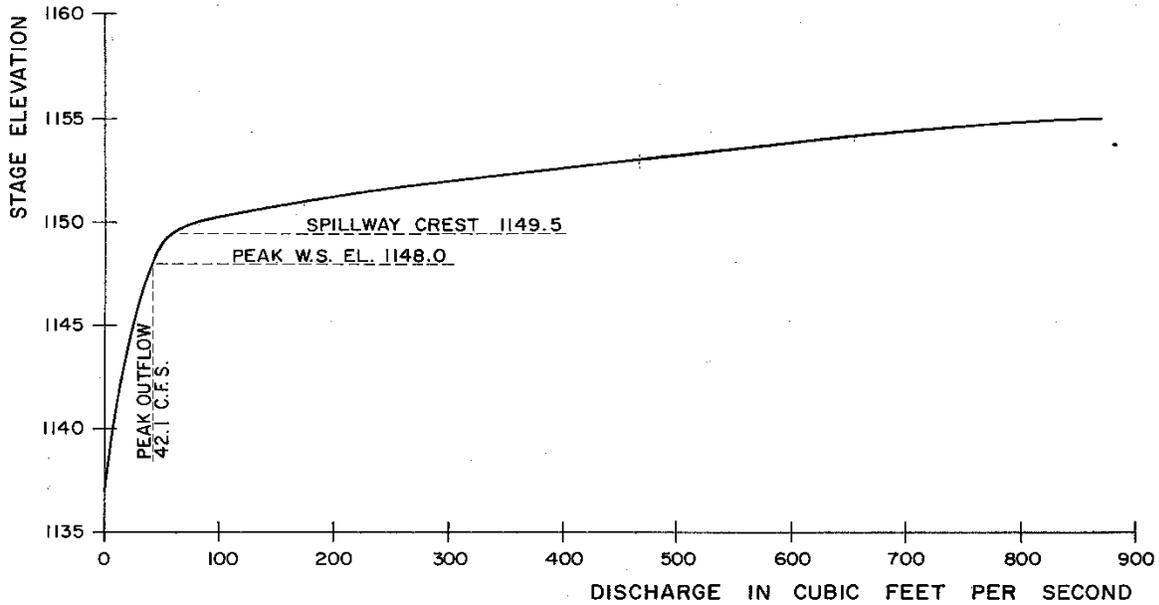
Notes

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

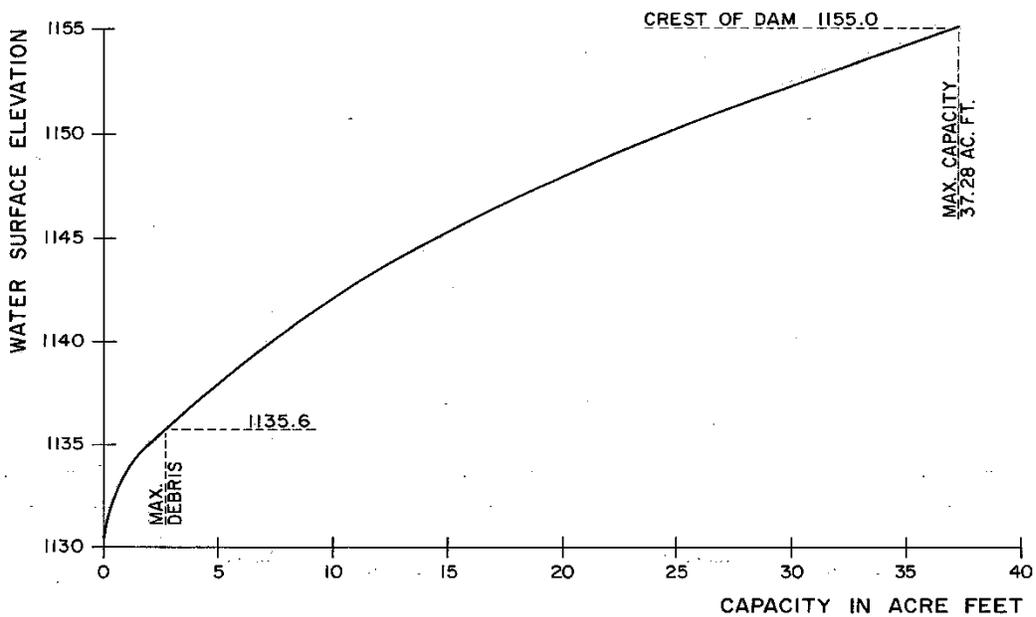
*** Theoretical Value from Scott and Williams (1978)- 10% of 50-Yr Design Debris Production

NA= Not Available / Not Applicable





STAGE - DISCHARGE CURVE
WEST DAM

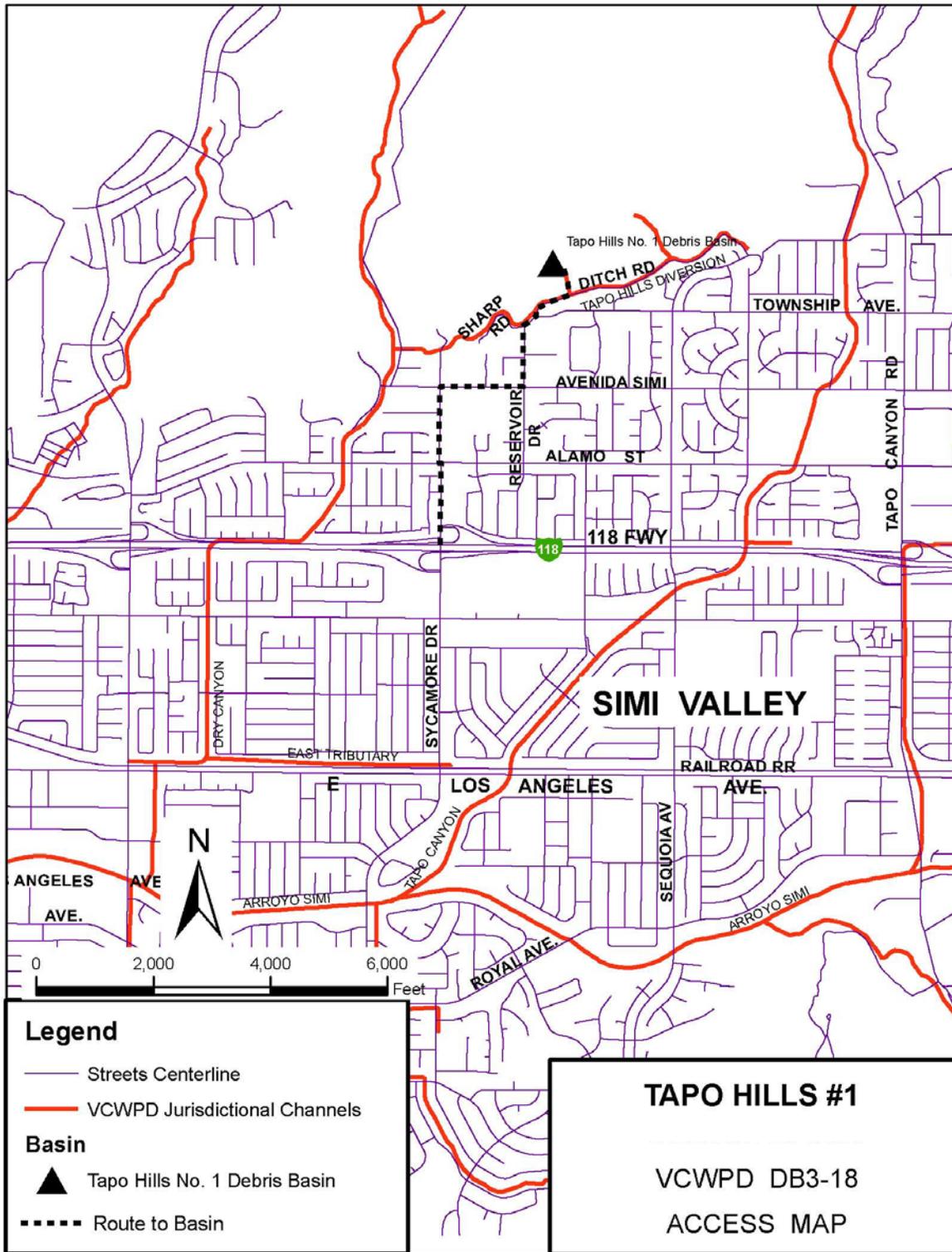


Stage Storage Discharge Data from Y-3-1726; Discharge data superseded by silting of bleeder riser to elev 1137.5 due to 125% of 100-yr debris volume.

Stage Storage Discharge Data

Elevation	As-Built Design Vol.	2003 VCRat Vol.	2018 Net Vol.	Riser	Net Riser with Silt	Spillway	Total
Ft. NGVD29	Ac-Ft	Ac-Ft	Ac-Ft	Cfs	Cfs	Cfs	Cfs
1131	0			-			
1132	0.3			1.2			
1133	0.7			3.1			
1134	1.2			5.6			
1135	2.0	-		8.6			
1136	2.9	0.8		12.0			
1137	3.9	1.6		15.8			
1137.5	4.4	NA	-	17.8	-		-
1138	5.0	2.5	0.562	19.9	0.5		0.5
1139	6.1	3.6	1.662	24.3	2.0		2.0
1140	7.4	4.7	2.962	29.0	4.3		4.3
1141	8.5	5.9	4.062	33.9	7.1		7.1
1142	9.9	7.3	5.462	39.1	10.3		10.3
1143	11.1	8.8	6.662	44.5	13.9		13.9
1144	12.9	10.4	8.462	49.7	17.8		17.8
1145	14.4	12.1	9.962	52.0	22.0		22.0
1146	16.2	13.7	11.762	53.2	26.6		26.6
1147	17.9	15.6	13.462	54.4	31.2		31.2
1147.5	19.0	16.6	14.512	55.0	33.3		33.3
1148	20.0	17.6	15.562	55.6	46.3		46.3
1149	21.9	19.6	17.462	56.7	56.7		56.7
1149.5	23.1	20.8	18.612	57.3	57.3	-	57.3
1150	24.2	21.9	19.762	57.8	57.8	22	79.8
1151	27.4	24.0	22.962	58.9	58.9	114	172.9
1152	30.0	26.6	25.562	60.0	60.0	245	305.0
1153	32.3	29.2	27.862	61.1	61.1	406	467.1
1154	35.0	31.8	30.562	62.1	62.1	592	654.1
1155	37.3	34.6	32.842	63.1	63.1	800	863.1

NA= Not Analyzed



TAPO HILLS NO. 2 DETENTION BASIN DD3-19

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 41,190 cu.yds. (T-245) 7-8-80 to top of spillway 1,153 ft
 Maximum Debris Capacity 51,820 cu.yds. (T-245) 7-8-80 level at top of dam
 100-Yr Inflow and Outflow Rates IN:364 cfs; OUT: 111.3 cfs fm as-builts
 Debris Cleanout Elevation 1,138.6 ft (1,000 cy) [25% of 100-yr volume 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 18-in Perforated CMP
 Top Elevation 1,140.75 ft NGVD29
 Outlet Conduit 18-in CMP to principal spillway tower

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)

Basin designed not to spill in 100-yr storm but lacking emergency spillway. Outflow at higher heads controlled by 36-in RCP outlet pipe under outlet control. Basin included in 2003 Calleguas Model.

EXPECTED DEBRIS PRODUCTION (cy): (1), (2)		
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 used 50-yr vol of 3,650 cy from Scott and Williams (1973). Assumed debris would accumulate with a slope so estimated level elevation of 1140.5 could be assumed to be 1140 ft. Corresponded to 1.68 ac-ft on stage-storage curve.
- (2) Current design values calculated in 1990. Reserved storage for basin design is $4,000 \times 1.25 = 5,000$ cy.

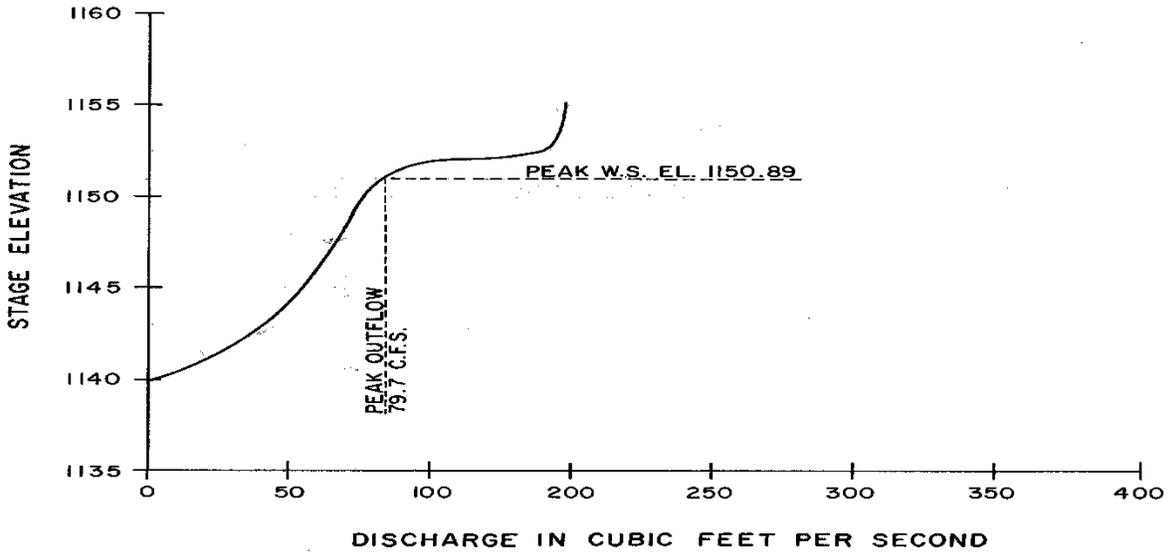
BASIN HISTORY: TAPO HILLS NO. 2 EAST BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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 – Survey analysis by O&M		4,353	
10-05	TIN analysis by WR&T 10-05 vs 05-05 TINs		3,599 Fill vol 1,039 Cut vol	
10-05	TIN analysis by WR&T	26,073 to elev 1,150 ft NGVD29		

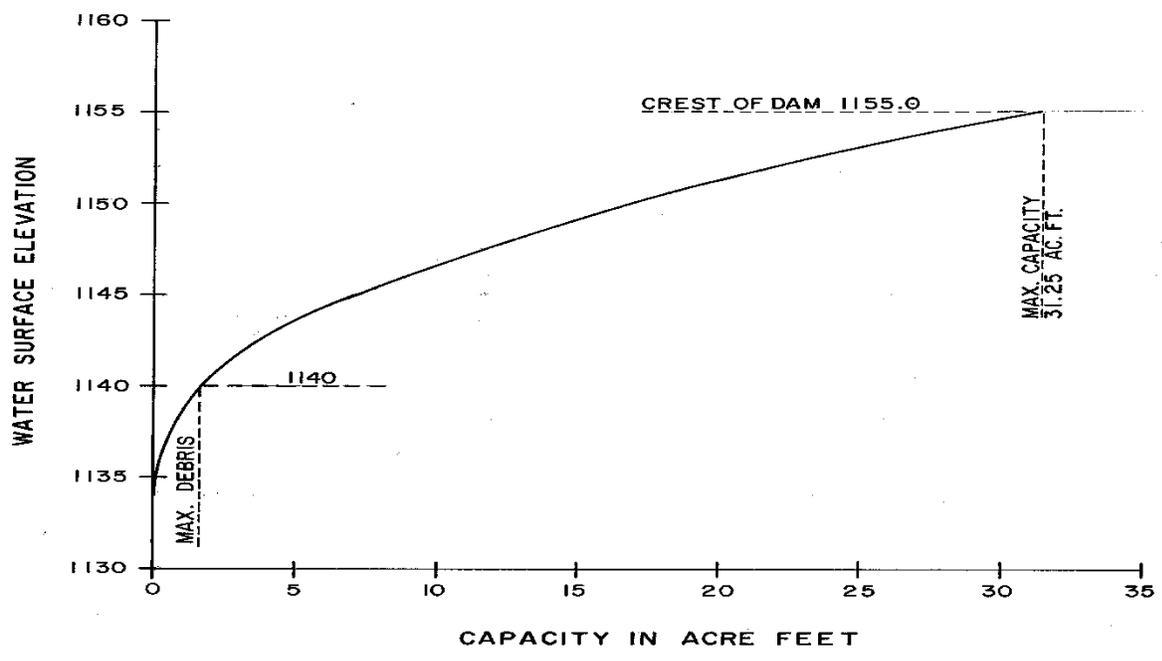
Notes

- * AADP (Average Annual Debris Production) Computed Excluding Disaster Debris
- NA= Not Available / Not Applicable





STAGE-DISCHARGE CURVE
EAST DAM



RESERVOIR CAPACITY CURVE
EAST DAM

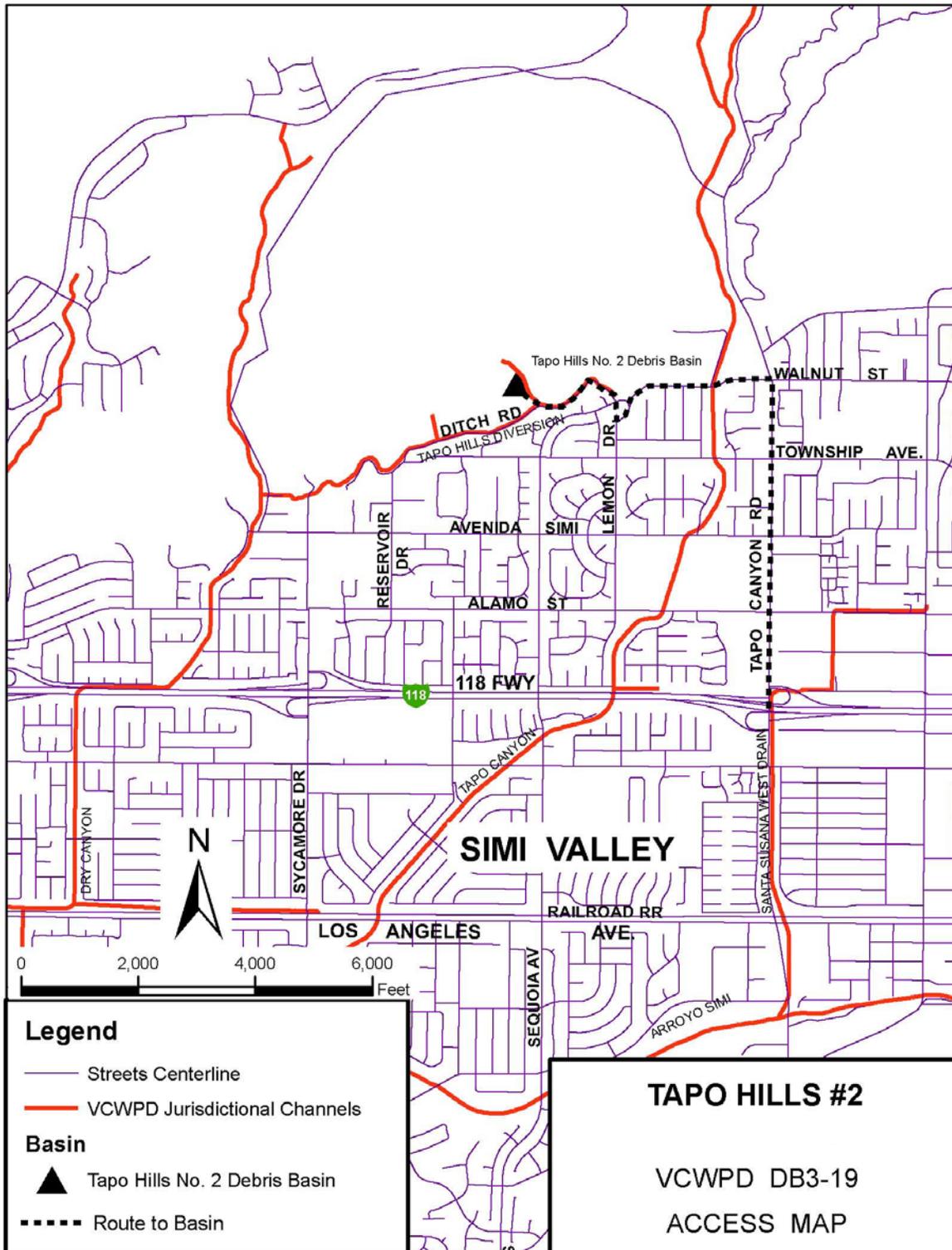
Tapo Hills Basin No. 2 (East)

[Discharge curve superseded due to low flow inlet blocked by silt to elev 1141.9 ft]

Stage-Storage-Discharge Data (Basin Does Not Have Spillway)

Elevation	2005 TIN Vol.	As-Built Vol.	2003 VCRat Vol.	2018 VCRat Vol.	Silted Riser	Spillway	Total
Ft. NGVD29	Ac-Ft	Ac-Ft	Ac-Ft	Ac-Ft	Cfs	Cfs	Cfs
1135	-	-					-
1136	0.011	0.300					
1137	0.061	0.450					
1138	0.200	0.750					
1139	0.488	1.150					
1140	0.962	1.700	-				
1141	1.642	2.350	0.9				
1141.9	NA	NA	NA	-	0.0		-
1142	2.535	3.200	NA	0.101	0.0		-
1143	3.642	4.250	2.7	1.151	0.0		-
1144	4.937	5.400	NA	2.301	0.0		-
1145	6.400	7.000	5.1	3.901	0.0		-
1146	8.012	8.700	NA	5.601	0.0		-
1147	9.753	10.700	8.5	7.601	0.0		-
1148	11.624	12.750	10.6	9.651	0.0	NA	-
1149	13.641	14.750	12.7	11.651	31.0	NA	31.0
1150	15.830	16.900	15.0	13.801	87.7	NA	87.7
1151	18.207	19.000	17.4	15.901	136.5	NA	136.5
1152	20.775	21.800	20.1	18.701	139.0	NA	139.0
1153	23.535	24.300	NA	21.201	141.4	NA	141.4
1154	26.478	27.300	25.8	24.201	143.7	NA	143.7
1155	29.593	31.250	29.0	28.151	146.1	NA	146.1

NA= Not Analyzed; Not Available



WALNUT CANYON (BASIN 0) DETENTION BASIN DD3-37

LOCATION: Moorpark, Adj. to Walnut Cyn Rd Upstream of Meridian Hills Dr.
 N 291,365,E 1,734,875 (Lambert Zone 5 Coordinates);
 Moorpark 7 1/2' Quad.

DESIGN DATA

(Elevations ft NGVD29)

Design Agency Hall & Foreman
 Level Capacity 36,950 cy at spillway invert (Y-3-4310)
 Maximum Debris Capacity 15,850 cy (125% of 100-yr design) to elev. 663.78 ft
 100-Yr Inflow Rate 385 cfs,
 Outflow Rate 242 cfs at 673.04 ft NGVD29 on plans, 254 cfs from hydrology model at 677.79 ft
 Debris Cleanout Elevation 655 ft, 3,170 cy (25% of 100-yr sediment volume)

EMERGENCY SPILLWAY

Type Top of Principal Outlet Tower, 8.5 x 5 ft drop inlet
 Crest Elevation 674 ft NGVD29
 Spillway Length 27 ft
 Capacity w/o Freeboard 900 cfs at elev. 678

PRINCIPAL SPILLWAY

Type 4.5 ft x 8.5 ft Rect. Tower Opening
 Inlet Weir Elevations 663.2 ft NGVD29
 Outlet Conduit 60 in RCP
 Outflow Rates 242 cfs at 673.04 ft; 385 cfs at 676.25 ft with orifices blocked
 Floodwall Crest Elev. 680 ft NGVD29

DEBRIS BLEEDER

Type Double 5x9 in orifice inlets in Tower, 14 total
 Start/End Elevations 650 ft NGVD29/661 ft
 Outlet Conduit Same as Principal Spillway

DAM

Dam Type Earthfill topped by roadbed
 Dam Crest Elevation 677.26 ft NGVD29
 Length ~200 ft
 Surface Area of Full Basin ~1.8 ac
 Watershed Area 338 ac from Calleguas 2000 VCRat model
 Width at Crest 30 ft

CONSTRUCTION DATA

Construction Agency Meridian Tract 5187 Basin 0 on Y-drawings
 Completion Date 2005

REFERENCE DRAWINGS

Construction Drawings Y-3-4305 to 4316a
 Right-of-Way and Topo Drawings NA

EXPECTED DEBRIS PRODUCTION (cy):		
Storm Frequency	Design Condition	100% Burn
100-YEAR	12,680*	18,390
50-YEAR	8,960	12,990
25-YEAR	6,840	9,920
10-YEAR	4,320	6,265

NA=Not Available

*100-yr debris volume obtained through comparison of net storage data used in hydrologic model to storage data obtained from Y-3-4310. Results do not include effects of orchard areas expected to reduce sediment inflow to basin.

BASIN HISTORY: WALNUT CANYON BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	No cleanout data reported by O&M			

Notes

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

** FEMA Accepted Value for Disaster Declaration

*** Theoretical Value from Kevin Scott Formula

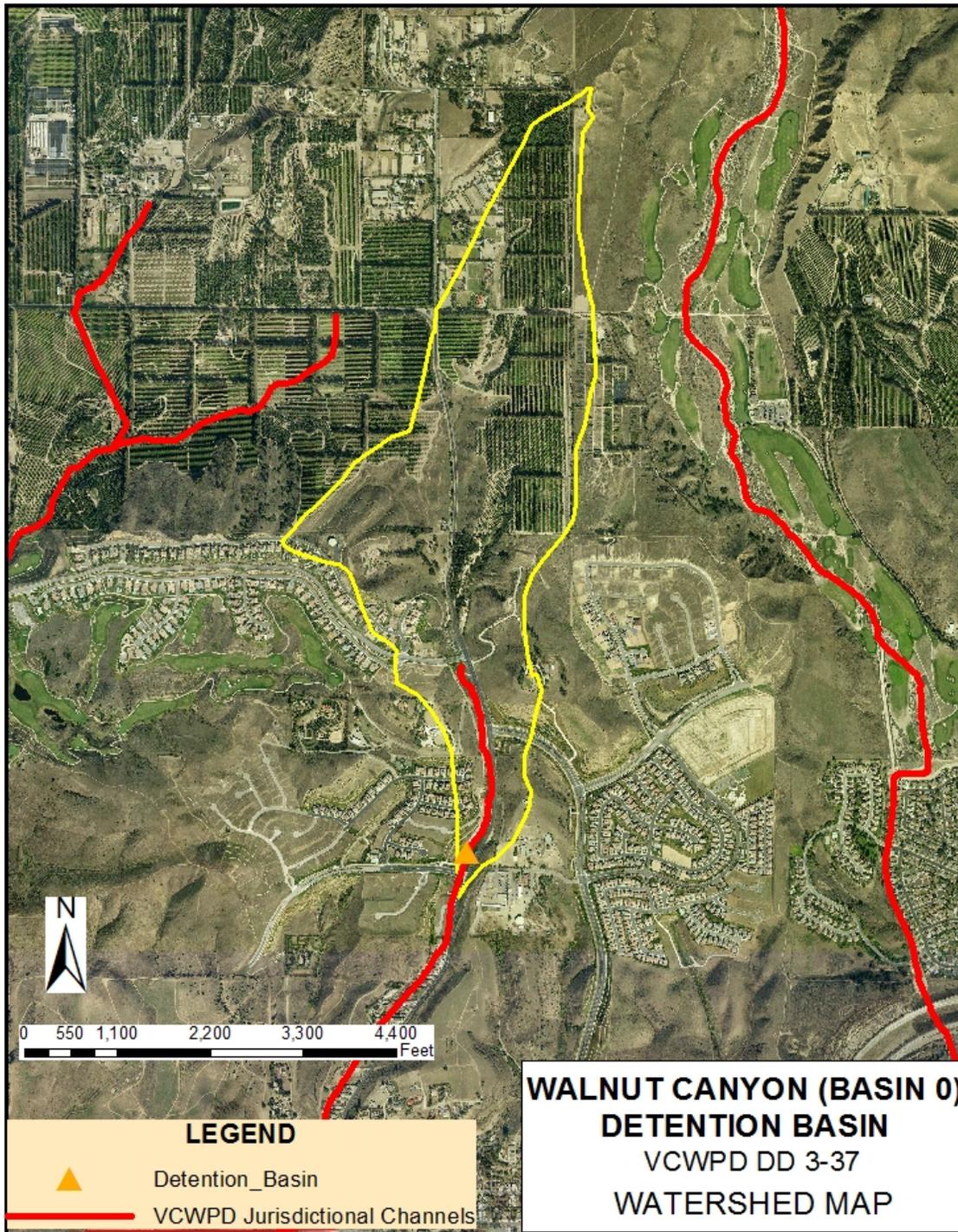
NA= Not Available / Not Applicable

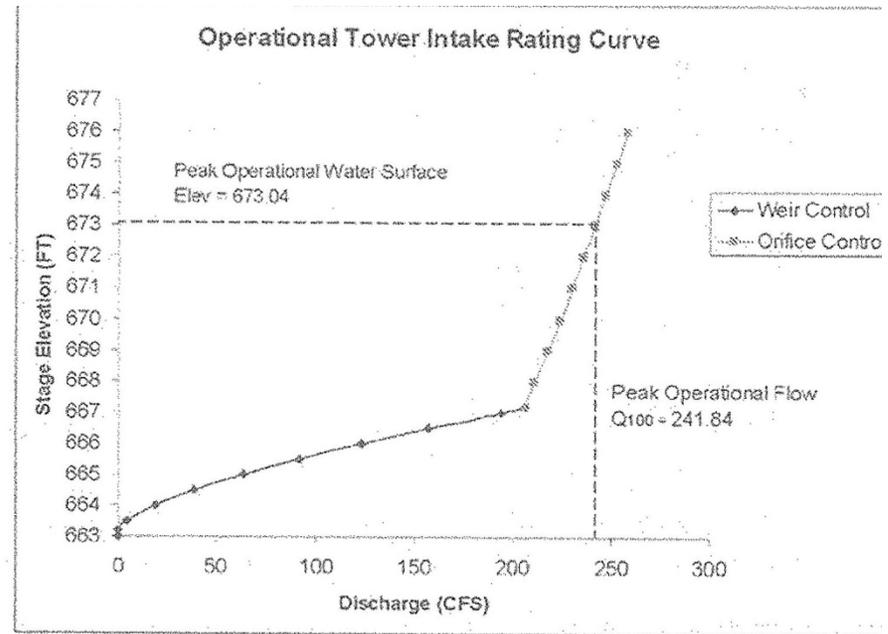
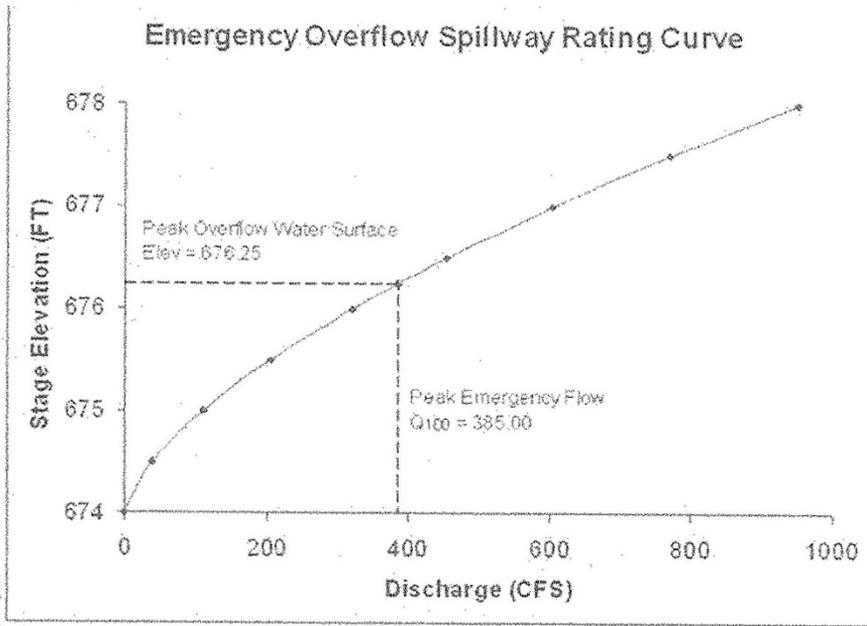
Stage-Storage-Discharge Data used in VCRat model of basin from Hall and Foreman Report.

Stage - Storage - Discharge Curve for Reservoir at 5A
 STAGE (ft) STORAGE (ac-ft) DISCHARGE (cfs)

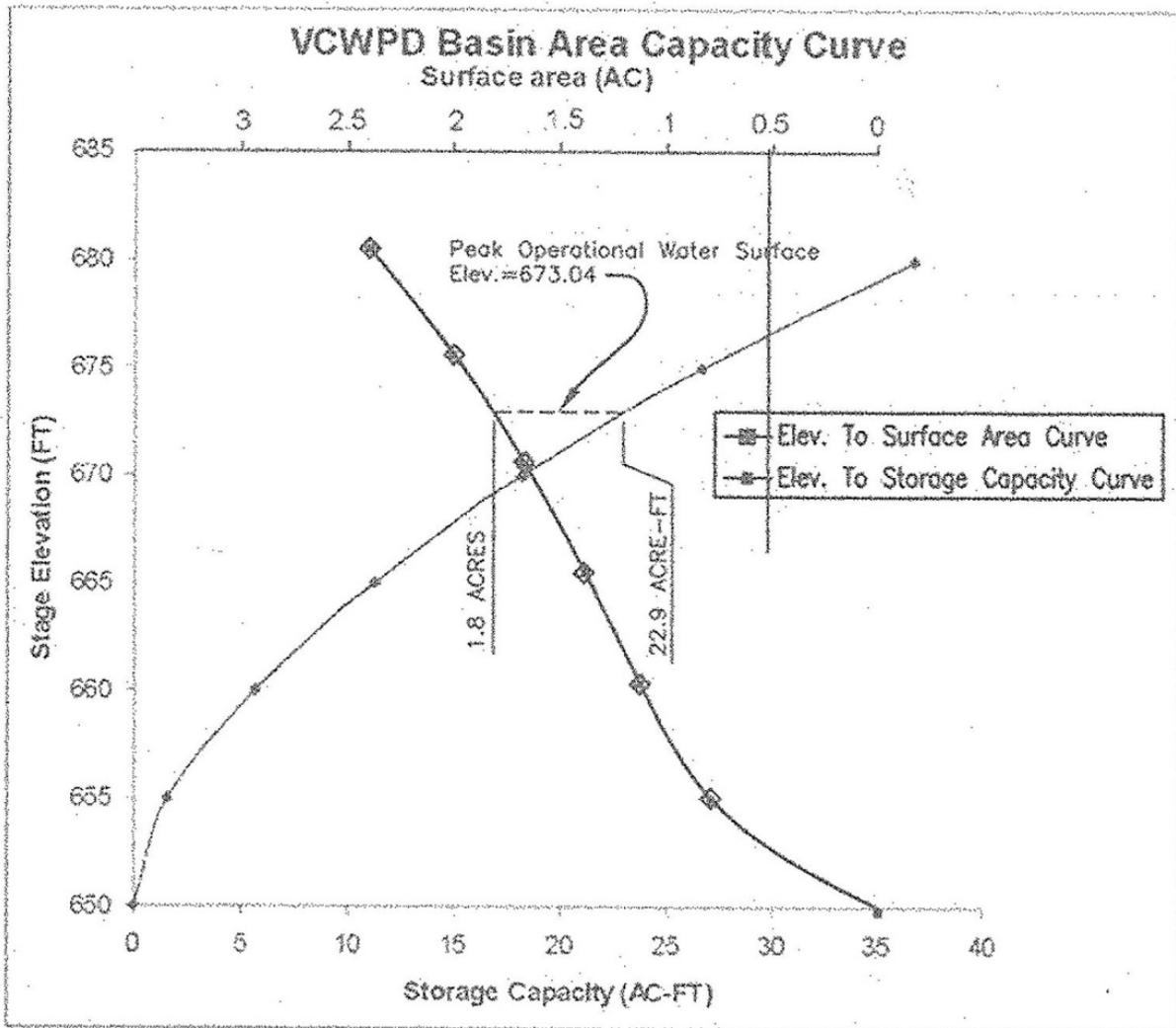
663.78	0.00	0.00
664.00	0.36	0.26
665.00	1.54	7.60
666.00	2.88	23.50
667.00	4.28	45.67
668.00	5.74	71.69
669.00	7.25	98.81
670.00	8.82	118.64
672.00	12.32	148.37
675.00	17.58	188.54
676.00	19.67	210.58
677.00	21.76	236.61
680.00	28.03	302.67
681.00	30.12	324.69

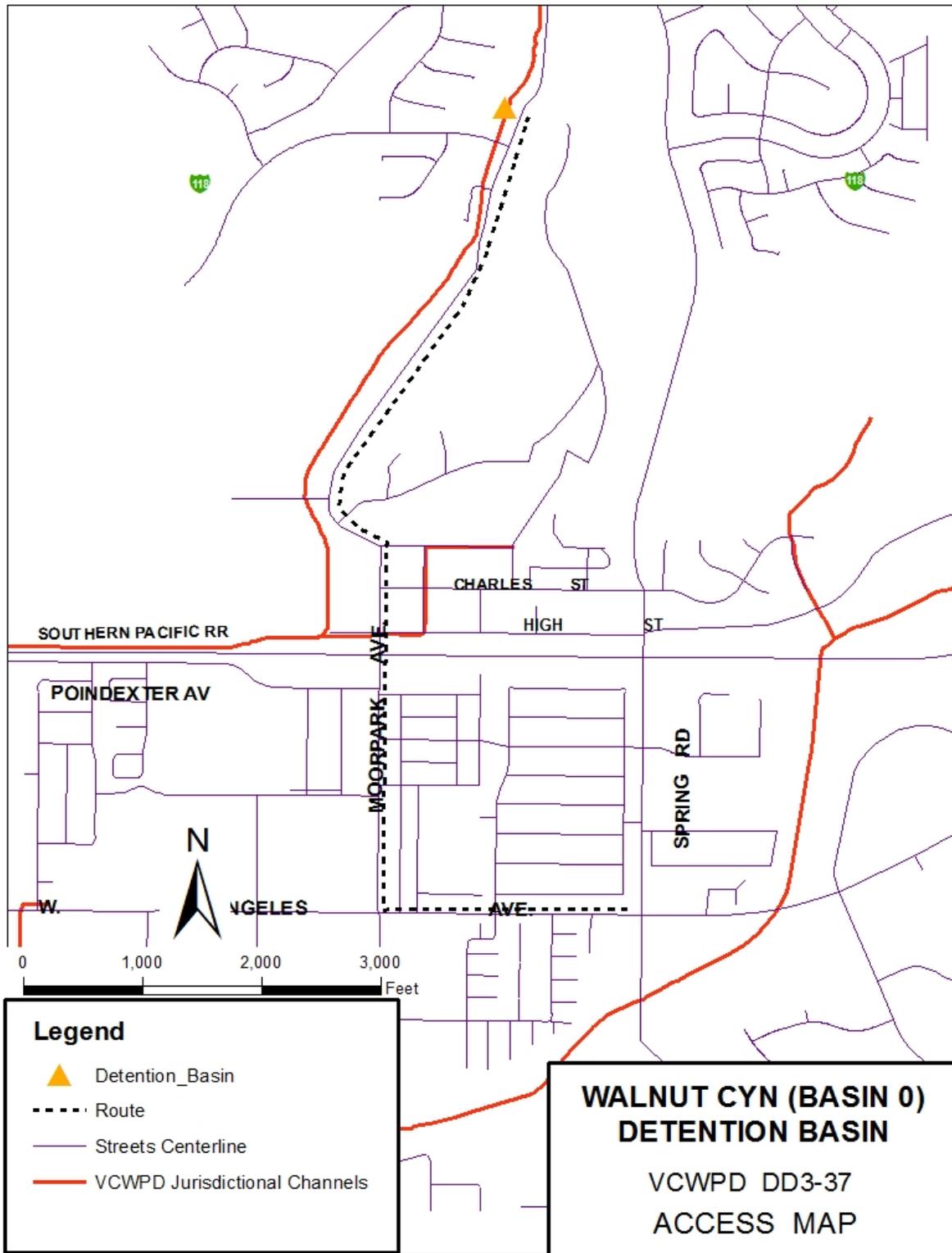
Note: 9.824 af subtracted from stage storage data shown on plans to account for 125% of 100-yr debris volume present in basin when 100-yr peak arrives per VCWPD methods. Because of this assumption, 14 orifice holes below debris volume are blocked and stage discharge curve only has contribution from 8.5ft x 5 ft tower opening. Instead of outflow of 241.84 cfs shown on plans, hydrologic model uses 162.3 cfs at elevation 673.04 and operating WSE for 100-yr storm is 677.79 ft from hydrology model.





Walnut Canyon Detention Basin





WEST CAMARILLO HILLS EAST BRANCH DEBRIS BASIN DB3-02 (Obsolete)

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

No easement rights- stopped maintaining after landslide adjacent to basin

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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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		
05-91	Aerial Survey			

VCWPD- Zone 3**Debris and Detention Basin Manual****BASIN HISTORY: WEST CAMARILLO HILLS EAST BRANCH DEBRIS BASIN**

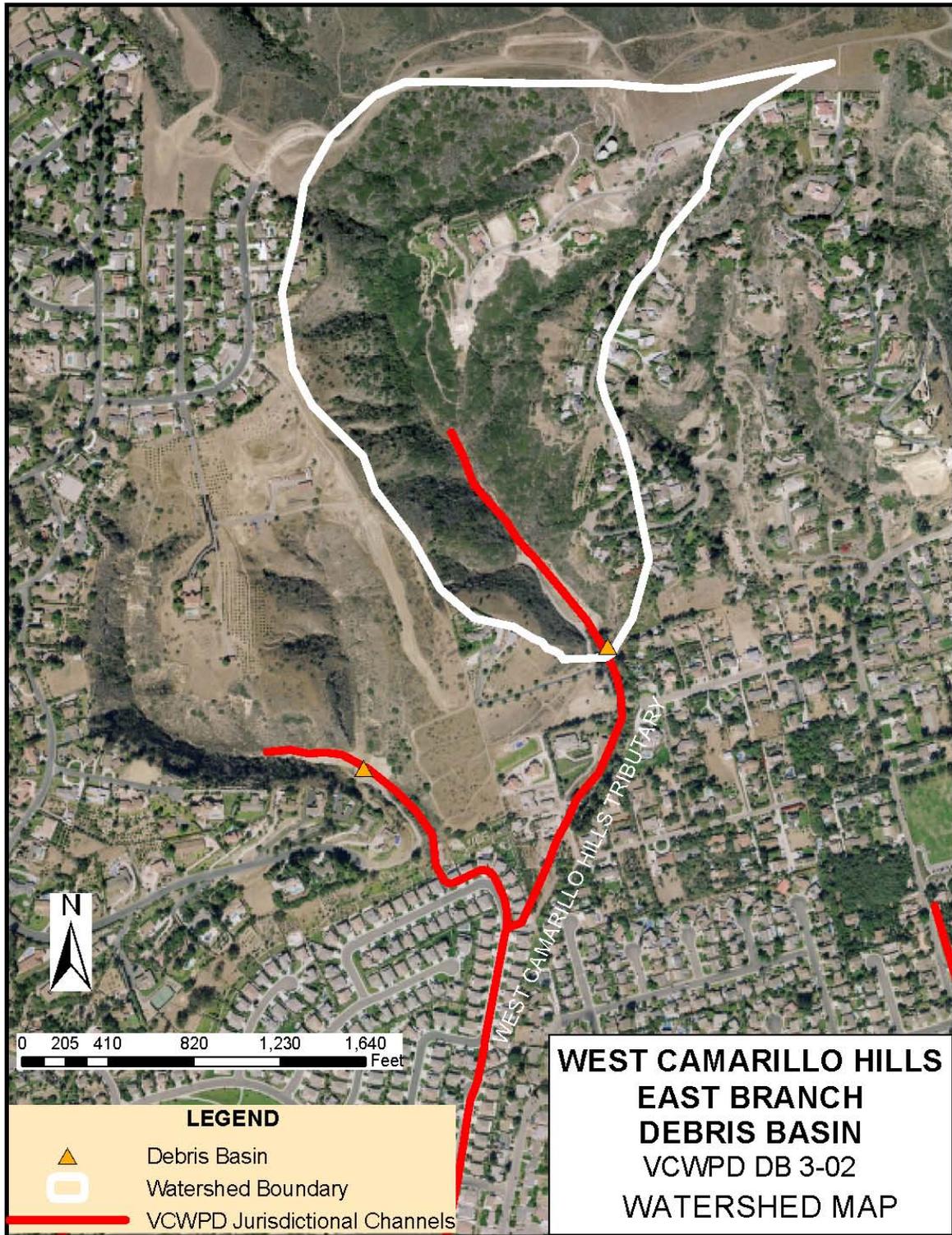
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
06-91	Aerial Survey	4,388		
02-92	Disaster Declaration			183**
05-92	Aerial Survey	3,650		
12-92	Cleanout		1,150	
12-92	Aerial Survey	4,800		
07-93	Aerial Survey	4,590		
01-95	Disaster Declaration			179
08-96	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

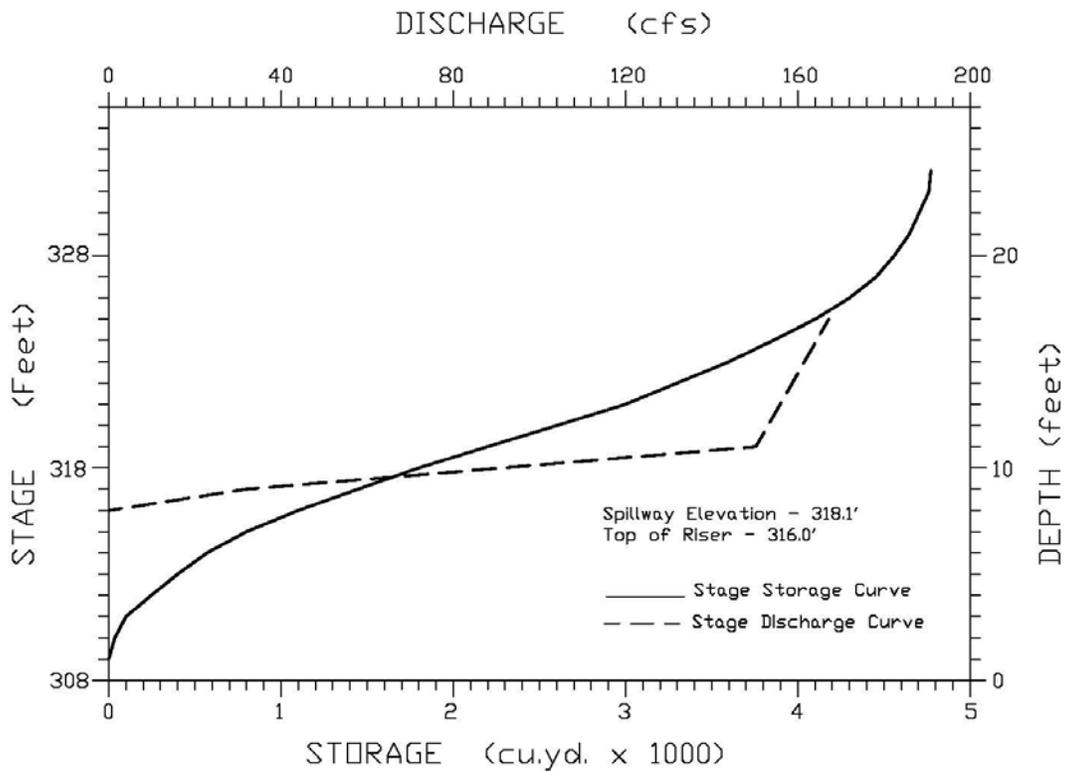
* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris

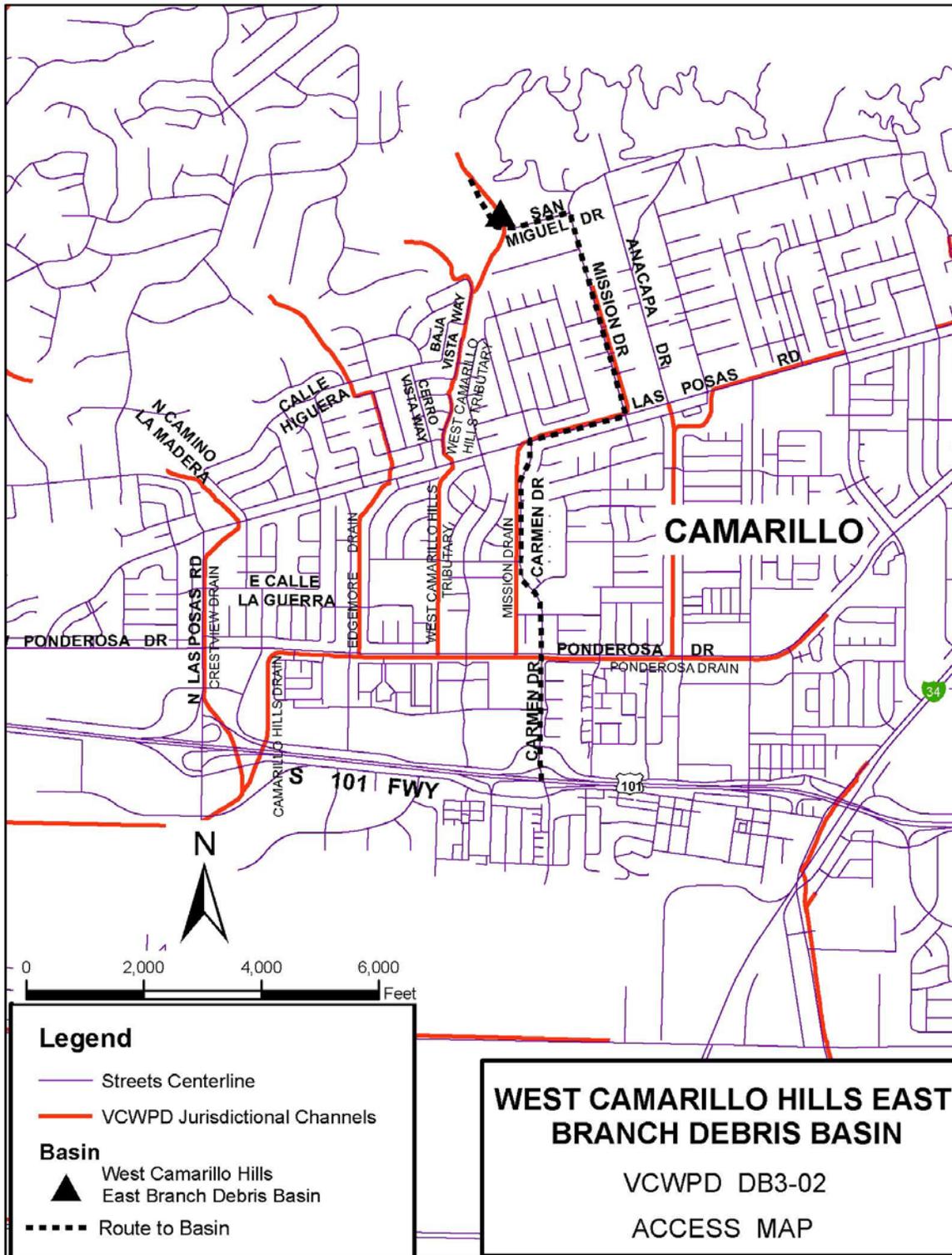
** FEMA Accepted Value for Disaster Declaration

NA= Not Available / Not Applicable



WEST CAMARILLO HILLS
EAST BRANCH DEBRIS BASIN





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

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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
06-91	Aerial Survey	22,504		

VCWPD- Zone 3**Debris and Detention Basin Manual****BASIN HISTORY: WEST CAMARILLO HILLS WEST BRANCH DEBRIS BASIN**

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
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			

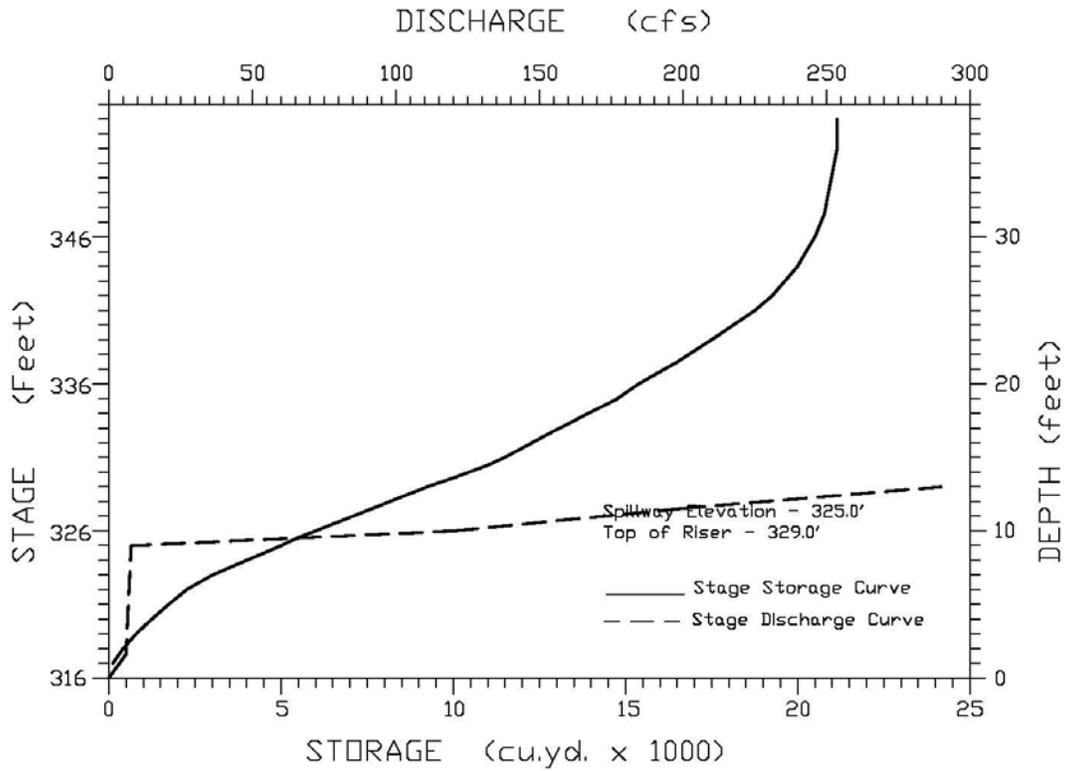
Notes

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

** FEMA Accepted Value for Disaster Declaration

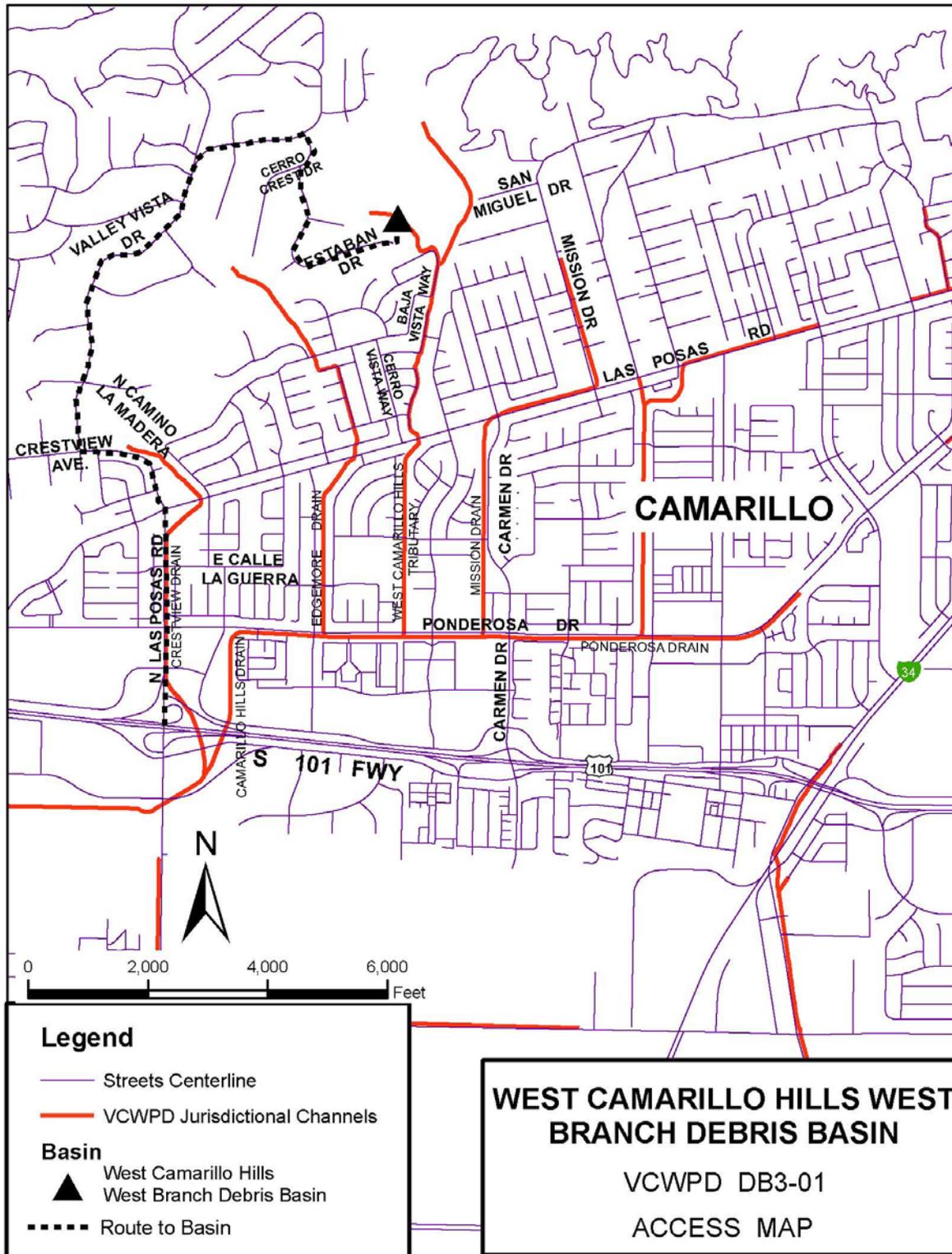
NA= Not Available / Not Applicable



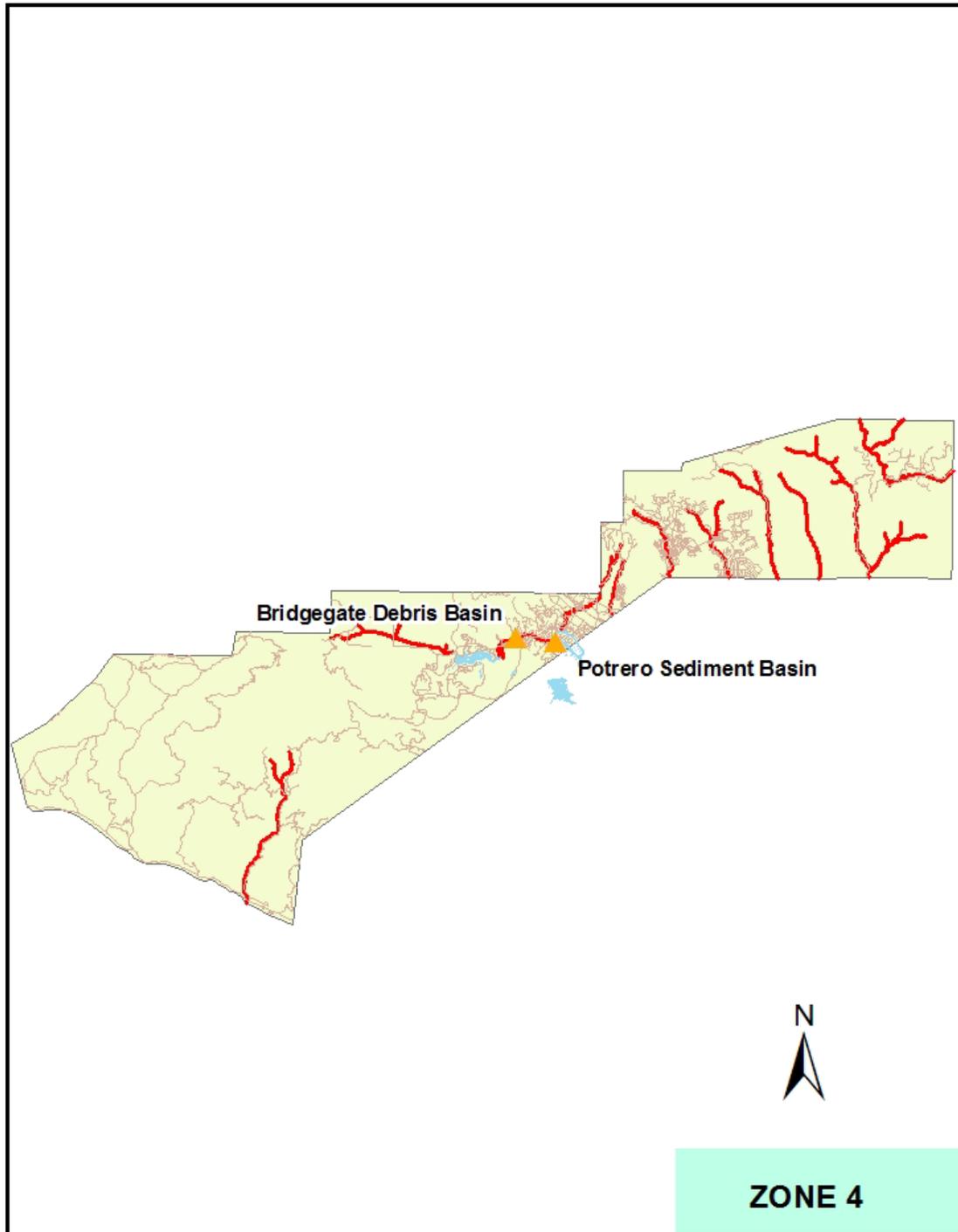


Stage Storage Discharge Data

Elevation	Design Vol.	Riser	Spillway	Total Disch.
Ft NGVD29	CY	CFS	CFS	CFS
315	-	0		
316	250	1.1		-
317	500	3.9		-
318	700	5.4		5.4
319	1,100	5.8		5.8
320	1,700	6		6.0
321	2,350	6.1		6.1
322	3,000	6.3		6.3
323	4,000	6.5		6.5
324	5,000	6.6		6.6
325	5,900	6.8	0	6.8
326	7,000	6.9	109	115.9
327	8,100	7.1	159	166.1
328	9,250	7.2	216	118.5
329	10,400	7.3	279	286.3



Zone 4 Basins



BRIDGEGATE DEBRIS BASIN DB4-02

LOCATION: City of Thousand Oaks- On Chevlot Hills Ct approximately 250 ft SW of
Bridgeway Street at end of the Thornhill Ave.
N236,125 E1,742,000 (Lambert Zone 5 Coordinates)
Thousand Oaks Quad 7-1/2' N34°08'48", W118°51'06

DESIGN DATA	<u>Elevations NGVD29</u>
Design Agency	<u>CMB Engineering</u>
Level Capacity	<u>8 ac-ft (12,936 cy) fm as-builts</u>
Maximum Debris Capacity	<u>5,645 cy on as-builts, elev 900.16 ft</u>
100-Yr Inflow Rate	<u>525 cfs</u>
100-Yr Outflow Rate	<u>525 cfs at 905.1 ft NGVD29 including Emerg. Spillway</u>
Debris Cleanout Elevation	<u>894 ft, 1,130 cy, (25% of 100-yr vol sediment volume)</u>

<u>EMERGENCY SPILLWAY</u>	
Type	<u>Trapezoidal Concrete Channel 95 ft W, 4 ft H, 50:4 H:V</u>
	<u>Sideslopes</u>
Invert Elevation	<u>904 ft NGVD29</u>
Spillway Length	<u>NA</u>
100-Yr Spillway Flow w/Freeboard	<u>370 cfs at elev 905, 2,960 cfs at elev 908 ft from weir eqn</u>

<u>PRINCIPAL SPILLWAY</u>	
Type	<u>6 ft X 6 ft RC Rectangular Tower 11 ft high with projecting</u>
	<u>trash rack on top allowing 4.5 ft X4.5 ft weir flow</u>
Top Elevation	<u>902 ft (1929 NGVD29)</u>
Outlet Conduit and Q100 Flow	<u>48 in RCP; Q100=155 cfs</u>

<u>DEBRIS BLEEDER/RISER</u>	
Type	<u>Slots in principal spillway riser tower to 901 ft NGVD29</u>
Top Elevation	<u>NA</u>
Outlet Conduit	<u>NA</u>

<u>DAM</u>	
Dam Type	<u>Earthfill</u>
Dam Crest Elevation	<u>908 ft NGVD29</u>
Length	<u>265 ft</u>
Surface Area of Full Basin	<u>0.87 ac</u>
Watershed Area	<u>262 ac</u>
Width at Crest	<u>25 ft</u>

<u>CONSTRUCTION DATA</u>	
Construction Agency	<u>SME Construction, INC</u>
Completion Date	<u>2004</u>

<u>REFERENCE DRAWINGS</u>	
Construction Drawings	<u>Y-4-60 – Y-4-68</u>
Right-of-Way Drawings	<u>NA</u>
Topographic Drawings	<u>NA</u>

VCWPD- Zone 4

Debris and Detention Basins

EXPECTED DEBRIS PRODUCTION (cy): Sediment has to traverse drainage network of v-ditches and pipes, minimal sediment expected to reach basin		
Storm Frequency	Design Condition	100% Burn
100-YEAR	4,517*	6,550
50-YEAR	3,300	4,790
25-YEAR	2,270	3,290
10-YEAR	1,295	1,875

*100-yr value estimated as max debris yield/1.25, design debris elev = 900.16 ft on as-builts = 3.5 af
 Other values estimated from rainfall ratios and fire factors.

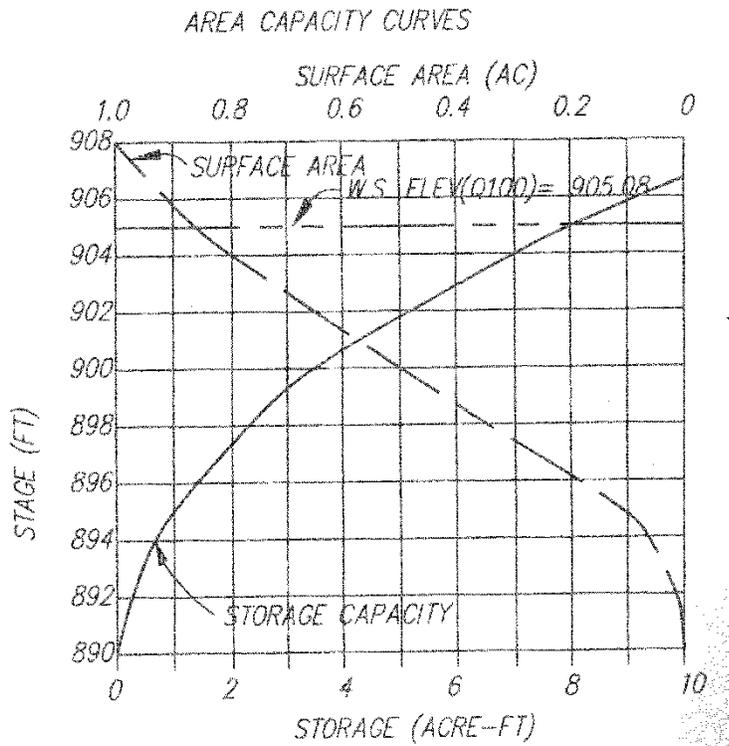
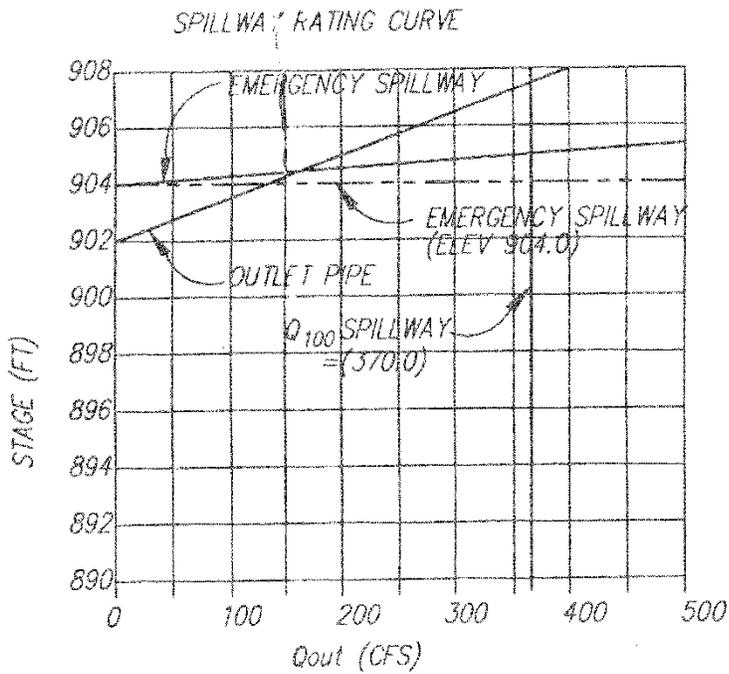
BASIN HISTORY: BRIDGEGATE DEBRIS BASIN

<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
	No cleanout data reported by O&M			

Notes

* AADP (Average Annual Debris Production) Computed Excluding Disaster Debris
 NA= Not Available / Not Applicable



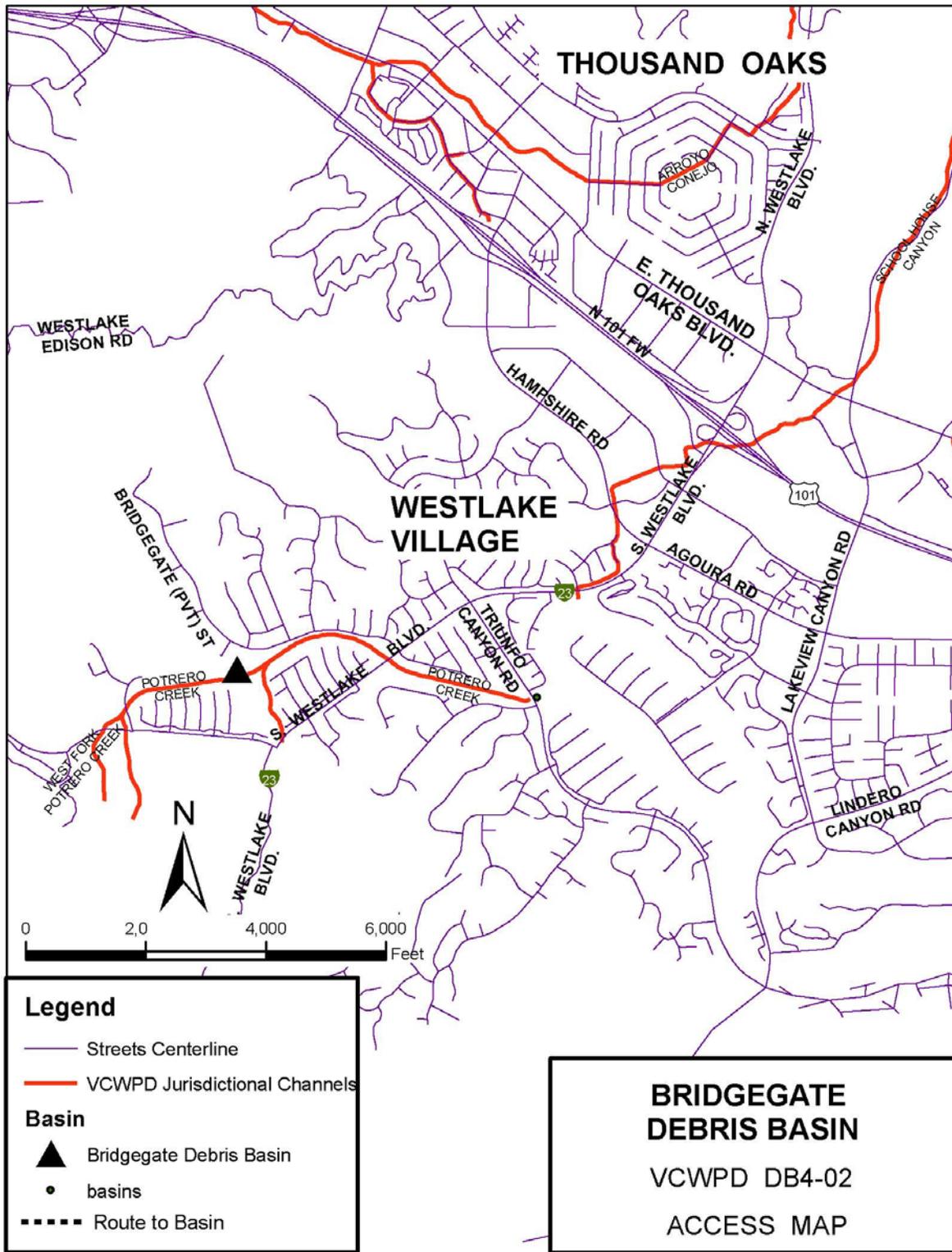


Bridgegate Debris Basin Stage-Storage Curve

Stage Storage Discharge Data from As-Built

Elevation	Design Vol.	Riser	Spillway	Total Disch.
Ft NGVD29	Ac-Ft	CFS	CFS	CFS
890	-			
891	0.130			-
892	0.260			-
893	0.450			-
894	0.650			-
895	1.000			-
896	1.400			-
897	1.825			-
898	2.325			-
899	2.800			-
900	3.500			-
901	4.275			-
902	5.250	0		-
903	6.000	55		55
904	7.000	130	0	130
905	8.000	186	300	486
906	9.150	270	600	870
907	10.300	330	NA	NA

NA= Not Analyzed



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

Design Agency (Elevations NGVD29)
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 (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 (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): Sediment from undeveloped areas has to traverse drainage network. This will minimize sediment conveyed in Potrero Creek.		
Storm Frequency	Design Condition	100% Burn*
100-YEAR	10,340	15,000
50-YEAR	7,586	11,000
25-YEAR**	5,463	7,900
10-YEAR	2,790	4,000

***100% Burn data not available from design study, estimated by matching design data and changing fire factor to 88. Lakes Sherwood and Eleanor assumed to intercept all sediment from their watersheds. Bridgegate Basin assumed to eliminate sediment inflow from that watershed.**

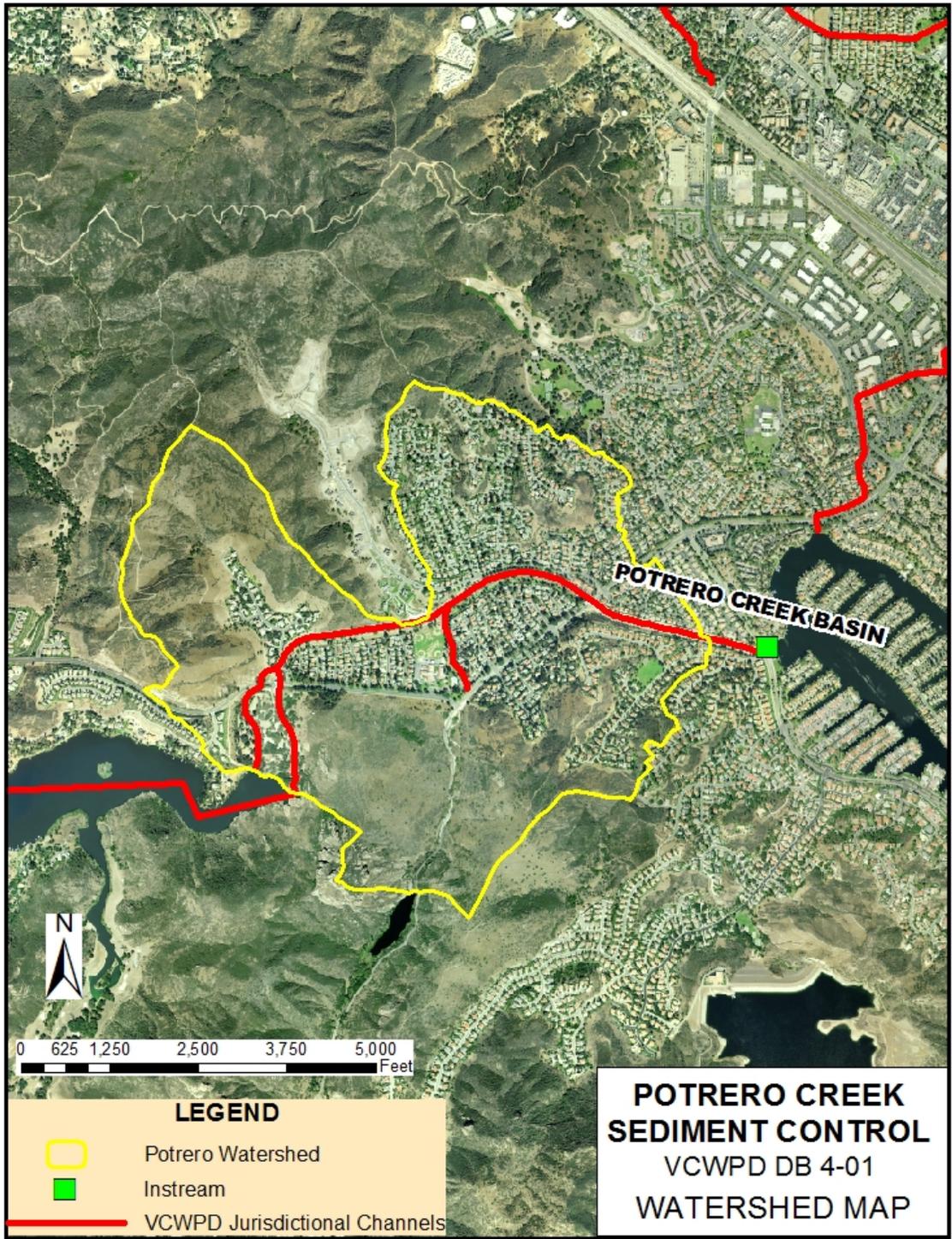
****25-Yr data not available from design study but estimated along with burn data.**

BASIN HISTORY: POTRERO CREEK SEDIMENT CONTROL/INSTREAM BASIN

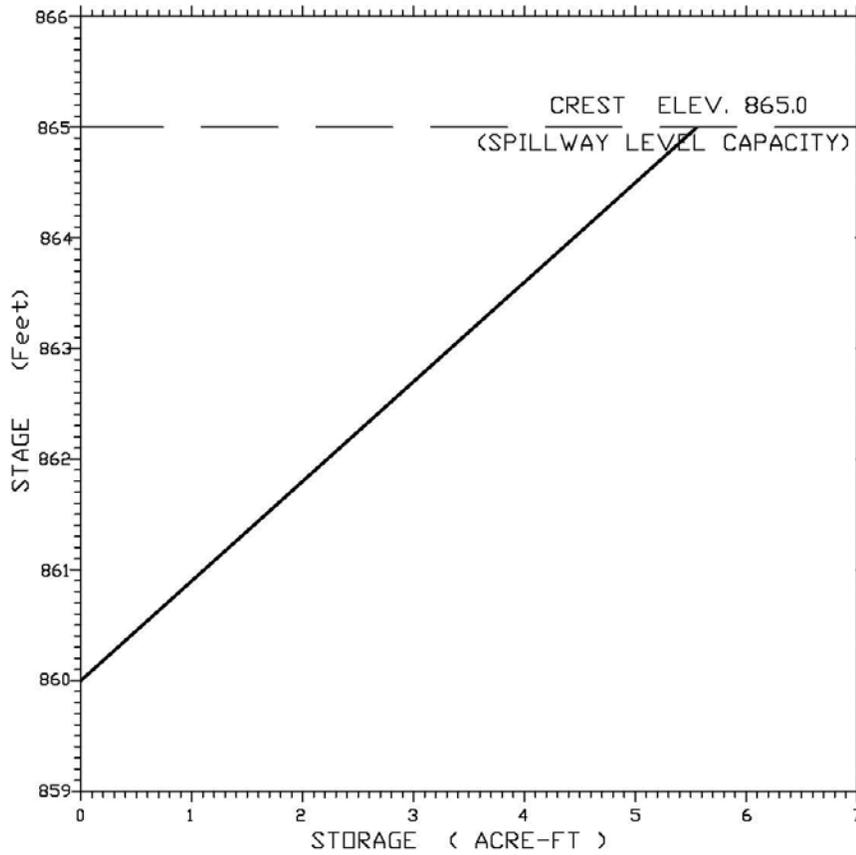
<u>DATE</u>	<u>ACTION</u>	<u>REMAINING CAPACITY (cy)</u>	<u>REMOVED (cy)</u>	<u>AADP* (cy)</u>
2008	No cleanout data from O&M			

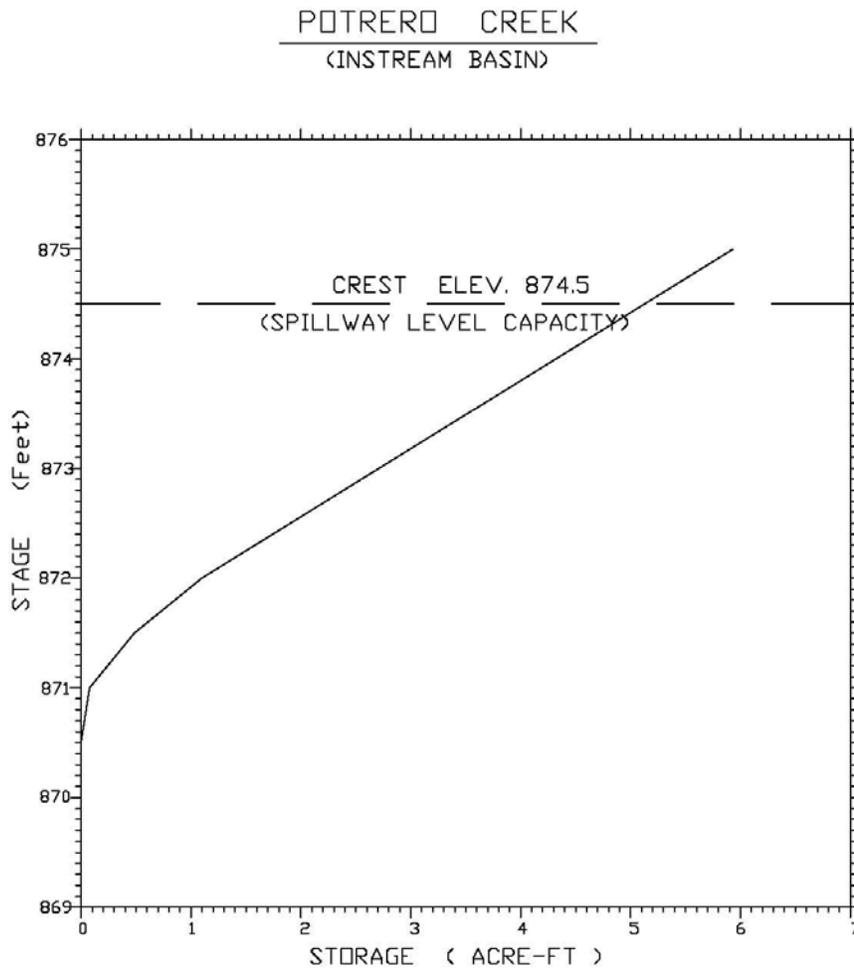
Notes

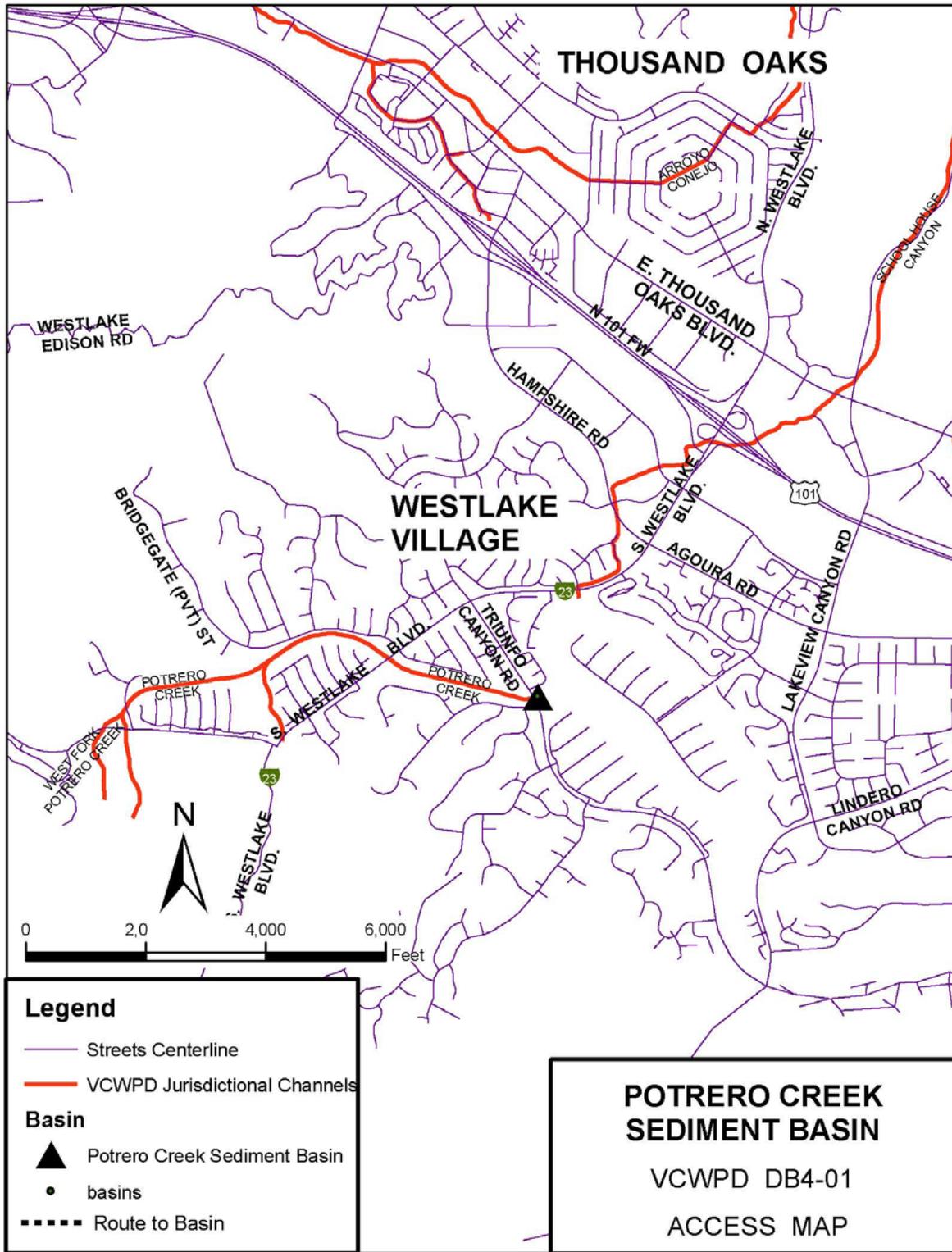
- * AADP (Average Annual Debris Production) Computed Excluding Disaster Debris
- *** Theoretical Value from Scott and Williams (1978); 10% of 50-yr debris yield
- NA= Not Available / Not Applicable



POTRERO CREEK
(U/W DIKE BASIN)







APPENDIX A – Channel Debris Removal Data

Calleguas Creek from Highway 1 to Hueneme Road

CHANNEL HISTORY:

<u>Time Period</u>	<u>Actual Reported Sediment Removal (cy)</u>	<u>Sediment Removal Adjusted for Breakout Flow (cy)</u>	<u>Source</u>
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 Calx Eng 6/99
1/1-12/31/05	200,000		O&M

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

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

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JUN 01 2005

WATERSHED PROTECTION DIST.



DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

MATILJA 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

DEPARTMENT OF WATER RESOURCES

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DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

RUNKLE DAM, NO. 86-3
VENTURA COUNTY

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DIVISION OF SAFETY OF DAMS

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EMERGENCY PROCEDURES

LAS LLAJAS DAM, NO. 86-5
VENTURA COUNTY

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DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

SYCAMORE CANYON DAM, NO. 86-6
VENTURA COUNTY

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DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

FERRO DEBRIS DAM, NO. 86-8
VENTURA COUNTY

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DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

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

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DIVISION OF SAFETY OF DAMS

- NOTICE -

EMERGENCY PROCEDURES

ARUNDELL BARRANCA DAM, NO. 86-10
VENTURA COUNTY

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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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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