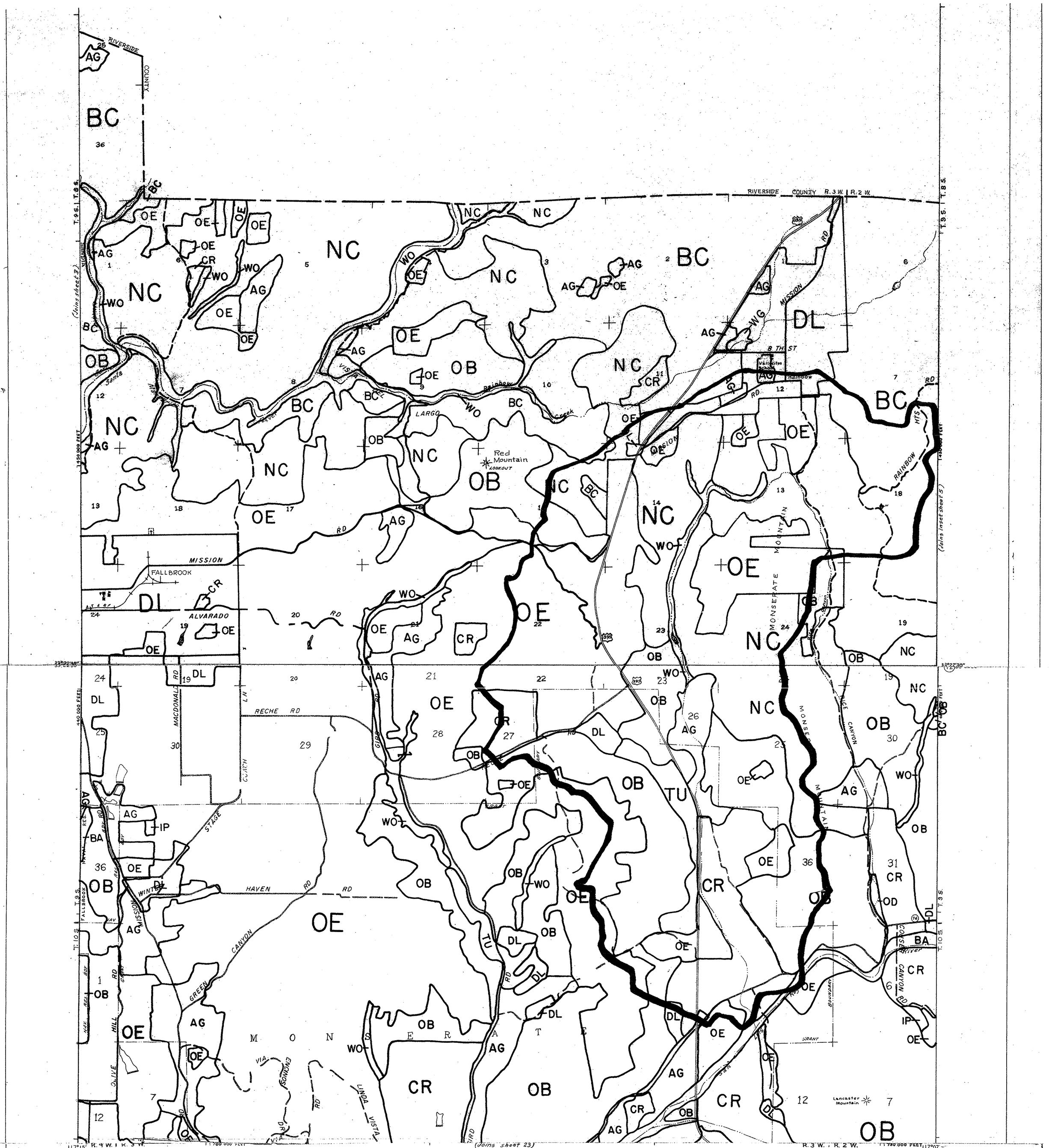
Appendix G

Support Material for NRCS Hydrologic Method Parameters for Horse Ranch Creek Watershed



San Diego County Soils Interpretation Study

GROUND COVER - Vegetative & Man Made

SEE CAUTION NOTES

AG Annual Grass	DL Developed Lands	OB Open Brush	TU Turf
BA Barren	IP Irrigated Pasture	OD Orchard, Deciduous	VY Vineyard
BC Broadleaf Chaparral	ME Meadow	OE Orchard, Evergreen	WG Woodland Grass
CR Cropland	NC Narrowleaf Chaparral	PG Perennial Grass	WO Woodland

CAUTION NOTES:

1. User is urged to refer to corresponding SUPPLEMENTAL DATA SHEET for assumptions, criteria, map sources, additional legend items, and necessary explanation of ratings shown on map.

2. This map does not eliminate the need for detailed on-site investigation of the soil and site to determine precise soil conditions prior to undertaking any construction, grading, planting, or other soils related activity.

Base Map Source: U. S. Geological Survey with California State Coordinate System, Zone 6 Indicated

Prepared by: U. S. Department of Agriculture, Soil Conservation Service

Published by: San Diego County Planning Department for the Comprehensive Planning Organization – 1969

North

SCALE 1:24000

0 2000 4000 6000 feet

0 ¼ mile ½ mile 1 mile

FEDERAL ASSISTANCE – The preparation of this map was financed in part through a comprehensive planning grant from the Department of Housing and Urban Development.

Represents 40 acres

SHEET NAME	SHEET NUMBER
Bonsall	12

Meadowood VTM - Horse Ranch Creek Watershed

J-15956

J-15956
Meadowood VTM -
Horse Ranch Creek
Watershed

WORKSHEET 4-3 Horse Ranch Creek (name of project) **Peak Discharge Computation**

*****For use with NRCS Hydrologic Method Computations*****

Items in boxes are required input parameters for the SDUH Peak Discharge Program.

Computed by: Nobu M. Date: 6/26/09

Project Identification (Drainage Area Name): Basin 2

Geographic location of center of drainage area: Long: " Lat: "

Drainage Area: 11.97 – square miles

Storm Frequency (Section 2.3): 100 – year

6-Hour Storm Duration Precipitation (Appendix B): 3.6 – inches

24-Hour Storm Duration Precipitation (Appendix B): 6.1 – inches

Precipitation Zone Number (PZN): (Section 4.1.2.4 and Appendix C)
PZN = 1.0 1.8 2.0 ____ 3.0 ____ 4.0

PZN Ajustment Factor for 5-year to 35-year storm frequency (interpolate): (Section 4.1.2.4 and Table 4-6)
1.5 ____ 2.5 ____ 2.0 ____ 1.5

PZN Ajustment Factor for 35-year to 150-year storm frequency (interpolate): (Section 4.1.2.4 and Table 4-6)
2.0 2.8 3.0 ____ 3.0 ____ 2.0

PZN Adjusted Runoff Curve Number (interpolate between nearest whole number PZN conditions): (Sections 4.1.2.4 and 4.2.4, Tables 4-6 and 4-10)
$CN_{1.0 \text{ or } (2.0)}$ 81 CN_X 89 $CN_{2.0 \text{ or } (3.0)}$ 91

Watershed Length (L) (Section 4.3.1): 7.35 – miles

Length to Centroid (L_c) (Section 4.3.1): 3.22 – miles

Slope (s) (Section 4.3.1): 230 – feet/mile Basin $\bar{n}$ Factor (Section 4.3.5): 0.050

$\Delta(EL) = 1664' + 26' = 1690'$

Corps lag (T_L) = 24 $\bar{n}$ $((L \times L_c)/s^{0.5})^m$ (Section 4.3.1.1)
OR
Corps lag (T_L) = 0.8 T_c (Section 4.3.1.2) Lag Time: 1.421 – hours

Time to Peak = 0.862 x Corps lag (Section 4.1.5.5): Time to Peak : 1.225 – hours

$0.2 T_p = 0.2(1.225 \text{ hrs})$
$= 14.7 \text{ minutes}$ → Use D = 5 minutes

NRCS $T_1 = T_p - D/2$
$= 1.225 - \frac{(5/60)}{2}$
$= 1.183$ hrs

J-15956
June 26, 2009

Horse Ranch Creek - Composite Curve Number Calculations

GROUND COVER / LAND USE	HYDROLOGIC CONDITION	SOIL GROUP	CN_2 from Hydrology Manual Table 4-2	Number of Ticks	FRACTION OF TICKS	PARTIAL CN_2 CN_2 X FRACTION OF TICKS
AG - Annual Grass (Dryland Pasture)	Good	B	61	1	0.003	0.21
AG - Annual Grass (Dryland Pasture)	Good	D	80	1	0.003	0.27
BC - Broadleaf Chaparral	Fair	B	63	8	0.027	1.70
BC - Broadleaf Chaparral	Fair	C	75	3	0.010	0.76
BC - Broadleaf Chaparral	Fair	D	81	24	0.081	6.55
CR - Fallow Bare Soil	N/A	B	86	11	0.037	3.19
FRE - Freeway	N/A	B	98	14	0.047	4.62
FRE - Freeway	N/A	C	98	5	0.017	1.65
FRE - Freeway	N/A	D	98	1	0.003	0.33
HIG - High Residential (65% impervious)	N/A	B	85	3	0.010	0.86
HIG - High Residential (65% impervious)	N/A	D	92	1	0.003	0.31
LOW - Low Residential (Assume 20% Impervious)	N/A	B	68	15	0.051	3.43
LOW - Low Residential (Assume 20% Impervious)	N/A	C	79	23	0.077	6.12
LOW - Low Residential (Assume 20% Impervious)	N/A	D	84	18	0.061	5.09
MED - Medium Residential (Assume 50% Impervious)	N/A	D	89	2	0.007	0.60
NC - Narrowleaf Chaparral	Fair	B	72	4	0.013	0.97
NC - Narrowleaf Chaparral	Fair	C	81	39	0.131	10.64
NC - Narrowleaf Chaparral	Fair	D	86	6	0.020	1.74
OB - Open Brush	Fair	B	66	10	0.034	2.22
OB - Open Brush	Fair	C	77	22	0.074	5.70
OB - Open Brush	Fair	D	83	11	0.037	3.07
OE - Orchards Evergreen	Poor	B	73	27	0.091	6.64
OE - Orchards Evergreen	Poor	C	82	15	0.051	4.14
OE - Orchards Evergreen	Poor	D	86	21	0.071	6.08
PAR - Parking	N/A	B	98	8	0.027	2.64
PAR - Parking	N/A	D	98	2	0.007	0.66
PAS - Passive Parks - Open Space	Good	B	69	1	0.003	0.23
WAT - Water	N/A	D	99	1	0.003	0.33
			Total:	**297**	**1.00**	**80.74**

Composte CN_2 = 81

Note: Refer to exhibits titled, "Existing Hydrologic Land Use Information," "Existing Hydrologic Soil Group Information," and "GROUND COVER - Vegetative & Man Made" for Land Use and Soil Information.

Meadowood VTM - Horse Ranch Creek Watershed

Hydrologic Land Use and Soils Information for Curve Number Calculation

J:\15956\GIS\gis_layers\Hydro_Analysis\HorseRanchCreek\15956_HRC_TICS_Basin2.mxd

Exhibit Date: June 30, 2009

REC JN: 15956

NORTH

0 1,000 2,000 4,000 Feet

Data Sources:
Landiscor Aerial Photo: January 2008

RICK ENGINEERING COMPANY

Legend
Drainage Basin Boundary
Soil Group A
Soil Group B
Soil Group C
Soil Group D

Meadowood VTM - Horse Ranch Creek Watershed

Hydrologic Soil Group Information

J:\15956\GIS\gis_layers\Hydro_Analysis\HorseRanchCreek\15956_HRC_Soils.mxd

Exhibit Date: June 30, 2009

REC JN: 15956

NORTH

0 1,000 2,000 4,000 Feet

Data Sources:
SSURGO Soils Information: 2007
Landiscor Aerial Photo: January 2008

RICK ENGINEERING COMPANY

Meadowood VTM - Horse Ranch Creek Watershed

Existing Hydrologic Land Use Information

J:\15956\GIS\gis_layers\Hydro_Analysis\HorseRanchCreek\15956_HRC_ExistLU.mxd

Exhibit Date: June 30, 2009

REC JN: 15956

NORTH

0 1,000 2,000 4,000 Feet

Data Sources:
SanGIS Existing Land Use: 2008
Landiscor Aerial Photo: January 2008

RICK ENGINEERING COMPANY

Legend

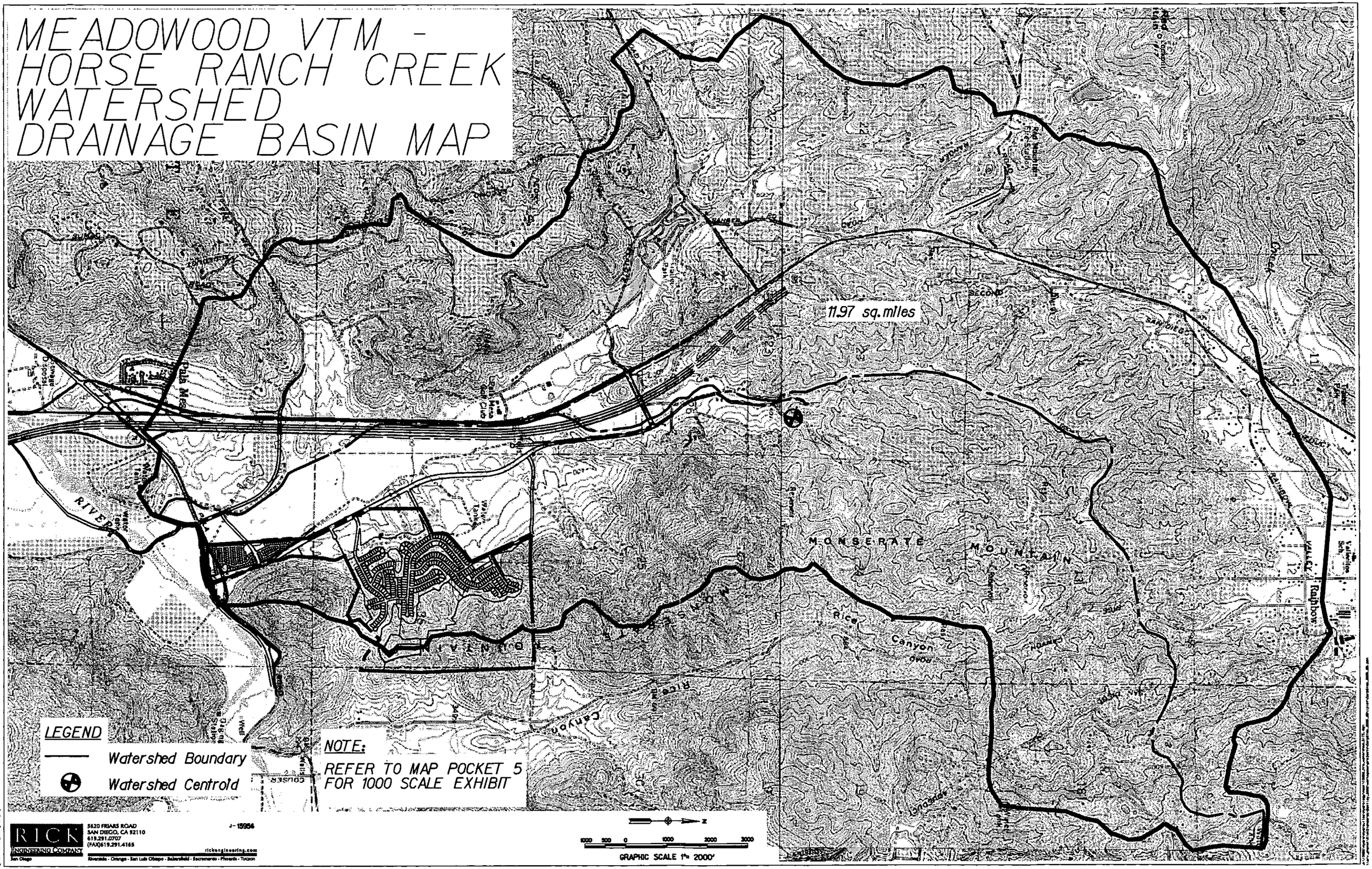
- Drainage Basin Boundary

Existing Land Use

- COM - Commercial
- LOW - Low Residential
- MED - Medium Residential
- HIG - High Residential
- FRE - Freeway
- PAR - Parking
- PAS - Passive Parks
- WAT - Water

Note: Refer to exhibit titled, "GROUND COVER - Vegetative & Man Made" for this information

MEADOWOOD VTM - HORSE RANCH CREEK WATERSHED DRAINAGE BASIN MAP


11.97 sq. miles
MONSERATE MOUNTAIN
Rice Canyon
Rice Canyon
RIVERA
SAN DIEGO
Rainbow
Valley
Rainbow
Second
Landside
Mesa
Mesa
Mesa