Appendix C

Pollutant Load Calculations

Verdugo Hills Storm Drain Upstream Land Use (acres)						
Row Labels	**AREA (acres)**		**Runoff Coefficient**		**Runoff Value (0.75-in Storm) (ft^3)**	
	Verdugo Wash	**Barras Canyon**	**Verdugo Wash**	**Barras Canyon**	**Verdugo Wash**	**Barras Canyon**
Commercial/Institutional	54	0	0.85	0.85	125,051	0
Industrial	4	20	0.85	0.85	9,143	47,206
Natural/Vacant	383	89	0.15	0.15	156,494	36,435
Open Space/Recreation	6	20	0.15	0.15	2,377	8,108
Residential	236	61	0.35	0.35	225,352	58,463
Summary (total)	684	191	0.28	0.29	518,416	150,212
Summary (urban only)	300	102	0.44	0.41	361,923	113,777

Dry Weather Flows for Verdugo Hills				
	Verdugo Wash	**Barras Canyon**	**On-Site Drainage**	**Total**
Developed Area (acres)	300	102	42	444
Dry Weather Runoff Generation (gal/day/acre)	100	100	0	
Dry Weather Runoff (mgd)	0.030	0.010	0.000	0.040
Dry Weather Runoff (AFD)	0.09	0.03	0.00	0.12

Note: Assume 100 gal/day/acre per urbanized area

Short-Term Wet Weather Flows for Verdugo Hills				
	Verdugo Wash	**Barras Canyon**	**On-Site Drainage**	**Total**
Developed Area (acres)	300	102	42	444
Runoff Coefficient	0.44	0.41	0.15	
Rainfall (in)	0.75	0.75	0.75	
Volume (ft^3)	361,923	113,777	17,201	492,900
Volume (gallons)	2,707,182	851,052	128,662	3,686,895
Volume (AF)	8.31	2.61	0.39	11.32

Note: Used Rational Method

Long-Term Wet Weather Flows for Verdugo Hills				
	Verdugo Wash	**Barras Canyon**	**On-Site Drainage**	**Total**
Developed Area (acres)	300	102	42	444
Runoff Coefficient	0.45	0.42	0.15	
Rainfall Gauge	LAARPT	LAARPT	LAARPT	
Initial Abstraction (inches)	0.15	0.15	0.15	
Evaporation Rate (in/day)	0.15	0.15	0.15	
Interevent Time (hrs)	6.00	6.00	6.00	
Annual Precipitation (in.)	12.24	12.24	12.24	
Wet Weather Runoff (AFY)	103.5	32.9	4.8	141.2

Note: Used NetSTORM

Table C-1. Event-Mean Concentrations Consolidated by Land Use									
LandUse	**Units**	**Commercial**	**Educational**	**Industrial**	**MF Residential**	**Mixed Residential**	**SF Residential**	**Transportation**	**Vacant**
Total Petroleum Hydrocarbons	mg/L	3.1	0	1.7	0	0	1.3	3.1	0
Total Coliform	MPN/100mL	1,140,000	0	454,000	0	0	1,366,667	692,500	9,187
Fecal Coliform	MPN/100mL	528,750	0	338,220	0	0	933,333	328,750	1,397
Fecal Enterococcus	MPN/100mL	86,250	0	98,200	0	0	610,000	32,000	679
Total Suspended Solids	mg/L	66	95	240	46	63	95	78	186
Oil and Grease	mg/L	3.3	0	1.7	0	0	1.3	3.1	0
Total Aluminum	ug/L	4,055	881	1,824	387	513	599	672	1,681
Total Cadmium	ug/L	0.73	0	0	0	0	0	1.1	0
Total Copper	ug/L	39	24	32	12	19	15	56	15
Total Lead	ug/L	18	4.9	17	5.8	11	10	10	0
Total Mercury	ug/L	0	0	0	0	0	0	0	0
Total Nickel	ug/L	15	4.7	9.8	0	0	0	6	0
Total Zinc	ug/L	241	138	639	146	203	79	291	46
Dissolved Copper	ug/L	14	13	20	3.9	12	8.5	33	0
Dissolved Lead	ug/L	0	0	0	0	0	0	0	0
Dissolved Zinc	ug/L	152	66	407	83	133	44	192	0
Nitrate as N	mg/L	0.48	0.51	0.87	1.1	0.55	0.86	0.7	1.05
Total Kjeldahl Nitrogen	mg/L	3.4	1.6	3	2	2.5	2.9	1.9	0.79
Total Phosphorus	mg/L	0.39	0.31	0.41	0.19	0.26	0.39	0.44	0.16

Source: Table 4-12 Summary of 1994-2000 Land Use Results by Site.

Runoff Value (0.75-in Storm) (ft^3)					
Land Use	**Commercial/Institutional**	**Industrial**	**Natural/Vacant**	**Open Space/Recreation**	**Residential**
Verdugo Wash	125,051	9,143	156,494	2,377	225,352
Barras Canyon	0	47,206	36,435	8,108	58,463

EMCs Used in the Analysis						
Pollutants	Unit	**Commercial**	**Industrial**	**Vacant**	**Vacant**	**SF Residential**
Total Petroleum Hydrocarbons	mg/L	3.1	1.7	0	0	1.3
Total Coliform	MPN/100mL	1,140,000	454,000	9,187	9,187	1,366,667
Fecal Coliform	MPN/100mL	528,750	338,220	1,397	1,397	933,333
Fecal Enterococcus	MPN/100mL	86,250	98,200	679	679	610,000
Total Suspended Solids	mg/L	66	240	186	186	95
Oil and Grease	mg/L	3.3	1.7	0	0	1.3
Total Aluminum	ug/L	4,055	1,824	1,681	1,681	599
Total Cadmium	ug/L	0.73	0	0	0	0
Total Copper	ug/L	39	32	15	15	15
Total Lead	ug/L	18	17	0	0	10
Total Mercury	ug/L	0	0	0	0	0
Total Nickel	ug/L	15	9.8	0	0	0
Total Zinc	ug/L	241	639	46	46	79
Dissolved Copper	ug/L	14	20	0	0	8.5
Dissolved Lead	ug/L	0	0	0	0	0
Dissolved Zinc	ug/L	152	407	0	0	44
Nitrate as N	mg/L	0.48	0.87	1.05	1.05	0.86
Total Kjeldahl Nitrogen	mg/L	3.4	3	0.79	0.79	2.9
Total Phosphorus	mg/L	0.39	0.41	0.16	0.16	0.39

% runoff retained on site	40%
Conversion from ft^3 to L	28.3168
Conversion from kg to lbs	2.20462

Pollutant Loading from Verdugo Wash					
Pollutants	Conversion	**Total Loading (kg)**	**Total Loading (lbs)**	**Loading Removed (lbs)**	**Resulting Downstream Loading (lbs)**
Total Petroleum Hydrocarbons	1E-06	19.7	43.5	17.4	26.1
Total Coliform [1]	1E-08	129,167	129,167	51,667	77,500
Fecal Coliform [1]	1E-08	79,220	79,220	31,688	47,532
Fecal Enterococcus [1]	1E-08	42,265	42,265	16,906	25,359
Total Suspended Solids	1E-06	1,739	3,833	1,533	2,300
Oil and Grease	1E-06	20.4	45.0	18.01	27.01
Total Aluminum	1E-09	26.2	57.8	23.12	34.68
Total Cadmium	1E-09	0.003	0.006	0.00	0.00
Total Copper	1E-09	0.310	0.683	0.27	0.41
Total Lead	1E-09	0.132	0.291	0.12	0.17
Total Mercury	1E-09	0.000	0.000	0.00	0.00
Total Nickel	1E-09	0.056	0.123	0.05	0.07
Total Zinc	1E-09	1.730	3.814	1.53	2.29
Dissolved Copper	1E-09	0.109	0.240	0.10	0.14
Dissolved Lead	1E-09	0.000	0.000	0.00	0.00
Dissolved Zinc	1E-09	0.924	2.04	0.82	1.22
Nitrate as N	1E-06	12.1	26.8	10.7	16.1
Total Kjeldahl Nitrogen	1E-06	34.9	76.9	30.8	46.1
Total Phosphorus	1E-06	4.70	10.4	4.14	6.21

Note: Bacteria loading expressed in 10^9 MPN

Pollutant Loading from Barras Canyon					
Pollutants	Conversion	Total Loading (kg)	Total Loading (lbs)	Loading Removed (lbs)	Resulting Downstream Loading (lbs)
Total Petroleum Hydrocarbons	1E-06	4.4	9.8	3.9	5.9
Total Coliform [1]	1E-08	28,810	28,810	11,524	17,286
Fecal Coliform [1]	1E-08	19,990	19,990	7,996	11,994
Fecal Enterococcus [1]	1E-08	11,420	11,420	4,568	6,852
Total Suspended Solids	1E-06	713	1,571	628	943
Oil and Grease	1E-06	4.4	9.8	3.90	5.85
Total Aluminum	1E-09	5.6	12.2	4.89	7.34
Total Cadmium	1E-09	0.000	0.000	0.00	0.00
Total Copper	1E-09	0.087	0.191	0.08	0.11
Total Lead	1E-09	0.039	0.087	0.03	0.05
Total Mercury	1E-09	0.000	0.000	0.00	0.00
Total Nickel	1E-09	0.013	0.029	0.01	0.02
Total Zinc	1E-09	1.043	2.299	0.92	1.38
Dissolved Copper	1E-09	0.041	0.090	0.04	0.05
Dissolved Lead	1E-09	0.000	0.000	0.00	0.00
Dissolved Zinc	1E-09	0.617	1.36	0.54	0.82
Nitrate as N	1E-06	3.9	8.6	3.4	5.2
Total Kjeldahl Nitrogen	1E-06	9.8	21.6	8.6	13.0
Total Phosphorus	1E-06	1.40	3.1	1.23	1.85

Note: Bacteria loading expressed in 10^9 MPN

Table 2. Pollutant Loading Results for a 0.75-in Storm Event				
Pollutants	**Units**	**Total Load**	**Load Removed**	**Resulting Downstream Load**
Total Petroleum Hydrocarbons	lbs	53.2	21.3	31.9
Total Coliform	MPN	157,977	63,191	94,786
Fecal Coliform	MPN	99,210	39,684	59,526
Fecal Enterococcus	MPN	53,684	21,474	32,211
Total Suspended Solids	lbs	5,405	2,162	3,243
Oil and Grease	lbs	54.8	21.9	32.87
Total Aluminum	lbs	70.0	28.0	42.02
Total Cadmium	lbs	0.006	0.002	0.00
Total Copper	lbs	0.873	0.349	0.52
Total Lead	lbs	0.378	0.151	0.23
Total Mercury	lbs	0.000	0.000	0.00
Total Nickel	lbs	0.152	0.061	0.09
Total Zinc	lbs	6.113	2.445	3.67
Dissolved Copper	lbs	0.330	0.132	0.20
Dissolved Lead	lbs	0.000	0.000	0.00
Dissolved Zinc	lbs	3.398	1.36	2.04
Nitrate as N	lbs	35.4	14.2	21.2
Total Kjeldahl Nitrogen	lbs	98.5	39.4	59.1
Total Phosphorus	lbs	13.43	5.4	8.06