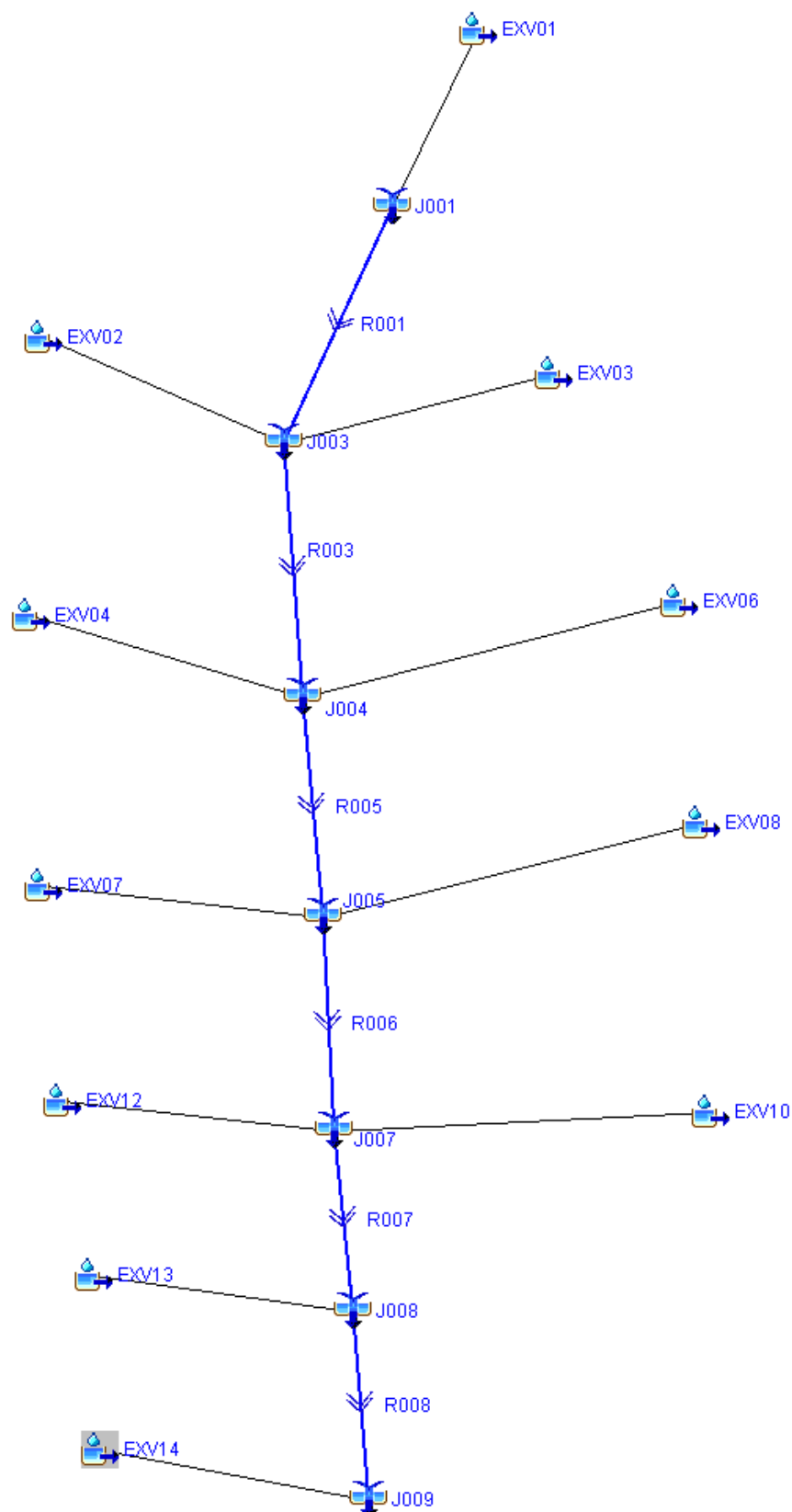


CHAPTER 3

100-Year Unit Hydrograph Hydrologic Model for Existing Conditions

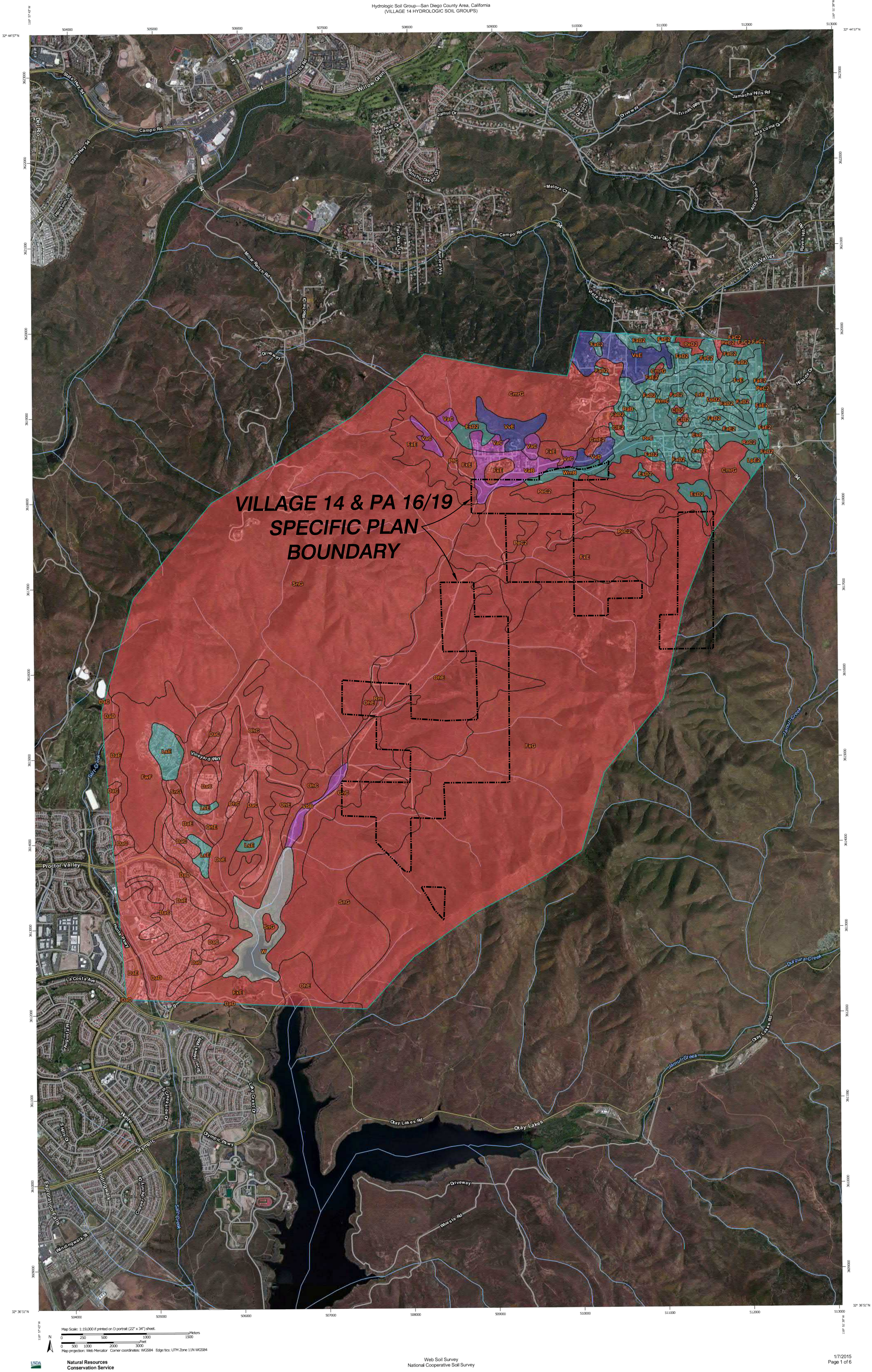
CHAPTER 3

3.1 – Unit Hydrograph Hydrologic Analysis (HEC HMS)



Existing Conditions

Subarea	Total Acres	Soil Type	Acreage	CN	Soil Type	Acreage	CN	Soil Type	Acreage	CN	Soil Type	Acreage	CN	CN _{2,0}	CN _{2,7}
EXV01	953.77	A	155.7	41	B	71.7	64	C	591.5	75	D	134.87	85	70	81
EXV02	932.77	A	0	41	B	0	62	C	0	74	D	932.77	85	85	91
EXV03	889.16	A	0	41	B	0	62	C	0	74	D	889.16	85	85	91
EXV04	633.99	A	0	41	B	0	62	C	0	74	D	633.99	85	85	91
EXV06	591.83	A	0	41	B	0	62	C	0	74	D	591.83	85	85	91
EXV07	373.90	A	0	41	B	0	62	C	0	74	D	373.90	85	85	91
EXV08	997.21	A	0	41	B	0	62	C	0	74	D	997.21	85	85	91
EXV09	429.36	A	0	41	B	0	62	C	0	74	D	429.36	85	85	91
EXV11	309.18	A	0	41	B	0	62	C	0	74	D	309.18	85	85	91
EXV12	112.53	A	0	41	B	0	62	C	0	74	D	112.53	85	85	91
EXV13	656.95	A	0	41	B	4.13	62	C	0	74	D	652.82	85	85	91



HEC-HMS Basin Input-Existing Conditions

Subarea	Area (ft ²)	Area (mi ²)	"n" value	L (ft)	L _c (ft)	L (miles)	L _c (miles)	Elev ₁ (ft)	Elev ₂ (ft)	Elev ₍₁₋₂₎ (ft)	Slope (ft/mile)	Corps T ₁ (hrs)	NRCS T ₁ (hrs)	NRCS T ₁ (min)
EXV01	41546298.4	1.490	0.050	10200	5571	1.932	1.055	1148.0	868.0	280	144.941	0.61	0.52	31.10
EXV02	40631422.4	1.457	0.050	8232	3865	1.559	0.732	2510.0	820.0	1690	1083.965	0.33	0.28	16.80
EXV03	38731994.7	1.389	0.050	11165	7918	2.115	1.500	2042.0	820.0	1222	577.892	0.56	0.47	28.24
EXV04	27616564.8	0.991	0.050	7749	3323	1.468	0.629	2060.0	618.0	1442	982.547	0.31	0.26	15.76
EXV06	25780074.4	0.925	0.050	11382	5784	2.156	1.095	1910.0	618.0	1292	599.346	0.49	0.42	25.02
EXV07	16286919.6	0.584	0.050	11505	5479	2.179	1.038	2560.0	588.0	1972	905.012	0.45	0.38	22.71
EXV08	43438392.5	1.558	0.050	11576	6847	2.192	1.297	1910.0	588.0	1322	602.985	0.53	0.45	26.85
EXV10	18703089.0	0.671	0.050	9065	6947	1.717	1.316	1870.0	568.0	1302	758.363	0.46	0.39	23.50
EXV11	0.0	0.000	0.050	8973	5061	1.699	0.959	1870.0	580.0	1290	759.077	0.41	0.34	20.69
EXV12	13468052.8	0.483	0.050	6665	4490	1.262	0.850	1095.0	568.0	527	417.488	0.39	0.33	19.76
EXV13	4901874.8	0.176	0.050	2964	2964	0.561	0.561	774.0	558.0	216	384.777	0.25	0.21	12.41
EXV14	28616610.3	1.026	0.050	11978	8327	2.269	1.577	1720.0	515.0	1205	531.174	0.59	0.50	30.08
Total Check	299721293.620	10.751												

Lag Equations from SD County Manual (2003)

$$\text{Corps } T_1 = 24n((L \times L_c)/(s^{0.5}))^m$$

$$\text{NRCS } T_1 = T_p - 0.5D$$

$$T_p = 0.862 \times \text{Corps } T_1$$

HEC-HMS Routing Input-Existing Conditions

Subarea	Reach	U/S Node	D/S Node	Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope (ft/ft)	Slope (ft/mi)	"n" value	Channel Type	Dimensions
EXV01	R001	J001	J003	2189	868.0	818.0	0.02284	120.60302	0.05	Trap	50' (W), 3H:1V
EXV04	R003	J003	J004	8460	818.0	618.0	0.02364	124.82270	0.05	Trap	30' (W), 3H:1V
EXV07	R005	J004	J005	2399	618.0	588.0	0.01251	66.02751	0.05	Trap	50' (W), 8H:1V
EXV12	R006	J005	J007	2125	588.0	568.0	0.00941	49.69412	0.05	Trap	50' (W), 8H:1V
EXV13	R007	J007	J008	1409	568.0	558.0	0.00710	37.47339	0.05	Trap	20' (W), 3H:1V
EXV14	R008	J008	J009	4455	558.0	515.0	0.00965	50.96296	0.05	Trap	50' (W), 3H:1V

OTAY RANCH VILLAGE 14

HEC HMS HYETOGRAPH CALCULATIONS

SD COUNTY HYETOGRAPH CALCULATIONS

Area	(sq ft)	(sq mi)	
EXV01	41546298.41	1.49	953.77
EXV02	40631422.43	1.46	932.77
EXV03	38731994.66	1.39	889.16
EXV04	27616564.76	0.99	633.99
EXV06	25780074.4	0.92	591.83
EXV07	16286919.58	0.58	373.90
EXV08	43438392.48	1.56	997.21
EXV10	18703089.01	0.67	429.36
EXV11	0	0.00	0.00
EXV12	13468052.84	0.48	309.18
EXV13	4901874.77	0.18	112.53
EXV14	28616610.28	1.03	656.95

Total 299721293.6 10.75 6880.65

Watershed area (sq mi)	Rainfall Depth-Area Adjustment Data Points					
	30	60	180	360	1440	
10	0.9	0.947	0.97	0.98	0.985	Taken from Table 4-1
10.75	0.895	0.943	0.969	0.979	0.984	Interpolated
20	0.834	0.9	0.952	0.963	0.975	Taken from Table 4-1

P(6)= 3.1 in

CALCULATED RAINFALL SORTED IN (2/3,1/3) DISTRIBUTION

RAINFALL DISTRIBUTION SORTED IN ORDER OF INCREASING DURATION

Duration (min)	Rainfall Precipitation for Duration (in)	Depth Area Adjustment for Duration	Depth-Area Adjusted		Hyetograph Ordinate (in)	Sorted Hyetograph Ordinate (in)	
			Precipitation (in)				
5	0.681	0.895	0.609		0.609	1	0.010
10	0.871	0.895	0.779		0.170	2	0.010
15	1.005	0.895	0.900		0.121	3	0.010
20	1.113	0.895	0.997		0.097	4	0.011
25	1.205	0.895	1.079		0.082	5	0.011
30	1.286	0.895	1.151		0.072	6	0.011
35	1.358	0.903	1.227		0.076	7	0.011
40	1.424	0.911	1.298		0.071	8	0.011
45	1.485	0.919	1.365		0.067	9	0.011
50	1.541	0.927	1.429		0.064	10	0.011
55	1.594	0.935	1.491		0.062	11	0.011
60	1.644	0.943	1.552		0.060	12	0.011
65	1.692	0.945	1.598		0.046	13	0.011
70	1.737	0.946	1.642		0.044	14	0.011
75	1.780	0.947	1.685		0.043	15	0.011
80	1.821	0.948	1.726		0.041	16	0.011
85	1.861	0.949	1.765		0.040	17	0.011
90	1.899	0.950	1.804		0.038	18	0.011
95	1.936	0.951	1.841		0.037	19	0.011
100	1.971	0.952	1.877		0.036	20	0.011
105	2.006	0.953	1.911		0.035	21	0.011
110	2.039	0.954	1.945		0.034	22	0.011
115	2.072	0.955	1.979		0.033	23	0.011
120	2.103	0.956	2.011		0.032	24	0.011
125	2.134	0.957	2.042		0.032	25	0.011
130	2.164	0.958	2.073		0.031	26	0.011
135	2.193	0.959	2.104		0.030	27	0.011
140	2.222	0.960	2.133		0.030	28	0.011
145	2.249	0.961	2.162		0.029	29	0.011
150	2.277	0.962	2.191		0.029	30	0.011
155	2.303	0.963	2.219		0.028	31	0.011
160	2.329	0.964	2.247		0.028	32	0.011
165	2.355	0.966	2.274		0.027	33	0.011
170	2.380	0.967	2.300		0.027	34	0.011
175	2.405	0.968	2.327		0.026	35	0.011

OTAY RANCH VILLAGE 14
HEC HMS HYETOGRAPH CALCULATIONS

180	2.429	0.969	2.353	0.026	36	0.012
185	2.453	0.969	2.376	0.024	37	0.012
190	2.476	0.969	2.400	0.023	38	0.012
195	2.499	0.969	2.423	0.023	39	0.012
200	2.521	0.970	2.445	0.023	40	0.012
205	2.544	0.970	2.467	0.022	41	0.012
210	2.565	0.970	2.489	0.022	42	0.012
215	2.587	0.971	2.511	0.022	43	0.012
220	2.608	0.971	2.532	0.021	44	0.012
225	2.629	0.971	2.553	0.021	45	0.012
230	2.650	0.971	2.574	0.021	46	0.012
235	2.670	0.972	2.595	0.020	47	0.012
240	2.690	0.972	2.615	0.020	48	0.012
245	2.710	0.972	2.635	0.020	49	0.012
250	2.729	0.973	2.654	0.020	50	0.012
255	2.749	0.973	2.674	0.019	51	0.012
260	2.768	0.973	2.693	0.019	52	0.012
265	2.786	0.973	2.712	0.019	53	0.012
270	2.805	0.974	2.731	0.019	54	0.012
275	2.823	0.974	2.750	0.019	55	0.012
280	2.841	0.974	2.768	0.018	56	0.012
285	2.859	0.975	2.786	0.018	57	0.012
290	2.877	0.975	2.804	0.018	58	0.012
295	2.894	0.975	2.822	0.018	59	0.012
300	2.912	0.975	2.840	0.018	60	0.012
305	2.929	0.976	2.858	0.018	61	0.013
310	2.946	0.976	2.875	0.017	62	0.013
315	2.963	0.976	2.892	0.017	63	0.013
320	2.979	0.976	2.909	0.017	64	0.013
325	2.996	0.977	2.926	0.017	65	0.013
330	3.012	0.977	2.943	0.017	66	0.013
335	3.028	0.977	2.959	0.017	67	0.013
340	3.044	0.978	2.976	0.016	68	0.013
345	3.060	0.978	2.992	0.016	69	0.013
350	3.076	0.978	3.008	0.016	70	0.013
355	3.091	0.978	3.024	0.016	71	0.013
360	3.106	0.979	3.040	0.016	72	0.013
365	3.021	0.979	2.957	0.018	73	0.013
370	3.041	0.979	2.977	0.020	74	0.013
375	3.062	0.979	2.997	0.020	75	0.013
380	3.082	0.979	3.017	0.020	76	0.013
385	3.102	0.979	3.037	0.020	77	0.013
390	3.122	0.979	3.057	0.020	78	0.013
395	3.142	0.979	3.076	0.020	79	0.013
400	3.162	0.979	3.096	0.019	80	0.014
405	3.182	0.979	3.115	0.019	81	0.014
410	3.202	0.979	3.134	0.019	82	0.014
415	3.221	0.979	3.153	0.019	83	0.014
420	3.240	0.979	3.172	0.019	84	0.014
425	3.260	0.979	3.191	0.019	85	0.014
430	3.279	0.979	3.210	0.019	86	0.014
435	3.298	0.979	3.229	0.019	87	0.014
440	3.317	0.979	3.247	0.019	88	0.014
445	3.335	0.979	3.266	0.018	89	0.014
450	3.354	0.979	3.284	0.018	90	0.014
455	3.373	0.979	3.303	0.018	91	0.014
460	3.391	0.979	3.321	0.018	92	0.014
465	3.410	0.979	3.339	0.018	93	0.014
470	3.428	0.979	3.357	0.018	94	0.014
475	3.446	0.979	3.375	0.018	95	0.014
480	3.464	0.979	3.393	0.018	96	0.015
485	3.482	0.979	3.410	0.018	97	0.015
490	3.500	0.979	3.428	0.018	98	0.015
495	3.518	0.979	3.445	0.018	99	0.015
500	3.536	0.979	3.463	0.017	100	0.015
505	3.553	0.979	3.480	0.017	101	0.015

OTAY RANCH VILLAGE 14
HEC HMS HYETOGRAPH CALCULATIONS

510	3.571	0.979	3.497	0.017	102	0.015
515	3.588	0.980	3.515	0.017	103	0.015
520	3.606	0.980	3.532	0.017	104	0.015
525	3.623	0.980	3.549	0.017	105	0.015
530	3.640	0.980	3.566	0.017	106	0.015
535	3.657	0.980	3.583	0.017	107	0.015
540	3.674	0.980	3.599	0.017	108	0.016
545	3.691	0.980	3.616	0.017	109	0.016
550	3.708	0.980	3.633	0.017	110	0.016
555	3.725	0.980	3.649	0.017	111	0.016
560	3.742	0.980	3.666	0.016	112	0.016
565	3.758	0.980	3.682	0.016	113	0.016
570	3.775	0.980	3.699	0.016	114	0.016
575	3.791	0.980	3.715	0.016	115	0.016
580	3.808	0.980	3.731	0.016	116	0.016
585	3.824	0.980	3.747	0.016	117	0.016
590	3.841	0.980	3.763	0.016	118	0.017
595	3.857	0.980	3.779	0.016	119	0.017
600	3.873	0.980	3.795	0.016	120	0.017
605	3.889	0.980	3.811	0.016	121	0.017
610	3.905	0.980	3.827	0.016	122	0.017
615	3.921	0.980	3.843	0.016	123	0.017
620	3.937	0.980	3.858	0.016	124	0.017
625	3.953	0.980	3.874	0.016	125	0.017
630	3.969	0.980	3.890	0.016	126	0.018
635	3.984	0.980	3.905	0.016	127	0.018
640	4.000	0.980	3.921	0.015	128	0.018
645	4.016	0.980	3.936	0.015	129	0.018
650	4.031	0.980	3.951	0.015	130	0.018
655	4.047	0.980	3.967	0.015	131	0.018
660	4.062	0.980	3.982	0.015	132	0.018
665	4.077	0.980	3.997	0.015	133	0.018
670	4.093	0.980	4.012	0.015	134	0.019
675	4.108	0.980	4.027	0.015	135	0.019
680	4.123	0.980	4.042	0.015	136	0.019
685	4.138	0.980	4.057	0.015	137	0.019
690	4.153	0.980	4.072	0.015	138	0.019
695	4.168	0.980	4.087	0.015	139	0.019
700	4.183	0.980	4.102	0.015	140	0.020
705	4.198	0.980	4.116	0.015	141	0.020
710	4.213	0.981	4.131	0.015	142	0.020
715	4.228	0.981	4.146	0.015	143	0.020
720	4.243	0.981	4.160	0.015	144	0.016
725	4.257	0.981	4.175	0.015	145	0.016
730	4.272	0.981	4.189	0.014	146	0.016
735	4.287	0.981	4.204	0.014	147	0.016
740	4.301	0.981	4.218	0.014	148	0.017
745	4.316	0.981	4.232	0.014	149	0.017
750	4.330	0.981	4.247	0.014	150	0.017
755	4.345	0.981	4.261	0.014	151	0.017
760	4.359	0.981	4.275	0.014	152	0.018
765	4.373	0.981	4.289	0.014	153	0.018
770	4.387	0.981	4.303	0.014	154	0.018
775	4.402	0.981	4.317	0.014	155	0.018
780	4.416	0.981	4.331	0.014	156	0.019
785	4.430	0.981	4.345	0.014	157	0.019
790	4.444	0.981	4.359	0.014	158	0.019
795	4.458	0.981	4.373	0.014	159	0.020
800	4.472	0.981	4.387	0.014	160	0.020
805	4.486	0.981	4.401	0.014	161	0.020
810	4.500	0.981	4.415	0.014	162	0.021
815	4.514	0.981	4.428	0.014	163	0.021
820	4.528	0.981	4.442	0.014	164	0.022
825	4.541	0.981	4.456	0.014	165	0.022
830	4.555	0.981	4.469	0.014	166	0.023
835	4.569	0.981	4.483	0.014	167	0.023

OTAY RANCH VILLAGE 14
HEC HMS HYETOGRAPH CALCULATIONS

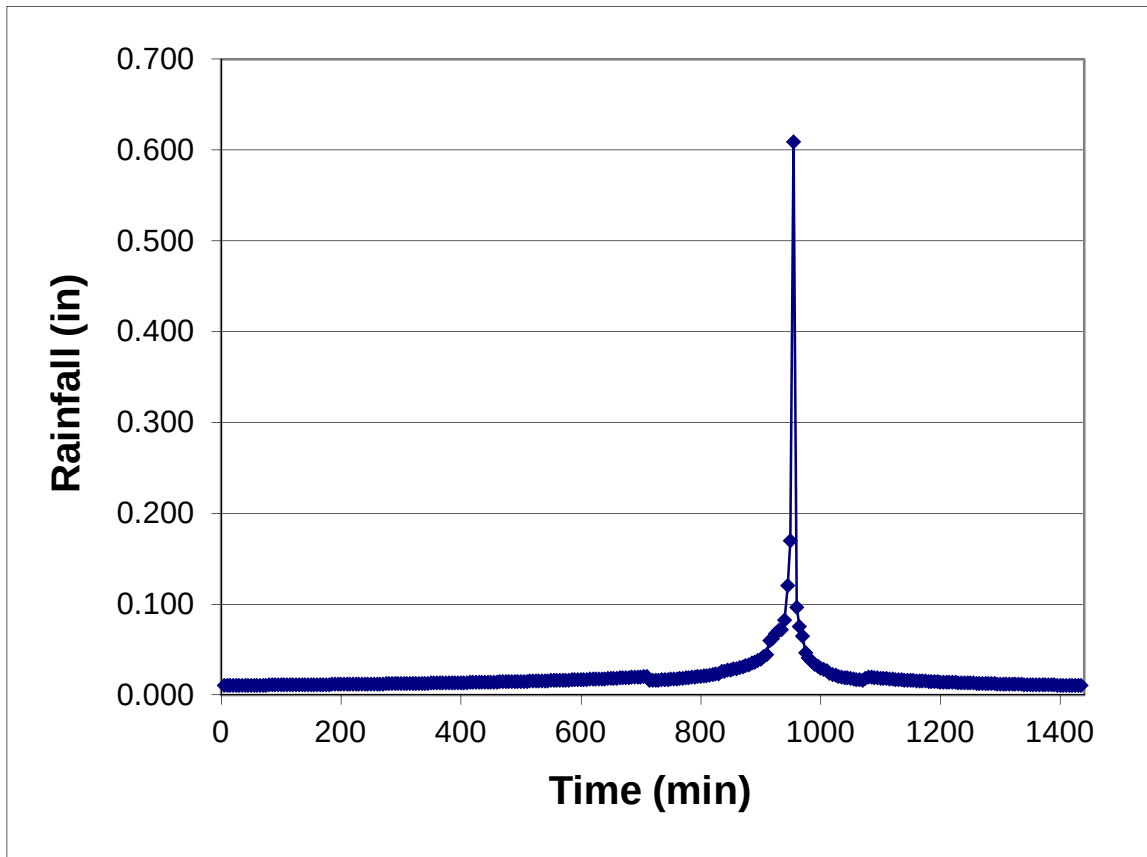
840	4.583	0.981	4.496	0.014	168	0.026
845	4.596	0.981	4.510	0.013	169	0.026
850	4.610	0.981	4.523	0.013	170	0.027
855	4.623	0.981	4.537	0.013	171	0.028
860	4.637	0.981	4.550	0.013	172	0.029
865	4.650	0.981	4.563	0.013	173	0.029
870	4.664	0.981	4.577	0.013	174	0.030
875	4.677	0.981	4.590	0.013	175	0.031
880	4.690	0.981	4.603	0.013	176	0.032
885	4.704	0.981	4.616	0.013	177	0.033
890	4.717	0.981	4.629	0.013	178	0.035
895	4.730	0.981	4.643	0.013	179	0.036
900	4.743	0.981	4.656	0.013	180	0.038
905	4.757	0.982	4.669	0.013	181	0.040
910	4.770	0.982	4.682	0.013	182	0.043
915	4.783	0.982	4.695	0.013	183	0.044
920	4.796	0.982	4.708	0.013	184	0.060
925	4.809	0.982	4.720	0.013	185	0.062
930	4.822	0.982	4.733	0.013	186	0.067
935	4.835	0.982	4.746	0.013	187	0.071
940	4.848	0.982	4.759	0.013	188	0.072
945	4.861	0.982	4.772	0.013	189	0.082
950	4.873	0.982	4.784	0.013	190	0.121
955	4.886	0.982	4.797	0.013	191	0.170
960	4.899	0.982	4.810	0.013	192	0.609
965	4.912	0.982	4.822	0.013	193	0.097
970	4.924	0.982	4.835	0.013	194	0.076
975	4.937	0.982	4.848	0.013	195	0.064
980	4.950	0.982	4.860	0.013	196	0.046
985	4.962	0.982	4.873	0.013	197	0.041
990	4.975	0.982	4.885	0.012	198	0.037
995	4.987	0.982	4.898	0.012	199	0.034
1000	5.000	0.982	4.910	0.012	200	0.032
1005	5.012	0.982	4.922	0.012	201	0.030
1010	5.025	0.982	4.935	0.012	202	0.028
1015	5.037	0.982	4.947	0.012	203	0.027
1020	5.050	0.982	4.959	0.012	204	0.024
1025	5.062	0.982	4.972	0.012	205	0.023
1030	5.074	0.982	4.984	0.012	206	0.022
1035	5.087	0.982	4.996	0.012	207	0.021
1040	5.099	0.982	5.008	0.012	208	0.020
1045	5.111	0.982	5.020	0.012	209	0.019
1050	5.123	0.982	5.033	0.012	210	0.019
1055	5.136	0.982	5.045	0.012	211	0.018
1060	5.148	0.982	5.057	0.012	212	0.018
1065	5.160	0.982	5.069	0.012	213	0.017
1070	5.172	0.982	5.081	0.012	214	0.017
1075	5.184	0.982	5.093	0.012	215	0.016
1080	5.196	0.982	5.105	0.012	216	0.018
1085	5.208	0.982	5.117	0.012	217	0.020
1090	5.220	0.982	5.129	0.012	218	0.020
1095	5.232	0.982	5.140	0.012	219	0.019
1100	5.244	0.983	5.152	0.012	220	0.019
1105	5.256	0.983	5.164	0.012	221	0.019
1110	5.268	0.983	5.176	0.012	222	0.018
1115	5.280	0.983	5.188	0.012	223	0.018
1120	5.292	0.983	5.199	0.012	224	0.018
1125	5.303	0.983	5.211	0.012	225	0.017
1130	5.315	0.983	5.223	0.012	226	0.017
1135	5.327	0.983	5.235	0.012	227	0.017
1140	5.339	0.983	5.246	0.012	228	0.017
1145	5.350	0.983	5.258	0.012	229	0.016
1150	5.362	0.983	5.269	0.012	230	0.016
1155	5.374	0.983	5.281	0.012	231	0.016
1160	5.385	0.983	5.293	0.012	232	0.016
1165	5.397	0.983	5.304	0.012	233	0.016

OTAY RANCH VILLAGE 14
HEC HMS HYETOGRAPH CALCULATIONS

1170	5.408	0.983	5.316	0.012	234	0.016
1175	5.420	0.983	5.327	0.011	235	0.015
1180	5.431	0.983	5.339	0.011	236	0.015
1185	5.443	0.983	5.350	0.011	237	0.015
1190	5.454	0.983	5.361	0.011	238	0.015
1195	5.466	0.983	5.373	0.011	239	0.015
1200	5.477	0.983	5.384	0.011	240	0.015
1205	5.489	0.983	5.396	0.011	241	0.014
1210	5.500	0.983	5.407	0.011	242	0.014
1215	5.511	0.983	5.418	0.011	243	0.014
1220	5.523	0.983	5.429	0.011	244	0.014
1225	5.534	0.983	5.441	0.011	245	0.014
1230	5.545	0.983	5.452	0.011	246	0.014
1235	5.557	0.983	5.463	0.011	247	0.014
1240	5.568	0.983	5.474	0.011	248	0.013
1245	5.579	0.983	5.486	0.011	249	0.013
1250	5.590	0.983	5.497	0.011	250	0.013
1255	5.601	0.983	5.508	0.011	251	0.013
1260	5.612	0.983	5.519	0.011	252	0.013
1265	5.624	0.983	5.530	0.011	253	0.013
1270	5.635	0.983	5.541	0.011	254	0.013
1275	5.646	0.983	5.552	0.011	255	0.013
1280	5.657	0.983	5.563	0.011	256	0.013
1285	5.668	0.983	5.574	0.011	257	0.013
1290	5.679	0.983	5.585	0.011	258	0.012
1295	5.690	0.984	5.596	0.011	259	0.012
1300	5.701	0.984	5.607	0.011	260	0.012
1305	5.712	0.984	5.618	0.011	261	0.012
1310	5.723	0.984	5.629	0.011	262	0.012
1315	5.734	0.984	5.640	0.011	263	0.012
1320	5.745	0.984	5.651	0.011	264	0.012
1325	5.755	0.984	5.661	0.011	265	0.012
1330	5.766	0.984	5.672	0.011	266	0.012
1335	5.777	0.984	5.683	0.011	267	0.012
1340	5.788	0.984	5.694	0.011	268	0.012
1345	5.799	0.984	5.705	0.011	269	0.012
1350	5.809	0.984	5.715	0.011	270	0.011
1355	5.820	0.984	5.726	0.011	271	0.011
1360	5.831	0.984	5.737	0.011	272	0.011
1365	5.842	0.984	5.747	0.011	273	0.011
1370	5.852	0.984	5.758	0.011	274	0.011
1375	5.863	0.984	5.769	0.011	275	0.011
1380	5.874	0.984	5.779	0.011	276	0.011
1385	5.884	0.984	5.790	0.011	277	0.011
1390	5.895	0.984	5.801	0.011	278	0.011
1395	5.906	0.984	5.811	0.011	279	0.011
1400	5.916	0.984	5.822	0.011	280	0.011
1405	5.927	0.984	5.832	0.011	281	0.011
1410	5.937	0.984	5.843	0.011	282	0.011
1415	5.948	0.984	5.853	0.011	283	0.011
1420	5.958	0.984	5.864	0.010	284	0.011
1425	5.969	0.984	5.874	0.010	285	0.011
1430	5.979	0.984	5.885	0.010	286	0.011
1435	5.990	0.984	5.895	0.010	287	0.010
1440	6.000	0.984	5.905	0.010	288	0.010

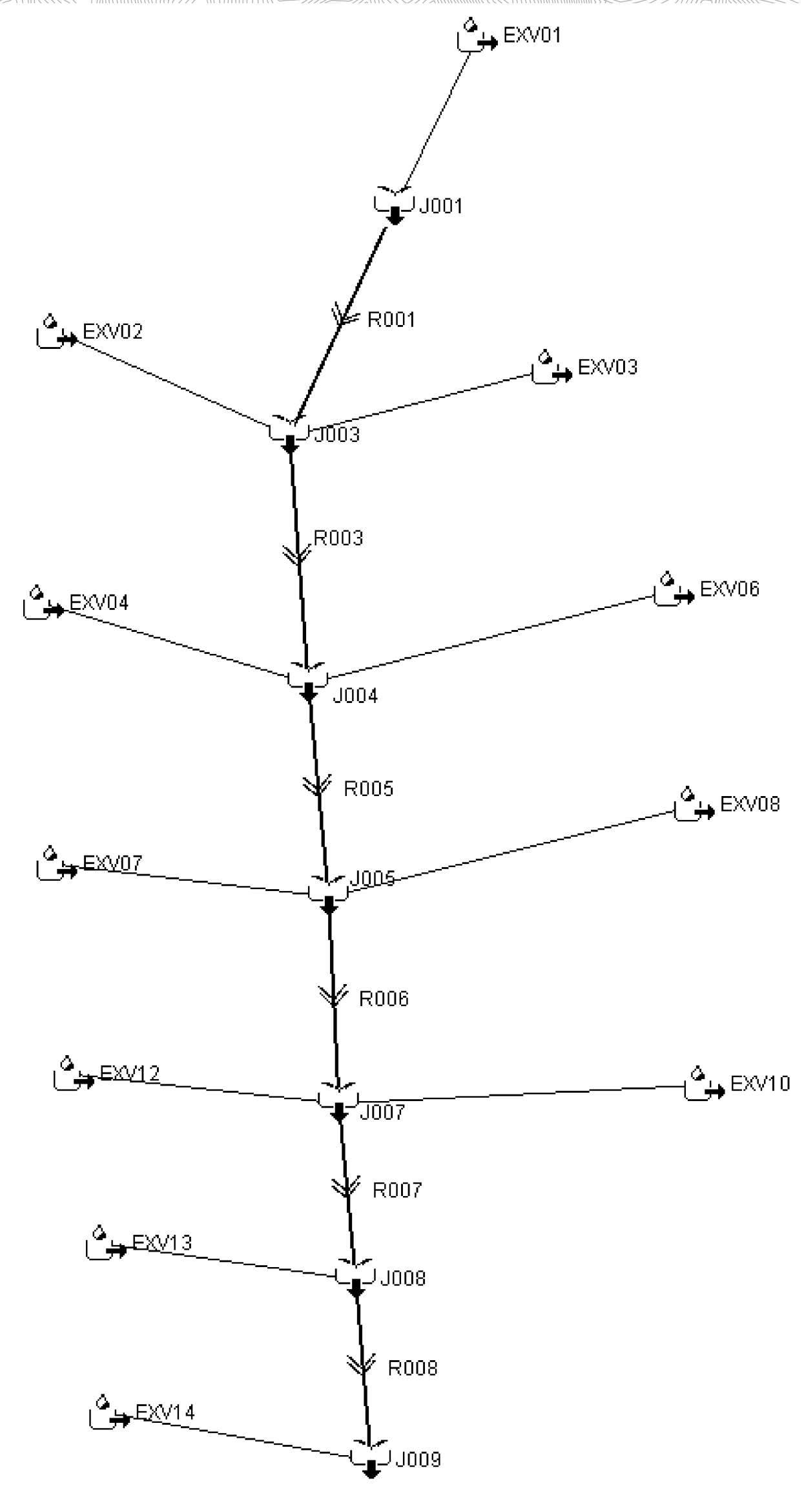
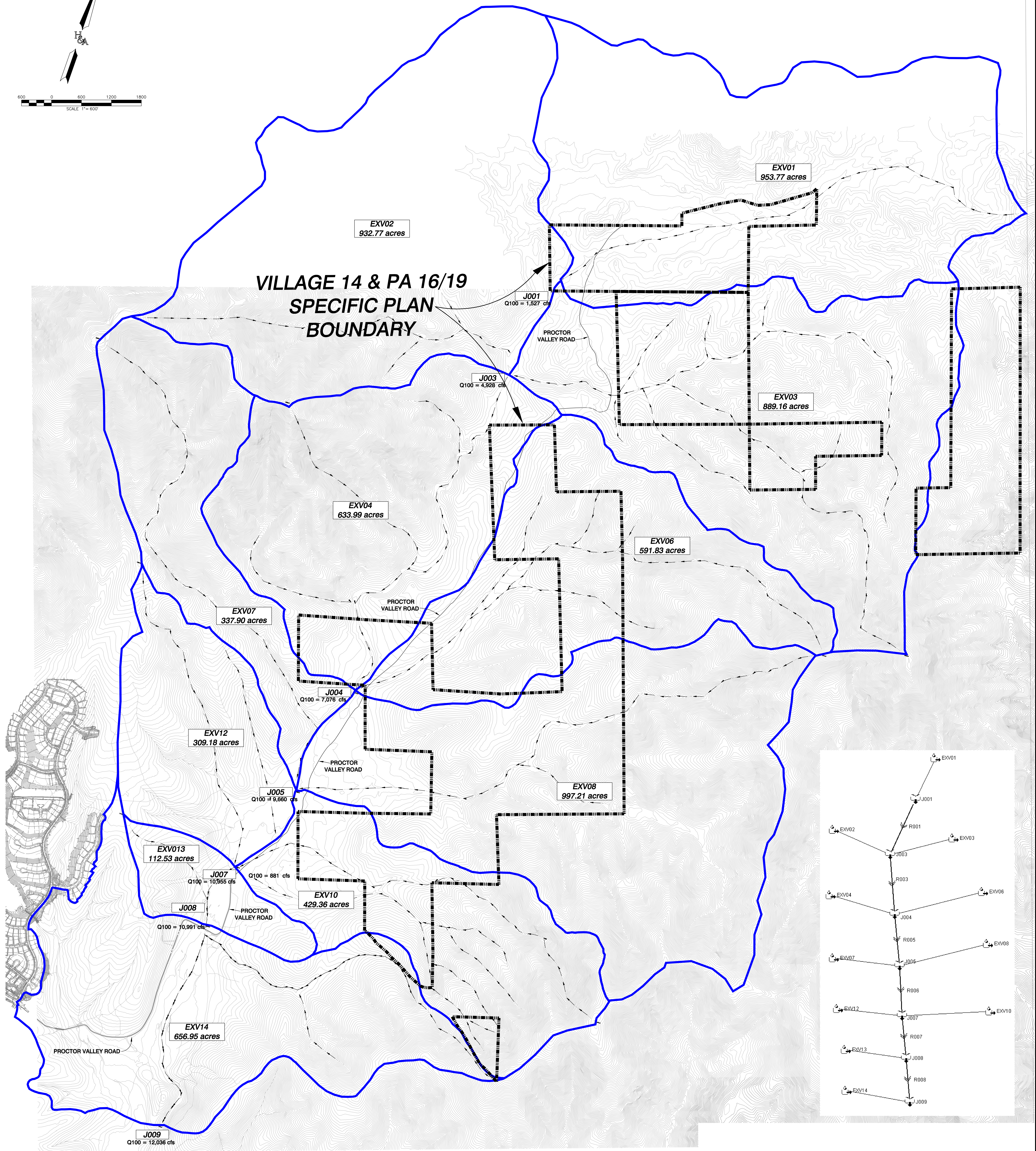
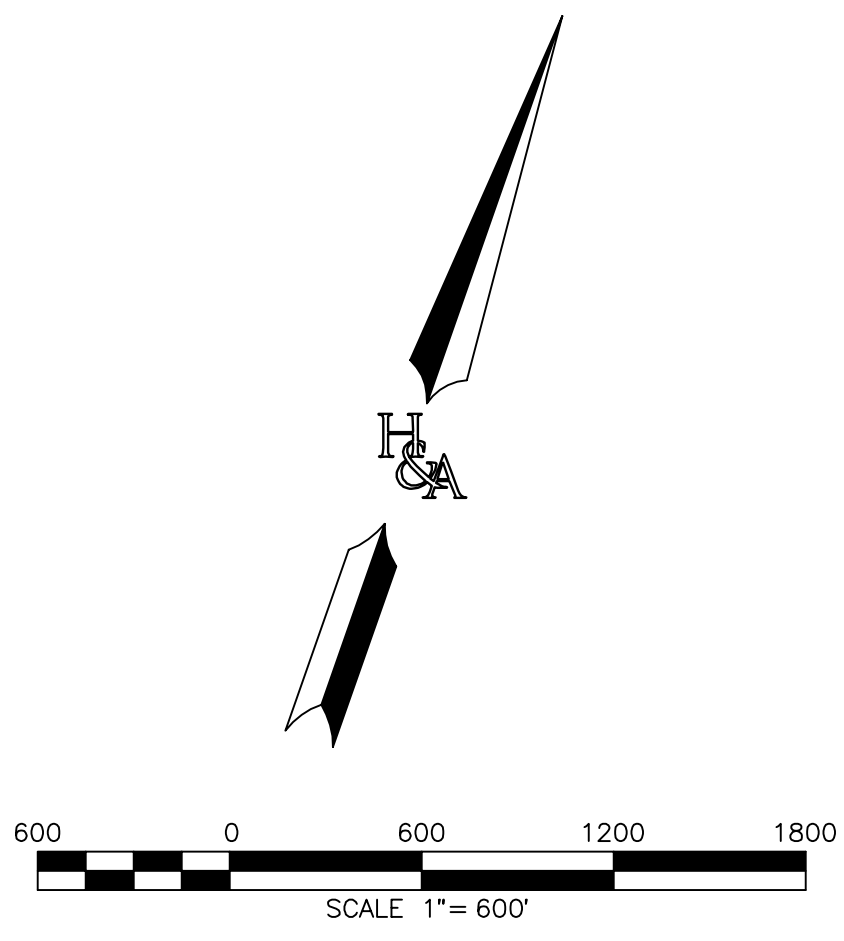
OTAY RANCH VILLAGE 14
HEC HMS HYETOGRAPH CALCULATIONS

CALCULATED RAINFALL SORTED IN (2/3,1/3) DISTRIBUTION



CHAPTER 3

3.2 – Existing Condition Hydrology Map



LEGEND:

- EXVxx**
xx.xx acres DRAINAGE AREA
- SUBAREA BOUNDARY

PREPARED BY:
HUNSAKER & ASSOCIATES
S.A.B. CONSULTING, INC.
PLANNING 3707 Wadsworth Street
ENGINEERING San Diego, CA 92121
SURVEYING PH0858558-4500 / PH0858558-1414

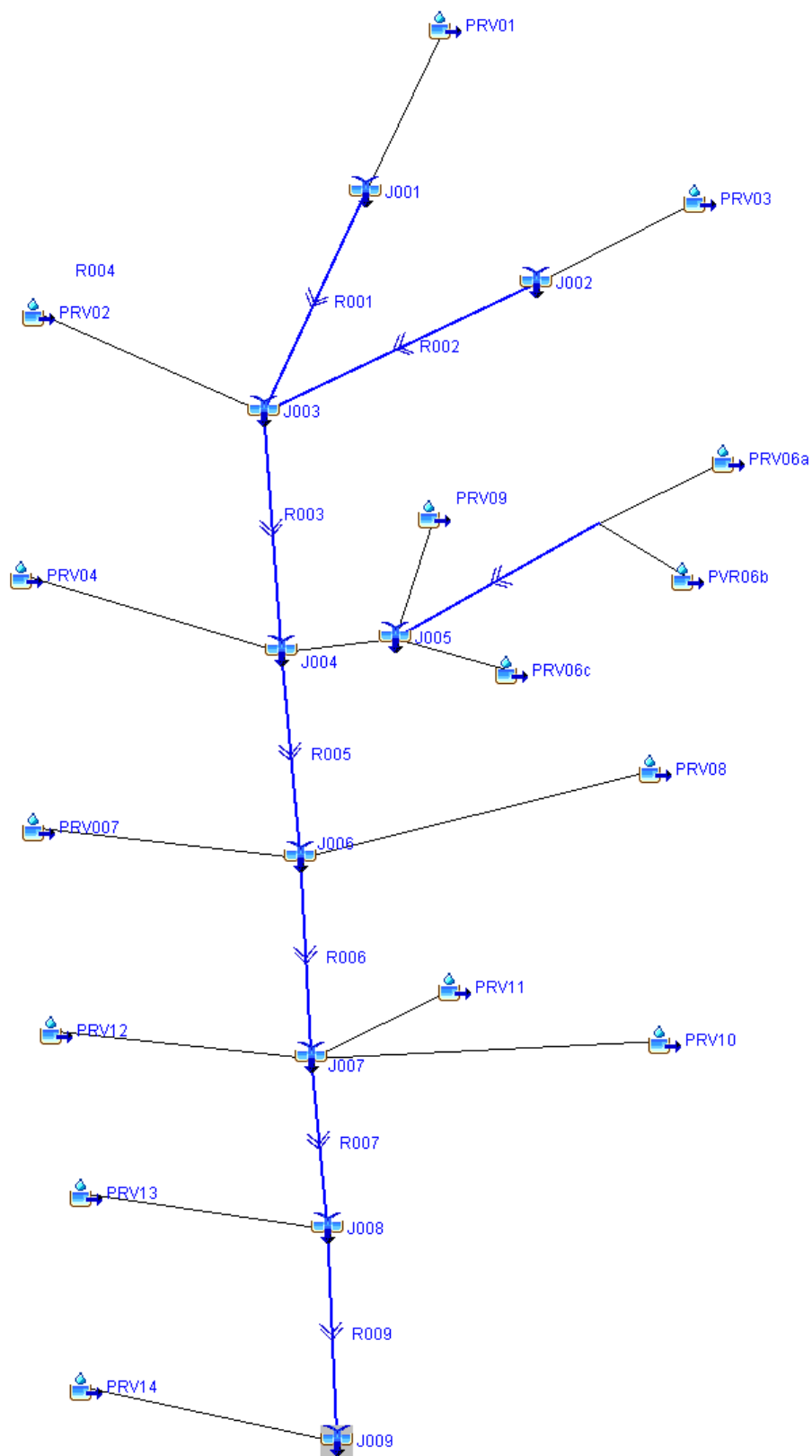
EXHIBIT 3.1
EXISTING CONDITION HEC-HMS HYDROLOGY MAP
OTAY RANCH VILLAGE 14 & PA 16/19
COUNTY OF SAN DIEGO, CALIFORNIA

CHAPTER 4

100-Year Unit Hydrograph Hydrologic Model for Proposed Conditions

CHAPTER 4

4.1 – Unit Hydrograph Hydrologic Analysis (HEC HMS)



Proposed Conditions

Subarea	Total Acres	Soil Type	Acreage	CN	Soil Type	Acreage	CN	Soil Type	Acreage	CN	Soil Type	Acreage	CN	CN _{2.0}	CN _{2.7}
PRV01	955.78	A	155.7	41	B	71.7	64	C	591.5	75	D	136.88	86	70	81
PRV02	1047.38	A	0	0	B	0	62	C	0	74	D	1047.38	85	85	91
PRV03	772.24	A	0	0	B	0	62	C	0	74	D	772.24	86	86	92
PRV04	597.84	A	0	0	B	0	62	C	0	74	D	597.84	85	85	91
PRV06a	264.07	A	0	0	B	0	62	C	0	74	D	264.07	85	85	91
PRV06b	62.06	A	0	0	B	0	62	C	0	74	D	62.06	85	85	91
PRV06c	153.56	A	0	0	B	0	62	C	0	74	D	153.56	85	85	91
PRV07	414.42	A	0	0	B	0	62	C	0	74	D	414.42	85	85	91
PRV08	824.69	A	0	0	B	0	62	C	0	74	D	824.69	85	85	91
PRV09	217.74	A	0	61	B	0	75	C	0	83	D	217.74	87	87	93
PRV10	315.16	A	0	0	B	0	62	C	0	74	D	315.16	85	85	91
PRV11	161.23	A	0	61	B	0	75	C	0	83	D	161.23	87	87	93
PRV12	322.97	A	0	0	B	0	62	C	0	74	D	322.97	85	85	91
PRV13	80.78	A	0	0	B	0	62	C	0	74	D	80.78	85	85	91
PRV14	690.32	A	0	0	B	0	62	C	0	74	D	690.32	85	85	91

HEC-HMS Basin Input-Proposed Conditions

Subarea	Area (ft ²)	Area (mi ²)			"n" value	L (ft)	L _c (ft)	L (miles)	L _c (miles)	Elev ₁ (ft)	Elev ₂ (ft)	Elev ₍₁₋₂₎ (ft)	Slope (ft/mile)	Corps T ₁ (hrs)	NRCS T ₁ (hrs)	NRCS T ₁ (min)
PRV01	41,633,811	1.493	955.781	955.781	0.050	10200	5571	1.932	1.055	1148.0	868.0	280	144.941	0.61	0.52	31.10
PRV02	45,623,821	1.637	1047.379	2003.160	0.050	8232	3865	1.559	0.732	2510.0	820.0	1690	1083.965	0.33	0.28	16.80
PRV03	33,638,681	1.207	772.238	2775.397	0.050	10119	5744	1.916	1.088	1620.0	890.0	730	380.907	0.51	0.43	26.03
PRV04	26,041,858	0.934	597.839	3373.236	0.050	7749	3323	1.468	0.629	2060.0	618.0	1442	982.547	0.31	0.26	15.76
PRV06a	11,503,021	0.413	264.073	3637.309	0.050	6255	2880	1.185	0.545	1910.0	780.0	1130	953.861	0.28	0.23	13.78
PRV06b	2,703,438	0.097	62.062	3699.372	0.050	2969	1491	0.562	0.282	1540.0	820.0	720	1280.431	0.15	0.12	7.42
PRV06c	6,688,981	0.240	153.558	3852.930	0.050	4190	1560	0.794	0.295	990.0	655.0	335	422.148	0.22	0.18	10.84
PRV07	18,052,194	0.648	414.421	4267.351	0.050	11608	6021	2.198	1.140	2560.0	588.0	1972	896.981	0.47	0.39	23.68
PRV08	35,923,546	1.289	824.691	5092.042	0.050	10842	4868	2.053	0.922	1910.0	610.0	1300	633.094	0.45	0.38	22.72
PRV09	9,484,809	0.340	217.741	5309.783	0.018	7865	5405	1.490	1.024	1000.0	685.0	315	211.469	0.18	0.15	8.98
PRV10	13,728,283	0.492	315.158	5624.941	0.050	9468	4750	1.793	0.900	1870.0	580.0	1290	719.392	0.41	0.35	20.83
PRV11	7,023,237	0.252	161.231	5786.173	0.018	6027	2330	1.141	0.441	890.0	596.0	294	257.561	0.12	0.09	5.50
PRV12	14,068,502	0.505	322.968	6109.141	0.050	6658	3964	1.261	0.751	1095.0	568.0	527	417.927	0.37	0.31	18.81
PRV13	3,518,607	0.126	80.776	6189.917	0.050	2752	1823	0.521	0.345	774.0	558.0	216	414.419	0.20	0.16	9.79
PRV14	30,070,544	1.079	690.325	6880.242	0.050	11978	8327	2.269	1.577	1720.0	515.0	1205	531.174	0.59	0.50	30.08
Total Check	299,703,333	10.750														

Lag Equations from SD County Manual

Corps T₁ = 24n((L x L_c)/(s^{0.5}))^m

NRCS T₁ = T_p-0.5D

T_p=0.862*Corps T₁

HEC-HMS Routing Input-Proposed Conditions

Subarea	Reach	U/S Node	D/S Node	Length (ft)	U/S Elev (ft)	D/S Elev (ft)	Slope (ft/ft)	Slope (ft/mi)	"n" value	Channel Type	Dimensions
PRV01	R001	J001	J003	2189	868.0	818.0	0.02284	120.60302	0.05	Trap	50' (W), 3H:1V
PRV03	R002	J002	J003	2563	885.0	818.0	0.02614	138.02575	0.05	Trap	30' (W), 3H:1V
PRV04	R003	J003	J004	8454	818.0	615.0	0.02401	126.78495	0.018	Trap	30' (W), 3H:1V
PRV06c	R004	PRV06a	J006	3280	760.0	655.0	0.03201	169.02439	0.05	Trap	40' (W), 3H:1V
PRV07	R005	J004	J005	2399	615.0	587.0	0.01167	61.62568	0.05	Trap	50' (W), 8H:1V
PRV12	R006	J005	J007	2125	587.0	568.0	0.00894	47.20941	0.05	Trap	50' (W), 8H:1V
PRV13	R007	J007	J008	1429	568.0	558.0	0.00700	36.94892	0.05	Trap	20' (W), 3H:1V
PRV14	R009	J008	J009	4448	558.0	515.0	0.00967	51.04317	0.05	Trap	20' (W), 3H:1V

OTAY RANCH VILLAGE 14

HEC HMS HYETOGRAPH CALCULATIONS

SD COUNTY HYETOGRAPH CALCULATIONS

Area	(sq ft)	(sq mi)	(ac)
PRV01	41633811	1.49	955.78
PRV02	45623821	1.64	1047.38
PRV03	33638681	1.21	772.24
PRV04	26041858	0.93	597.84
PRV06a	11503021	0.41	264.07
PRV06b	2703438	0.10	62.06
PRV06c	6688981	0.24	153.56
PRV07	18052194	0.65	414.42
PRV08	35923546	1.29	824.69
PRV09	9484809	0.34	217.74
PRV10	13728283	0.49	315.16
PRV11	7023237	0.25	161.23
PRV12	14068502	0.50	322.97
PRV13	3518607	0.13	80.78
PRV14	30070544	1.08	690.32

Total 299703333 10.75 6880.24

Watershed area Rainfall Depth-Area Adjustment Data Points

Watershed area (sq mi)	30	60	180	360	1440
10	0.9	0.947	0.97	0.98	0.985 Taken from Table 4-1
10.75	0.895	0.943	0.969	0.979	0.984 Interpolated
20	0.834	0.9	0.952	0.963	0.975 Taken from Table 4-1

P(6)= 3.1 in

CALCULATED RAINFALL SORTED IN (2/3,1/3) DISTRIBUTION

RAINFALL DISTRIBUTION SORTED IN ORDER OF INCREASING DURATION

Duration (min)	Rainfall Precipitation for Duration (in)	Depth Area Adjustment for Duration	Depth-Area Adjusted Precipitation (in)	Hyetograph Ordinate (in)	Sorted Hyetograph Ordinate (in)
5	0.681	0.895	0.609	0.609	1
10	0.871	0.895	0.779	0.170	2
15	1.005	0.895	0.900	0.121	3
20	1.113	0.895	0.997	0.097	4
25	1.205	0.895	1.079	0.082	5
30	1.286	0.895	1.151	0.072	6
35	1.358	0.903	1.227	0.076	7
40	1.424	0.911	1.298	0.071	8
45	1.485	0.919	1.365	0.067	9
50	1.541	0.927	1.429	0.064	10
55	1.594	0.935	1.491	0.062	11
60	1.644	0.943	1.552	0.060	12
65	1.692	0.945	1.598	0.046	13
70	1.737	0.946	1.642	0.044	14
75	1.780	0.947	1.685	0.043	15
80	1.821	0.948	1.726	0.041	16
85	1.861	0.949	1.765	0.040	17
90	1.899	0.950	1.804	0.038	18
95	1.936	0.951	1.841	0.037	19
100	1.971	0.952	1.877	0.036	20
105	2.006	0.953	1.911	0.035	21
110	2.039	0.954	1.945	0.034	22
115	2.072	0.955	1.979	0.033	23
120	2.103	0.956	2.011	0.032	24
125	2.134	0.957	2.042	0.032	25
130	2.164	0.958	2.073	0.031	26
135	2.193	0.959	2.104	0.030	27
140	2.222	0.960	2.133	0.030	28
145	2.249	0.961	2.162	0.029	29
150	2.277	0.962	2.191	0.029	30
155	2.303	0.963	2.219	0.028	31
160	2.329	0.964	2.247	0.028	32

OTAY RANCH VILLAGE 14
HEC HMS HYETOGRAPH CALCULATIONS

165	2.355	0.966	2.274	0.027	33	0.011
170	2.380	0.967	2.300	0.027	34	0.011
175	2.405	0.968	2.327	0.026	35	0.011
180	2.429	0.969	2.353	0.026	36	0.012
185	2.453	0.969	2.376	0.024	37	0.012
190	2.476	0.969	2.400	0.023	38	0.012
195	2.499	0.969	2.423	0.023	39	0.012
200	2.521	0.970	2.445	0.023	40	0.012
205	2.544	0.970	2.467	0.022	41	0.012
210	2.565	0.970	2.489	0.022	42	0.012
215	2.587	0.971	2.511	0.022	43	0.012
220	2.608	0.971	2.532	0.021	44	0.012
225	2.629	0.971	2.553	0.021	45	0.012
230	2.650	0.971	2.574	0.021	46	0.012
235	2.670	0.972	2.595	0.020	47	0.012
240	2.690	0.972	2.615	0.020	48	0.012
245	2.710	0.972	2.635	0.020	49	0.012
250	2.729	0.973	2.654	0.020	50	0.012
255	2.749	0.973	2.674	0.019	51	0.012
260	2.768	0.973	2.693	0.019	52	0.012
265	2.786	0.973	2.712	0.019	53	0.012
270	2.805	0.974	2.731	0.019	54	0.012
275	2.823	0.974	2.750	0.019	55	0.012
280	2.841	0.974	2.768	0.018	56	0.012
285	2.859	0.975	2.786	0.018	57	0.012
290	2.877	0.975	2.804	0.018	58	0.012
295	2.894	0.975	2.822	0.018	59	0.012
300	2.912	0.975	2.840	0.018	60	0.012
305	2.929	0.976	2.858	0.018	61	0.013
310	2.946	0.976	2.875	0.017	62	0.013
315	2.963	0.976	2.892	0.017	63	0.013
320	2.979	0.976	2.909	0.017	64	0.013
325	2.996	0.977	2.926	0.017	65	0.013
330	3.012	0.977	2.943	0.017	66	0.013
335	3.028	0.977	2.959	0.017	67	0.013
340	3.044	0.978	2.976	0.016	68	0.013
345	3.060	0.978	2.992	0.016	69	0.013
350	3.076	0.978	3.008	0.016	70	0.013
355	3.091	0.978	3.024	0.016	71	0.013
360	3.106	0.979	3.040	0.016	72	0.013
365	3.021	0.979	2.957	0.018	73	0.013
370	3.041	0.979	2.977	0.020	74	0.013
375	3.062	0.979	2.997	0.020	75	0.013
380	3.082	0.979	3.017	0.020	76	0.013
385	3.102	0.979	3.037	0.020	77	0.013
390	3.122	0.979	3.057	0.020	78	0.013
395	3.142	0.979	3.076	0.020	79	0.013
400	3.162	0.979	3.096	0.019	80	0.014
405	3.182	0.979	3.115	0.019	81	0.014
410	3.202	0.979	3.134	0.019	82	0.014
415	3.221	0.979	3.153	0.019	83	0.014
420	3.240	0.979	3.172	0.019	84	0.014
425	3.260	0.979	3.191	0.019	85	0.014
430	3.279	0.979	3.210	0.019	86	0.014
435	3.298	0.979	3.229	0.019	87	0.014
440	3.317	0.979	3.247	0.019	88	0.014
445	3.335	0.979	3.266	0.018	89	0.014
450	3.354	0.979	3.284	0.018	90	0.014
455	3.373	0.979	3.303	0.018	91	0.014
460	3.391	0.979	3.321	0.018	92	0.014
465	3.410	0.979	3.339	0.018	93	0.014
470	3.428	0.979	3.357	0.018	94	0.014
475	3.446	0.979	3.375	0.018	95	0.014
480	3.464	0.979	3.393	0.018	96	0.015
485	3.482	0.979	3.410	0.018	97	0.015
490	3.500	0.979	3.428	0.018	98	0.015

OTAY RANCH VILLAGE 14
HEC HMS HYETOGRAPH CALCULATIONS

495	3.518	0.979	3.445	0.018	99	0.015
500	3.536	0.979	3.463	0.017	100	0.015
505	3.553	0.979	3.480	0.017	101	0.015
510	3.571	0.979	3.497	0.017	102	0.015
515	3.588	0.980	3.515	0.017	103	0.015
520	3.606	0.980	3.532	0.017	104	0.015
525	3.623	0.980	3.549	0.017	105	0.015
530	3.640	0.980	3.566	0.017	106	0.015
535	3.657	0.980	3.583	0.017	107	0.015
540	3.674	0.980	3.599	0.017	108	0.016
545	3.691	0.980	3.616	0.017	109	0.016
550	3.708	0.980	3.633	0.017	110	0.016
555	3.725	0.980	3.649	0.017	111	0.016
560	3.742	0.980	3.666	0.016	112	0.016
565	3.758	0.980	3.682	0.016	113	0.016
570	3.775	0.980	3.699	0.016	114	0.016
575	3.791	0.980	3.715	0.016	115	0.016
580	3.808	0.980	3.731	0.016	116	0.016
585	3.824	0.980	3.747	0.016	117	0.016
590	3.841	0.980	3.763	0.016	118	0.017
595	3.857	0.980	3.779	0.016	119	0.017
600	3.873	0.980	3.795	0.016	120	0.017
605	3.889	0.980	3.811	0.016	121	0.017
610	3.905	0.980	3.827	0.016	122	0.017
615	3.921	0.980	3.843	0.016	123	0.017
620	3.937	0.980	3.858	0.016	124	0.017
625	3.953	0.980	3.874	0.016	125	0.017
630	3.969	0.980	3.890	0.016	126	0.018
635	3.984	0.980	3.905	0.016	127	0.018
640	4.000	0.980	3.921	0.015	128	0.018
645	4.016	0.980	3.936	0.015	129	0.018
650	4.031	0.980	3.951	0.015	130	0.018
655	4.047	0.980	3.967	0.015	131	0.018
660	4.062	0.980	3.982	0.015	132	0.018
665	4.077	0.980	3.997	0.015	133	0.018
670	4.093	0.980	4.012	0.015	134	0.019
675	4.108	0.980	4.027	0.015	135	0.019
680	4.123	0.980	4.042	0.015	136	0.019
685	4.138	0.980	4.057	0.015	137	0.019
690	4.153	0.980	4.072	0.015	138	0.019
695	4.168	0.980	4.087	0.015	139	0.019
700	4.183	0.980	4.102	0.015	140	0.020
705	4.198	0.980	4.116	0.015	141	0.020
710	4.213	0.981	4.131	0.015	142	0.020
715	4.228	0.981	4.146	0.015	143	0.020
720	4.243	0.981	4.160	0.015	144	0.016
725	4.257	0.981	4.175	0.015	145	0.016
730	4.272	0.981	4.189	0.014	146	0.016
735	4.287	0.981	4.204	0.014	147	0.016
740	4.301	0.981	4.218	0.014	148	0.017
745	4.316	0.981	4.232	0.014	149	0.017
750	4.330	0.981	4.247	0.014	150	0.017
755	4.345	0.981	4.261	0.014	151	0.017
760	4.359	0.981	4.275	0.014	152	0.018
765	4.373	0.981	4.289	0.014	153	0.018
770	4.387	0.981	4.303	0.014	154	0.018
775	4.402	0.981	4.317	0.014	155	0.018
780	4.416	0.981	4.331	0.014	156	0.019
785	4.430	0.981	4.345	0.014	157	0.019
790	4.444	0.981	4.359	0.014	158	0.019
795	4.458	0.981	4.373	0.014	159	0.020
800	4.472	0.981	4.387	0.014	160	0.020
805	4.486	0.981	4.401	0.014	161	0.020
810	4.500	0.981	4.415	0.014	162	0.021
815	4.514	0.981	4.428	0.014	163	0.021
820	4.528	0.981	4.442	0.014	164	0.022

OTAY RANCH VILLAGE 14
HEC HMS HYETOGRAPH CALCULATIONS

825	4.541	0.981	4.456	0.014	165	0.022
830	4.555	0.981	4.469	0.014	166	0.023
835	4.569	0.981	4.483	0.014	167	0.023
840	4.583	0.981	4.496	0.014	168	0.026
845	4.596	0.981	4.510	0.013	169	0.026
850	4.610	0.981	4.523	0.013	170	0.027
855	4.623	0.981	4.537	0.013	171	0.028
860	4.637	0.981	4.550	0.013	172	0.029
865	4.650	0.981	4.563	0.013	173	0.029
870	4.664	0.981	4.577	0.013	174	0.030
875	4.677	0.981	4.590	0.013	175	0.031
880	4.690	0.981	4.603	0.013	176	0.032
885	4.704	0.981	4.616	0.013	177	0.033
890	4.717	0.981	4.629	0.013	178	0.035
895	4.730	0.981	4.643	0.013	179	0.036
900	4.743	0.981	4.656	0.013	180	0.038
905	4.757	0.982	4.669	0.013	181	0.040
910	4.770	0.982	4.682	0.013	182	0.043
915	4.783	0.982	4.695	0.013	183	0.044
920	4.796	0.982	4.708	0.013	184	0.060
925	4.809	0.982	4.720	0.013	185	0.062
930	4.822	0.982	4.733	0.013	186	0.067
935	4.835	0.982	4.746	0.013	187	0.071
940	4.848	0.982	4.759	0.013	188	0.072
945	4.861	0.982	4.772	0.013	189	0.082
950	4.873	0.982	4.784	0.013	190	0.121
955	4.886	0.982	4.797	0.013	191	0.170
960	4.899	0.982	4.810	0.013	192	0.609
965	4.912	0.982	4.822	0.013	193	0.097
970	4.924	0.982	4.835	0.013	194	0.076
975	4.937	0.982	4.848	0.013	195	0.064
980	4.950	0.982	4.860	0.013	196	0.046
985	4.962	0.982	4.873	0.013	197	0.041
990	4.975	0.982	4.885	0.012	198	0.037
995	4.987	0.982	4.898	0.012	199	0.034
1000	5.000	0.982	4.910	0.012	200	0.032
1005	5.012	0.982	4.922	0.012	201	0.030
1010	5.025	0.982	4.935	0.012	202	0.028
1015	5.037	0.982	4.947	0.012	203	0.027
1020	5.050	0.982	4.959	0.012	204	0.024
1025	5.062	0.982	4.972	0.012	205	0.023
1030	5.074	0.982	4.984	0.012	206	0.022
1035	5.087	0.982	4.996	0.012	207	0.021
1040	5.099	0.982	5.008	0.012	208	0.020
1045	5.111	0.982	5.020	0.012	209	0.019
1050	5.123	0.982	5.033	0.012	210	0.019
1055	5.136	0.982	5.045	0.012	211	0.018
1060	5.148	0.982	5.057	0.012	212	0.018
1065	5.160	0.982	5.069	0.012	213	0.017
1070	5.172	0.982	5.081	0.012	214	0.017
1075	5.184	0.982	5.093	0.012	215	0.016
1080	5.196	0.982	5.105	0.012	216	0.018
1085	5.208	0.982	5.117	0.012	217	0.020
1090	5.220	0.982	5.129	0.012	218	0.020
1095	5.232	0.982	5.140	0.012	219	0.019
1100	5.244	0.983	5.152	0.012	220	0.019
1105	5.256	0.983	5.164	0.012	221	0.019
1110	5.268	0.983	5.176	0.012	222	0.018
1115	5.280	0.983	5.188	0.012	223	0.018
1120	5.292	0.983	5.199	0.012	224	0.018
1125	5.303	0.983	5.211	0.012	225	0.017
1130	5.315	0.983	5.223	0.012	226	0.017
1135	5.327	0.983	5.235	0.012	227	0.017
1140	5.339	0.983	5.246	0.012	228	0.017
1145	5.350	0.983	5.258	0.012	229	0.016
1150	5.362	0.983	5.269	0.012	230	0.016

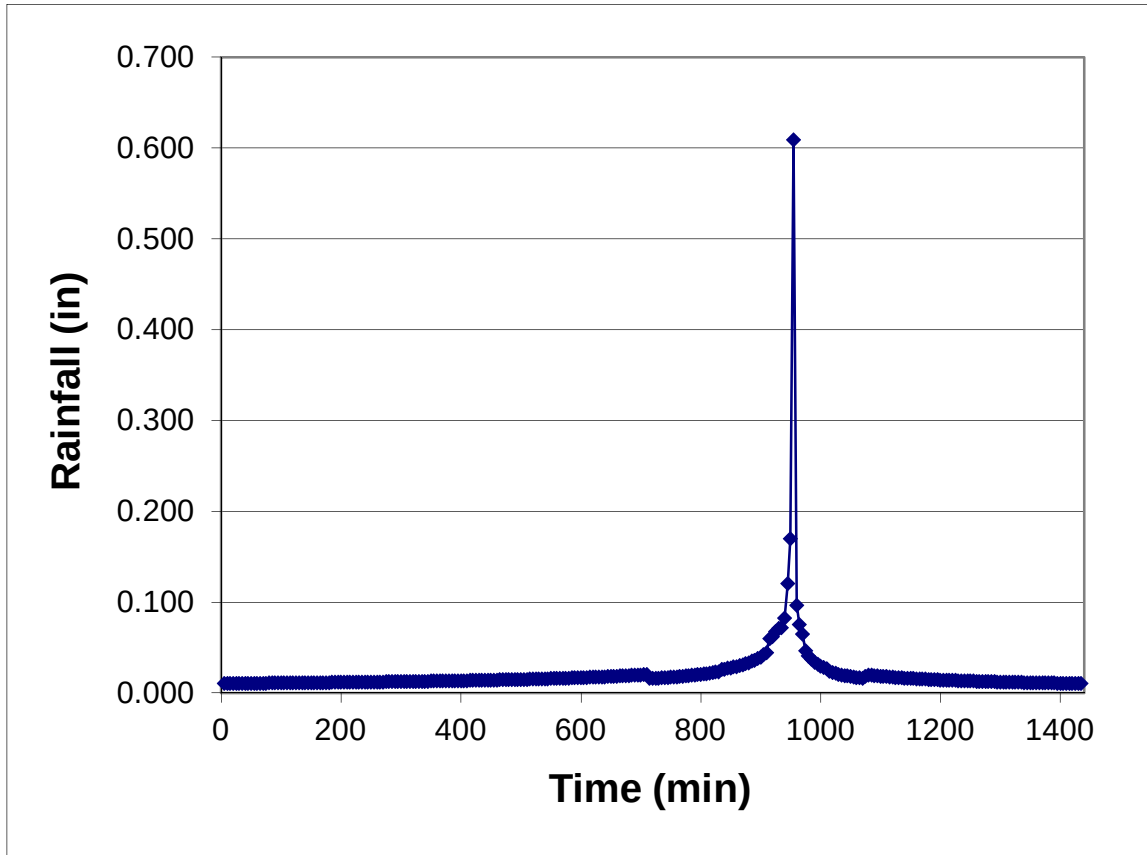
OTAY RANCH VILLAGE 14
HEC HMS HYETOGRAPH CALCULATIONS

1155	5.374	0.983	5.281	0.012	231	0.016
1160	5.385	0.983	5.293	0.012	232	0.016
1165	5.397	0.983	5.304	0.012	233	0.016
1170	5.408	0.983	5.316	0.012	234	0.016
1175	5.420	0.983	5.327	0.011	235	0.015
1180	5.431	0.983	5.339	0.011	236	0.015
1185	5.443	0.983	5.350	0.011	237	0.015
1190	5.454	0.983	5.361	0.011	238	0.015
1195	5.466	0.983	5.373	0.011	239	0.015
1200	5.477	0.983	5.384	0.011	240	0.015
1205	5.489	0.983	5.396	0.011	241	0.014
1210	5.500	0.983	5.407	0.011	242	0.014
1215	5.511	0.983	5.418	0.011	243	0.014
1220	5.523	0.983	5.429	0.011	244	0.014
1225	5.534	0.983	5.441	0.011	245	0.014
1230	5.545	0.983	5.452	0.011	246	0.014
1235	5.557	0.983	5.463	0.011	247	0.014
1240	5.568	0.983	5.474	0.011	248	0.013
1245	5.579	0.983	5.486	0.011	249	0.013
1250	5.590	0.983	5.497	0.011	250	0.013
1255	5.601	0.983	5.508	0.011	251	0.013
1260	5.612	0.983	5.519	0.011	252	0.013
1265	5.624	0.983	5.530	0.011	253	0.013
1270	5.635	0.983	5.541	0.011	254	0.013
1275	5.646	0.983	5.552	0.011	255	0.013
1280	5.657	0.983	5.563	0.011	256	0.013
1285	5.668	0.983	5.574	0.011	257	0.013
1290	5.679	0.983	5.585	0.011	258	0.012
1295	5.690	0.984	5.596	0.011	259	0.012
1300	5.701	0.984	5.607	0.011	260	0.012
1305	5.712	0.984	5.618	0.011	261	0.012
1310	5.723	0.984	5.629	0.011	262	0.012
1315	5.734	0.984	5.640	0.011	263	0.012
1320	5.745	0.984	5.651	0.011	264	0.012
1325	5.755	0.984	5.661	0.011	265	0.012
1330	5.766	0.984	5.672	0.011	266	0.012
1335	5.777	0.984	5.683	0.011	267	0.012
1340	5.788	0.984	5.694	0.011	268	0.012
1345	5.799	0.984	5.705	0.011	269	0.012
1350	5.809	0.984	5.715	0.011	270	0.011
1355	5.820	0.984	5.726	0.011	271	0.011
1360	5.831	0.984	5.737	0.011	272	0.011
1365	5.842	0.984	5.747	0.011	273	0.011
1370	5.852	0.984	5.758	0.011	274	0.011
1375	5.863	0.984	5.769	0.011	275	0.011
1380	5.874	0.984	5.779	0.011	276	0.011
1385	5.884	0.984	5.790	0.011	277	0.011
1390	5.895	0.984	5.801	0.011	278	0.011
1395	5.906	0.984	5.811	0.011	279	0.011
1400	5.916	0.984	5.822	0.011	280	0.011
1405	5.927	0.984	5.832	0.011	281	0.011
1410	5.937	0.984	5.843	0.011	282	0.011
1415	5.948	0.984	5.853	0.011	283	0.011
1420	5.958	0.984	5.864	0.010	284	0.011
1425	5.969	0.984	5.874	0.010	285	0.011
1430	5.979	0.984	5.885	0.010	286	0.011
1435	5.990	0.984	5.895	0.010	287	0.010
1440	6.000	0.984	5.905	0.010	288	0.010

OTAY RANCH VILLAGE 14

HEC HMS HYETOGRAPH CALCULATIONS

CALCULATED RAINFALL SORTED IN (2/3,1/3) DISTRIBUTION



CHAPTER 4

4.2 – Proposed Condition Hydrology Map (HEC HMS)