PLACER VINEYARDS

PLACER COUNTY, CA

MASTER PROJECT DRAINAGE STUDY

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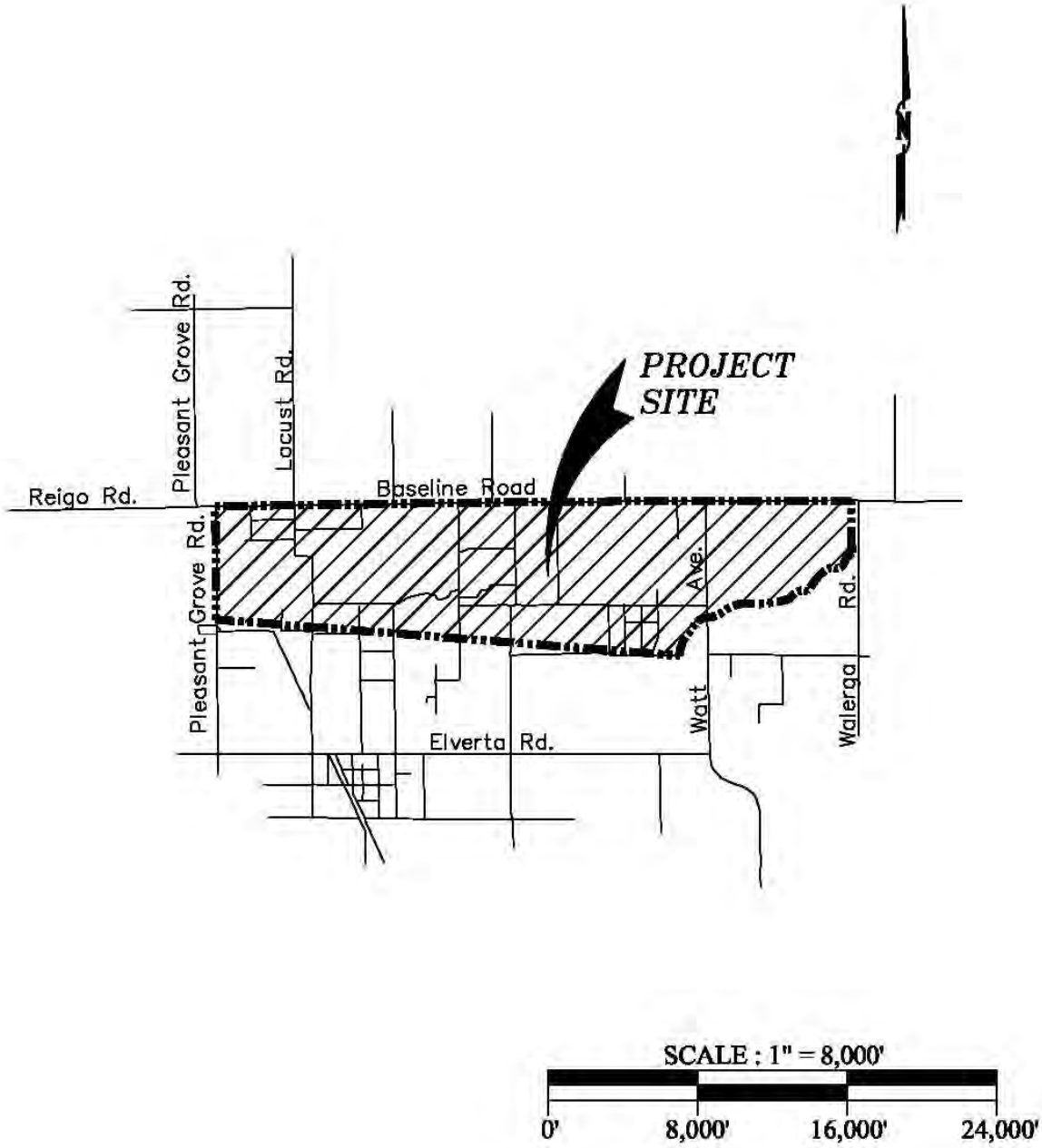
FIGURE I.1 - LOCATION MAP



I. Introduction:

The proposed Placer Vineyards development includes roughly 5200 acres of proposed mixed use development. The project development would include mixed zoning for residential, commercial, business professional, light industrial, commercial, schools, parks and open space. The project is located in the extreme western portion of Placer County near the Sutter County border and adjacent to Sacramento County along the southern project boundary.

Similar but smaller developments are occurring adjacent to the eastern project boundary with the Morgan Creek and Doyle Ranch subdivisions. The project is tributary to three (3) regional watersheds. The southeastern area of the project drains directly to the Dry Creek floodplain which bounds the project at this location. The northeast area of the project drains to Curry Creek which is ultimately tributary to the Natomas Cross Canal north of the project. The remainder of the project drains through tributaries of the Steelhead Creek, formerly known(and referenced in the calculations and in this study) as the Natomas East Main Drainage Canal (NEMDC) which flows north to south, west of the project conveying flows to the American River.

Mitigation of impacts to peak flow rates, resulting from the additional impervious surfaces and proposed drainage systems, would be provided within the project by providing additional attenuation at the following facilities : existing floodplain, flood control channels, upstream of proposed culvert facilities, detention basins and water quality treatment basins.

The hydrology analysis included with this project provides analysis of 13.2 square miles of tributary area of the previously mentioned watershed areas surrounding the project. A detailed hydraulic analysis of the onsite creeks, swales and channels was performed for the pre-project and post-project conditions for this project. Floodplains are delineated on the included exhibits. In November of 2013, the hydrology analysis was updated. For Dry Creek, the hydrology analysis was updated to use the base analysis data provided with the "Update to the Dry Creek Watershed Plan" (2010) provided by the Placer County Flood Control and Water Conservation District. The hydrology basis for the Curry Creek areas was also updated to be consistent with the studies performed with the 2011 FEMA CTP MAS #1, which created new FEMA basis studies for Curry Creek.

All calculations and analysis included in this study were prepared in accordance with the "Preliminary Plan" requirements of the *"Stormwater Management Manual (SWMM)"* dated September 1, 1990 and the SWMM Addendum 1, dated October 1997. HEC-1 files were generated using the Placer County Pre-processor utility and the PDP precipitation generation software. November 2013 updates, used PDP version 2 which corrects some of the raingall distribution amounts (identified in the Dry Creek Watershed Pan Update) and adds flexibility in process control.

This study was revised in August of 2005 for an updated Land Use Plan developed by EDAW in June of 2005. Additionally, the system of flood control facilities were revised to preserve "avoidance" areas, where sensitive facilities exist pre-project, such as wetlands, or critical habitat. In addition to avoiding impact to these facilities from the construction of the flood

control facilities directly, the revised plan includes provisions to maintain the hydrology of these features, by preserving the mean annual and peak annual flow rates through them.

In January of 2006, this study was revised again in response to comments from the County, and a consistency review performed by WRIME. More onsite attenuation was added to the project to mitigate offsite impacts in peak flow rates and water surface elevations. Also, the Steelhead Creek impacts analysis was also incorporated into the plan.

In August of 2006, this study was revised in response to comments from Sacramento County Department of Water Resources. The comments from Sacramento County requested that the project watershed delineations for the Placer Vineyards project offsite, match the Elverta Specific Plan, and that the Elverta Specific Plan offsite sheds match the Placer Vineyards Project areas. We obtained digital shed maps and topographic maps for the Elverta Plan area, and modified the Placer Vineyards Hydrology for the corrected offsite watershed delineations. The most significant change occurs at the EMGS24B shed area which was found to be tributary to Dry Creek via the Gibson Park Lake. The changes also affect the analysis of Steelhead Creek Flood elevations and flowrates. The changes of this revision did not modify the relative impact of the project at Steelhead Creek and Curry Creek. The EMGS24B watershed change is modifies the Dry Creek hydrology and is discussed in the Dry Creek section of this document.

In November of 2013, this study was amended to include information that was requested by Placer County, and the Placer County Flood Control and Water Conservation District. Additional information was requested regarding the design and operation of several of the special flow separation structures identified in this study. In addition, it was requested that the report be ammended to include the necessary information for evaluation under post 2015 SB-5 and MS4 permit criteria. For SB-5, this means that the Urban Levee Design Criteria (ULDC) and the Urban Level of Flood Protection (ULOP) criteria needs to be evaluated for the project. For the MS4 permit (stormwater quality), a new MS4 permit was implemented in July of 2013 which phases in several new permit criteria, including mandatory Low Impact Development, and Hydrograph Modification criteria which goes into effect in July of 2015.

This Study was finalized in May of 2014 to include final analysis of the NEMDC impacts and recommended mitigation of 25 AF of retention storage for that impact.

II. Hydrology:

The Army Corps HEC-1 software was utilized to develop the included hydrologic models for the proposed Placer Vineyards project.

II.1 Standards:

The Placer County PDP software was utilized to determine precipitation rates for the design events 2-year, 10-year, 100-year, 200-year and 500-year. Elevation data for each watershed centroid was input into the "DAT" file. The ".DAT file was fed into the PDP2 program to generate the HEC-1 input (.in) file for each event. Storm centering was not utilized in this analysis.

II.2 Soils:

Figure IIA2 shows the hydrologic soils delineation for the project watershed areas. The soil type delineation was obtained from the "Soil Survey of Placer County, California Western Part". The delineation is shown on the attached shed maps.

The analysis included with this study shows that three hydrologic soil types exist within the limits of the project boundary. Soils are classified into four hydrologic Categories:

GROUP A : Consist of soils that have a high infiltration rate when thoroughly wet. These soils have a high rate of water transmission and low runoff potential. They area deep, well drained or excessively drained, and consist chiefly of sand, gravel, or both. No soils in this project are in Group A.

GROUP B : Consist of soils having a moderate infiltration rate when thoroughly wet. These soils have a moderate runoff potential. They are moderately deep, well drained, and area medium in texture to moderately course in texture.

GROUP C : Consist of soils having a slow infiltration rate when thoroughly wet. These soils have a slow rate of water transmission and high runoff potential. The have soil layers which impede downward movement of water and have a slow infiltration rate.

GROUP D : Consist of soils having a slow infiltration rate when thoroughly wet. The rate of water transmission is very slow, and runoff potential is very high. This group includes:

a. clay soils that have high shrink-swell potential
b. soils that have a permanent high water table
c. soils that have a clay pan or clay layer at or near the surface and
d. soils that are shallow over nearly impervious material

The constant soil infiltration rates listed on the following table, by land use are

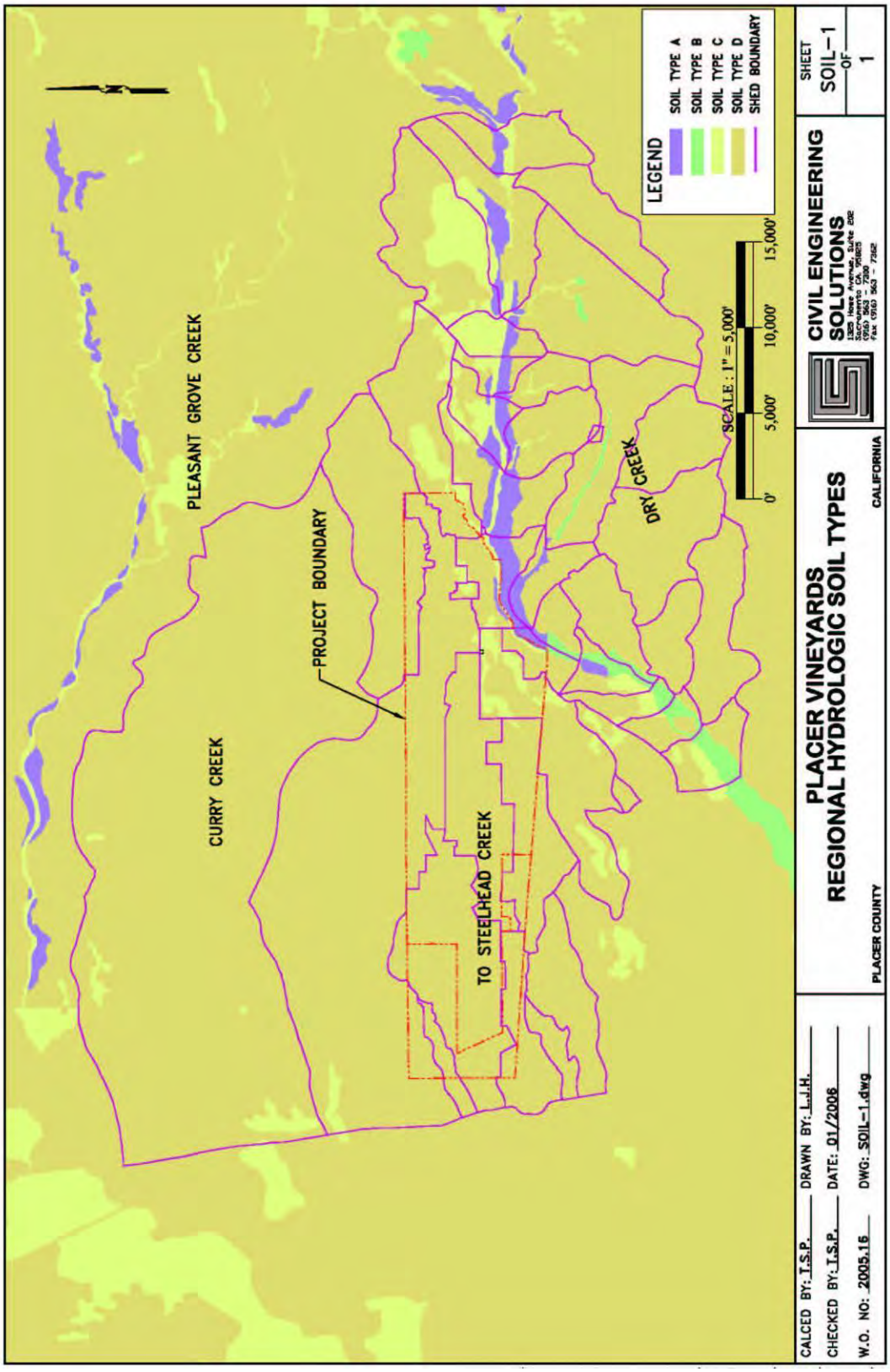
from TABLE 5-3 of the Placer County Stormwater Management Manual dated September 1, 1990.

TABLE IIA2 - Hydrologic Soil Parameters:

Hydrologic Soil Type	Land Use Type	Constant Infiltration Rate
D	Open Space/Natural	.07
D	Paved or Impervious Areas	.02
D	Landscaping	.12
C	Open Space/Natural	.09
C	Paved or Impervious Areas	.03
C	Landscaping	.16
B	Open Space/Natural	.16
B	Paved or Impervious Areas	.06
B	Landscaping	.25

Hydrologic Soil Group "A" soils were analyzed with the same parameters as Group "B" soils in this report. Group "A" soils can have a large infiltration rate, but during the peak events they can become saturated and loose their infiltration capacity such that those rates may not be applicable, and it is more conservative to use the Group "B" rates. Also, if these soils are disturbed, mixed or compacted in any way they will not retain their permeability at the published levels.

FIGURE IIA2 – WATERSHED SOILS DELINEATIONS



II.3 Land Use:

Civil Solutions was provided with a proposed land use map for the project areas. The post-project land uses are shown on exhibit SH-2. The shed areas in the HEC-1 file were subdivided into a sufficient number of sub-sheds such that each amount of soil type and land use could be specified independently. The individual factors are presented in Tables IIA1-3 and IIB1-3 of this report.

Updated Land Use was provided in July 2013 for the purposes of this ammendment. The main changes of this updated land use map designated previously identified development areas as open space per changes made while the project was being reviewed for regulatory permitting. The updated land use is represented in the figures included with this amended version of the report.

II.4 Other Factors:

Precipitation rates for the 100-foot elevation were utilized throughout this analysis.

For the Natomas East Main Drainage Canal (NEMDC – also known as Steelhead Creek) and Curry Creek, storm centering was not utilized in this analysis. While an overall study area of 13.2 square miles does generally require the use of Storm Centering analysis, the individual tributaries studied in this analysis were not of sufficient size to their exit points from the project that Storm Centering would have any effect. Storm Centering was used in the evaluations of Dry Creek and Dry Creek tributaries.

Overland flow Manning's 'n' values were estimated using Table 5-5 of the SWMM and range from 0.11 for roadways and pavement areas to 0.4 to 0.6 for open space and wooded areas. A value of 0.24 was utilized for future landscaped areas including single family residences. In general the included models were developed with a pervious areas shed element and a directly connected impervious areas shed element.

II.5 Watershed Delineation:

The lands of the proposed project are divided between three major watersheds: Dry Creek, Curry Creek and Steelhead Creek (NEMDC). For the post-project analysis, watershed boundaries were adjusted to conform to the estimated development requirements. Total tributary to each watershed closely matches the pre-project parameters but minor adjustments were made for the above mentioned purpose. In addition, some minor areas of the watersheds were diverted to pass through project detention facilities rather than release un-detained flows into an existing tributary.

For the pre-project analysis. the project site area was divided into watersheds utilizing the project topography maps (1 and 2 foot contours), which we supplemented with USGS topography maps and CVFED Task Order 13 LiDAR information for areas beyond the project boundary. Flow paths through and off the site for both the pre-project and post project conditions were identified (see shed maps SH-1 and SH-2). Existing drainage

paths and culverts were identified using the topographic information and field survey information. For the post project condition, the sub-watersheds were further subdivided to account for the proposed site alterations including: changes in infiltration rate due to grading, changes in impermeability due to roofs and paving, and changes in sub-watershed boundary locations due to the proposed piping and grading.

In November of 2013. the project analysis was updated to be consistent with Dry Creek Watershed Plan Update (PCFCWCD) and the FEMA Placer Streams CTP study for Curry Creek (PCFCWCD). The Dry Creek portion of the study also utilizes HEC-1 and HEC-HMS to generate DSS files for the inflow hydrographs used in the Dry Creek HEC-RAS Hydraulic Routing Model. The Dry Creek Desktop software toolbox is used to convert HEC-1 input with an ELTROID.DAT file to an HEC-HMS file structure for the final hydrology computations.

II.A Pre-Project Model:

II.A.1 Site Area Model

A site specific model has been created. The model includes only drainage areas of the project and in the local area of the project. All three required model types (pre-project, post-project unmitigated and post-project mitigated) were developed. This model was used for computing required detention basin volumes and impacts at the project boundary. The HEC-1 and HEC-HMS files for these models are included on the CDROM provided with this document within the “HEC-1" directory. (Due to the size, the Dry Creek files are provided separately requiring several DVD’s to deliver)

The Pre-project watershed factors were applied in the HEC-1 analysis as summarized in TABLE IIA1 through TABLE IIA3.

TABLE IIA1 - Pre-Project Hydrologic Factors

			Non Improved Plane							Improved Plane						
		SHED	Initial	Constant		Overland			% of	Initial	Constant		Overland			% of
SHED	DESCRIPTION	AREA (mi^2)	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed
DRY CREEK WATERSHED (ONLY PROJECT SHEDS NEAR PROJECT ARE INCLUDED HERE)																
DC65B	DC65B 21.0 ac	0.0341	0.1	0.12	43.94	121	0.01	0.24	100							
DC65J	DC65J 48.9 ac	0.0765	0.1	0.12	17.25	200	0.0089	0.24	100							
DC65C	DC65C 87.5 ac	0.1367	0.1	0.0718	2.11	600	0.001	0.4	10	0.1	0.12	41.91	127	0.01	0.24	90
DC65D	DC65D 5.6 ac	0.0088	0.1	0.12	61.53	89	0.0122	0.24	100							
DC65E	DC65E 11.2 ac	0.0175	0.1	0.1252	18.99	202	0.0091	0.24	100							
DC65A	DC65A 259.0 ac	0.4046	0.1	0.0799	2	660	0.001	0.4	3	0.1	0.128	15.34	220	0.0087	0.24	97
DC65F	DC65F 82.9 ac	0.1296	0.1	0.1283	15	220	0.0087	0.24	100							
DC65G	DC65G 9.9 ac	0.0154	0.1	0.07	2	600	0.001	0.4	71	0.1	0.12	54.47	96	0.0108	0.24	29
DC65H	DC65H 42.6 ac	0.0665	0.1	0.0753	2	418	0.001	0.4	11	0.1	0.141	18.65	202	0.0091	0.24	89
DC65K	DC65K 154.0 ac	0.2407	0.1	0.0776	2	362	0.001	0.4	65	0.1	0.1332	16.52	214	0.0088	0.24	35
DC65I	DC65I 86.1 ac	0.1345	0.1	0.0797	2	350	0.001	0.4	59	0.1	0.1386	15	220	0.0087	0.24	41
DC75A	DC75A 261.9 ac	0.4093	0.1	0.1335	2.04	861	0.001	0.4	100							
DC68A	DC68A 555.0 ac	0.8673	0.1	0.07	2.17	423	0.001	0.4	12	0.1	0.1249	41	127	0.01	0.24	88
DC68B	DC68B 351.1 ac	0.5486	0.1	0.0982	2	370	0.001	0.4	17	0.1	0.1314	41.2	127	0.01	0.24	83
DC70A	DC70A 190.6 ac	0.2978	0.1	0.124	2	243	0.001	0.4	52	0.1	0.12	39.93	132	0.01	0.24	48
DC75B	DC75B 73.0 ac	0.1141	0.1	0.1062	2	582	0.001	0.4	88	0.1	0.12	35	140	0.01	0.24	12
DC75C	DC75C 179.1 ac	0.2798	0.1	0.1549	2.15	434	0.001	0.4	100							
DC76A	DC76A 244.7 ac	0.3823	0.1	0.1209	2	658	0.001	0.4	100							
DC70B	DC70B 42.8 ac	0.0669	0.1	0.1448	2	433	0.001	0.4	100							
DC71A	DC71A 99.3 ac	0.1552	0.1	0.07	2	365	0.001	0.4	30	0.1	0.12	39.97	132	0.01	0.24	70
DC71B	DC71B 74.1 ac	0.1159	0.1	0.1225	2.65	365	0.001	0.4	76	0.1	0.2028	56.72	92	0.0116	0.24	24
EMGS27	EMGS27 (20.392 AC undeveloped)	0.03186	0.1	0.08	2	385	0.001	0.4	100							
EMGS29	EMGS29 (33.524 AC undeveloped)	0.03186	0.1	0.08	2	385	0.001	0.4	100							
EMGS26	EMGS26 (34.008 AC undeveloped)	0.05314	0.1	0.08	2	385	0.001	0.4	100							
EMGS25	EMGS25 (18.11 AC undeveloped)	0.0283	0.1	0.08	2	385	0.001	0.4	100							
MGS24A	EMGS24A (36.69 AC undeveloped)	0.05733	0.1	0.08	2	385	0.001	0.4	100							
MGS26A	EMGS26A (18.55 AC undeveloped)	0.02898	0.1	0.08	2	385	0.001	0.4	100							
MGS24B	EMGS24B (35.863 AC undeveloped)	0.05604	0.1	0.08	2	385	0.001	0.4	100							
MGS28B	EMGS28B (17.734 AC undeveloped)	0.02771	0.1	0.08	2	385	0.001	0.4	100							
EMGS23	EMGS23 (31.619 AC undeveloped)	0.0494	0.1	0.08	2	385	0.001	0.4	100							
EMGS22	EMGS22 (60.58 AC undeveloped)	0.07903	0.1	0.08	2	385	0.001	0.4	100							
DC76B	DC76B 104.3 ac	0.16295	0.1	0.0708	2	450	0.001	0.4	100							
DC86	DC86 192.9 ac	0.3013	0.1	0.134	2.77	109	0.001	0.4	94	0.1	0.1207	40	130	0.01	0.24	6
DC90	DC90 445.5 ac	0.6962	0.1	0.0924	3.06	556	0.0023	0.4	28	0.1	0.1197	44.84	118	0.01	0.24	72
DC95A	DC95A 162.0 ac	0.2531	0.1	0.07	2	349	0.001	0.4	61	0.1	0.12	40.71	130	0.01	0.24	39
DC95B	DC95B 432.4 ac	0.6756	0.1	0.07	2	455	0.001	0.4	22	0.1	0.12	46.16	112	0.01	0.24	78
DC96C	DC96C 334.3 ac	0.5223	0.1	0.07	2	680	0.001	0.4	13	0.1	0.12	47.65	109	0.01	0.24	87
DC96A	DC96A 343.9 ac	0.5374	0.1	0.0707	2.04	440	0.001	0.4	13	0.1	0.12	42.94	124	0.01	0.24	87
DC96D	DC96D 253.3 ac	0.3957	0.1	0.0725	2.15	500	0.001	0.4	19	0.1	0.12	42.19	124	0.01	0.24	81
DC100A	DC100A 235.2 ac	0.3675	0.1	0.0753	2.83	442	0.001	0.4	42	0.1	0.1194	40.6	130	0.01	0.24	58
DC100B	DC100B 88.6 ac	0.1385	0.1	0.0867	2.92	459	0.001	0.4	96	0.1	0.106	51.22	99	0.0102	0.24	4
DC110	DC110 173.393 ac	0.27093	0.1	0.1721	4.31	547	0.0037	0.4	44	0.1	0.1212	40	130	0.01	0.24	56
DC105A	DC105A 116.2 ac	0.1815	0.1	0.07	2	415	0.001	0.4	2	0.1	0.12	42.63	124	0.01	0.24	98
DC105B	DC105B 118.2 ac	0.1847	0.1	0.07	4.46	437	0.0037	0.4	78	0.1	0.106	78.27	72	0.016	0.24	22
DC105C	DC105C 163.6 ac	0.287	0.1	0.071	4.04	222	0.0037	0.4	72	0.1	0.0963	58.95	92	0.0116	0.24	28
DC105E	DC105E 123.0 ac	0.1922	0.1	0.07	2.83	272	0.001	0.4	53	0.1	0.07	60	70	0.0167	0.24	47
DC105D	DC105D 63.7 ac	0.0995	0.1	0.0703	3.99	246	0.0023	0.4	97	0.1	0.07	80	70	0.0167	0.24	3
DC115	DC115 197.797 ac	0.30906	0.1	0.1342	4.09	853	0.0037	0.4	83	0.1	0.1201	40	130	0.01	0.24	17
CURRY CREEK WATERSHED																
CUS3A	AREA EAST OF FIDDYMENT ROAD ARE	0.43449	0.1	0.096	3.68	550	0.0023	0.4	8	0.1	0.12	47.28	109	0.01	0.24	92
CUS3B	CUS3 AREA (242.95) REVISED PER NE	0.3796	0.1	0.07	2	600	0.001	0.4	100							
CUS4	CSU4 AREA (39.39 AC) REVISED PER N	0.06155	0.1	0.07	2	600	0.001	0.4	100							
CUS5A	CUS5A 35.55 AC MAY 18-06	0.05555	0.1	0.07	2	600	0.001	0.4	100							
CUS5	CUS5 AREA (39.3AC) REVISED PER NE	0.0614	0.1	0.07	2	600	0.001	0.4	100							
CUS6	CUS6 107.95ac CUS6 AREA (107.8 AC) R	0.16867	0.1	0.07	2	600	0.001	0.4	100							
CUS6B	CUS6B 57.951ac	0.09055	0.1	0.07	2	600	0.001	0.4	100							
CUS11B	CUS11B 111.664 ac	0.17448	0.1	0.07	2	600	0.001	0.4	100							
CUS12A	CUS12A AREA (160.356 AC) REVISED P	0.25056	0.1	0.07	2	600	0.001	0.4	100							
CUS13A	CUS13A AREA (8.844 AC) REVISED PER	0.01382	0.1	0.07	2	600	0.001	0.4	100							
CUS14	CUS14 64.214 AC	0.10033	0.1	0.07	2	600	0.001	0.4	100							
CUS16B	CUS16B 13.158 AC	0.02056	0.1	0.07	2	600	0.001	0.4	100							
CUS15	CUS15 AREA =79.216 AC PER WATT AV	0.12378	0.1	0.07	2	600	0.001	0.4	100							
CUS15B	CUS15B AREA=52.313 AC PER WATT A	0.08174	0.1	0.07	2	600	0.001	0.4	100							
CUS17A	CUS17A 29.596 AC	0.04624	0.1	0.07	2	600	0.001	0.4	100							
CUS17B	CUS17B AREA (49.318 AC) REVISED PE	0.07706	0.1	0.07	2	600	0.001	0.4	100							
CUS17C	CUS17C AREA (69.026 AC) REVISED PE	0.10785	0.1	0.07	2	600	0.001	0.4	100							
CWP7	Curry Creek Basin CU2A (5-03)	0.0843	0.1	0.12	5	450	0.006	0.4	2	0.1	0.12	43.43	121	0.01	0.24	98
CU2A1A	SHED AREA=42.4 AC	0.0696	0.1	0.07	2	600	0.001	0.4	96	0.1	0.12	80	70	0.0167	0.24	4
CU2A1B	SHED AREA=51.6	0.0793	0.1	0.07	2	600	0.001	0.4	99	0.1	0.12	80	70	0.0167	0.24	1
CU2A1C	SHED AREA=46.0 AC	0.0709	0.1	0.07	2	600	0.001	0.4	98	0.1	0.12	77.66	73	0.0157	0.24	2
CWP8	Basin CU2A (5-03)	0.1068	0.1	0.1138	4.63	500	0.0037	0.4	7	0.1	0.12	42.78	124	0.01	0.24	93
CU2A9	PORTION OF SHED CU2A	0.1265	0.1	0.07	2	600	0.001	0.4	100							
CU2A8	PORTION OF SHED CU2A	0.0629	0.1	0.07	2	600	0.001	0.4	100							
CU2A3	PORTION OF SHED CU2A	0.2463	0.1	0.07	2	600	0.001	0.4	100							
CU2A7	PORTION OF SHED CU2A	0.1677	0.1	0.07	2	600	0.001	0.4	100							
CU2A4	AREA=47.861 AC PER WATT AVE	0.0756	0.1	0.07	2	600	0.001	0.4	100							
CU2A6C	AREA=7.464 AC PER WATT AVE	0.0116	0.1	0.07	2	600	0.001	0.4	100							
CU2A4B	AREA 26.094 AC WEST OF WATT AVE	0.0411	0.1	0.07	2	600	0.001	0.4	100							
CU2A5	AREA = 131.754 AC PER WATT AVE	0.2074	0.1	0.07	2	600	0.001	0.4	100							
CU2A5B	AREA = 8.664 AC PER WATT AVE	0.0137	0.1	0.07	2	600	0.001	0.4	100							
CU2A6B	AREA 3.383 AC PER WATT AVE	0.0054	0.1	0.07	2	600	0.001	0.4	100							
CU2A6	AREA =55.457 AC PER WATT AVE	0.0994	0.1	0.07	2	600	0.001	0.4	100							
CU2A1	AREA = 9.6 AC UP/S OF WATT	0.0151	0.1	0.07	2	600	0.001	0.4	100							
CU2A5C	AREA = 58.6 AC	0.0775	0.1	0.07	2	600	0.001	0.4	100							
CU2A2	AREA = 24.1 AC UP/S OF WATT	0.0379	0.1	0.07	2	600	0.001	0.4	100							
CU2A3A	AREA = 38.2 AC WEST OF WATT	0.0601	0.1	0.07	2	600	0.001	0.4	100							
CU2A	AREA = 485.3 AC NOV 29-06	0.7642	0.1	0.07	2	600	0.001	0.4	100							
CWP1	AREA REVISED 6-05	0.1436	0.1	0.1151	4.7	600	0.0037	0.4	12	0.1	0.12	54.15	96	0.0108	0.24	88
CWP2	AREA REVISED 6-05	0.1939	0.1	0.074	2.24	600	0.001	0.4	68	0.1	0.12	41.85	127	0.01	0.24	32
CWP4	Revise Date (5-03)	0.3583	0.1	0.0968	3.61	550	0.0023	0.4	12	0.1	0.1157	49.24	103	0.01	0.24	88
CWP3	AREA REVISED 6-05	0.3014	0.1	0.07	2	600	0.001	0.4	36	0.1	0.0989	64.56	86	0.0128	0.24	64
CWP6	Revise Date (5-03) (194.5 ac)	0.3008	0.1	0.0813	2.68	600	0.001	0.4	43	0.1	0.12	40.01	130	0.01	0.24	57
CWP9	AREA REVISED 6-05 area revised to 191	0.3188	0.1	0.12	80	71	0.0163	0.24	100							
CWP13	AEEA REVISED 6-05	0.0942	0.1	0.096	3.68	550	0.0023	0.4	25	0.1	0.12	44.24	118	0.01	0.24	75
CWP14	AERA REVISED 6-05	0.1558	0.1	0.07	2	600	0.001	0.4	98	0.1	0.12	53.2	97	0.0106	0.24	2
CU2B1	53.9 ACRES AREA REVISED 6-05	0.0623	0.1	0.07	2	600	0.001	0.4	100							
CU2B1A	29.2 ACRES AREA REVISED 6-05	0.0816	0.1	0.07	2	600	0.001	0.4	100							
CU2B2	AREA = 214.8 AC NOV 29-06	0.296	0.1	0.07	2	600	0.001	0.4	100							
CU2B3	221.1 ACRES	0.3433	0.1	0.07	2	600	0.001	0.4	100							
CU2C1	186.4 ACRE @ COUNTRY ACRE LN	0.2887	0.1	0.07	2	600	0.001	0.4	100							
CU2C2	" 146.6 ACRES COUNTRY ACRES LN TO	0.2333	0.1	0.07	2	600	0.001	0.4	100							
CU2C3	" 216.6 ACRES ""LANDING STRIP"" TO BI	0.3597	0.1	0.07	2	600	0.001	0.4	100							
CWP11A	Open Space	0.0639	0.1	0.07	2	600	0.001	0.4	10	0.1	0.12	40	130	0.01	0.24	90
CWP11	Open Space	0.1216	0.1	0.07	2	600	0.001	0.4	97	0.1	0.12	40	130	0.01	0.24	3
CWP12		0.0769	0.1	0.07	2	600	0.001	0.4	100							
CU3A	247.3 acres	0.3724	0.1	0.07	2	600	0.001	0.4	100							
CU3B	307.4 ACRES	0.4841	0.1	0.07	2	600	0.001	0.4	100							
CU3C	110.3 acres	0.1785	0.1	0.07	2	600	0.001	0.4	100							
CU3D	465.8 acres ROUTES & COMBINES 465	0.7175	0.1	0.07	2	600	0.001	0.4	100							

TABLE IIA2 - Pre-Project Hydrologic Factors (cont)

			Non-Improved Plane							Improved Plane						
		SHED	Initial	Constant		Overland			% of	Initial	Constant		Overland			% of
SHED	DESCRIPTION	AREA (mi^2)	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed
CU3E	111.8 acres	0.1931	0.1	0.07	2	600	0.001	0.4	100							
CU3F	641.7ACRES	1.1282	0.1	0.0702	2	600	0.001	0.4	100							
CU3G	209.0 acres	0.2966	0.1	0.07	2	600	0.001	0.4	100							
CU3HA	57.4 acres	0.0776	0.1	0.07	2	600	0.001	0.4	100							
CU3HB	106.1 acres	0.1634	0.1	0.07	2	600	0.001	0.4	100							
CU4		3.4147	0.1	0.0703	2	600	0.001	0.4	100							
CU5		0.2757	0.1	0.07	2	600	0.001	0.4	100							
CU6		0.909	0.1	0.07	2	600	0.001	0.4	100							
STEELHEAD CREEK (NEMDC) WATERSHED																
EMA1D3	EMA1D3	0.06406	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMA1D2	EMA1D2	0.26938	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMA1D1	EMA1D1	0.53422	0.1	0.07	2	200	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA1F	EMA1F	1.1306	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA1E	EMA1E	0.21328	0.1	0.07	2	300	0.005	0.4	100							
EMA1C	EMA1C	0.80844	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMAS33	EMAS33	0.09109	0.1	0.07	2	200	0.005	0.4	100							
EMAS32	EMAS32	0.045	0.1	0.07	2	200	0.005	0.4	100							
EMAS31	EMAS31	0.03531	0.1	0.07	2	200	0.005	0.4	100							
EMAS30	EMAS30	0.01531	0.1	0.07	2	200	0.005	0.4	100							
EMAS29	EMAS29	0.03672	0.1	0.0702	2	200	0.005	0.4	100							
EMAS28	EMAS28	0.02828	0.1	0.07	2	200	0.005	0.4	100							
EMAS27	EMAS27	0.03625	0.1	0.07	2	200	0.005	0.4	100							
EMAS26	EMAS26	0.01203	0.1	0.07	2	200	0.005	0.4	100							
EMAS25	EMAS25	0.01609	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMAS24	EMAS24	0.03906	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMAS23	EMAS23	0.94	0.1	0.07	2	200	0.005	0.4	100							
EMAS22	EMAS22	0.02938	0.1	0.07	2	200	0.005	0.4	100							
EMAS21	EMAS21	0.035	0.1	0.07	2	200	0.005	0.4	100							
MAS20C	EMAS20C	0.07813	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
MAS20D	EMAS20D	0.07703	0.1	0.072	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
MAS20E	EMAS20E	0.03906	0.1	0.07	2	200	0.005	0.4	100							
MAS20B	EMAS20B	0.08419	0.1	0.072	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
MAS20A	EMAS20A	0.09422	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMAS19	EMAS19	0.01656	0.1	0.07	2	200	0.005	0.4	100							
EMAS18	EMAS18	0.03906	0.1	0.07	2	200	0.005	0.4	100							
EMAS17	EMAS17	0.08172	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMAS16	EMAS16	0.01625	0.1	0.07	2	200	0.005	0.4	100							
EMAS15	EMAS15	0.05156	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMAS14	EMAS14	0.21875	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMAS13	EMAS13	0.04328	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMAS12	EMAS12	0.035	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
MAS11E	EMAS11E	0.02063	0.1	0.07	2	200	0.005	0.4	100							
MAS11B	EMAS11B	0.02906	0.1	0.07	2	200	0.005	0.4	100							
MAS11D	EMAS11D	0.00984	0.1	0.07	2	200	0.005	0.4	100							
MAS11C	EMAS11C	0.02391	0.1	0.07	2	200	0.005	0.4	100							
MAS11A	EMAS11A	0.06047	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMAS10	EMAS10	0.03047	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMAS9	EMAS9	0.10391	0.1	0.07	2	200	0.005	0.4	100							
EMAS8	EMAS8	0.04922	0.1	0.07	2	200	0.005	0.4	100							
EMAS7	EMAS7	0.05203	0.1	0.07	2	200	0.005	0.4	100							
EMAS6	EMAS6	0.04094	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMAS5	EMAS5	0.01453	0.1	0.07	2	200	0.005	0.4	90	0.1	0.03	90	50	0.02	0.11	10
EMAS4	EMAS4	0.03016	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMAS3	EMAS3	0.015	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMAS2	EMAS2	0.05813	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMAS1	EMAS1	1.002	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMA1B	EMA1B	0.99031	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMACU	EMACU - SANKEY ROAD SHEDS	1.6713	0.1	0.07	2	600	0.002	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA2	EMA2	0.54344	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA3I	EMA3I	0.02219	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.8	150	0.01	0.24	99
EMA3H	EMA3H	0.03328	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.8	150	0.01	0.24	99
EMA3G	EMA3G	0.05125	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.8	150	0.01	0.24	99
EMA3E	EMA3E	0.04313	0.1	0.07	2	200	0.005	0.4	45	0.1	0.0755	21.8	150	0.01	0.24	55
EMA3D	EMA3D	0.02734	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMA3C	EMA3C	0.02922	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMA3B	EMA3B	0.00969	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMA3A	EMA3A	0.64422	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMB4	EMB4	0.00625	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMB3	EMB3	0.06203	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	150	0.01	0.24	99
EMB2	EMB2	0.07047	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	150	0.01	0.24	99
EMB1	EMB1	0.08688	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC19	EMC19	0.09484	0.1	0.07	2	200	0.005	0.4	100							
EMC18	EMC18	0.01391	0.1	0.07	2	200	0.005	0.4	100							
EMC17	EMC17	0.04844	0.1	0.07	2	200	0.005	0.4	100							
EMC16	EMC16	0.02984	0.1	0.07	2	200	0.005	0.4	100							
EMC15	EMC15	0.01531	0.1	0.07	2	200	0.005	0.4	100							
EMC14	EMC14	0.01703	0.1	0.07	2	200	0.005	0.4	100							
EMC13	EMC13	0.02766	0.1	0.07	2	200	0.005	0.4	100							
EMC12G	EMC12G	0.05406	0.1	0.07	2	200	0.005	0.4	100							
EMC12F	EMC12F	0.02656	0.1	0.07	2	200	0.005	0.4	100							
EMC12E	EMC12E	0.03375	0.1	0.07	2	200	0.005	0.4	100							
EMC12D	EMC12D	0.05781	0.1	0.07	2	200	0.005	0.4	100							
EMC12C	EMC12C	0.02578	0.1	0.07	2	200	0.005	0.4	100							
EMC12B	EMC12B	0.03281	0.1	0.07	2	200	0.005	0.4	100							
EMC12A	EMC12A	0.06969	0.1	0.07	2	200	0.005	0.4	100							
EMC11B	EMC11B	0.04078	0.1	0.07	2	200	0.005	0.4	100							
EMC11A	EMC11A	0.03484	0.1	0.07	2	200	0.005	0.4	100							
EMC10	EMC10	0.0325	0.1	0.07	2	200	0.005	0.4	100							
EMC9	EMC9	0.05875	0.1	0.07	2	200	0.005	0.4	100							
EMC8D	EMC8D	0.05094	0.1	0.07	2	200	0.005	0.4	100							
EMC8C	EMC8C	0.03594	0.1	0.07	2	200	0.005	0.4	100							
EMC8B	EMC8B	0.01625	0.1	0.07	2	200	0.005	0.4	100							
EMC8A	EMC8A	0.06531	0.1	0.07	2	200	0.005	0.4	100							
EMC7	EMC7	0.04453	0.1	0.07	2	200	0.005	0.4	100							
EMC6	EMC6	0.01	0.1	0.07	2	200	0.005	0.4	100							
EMC5B	EMC5B	0.01563	0.1	0.07	2	200	0.005	0.4	100							
EMC5A	EMC5A	0.06688	0.1	0.07	2	200	0.005	0.4	100							
EMC4E	EMC4E	0.03703	0.1	0.07	2	200	0.005	0.4	100							
EMC4D	EMC4D	0.0575	0.1	0.07	2	200	0.005	0.4	100							
EMC4C	EMC4C	0.09938	0.1	0.07	2	200	0.005	0.4	75	0.1	0.03	90	50	0.02	0.11	25
EMC4B	EMC4B	0.00719	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC4A	EMC4A	0.03484	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMC3	EMC3	0.0575	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC2	EMC2	0.06938	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC1Z2	EMC1Z2	0.07172	0.1	0.07	2	200	0.005	0.4	100							
EMC1Z1	EMC1Z1	0.03125	0.1	0.07	2	200	0.005	0.4	100							
EMC1Y1	EMC1Y1	0.02531	0.1	0.07	2	200	0.005	0.4	100							
EMC1Y2	EMC1Y2	0.02844	0.1	0.07	2	200	0.005	0.4	100							
EMC1X	EMC1X	0.02578	0.1	0.07	2	200	0.005	0.4	100							
EMC1W	EMC1W	0.01859	0.1	0.07	2	200	0.005	0.4	100							
EMC1V	EMC1V	0.03547	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1U	EMC1U	0.01594	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1T	EMC1T	0.02391	0.1	0.08	15	150	0.01	0.24	100							
EMC1L2	EMC1L2	0.01516	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1R	EMC1R	0.04875	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC1Q	EMC1Q	0.02844	0.1	0.08	15	150	0.01	0.24	100							
EMC1P	EMC1P	0.11313	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC1O	EMC1O	0.02188	0.1	0.08	15	150	0.01	0.24	100							
EMC1S	EMC1S	0.02234	0.1	0.08	15	100	0.01	0.24	100							

TABLE IIA3 - Pre-Project Hydrologic Factors (cont)

			Non-Improved Plane							Improved Plane						
		SHED	Initial	Constant		Overland			% of	Initial	Constant		Overland			% of
SHED	DESCRIPTION	AREA (mi^2)	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed
EMC1N	EMC1N	0.01359	0.1	0.08	15	150	0.01	0.24	100							
EMC1M	EMC1M	0.02313	0.1	0.08	15	150	0.01	0.24	100							
EMC1L1	EMC1L1	0.02472	0.1	0.08	15	150	0.01	0.24	100							
EMC1K	EMC1K	0.01531	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1J	EMC1J	0.00938	0.1	0.08	15	150	0.01	0.24	100							
EMC1G	EMC1G	0.02962	0.1	0.07	2	200	0.005	0.4	41.62	0.1	0.08	15	150	0.01	0.24	58.38
EMC1H	EMC1H	0.05969	0.1	0.08	15	150	0.01	0.24	100							
EMC1F	EMC1F	0.04266	0.1	0.07	2	200	0.005	0.4	50	0.1	0.08	15	150	0.01	0.24	50
EMC1D	EMC1D	0.03828	0.1	0.07	2	200	0.005	0.4	100							
EMC1E	EMC1E	0.00375	0.1	0.07	2	200	0.005	0.4	100							
EMC1C	EMC1C	0.02531	0.1	0.07	2	200	0.005	0.4	100							
EMC1B	EMC1B	0.04234	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMC1A	EMC1A	0.13	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMD10	EMD10	0.02828	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD9	EMD9	0.03297	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD8	EMD8	0.06203	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD7	EMD7	0.07156	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD6	EMD6	0.03172	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD5	EMD5	0.03813	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD4	EMD4	0.02234	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD3	EMD3	0.07031	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
235	235	0.02563	0.1	0.07	2	200	0.005	0.4	100							
EMD2	EMD2	0.16547	0.1	0.07	2	200	0.005	0.4	78	0.1	0.0755	21.82	150	0.01	0.24	22
EMD1	EMD1	0.23406	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	2	150	0.01	0.24	2
EME5	EME5	0.02781	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	50	0.01	0.24	99
EME4	EME4	0.05281	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	50	0.01	0.24	99
EME3	EME3	0.04719	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	50	0.01	0.24	99
EME2	EME2	0.08438	0.1	0.07	2	200	0.005	0.4	98	0.1	0.08	90	50	0.01	0.24	2
EME1	EME1	0.04156	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.01	0.24	2
EMGS27	EMGS27	0.02702	0.1	0.076	2	200	0.005	0.4	100							
FN12JB	EMFN12JB	0.0735	0.1	0.07	2	200	0.005	0.4	100							
EMFN16	EMFN16	0.03364	0.1	0.07	2	200	0.005	0.4	100							
EMFN15	EMFN15	0.02484	0.1	0.07	2	200	0.005	0.4	100							
EMFN14	EMFN14	0.02641	0.1	0.07	2	200	0.005	0.4	100							
FN13A	EMFN13A	0.04031	0.1	0.07	2	200	0.005	0.4	100							
FN13C	EMFN13C	0.05223	0.1	0.07	2	200	0.005	0.4	100							
FN13B	EMFN13B	0.03	0.1	0.07	2	200	0.005	0.4	100							
FN12JJ	EMFN12JJ	0.07953	0.1	0.07	2	200	0.005	0.4	100							
FN12I	EMFN12I	0.04328	0.1	0.07	2	200	0.005	0.4	100							
FN12K	EMFN12K	0.05375	0.1	0.07	2	200	0.005	0.4	100							
FN12H	EMFN12H	0.00859	0.1	0.07	2	200	0.005	0.4	100							
FN12E	EMFN12E	0.01984	0.1	0.07	2	200	0.005	0.4	100							
FN12D	EMFN12D	0.04266	0.1	0.07	2	200	0.005	0.4	100							
FN12JA	EMFN12JA	0.0735	0.1	0.07	2	200	0.005	0.4	100							
FN12F	EMFN12F	0.04403	0.1	0.07	2	200	0.005	0.4	100							
FN12C	EMFN12C	0.01938	0.1	0.07	2	200	0.005	0.4	100							
FN12B	EMFN12B	0.04953	0.1	0.07	2	200	0.005	0.4	100							
FN12A	EMFN12A	0.015	0.1	0.07	2	200	0.005	0.4	100							
EMFN11	EMFN11	0.12797	0.1	0.07	2	200	0.005	0.4	100							
EMFN10	EMFN10	0.02672	0.1	0.07	2	200	0.005	0.4	100							
EMFN9	EMFN9	0.04688	0.1	0.07	2	200	0.005	0.4	100							
EMFN8	EMFN8	0.01828	0.1	0.07	2	200	0.005	0.4	100							
EMFN7A	EMFN7A	0.02469	0.1	0.07	2	200	0.005	0.4	100							
EMFN7E	EMFN7E	0.02391	0.1	0.07	2	200	0.005	0.4	100							
EMFN7D	EMFN7D	0.10141	0.1	0.07	2	200	0.005	0.4	100							
EMFN7C	EMFN7C	0.03484	0.1	0.07	2	200	0.005	0.4	100							
EMFN7B	EMFN7B	0.02759	0.1	0.07	2	200	0.005	0.4	100							
EMFN6	EMFN6	0.06828	0.1	0.07	2	200	0.005	0.4	100							
EMFN5	EMFN5	0.03125	0.1	0.07	2	200	0.005	0.4	100							
EMFN4	EMFN4	0.01297	0.1	0.07	2	200	0.005	0.4	100							
EMFN3B	EMFN3B	0.01688	0.1	0.07	2	200	0.005	0.4	100							
EMFN3A	EMFN3A	0.03046	0.1	0.07	2	200	0.005	0.4	100							
EMFN2B	EMFN2B	0.01688	0.1	0.07	2	200	0.005	0.4	100							
EMFN2A	EMFN2A	0.02422	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	50	0.02	0.11	99
EMFN1	EMFN1	0.04297	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	50	0.02	0.11	99
MFS10B	EMFS10B	0.05766	0.1	0.072	2	200	0.005	0.4	100							
MFS10A	EMFS10A	0.05658	0.1	0.073	2	200	0.005	0.4	100							
EMFS9	EMFS9	0.04317	0.1	0.07	2	200	0.005	0.4	100							
EMFS8A	EMFS8A	0.07269	0.1	0.07	2	200	0.005	0.4	100							
EMGS26	EMGS26	0.04816	0.1	0.079	2	200	0.005	0.4	100							
EMFS8D	EMFS8D	0.02361	0.1	0.07	2	200	0.005	0.4	100							
EMFS8C	EMFS8C	0.07375	0.1	0.07	2	200	0.005	0.4	100							
EMFS8B	EMFS8B	0.02094	0.1	0.07	2	200	0.005	0.4	100							
EMFS7	EMFS7	0.12048	0.1	0.07	2	200	0.005	0.4	70	0.1	0.0717	27.5	50	0.02	0.11	30
EMFS6	EMFS6	0.02178	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMFS5	EMFS5	0.03964	0.1	0.07	2	200	0.005	0.4	100							
EMFS4E	EMFS4E	0.1365	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMFS4D	EMFS4D	0.05188	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMFS3	EMFS3	0.23647	0.1	0.07	2	200	0.005	0.4	100							
EMFS2	EMFS2	0.0375	0.1	0.07	2	200	0.005	0.4	100							
EMFS1	EMFS1	0.06486	0.1	0.07	2	200	0.005	0.4	51.82	0.1	0.08	15	100	0.01	0.24	48.18
EMF7	EMF7	0.11752	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	100	0.01	0.24	99
EMF6	EMF6	0.09875	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF6C	EMF6C	0.03228	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF6B	EMF6B	0.09444	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF6A	EMF6A	0.02803	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF5A	EMF5A	0.11984	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF4A	EMF4A	0.02651	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF4B	EMF4B	0.09469	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF3B	EMF3B	0.07762	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF3A	EMF3A	0.12016	0.1	0.07	2	300	0.005	0.4	1	0.1	0.0775	18.75	100	0.01	0.24	99
EMF2	EMF2	0.26328	0.1	0.07	2	300	0.005	0.4	100							
EMF1	EMF1	0.06515	0.1	0.07	2	300	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
MGS22B	EMGS22B	0.09078	0.1	0.0763	2	200	0.005	0.24	95	0.1	0.03	90	50	0.02	0.11	5
MGS22A	EMGS22A	0.15441	0.1	0.0763	2	200	0.005	0.24	95	0.1	0.03	90	50	0.02	0.11	5
EMGS21	EMGS21	0.12486	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS20	EMGS20	0.09625	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS19	EMGS19	0.13288	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS18	EMGS18	0.04078	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS17	EMGS17	0.07639	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS16	EMGS16	0.29625	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS15	EMGS15	0.13197	0.1	0.0741	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS14	EMGS14	0.06528	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
MGS13B	EMGS13B	0.01242	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
MGS13A	EMGS13A	0.2123	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
MGS12B	EMGS12B	0.02278	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
MGS12A	EMGS12A	0.16186	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS11	EMGS11	0.0688	0.1	0.0704	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN4	EMGN4 SOUTH	0.18694	0.1	0.07	2	200	0.005	0.24	100							
EMGN3	EMGN3	0.14145	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN2D	EMGN2D	0.04063	0.1	0.074	2	200	0.005	0.24	100							
EMGN2C	EMGN2C	0.01691	0.1	0.074	2	200	0.005	0.24	100							
EMGN2B	EMGN2B	0.01966	0.1	0.074	2	200	0.005	0.24	100							
EMGN2E	EMGN2E	0.05538	0.1	0.074	2	200	0.005	0.24	100							
EMGN2A	EMGN2A	0.12390	0.1	0.073	2	200	0.005	0.24	100							
EMGN1F	EMGN1F	0.05105	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1E	EMGN1E	0.03023	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1D	EMGN1D	0.17969	0.1	0.0802	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1H	EMGN1H	0.05595	0.1	0.074	2	200	0.005	0.24	100							
EMGN1G	EMGN1G	0.06734	0.1	0.073	2	200	0.005	0.24	100							
EMGN1J	EMGN1J	0.03997	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1K	EMGN1K	0.06234	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1L	EMGN1L	0.03108	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1I	EMGN1I	0.37828	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1C	EMGN1C	0.09906	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1B	EMGN1B	0.33188	0.1	0.07	2	200	0.005	0.24	100							
EMGN1A	EMGN1A	0.06797	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2

In November 2013, the project hydrology analysis was supplemented with hydraulic routing capaibilities using HEC-RAS unsteady state modeling. This was a substantial element of the Dry Creek Update Plan, and it was further incorporated into the Curry Creek and NEMDC watersheds for this project plan update due ot the need for a basis of comparison in the hydrograph modification analysis. Hydraulic Routing utilizes the hydraulic analysis of the main floodplains to pass the inflow hydrographs (developed in the HEC-1 hydrology analysis), through the model area. This provides an improved(better than PULS routing method) basis of evaluation of the detention and floodplain storage volume's effect on the peak flow and overall runoff of the project based on the existing and proposed conditons. This was performed for all storm events and land use conditions studied in this report. The results of this type of analysis, permit the comparison of the complete flow hyrographs for particular events rather then just the peak flows such as those listed in Tables IIA3A and IIA4b. Unfortunately, this methodology makes it more difficult to summarize the peak flow conditions data that is provided in these tables as they must be obtained from the HEC-RAS output data and DSS files rather then from simple text formatted HEC-1 output data.

Table IIA4a and IIA4b lists the computed Pre-project peak flow rates for the 2-year through the 500-year events, at project flow exit points. The base HEC-1 file for PDP2 input for the pre-project conditions is shown in Appendix A. Detailed in-project flow rates are provided in Section III of this report.

For the November 2013 amendment, the revised methodologies above do not permit the direct the solution for the "Mean Annual" and "1-year" event previously documented in the study, because the PDP2 software must be used for the generation of the precipitation cards in the semi-automated process. Instead to derive these event flows, they were estimated based on the 2-year event. It is estimated that the mean annual event can be generated by using the 2-year event hydrographs reduced to 35% of the 2-year flow rates. For the 1-year event, it was estimated that this event can be produced by using 70% of the 2-year inflow rates. To generate these events, multipliers were used on the 2-year event inflow hydrographs to the HEC-RAS hydraulic routing models. Executing runs with very small inflows can result in intabilities in the HEC-RAS hydraulic routing models. Therefore, minimum allowable flow rates are specified in the models to maintain stability. For these small events, the specification of minimum flow rate can exceed the computed flow rates at certain points in the system and the reported flow rates can be artificially inflated by the minimum flow rate specifications.

TABLE IIA4a - PRE-PROJECT PEAK FLOW RATES

Placer Vineyards - Key System Points Flow Summary
Pre-Project - NOVEMBER 2013

Description	RAS STA (RM)	DA (mi^2)	Annual (cfs)	1-year (cfs)	2-year (cfs)	10-year (cfs)	100-year (cfs)	200-year (cfs)	500-year (cfs)
Upstream of Project on Curry Creek	1.25	1.05	23.25	46.5	66.42	175.4	356.89	413.08	495.22
Baseline Road Crossing	1.22	1.23	23.04	45.74	63.06	170.84	317.39	355.26	420.8
Downstream of Baseline Road	1.16	1.24	26.23	52.54	72.95	203.91	386.6	433.11	509.7
Downstream of CUS11 Flow Addition Onsite	1.15	1.38	25.97	51.92	72.73	203.28	386.12	432.73	508.62
Intermediate Point of Onsite Curry Creek	1.12	1.64	25.72	48.51	72.71	202.39	385.25	431.59	505.41
At Connection from North	1.09	1.75	28.43	53.6	79.85	233.85	440.66	487.6	575.37
At Culvert Discharge from Site	1.04	1.78	29.55	54.67	81.77	228.49	387.12	472.36	609.96
Downstream of Project At Curry Creek	1.01	2	29.53	54.65	81.75	227.17	386.98	472.33	609.84
EMA Shed	18.8	0.15	15.33	30.65	43.79	98.24	192.26	224.54	277.66
EMA Shed	18.7	0.15	15.03	30.1	43.16	93.57	179.46	207.32	253.89
EMA Shed - Project Exit	18.4	0.18	34.87	66.71	88.03	92	94.32	107.9	128.58
EMAS31 North Branch	2.65	0.16	11.44	22.88	32.68	73.87	144.23	166.06	204.51
EMAS28 North Branch	2.62	0.24	10.6	22.89	33.63	71.81	140.3	161.92	199.88
EMAS27 North Branch	2.59	0.28	12.59	27.23	39.53	88.83	173.02	197.02	238.46
EMAS25 North Branch	2.57	0.31	12.5	26.06	36.44	81.03	133.22	144.22	168.26
Watt Avenue Culvert - North Branch	2.53	0.31	8.68	14.41	17.78	25.23	84.84	105.78	142.41
EMAS23 North Branch	2.47	0.35	8.59	14.4	17.8	25.29	84.21	104.89	140.41
MAS20C South Branch	3.1	0.19	12.39	24.78	35.39	80.13	155.08	177.43	220.15
MAS20B South Branch	3.06	0.28	6.22	6.22	7.15	23.93	106.38	129.95	166.61
MAS20A South Branch	3.02	0.37	11.09	22.2	32.38	74.07	147.35	181.44	232.14
At Confluence	2.43	0.82	16.65	31.05	44.05	92.51	198.49	247.54	326.45
EMAS19	2.39	0.84	17.31	32.09	45.66	95.58	205.78	255.11	334
EMAS16	2.36	0.98	17.65	32.31	45.48	91.89	179.78	211.99	267.98
Upstream of Culvert	2.33	1.03	14.9	22.1	27.47	43.18	63.09	98.38	190.59
EMAS14	2.23	1.25	16.04	23.16	28.54	44.1	63.13	75.24	93.17
EMAS12	2.18	1.32	16.54	23.66	29.06	44.62	67.14	80.7	100.8
EMAS10	2.14	1.5	17.97	25.09	30.96	56.28	125.34	149.81	198.18
EMAS9	2.11	1.6	18.76	31.95	42.99	73.47	120.93	134.19	154.67
EMAS6R - Flows Leaving Site	2.05	1.74	25.11	44.24	59.45	95.16	146.96	155.71	176.94
Combined flows exiting project @ Baseline Rd.	2.02	1.74	24.69	43.29	57.97	89.94	130.96	150.57	176.26
Downstream of Project and Culvert	2.00	1.86	25.99	46.03	61.9	96.73	135.31	156.01	183.1
EMAS1 - Downstream	N/A	2.86	87.15	174.3	249	496	496	1006	1248
EMGN - Project Exit	N/A	0.11	9.1	18.2	26	57	57	130	162
EMFS Upstream Point near Dyer Lane	3.26	0.06	3.61	7.23	10.33	23.66	46.77	53.91	66.9
S10ACC	3.23	0.11	4.1195	8.239	11.77	19.49	41.81	49.1	60.9
EMFS9	3.19	0.16	3.7765	7.553	10.79	26.54	54.76	64.97	80.94
S9R	3.14	0.16	3.4965	6.993	9.99	24.42	50.98	60.73	77.27
EMFS7	3.09	0.52	5.278	10.556	15.08	37.4	79.4	87.35	97.72
S7R	3.065	0.52	9.59	12.89	22.95	57.38	115.02	127.14	140.44
EMFS6	3.02	0.54	9.56	12.85	20.51	36.42	42.64	43.8	45.2
MFS10B	4.2	0.06	3.68	7.37	10.52	24	47.49	54.35	67.25
EMFS4D	11.9	0.05	3.23	4	4.62	10.37	20	22.82	28.13
FS4DR	11.45	0.05	2.11	2.13	2.16	2.26	2.52	2.54	2.59
EMFS4C	10.22	0.54	3.23	4	4.62	10.37	20	22.82	28.13
EMFS5C	10.175	0.58	1.19	1.59	2.15	2.9	5	5.6	6.4
EMFS4E	10.13	0.72	4	7	10	14	20	21	22
FS4ACC	10.1	0.77	27.09	46.69	66.31	122.73	231.27	266.09	366.82
EMFS3	10.06	1.01	35.82	70.1	101.08	194.67	311.64	351.41	408.9
FS1R Upstream of Confluence	10.02	1.11	15.91	23.27	28.2	41.56	170.4	202.98	260.12
FN13C	8.3	0.05	3.35	6.69	9.56	21.74	42.44	49.65	60.95
FN12G	55.3	0.08	5.17	10.35	14.79	33.45	65.91	76.39	93.88
FN12K	5.66	0.05	3.49	6.99	9.98	22.59	44.48	51.54	63.6
FN12HC	5.61	0.19	10.27	12.54	19.26	26.64	34.01	38.6	46.32
FN12E	5.58	0.2	9.96	12.29	19.07	27.71	45.95	50.86	59.82
FN12DR	5.52	0.25	10.5	19.9	28.74	61.03	114.93	131.91	159.76
FN12CC	5.49	0.38	10.31	21.21	31.69	63.61	115.2	131.43	158.11
FN12B	5.41	0.43	10.54	23.74	36.62	70.83	127.68	146.02	173.83
N12ACC	5.35	0.76	16.5585	33.117	47.31	71.33	164.73	193.73	224.74
EMFN11	5.29	0.89	13.916	27.832	39.76	84.47	180.64	212.78	253.01
EMFN8	5.22	0.98	20.82	21.25	25.99	42.7	90.23	106.26	134.01
FN7BCC	5.17	1.19	22.69	35.06	45.78	87.17	159.53	180.73	217.91
EMFN5	5.13	1.29	25.13	41.68	54.63	101.13	180.38	203.43	241.71
FN2BCC	5.097	1.37	25.84	41.88	57.74	88.92	122.09	134.13	158.84
FS1CC - Downstream EMFN+EMFS Comb	5.04	2.54	41.09	56.79	66.75	89.02	218.13	251.69	309.43
Downstream of Confl. Offsite	5.02		39.81	56.83	66.79	89.03	216.93	250.56	307.61
EMFN15	7.11	0.16	10.17	20.34	29.05	65.95	129.49	148.68	183.74
EMFN14	7.04	0.19	22.23	22.23	22.23	22.23	26.14	28.78	35.09
FN13A	7.03	0.23	22.18	22.18	22.18	24	26.11	28.19	33.82

TABLE IIA4b - PRE-PROJECT PEAK FLOW RATES

Placer Vineyards - Key System Points Flow Summary
Pre-Project - NOVEMBER 2013

Description	RAS STA (RM)	DA (mi^2)	Annual (cfs)	1-year (cfs)	2-year (cfs)	10-year (cfs)	100-year (cfs)	200-year (cfs)	500-year (cfs)
EMD7	12.13	0.19	21.04	42.08	60.12	134.09	265.07	301.79	368.06
EMD5	12.08	0.26	23.39	48.43	69.25	133.54	231.35	262.53	318.5
EMD4	12.03	0.29	23.34	48.6	70.12	133.46	225.84	253.57	311.52
EMD3	12.01	0.36	26.39	56.24	80.73	151.91	257.3	289.91	351.94
EMC1Z2	25.47	0.07	4.6	9.21	13.16	29.79	58.97	67.79	83.63
EMC1Z1	25.45	0.1	6.58	8.09	11.94	26.69	50.74	58.18	71.07
EMC1Y2	24.3	0.03	1.83	3.66	5.23	11.86	26.38	27.09	33.58
EMC1Y1	25.41	0.13	16.57	25.35	35.07	53.49	98.33	115.49	138.64
MC1WR	25.367	0.2	11.32	14.02	15.94	29.12	47.78	50	53.42
EMC1T	25.24	0.28	13.87	17.89	21.27	39.29	59.45	62.87	71.15
EMC1S	23.9	0.02	2.37	4.74	6.78	14.1	27	30.34	37.89
EMC1O	22.2	0.21	11.54	23.09	32.98	74.54	143.34	165.12	200.73
MC1SCC	23.05	0.23	17.06	20.47	33.1	102.1	181.57	195.28	213.05
MC1L1R	23.02	0.3	14.58	21.26	33.57	81.43	181.29	199.19	222.09
C1L1CC	25.21	0.59	24.54	31.46	34	98.53	203.51	223.83	245.41
MC1GR	25.19	0.63	24	27.66	33.15	62.99	95.4	102.9	120.83
EMC1H	25.17	0.69	24	27.66	33.15	62.99	95.41	102.9	120.83
EMC1F	26.5	0.04	3.28	6.55	9.36	21.28	41.47	47.5	57.35
MC1ER	25.07	0.78	25.83	36.23	45.44	85.13	134.92	143.87	163.55
MC1ECC	25.03	0.78	25.77	34.94	43.96	81.6	129.76	138.99	159.99
EMC11B	18.5	0.04	2.61	5.21	7.45	16.89	33.35	38.55	47.22
EMC8D	16.4	0.05	3.26	6.52	9.32	21.17	41.7	48.09	59.37
EMC8B	16.1	0.1	10	13.63	16.57	46.55	86.62	95.09	107.52
EMC17	17.9	0.16	10.06	20.11	28.73	65.3	127.57	147.96	182
EMC15	17.5	0.2	13.78	26.3	37.2	81.89	157.96	182.57	222.5
EMC12G	15.51	0.05	3.47	6.95	9.92	22.5	44.52	51.19	62.92
EMC12E	15.46	0.11	3.955	7.91	11.3	24.97	45.75	52.33	63.11
EMC12D	15.39	0.17	11.5	14.85	21.75	45.3	81.7	93.07	110.5
EMC12A	15.35	0.55	25.87	46.26	65.27	138.91	261.51	298.06	364.74
EMC11A	15.32	0.61	23.03	47.86	68.51	147.55	270.83	307.71	375.48
EMC9	15.3	0.7	36.37	52.28	76.56	163.66	302.63	343.94	419.26
EMC8A	15.25	0.87	43.18	62.09	101.01	192.95	309.52	362.58	451.97
EMC7	15.22	0.92	32.22	43.42	51.8	67.11	279.42	346.37	439.9
EMC6	15.19	0.93	30.64	43.51	52.47	68.48	244.08	301.01	391.38
EMC5A	15.16	1.01	29.95	43.39	52.48	68.73	241.95	298.52	387.39
EMC4A	15.12	1.16	37.69	45.96	55.93	97.54	262.24	321.92	414.63
EMC3	15.05	1.21	33.56	46.34	56.4	96.76	256.36	317.74	407.75
EMC2	15.04	1.28	39.7	45.18	54.62	80.36	249.77	309.98	400.79
EMC1A	15	2.26	33.5	44.46	53.48	72.68	251.93	313.12	400.12
EMC4D	14.6	0.09	6.01	12.02	17.18	39.07	76.71	88.63	109.81
EMA3A		0.86	39.2	78.4	112	251	251	548	671
EMB1		0.23	5.25	10.5	15	35	35	79	97
DRY CREEK									
Dry Creek Upstream of Walerga Avenue	50055		572.11	1144.22	1634.6	4822.9	12535.2	14788.7	19129.9
Doyle Tributary at Walerga	1.13		9.8	19.6	28	107	438	567	907
Doyle Tributary at Downstream End	1.26		10.5	21	30	119	478	616	972
DC75A Shed	0.41		0.35	0.7	1	15	59	77	100
DC75C Shed	0.28		1.4	2.8	4	22	66	81	106
Dry Creek at Watt Avenue	47874		586.495	1172.99	1675.7	4798.4	12568.3	14871.6	19160.9
DC76A Shed	0.38		2.45	4.9	7	27	77	94	119
Southern Western Sheds At Project Boundary	0.09		1.05	2.1	3	14	30	35	43
Southern Eastern Sheds At Project Boundary	0.08		1.4	2.8	4	13	27	32	39
Inflow to Gibson Lake	0.44		5.6	11.2	16	71	157	184	223
Outflow to Dry Creek	0.61		7	14	20	86	194	227	277
Dry Creek Downstream of Project	39008		587.545	1175.09	1678.7	4798	12567.8	14880.9	19160.9

II.B Post-Project Model:

Civil Solutions prepared a modified post project hydrologic model based on the proposed project land use information and the soils delineation boundaries. This study is based on the updated plan information shown on Exhibits SH-2. Tables IIB1, IIB2, and IIB3 identify the watershed factors utilized in the analysis.

TABLE IIB1 – Post Project Hydrologic Factors

			Non-Improved Plane							Improved Plane						
		SHED	Initial	Constant		Overland			% of	Initial	Constant		Overland			% of
SHED	DESCRIPTION	AREA (mi^2)	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed
DRY CREEK WATERSHED (ONLY PROJECT SHEDS NEAR PROJECT ARE INCLUDED HERE)																
DC65B	DC65B 21.8 ac	0.0341	0.1	0.12	43.94	121	0.01	0.24	100							
DC65J	DC65J 48.9 ac	0.0765	0.1	0.12	17.25	208	0.0089	0.24	100							
DC65C	DC65C 87.5 ac	0.1367	0.1	0.0718	2.11	600	0.001	0.4	10	0.1	0.12	41.91	127	0.01	0.24	90
DC65D	DC65D 5.6 ac	0.0088	0.1	0.12	61.53	89	0.0122	0.24	100							
DC65E	DC65E 11.2 ac	0.0175	0.1	0.1252	18.99	202	0.0091	0.24	100							
DC65A	DC65A 259.0 ac	0.4046	0.1	0.0799	2	660	0.001	0.4	3	0.1	0.128	15.34	220	0.0087	0.24	97
DC65F	DC65F 82.9 ac	0.1296	0.1	0.1283	15	220	0.0087	0.24	100							
DC65G	DC65G 9.9 ac	0.0154	0.1	0.07	2	600	0.001	0.4	71	0.1	0.12	54.47	96	0.0108	0.24	29
DC65H	DC65H 42.6 ac	0.0665	0.1	0.0753	2	418	0.001	0.4	11	0.1	0.141	18.65	202	0.0091	0.24	89
DC65K	DC65K 130.497 ac	0.2039	0.1	0.09	2	362	0.001	0.4	100							
DC65I	DC65I 122.58 ac	0.19153	0.1	0.09	2	350	0.001	0.4	56.2	0.1	0.089	41.4	130	0.01	0.24	43.8
DC75A	DC75A 243.08 ac	0.37981	0.1	0.091	2	861	0.001	0.4	56.6	0.1	0.115	42.2	130	0.01	0.24	43.4
DC68A	DC68A 555.0 ac	0.8673	0.1	0.07	2.17	423	0.001	0.4	12	0.1	0.1249	41	127	0.01	0.24	88
DC68B	DC68B 351.1 ac	0.5486	0.1	0.0982	2	370	0.001	0.4	17	0.1	0.1314	41.2	127	0.01	0.24	83
DC70A	DC70A 190.6 ac	0.2978	0.1	0.124	2	243	0.001	0.4	52	0.1	0.12	39.93	132	0.01	0.24	48
DC75B	DC75B 73.0 ac	0.1141	0.1	0.1062	2	582	0.001	0.4	88	0.1	0.12	35	140	0.01	0.24	12
DC75C	DC75C 196.66 ac	0.30728	0.1	0.101	2	434	0.001	0.4	45.9	0.1	0.111	55.1	130	0.01	0.24	54.1
DC76A	DC76A 249.111 ac	0.38924	0.1	0.106	2	658	0.001	0.4	53	0.1	0.153	53	130	0.01	0.24	47
DC70B	DC70B 42.8 ac	0.0669	0.1	0.1448	2	433	0.001	0.4	100							
DC71A	DC71A 99.3 ac	0.1552	0.1	0.07	2	365	0.001	0.4	30	0.1	0.12	39.97	132	0.01	0.24	70
DC71B	DC71B 74.1 ac	0.1158	0.1	0.1225	2.65	385	0.001	0.4	76	0.1	0.2028	58.72	92	0.0116	0.24	24
DC76C	DC76C 113.973 ac	0.17808	0.1	0.25	2	450	0.001	0.4	78	0.1	0.247	47.5	130	0.01	0.24	22
DC76D	DC76D (12.888 AC undeveloped)	0.02014	0.1	0.08	2	385	0.001	0.4	100							
DC76E	DC76E (50.959 AC undeveloped)	0.07962	0.1	0.08	2	385	0.001	0.4	100							
DC76B	DC76B 100.937 ac	0.15771	0.1	0.09	2	450	0.001	0.4	78.8	0.1	0.118	40	130	0.01	0.24	21.2
DC85	DC85 192.8 ac	0.3013	0.1	0.134	2.77	408	0.001	0.4	94	0.1	0.1207	40	130	0.01	0.24	6
DC90	DC90 445.5 ac	0.6962	0.1	0.0924	3.06	556	0.0023	0.4	28	0.1	0.1197	44.84	118	0.01	0.24	72
DC95A	DC95A 162.0 ac	0.2531	0.1	0.07	2	349	0.001	0.4	61	0.1	0.12	40.71	130	0.01	0.24	39
DC95B	DC95B 432.4 ac	0.6756	0.1	0.07	2	455	0.001	0.4	22	0.1	0.12	46.16	112	0.01	0.24	78
DC96C	DC96C 334.3 ac	0.5223	0.1	0.07	2	680	0.001	0.4	13	0.1	0.12	47.55	109	0.01	0.24	87
DC96A	DC96A 343.9 ac	0.5374	0.1	0.0707	2.04	440	0.001	0.4	13	0.1	0.12	42.94	124	0.01	0.24	87
DC96B	DC96B 253.3 ac	0.3957	0.1	0.0725	2.15	580	0.001	0.4	19	0.1	0.12	42.19	124	0.01	0.24	81
DC100A	DC100A 235.2 ac	0.3675	0.1	0.0753	2.83	442	0.001	0.4	42	0.1	0.1194	40.6	130	0.01	0.24	58
DC100B	DC100B 88.6 ac	0.1385	0.1	0.0867	2.92	459	0.001	0.4	96	0.1	0.106	51.22	99	0.0102	0.24	4
DC110	DC110 173.271 ac	0.27074	0.1	0.1721	4.31	547	0.0037	0.4	44	0.1	0.1212	40	130	0.01	0.24	56
DC105A	DC105A 116.2 ac	0.1815	0.1	0.07	2	415	0.001	0.4	2	0.1	0.12	42.63	124	0.01	0.24	98
DC105B	DC105B 118.2 ac	0.1847	0.1	0.07	4.45	437	0.0037	0.4	78	0.1	0.106	78.27	72	0.016	0.24	22
DC105C	DC105C 183.6 ac	0.287	0.1	0.071	4.04	222	0.0037	0.4	72	0.1	0.0963	58.95	92	0.0116	0.24	28
DC105E	DC105E 123.0 ac	0.1922	0.1	0.07	2.83	272	0.001	0.4	53	0.1	0.07	80	70	0.0167	0.24	47
DC105D	DC105D 63.7 ac	0.0995	0.1	0.0703	3.99	246	0.0023	0.4	97	0.1	0.07	80	70	0.0167	0.24	3
DC115	DC115 197.703 ac	0.30891	0.1	0.1342	4.09	853	0.0037	0.4	83	0.1	0.1201	40	130	0.01	0.24	17
CURRY CREEK WATERSHED																
CUS3A	AREA EAST OF FIDDYMENT ROAD ARE	0.43449	0.1	0.098	3.68	550	0.0023	0.4	8	0.1	0.12	47.28	109	0.01	0.24	92
CUS3B	CUS3 AREA (242.95) REVISED PER NE	0.3796	0.1	0.07	2	600	0.001	0.4	100							
CUS4	CSU4 AREA (39.39 AC) REVISED PER N	0.06155	0.1	0.07	2	600	0.001	0.4	100							
CUS5A	CUS5A 35.55 AC MAY 18-06	0.05555	0.1	0.07	2	600	0.001	0.4	100							
CUS5	CUS5 AREA (39.3AC) REVISED PER NE	0.0614	0.1	0.07	2	600	0.001	0.4	98.2	0.1	0.07	90	61	0.0197	0.11	1.8
CUS6	CUS6 107.95ac CUS6 AREA (107.8 AC)	0.16867	0.1	0.07	2	600	0.001	0.4	99.1	0.1	0.07	90	61	0.0197	0.11	0.9
CUS6B	CUS6B 31.95ac	0.05023	0.1	0.07	2	600	0.001	0.4	1	0.1	0.086	50.8	100	0.01	0.24	99
CUS11A	CUS11A 25.76 AC	0.04028	0.1	0.07	2	600	0.001	0.4	1	0.1	0.09	40	132	0.01	0.24	99
CUS11B	CUS11B 33.23 ac	0.05193	0.1	0.07	2	600	0.001	0.4	75.8	0.1	0.07	88.8	62	0.0193	0.24	24.2
CUS11C	CUS11C 23.98 ac	0.03767	0.1	0.07	2	600	0.001	0.4	7.8	0.1	0.09	40	132	0.01	0.24	92.2
CUS12A	CUS12A AREA (160.356 AC) REVISED P	0.25056	0.1	0.07	2	600	0.001	0.4	100							
CUS13A	CUS13A AREA (8.844 AC) REVISED PER	0.01382	0.1	0.07	2	600	0.001	0.4	99	0.1	0.07	90	61	0.0197	0.11	1
CUS14	CUS14 60.14 AC	0.09396	0.1	0.07	2	600	0.001	0.4	25.8	0.1	0.085	71.9	79	0.0142	0.24	74.2
CUS16B	CUS16B 12.77 AC	0.01996	0.1	0.07	2	600	0.001	0.4	80.6	0.1	0.07	90	61	0.0197	0.24	19.4
CUS15	CUS15 AREA =79.216 AC PER WATT AV	0.12378	0.1	0.07	2	600	0.001	0.4	100							
CUS15B	CUS15B AREA=52.313 AC PER WATT A	0.08174	0.1	0.07	2	600	0.001	0.4	100							
CUS17A	CUS17A 37.73 AC	0.05895	0.1	0.07	2	600	0.001	0.4	85.3	0.1	0.07	90	61	0.0197	0.24	14.7
CUS17B	CUS17B AREA (49.318 AC) REVISED PE	0.07706	0.1	0.07	2	600	0.001	0.4	100							
CUS17C	CUS17C AREA (69.026 AC) REVISED PE	0.10785	0.1	0.07	2	600	0.001	0.4	100							
CWP7	Curry Creek Basin CU2A (5-03)	0.0843	0.1	0.12	5	450	0.005	0.4	2	0.1	0.12	43.43	121	0.01	0.24	98
CU2A1A	SHED AREA=42.4 AC	0.0596	0.1	0.07	2	600	0.001	0.4	96	0.1	0.12	80	70	0.0167	0.24	4
CU2A1B	SHED AREA=51.6	0.0793	0.1	0.07	2	600	0.001	0.4	99	0.1	0.12	80	70	0.0167	0.24	1
CU2A1C	SHED AREA=46.0 AC	0.0709	0.1	0.07	2	600	0.001	0.4	98	0.1	0.12	77.66	73	0.0157	0.24	2
CWP8	Basin CU2A (5-03)	0.1068	0.1	0.1138	4.63	500	0.0037	0.4	7	0.1	0.12	42.78	124	0.01	0.24	93
CU2A9	PORTION OF SHED CU2A	0.1265	0.1	0.07	2	600	0.001	0.4	100							
CU2A8	PORTION OF SHED CU2A	0.0629	0.1	0.07	2	600	0.001	0.4	100							
CU2A3	PORTION OF SHED CU2A	0.2463	0.1	0.07	2	600	0.001	0.4	100							
CU2A7	PORTION OF SHED CU2A	0.1677	0.1	0.07	2	600	0.001	0.4	100							
CU2A4	AREA=47.861 AC PER WATT AVE	0.0756	0.1	0.07	2	600	0.001	0.4	100							
CU2A6C	AREA=7.464 AC PER WATT AVE	0.0115	0.1	0.07	2	600	0.001	0.4	100							
CU2A4B	AREA 26.094 AC WEST OF WATT AVE	0.0411	0.1	0.07	2	600	0.001	0.4	100							
CU2A5	AREA = 131.754 AC PER WATT AVE	0.2074	0.1	0.07	2	600	0.001	0.4	100							
CU2A5B	AREA = 8.664 AC PER WATT AVE	0.0137	0.1	0.07	2	600	0.001	0.4	100							
CU2A6B	AREA 3.383 AC PER WATT AVE	0.0054	0.1	0.07	2	600	0.001	0.4	100							
CU2A6	AREA =55.457 AC PER WATT AVE	0.0994	0.1	0.07	2	600	0.001	0.4	100							
CU2A1	AREA = 9.6 AC UP/S OF WATT	0.0151	0.1	0.07	2	600	0.001	0.4	100							
CU2A5C	AREA = 58.6 AC	0.0775	0.1	0.07	2	600	0.001	0.4	100							
CU2A2	AREA = 24.1 AC UP/S OF WATT	0.0379	0.1	0.07	2	600	0.001	0.4	100							
CU2A3A	AREA = 38.2 AC WEST OF WATT	0.0601	0.1	0.07	2	600	0.001	0.4	100							
CU2A	AREA = 485.3 AC NOV 29- 06	0.7942	0.1	0.07	2	600	0.001	0.4	100							
CWP1	AREA REVISED 6-05	0.1436	0.1	0.1151	4.7	500	0.0037	0.4	12	0.1	0.12	54.15	96	0.0108	0.24	88
CWP2	AREA REVISED 6-05	0.1939	0.1	0.074	2.24	600	0.001	0.4	68	0.1	0.12	41.85	127	0.01	0.24	32
CWP4	Revise Date (5-03)	0.3583	0.1	0.0968	3.61	550	0.0023	0.4	12	0.1	0.1157	49.24	103	0.01	0.24	88
CWP3	AREA REVISED 6-05	0.3014	0.1	0.07	2	600	0.001	0.4	36	0.1	0.0989	64.56	86	0.0128	0.24	64
CWP6	Revise Date (5-03) (194.5 ac)	0.3008	0.1	0.0813	2.68	600	0.001	0.4	43	0.1	0.12	40.01	130	0.01	0.24	57
CWP9	AREA REVISED 6-05 area rewised to 191	0.3188	0.1	0.12	80	71	0.0163	0.24	100							
CWP13	AEEA REVISED 6-05	0.0942	0.1	0.098	3.68	550	0.0023	0.4	25	0.1	0.12	44.24	118	0.01	0.24	75
CWP14	AERA REVISED 6-05	0.1558	0.1	0.07	2	600	0.001	0.4	98	0.1	0.12	53.2	97	0.0106	0.24	2
CU2B1	53.9 ACRES AREA REVISED 6-05	0.0623	0.1	0.07	2	600	0.001	0.4	100							
CU2B1A	29.2 ACRES AREA REVISED 6-05	0.0816	0.1	0.07	2	600	0.001	0.4	100							
CU2B2	AREA = 214.8 AC NOV 29- 06	0.296	0.1	0.07	2	600	0.001	0.4	100							
CU2B3	221.1 ACRES	0.3433	0.1	0.07	2	600	0.001	0.4	100							
CU2C1	186.4 ACRE @ COUNTRY ACRE LN	0.2887	0.1	0.07	2	600	0.001	0.4	100							
CU2C2	" 146.6 ACRES COUNTRY ACRES LN TO	0.2333	0.1	0.07	2	600	0.001	0.4	100							
CU2C3	" 216.6 ACRES ""LANDING STRIP"" TO B	0.3597	0.1	0.07	2	600	0.001	0.4	100							
CWP11A	Open Space	0.0639	0.1	0.07	2	600	0.001	0.4	10	0.1	0.12	40	130	0.01	0.24	90
CWP11	Open Space	0.1216	0.1	0.07	2	600	0.001	0.4	97	0.1	0.12	40	130	0.01	0.24	3

TABLE IIB2 – Post Project Hydrologic Factors (Cont)

			Non-Improved Plane							Improved Plane						
		SHED	Initial	Constant		Overland			% of	Initial	Constant		Overland			% of
SHED	DESCRIPTION	AREA (mi^2)	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed
CWP12		0.0769	0.1	0.07	2	600	0.001	0.4	100							
CU3A	247.3 acres	0.3724	0.1	0.07	2	600	0.001	0.4	100							
CU3B	307.4 ACRES	0.4841	0.1	0.07	2	600	0.001	0.4	100							
CU3C	110.3 acres	0.1785	0.1	0.07	2	600	0.001	0.4	100							
CU3D	465.8 acres ROUTES & COMBINES 465	0.7175	0.1	0.07	2	600	0.001	0.4	100							
CU3E	111.8 acres	0.1931	0.1	0.07	2	600	0.001	0.4	100							
CU3F	641.7ACRES	1.1282	0.1	0.0702	2	600	0.001	0.4	100							
CU3G	200.0 acres	0.2966	0.1	0.07	2	600	0.001	0.4	100							
CU3HA	57.4 acres	0.0776	0.1	0.07	2	600	0.001	0.4	100							
CU3HB	106.1 acres	0.1634	0.1	0.07	2	600	0.001	0.4	100							
CU4		3.4147	0.1	0.0703	2	600	0.001	0.4	100							
CU5		0.2757	0.1	0.07	2	600	0.001	0.4	100							
CU6		0.909	0.1	0.07	2	600	0.001	0.4	100							
STEELHEAD CREEK (NEMDC) WATERSHED																
EMA1D3	EMA1D3	0.06406	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMA1D2	EMA1D2	0.26938	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMA1D1	EMA1D1	0.33422	0.1	0.07	2	200	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA1F	EMA1F	1.1306	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA1E	EMA1E	0.21328	0.1	0.07	2	300	0.005	0.4	100							
EMA1C	EMA1C	0.80844	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMAS1D	EMAS1D 38.5ac	0.06015	0.1	0.09	2	600	0.001	0.4	6.8	0.1	0.09	40.7	130	0.01	0.24	93.2
EMAS3D	EMAS3D 5.81ac	0.00905	0.1	0.09	2	600	0.001	0.4	100							
EMAS4	EMAS4 11.12ac	0.01737	0.1	0.09	2	600	0.001	0.4	1.6	0.1	0.09	40	130	0.01	0.24	98.4
EMAS6A	EMAS6A 3.63ac	0.00566	0.1	0.09	2	600	0.001	0.4	26	0.1	0.07	89.7	61	0.0197	0.11	74
EMAS2	EMAS2 11.85ac	0.01837	0.1	0.09	2	600	0.001	0.4	5	0.1	0.088	45	90	0.012	0.24	95
EMAS6B	EMAS6B 11.3ac	0.01765	0.1	0.09	2	600	0.001	0.4	1	0.1	0.09	40	130	0.01	0.24	99
EMAS9	EMAS9 24.48ac	0.03826	0.1	0.09	2	600	0.001	0.4	5.1	0.1	0.09	40	130	0.01	0.24	94.9
EMAS8	EMAS8 2.38ac	0.00377	0.1	0.09	2	600	0.001	0.4	2	0.1	0.07	89.8	61	0.0197	0.11	98
EMAS7D	EMAS7D 10.95ac	0.01711	0.1	0.09	2	600	0.001	0.4	99	0.1	0.085	53.4	97	0.0106	0.24	1
EMAS10	EMAS10 4.69ac	0.00733	0.1	0.09	2	600	0.001	0.4	1	0.1	0.09	40	132	0.01	0.24	99
EMAS12	EMAS12 4.98ac	0.00778	0.1	0.09	2	600	0.001	0.4	12	0.1	0.09	40	132	0.01	0.24	88
MAS14D	MAS14D 15.74ac	0.02459	0.1	0.09	2	600	0.001	0.4	1	0.1	0.093	44.8	118	0.01	0.24	99
EMAS13	EMAS13 14.44ac	0.02251	0.1	0.09	2	600	0.001	0.4	99	0.1	0.087	47.5	109	0.01	0.24	1
MAS15D	MAS15D 8.89ac	0.01388	0.1	0.09	2	600	0.001	0.4	1	0.1	0.089	54.6	96	0.0108	0.24	99
MAS18D	MAS18D 16.06ac	0.0251	0.1	0.09	2	600	0.001	0.4	1	0.1	0.087	46.5	112	0.01	0.24	99
EMAS16	EMAS16 6.69ac	0.01045	0.1	0.09	2	600	0.001	0.4	1	0.1	0.082	66.3	84	0.0132	0.24	99
EMAS19	EMAS19 71.56ac	0.11181	0.1	0.09	2	600	0.001	0.4	1	0.1	0.088	45.7	115	0.01	0.24	99
MAS20E	MAS20E 49.68ac	0.07761	0.1	0.09	2	600	0.001	0.4	38.6	0.1	0.086	72.2	85	0.013	0.24	61.4
EMAS23	MAS23 58.76ac	0.09182	0.1	0.09	2	600	0.001	0.4	66.3	0.1	0.085	60.2	90	0.012	0.24	33.7
MAS20C	MAS20C 114.49ac	0.17873	0.1	0.104	2	600	0.001	0.4	4.3	0.1	0.099	63.4	87	0.0126	0.24	95.7
MAS20A	MAS20A 30.56ac	0.04774	0.1	0.09	2	600	0.001	0.4	8.7	0.1	0.09	50	103	0.01	0.24	91.3
MAS20B	MAS20B 14.14ac	0.02214	0.1	0.09	2	600	0.001	0.4	90	0.1	0.071	88	63	0.019	0.11	10
EMAS18	MAS18 71.58ac	0.1461	0.1	0.09	2	600	0.001	0.4	23.3	0.1	0.089	52.9	98	0.0104	0.24	76.7
EMAS17	MAS17 26.94ac	0.04232	0.1	0.09	2	600	0.001	0.4	1	0.1	0.085	82.4	68	0.0173	0.11	99
EMAS15	MAS15 37.04ac	0.05787	0.1	0.09	2	600	0.001	0.4	9.3	0.1	0.087	63.8	87	0.0126	0.24	90.7
EMAS14	EMAS14 169.42	0.26472	0.1	0.07	2	600	0.001	0.4	100							
MAS11B	MAS11B 119.60ac	0.18688	0.1	0.09	2	600	0.001	0.4	16.5	0.1	0.087	58.8	92	0.0116	0.24	83.5
MAS12A	MAS12A 127.06ac	0.19852	0.1	0.09	2	600	0.001	0.4	50.1	0.1	0.082	77.5	73	0.0157	0.24	49.9
EMAS7	EMAS7 100.01ac	0.15626	0.1	0.09	2	600	0.001	0.4	33	0.1	0.085	64.8	86	0.0128	0.24	67
EMAS6	EMAS6 45.52ac	0.07112	0.1	0.09	2	600	0.001	0.4	7.6	0.1	0.086	82.2	68	0.0173	0.11	92.4
EMAS3	EMAS3 42.4ac	0.06625	0.1	0.09	2	600	0.001	0.4	1	0.1	0.087	55.6	95	0.011	0.24	99
EMAS1	EMAS1	1.0022	0.1	0.07	2	600	0.001	0.4	99	0.1	0.03	90	61	0.0197	0.11	1
EMA1B	EMA1B	0.99031	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMACU	EMACU - SANKEY ROAD SHEDS	1.6713	0.1	0.07	2	600	0.002	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA2	EMA2	0.54344	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA3I	EMA3I	0.02219	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.8	150	0.01	0.24	99
EMA3H	EMA3H	0.03328	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.8	150	0.01	0.24	99
EMA3G	EMA3G	0.05125	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.8	150	0.01	0.24	99
EMA3E	EMA3E	0.04313	0.1	0.07	2	200	0.005	0.4	45	0.1	0.0755	21.8	150	0.01	0.24	55
EMA3D	EMA3D	0.02734	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMA3C	EMA3C	0.02922	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMA3B	EMA3B	0.00969	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMA3A	EMA3A	0.64422	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMB4	EMB4	0.00625	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMB3	EMB3	0.06203	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	150	0.01	0.24	99
EMB2	EMB2	0.07047	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	150	0.01	0.24	99
EMB1	EMB1	0.08688	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC17	EMC17 115.2	0.18	0.1	0.09	2	600	0.001	0.4	20.5	0.1	0.087	53.1	97	0.0106	0.24	79.5
EMC1Z2	EMC1Z2 112.36	0.17556	0.1	0.07	2	600	0.001	0.4	6.4	0.1	0.087	64.3	86	0.0128	0.24	93.6
EMC1Y1	EMC1Y1 119.81	0.1872	0.1	0.09	2	600	0.001	0.4	18	0.1	0.087	65.3	85	0.013	0.24	82
EMC1W	EMC1W	0.01859	0.1	0.07	2	200	0.005	0.4	100							
EMC1V	EMC1V	0.03547	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1U	EMC1U	0.01594	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1T	EMC1T	0.02391	0.1	0.08	15	150	0.01	0.24	100							
EMC1L2	EMC1L2	0.01516	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1R	EMC1R	0.04875	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC1Q	EMC1Q	0.02844	0.1	0.08	15	150	0.01	0.24	100							
EMC1P	EMC1P	0.11313	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC1O	EMC1O	0.02188	0.1	0.08	15	150	0.01	0.24	100							
EMC1S	EMC1S	0.02234	0.1	0.08	15	100	0.01	0.24	100							
EMC1N	EMC1N	0.01359	0.1	0.08	15	150	0.01	0.24	100							
EMC1M	EMC1M	0.02313	0.1	0.08	15	150	0.01	0.24	100							
EMC1L1	EMC1L1	0.02422	0.1	0.08	15	150	0.01	0.24	100							
EMC1K	EMC1K	0.01531	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1J	EMC1J	0.00938	0.1	0.08	15	150	0.01	0.24	100							
EMC1G	EMC1G	0.02062	0.1	0.07	2	200	0.005	0.4	41.62	0.1	0.08	15	150	0.01	0.24	58.38
EMC1H	EMC1H	0.05969	0.1	0.08	15	150	0.01	0.24	100							
EMC1F	EMC1F	0.04498	0.1	0.09	2	600	0.001	0.4	6	0.1	0.09	40.1	130	0.01	0.24	94
EMC1D	EMC1D	0.02284	0.1	0.07	2	200	0.005	0.4	100							
EMC1C	EMC1C	0.02504	0.1	0.07	2	200	0.005	0.4	100							
EMC1B	EMC1B	0.04268	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMC15	EMC15 120ac	0.13681	0.1	0.09	2	600	0.001	0.4	15	0.1	0.081	68.5	82	0.0136	0.24	85
EMC12A	EMC12A 95.99	0.14998	0.1	0.09	2	200	0.005	0.4	61.7	0.1	0.087	51.6	99	0.0102	0.24	38.3
EMC10B	EMC10B 13.4ac	0.02098	0.1	0.09	2	600	0.001	0.4	100							
EMC10	EMC10 13.8ac	0.02156	0.1	0.09	2	600	0.001	0.4	100							
EMC9	EMC9 45ac	0.07062	0.1	0.09	2	600	0.001	0.4	55.6	0.1	0.088	53.5	97	0.0106	0.24	44.4
EMC8B	EMC8B 93.05	0.14628	0.1	0.09	2	600	0.001	0.4	48.2	0.1	0.088	50.1	100	0.01	0.24	51.8
EMC8A	EMC8A 8.74	0.01366	0.1	0.07	2	200	0.005	0.4	100							
EMC8	EMC8	0.03289	0.1	0.09	2	600	0.001	0.4	15.3	0.1	0.087	50.6	100	0.01	0.24	84.7
EMC7	EMC7 23.76	0.03713	0.1	0.09	2	600	0.001	0.4	46.6	0.1	0.088	45.3	115	0.01	0.24	53.4

TABLE IIB3 – Post Project Hydrologic Factors (Cont)

			Non-Improved Plane							Improved Plane						
		SHED	Initial	Constant		Overland			% of	Initial	Constant		Overland			% of
SHED	DESCRIPTION	AREA (mi^2)	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed
EMC5B	EMC5B 15.06	0.02353	0.1	0.09	2	600	0.001	0.4	43.9	0.1	0.09	50	103	0.01	0.24	56.1
EMC5A	EMC5A 28.46	0.04447	0.1	0.09	2	600	0.001	0.4	99	0.1	0.09	50	103	0.01	0.24	1
EMC4E	EMC4E 10.27	0.01604	0.1	0.09	2	600	0.001	0.4	20.4	0.1	0.09	40	132	0.01	0.24	79.6
EMC4D	EMC4D 47.4	0.07405	0.1	0.09	2	600	0.001	0.4	7.1	0.1	0.09	40	130	0.01	0.24	92.9
EMC4C	EMC4C 3.99	0.00624	0.1	0.07	2	200	0.005	0.4	75	0.1	0.03	90	50	0.02	0.11	25
EMC4B	EMC4B 4.43	0.00692	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC4A	EMC4A 22.22	0.03472	0.1	0.09	2	600	0.001	0.4	56.3	0.1	0.085	53.6	97	0.0106	0.24	43.7
EMC3	EMC3	0.05743	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC2A	EMC2A 16.12	0.02519	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC2	EMC2 44.77	0.06995	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC1A	EMC1A	0.13	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMD10	EMD10 12.78	0.01996	0.1	0.07	2	600	0.001	0.4	1	0.1	0.09	40	150	0.01	0.24	99
EMD9	EMD9 23.86	0.03728	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD8	EMD8	0.05902	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD6A	EMD6A 23.36	0.0365	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD6B	EMD6B 48.11	0.07518	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD5	EMD5 25.26	0.03947	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD4	EMD4 15.75	0.02462	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD3	EMD3 47.68	0.0745	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD2	EMD2 105.98	0.16559	0.1	0.07	2	200	0.005	0.4	78	0.1	0.0755	21.82	150	0.01	0.24	22
EMD1	EMD1 150.08	0.2345	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	2	150	0.01	0.24	2
EME5	EME5	0.02781	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	50	0.01	0.24	99
EME4	EME4	0.05281	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	50	0.01	0.24	99
EME3	EME3	0.04719	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	50	0.01	0.24	99
EME2	EME2	0.08438	0.1	0.07	2	200	0.005	0.4	98	0.1	0.08	90	50	0.01	0.24	2
EME1	EME1	0.04156	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.01	0.24	2
MFN12K	EMFN12K 165.43	0.25854	0.1	0.093	2	600	0.001	0.4	12.4	0.1	0.088	55.5	95	0.011	0.24	87.6
MFN12F	EMFN12F 76.07	0.11886	0.1	0.09	2	600	0.001	0.4	7.2	0.1	0.088	54.1	96	0.0108	0.24	92.8
MFN12C	EMFN12C 40.36	0.06307	0.1	0.09	2	600	0.001	0.4	11.2	0.1	0.087	65.2	85	0.013	0.24	88.8
EMFN17	EMFN17 28.23	0.0441	0.1	0.09	2	600	0.001	0.4	14	0.1	0.089	52.9	98	0.0104	0.24	86
MFN13A	EMFN13A 175.87	0.2748	0.1	0.09	2	600	0.001	0.4	8	0.1	0.086	63.6	87	0.0126	0.24	92
EMFN11	EMFN11 135.55	0.2118	0.1	0.09	2	600	0.001	0.4	9.4	0.1	0.086	57.3	93	0.0114	0.24	90.6
EMFN8	EMFN8 53.73	0.08396	0.1	0.09	2	600	0.001	0.4	25.3	0.1	0.086	58	92	0.0116	0.24	74.7
EMFN9	EMFN9 16.1	0.02514	0.1	0.09	2	600	0.001	0.4	71.9	0.1	0.081	78.2	72	0.016	0.24	28.1
EMFN10	EMFN10 71.32	0.11144	0.1	0.09	2	600	0.001	0.4	6.4	0.1	0.087	53.3	97	0.0106	0.24	93.6
EMFN6	EMFN6 80.49	0.12577	0.1	0.09	2	600	0.001	0.4	39.9	0.1	0.086	51.7	99	0.0102	0.24	60.1
EMFN5	EMFN5 14.52	0.02269	0.1	0.07	2	200	0.005	0.4	100							
EMFN4	EMFN4 9.66	0.01509	0.1	0.07	2	200	0.005	0.4	100							
EMFN3B	EMFN3B 20.25	0.03167	0.1	0.09	2	200	0.005	0.4	1	0.1	0.09	40	130	0.01	0.24	99
EMFN3A	EMFN3A	0.03289	0.1	0.09	2	600	0.001	0.4	1	0.1	0.087	56.3	94	0.0112	0.24	99
EMFN2A	EMFN2A 14.43	0.02255	0.1	0.09	2	200	0.005	0.4	99	0.1	0.09	40	132	0.01	0.24	1
EMFN1	EMFN1 19.42	0.03034	0.1	0.07	2	200	0.005	0.4	43.9	0.1	0.09	40	132	0.01	0.24	56.1
EMFS8D	EMFS8D 87.32	0.13644	0.1	0.187	2	600	0.001	0.4	30.6	0.1	0.116	52	99	0.0102	0.24	69.4
EMFS8C	EMFS8C 122.17	0.19089	0.1	0.09	2	600	0.001	0.4	20.6	0.1	0.095	56.2	94	0.0112	0.24	79.4
MFS10B	EMFS10B 64.68	0.10105	0.1	0.101	2	600	0.001	0.4	17	0.1	0.1	40.8	130	0.01	0.24	83
EMFS8A	EMFS8A 44.45	0.06946	0.1	0.09	2	600	0.001	0.4	42.3	0.1	0.085	59.7	91	0.0118	0.24	57.7
EMFS7A	EMFS7A 57.31	0.08954	0.1	0.09	2	600	0.001	0.4	37.9	0.1	0.085	60	91	0.0118	0.24	62.1
EMFS11	EMFS11	0.0176	0.1	0.07	2	200	0.005	0.4	100							
EMFS10	EMFS10	0.03339	0.1	0.07	2	200	0.005	0.4	100							
EMFS6	EMFS6+ 19.66	0.03072	0.1	0.09	2	600	0.001	0.4	49	0.1	0.09	40	130	0.01	0.24	51
EMFS5A	EMFS5A 6.50	0.01016	0.1	0.07	2	200	0.005	0.4	100							
EMFS4E	EMFS4E 81.53	0.12738	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMFN7A	EMFN7A 42.39	0.06624	0.1	0.09	2	600	0.001	0.4	21.4	0.1	0.089	42.9	124	0.01	0.24	78.6
EMFN7B	EMFN7B 7.29	0.01138	0.1	0.09	2	600	0.001	0.4	95.2	0.1	0.07	90	61	0.0197	0.11	4.8
EMFS3	EMFS3	0.20393	0.1	0.07	2	200	0.005	0.4	100							
EMFS2	EMFS2	0.0375	0.1	0.07	2	200	0.005	0.4	100							
EMFS1	EMFS1	0.06486	0.1	0.07	2	200	0.005	0.4	51.82	0.1	0.08	15	100	0.01	0.24	48.18
EMF7	EMF7	0.11752	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	100	0.01	0.24	99
EMF6	EMF6	0.09875	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF6C	EMF6C	0.03228	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF6B	EMF6B	0.09444	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF6A	EMF6A	0.02003	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF5A	EMF5A	0.11984	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF4A	EMF4A	0.02691	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF4B	EMF4B	0.09488	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF3B	EMF3B	0.07762	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF3A	EMF3A	0.12016	0.1	0.07	2	300	0.005	0.4	1	0.1	0.0775	18.75	100	0.01	0.24	99
EMF2	EMF2	0.20328	0.1	0.07	2	300	0.005	0.4	100							
EMF1	EMF1	0.06515	0.1	0.07	2	300	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
MGS22B	EMGS22B	0.09078	0.1	0.0763	2	200	0.005	0.24	95	0.1	0.03	90	50	0.02	0.11	5
MGS22A	EMGS22A	0.15441	0.1	0.0763	2	200	0.005	0.24	95	0.1	0.03	90	50	0.02	0.11	5
EMGS21	EMGS21	0.12405	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS20	EMGS20	0.09625	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS19	EMGS19	0.13288	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS18	EMGS18	0.04078	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS17	EMGS17	0.07639	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS16	EMGS16	0.20625	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS15	EMGS15	0.13197	0.1	0.0741	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS14	EMGS14	0.06528	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
MGS13B	EMGS13B	0.01242	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
MGS13A	EMGS13A	0.2123	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
MGS12B	EMGS12B	0.02278	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
MGS12A	EMGS12A	0.16186	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS11	EMGS11	0.0558	0.1	0.0704	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN4	EMGN4A SOUTH 20.4	0.03191	0.1	0.09	2	600	0.001	0.4	23	0.1	0.09	40	132	0.01	0.24	77
EMGN4	EMGN4A SOUTH 20.4	0.03191	0.1	0.09	2	600	0.001	0.4	23	0.1	0.09	40	132	0.01	0.24	77
EMGN3	EMGN3	0.13995	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN2D	EMGN2D	0.04063	0.1	0.074	2	200	0.005	0.24	100							
EMGN2C	EMGN2C	0.01691	0.1	0.074	2	200	0.005	0.24	100							
EMGN2B	EMGN2B	0.01966	0.1	0.074	2	200	0.005	0.24	100							
EMGN2E	EMGN2E	0.05938	0.1	0.074	2	200	0.005	0.24	100							
EMGN2A	EMGN2A	0.12392	0.1	0.073	2	200	0.005	0.24	100							
EMGN1F	EMGN1F	0.05105	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1E	EMGN1E	0.03023	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1D	EMGN1D	0.17969	0.1	0.0802	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1H	EMGN1H	0.05595	0.1	0.074	2	200	0.005	0.24	100							
EMGN1G	EMGN1G	0.06734	0.1	0.073	2	200	0.005	0.24	100							
EMGN1J	EMGN1J	0.03997	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1K	EMGN1K	0.06234	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1L	EMGN1L	0.03108	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1I	EMGN1I	0.37828	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1C	EMGN1C	0.09906	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1B	EMGN1B	0.33188	0.1	0.07	2	200	0.005	0.24	100							
EMGN1A	EMGN1A	0.06797	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2

Exhibit SH-2 shows the shed boundaries for the post-project analysis. With the updated analysis for the November 2013 submittal, the inclusion of a Hydraulic Routing model, means that the post project routing conditions are inherently included in all post project conditions analysis. This makes it non-feasible to provide a unmitigated analysis for the post-proejct conditions that would be comparable to the other scenarios, as the routing characteristics cannot be easily removed from the model.

The input PDP file for the post-project mitigated solution is provided in Appendix B.

II.C Post-Project Mitigated Model:

A Post-project Mitigated model was developed to represent the post-project hydrologic conditions of the Placer Vineyards project development area. The mitigated model includes attenuation parameters for the proposed detention facilities, proposed water quality facilities, proposed lakes and proposed wetland areas. The Base HEC-1 PDP input file is included in Appendix B.

Attenuation for mitigation of peak flow rate increases is provided within the project at proposed attenuation and lake storage locations. Storage and flow rate values determined in the HEC-RAS unsteady state hydraulic routing analysis. At the proposed detention and water quality facilities inflow/outflow/storage rating curve information was developed from the proposed grading parameters and design outflow pipe sizes. The estimated peak flow rates for the post-project conditions are shown in TABLES IIC1a and IIC1b.

TABLE IIC2 demonstrates that the mitigation objectives per section VII of the Stormwater Management Manual are achieved downstream of the project contribution areas.

Each phase of the development will be required, at a minimum, to mitigate the volumetric impacts of that phase at the time of development. Mitigation beyond a phase's individual impacts may be required by the County in order to construct, or complete construction, of Permanent Drainage Facilities per the requirements of the Development Agreement.

TABLE IIC1a - ESTIMATED POST-PROJECT MITIGATED PEAK FLOW RATES

Placer Vineyards - Key System Points Flow Summary
Post-Project - NOVEMBER 2013

Description	RAS STA (RM)	DA (mi^2)	Annual (cfs)	1-year (cfs)	2-year (cfs)	10-year (cfs)	100-year (cfs)	200-year (cfs)	500-year (cfs)
Upstream of Project on Curry Creek	1.25	0.99	23.3	46.59	66.56	175.42	356.61	412.69	494.71
Baseline Road Crossing	1.22	1.16	23.26	46.57	66.51	175.22	349.5	401.89	475.95
Downstream of CUS11 Flow Addition Onsite	1.16	1.25	23.81	47.56	66.9	166.38	320.89	370.52	441.87
Intermediate Point of Onsite Curry Creek	1.12	1.59	22.52	47.37	66.2	161.53	303.15	346.2	407.32
At Connection from North	1.08	1.7	25.32	52.48	74.03	192.33	351.96	398.04	460.13
At Culvert Discharge from Site	1.03	1.93	26.9	55.61	79.02	203.65	346.8	409.58	468.86
Downstream of Baseline Road	1.01	2.17	26.9	55.6	79.02	203.65	364.76	409.57	468.83
EMA Shed	18.8	0.15	15.35	30.71	43.87	97.34	191.65	224.99	276.74
EMA Shed	18.7	0.15	15.04	30.17	43.21	92.84	178.87	207.35	253.45
EMA Shed - Project Exit	18.4	0.18	34.58	66.43	85.35	90	94.11	107.62	128.83
Section 2.79	2.79	0.07	6.67	13.33	19.04	41.81	82.04	94.49	114.53
Upstream of Culvert	2.76	0.08	15.76	15.85	19.02	30.3	45.55	49.23	55.97
Channel Junction	2.75	0.1	15.76	15.85	19.02	30.3	45.55	49.23	55.97
Culvert	2.7	0.17	19.63	23.41	26.18	35.2	60.23	69.43	82.42
Culvert	2.65	0.26	24.24	29.46	32.91	42.1	56.1	60.52	66.88
Culvert	2.61	0.31	25.2	32.04	38.23	55.45	78.96	87.46	100.52
Culvert	2.59	0.31	24.73	30.74	34.82	44.33	58.42	62.41	68.1
WATT AVE Culvert Crossing North Branch	2.54	0.4	29.52	40.69	49.12	67.86	86.5	91.11	97.41
Culvert	2.44	0.47	33.74	50.78	53.64	89.46	156.57	174.56	209.2
Channel Junction	3.05	0.22	3.2165	6.433	9.19	19.17	38.36	44.57	54.03
Channel Junction	3.02	0.22	2.289	4.578	6.54	12.01	23.49	27.39	34.02
At Confluence	2.43	0.72	18.3575	36.715	52.45	105.7	205.07	233.33	282.34
Culvert	2.39	0.72	20.2895	40.579	57.97	107.56	169.53	182.44	199.64
Channel Junction	2.37	0.91	21.0595	42.119	60.17	110.6	174.86	188.38	206.59
Culvert	2.33	1.08	21.721	43.442	62.06	113.34	180.67	195.25	212.57
Route Through possible Lake area	2.21	1.34	22.9915	45.983	65.69	113.89	165.94	179.21	197.98
Culvert	2.2	1.49	22.001	44.002	62.86	99.46	130.44	137.95	145.58
Culvert	2.16	1.57	38.68	58.68	60.2	90.83	120.73	127.69	135.84
Lake Area and Roadway Crossing	2.11	1.73	33.52	47.95	54.13	82.71	117.98	126.29	136.65
Baseline Road - Flows Leaving Site	2.04	1.9	35.16	49.5	55.54	85.57	123.61	132.1	143.98
Downstream of Project and Culvert	2.00	1.97	35.76	50.1	63.09	99.2	154.72	168.12	185.54
EMAS1 - Downstream	N/A	2.97	15.05	30.1	43	127	272	319	389
EMGN Exit Flows to South	N/A	0.04	2.8	5.6	8	16	31	35	43
EMFS Upstream Point near Dyer Lane - Existing Swale	3.29	0.35	3.101	6.202	8.86	10.64	13.28	14.79	18.32
EMFS Upstream Point near Dyer Lane - Flood Channel	3.29	0.35	34.06	68.11	97.3	217.11	415.9	475.85	576.93
Combination of EMF8E - Upstream Pond Exist Swale	3.21	0.38	5.48	6.41	7.36	8.65	9.81	10.21	11.01
Combination of EMF8E - Upstream Pond Flood Channel	3.21	0.38	14.87	46.32	72.44	164.7	330.36	376.31	440.01
Combination of 8C - Existing Swale	3.18	0.38	2.982	5.964	8.52	8.97	10.94	12.06	14.23
Combination of 8C - Flood Channel	3.18	0.38	12.48	38.89	61.81	140.42	277.96	312.33	375.18
Second Ex. Pond Location - Existing Swale	3.13	0.41	7.31	9.32	14.2	28.41	53	60.65	76.99
Second Ex. Pond Location - Flood Channel	3.13	0.41	11.62	35.36	55.6	123.81	241.8	271.02	331.62
Comb of S7 - Existing Swale	3.08	0.53	5.67	10.33	14.08	19.14	21.08	21.45	22.44
Comb of S7 - Flood Channel	3.08	0.53	12.91	36.61	55.64	136.56	278.75	302.26	330.59
S7R	3.04	0.63	9.15	18.64	25.55	33.3	41.45	43.3	45.99
Project Boundary	3.02	0.67	10.87	21.39	30.57	65.45	112.03	146.48	174.78
South Channel	4.06	0.1	0.53	1.06	1.51	5.16	12.26	14.53	18.03
Channel Point	4.02	0.1	2.373	4.746	6.78	6.78	10.47	11.75	13.97
Upstream of Roadway Crossing	11.3	0.07	0.15	0.29	0.42	1.18	2.8	3.31	4.1

TABLE IIC1b - ESTIMATED POST-PROJECT MITIGATED PEAK FLOW RATES

Placer Vineyards - Key System Points Flow Summary
Post-Project - NOVEMBER 2013

Description	RAS STA (RM)	DA (mi^2)	Annual (cfs)	1-year (cfs)	2-year (cfs)	10-year (cfs)	100-year (cfs)	200-year (cfs)	500-year (cfs)
Flow Leaving Site at EMFS	10.13	0.02	0.595	1.19	1.7	2.3	2.74	3.32	4.21
EMFS Combined with Southern Tributary	10.1	0.67	14.658	23.42	41.88	87.27	162.57	185.09	227.89
EMFS3- Downstream of all added Development	10.09	0.79	13.5625	20.18	38.75	85.21	152.46	174.3	213.99
MFS2 Routing	10.07	1	15.351	18.61	43.86	95.82	165.72	187.08	232.97
FS1R	10.02	1.1	5.628	11.73	16.08	24.41	33.07	35.03	37.46
Upstream end of the Channel	5.5	0.5	61.8205	123.641	176.63	375.6	760.06	881.76	1052.3
Future Road Crossing at School	5.4	0.5	80.353	160.706	229.58	469.43	833.7	909.86	1022.18
Planned Roadway Crossing	5.31	0.58	72.6775	145.355	207.65	407.69	665	717.69	757.76
Culvert	5.26	1.01	79.205	158.41	226.3	423.58	683.34	759.07	813.26
Culvert to Existing Swale	5.22	1.04	2.604	5.208	7.44	9.6	26.04	31.93	58.7
Culvert to Flood Channel	5.23	1.04	78.5995	157.199	224.57	422.82	669.3	736.81	776.8
Roadway Crossing - Existing Swale	5.19	1.18	2.59	5.18	7.4	27.19	41.88	44.26	46.74
Roadway Crossing - Flood Channel	5.19	1.18	66.248	132.496	189.28	325.47	442.42	476.01	570.85
Site Discharge	5.11	1.52	19.4775	38.955	55.65	97.1	309.74	354.08	418.11
Downstream Project Boundary	5.096	1.52	23.177	46.354	66.22	94.51	294.1	337.91	403.77
Downstream of Project Areas	5.04	2.68	21.2625	42.525	60.75	80.64	187.82	238.44	315.69
EMD7	12.13	0.18	24.18	48.356	69.08	153.51	296.65	346.25	428.53
EMD5CC	12.08	0.27	22.82	49.021	70.03	131.67	231.26	271.45	326.61
EMD4	12.03	0.3	22.8	49.847	71.21	131.77	226.84	260.88	318.7
EMD Project Exit	12.01	0.37	25.75	57.624	82.32	150.71	257.02	298.59	361.35
EMC1W	25.4	0.23	6.9125	13.825	19.75	42.12	83.36	95.16	117.55
EMC1WR	25.367	0.02	3.5735	7.147	10.21	11.09	14.41	14.73	14.98
EMC1T	25.24	0.09	4.606	9.212	13.16	26.6	47.56	54.45	65.29
EMC1S	23.9	0.02	2.3695	4.739	6.77	14.12	26.99	30.35	37.65
EMC1O	22.2	0.14	11.5115	23.023	32.89	74.44	142.98	164.97	200.58
EMC1M	23.05	0.22	16.69	19.117	27.31	91.87	182.2	202.52	227.63
MC1L1R	23.02	0.25	13.09	19.551	27.93	83.09	187.88	209.88	237.98
C1L1CC	25.21	0.35	9.023	18.046	25.78	93.42	204.41	227.17	253.33
MC1IR	25.19	0.39	8.54	17.08	24.4	53.66	90.31	101.81	119.76
EMC1H	25.17	0.45	8.54	17.08	24.4	53.66	90.31	101.81	119.76
MC1ER	25.07	0.53	11.011	22.022	31.46	59.51	100.67	111.35	131.84
MC1FCC	25.03	0.53	11.2525	22.505	32.15	59.37	105.72	116.96	137.56
Open Space Area	15.35	0.78	29.8655	59.731	85.33	200.2	383.29	445.22	532.47
Open Space Area - Existing Swale	15.31	0.89	4.3645	8.729	12.47	21.13	32.68	35.93	40.69
Open Space Area - Flood Channel	15.31	0.89	64.386	128.772	183.96	381.59	726.27	817.92	979.57
MC8AR - Existing Swale	15.23	0.94	5.9115	11.823	16.89	30.22	58.4	76.35	99.96
MC8AR - Flood Channel	15.23	0.94	36.568	73.136	104.48	145.54	173.81	177.07	180.66
EMC5D - Existing Swale	15.19	1.14	5.887	11.774	16.82	30.03	58.35	76.03	99.65
EMC5D - Flood Channel	15.19	1.14	35.217	70.434	100.62	131.48	150.03	154.23	159.34
EMC5A @ Roadway Crossing - Existing Swale	15.15	1.25	10.059	20.118	28.74	35.31	134.07	157.68	189.61
EMC5A @ Roadway Crossing - Flood Channel	15.15	1.25	17.7485	35.497	50.71	74.49	103.61	104.36	106.66
MC4AR - Existing Swale	15.12	1.38	9.6775	19.355	27.65	35.29	149.75	177.43	214.58
MC4AR - Flood Channel	15.12	1.38	10.5035	21.007	30.01	66.45	97.6	100	102.17
MC3R	15.05	1.44	17.451	34.902	49.86	101.01	252.03	284.27	326.3
EMC2	15.04	1.5	15.1445	30.289	43.27	100.99	249.28	279.6	316.01
ALL EMC Combined - Downstream of Project	15	2.23	12.992	25.984	37.12	102.6	251.02	268.96	291.04
EMC4D	14.6	0.09	6.01	12.02	17.18	39.07	76.71	88.63	109.81
EMA3A		0.86	39.2	78.4	112	251	481	550	669
EMB1		0.23	5.25	10.5	15	35	69	79	97
DRY CREEK									
Dry Creek Upstream of Walerga Avenue	50055		567.98	1135.96	1622.8	4822.9	12535.1	14789.8	19133.4
Doyle Tributary at Walerga	1.09		8.75	17.5	25	97	413	542	875
Doyle Tributary at Downstream End	1.29		10.15	20.3	29	114	466	606	958
DC75A Shed	0.38		5.6	11.2	16	71	170	200	247
DC75C Shed	0.31		15.75	31.5	45	134	279	321	391
Dry Creek at Watt Avenue	47754		568.3265	1136.653	1623.79	4776.1	12508.9	14777.5	19099.9
DC76A Shed	0.39		22.05	44.1	63	144	292	336	414
Southern Sheds At Project Boundary (detention outlet)	0.18		0.7	1.4	2	5	19	23	29
Inflow to Gibson Lake	0.44		3.85	7.7	11	40	96	115	143
Outflow to Dry Creek	0.44		3.15	6.3	9	30	81	99	125
Dry Creek Downstream of Project	39008		582.5505	1165.101	1664.43	4805	12572.2	14884.8	19170.9

TABLE IIC2 – DOWNSTREAM MITIGATION FLOWS

				2-YEAR EVENT			10-YEAR EVENT			100-YEAR EVENT			200-YEAR EVENT		
Description	**RAS STA (RM)**	**PRE DA (mi^2)**	**POST DA (mi^2)**	**PRE Qp (cfs)**	**POST Qp (cfs)**	**Diff Qp (cfs)**	**PRE Qp (cfs)**	**POST Qp (cfs)**	**Diff Qp (cfs)**	**PRE Qp (cfs)**	**POST Qp (cfs)**	**Diff Qp (cfs)**	**PRE Qp (cfs)**	**POST Qp (cfs)**	**Diff Qp (cfs)**
Curry Creek Enters Project at Baseline Road (*)	1.22	1.23	1.16	63.06	66.51	3.45	170.84	175.22	4.38	317.39	349.5	32.11	355.26	401.89	46.63
Curry Creek Leaves Project at Baseline Road	1.03	1.78	1.93	81.77	79.02	-2.75	228.49	203.65	-24.84	387.12	346.8	-40.32	472.36	409.58	-62.78
Curry Creek downstream, other areas add	1.01	2	2.17	81.75	79.02	-2.73	227.17	203.65	-23.52	386.98	364.76	-22.22	472.33	409.57	-62.76
EMA Triubutary Leaves Site	18.4	0.18	0.18	88.03	85.35	-2.68	92	90	-2	94.32	94.11	-0.21	107.9	107.62	-0.28
EMAS Tributary - Exits project at Baseline Road	2.04	1.74	1.9	59.45	55.54	-3.91	95.16	85.57	-9.59	146.96	123.61	-23.35	155.71	132.1	-23.61
EMAS Tributary - Downstream of Baseline Road	2	2.86	2.97	249	43	-206	496	127	-369	496	272	-224	1006	319	-687
EMCN - Mostly Offsite shed leaves east boundary	25.04	0.78	0.53	43.96	32.15	-11.81	81.6	59.37	-22.23	129.76	105.72	-24.04	138.99	116.96	-22.03
EMCS - ONSITE Shed nears Exit at Eastern Boundary	15.12	1.16	1.38	55.93	57.66	1.73	97.54	101.74	4.2	262.24	247.35	-14.89	321.92	277.43	-44.49
EMCS - Offsite - Shed downstream of Eastern Bndy	15.05	1.21	1.44	56.4	49.86	-6.54	96.76	101.01	4.25	256.36	252.03	-4.33	317.74	284.27	-33.47
EMD - Downstream of project	12.08	0.26	0.27	69.25	70.03	0.78	133.54	131.67	-1.87	231.35	231.26	-0.09	262.53	271.45	8.92
EMFNC - At Project Boundary	5.13	1.29	1.52	54.63	67.58	12.95	101.13	97.1	-4.03	180.38	126.49	-53.89	203.43	156.5	-46.93
EMFNC - Downstream of Junction of EMFS	5.03	2.54	2.68	66.75	73.11	6.36	89.02	97.79	8.77	218.13	134.56	-83.57	251.69	144.31	-107.38
EMFS - Downstream of Project Boundary	10.09	0.77	0.79	66.31	38.75	-27.56	122.73	85.21	-37.52	231.27	152.46	-78.81	266.09	174.3	-91.79
EMFSS - Downstream of Project boundary	3.02	0.54	0.67	20.51	25.54	5.03	36.42	33.3	-3.12	42.64	41.45	-1.19	43.8	43.3	-0.5
Doyle Tributary at Discharge to Dry Creek				30	29	-1	119	114	-5	478	466	-12	616	606	-10
Dry Creek at Watt Avenue				1675.7	1623.79	-51.91	4798.4	4776.1	-22.3	12568.3	12508.9	-59.4	14871.6	14777.5	-94.1
Discharge to Gibson Ranch				16	11	-5	71	40	-31	157	96	-61	184	115	-69
Dry Creek Downstream of Project				1678.7	1664.43	-14.27	4798	4805	7	12567.8	12572.2	4.4	14880.9	14884.8	3.9

- ORANGE Roadway improvements at Baseline Road increase flows entering site - This is satisfactory, as it only impacts the project aras with increased flows.
- RED: Some Items don't meet the mitigation requirements so that in the 100-year event, the mitigation requirements can be met. Note, for the events less than the 100-year where this occurs, factoring the proposed LID imp as shown in the Hydromod comparison.
- GREEN comparison Items meet mitigation requirements
- Dry Creek Watershed Plan Update (PCFCWCD) does not require mitigation - detention is provided for areas draining through Gibson Ranch

II.D Future Fully Developed Unmitigated Model:

A Post-project model was developed to represent the post-project hydrologic conditions of the Placer Vineyards project development area, which includes the offsite fully developed and unmitigated conditions for all upstream areas. This analysis is used in the final hydraulics analysis as a special case "what if" scenario for verifying that these flow rates can pass through the project without resulting in damages within the project areas. The Offsite Unmitigated model includes attenuation parameters for the proposed detention facilities, proposed water quality facilities, proposed lakes and proposed wetland areas. The Base HEC-1 PDP input file is included in Appendix B.

The estimated peak flow rates for the post-project conditions are shown in TABLES IID1a and IID1b.

TABLE IID1a - ESTIMATED POST-PROJECT OFFSITE UNMITIGATED PEAK FLOW RATES

TABLE IID1b - ESTIMATED POST-PROJECT OFSITE UNMITIGATED PEAK FLOW RATES

II.E Proposed Attenuation at Curry Creek Tributaries:

The Placer Vineyards project proposes the use of several types of facilities to provide attenuation in reducing peak flow discharges from the project site area. The main method of providing detention attenuation will be through the use of existing swales and excavated flood control channel detention facilities upstream of regulating culvert facilities.

Other types of attenuation facilities proposed with the project include excavated lake areas, constructed wetland areas, and water quality basins and channels.

TABLE IIE1 details the concepts for attenuation facilities at Curry Creek and itemizes the factors which were applied to the "mitigated" hydrology analysis. The results of the mitigated analysis show flow reductions as a result of the proposed attenuation facilities. The Culvert and Weir dimensions are detailed on the AT-1A and AT-1B exhibit.

At the midway point of the Curry Creek tributary within the project(station 1.158), a detention weir is proposed to hold back and attenuate the flows passing through the project after combining with the project flows. This weir provides both detention and hydromod functions.

TABLE IIE1 - PROPOSED ATTENUATION FACILITY SUMMARY DATA (Retention full Scenario)

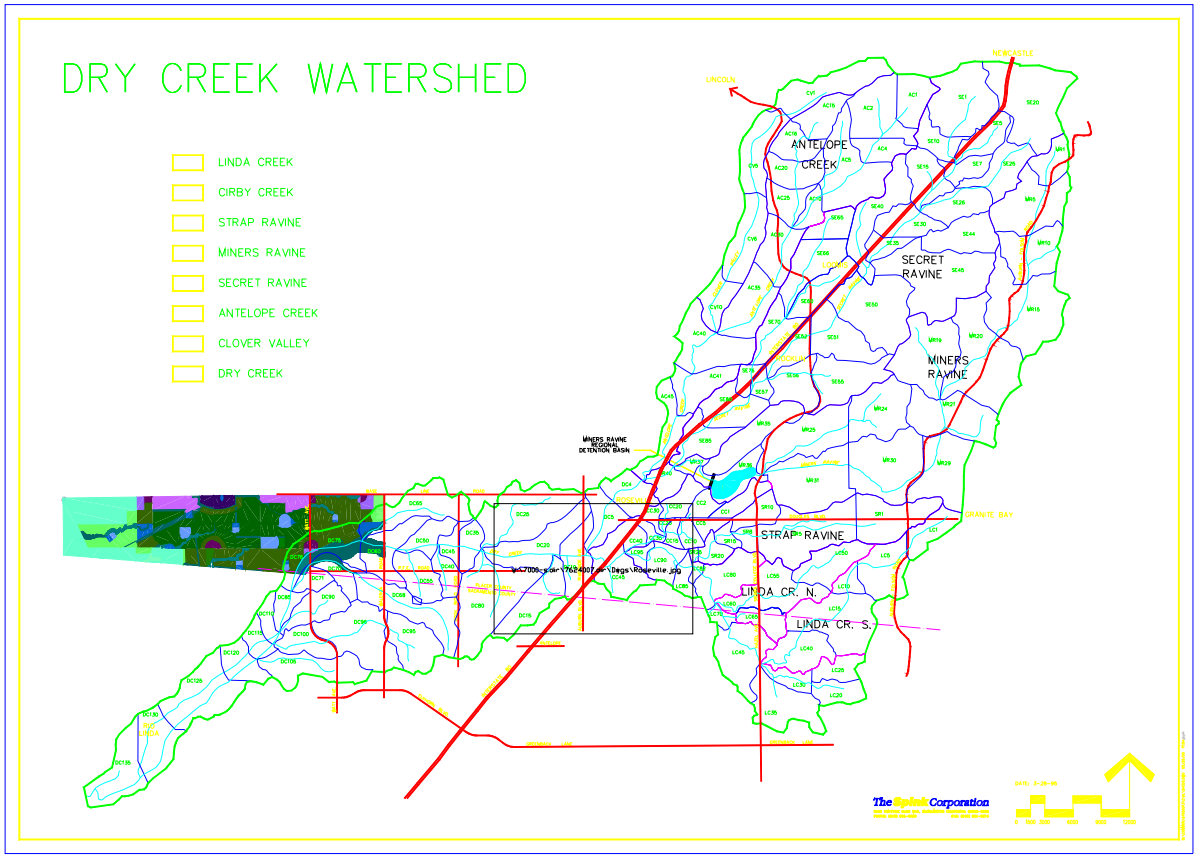
Detention Location - Watershed	Type of Facility	Discharge Control By:	Estimated 100-year Peak Storage
CUS6D – Curry Creek Offsite	Existing Channel Routing upstream of Culvert at Baseline Road	Reconstructed Culvert at Baseline Road and Roadway Embankment	23 AF (slightly less than existing at offsite)
Y - 6CCR – Curry Creek upstream of 1.158 inline weir	Existing Channel routing downstream of Baseline Road Crossing + Overbank Excavation	Backwater	DET=28 AF HMOD=4.1 AF
N - 11CCR – Curry Creek	Existing + Overbank Inline Channel Routing	Proposed Culvert	DET=18.7 AF HMOD=3.4 AF
J - CUS16D – Curry Creek	Existing floodplain routing areas	Reconstructed Culvert at Baseline Road	DET=17 AF HMOD=4.2 AF

II.F Proposed Attenuation at Dry Creek Tributaries:

Hydrologic Impacts at Dry Creek were evaluated with the updated analysis provided with the Dry Creek Watershed Plan Update (2011-CESI). Hydraulic Routing was used for Dry Creek, and PULS routing was used for elements in the tributary watersheds. The 7 mandated storm cetnerings were run to determine the maximum flows which control in Dry Creek at the project location (SE40M and SE40N). An additional storm centering to determine peak flows at local facilities was performed at DC76A. Per the Watershed Plan update, local detention is not required for this project, and peak flows are mitigated through regional facilities. However, the project proposes to provide detention at the discharges which would enter Gibson Ranch, to prevent impacts to this regional facility, and the lake feature within the ranch.

II.F.1 Dry Creek Analysis:

FIGURE IIF1A – DRY CREEK WATERSHEDS



We have performed an analysis of potential impacts to the Dry Creek peak flow rates resulting from this project. We have performed calculations using the base models for the "2010-Current" Conditions and the Future Fully Developed without Mitigation Conditions. We have modified the land uses in these models for the post-project alternatives to be consistent with the proposed plan, and we modified watershed boundaries to match the project determined (from detailed topography) boundaries for the NEMDC and Curry Creek watersheds.

Four hydrology models wer developed: Modified 2010-Current to represent the existing conditions, and pre-project model ("PRE-2010" directory). "POST-PV" contains the 2010-Current model modified for the project's improvements and land uses. The POST-PV_LID incorporates the estimated benefits of the projects plans to use Low Impact Development Measures for stormwater quality and hydrograph modification mitigation purposes. The "FFDU" includes the update Plans Future Fully Developed without Mitigation plan alternative, modified for the projects improvements and land uses. The detention basin proposed within the project upstream of Gibson Ranch is not included in this model.

Figure IIF1A and Exhibits SH-2, AT-1A and AT-1B document the proposed land use areas within the Dry Creek watersheds. The affected watershed are DC65K, DC65I, DC75A, DC75C, DC76A, DC76C. For the post-project model, the imperviousness of DC-65, DC-75 and DC76 were adjusted as shown in tables IIB1, IIB2 and IIB3.

For the 100-year event, the resulting outflows for the dry creek watershed are summarized in TABLES IIC1b and IIC2.

For the Mitigated Analysis a 60 AF detention basin was placed at DC76C upstream of the discharge to the Gibson Ranch property. This basin will be used for both detention and hydrograph modification matching purposes.

II.G Proposed Attenuation at Steelhead Creek Tributaries :

The proposed onsite attenuation facilities and 100-year capacities which are to be built in the tributaries to Steelhead Creek (NEMDC) are shown in Table IIG1 and exhibits AT-1A and AT-1B. Much of the attenuation storage proposed will serve dual use for both peak flow mitigation and hydrograph modification purposes as detailed in Table IIG1.

TABLE IIG1 - PROPOSED ATTENUATION FACILITY SUMMARY DATA

Detention Location – Watershed	Type of Facility	Discharge Control By:	Estimated 100-year Peak Storage
EMA WATERSHED			
S1 - S25E – EMA	Existing + overbank excavated channel routing	Backwater/Culvert (36" pipe)	DET=3AF HMOD=0.2 AF
L1- MAS28R - EMA	Existing + overbank excavated channel routing	Channel Flow	DET=1.4 AF HMOD=0.7 AF
Q - MAS23R – EMA	Existing + overbank excavated channel routing	Channel Flow	DET=1.4 AF HMOD=0.7 AF
T1 - EMA	Existing + overbank excavated channel routing	Channel Flow	DET=4.0 AF HMOD=3.6 AF
OP - EMA	Existing + overbank excavated channel routing	Channel Flow and Downstream Culvert (42" pipe)	DET=7.0 AF HMOD=2.5 AF
UV - MAS21R – EMA	Existing + overbank excavated channel routing	Backwater/Culvert (42" pipe)	DET=7.0 AF HMOD=2.5 AF
D5D - AS21RR – EMA	New excavated channel routing	Backwater and Downstream Culvert (42" pipe)	DET=6.8 AF HMOD=1.8 AF
D5C - S25D – EMA	New Excavated Channel routing	Backwater and Proposed Culvert (48" pipe)	DET=6.1 AF HMOD=1.8 AF
D4D3 - 20CD – EMA	New Excavated Channel	Channel flow and backwater at Proposed Culvert (1/12'wx4.2'h arch)	DET=36.4 AF HMOD=14.8 AF
D3S1 - AS20AR – EMA	Excavated Overbank and existing swale	Channel Flow	DET=6.3 AF HMOD=2.8 AF
D3S3 - AS20AR – EMA	Excavated Overbank and existing swale	Channel Flow	DET=7.4 AF HMOD=1.9 AF
D3H - 20BCR – EMA	Proposed New Excavated Channel	Channel Flow	DET=9.0 AF HMOD=2.4 AF
D3S3 - MAS15R – EMA	Proposed Lake or Meadow	Backwater and Downstream Culvert (2-48" pipe)	LAKE=85 AF DET=65.6 AF HMOD=12.0 AF
D3D2 - MAS13R – EMA	Proposed New Excavated Channel	Channel Flow and Culvert (2-48" pipe)	DET=12.2 AF HMOD=3.7 AF
D3L - MAS12R – EMA	Proposed Lake or Meadow	Proposed Culvert	LAKE=70 AF DET=37.7 AF HMOD=10.0AF
D3F - S12D – EMA	Proposed New Excavated Channel	Channel Flow + Proposed Culvert @ Baseline Road (2-7'wx3.2'h CM Arch) + HMOD/DET Control	DET=29.1 AF HMOD=9.7AF

		Weir at 2.065 = 36”pipe+WEIR @ Elev-70.0	
EMFN WATERSHED			
D2Z2 - FN12RR – EMFN	Proposed New Excavated Channel	Proposed Culvert (2-10’w x 5’h BOX)	DET=8.3 AF HMOD=2.8AF
D2U - FN8BRR – EMFN	Proposed New Excavated Channel	Proposed Culvert (2-10’w x 5’h BOX)	DET=9.5 AF HMOD=4.0AF
D2U1 - FN9RR – EMFN	Proposed New Excavated Channel	Proposed Culvert (2-10’w x 5’h BOX)	DET=14.8 AF HMOD=4.7AF
D2X - FN10CR –EMFN	Proposed New Excavated Channel	Proposed Culvert (2-12’w x 6’h BOX)	DET=23.8 AF HMOD=9.2AF
D2Y - FN8R – EMFN	Existing and Proposed New Excavated Flood Channel	Control Weir 20’@ Elev=58.5 Culvert (2-16’w x 5’h CM Arch + 1-18” pipe)	DET=15.0 AF HMOD=9.0AF
D2R - FN7AR	Existing and Proposed New Excavated Flood Channel	Proposed Culvert (1-16’w x 5’h CM Arch + 1-24” pipe)	DET=23.4 AF HMOD=8.1AF
D2R2 - MFN4CR – EMFN	Existing and Proposed New Excavated Flood Channel	Proposed Detention Weir(24” pipe+42” pipe + 100’ weir elev=58.5)	DET=31.1 AF HMOD=11.0AF
D2S1 - EMFN	Proposed New Excavated Channel	Proposed Culvert (1-30” pipe)	DET=4.2 AF HMOD=2.2AF
EMFS WATERSHED			
D3DL - S9R – EMFS	Existing and Proposed New Excavated Flood Channel	Proposed Culvert (1-24” pipe+1/18” pipe+1-5’w x 1’h box for high flow release)	DET=37.4 AF HMOD=15.0AF
D4DC - EMFS	Proposed New Excavated Channel	Drainage to existing flow path	DET=5.8 AF HMOD=2.4AF
EMC WATERSHED			
D1R - EMC9R – EMC	Existing and Proposed New Excavated Flood Channel	Proposed Culvert (2-7’w x 3.5’h CM Arch)	DET=35.55 AF HMOD=12.0AF
MC8AR – EMC	Existing and Proposed New Excavated Flood Channel	3 – Detention Control Weirs. 30’Weir at El 40.9 with 36” pipe 30’Weir at El 38.9 with 30” pipe 20’Weir at El 37.0 with 24” pipe	DET=60.7 AF HMOD=27.3AF

II.H Proposed Attenuation at Steelhead Creek (NEMDC) Tributaries :

A meeting was held July 11, 2005 at the Placer County Flood Control and Water Conservation District Offices to discuss potential project impacts at the Steelhead Creek tributaries, and so that the project team could gain a better understanding of how the Steelhead Creek system is operated. Attending the meeting were George Booth from Sacramento County Municipal

Services Agency, John Basset from SAFCA, Andrew Darrow and Brian Keating from the Placer County Flood Control and Water Conservation District, Jim Ray from Mackay and Somps, Wes Zicker from Placer County Public Works, and Thomas Plummer from CESI.

Key discussion topics of the meeting:

- Sacramento County would like to increase the pumping capacity of the D15 NEMDC (Steelhead Creek) pumping plant at some future time, and collect a fee from tributary areas for those improvements.
- Increase Pumping alone may not address the impacts of the project.
- Placer Vineyards will need to assess the potential impacts of the project to the NEMDC system.
- SAFCA to release NEMDC model to CESI via MBK.
- CESI to perform the analysis.

Following the meeting, CESI received computer file models from MBK as follows:

- DSS files containing inflow hydrographs
- Sankey Spill DSS File for 10-year, 100-year and 200-year
- Event timed to occur May 4, 1994, with peak precipitation at 1200 hours.
- PDF file of supporting documentation of the UNET models (shed map included in report).
- UNET files containing 4 scenarios:
    - 200-fut94-2pump: SAFCA NEMDC UNET Model for 200-year Future Land Use 2 PUMP model.
    - 100-fut94-2pump: SAFCA NEMDC UNET Model for 100-year Future Land Use 2 PUMP model.
    - 200-exist94-2pump: SAFCA NEMDC UNET Model for 200-year Existing Land Use 2 PUMP model.
    - 100-exist94-pump: SAFCA NEMDC UNET Model for 100-year Existing Land Use 2 PUMP model.

CESI adapted the four UNET models for HEC-RAS Unsteady State version 3.13, with extremely close correlation to the original UNET models as follows:

	UPSTREAM RESULTS (MAX WS ELEV.)			**DOWNSTREAM RESULTS (MAX WS ELEV.)**		
Model Adaptation Title:	**UNET**	**BASE HEC-RAS**	**DIFF**	**UNET**	**BASE HEC-RAS**	**DIFF**
200-fut94-2pump	39.48	39.43	-0.05	35.52	35.51	-0.01
200-exist94-2pump	39.44	39.42	-0.02	34.52	34.41	-0.11
100-fut94-2pump	37.46	37.49	+0.03	33.29	31.99	-1.30
100-exist94-pump	36.74	36.81	+0.07	32.09	31.82	-0.27

CESI made the following changes to the parameters used to compute the HEC-RAS model, in

order to obtain the above results:

- Computational interval of 30 seconds was used instead of the 1 minute specified in the UNET – smooth out some of the results.
- 20 warm up time steps were added with an interval of 0.01 hours.
- Convert Energy method bridges to Cross sections with Lids

The UNET models provided information for the existing conditions of the NEMDC, as well as the assumed buildout conditions. Two events were provided, the 200-year and the 100-year. Sufficient data was not provided in the DSS files to extend the analysis to any other events.

Upon review of the results of the HEC-RAS analysis we determined that it would be satisfactory to prepare the impacts analysis for the Placer Vineyards project using the HEC-RAS models as they were converted.

The hydrology analysis of the Placer Vineyards project needed to be extended downstream to the Steelhead Creek (NEMDC) points of inflow, for the pre-project and post-project mitigated conditions. All extensions of the models were added offsite from the project, and the same modifications were made to all hydrology files (HEC-1). The Placer Vineyards HEC-1 analysis node locations correspond to the Steelhead Creek (NEMDC) watershed hydrograph insertions points as follows:

TRIB A - 267
TRIB B – EMA1B
TRIB C – EMA2
TRIB D - EMB1 + EMC1A
TRIB E – EMD1
TRIB F – EMF1
TRIB G – EMGN1A
TRIB H – Not a part
TRIB I – Not a part.
TRIB J – Not a part.
TRIB K – Not a part
TRIB M – EME1
TRIB N – EMA3A

Hydrology was prepared for the 24-hour 100-year and 200-year events. In the UNET and HEC-RAS files, several hydrographs are added at the same points as follows:

UNET INFLOW LOCATION	**TRIB**
STA 14.473	SANKEY, TRIB A
STA 10.075	TRIB H
STA 9.295	NATOMAS SUMP #6 – 100cfs then 200 cfs inflow from west
SA #1	TRIB B

	TRIB C
SA #2	TRIB D TRIB N
SA #3	TRIB E TRIB F TRIB G TRIB M
SA #4	TRIB I TRIB J
SA #5	TRIB K

HEC-RAS will not permit more than one inflow hydrograph at a location. As a result, TRIB A combination point was moved to STA 14.253, and the remaining hydrographs were combined in the DSS files prior to being used in the HEC-RAS analysis.

Inflow Hydrographs for the Placer Vineyards Hydrologic analysis are compared with the Hydrographs provided with the UNET analysis in Appendix K of this report. Overall a fairly good correlation exists between the Placer Vineyards Hydrology, which is based on the Placer Stormwater Management Manual (kinematic wave methodology), and the SAFCA models, based on the Sacramento County/City methodologies. The more detailed the watershed analysis was performed in the Placer Vineyards models(meaning the more a watershed is broken up into it's parts for analysis), the closer the results correlated, for example the "E+M+F&G" combination. In general, the Placer County methodology produces a more flashy (higher flowrate, occurring earlier in the event) result, with a longer drawdown curve at the tail end of the event. The Placer County methodology also produces more volume of runoff.

The comparison of the Pre-project and post-project mitigated hydrographs is provided in Appendix B. The post-project mitigated hydrology includes the detention facilities proposed for the project to meet the Placer County guidelines for peak flow reductions in various events, as detailed in the Master Drainage Plan.

Modification of the hydrographs for the Placer County methodology results in the following changes from the base HEC-RAS models previously described:

	UPSTREAM RESULTS (MAX WS)			**DOWNSTREAM RESULTS (MAX WS)**		
Model Adaptation Title:	**BASE HEC-RAS**	**PLACER HEC-RAS**	**DIFF**	**BASE HEC-RAS**	**PLACER HEC-RAS**	**DIFF**
200-year Exist – PVIN REVISED 08-06	39.42	39.53	+0.11	34.41	34.78	+0.37
100-year Exist – PVIN REVISED 08-06	36.81	37.65	+0.84	31.82	32.41	+0.59

These differences between the BASE HEC-RAS models and the PLACER HEC-RAS models result solely from the change in hydrology methodology.

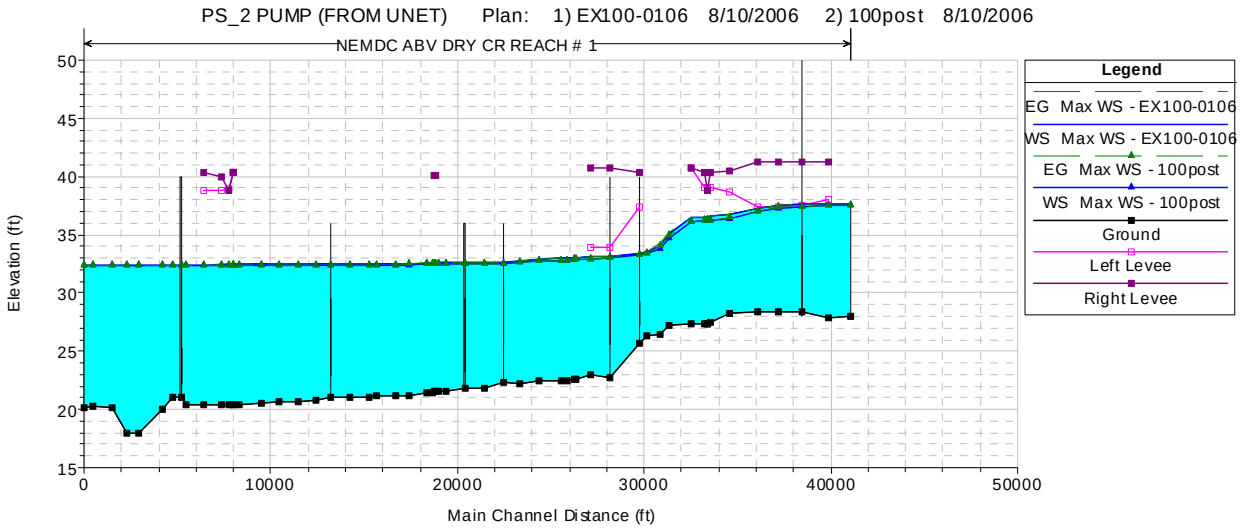
For determining impacts associated with the project, the post-project mitigated hydrology was input into the HEC-RAS model, and compared with the Placer Vineyards HEC-RAS as follows:

TABLE IIH4 – Water Surface Comparison at Steelhead Creek (NEMDC)

		MAX WS ELEV.			MAX WS ELEV.		
REACH	STATION	100-PRE	100-POST	REDUCTION	200-PRE	200-POST	REDUCTION
REACH #1	14.473	37.65	37.46	0.19	39.53	39.58	-0.05
REACH #1	14.253	37.65	37.46	0.19	39.49	39.54	-0.05
REACH #1	13.982	37.63	37.44	0.19	39.42	39.47	-0.05
REACH #1	13.981						
REACH #1	13.732	37.55	37.33	0.22	39.36	39.41	-0.05
REACH #1	13.524	37.2	36.94	0.26	39.27	39.33	-0.06
REACH #1	13.249	36.72	36.42	0.3	39.16	39.23	-0.07
REACH #1	13.041	36.58	36.27	0.31	39.13	39.2	-0.07
REACH #1	13.022	36.53	36.22	0.31	39.11	39.18	-0.07
REACH #1	13.012	36.52	36.21	0.31	39.1	39.17	-0.07
REACH #1	12.993	36.53	36.22	0.31	39.11	39.18	-0.07
REACH #1	12.849	36.46	36.14	0.32	39.1	39.17	-0.07
REACH #1	12.714	35.04	34.74	0.3	37.41	37.47	-0.06
REACH #1	12.623	34.06	33.8	0.26	36.04	35.99	0.05
REACH #1	12.487	33.53	33.35	0.18	35.31	35.27	0.04
REACH #1	12.416	33.43	33.24	0.19	35.16	35.12	0.04
REACH #1	12.415						
REACH #1	12.126	33.18	33	0.18	34.92	34.86	0.06
REACH #1	12.125						
REACH #1	11.918	33.08	32.9	0.18	34.91	34.84	0.07
REACH #1	11.778	33.04	32.85	0.19	34.9	34.83	0.07
REACH #1	11.759	33.03	32.84	0.19	34.9	34.83	0.07
REACH #1	11.757	33.03	32.84	0.19	34.9	34.83	0.07
REACH #1	11.688	32.99	32.8	0.19	34.9	34.83	0.07
REACH #1	11.626	32.97	32.77	0.2	34.9	34.83	0.07
REACH #1	11.401	32.91	32.71	0.2	34.9	34.82	0.08
REACH #1	11.211	32.7	32.6	0.1	34.88	34.8	0.08
REACH #1	11.045	32.63	32.56	0.07	34.87	34.79	0.08
REACH #1	11.044						
REACH #1	10.846	32.63	32.56	0.07	34.87	34.79	0.08
REACH #1	10.651	32.63	32.56	0.07	34.87	34.79	0.08
REACH #1	10.65						
REACH #1	10.461	32.59	32.5	0.09	34.85	34.78	0.07
REACH #1	10.381	32.58	32.49	0.09	34.85	34.77	0.08
REACH #1	10.352	32.57	32.48	0.09	34.85	34.77	0.08
REACH #1	10.343	32.57	32.48	0.09	34.85	34.77	0.08
REACH #1	10.314	32.57	32.48	0.09	34.85	34.77	0.08
REACH #1	10.268	32.56	32.47	0.09	34.84	34.77	0.07
REACH #1	10.075	32.52	32.43	0.09	34.82	34.75	0.07
REACH #1	9.954	32.52	32.42	0.1	34.82	34.74	0.08
REACH #1	9.759	32.5	32.4	0.1	34.81	34.73	0.08
REACH #1	9.672	32.49	32.4	0.09	34.81	34.73	0.08
REACH #1	9.476	32.48	32.39	0.09	34.81	34.73	0.08
REACH #1	9.295	32.48	32.38	0.1	34.81	34.73	0.08
REACH #1	9.294						
REACH #1	9.138	32.47	32.38	0.09	34.81	34.73	0.08
REACH #1	8.951	32.47	32.38	0.09	34.81	34.73	0.08
REACH #1	8.769	32.47	32.38	0.09	34.81	34.73	0.08
REACH #1	8.589	32.47	32.37	0.1	34.81	34.73	0.08
REACH #1	8.354	32.46	32.37	0.09	34.8	34.72	0.08
REACH #1	8.302	32.45	32.36	0.09	34.8	34.72	0.08
REACH #1	8.293	32.45	32.36	0.09	34.8	34.72	0.08
REACH #1	8.255	32.44	32.35	0.09	34.8	34.72	0.08
REACH #1	8.172	32.44	32.34	0.1	34.79	34.71	0.08
REACH #1	7.994	32.43	32.33	0.1	34.79	34.71	0.08
REACH #1	7.815	32.42	32.32	0.1	34.79	34.7	0.09
REACH #1	7.777	32.42	32.32	0.1	34.79	34.7	0.09
REACH #1	7.776						
REACH #1	7.688	32.42	32.32	0.1	34.79	34.7	0.09
REACH #1	7.573	32.42	32.32	0.1	34.79	34.7	0.09
REACH #1	7.345	32.42	32.32	0.1	34.79	34.7	0.09
REACH #1	7.217	32.42	32.32	0.1	34.79	34.7	0.09
REACH #1	7.072	32.41	32.32	0.09	34.78	34.7	0.08
REACH #1	6.874	32.41	32.31	0.1	34.78	34.7	0.08
REACH #1	6.786	32.41	32.31	0.1	34.78	34.7	0.08

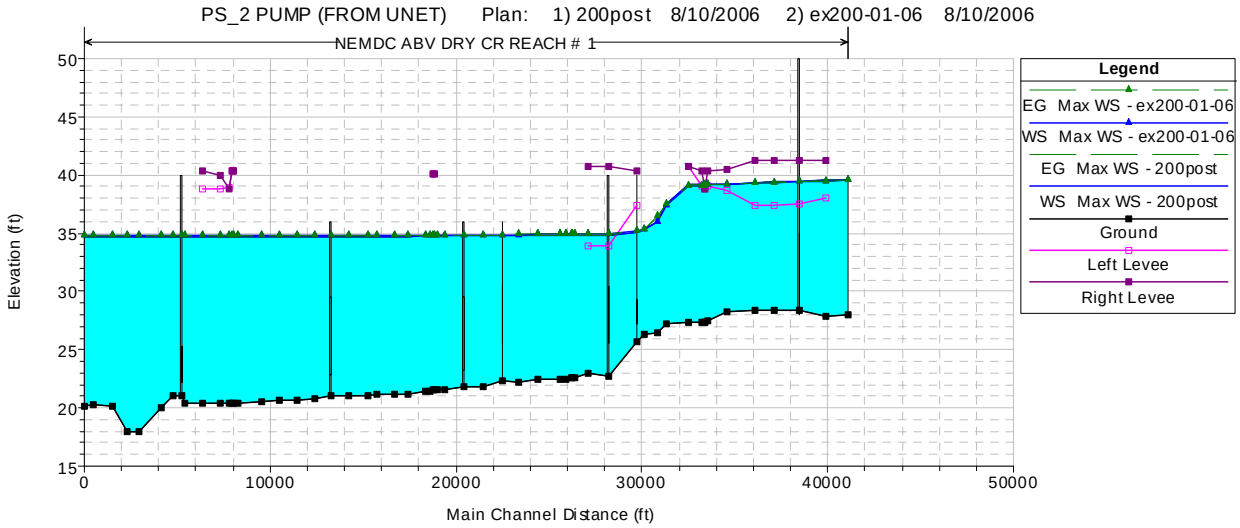
The following profiles also demonstrate the above results:

100-year Profile Comparison:



The results of the 100-year comparison analysis indicate that the proposed detention mitigation at the proposed Placer Vineyards project adequately mitigates the peak discharge rates to less than the pre-project amounts, as demonstrated in the reductions in MAX WS elevations throughout the run.

200-year Profile Comparison:



In the 200-year event, the pre-project and post-project mitigated analysis are virtually identical for the MAX WS elevations reported. Increases in MAX WS elevations in the upper reaches are noted (0.07 feet). For the lower reach, in the sump upstream of the D15 pump station, MAX WS elevations are shown to be reduced by as much as 0.1 feet. Further review of the data shows that the falling limb of the project release hydrographs are slightly higher during the period when the Sankey spill flows are expected to peak.

The results of the analysis demonstrate that no adverse impacts would result from the project in

the D15 sump area, however, a negligible impact is reported in the areas between the project and the D15 sump resulting from increase volumes being discharged during the timing of peak flow from the Sankey spill. Additional pumping at the D15 station will not reduce this impact. The impact would not appear to be significant because it only occurs if the Sankey spill is occurring. However, this impact could be reduced by modifying the proposed control structures on some of the Steelhead Creek tributary detention structures within the project, and by monitoring the Sankey gap spill occurrences. The gates could be installed when the Sankey spill's occur, reducing project runoff volumes during thee period. RET-1A and RET-1B identify the planned volumetric storage locations volumes in several of these reaches. The impact analysis was re-run using the full HEC-RAS unsteady state project modeling to quantify the onsite detention benefits from the proposed facilities intended for peak flow and hydrograph modification purposes. The net change in volumetric impacts was reduced from 174 AF to 25 acre feet for the 100-year event in this analysis.

Modify design facilities at:

D1 to be able to store 10 AF of volumetric mitigation
D1R to be able to store 5 AF of Volumetric Mitigation
D3L to be able to store 5 AF of Volumetric Mitigation
D3S3 to be able to store 5 AF of volumetric Mitigation

These facilities would be operated to store runoff volumes while Sankey Spills are occurring and water levels from the Pleasant Grove Canal are spilling to Steelhead Creek(NEMDC).

The Sankey spill is a special event, which is known to be possible, where, flows in the Natomas Cross Canal could overtop Sankey Road and spill into the Natomas and Steelhead Creek basins.

III. Hydraulics:

III.A Flood Plain Analysis:

The existing project site includes FEMA delineated flood hazard areas at Dry Creek. Also west of the project, Zone A areas are delineated adjacent to Steelhead Creek. The project area is shown on the Placer County FIRM maps 475F and 458F, included as Figures IIIA1 and IIIA2. The project would be required to submit CLOMR and LOMR documents to FEMA for proposed Base Flood Elevation data where changes are proposed.

The Army Corps HEC-RAS software was utilized to develop the included hydraulic models for the proposed Placer Vineyards project area. Flood Plain elevations were determined for the 10-year and 100-year events, for the pre-project and post-project conditions, and for the post-project mitigated conditions events. The Base Flood Elevations established with this study are shown on Exhibit FP-1A and FP-1B . The proposed post-project flood elevations and limits are shown on Figure FP-3A and FP-3B.

Added in this amendment (November 2013), FP-2A and FP-2B, and FP-4A and FP-4B show the flood extents and flood elevations for the extreme event 200-year and 500-year floods for the pre-project and post-project respectively.

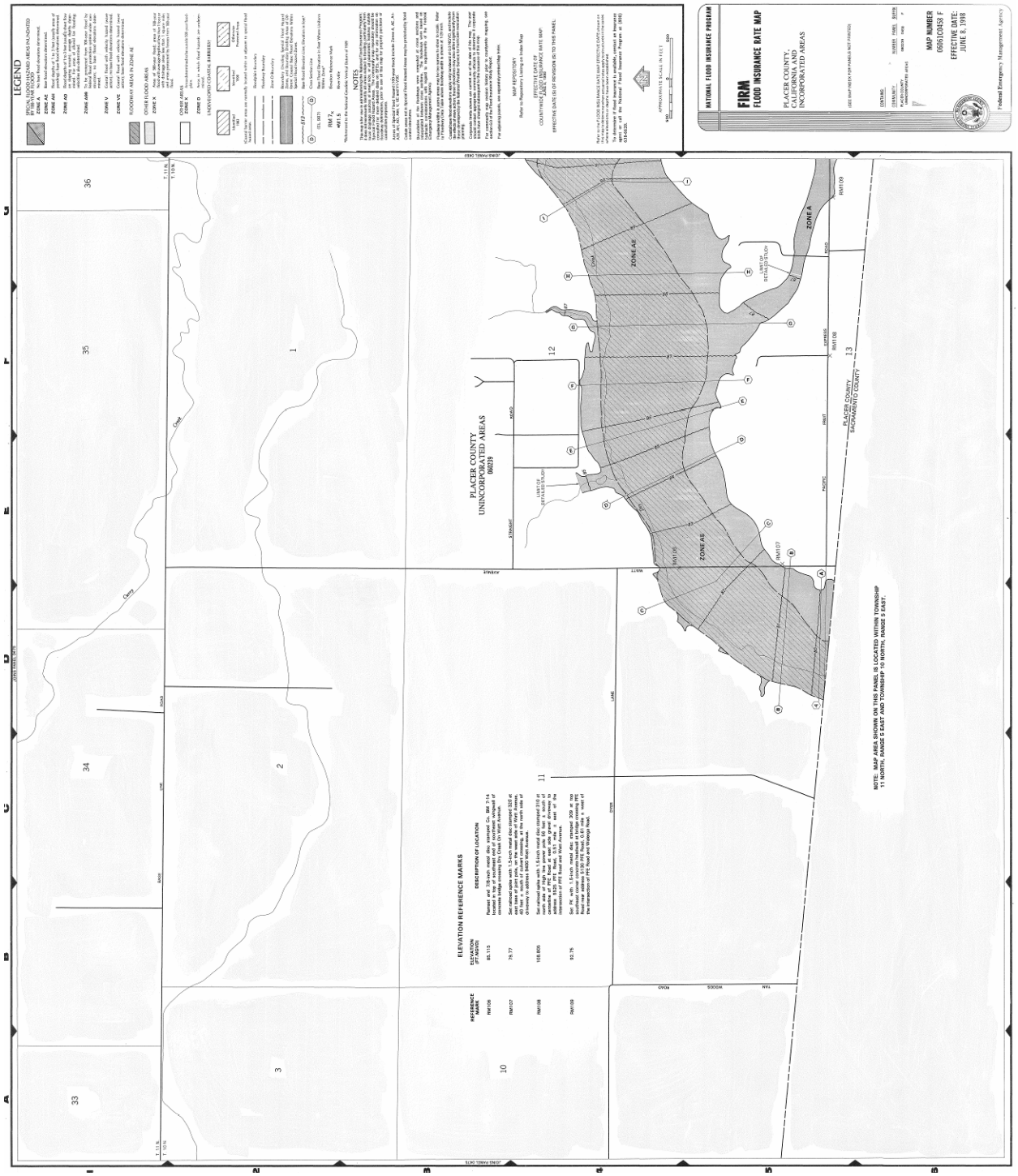
The hydraulic evaluation was performed for all the events of the hydrologic model including: mean annual, peak annual, 2-year, 10-year, 100-year, 200-year and 500-year. The HEC-RAS summary tables for all events are provided in Appendices C, and D for the pre-project and post-project mitigated events respectively.

III.A.1 Pre-Project Flowrates:

Pre-project flowrates for all locations of the hydraulic evaluation were developed in the hydrologic analysis (Chapter II). Tables IIIA4a and IIA4b summarize the computed flowrates used in the hydraulic evaluation.

FIGURE IIIA1 - FIRM MAP 475F

FIGURE IIIA2 - FIRM MAP 458F



III.A.2 Post-Project Mitigated Flowrates:

Post-project mitigated flowrates for all locations of the hydraulic evaluation were developed in the hydrologic analysis (Chapter II). Tables IIC1a and IIC1b summarize the computed flowrates used in the hydraulic evaluation.

FIGURE IIIA3 – Comparison of Pre- and Post-project water levels at Project Boundaries

HEC-RAS RIVER	HEC-RAS REACH	LOCATION STATION (RM)	Description	WATER SURFACE ELEVTIONS (FT)					
				10-YEAR EVENT			100-YEAR EVENT		
				PRE-	POST-MIT	Reduction	PRE-	POST-MIT	Reduction
Curry Creek	CUR-1	1.22	North Boundary - Curry Creek - Enters Site	102.14	99.16	2.98	103	101.62	1.38
Curry Creek	CUR-1	1.02	North Boundary - Curry Creek - Leaves Site	88.77	88.64	0.13	89.56	88.97	0.59
EMAS	EMAS2	2.02	North Boundary - EMAS NEMDC - Leaves Site	65.49	65.23	0.26	66.64	66.29	0.35
EMCS	EMCS9	15.08	West Boundary EMC Sheds Leaving Project	34.48	34.31	0.17	35	34.47	0.53
EMCN	EMCN9	25.03	West Boundary EMC North Sheds Leave Proj.	34.86	34.58	0.28	35.15	34.83	0.32
EMD	EMD1	12.03	West Boundary EMD Sheds Leaving Site	38.68	38.66	0.02	39.08	39.02	0.06
EMF	EMFN1	5.1	South Boundary - EMFN Leaves Project	54.3	54.15	0.15	54.6	54.36	0.24
EMF	EMF1	5.01	NEMDC - EMF Downstream of all PROJ. Trib.	47.65	47.51	0.14	49.27	48.05	1.22
EMF	EMFSS3	3.01	EMFS - East trib of South branch Leaves Project	62.22	62.18	0.04	62.35	62.23	0.12
EMF	EMFS3	10.1	South Boundary - EMFS Leaves Project Comb.	53.9	53.14	0.76	54.36	53.65	0.71
EMF	EMFS3	10.08	NEMDC - EMFS Downstream of all PROJ. Trib.	52.9	52.33	0.57	53.2	52.72	0.48
EMG	N/A	N/A	South Boundary - EMG Leaves Project	No water levels established for this release. Flow reduction.					
Dry Creek	N/A	N/A	Dry Creek	Analysis reports no measurable change in WS Elevation along creek frontage.					

III.A.3 Post-Project Offsite Unmitigated Flowrates:

Post-project offsite unmitigated flowrates for all locations of the hydraulic evaluation were developed in the hydrologic analysis (Chapter II). Tables IID1a and IID1b summarize the computed flowrates used in the hydraulic evaluation. The resulting computed water surface elevations and floodplain are shown on Exhibit FP-3.

III.B Proposed Culvert Sizing:

Culvert sizing for this project is optimized to maximize onsite attenuation, while providing the passage of the 100-year peak flows. TABLE IIIB1 summarizes the recommended culvert sizes which achieve the project attenuation objectives. Substitutions may be made at project design, with analysis showing that attenuation objectives are met.

TABLE IIIB1 - Culvert Sizing

Shed	Station	Culvert Description	Overtopping Flow Rate (cfs)	Post Project overtopping event (yr)	Post-project 100-year flowrate (cfs)
CURRY CREEK					
CUS6	1.215	Baseline Road – Replace Existing Culvert with 150’ of Dual 14’x5’ CM Arch Culvert	830	500	714 772 (2)
CUS11B	1.158	Inline Detention Weir – Notched at existing low flow channel	665	200	478 509 (2)
CUS11B	1.115	Roadway Crossing 1-16x5.5 CM Arch	NONE	NONE	403 411 (2)
CUS14	1.025	Baseline Road – Replace existing culvert with 200’ of 16’x5.5’ CM Arch	NONE	NONE	407 439 (2)
Steelhead Creek - NEMDC – EMAS					
EMAS6A	2.755	36” Concrete Pipe	NONE	NONE	47
EMAS26B	2.645	42” Concrete Pipe	NONE	NONE	84
EMAS20E	2.605	Low Flow Pedestrian Crossing	61 (*)	10 (*)	92
EMAS20E	2.585	1-42” Concrete Pipe	NONE	NONE	82
EMAS20E	2.52	1-48” Concrete Pipe	NONE	NONE	88
EMAS20A	2.447	High Flow Pedestrian Crossing	NONE	NONE	88
EMAS20B	3.025	Low Flow Pedestrian Crossing	178 (*)	10 (*)	342
EMAS17A	2.385	1-12’x4.2’ CM Arch	NONE	NONE	153
EMAS16	2.192	2-48” Concrete Pipe	NONE	NONE	214
EMAS12A	2.155	2-48” Concrete Pipe	NONE	NONE	221
EMAS12A	2.106	36” Concrete Pipe Low Flow + 48” Concrete Pipe High Flow	NONE	NONE	212
EMAS12A	2.065	20’ Weir Elev = 70.0 + 36” Concrete Pipe	NONE	NONE	212
EMAS12A	2.025	2-7’x3.2’ CM Arch	NONE	NONE	213
Steelhead Creek - NEMDC – EMF					
EMFN12	5.445	2-10’w x5h’ Concrete Box	NONE	NONE	
EMFN12	5.365	2-10’w x5h’ Concrete Box	NONE	NONE	343
EMFN9	5.305	2-10’w x5h’ Concrete Box	NONE	NONE	322
EMFN9	5.255	2-12’w x6’h Concrete Box	455	500	342
EMFN9	5.225	2-16’x5’ CM Arch + 18” pipe to Existing Swale	366	200	331
EMFN5	5.185	1-16’w x5’h CM Arch + 24” pipe to existing swale	408	500	312
EMFN4	5.109	Inline Detention Weir with 24” pipe + 42” pipe.	NONE	200	222
EMFS7	3.035	1-24” @ new Channel and 1-24” pipe at existing channel + 5’w x 1’high BOX for high flow release.	NONE	NONE	53
FN7	None	1-30” Pipe	NONE	NONE	50

Steelhead Creek - NEMDC – EMC					
EMC12A	15.325	2-12'x4' CM Arch	915	500	671
EMC8B	15.225	2-7'w x3'h CM Arch	NONE	NONE	194
EMC5A	15.151	Inline Detention Weir. 36" Pipe	290	500	184
EMC5A	15.1255	Inline Detention Weir. 30" Pipe	290	500	184
EMC5A	15.1221	Inline Detention Weir. 24" Pipe	290	500	184

NONE : Events computed did not overtop roadway at this location.
(*) – Overtopping at abutment transitions only – Deck not overtopped.
(2) – Flowrate value for offsite unmitigated 100-year event.

III.C Proposed Channels and Attenuation Facilities:

The project proposes to collect runoff within storm drainage systems which would discharge into channels and detention facilities. Flood control channels within this project will consist of newly constructed complete channel systems and parallel flood control channels where "avoidance areas" are to be maintained in the natural state. These facilities would generally follow or be placed along the natural drainage courses within the project. The flooding limits would be confined within the channels and existing floodplain areas, generally providing 3 feet of 100-year freeboard to adjacent proposed structures. The channels would be excavated below the existing grades, and daylight at the downstream end to natural grades at the project limits. A low flow channel would be constructed throughout to confine the conveyance of year round nuisance waters.

Based on information previously provided by the project engineer, we have prepared the cross sections shown in Figures IIIC2 to Figure IIIC10 (A to Z). The sections are located on Figure IIIC1, the project Schematic. Because this drawing is at a small scale, the Section locations are also shown on FP-2 (3 sheets). The cross sections presented show a concept of how the channelization and "avoidance areas" would be located within the project open space areas. The vegetation shown is simply for reference and does not necessarily represent the design vegetation of the improved areas (to be done by others).

FIGURE IIIC1 – PROJECT SCHEMATIC

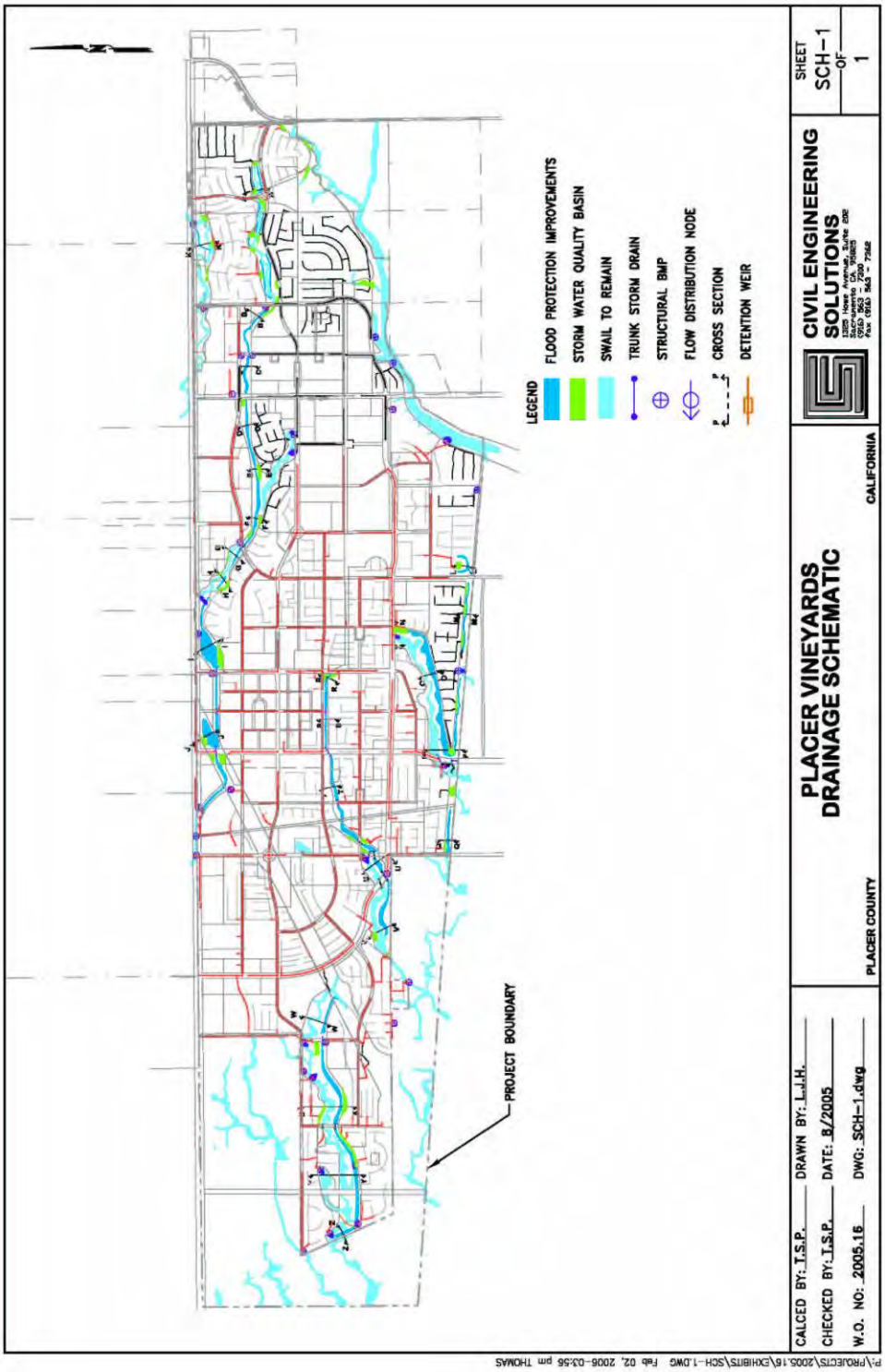


FIGURE IIIC2 – SECTIONS A-C

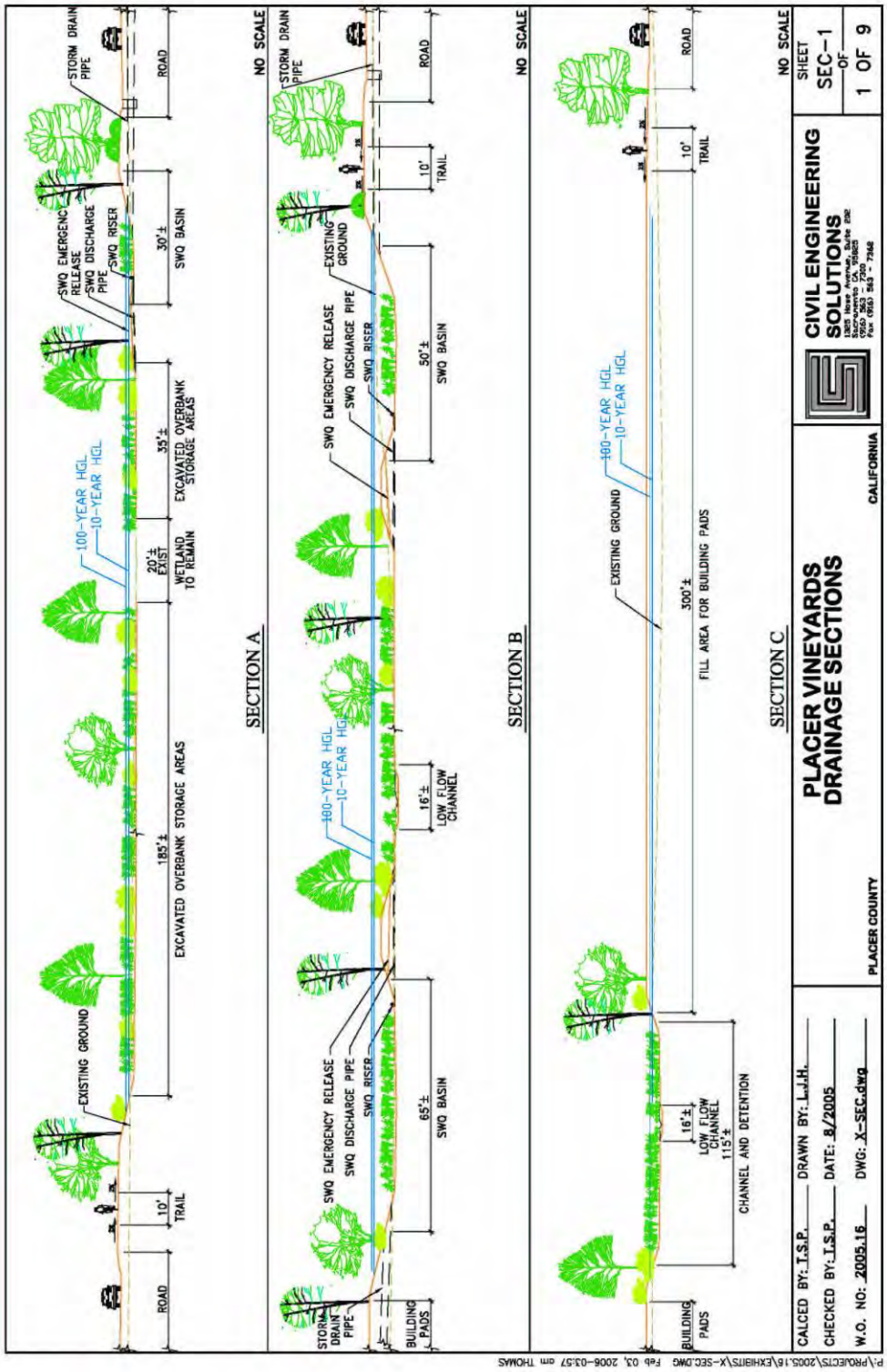


FIGURE IIIC3 – SECTIONS D-F

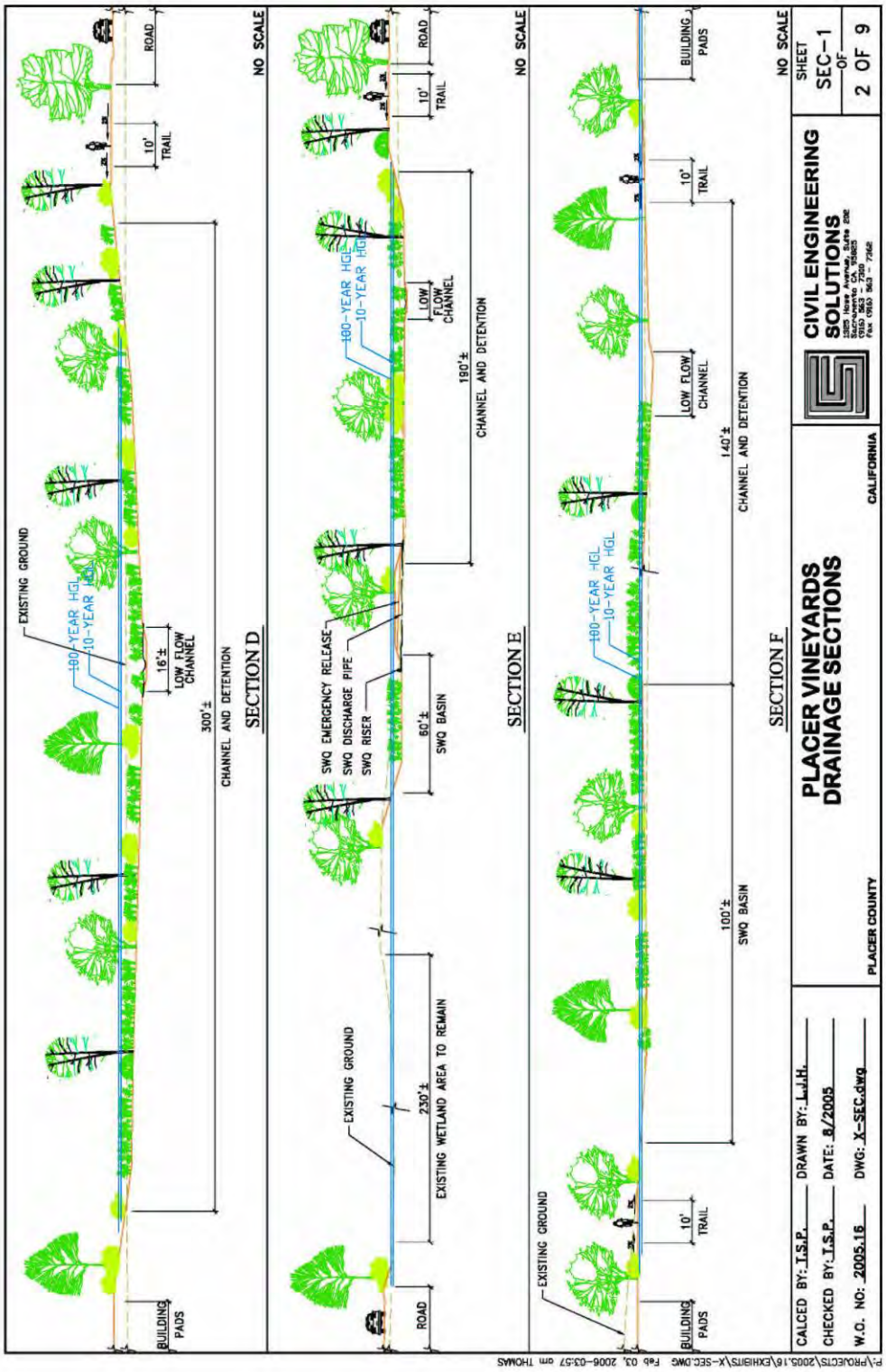


FIGURE IIIC4 – SECTIONS G-I

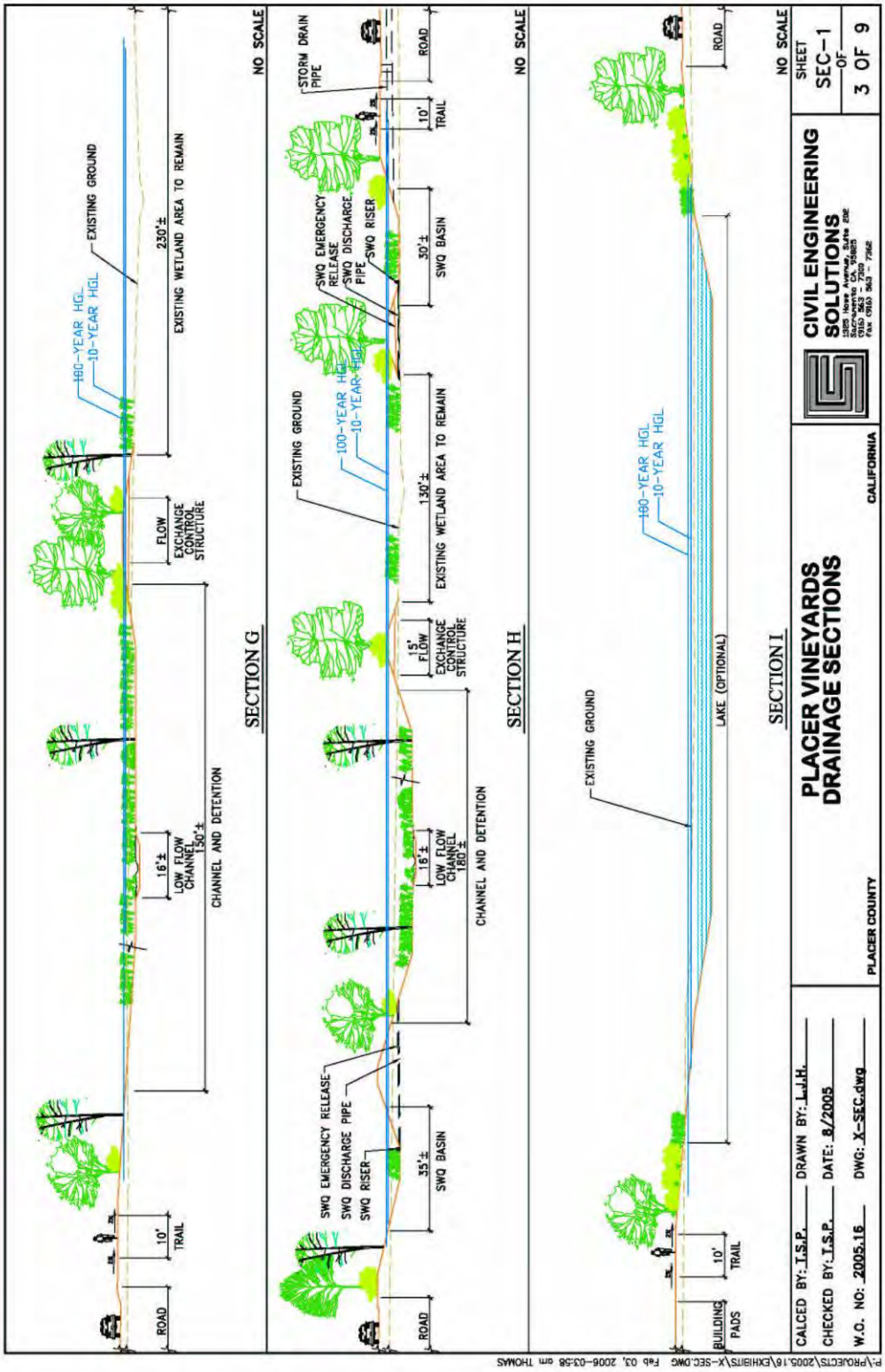


FIGURE IIIC5 – SECTIONS J-L

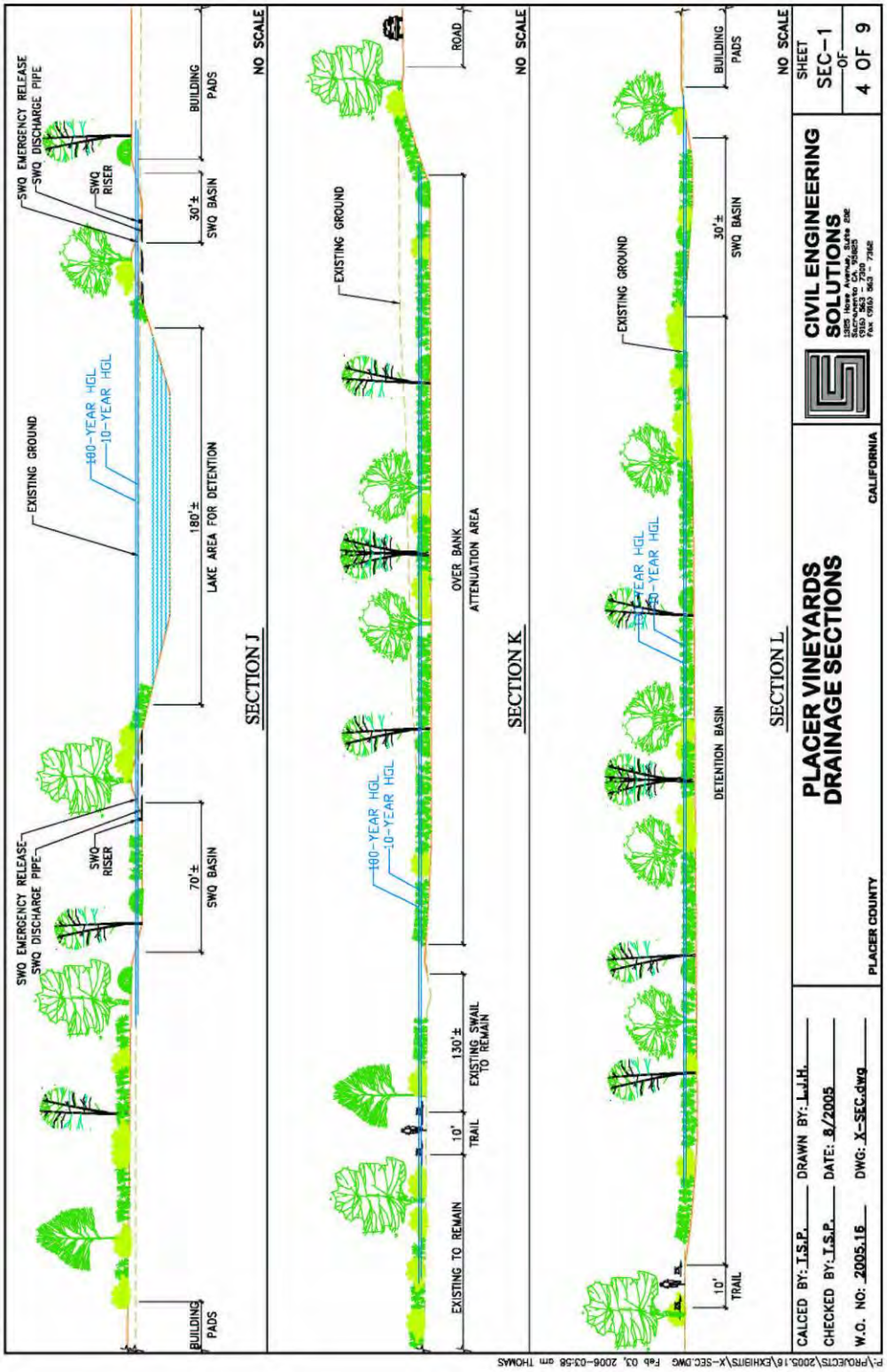


FIGURE IIIC6 – SECTIONS M-O

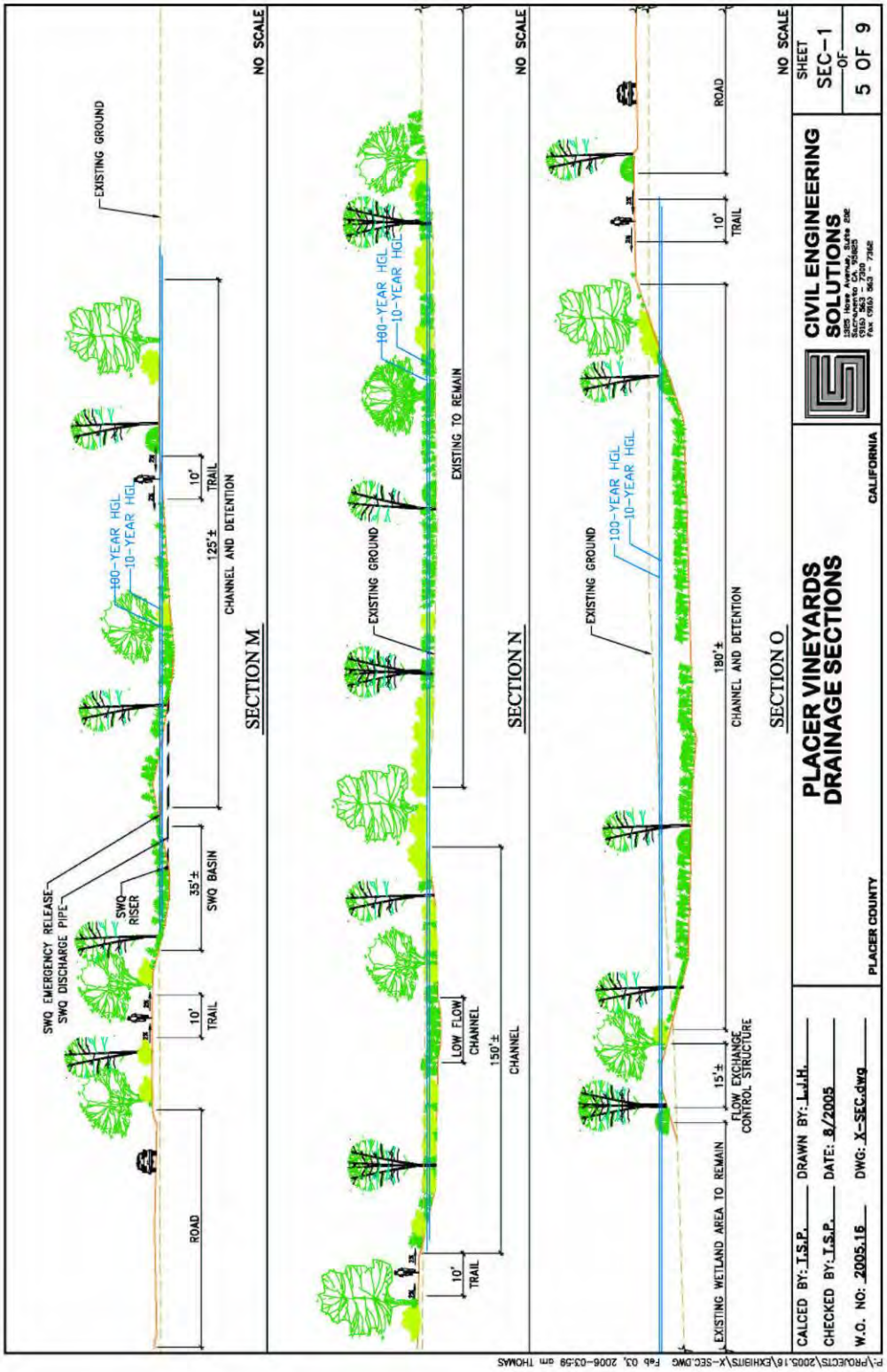


FIGURE IIIC7 – SECTIONS P-R

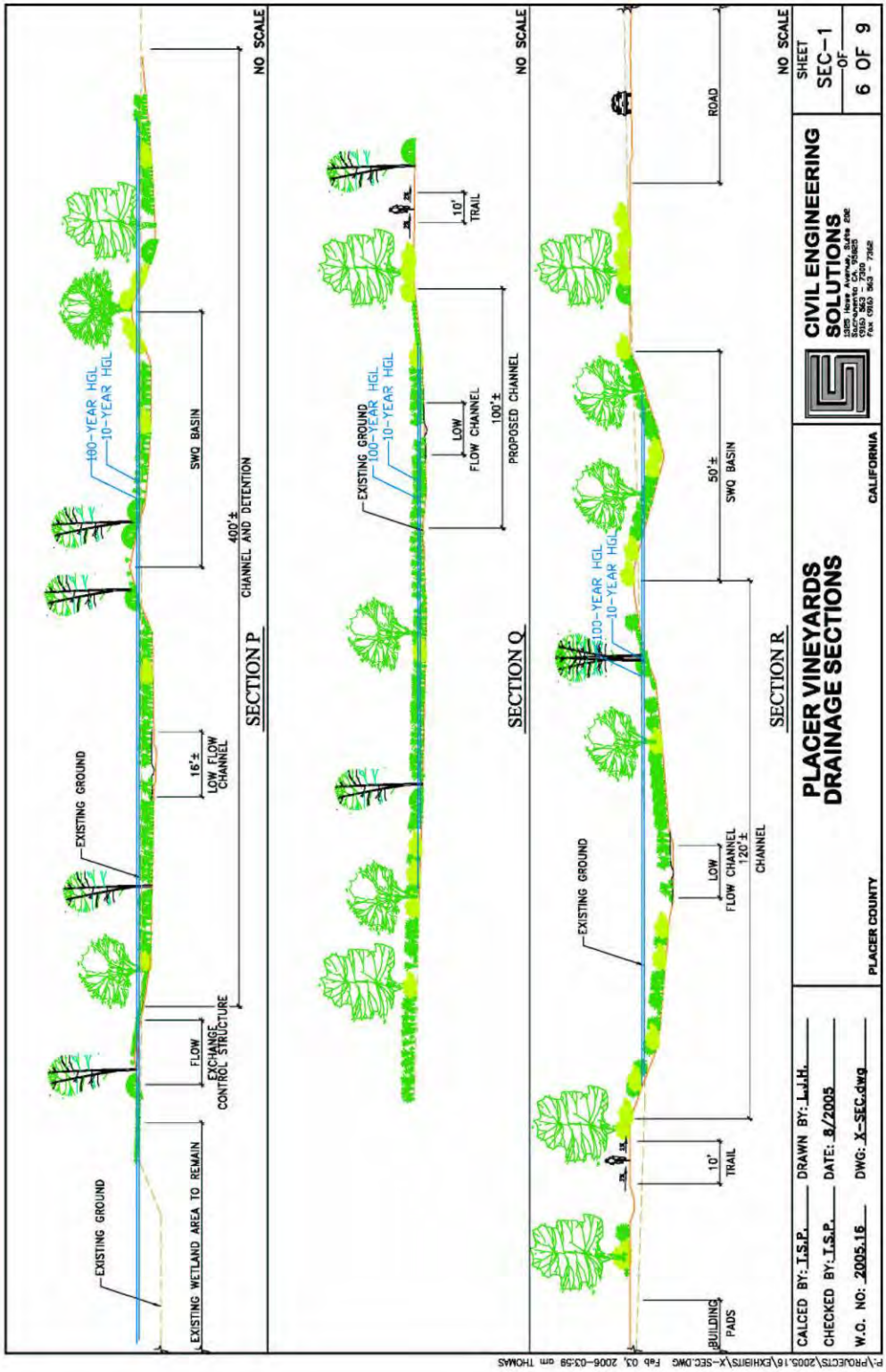


FIGURE IIIC8 – SECTIONS S-U

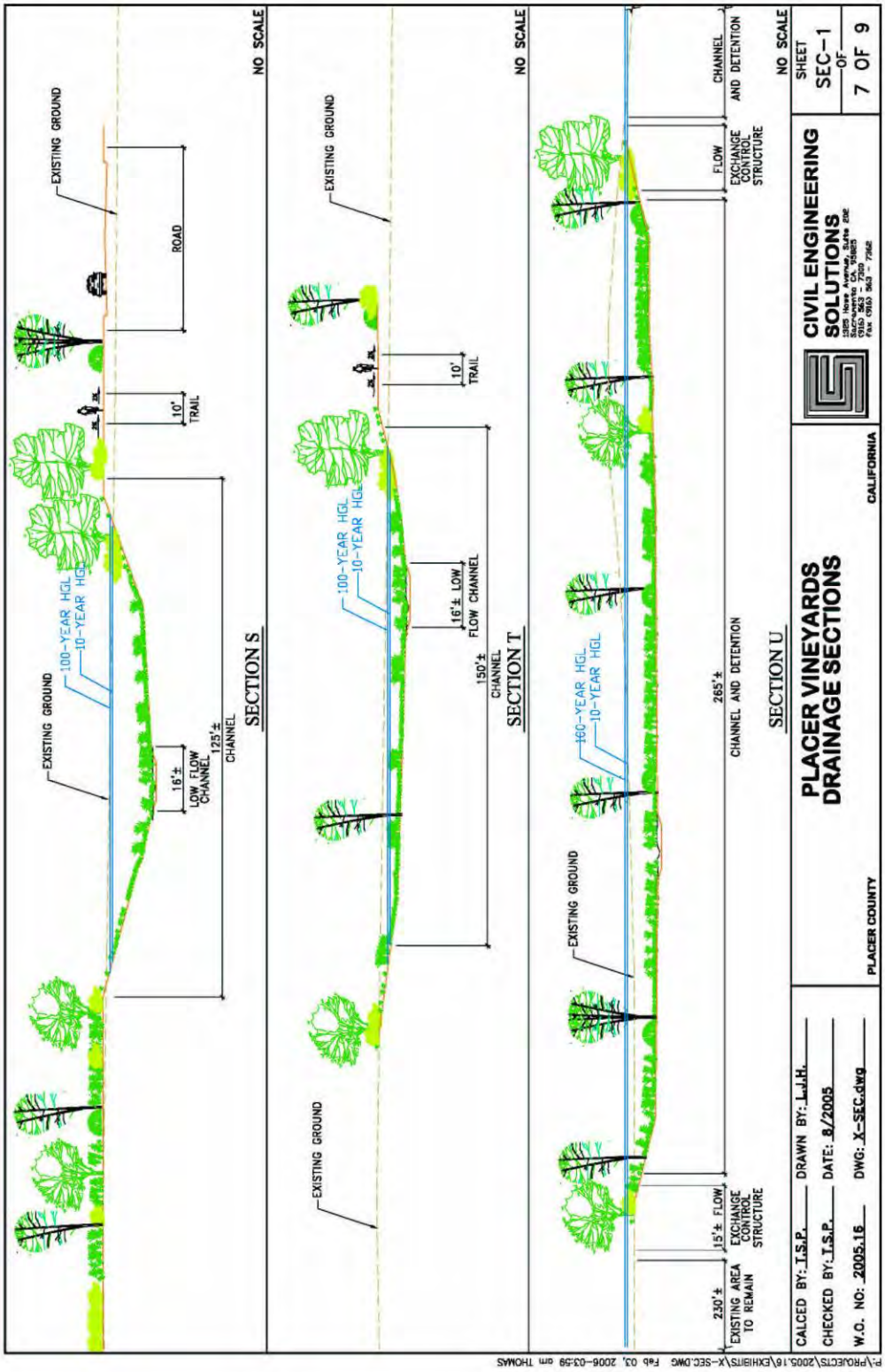


FIGURE IIIC9 – SECTIONS V-X

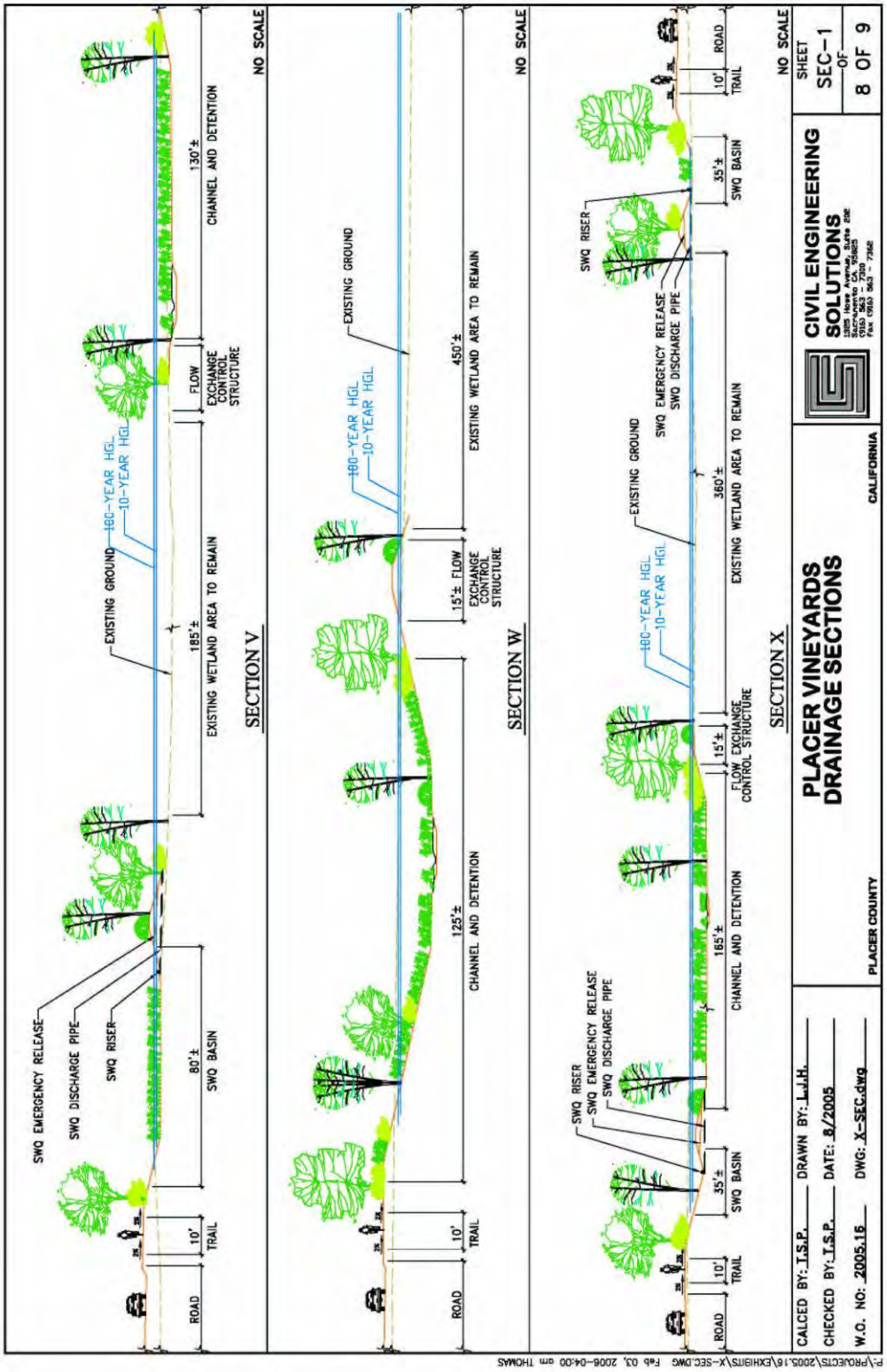
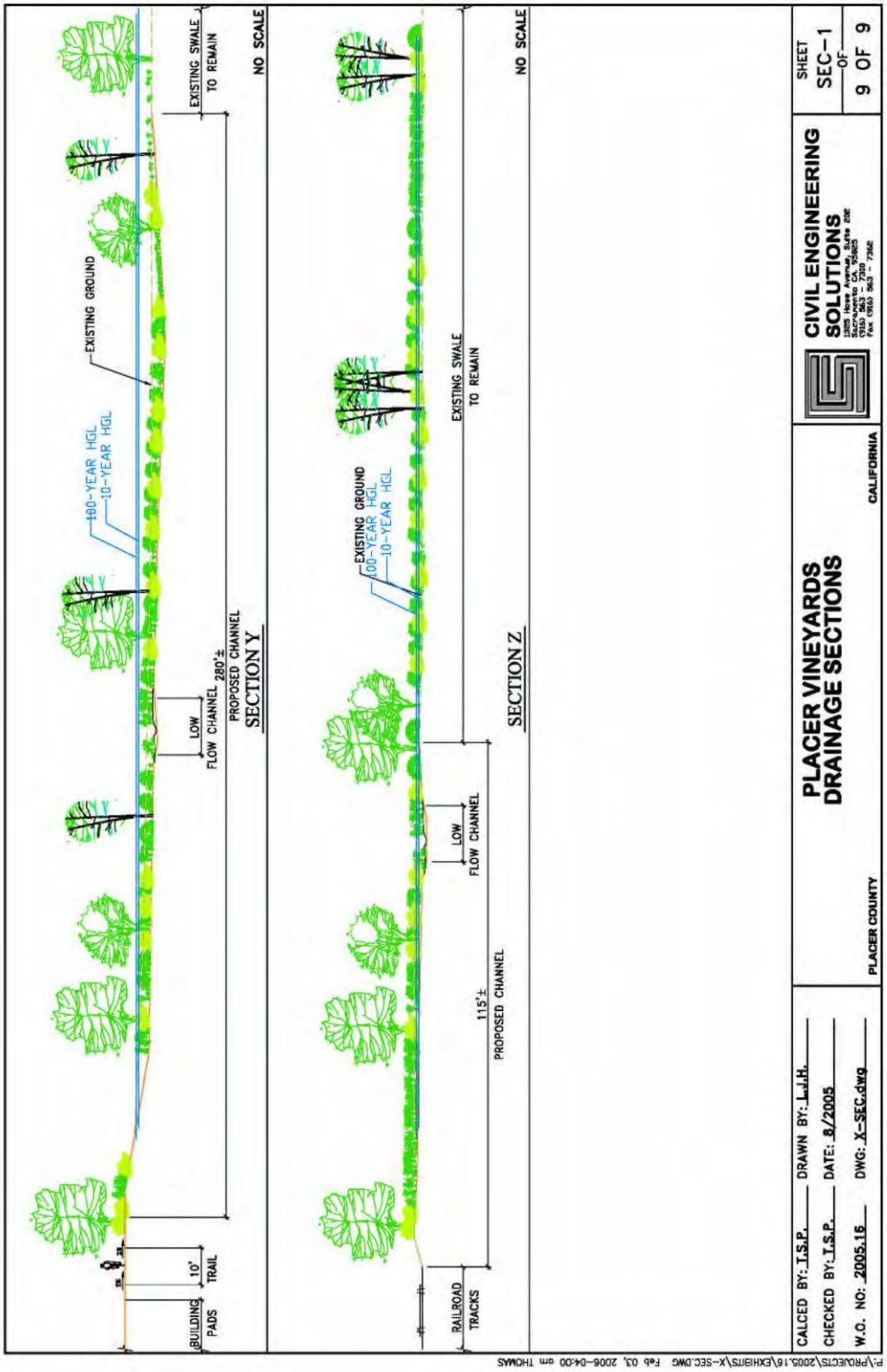


FIGURE IIIC10 – SECTIONS Y-Z



III.D Trunk Storm Drain Facilities:

Figure IIIC1, the project Schematic and Exhibits SD-1A and SD-1B shows trunk storm drainage facilities. Trunk Storm drainage facilities were sized using the "Small Watershed Method" identified in the Placer County Flood Control and Water Conservation District Stormwater Management Manual (SWMM). The CS DRAINAGE STUDIO software was used to evaluate and optimize the trunk facility sizes. Complete calculation summaries are provided in Appendix K, for the 10-year and 100-year events.

III.E Special Structures for Avoidance Areas:

In order to preserve the integrity of the "avoidance areas" within the project where wetlands and critical habitat are to be preserved, it will be necessary that the project not adversely impact mean annual and peak annual type events. Meaning, increases in flow rates for these events should not be allowed within the unaltered swales. Additionally, where seasonal wetlands are identified, nuisance waters from non storm discharges will need to be diverted to the flood control facilities so as to not affect the seasonal nature of the existing features.

In the Amendment (November 2013), we connected Trunk Storm Drain outfalls to stormwater quality basins, and determined that all storm drain can gravity outfall to proposed channels. The need for many of the complex structures previously documented has gone away, and flow distributions will be handled by weirs, channels and culverts to maintain mean annual runoff without nuisance waters to the existing swale preservation areas. These are documented on the AT-1A and AT-1B exhibits as well as the tables of this report. See detail included for special structure.

A flow separation structure will still be needed in the northwest area of the project where trunk storm drains intercept runoff which currently exits the site. It is the intent of the project to install a special structure at this location that will permit nuisance waters to drain in the trunk system to project Stormwater quality basins, but discharge the mean annual even flows to the existing swale which drains offsite to the west. Because these flows are not treated, a structural type BMP will be installed on this discharge. Additionally, a high flow release will be installed at this location to discharge flows below the proposed street level which are in excess of the pressure flow capacity of this truink system. This flow split will reduce peak flows that would currently discharge to this system.

Due to future potential conflicts it may be necessary to specify and construct special structures or structural BMP's in the design phase which are not shown in this plan. These special structures may need to be used in the drainage system to divert excess floodwaters to the flood control channels, or to divert nuisance waters away from the existing swales. In any case, project drainage will be treated for water quality prior to discharge to an existing or proposed flood control channel. The Project Schematic Figure IIIC1 and Exhibits SD-1A and SD-1B show the locations of these special structures.

Initial design concepts of the structures are shown in Figures IIIE1 and IIIE2 of this section.

Based on the hydraulic function of the proposed project improvements, the following generalizations may be used in preliminary design of the systems:

- It roughly works out such that when the difference in elevation between the existing wetland invert and the surface elevation of the future streets is less than 7 feet, pumping or a design standard modification may be necessary to maintain mean annual flow rates. The design standard modification relates to the Placer County standard which does not permit pressure flow in the 10-year design event. When the difference is less than roughly 7 feet, in order to prevent submergence of the storm drainage system in the 10-year event it would need to be constructed so shallow it would conflict with other utilities, and minimum pipe slopes cannot be obtained. Minimum pipe slopes must be maintained, and conflicts with other utilities must be avoided. As a result, in some cases the storm drain will be constructed to a depth where flows cannot gravity to the wetland areas directly, and pumps may be necessary. In other cases, where the storm drain minimum slopes can be maintained, it may be necessary to request a design standard exception to permit a portion of the trunk storm drainage system, upstream of the diversion structure, to flow under pressure in the 10-year event.
- The gate or stop log system between the wetland discharge and the stormwater quality discharge should be removable to permit maintenance flushing of sediment out of the system. Also, it may be possible to design this gate on a float system, to permit flood event flows (in excess of mean annual) to pass directly through to the next chamber, such that sediment and debris will not collect in the backwater upstream of the wetland diversion weir.
- Note that where the pipe system invert is above the invert of the wetlands, the diversion to wetlands component should be placed downstream of the water quality device.
- Where the pipe system invert is below the invert of the wetlands, a separate stormwater quality device would be necessary on the wetland feeder system.
- The exhibits provided are schematic only, and each system will have different constraints which will require special design considerations. We recommend that the ability to use pumping and 10-year pipe submergence criteria be verified prior to design.

FIGURE IIIE1 – DIVERSION STRUCTURE SCHEMATIC

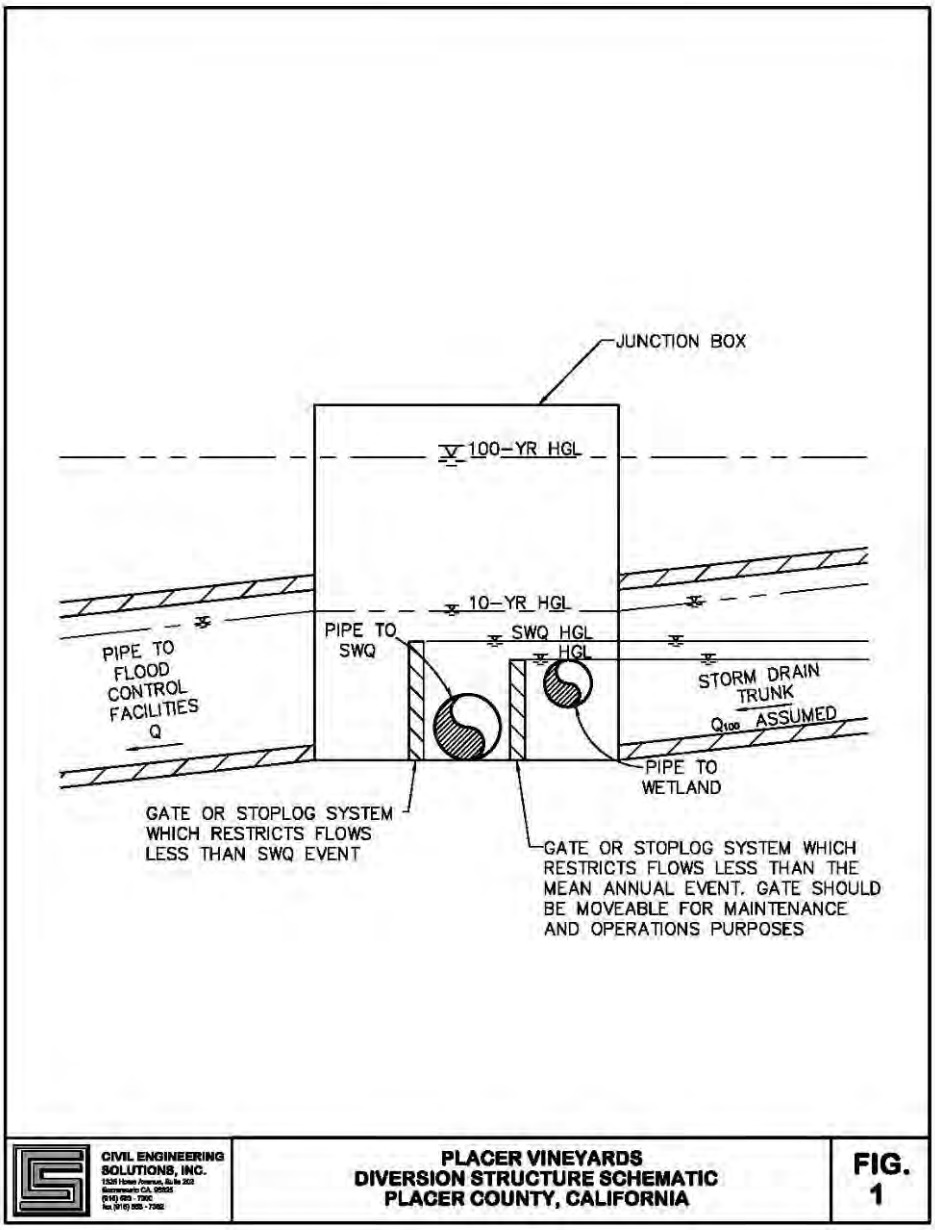
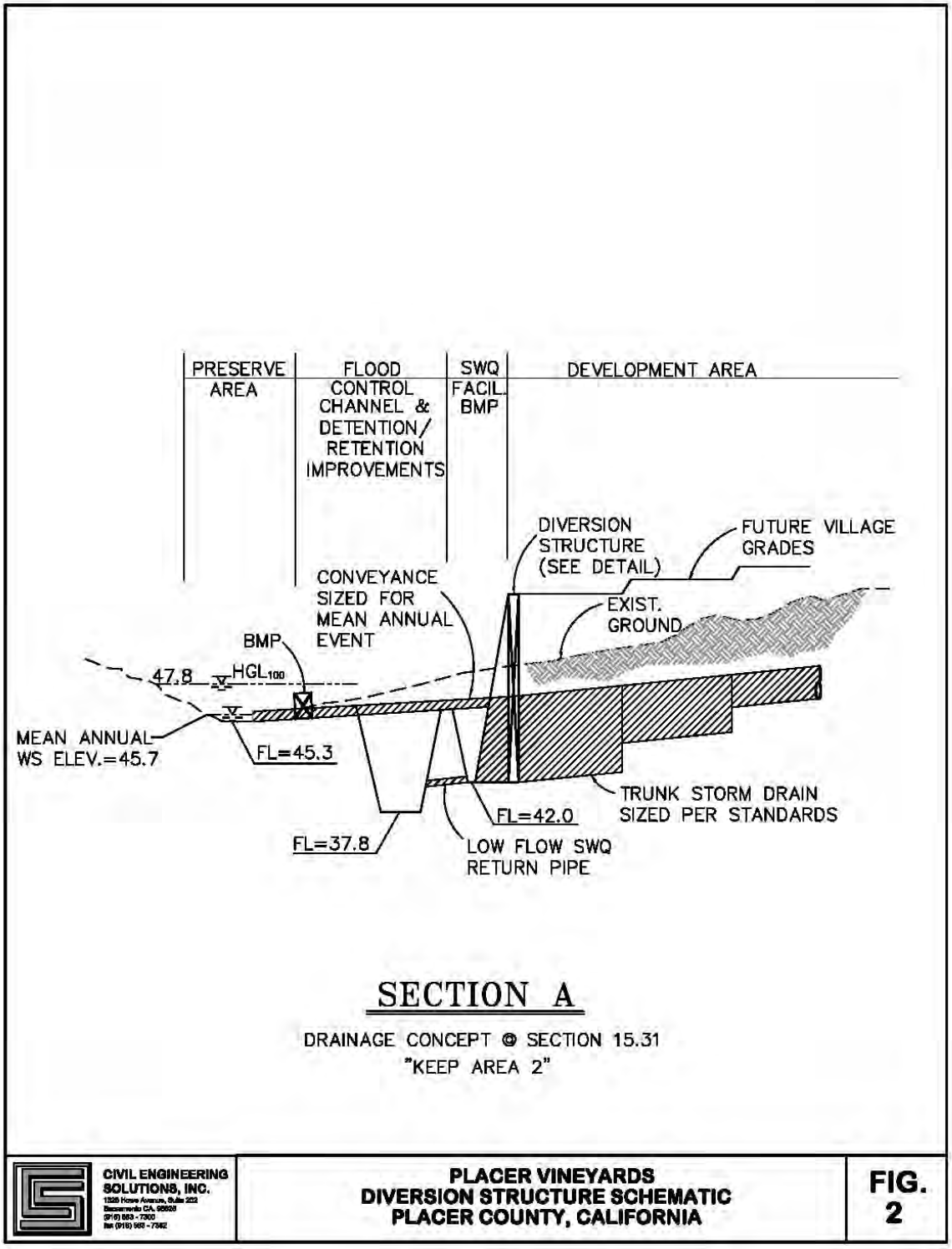


FIGURE IIIE2 – DRAINAGE SYSTEM SCHEMATIC



III.F State Legislative Requirements (SB5):

The State of California has passed several legislative mandates that have the potential to impact the project design requirements. In 2007, the State of California passed a series of laws referred to as SB5(2007) directing the Department of Water Resources to prepare flood maps for the central valley flood system and the State Plan of Flood Control (SPFC) which includes a system of levees and flood control facilities located in the Central Valley. This legislation also set the 200-year event as the urban level of flood protection for the state. Finally this legislation renamed the State Reclamation Board as the "Central Valley Flood Protection Board" (CVFBP) and provided that Board with additional direction on its authority with respect to certain provisions of Title 23 – Water Code.

Specifically related to this project, SB5 "requires all cities and counties within the Sacramento-San Joaquin Valley, as defined in California Government Code Sections 65007(h) and (j), to make findings related to an urban level of flood protection or the national Federal
1-2 August 2013 Urban Level of Flood Protection Criteria Emergency Management Agency (FEMA) standard of flood protection before: (1) entering into a development agreement for any property that is located within a flood hazard zone; (2) approving a discretionary permit or other discretionary entitlement, or a ministerial permit that would result in the construction of a new residence, for a project that is located within a flood hazard zone; or (3) approving a tentative map, or a parcel map for which a tentative map was not required, for any subdivision that is located within a flood hazard zone." (ULOP August 2013 DRAFT)

This means that Cities and counties with areas that drain to the Central Valley and have urban developing areas within the FEMA identified potential 500-year flood prone zones must make a finding of fact about the flood protection meeting the Urban Level of flood Protection before issuing permits.

In 2012, SB1278 and AB1965 establish the timeline for the requirements of Cities and Counties to amend their General Plans and Zoning Ordinances to comply with SB5, and also defined the Urban Level of Flood Protection (ULOP) per the following:

> *"Urban level of flood protection" means the level of protection that is necessary to withstand flooding that has a 1-in-200 chance of occurring in any given year using criteria consistent with, or developed by, the Department of Water Resources. "Urban level of flood protection" shall not mean shallow flooding or flooding from local drainage that meets the criteria of the national Federal Emergency Management Agency standard of flood protection.*

Once Cities and Counties have revised their General Plans and Zoning Ordinances, the ULOP requirements will go into effect (expected by July 15, 2015). The Department of Water Resources is developing a guidance document for how to interpret the ULOP criteria. Essential to this is defining "Local" and ":Shallow". The August 2013 draft of this document (not currently available to the public) defines:

> "Flooding from **local** drainage considers both the watershed size and source of flooding. For these criteria, flooding from local drainage is defined as flooding from a drainage area less than 10 square miles. "
>
> "For purposes of these criteria, **shallow** flooding is defined as flooding that is 3.0 feet or less based on a 200-year event. Shallow flooding typically includes unconfined flows over broad, relatively low relief areas, such as alluvial plains; intermittent flows in arid regions that have not developed a system of well-defined channels; overbank flows that remain unconfined, such as on delta formations; overland flow in urban areas; and flows collecting in depressions to form ponding areas."

The Finding of Fact process is defined in the ULOP as: The California Department of Water Resources developed the Urban Level of Flood Protection Criteria (Criteria). For **selected land use decisions**, cities and counties in **specific locations** within the Sacramento and San Joaquin river basins need to make a **finding** related to an urban level of flood protection based on **substantial evidence** in the record. Cities and counties may use criteria consistent with this Criteria or apply this Criteria directly

The Evidentiary processes are defined in the ULOP guidance document.

The affected Land Use decisions are listed as:

- Entering into a development agreement for all types of property development
- Approving a discretionary permit or discretionary entitlement for all projects
- Approving a ministerial permit for all projects that would result in construction of a new residence
- Approving a tentative map consistent with the Subdivision Map Act for all subdivisions
- Approving a parcel map for which a tentative map is not required consistent with the Subdivision Map Act for all subdivisions

An Urban Area is defined as: "*It is located within an urban area that is a developed area as defined by Code of Federal Regulations Title 44, Section 59.1 with 10,000 residents or more*[4]*, or an urbanizing area that is a developed area or an area outside a developed area that is planned or anticipated to have 10,000 residents or more within the next 10 years."*

III.F.1 Applicability to Placer Vineyards:

The ULOP sets forth two criteria applicable to all lands within the Central Valley. The fundamental difference between the two is whether the lands are considered Urban, in which case the 200-year event criteria goes into effect. The alternate minimum criteria for areas which are not subject to the Urban Level of Protection is the NFIP 100-year event criteria described in the code of federal regulations Articles 63 and 65.

To determine this project's applicability to the Urban Level of Protection, Table III.F.1 is used to respond to the ULOP questions:

TABLE III.F.1 – ULOP APPLICABILITY QUESTIONAIRRE

• It is located within the Sacramento-San Joaquin Valley.	**YES**
It is located within an urban area that is a developed area as defined by Code of Federal Regulations Title 44, Section 59.1 with 10,000 residents or more[4], or an urbanizing area that is a developed area or an area outside a developed area that is planned or anticipated to have 10,000 residents or more within the next 10 years.	**YES**
• It is located within a flood hazard zone that is mapped as either a special hazard area or an area of moderate hazard on FEMA's official (i.e., effective) Flood Insurance Rate Map (FIRM) for the National Flood Insurance Program.	**YES**, There are areas of the project along Dry Creek, Curry Creek and the NEMDC which are mapped as 500-year floodplains. (see figure UL-1)
• It is located within a watershed that is more than 10 square miles.	**YES**, Dry Creek within the project and the NEMDC downstream of the project have tributary areas greater than 10 square miles.(See figure UL-1)
• It is located within an area with a potential flood depth above 3.0 feet during a 200-year event, from sources of flooding other than localized conditions that may occur anywhere in a community, such as, localized rainfall, water from poor stormwater and drainage problems, and water from temporary water and wastewater distribution system failure.	**YES**, however, only Dry Creek generates flood depths greater than 3 feet which extend within the development limits. (see figure UL-2)

Figures UL-1 and UL-2 show the applicability of the above criteria within the project limits and in nearby areas. For all areas shaded in Blue(within FEMA 500-year event limits – Special Flood Hazard Areas) on Figure UL-1, Findings of Fact will be required demonstrating the required level of flood protection. The only sources of flooding which meet the above criteria for ULOP 200-year which extend within the project limits occurs along Dry Creek. For development areas within the "Red" zones shown on Figure UL-3, Findings of Fact for the Urban Level of Flood Protection (200-year event) will be required, with evidence. For other areas shown in Blue (small area near NEMDC) on UL-1, findings of Fact for the FEMA requirements are necessary.

For the purpose of this document, it is planned that the ULOP 200-year areas of the development will be elevated with fill materials to provide the same freeboard normally required by Placer County for the 100-year event, for the 200-year event base flood elevations for the Future Fully Developed without Mitigation event identified per the hydrology provided by the Update to the Dry Creek Watershed Plan (2011) and the project hydraulics models for Dry Creek. These Base Flood Elevations are Provided on Exhibit UL-3.

For the Remainder of the project, the current Placer County requirements for Freeboard and analysis of the 100-year event, meet or exceed the requirements of the code of Federal Regulations (FEMA criteria), and will be required as described in this report to meet the non-urban ULOP requirements..

IV. Water Quality:

Stormwater Managmeent During Construction:

The release of on-site stormwater runoff during Construction activities is regulated by the State General Construction Permit issued by the Regional Water Quality Control Board for all construction sites greater than one acre. The General Construction permit requires that a Storm Water Pollution Prevention Plan (SWPPP) is created to address how the storm water from a particular construction site will be maintained and treated prior to being discarded from the site. The SWPPP is an evolving document that changes with the dynamics of the site development.

The use of Best Management Practices (BMPs) during the construction process will generally incorporate erosion controls and sediment controls. Erosion and sediment control BMPs include such things as applying straw mulch to disturbed areas, the use of fiber rolls and silt fences, sedimentation basins, drain inlet protection, stabilized construction accesses, and material management. The final sizing and selection of BMPs will consider requirements specific to the Curry Creek watershed and proposed developed activities.

A Stormwater Pollution Prevention Plan (SWPPP) will be required to describe the BMPs which will be used to prevent erosion and to clean site discharge waters before entering State Waters. A permit with the Central Valley Regional Water Quality Control Board of the State of California will be obtained for the proposed construction activities. If construction occurs during the wet season, additional winterization improvements will be required to stabilize the disturbed areas of the site, prevent erosion, and clean discharge waters. All construction related BMP improvements must comply with the "NPDES General Permit for Storm Water Discharges Associated with Construction Activities, NPDES No. CAS000002, Order No. 99-08DWQ".

A Fact Sheet on the pplicability and requirements of the General Construction Permit can be found at the following link:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_factsheet.pdf

Post Construction Stormwater Management:

The onsite project drainage would be designed to provide water quality treatment of runoff from paved and other developed areas prior to release into the swales and streams. This treatment will consist of the following:

1. Directing some of the flow to sheet discharge onto grassy areas or open space.
2. The installations of "Fossil Filter" or equivalent petroleum absorbing insert assemblies in the project drop inlets.
3. The placement of water quality interceptor devices.

4. The placement of water quality sediment basins within detention facilities and channels.
5. ...Use of rock-lined ditches below pipe outlets.

Another best management practice will involve prompt re-vegetation of disturbed areas.

Regional proposed project Stormwater Quality facilities are shown on Figure IVA1 and on exhibits SWQ-1A and SWQ-1B. Preliminary Sizing for the basins shown are presented in Table IVA1. Sizing of these facilities is based on the methodologies outlined in the "BMP Sizing Recommendations – Technical Subcommittee of the PRSCG – Placer Regional Stormwater Coordination Group", dated 7/23/04. The sizing outlined in Table IV1 also assumes that no other inner basin treatment or BMP's are proposed which would reduce the size of the regional facilities. However, some of the BMP's typically implemented on projects like this may required reduce the size of the regional facilities, by treating a portion of the flows upstream of the proposed regional basin or structural BMP locations. The sizing factors using Low Impact Development Measures as further detailed in this section.

Figure IVA2 shows the locations where untreated and treated flows would be located in the post-project conditions.

FIGURE IVA1 – STORMWATER QUALITY EXHIBIT

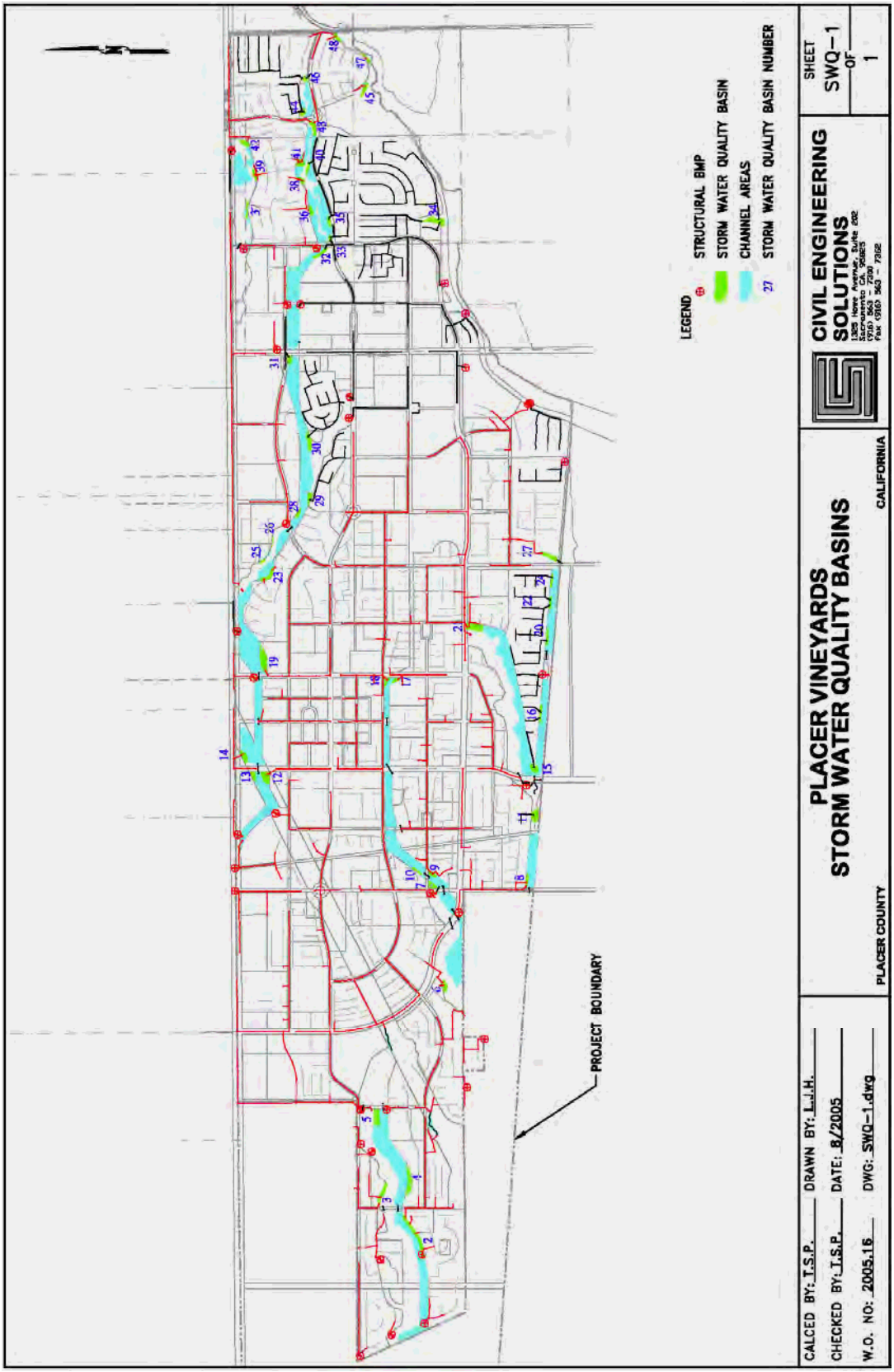


FIGURE IVA2 – TREATED AND UNTREATED WATERS

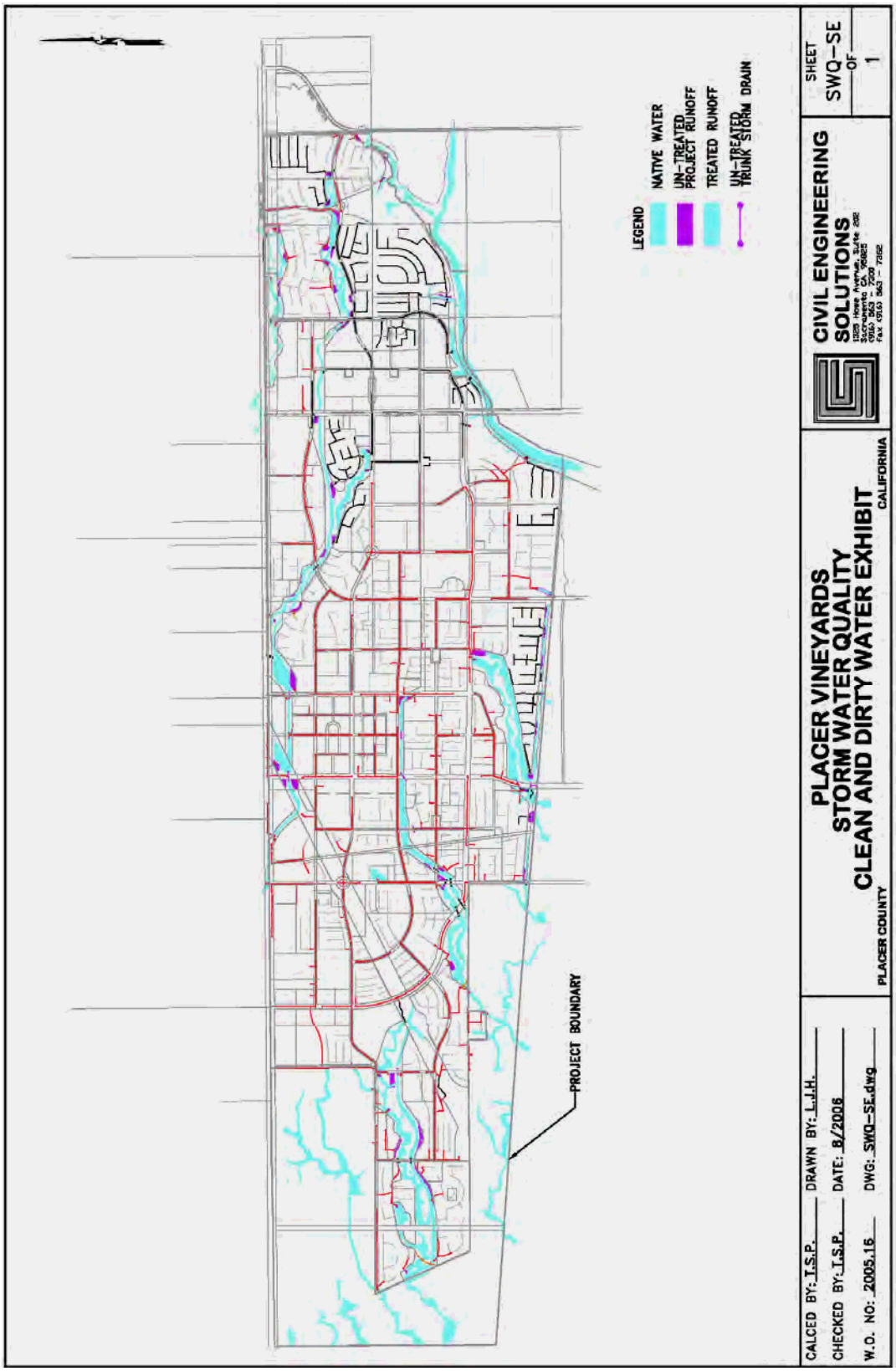


TABLE IVA1 – PRELIMINARY REGIONAL SWQ BASIN SIZING

	REDUCED for LID - SWQ VOLUME/FLOWRATE DESIGN - PRSCG FACTORS - SWQ BASINS OR SWALES											
Outfall Location	Total Area ac	Imperv. Area ac	LID Mit. Imp. Area ac	Reduced % Imperv	C Value	Volume Ft^3	Reserve Volume Ft^3	Total Volume Ft^3	Design Flowrate cfs	Min. Swale Length ft	Min. Swale B. Width ft	Velocity < 1 fps Check
D2L	43.446	23.77	7.90592	54.71%	0.37	42078	2104	44182	3.06	133	22.0	0.32
D3F2+D3Y	16.4	10.17	2.6	62.11%	0.43	18217	911	19127	1.32	124	9.5	0.30
D3E+D3F	42.7	15.05	7.0	35.20%	0.25	28297	1415	29712	2.06	128	15.0	0.30
D3D1	38.157	21.96	7.08148	57.56%	0.39	38969	1948	40918	2.83	128	21.0	0.31
D3Z1	3.8505	2.77	0.69282	71.97%	0.51	5163	258	5421	0.38	116	2.0	0.28
D3Z2	3.8505	2.77	0.69282	71.97%	0.51	5163	258	5421	0.38	116	2.0	0.28
D3D2	81.516	41.46	13.955868	50.87%	0.34	73473	3674	77146	5.34	134	39.0	0.32
D3C	3.435	2.45	0.61128	71.21%	0.51	4538	227	4765	0.33	102	2.0	0.24
D3G	66.495	25.16	11.34198	37.83%	0.27	46521	2326	48847	3.38	135	24.0	0.32
M+N	24.4	4.49	4.4	18.38%	0.16	10293	515	10808	0.75	121	5.0	0.29
A	33.166	10.82	6.42862	32.62%	0.24	20741	1037	21778	1.51	124	11.0	0.30
J	25.916	5.17	5.1714	19.96%	0.17	11532	577	12109	0.84	117	6.0	0.28
B	36.625	7.27	6.81852	19.85%	0.17	16238	812	17050	1.18	122	8.5	0.29
MH3	11.11	2.19	2.18314	19.70%	0.17	4901	245	5146	0.36	110	2.0	0.26
G	2.86	1.77	0.44136	62.01%	0.42	3175	159	3333	0.23	85	1.5	0.20
L1+L2	17.8	4.02	3.4	22.63%	0.19	8598	430	9028	0.62	120	4.0	0.29
K	5.734	1.14	1.1442	19.96%	0.17	2552	128	2679	0.19	68	1.5	0.16
Q	4.528	0.87	0.862	19.13%	0.17	1959	98	2057	0.14	64	1.0	0.15
T1	26.816	6.34	5.04386	23.64%	0.19	13368	668	14036	0.97	119	7.0	0.28
O	4.623	0.88	0.8718	18.97%	0.16	1989	99	2089	0.14	65	1.0	0.15
U	15.989	4.11	3.147015	25.73%	0.20	8449	422	8871	0.61	118	4.0	0.28
V	8.946	4.32	1.72381	48.23%	0.33	7674	384	8057	0.56	118	3.5	0.28
W	6.554	3.68	1.23675	56.09%	0.38	6513	326	6839	0.47	112	3.0	0.27
P	15.716	4.22	3.10187	26.84%	0.21	8551	428	8978	0.62	119	4.0	0.28
D5E	71.188	18.69	13.75442	26.26%	0.21	38148	1907	40055	2.77	126	21.0	0.30
D5D	27.302	8.78	3.27511	32.15%	0.24	16894	845	17739	1.23	127	8.5	0.30
AH	13.327	8.34	2.60029	62.56%	0.43	14946	747	15693	1.09	118	8.0	0.28
D3N+D3P3	32.7	8.15	4.9	24.92%	0.20	16910	846	17756	1.23	127	8.5	0.30
D3P2+D4Y	29.6	7.40	3.5	25.03%	0.20	15336	767	16103	1.11	121	8.0	0.29
D5X	30.332	8.30	5.495505	27.37%	0.21	16732	837	17568	1.22	126	8.5	0.30
D3P	46.647	14.66	8.9197	31.43%	0.23	28391	1420	29810	2.06	128	15.0	0.30
D4R	2.559	1.83	0.45774	71.56%	0.51	3404	170	3574	0.25	77	2.0	0.18
D2P+D2D	382.2	140.31	57.0	36.72%	0.26	261223	13061	274284	18.99			
D2C+D2C1	28.7	9.32	4.4	32.51%	0.24	17891	895	18786	1.30	128	9.0	0.30
D1M	4.641	1.38	0.92088	29.84%	0.22	2721	136	2857	0.20	72	1.5	0.17
D1R+D1E	82.3	14.92	10.0	18.13%	0.16	34381	1719	36100	2.50	124	19.0	0.30
D1A	47.142	8.98	8.80452	19.05%	0.17	20341	1017	21358	1.48	122	11.0	0.29
D2H	122.566	41.25	19.51939	33.65%	0.24	78445	3922	82367	5.70	136	41.0	0.32
D2S	40.323	14.43	7.37482	35.78%	0.26	27022	1351	28373	1.96	130	14.0	0.31
D2Y	18.105	4.36	3.41742	24.10%	0.19	9146	457	9603	0.66	117	4.5	0.28
D2U	80.277	39.01	13.485078	48.60%	0.33	69334	3467	72801	5.04	136	36.0	0.32
D2U2	10.428	3.13	2.06582	30.03%	0.23	6142	307	6449	0.45	106	3.0	0.25
D2U1	52.449	18.53	8.653635	35.34%	0.25	34819	1741	36560	2.53	133	18.0	0.32
D2Z2	9.775	3.64	1.89208	37.19%	0.26	6749	337	7086	0.49	104	3.5	0.25
D3B	286.083	98.95	47.439665	34.59%	0.25	186882	9344	196227	13.58			
D3M	16.861	2.18	2.0216	12.92%	0.13	5678	284	5962	0.41	98	3.0	0.23
D2S1	35.721	6.93	6.40808	19.39%	0.17	15594	780	16374	1.13	124	8.0	0.29
D4K	47.374	13.74	5.900715	29.01%	0.22	27223	1361	28584	1.98	131	14.0	0.31
D4J	9.784	1.12	1.0308	11.48%	0.12	3066	153	3219	0.22	100	1.0	0.24
D3K1	8.4	1.30	1.3	15.49%	0.14	3164	158	3322	0.23	103	1.0	0.25
D3K2	12.214	1.96	1.9056	16.04%	0.15	4713	236	4949	0.34	106	2.0	0.25
D4F+D4G	208.2	56.46	29.9	27.12%	0.21	114097	5705	119801	8.29			
D4D1	21.5	3.66	3.6	17.08%	0.15	8621	431	9052	0.63	41	14.0	0.10
D4D2+D4C1	33.3	5.92	5.8	17.78%	0.16	13743	687	14430	1.00	115	7.5	0.27
D4C2	10.75	2.38	1.40784	22.18%	0.18	5134	257	5390	0.37	100	2.5	0.24
D4A	115.194	29.39	22.25192	25.51%	0.20	60512	3026	63537	4.40	133	32.0	0.32
D3A	27.675	8.08	4.82282	29.20%	0.22	15976	799	16775	1.16	127	8.0	0.30

REDUCED for LID - SWQ VOLUME/FLOWRATE DESIGN - PRSCG FACTORS - STRUCTURAL BMPs									
Outfall Location	Total Area	Imperv. Area	LID Mit. Imp. Area	Reduced % Imperv	C Value	Volume	Reserve Volume	Total Volume	Design Flowrate
	ac	ac	ac			Ft^3	Ft^3	Ft^3	cfs
D2K	6.867	4.93	1.239	71.74%	0.51	9166	458	9625	0.67
D5F4	24.278	15.54042	4.693258	64.01%	0.44	27979	1399	29378	2.03
D5F	48.556	31.08	9.386515	64.01%	0.44	55958	2798	58756	4.07
D5F3	24.278	15.54042	4.693258	64.01%	0.44	27979	1399	29378	2.03
X	6.045	1.43	0.34928	23.66%	0.19	3016	151	3166	0.22
Y	1.879	1.35	0.33822	72.00%	0.51	2521	126	2647	0.18
D5A	13.147	4.08	1.75125	31.02%	0.23	7927	396	8324	0.58
D5B	100.377	43.81	19.36109	43.65%	0.30	78868	3943	82812	5.73
D2D*									
D2D*	347.872	138.97	56.862188	39.95%	0.28	254096	12705	266801	18.47
D1K2	1.584	1.08	0.2688	67.88%	0.47	1964	98	2062	0.14
D1S	5.185	1.70	0.94128	32.84%	0.24	3259	163	3422	0.24
D1K1	10.429	3.27	1.96296	31.36%	0.23	6338	317	6655	0.46
D1H	2.276	0.57	0.4504	25.26%	0.20	1187	59	1247	0.09
D1D	13.805	3.27	2.16894	23.72%	0.19	6898	345	7243	0.50
D1C	12.196	3.58	1.98332	29.38%	0.22	7072	354	7426	0.51
D1B	27.288	5.95	5.34746	21.82%	0.18	12887	644	13531	0.94
D2B	31.664	4.62	2.178	14.59%	0.14	11504	575	12079	0.84
D2A	17.2	2.90	2.8388	16.85%	0.15	6852	343	7195	0.50
D2H	122.566	41.25	19.51939	33.65%	0.24	78445	3922	82367	5.70
D2J2	12.0	2.4	2.4	20.03%	0.17	5340	267	5607	0.39
D2J1	10.171	2.03	2.0342	20.00%	0.17	4532	227	4759	0.33
D2F	7.82	1.54	1.5366	19.71%	0.17	3451	173	3624	0.25
D2G	48.424	13.96	7.906115	28.83%	0.22	27705	1385	29090	2.01
D4H	21.423	4.15	4.1358	19.37%	0.17	9348	467	9815	0.68
AF	93.043	18.73	11.58066	20.13%	0.17	41642	2082	43724	3.03
AE	23.565	4.69	4.6868	19.90%	0.17	10466	523	10989	0.76
AL	34.14	13.66	5.828885	40.00%	0.28	24963	1248	26211	1.81
AM	48.412	16.43	8.78498	33.93%	0.25	31176	1559	32735	2.27
AA	65.723	21.93	12.183455	33.36%	0.24	41792	2090	43881	3.04
AB	25.621	6.99	4.693435	27.29%	0.21	14104	705	14809	1.03
F	22.19	3.89	3.78562	17.55%	0.16	9073	454	9527	0.66
E	13.75	2.70	2.6942	19.63%	0.17	6053	303	6355	0.44
D	5.113	1.02	1.0226	20.00%	0.17	2278	114	2392	0.17
C	14.346	3.54	2.70946	24.69%	0.20	7367	368	7735	0.54

IV.A LOW IMPACT DEVELOPMENT MEASURES:

Order NO. 2013-0001-DWQ (CAS000004), otherwise known as the new (2013) Phase II MS4 Permit, requires (starting July 2014):

E.12.b.ii **Implementation Level** - Projects shall implement one or more of the following site design measures to reduce project site runoff:

(a) Stream Setbacks and Buffers - a vegetated area including trees, shrubs, and herbaceous vegetation, that exists or is established to protect a stream system, lake reservoir, or coastal estuarine area;
(b) Soil Quality Improvement and Maintenance - improvement and maintenance soil through soil amendments and creation of microbial community;
(c) Tree Planting and Preservation - planting and preservation of healthy, established trees that include both evergreens and deciduous, as applicable;
(d) Rooftop and Impervious Area Disconnection - rerouting of rooftop drainage pipes to drain rainwater to rain barrels, cisterns, or permeable areas instead of the storm sewer;
(e) Porous Pavement - pavement that allows runoff to pass through it, thereby reducing the runoff from a site and surrounding areas and filtering pollutants;
(f) Green Roofs - a vegetative layer grown on a roof (rooftop garden);
(g) Vegetated Swales - a vegetated, open-channel management practice designed specifically to treat and attenuate storm water runoff;
(h) Rain Barrels and Cisterns - system that collects and stores storm water runoff from a roof or other impervious surface.

E.12.e.ii.(a) ***Site Assessment***
At the earliest planning stages, the Permittee shall require Regulated Projects to assess and evaluate how site conditions, such as soils, vegetation, and flow paths, will influence the placement of buildings and paved surfaces. The evaluation will be used to meet the goals of capturing and treating runoff and assuring these goals are incorporated into the project design. The Permittee may adopt or reference an existing LID site assessment methodology[22]Permittees shall require Regulated Projects to consider optimizing the site layout through the following methods:

1) *Define the development envelope and protected areas, identifying areas that are most suitable for development and areas to be left undisturbed.*
2) *Concentrate development on portions of the site with less permeable soils and preserve areas that can promote infiltration.*
3) *Limit overall impervious coverage of the site with paving and roofs.*
4) *Set back development from creeks, wetlands, and riparian habitats.*
5) *Preserve significant trees.*
6) *Conform the site layout along natural landforms.*
7) *Avoid excessive grading and disturbance of vegetation and soils.*
8) *Replicate the site's natural drainage patterns.*
9) *Detain and retain runoff throughout the site.*

These two sections of the permit address the mandatory need for the use of Low Impact development measures with this project.

Through the development of a plan to implement the above measures we estimate that the following mitigation for the stormwater quality and 2-year events can be achieved:

TABLE IV.A.1: Proposed LID % Impervious Reductions:

Proposed Land Use	Hydrology Model Assumed % Imperv	Estimated LID Reduction Imperv %	Modified Hydrology % Impervious
Bus.prof.	80	25.00	60
Bus.prof/Pub.Com	80	25.00	60
Cemetery	30	25.00	22.5
Cemetery	30	25.00	22.5
Comm.Multiuse	75	25.00	56.25
Commercial	80	25.00	60
Elementary School	50	30.00	35
Fire	70	30.00	49
Hospital	70	25.00	52.5
Hi Dens.Res.	65	30.00	45.5
High School	50	25.00	37.5
Landscape	5	50.00	2.5
Low Dens.Res	40	50.00	20
Med. Dens.Res.	50	40.00	30
Mid School	50	30.00	35
Office	80	25.00	60
Open Space	2	0.00	2
Park	2	0.00	2
Muni.Faci.	65	30.00	45.5
Public	65	30.00	45.5
Recreation	5	50.00	2.5
Religion	50	30.00	35
Road	90	20.00	72
school	50	25.00	37.5
Public	90	30.00	63
Public	65	30.00	45.5
Transport	90	20.00	72

IV.B HYDROGRAPH MODIFICATION:

Order NO. 2013-0001-DWQ (CAS000004), otherwise known as the new (2013) Phase II MS4 Permit, requires (starting July 2015):

E.12.f. ***Hydromodification Management***

(i) ***Task Description*** *– Within the third year of the effective date of the permit, the Permittee shall develop and implement Hydromodification Management procedures. Hydromodification management projects are Regulated Projects that create and/or replace one acre or more of impervious surface. A project that does not increase*

impervious surface area over the pre-project condition is not a hydromodification management project.

(ii) ***Implementation Level*** *- The Permittee shall implement the following Hydromodification Standard:*

(a) Post-project runoff shall not exceed estimated pre-project flow rate for the 2-year, 24-hour storm

Alternatively, the Permittee may use a geomorphically based hydromodification standard or set of standards and analysis procedures designed to ensure that Regulated Projects do not cause a decrease in lateral (bank) and vertical (channel bed) stability in receiving stream channels. The alternative hydromodification standard or set of standards and analysis procedures must be reviewed and approved by the Regional Board Executive Officer.

Alternative methods and requirements have not been established by PRSCG or Placer County. For the purposes of this study "(a)" is interpreted such that the term "flow rate" means the "peak flow rate". However, we recognize that the timing and shape of resulting hydrographs should also be considered. In order to provide a better comparison, the hydrology models have been improved (November 2013 amendment), and hydraulic routing is being used for main channels within the project to better estimate the expected hydrograph response for small events including the 2-year 24-hour event.

A special version of the hydrology models were created for the Post-project Conditions factoring the Low Impact Development measures, and impervious reductions identified in TABLE IV.A.1. Tables IVB1, IVB2 and IVB3 identify the hydrology input factors used for the LID factored post-project analysis. This analysis was only run for the 2-year 24-hour event.

TABLE IVB1 – LID Included Post Project Hydrologic Factors

			Non-Improved Plane							Improved Plane						
		SHED	Initial	Constant		Overland			% of	Initial	Constant		Overland			% of
SHED	DESCRIPTION	AREA (mi^2)	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed
DRY CREEK WATERSHED (ONLY PROJECT SHEDS NEAR PROJECT ARE INCLUDED HERE)																
DC65B	DC65B 21.8 ac	0.0341	0.1	0.12	43.94	121	0.01	0.24	100							
DC65J	DC65J 48.9 ac	0.0765	0.1	0.12	17.25	208	0.0089	0.24	100							
DC65C	DC65C 87.5 ac	0.1367	0.1	0.0718	2.11	600	0.001	0.4	10	0.1	0.12	41.91	127	0.01	0.24	90
DC65D	DC65D 5.6 ac	0.0088	0.1	0.12	61.53	89	0.0122	0.24	100							
DC65E	DC65E 11.2 ac	0.0175	0.1	0.1252	18.99	202	0.0091	0.24	100							
DC65A	DC65A 259.0 ac	0.4046	0.1	0.0799	2	660	0.001	0.4	3	0.1	0.128	15.34	220	0.0087	0.24	97
DC65F	DC65F 82.9 ac	0.1296	0.1	0.1283	15	220	0.0087	0.24	100							
DC65G	DC65G 9.9 ac	0.0154	0.1	0.07	2	600	0.001	0.4	71	0.1	0.12	54.47	96	0.0108	0.24	29
DC65H	DC65H 42.6 ac	0.0665	0.1	0.0753	2	418	0.001	0.4	11	0.1	0.141	18.65	202	0.0091	0.24	89
DC65K	DC65K 130.497 ac	0.2039	0.1	0.09	2	362	0.001	0.4	100							
DC65I	DC65I 122.58 ac	0.19153	0.1	0.09	2	350	0.001	0.4	56.2	0.1	0.089	21.5	130	0.01	0.24	43.8
DC75A	DC75A 243.08 ac	0.37981	0.1	0.091	2	861	0.001	0.4	56.6	0.1	0.115	22.4	130	0.01	0.24	43.4
DC68A	DC68A 555.0 ac	0.8673	0.1	0.07	2.17	423	0.001	0.4	12	0.1	0.1249	41	127	0.01	0.24	88
DC68B	DC68B 351.1 ac	0.5486	0.1	0.0982	2	370	0.001	0.4	17	0.1	0.1314	41.2	127	0.01	0.24	83
DC70A	DC70A 190.6 ac	0.2978	0.1	0.124	2	243	0.001	0.4	52	0.1	0.12	39.93	132	0.01	0.24	48
DC75B	DC75B 73.0 ac	0.1141	0.1	0.1062	2	582	0.001	0.4	88	0.1	0.12	35	140	0.01	0.24	12
DC75C	DC75C 196.66 ac	0.30728	0.1	0.101	2	434	0.001	0.4	45.9	0.1	0.111	35.4	130	0.01	0.24	54.1
DC76A	DC76A 249.111 ac	0.38924	0.1	0.106	2	658	0.001	0.4	53	0.1	0.153	33.3	130	0.01	0.24	47
DC70B	DC70B 42.8 ac	0.0669	0.1	0.1448	2	433	0.001	0.4	100							
DC71A	DC71A 99.3 ac	0.1552	0.1	0.07	2	365	0.001	0.4	30	0.1	0.12	39.97	132	0.01	0.24	70
DC71B	DC71B 74.1 ac	0.1158	0.1	0.1225	2.65	385	0.001	0.4	76	0.1	0.2028	58.72	92	0.0116	0.24	24
DC76C	DC76C 113.973 ac	0.17808	0.1	0.25	2	450	0.001	0.4	78	0.1	0.247	27.7	130	0.01	0.24	22
DC76D	DC76D (12.888 AC undeveloped)	0.02014	0.1	0.08	2	385	0.001	0.4	100							
DC76E	DC76E (50.959 AC undeveloped)	0.07962	0.1	0.08	2	385	0.001	0.4	100							
DC76B	DC76B 100.937 ac	0.15771	0.1	0.09	2	450	0.001	0.4	78.8	0.1	0.118	20	130	0.01	0.24	21.2
DC85	DC85 192.8 ac	0.3013	0.1	0.134	2.77	408	0.001	0.4	94	0.1	0.1207	40	130	0.01	0.24	6
DC90	DC90 445.5 ac	0.6962	0.1	0.0924	3.06	556	0.0023	0.4	28	0.1	0.1197	44.84	118	0.01	0.24	72
DC95A	DC95A 162.0 ac	0.2531	0.1	0.07	2	349	0.001	0.4	61	0.1	0.12	40.71	130	0.01	0.24	39
DC95B	DC95B 432.4 ac	0.6756	0.1	0.07	2	455	0.001	0.4	22	0.1	0.12	46.16	112	0.01	0.24	78
DC96C	DC96C 334.3 ac	0.5223	0.1	0.07	2	680	0.001	0.4	13	0.1	0.12	47.55	109	0.01	0.24	87
DC96A	DC96A 343.9 ac	0.5374	0.1	0.0707	2.04	440	0.001	0.4	13	0.1	0.12	42.94	124	0.01	0.24	87
DC96B	DC96B 253.3 ac	0.3957	0.1	0.0725	2.15	580	0.001	0.4	19	0.1	0.12	42.19	124	0.01	0.24	81
DC100A	DC100A 235.2 ac	0.3675	0.1	0.0753	2.83	442	0.001	0.4	42	0.1	0.1194	40.6	130	0.01	0.24	58
DC100B	DC100B 88.6 ac	0.1385	0.1	0.0867	2.92	459	0.001	0.4	96	0.1	0.106	51.22	99	0.0102	0.24	4
DC110	DC110 173.271 ac	0.27074	0.1	0.1721	4.31	547	0.0037	0.4	44	0.1	0.1212	40	130	0.01	0.24	56
DC105A	DC105A 116.2 ac	0.1815	0.1	0.07	2	415	0.001	0.4	2	0.1	0.12	42.63	124	0.01	0.24	98
DC105B	DC105B 118.2 ac	0.1847	0.1	0.07	4.45	437	0.0037	0.4	78	0.1	0.106	78.27	72	0.016	0.24	22
DC105C	DC105C 183.6 ac	0.287	0.1	0.071	4.04	222	0.0037	0.4	72	0.1	0.0963	58.95	92	0.0116	0.24	28
DC105E	DC105E 123.0 ac	0.1922	0.1	0.07	2.83	272	0.001	0.4	53	0.1	0.07	80	70	0.0167	0.24	47
DC105D	DC105D 63.7 ac	0.0995	0.1	0.0703	3.99	246	0.0023	0.4	97	0.1	0.07	80	70	0.0167	0.24	3
DC115	DC115 197.703 ac	0.30891	0.1	0.1342	4.09	853	0.0037	0.4	83	0.1	0.1201	40	130	0.01	0.24	17
CURRY CREEK WATERSHED																
CUS3A	AREA EAST OF FIDDYMENT ROAD ARE	0.43449	0.1	0.090	3.60	550	0.0023	0.4	8	0.1	0.12	47.20	109	0.01	0.24	92
CUS3B	CUS3 AREA (242.95) REVISED PER NEV	0.3796	0.1	0.07	2	600	0.001	0.4	100							
CUS4	CSU4 AREA (39.39 AC) REVISED PER N	0.06155	0.1	0.07	2	600	0.001	0.4	100							
CUS5A	CUS5A 35.55 AC MAY 18-06	0.05555	0.1	0.07	2	600	0.001	0.4	100							
CUS5	CUS5 AREA (39.3AC) REVISED PER NE	0.0614	0.1	0.07	2	600	0.001	0.4	100							
CUS6	CUS6 107.95ac CUS6 AREA (107.8 AC) F	0.16867	0.1	0.07	2	600	0.001	0.4	99.1	0.1	0.07	72	79	0.0142	0.11	0.9
CUS6B	CUS6B 31.95ac	0.05023	0.1	0.07	2	600	0.001	0.4	1	0.1	0.086	31.2	148	0.01	0.24	99
CUS11A	CUS11A 25.76 AC	0.04028	0.1	0.07	2	600	0.001	0.4	1	0.1	0.09	20	196	0.0092	0.24	99
CUS11B	CUS11B 33.23 ac	0.05193	0.1	0.07	2	600	0.001	0.4	75.8	0.1	0.07	70.7	80	0.014	0.24	24.2
CUS11C	CUS11C 23.98 ac	0.03767	0.1	0.07	2	600	0.001	0.4	7.8	0.1	0.09	20	196	0.0092	0.24	92.2
CUS12A	CUS12A AREA (160.356 AC) REVISED P	0.25056	0.1	0.07	2	600	0.001	0.4	100							
CUS13A	CUS13A AREA (8.844 AC) REVISED PER	0.01382	0.1	0.07	2	600	0.001	0.4	99	0.1	0.07	72	79	0.0104	0.11	1
CUS14	CUS14 60.14 AC	0.09396	0.1	0.07	2	600	0.001	0.4	25.8	0.1	0.085	52.4	98	0.0104	0.24	74.2
CUS16B	CUS16B 12.77 AC	0.01996	0.1	0.07	2	600	0.001	0.4	80.6	0.1	0.07	72	79	0.0142	0.24	19.4
CUS15	CUS15 AREA =79.216 AC PER WATT AV	0.12378	0.1	0.07	2	600	0.001	0.4	100							
CUS15B	CUS15B AREA=52.313 AC PER WATT A	0.08174	0.1	0.07	2	600	0.001	0.4	100							
CUS17A	CUS17A 37.73 AC	0.05895	0.1	0.07	2	600	0.001	0.4	85.3	0.1	0.07	72	79	0.0142	0.24	14.7
CUS17B	CUS17B AREA (49.318 AC) REVISED PE	0.07706	0.1	0.07	2	600	0.001	0.4	100							
CUS17C	CUS17C AREA (69.026 AC) REVISED PE	0.10785	0.1	0.07	2	600	0.001	0.4	100							
CWP7	Curry Creek Basin CU2A (5-03)	0.0843	0.1	0.12	5	450	0.005	0.4	2	0.1	0.12	43.43	121	0.01	0.24	98
CU2A1A	SHED AREA=42.4 AC	0.0596	0.1	0.07	2	600	0.001	0.4	96	0.1	0.12	80	70	0.0167	0.24	4
CU2A1B	SHED AREA=51.6	0.0793	0.1	0.07	2	600	0.001	0.4	99	0.1	0.12	80	70	0.0167	0.24	1
CU2A1C	SHED AREA=46.0 AC	0.0709	0.1	0.07	2	600	0.001	0.4	98	0.1	0.12	77.66	73	0.0157	0.24	2
CWP8	Basin CU2A (5-03)	0.1068	0.1	0.1138	4.63	500	0.0037	0.4	7	0.1	0.12	42.78	124	0.01	0.24	93
CU2A9	PORTION OF SHED CU2A	0.1265	0.1	0.07	2	600	0.001	0.4	100							
CU2A8	PORTION OF SHED CU2A	0.0629	0.1	0.07	2	600	0.001	0.4	100							
CU2A3	PORTION OF SHED CU2A	0.2463	0.1	0.07	2	600	0.001	0.4	100							
CU2A7	PORTION OF SHED CU2A	0.1677	0.1	0.07	2	600	0.001	0.4	100							
CU2A4	AREA=47.861 AC PER WATT AVE	0.0756	0.1	0.07	2	600	0.001	0.4	100							
CU2A6C	AREA=7.464 AC PER WATT AVE	0.0115	0.1	0.07	2	600	0.001	0.4	100							
CU2A4B	AREA 26.094 AC WEST OF WATT AVE	0.0411	0.1	0.07	2	600	0.001	0.4	100							
CU2A5	AREA = 131.754 AC PER WATT AVE	0.2074	0.1	0.07	2	600	0.001	0.4	100							
CU2A5B	AREA = 8.664 AC PER WATT AVE	0.0137	0.1	0.07	2	600	0.001	0.4	100							
CU2A6B	AREA 3.383 AC PER WATT AVE	0.0054	0.1	0.07	2	600	0.001	0.4	100							
CU2A6	AREA =55.457 AC PER WATT AVE	0.0994	0.1	0.07	2	600	0.001	0.4	100							
CU2A1	AREA = 9.6 AC UP/S OF WATT	0.0151	0.1	0.07	2	600	0.001	0.4	100							
CU2A5C	AREA = 58.6 AC	0.0775	0.1	0.07	2	600	0.001	0.4	100							
CU2A2	AREA = 24.1 AC UP/S OF WATT	0.0379	0.1	0.07	2	600	0.001	0.4	100							
CU2A3A	AREA = 38.2 AC WEST OF WATT	0.0601	0.1	0.07	2	600	0.001	0.4	100							
CU2A	AREA = 485.3 AC NOV 29- 06	0.7942	0.1	0.07	2	600	0.001	0.4	100							
CWP1	AREA REVISED 6-05	0.1436	0.1	0.1151	4.7	500	0.0037	0.4	12	0.1	0.12	54.15	96	0.0108	0.24	88
CWP2	AREA REVISED 6-05	0.1939	0.1	0.074	2.24	600	0.001	0.4	68	0.1	0.12	41.85	127	0.01	0.24	32
CWP4	Revise Date (5-03)	0.3583	0.1	0.0968	3.61	550	0.0023	0.4	12	0.1	0.1157	49.24	103	0.01	0.24	88
CWP3	AREA REVISED 6-05	0.3014	0.1	0.07	2	600	0.001	0.4	36	0.1	0.0989	64.56	86	0.0128	0.24	64
CWP6	Revise Date (5-03) (194.5 ac)	0.3008	0.1	0.0813	2.68	600	0.001	0.4	43	0.1	0.12	40.01	130	0.01	0.24	57
CWP9	AREA REVISED 6-05 area rewised to 191	0.3188	0.1	0.12	80	71	0.0163	0.24	100							
CWP13	AEEA REVISED 6-05	0.0942	0.1	0.098	3.68	550	0.0023	0.4	25	0.1	0.12	44.24	118	0.01	0.24	75
CWP14	AERA REVISED 6-05	0.1558	0.1	0.07	2	600	0.001	0.4	98	0.1	0.12	53.2	97	0.0106	0.24	2
CU2B1	53.9 ACRES AREA REVISED 6-05	0.0623	0.1	0.07	2	600	0.001	0.4	100							
CU2B1A	29.2 ACRES AREA REVISED 6-05	0.0816	0.1	0.07	2	600	0.001	0.4	100							

TABLE IVB2 – LID Included Post Project Hydrologic Factors (Cont)

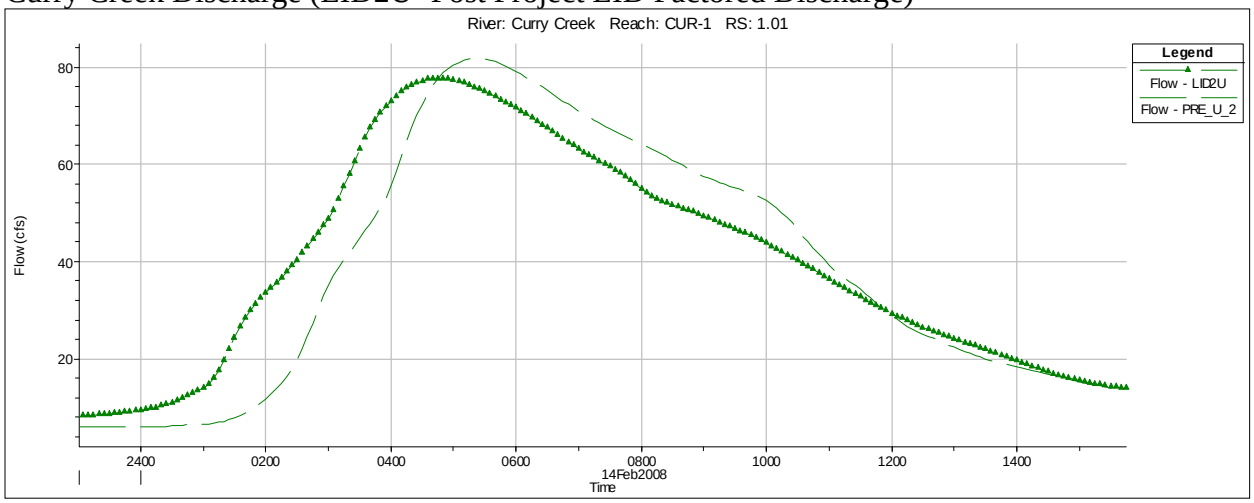
			Non-Improved Plane							Improved Plane						
		SHED	Initial	Constant		Overland			% of	Initial	Constant		Overland			% of
SHED	DESCRIPTION	AREA (mi^2)	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed
CU2B2	AREA = 214.8 AC NOV 29- 06	0.296	0.1	0.07	2	600	0.001	0.4	100							
CU2B3	221.1 ACRES	0.3433	0.1	0.07	2	600	0.001	0.4	100							
CU2C1	186.4 ACRE @ COUNTRY ACRE LN	0.2887	0.1	0.07	2	600	0.001	0.4	100							
CU2C2	" 146.6 ACRES COUNTRY ACRES LN TO	0.2333	0.1	0.07	2	600	0.001	0.4	100							
CU2C3	" 216.6 ACRES ""LANDING STRIP"" TO BI	0.3597	0.1	0.07	2	600	0.001	0.4	100							
CWP11A	Open Space	0.0639	0.1	0.07	2	600	0.001	0.4	10	0.1	0.12	40	130	0.01	0.24	90
CWP11	Open Space	0.1216	0.1	0.07	2	600	0.001	0.4	97	0.1	0.12	40	130	0.01	0.24	3
CWP12		0.0769	0.1	0.07	2	600	0.001	0.4	100							
CU3A	247.3 acres	0.3724	0.1	0.07	2	600	0.001	0.4	100							
CU3B	307.4 ACRES	0.4841	0.1	0.07	2	600	0.001	0.4	100							
CU3C	110.3 acres	0.1785	0.1	0.07	2	600	0.001	0.4	100							
CU3D	465.8 acres ROUTES & COMBINES 465	0.7175	0.1	0.07	2	600	0.001	0.4	100							
CU3E	111.8 acres	0.1931	0.1	0.07	2	600	0.001	0.4	100							
CU3F	641.7ACRES	1.1282	0.1	0.0702	2	600	0.001	0.4	100							
CU3G	200.0 acres	0.2966	0.1	0.07	2	600	0.001	0.4	100							
CU3HA	57.4 acres	0.0776	0.1	0.07	2	600	0.001	0.4	100							
CU3HB	106.1 acres	0.1634	0.1	0.07	2	600	0.001	0.4	100							
CU4		3.4147	0.1	0.0703	2	600	0.001	0.4	100							
CU5		0.2757	0.1	0.07	2	600	0.001	0.4	100							
CU6		0.909	0.1	0.07	2	600	0.001	0.4	100							
STEELHEAD CREEK (NEMDC) WATERSHED																
EMA1D3	EMA1D3	0.06406	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMA1D2	EMA1D2	0.26938	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMA1D1	EMA1D1	0.33422	0.1	0.07	2	200	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA1F	EMA1F	1.1306	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA1E	EMA1E	0.21328	0.1	0.07	2	300	0.005	0.4	100							
EMA1C	EMA1C	0.80844	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMAS1D	EMAS1D 38.5ac	0.06015	0.1	0.09	2	600	0.001	0.4	6.8	0.1	0.09	20.7	190	0.0093	0.24	93.2
EMAS3D	EMAS3D 5.81ac	0.00905	0.1	0.09	2	600	0.001	0.4	100							
EMAS4	EMAS4 11.12ac	0.01737	0.1	0.09	2	600	0.001	0.4	1.6	0.1	0.09	20	190	0.0093	0.24	98.4
EMAS6A	EMAS6A 3.63ac	0.00566	0.1	0.09	2	600	0.001	0.4	26	0.1	0.07	71.7	79	0.0142	0.11	74
EMAS2	EMAS2 11.85ac	0.01837	0.1	0.09	2	600	0.001	0.4	5	0.1	0.088	25.2	160	0.01	0.24	95
EMAS6B	EMAS6B 11.3ac	0.01765	0.1	0.09	2	600	0.001	0.4	1	0.1	0.09	20	190	0.0093	0.24	99
EMAS9	EMAS9 24.48ac	0.03826	0.1	0.09	2	600	0.001	0.4	5.1	0.1	0.09	20	190	0.0093	0.24	94.9
EMAS8	EMAS8 2.38ac	0.00377	0.1	0.09	2	600	0.001	0.4	2	0.1	0.07	71.8	79	0.0142	0.11	98
EMAS7D	EMAS7D 10.95ac	0.01711	0.1	0.09	2	600	0.001	0.4	99	0.1	0.085	34	144	0.01	0.24	1
EMAS10	EMAS10 4.69ac	0.00733	0.1	0.09	2	600	0.001	0.4	1	0.1	0.09	20	196	0.0092	0.24	99
EMAS12	EMAS12 4.98ac	0.00778	0.1	0.09	2	600	0.001	0.4	12	0.1	0.09	20	196	0.0092	0.24	88
MAS14D	MAS14D 15.74ac	0.02459	0.1	0.09	2	600	0.001	0.4	1	0.1	0.093	25	160	0.01	0.24	99
EMAS13	EMAS13 14.44ac	0.02251	0.1	0.09	2	600	0.001	0.4	99	0.1	0.087	27.8	156	0.01	0.24	1
MAS15D	MAS15D 8.89ac	0.01388	0.1	0.09	2	600	0.001	0.4	1	0.1	0.089	39.2	132	0.01	0.24	99
MAS18D	MAS18D 16.06ac	0.0251	0.1	0.09	2	600	0.001	0.4	1	0.1	0.087	26.8	158	0.01	0.24	99
EMAS16	EMAS16 6.69ac	0.01045	0.1	0.09	2	600	0.001	0.4	1	0.1	0.082	50.1	100	0.01	0.24	99
EMAS19	EMAS19 71.56ac	0.11181	0.1	0.09	2	600	0.001	0.4	1	0.1	0.088	26.1	158	0.01	0.24	99
MAS20E	MAS20E 49.68ac	0.07761	0.1	0.09	2	600	0.001	0.4	38.6	0.1	0.086	53.7	97	0.0106	0.24	61.4
EMAS23	MAS23 58.76ac	0.09182	0.1	0.09	2	600	0.001	0.4	66.3	0.1	0.085	40.8	130	0.01	0.24	33.7
MAS20C	MAS20C 114.49ac	0.17873	0.1	0.104	2	600	0.001	0.4	4.3	0.1	0.099	44	121	0.01	0.24	95.7
MAS20A	MAS20A 30.56ac	0.04774	0.1	0.09	2	600	0.001	0.4	8.7	0.1	0.09	30	152	0.01	0.24	91.3
MAS20B	MAS20B 14.14ac	0.02214	0.1	0.09	2	600	0.001	0.4	90	0.1	0.071	69.9	81	0.0138	0.11	10
EMAS18	MAS18 71.58ac	0.1461	0.1	0.09	2	600	0.001	0.4	23.3	0.1	0.089	33.1	144	0.01	0.24	76.7
EMAS17	MAS17 26.94ac	0.04232	0.1	0.09	2	600	0.001	0.4	1	0.1	0.085	62.9	88	0.0124	0.11	99
EMAS15	MAS15 37.04ac	0.05787	0.1	0.09	2	600	0.001	0.4	9.3	0.1	0.087	45.5	115	0.01	0.24	90.7
EMAS14	EMAS14 169.42	0.26472	0.1	0.07	2	600	0.001	0.4	100							
MAS11B	MAS11B 119.60ac	0.18688	0.1	0.09	2	600	0.001	0.4	16.5	0.1	0.087	39.7	132	0.01	0.24	83.5
MAS12A	MAS12A 127.06ac	0.19852	0.1	0.09	2	600	0.001	0.4	50.1	0.1	0.082	58.9	92	0.0116	0.24	49.9
EMAS7	EMAS7 100.01ac	0.15626	0.1	0.09	2	600	0.001	0.4	33	0.1	0.085	47.1	109	0.01	0.24	67
EMAS6	EMAS6 45.52ac	0.07112	0.1	0.09	2	600	0.001	0.4	7.6	0.1	0.086	61.8	89	0.0122	0.11	92.4
EMAS3	EMAS3 42.4ac	0.06625	0.1	0.09	2	600	0.001	0.4	1	0.1	0.087	42.4	124	0.01	0.24	99
EMAS1	EMAS1	1.0022	0.1	0.07	2	600	0.001	0.4	99	0.1	0.03	72	79	0.0142	0.11	1
EMA1B	EMA1B	0.99031	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMACU	EMACU - SANKEY ROAD SHEDS	1.6713	0.1	0.07	2	600	0.002	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA2	EMA2	0.54344	0.1	0.07	2	300	0.005	0.4	99	0.1	0.03	90	50	0.02	0.11	1
EMA3I	EMA3I	0.02219	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.8	150	0.01	0.24	99
EMA3H	EMA3H	0.03328	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.8	150	0.01	0.24	99
EMA3G	EMA3G	0.05125	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.8	150	0.01	0.24	99
EMA3E	EMA3E	0.04313	0.1	0.07	2	200	0.005	0.4	45	0.1	0.0755	21.8	150	0.01	0.24	55
EMA3D	EMA3D	0.02734	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMA3C	EMA3C	0.02922	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMA3B	EMA3B	0.00969	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMA3A	EMA3A	0.64422	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMB4	EMB4	0.00625	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMB3	EMB3	0.06203	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	150	0.01	0.24	99
EMB2	EMB2	0.07047	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	150	0.01	0.24	99
EMB1	EMB1	0.08688	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC17	EMC17 115.2	0.18	0.1	0.09	2	600	0.001	0.4	20.5	0.1	0.087	37.2	136	0.01	0.24	79.5
EMC1Z2	EMC1Z2 112.36	0.17556	0.1	0.07	2	600	0.001	0.4	6.4	0.1	0.087	44.8	118	0.01	0.24	93.6
EMC1Y1	EMC1Y1 119.81	0.1872	0.1	0.09	2	600	0.001	0.4	18	0.1	0.087	45.7	115	0.01	0.24	82
EMC1W	EMC1W	0.01859	0.1	0.07	2	200	0.005	0.4	100							
EMC1V	EMC1V	0.03547	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1U	EMC1U	0.01594	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1T	EMC1T	0.02391	0.1	0.08	15	150	0.01	0.24	100							
EMC1L2	EMC1L2	0.01516	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1R	EMC1R	0.04875	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC1Q	EMC1Q	0.02844	0.1	0.08	15	150	0.01	0.24	100							
EMC1P	EMC1P	0.11313	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC1O	EMC1O	0.02188	0.1	0.08	15	150	0.01	0.24	100							
EMC1S	EMC1S	0.02234	0.1	0.08	15	100	0.01	0.24	100							
EMC1N	EMC1N	0.01359	0.1	0.08	15	150	0.01	0.24	100							
EMC1M	EMC1M	0.02313	0.1	0.08	15	150	0.01	0.24	100							
EMC1L1	EMC1L1	0.02422	0.1	0.08	15	150	0.01	0.24	100							
EMC1K	EMC1K	0.01531	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMC1J	EMC1J	0.00938	0.1	0.08	15	150	0.01	0.24	100							
EMC1G	EMC1G	0.02062	0.1	0.07	2	200	0.005	0.4	41.62	0.1	0.08	15	150	0.01	0.24	58.38
EMC1H	EMC1H	0.05969	0.1	0.08	15	150	0.01	0.24	100							
EMC1F	EMC1F	0.04498	0.1	0.09	2	600	0.001	0.4	6	0.1	0.09	20.1	190	0.0093	0.24	94
EMC1D	EMC1D	0.02284	0.1	0.07	2	200	0.005	0.4	100							
EMC1C	EMC1C	0.02504	0.1	0.07	2	200	0.005	0.4	100							
EMC1B	EMC1B	0.04268	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMC15	EMC15 120ac	0.13681	0.1	0.09	2	600	0.001	0.4	15	0.1	0.081	50.4	100	0.01	0.24	85
EMC12A	EMC12A 95.99	0.14998	0.1	0.09	2	200	0.005	0.4	61.7	0.1	0.087	32	148	0.01	0.24	38.3
EMC10B	EMC10B 13.4ac	0.02098	0.1	0.09	2	600	0.001	0.4	100							

TABLE IVB3 – LID Included Post Project Hydrologic Factors (Cont)

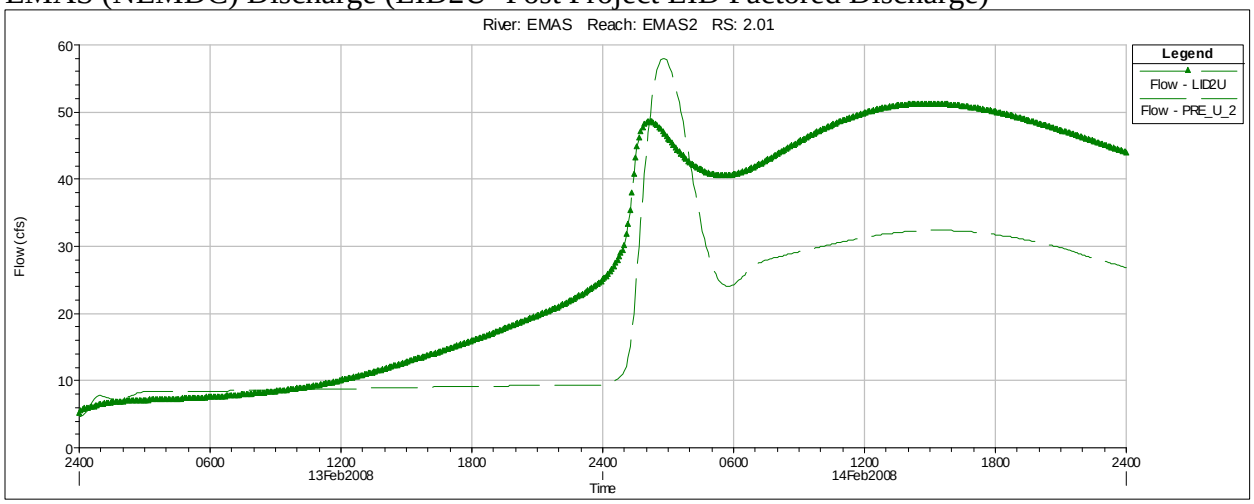
		Non-Improved Plane							Improved Plane						
	SHED	Initial	Constant		Overland			% of	Initial	Constant		Overland			% of
DESCRIPTION	AREA (mi^2)	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed	Abs. (in)	Infiltration (in/hr)	Imperv. %	Length (ft)	Slope	nval	Shed
EMC10 13.8ac	0.02156	0.1	0.09	2	600	0.001	0.4	100							
EMC9 45ac	0.07062	0.1	0.09	2	600	0.001	0.4	55.6	0.1	0.088	30.3	150	0.01	0.24	44.4
EMC8B 93.05	0.14628	0.1	0.09	2	600	0.001	0.4	48.2	0.1	0.088	30.3	150	0.01	0.24	51.8
EMC8A 8.74	0.01366	0.1	0.07	2	200	0.005	0.4	100							
EMC8	0.03289	0.1	0.09	2	600	0.001	0.4	15.3	0.1	0.087	31	150	0.01	0.24	84.7
EMC7 23.76	0.03713	0.1	0.09	2	600	0.001	0.4	46.6	0.1	0.088	26.5	160	0.01	0.24	53.4
EMC5B 15.06	0.02353	0.1	0.09	2	600	0.001	0.4	43.9	0.1	0.09	30	152	0.01	0.24	56.1
EMC5A 28.46	0.04447	0.1	0.09	2	600	0.001	0.4	99	0.1	0.09	30	152	0.01	0.24	1
EMC4E 10.27	0.01604	0.1	0.09	2	600	0.001	0.4	20.4	0.1	0.09	20	196	0.0092	0.24	79.6
EMC4D 47.4	0.07405	0.1	0.09	2	600	0.001	0.4	7.1	0.1	0.09	20	190	0.0093	0.24	92.9
EMC4C 3.99	0.00624	0.1	0.07	2	200	0.005	0.4	75	0.1	0.03	20	196	0.0092	0.11	25
EMC4B 4.43	0.00692	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC4A 22.22	0.03472	0.1	0.09	2	600	0.001	0.4	56.3	0.1	0.085	34.2	142	0.01	0.24	43.7
EMC3	0.05743	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC2A 16.12	0.02519	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC2 44.77	0.06995	0.1	0.07	2	200	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMC1A 0.13		0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.02	0.11	2
EMD10 12.78	0.01996	0.1	0.07	2	600	0.001	0.4	1	0.1	0.09	20	196	0.0092	0.24	99
EMD9 23.86	0.03728	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	20	196	0.0092	0.24	99
EMD8	0.05902	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD6A 23.36	0.0365	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD6B 48.11	0.07518	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD5 25.26	0.03947	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD4 15.75	0.02462	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	20	196	0.0092	0.24	99
EMD3 47.68	0.0745	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	150	0.01	0.24	99
EMD2 105.98	0.16559	0.1	0.07	2	200	0.005	0.4	78	0.1	0.0755	21.82	150	0.01	0.24	22
EMD1 150.08	0.2345	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	2	150	0.01	0.24	2
EMF5	0.02781	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	50	0.01	0.24	99
EMF4	0.05281	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	50	0.01	0.24	99
EMF3	0.04719	0.1	0.07	2	200	0.005	0.4	1	0.1	0.0775	18.75	50	0.01	0.24	99
EMF2	0.08438	0.1	0.07	2	200	0.005	0.4	98	0.1	0.08	90	50	0.01	0.24	2
EMF1	0.04156	0.1	0.07	2	200	0.005	0.4	98	0.1	0.03	90	50	0.01	0.24	2
EMFN12K 165.43	0.25854	0.1	0.093	2	600	0.001	0.4	12.4	0.1	0.089	37.4	136	0.01	0.24	87.6
EMFN12F 76.07	0.11886	0.1	0.09	2	600	0.001	0.4	7.2	0.1	0.088	34.3	142	0.01	0.24	92.8
EMFN12C 40.36	0.06307	0.1	0.09	2	600	0.001	0.4	11.2	0.1	0.087	45.8	115	0.01	0.24	88.8
EMFN17 28.23	0.0441	0.1	0.09	2	600	0.001	0.4	14	0.1	0.089	33.1	144	0.01	0.24	86
EMFN13A 175.87	0.2748	0.1	0.09	2	600	0.001	0.4	8	0.1	0.086	44.6	118	0.01	0.24	92
EMFN11 135.55	0.2118	0.1	0.09	2	600	0.001	0.4	9.4	0.1	0.086	38	136	0.01	0.24	90.6
EMFN8 53.73	0.08396	0.1	0.09	2	600	0.001	0.4	25.3	0.1	0.086	38.4	134	0.01	0.24	74.7
EMFN9 16.1	0.02514	0.1	0.09	2	600	0.001	0.4	71.9	0.1	0.081	59.6	91	0.0118	0.24	28.1
EMFN10 71.32	0.11144	0.1	0.09	2	600	0.001	0.4	6.4	0.1	0.087	34.1	142	0.01	0.24	93.6
EMFN6 80.49	0.12577	0.1	0.09	2	600	0.001	0.4	39.9	0.1	0.086	33.3	144	0.01	0.24	60.1
EMFN5 14.52	0.02269	0.1	0.07	2	200	0.005	0.4	100							
EMFN4 9.66	0.01509	0.1	0.07	2	200	0.005	0.4	100							
EMFN3B 20.25	0.03167	0.1	0.09	2	200	0.005	0.4	1	0.1	0.09	20	190	0.0093	0.24	99
EMFN3A	0.03289	0.1	0.09	2	600	0.001	0.4	1	0.1	0.087	36.7	138	0.01	0.24	99
EMFN2A 14.43	0.02255	0.1	0.09	2	200	0.005	0.4	99	0.1	0.09	20	196	0.0092	0.24	1
EMFN1 19.42	0.03034	0.1	0.07	2	200	0.005	0.4	43.9	0.1	0.09	20	196	0.0092	0.24	56.1
EMFS8D 87.32	0.13644	0.1	0.187	2	600	0.001	0.4	30.6	0.1	0.116	32.4	146	0.01	0.24	69.4
EMFS8C 122.17	0.19089	0.1	0.09	2	600	0.001	0.4	20.6	0.1	0.095	37.1	136	0.01	0.24	79.4
EMFS10B 64.68	0.10105	0.1	0.101	2	600	0.001	0.4	17	0.1	0.1	20.8	190	0.0093	0.24	83
EMFS8A 44.45	0.06945	0.1	0.09	2	600	0.001	0.4	42.3	0.1	0.085	40.2	130	0.01	0.24	57.7
EMFS7A 57.31	0.08954	0.1	0.09	2	600	0.001	0.4	37.9	0.1	0.085	40.5	130	0.01	0.24	62.1
EMFS11	0.0176	0.1	0.07	2	200	0.005	0.4	100							
EMFS10	0.03339	0.1	0.07	2	200	0.005	0.4	100							
EMFS6+ 19.66	0.03072	0.1	0.09	2	600	0.001	0.4	49	0.1	0.09	20	190	0.0093	0.24	51
EMFS5A 6.50	0.01016	0.1	0.07	2	200	0.005	0.4	100							
EMFS4E 81.53	0.12738	0.1	0.07	2	200	0.005	0.4	97	0.1	0.03	90	50	0.02	0.11	3
EMFN7A 42.39	0.06624	0.1	0.09	2	600	0.001	0.4	21.4	0.1	0.089	23	178	0.0096	0.24	78.6
EMFN7B 7.29	0.01138	0.1	0.09	2	600	0.001	0.4	95.2	0.1	0.07	72	79	0.0142	0.11	4.8
EMFS3	0.20393	0.1	0.07	2	200	0.005	0.4	100							
EMFS2	0.0375	0.1	0.07	2	200	0.005	0.4	100							
EMFS1	0.06486	0.1	0.07	2	200	0.005	0.4	51.82	0.1	0.08	15	100	0.01	0.24	48.18
EMF7	0.11752	0.1	0.07	2	200	0.005	0.4	1	0.1	0.08	15	100	0.01	0.24	99
EMF6	0.09875	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF6C	0.03228	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF6B	0.09444	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF6A	0.02003	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF5A	0.11984	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF4A	0.02691	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF4B	0.09488	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF3B	0.07762	0.1	0.07	2	300	0.005	0.4	1	0.1	0.079	16.5	100	0.01	0.24	99
EMF3A	0.12016	0.1	0.07	2	300	0.005	0.4	1	0.1	0.0775	18.75	100	0.01	0.24	99
EMF2	0.20328	0.1	0.07	2	300	0.005	0.4	100							
EMF1	0.06515	0.1	0.07	2	300	0.005	0.4	95	0.1	0.03	90	50	0.02	0.11	5
EMGS22B	0.09078	0.1	0.0763	2	200	0.005	0.24	95	0.1	0.03	90	50	0.02	0.11	5
EMGS22A	0.15441	0.1	0.0763	2	200	0.005	0.24	95	0.1	0.03	90	50	0.02	0.11	5
EMGS21	0.12405	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS20	0.09625	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS19	0.13288	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS18	0.04078	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS17	0.07639	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS16	0.20625	0.1	0.0706	2	200	0.005	0.24	99	0.1	0.03	90	50	0.02	0.11	1
EMGS15	0.13197	0.1	0.0741	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS14	0.06528	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS13B	0.01242	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS13A	0.2123	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS12B	0.02278	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS12A	0.16196	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGS11	0.0558	0.1	0.0704	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN4A SOUTH 20.4	0.03191	0.1	0.09	2	600	0.001	0.4	23	0.1	0.09	20	196	0.0092	0.24	77
EMGN4A SOUTH 20.4	0.03191	0.1	0.09	2	600	0.001	0.4	23	0.1	0.09	20	196	0.0092	0.24	77
EMGN3	0.13995	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN2D	0.04063	0.1	0.074	2	200	0.005	0.24	100							
EMGN2C	0.01691	0.1	0.074	2	200	0.005	0.24	100							
EMGN2B	0.01966	0.1	0.074	2	200	0.005	0.24	100							
EMGN2E	0.05938	0.1	0.074	2	200	0.005	0.24	100							
EMGN2A	0.12392	0.1	0.073	2	200	0.005	0.24	100							
EMGN1F	0.05105	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1E	0.03023	0.1	0.072	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1D	0.17969	0.1	0.0802	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1H	0.05595	0.1	0.074	2	200	0.005	0.24	100							
EMGN1G	0.06734	0.1	0.073	2	200	0.005	0.24	100							
EMGN1J	0.03997	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1K	0.06234	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1L	0.03108	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1I	0.37828	0.1	0.071	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1C	0.09906	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2
EMGN1B	0.33188	0.1	0.07	2	200	0.005	0.24	100							
EMGN1A	0.06797	0.1	0.07	2	200	0.005	0.24	98	0.1	0.03	90	50	0.02	0.11	2

The results of the hydrology models were run through the hydraulic routing model and compared to the pre-project runoff hydrograph at the project discharge locations as summarized in the following graphs:

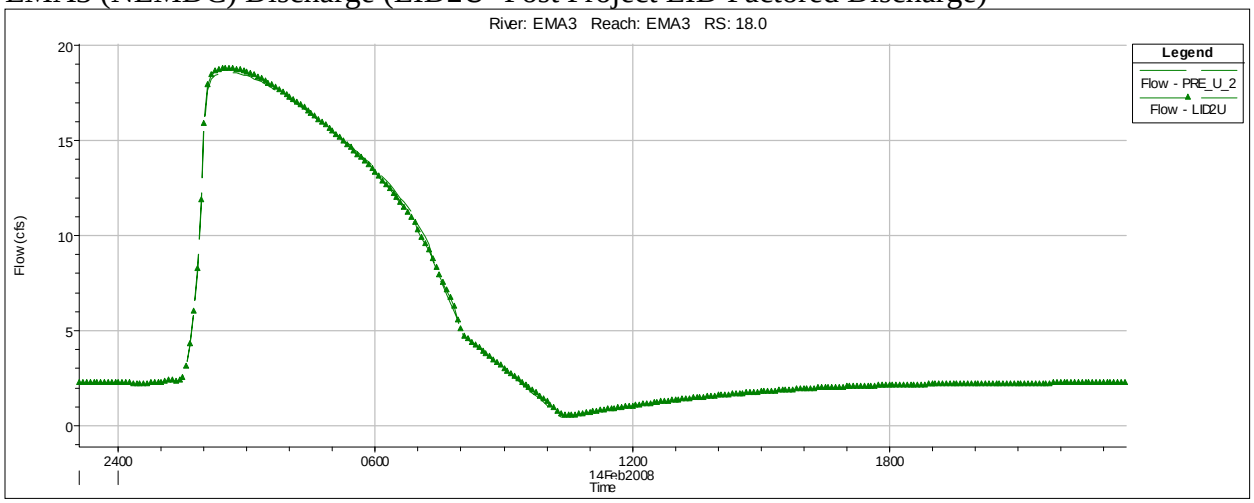
Curry Creek Discharge (LID2U=Post Project LID Factored Discharge)



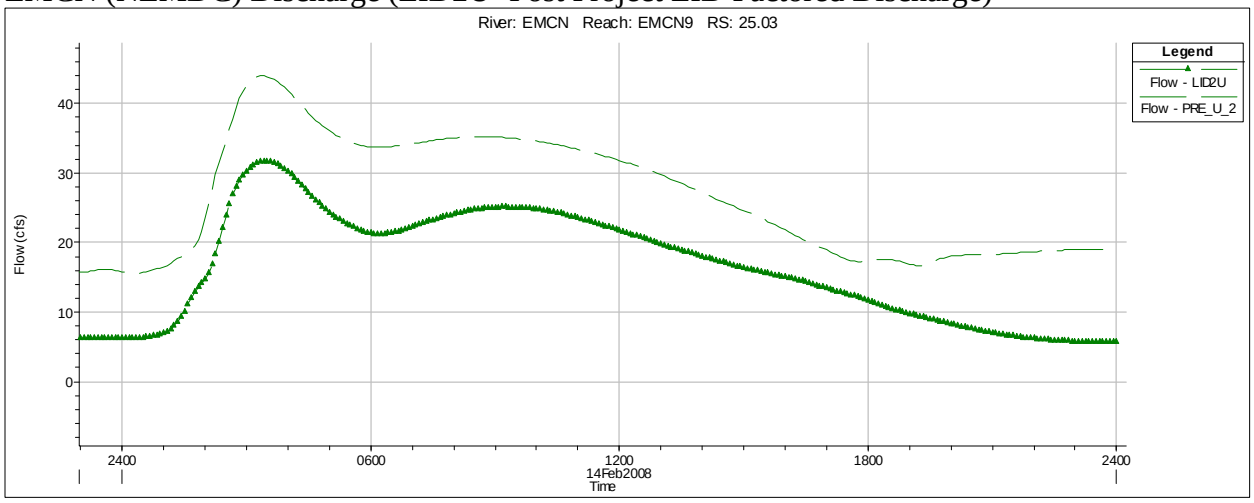
EMAS (NEMDC) Discharge (LID2U=Post Project LID Factored Discharge)



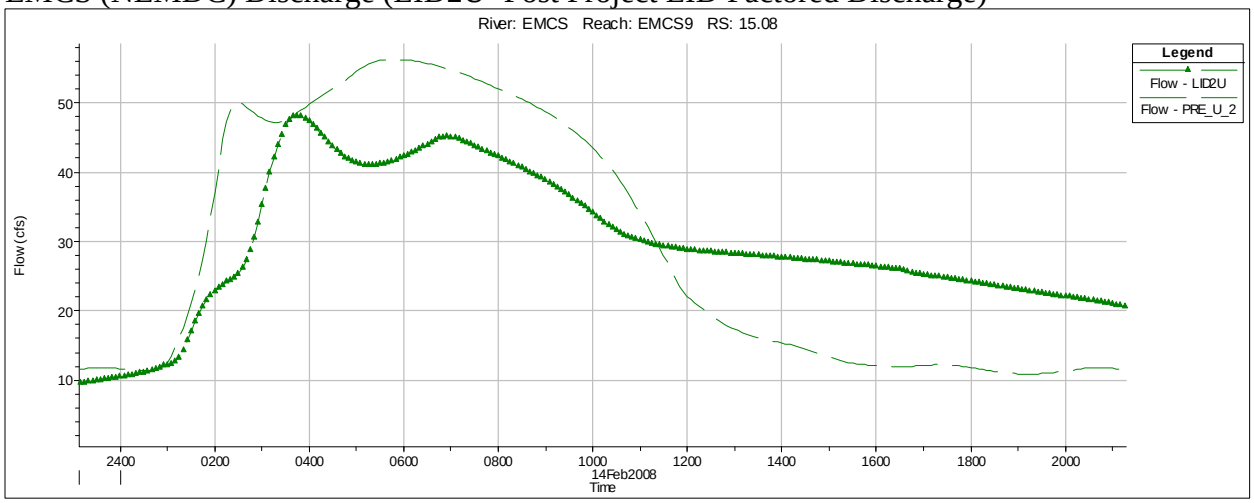
EMA3 (NEMDC) Discharge (LID2U=Post Project LID Factored Discharge)



EMCN (NEMDC) Discharge (LID2U=Post Project LID Factored Discharge)



EMCS (NEMDC) Discharge (LID2U=Post Project LID Factored Discharge)



EMD (NEMDC) Discharge (LID2U=Post Project LID Factored Discharge)