COUNTY OF PLACER
Community Development/Resource Agency

Michael Johnson, AICP
Agency Director

ENGINEERING AND SURVEYING DIVISION
Richard Eiri, Deputy Director

MEMORANDUM

TO: Honorable Board of Supervisors

FROM: Michael Johnson, AICP
Agency Director

By: Richard Eiri, Deputy Director

DATE: July 8, 2014

SUBJECT: PLACER VINEYARD SPECIFIC PLAN MASTER PROJECT DRAINAGE STUDY

ACTION REQUESTED

1. Approve the Placer Vineyard Specific Plan Master Project Drainage Study

There is no net County cost associated with these actions.

BACKGROUND

The Placer Vineyards Specific Plan and Development Agreement was approved by the Board of Supervisors in July, 2007 and encompasses 5,230 acres with 14,132 proposed dwelling units in the unincorporated area of western Placer County. Section 3.5.1.3 of the Development Agreement, "Processing of Master Plans", requires the applicant to first obtain conceptual approval from the County Executive Officer of the Master Plans for Drainage, Sanitary Sewer, Landscape, Parks, Transit and County Facilities, prior to the submittal of the first Development Phase, then obtain approval of the Master Plans from the Board of Supervisors prior to approval of the first Development Phase. The purpose of the Master Plans is to outline the general sizes and locations of these facilities as required by the project's Development Agreement and Conditions of Approval. Once the Master Plans are approved, they will be used to help guide staff to ensure adequate infrastructure is being provided as the project develops.

The applicant has submitted all of the required Master Plans for staff review. Two of the Master Plans, Sanitary Sewer and Transit, were approved by the Board of Supervisors at the June 3, 2013 hearing. At this time, the Master Project Drainage Study has been reviewed by staff and approved by the County Executive Officer and is now ready for the Board's consideration. The Executive Summary portion of the Master Project Drainage Study is included as Attachment 1 (the complete 1,565-page study, plus appendices, has been provided under separate cover and is available for review at the Clerk of the Board's office).

The Master Project Drainage Study provides a hydrology analysis for the Placer Vineyards Specific Plan area, including approximately 13.2 square miles of tributary area. The Drainage Master Plan also includes a hydraulic analysis of the onsite creeks, swales and channels, as well as delineations of the floodplains. Recommendations to mitigate the project's impacts from the additional proposed impervious surfaces are also included in the Master Project Drainage Study.

ENVIRONMENTAL CLEARANCE

A Final Environmental Impact Report (FEIR) for the Placer Vineyards Specific Plan project was prepared pursuant to the requirements of the California Environmental Quality Act (CEQA). The FEIR was certified by the Board of Supervisors on July 16, 2007 and modified by Addendum on September 11, 2012. All potential impacts related to the subject matter of the proposed Master Plan were analyzed in the certified FEIR and, where feasible, mitigation measures were imposed. Approval of the Master Plan is consistent with the certified FEIR analysis and none of the conditions outlined in CEQA Guidelines section 15162 apply.

FISCAL IMPACT

There is no fiscal impact for associated with the approval of the Placer Vineyard Specific Plan Master Project Drainage Study. There is no net County cost associated with this action.

ATTACHMENTS

Attachment 1: Placer Vineyard Specific Plan Master Project Drainage Study, Executive Summary (Title sheet, table of contents and introduction)
(The complete 1,565-page report is available for review at the Clerk of the Board's office)

PLACER VINEYARDS

PLACER COUNTY, CA

MASTER PROJECT DRAINAGE STUDY

Revised August 23, 2005
Revised January 26, 2006
Revised February 26, 2006
Revised March 28, 2006
Revised August 7, 2006
Amended May 5, 2014

Prepared By:

CIVIL ENGINEERING SOLUTIONS, INC.
590 E Street
Lincoln, CA 95648
(916) 645-5700

JOB # 2013.10

This document prepared under the supervision of:

REGISTERED PROFESSIONAL ENGINEER
THOMAS S. PLUMMER
NO. C49582
EXP. 9/30/14
STATE OF CALIFORNIA

Signature dated :

5-5-2014

309

TABLE OF CONTENTS :

TABLE OF CONTENTS : 1
TABLE OF CONTENTS : 2
List of Appendices 2
List of Tables 3
List of Figures 4
I. Introduction: 6
II. Hydrology: 8
II.1 Standards: 8
II.2 Soils: 8
II.3 Land Use: 11
II.4 Other Factors: 11
II.5 Watershed Delineation: 11
II.A Pre-Project Model: 13
II.A Pre-Project Model: 13
II.A.1 Site Area Model 13
II.B Post-Project Model: 20
II.C Post-Project Mitigated Model: 24
II.D Future Fully Developed Unmitigated Model: 28
II.E Proposed Attenuation at Curry Creek Tributaries: 31
II.F Proposed Attenuation at Dry Creek Tributaries: 32
II.F.1 Dry Creek Analysis: 32
II.G Proposed Attenuation at Steelhead Creek Tributaries : 34
II.H Proposed Attenuation at Steelhead Creek (NEMDC) Tributaries : 35
III. Hydraulics: 42
III.A Flood Plain Analysis: 42
III.A.1 Pre-Project Flowrates: 42
III.A.2 Post-Project Mitigated Flowrates: 45
III.A.3 Post-Project Offsite Unmitigated Flowrates: 45
III.B Proposed Culvert Sizing: 46
III.C Proposed Channels and Attenuation Facilities: 48
III.D Trunk Storm Drain Facilities: 59
III.E Special Structures for Avoidance Areas: 59
III.F State Legislative Requirements (SB5): 63
III.F.1 Applicability to Placer Vineyards: 64
IV. Water Quality: 67
IV.A LOW IMPACT DEVELOPMENT MEASURES: 73
IV.B HYDROGRAPH MODIFICATION: 74
V. Volumetric Impacts at Curry Creek: 84
A. Hydrologic Storm Parameters 84
B Retention Storage Quantities: 86
C Proposed Mitigation 88

List of Appendices

A. HEC-1 Pre-Project PDP Input Files
B HEC-1 Post-Project PDP Input Files
C HEC-RAS Pre-project Summary Tables
D HEC-RAS Post-project Summary Tables
E Detailed Pre-project Watershed Parameters
F Detailed Post-project Watershed Parameters
G Detailed Pre-project Computed Peak Flows
H Detailed Post-project Computed Peak Flows

I Trunk Storm Drain Calculations
J Project Photos
K Steelhead Creek Hydrographs Comparisons
L Project Disk
M Oversized Exhibits SH-1, SH-2, SOIL-1, FP-1(A&B), FP-2(A&B), FP-3(A&B), SF-1(A&B), SD-1(A&B), AT-1(A&B), RET-1(A&B), UL-1(A&B), UL-2 and UL-3

List of Tables

TABLE IIA2 - Hydrologic Soil Parameters: 9
TABLE IIA1 - Pre-Project Hydrologic Factors 14
TABLE IIA1 - Pre-Project Hydrologic Factors 14
TABLE IIA2 - Pre-Project Hydrologic Factors (cont) 15
TABLE IIA3 - Pre-Project Hydrologic Factors (cont) 16
TABLE IIA4a - PRE-PROJECT PEAK FLOW RATES 18
TABLE IIA4b - PRE-PROJECT PEAK FLOW RATES 19
TABLE IIB1 – Post Project Hydrologic Factors 21
TABLE IIB2 – Post Project Hydrologic Factors (Cont) 22
TABLE IIB3 – Post Project Hydrologic Factors (Cont) 23
TABLE IIC1a - ESTIMATED POST-PROJECT MITIGATED PEAK FLOW RATES 25
TABLE IIC1b - ESTIMATED POST-PROJECT MITIGATED PEAK FLOW RATES 26
TABLE IIC2 – DOWNSTREAM MITIGATION FLOWS 27
TABLE IID1a - ESTIMATED POST-PROJECT OFFSITE UNMITIGATED PEAK FLOW RATES 29
TABLE IID1b - ESTIMATED POST-PROJECT OFSITE UNMITIGATED PEAK FLOW RATES 30
TABLE IIE1 - PROPOSED ATTENUATION FACILITY SUMMARY DATA 31
TABLE IIG1 - PROPOSED ATTENUATION FACILITY SUMMARY DATA 34
TABLE IIH4 – Water Surface Comparison at Steelhead Creek (NEMDC) 39
FIGURE IIIA3 – Comparison of Pre- and Post-project water levels at Project Boundaries 45
TABLE IIIB1 - Culvert Sizing 46
TABLE III.F.1 – ULOP APPLICABILITY QUESTIONAIRRE 65
TABLE IVA1 – PRELIMINARY REGIONAL SWQ BASIN SIZING 71
TABLE IV.A.1: Proposed LID % Impervious Reductions: 74
TABLE IVB1 – LID Included Post Project Hydrologic Factors 76
TABLE IVB2 – LID Included Post Project Hydrologic Factors (Cont) 77
TABLE IVB3 – LID Included Post Project Hydrologic Factors (Cont) 78
TABLE VA1 - 1986 8-Day Rainfall Totals 84
TABLE VA2 - Adjusted Rainfall Depths for Elevation 85
TABLE VB1 - VOLUMETRIC IMPACTS SUMMARY TABLE 86
TABLE VB2 - VOLUMETRIC IMPACTS COMPUTATIONS 87
TABLE VB3 – PROPOSED RETENTION LOCATIONS 88

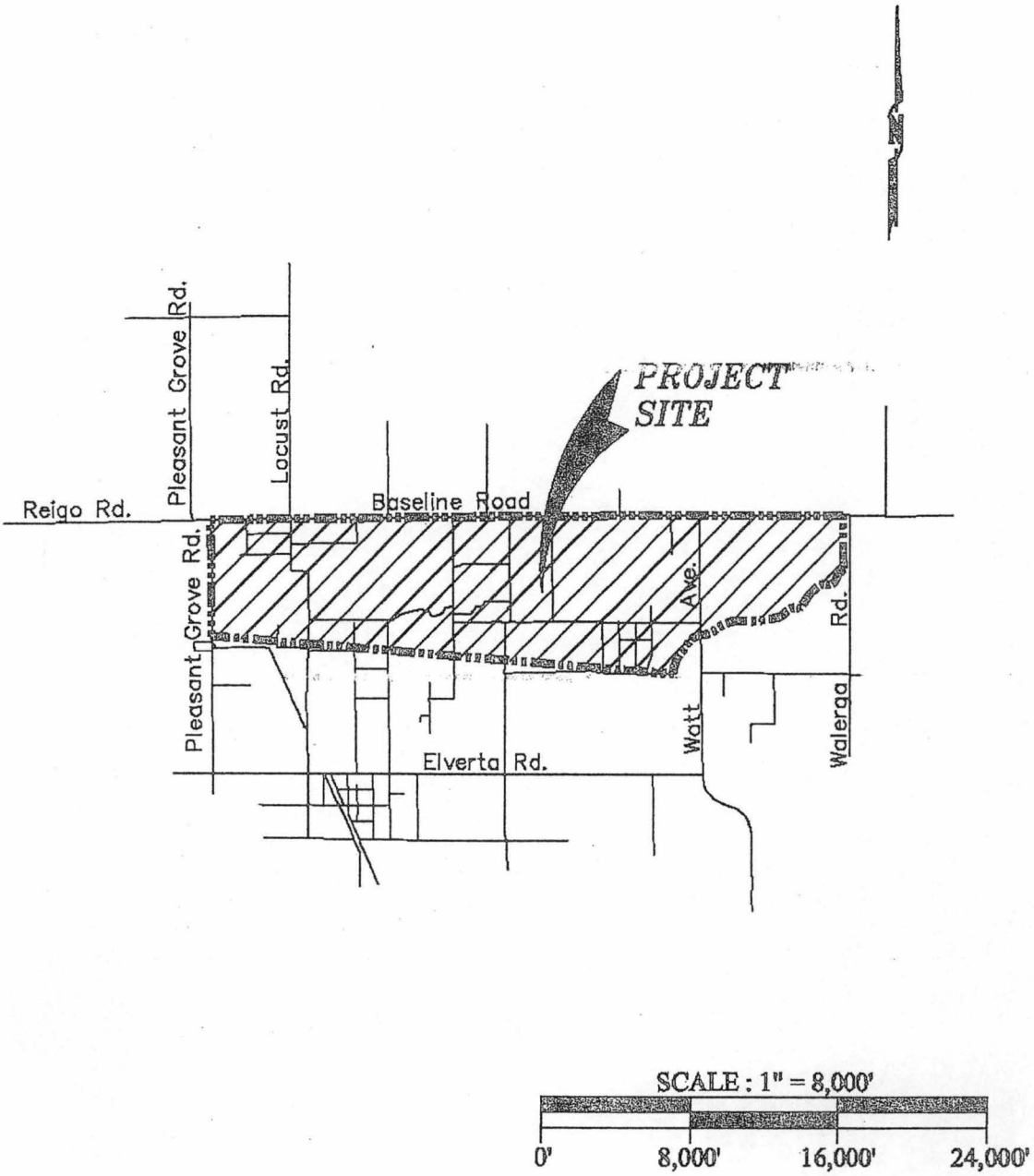
List of Figures

FIGURE I.1 - LOCATION MAP 5
FIGURE IIA2 – WATERSHED SOILS DELINEATIONS 10
FIGURE IIF1A – DRY CREEK WATERSHEDS 32
FIGURE IIIA1 - FIRM MAP 475F 43
FIGURE IIIA2 - FIRM MAP 458F 44
FIGURE IIIC1 – PROJECT SCHEMATIC 49
FIGURE IIIC2 – SECTIONS A-C 50
FIGURE IIIC3 – SECTIONS D-F 51
FIGURE IIIC4 – SECTIONS G-I 52
FIGURE IIIC5 – SECTIONS J-L 53
FIGURE IIIC6 – SECTIONS M-O 54
FIGURE IIIC7 – SECTIONS P-R 55
FIGURE IIIC8 – SECTIONS S-U 56
FIGURE IIIC9 – SECTIONS V-X 57
FIGURE IIIC10 – SECTIONS Y-Z 58
FIGURE IIIE1 – DIVERSION STRUCTURE SCHEMATIC 61
FIGURE IIIE2 – DRAINAGE SYSTEM SCHEMATIC 62
FIGURE IVA1 – STORMWATER QUALITY EXHIBIT 69
FIGURE IVA2 – TREATED AND UNTREATED WATERS 70

(Oversized)

Exhibit SH-1 - Pre-Project HEC-1 Shed Map
Exhibit SH-2 - Post-Project HEC-1 Shed Map
Exhibit SOIL-1 - Project Area Hydrologic Soil Types
Exhibit FP-1A & FP-1B - Pre-Project Flood Map for 10-year and 100-year
Exhibit FP-2A & FP-2B - Pre-Project Extreme Event Flood Maps (500-200)
Exhibit FP-3A & FP-3B - Post-Project FFDU Flood Maps (10yr & 100yr)
Exhibit FP-4A & FP-4B - Post-Project FFDU Extreme Event (500-200)
Exhibit SD-1A & SD-1B - Trunk Storm Drainage System Maps
Exhibit SF-1A & SF-1B - Special Facilities Exhibit
Exhibit SWQ-1A & SWQ-1B- Stormwater Quality Exhibit
Exhibit AT-1A & AT-1B - Attenuation Exhibit for 100-year Event
Exhibit RET-1A & RET-1B - Volumtric Mitigation Exhibit
Exhibit UL-1A & UL-1B - Regional ULOP Applicability by Stream
Exhibit UL-2 - Project Area Finding of Fact Areas
Exhibit UL-3 - Dry Creek Finding of Fact Areas

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.