

**Water Availability Analysis  
Appropriative Application 30558  
County of Sonoma Regional Parks**

**Prepared by Napa Valley Vineyard Engineering, Inc.  
April 1, 2008  
Revised February 18, 2009**

## 1.0 Introduction

The purpose of this report is to summarize the results of the Water Availability Analysis conducted for Appropriative Application 30558 of County of Sonoma Regional Parks Department. The analysis includes calculation of the water available between October 1 and May 15 (diversion season under application), in an average water year at the points of diversion (POD). POD #4 is a back dam for the purposes of controlling the surface area of the reservoir. This analysis does not calculate water availability at POD #4.

Attachment A is a map of the Tolay Creek watershed, which identifies the project PODs, and all known diverters of record within the Tolay Creek watershed, including pending applications. Watershed acreages were determined using AutoCad.

## 2.0 Project Description

This project is development of a Regional Park and includes two existing onstream reservoirs each with a capacity of 25 AF, and restoration of historic Tolay Lake to an estimated capacity of 1,050 AF. Water stored in existing Reservoirs #1 and #2 will be used for irrigation and frost protection of the 10 acres of existing vineyard, and may provide irrigation water for landscaping and various projects such as woodland, riparian and grassland restoration, and demonstration crops/gardens. In addition, Reservoirs #1 and #2 may be used for recreational purposes and for stock watering as part of a grazing program for fire control and ecology. Water collected and stored in Tolay Lake will only be used to irrigate the lake margins as part of a lake management program and for restoration projects within park boundaries described above. Tolay Lake will also be used for recreational purposes. The place of use for irrigation from Tolay Lake under the petition and amended application is a non-specific 150 acres per year within the 1,737-acre site. No more than 150 acres will be irrigated from Tolay Lake during a given year, but the area may rotate from year to year, as project and park management needs change.

Application 30558 seeks wintertime diversion from October 1 to May 15 for irrigation, frost protection, recreation, and stockwatering.

## 2.0 Method

Streamflow at each POD is estimated based on a proration of USGS streamflow data using the gage on the Petaluma River at Petaluma CA (USGS 11459000). The following formula is used:

$$Q_2 = Q_1 \times (A_2/A_1) \times (I_2/I_1)$$

Where  $Q_2$  = Seasonal Flow (AF) @ POD

$Q_1$  = Seasonal Flow (AF) @ gage

$A_2$  = Watershed area (sq. mi.) above POD

$A_1$  = Watershed area (sq. mi.) above gage

$I_2$  = Precipitation @ POD

$I_1$  = Precipitation @ gage

## 3.0 Seasonal Unimpaired Flow

The period used in determining seasonal unimpaired flow is the diversion season under application (October 1 to May 15). Unimpaired flow is the total volume of water, on average, that would flow past the POD on a seasonal basis if no diversions (impairments) were taking place in the watershed above the POD. Flow is measured in units of acre-feet (AF).

### 3.1 Data and Assumptions

Streamflow data collected by the USGS at the Petaluma River gage (gage), and shown on Table 1, represents 15 years of record (1948 through 1963). Because the data is measured flow, it is considered impaired flow. However, this analysis does not adjust the flow data to account for diversions that were occurring during the period of data collection. Thus, the use of actual streamflow data as the unimpaired flow value in these calculations makes the results conservative. Isohyetals used to determine mean annual precipitation above each POD were obtained from Plate B-3 of the Sonoma County Water Agency's Flood Control Design Criteria manual. The isohyets are shown on the attached watershed map (Attachment A). The mean annual precipitation throughout the watershed is 25 inches. The acreage above each POD is as follows:

POD #1 – 0.5 sq. mi.

POD #2 – 0.8 sq. mi.

POD #3 – 4.9 sq. mi.

The watershed above the USGS gage is 30.9 sq. mi. and the weighted mean annual precipitation is 28.9 inches.

### 3.2 Calculations

Seasonal Unimpaired Flow @ POD #1:

$$Q_1 = 10,741.2 \text{ AF}$$

$$A_2 = 0.5 \text{ sq. mi.}$$

$$A_1 = 30.9 \text{ sq. mi.}$$

$$I_2 = 25 \text{ in.}$$

$$I_1 = 28.9 \text{ in.}$$

$$Q_2 = 10,741.2 (0.5/30.9)(25/28.9) \\ = 150.4 \text{ AF}$$

Seasonal Unimpaired Flow @ POD #2:

$$Q_1 = 10,741.2 \text{ AF}$$

$$A_2 = 0.8 \text{ sq. mi.}$$

$$A_1 = 30.9 \text{ sq. mi.}$$

$$I_2 = 25 \text{ in.}$$

$$I_1 = 28.9 \text{ in.}$$

$$Q_2 = 10,741.2 (0.8/30.9)(25/28.9) \\ = 240.6 \text{ AF}$$

Seasonal Unimpaired Flow @ POD #3:

$$Q_1 = 10,741.2 \text{ AF}$$

$$A_2 = 4.9 \text{ sq. mi.}$$

$$A_1 = 30.9 \text{ sq. mi.}$$

$$I_2 = 25 \text{ in.}$$

$$I_1 = 28.9 \text{ in.}$$

$$Q_2 = 10,741.2 (4.9/30.9)(25/28.9) \\ = 1,473.4 \text{ AF}$$

### 4.0 Water Availability

Water availability is estimated by subtracting the **Demand** above each POD from the Seasonal Unimpaired Flow at each POD (Refer to Sec. 3.2).

Where:

**Demand** is the "face value" of all existing water rights and senior pending water rights above the POD measured in AF, and identified by using the SWRCB's water right database, files, and mapping. Demand includes Statements of Water Diversion and Use, Small Domestic Registrations, Stockpond Certificates, Appropriate Applications Permits and Licenses. The season used to determine demand is October 1 to May 15 (diversion season under application). In absence of detailed records of water use under the existing water rights, it was assumed that for storage rights, the maximum allowable use (face value of the right) occurred between October 1 and May 15, even if the season of diversion under the existing right extends outside that period. There are no direct diversion rights within the watershed. There are no existing rights above POD #1 and POD #2, which are senior to Application 30558, thus the demand above POD #1 is 0 and the demand above POD #2 is 25 (the amount diverted at POD #1). Existing rights above POD #3 are shown on Table 2 and total 303 AF.

#### 4.1 Calculations

POD #1:

150.4 (Supply) – 0 (Demand) = **150.4 AF** (Water available)

Diversion requested @ POD #1 = **25 AF**

POD #2:

240.6 (Supply) – 25 (Demand) = **215.6 AF** (Water available)

Diversion requested @ POD #2 = **25 AF**

POD #3:

1,473.4 (Supply) – 303 (Demand) = **1,170.4 AF** (Water available)

Diversion requested @ POD #3 = **800 AF\***

**\*Consumptive use at Tolay Lake will be limited to 150 AF per annum. Seasonal demand is estimated by adding expected evaporation and seepage losses to the consumptive use.**

b. State Planar and Public Land Survey Coordinate Description:

POD/ PORD #	CALIFORNIA COORDINATES (NAD 27) <b>NAD83</b>	ZONE	POINT IS WITHIN (40-acre subdivision)	SECTION	TOWN -SHIP	RANGE	BASE AND MERIDIAN
1	1,836,094N 6,418,953E	2	SW ¼ of SW ¼	11	4N	6W	MD
2	1,835,498N 6,417,818E	2	SE ¼ of SE ¼	10	4N	6W	MD
3	1,834,139N 6,415,511E	2	NW ¼ of NE ¼	15	4N	6W	MD
4	1,840,915N 6,412,071E	2	SE ¼ of SE ¼	4	4N	6W	MD

See Attachment No. \_\_\_\_\_

c. Name of the post office most often used by those living near the proposed point(s) of diversion:

Petaluma

6. WATER AVAILABILITY

a. Have you attached a water availability analysis for this project?  YES  NO

If NO, provide sufficient information to demonstrate that there is reasonable likelihood that unappropriated water is available for the proposed appropriation:

A Water Availability Analysis will be prepared and submitted as part of the environmental review process.

See Attachment No. \_\_\_\_\_

b. Is your project located on a stream system declared to be fully appropriated by the State Water Resources Control Board during your proposed season of diversion?  YES  NO

c. In an average year, does the stream dry up at any point downstream of your project?  YES  NO If YES, during which months?  Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec

d. What alternate sources of water are available if a portion of your requested diversion season must be excluded because water is not available for appropriation? (e.g., percolating groundwater, purchased water, etc.)

none

See Attachment No. \_\_\_\_\_

7. PLACE OF USE See Attachment #3

USE IS WITHIN (40-acre subdivision)	SECTION*	TOWNSHIP	RANGE	BASE & MERIDIAN	IF IRRIGATED	
					Acres	Presently cultivated?
¼ of ¼						<input type="checkbox"/> YES <input type="checkbox"/> NO
¼ of ¼						<input type="checkbox"/> YES <input type="checkbox"/> NO
¼ of ¼						<input type="checkbox"/> YES <input type="checkbox"/> NO
¼ of ¼						<input type="checkbox"/> YES <input type="checkbox"/> NO
¼ of ¼						<input type="checkbox"/> YES <input type="checkbox"/> NO
¼ of ¼						<input type="checkbox"/> YES <input type="checkbox"/> NO
¼ of ¼						<input type="checkbox"/> YES <input type="checkbox"/> NO
¼ of ¼						<input type="checkbox"/> YES <input type="checkbox"/> NO
Total:						

\*Please indicate if section is projected with a "(P)" following the section number.

See Attachment No. 3

8. PROJECT SCHEDULE

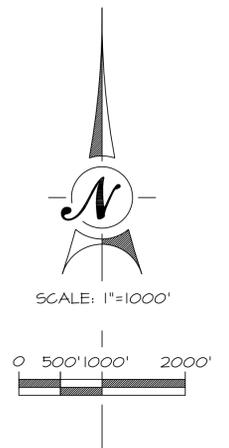
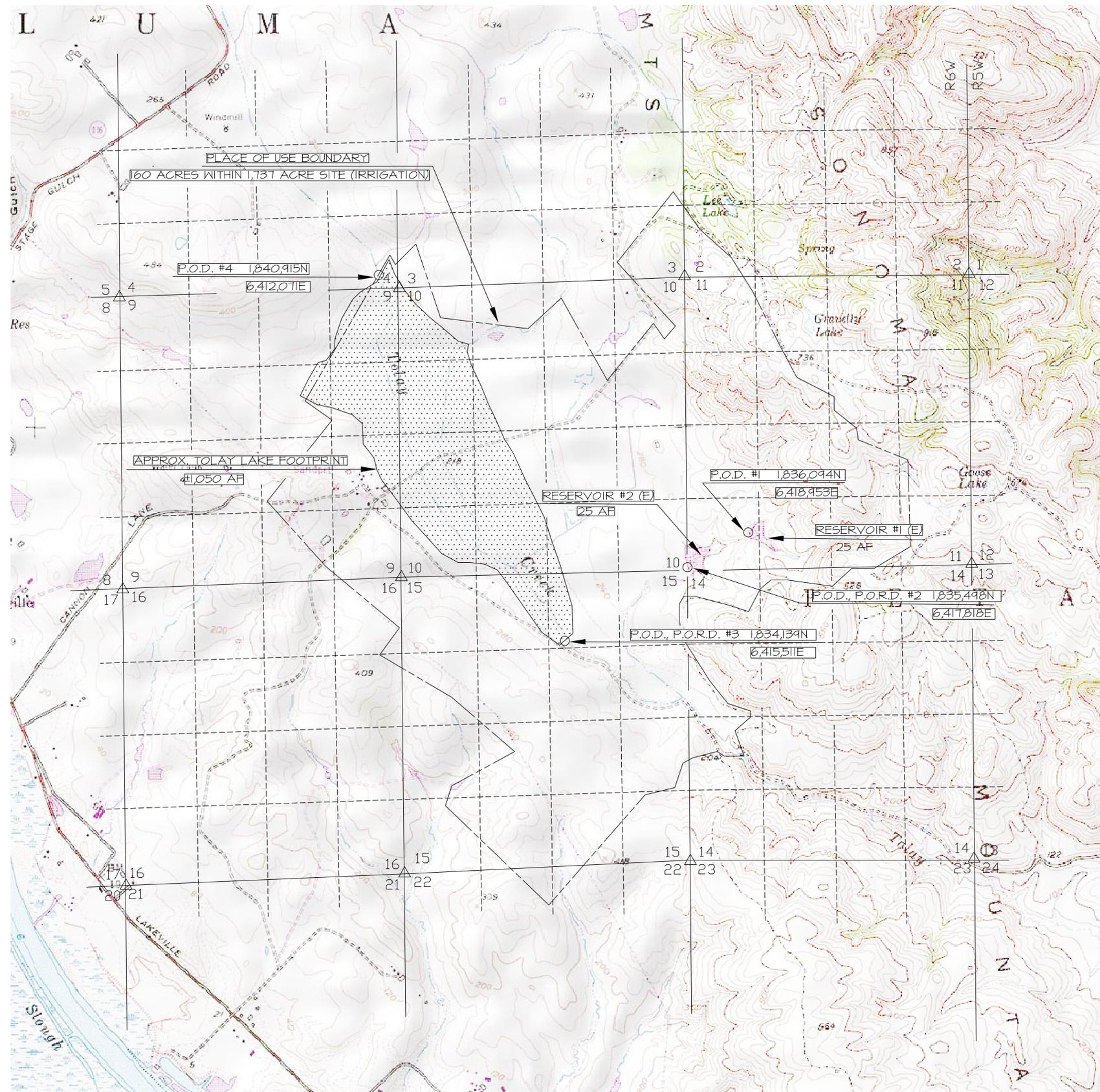
a. Project is:

proposed. Year construction will begin: \_\_\_\_\_

partially complete. Extent of completion: Reservoirs #1 and #2 are existing, and 10 acres of vineyard are existing.

complete. Year completed: \_\_\_\_\_

b. Year of first use: \_\_\_\_\_ Year water will be used to the full extent intended: 20 years after permit issuance



LEGEND

- AF           ACRE-FEET
- (E)          EXISTING
- P.O.D., O    POINT OF DIVERSION
- P.O.R.D.     POINT OF REDIVERSION
- PROPERTY/PLACE OF USE BOUNDARY
- - - - -     QUARTER, QUARTER SECTION LINE
- ▨          RESERVOIR
- △          SECTION CORNER
- SECTION LINE (MAY BE PROJECTED)

REV.	DESCRIPTION	BY	DATE
1	Change coord. to NAD83	DLW	2-18-04

This document and the ideas and designs incorporated herein, as an instrument of professional service, are the property of Napa Valley Vineyard Engineering, Inc., and are not to be used, in whole or part, for any other project without written authorization from Napa Valley Vineyard Engineering, Inc.

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DATE August 15, 2006	SCALE AS SHOWN
TolayAppl.dwg	DRAWN TPO
APPROVED	CHECKED DLW
DREW L. ASPEGREN, PE	R.C.E. 31418

COUNTY OF SONOMA  
 TOLAY LAKE  
 REGIONAL PARK

MAP TO ACCOMPANY  
 PETITION FOR CHANGE  
 30558