APPENDIX A

NOP and Scoping Comments

COUNTY OF SONOMA
PERMIT AND RESOURCE MANAGEMENT DEPARTMENT

2550 Ventura Avenue, Santa Rosa, CA 95403
(707) 565-1900 FAX (707) 565-1103

September 9, 2015

NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT

NOTICE OF PUBLIC SCOPING MEETING

AB 52 PROJECT NOTIFICATION

Project Title: Belden Barns Farmstead and Winery Project (PLP12-0016)
Project Applicant: Nathan Belden
Project Location: 5561 Sonoma Mountain Road, Sonoma County

Environmental Impact Report: The Sonoma County Permit and Resource Management Department (PRMD) has received a revised application from Nathan Belden for the Belden Barns Farmstead and Winery Project ("Belden Barns"). A Mitigated Negative Declaration was previously prepared and adopted for the project. Pursuant to a settlement agreement, Sonoma County (County) will prepare an Environmental Impact Report (EIR) for the revised project. The County is the Lead Agency for the project pursuant to the California Environmental Quality Act. This Notice of Preparation (NOP) describes the proposed project that will be analyzed in the EIR and identifies areas of probable environmental effects of the project.

Agencies and interested members of the public are invited to provide input on the scope of the environmental analysis. If you are a responsible or trustee agency, we need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Due to the time limits mandated by state law, your response must be sent at the earliest possible date, but no later than 30 days after the receipt of this notice.

This NOP also serves as notification to California Native American tribes that are traditionally and culturally affiliated with the geographic area of the proposed project, pursuant to Public Resources Code 21080.3.1(Assembly Bill 52). If your tribe wishes to consult on this project, please note you have 30 days to request consultation.

Written Comment:
Please submit written comments to any of the below:

Email: Laura.Peltz@sonoma-county.org Fax: (707) 565-1103

Regular Mail: PRMD, Attn: Laura Peltz, 2550 Ventura Avenue, Santa Rosa, CA 95403

Public Scoping Meeting: The County will hold a scoping meeting to provide an opportunity for agency staff and interested members of the public to submit comments, either written or verbal, on the scope of the environmental issues to be addressed in the EIR. The scoping meeting will be held on **Tuesday, September 29, 2015 from 5:00 p.m. to 7:00 p.m.** at the PRMD Hearing Room, 2550 Ventura Avenue, Santa Rosa.

For questions regarding this notice, please contact Laura Peltz, Senior Environmental Specialist, at (707) 565-8356 or the email address above.

Project Description:

The proposed Belden Barns Farmstead & Winery is a new winemaking, hospitality and farmstead food production facility on a 55-acre parcel located at 5561 Sonoma Mountain Road. The farmstead products would include fresh/preserved vegetables/fruits, eggs, charcuterie and cheeses. The proposed project would include three primary uses with supporting uses and structures:

1. Production Facility: A new creamery and winery facility producing 10,000 pounds of cheese and 10,000 cases of wine per year. The regular production hours would be 7:00 a.m. to 6:00 p.m., Monday through Friday. Wine production harvest hours would be 6:00 a.m. to 10:00 p.m., seven days per week, during the harvest season, which is typically late August through mid-October. Fruit for the wine would come predominately from the project site with some fruit coming from the local area. Milk for the creamery would come from on-site livestock and from other dairies in the local area.

   The production facility would be a new approximately 10,941 square foot ("SF"), two-story building. The first floor would be approximately 8,796 SF and would be used for barrel storage, fermentation, winery production, the cheese creamery, and support spaces. The second floor would be approximately 2,145 SF and has administration, lab, and private tasting facilities. An existing barn would be demolished in order to construct the production building.

2. Farmstead and Wine Tasting Room: This would be a by-appointment-only tasting room for the direct sales of wine, cheese, farmstead products, and incidental items from the local area. The requested tasting room hours are 11:00 a.m. to 5:00 p.m., seven days per week.

   The tasting room would be the primary hospitality space for all products produced on site. This 3,033 SF space would be the located on the first floor of the owner's residence and would include a commercial kitchen.

3. Agricultural Promotional Events: The applicant requests eight agricultural promotional events per year with the participant levels set forth below. The agricultural promotional events would feature food, wine, and other products produced on the site or in the local area and would be held in the farm building complex area. Events would end by 9:30 p.m. with clean up being completed by 10:00 p.m. There would be no outdoor amplified music at any event. Event parking would be on-site as shown in the site plan, with parking guides present when event participants arrive. The proposed project includes a sanitary wastewater system, designed to handle flows from the largest agricultural promotional event of up to 200 people; however, "crowd pleaser" style portable toilets would also be used for participants' convenience.

   The requested events are:

Event Description	Quantity	Date &Time Period	Participants
Spring Wine & Farm Events	1	March – May	150
Summer Wine & Farm Event	1	June – August	150
Fall Wine & Farm Event	1	September – October	200
Winter Wine & Farm Event	1	November – February	150
Wine and Farm Event or Wedding	1	June – October	125
Wine Club Members' Pick Up Event	1	Anytime	100
Wine Club Members Only Event	1	Anytime	60
Tasting and Dinner for Distributors	1	Anytime	60
TOTAL	8		

4. Supporting Uses and Structures:

Farmworker Housing

A new approximately 1,877 SF agricultural employee unit would be constructed to replace an existing legal non-conforming 1,780 SF building currently being used for farmworker housing, which would be demolished. The current primary residence would be converted to a Farm Family unit.

Crop Production (excluding grapes)

The project would expand the existing vegetable garden from one to two acres and the fruit orchard from one to two acres. These acreage estimates are approximate numbers.

Livestock and Grazing

The numbers of livestock expected are: two milk cows, five milk sheep, chickens, and four pigs. The animals would be housed and grazed on approximately six acres.

Infrastructure

The project's infrastructure includes minor improvements to the existing entrance on Sonoma Mountain Road and driveway, sanitary wastewater leach field system improvements, process wastewater treatment system, storm water management improvements, fire protection water storage, utilities and associated grading and landscape improvements. The project also includes clearing the vegetation for approximately 400 feet east of the entrance along the property line, to increase sight-distance for cars.

Employees

The project includes five full-time and four part-time employees for most of the year. There would be seven additional full-time employees during the grape harvest season and bottling.

Water Supply and Distribution

The existing on-site well would supply water for all project structures. Reclaimed processed wastewater would supplement the pond water used to irrigate the vineyards. The well would have the ability to provide irrigation water for the gardens and orchard, however, primary irrigation would be from the existing irrigation reservoir supplied by surface runoff.

Separate water storage and distribution systems would be provided for the domestic water and the landscape/livestock water. Each system would be supplied by the well. The Domestic Water System would include a 10,000-gallon water storage tank that would be filled with groundwater from the existing well. The landscape/livestock system would also include a 10,000-gallon storage tank that would be filled with groundwater from the existing well. The existing well would supply water to the storage tanks (when called for) at a rate of approximately 20 gallons per minute (GPM). The controls would be set to allow one tank to be filled at a time, not simultaneously. Each system would have an independent pumping system from the respective storage tank to the source.

The average flow to the winery and creamery facility would be 15 GPM, with a peak of 40 GPM. The average and peak flow to the landscape/livestock would be approximately 25 GPM, if occurring simultaneously. The project maximum water demand for the project is 1.77 AF/year.

Wastewater Treatment

The sanitary wastewater (“SW”) would consist of wastewater from the laboratory, tasting room, and restroom facilities. The process wastewater (“PW”) would consist of winery wastewater generated from producing 10,000 cases of wine and 10,000 pounds of cheese. The proposed combined PW and SW wastewater management system would consist of a filled land system, which includes a designated SW 200% expansion/reserve area. The reserve PW disposal system would include a rotary screen for solids filtration, septic/settling tanks, aeration, a separate commercial grade aerated textile pre-treatment unit, an above ground storage tank and ultimate disposal via drip irrigation of the existing vineyard on site.

The proposed new wastewater management systems described above would be adequate to treat and dispose of the projected SW and PW flows generated from the new winery and creamery facility.

Drainage

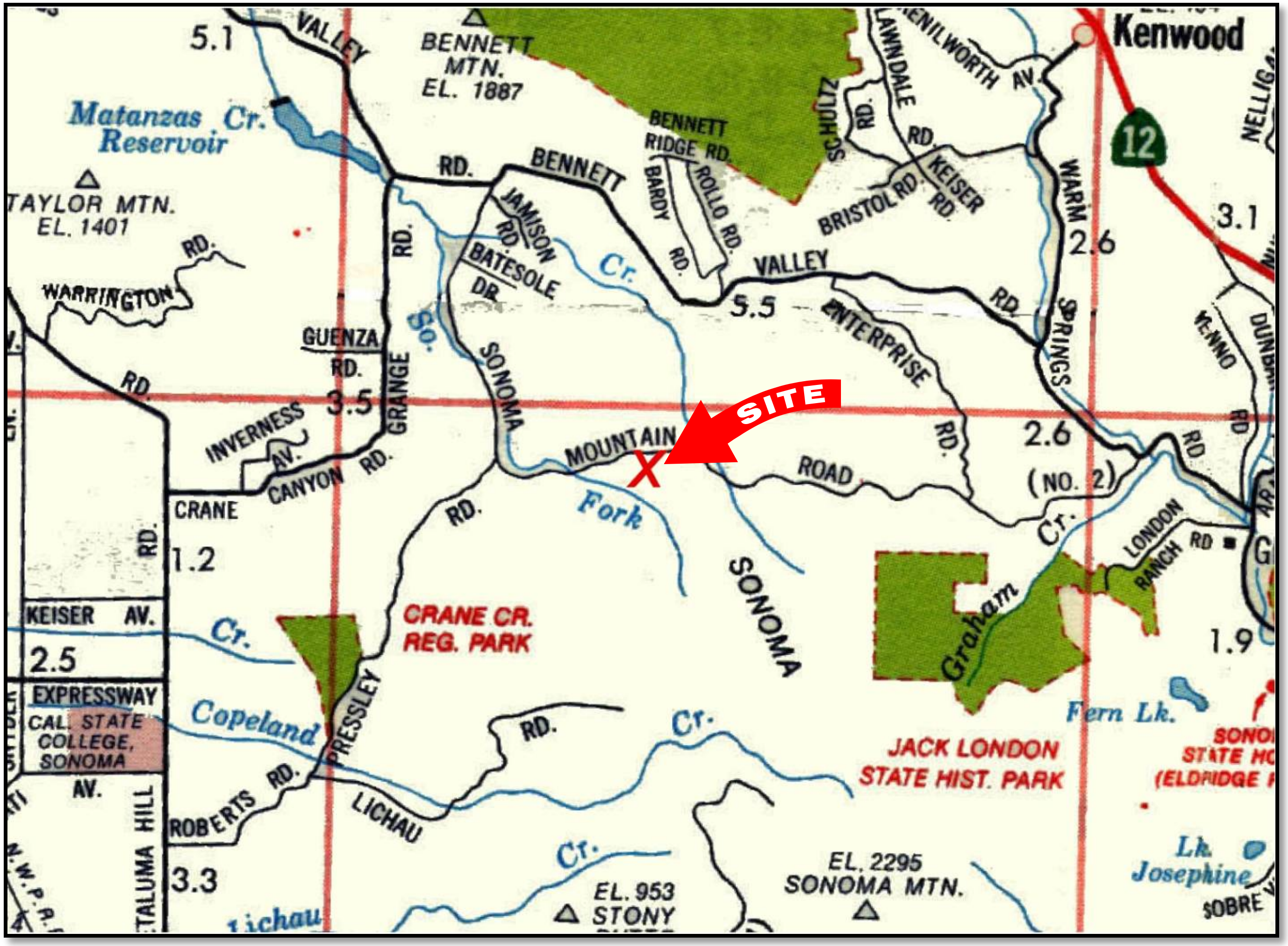
Surface runoff from the proposed development area would continue to sheet flow to the ephemeral creek along the east property line. The project would include Low Impact Development (“LID”) techniques. For example, roof drainage would be collected in gutters and conveyed via downspouts and storm drain piping to infiltration trenches to facilitate infiltration into the soils. The storm water system would be designed so that there is no increase between the pre-development to the post development flows. The final site grading would have erosion prevention/sediment control features and use best management practices to prevent erosion and sediment travel from disturbed areas on the site.

Potential Environmental Effect Areas:

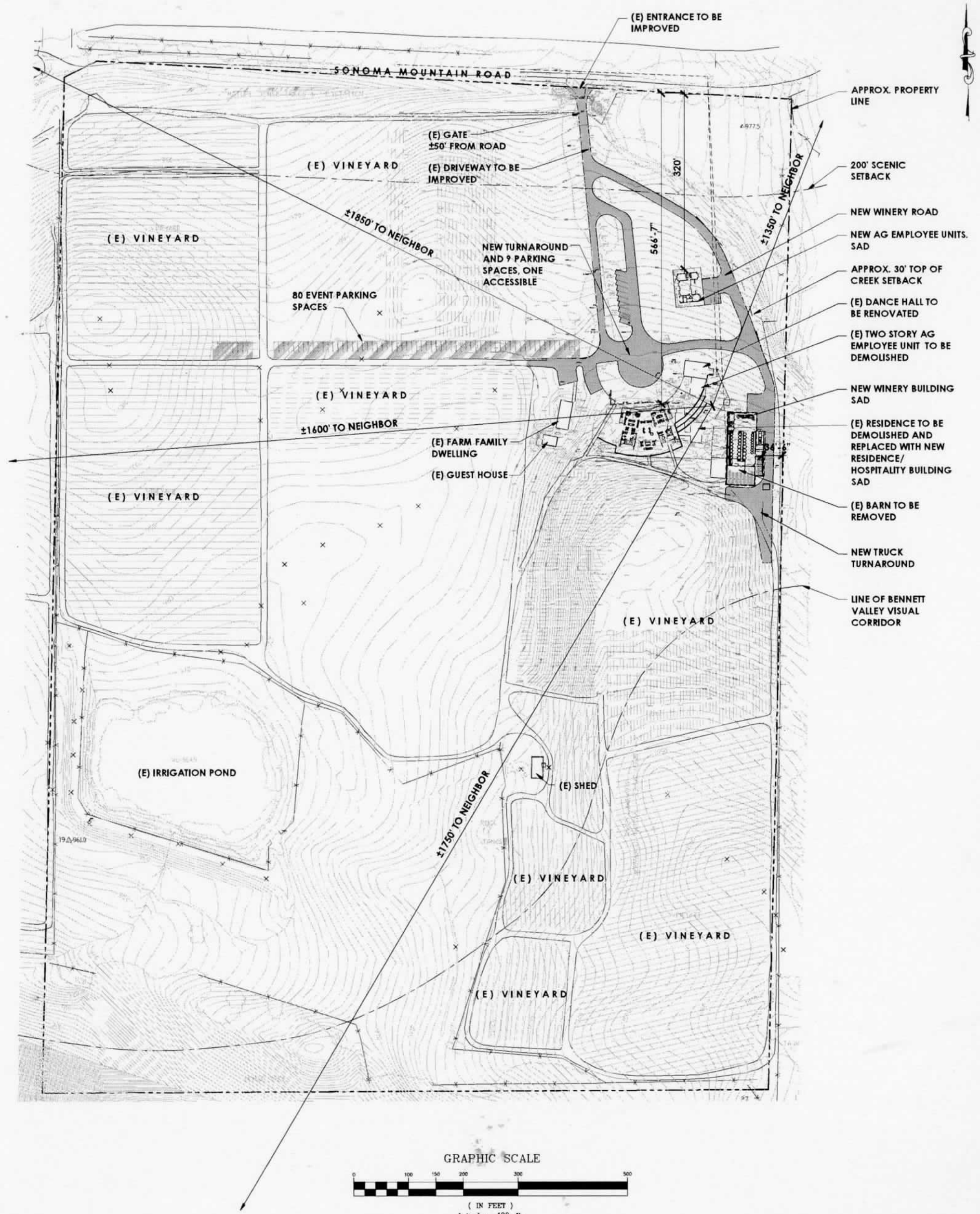
The County has identified the following areas of probable environmental effect of the project:

Aesthetics/Visual
Agriculture and Forest Resources
Air Quality
Biological Resources
Cultural Resources
Geology and Soils
Greenhouse Gas Emissions
Hazards and Hazardous Materials
Hydrology and Water Quality
Land Use
Noise
Transportation and Traffic
Utilities and Service Systems
Cumulative Effects
Growth Inducing Effects

Vicinity Map



Belden Barns Farmstead and Winery Project
PLP12-0016
5561 Sonoma Mountain Road



SMA
Steve Martin Associates, Inc.
NORTHERN CALIFORNIA:
130 S. Main Street, Ste 201
Sebastopol, CA 95472
(707) 824-9730
Fax (707) 824-9707
CENTRAL COAST:
606 Alamo Pintada Rd.
Suite 3-221
Solvang, CA 93463
(805) 541-9730
www.SMAssociates.net

USE PERMIT

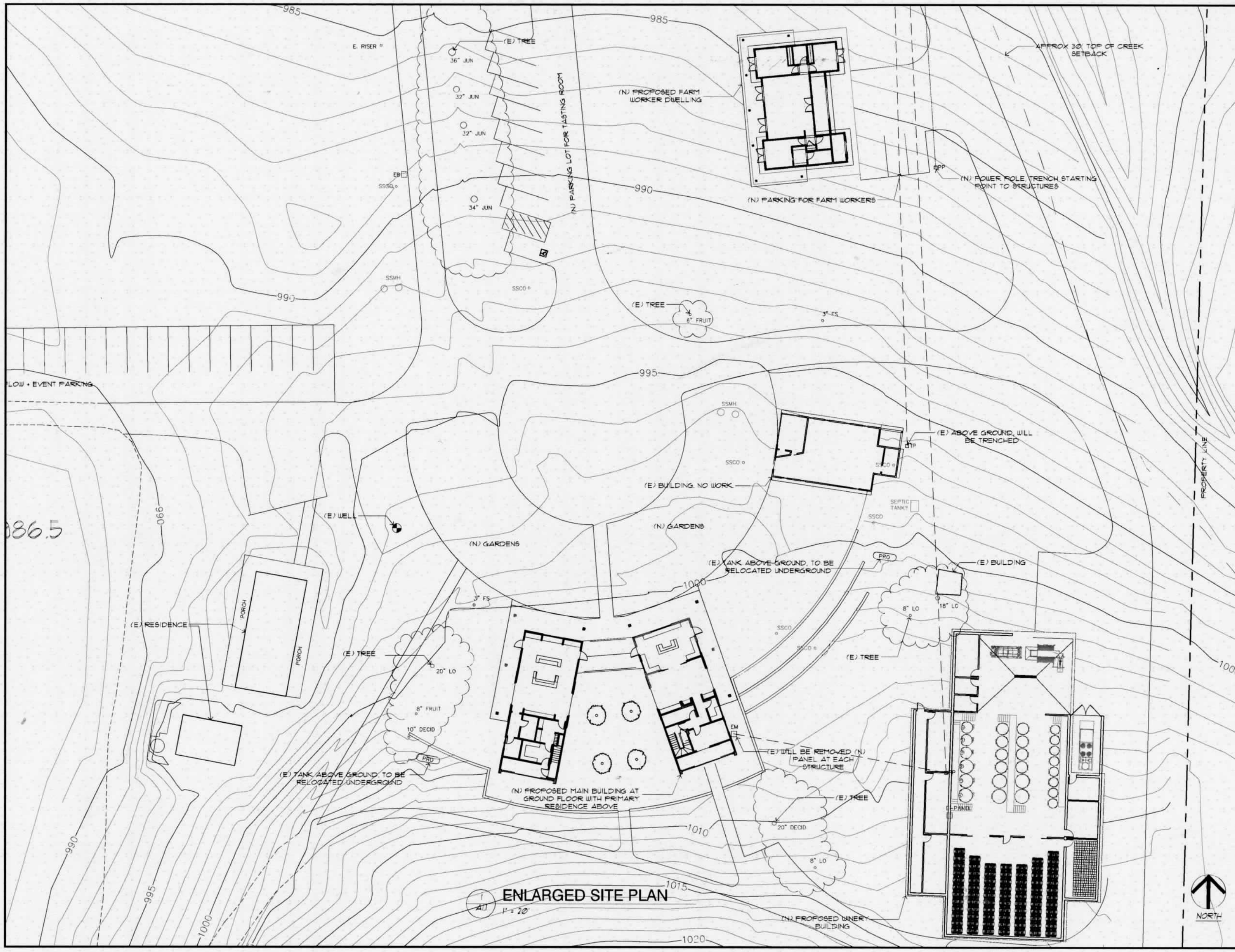
OVERALL SITE PLAN

BELDEN BARNS
Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404
AP # 049-030-010

REVISIONS

	DATE	DESCRIPTION
2	10.17.13	Neighbors Distances
3	06.03.15	Changes in Bldgs and Locations per Owner

JOB NO. SMA 2011-014
DATE May 5, 2012
DRAWN cM CHKD SM
FILE NO. 1114-UP1
SHEET
UP1



1
A1.1
ENLARGED SITE PLAN
1" = 20'

GENERAL NOTES

SHEET NOTES

WADEDESIGN
ARCHITECTS
29 Magnolia Ave. San Anselmo, CA 94960
Phone: 415.578.2856 Fax: 415.578.2867
info@wade-design.com

Belden Barns

5561 Sonoma Mountain Road, Santa Rosa, CA 94504

NOT FOR CONSTRUCTION

Drawn By	WD
Checked By	WD
Project No.	13009
Date	Issue
07-15-15	PROGRESS SET
07-30-15	PRICING SET
08-03-15	EIR SET

ENLARGED SITE PLAN

1" = 20'

A1.1

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 4
P.O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5528
FAX (510) 286-5559
TTY 711
www.dot.ca.gov

Serious Drought.
Help save water!

October 8, 2015

SON012620
SON-012-30.65
SCH# 2015092031

Ms. Laura Peltz
County of Sonoma
2550 Ventura Avenue
Santa Rosa, CA 95403

Belden Barns Farmstead and Winery Project – Notice of Preparation

Dear Ms. Peltz:

Thank you for including the California Department of Transportation (Caltrans) in the review process for the Belden Barns Farmstead and Winery Project. Caltrans' new mission, vision, and goals signal a modernization of our approach to California's transportation system, in which we seek to reduce statewide Vehicle Miles Traveled (VMT) and increase non-auto modes of active transportation. Our comments seek to promote the State's smart mobility goals and are based on the Notice of Preparation for the Belden Barns Farmstead and Winery Draft Environmental Impact Report. Additional comments may be forthcoming pending final review.

Project Understanding
The proposed project would develop a new winemaking, hospitality and farmstead food production facility on a 55-acre parcel located at 5561 Sonoma Mountain Road. Additionally, the project would also construct a 1,877 sq ft agricultural employee housing unit to replace the 1,780 sq ft of existing housing. The production facility is anticipated to produce 10,000 pounds of cheese and 10,000 cases of wine annually. The applicant also requests that the new production facility hold eight agricultural promotional events a year with guest lists ranging from 60 to 200 participants. Event parking would be provided on-site. Access to the site would be gained via Sonoma Mountain Road, and regional access would be provided via U.S. 101 and State Route (SR) 12.

Transportation Impacts
During peak promotional events this project may generate traffic at volumes sufficient to impact the operations of SR 12 and U.S. 101. Please consider the comments we have provided below in order to mitigate any project-related traffic impacts.

- Special events of 100 people or more are to take place several times per year, and private events are proposed to occur every month. These events will be occurring at sufficient frequency to be included in the 'Special Events' section of Sonoma County's Transportation Impact Fees;

- Since major special events involving 100 or more guests may cause significant delays on adjacent roadways - particularly for events featuring meals where guests would be arriving at the same time, temporary mitigation measures should be considered. These may include the use of the California Highway Patrol for traffic control at the intersection, shuttle buses, valet parking, encouraging carpooling, and advance public notice;

- Please identify the generated peak hour trips per event type, scheduling, frequency and duration of special events;

- Please identify the winery's recommended access route that would be provided to customers; and

- Is the one wedding that is listed, per the Events Table (p. 2 of 4), an accurate annual estimate?

Lead Agency
As the lead agency, the County of Sonoma is responsible for all project mitigation, including any needed improvements to State highways. The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.

Where mitigation is a condition of approval, CEQA requires a Mitigation Monitoring and Reporting Program (MMRP). Required information is listed below. Further information on the MMRP is available on the following website:
http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa.html.

- Lead Agency contact name, address, and telephone number;
- Location, type and implementation schedule for each mitigation measure; and
- Signed and dated certification that the mitigation has been implemented, and all other reporting requirements have been adhered to, in accordance with Public Resources Code Sections 21081.6 and 21081.7.

Should you have any questions regarding this letter or require additional information, please contact Cole Iwamasa at (510) 286-5534 or by email at: cole.iwamasa@dot.ca.gov.

Sincerely,

Pat C

PATRICIA MAURICE
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

bcc:PMaurice/CIwamasa/ChronFile/PVan/EGestuvo/

State of California • Natural Resources Agency
Department of Conservation
Division of Land Resource Protection
801 K Street • MS 18-01
Sacramento, CA 95814
(916) 324-0850 • FAX (916) 327-3430

Edmund G. Brown Jr., *Governor*
John M. Lowrie, *Assistant Director*

September 30, 2015

VIA EMAIL: LAURA.PELTZ@SONOMA-COUNTY.ORG
Ms. Laura Peltz
2550 Ventura Avenue
Santa Rosa, Ca 95403

Dear Ms. Peltz:

BELDEN BARNS FARMSTEAD AND WINERY PROJECT (PLP12-0016); NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT

The Department of Conservation's (Department) Division of Land Resource Protection (Division) has reviewed the Notice of Preparation of a Draft Environmental Impact Report submitted by the County of Sonoma (County). The Division monitors farmland conversion on a statewide basis and administers the California Land Conservation (Williamson) Act and other agricultural land conservation programs. We offer the following comments and recommendations with respect to the proposed project's potential impacts on agricultural land and resources.

Project Description

The proposed Belden Barns Farmstead and Winery is a new winemaking, hospitality and farmstead food production facility on a 55 acre parcel located at 5561 Sonoma Mountain Road. The farmstead products would include fresh and preserved vegetables/fruits, eggs, charcuterie and cheese. The production facility would be a new approximately 10,941 square foot, two story building. The first floor would be approximately 8,796 square feet and would be used for barrel storage, fermentation, winery production, the cheese creamery, and support spaces. The second floor would be approximately 2,145 square feet and would have administration, lab, and private tasting facilities. An existing barn would be demolished in order to construct the production building.

A tasting room would be the primary hospitality space for all products produced on site. This 3,033 square foot space would be located on the first floor of the owner's residence and would include a commercial kitchen. The project site would feature eight agricultural promotional events per year hosting approximately 995 people. The project would employ five full time and four part time employees for most of the year and an additional seven full time employees during the grape harvest season and bottling.

A new approximately 1,877 square foot employee unit would be constructed to replace an existing legal non-conforming 1,780 square foot building currently being used for farmworker housing, which would be demolished. Livestock and grazing would take place on approximately six acres of the project site. The numbers of livestock cited are: two milk cows, five milk sheep, chickens, and four pigs. The current primary residence would be converted to a family farm unit. The 55 acre project site is currently under a Williamson Act contact.

Department Comments

The Williamson Act enables local governments to enter into 10- and 20-year contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or compatible uses. California Government Code (GC) § 51230 enables local governments to enter into Williamson Act contracts, which have an initial term of 10 years. Williamson Act contracts are entered into between private landowners and the County. In return, restricted parcels are assessed for property tax purposes at a rate consistent with their actual, farming, and open space uses, as opposed to potential market value.

The Department supports the activities of an agribusiness venture on land under a Williamson Act contract as long as marketing events support and promote the agriculture commodity being grown on the premises (such as wine tasting facilities); and the number of attendees does not abuse the Williamson Act's leniency in allowing Counties to determine the permanent or temporary human population of the agricultural area (GC § 51220.5). This section of Government Code was written to protect agricultural lands from uses that often hinder or impair agricultural operations and as such should not be taken lightly.

The proposed project will host 8 agricultural promotional events per year which will bring approximately 995 people onto the project site. The Department has a concern with the increase in population on the project site, and notes GC § 51220.5:

> *The Legislature finds and declares that agricultural operations are often hindered or impaired by uses which increase the density of the permanent or temporary human population of the agricultural area. For this reason, cities and counties shall determine the types of uses to be deemed "compatible uses" in a manner which recognizes that a permanent or temporary population increase often hinders or impairs agricultural operations.*

The Department suggests that the Draft Environmental Impact Report address the County's rationale to support that this increased population would not violate Williamson Act statute (specifically §51220.5) and the Principles of Compatibility (§51238.1). The linkage between the two is important to ensure that activities which will clearly increase the population of the site are not violating the eligibility of the property to receive tax benefits for agricultural or compatible uses.

In addition, the scale of the structures proposed and the range of products to be processed appears large relative to the stated number of livestock and garden size. It is recommended that the staff report and/or environmental impact report for the project include an evaluation of the project's impacts to the agricultural productivity of the subject land, including how the project is consistent with the Williamson Act contract, any potential growth and/or loss of commercially viable agricultural land, cumulative effects, and mitigation measures for onsite and offsite impacts.

Should the County be unable to meet the statutory requirements for compatible use and satisfy the Legislature's intent, the Department suggests that the County consider partial non-renewal and cancellation for the areas in which the project will impact contracted land (GC § 51282). This action allows the proposed use to not conflict with existing law, and yet retains the protections and benefits for the remaining areas of contracted land.

Thank you for giving us the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report submitted by the County of Sonoma for the Belden Barns Farmstead and Winery Project. Please provide this Department with notices of any future hearing dates as well as any staff reports pertaining to this project. If you have any questions regarding our comments, please contact Farl Grundy, Environmental Planner at (916) 324-7347 or via email at Farl.Grundy@conservation.ca.gov.

Sincerely,

Molly A. Penberth

Molly A. Penberth, Manager
Division of Land Resource Protection
Conservation Support Unit

State Water Resources Control Board

OCT 19-2015

County of Sonoma
Permit and Resource Management Department
c/o Laura Peltz
2550 Ventura Avenue
Santa Rosa, CA 95403

RE: NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT FOR BELDEN BARNS FARMSTEAD AND WINERY PROJECT (PLP12-0016)

Dear Ms. Peltz:

The State Water Resources Control Board, Division of Water Rights (Division) received the subject Notice of Preparation (NOP) on September 15, 2015. The Division regularly reviews NOPs and related public notices and environmental review documents to identify water right compliance issues and projects that may require appropriative water rights. Based on the Division's review of the subject NOP, the surface water diversions and uses described therein are authorized by water right Licenses 011198 and 013138 (Applications 24004 and 26975). The Division has no further comments at this time.

Thank you for providing the Division with the opportunity to comment on the Belden Barns Farmstead and Winery Project. If you require further assistance, I can be contacted by phone at (916) 341-5803 or by email Shay.Richardson@waterboards.ca.gov. Written correspondence or inquiries should be addressed as follows: State Water Resources Control Board, Division of Water Rights, Attn: Shay Richardson, P.O. Box 2000, Sacramento, CA 95812-2000.

Sincerely,

ORIGINAL SIGNED BY

Shay Richardson
Environmental Scientist
North Bay Unit
Division of Water Rights

Ec: Laura Peltz at Laura.Peltz@sonoma-county.org

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Sonoma County
DEPARTMENT OF HEALTH SERVICES
PUBLIC HEALTH DIVISION

Rita Scardaci, PHN, MPH – Director
Ellen Bauer, PhD, MPP – Division Director

September 23, 2015

Laura Peltz
Permit and Resource Management Department
2550 Ventura Avenue
Santa Rosa, CA 95403

RE: PLP12-0016, a request for a Draft Environmental Impact Report and Public Scoping Meeting for a proposed Belden Barns Farmstead and Winery Project on a 55 acre parcel. The farmstead products would include fresh/preserved vegetables/fruits, eggs, charcuterie and cheeses. This property is located at 5561 Sonoma Mountain Road, Santa Rosa.

Dear Ms. Peltz,

Thank you for the opportunity to comment on this project. This request is for a comment on a Draft Environmental Impact Report as described above.

All plans for construction of the dairy processing plant and dairy farm must be submitted Sonoma County Environmental Health. Plan approval will be required prior to the beginning of any construction. The dairy processing plant proposal should address water usage and water availability issues. This site requires a manure management plan. Contact Kathleen Holden-Haase at 707-318-0554.

This site is required to obtain California Department of Food & Agriculture-Milk & Dairy approval for the cheese making operation. Contact John Macy at this department (510)622-4810 jmacy@cdfa.ca.gov

A Retail Food Facility Permit is required to store, prepare, package, serve or vend food. However the California Health and Safety Code exempts wine tasting activities itself if the wine tasting activities include no other beverage and no food, except for crackers, is served or sold. A review and approval of the operation plan will be required prior to issuance of a food facility permit to operate; or if an exemption is requested, then documents for a wine tasting room exemption will be submitted and approved prior to concurrence with the exemption and subsequent operation of the facility. Final construction approval is required prior to issuance of a Retail Food Facility Permit.

Wholesale and Retail production of foods that are canned or sealed may require the approval of the California Food and Drug Branch and a Processed Food Registration. Contact this department at (916) 650-6500 FDBinfo@cdph.ca.gov

All raw or prepared food products for retail sale must be obtained from an approved source.

If the site participates in or hosts a special event that is two or more days, it must be approved as a community event. Community events require additional permits and inspections from this Department for the organizer as well as all food vendors.

All existing or new onsite water well(s) and transient non community water systems are required to apply for and maintain a state water well system permit as an approved potable water supply for the food facility areas. The well permit would be issued by the California Department of Public Health Drinking Water Program 707-576-2145.

Wholesale or retail production of charcuterie products requires the approval of the California Department of Food and Agriculture- Meat and Poultry Division. Contact this department at (916) 900-5004 or ahbfeedback@cdfa.ca.gov

All owners/operators, managers, supervisors, and employees who sell or serve alcoholic beverages shall complete Responsible Beverage Service (RBS) Training within 90 days from issuance of a new permit and every third year thereafter. All servers/sellers of alcohol hired after the initial 90 day period shall complete the training course within 60 days of employment and every third year thereafter. If alcohol is to be served at special events, all employees and volunteers shall complete special event RBS training prior to the event.

The RBS Training shall meet the standards of the State of California, Department of Alcoholic Beverage Control or other certifying/licensing body which the State may designate. Records of successful completion for each owner/operator, manager, supervisor, employee and volunteer shall be maintained on the premises and shall be presented upon request by a representative of the County or local law enforcement agency.

As of June 1, 2012 smoking is no longer allowed in outdoor dining areas. This includes picnic areas, sidewalks, and any area available to, or customarily used by, the general public or an employee that is intended or regularly used for consuming food or drink. A business with an unenclosed dining area may establish a designated smoking area elsewhere on the premises if it meets the criteria outlined in the County Smoking Ordinance #5953.

A designated smoking area is a portion of an unenclosed area where smoking may be allowed. It must meet all of the following criteria:

- It must be located at least 25 feet in any direction from any operable doorway, window, vent or other opening into an enclosed area.
- It must be located at least 25 feet in any direction from any space that is designated as "smoke-free".
- It must be located at least 25 feet from unenclosed recreational areas that are primarily used by children and/or areas that have improvements that facilitate physical activity including playgrounds, tennis courts, swimming pools, walking paths, and sports fields.
- It must be no more than five percent (5%) of the total unenclosed area for which it is designated.
- It must be clearly identified by conspicuous signs and have ash receptacles, such as ash trays or ash cans, within the area for proper disposal of smoking waste.

Public events held in the unincorporated areas of Sonoma County are required to comply with Sonoma County Ordinance #5953 which prohibits smoking in public places. The ordinance does allow for the establishment of a Designated Smoking Area that meets criteria outlined in the ordinance. Criteria can be found at www.Sonoma-County.org/BreatheEasy under Overview and Background – Major Provisions.

If you have any questions, please call me at (707) 565-6534 or email at jennifer.lyle@sonoma-county.org

Sincerely,

Jen Lyle

Jennifer Lyle
Environmental Health Specialist III

C: Karen Milman MD MPH, Health Officer County of Sonoma
Christine Sosko, Director of Environmental Health
Leslye Choate, Environmental Health Program Manager

September 28, 2015

Ms. Laura Peltz
Senior Environmental Specialist
Sonoma County PRMD
2550 Ventura Ave.
Santa Rosa, CA 95403

Re: Belden Barns, Scoping Session Comments

Dear Ms. Peltz;
Please consider and include the following areas of concern in your determinations.

Provide complete and accurate descriptions of :
1. The entire area affected, not just the area immediately surrounding the proposed setting,
2. Traffic, Noise, and Roadway impacts (safety, esthetic, and otherwise) as they relate to Sonoma Mountain Road (both the upper and lower segments) AS WELL AS Pressley Road. These are access routes to the proposed "isolated" site, Use applicable information used by the County instead of "state" figures. Use accurate designations,
3. Hydrology concerns both with drawdown usage but also including recharge reduction and potential contamination,
4. Importation and Exportation of materials, goods and people to facilitate the ongoing usage of the proposed project,
5. Impacts on the important "night sky" feature of this area and added light pollution,
6. Noise concerns including heavy truck noise, (steep terrain), operating noise, and noise from additional people and any gatherings,
7. Wildlife and Avian impacts including but not limited to access to food and water, nesting, and vehicular dangers,
8. Fire safety due to increased human and vehicular intrusion,
9. Commercial usage rather than strictly agricultural,
10. Lack of ability of County to enforce conditions which might make project "more feasible",
11. Land Use and Planning - Consistency with the adopted planning documents. The Bennett Valley Area Plan needs to be used as a defining document, especially where it is more restrictive than the General Plan and where it lays out the long term, future intent, look and protections for the area .(Note: the original text, which is kept on file

at the County, should be referenced for clarification and determination of letter and intent of the Plan. This is specifically noted in the front of the current, condensed copy of the BVAP),

12. Cumulative impacts of other projects in the overall area - both individual and government/quasi-government entities,

13. Impacts on unique geographic treasures,

14. Appropriateness or not of the isolated location for proposed project.

Thank you for your consideration.

Sincerely,

Tamara Boultbee
4740 Pressley Road
Santa Rosa, CA.

To: Laura Peltz, Senior Environmental Specialist
Re: Comments regarding Belden Barns Farmstead and Winery Project (PLP12-0016) Draft EIR
From: Kirsten and Edwin Cutler, 5650 Sonoma Mountain Road, Santa Rosa, CA
Date: September 27, 2015

We are writing regarding the Belden Barns (PLP12-0016) project. Please consider the following concerns.

Our primary concern it that this project proposes an industrial manufacturing, retail sales and entertainment enterprise which is not appropriate for and will fundamentally change the nature of what is a rural, residential and agricultural neighborhood. I am requesting that the EIR scrutinize thoroughly the impacts to our neighborhood and the nature and quality of life in our community.

Our property at 5650 Sonoma Mountain Road is directly across the road from the Belden Barns project and has a common property line for approximately 116 feet of their north-east property line along the road. Thus this project will have a very direct impact on us and the quality of our immediate environment and our lives. We have lived here for 35 years and moved here from an urban environment to live in the rural, agricultural and bucolic setting of this area of Bennett Valley. To build our home we had to meet very stringent design review requirements that were in place to preserve this beautiful agricultural and residential setting. We have raised our children in this rural residential area, and now introduce our grandchildren to the pleasures of country life. From the description of the proposed Belden Barns project all of this will change dramatically and we will be forced to live in the midst of a busy, noisy and disruptive commercial industrial enterprise.

Integral components of this project are not agricultural and instead comprise a commercial manufacturing, sales and entertainment enterprise that will consequently disrupt and transform this rural residential and agricultural neighborhood in very significant ways. The retail and entertainment operations will bring increased traffic, potentially inebriated drivers, noise and auto pollution. The proposal to manufacture cheese will have a significant negative impact on this agricultural and residential area. two dairy cows will not produce 10,0000 pounds of cheese, the fact is that a large amount of milk will need to be trucked in to produce the cheese. The project proposal represents itself as a home grown enterprise when in fact the manufacturers will be importing large amounts of milk to produce cheese products. Farming is one thing but importing grapes and milk to process is clearly something else. Hundreds of people bought property in the Bennett Valley Sonoma Mountain area to live quiet country lives. They accepted the conditions of agriculture in order to have a different lifestyle than that of urban life. The county would be breaking trust with the people who live in this neighborhood to mitigate the zoning of a rural area to allow industrial use. Imagine, if all of a sudden your home had a industry planted next to it, I think you would not want this. Residential areas should not be subject to the incongruent and incompatible conditions commercial industry brings. Instead, industry should be restricted to areas designed for such activity. There are plenty of areas in Sonoma County that are already set up to accommodate manufacturing, industry and commerce. Those components of this project should be welcomed in such an area where they will not disturb this carefully preserved natural setting and the lives of long term Sonoma County residents.

The EIR should carefully evaluate the sound pollution impact of these activities including their timing, frequency, volume, their disruption of the current residential setting and impact on neighbors. The only sounds in this neighborhood throughout the day and night are those of nature and the occasional car, tractor and seasonal farming such as the grape harvest in the fall. We can still sit outside at any time of day or night and experience the beautiful silence of country life. Sounds on the Belden property such as field workers calling to one another as they work, people partying and their radios or stereos, machinery, etc. carry to and are easily heard on our property and we experience this as a normal part of country life. However, any increase in the frequency and volume of such sounds will be both clearly noticeable and disruptive. Consequently we are very concerned about any proposed activities which could increase the frequency and volume of noise created at Belden Barns. This would include both events and commercial production. The machinery involved in the proposed industrial manufacturing could be especially destructive of the natural soundscape of the neighborhood for all of the proposed daytime hours. The noise level from manufacturing will be significant and it is not clear how it could be mitigated. The proposed clearing of the vegetation for approximately 400 feet east of the Belden Barns entrance along the property line would open the view from the road and my property line to the proposed new AG employee units and the new processing plants and eliminate natural noise/sound/sight filtering. The noise from events and increased traffic would also be significant. Certainly the environmental impact of noise from the many different facets of the project is significant and complex and will require careful study to ensure it will not negatively effect the environment.

The EIR should carefully evaluate the project impacts to neighborhood hydrology and water quality and impacts on the aquifer including defining the aquifer and all wells in the vicinity based on, among other things, actual data on neighboring wells and testing of the quantity of existing and available water, and accurate water balance calculations. Our well is near the property line of Belden Barns and we are concerned that the high usage of water by this project will adversely affect our well and water supply. Wells have already dried up on this road so this is a real concern. Our water well is less than 80 feet from our common Belden Barns property line and we are concerned with the impact of the project on the quality and quantity of our only water source. The increased pressure on the already stressed groundwater supply in an area experiencing regular drought cycles is a real concern. We understand it takes 400-600 gallons of water to produce each pound of cheese and there will be a significant amount of waste water produced; this could impact an already at-risk groundwater supply. The EIR needs to be especially thorough in evaluating the project's impact in this critically important area.

The EIR should carefully evaluate the project's impacts on neighborhood transportation, traffic and road conditions. We are concerned with the possible and likely negative impact on road conditions and safety. Sonoma Mountain Road's condition is fragile at best and some areas of the road are very dangerous especially in the winter due to its narrowness, curves, poor sight lines, crumbling shoulders, drop-offs and generally poor condition. It is a failed road that does not hold up to its already limited traffic and requires careful, alert and attentive driving. The project will increase traffic on the road which will effect both the road and driving conditions. Neighborhood residents enjoy walking the road and it is a popular route for bicyclists. Add to this serving wine on site and the dangers to those living in and visiting the neighborhood are likely to be increased. Wine tasting and wine tasting events will lead to drivers impaired by alcohol intake driving a very narrow rural road thus endangering residents, other drivers, walkers and bicyclists. It is important that the EIR assess/evaluate carefully these impacts.

The EIR should also carefully consider the potential impacts on vulnerable wildlife including native species, nesting and migrating raptors and other birds, amphibians (e.g., frogs annually migrate across Sonoma Mountain Road from the drainage creek running along the road on the Belden Barns property and could be decimated by increased road traffic), fauna, etc. Wildlife is in abundance in the neighborhood and it will be critical to consider the impacts clearing of vegetation, increased traffic, noise and other products of the proposed industrialization of the environment will have on them.

Sonoma Mountain is a rural treasure in Sonoma County. A park has just been opened on Sonoma Mountain Road down the road and in part adjacent to the proposed project allowing access to beautiful rural scenery for all Sonoma County residents and tourists. It would be a disservice to Sonoma County residents to despoil this preserved rural environment with the impacts of industry that should be more appropriately located in a commercial industrial area. The manufacturing and entertainment aspects of the Belden Barns project would adversely impact the rural serenity of these protected areas, potentially disturb the wildlife that inhabit them and place additional stress on a vulnerable environment. The EIR needs to carefully evaluate the aesthetic impact of the project's events, manufacturing and new structures on nearby neighbors and others who will be affected.

Careful consideration of all these factors lead us to believe that the proposed industrialized commercial operation is completely at odds with and will dramatically alter the rural residential nature of our neighborhood. We have deeply appreciated and continue to treasure the opportunity to raise our family in this unique community and fear that if the EIR does not thoroughly consider all the potential impacts of the proposed project and explore possible alternatives this wonderful and unique experience of Sonoma County will be lost to us, our neighbors and future generations.

Thank you for the opportunity to provide our input to the EIR process.

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Monday, September 21, 2015 9:02 AM
To: Heather Ivey
Cc: TINA WALLIS; Verne Ball
Subject: FW: Objection to the Belden Project

From: Yvette Fallandy [mailto:ymf@sonic.net]
Sent: September 19, 2015 3:06 PM
To: Laura Peltz
Cc: rzoia@sbcglobal.net; Byron LaGoy
Subject: Objection to the Belden Project

Laura Peltz
Sonoma County Board Permit and Resources Management Department

2550 Ventura Avenue

Santa Rosa, California 95403

RE: Belden Barns Scoping Comments

Hearing Date: September 29, 2015

My recent personal experience convinced me that *no enterprise*, for-profit or non-profit, of any size, requiring visitors in any numbers, is appropriate at any address on **Sonoma Mountain Road**. About a month ago at 4PM, a CHP Officer obliged me to take Sonoma Mountain Road to Enterprise Road to access Old Bennett Ridge Road and my home. (Bennett Valley Road in both directions was closed to all, except resident traffic because of a serious accident).

The experience was horrendous. It had been years since I had driven Sonoma Mountain Road, and I had forgotten how dangerous it is: too narrow, many blind curves, no shoulders, in poor condition, and relatively l-o-n-g! The unusual volume of traffic in both directions, including many *drivers unfamiliar with the road*, caused near accidents and an actual accident. My experience was an insight into the consequences of any increased traffic on Sonoma Mountain Road. **Sonoma Mountain Road, as is, simply can not accommodate commercial, non-residential, traffic**.

Ms Peltz, I most respectfully and sincerely implore you to exercise your authority to prevent the Belden project.

Thank you for your attention to my message.

Yvette M. Fallandy

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Friday, September 11, 2015 5:16 PM
To: Heather Ivey
Cc: Verne Ball; Melinda Grosch
Subject: FW: Belden Barns (PLP12-0016)

From: Stan Feingold [mailto:feingoldstanley@gmail.com]
Sent: September 11, 2015 4:56 PM
To: Scott McIntosh
Cc: Laura Peltz
Subject: Re: Belden Barns (PLP12-0016)

I agree with Scott's analysis of the hazardous situation that a crowd of 150 to 200 people traversing Sonoma Mountain road will create on this narrow county road. This narrow roadway has no shoulders, no traffic center or edge lines and many short sight distances.

While it serves the few farmers and residents who know it well, it simply cannot serve 100 to 200 (urban) people (perhaps wine drinkers) without the potential for far too many accidents. This remote agricultural community deserves better. Wineries and commercial businesses should be located along well traveled corridors served by adequate roadways.
Stan Feingold
<feingoldstanley@gmail.com>

On Fri, Sep 11, 2015 at 2:31 PM, Scott McIntosh <ivyglen@msn.com> wrote:
Dear Laura,

At your invitation I provide the following comments.

My name is Scott McIntosh, residing at 6607 Sonoma Mountain Road operating a wine grape vineyard since 1972.

I oppose the requested Belden Barns project entirely.

Once a commercial retail business with daily wine tasting and occasional events with attendance up to 200 persons is granted for Sonoma Mountain Road road safety and other issues will become problematic for all residents between Pressley and Enterprise road.

There is no outlet between the named roads.

In addition to local resident traffic, Daily wine tasters, County Sonoma Mountain trail traffic, daily Zen Center attendance and increasing crossover traffic will be added to the designated second worse road in Sonoma County.

In addition, with approval of the first commercial retail daily business operating on Sonoma Mountain Road it may be unlikely Sonoma County will turn down approval for the next applicant wishing to conduct retail business on the road access to my family cherished lifestyle for the past 43 years.

Thank you.

--
Stan

TO: Ms. Laura Peltz 24 September 2015

FROM: Amb. (ret.) Michael Guest
and Mr. Alexander Nevarez
255 Sonoma Ridge Road
Santa Rosa, CA 95404

SUBJECT: SCOPING FOR ENVIRONMENTAL IMPACT REPORT (EIR) RELATED TO PLP12-0016 (PROPOSED BELDEN BARNS WINERY AND CREAMERY)

Thank you for the opportunity to help frame the potential environmental impacts of the above-noted project proposal.

In the earlier, now-rescinded approval of this project, scant attention was paid to its impacts on those of us who live in its immediate vicinity. As owners of a contiguous property that will be among those most directly impacted should this project be allowed to proceed, we ask that the EIR pay particular scrutiny to the following issues, in accordance with CEQA and the California Code of Regulations.

Visual Impacts

- Our home sits at the same elevation as many of the facilities this proposed project would construct. According to available topographical information, most of these structures likely would be in direct view from the front (southern) and side (eastern and western) yards of our property, as well as from south-facing house windows.
- Sight-line screenings must be developed to shield any project structures not only from the view of passers-by on Sonoma Mountain Road, but from the view of those who live within view of those structures. To do otherwise is to ignore and diminish our ability to enjoy the properties in which each of us has invested.
- Accordingly, we ask that the review specifically address sight lines for all neighbors with regard to all buildings, structures and roadways to be built or altered in conjunction with this proposal. Facilities to be evaluated in this regard should include the proposed winery, parking lots, roads, transfer and unloading areas, creamery, living quarters, truck turnarounds, wastewater treatment structures, and fire protection water storage facilities.
- We further ask that the EIR review, from this standpoint, the widening of on-site driveways and roadways alluded to in project filings, as these similarly may carry adverse sight-line impacts for nearby properties.
- Finally, we note that the project description calls for "…clearing the vegetation for approximately 400 feet east of the entrance along the property line, to increase sight-distance for cars…." This proposed destruction of century-old trees and other vegetation is questionable for the stated purpose, as the proposed facilities would be located along the straightest stretch of Sonoma Mountain Road, where visibility arguably is not an issue. While perhaps good for the visibility of the applicant's

proposed commercial enterprise, removal of these trees would further impact the visuals and, potentially, noise levels along this rural byway.

Noise

- The only reference to noise levels in the project description is to a prohibition of "…amplified music at any event." The project description fails to note that the site's mountain backdrop itself projects sound forward. For us, as the property's nearest neighbor, this sound projection already is evident in the one-on-one conversations of vineyard workers on the applicant's property that we can hear from our home, word for word.
- We ask that a qualified noise consultant or acoustician be retained to assess the noise impacts that the project would entail, including, *inter alia*, noise generated by: day-to-day facility operations; periodic cleaning and other maintenance needs; attendance at proposed events, in the numbers described in the project description; use of delivery and service vehicles; and passenger cars and vans. The scope of this assessment logically should include the nuisance posed to all residences within the area of expected sound projection.
- We further ask that other aspects of the proposal be reviewed from the standpoint of their potential impact on noise levels. These include diminished sound abatement that might result in tree/shrub removal for grading, landscaping, and (as noted above) road visibility enhancements referenced in the project description or in more detailed plans – any of which might impact how sound travels and, consequently, the level of noise for those of us who live in the immediate vicinity.
- In the same manner, we ask that the event ending and clean-up times offered in the project description be considered from the standpoint of compatibility with the schedules of those who must rise early. (We respectfully note that Alexander, a public school teacher, of necessity goes to bed a half hour before the proposed end times noted in the project description.)
- Finally, we ask that the project description clarify whether the prohibition of "…amplified **music** at any **event**" (emphasis added) is intended to embrace the use of (a) spoken sound amplification and (b) music used for normal winery, creamery, and tasting room operations – i.e., apart from the particular "events" listed in the project description.

Air Quality

- Given the swirling and constantly changing air currents in this particular mountaintop area, we similarly ask that an air specialist be retained to examine the impact of these proposed facilities on air quality on the properties and residences of those of us who live in the project's immediate vicinity. In addition to processing-related exhausts and other odor non-tangibles, this should include control of dust and other windblown materials.

Hydrology

- The production of wine consumes large quantities of water: according to the San Francisco Chronicle, it takes 18 gallons of water to produce one *glass* of chardonnay!

Particularly in view of the ongoing drought, it is imperative that the EIR give particular attention to how water availability to neighbors might be impacted by the proposed ramped-up grape production; new commercial winery and creamery operations; tasting room visits; and events.

- The operation under review is located in an area with few surface water sources. Accordingly, the EIR needs to arrive at a better appreciation of the relationship between the site's well water availability and that of neighbors. Those of us who live on Sonoma Mountain count on government to assure that the water needs entailed by a new venture such as this, being created entirely for the commercial advantage of one non-resident property owner, not adversely impact our pre-existing investments and our ability to survive, individually and as a community.
- Of note, we and others depend on the water from our wells not only for the viability of our homes, but for protection from fire disaster. Given recent catastrophic fires only a few mountains away, this should be a matter of concern, too, within the scoping of the EIR.
- In sum, hydrology concerns should not be checked off with a questionable hydrology report that uses pre-drought historical data, postulates water sufficiency without real data, ignores any physical testing of the impact of the increased water usage that would be entailed by these operations, and is silent on water needs for fire protection in a high-risk zone.

<u>Transportation, Traffic, and Hazards</u>

- The project's earlier W-Trans traffic "study" was in reality a guesstimate, and one that focused solely on traffic immediately in front of the proposed winery/creamery. This "study" ignored traffic flow impacts that might be expected along the more heavily traveled four access points to Sonoma Mountain Road, and on the stretches of road proceeding from those access points. We ask that the EIR rely on a more genuine traffic study that embraces careful consideration of these impacts – on those who live along the road, and indeed on the road itself. This is all the more important given the already dramatically increased vehicular traffic that the opening of the North Sonoma Mountain Regional Park has entailed.
- The earlier W-Trans "report" of an additional winery-generated traffic of 71 daily visits also appears to be at odds with the applicant's declared intention, in supporting documentation submitted to PRMD, to create a destination winery. This, combined with the proximity of the property in question to both San Francisco and Sonoma Valley, suggests a need to better evaluate and explain the lowball estimate that has been put forward of traffic to be generated by the project.
- The project description notes that a mere two milk cows and five milk sheep are to be housed and grazed on-site. This suggests that the bulk of dairy supplies for the proposed creamery will be trucked along Sonoma Mountain Road to the proposed project site. In this regard, we ask that the EIR provide the public specific information as to expected commercial traffic that would be directly attributable to locating a creamery in a location that lacks sufficient on-site farm animals.

- Finally, we ask that the EIR examine not only potential road traffic increases, but road safety as well. The safety concerns of those of us who live along this road – widely seen as one of the worst in the county – cannot be discounted on grounds that county roads generally are bad, as one person involved in this proposal has stated. Sonoma Mountain Road is unlike the more level, wider, and relatively straight terrain of roads that lead to many of the county's existing wineries (e.g. Dry Creek Road, Route 128, River Road, Westside Road, Sonoma Valley, and the wineries of Carneros). It is laid on clay, without modern engineering. It is narrow and, with the exception of one light immediately at the base of my property, unlit. Its many sharp curves and uneven grades are traveled by a large cycling community. The increase in traffic along Sonoma Mountain Road directly attributable to the proposal – hardly negligible in and of itself – is magnified by the seriously negative condition and observable deterioration, in the time we have lived here, of that road. It would be irresponsible not to address the safety issues entailed by adding wine-tasters and wine-imbibing events to this mix in the context of considering this proposal.
- We specifically ask, in this regard, that the EIR address the topographical differences between this location, on the one hand, and the flatter, safer, more accessible areas in which the preponderance of commercial wineries are located.

<u>Growth, Impact on Area</u>

- In that regard, in choosing to make our home here, we specifically relied on the commercial development restrictions posited in the Bennett Valley Area Plan. Indeed, we rejected locating in "winery corridors," including those cited above, and where winery development otherwise was not specifically precluded in available planning documents. We are now told that the county's General Plan supersedes any community-specific plan – a position that makes no sense from the standpoint either of <u>having</u> a community-specific plan or, indeed, of representative government.
- We have been told that the applicant's proposal is consistent with his agricultural product promotion needs – even though there clearly are viable wine-promotion alternatives to having on-site production, an on-site tasting room, and on-site events in this hitherto uncommercialized area. We further are told that the commercial facilities that the applicant has proposed are incidental to the agricultural character of the property – even though those commercial projects would vastly alter the agricultural character not only of the property in question, but of the broader vicinity that we and others in this community have embraced, in no small part because of the absence of permitted commercial facilities.
- We respectfully ask that the EIR address these incompatibilities. The applicant's project runs directly counter to the known and advertised qualities of the Sonoma Mountain area – qualities that have led us and others to invest our lives, finances and futures here. One property owner should not be permitted to so radically re-sculpt the character of an area that belongs to so many others.
- We note that, should a commercial winery, creamery, and related retail-directed facilities be allowed, there would be no reason, in fairness, that others should be

denied the ability to develop similar commercial facilities to promote their/our own agricultural products – with attendant consequences in each of the substantive areas outlined above. The project in question, therefore, is precedential. Should it be permitted, denial of other similar "agriculture-supportive" projects would be flatly inconsistent with democratic practice – yet the commercial consequences for this area would be large.

- What has been proposed, then, has the prospect of vastly altering the landscape of Sonoma Mountain, introducing commercial operations, parties, and events into an area designated for <u>residential</u> and <u>intensive agricultural</u> usage. We have the right to the peaceful enjoyment of our properties, in line with the development criteria limned across the Bennett Valley Area Plan. The proposal in question impinges on that right.

Thank you again, and please confirm your receipt of these comments.

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Monday, September 28, 2015 4:14 PM
To: Heather Ivey
Cc: Verne Ball; TINA WALLIS
Subject: FW: Belden Barns Project

-----Original Message-----
From: aehaas [mailto:aeh@sonic.net]
Sent: September 28, 2015 4:13 PM
To: Laura Peltz; ivyglen@msn.com
Subject: Belden Barns Project

Hello Laura,

I have written before to express my opposition to the Belden Barns project; I am writing again to reiterate and expand on my previous letter.

I continue to oppose the project. I do not think that either the roadbed or the neighbors should be asked to support either a retail outlet or special events of this proposed magnitude. The additional wear and tear on what is a rural road built on an old carriage way is in no way desirable. The county cannot keep the road up properly as it is, in spite of all good efforts.

The change of the area from a rural setting to one allowing commercial use is a precedent which ought to be though out on a broad base, rather than project to project. There is no precedent for this project, nor should it be the precedent for future projects.

Other projects on the road have historically been refused for reasons of road use and rural character; this one should certainly be. A vineyard and/or winery can certainly exist without an onsite tasting room; many are so operated in the county. Some have no tasting rooms, some have tasting rooms in an area zoned appropriately.

My family has owned and lived on Sonoma Mountain Road for over 45 years; certainly change has occurred, but this step is in a wrong direction.

I cannot attend the meeting on Sept 29, but wish to express my unqualified disapproval of this proposal as written.

Thank you for your attention to this matter.

Anthony E. Haas
6480 Sonoma Mountain Road
Santa Rosa, CA 95404
aeh@sonic.net

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Monday, September 21, 2015 10:31 AM
To: Heather Ivey
Cc: TINA WALLIS; Verne Ball
Subject: FW: Belden Farms Farmstead and Winery Project

-----Original Message-----
From: Hal Koch [mailto:haldko@gmail.com]
Sent: September 21, 2015 9:45 AM
To: Laura Peltz
Subject: Belden Farms Farmstead and Winery Project

Sonoma County: I wish to offer 2 issues with this project: I live at 5290 Burnham Ranch Road, (Summit View Ranch-SVR). I bought the property 12 years ago, (2004). From the east side of our ranch, (20 properties), we look down on the 2 existing bldgs., which gives us a proximity point for the detailed maps/plans of this project. My wife, 11 year old daughter, and I live here.

1) We have required at SVR, homes to be built within a designated building envelope, set next to and among trees/hills. These are a part of our community covenants, including new structures. Once, a home was slated to be built on a treeless nob and the community denied it due to this issue. It was never built.
I am concerned the "main building" sits on top of a treeless knob, at the peak of the hill.
The winery/cheese building sits on the east side of the property. Is this visible or within/among trees?
They are both very large buildings for Bennett Valley.

2) We included in our valuation, when buying our property, based on the Open Space Districts plan for above us (Jacob's Ranch to Coopers Grove) to Sonoma, (protecting upper hills from development while making available to the public). Bennett Valley has the non-commercial development zoning which meant to us there would be no commercial wineries or other businesses other than pure agriculture. The limited roads would be ok and justify a further drive for us raising our now 11 year old, due to the promise of maintaining Bennett Valley's character for decades to come.
Will this project set a precedence for commercial business development in Bennett Valley?
If this reduces the value of our property, will Sonoma County adjust down our land values to contemplate this major change, (precedence)?
What justification is there for making such a change to the zoning/planning of the Bennett Valley community?

Thank you for your consideration. Respectfully submitted,

Harry D. (Hal) Koch

Hal Koch
High Energy Advisors, LLC
haldko@gmail.com
707-545-3018
402-578-7773(c)

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Friday, September 25, 2015 8:39 AM
To: Heather Ivey
Cc: Verne Ball; TINA WALLIS
Subject: FW: Scoping Concerns re Belden EIR

From: Byron LaGoy [mailto:blagoy@sonic.net]
Sent: September 25, 2015 8:17 AM
To: Laura Peltz
Cc: Rose Zoia
Subject: Scoping Concerns re Belden EIR

Dear Ms. Peltz:

We are writing in regards to the EIR analysis to be conducted for the Belden Barns project. We have many concerns about what needs to be addressed. Many of those needs are included in a letter from Rose M. Zoia. In addition and/or more specifically:

Impact Areas

Project Setting

In describing the surrounding rural area for the proposed Belden project, please include the fact that the area is residential, includes the growing of crops such as grapes, and that nowhere on this side of Sonoma Mountain is there any commercial activity such as applicant proposes.

Hydrology/Water Quality

Many assertions made in the Project Description about water use lack substantiation. We request that all alleged factual statements, made or relied upon, be backed up with hard data.

For example, regarding water use: What is the maximum anticipated water use, and what could be the maximum increase in water use? Identify the use for each component of the project and also the combined use.

How many employees (farm workers or other) actually live on the land at the time of application? How many are part-time and how many full-time? Accurately describe the current situation (baseline) versus what would be the maximum use in the project.

Currently, the Beldens do not live on the property except occasionally in what is called the "Farm Family Unit." How many people maximum will occupy the "Farm Family Unit" and what will be the water use in that building?

What is the anticipated, gallons-per-day water use in the new Belden residence for this 4-person family. What other family members may live there, as Belden has stated may happen, and what is the impact of their presence?

What will be the water use of the "Production Facility?" This should include all the uses planned for the two story building and any other water use outside the building for its operations. What is the total, anticipated water use of the "Farmstead and Wine Tasting Room," including a commercial kitchen.

What would be the maximum use of water for all "Agricultural Promotional Events" - include all aspects of water use?

What would be the water use for the crop production? The livestock and grazing?

What happens if the drought continues, as most predict will occur, and the runoff pond does not have sufficient water for irrigation of the grapes and other products? Or for any other uses for which that water is intended? What would be the use of water from the well for growing crops or other use?

If wastewater from the creamery cannot be used for irrigation, what is the impact on the use of water needed from the well? How does that add to the total water use and what is the impact of that use?

Another major area for EIR analysis is the impact on the aquifer, any related aquifers, and all wells that draw water from that same or related aquifers. Identify the aquifer and related aquifers and identify all wells that would or could be impacted and do all necessary testing to determine the impact of the maximum water use from the project. Consider all wells that draw from the same aquifer and not just those wells in geographic proximity to the Belden property which may not draw from the same aquifer or related aquifers. Consider all cumulative uses, including but not limited to those from the Zen Center and the North Sonoma Mountain Regional Park.

Land Use and Planning

While the word "commercial" has a common meaning that is understood by most of us, and is a meaning that includes what the Belden project proposes, PRMD and the County have apparently re-defined that word in order to approve projects of this kind. Research and describe the intent of the Bennett Valley plan in relation to the prohibition of "commercial development" and why it is to be prohibited in this area.

Noise

In the noise study, please interview neighbors who are nearby or who may hear workers, event goers, etc. so that the impact of noise can be more accurately determined. Look at how noise travels in relation to this particular site, and how sound amplifies naturally by the geography of the setting.

Transportation and Traffic

In prior reports and comments of the previous application by the Beldens, there were errors regarding how much traffic (number of vehicles) a rural road such as Sonoma Mtn. Rd. can handle. Be sure that the new traffic impact analysis accurately reflects the difference between Sonoma Mtn. Rd. from Bennett Valley to Pressley and the road between Pressley and Warm Springs Road, as well as Pressley Road coming from and going to Rohnert Park. These sections of road involve substantially different sets of road conditions.

Consider not only the volume of traffic, but all the conditions of the road. Then include and consider the effect of a tasting room, alcohol consumption, even if such consumption is monitored, on such a road in relation to safety concerns.

Talk to the bicycle coalitions in Sonoma County, talk to bikers on the road, talk to the companies that run bicycle trips from Glen Ellen up Sonoma Mountain Road. Analyze the impact of more traffic on the bicycle users of this road.

Talk to the people who walk this road and ask about what it is like and how more traffic will impact them/us.

Growth Inducing Impacts

A very careful look at the precedent setting nature of the Belden project needs to be included in an impact analysis. There is no other project like this on Sonoma Mountain Rd. (SMR). Thus far, the possibility for such precedent setting, retail development on SMR has been shrugged off by the county with the comment, "That's not a problem because each application is considered on its own merits." That is unfortunately a very misleading response. The reality is, if the Belden project is approved, every subsequent application for a similar project on SMR will cite the county's approval of the Belden project as a central argument in their application. Every subsequent application will be modeled after what the county approved for the Beldens. There are currently dozens of applications eager for wineries, tasting rooms, and special events on file with the county. Approving the Belden project means there will soon enough be Belden look-alike applications targeting SMR. This impact needs to be thoroughly analyzed.

Alternatives

Consider all alternatives to the various aspects of this project: no tasting room, off-site tasting, off-site events, no wedding, off-site creamery, no or limited retail sales, only retail sales of products actually grown on the land and no others, etc.

Sincerely,

Amy Rodney and Byron LaGoy

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Friday, September 11, 2015 3:02 PM
To: Heather Ivey
Cc: Verne Ball; Melinda Grosch
Subject: FW: Belden Barns (PLP12-0016)

From: Scott McIntosh [mailto:ivyglen@msn.com]
Sent: September 11, 2015 2:31 PM
To: Laura Peltz
Subject: Belden Barns (PLP12-0016)

Dear Laura,

At your invitation I provide the following comments.

My name is Scott McIntosh, residing at 6607 Sonoma Mountain Road operating a wine grape vineyard since 1972.

I oppose the requested Belden Barns project entirely.

Once a commercial retail business with daily wine tasting and occasional events with attendance up to 200 persons is granted for Sonoma Mountain Road road safety and other issues will become problematic for all residents between Pressley and Enterprise road.

There is no outlet between the named roads.

In addition to local resident traffic, Daily wine tasters, County Sonoma Mountain trail traffic, daily Zen Center attendance and increasing crossover traffic will be added to the designated second worse road in Sonoma County.

In addition, with approval of the first commercial retail daily business operating on Sonoma Mountain Road it may be unlikely Sonoma County will turn down approval for the next applicant wishing to conduct retail business on the road access to my family cherished lifestyle for the past 43 years.

Thank you.

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Tuesday, September 29, 2015 11:55 AM
To: Heather Ivey
Cc: Verne Ball; TINA WALLIS
Subject: FW: Belden Barns EIR Scoping
Attachments: 2013 SMR tied for worst road in Sonoma Co..pdf

From: Scott McIntosh [mailto:ivyglen@msn.com]
Sent: September 29, 2015 11:52 AM
To: Laura Peltz
Subject: Belden Barns EIR Scoping

Dear Ms Peltz,

Enclosed is a report from 2013 that ties Sonoma Mountain Road for the worst condition in Sonoma County.

I am apposed to the Belden Barns project.

In addition to Sonoma Mountain Road condition between Pressley and Warm Spring Roads I read the Project application includes using waste water from cheese and wine production to irrigate the grape vineyard. I did not read that waste water treatment would occur before irrigation that could affect the local aguafier for neighboring wells.

Thank you,
Scott McIntosh
6607 Sonoma Mountain Road
43 year resident

[Road Warrior](#)

2013 Worst Roads: It's a tie

Thursday, November 14, 2013 at 5:49 by Road.Warrior

Spring Hill Road has patches, pot holes, eroded edges and alligator pavement. "Even the dairy trucks avoid it now," writes Andy Eber.

Two stretches of bumpy two-lane pavement, both 7.5 miles long, both heavily patched but revered by cyclists who prefer scenic back roads over city bike lanes. In all other ways, the winners of this year's Worst Road contest couldn't be more different.

Spring Hill is a dusty "farm to market" road linking the west county dairies with Helen Putnam Park and downtown Petaluma to the east, Tomales and the Two Rock Coast Guard Training Center to the west. Cows outnumber people, which explains the loamy aroma and the relatively low traffic volume, just 229 vehicles a day.

Sonoma Mountain is a tree-lined residential road that also serves as an east-west link for Glen Ellen and Kenwood travelers on their way to Rohnert Park or Petaluma. Between Bennett Valley Road to the west and Warm Springs Road to the east, it gains altitude while winding past gated driveways, vineyards and a zen center. The air smells of wood smoke and wet trees, with the road narrowing to one lane as it passes through a small redwood grove. In 2012, the county counted 1,390 vehicles a day on the western end, between Bennett Valley and Pressley roads, and 474 on the longer stretch east of Pressley.

Those who responded to the 2013 Worst Road Contest nominated a total of 57 roads, and although Spring Hill and Sonoma Mountain "won" this year, many other roads are as bad or worse. Sonoma County has nearly 2,750 lane-miles of pavement, and in October, the Metropolitan Transportation Commission rated their condition as "poor" and in need of major rehabilitation or reconstruction. (Read more about that report here.)

Readers called Spring Hill atrocious, a disaster and a meteor-blasted moonscape. It's "a real live jiggler," wrote Cookie, and bicyclist Bill W. had this to add: "With 110 psi and no shocks, it's butt numbing." Carrie Winningham was focused more on the discomfort of the residents when she wrote, "My heart breaks for the MANY people who live off that road. I hope they never need emergency services, because it won't be long before they can no longer get to them."

Andy Eber had the most telling comment: "Even the dairy trucks avoid it now."

Save Our Sonoma Roads advocacy group has staked out Sonoma Mountain Road.

Those voting for Sonoma Mountain Road pointed out man-eating potholes, describing the drive as similar to Mr. Toad's Wild Ride. "My mail person can't get close to the mailbox because the shoulder of the road by the mailbox is now a 9 foot long, 8 inch deep pothole," wrote a reader named Sally. "Pot holes, patches on patches, cracks everywhere," wrote Andrea Tobias. "It is the main road between Bennett Valley Road and Pressley Road for wine trucks during harvest season, and the noise is terrible."

"It's just one pot hole patched over another with OK pavement in between," said Craig Harrison, a Sonoma Mountain Road resident and co-founder of the advocacy group Save Our Sonoma Roads. What isn't already crumbling looks like alligator skin, he said, and in addition to inconveniencing residents, the rough road is a big issue for the 200 bicyclists a day who use it as a scenic place to work up a sweat.

"Besides residents, about half the traffic comes from tourists, winery vehicles and nonresidents who use it as a main route to west county," Harrison said, adding that more than 550 residents have signed a petition asking to have the road paved.

Tom O'Kane said he would like to fix Spring Hill Road if funding was available, pointing to smooth pavement on nearby Chileno Valley Road and Western Avenue. Micro-paving it would cost about $1 million, a chip seal more than $400,000, but even that's not going to happen this year. The deputy director of the county's Transportation and Public Works department said "neither of these corridors is in (the ad hoc committee's) proposed work plan for pavement preservation next year."

Sonoma Mountain Road is a different challenge, built on mountainous terrain with lots of ground movement and moisture, he said. The least expensive fix would entail repairing the road base and chip sealing it. That would cost more than $1 million for just 7.6 miles of sparsely traveled road.

Six or seven years ago a 200-foot stretch east of the redwood grove was washed out during a huge winter storm, closing the road completely. The county did major landslide repair there a few years ago, O'Kane said. "Last summer a crew was out doing more work and looked down. There was already a crack about 100 feet from the repair that was filled with sand and top sealed. It was 22 inches deep.

"There are lots of bad roads," he said. "Irwin Road and portions of Frei Road, they're in horrible shape, but the problem has occurred over decades. These roads were never constructed properly. Someone graded a path, put rock down and laid down asphalt on top of it."

Repairing them often involves a complete rebuild, something O'Kane's department did this summer to more than 50 miles of heavily traveled county roads, using money allocated for that purpose by the Board of Supervisors. "This has been a good year," he said, "and I'm hoping for the same next year, that we'll get into a routine of every year doing significant work. But even then it will take a decade to get caught up."

To read about previous years' winners, click here and here.

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Wednesday, September 30, 2015 9:10 AM
To: Heather Ivey
Cc: Verne Ball; TINA WALLIS
Subject: FW: Belden Barns Farmstead and Winery Project

From: Jane Nielson [mailto:jenielson@comcast.net]
Sent: September 29, 2015 5:42 PM
To: Laura Peltz
Cc: Susan Gorin; Shirlee Zane; James Gore; Efren Carrillo; David Rabbitt
Subject: Belden Barns Farmstead and Winery Project

The following are comments for EIR Scoping on Belden Barns Farmstead and Winery Project project PLP12-0016, 5561 Sonoma Mountain Road, Sonoma County

I am commenting as a geologist with 25+ years experience, including examination of landslides and landslide-prone sites in the Coast Ranges of California.
I have 3 degrees in geology and am a California-licensed Professional Geologist (Lic. No. 9011).

The Belden Barns property is in a hazard zone, as shown in the County's Hazard Mitigation Plan. In fact it is in 2 hazard zones: it is in a zone of moderately high potential for earthquake shaking because the site is less than 2 miles from the Rodgers Creek Fault. It is also in a zone of relatively high landslide hazard (between class VII and IX), and the previous Staff Report stated "the site has an historic landslide area."

The presence of these hazards, and the Boudreau Report's depiction of a well drilled into the toe of a landslide, means that the EIR needs to thoroughly examine the relative stability of the whole property, including the slopes above the building sites.

I recommend this also because of a Geotechnical report done for previous owners of the same property, who were interested in building a house much farther up the hill. The Reese report, withheld from the Belden Barns file, describes the finding of unstable areas upslope, where previous owners wished to build a home. The Reese report recommended that any residence would have to be constructed with extraordinarily buttressed foundations to be safe.

This means that the area of the current Belden Barns project could be threatened by a landslide under conditions of continued heavy rains, or even of earthquake shaking.

I therefore recommend that the EIR include a full geotechnical report that determines the slope stability of the upslope areas. The studies must include detailed trenching and measurements of features in the slopes above the project site, using established engineering geology techniques. The field work will produce measurements that can be used to calculate factors for estimating the slope stability.

I urge this because I have seen the former Love Creek neighborhood in the Santa Cruz Mountains, where a landslide from a higher slope buried 10 people in their homes. This happened during the heavy rains of 1982, a time before we know about El Ninos or atmospheric rivers. That same year, a powerful landslide rushed into a

Pacifica neighborhood from a totally natural slope, and entombed 3 children in their beds. I have seen that place also; the mud in that slide formed a wall that was 10 feet high when it hit the house across the street.

Given a major El Nino year, Sonoma County could be the recipient of such ferocious rainstorms, and suffer widespread landsliding. it's time to start insisting on steps that will mitigate landslide and earthquake hazards that the County has identified BEFORE they take the lives of real people.

Jane E. Nielson, Ph.D., PG
Geologist

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Wednesday, October 07, 2015 2:10 PM
To: Heather Ivey
Subject: FW: Belden Barns Scoping Hearing September 29, 2015 - Comments
Attachments: Belden Barns EIR alternatives 9-25-15.docx

Hi heather,

I think I might have forgot to forward this one.

Laura

From: Donna Parker [mailto:Donna@winepro.com]
Sent: September 25, 2015 5:21 PM
To: Laura Peltz
Subject: Belden Barns Scoping Hearing September 29, 2015 - Comments

Dear Ms. Peltz: Attached please find my comments for the hearing on September 29th. I am also including it below:

Belden Barns, Scoping Comments

Scoping Hearing Date: September 29, 2015

Dear Ms. Peltz:

In my 30 years of hiring for the wine industry, I have seen a number of winery business plans and many wineries have chosen NOT to have their Tasting Rooms on site. There are a variety of reasons for this decision: 1) financial 2) access 3) neighborhood opposition 4) owners who did not want to live on site with alcohol consuming customers 5) more appropriate infrastructure in place, i.e., parking, adequate roads, easy access, general location. Many alternative locations offer additional business access to attract potential customers to the Tasting Room.

For example, another plan for Belden Barns would be to have their Tasting Room in Glen Ellen, have customers in to taste their wines there, bring them up to the winery in their shuttle, tour the winery, have them taste the vegetables, fruits, and cheeses, bring them back to the Tasting Room via the shuttle and consummate the sale of wines and other products there. This is a viable and interesting way to approach customers and address the objections everyone is concerned about regarding drinking and driving on Sonoma Mountain Road.

There are many more alternatives and solutions to the serious issues this present plan creates. Just look around at the many off site Tasting Rooms. And please remember it is a "bar" and "event center" we are kindly calling a Tasting Room. It does not belong on one of the worst roads in Sonoma County.

Please consider these alternatives in the EIR.

Donna Parker

5412 Sonoma Mountain Road

Santa Rosa, California 05404

September 25, 2015

Laura Peltz

Sonoma County Board Permit

and Resources Management Department

2550 Ventura Avenue

Santa Rosa, California 95403

Re: Belden barns, Scoping Comments

Scoping Hearing Date: September 29, 2015

Dear Ms. Peltz:

In my 30 years of hiring for the wine industry, I have seen a number of winery business plans and many wineries have chosen NOT to have their Tasting Rooms on site. There are a variety of reasons for this decision: 1) financial 2) access 3) neighborhood opposition 4) owners who did not want to live on site with alcohol consuming customers 5) more appropriate infrastructure in place, i.e., parking adequate roads, easy access, general location. Many alternative locations offer additional business access to attract potential customers to the Tasting Room.

For example, another plan for Belden Barns would be to have their Tasting Room in Glen Ellen, have customers in to taste their wines there, bring them up to the winery in their shuttle, tour the winery, have them taste the vegetables, fruits, and cheeses, bring them back to the Tasting Room via the shuttle and consummate the sale of wines and other products there. This is a viable and interesting way to approach customers and address the objections everyone is concerned about regarding drinking and driving on Sonoma Mountain Road.

There are many more alternatives and solutions to the serious issues this present plan creates. Just look around at the many off site Tasting Rooms. And please remember it is a “bar” and “event center” we are kindly calling a Tasting Room. It does not belong on one of the worst roads in Sonoma County.

Please consider these alternatives in the EIR.

Donna Parker

5412 Sonoma Mountain Road

Santa Rosa, California 05404

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Tuesday, September 22, 2015 8:37 AM
To: Heather Ivey
Cc: TINA WALLIS; Verne Ball
Subject: FW: Belden Barns EIR scoping

From: Toby Rosenblatt [mailto:trosenblatt@msn.com]
Sent: September 21, 2015 6:03 PM
To: Laura Peltz
Subject: Belden Barns EIR scoping

With respect to the scoping of the subject EIR, I ask that the following information be included:

Reference:
Project Title: Belden Barns Farmstead and Winery Project (PLP12-0016)

Potential Environmental Effect Area:

As to Transportation and Traffic: Sonoma Mountain Road between Warm Springs Road and Pressley Road varies in width in several places; analysis should be done as to whether tour buses coming to the proposed project could safely pass pickup trucks and automobiles that regularly travel this road.
This section of Sonoma Mountain Road is one of the lowest rated roads in the county. Analysis should be done as to the effect of the increased traffic on the condition and maintenance of this road section.

As to Cumulative effects and Growth Inducing effects: approval of this commercial usage on an agricultural property would set a precedent for other wine grape growing and cheese producing properties on Sonoma Mountain Road. Analysis should be done to indicate and count the other currently existing vineyards on this road and analysis of what the traffic result could be if all of those (or some significant proportion) of those properties sought and received the same permit with proportionately comparable proposed usage.

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Monday, September 21, 2015 10:37 AM
To: Heather Ivey
Cc: TINA WALLIS; Verne Ball
Subject: FW: Belden Barns

-----Original Message-----
From: Deborah shein [mailto:shein.deborah@gmail.com]
Sent: September 21, 2015 10:11 AM
To: Laura Peltz
Cc: Harvey Shein; <nate@beldenbarns.com>
Subject: Belden Barns

Dear Ms. Peltz,

My husband, Harvey and I have lived on Enterprise Road near the junction of Sonoma Mountain Road for 18 years. We knew when we built our house that we were moving to an agricultural area. We are surrounded by vineyards. Our neighbors have cattle and goats, chickens and horses. There is a lot of large truck and trailer traffic, especially during harvest. Now that a lovely regional park has opened on SMR there is additional traffic. The roads have been in bad shape for many years and continue to deteriorate.

We believe the Bledens are entitled to use their property for agricultural and related purposes, as is historic here. The condition of Sonoma Mountain Road is an entirely separate issue. Having visitors by appointment or selling cheese on their property will in no way have any greater impact, in our opinion. In fact, a far greater problem exists with the illegal vacation rental properties disturbing the peaceful environment.

If families like the Beldens are prevented from using their property for historic agricultural purposes, going forward, the only people who will be able to afford to live here are weekenders from San Francisco or those who buy property for vacation rentals. Neither, perhaps, make the best neighbors or contribute to the community.

Thank you for your consideration,
Deborah Shein
6875 Enterprise Road
Glen Ellen

Sent from my iPad

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Monday, September 21, 2015 9:04 AM
To: Heather Ivey
Cc: TINA WALLIS; Verne Ball
Subject: FW: Our cherished Sonoma Mountain Road

From: Marlene Stein [mailto:marlenellamas@yahoo.com]
Sent: September 20, 2015 6:28 PM
To: Laura Peltz
Cc: rzoia@sbcglobal.net; ivyglen@msn.com
Subject: Our cherished Sonoma Mountain Road

As a transplant from Manhattan, my life in Sonoma County is a dream come true. My husband and I live on 60 acres with 60 animals. We have spent 18 years on this road, loving the quiet and pristine environment. Now, in our retirement years, our lives are threatened. We are surrounded by the discussions of development- of the Zen Center, of wineries, of event centers.....our pond has shrunk to half its size and now we have the possible prospect of our water supply diminishing even further. I have gone through the ordeal of 6 flat tires in less that 18 months-- the pot holes are brutal here. Our winding, narrow roads cannot sustain more traffic (and surely not with people who have been wine tasting and partying!). I firmly support a serious and thorough environmental impact study and believe that intelligent minds can objectively view and study all alternatives for the best use and preservation of our beautiful resources.

Respectfully submitted,
Marlene W. Stein
6195 Sonoma Mountain Road
Santa Rosa, CA 95404

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Monday, September 21, 2015 9:05 AM
To: Heather Ivey
Cc: TINA WALLIS; Verne Ball
Subject: FW: Beldon Farms -- Sonoma Mountain Road

From: marty stein [mailto:llamas1@yahoo.com]
Sent: September 20, 2015 7:31 PM
To: Laura Peltz
Subject: Beldon Farms -- Sonoma Mountain Road

Dear Ms. Peltz,

As a seventeen year resident of Sonoma Mountain Road I am concerned about the additional traffic that would be generated by the Belden application as it would add substantial traffic to a sub-standard (failed) road.
If approved, there would be multiple large events as well as every day wine tasters. Many of these visitors will be unfamiliar with a dangerous road that is difficult even those familiar with it.
I fear there will be serious accidents, especially for those coming through the "Grove" from the Glen Ellen side. Please understand that after sampling wine elsewhere, driving through a winding one lane "Grove" is a recipe for accidents.

Traffic has increased because of Zen Center visitors and the new park and hiking trails that have been added to Sonoma Mountain Road and a large event and winetasting project would totally overwhelm this road which has caused constant problems (tire and rim blowouts) to its current users.
Please disapprove this request!
Thank You ,
Martin Stein

Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Monday, September 28, 2015 3:18 PM
To: Heather Ivey
Cc: Verne Ball; TINA WALLIS
Subject: FW: EIR scoping hearing for Belden application PLP12-0016
Attachments: Belden hearing 9.16.14.pdf

From: Dixie van der Kamp [mailto:vdkaloha@pacbell.net]
Sent: September 28, 2015 3:13 PM
To: Laura Peltz
Cc: Rose Zoia; Scott McIntosh
Subject: EIR scoping hearing for Belden application PLP12-0016

We are long time residents of Sonoma Mountain Rd.: my husband moved here in1965, and myself in 1989. We are farmers, with wine grapes, fruit orchard, huge vegetable gardens, chickens, rabbits, goats, and sheep. We have raised six children here, and have watched the quaint, peaceful rural character we and they have always loved gradually fade as numbers of weekenders, tourists, bicyclists, and non-farmers have proliferated.

In addition to what appears to be 'normal' growth in traffic, there is unmistakably an noticeable increase with the opening of the new park. And the Zen Center is looking to increase their traffic volume from a reported 32 trips per day to 88. There seems to be ongoing construction at multiple sites on our road, with big trucks a constant hazard on our very narrow road. Making matters even worse, there is an influx of folks not accustomed to rural driving, who seem to be in a much bigger hurry than they should be on our road, already causing extremely dangerous 'close calls' daily. And I concur with the many neighbors who are expressing fears of drunken driving should a tasting room and almost monthly large-scale events be allowed. As for events, the 8 listed are way too many, in my opinion. It seems reasonable to allow maybe 4 - as long as they do not co-incide with events at the ever-busier Zen Center nor with grape harvest time.

Attached is a copy of an email I sent a year ago. My thoughts are the same. I do support the Belden's desire to have the ability to sell fruits, vegetables, and wines they grow and produce, dairy and meat products from animals they raise. I do NOT support bringing in milk, produce, nor products not from their own ranch for sale. Their stated aim to have 2 milk cows, 5 milk sheep, and 4 pigs will not be sufficient to produce 10,000 lbs of cheese, nor supply a retail charcuterie. The scale of their stated commercialization desires is much, much larger than 'home-grown'.

Please know that there is already an undercurrent of buzz from many folks watching this application. If this is approved, there will definitely be a steady stream of other similar applications. This is absolutely a tipping point - defining the future of Sonoma Mountain Rd. Will it remain a rural, scenic corridor? Or will it become the next Dry Creek Road? That choice is what is on the table here.

Very sincerely,

Dixie van der Kamp

Subject:	Re: Hearing on Belden Use Permit 16 Sept 2:10 PM Sonoma County Bd Supt
From:	Scott McIntosh (ivyglen@msn.com)
To:	vdkaloha@pacbell.net;
Date:	Monday, September 15, 2014 5:25 PM

Dixie,
Exactly my thoughts!
Scott

----- Original Message -----
From: Dixie van der Kamp
To: Scott McIntosh
Sent: Monday, September 15, 2014 5:03 PM
Subject:
Re: Hearing on Belden Use Permit 16 Sept 2:10 PM Sonoma County Bd Supt

Hello, Scott...

I am wholeheartedly in favor of agriculture - and in the ability for farmers to sell their own produce from their land. To that end, I support the Beldon's desire to have a winery, cheese production, and produce sales as a means to market their own produce.

I am also avidly opposed to commercialization of Sonoma Mountain Rd. That means no tasting room, event center, or resale of produce not grown here.

Those of us who have chosen to live here have sacrificed convenience of being 'in town' to relish the peaceful, quiet, rustic beauty of rural life. More cars, tourists, noise, 'hustle and bustle' energy mar what we work hard to enjoy.

It is not just this one location in question. If this enterprise goes through, there is no ground to say that every owner of vineyards, goat herds, picturesque wedding sites should be denied similar enterprise. And if the delicate balance of rural living is tipped by this one allowance, there will be no reason for everyone else not to follow suit.

Thank you for all your efforts in safeguarding our right to rural serenity.

Dixie van der Kamp

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Heather Ivey

From: Laura Peltz <Laura.Peltz@sonoma-county.org>
Sent: Monday, September 28, 2015 4:09 PM
To: Heather Ivey
Cc: Verne Ball; TINA WALLIS
Subject: FW: AB 52 Project Comments for Scoping Meeting
Attachments: Belden Barns comments r1.docx

From: Shay Weisbrich [mailto:shayweisbrich@msn.com]
Sent: September 28, 2015 3:21 PM
To: Laura Peltz; nate@beldenbarns.com
Cc: 'Terry Weisbrich'
Subject: AB 52 Project Comments for Scoping Meeting

Laura,

Attached are our comments for the Belden Barns scoping meeting on Tuesday. We're copying Nate Belden on this message and he has seen an earlier draft of the letter. We'd like to note he has been excellent in responding to questions and concerns from us and other neighbors at Summit View Ranch, which is an adjacent property. We appreciate his concern for the neighborhood. At the same time, given our close proximity, we wanted to ensure that one topic concerning the hospitality and production aspect of the business is addressed at the meeting and in future impact reports, hence our letter.

Nate,
Thanks for working with us to ensure concerns are addressed. We appreciate it and look forward to hosting an upcoming meeting with you and our neighbors to continue the discussion.

Thanks,
Shay and Terry Weisbrich
4201 Burnham Ct.
Santa Rosa, CA 95404
707-546-3729

To: Laura Peltz, PRMD

Cc: Nate Belden

The following comments are prepared in response regarding the Belden Barns Project and public scoping meeting AB Project Notification. We are residents of Summit View Ranch and could be considered “adjacent neighbors” relative to our proximity to the current Belden Barns operation.

My wife and I have attended a Belden Barns wine tasting. We were very impressed with many things we observed. Their excellent wines have been recognized in the professional wine community and so impressed us that we have become members! Their approach to grape production is consistent with sustainable processes and we noticed an ample amount of water in their reservoir leading us to believe there is no immediate threat to the surrounding water table.

The Beldens project a community concern and have demonstrated an openness and transparency in their activities. They have offered to speak with and answer concerns/questions to all interested in their current and projected project. We find them to be open, congenial and responsible people with which we hope to continue building a community relationship. In fact, we are inviting them to our home to address interested SVR neighbors in the next few weeks.

Our concerns have generally been addressed. There is one concern, however, that seems to require more information. As a self-defined “hospitality and farmstead food production facility” Belden Barns represents a new kind of entity, unique from other wineries. As such, their plan calls for a commercial kitchen for production and events, include a wedding, which is a different focus than “agricultural promotion events.”

This hospitality and production aspect of the business seems to move beyond the scope of the zoning for our area and opens the door to changing the character of our community. We’d like to obtain more information regarding the long-term plan for retail sales, particularly how and where retail products are proposed to be sold.

Thanks,

Terry and Shay Weisbrich
4201 Burnham Ct.
Santa Rosa, C 95404
707-546-3729

Law Office of Rose M. Zoia

50 Old Courthouse Square . Suite 401
Santa Rosa . California 95404
707.526.5894 . fax 267.381.6097
rzoia@sbcglobal.net . zoialaw.com

September 25, 2015

via email

Laura Peltz
Sonoma County Board Permit
and Resources Management Department
2550 Ventura Avenue
Santa Rosa, California 95403

RE: Belden Barns
Scoping Comments
Scoping Hearing Date: September 29, 2015

Dear Ms. Peltz:

Please accept these EIR scoping comments on behalf of Friends of Sonoma Mountain Road regarding the above-referenced project. The bullet points below indicate areas the EIR should include in discussion and evaluation. They are not all inclusive.

Project Descriptions and Project Setting

Project Description

• Provide an accurate and complete project description.

A project is defined as "…the whole of an action, which has the potential for resulting in a…physical change in the environment…" (CEQA Guidelines (14 Cal. Code Regs.), § 15378 (a).) The project description provides the analytical foundation for the entire EIR and, therefore it is essential that an EIR have an accurate, well-conceived, stable and finite project description.

Project Setting

• Provide an accurate and complete description of the project setting including a detailed and accurate description of the surrounding area and its rural residential nature.

Impact Areas

Aesthetics

- Impacts of events and structures on neighbors and all viewsheds

Hydrology/Water Quality

- Impacts on the aquifer, including defining the aquifer, and all wells in the vicinity, based on, among other things, actual data on neighboring wells and testing of the quantity of existing and available water, and accurate water balance calculations

- Water usage based on full capacity of all structures and uses on site, including wine making, cheese production, hospitality, livestock, crops, residents, employees, visitors, event goers, and other

- Explain whether the stated maximum water demand for the project of 1.77 AF/year includes using water from the two 10,000 gallon storage tanks, or whether the tanks are dedicated to the winery/creamery and landscape/livestock.

- Explain how the 1.77 AF/year figure is calculated.

- Verify the legality and impacts of using creamery wastewater for irrigation, and identify and discuss creamery wastewater requirements and regulations.

Land Use and Planning

- Discuss inconsistency of this new wine making, hospitality, and production facility with the Bennett Valley Area Plan (BVAP), including but not limited to goals and policies prohibiting commercial development.

- Discuss inconsistency with the Sonoma County General Plan Policy LU-1a which mandates BVAP's more restrictive policies take priority over the broader General Plan when a conflict appears.

Noise

- Prepare a noise study that includes, among other things, an explanation and evaluation of how sound carries to neighbors as well as accurate attenuation.

Transportation and Traffic

- Provide accurate report of the collision rate on the entirety of Sonoma Mountain Road and include study conducted during normal traffic patterns.

- Analyze the entire road including the westerly segment of the road from Bennett Valley Road to Pressley Road and the segment from the project site to Warm Springs Road.

- Analyze road and traffic safety issues on Sonoma Mountain Road including but not limited to pedestrians and bicyclists as well as motor vehicles. Analysis should consider overall condition of the road including width, lack of shoulders, poor sight lines, curves, drop offs, ranking as one of the worst roads in the County.

Cumulative Impacts

- Include the North Sonoma Mountain Regional Park in a cumulative traffic and water impacts analysis, as well as all other past, present, and reasonably foreseeable projects.

Growth Inducing Impacts

- Analyze direct and indirect growth inducing impacts including but not limited to the ways in which the proposed project could foster economic growth in the surrounding environment, remove obstacles to growth, and/or encourage or facilitate other activities that have the potential to affect the environment, either individually or cumulatively.

Project Objectives

- The objectives carried into the EIR must be rewritten in a broader manner so that alternatives can be effectively analyzed.

The project objectives are overly narrow, thus precluding an effective analysis of alternatives, including the no tasting room alternative required in the Settlement Agreement. There is a difference between project objectives and the project description, so project objectives must not be a mere repetition of the substantive elements of the project. To morph them is to eliminate meaningful analysis of alternatives and preordains that the proposed project must be approved in the precise form described in the notice.

Alternatives

- No tasting room, per the Settlement Agreement.
- Off-site tasting room
- Off-site events, such as wine club gatherings
- Off-site tasting room and fewer than seven (7) days/week, fewer people at events, and more limited hours of operations and no weddings
- Fewer events, e.g., wine club events only, and fewer than seven (7) days/week, fewer people at events, and more limited hours of operations and no weddings
- No weddings
- Off -site tasting and limited retail sales in terms of days, hours, and range of products
- Limited retail sales in terms of days, hours, and range of products
- Reduced cheese production, e.g., 5,000 pounds
- Smaller overall project
- Combinations of the above

Thank you for your attention to this matter.

Very truly yours,

Rose M. Zoia

From:	Catherine Sowell
To:	Laura Peltz
Subject:	Belden Barnes PLP 12-0016
Date:	September 28, 2015 6:51:06 PM

As a 28 year resident of Sonoma Mountain Road, We are writing in protest to the application of Belden Barns for their project at 5561 Sonoma Mountain Road. The project is unsuitable for the neighborhood and will open the door to the possibility of every grape grower on the road who might wish to develop their "brand" in the same manner as the Belden project. Open-to-the-public wine tasting is dangerous for such a narrow and winding road. Water usage has not been adequately studied in relation to our water table. We are unfortunately unable to attend tomorrow's meting but wish to have our names listed among those in opposition to the project. Thanks you.

Cathy and Malcolm Sowell
6505 Sonoma Mountain Road
Santa Rosa, CA 95404
(707) 528-2995

From: Rose Zoia
To: Laura Peltz
Cc: hilary burton; Byron LaGoy
Subject: Belden comments
Date: September 27, 2015 10:59:45 AM
Attachments: image001.gif

Dear Laura,

The following comments are from Hilary Burton:

Ms. Peltz:

Regarding the forthcoming scoping hearing (9/29/2015) on the Belden proposal for Sonoma Mountain Road, I have the following comments (I'll be returning from Chicago and unable to attend).

Having lived on Sonoma Mountain Road since 1978, I've seen it change considerably. The increase in traffic and decrease in road quality have been significant. To encourage drinking and driving on that road is insane.

At least two people have died in accidents on the road (Mrs. Turner who lived where the Cascianis now live, and a young motorcyclist who crashed just before Pressley Road). When it rains (if it ever does), the road floods easily and then we get people at our front door asking for help -- each year, using a tractor, we pull out at least a half dozen cars that have strayed from the road and gotten stuck. Those Belden Wine Club members that live outside Sonoma County, and are likely to be tasting room visitors, run the likelihood of similar "getting stuck" problems. It is not an easy road to drive under the best of conditions. A new set of man-made, County sanctioned changes conducive to serious problems (daily drinking at the "tasting room") is not needed. The EIR must analyze all aspects of the increased traffic from this project, combined with the state of the road.

And, to claim as the applicants do, that they want to introduce and demonstrate the wonders of Sonoma Mountain agriculture is not credible. Young farmers or would-be agricultural workers could no more afford to farm on Sonoma Mountain Road than I could afford Warren Buffet's stock portfolio. The applicant is dangling the proverbial carrot. Why not support the Farmer's Guild or some of the many existing pro-agriculture programs in the County? Why compete with the various Farmers' Markets? Belden has spent, and is currently spending, considerable time in the financial sector in New York City and San Francisco to support his farmstead. Newcomers would be hard-pressed to match his financial resources.

The applicants seem unconcerned with the substantial water requirements of the proposed farmstead. The EIR must analyze all aspects of the water use of the project. There are numerous wells that have gone dry in the area, including two on the Belden property.

Furthermore, the thought of having a Sonoma Mountain mini-mart disbursing "beer, wine, vegetables, fruits, eggs, charcuterie, cheese, farmstead products, and individual items from the local area" (from the Project Description) on a daily basis sounds more like a tourist trap than the unspoiled rural environment we wish to preserve. The applicants claim they are creating this farmstead to share the magic of the area, yet the commercial/retail enterprise they seek to develop takes the first step down a pathway that will destroy the tranquility and magic that originally brought them to Sonoma Mountain. The EIR must look at alternatives that do not create these impacts.

I hope the County does not support the introduction of retail/commercial establishments on Sonoma

Mountain Road. There currently are none, and the Bennett Valley plan was developed to insure it continued that way.

As a result of the serious, undesirable changes an approval of the Belden project would allow, we hope the EIR will include a thorough investigation into the issues of traffic, road conditions, safety, hydrology in its many aspects, precedent setting retail operations, and the rural nature of the Sonoma Mountain Road area.

Thank you.

Hilary Burton

5700 Sonoma Mountain Road

~ Rose Zoia

Law Office of Rose M. Zoia
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APPENDIX B

Original Initial Study/MND

Mitigated Negative Declaration

Sonoma County Permit and Resource Management Department
2550 Ventura Avenue, Santa Rosa, CA 95403
(707) 565-1900 FAX (707) 565-1103

Pursuant to Section 15071 of the State CEQA Guidelines, this summary of findings and the attached Initial Study and mitigations constitute the Mitigated Negative Declaration as proposed for or adopted by the County of Sonoma for the project described below:

Project Title: Belden Barns (PLP12-0016)

Project Location Address: 5561 Sonoma Mountain Road, Santa Rosa (APN: 049-030-010)

Lead Agency: Sonoma County Permit and Resource Management Department

Decision Making Body: Board of Zoning Adjustments

Project Applicant: Nathan Belden

Project Description: Request for a Use Permit for a new phased agricultural processing facility with a maximum annual production of 10,000 cases of wine, 10,000 pounds of cheese, retail sales of wine, cheese and other farmstead products, wine, cheese, and farmstead product tasting by appointment only, and 10 special events on a 55 +/- acre parcel.

Environmental Finding:

Basis on the attached Initial Study, the project described above will not have a substantial adverse impact on the environment, provided that the mitigation measures identified in the Initial Study are included in the project.

Initial Study: See attached. For more information call Melinda Grosch at 565-2397.

Mitigation Measures: Included in attached Initial Study. The project applicant has agreed to implement all mitigation measures.

Introduction: The applicant, Nathan Belden proposes a Use Permit for a new phased agricultural processing facility with a maximum annual production of 10,000 cases of wine and production 10,000 pounds of cheese. A referral letter was sent to the appropriate local, state and federal agencies, and interest groups who may wish to comment on the project. Additionally, an "Early Neighborhood Notification" notice was mailed to all neighbors alerting them to the application and asking for comments.

This report is the Initial Study required by the California Environmental Quality Act (CEQA). The report was prepared by Melinda Grosch, Project Review Planner with the Sonoma County Permit and Resource Management Department, Project Review Division. Information on the project was provided by Nathan Belden. Additional information was provided by various consultants as identified in this Initial Study. Technical studies referred to in this document are available for review at the Permit and Resource Management Department.

Please contact Melinda Grosch, Planner III at Melinda.Grosch@sonoma-county.org or (707) 565-2397, for more information.

EXISTING FACILITY

The site is currently developed with an agricultural complex which was fairly typical of the early 20th Century. There are three dwellings, an old barn and some accessory structures. One of the dwellings has already been remodeled and upgraded. The remaining buildings have been maintained over the years and some modifications have occurred but they remain much as they have always been. The site is currently planted in 25 acres of wine grapes, pasture, fruit orchard and vegetable plot. There is an agricultural reservoir on site in the pasture area. A site plan overlaying an aerial photograph showing the existing structures and other features of the property is attached.

PROJECT DESCRIPTION

The project consists of a request for a Use Permit for a new phased agricultural processing facility with a maximum annual production of 10,000 cases of wine and 10,000 pounds of cheese, retail sales, wine and farmstead product tasting by appointment only, and 10 special events per year are included in the request. The site is a 55-acre parcel located easterly of the intersection of Pressley Road and Sonoma Mountain Road.

Phase I (Start time: 1 to 2 years after approval)

1. The existing 2,285 square foot barn will be renovated for the conversion of use to a small winery and creamery. An additional 475 square feet will be added for the creamery and 530 square feet will be added to the milking shed.
2. The existing 2,490 square foot residence will be reconstructed into a 4,270 square foot tasting/hospitality, commercial kitchen, and administrative space and serve as the owner's residence.
3. Demolish the 1,780 square foot garage and residence northerly of the residence to be reconstructed.

Phase II (Start time: 3 to 4 years after approval)

1. The new 8,300 square foot winery building will be constructed adjacent to the existing small barn and immediately downhill of the large barn (Phase I winery building).
2. Add 1,090 square feet to the existing barn.

Events

Two Wine Club Member's Events with total of 60 Attendees
Two Distributors Tasting & Dinner Events with a total of 60 Attendees
One Chef Tastings & Dinner Event with a total of 60 Attendees
One Wine Club Member's Pick-Up Event with a total of 100 Attendees
One Harvest Party with a total of 100 Attendees
One Wine & Farm Product Marketing Event with a total of 100 Attendees
One Wedding with a total of 200 Attendees
One Wine & Farm Product Marketing Event with a total of 200 Attendees

SETTING

The project is located in the hills to the south east of Santa Rosa at the base of Sonoma Mountain. This is a large lot, rural area with mixed pasture land and vineyards. The property to the east, a 226 +/- acre parcel, is owned by the Open Space District. The properties in the area are all designated Diverse Agriculture, Resources and Rural Development, Rural Residential, and Land Intensive Agriculture in the General Plan with densities ranging from 15 acres to 40 acres per dwelling unit. There is an ephemeral drainage on the easterly side of the property which drains into Matanzas Creek.

ISSUES RAISED BY THE PUBLIC OR AGENCIES

A referral packet was drafted and circulated to inform and solicit comments from selected relevant local, state and federal agencies; and to special interest groups that were anticipated to take interest in the project.

Conditions and suggested mitigation measures are included from responses to the referral packet.

OTHER RELATED PROJECTS

The Sonoma Mountain Zen Center has applied for a Use Permit to legalize some activities that have been ongoing for a number of years and to clarify other uses allowed by the previous Use Permit. The traffic from this project is already factored in to the existing traffic due to the fact that the uses have been ongoing for many years. No other impacts would be cumulative with those of the proposed Belden Barns project.

RESPONSIBLE AND TRUSTEE AGENCIES

Sonoma County Permit and Resource Management Department (PRMD) - Grading and building permits.

Bay Area Air Quality Management District (BAAQMD) – permits for asbestos removal during demolition and remodel.

Environmental Health – food facility permits.

North Coast Regional Water Agency – grading, septic systems, drainage.

Sonoma County Agricultural Commissioner – Any conversion of pasture to vineyard, orchard, or other crops.

Initial Study Checklist

This checklist is taken from Appendix G of the State CEQA Guidelines. For each item, one of four responses is given:

> **No Impact: The project would not have the impact described.** The project may have a beneficial effect, but there is no potential for the project to create or add increment to the impact described.
>
> **Less Than Significant Impact**: The project would have the impact described, but the impact would not be significant. Mitigation is not required, although the project applicant may choose to modify the project to avoid the impacts.
>
> **Potentially Significant Unless Mitigated:** The project would have the impact described, and the impact could be significant. One or more mitigation measures have been identified that will reduce the impact to a less than significant level.
>
> **Potentially Significant Impact:** The project would have the impact described, and the impact could be significant. The impact cannot be reduced to less than significant by incorporating mitigation measures. An environmental impact report must be prepared for this project.

Each question on the checklist was answered by evaluating the project as proposed, that is, without considering the effect of any added mitigation measures. The checklist includes a discussion of the impacts and mitigation measures that have been identified. Sources used in this Initial Study are at the end of the document.

The Project Applicant, Nathan Belden, has agreed to accept all mitigation measures listed in this checklist as conditions of approval of the proposed project and to obtain all necessary permits.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or "Less than Significant with Mitigation" as indicated by the checklist on the following pages.

X Aesthetics	X Agricultural & Forest Resources	___ Air Quality
X Biological Resources	X Cultural Resources	X Geology/Soils
X Greenhouse Gas Emission	___ Hazards & Hazardous Materials	___ Hydrology/Water Quality
___ Land Use and Planning	___ Mineral Resources	X Noise
___ Population/Housing	___ Public Services	___ Recreation
X Transportation/Traffic	___ Utilities/Service Systems	
___ Mandatory Findings of Significance		

Incorporated Source Documents

In preparation of the Initial Study checklist, the following documents were referenced/developed, and are hereby incorporated as part of the Initial Study. All documents are available in the project file or for reference at the Permit and Resource Management Department.

X Project Application and Description
X Initial Data Sheet
X County Planning Department's Sources and Criteria Manual
X Sonoma County General Plan and Associated EIR
X Specific or Area Plan Bennett Valley Area Plan
X Sonoma County Zoning Ordinance

___ Sonoma County Rare Plant Site Identification Study
_X_ Project Referrals from Responsible Agencies
_X_ State and Local Environmental Quality Acts (CEQA)
___ Full record of previous hearings on project in File
___ Correspondence received on project.
_X_ Other technical reports:

Biological Assessment, Belden Barns – Winery and Farmstead, 5560 Sonoma Mountain Road, CA 95404, APN 049-030-010. By Kjeldsen Biological Consulting. May 24, 2012

An Archaeological Survey for the Belden Barns Project, at 5561 Sonoma Mountain Road, Sonoma County, California. By Virginia Hagensieker BA and Janine M. Loyd, MA/RPA. Om Origer & Associates. March 6, 2012.

Historical Evaluation of the Belden Barns Complex, 5561 Sonoma Mountain Road, Santa, Sonoma County, California. Vicki R. Beard, M.A. Tom Origer & Associates. March 6, 2012

Focused Traffic Study for the Belden Barns Winery Project. Sam Lam Transportation Engineer and Darlene J. Whitlock, PE, PTOE. W-Trans. August 19, 2013

Preliminary Geologic Evaluation, Belden Barns Winery and Farmstead, Santa Rosa, California. Brian F. Piazza, Staff Geologist and Jeffrey K. Reese, Civil Engineer. Reese & Associates. May 2013.

Geology & Ground Water Potential, Belden Property, 5560 Sonoma Mountain Road, Santa Rosa, California. E.H. Boudreau, Registered Geologist #3000. August 2013.

1. AESTHETICS *Would the project:*

a) Have a substantial adverse effect on a scenic vista?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The project is in an area designated as visually sensitive by the Sonoma County General Plan. However, it would not affect a scenic vista. See 1.c. below.

Mitigation:
No mitigation measures are required.

b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The parcel is not located on a site visible from a state scenic highway. However, it is within the Bennett Valley Visual Corridor. See 1.c. below.

Mitigation:
No mitigation measures are required.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
The current development on the site is completely within the Bennett Valley Visual Corridor which covers most of the parcel with the exception of the southeasterly portion. These buildings are all old enough to potentially be designated as historic structures. The proposal includes remodel of some of the structures but two of the single family dwellings will be demolished and replaced with units inside the new winery building. The new winery building is planned at 8,300 sq. ft. with the building set into the slope somewhat. The design will take advantage of natural earth cooling and screening provided by the existing building, trees, and the earth. Staff initially had serious reservations about the location of the new structure and its size as the Bennett Valley Visual Corridor specifically prohibits new development in this area. The applicant provided a site plan and photo-simulations that the building will be minimally visible from Sonoma Mountain Road. The applicant has provided reasons that he feels the proposal is consistent with the exceptions allowed in the Bennett Valley Design Guidelines for the placement of structures in the Visual Corridor. The primary reason is the area outside the Visual Corridor designation is geologically unstable due to an old landslide.

The proposed buildings would be screened from view from public roads and parks by existing vegetation. Additionally the project went to the Design Review Committee for review. They recommended some changes to the style of the buildings, the driveways and parking areas, lighting, colors, and additional information to be called out on the site and floor plans. The Design Review Committee requested that the Bennett Valley Visual Corridor be called out on the site plan in addition to the other information shown.

The project is to be brought back to the Design Review Committee after the Board of Zoning Adjustments' action. They will be reviewing all aspects of the project's conformance with requirements that all development be well screened, that the proposed colors and materials are harmonious with the existing historic structures, and that appropriate native and agricultural plants are used for the landscaping.

Mitigation 1.c.i:
Prior to issuance of building permits the applicant shall submit the building and landscaping plans for final Design Review.

Mitigation Monitoring:
The Design Review Committee will ensure that the buildings are appropriately sited and screened from view from public roadways and adjoining properties in conformance with the Bennett Valley Design guidelines. Building and grading permits shall not be issued until they have been approved by the Design Review Committee.

Mitigation 1.c.ii.:
Additional trees and shrubs shall be planted along Sonoma Mountain Road to more completely screen the new winery building from the road. Additional orchard trees should be located on the north side of the new winery building, the existing dance hall, and along that area to the west to provide screening and breakup the northerly façade of the new winery and dwelling/tasting facility.
The roadside plantings shall be reviewed by the transportation consultant Whitlock & Weinberger to ensure that sight distances at the driveway are not impaired by the new vegetation.

Mitigation Monitoring:
Prior to building permit issuance the applicant shall provide the project planner with a detailed landscaping plan showing the location, type, irrigation lines, and sizes of all new landscaping and orchard plantings. These plans must be approved by the planner and the transportation consultant.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime view in the area?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
New structures will introduce new sources of light and glare. Lighting of the facility, especially lighting of the parking lot, security and safety lighting, may affect nighttime views.

Mitigation 1.d.:
Prior to issuance of the Building Permit, an exterior lighting plan shall be submitted to the Design Review Committee for review and approval. Exterior lighting is required to be fully shielded, and directed downward to prevent "wash out" onto adjacent properties. Generally fixtures should accept sodium vapor lamps and not be located at the periphery of the property. Flood lights are not allowed. The lighting shall be installed in accordance with the approved lighting plan during the construction phase.

Mitigation Monitoring:
The Permit and Resource Management Department shall not issue the Building Permit until an exterior night lighting plan has been submitted that is consistent with the approved plans and

County standards. The Permit and Resource Management Department shall not sign off final occupancy on the Building Permit until a site inspection of the property has been conducted that indicates all lighting improvements have been installed according to the approved plans and conditions. If light and glare complaints are received, the Permit and Resource Management Department shall conduct a site inspection and require the property be brought into compliance or initiate procedures to revoke the permit. (Ongoing)

2. AGRICULTURE AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?			X	

Comment:
According to the Sonoma County Important Farmlands Map, the project site is designated as Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. The proposed development is located in the area of the existing farm complex with only a small additional area needed for the winery building. This would not be considered a significant loss of land devoted to agricultural production. The primary use of the site would remain agricultural production. The project would not convert a significant amount of important farmland to non-agricultural use and therefore potential impacts are less than significant.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
b) Conflict with existing zoning for agricultural use, or Williamson Act Contract?			X	

Comment:
The project site is in LIA (Land Intensive Agriculture) B6-40ac density/40 acre minimum. SR (Scenic Resources) zoning district which allows agricultural processing and promotion with a Use Permit.

The site is included in a Prime Williamson Act contract entered into in 1974. There is the potential for conflicts with the Williamson Act. The maximum area of the property that can be devoted to buildings is 15% of the parcel with a maximum of 5 acres. The development will cover about 2.2 acres in the area that has always been the farm building complex. The applicant has prepared documentation of how they continue to maintain compliance with the Williamson Act.

The new Sonoma County Uniform Rules for Agricultural Preserves and Farmland Security Zones (adopted in 2011 and amended in 2013) include provisions for determining whether a use is compatible. The following rules are the most relevant:

Uniform Rule 11.1 requires that prior to issuance of any permit for development or use of contracted land (other than qualifying agricultural or open space uses), PRMD must determine that the proposed development or use complies with the contract and the uniform rules.

Uniform Rule 8.0 - Compatible and Incompatible Uses, requires contracted land to be devoted to agricultural or open space uses. However, the County recognizes that it may be appropriate to allow other uses of contracted land that are compatible with the agricultural or open space uses on the land and the following two categories apply to this project:

8.3 Compatible Uses - Agricultural Contracted Land: Category B.2.Agricultural Support Services: Sale and marketing of agricultural commodities in their natural state or beyond, including winery tasting rooms, promotional activities, marketing accommodations, farmer's markets, stands for the sampling and sale of agricultural products, livestock auction or sale yards, and related signage.

8.3 Compatible Uses - Agricultural Contracted Land: Category G.1. Miscellaneous: Special events, when directly related to agricultural education or the promotion or sale of agricultural commodities and products produced on the contracted land, provided that:

a. *The events last no longer than two consecutive days and do not provide overnight accommodations; and*
b. *No permanent structure dedicated to the events is constructed or maintained on the contracted land.*

The applicant has provided a Williamson Act Compliance statement showing that the property remains in compliance with the contract. Additional agricultural uses will be undertaken with the proposed project, including the addition of cattle or goats for milk for the cheese operation. The winery and cheese production are clearly compatible uses under Category B.2. and the promotional events and uses proposed fall under Category G.1.

The County has found that special events are a compatible use for agricultural land under Williamson Act Contracts because they are a marketing tool to insure the long term viability of wine sales or other agricultural products produced on site. Events which feature agricultural products grown or produced on site are usually similar to those produced or grown elsewhere in the County thus events at one site tend to promote the long-term viability of agriculture within the county. In these cases, special events require a Use Permit and are limited by conditions to prevent conflicts with agricultural operations. Because the events are limited by conditions, the temporary increase in population does not hinder the operations and is considered supportive of agriculture.

Special events generally would not compromise agricultural capability because they are marketing tools to help sell wine, cheese, or other agricultural products produced on site which provides for the long term viability of the farm or ranch. The proposed special events would not affect agricultural capability or other surrounding contracted lands except in positive ways because special events help promote local agricultural products which enables the purchase of grapes, milk, vegetables, etc. from other growers, further promoting the local agricultural industry.

Mitigation:
No mitigation measures are required.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 4526) or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The site is not within an area defined as forest land or timberland. With the exception of one small scrub oak, no trees will be removed as a part of this project.

Mitigation:
No mitigation measures are required.

d) Result in the loss of forest land or conversion of forest land to non-forest use?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The site is not within an area defined as forest land or timberland. The project is located in an area that has been used for agricultural cultivation for many years.

Mitigation:
No mitigation measures are required.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland, to non-agricultural use or conversion of forest land to non-forest use?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The project does not involve other changes in the environment that could result in conversion of farmland to non-agricultural use or forest land to non-forest use.

Mitigation:
No mitigation measures are required.

3. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.

Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The project is within the jurisdiction of the Bay Area Air Quality Management District. The District does not meet the Federal or State standards for ozone, and has adopted an ozone Attainment Plan and a Clean Air Plan in compliance with Federal and State Clean Air Acts. These plans include measures to achieve compliance with both ozone standards. The plans deal primarily with emissions of ozone precursors (nitrogen oxides and volatile organic compounds). The project will not conflict with the District's air quality plan because the proposed use will not emit significant quantities of ozone precursors or involve construction of transportation facilities that are not addressed in the adopted transportation plan.

Mitigation:
No mitigation measures are required.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
			X	

Comment:
State and federal standards have been established for criteria pollutants and ozone precursors, carbon monoxide, sulfur dioxide and particulates (PM_{10} and $PM_{2.5}$). The pollutants NOx (nitrogen oxides) and hydrocarbons form ozone in the atmosphere in the presence of sunlight. Significance thresholds for ozone precursors, carbon monoxide and particulates have been established by Bay Area Air Quality Management District (BAAQMD). The principal source of ozone precursors is vehicle emissions, although stationary internal combustion engines must also be considered. BAAQMD generally does not recommend detailed NOx and hydrocarbon air quality analysis for projects generating less than 2,000 vehicle trips per day. Given the low traffic generation of the project relative to the screening criteria, ozone precursor emissions would be less than significant.

Detailed air quality analysis for carbon monoxide is generally not recommended unless a project would generate 10,000 or more vehicle trips a day, or contribute more than 100 vehicles per hour to intersections operating at LOS D, E or F with project traffic. Given the low traffic generation of the project relative to the screening criteria, carbon monoxide emissions would be less than significant.

Wood smoke from fireplaces and wood stoves are sources of pollutants receiving increasing scrutiny and generating numerous complaints to the BAAQMD. Although constituting a very small percentage of the total PM_{10} emissions on an annual basis, wood smoke is a major contributor to reduced visibility and reduced air quality on winter evenings in both urban and rural areas. Sonoma County building regulations restrict fireplaces to natural gas fireplaces, pellet stoves and EPA-Certified wood burning fireplaces or stoves. With the restriction on fireplace design, this would be a less than significant impact.

Mitigation:
No mitigation measures are required.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
The Bay Area is a non-attainment area for ozone, PM_{10} (Respirable Particulate Matter and $PM_{2.5}$ (Fine Particulate Matter). The project will not have a cumulative effect on ozone because it will not generate traffic which would result in new emissions of ozone precursors (hydrocarbons and NOx). The project will have no long-term effect on PM_{10}, because all surfaces will be paved or landscaped, and dust generation will be insignificant. However, there could be a significant short-term emission of dust (which would include PM_{10} and $PM_{2.5}$) during construction. These emissions could be significant at the project level, and would also contribute to a cumulative impact.

The impact could be reduced to less than significant by including dust control measures as described in the following mitigation measure:

Mitigation Measure 3.c. :
The following dust control measures will be included in the project:
A. Water or dust palliative shall be sprayed on unpaved construction and staging areas during construction as directed by the County.
B. Trucks hauling soil, sand and other loose materials over public roads will cover the loads, or will keep the loads at least two feet below the level of the sides of the container, or will wet the load sufficiently to prevent dust emissions.
C. Paved roads will be swept as needed to remove soil that has been carried onto them from the project site.
D. Water or other dust palliative will be applied to stockpiles of soil as needed to control dust.

Mitigation Monitoring:
Building/grading permits for ground disturbing activities shall not be approved for issuance by Project Review staff until the above notes are printed on the building, grading and improvement plans. The applicant shall be responsible for notifying construction contractors about the requirement for dust control measures to be implemented during construction. If dust complaints are received, PRMD staff shall conduct an on-site investigation. If it is determined by PRMD staff that complaints are warranted, the permit holder shall implement additional dust control measures as determined by PRMD or PRMD may issue a stop work order.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
d) Expose sensitive receptors to substantial pollutant concentrations?			X	

Comment:
Sensitive receptors are facilities or locations where people may be particularly sensitive to air pollutants such as children, the elderly, or people with illnesses. These uses include schools, playgrounds, hospitals, convalescent facilities, and residential areas. There are no nearby sensitive receptors.

Mitigation:
There are no sensitive receptors in close to the project. See 3.c. above.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
e) Create objectionable odors affecting a substantial number of people?		X		

Comment:

Wineries do not generate odors with the possible exception of pomace which can produce very objectionable odors if not handled properly. The following mitigation measure has successfully reduced this impact to less than significant at the many wineries in Sonoma County where it has been applied.

The cheese processing facility may also result in waste products that have potentially strong odors. These products are often composted, fed to livestock (particularly hogs), or sold to companies that make use of it as feed or composting material.

It is assumed that the vegetable garden will employ some form of composting as a way to dispose of waste plant materials. Again the composting can generate odors if not handled properly. Given the size of the property and the distance to adjoining dwellings it is unlikely that odors will be a problem at the small level of composting that would result from this aspect of the project.

Mitigation 3.e.:
Disposal of pomace and other waste products from processing of agricultural materials, shall be disposed of in a manner that does not create a discharge to surface water, or create nuisance odor conditions, or attract nuisance insects or animals, according to the following priority:

a. Agricultural waste products (pomace, cheese waste, etc.) shall be composted and land applied, or land applied and disced into the soil on vineyards or agricultural land owned or controlled by the applicant.

b. Agricultural waste products (pomace, cheese waste, etc.) shall be sold, traded or donated to willing soil amendment or composting companies that prepare organic material for use in land application.

c. Agricultural waste products (pomace, cheese waste, etc.) shall be transported to the County's composting facility at the Central Disposal Site (or any future location) in a fashion that allows the waste to be used by the County's composting program.

Agricultural waste products (pomace, cheese waste, etc.) shall not be disposed of into the County solid waste landfill by direct burial, except where all possibilities to dispose according to priorities a) through c) above have been exhausted. In all cases, care shall be taken to prevent contamination by petroleum products, heavy metals, pesticides or any other material that renders the material unsuitable for composting with subsequent land application. Land application, placement of waste into a composting facility or disposal shall occur within two weeks of the end of processing.

Mitigation Monitoring:
If PRMD receives complaints regarding objectionable odors, PRMD staff would investigate the complaint and if the condition is violated the Use Permit may be subject to modification.

4. BIOLOGICAL RESOURCES *Would the project:*

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		

Comment:
The California Natural Diversity Database does not list any species of concern for this site. No tree removals will be involved in the construction of this site with the exception of one small live oak. A row of non-native cypress lines the driveway near the location of the proposed structures that may provide nesting habitat for birds. The property owner has installed raptor boxes in the vineyard but these are a fairly long distance from the proposed construction.

It is possible that the existing barn that is to be converted to the creamery is used by owls or bats. Since the barn has been in continuous use in conjunction with the agricultural uses of the land it is assumed that any owls or bats using the space are tolerant of some human activity. However, construction will likely result in disturbance to the physical space and thus displacement of any species in the area.

A study, *Biological Assessment, Belden Barns – Winery and Farmstead, 5560 Sonoma Mountain Road, Santa Rosa, CA 95404, APN 049-030-010*, for possible biological resources was prepared in May 2013 by Kjeldsen Biological Consulting. The study looked for both plants and animals in the area where the new buildings, renovations, and driveways will be; a relatively small portion of the property.

The study concludes that the "project footprint is within a developed landscape or routinely disturbed agricultural lands, and as such will not significantly contribute to habitat loss or habitat fragmentation." Therefore, it is not anticipated that the proposed project will impact any special status plant or animal species. No special status species were observed during the study and no raptor nests were discovered in the trees nearest the proposed project site.

The study does note that the drainage along the easterly property boundary is a sensitive habitat and will require protection during construction of the project. The report recommends a 30-foot buffer and protective fencing along the drip line of the riparian canopy. County policy requires a 50-foot setback to the centerline of the "blue-line" streams identified by the US Geological Survey this drainage is not shown as a blue-line stream.

Mitigation 4.a.i.:
Prior to reconstruction of the barn, the applicant shall hire a qualified bat and bird specialist to conduct a pre-demolition survey during the time when bats or barn owls would be expected to be present and active (i.e., early April) to determine the presence of roosting bats or nesting owls. If no evidence exists that either bats are roosting or owls are nesting in the barn, then no further mitigation is required.

Mitigation Monitoring:
Prior to issuance of demolition/reconstruction permits for the barn a copy of the study shall be provided to the project planner.

Mitigation 4.a.ii.:
If roosting bats or nesting owls are determined to be present, the applicant shall provide for a replacement roosting facility, in the form of either a bat house or several bat boxes, immediately adjacent to the barn, to the extent feasible. Based on recommendation from a bat and bird specialist, appropriate exclusion devices shall be installed at to prevent roosting bats and nesting owls from being in the facility when demolition and reconstruction occurs. The replacement roosting facility shall be monitored weekly during the first month after installation and then once every three months until activities are completed to document bat utilization.

Mitigation Monitoring:
Prior to issuance of permits for demolition/reconstruction for the barn the applicant's consultant shall provide documentation that the replacement roosting facilities have been installed along with the exclusion devices to prevent bats and owls from reoccupying the barn. Monitoring

reports shall be submitted to the project review planner as they are prepared.

Mitigation 4.a.iii.:
A riparian (streamside conservation area) line shall be established 30-feet from the top of the bank of drainage on the easterly side of the construction area. "NOTE ON SITE PLAN": Structures, roads, utility lines, parking lots, lawns, agricultural uses (planting, grazing, etc.), grading, fill, and excavation shall be prohibited in this conservation area unless a waiver is granted per Section 26-66-030 (b) of the zoning ordinance.

Mitigation Monitoring:
The setback line shall be shown on the map and prohibits activities within the creek setback, unless the applicant obtains a zoning permit for waiver from the Permit and Resource Management Department.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		

Comment:
An un-named drainage runs along the eastern property boundary in the area where a new driveway and the new winery building will be located. Grading and land disturbance shall be setback a minimum of 30-feet from the top of stream bank.

Mitigation Measure 4.b.:
See 4.a. above.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X

Comment:
There is a man made pond on the property but it is well removed from the area where the buildings are and where new construction will be located. It is also separated hydrologically from the drainage on the easterly side of the property.

Mitigation Measure:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				X

Comment:
The biological assessment stated that there is no evidence that the addition of the winery building to the existing farm complex will interfere with wildlife movement. The site is not a migratory wildlife corridor.

Mitigation:
No mitigation measures are required.

e) Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
			X	

Comment:
The County has a tree protection ordinance which protects a variety of native trees. The proposed project does not include significant tree removal. A single, small coast live oak will be removed and no trees will be disturbed as a resulted of this project.

Mitigation:
No mitigation measures are required.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat Conservation Plan?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
Habitat Conservation Plans and Natural Community Conservation Plans are site-specific plans to address effects on sensitive species of plants and animals. The project site is not located in an area subject to a habitat conservation plan or natural community conservation plan. There are very few HCPs in Sonoma County-they would only affect certain land in timber production areas in the northwest county (for spotted owl) and in the lower Petaluma River/Sonoma Creek watershed (for saltmarsh harvest mouse/black rail/clapper rail).

Mitigation:
No mitigation measures required.

5. CULTURAL RESOURCES *Would the project*:

a). Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
			X	

Comment:
According to the *Historical Evaluation of the Belden Barns Complex, 5561 Sonoma Mountain road, Santa Rosa, Sonoma County, California,* prepared by Vicki R. Beard M.A. of Tom Origer & Associates in March 2012 the farm complex was started in the mid 1800's by Alexander Sutherland. Despite the age of the farm the evaluation determined that most of the buildings have been heavily modified over the years and do not have any architectural features that have a significant historical context. Additionally, neither the farm nor the Sutherland family are associated with a significant part of Sonoma County's history. The study thus concludes that the farm complex does not qualify as an historically significant resource.

Mitigation:
No mitigation measures are required.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
An archaeological study of the property was requested by the North West Information Center at Sonoma State University. Virginia Hagensieker BA and Janine M. Loyd, MA/RPA of Tom Origer & Associates conducted a study in February 2012 and prepared a report, *An Archaeological Survey for the Belden Barns Project, at 5561 Sonoma Mountain Road, Sonoma County, California* detailing their findings.

There are no known archaeological resources on the site, but the project could uncover such materials during construction. The following measure will reduce the impact to less than significant.

Mitigation Measure 5.b.:
All building and/or grading permits shall have the following note printed on plan sheets:

"In the event that archaeological resources such as pottery, arrowheads, midden or culturally modified soil deposits are discovered at any time during grading, scraping or excavation within the property, all work shall be halted in the vicinity of the find and County PRMD Project Review staff shall be notified and a qualified archaeologist shall be contacted immediately to make an evaluation of the find and report to PRMD. PRMD staff may consult and/or notify the appropriate tribal representative from tribes known to PRMD to have interests in the area. Artifacts associated with prehistoric sites include humanly modified stone, shell, bone or other cultural materials such as charcoal, ash and burned rock indicative of food procurement or processing activities. Prehistoric domestic resources include hearths, firepits, or house floor depressions whereas typical mortuary resources are represented by human skeletal remains. Historic artifacts potentially include all by products of human land use greater than 50 years of age including trash pits older than fifty years of age. When contacted, a member of PRMD Project Review staff and the archaeologist shall visit the site to determine the extent of the resources and to develop and coordinate proper protection/mitigation measures required for the discovery. PRMD may refer the mitigation/protection plan to designated tribal representatives for review and comment. No work shall commence until a protection/mitigation plan is reviewed and approved by PRMD Project Review staff. Mitigations may include avoidance, removal, preservation and/or recordation in accordance with California law. Archeological evaluation and mitigation shall be at the applicant's sole expense.

If human remains are encountered, all work must stop in the immediate vicinity of the discovered remains and PRMD staff, County Coroner and a qualified archaeologist must be notified immediately so that an evaluation can be performed. If the remains are deemed to be Native American, the Native American Heritage Commission must be contacted by the Coroner so that a "Most Likely Descendant" can be designated and the appropriate provisions of the California Government Code and California Public Resources Code will be followed."

Mitigation Monitoring:
Building/grading permits shall not be approved for issuance by Project Review staff until the above notes are printed on the building, grading and improvement plans.

c) Directly or indirectly destroy a unique paleontological resource or site or unique	Potentially Significant Impact	Less than Significant with	Less than Significant Impact	No impact

geologic feature?		Mitigation Incorporation		
				X

Comment:
There are no unique geological features on the property. There will be limited excavation that will not reach a level that would contain paleontological resources. The geology of the site and the nature of the project make it extremely unlikely that paleontological resources would be destroyed.

Mitigation:
No mitigation measures are required.

d) Disturb any human remains, including those interred outside of formal cemeteries?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
No burial sites are known in the vicinity of the project, and most of the project site has already been disturbed by past construction. In the event that human remains are unearthed during construction, state law requires that the County Coroner be notified to investigate the nature and circumstances of the discovery. At the time of discovery, work in the immediate vicinity would cease until the Coroner permitted work to proceed. If the remains were determined to be prehistoric, the find would be treated as an archaeological site and the mitigation measure described in item 5(b) above would apply. (1, 6)

Mitigation:
See 5.b. above.

6. GEOLOGY AND SOILS: *Would the project*:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X

Comment:
The project site is not within a fault hazard zone as defined by the Alquist-Priolo fault maps. (11) However, a landslide area was identified on the property during previous attempts to develop the parcel. An evaluation of the landslide and the general geological suitability of the site for the development was prepared. The findings of the latest geological evaluation are presented in the report titled, *Preliminary Geologic Evaluation, Belden BarnsWinery and Farmstead, Santa Rosa, California* which was prepared by Brian F. Piazza, Staff Geologist and Jeffrey K. Reese, Civil

Engineer of Reese & Associates in May 2013. The nearest fault is the Rogers Creek Fault which is 1.9 miles southwest of the site. Typical earthquakes are 7.0 magnitude and are expected to cause ground shaking from "very strong" to "violent." The report concludes that buildings built to meet the building code will withstand an earthquake centered on this fault. All new or remodeled buildings in Sonoma County are required to meet the building code.

Mitigation:
No mitigation measures are required.

ii. Strong seismic ground shaking?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
All of Sonoma County is subject to seismic shaking that would result from earthquakes along the San Andreas, Healdsburg-Rodgers Creek, and other faults. Predicting seismic events is not possible, nor is providing mitigation that can entirely reduce the potential for injury and damage that can occur during a seismic event. However, using accepted geotechnical evaluation techniques and appropriate engineering practices, potential injury and damage can be diminished, thereby exposing fewer people and less property to the effects of a major damaging earthquake. The design and construction of future dwellings on new parcels are subject to load and strength standards of the California Building Code (CBC), which take seismic shaking into account. The Reese & Associates report states: "A detailed geotechnical investigation should be performed at the site to further evaluate the site conditions and to provide design level criteria for proposed improvements including site grading, foundation and retaining wall design, roadway pavement support, and geotechnical engineering drainage."

Project conditions of approval require that building permits be obtained for all construction and that the project meet all standard seismic and soil test/compaction requirements. The project would therefore not expose people to substantial risk of injury from seismic shaking. The following mitigation measures will ensure that potential impacts are reduced to less than significant levels.

Mitigation 6.a.ii. 1:
All earthwork, grading, trenching, backfilling and compaction operations shall be conducted in accordance with the erosion control provisions of the Drainage and Storm Water Management Ordinance (Chapter 11, Sonoma County Code and Building Ordinance (Chapter 7, Sonoma County Code).

All construction activities shall meet the California Building Code regulations for seismic safety (i.e., reinforcing perimeter and/or load bearing walls, bracing parapets, etc.). Construction plans shall be subject to review and approval of PRMD prior to the issuance of a building permit. All work shall be subject to inspection by PRMD and must conform to all applicable code requirements and approved improvement plans prior to the issuance of a certificate of occupancy.

Mitigation Monitoring:
Building/grading permits for ground disturbing activities shall not be approved for issuance by Project Review staff until the above notes are printed on applicable building, grading and improvement plans. The applicant shall be responsible for notifying construction contractors about code requirements.

Mitigation 6.a.ii. 2:
The design of all earthwork, cuts and fills, drainage, pavements, utilities, foundations and structural components shall conform with the specifications and criteria contained in the geotechnical report when approved by PRMD. The geotechnical engineer shall certify the design as conforming to the specifications. The geotechnical engineer shall also inspect the construction work and shall certify to PRMD, prior to the acceptance of the improvements or issuance of a certificate of occupancy that the improvements have been constructed in accordance with the geotechnical specifications.

Mitigation Monitoring:
PRMD Plan Check staff will ensure plans are in compliance with geotechnical requirements. PRMD inspectors will ensure construction is in compliance with geotechnical requirements.

iii. Seismic-related ground failure, including liquefaction?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
The project site is not located within an area subject to liquefaction as shown on the Sonoma County Relative Hazard from Seismic Shaking map. All structures will be required to meet building permit requirements, including seismic safety standards and soil test/compaction requirements. Based on standard permitting requirements, the project will have no significant risk of loss, injury or death from seismic ground failure or liquefaction. Also see mitigation measures included in 6.a.ii above.

Mitigation:
See mitigation measures in 6.a.ii. above.

iv. Landslides?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact

Comment:
The geotechnical report confirmed that there are two landslides on the property. The slides were identified as being 340 feet upslope of the area where development will occur. The report concludes "that these slides are a sufficient distance away from the proposed improvements such that no mitigation measures are warranted."

Mitigation:
No mitigation measures are required.

b) Result in substantial soil erosion or the loss of topsoil?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact

Comment:
See Section 9.c. below.

Mitigation Measure 6.b.:

See mitigation measures in 9.c. below.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		X		

Comment:
The Preliminary Geotechnical Evaluation of May 2013 states that they "encountered about 2-feet of weak porous soils underlain by about 3 1/2-feet of highly expansive clays." The report offers three possible methods of resolving the issue of unstable soils. These are: 1) Removal of the weak soils and replacement with non-expansive fill, 2) Use of drilled piers and grade beams, and 3) post-tensioned or mat slab foundations. All of these are standard building methods used in Sonoma County for areas with unstable soils. Additionally, the Evaluation proposes a detailed geotechnical evaluation prior to design to address these issues. See 6.a.ii. above.

Mitigation:
See 6.a.ii. above.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?		X		

Comment:
Table 18-1-B of the Uniform Building Code is an index of the relative expansive characteristics of soil as determined through laboratory testing. The preliminary Geological Evaluation of May 2013 did find expansive soils on the site and provided recommendations for dealing with them. No substantial risks to life or property would be created from soil expansion at the proposed project, even if it were to be affected by expansive soils.

Mitigation:
See 6.a.ii. and 6.c. above.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X

Comment:
The project site is not in an area served by public sewer. Preliminary documentation provided by the applicant and reviewed by the PRMD Project Review Health Specialist indicates that the soils on site would support a septic system and the required expansion area.

Mitigation:
No mitigation measures are required.

7. GREENHOUSE GAS EMISSIONS *Would the project:*

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
Greenhouse Gas Emissions (GHG) – Greenhouse gases trap heat in the atmosphere. Increases in greenhouse gases due to human activity are associated with Global Climate Change (aka "Global Warming"), that is, the change in the average weather on earth, as measured by wind patterns, storms, precipitation and temperature. The primary greenhouse gases are CO2, methane (CH4), nitrous oxide (N20), sulfur hexafluoride (SF6), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and water vapor (H20). Considered the most important greenhouse gas, CO2 is the reference gas for climate change and emissions of greenhouse gases in general are often reported as CO2 equivalents (CO2e).

The California Air Resources Board ("CARB") is required by the Global Warming Solutions Act of 2006 to design and implement emissions limits, regulations, and other statewide measures to reduce statewide greenhouse gas emissions to 1990 levels by 2020. The Act does not indicate what role local land use planning should play in the statewide strategy or how environmental review under CEQA is implicated. In October, 2007, CARB published the Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration. None of the early action measures address how local agencies should address greenhouse gas emissions associated with land use applications.

By July 1, 2009 the State Office of Planning and Research is required to provide thresholds of significance for GHGs and transmit them to the Resources Agency for adoption no later than January 1, 2010. As indicated by the Governor's letter to the Senate on signing the Act, the development of CEQA significance thresholds should be guided by the appropriate responsible agencies to achieve a standardized approach consistent with the state law. This is critical given the complexity of global climate change and the State's role in directing Californians' response to this environmental issue. Therefore it is speculative at this time to generate a local threshold of significance before such levels are determined on a statewide basis.

Regarding local efforts on GHG reductions, the Sonoma County Board of Supervisors recently adopted the Sonoma County Climate Protection Campaign which sets a target to reduce GHG emissions to 25% below 1990 levels by the year 2015. The County has completed the first two of five steps in the campaign. The next step is to complete the Community Climate Action Plan (the blueprint to help Sonoma County achieve this emissions target) and then implement the actions in the Plan and develop an on-going monitoring process to ensure that the County meets its reduction target.

For purposes of the Mitigated Negative Declaration, the project would be considered to have a significant impact on greenhouse gases if it would conflict with the state goal of reducing greenhouse gas emissions in California to 1990 levels by 2020, as set forth by the California Global Warming Solutions Act of 2006. There is currently no indication that the project would conflict with the Act's timeline. In addition, the County's Climate Protection Campaign has yet to establish emissions targets to reduce GHG in Sonoma County. However, the Climate Protection Campaign has provided a list of projects that are effective and under local control that will reduce Greenhouse Gases if they are implemented. The Plan's solutions involve four major categories: 1. Improve efficiency in energy and water use; 2. Shift transportation from fossil fuel vehicles to transit, walking, bicycling, etc.; 3. Invest in local renewable energy sources; 4. Protect forests and farmlands, sequester carbon, and convert waste into energy. The inclusion of these types of activities in this project will ensure that there is not a cumulative contribution to Greenhouse Gas emissions as a result of this project.

On November 4, 2008 the Sonoma County Board of Supervisors adopted a resolution selecting the Build it Green (BIG) New Home Construction, Home Remodeling and Multifamily Green Building Guidelines for Residential Construction, and Leadership in Energy and Environmental Design (LEED®) Commercial Green Building System for Commercial Construction guidelines, along with their respective Green Points Checklists, set compliance thresholds, and directed staff to develop a green building ordinance based on these guidelines.

On November 2, 2010, the Board of Supervisors approved all state mandated model codes including the new California Green Building Standards Code (CalGreen). Sonoma County's existing green building ordinance and energy efficiency ordinance were modified to accommodate the new CalGreen code, and to replace the existing green point rated systems, Build-It-Green and LEED for both new residential and non-residential construction respectively. The ordinances became effective January 1, 2011. Compliance with this ordinance meets the aforementioned state regulations. The following mitigation measures reflect the provisions of this ordinance.

Mitigation 7.a.i.:
All new buildings shall be constructed in conformance with CalGreen at the Tier 1 level of compliance. These standards apply to both new residential and non-residential construction excepting remodels and additions, and result in buildings that are more energy efficient and reduce GHG emissions.

Mitigation Monitoring:
CalGreen + Tier 1 compliance became mandatory in Sonoma County when it was adopted and approved by the Board of Supervisors and California Energy Commission; the ordinance effective date was January 1, 2011. Building permits will not be approved without compliance with this ordinance.

Mitigation 7.a.ii.:
The applicant shall install solar panels on the new winery buildings or ground mounted to provide a part of the energy which will be required for the proposed uses.

Mitigation Monitoring:
The solar panels will be incorporated into the building plans and inspected by the Building Inspection section of the Permit and Resource Management Department. The Building Inspector will provide clearance that the applicant has carried out the installation of the solar panels to the project planner.

Mitigation 7.a.iii.:
The applicant shall prepare an idle time reduction plan to reduce the time that trucks making deliveries or picking up products or grapes spend with engines idling. For diesel engines idle times shall be no longer than 5 minutes.

Mitigation Monitoring:
The idle time reduction plan shall be submitted to the project planner who will verify that it meets the minimum standards established by State of California's Commercial Vehicle Idling Regulations.

Mitigation 7.a.iv.:
Prior to building permit issuance a Water Conservation Plan shall be submitted for all landscaping, subject to PRMD review and approval. The Water Conservation Plan shall comply with all provisions of the County Low Water Use Landscaping Ordinance and the State or County Model Efficiency Ordinance as applicable.

Mitigation Monitoring:
Verification, from a qualified irrigation specialist, that landscaping complies with the Model Water Efficiency Ordinance shall be provided prior to Building Permit issuance. The measures in the Plan shall be implemented and verified by PRMD staff prior to Certificate of Occupancy.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				X

Comment:
The project will not conflict with the goals and objectives of the Regional Climate Protection Authority.

Mitigation:
No mitigation measures are required.

8. HAZARDS AND HAZARDOUS MATERIALS *Would the project:*

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		X		

Comment:
Construction will require use of fuels and other hazardous materials. Improper storage or handling of these materials could result in spills. However, the proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (6)

The following mitigation measures will ensure that these potential impacts are reduced to less than significant.

Mitigation 8.a.:
During construction, hazardous materials shall be stored away from drainage or environmentally sensitive areas, on non-porous surfaces. Storage of flammable liquids shall be in accordance with Sonoma County Fire Code.

A concrete washout area, such as a temporary pit, shall be designated to clean concrete trucks and tools. At no time shall concrete waste be allowed to enter waterways, including creeks and storm drains.

Vehicle storage, fueling and maintenance areas shall be designated and maintained to prevent the discharge of pollutants to the environment. Spill cleanup materials shall be kept on site at all times during construction, and spills shall be cleaned up immediately. In the event of a spill of hazardous materials, the applicant will call 911 to report the spill and take appropriate action to contain and clean up the spill.

Portable toilets shall be located and maintained to prevent the discharge of pollutants to the environment.

Mitigation Monitoring:
Building/grading permits shall not be approved for issuance by Project Review staff until the above notes are printed on the building, grading and improvement plans. The applicant shall be responsible for notifying construction contractors about the requirement for responsible storage and spill cleanup of hazardous materials.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
During construction there could be spills of hazardous materials. See Item 8.a. above.

Mitigation:
See Item 8.a. above.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The project does not involve any hazardous materials and there are no existing or proposed schools within 0.25 miles of the project site. (1)

Mitigation:
No mitigation measures are required.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The project site was not identified on, or in the vicinity of, any parcels on lists compiled by the California Environmental Protection Agency, Regional Water Quality Control Board, California Department of Toxic Substances, and the California Integrated Waste management Board. (8)

Mitigation:
No mitigation measures are required.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The site is not within an airport land use plan as designated by Sonoma County.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
f) For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X

Comment:
There are no known private airstrips within the vicinity of the proposed project.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X

Comment:
The project would not impair implementation of, or physically interfere with the County's adopted emergency operations plan. There is no separate emergency evacuation plan for the County. In any case, the project would not change existing circulation patterns significantly, and would have no effect outside the area. See Item 16.e. for discussion of emergency access. (1)

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas of where residences are intermixed with wildlands?				X

Comment:
The project is located in an area of high fire danger but the specific location of the existing and proposed structures is in an open grassy area. Additionally, materials that the structures are constructed with will be low flammability and the buildings will have fire sprinkler systems installed as a part of the standard building permit process. On-site access and turn-arounds for fire equipment are also required. In addition the farm complex is surrounded by cultivated areas, either vineyards or vegetable gardens which provide a fire break around the buildings. Therefore, the project would not expose people to risk from wildland fires.

Mitigation:
No mitigation measures are required.

9. HYDROLOGY AND WATER QUALITY *Would the project:*

	Potentially Significant	Less than Significant	Less than Significant	No impact
a) Violate any water quality standards or				

waste discharge requirements?	Impact	with Mitigation Incorporation	Impact	
		X		

Comment:
An ephemeral drainage course runs along the easterly boundary of the property and eventually drains into the South Fork of Matanzas Creek.

If the cumulative land disturbance of the project is equal to or greater than one (1) acre, then the project is subject to National Pollutant Discharge Elimination System (NPDES) requirements and must obtain coverage under the State Water Resource Control Board's General Construction Permit (General Permit). Documentation of coverage under the General Permit must be submitted to the Grading & Storm Water Section of the Permit and Resource Management Department prior to issuance of any grading permit for the proposed project.

Mitigation 9.a:
This project is subject to the National Pollution Discharge Elimination System (NPDES) requirements, and coverage under the State General Construction Permit, as adopted by the State Water Resources Control Board (SWRCB). A copy of the Notice Of Intent (NOI) filed with the SWRCB, as well as the Waste Discharge Identification Number (WDID) issued by that agency must be submitted to the Grading and Storm Water Section of the Permit and Resource Management Department.

Mitigation Monitoring:
The Permit and Resource Management Department shall not issue the Building Permit until the NOI and the WDID have been received.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			X	

Comment:
The project site is not designated as an aquifer recharge area. The project includes a water supply well and creation of impervious surfaces. However, the project is in a Groundwater Availability Area 4 which means that groundwater is scarce. A hydrological evaluation in accordance with General Plan policy WR-2e was requested by the Project Review Health Specialist. The report, *Geology & Ground Water Potential, Belden Property, 5560 Sonoma Mountain Road, Santa Rosa California*, was prepared by E.H. Boudreau, Reg. Geologist, who looked at the wells and water usage on the subject property and adjoining properties. Mr. Boudreau's report examines the geology of the area, the drilling logs which indicate the elevations where water tables were discovered, soil structures at various depths, water quality and volumes, etc. for the wells. The report also estimates the annual recharge from rainfall for the catchment area for the groundwater table and proposed increase in water use from the project. Mr. Boudreau estimates that the aquifer may have as much as 645-acre feet of water with recharge of at least 14-acre feet per year from the Belden property alone. The estimated increase in use for the proposed project is 1.5-acre feet per year. Therefore, Mr. Boudreau determined that there would not be a net deficit in aquifer volume or a lowering of the local groundwater table level resulting from the project.

Mitigations:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?		X		

Comment:
The project includes grading, cuts and fills which may require the issuance of a grading permit. Unregulated grading during construction has the potential to increase soil erosion from a site which could have adverse downstream flooding and further erosional impacts, and which could adversely impact downstream water quality.

However, in regard to potential soil erosion, the County grading ordinance and adopted best management practices require grading applications and issued permits to depict and install adequate erosion prevention and sediment control best management practices. Required inspection by County inspectors insures that all work is constructed according to the approved plans. These ordinance requirements and adopted best management practices are specifically designed to maintain potential project water quantity impacts at a less than significant level during and post construction.

The proposed project has been designed and/or conditioned to prevent and/or minimize the discharge of pollutants or waste from the project site during construction. There are numerous storm water best management practices that can be utilized to accomplish this goal. These include measures such as silt fencing, straw wattles, and construction entrances to control soil discharges. Storm water best management practices also include primary and secondary containment for petroleum products, paints, lime, and other materials of concern.

The applicant has submitted a preliminary report and conceptual plan to specify the location, type, and approximate size of storm water best management practices necessary for the proposed project. The location of the storm water best management practices are site specific and predicated by the development. The type and approximate size of the selected storm water best management practices shall be in accordance with the adopted Sonoma County Best Management Practice Guide. The preliminary report and conceptual plan has been reviewed and approved by the Grading & Storm Water Section of the Permit and Resource Management Department, with conditions added as needed.

The listed storm water best management practices, pollutants, and materials of concern are examples and do not represent a comprehensive listing of all available storm water best management practices.

Mitigation 9.c.:
Prior to grading or building permit issuance, construction details for all storm water best management practices shall be submitted for review and approval by the Grading & Storm Water Section of the Permit and Resource Management Department. The construction plans shall be in substantial conformance with the conceptual plan reviewed at the planning permit stage.

Storm water best management practices must be installed per approved plans and specifications, and working properly prior to each rainy season (October 15 each year) and remain functional throughout the rainy season. The Permit and Resource Management Department will verify storm water best management practice installation and functionality, through inspections, throughout the life of the construction permit(s).

Storm water best management practices shall be designed and installed pursuant to adopted

Sonoma County Best Management Practice Guide.

Mitigation Monitoring:
Grading and Storm Water Section staff shall not sign-off building or grading plans for issuance until they are satisfied that the plans meet all storm water best management practices. Final occupancy shall not be issued until correct installation has been verified by Grading and Storm Water staff.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in an a manner which would result in flooding on- or off-site?		X		

Comment:
The proposed project has been designed and/or conditioned to prevent and/or minimize the discharge of pollutants and waste after the project is constructed (post-construction). There are numerous post-construction storm water best management practices that can be utilized to accomplish this goal. These range from project designs and/or Low Impact Development (LID) best management practices that minimize new impervious surfaces, disperse development over larger areas, and/or that create areas that allow storm water to be detained, infiltrated, or retained for later use. Other post-construction storm water best management practices include storm water treatment devices based on filtering, settling or removing pollutants.

LID is a site design strategy that seeks to mimic the pre-development site hydrology through infiltration, interception, reuse, and evapotranspiration. LID techniques include the use of small scale landscape-based best management practices such as vegetated natural filters and bioretention areas (e.g. vegetated swales and raingardens) to treat and infiltrate storm water runoff. LID also requires preservation and protection of environmentally sensitive site features such as riparian buffers, wetlands, steep slopes, valuable trees, flood plains, woodlands, native vegetation and permeable soils.

The proposed project shall address water quality through storm water treatment best management practices and shall also address water quantity through storm water flow control best management practices. Storm water treatment best management practices shall be designed to treat storm events and associated runoff to the 85 percentile storm event. Storm water flow control best management practices shall be designed to treat storm events and associated runoff to the channel forming discharge storm event which is commonly referred to at the two year 24 hour storm event. Storm water treatment best management practices and storm water flow control best management practices are subsets of post-construction storm water best management practices. However, there is overlap between the two subsets. Post-construction storm water best management practices should utilize LID techniques as the first priority.

The applicant has submitted a preliminary report and conceptual plan to specify the location, type and approximate size of post-construction storm water treatment and flow control best management practices necessary for the proposed project. The location of the storm water best management practices are site specific and predicated by the development. The type and approximate size of the selected storm water best management practices are in accordance with the adopted Sonoma County Best Management Practice Guide. The preliminary report and conceptual plan has been reviewed and approved by the Grading & Storm Water Section of the Permit and Resource Management Department, with conditions added as needed.

Proper operation and maintenance of post-construction storm water best management practices is needed to achieve the goal of preventing and/or minimizing the discharge of pollutants.

Development projects have been conditioned to require the proper maintenance and operation of post-construction storm water best management practices and to require annual reporting and certification to document proper maintenance and operation of post-construction storm water best management practices.

Mitigation 9.d.:
Prior to grading or building permit issuance, construction details for all post-construction storm water best management practices shall be submitted for review and approval by the Grading & Storm Water Section of the Permit and Resource Management Department. The construction plans shall be in substantial conformance with the conceptual plan reviewed at the planning permit stage.

Post-construction storm water best management practices shall be designed and installed pursuant to the adopted Sonoma County Best Management Practice Guide.

The owner/operator shall maintain the required post-construction best management practices for the life of the development. The owner/operator shall conduct annual inspections of the post-construction best management practices to ensure proper maintenance and functionality. The annual inspections shall typically be conducted between September 15 and October 15 of each year.

Mitigation Monitoring:
Post-construction storm water best management practices shall be installed per approved plans and specifications, and working properly prior to finaling the grading or building permits. The Permit and Resource Management Department will verify post-construction storm water best management practice installation and functionality, through inspections, prior to finaling the permit(s).

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?		X		

Comment:
The proposed project has been designed and/or conditioned to prevent and/or minimize drainage impacts through the proper design and installation of a storm water drainage system. Drainage impacts typically include storm water intrusion into structures, flooding of local roadways, soil erosion, standing water, and nuisance conditions for property owners and neighbors. Storm water drainage systems may take many forms such as site grading, swales, ditches, small or single run drain pipes, a piping system or network, or a combination of all these. Drainage systems should also integrate storm water treatment and flow control storm water best management practices discussed above.

The applicant has submitted a preliminary drainage report and conceptual plan to specify the location, type and approximate size of drainage improvements. The preliminary drainage report includes an analysis of the existing downstream drainage to determine if downstream or off-site drainage improvements are needed to properly handle anticipated runoff in compliance with the adopted Sonoma County Water Agency Flood Control Design Criteria, 1983 or most recently revised edition.

At the time of improvement plan submittal or grading or drainage permit application, the applicant shall submit a final drainage report for the proposed project. A typical drainage report will include a project narrative, on- and off-site hydrology maps, hydrologic calculations, hydraulic calculations, pre- and post-development analysis for all existing and proposed drainage facilities. The drainage report shall abide by and contain all applicable items in the Drainage Report

Required Contents (DRN-006) handout.

Mitigation 9.e.:
The construction plans shall include a storm water drainage system that adequately addresses the impacts and design features discussed above, in substantial conformance with the final drainage report. The design and sizing of the storm water drainage system shall be in compliance with the adopted Sonoma County Water Agency Flood Control Design Criteria, 1983 or most recently revised edition.

A final drainage report for the proposed project shall be prepared for this project. The drainage report shall include, at a minimum, a project narrative, on- & off-site hydrology maps, hydrologic calculations, hydraulic calculations, pre- & post-development analysis for all existing and proposed drainage facilities. The final drainage report shall abide by and contain all applicable items in the Drainage Report Required Contents (DRN-006) handout.

The construction plans and final drainage report shall be prepared by a civil engineer, registered in the State of California, be submitted with the grading and/or building permit application and/or improvement plans, as applicable, and be subject to review and approval by the Grading & Storm Water Section of the Permit and Resource Management Department prior to the issuance of any grading or building permits.

Mitigation Monitoring:
Grading and Storm Water Section staff shall not sign-off building or grading plans for issuance until they are satisfied that the final drainage improvements are in compliance with the final drainage report. Final occupancy shall not be issued until correct installation has been verified by Grading and Storm Water staff.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
f) Otherwise substantially degrade water quality?		X		

Comment:
The County has adopted setbacks from riparian corridors, creeks, wetlands, lakes, and ponds for grading, structures, vineyards, and other developments. The distances for these setbacks vary based on several factors including the type of riparian corridor, stream type, stream depth, soil type, natural slope of the site, and the type of wetland.

Setbacks are specified in County Code Chapters 11 and 26, in the Sonoma County General Plan, and in the Sonoma County Water Agency Flood Control Design Criteria. The setback with the largest distance or the most stringent setback applies to the project. Each project shall be analyzed to determine which setback is the controlling or most stringent setback.

If waterways, streams, wetlands, or lakes exist on-site or nearby, or are to be created by the project, the application shall include a depiction of the setback(s) in cross-section, similar to that found in the Permit and Resource Management Department's Form DRN-005. The setback cross-section(s) shall present the applicable setbacks for the proposed project and determine the most stringent setback. Typical setbacks include the following:

- Stream Setback for Structures (2 ½ times the stream bank height plus 30')
- Grading Setback for Creeks (50' or 25', site specific)
- Wetland Setback (100' or 50', site specific)
- Pond or Lake Setback (50')
- Floodway Prohibition (no new permanent structures allowed; zero

- net fill for grading)
- Riparian Corridor Setback (200', 100' or 50', site specific)

(Note: If existing riparian vegetation extends beyond the numerical setback distance, then the setback shall be established at the drip line of the existing riparian vegetation or offsite mitigation shall be required.)

Mitigation 9.f.:
The project shall be subject to Policy OSRC-8b (Riparian Corridor Setback) of the Sonoma County General Plan. (Note: If existing riparian vegetation extends beyond the numerical setback distance, then the setback shall be established at the drip line of the existing riparian vegetation or offsite mitigation shall be required.)

The project shall be subject to county code section 7-14.5 Stream setback for structures requiring a building permit.

Sec. 7-14.5. Stream setback for structures requiring a building permit.

All structures requiring a building permit or an agricultural exemption shall be set back from streams, as measured from the toe of the stream bank outward, a distance of two and one-half (2.5) times the height of the stream bank plus thirty (30) feet, or thirty (30) feet outward from the top of the stream bank, whichever distance is greater, unless a greater distance is established in the general plan, local coastal program, and/or zoning code. If the top of the stream bank cannot be determined by visual analysis, it shall be determined by hydraulic analysis as the water surface elevation for the one hundred-year event plus one and one-half (1.5) feet. Stream bank height is the change in elevation from the top of bank and the lowest toe of bank.

(a) Exceptions. An exception to the thirty (30) feet portion may be approved by the chief building official if one (1) or more of the following criteria apply:

(1) Constructability. The stream setback in makes the lot unbuildable for the primary use of the base planning district.

(2) Minor expansion. The proposed development involves a minor expansion of an existing structure. A minor expansion shall not exceed twenty-five (25) percent of the existing structure by area, and shall not expand in a direction toward, or closer to, any stream.

(3) Existing structures. The proposed development involves only the maintenance or restoration of an existing structure or a non-structural use.

(4) Stream bank restoration or stabilization. The proposed development involves the restoration or stabilization of a stream bank.

(b) Exception provisions. An exception may be approved by the chief building official if the following provisions are met:

(1) Minimize disturbance. The removal of the natural vegetation is minimized or compensated by planting of natural vegetation within the setback.

(2) Riparian function. The applicant demonstrates that the encroachment into the setback area will be accomplished with a minimum damage to the riparian functions and no reasonable alternative exists.

(3) Soils report. The applicant submits a soils report that is acceptable to the chief building official. The soils report shall address the soil stability relative to the foundation of the proposed development and relative to the potential destabilizing effect the stream may or may not have on the proposed development.

The project shall be subject to county code section 11.16.120 Setback for streams.

Sec. 11.16.120. Protection of watercourses.

Grading, drainage improvement, and vineyard and orchard site development within, adjacent to, or involving the alteration of watercourses shall comply with the provisions of article II (water clarity) of chapter 23 of this Code and the following requirements.

A. Flood carrying capacity. The flood carrying capacity of any altered or relocated portion of a watercourse shall be maintained.

B. Obstruction of watercourses. Watercourses shall not be obstructed unless alternate drainage improvements complying with section 11.16.040 are installed.

C. Fills within watercourses. Fills placed within watercourses shall have protection against soil loss.

D. Heavy equipment. Heavy equipment shall not cross or disturb channels of actively flowing streams without best management practices referenced or detailed in the permit authority's best management practices guide in place.

E. Materials storage. Excavated materials and soil amendment and fertilizing materials shall not be deposited or stored in or adjacent to a watercourse where they can be washed away by high water or storm runoff.

The development plans shall present the setbacks associated with each of the county code sections detailed above.

The development plans shall be subject to review and approval by the Grading & Storm Water Section, the Building Division and/or the Planning Division of the Permit and Resource Management Department prior to the issuance of any building or grading permits.

Mitigation Monitoring:
Grading and Storm Water Section Staff shall ensure that all plans provide evidence that the appropriate setback to the drainage along the eastern side of the property is maintained for all building and grading permits. The project planner shall ensure that all landscaping and other activities are setback from the drainage appropriately.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
g) Place housing within a 100-year hazard area as mapped on a federal Flood hazard Boundary of Flood Insurance Rate Map or other flood hazard delineation map?				X

Comment:
The project site is not located in a flood hazard area.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X

Comment:
The project site is not located in a flood hazard area.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X

Comment:
The project site is not located in an area subject to flooding as a result of dam failure.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
j) Inundation by seiche, tsunami, or mudflow?				X

Comment:
The project site is not located in an area subject to seiche or tsunami. A seiche is a wave in a lake triggered by an earthquake. A tsunami is a giant wave in the ocean triggered by an earthquake or volcano. Mudflow can be triggered by heavy rainfall, earthquakes or volcanic eruption. See discussion of landslide in 6.a.iv. above for areas with high potential for mudflow.

Mitigation:
No mitigation measures are required.

10. LAND USE AND PLANNING *Would the project*

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
a) Physically divide an established community?				X

Comment:
The project would not divide a community.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning				X

ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				

Comment:
The property has a General Plan designation of Land Intensive Agriculture 40-acre density. The Zoning designation is LIA (Land Intensive Agriculture) with a density of 40-acres per dwelling unit and a 40-acre minimum parcel size and a SR (Scenic Resources) combining district. The LIA district allows a range of agricultural processing and promotional activities governed by a number of General Plan policies.

Policy AR-4a:
The primary use of any parcel within the three agricultural land use categories shall be agricultural production and related processing, support services, and visitor serving uses. Residential uses in these areas shall recognize that the primary use of the land may create traffic and agricultural nuisance situations, such as flies, noise, odors, and spraying of chemicals.

The parcel has approximately 25 of the 55 acres planted in vineyard. Additional acreage will be devoted to grazing and approximately one acre is currently used for vegetables. The vegetable garden is planned for expansion and the addition of a small orchard. While the proposal includes events and retail activities the primary use of the property will continue to be agricultural production and processing.

GOAL AR-5:
Facilitate agricultural production by allowing agriculture-related support uses, such as processing, storage, bottling, canning and packaging, and agricultural support services, to be conveniently and accessibly located in agricultural production areas when related to the primary agricultural production in the area.

The project proposal states that they would process grapes grown on-site and in the area and milk from animals pastured on site or in the area consistent with the General Plan goal.

Objective AR-5.1:
Facilitate County agricultural production by allowing agricultural processing facilities and uses in all agricultural land use categories.

The site is designated Land Intensive Agriculture and the expansion of the processing facility is a use permitted with a Use Permit in the LIA zone.

Policy AR-5a:
Provide for facilities that process agricultural products in all three agricultural land use categories only where processing supports and is proportional to agricultural production on site or in the local area.

The site has an agricultural land use designation, Land Intensive Agriculture. The site is planted with grapes that are to be used at the winery. The site is located in an area with other vineyards. The winery will support the vineyards on site and in the area. The cheese processing facility will process milk from animals pastured on-site and from other areas of Sonoma County supporting the remaining dairies in Sonoma County.

Policy AR-5c:
Permit storage, bottling, canning, and packaging facilities for agricultural products either grown or processed on site provided that these facilities are sized to accommodate, but not exceed, the needs of the growing or processing operation. Establish additional standards in the Development Code that differentiate between storage facilities directly necessary for processing, and facilities to be utilized for the storage of finished product such as case storage of bottled wine. Such standards should require an applicant to demonstrate the need for such on-site storage.

The proposal includes a case goods storage area of 470 square feet in the 8,300 square foot winery building. Case goods are considered a finished product, and should be stored in warehouses on industrial land rather than utilizing prime agricultural lands. The Use Permit would allow for the processing of 60,000 cases per year. The storage area is about 5% of the total floor area. This is less than the maximum of 15% that has been allowed in some cases. The 5% is typical for wineries that include "direct to consumer" sales.

Policy AR-5f:
Use the following guidelines for approving zoning or permits for agricultural support services:
(1) The use will not require the extension of sewer or water,
(2) The use does not substantially detract from agricultural production on-site or in the area,
(3) The use does not create a concentration of commercial uses in the immediate area, and
(4) The use is compatible with and does not adversely impact surrounding residential neighborhoods.

Policy AR-6a:
Permit visitor serving uses in agricultural categories that promote agricultural production in the County, such as tasting rooms, sales and promotion of products grown or processed in the County, educational activities and tours, incidental sales of items related to local area agricultural products, and promotional events that support and are secondary and incidental to local agricultural production."

The tasting room and events would promote wine and cheese made on-site. Items sold in the tasting room include other products grown on-site such as fruits and vegetables and eggs. The project has been conditioned with a requirement that this policy must be met. The LIA (Land Intensive Agriculture) zoning district allows for tasting rooms, subject to the minimum criteria of General Plan Policies AR-6d and AR-6g and approval of a Use Permit.

The events establish name brand recognition for the winery. In the Sonoma County Zoning Ordinance the LIA district allows for promotion of agricultural products grown or processed in the county.

Policy AR-6d:
Follow these guidelines for approval of visitor serving uses in agricultural areas:

(1) The use promotes and markets only agricultural products grown or processed in the local area.

The existing and proposed tasting facilities are primarily used to promote wine and cheese produced on site. The project has been conditioned with a requirement that retail sales of products grown or processed in Sonoma County are permitted in the tasting room to the extent such items are clearly secondary, incidental, and related to the primary promotional products of wine and cheese produced on-site in accordance with General Plan Agricultural Resources Element policies.

(2) The use is compatible with and secondary and incidental to agricultural production activities in the area.

In this area the primary agricultural production activity is vineyards for the processing of wine. The winery would facilitate the processing of grapes into wine and the cheese facility will process milk from animals on-site and from elsewhere in Sonoma County into cheese. The farm complex will cover about 2.2 acres of the 55-acre site, therefore, it is considered incidental and secondary to agricultural activities on site and in the area.

(3) The use will not require the extension of sewer and water.

The Project Review Health Specialist determined that it is not likely that the project would substantially deplete groundwater supplies. This is a Zone 3 water availability area and the project should not cause a drop in water levels in nearby wells. The 55-acre parcel has adequate area for expansion of the septic system.

(4) The use is compatible with existing uses in the area.

Currently there are no other wineries on Sonoma Mountain Road in this area. The Sonoma Mountain Zen Center is located to the east of the subject property. The Zen Center has been in this location for many years and is currently going through a Use Permit process to cover some additional uses not included in the original permit.

(5) Hotels, motels, resorts, and similar lodging are not allowed.

There are no accommodations associated with this request.

(6) Activities that promote and market agricultural products such as tasting rooms, sales and promotion of products grown or processed in the County, educational activities and tours, incidental sales of items related to local area agricultural products are allowed.

Events must be directly related to the promotion and marketing of the wine. The applicant has stated that the "We plan to implement programming including wine pick-up events, chef dinners, selective county-wide industry events, limited weddings, and other events to introduce potential and current customers to our wines and farmstead products."

Policy AR-6f:
Local concentrations of visitor serving and recreational uses, and agricultural support uses as defined in Goal AR-5, even if related to surrounding agricultural activities, are detrimental to the primary use of the land for the production of food, fiber and plant materials and may constitute grounds for denial of such uses. In determining whether or not the approval of such uses would constitute a detrimental concentration of such uses, consider all the following factors:

(1) Whether the above uses would result in joint road access conflicts, or in traffic levels that exceed the Circulation and Transit Element's objectives for level of service on a site specific and cumulative basis.
(2) Whether the above uses would draw water from the same aquifer and be located within the zone of influence of area wells.
(3) Whether the above uses would be detrimental to the rural character of the area.

Currently there are no nearby wineries or other visitor serving uses with the exception of the Sonoma Mountain Zen Center approximately 1.5 miles to the east and Cooper's Grove a Sonoma County Agricultural Preservation and Open Space District property is located between the two sites. This property has limited public access and generates very little in the way of traffic on Sonoma Mountain Road. There are no public improvements so it does not use water or have any septic system. The proposed project does not result in a local concentration of visitor and recreational uses that would impact agricultural uses. However, there may be impacts to the roadway see Section 16 below.

The Sonoma County Zoning Code Section 26-040-20 (Uses permitted with a use permit) includes the following sections which allow for processing and tasting rooms:

(f) Preparation of agricultural products which are not grown on site, processing of agricultural product of a type grown or produced primarily on site or in the local area, storage of agricultural products grown or processed on site, and bottling or canning of agricultural products grown or processed on site, subject, at a minimum, to the criteria of General Plan Policies AR-5c and AR-5g;

(i) Tasting rooms and other temporary, seasonal or year-round sales and promotion of

agricultural products grown or processed in the county subject to the minimum criteria of General Plan Policies AR-6d and AR-6f. This Subsection shall not be interpreted so as to require a use permit for uses allowed by Section 26-04-010(g);
Mitigation: No mitigation measures are required.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
See 4.f. above. Habitat Conservation Plans and Natural Community Conservation Plans are site-specific plans to address effects on sensitive species of plants and animals. The project site is not located in an area subject to a Habitat Conservation Plan or Natural Community Conservation Plan. There are very few Habitat Conservation Plans in Sonoma County-they would only affect certain land in timber production areas in the northwest county (for spotted owl) and in the lower Petaluma River/Sonoma Creek watershed (for saltmarsh harvest mouse/black rail/clapper rail).

Mitigation:
No mitigation measures are required.

11. MINERAL RESOURCES *Would the project:*

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
There is no known mineral resource on the project site.

Mitigation:
No mitigation measures are required.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The project site is not a mineral resource recovery site.

Mitigation:
No mitigation measures are required.

12. NOISE *Would the project:*

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
The Noise Element of the Sonoma County General Plan establishes goals, objectives and policies including performance standards to regulate noise affecting residential and other sensitive receptors. The general plan sets separate standards for transportation noise and for noise from non-transportation land uses. The following mitigation measure will ensure that the completed project will not result in excessive noise generation or expose persons to noise levels in excess of County standards.

Mitigation 12.a.i.:

Noise shall be controlled in accordance with Table NE-2 (or an adjusted Table NE-2 with respect to ambient noise as described in General Plan 2020, Policy NE-1c,) as measured at the exterior property line of any affected residential or sensitive land use:

Hourly Noise Metric[1], dBA	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
L_{50} (30 minutes in any hour)	50	45
L_{25} (15 minutes in any hour)	55	50
L_{08} (5 minutes in any hour)	60	55
L_{02} (1 minute in any hour)	65	60

[1] The sound level exceeded n% of the time in any hour. For example, the L_{50} is the value exceeded 50% of the time or 30 minutes in any hour; this is the median noise level. The L_{02} is the sound level exceeded 1 minute in any hour.

Mitigation Monitoring:
Any noise complaints will be investigated by PRMD staff. If such investigation indicates that the appropriate noise standards have been or may have been exceeded, the permit holders shall be required to install, at their expense, additional professionally designed noise control measures. Failure to install the additional noise control measure(s) will be considered a violation of the use permit conditions. If noise complaints continue, PRMD shall investigate complaints. If violations are found, PRMD shall seek voluntary compliance from the permit holder and thereafter may initiate an enforcement action and/or revocation or modification proceedings, as appropriate. (Ongoing)

Mitigation 12.a.ii.:
Special events shall be limited to the hours of the Daytime Noise Standard found in the Noise Element of the Sonoma County General Plan (currently 7:00 a.m. to 10:00 p.m.).

Mitigation Monitoring:
Any complaints about events outside the hours established by the Noise Element of the General Plan shall be investigated and if events are held or allowed to continue outside the allowed hours of operation then enforcement actions may be undertaken up to and including potential revocation.

Mitigation 12.a.iii:
Construction activities for this project shall be restricted as follows:

a) All internal combustion engines used during construction of this project will be operated with mufflers that meet the requirements of the State Resources Code, and, where applicable, the Vehicle Code. Equipment shall be properly maintained and turned off when not in use.

b) Except for actions taken to prevent an emergency, or to deal with an existing emergency, all construction activities shall be restricted to the hours of 7:00 a.m. and 7:00 p.m. on weekdays and 9:00 a.m. and 7:00 p.m. on weekends and holidays. If work outside the times specified above becomes necessary, the applicant shall notify the PRMD Project Review Division as soon as practical.

c) There will be no start up of machines nor equipment prior to 7:00 a.m, Monday through Friday or 9:00 am on weekends and holidays; no delivery of materials or equipment prior to 7:00 a.m nor past 7:00 p.m, Monday through Friday or prior to 9:00 a.m. nor past 7:00 p.m. on weekends and holidays and no servicing of equipment past 7:00 p.m., Monday through Friday, or weekends and holidays. A sign(s) shall be posted on the site regarding the allowable hours of construction, and including the developer=s phone number for public contact.

d) Pile driving activities shall be limited to 7:30 a.m. to 7:00 p.m. weekdays only.

e) Construction maintenance, storage and staging areas for construction equipment shall avoid proximity to residential areas to the maximum extent practicable. Stationary construction equipment, such as compressors, mixers, etc., shall be placed away from residential areas and/or provided with acoustical shielding. Quiet construction equipment shall be used when possible.

f) The developer shall designate a Project Manager with authority to implement the mitigation prior to issuance of a building/grading permit. The Project Manager's phone number shall be conspicuously posted at the construction site. The Project Manager shall determine the cause of noise complaints (e.g. starting too early, faulty muffler, etc.) and shall take prompt action to correct the problem.

Mitigation Monitoring:
PRMD staff shall ensure that the measures are listed on all site alteration, grading, building or improvement plans, prior to issuance of grading or building permits. Any noise complaints will be investigated by PRMD staff. If violations are found, PRMD shall seek voluntary compliance from the permit holder and thereafter may initiate an enforcement action and/or revocation or modification proceedings, as appropriate. (Ongoing)

b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The project includes construction activities that may generate ground borne vibration and noise. These levels would not be significant because they would be short-term and temporary, and would be limited to daytime hours. There are no other activities or uses associated with the project that would expose persons to or generate excessive ground borne vibration or ground borne noise levels. Adjoining residential uses are over 600 feet away from the site and there are only three dwellings on the adjoining properties.

Mitigation:
No mitigation measures are required.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
See 12.a.

Mitigation:
See 12.a.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
		X		

Comment:
There will be potentially significant noise impacts from the construction activities. This impact will cease when construction is finished. However, this is a temporary increase in noise that will end once construction is complete. See 12.a.

Mitigation Measure:
See 12.a.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The site is not within an airport land use plan as designated by Sonoma County.

Mitigation:
No mitigation measures are required.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
There are no known private airstrips within the project area. (1)

Mitigation:
No mitigation measures are required.

13. POPULATION AND HOUSING *Would the project*:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X

Comment:
The project would not include construction of a substantial amount of homes, businesses or infrastructure and therefore would not induce substantial population growth.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
b) Displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere?				X

Comment:
Two dwelling units will be demolished with this project. However, the project includes two new Agricultural Employee units and a new Single Family Dwelling in addition to the Single Family Dwelling that was already remodeled. This results in too many residential units on the property, unless enough milking cows or goats are established to support three Agricultural Employee units. In any event the demolition of two units will not result in a deficit of housing.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

Comment:
No people will be displaced by the project.

Mitigation:
No mitigation measures are required.

14. PUBLIC SERVICES *Would the project:*

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order				X

to maintain acceptable service rations, response times or other performance objectives for any of the public services:				

Comment:
Construction of the project would not involve substantial adverse physical impacts associated with provision of government facilities as no new facilities will be required as a result of this project.

Mitigation:
No mitigation measures are required.

i. Fire protection?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The County Fire Marshal reviewed the project description and requires that the expansion comply with Fire Safe Standards, including fire protection methods such as sprinklers in buildings, alarm systems, extinguishers, vegetation management, hazardous materials management, and management of flammable or combustible liquids and gases.

Mitigation:
No mitigation measures are required.

ii. Police?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The Sonoma County Sheriff will continue to serve this area. There will be no increased need for police protection resulting from the new winery, tasting room, cheese processing facility, and farmstead.

Mitigation:
No mitigation measures are required.

iii. Schools, parks, or other public facilities?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
Development fees to offset potential impacts to public services include school and park mitigation fees.

Mitigation:
No mitigation measures are required.

iv. Parks?	Potentially	Less than	Less than	No impact

	Significant Impact	Significant with Mitigation Incorporation	Significant Impact	
				X

Comment:
Development fees to offset potential impacts to public services include school and park mitigation fees.

Mitigation:
No mitigation measures are required.

v. Other public facilities?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
Development fees to offset potential impacts to public services include school and park mitigation fees.

Mitigation:
No mitigation measures are required.

15. RECREATION *Would the project*:

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The proposed project would not involve activities that would cause or accelerate substantial physical deterioration of parks or recreational facilities.

Mitigation:
No mitigation measures are required.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The project does not include the construction or expansion of recreational facilities.

Mitigation:
No mitigation measures are required.

16. TRANSPORTATION / TRAFFIC *Would the project*:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?		X		

Comment:
In August 2013 Focused Traffic Study was prepared for the project by Sam Lam and Dalene Whitlock of Whitlock & Weinberger Transportation, Inc. (W-Trans). The Study reached the following conclusions:

i. The project would generate an average of 71 new daily trip ends over existing levels with 13 trips during the weekday p.m. peak hour and 6 during the weekend midday peak hour.
ii. Internal roadways do not meet the minimum Fire Safe Standards for Sonoma County.
iii. Sight distances at the project driveway are adequate for outbound right-turn and inbound left-turn movements.
iv. Sight distance at the project driveway is inadequate for outbound left-turn movements.
v. A westbound left-turn lane is not warranted on Sonoma Mountain Road at the project driveway.
vi. Neither an eastbound right-turn lane nor taper are warranted on Sonoma Mountain Road at the project driveway.
vii. The driveway entrance and internal roadways configuration will accommodate a heavy-duty 10-wheel bottling line truck.
viii. Adequate parking for employees, tasting room visitors, and special events has been included in the design of the project.

Sonoma Mountain Road in the vicinity of the project has very low traffic volumes and accident rates are below the state average for this type of roadway. The report recommends two actions to address on-site safety and sight distances from the driveway entrance onto Sonoma Mountain Road. The implementation of these two measures will reduce potential impacts to less than significant.

Mitigation Measure 16.a.i.:
Widen all internal roadways/driveways to a 20-foot cross section or install turnouts every 400-feet or as prescribed by Fire Services to meet the Sonoma County Standard.

Mitigation Monitoring:
Prior to building permit issuance Fire Services shall review the development plans to ensure that on-site access meets the requirements for width or includes the correct number of turnouts.

Mitigation Measure 16.a.ii.:
Obtain a permit from Public Works to trim or remove vegetation along the north side of Sonoma Mountain Road approximately 400 feet east of the project driveway to achieve at least 445 feet of site distance and on the south side of Sonoma Mountain Road approximately 200 feet west of the driveway to achieve at least 385 feet of site distance to insure adequate sight distance for outbound left-turn movements (the dominant turning movement for outbound vehicles). If vegetation is not permanently removed but is only trimmed then an ongoing maintenance program shall be developed in conjunction with Sonoma County Public Works to ensure that the sight distance is maintained.

Mitigation Monitoring:
Prior to building permit issuance the applicant shall provide documentation that an agreement with Sonoma County Transportation and Public Works for vegetation removal and maintenance of that vegetation has been entered into. The project planner and/or Public Works staff will verify that the work has been completed and results in a minimum sight distance of 445 feet to the east and 385 feet to the west.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?			X	

Comment:
There is no longer a Congestion Management Plan for Sonoma County. However, the General Plan includes a goal of maintaining a Level of Service C for all roadway segments not specifically addressed in the General Plan. Level of Service on this segment of Sonoma Mountain Road is C or better even with the addition of the project traffic.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
c) Result in change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X

Comment:
The project would have no effect on air traffic patterns.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?		X		

Comment:
As discussed in 16.a. above, the sight distance to the east does not meet the minimum sight distance for the type of road and speeds traveled.

Mitigation Measure:
See 16.a.ii. above.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
e) Result in inadequate emergency access?				

Comment:
The proposed project will not affect emergency access to the site. On-site roadways and driveways do not meet the County Fire Safe Standards as discussed above in 16.a.

Mitigation Measure:
See 16.a.i. above.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
			X	

Comment:
Sonoma Mountain Road is designated as a future Class III bicycle facility. The *2010 Bicycle and Pedestrian Plan* provides the following information on Class III Bikeways:

Class III Bikeways are intended to provide continuity to the County bicycle network. Bike routes are established along through routes not served by Class I or II bikeways or to connect discontinuous segments of Class I or Class II bikeways.

Class III Bikeways are facilities shared with motor vehicles that provide connection to Class I and II bikeways through signage, and design, creating advantages for bicyclists not available on other streets. By law, bicycles are allowed on all roadways in California except on freeways when a suitable alternate route exists. However, Class III bikeways serve to identify roads that are more suitable for bicycles.

The proposed project should not interfere with the designation of Sonoma Mountain Road as a Class III Bikeway as the modifications to the driveway entrance will require an encroachment permit which will ensure that the roadway is not impacted by the driveway.

In addition the *2010 Bicycle and Pedestrian Plan* requires the installation of bike racks at new commercial sites: The following criteria apply and will become a condition of approval: Commercial and industrial uses over 10,000 gross square feet one bicycle rack space per 15 employees with a minimum of eight bicycle rack spaces per location. Bicycle lockers may be substituted for bicycle rack spaces and should be located near a main entrance with good visibility.

Mitigation:
No mitigation measures are required.

g) Result in inadequate parking capacity?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The site plan shows up to 96 parking spaces which the consultant states will be adequate for the proposed uses. Additional or overflow parking could be located within the vineyards.

Mitigation:
No mitigation measures are required.

17. UTILITIES AND SERVICE SYSTEMS *Would the project*:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X

Comment:
The project will be served by a private septic system installed under permits from the Permit and Resource Management Department. In addition a standard condition of approval requires that the applicant apply for and receive a Waste Discharge Permit from the North Coast Regional Water Quality Control Board. The permitting process ensures that there will be no impacts from wastewater treatment in the private septic system.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X

Comment:
The site is not served by a public water or wastewater treatment facility.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	

Comment:
There are no formal storm water drainage facilities in the area as the project is located in an agricultural area with limited impervious surfaces, large parcel sizes with natural vegetation or crops, etc. all of which allow storm water to percolate into the ground or sheet flow into existing natural drainage swales.

The project has been reviewed by the Grading and Storm Water Section of the Permit and Resource Management Department. Eleven standard conditions of approval have been applied to the project regarding drainage and runoff these conditions will ensure that there no impacts from storm water runoff. See Section 9 above for an analysis of drainage and runoff.

Mitigation:
No mitigation measures are required.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or				

expanded entitlements needed?			X	

Comment:
The site is served by a private well. A hydrologic study was prepared which reviewed groundwater resources for both the site and surrounding properties. It concluded that there would be no impacts. See 9.b above.

Mitigation:
No mitigation measures are required.

e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
				X

Comment:
The site is served by a private septic system not a public wastewater treatment provider.

Mitigation:
No mitigation measures are required.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
			X	

Comment:
Sonoma County has a solid waste management program in place that provides solid waste collection and disposal services for the entire County. The program can accommodate the permitted collection and disposal of the waste that will result from the proposed project.

g) Comply with federal, state, and local statutes and regulations related to solid waste?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
			X	

Comment:
Sonoma County has access to adequate permitted landfill capacity to serve the proposed project.

Mitigation:
No mitigation measures are required.

18. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
			X	

levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact
			X	
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No impact

Sources

1. PRMD staff evaluation based on review of the project site and project description.

2. PRMD staff evaluation of impact based on past experience with construction projects.

3. Sonoma County Important Farmland Map 1996. California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program.

4. Assessor's Parcel Maps

5. BAAQMD CEQA Guidelines; Bay Area Air Quality Management District; April 1999; California Air Resources Board (CARB) http://www.arb.ca.gov/

6. California Natural Diversity Database, California Department of Fish & Game.

7. Sonoma County General Plan 2020 (as amended), Sonoma County Board of Supervisors, September 23, 2008.

8. California Environmental Protection Agency - http://www.calepa.ca.gov/SiteCleanup/corteseList/default.htm; California Regional Water Quality Control Board - http://geotracker.swrcb.ca.gov/; California Dept of Toxic Substances Control http://www.dtsc.ca.gov/database/calsites/cortese_list.cfm, and Integrated Waste Management Board - http://www.ciwmb.ca.gov/SWIS/Search.asp

9. Alquist-Priolo Special Studies Zones; State of California; 1983.

10. Flood Insurance Rate Maps, Federal Emergency Management Agency.

11. Special Report 120, California Division of Mines and Geology; 1980.

12. General Plan Consistency Determination, (65402 Review), Sonoma County Permit & Resource Management Department.

13. Standard Specifications, State of California Department of Transportation, available online: http://www.dot.ca.gov/hq/esc/oe/specs_html

14. American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices, Pruning (ANSI A300 (Part 1)-2008 Pruning), American National Standard Institute (ANSI) and National Arborist Association (NAA), 2008;

15. Best Management Practices: Tree Pruning, International Society of Arboriculture (ISA), 2008.

16. Tree Protection and Replacement Ordinance (Ordinance No. 4014); Sonoma County.

17. Valley Oak Protection Ordinance (Ordinance No. 4991); Sonoma County, December 1996.

18. Heritage or Landmark Tree Ordinance (Ordinance No. 3651); Sonoma County.

19. Manual of Standards for Erosion and Sediment Control Measures, Association of Bay Area Governments; May, 1995.

20. Soil Survey of Sonoma County, California, Sonoma County, U.S. Department of Agriculture; 1972.

21. Evaluation of Groundwater Resources, California Department of Water Resources; 1975.

22. Sonoma County Congestion Management Program, Sonoma County Transportation

Authority; December 18, 1995.

23. Sonoma County Aggregate Resources Management Plan and Program EIR, 1994.

24. Sonoma County Bikeways Plan, Sonoma County Permit and Resource Management Department, August 24, 2010.

Planning Application
PJR-001

File#: PLP12-0016

Type of Application:

- [ ] Admin Cert. Compliance
- [ ] Ag./Timber Preserve
- [ ] Cert. of Compliance
- [ ] Cert. of Modification
- [ ] Coastal Permit
- [ ] Design Review Admin.
- [ ] Design Review Comm./Ind.
- [ ] Design Review Residential
- [ ] Design Review Signs
- [ ] General Plan Amendment
- [ ] Lot Line Adjustment
- [ ] Major Subdivision
- [ ] Minor Subdivision
- [ ] Mobile Home Zoning Permit
- [ ] Ordinance Interpretation
- [ ] Second Unit Permit
- [ ] Specific/Area Plan Amendment
- [x] Use Permit
- [ ] Variance
- [ ] Zone Change
- [ ] Zoning Permit
- [ ] Other:

Applicant (Contact Person):

Nathan L. Belden
Name

5561 Sonoma Mountain Road
Mailing Address

Santa Rosa — CA 95405
City/Town — State/Zip

415-577-8552
Phone — Fax:

Signature — May 23, 2012
Date

Owner, if other than Applicant:

Nathan L. Belden Trust
Name

527 Alvarado Street
Mailing Address

San Francisco — CA 94114
City/Town — State/Zip

415-577-8552
Phone — Fax

Signature — May 23, 2012
Date

Other Persons to be Notified: (Specify: Other Owner(s), Agent, Lender, Architect, **Engineer**, Surveyor)

Name: SMA - Steve Martin, P.E.	Name	Name
Mailing Address: 130 South Main St., Suite 201	Mailing Address	Mailing Address
City/Town: Sebastopol — State/Zip: CA 95472	City/Town — State/Zip	City/Town — State/Zip
Title: Project Manager / Engineer	Title	Title
Phone: (707) 824-9730 — Fax: (707) 824-9707	Phone — Fax	Phone — Fax

Project Information:

5561 Sonoma Mountain Road — Santa Rosa
Address — City/Town

APN 049-030-010 — 55.0 acres
Assessor's Parcel Number(s) — Acreage

Project Description: **New phased winery & farmstead with ultimate 10,000 case wine production, 10,000 lbs cheese production and public tasting, tours and retail sales.**

Site Served by Public Water? ☐ yes ☒ no Site Served by Public Sewer? ☐ yes ☒ no Number of new lots proposed **None**

☺ DO NOT WRITE BELOW THIS LINE - To Be Completed by PRMD Staff ☺

Planning Area: 9 Supervisorial District: 1 Current Zoning: LIA B6-40/40, SR General Plan Land Use: LIA-40
Specific Plan: Bennett Valley Area Plan S.P. Land Use: — Needs CEQA Review? ☒ yes ☐ no
Commercial/Industrial Uses: (Enter numbers where applicable)
Bldg. sq. ft. Existing: ____ Proposed: ____ Existing Employees: ____ New Employees: ____
Residential Uses: (Enter numbers where applicable)
New Single-Family Homes: ____ New Multi-Family Units: ____ New Second Units: ____
New Manufactured Homes: — New Units For Sale: — New Units For Rent: — Density Bonus Units: —
Violation? ☐ yes ☒ no; Application resolve planning violation? ☐ yes ☒ no; Penalty applicable? ☐ yes ☒ no; Civil Penalty Factor —
Previous Files: PLP06-0021 (Design Review), ZPE06-0279 (legal non-conforming det.)
Application accepted by Karin Theriault Date 5-31-12

SR = Scenic landscape Unit

Ag. Pres. 1

USE PERMIT – SUPPLEMENTAL APPLICATION INFORMATION

Existing site characteristics:

Existing use of property: Vineyard and residence Acreage: 55.0 acres

Proximity to creeks, waterways, and impoundment areas: 940' +/-

Vegetation on site: Vineyard

General Topography: Varies, sloping (5%-15%)

Surrounding uses to North: vineyards South: open space East: agriculture West: vineyards

New buildings proposed (size, height, type): **Phase I will include reconstruction of the existing 2490 SF residence to tasting, hospitality, commercial kitchen, administrative and residential use (4270 SF w/ 1410 SF porch); conversion of one 480 SF wing of an existing barn to locker/restrooms; and demolition of an existing 1780 SF garage and residence building. Winemaking during Phase I will take place at the existing barn area with offsite barrel storage. Phase II will include a new 8300 SF winery building (7650SF – 1st Floor, 650 SF 2nd Floor) nestled into the topography. The wine facility incorporates a covered grape receiving and crushing area with press, fermentation, barrel storage, case goods/bottling, equipment storage, production restroom, equipment room, office, lab and attached workforce residences (900 SF 2 bedroom unit, 470 SF 1 bedroom unit). The 2nd floor includes a VIP tasting and hospitality area. Phase II will also include a new 1090SF wing to an existing barn.**

Number of employees (total): **Phase I: 4 full-time employees and 2 part-time during non-harvest and 6 full-time employees during harvest and bottling. Phase II: during non-harvest, 5 full-time and 4 part-time employees, with an increase to 7 full-time employees during the harvest season and bottling.**

Operating day: **Monday–Sunday** Hours of operation: **7:00 am–6:00 pm, non-harvest : 6:00 am- 10:00 pm harvest**

Number of vehicles per day: **12**

Water source: **private wells** Sewage disposal: **onsite septic tank and underground leachfield systems**

Provider, if applicable: **N/A** Provider, if applicable: **N/A**

Noise generated: **Minimal noise generated from crush equipment and compressors**

Grading required: **Phase II - Cut Max: 2,000 CY Fill Max: 2,000 CY**
Fill Area: 0.25 AC Approx. Total Yds: 4,000 CY
Area of Disturbance: 1.0 AC

Vegetation to be removed: **Phase II - pasture**

Will proposal require annexation to a district in order to obtain public services?
☐ Yes ☒ No

Are there currently any hazardous materials (chemicals, oils, gasoline, etc.) stored, used, or processed on this site?
☐ Yes ☒ No

Were there any hazardous materials used, store, or processed on this site?
☐ Yes ☒ No

Will the use, storage, or processing of hazardous materials occur on this site in the future if this project is authorized?
☒ Yes ☐ No

Additional information: See attached Preliminary Engineering and Planning Data.

Belden Barns Winery & Farmstead

Belden Barns
Proposed New Winery and Farmstead Facilities
5561 Sonoma Mountain Road
Santa Rosa, Sonoma County

Proposal Statement

The proposed Belden Barns Winery and Farmstead involves the development of new winemaking, hospitality and farmstead food production facilities on our 55 acre parcel located at 5561 Sonoma Mountain Road near Santa Rosa, California. The facilities will be owner-operated dedicated primarily to the production of ultra-premium Pinot Noir, Syrah, Sauvignon Blanc and Gruner Veltliner as well as various farmstead products including fresh/preserved vegetables/fruits, eggs, charcuterie and cheeses.

The facilities will be located on our vineyard property known as Steiner Vineyard, which was first planted in 1973 and is a historically important vineyard in the Sonoma Mountain/Bennett Valley AVAs. The vineyard currently has16.0 acres of producing vines, 4.0 acres of vines under development, irrigation reservoir, pasture, fruit orchard, vegetable plots, barns and residences. It is our desire to have a quiet farmstead operation and winemaking facility. And while an ultimate production of 10,000 cases of wine and 10,000 lbs of cheese is requested, the production at our facilities will begin small and grow to match the success of producing world class wines in conjunction with farmstead products and farmstead themed experiences.

Tastings and tours will be by appointment with retail sales direct to customers. We plan on having agricultural promotional events to introduce potential and current customers to our wines and farmstead products including wine pick-up events, chef dinners, selective county-wide industry events, limited weddings and other agricultural promotional gatherings. The proposed winery will produce wines primarily from our estate vineyard and other local vineyards in the region. The farmstead production will utilize vegetables, fruit, eggs and milk produced sustainably on site and from surrounding producers. For reference, 10,000 pounds of cheese production utilizes the milk production of 10 cows / 50 sheep / 100 goats. The sustainable carrying capacity of our pasture supports fewer animals than our targeted cheese production implies, so we plan to source a portion of milk for cheese production from local producers.

The facility development is planned to be a phased project. Phase I will include reconstruction of the existing 2490 SF residence to tasting, hospitality, commercial kitchen, administrative and residential use (4270 SF w/ 1410 SF porch); conversion of one 480 SF wing of an existing barn to locker/restrooms; and demolition of an existing 1780 SF garage and residence building. Winemaking during Phase I will take place at the existing barn area with offsite barrel storage. Phase II will include a new 8300 SF winery building (7650SF – 1st Floor, 650 SF 2nd Floor) nestled into the topography adjacent to the new hospitality building and demolished garage/residence. The wine facility incorporates a covered grape receiving and crushing area with press, fermentation, barrel storage, case goods/bottling, equipment storage, production restroom, equipment room, office, lab and attached workforce residences (900 SF 2 bedroom unit, 470 SF 1 bedroom unit). The 2nd floor includes a VIP tasting and hospitality area. Phase II will also include a new 1090SF wing to an existing barn. This new construction will include a milking parlor, micro creamery, cheese making room and affinage rooms for cheese and charcuterie aging. Due to tree coverage and use of topography each phase of development will be minimally visible from Sonoma Mountain Road and is located 420± feet from the existing road and 640± feet from the closest neighboring residence. The winery design and layout has been driven by the function and the criteria for gentle handling of fruit, gentle wine processing, minimized power usage and reduced exposure of the structure. All building designs are agrarian in character with the existing residence, barns and surrounding agricultural area.

Related infrastructure includes minor improvements to the existing entrance on Sonoma Mountain Road, process wastewater treatment system, storm water management improvements, fire protection water storage and associated grading and landscape improvements.

Belden Barns Winery & Farmstead

During Phase I, we plan on having 4 full-time employees and 2 part-time employees To support the proposed Phase II winery and farmstead facilities during non-harvest, we anticipate maintaining a staff of 5 full-time and 4 part-time employees, with an increase to 7 full-time employees during the harvest season and bottling. Visitation for both phases will be by appointment and visitors anticipated are to be on the order of 20 for an average day and 60 for a peak day. Operating hours shall be 7 AM to 6 PM Monday through Friday off harvest and 6 AM to 10 PM Monday through Sunday during harvest season.

It is our intention to create a small, quiet farmstead and winery facility that produces outstanding, unique wines and farmstead products from Sonoma County. In turn, we hope to celebrate and support local agriculture and Sonoma County's economy. The new facilities are designed to have minimal impact to the land with use of existing structures, sustainable materials and systems, and an architectural style that blends with the surroundings and existing structures in the area.

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707-824-9730
707-824-9707 (fax)

606 Alamo Pintada Road #3-221
Solvang, CA 93463
805-541-9730

September 19, 2012

Sonoma County Permit &
Resource Management Department
2550 Ventura Avenue
Santa Rosa, CA 95403

Attn: Melinda Grosch

Re: Belden Barns Winery & Farmstead
PLP12-0016
APN 049-030-010
Project No. 2011014

Dear Melinda

The purpose of this letter is to review items discussed during our project meeting on June 19, 2012 in response to your letter dated June 12, 2012 regarding application incompleteness. In addition, we'll provide written response to items No. 1 through No. 7 per your email of today, 9-19-12, though some of these items were addressed at our meeting referenced above as well as in our preliminary Design Review submittal on August 23, 2012 and our Memorandum dated 9-7-12 regarding the requested narrative for the siting of the winery building within the Bennett Valley Visual Corridor.

1. A revised Site Plan showing all new construction outside the Bennett Valley Visual Corridor is not being provided. We had addressed this with you in our meeting on June 19, 2012, the subsequent design review application and further memorandum dated September 7, 2012, which provided the requested written narrative justifying the siting of the building within the BV Visual Corridor. Please set this project for preliminary Design Review as you recommended and have indicated is a first priority in the processing due to being in the visual corridor.
2. Design Review submittal package with the required items (photo simulations, site plans, building plans & elevations, etc.) and multiple copies was provided to you on 8-23-12.
3. Up to 10 special events per year with attendance levels of 60 to 200 people are requested with the UP application. No outdoor amplified music is planned for the events. The event breakdown is projected as follows:
   - 5 events at 60 people maximum
   - 3 events at 100 people maximum
   - 2 events at 200 people maximum

   Anticipated event information is as follows:

Event Description	Quantity	Date &Time Period	Attendees (maximum)
Wine Club Member's Event	2	January - December	60
Distributors Tasting & Dinner	2	January - December	60

Chef Tastings & Dinner	1	January - December	60
Wine Club Member's Pick-up Event	1	March - October	100
Harvest Party	1	March - October	100
Wine & Farm Product Marketing Event (TBD)	1	March - October	100
Wedding	1	March - October	200
Wine & Farm Product Marketing Event (TBD)	1	March - October	200
TOTAL	10		

Belden Barns plans to participate in selective County-wide industry events.

4. Winery Hospitality Functions: the number of events, description and maximum number of people are as described in the table above. Normal tasting room hours and related visitation will be from 11:00 AM to 6:00 PM. Events described above will be during the time between 11:00 AM to 10:00 PM. Generally, the Wine Club Member events and Harvest Party will be during the day and the Tasting & Dinner functions will be from 5:00 PM to 10:00 PM.
5. Williamson Act Compliance Statement is attached.
6. The winery structure has two attached agricultural employees units. The 2-bedroom unit will be a replacement for the existing Ag Employee dwelling to be removed. The 1-bedroom unit is planned to be a Workforce Housing Unit in order to satisfy the pending Condition of Approval related to Workforce Housing Requirements pursuant to 26-89-045 of the Sonoma County Code.
7. Signed At-Cost Agreement is attached.

I trust the above adequately addresses items #1 through #7 of your June 12, 2012 letter. Please call if you have any questions or comments.

Sincerely,

Steve Martin, P.E.

cc: Nate Belden

attachments

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Memorandum

To:	Melinda Grosch	From:	Steve Martin
Project:	Belden Barns Winery & Farmsead	Date:	August 7, 2012
Project No.:	2011014	No. of Pages:	1
Re:	Winery Siting Narrative		

Melinda,

Per your request in our telephone conversation this week, we are providing a narrative regarding the supporting information and reasoning for the proposed new winery building location (within the BV Visual Corridor) at the Belden Barns Winery & Homestead project located at 5561 Sonoma Mountain Road. This written information is consistent with that discussed during our meeting in June. We also appreciate your recommendation of having Preliminary Design Review as soon as possible and prior to the additional requested studies completed due to the impacts of the DR decision on building location.

<u>Building Locations</u>

Phase I buildings utilize existing structures on the property.

- The existing SF barn will be renovated for the conversion of use to a small winery and creamery.
- The existing 2490 SF residence will be reconstructed and serve as both the owner's residence and separate tasting/hospitality space.
- These existing structures are part of the historical farmstead buildings and predate the BV Area Plan & Visual Corridor.

Phase II winery building is located within the existing farmstead building cluster.

- The new winery building is adjacent to the existing small barn and immediately downhill of the large barn (Phase I winery building).
- To minimize building exposure and natural earth cooling, the building is built into the hillside.
- The building is screened on three sides by the existing farmstead buildings and on the east side by the existing oak trees and heavily vegetated area.

<u>Siting Information</u>

The existing farmstead building cluster is within the Bennett Valley Visual Corridor. To minimize visual impacts to the area, existing structures are being utilized in Phase I and the Phase II winery building (with workforce housing) is nestled into grade within the cluster of existing buildings. The majority of the property is within the BV Visual Corridor with the south east corner area outside of the corridor. The property area outside the BV Visual Corridor is geologically unstable with a documented landslide surveyed and mapped by Giblin Associates in May, 2002. This area is unbuildable.

In 2002, extensive planning and coordination efforts were completed by PRMD Planning staff, Design Review, Giblin Associates and the prior owner (Steve & Kim Bachman) regarding the location of a new residence. This work concluded in PRMD and DR approving a house location within the BV Visual Corridor.

Supporting Information

The proposed location of the new winery building meets the Goals and Policies of the BV Area Plan although it is within the boundaries of the BV Visual Corridor.

- The proposed new building can not be seen from public roadways or neighboring properties. As stated above, it is screened by existing tress and vegetation as well as existing structures (see photo simulation and rendering)
- Cluster development is being accomplished with the building siting (Goals & Policies I.F.)
- Winery building includes two new workforce housing units satisfying both the Work Force Housing policy and the need for low cost housing (Goals & Policies II.A. & II.B.)
- The winery and farmstead supports the agriculture production on site and supports the "vital rural character" (Goals & Policies III.A.)
- The area of the property outside of the BV Visual Corridor is within an open vista. The proposed location of the winery building supports the Open Space and protects the open vista (Goals & Policies IV.A.)
- Views for public roads and the community are protected with the proposed new location since it can not be seen from any public view shed (Goals & Policies IV.C.)

Mitigation Measures within the BV Area Plan include "Maintain Visual Amenity". The proposed location complies as follows:

- Avoids skyline Development
- Is in harmony with the existing structures, area and natural surroundings
- Does not impact visual/scenic corridors
- Will adhere to the BV Design Guidelines (with exception of being within the corridor)
- Does comply with the General Plan and Zoning Ordinance.

Summary

The proposed Belden Barns Winery & Farmstead is responsibly designed to minimize visual impacts to the public and neighboring properties by utilizing existing farm structures and siting the Phase II building within the cluster of farm buildings. The Phase II building architecture is in concert with the existing buildings on site and the agrarian setting. As stated above the public view shed is not affected by the proposed project structures; the new building cannot be seen outside of the property and the existing structures are part of the natural surroundings. Public safety is protected by not attempting to build in the geologically unstable area that falls outside of the BV Visual Corridor.

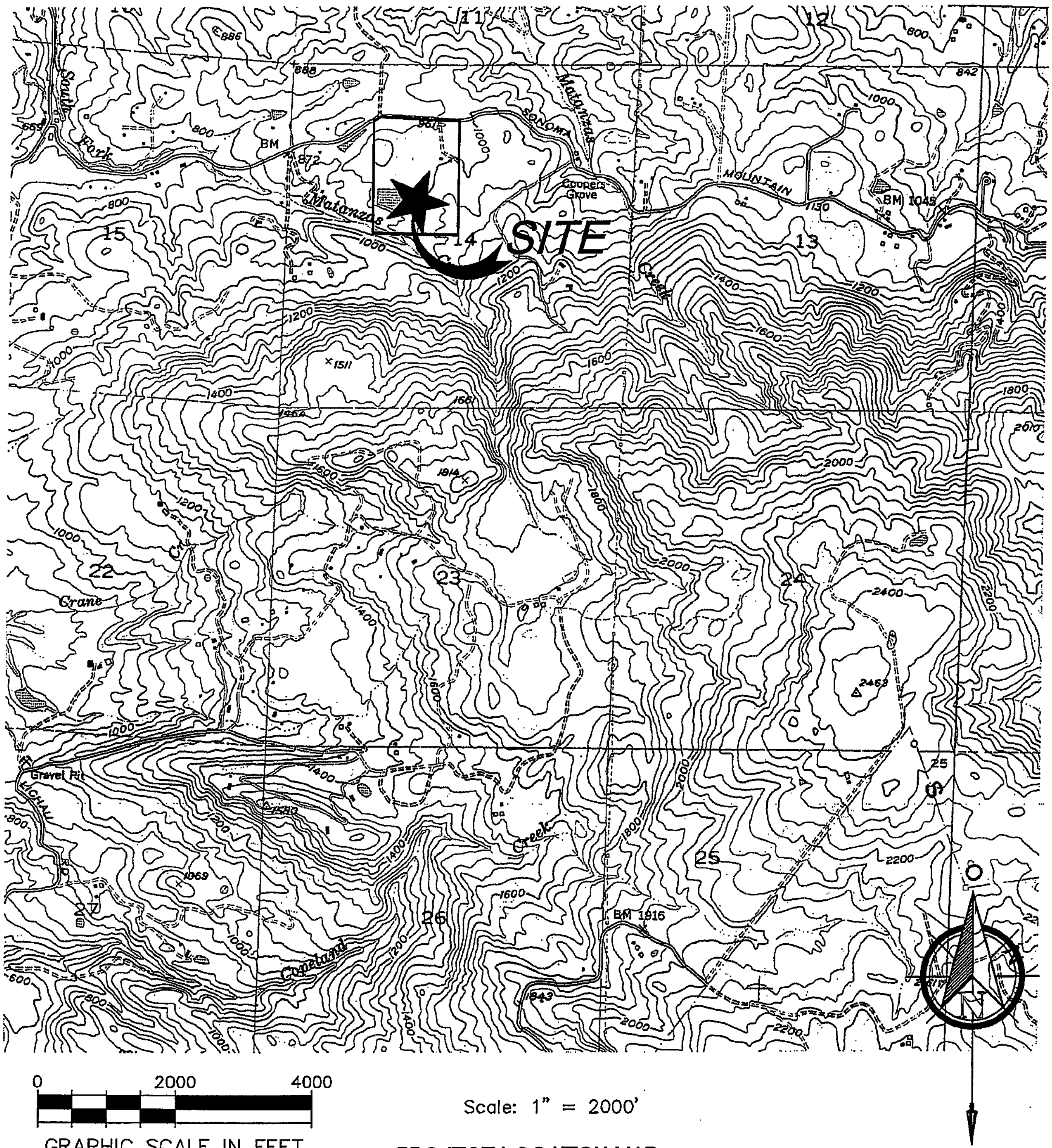
I trust the above adequately addresses your request for a narrative summary supporting the building location within the BV Visual Corridor. I look forward to discussing the above and additional supporting photos, renderings, photo-simulations and related information with the DR committee.

Please call if you have any questions or comments.

Regards,

Steve Martin, P.E

cc: Nate Belden



Scale: 1" = 2000'

PROJECT LOCATION MAP

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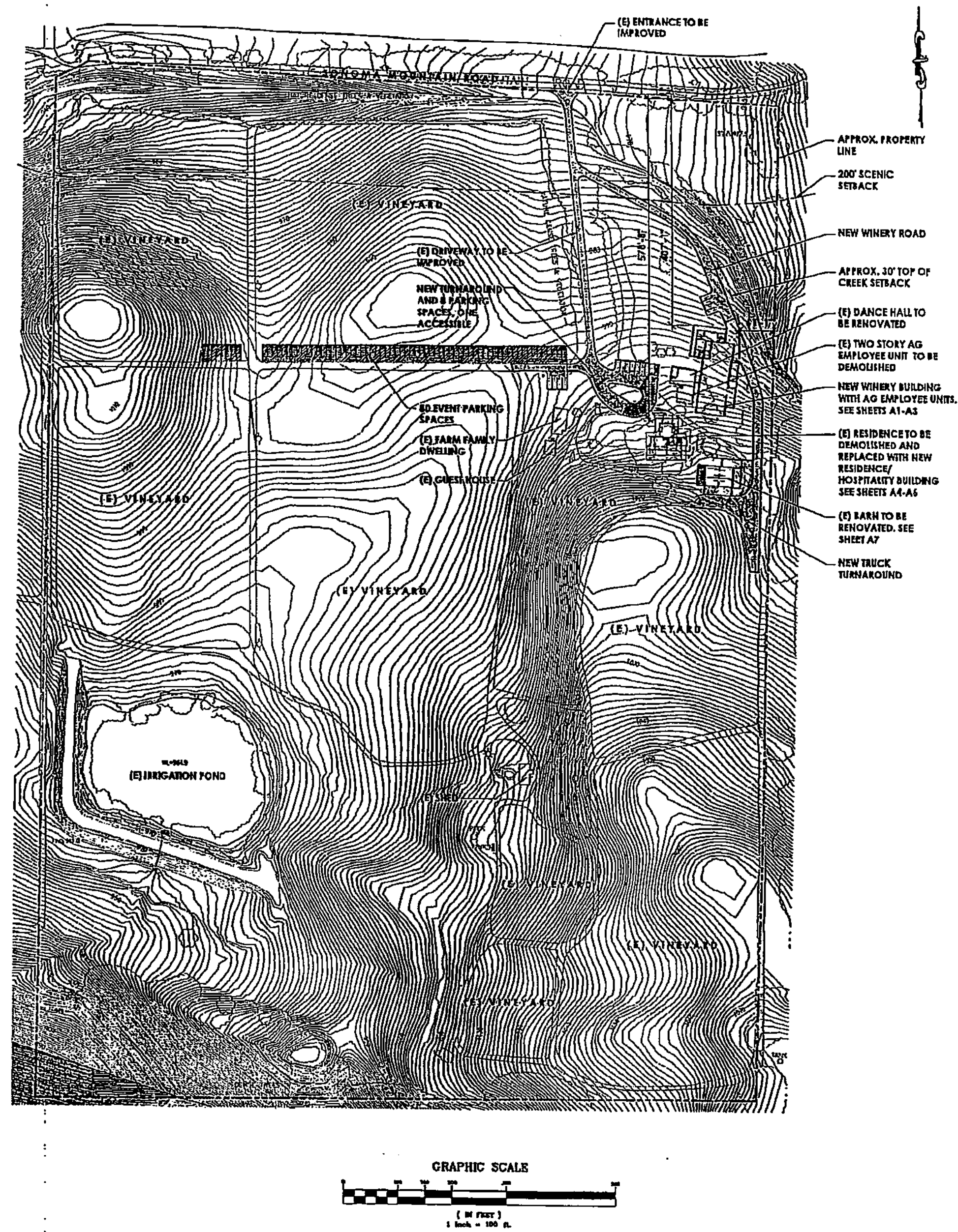
Belden Barns
Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404
AP # 049-030-010
SMA 2011-014 05.30.12



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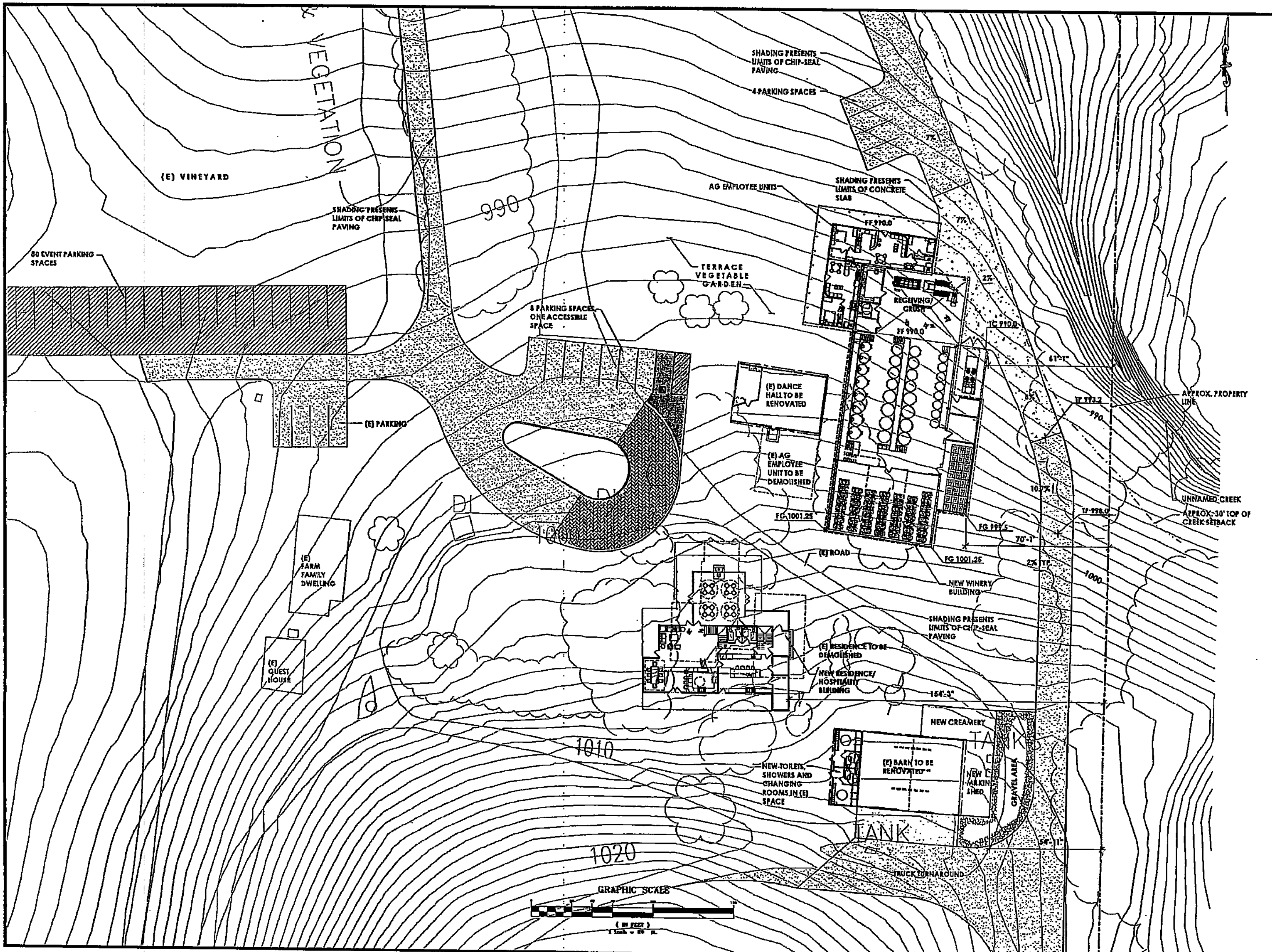
USE PERMIT

OVERALL SITE PLAN

BELDEN BARNS
Winery and Farmstead
5550 Sonoma Mountain Road
Santa Rosa, CA 95404
AP # 049-030-010

REVISIONS	
DATE	DESCRIPTION

JOB NO. SMA 2011-014
DATE May 3, 2012
DRAWN pH CHKD SM
FILE NO. 1114-UP1
SHEET
UP1



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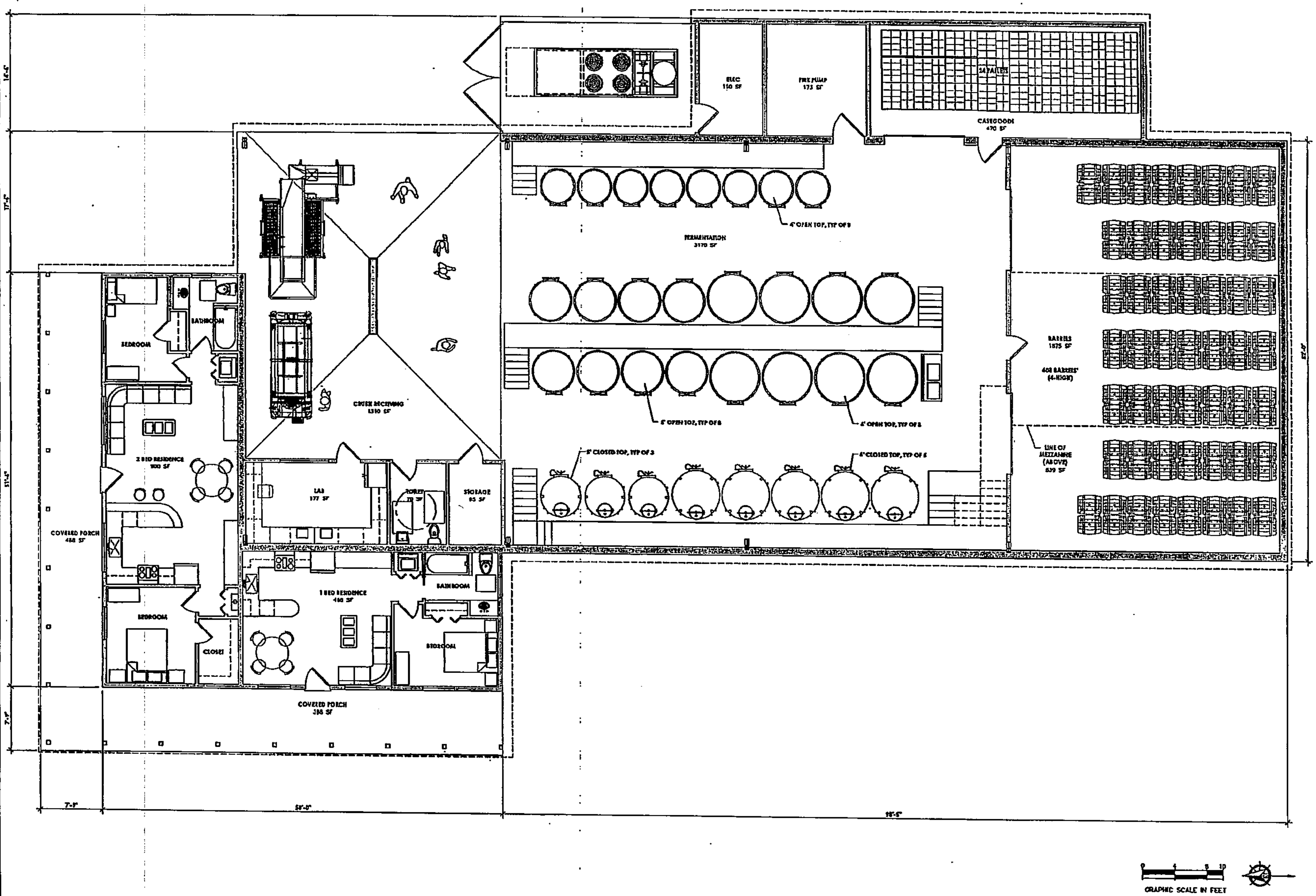
ENLARGED SITE PLAN

BELDEN BARNS
Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404
AP # 049-030-010

REVISIONS	
DATE	DESCRIPTION

JOB NO. SMA 2011-014
DATE May 5, 2012
DRAWN CM CHKD SM
FILE NO. 1114-UP1
SHEET
UP2



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USE PERMIT

PROPOSED WINERY /
AG EMPLOYEE UNITS
FLOOR PLAN

BELDEN BARNS
Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404
AP # 049-030-010

REVISIONS

	DATE	DESCRIPTION

JOB NO. SMA 2011-014

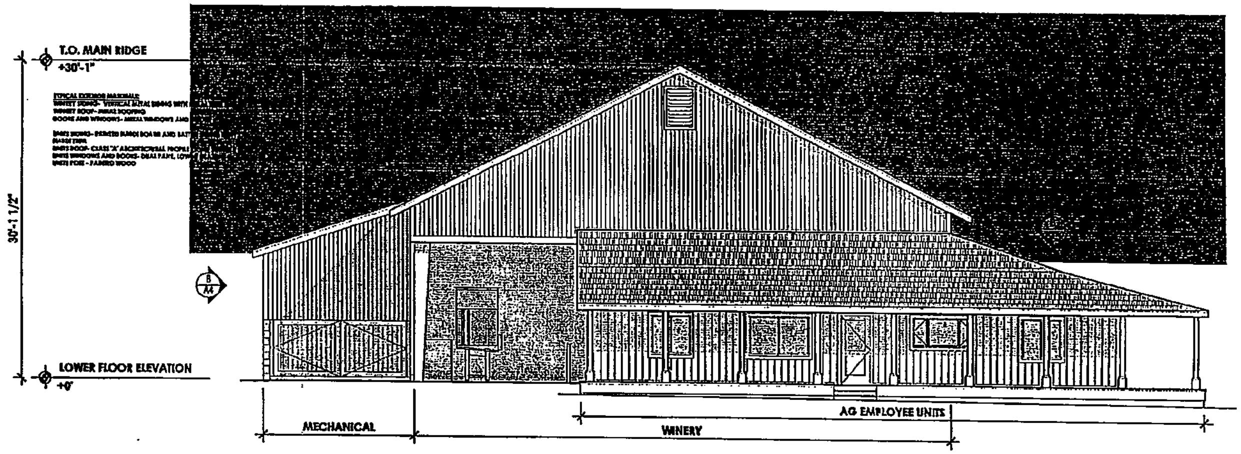
DATE May 5, 2012

DRAWN cW CHECKED SM

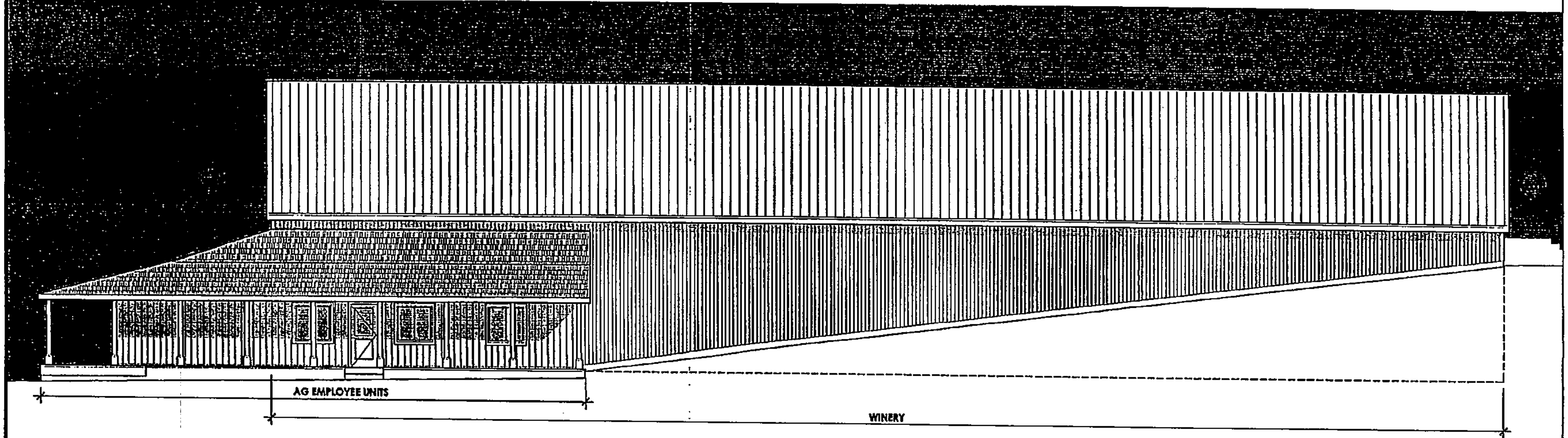
FILE NO. 1114-A1-UP

SHEET

A1



(A) FRONT ELEVATION (NORTH)



(B) SIDE ELEVATION (WEST)

SCALE: 3/16"=1'-0"

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USE PERMIT

PROPOSED WINERY/
AG EMPLOYEE UNITS
EXTERIOR ELEVATIONS

BELDEN BARNS
Winery and Farmstead
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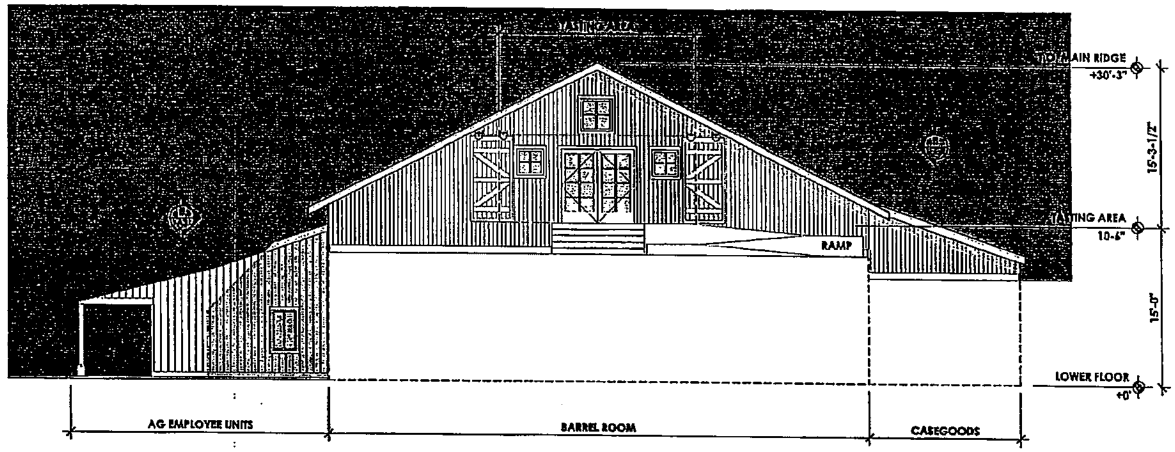
Santa Rosa, CA 95404
AP # 049-030-010

REVISIONS

	DATE	DESCRIPTION

JOB NO. SMA 2011-014
DATE May 5, 2012
DRAWN CH CHECKED SM
FILE NO. 1114-A2-3-UP
SHEET

A2



(A) REAR ELEVATION (SOUTH)
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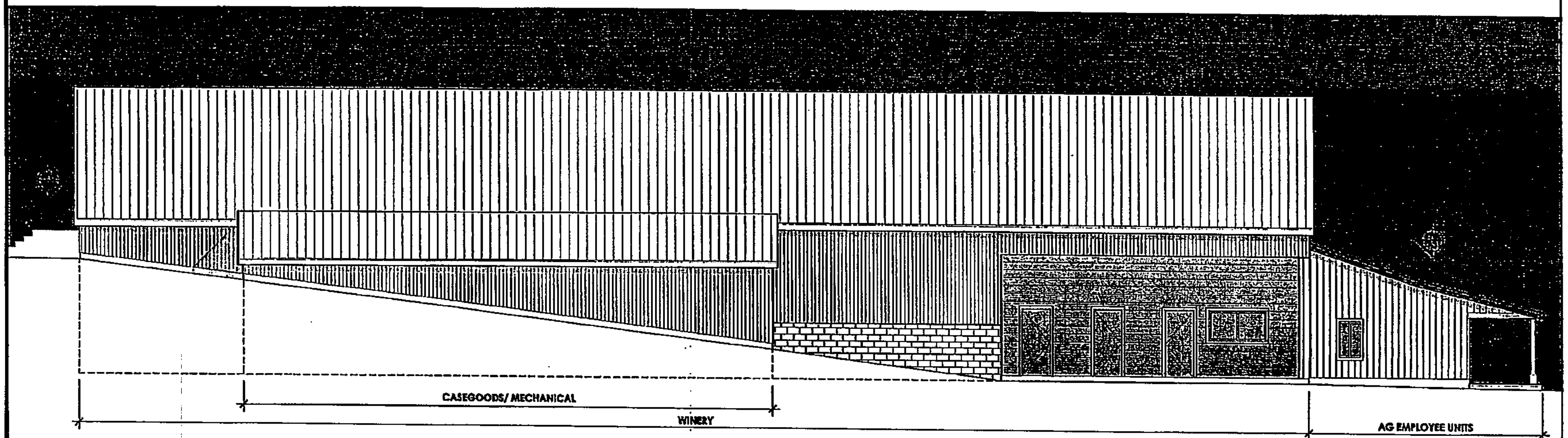

(B) SIDE ELEVATION (EAST)
SCALE: 3/16"=1'-0"

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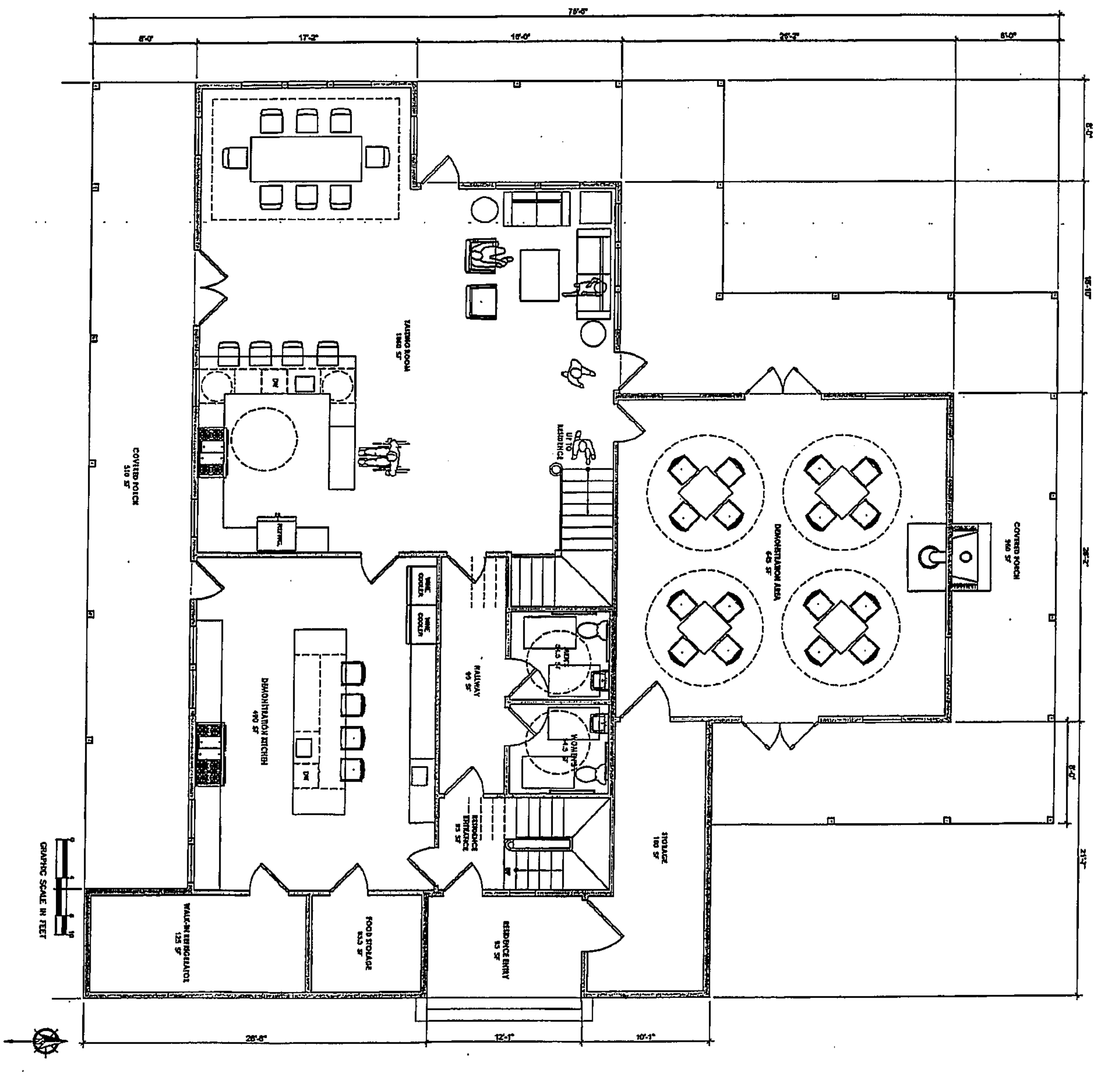
USE PERMIT
PROPOSED WINERY/
AG EMPLOYEE UNITS
EXTERIOR ELEVATIONS

BELDEN BARNS
Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404
AP # 049-030-010

REVISIONS	
DATE	DESCRIPTION

JOB NO. SMA 2011-014
DATE May 5, 2012
DRAWN cM CHECKED SM
FILE NO. 1114-A2-3-UP
SHEET
A3



BELDEN BARNS
Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404
AP # 049-030-010

USE PERMIT

PROPOSED HOSPITALITY/
RESIDENCE BUILDING
FLOOR PLAN

REVISIONS	
DATE	DESCRIPTION

JOB NO. SMA 2011-014
DATE May 5, 2012
SHEET

A4

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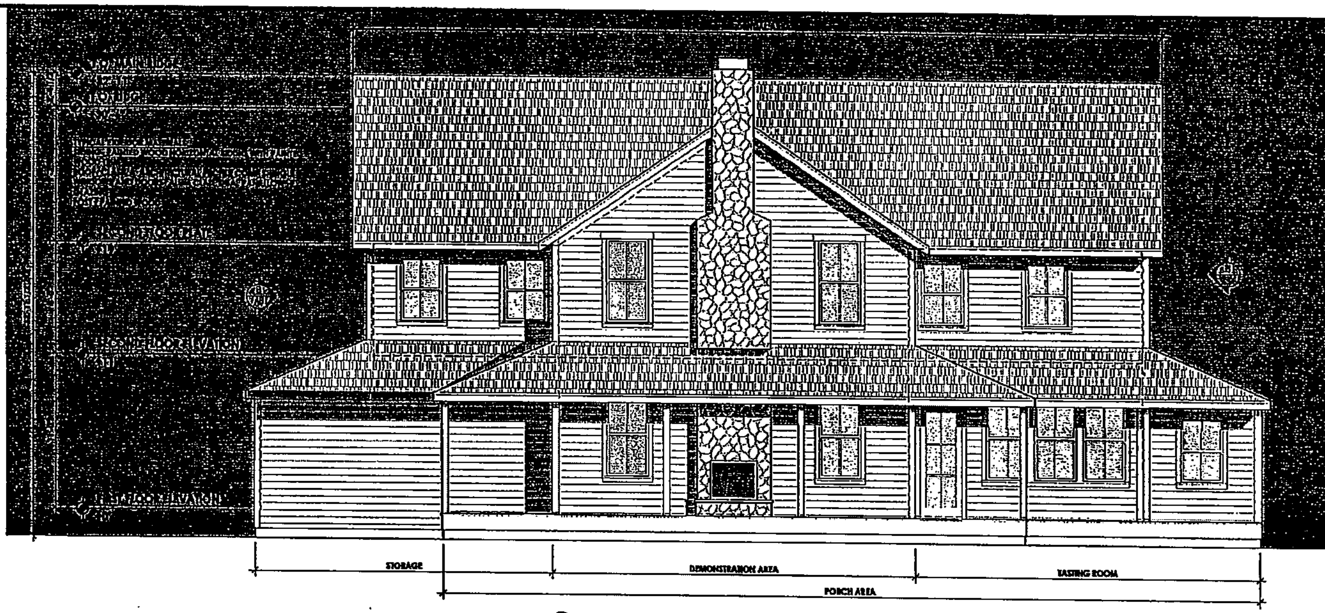

(A) FRONT ELEVATION (NORTH)

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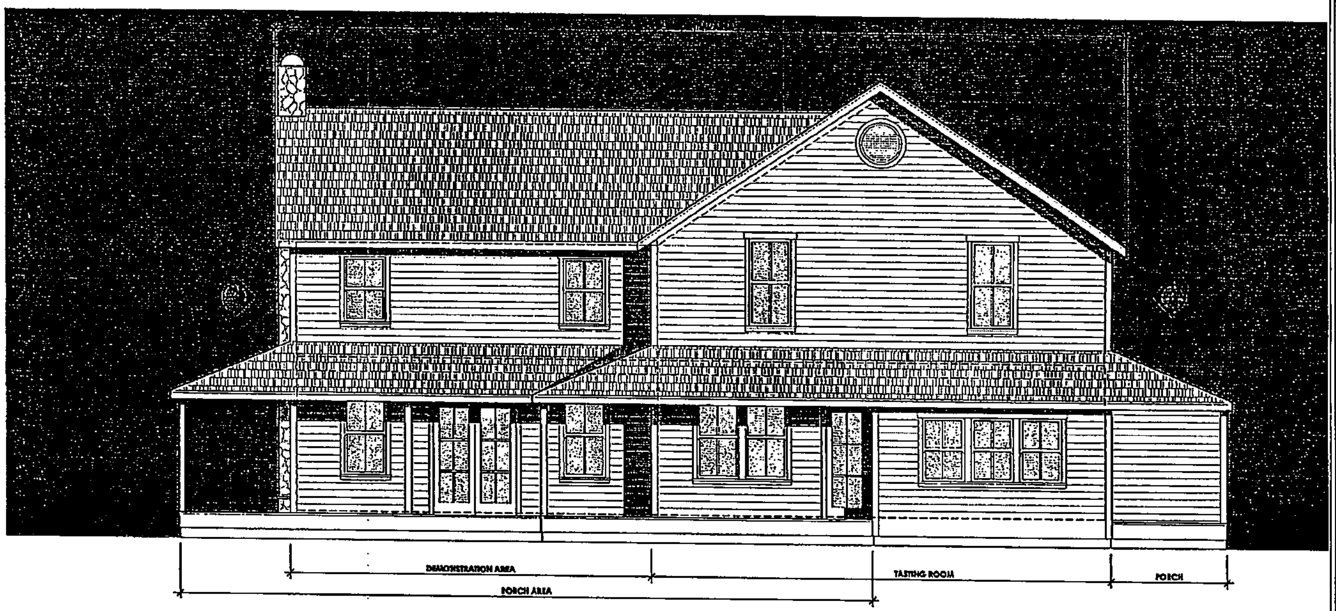

(B) SIDE ELEVATION (WEST)

SCALE: 1/4"=1'-0"

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AP # 049-030-010

REVISIONS	
DATE	DESCRIPTION

JOB NO. SMA 2011-014
DATE May 5, 2012
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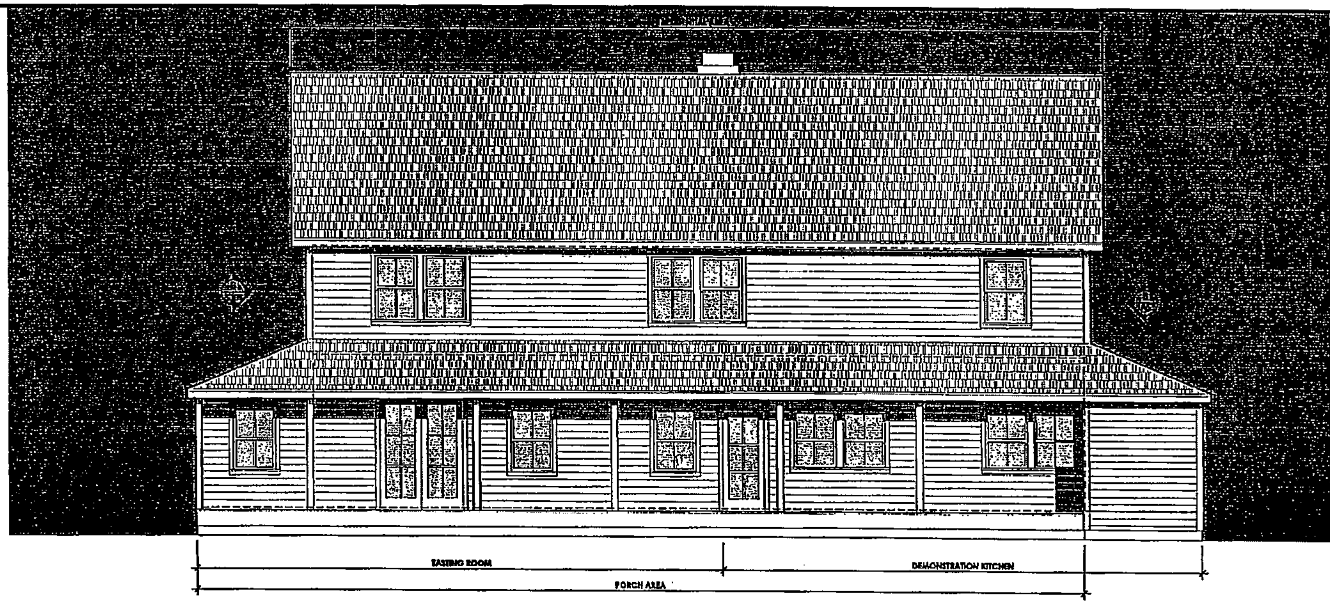
FILE NO. 1114-A5-E-UP
SHEET
A5



Ⓐ REAR ELEVATION (SOUTH)

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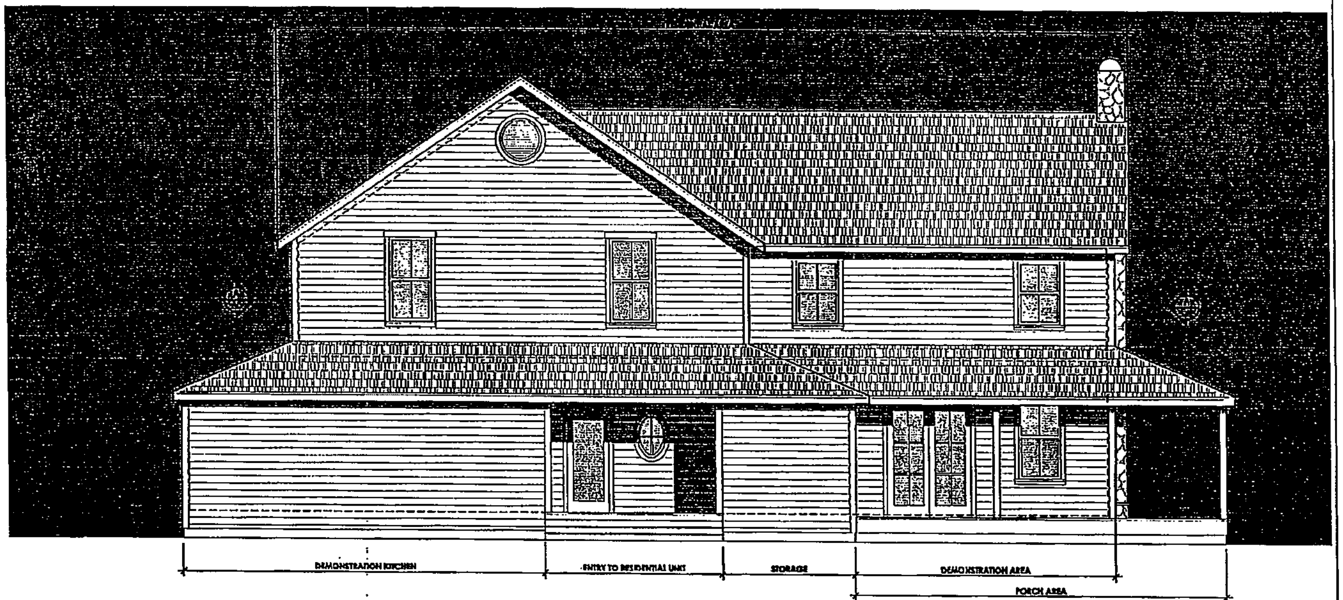

Ⓑ SIDE ELEVATION (EAST)

SCALE: 1/4"=1'-0"

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PROPOSED HOSPITALITY/
RESIDENCE BUILDING
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BELDEN BARNS
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REVISIONS	
DATE	DESCRIPTION

JOB NO. SMA 2011-014
DATE May 5, 2012
DRAWN SM CHECKED SM
FILE NO. 1114-A5-0-UP
SHEET

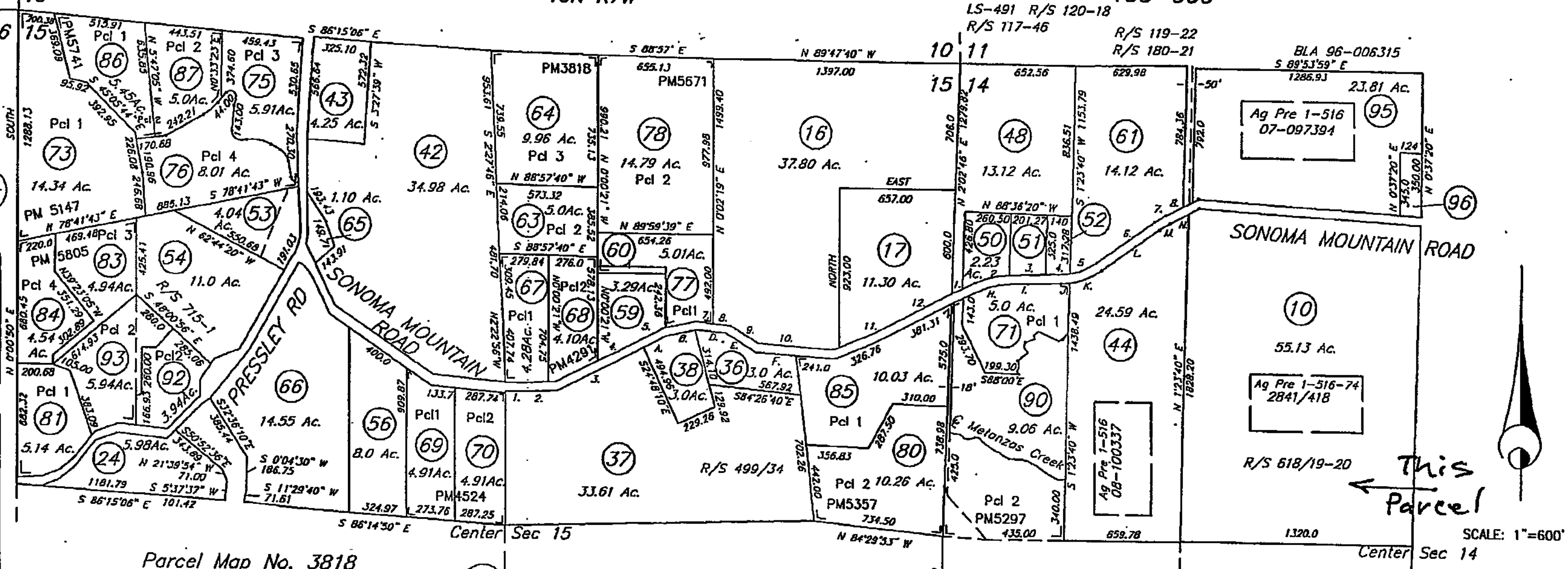
A6

COUNTY ASSESSOR'S PARCEL MAP

T6N R7W

TAX RATE AREA 153-000

49-03



N. Line Sonoma Road		
1	S64°58'W	150.16
2	R=481.0	L=195.14
3	S88°12'40"W	291.72
4	R=375.0	L=54.34
5	R=375.0	L=163.37
6	S54°56'40"W	399.0
7	R=525.0	L=75.75
8	S63°12'40"W	143.46

℄ Sonoma Road		
1	N89°26'10"E	125.49
2	N87°27'10"E	166.71
3	N63°01'50"E	255.63
4	N63°01'50"E	150.29
5	S62°30'10"W	281.82
6	S78°23'40"W	178.43
7	N84°26'32"W	96.92
8	S84°37'E	156.50
9	S58°17'E	208.40
10	S85°53'E	426.50
11	N87°07'E	258.10
12	N62°50'E	488.60

S Line Sonoma Road		
A	N85°11'50"E	148.86
B	N85°11'50"E	169.09
C	N85°11'50"E	5.58
D	S81°08'30"E	205.02
E	S54°56'30"E	248.46
F	N85°12'50"E	210.91
G	N84°58'E	175.72
H	R=431.0	L=174.85
I	N88°12'40"E	291.72
J	R=425.0	L=51.47
K	R=425.0	L=195.29
L	N54°56'40"E	399.0
M	R=475.0	L=68.53
N	N65°12'40"E	143.46

Parcel Map No. 3818
REC. 07-03-73 IN BK. 193, MAPS, PGS. 37-00

Parcel Map No. 4291
REC. 02-21-74 IN BK. 203, MAPS, PGS. 46-00

Parcel Map No. 4524
REC. 09-10-74 IN BK. 213, MAPS, PGS. 17-00

Parcel Map No. 5147
REC. 10-06-76 IN BK. 240, MAPS, PGS. 02-03

Parcel Map No. 5297
REC. 10-19-76 IN BK. 240, MAPS, PGS. 29-00

Parcel Map No. 5671
REC. 05-10-77 IN BK. 251, MAPS, PGS. 13-00

Parcel Map No. 5357
REC. 09-12-77 IN BK. 258, MAPS, PGS. 03-04

Parcel Map No. 5805
REC. 11-03-77 IN BK. 260, MAPS, PGS. 16-00

Parcel Map No. 5741
REC. 08-25-78 IN BK. 274, MAPS, PGS. 03-00

NOTE: This map was prepared for Assessment purposes only and does not indicate either parcel legality or a valid building site. No liability is assumed for the accuracy of the data delineated. The acreages are based on the information supplied to the Assessor (i.e. recorded survey maps recorded deeds, prior assessment maps, etc.)

NOTE: Assessor's parcels do not necessarily constitute legal lots. To verify legal parcel status, check with the appropriate city or county community development or planning division.

REVISED
01-04-07=P/O -LSL
02-28-08=AG-KB
03-28-08=R/S-KB
02-03-09=AG-KB

Assessor's Map Bk. 049, Pg. 03
Sonoma County, Calif. (ACAD)

KEY 2-28-09 KB

SMA Steve Martin Associates, Inc.
130 South Main Street, Suite 201
Sebastopol, CA 95472
707-824-9730
707-824-9707 (fax)

606 Alamo Pintada Road #3-221
Solvang, CA 93463
805-541-9730

TRANSMITTAL

PLP 12 - 0016

Project: **Belden Barns Winery**
Project No.: 2011014

Date: June 04,2013

To: **Melinda Grosch**
County of Sonoma PRMD
2550 Ventura Avenue
Santa Rosa, CA 95401

Site:
APN# 049-030-010
5560 Sonoma Mountain Road
Santa Rosa, CA 95404

SENT VIA: ☐ **Email** ☐ **Overnight** ☐ **Regular Mail** ☒ **Drop-off**

Copies	Date	Description
1	*06/03/13*	*Biological Assessment for APN#049-030-010*

TRANSMITTED: ☐ **For approval** ☒ **For your use** ☐ **As requested** ☐ **For review & comment**

Dear Melinda,

See attached hard copy of the Biological Assessment prepared by Kjeldsen Biological Consulting.

Please call if you need anything else.

Sincerely,

Jeannie VandeWeg
Project Administrator

cc: File

Start pg 12
In Initial St.

BIOLOGICAL ASSESSMENT
Belden Barns - Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404
APN 049-030-010

Prepared
By
Kjeldsen Biological Consulting

For
Belden Barns Winery and Farmstead
Steiner Vineyard, LLC
May 24, 2013

BIOLOGICAL ASSESSMENT
Belden Barns Winery and Farmstead
5560 Sonoma Mountain Road
Sonoma County

PROJECT NAME: Belden Barns Winery and Farmstead
APN 049-030-010
5560 Sonoma Mountain Road
Santa Rosa, CA 95404
Sonoma County

PROJECT COORDINATOR: Steve Martin Associates, Inc
130 South Main St. Suite 201
Sebastopol, CA 95472

REPORT PREPARED BY: Kjeldsen Biological Consulting
923 St. Helena Ave.
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PERIOD OF SURVEY: Spring-Summer 2013

BIOLOGICAL ASSESSMENT
Belden Barns Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404

TABLE OF CONTENTS

BIOLOGICAL ASSESSMENT
Belden Barns Winery and Farmstead
5560 Sonoma Mountain Road
Sonoma County

EXECUTIVE SUMMARY

This study was conducted at the request of Belden Barns Winery and Farmstead, as background information for project permits from the Sonoma County Permit and Resource Management Department.

The project proposes the construction of a winery within an existing ranch complex (improved entrance, new winery road, improved driveway, new turnaround and parking spaces, winery building, replacement of residence, existing barn renovation and truck turnaround). The property is located southeast of the city of Santa Rosa, within the northwest edge of the USGS Glen Ellen Quadrangle, at 5560 Sonoma Mountain Road.

The purpose of this report is to identify biological resources that may be affected by the proposed project. The fieldwork studied the proposed project envelope and surrounding environment. The findings presented below are the results of fieldwork conducted in 2013 by Kjeldsen Biological Consulting:

- The project footprint is within a developed landscape that has had decades of different agricultural endeavors (the habitat of the project footprint is ruderal agricultural grassland that has been routinely disked and mowed). The proposed project site is at the old ranch headquarters that consists of residence, employee unit and agricultural barns and infrastructure;
- The project is <u>not</u> located within the designated area of the U.S.F.W.S. Sonoma California Tiger Salamander, Proposed Critical Habitat Unit 1 -Santa Rosa Plain.
- The project is not located in the designated area of the U.S.F.W.S Programmatic Biological Opinion (PBO) for the U.S. Army Corps of Engineers for Projects that May Affect Listed Plant Species on the Santa Rosa Plain;
- No habitat for special-status plant or animal species was identified on the project site. We find that it is unlikely that the proposed project would impact any of the special-status plants known for the Quadrangle or the region based on the habitat present and historic use within and associated with the project footprint;
- The proposed project will not significantly reduce habitat for any local special-status animals;
- No raptor activity or nests were observed on or near the proposed project site;
- The project footprint drains by sheet flow into an unnamed tributary of Matanzas Creek;

- A man made reservoir is near the project site. The reservoir is separated from the project;
- The project sewer system and storm water drainage will be conveyed to an engineered disposal system with in existing vineyards. There is no reason to expect any hydrologic or significant impacts to aquatic life in the watershed;
- There are no indications of the presence of Sensitive Natural Communities regulated by the California Department of Fish and Game or US Fish and Wildlife are present within or directly associated with the project footprint;
- The new access road is adjacent to an unnamed drainage with riparian vegetation. The project proposes a 30 ft setback;
- The proposed project will not substantially interfere with native wildlife species, wildlife corridors, or native wildlife nursery sites;
- The footprint of the project will not significantly contribute to habitat loss or habitat fragmentation; and
- The flora and fauna observed on and near the site are included as an Appendix.

Assessment of Impacts
The property and project site conditions are such that there is no reason to expect any impacts to special-status species on site or off site provided Best Management Practices are implemented. The primary biological concern is the protection and prevention of sediment release from the construction phase of the project. Standard Erosion control measures and BMPs will protect resource on site during and post-construction. No natural habitat will be removed or impacted by the proposed project.

Riparian vegetation along the drainage has the potential to be impacted if the proposed road or construction is proposed under the drip line of trees.

Recommendations
All project construction activities must be limited to the project footprint. Best Management Practices including silt and erosion control measures must be implemented to prevent off-site movement of sediment and dust during and post construction.

Construction fencing should be considered for installation along the edge of the new winery access road adjacent to the drainage along the buffer zone. No construction should be allowed under the canopy of the riparian zone adjacent to the proposed project. Construction fencing will ensure that no construction equipment, fill, staging or storage occurs in this area.

Project construction has the potential for disturbing raptors during breeding/bird nesting season (March 1 through July 31). A pre-construction survey of potential nesting raptor habitat within 500 feet of earthmoving activities should be conducted is construction begins during this time. Surveys should be conducted within 14 days prior to groundbreaking activities associated with road construction. If active nests are found during preconstruction surveys the project applicant should consult with the California Department of Fish and Game and obtain approval for appropriate buffers or delay construction until it is determined that all young have fledged.

BIOLOGICAL ASSESSMENT
Belden Barns Winery and Farmstead

A. PROJECT DESCRIPTION

A.1 Introduction

This study was conducted at the request of Belden Barns Winery and Farmstead, as background information for project permits from the Sonoma County Permit and Resource Management Department.

The property consists of vineyards and ranch infrastructure with landscape plantings, reservoir,agricultural grasslands and a small portion of upland oak woodlands. The project proposes improvement of existing house and infrastructure (improved entrance, new winery road, improved driveway, new turnaround and parking spaces, winery building, replacement of residence, existing barn renovation and truck turnaround.

The property is located 5560 Sonoma Mountain Road southeast of the city of Santa Rosa. The parcel is within the northwest edge of the USGS Glen Ellen Quadrangle. The surrounding land use consists of vineyards, rural residential housing, pasturelands and upland oak woodlands. Plate I provides a site and location map of the property. Plate III provides an aerial photograph of the property and Plate V presents the site plan for the project.)

A.2 Purpose

The purpose of this report is to identify biological resources that may be affected by the proposed project as listed below:

- To determine the presence of potential habitat for special-status species which would be impacted by the proposed project, including habitat types which may have the potential for supporting special-status species (target species that are known for the region, the Quadrangle and surrounding Quadrangles);
- To identify the presence of special-status plant species and assess the potential impact of the project on sensitive plants or sensitive plant habitat;
- To identify if the project will have a substantial adverse effect on Sensitive Habitats or Communities regulated by the California Department of Fish and Game;
- To identify and assess potential impacts to Federal or State protected wetlands as defined by Section 404 of the Clean Water Act; and
- To determine if the project will substantially interfere with native wildlife species, wildlife corridors, and or native wildlife nursery sites.

A.3 Definitions

Definitions related to or used in this report are attached in Appendix B.

B SURVEY METHODOLOGY

B.1 Project Scoping

The scoping for the project considered location and type of habitat and or vegetation types present on the property or associated with potential special-status plant species known for the Quadrangles, surrounding Quadrangles the County or the region. Our scoping also considered records in the most recent version of the Department of Fish and Wildlife California Natural Diversity Data Base (DFW CNDDB Rare Find-4), Biogeographic Information and Observation System Online mapping tool, and the California Native Plant Society (CNPS) Electronic Inventory of Rare or Endangered Plants. "Target" special-status species are those listed by the State, the Federal Government or the California Native Plant Society or considered threatened in the region. Our scoping is also a function of our familiarity with the local flora and fauna as well as previous projects on other properties in the area.

The California Wildlife Habitat Relationships (WHR) System (Department of Fish and Wildlife) query was run to determine through habitat what potential species could be present on the project site.

Tables II and III present DFW CNDDB Rare Find-3 species within five miles. We also considered species which are known for the nine surrounding Quadrangles, and would potentially be present based on habitat present on site.

B.2 Field Survey Methodology

Site plans and background materials for the project were provided by Steve Martin Associates, Inc. Fieldwork was conducted by walking the project footprint and the surrounding area on the property with two personnel (Chris K. Kjeldsen, and Daniel T. Kjeldsen). Our fieldwork analyzed the project site and surrounding habitat for special-status organisms or the presence of suitable habitat, which would support special-status organisms. The findings presented below are the results of fieldwork conducted on March 14, April 18, and May16, 2013 by Kjeldsen Biological Consulting.

Plants Field surveys were conducted recording and identifying all species on the site and in the near proximity. Transects through the proposed project sites were made methodically by foot. Transects were established and scrutinized to cover topographic and vegetation variations within the study area. The Intuitive Controlled approach calls for the qualified surveyor to conduct a survey of the area by walking through it and around its perimeters, and closely examining portions where target species are especially likely to occur. The open nature of the site, historic and on going agricultural practices, and small size of the proposed development footprint facilitated our field studies.

The fieldwork for identifying special-status plant species is based on our knowledge and many years of experience in conducting special-status plant species surveys in the region. Plants were identified in the field or reference material was collected, when necessary, for verification using laboratory examination with a binocular microscope and reference materials. Herbarium specimens from plants collected on the project site were made when relevant. Voucher material for selected individuals is in the possession of the authors. All plants observed (living and/or remains from last season's growth) were recorded in field notes.

Typically, blooming examples are required for identification however; it is not the only method for identifying the presence of or excluding the possibility of rare plants. Vegetative morphology and dried flower or fruit morphology, which may persist long after the blooming period, may also be used. Skeletal remains from previous season's growth can also be used for identification. Some species do not flower each year or only flower at maturity and therefore must be identified from vegetative characteristics. Algae, fungi, mosses, lichens, ferns, Lycophyta and Sphenophyta have no flowers and there are representatives from these groups that are now considered to be special-status species, which require non-blooming identification. For some plants unique features such as the aromatic oils present are key indicator. For some trees and shrubs with unique vegetative characteristics flowering is not needed for proper identification. The vegetative evaluation as a function of field experience can be used to identify species outside of the blooming period to verify or exclude the possibility of special-status plants in a study area.

Habitat is also a key characteristic for consideration of special-status species in a study area. Many special-status species are rare in nature because of their specific and often very narrow habitat or environmental requirements. Their presence is limited by specific environmental conditions such as: hydrology, microclimate, soils, nutrients, interspecific and intraspecific competition, and aspect or exposure. In some situations special-status species particularly annuals may not be present each year and in this case one has to rely on skeletal material from previous years. A site evaluation based on habitat or environmental conditions is therefore a reliable method for including or excluding the possibility of special-status species in an area.

Animals were identified in the field by their sight, sign, or call. Our field techniques consisted of surveying the area with binoculars and walking the perimeter of the project site. Existing site conditions were used to identify habitat, which could potentially support special status species. All animal life was recorded and is presented in Appendix A.

Trees were surveyed to determine whether occupied raptor nests were present within the proximity of the project site (i.e., within a minimum 500 feet of the areas to be disturbed). Surveys consisted of scanning the trees on the property (500 ft +) with binoculars searching for nest or bird activity. Our search was conducted from the property and by walking under existing trees looking for droppings or nest scatter from nests that may be present that were not observable by binoculars.

Potential bat breeding habitat was surveyed for within 200 feet of the proposed project, by looking for roosting habitat in buildings that were accessible, rock outcrops, tree crevasses, and evidence of roosting.

Aerial photos were reviewed to look at the habitat surrounding the site and the potential for wildlife movement, or wildlife corridors from adjoining properties onto or through the site.

Wetlands The project site was reviewed to determine from existing environmental conditions with a combination of vegetation, soils, and hydrologic information if seasonal wetlands were present. Wetlands were evaluated using the ACOE's three-parameter approach: Vegetation, Hydrology, and Soils. Tributaries to Waters of the US are determined by the evaluation of continuity and "ordinary high water mark".

C RESULTS / FINDINGS

Our results and findings are based on our fieldwork, literature search, and the background material available for the project.

C.1 Biological Setting

The site is located in the North Coast Range Mountains, a geographic subdivision of the larger California Floristic Province (Hickman, 1993), which is strongly influenced by the Pacific Ocean. The region is in a climate Zone "Ocean influenced Northern and Central California" characterized as an area with ocean or cold air influence. The climate of the region is characterized by hot, dry summers and cool, wet winters, with precipitation that varies regionally from less than 30 to more than 60 inches per year. This climate regime is referred to as a "Mediterranean Climate". The average annual temperature ranges from 45 to 90 degrees Fahrenheit. The variations of abiotic conditions including geology results in a high level of biological diversity per unit area.

The photographs (Figures 1 to 5) below illustrate the study site.

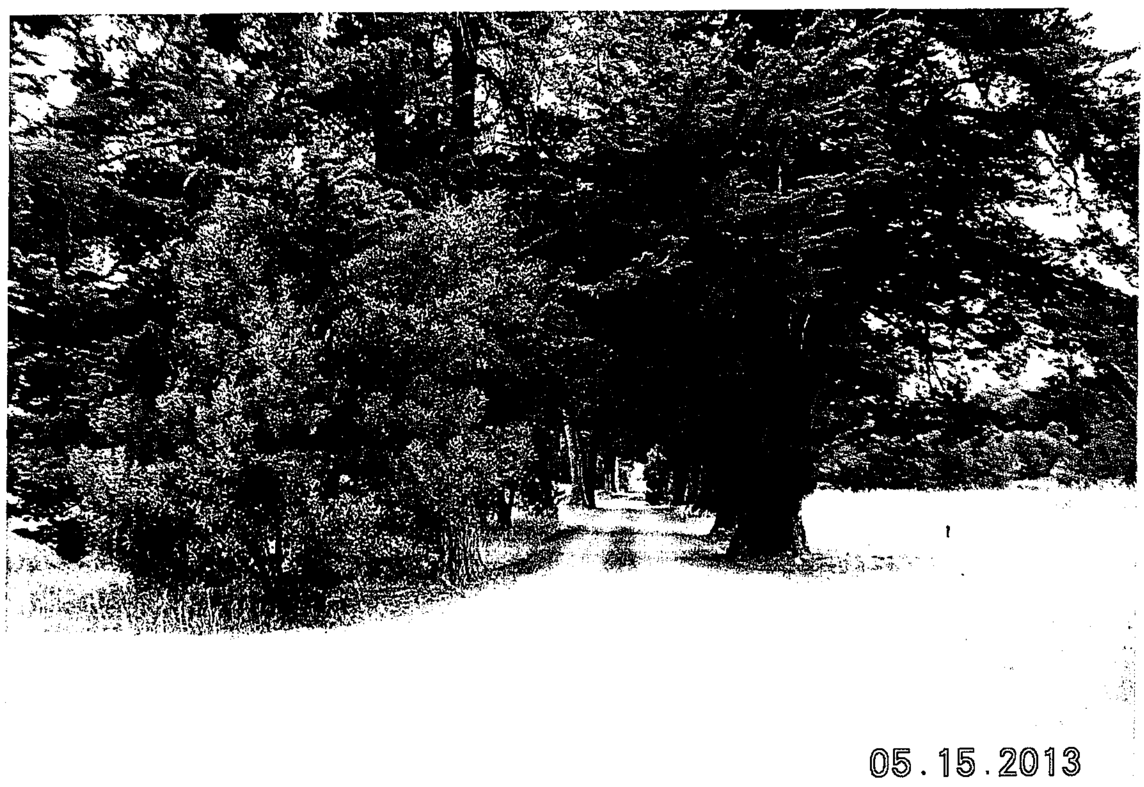

Figure 1. Existing driveway that will be improved. Planted Cypress. The view is to the north from the ranch headquarters. The new winery access road will be constructed in the ruderal grassland on the right.

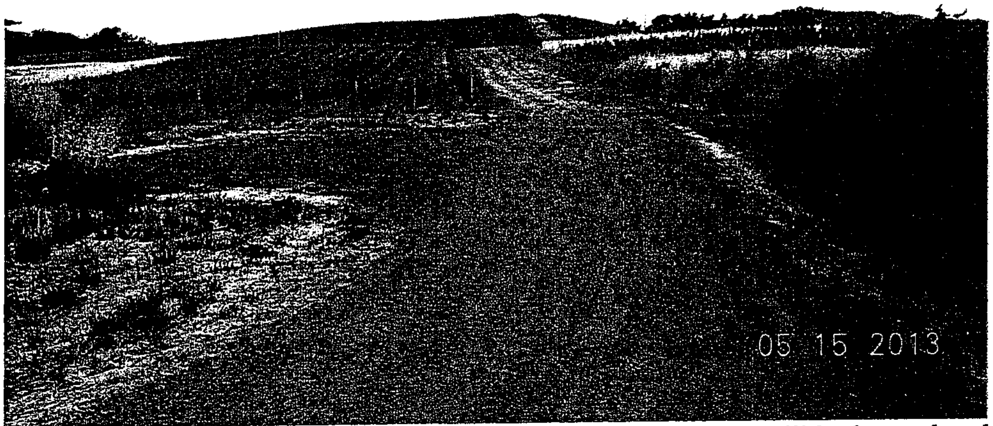

Figure 2. View to the west of the existing vineyards. The event parking will be located at the end of the existing gravel road along the vineyard access road in view.

Figure 3. Site for the proposed the new Winery Building.

Figure 4. The new winery access road will be constructed in the grasslands with a 30 ft setback from the creek with riparian vegetation on the right. View is to the north.

Figure 5. Winery location will be within the grasslands in the foreground. The buildings on the right will be renovated as well as the barn in the background.

C.2 Habitat Types Present

The vegetation of California has been considered to be a mosaic, with major changes present from one area to another, often with distinct changes within short distances. The variation in vegetation is a function of topography, geology, climate and biotic factors. It is generally convenient to refer to the vegetation associates on a site as a plant community or alliance. Biologists use habitat types or biotic communities for the plant and animals that are associated with a particular vegetation type in a region. Typically plant communities are identified or characterized by the dominant vegetation form or plant species present. There have been numerous community classification schemes proposed by different authors using different systems for the classification of vegetation. A basic premise for the designation of plant communities or associations is that in nature there are distinct plant populations occupying a site that are stable at any one time (climax community is a biotic association, that in the absence of disturbance maintains a stable assemblage over long periods of time). There is also evidence that vegetation on the site is part of a continuum without well-defined boundaries.

It is generally convenient to refer to the vegetation associates on a site as a plant community. There have been numerous plant community classification schemes proposed by different authors. There is also evidence that the vegetation in nature may part of a continuum without well-defined boundaries. For practical purposes and site descriptions plant communities/associations/alliances or habitat types are used. The 2009 Manual of California Vegetation (Sawyer) is the preferred system at present but much of the literature i.e. California Native Plant Society and CNDDB) use different systems.

The project footprint is entirely within a developed landscape that has been in agriculture use for decades. The footprint is either within or on hardscape or agricultural grasslands. The agricultural grasslands are classified according to Sawyer 2009 as Grassland Semi-Natural Herbaceous Stands with Herbaceous Layer (Annual Grasslands).

Grassland Semi-Natural Herbaceous Stands with Herbaceous Layer

Semi-Natural Herbaceous Grasslands are a result of decades of grazing and the introduction of non-native grasses and herbs. Sawyer uses the term "Semi-natural Stands to refer to non-native introduced plants that have become established and coexist with native species. Semi-natural stands are those dominated by non-native species that have become naturalized primarily as a result of historic agricultural practices and fire suppression or management practices for weed abatement and fire suppression. This includes what can be termed weeds, aliens, exotics or invasive plants in agricultural and nonagricultural settings. The Semi-natural Herbaceous Stand present within the proposed project is described below.

Avena (barbata, fatua) Semi-Natural Herbaceous Stands Wild oats grasslands. *Avena barbata* or *A. fatua* is dominant or co-dominant in the herbaceous layer. Emergent trees and shrubs may be present at low cover. Herbs <1.2 m; cover is open to continuous. Stands are present in waste places, rangelands, and openings in woodlands. The membership rules require *Avena ssp.* to be> 75% relative cover; other non-native <5% absolute cover, if present, in the herbaceous layer. *Avena* species are cool-season, annual grasses from Eurasia. These annual grasslands are common in the region.

The species observed on or near the project site are included as an attachment (Appendix A).

C.3 Special-Status Species

The flora and fauna observed during our study are presented in Appendix A.

The DFW CNDDB does not show any records of special-status species of plants or animals for the project study site.

Tables I and II below list the "target" special status plants and animals known from the near vicinity of the project site. The tables provide the habitat associated with the taxon, seasonality of plant species and justification for concluding absence on the project site. Several species are associated with habitat present on portions of the site as noted in the table. Our scoping as presented above also includes the species shown in Appendix C.

The project is not located in the designated area of the U.S.F.W.S. Programmatic Biological Opinion (PBO) for the U.S. Army Corps of Engineers for Projects that May the Three Endangered Plant Species on the Santa Rosa Plain (Map provided by the U.S. Fish and Wildlife Service July 21, 2005). There are no wetlands, vernal pools, or seasonal drainages associated with the proposed project, and no habitat which would contain topographic, hydrologic, and geographic conditions of suitable habitat.

Plants

Table I. Analysis of potential "target" special-status plant species. The taxa included in the table are selected based on the DFW CNDDB Rare Find 3 records for species known to occur within five miles of the project site (Plate II).

Scientific Name Common Name	Habitat Type or Plant Alliance	Habitat Present On Site	Flower Period	Species Observed	Justification for Concluding Absence on Project Site
Allium peninsulare var. *franciscanum* Franciscan Onion	Cismontane woodland, Valley and Foothill Grassland/Clay often Serpentinite.	No	May-June	No	Absence of requisite edaphic conditions. Historic agricultural use precludes presence.
Alopercus aequalis var. *sonomensis* Sonoma Alopercus	Marshes and Swamps	No	May-July	No	Absence of requisite mesic habitat or substrate on project site.
Amorpha californica var. *napensis* Napa False Indigo	Cismontane Woodland	No	April-July	No	Absence of typical habitat and vegetation associates.
Balsamorhiza macrolepis var. macrolepis Big-scale Balsamroot	Chaparral, Cismontane Woodland, Valley and Foothill Grassland	No	March-June	No	Historic use of site precludes presence.

Scientific Name Common Name	Habitat Type or Plant Alliance	Habitat Present On Site	Flower Period	Species Observed	Justification for Concluding Absence on Project Site
Blennosperma bakeri Sonoma Sunshine	Valley and Foothill Grassland, Vernal Pools	No	March-May	No	Absence of requisite mesic habitat.
Brodiaea leptandra Narrow-anthered California Brodiaea	Broadleaved Upland Forest, Chaparral	No	May-July	No	Requisite microhabitat, edaphic requirements, native vegetation associates not present.
Ceanothus divergens Calistoga Ceanothus	Chaparral, Serpentinite or Volcanic-Rocky.	No	May-Sep.	No	Absence of typical habitat and vegetation associates.
Ceanothus sonomensis Sonoma Ceanothus	Chaparral, Serpentinite or rocky Volcanic	No	Feb.-March	No	Absence of typical habitat and vegetation associates.
Centromadia parryi ssp. *parryi* Pappose Tarplant	Grassland salt or alkaline marshes	No	March-June	No	Requisite mesic conditions absent.
Downingia pusilla Dwarf Downingia	Wetlands	No	March -May	No	Absence of requisite mesic habitat or substrate on project site precludes presence.
Fritillaria liliacea Fragrant Fritillary	Open Grasslands	No	Feb.-April	No	Historic agricultural use precludes presence
Legenere limosa Legenere	Vernal Pools	No	April-June	No	Absence of requisite mesic habitat.
Leptosiphon jepsonii Jepson's Leptosiphon	Chaparral, Cismontane Woodland, Valley and Foothill Grassland.	No	April-May	No	Requisite habitat absent on the site. Absence of requisite mesic habitat.
Navarretia leucocephala ssp. *bakeri* Baker's Navarretia	Meadows and Seeps Cismontane Woodland, Valley Foothill Grassland, Vernal Pools	No	May-July	No	Absence of typical habitat and vegetation associates.
Pleuropogon hooverianus North Coast Semaphore Grass	Broadleaved Upland Forest, meadows and seeps, marshes and swamps	No	May-Aug.	No	Mesic habitat not present on project site.

Scientific Name Common Name	Habitat Type or Plant Alliance	Habitat Present On Site	Flower Period	Species Observed	Justification for Concluding Absence on Project Site
Sidalcea oregana ssp. *valida* Kenwood Marsh Checkerbloom	Meadows and seeps, Riparian scrub mesic	No	June-Aug.	No	Requisite mesic habitat absent.
Trifolium amoenum Showy Rancheria Clover Two-fork Clover	Valley and Foothill Grassland	No	April-June	No	Historical use of the site precludes presence. This species is vulnerable to livestock grazing.
Trifolium hydrophilum Saline Clover	Marshes and Swamps Grassland	No	April-June	No	Absence of mesic habitat required for presence.
Viburnum ellipticum Oval-leaved Viburnum	Chaparral, Cismontane Woodland, Lower Coniferous Forest	No	May-June	No	Requisite habitat absent on the site or in the immediate vicinity.

The only special-status plant that is close to the project (approximately 1 mile west) is the North Coast Semaphore Grass. This grass is found in wetlands (meadows and seeps, marshes and swamps) which are not present on or near the project site. The project site is located within developed landscape or within ruderal semi-natural grassland. Special-status plant species associated with native grasslands are reasonably precluded from presence as a result of historic use of the area.

We found no evidence for the presence of the above referenced special-status species or any other special-status species known for the region. Based on habitat present associated with the proposed project, historic use, and vegetation observed on or near the project footprint we conclude that it is unlikely that any of the species shown in the table above, or known for the region, would be present, or have the potential to occurred on the project site.

The Valley and Foothill Grassland as per CNPS classification on the project site has been disturbed as a result of past agricultural uses. As shown above the Sawyer Classification considers the site to be Semi-natural grassland herbaceous alliance. There were no indications of undisturbed (non-invaded with European weed species) native grasslands present.

It is unlikely that proposed project would have a substantial impact to special-status plant species, either directly or through habitat modifications based on the lack of habitat required for their presence and the historical use of the project site.

Animals

Plate II illustrates the records of special-status animal species, which are present within a five-mile radius of the study site. There are no records of special-status animals for the project site. Table II below provides information and findings relating to the special-status animals within the vicinity of the project site.

Table II. Analysis of special-status animals for the area. The taxa included in the table are selected based on DFW CNDDB records within five miles of the project (Appendix B, C, and Plate II).

Scientific Name Common Name	**Species Habitat**	**Habitat Present On the Project Site**	**Obs. on or Near Project Site**	**Justification for Concluding Absence on Project Site**
Agelaius tricolor Tricolored Blackbird	Tule Marshes	No	No	Lack of habitat.
Ambystoma californiense California Tiger Salamander	Ephemeral Breeding pools with upland oak woodlands for estivation	No	No	Project is not within known range. No potential habitat on site.
Antrozous pallidus Pallid Bat	Roosts in Caves, buildings, woodlands, arid regions	No	No	No rock outcrops, bridges, large mature trees, or riparian vegetation removed by project. No signs of significant bat activity observed.
Athene cunicularia Burrowing Owl	Low lying grasslands	No	No	Lack of habitat. Species not observed.
Caecidotea tomalensis Tomales Isopod	Aquatic	No	No	Lack of suitable habitat. No aquatic habitat impacted.
Coccyzus americanus occidentalis Western Yellow-billed Cuckoo	Riparian Forest and Woodlands along Permanent Streams	No	No	Requisite habitat absent. Not associated with Project. Drainage is intermittent.
Emys marmorata Western Pond Turtle	Slow moving water or ponds	No	No	Reservoir on property contains potential habitat. Distance (Approx. 800 feet) precluded presence on project site. Species was not observed.
Hydrochara rickseckeri Ricksecker's Water Scavenger Beetle	Shallow Water, creeks ponds	No	No	Requisite aquatic habitat absent. Drainage is intermittent.
Hydroporus leechi Leech's Skyline Diving Beetle	Ponds	No	No	Requisite aquatic habitat absent. Drainage is intermittent.

Scientific Name Common Name	Species Habitat	Habitat Present On the Project Site	Obs. on or Near Project Site	Justification for Concluding Absence on Project Site
Oncorhynchus mykiss irideus Steelhead-central California Coast	Aquatic	No	No	Lack of aquatic habitat.
Rana boylii Foothill Yellow-legged Frog	Streams with pools	No	No	Lack of habitat precludes presence.
Rana draytonii California Red-legged Frog	Creeks, Rivers, Permanent flowing water.	No	No	Lack of habitat on project site. (Approx. 800 feet from potential habitat)
Syncaris pacifica California Freshwater Shrimp	Creeks and Estuaries below 300 ft.	No	No	Requisite habitat required for presence lacking.

Species with potential for presence near the project site are addressed below.

The project is not located within the designated area of the U.S.F.W.S. Sonoma California Tiger Salamander, Proposed Critical Habitat. Unit 1 -Santa Rosa Plain.

Western Pond Turtle *(Emys marmorata)*. The western pond turtle is found throughout California and is listed by the State as a Species of Concern. It does not have Federal status. Suitable habitat consists of any permanent or nearly permanent body of water or slow moving stream with suitable refuge, basking sites and nesting sites. Refuge sites include partially submerged logs or rocks or mats of floating vegetation. Basking sites can be partially submerged rocks or logs, as well as shallow-sloping banks with little or no cover. Nesting occurs in sandy banks or in soils up to 100 meters away from aquatic habitat. The existing reservoir is not associated with the project and is approximately 800 feet form project activities. It was surveyed for pond turtles and we found no evidence for presence. If western pond turtle were present in the reservoir it is unlikely that they would move into or use habitat which will be impacted by the proposed project.

California Red-legged Frog *(Rana draytonii)* The California red-legged frog inhabits permanent or nearly permanent water sources (quiet streams, marshes, and reservoirs). They are highly aquatic and prefer shorelines with extensive vegetation. There are two recorded occurrences DFW CNDDB within 5- miles of the property. The closest is approximately 1.5 miles to the south and 2 miles to the north. The reservoir on the property contains limited habitat for this species. The unnamed drainage on the east side of the property is seasonal which reasonably precludes presence of this species. The reservoir contains bullfrogs and has year round water. These two factors do not eliminate the possibility for the occurrence but significantly reduce the potential for survival of this species. The project site is not near the reservoir and does not contain habitat which would support this species. If frogs were present is would be unlikely that they would move into or use habitat which will be impacted by the proposed project. No aquatic or upland habitat for this species will be impacted by the proposed project. We find that project will not have any adverse effects on California red-legged frogs should they be in the area.

Bats Any structure may support roosting bats or temporary roosts, no evidence of the presence of bats was found in the buildings on the property. Removal or remodeling of existing ranch buildings will not significantly impact roosting bats.

Pallid Bat (*Antrozous pallidus*): The Pallid Bat occupies a wide variety of habitats, such as grasslands, shrublands, and forested areas of oak and pine, but prefer rocky outcrops. The pallid bat roosts in caves, mines, crevices, and occasionally in hollow trees or buildings. They forage over open country. The large barn on the property is very open with large bay boors and therefore does not contain suitable roosting habitat. No roosts or evidence of their presence was observed during our field survey. The CNDDB lists a sighting of the bat approximately 2 miles east of project. The proposed project will not have a significant impact on this species.

Based on habitat associated with the proposed project site we conclude that it is unlikely that any of the species shown in the table above, or others known for the region, would occur on the site given history of disturbance, and lack of proper hydrology/topography. It is unlikely that the project would negatively impact special-status animals or have any significant habitat loss for special-status animal species.

C.4 Discussion of Sensitive Habitat Types

The sensitive habitat types identified by the DFW CNDDB for the quadrangles and surrounding quadrangles are the following; Coastal and Valley Freshwater Marsh, Northern Vernal Pool and Valley Needle Grass Grassland. The above referenced habitat types are not present on the project site. See Plate IV for the location of Biological Resources associated with the property.

• Riparian Vegetation

Riparian habitat and vegetation are by all standards considered sensitive. Riparian Vegetation functions to control water temperature, regulate nutrient supply (biofilters), bank stabilization, rate of runoff, wildlife habitat (shelter and food), release of allochthonous material, release of woody debris which functions as habitat and slow nutrient release, and protection for aquatic organisms. Riparian vegetation is also a moderator of water temperature has a cascade effect in that it relates to oxygen availability.

The proposed project does not include any removal of riparian vegetation. The riparian vegetation along the unnamed drainage on the east side of the property should be protected and avoided.

• Seasonal Wetland

Seasonal wetland generally denotes areas where the soil is seasonally saturated and/or inundated by fresh water for a significant portion of the wet season, and then seasonally dries during the dry season. To be classified as "Wetland," the duration of saturation and/or inundation must be long enough to cause the soils and vegetation to become altered and adapted to the wetland conditions. Varying degrees of pooling or ponding, and saturation will produce different edaphic and vegetative responses. These soil and vegetative clues, as well as hydrological features, are used to define the wetland type. Seasonal wetlands typically take the form of shallow depressions and swales that may be intermixed with a variety of upland habitat types. Seasonal wetlands fall under the jurisdiction of the U.S. Army Corps of Engineers.

There are no seasonal wetlands associated with the footprint of the proposed project.

• "Waters of the State"

"Waters of the State" include drainages which are characterized by the presence of definable bed and bank that meet ACOE, and RWQCB definitions and or jurisdiction. Any discharge of storm water into "Waters of the State" will require ACOE, DFW, and RWQCB permits. The project as designed will handle all storm water on-site.

The present conditions show that the project footprint drains by sheet flow into an unnamed tributary of Matanzas Creek. This is seasonal drainage on the east side of the property that conveys storm water to a roadside ditch thence Matanzas Creek which is part of the Russian River water shed.

Any impact to the bed and or bank of this drainage will require agency consultation and permits from the California Department of Fish and Wildlife, U.S. Army Corps of Engineers, and Regional Water Quality Control Boards for impacts to "Waters of the State".

The project as proposed will not impact any "Waters of the State."

• Migratory Corridors or Habitat Links

Wildlife Corridors are natural areas interspersed within developed areas that are important for animal movement, increasing genetic variation in plant and animal populations, reduction of population fluctuations, retention of predators of agricultural pests and for movement of wildlife and plant populations. Wildlife corridors have been demonstrated to not only increase the range of vertebrates including avifauna between patches of habitat but also facilitate two key plant-animal interactions: pollination and seed dispersal. Corridors and also preserve watershed connectivity. Corridor users can be grouped into two types: passage species and corridor dwellers. The data from various studies indicate that wildlife corridors should be a minimum of 100 feet wide to provide adequate movement for passage species and corridor dwellers in the landscape.

The project will not negatively impact any migratory corridor or interrupt habitat linkage.

• Trees

The project footprint is within a developed landscape or ruderal grasslands. No trees are proposed to be removed along the entrance road.

One small native oak trees will be impacted by the proposed project.

• Vernal Pools

Vernal pools are a type of seasonal wetland distinct for California and the western US. Typically they are associated with seasonal rainfall or "Mediterranean climate" and have a distinct flora and fauna, an impermeable or slowly permeable substrate and contain standing water for a portion of the year. They are characterized by a variable aquatic and dry regime with standing water during the spring plant growth regime. They have a high degree of endemism of flora and fauna.

The project is not associated with any vernal pools.

• Nesting or Breeding Habitat, or Unique Plant Distributions or Populations
Wildlife and bird nesting and breeding habitat as well as unique plant distributions or populations are protected and must be considered. Disruption or loss may require mitigation. The eucalyptus trees along Sonoma Mountain Road have the potential to support raptor nesting.

No nesting raptors were observed within the study area. We found no unique animal or plant populations associated with the project.

D. POTENTIAL BIOLOGICAL IMPACTS

The project footprint is within a developed landscape or routinely disturbed agricultural lands, and as such will not significantly contribute to habitat loss or habitat fragmentation.

D.1 Analysis of Potential Impacts to Special-status Species

The habitat impacted by the proposed project is such that there is little reason to expect impacts to special-status species on-site or off-site. Any potential off-site impacts will be less than significant with the use of standard erosion control measures and construction best management practices.

There is no reason to expect any significant negative impacts to special-status species, or locally significant biological resources by the proposed project.

D.2 Analysis of Potential Impacts on Sensitive Habitat

The sensitive habitat types identified in the DFW CNDDB are not present or associated with the property.

The primary concern is the avoidance and protection of the riparian corridor and seasonal drainage on the east side of the property, which is a local biological resource. Construction equipment or grading underneath the canopy of trees has the potential to damage or kill the tree.

The 30-foot buffer zone setback and installation of construction fencing along the drip line during the construction phase of the project will protect this resource.

The project will not significantly impact any nesting or breeding habitats for wildlife in the area if recommendations stated below are followed. The project will not impact any potential seasonal wetlands, riparian habitat, or vernal pools.

D.3 Potential Off-site Impacts

There will be no significant off-site impacts to biological resources that are known for the region. Any off-site impacts will be less than significant provided best management and erosion control practices are followed.

D.4 Potential Cumulative Impacts

On a local or regional scale it is anticipated that any cumulative effects will be negligible or un-quantifiable. The project footprint is within previously disturbed sites, and will not significantly contribute to habitat loss or habitat fragmentation. There is no reason to expect any species exclusion, isolation or extinction. There are no potential significant impacts to migratory corridors or wildlife nursery sites associated with the proposed project.

E. RECOMMENDATIONS TO AVOID IMPACTS

E.1 Significance

The significance of potential impacts is a function of the scope and scale of the proposed project within the existing Federal, State and Local regulations and management practices. The determination of significance of impacts to biological resources consists of an understanding of the project as proposed and an evaluation of the context in which the impact may occur. The extent and degree of any impact on-site or off–site must be evaluated consistent with known or expected site conditions. Therefore, the significance of potential impacts is assessed relevant to a site-specific scale and the larger regional context.

The project's effect on onsite or regional biological resources is considered to be significant if the project results in:

- Alteration of unique characteristics of the area, such as sensitive plant communities and habitats (i.e. serpentine habitat, wetlands, riparian habitat);
- Adverse impacts to special-status plant and animal species;
- Adverse impacts to important or vulnerable resources as determined by scientific opinion or resource agency concerns (i.e. sensitive biotic communities, special status habitats; e.g. wetlands);
- Loss of critical breeding, feeding or roosting habitat; and
- Interference with migratory routes or habitat connectivity.

E.2 Recommendations

All project construction activities must be limited to the project footprint. Best Management Practices including silt and erosion control measures must be implemented to prevent off-site movement of sediment and dust during and post construction.

Construction fencing should be considered for installation along the edge of the new winery access road adjacent to the drainage along the buffer zone. No construction should be allowed under the canopy of the riparian zone adjacent to the proposed project. Construction fencing will ensure that no construction equipment, fill, staging or storage occurs in this area.

Project construction has the potential for disturbing raptors during breeding/bird nesting season (March 1 through July 31). A pre-construction survey of potential nesting raptor habitat within 500 feet of earthmoving activities should be conducted is construction begins during this time. Surveys should be conducted within 14 days prior to groundbreaking activities associated with road construction. If active nests are found during preconstruction surveys the project applicant should consult with the California Department of Fish and Game and obtain approval for appropriate buffers or delay construction until it is determined that all young have fledged.

F. SUMMARY

Our floristic survey did not identify any evidence for or reason to believe that special-status species known for the Quadrangle, surrounding Quadrangles, the property, or the region would be impacted by the project. The proposed project site does not contain vegetation associates, habitat or edaphic conditions, which would support special-status species.

We find that the project will not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.

With the project avoiding any construction or grading beneath the canopy of the riparian vegetation along the drainage on the east side of the project, we find that the project will not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFW or USFWS.

We find that the project will not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means.

We find that the project will not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The project site does not contain any unique habitat, or unique plant or animal populations.

We find that the project will not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances.

We conclude that the proposed project with the implementation of Best Management Practices and recommendations presented above will not result in any potentially significant adverse biological impacts to the environment on site or off site.

Should you have any questions, please do not hesitate to contact us at:

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Fax (707) 575-8030
Email kjeldsen@sonic.net

Kjeldsen Biological Consulting

G. LITERATURE CITED / REFERENCES

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G.2 Names and Qualifications of Field Investigators.

Chris K. Kjeldsen, Ph.D., Botany, Oregon State University, Corvallis, Oregon. He has over thirty-five years of professional experience in the study of California flora. He was a member of the Sonoma County Planning Commission and Board of Zoning (1972 to 1976). He has over thirty years of experience in managing and conducting environmental projects involving impact assessment and preparation of compliance documents, Biological Assessments, DFW Habitat Assessments, DFW SB 34 Mitigation projects, COE Mitigation projects and State Parks and Recreation Biological Resource Studies. Experience includes conducting special-status species surveys, jurisdictional wetland delineations, general biological surveys, 404 and 1601-1603 permitting, and consulting on various projects. A full resume is available upon request. He has a valid DFW collecting permit.

Daniel T. Kjeldsen, B. S., Natural Resource Management, California Polytechnic State University, San Luis Obispo, California. He spent 1994 to 1996 in the Peace Corps managing natural resources in Honduras, Central America. His work for the Peace Corps in Central America focused on watershed inventory, mapping and the development and implementation of a protection plan. He has over ten years of experience in conducting Biological Assessments, DFW Habitat Assessments, ACOE wetland delineations, wetland rehabilitation, and development of and implementation of mitigation projects and mitigation monitoring. He has received 3.2 continuing education units MCLE 27 hours in Determining Federal Wetlands Jurisdiction from the University of California Berkeley Extension. Attended Wildlife Society Workshop Falconiformes of Northern California Natural History and Management California Tiger Salamander 2003, Natural History and Management of Bats Symposium 2005, Western Pond Turtle Workshop 2007, and Western Section Bat Workshop 2011. Laguna Foundation & The Wildlife Project Rare Pond Species Survey Techniques 2009. A full resume is available upon request.

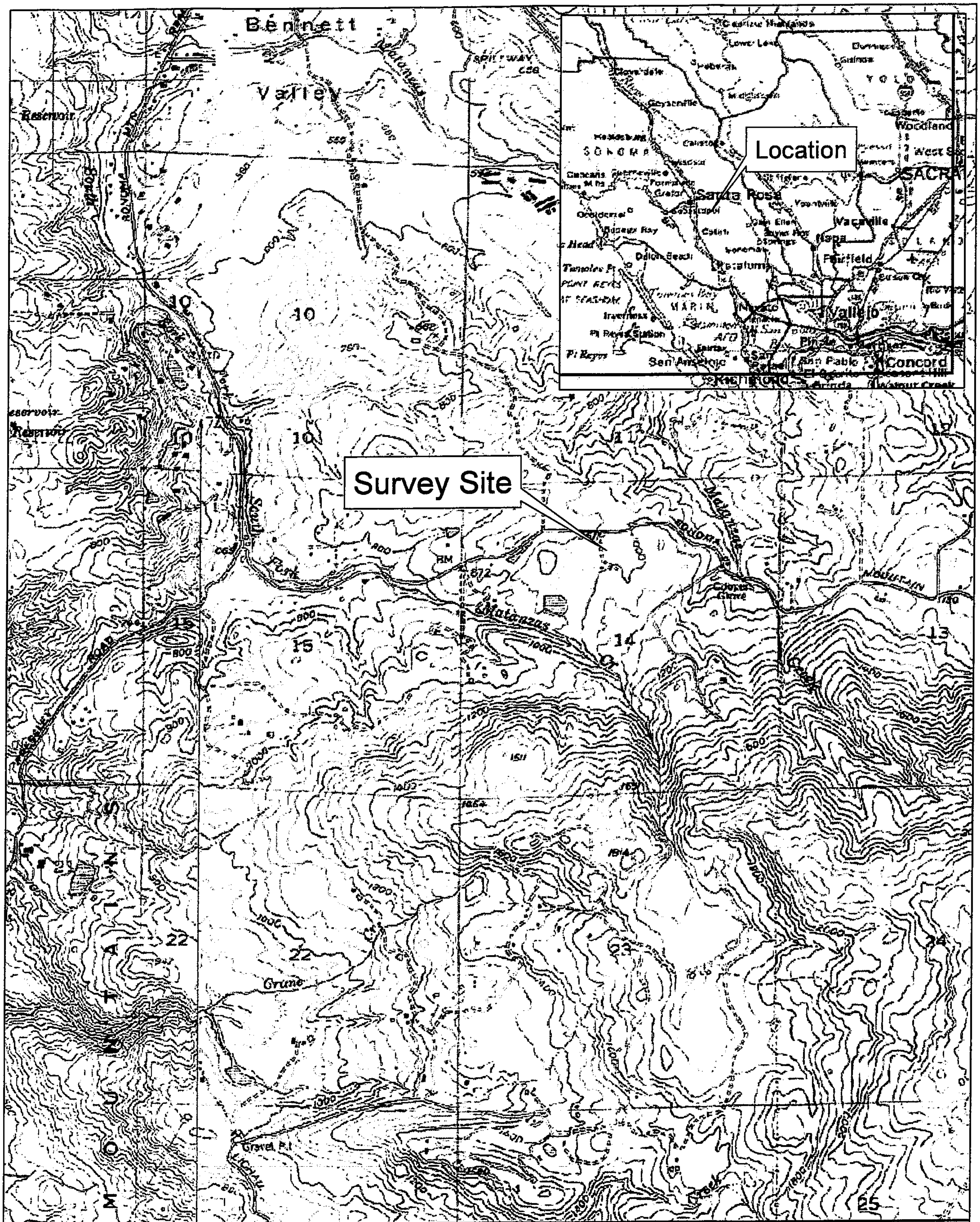

Plate I. Site / Location Map (Glen Ellen Quadrangle)

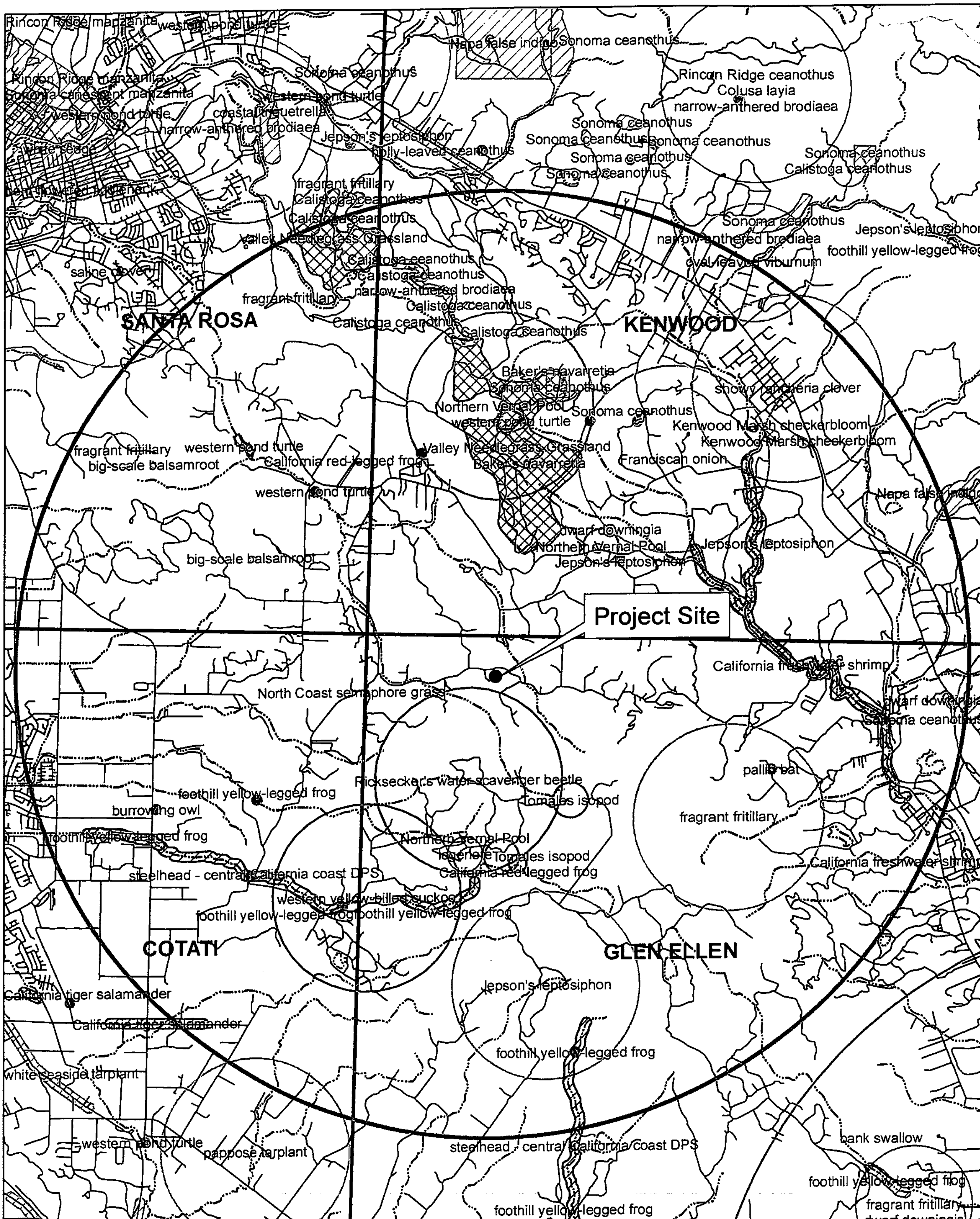

Plate II DFG CNDDB 5-Mile Search

(Data Date May 2013)

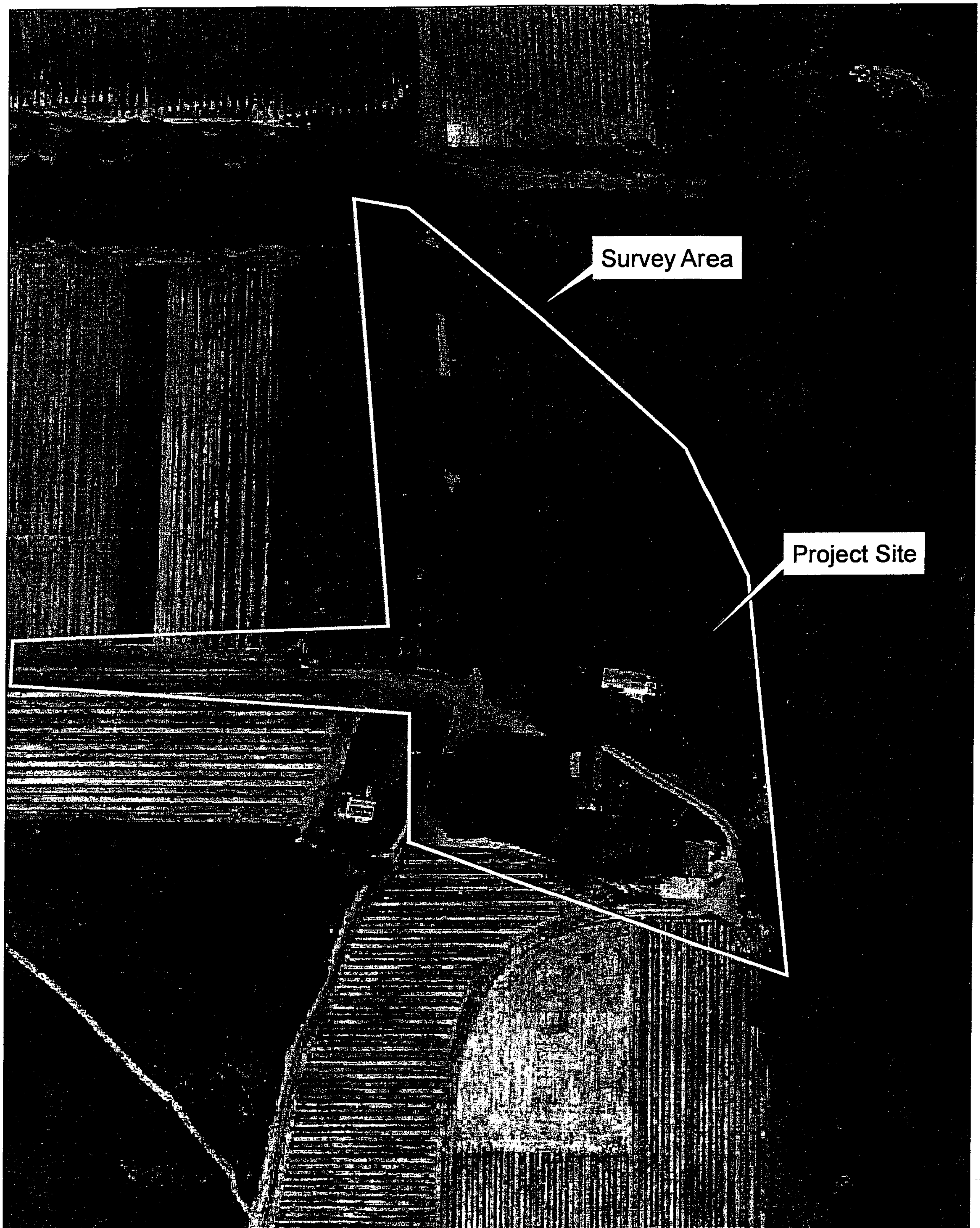

Plate III. Aerial Photo

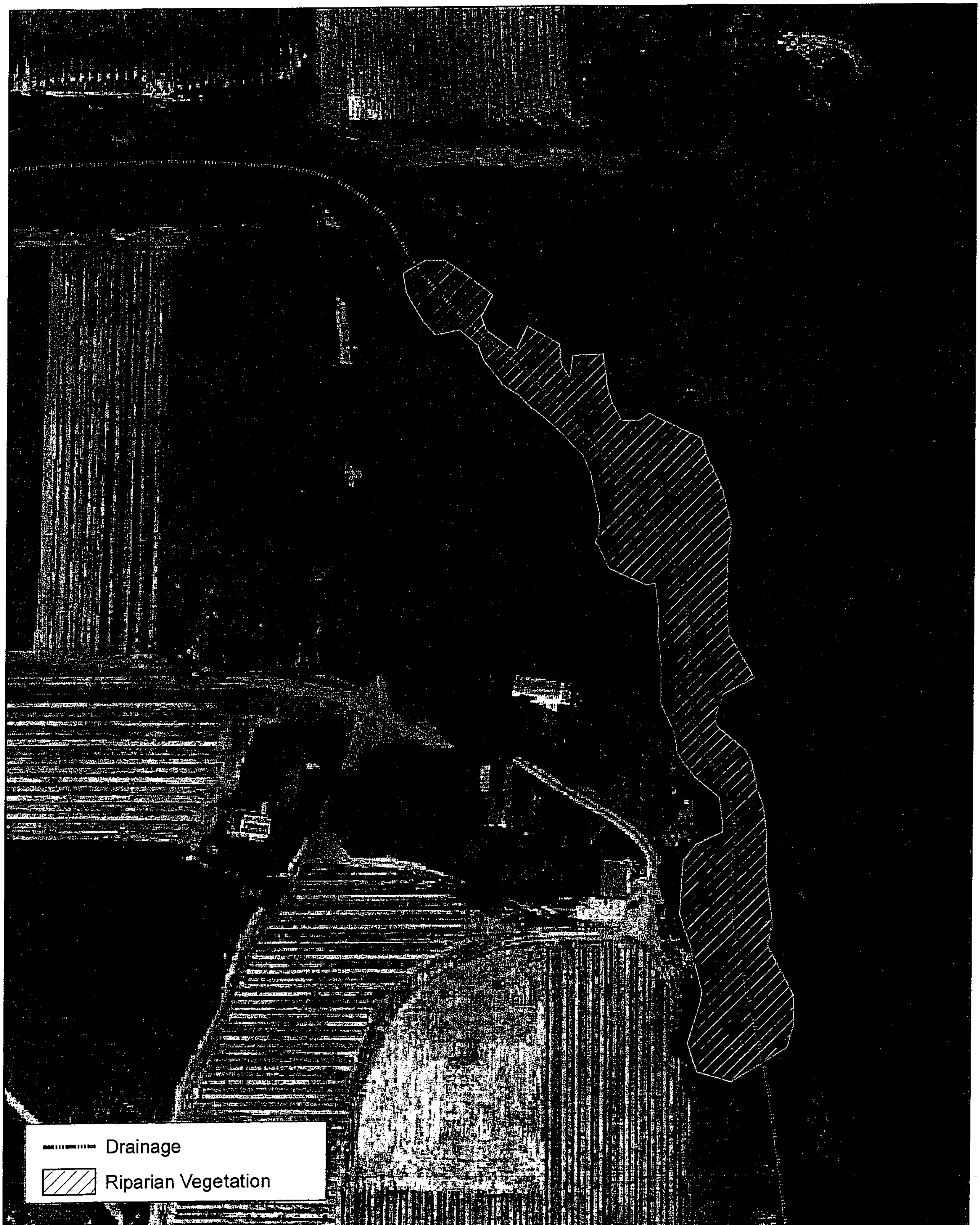

Plate IV. Biological Resources Map

1

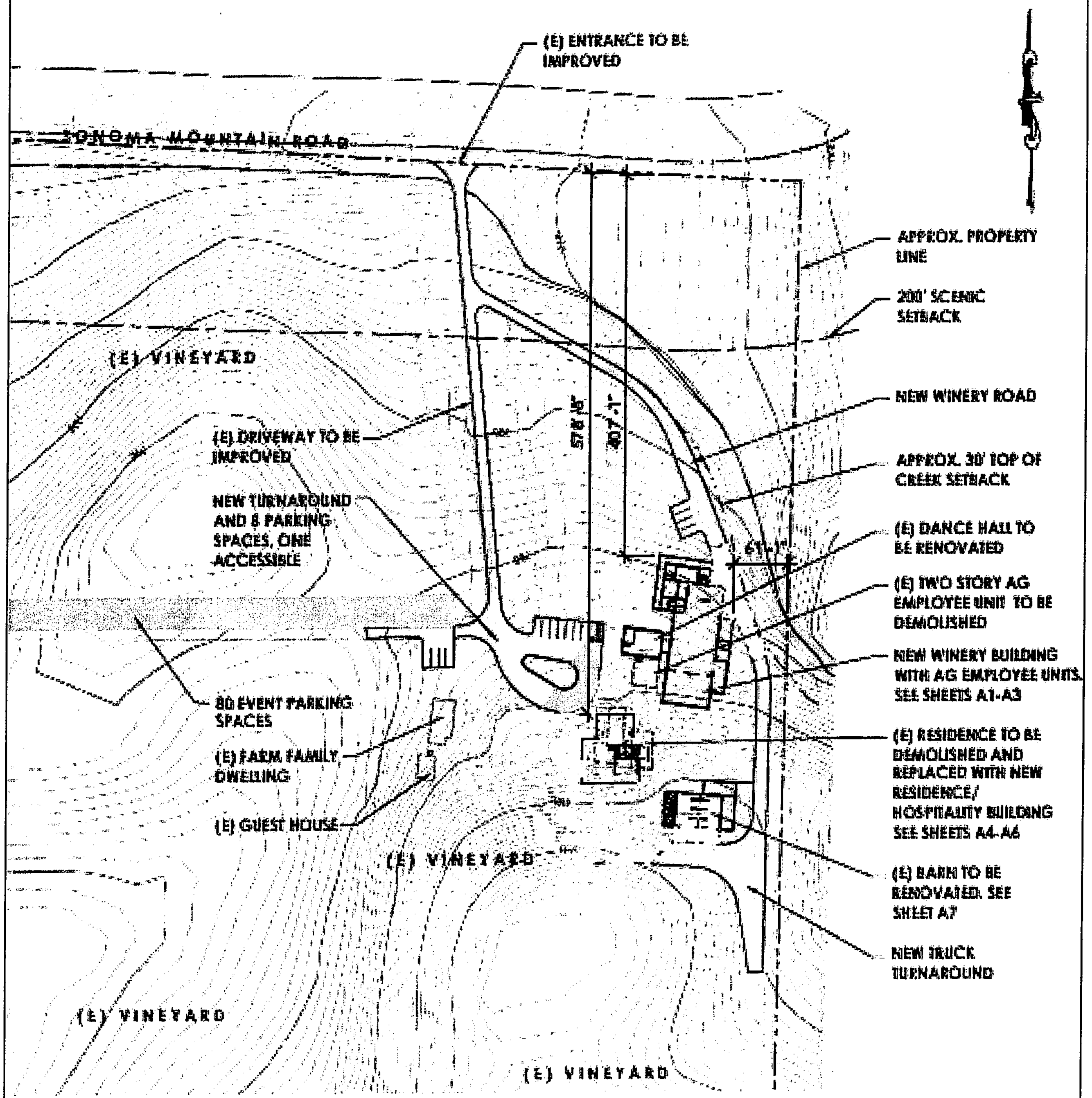

Plate V. Project Site Map

APPENDIX A

FLORA AND FAUNA

Plant Species Observed in the Vicinity of the Project Site

(Landscape plantings are not included unless they appear to have become naturalized and regenerating on site)

The nomenclature for the list of plants found on the project study areas and the immediate vicinity follows: Brodo, Irwin M., Sylvia Duran Sharnoff and Stephen Sharnoff, 2001, for the lichens; Arora - 1985, for the fungi; S Norris and Shevrock - 2004, for the mosses; Doyle and Stotler - 2006 for liverworts and hornworts and Hickman-1993, for the vascular plants.

Habitat type indicates the general associated occurrence of the taxon on the project site or in nature.
Abundance refers to the relative number of individuals on the project site or in the region.

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

FUNGI
Basidiomycota- Club Fungi
POLYPORACEAE

Schizophyllum commune	On Dead Wood	Common
Split-gill		
Trametes versicolor	On Dead Wood	Common
Turkey Tail		

MOSSES
MINACEAE

Alsia californica (W.J.Hooker&Arnott) Sullivant	Coastal Forests On Trees	Common
NCN		
Dendroalsia abietina (Hook.) Brit.	On Trees	Common
NCN		
Funaria hygrometrica Hedw.	Ruderal, Burned Areas	Common
NCN		
Hedwigia stellata Hedenas	Grasslands on Rocks	Common
NCN		
Homalothecium nuttallii (Wilson) Jaeger	Epiphytic on Trees	Common
NCN		
Orthotrichum lyellii Hook & Tayl.	Trees, Upper Canopy	Common
NCN		
Scleropodium touretii (Brid.) L Koch.	On Tree Trunks	Common
NCN		

MAJOR PLANT GROUP Family Genus Common Name	Habitat Type	Abundance

NCN = No Common Name, * = Non-native, @= Voucher Specimen

LICHENS

FOLIOSE

Genus / Common Name	Habitat Type	Abundance
Flavoparmelia caperata (L.) Hale NCN	On Trees	Common
Flavopunctilia flaventor (Stirt.) Hale NCN	On Trees	Common
Parmotrema perlatum (Osbeck) Hale & Ahti=*P. chinense* NCN	On Trees	Common
Phaeophysica decolor (Kashiw.) Essl. NCN	On Rocks	Common
Physcia adscendens (Fr.) H. Olivier NCN	On Trees	Common
Xanthoparmelia cumberlandia (Gyeln.) Hale NCN	On Rocks	Common
Xanthoparmelia mexicana (Gyeln.) Hale NCN	On Rocks	Common

FRUTICOSE

Genus / Common Name	Habitat Type	Abundance
Cladonia ssp. NCN	On Soil	Common
Cladonia fimbriata (L.) Fr. Pixie Cups	On Soil	Occasional
Evernia prunastri (L.) Ach. NCN	On Trees	Common
Ramalina farinacea (L.) Ach. NCN	On Trees	Common
Usnea intermedia=*U. arizonica* NCN	On Trees	Common

CRUSTOSE

Genus / Common Name	Habitat Type	Abundance
Caloplaca bolacina (Tuck.) Herre NCN	On Rocks	Common
Leicidia atrobrunnea (Ramond ex Lam. & DC.) Schaer. NCN	On Rocks	Common
Leicidia tessellata Flörke NCN	On Rocks With Rings of Aapothecia	Common
Ochrolechia orgonensis H. Magn. NCN	On Bark	Common
Pertusaria californica Dibben NCN	On Trees	Common
Thelomma californicum (Tuck.) Tibell Lobed Nipple Lichen	On Fence Posts	Common

MAJOR PLANT GROUP **Family** **Genus** **Common Name**	**Habitat Type**	**Abundance**
NCN = No Common Name, * = Non-native, @= Voucher Specimen		
Calandrinia ciliata Ruiz& Pav. DC.	Grasslands	Common
Red Maids		
Claytonia perfoliata Willd. ssp. *perfoliata*	Woodlands, Riparian	Common
Miners Lettuce		
MYRSINACEAE Myrsinaceae Family		
**Anagallis arvensis* L.	Ruderal	Common
Scarlet Pimpernel		
ONAGRACEAE Evening-primrose Family		
Clarkia purpurea (Curtis) Nels.&Macbr. subsp. *viminea*	Grasslands	Common
NCN		
Epilobium brachycarpum C.Presl	Ruderal Dry Areas	Common
Willow Herb		
OXILIDACEAE Oxalis Family		
**Oxalis pes-caprae* L.	Ruderal	Common
Bermuda Buttercup		
PAPAVERACEAE Poppy Family		
Eschscholzia californica Cahm.	Grasslands	Common
California Poppy		
PLANTAGINACEAE Plantain Family		
**Plantago lanceolata* L.	Ruderal	Common
English Plantain		
POLYGONACEAE Buckwheat Family		
**Polygonum agyrocoleon* Kunze	Ruderal Wet Ground	Occasional
Persian Wireweed		
**Rumex acetosella* L.	Ruderal	Common
Sheep Sorrel		
**Rumex crispus* L.	Ruderal	Common
Curly Dock		
RUBIACEAE Madder Family		
Galium aparine L.	Riparian, Ruderal	Common
Goose Grass		
URTICACEAE		
Urtica dioica L. subsp. *holosericea*	Riparian	Common
Stinging Nettle		
VISCACEAE Misteltoe Family		
Phoradendron serotinum (Raf.) Johnst. subsp. *tomentosum*	Riparian	Common
Oak Mistletoe		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

VASCULAR PLANTS FERNS

AZOLLACEAE
Azolla microphylla Kauf — Aquatic — Common
Mexican Mosquito Fern, Duckweed Fern

DRYOPTERIDACEAE
Dryotpteris arguta (Kaulf.) Maxon — Roiparian — Common
Coastal Wood Fern

PTERIDACEAE
Pentagramma triangularis (Kaulf.)G.Yatsk. subsp. *triangularis* Riparian Common
Goldback Fern

WOODSIACEAE
Athyrium filix-fema (L.) Roth — Riparian — Common
Western Lady Fern

VASCULAR PLANTS DIVISION CONIFEROPHYTA--GYMNOSPERMS

CUPRESSACEAE
Hesperocyparis macrocarpa (Hartw.)Bartel Domestic Introduction — Occasional
Monterey Cypress

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--DICOTYLEDONAE- TREES

MAGNOLIIDS

LAURACEAE
Umbellularia californica (Hook.&Arn.) Nutt. Riparian — Occasional
California Laurel, Sweet Bay, Pepperwood, California Bay

EUDICOTS

BETULACEAE Birch Family
Alnus rhombifolia Nutt. — Riparian — Common
White Alder

FABACEAE Legume Family
**Acacia melanoxylon* R. Br. — Escape — Occasional
Black Wood Acacia

FAGACEAE Oak Family
**Castanea dentate* Borkh. — Domestic — Common
Chestnut
Quercus agrifolia Nee — Riparian — Common
Live Oak
Quercus garryana Hook. — Riparian — Common
Oregon Oak

MAJOR PLANT GROUP **Family** **Genus** **Common Name**	**Habitat Type**	**Abundance**

NCN = No Common Name, * = Non-native, @= Voucher Specimen

ASTERACEAE (Compositae) Sunflower Family		
Achillea millefolium L.	Ruderal	Common
Yarrow		
**Anthemis cotula* L.	Ruderal	Common
Mayweed, Stinkweed, Dog-fennel		
**Carduus pycnocephalus* L.subsp.*pycnocephalus*	Grasslands	Common
Italian Thistle		
**Centaurea solstitialis* L.	Grasslands, Ruderal	Common
Yellow Star Thistle		
**Circium vulgare* (Savi) Ten.	Grasslands, Ruderal	Common
Bull Thistle		
**Helminthotheca echioides* (L.) Holub	Ruderal	Common
Ox-tongue (=*Picris echioides*)		
**Hypochaeris glabra* L.	Ruderal	Common
Cat's Ear		
**Hypochaeris radicata* L.	Ruderal	Common
Harry Cat's Ear		
**Lactuca serriola* L.	Ruderal	Occasional
Prickly Lettuce		
**Matricaria discoidea* DC.	Ruderal	Common
Pineapple Weed, Rayless Chamomile = *Chamomilla suavolens*)		
**Senecio vulgaris* L.	Ruderal	Occasional
NCN		
**Silybum marianum* (L.) Gaertn.	Ruderal	Common
Milk Thistle		
**Sonchus asper* (L.) Hill var. *asper*	Ruderal	Common
Prickly Sow Thistle		
**Sonchus oleraceus* L.	Ruderal	Common
Common Sow Thistle		
**Taraxacum officinale* F.H.Wigg	Ruderal	Common
Dandelion		
BRASSICACEAE Mustard Family		
**Brassica nigra* (L.) Koch	Ruderal	Common
Black Mustard		
**Capsella bursa-pastoris* L.	Ruderal	Common
Shepherd's Purse		
**Cardamine hirsuta* L.	Ruderal	Common
Bitter-cress		
Cardamine oligosperma Nutt.	Ruderal	Common
Bitter-cress		

MAJOR PLANT GROUP Family Genus Common Name	Habitat Type	Abundance

NCN = No Common Name, * = Non-native, @= Voucher Specimen

JUNCACEAE

Juncus effusus L. *pacificus* Rush	Seeps, Shorelines,Marshes	Common

<u>VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS</u>
<u>CLASS--MONOCOTYLEDONAE-HERBS</u>

AGAVACEAE Centuray Plant Family

Chlorogalum *pomeridianum* (DC.) Kunth var. *pomeridianum* Soap Plant	Woodlands, Grasslands	Common

AMARYLLIDACEAE Amaryllis Family

Narcissus pseudonarcissus L. Daffodil	Ruderal, Escape	Occasional

IRIDACEAE Iris Family

Iris douglasiana Herb. Iris	Open Grassland, Meadows	Common
**Iris pseudoacoris* L. Yellow Iris	Riparian	Common

MAMMALS ORDER Common Name	Genus	Observed
CARNIVORA		
Coyote	*Canis latrans*	Scat
CERVIDAE		
Black-tailed Deer	*Odocoileus hemionus*	Sight
RODENTIA		
Pocket Gopher	*Thomomys bottae*	Sight

MAJOR PLANT GROUP Family Genus Common Name	Habitat Type	Abundance

NCN = No Common Name, * = Non-native, @= Voucher Specimen

Quercus kelloggii Newb.	Riparian	Common
Black Oak		
Quercus lobata Nee.	Riparian	Common
Valley Oak		
JUGLANDACEAE Walnut Family		
**Juglans nigra* L.	Ruderal Escape	Common
Black Walnut		
MORACEAE Mulberry Family		
**Ficus carica* L.	Ruderal Escape	Occasional
Fig		
MYRTACEAE Myrtle family		
**Eucalyptus globulus* Labill	Ruderal Escape	Occasional
Blue Gum		
OLEACEAE Olive Family		
**Ligustrum* ssp.	Domestic Ruderal	Occasional
Privet		
**Olea europaea* L.	Domestic Ruderal	Occasional
Olive		
ROSACEAE Rose Family		
**Malus sylvestris* Mill.	Escape	Occasional
Apple		
**Prunus domestica* L.	Escape, Ruderal	Occasional
Prune		
**Prunus cerasifera* Ehrh.	Escape, Ruderal	Occasional
Cherry Plum		
**Pyrus communis* (L.)	Escape or Domestic	Occasional
Pear		
SALICACEAE Willow Family		
Salix laevigata Bebb.	Riparian	Common
Red Willow		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--DICOTYLEDONAE-SHRUBS AND WOODY VINES

EUDICOTS

ANACARDIACEAE Sumac Family		
Toxicodendron diversilobum (Torry&Gray) E.Green	Riparian	Common
Poison Oak		
APOCYANACEAE Dogbane Family		
**Nerium oleander* L.	Domestic Introduction	Common
Oleander		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

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**Vinca major* L.	Riparian, Ruderal	Common
Periwinkle		
ARALIACEAE Ginsing Family		
**Hedra helix* L.	Ruderal	Occasional
English Ivy		
ASTERACEAE (Compositae) Sunflower Family		
Baccharis pilularis deCandolle	Grasslands	Common
Coyote Brush		
CAPRIFOLIACEAE Honeysuckle Family		
**Lonicera japonica* Murray	Escape, Shrub/Scrub	Occasional
Japanese Honeysuckle		
Symphoricarpos albus (L.) SF Blake *var. laevigatus*	Riparian	Common
Snowberry		
LAMIACEAE Mint Family		
**Lavandula staechas* L.	Roadside Wafe	Occasional
Lavender		
**Rosmarinus officinalis* L.	Domestic Introduction	Occasional
Rosemary		
OLEACEAE Olive Family		
**Ligustrum* ssp.	Domestic Escape	Occasional
Privet		
**Syringa* ssp.	Domestic Escape	Occasional
Lilac		
ROSACEAE Rose Family		
**Cotoneaster pannosus* Franchet.	Ruderal	Common
Cotoneaster		
Heteromeles arbutifolia (Lind.) M. Rome.	Edge of Riparian	Common
Christmas Berry, Toyon		
**Rubus armeniacus* Focke	Ruderal	Common
Himalayan Blackberry		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--DICOTYLEDONAE-HERBS

APIACEAE (Umbelliferae) Carrot Family		
**Dacus carota*L.	Ruderal Grasslands	Common
Wild Carrot, Queen Anne's Lace		
**Foeniculum vulgare* Mill.	Ruderal	Common
Fennel		

MAJOR PLANT GROUP Family Genus Common Name	**Habitat Type**	**Abundance**

NCN = No Common Name, * = Non-native, @= Voucher Specimen

ASTERACEAE (Compositae) Sunflower Family		
Achillea millefolium L. Yarrow	Ruderal	Common
**Anthemis cotula* L. Mayweed, Stinkweed, Dog-fennel	Ruderal	Common
**Carduus pycnocephalus* L.subsp.*pycnocephalus* Italian Thistle	Grasslands	Common
**Centaurea solstitialis* L. Yellow Star Thistle	Grasslands, Ruderal	Common
**Circium vulgare* (Savi) Ten. Bull Thistle	Grasslands, Ruderal	Common
**Helminthotheca echioides* (L.) Holub Ox-tongue (=*Picris echioides)*	Ruderal	Common
**Hypochaeris glabra* L. Cat's Ear	Ruderal	Common
**Hypochaeris radicata* L. Harry Cat's Ear	Ruderal	Common
**Lactuca serriola* L. Prickly Lettuce	Ruderal	Occasional
**Matricaria discoidea* DC. Pineapple Weed, Rayless Chamomile = *Chamomilla suavolens)*	Ruderal	Common
**Senecio vulgaris* L. NCN	Ruderal	Occasional
**Silybum marianum* (L.) Gaertn. Milk Thistle	Ruderal	Common
**Sonchus asper* (L.) Hill var. *asper* Prickly Sow Thistle	Ruderal	Common
**Sonchus oleraceus* L. Common Sow Thistle	Ruderal	Common
**Taraxacum officinale* F.H.Wigg Dandelion	Ruderal	Common
BRASSICACEAE Mustard Family		
**Brassica nigra* (L.) Koch Black Mustard	Ruderal	Common
**Capsella bursa-pastoris* L. Shepherd's Purse	Ruderal	Common
**Cardamine hirsuta* L. Bitter-cress	Ruderal	Common
Cardamine oligosperma Nutt. Bitter-cress	Ruderal	Common

MAJOR PLANT GROUP **Family** **Genus** **Common Name**	**Habitat Type**	**Abundance**

NCN = No Common Name, * = Non-native, @= Voucher Specimen

**Hirschfeldia incana* (L.) Lagr.-Fossat	Ruderal	Common
Summer Mustard		
**Raphanus sativus* L.	Ruderal	Common
Wild Radish		
EUPHORBIACEAE Spurge Family		
Croton setigerus Hook.	Ruderal	Common
Turkey Mullein, Dove Weed (=*Eremocarpus setigerus*)		
FABACEAE (Leguminosae) Legum Family		
Acmispon micranthus (Torr.&A. Gray)	Grasslands, Ruderal	Common
Small Flowered Lotus (= *Lotus micranthus*)		
**Lathyrus odoratus* L.	Ruderal Escape	Occasional
Sweet Pea		
**Lotus corniculatus* L.	Grasslands, Ruderal	Common
Birdfoot Trefoil		
**Medicago arabica* (L.) Huds	Ruderal	Common
Spotted Bur Clover		
**Trifolium hirtum* All.	Ruderal	Common
Rose Clover		
Vicia americana Wild. subsp. *americana*	Grassland	Common
American Vetch		
**Vicia faba* L.	Ruderal	Common
Broad Bean, Faba Bean		
**Vicia sativa* L. subsp. *nigra*	Grasslands, Ruderal	Common
Narrow Leaved-vetch		
**Vicia villosa* Roth. subsp. *varia*	Ruderal	Common
Hairy Vetch, Winter Vetch, Lana Vetch		
GERANIACEAE Geranium Family		
**Erodium botrys* (Cav.) Bertol.	Grasslands	Common
Broadleaf Filaree, Long-beaked Filaree		
**Geranium dissectum* L.	Grasslands	Common
Common Geranium		
**Geranium molle* L.	Grasslands	Common
Dove's Foot Geranium		
LAMIACEAE (Labiatae) Mint Family		
Stachys ajugoides Benth.	Moist Open Places	Occasional
Hedge-nettle		
MALVACEAE Mallow Family		
**Malva parviflora* L.	Ruderal	Common
Cheeseweed, Mallow		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

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Calandrinia ciliata Ruiz& Pav. DC.	Grasslands	Common
Red Maids		
Claytonia perfoliata Willd. ssp. *perfoliata*	Woodlands, Riparian	Common
Miners Lettuce		
MYRSINACEAE Myrsinaceae Family		
**Anagallis arvensis* L.	Ruderal	Common
Scarlet Pimpernel		
ONAGRACEAE Evening-primrose Family		
Clarkia purpurea (Curtis) Nels.&Macbr. subsp. *viminea*	Grasslands	Common
NCN		
Epilobium brachycarpum C.Presl	Ruderal Dry Areas	Common
Willow Herb		
OXILIDACEAE Oxalis Family		
**Oxalis pes-caprae* L.	Ruderal	Common
Bermuda Buttercup		
PAPAVERACEAE Poppy Family		
Eschscholzia californica Cahm.	Grasslands	Common
California Poppy		
PLANTAGINACEAE Plantain Family		
**Plantago lanceolata* L.	Ruderal	Common
English Plantain		
POLYGONACEAE Buckwheat Family		
**Polygonum agyrocoleon* Kunze	Ruderal Wet Ground	Occasional
Persian Wireweed		
**Rumex acetosella* L.	Ruderal	Common
Sheep Sorrel		
**Rumex crispus* L.	Ruderal	Common
Curly Dock		
RUBIACEAE Madder Family		
Galium aparine L.	Riparian, Ruderal	Common
Goose Grass		
URTICACEAE		
Urtica dioica L. subsp. *holosericea*	Riparian	Common
Stinging Nettle		
VISCACEAE Misteltoe Family		
Phoradendron serotinum (Raf.) Johnst. subsp. *tomentosum*	Riparian	Common
Oak Mistletoe		

MAJOR PLANT GROUP		
Family		
Genus	Habitat Type	Abundance
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--MONOCOTYLEDONAE-GRASSES

POACEAE Grass Family

Genus / Common Name	Habitat Type	Abundance
**Avena fatua* L.	Grasslands	Common
Wild Oat		
**Bromus diandrus* Roth	Ruderal, Grasslands	Common
Ripgut Grass		
**Bromus hordeaceus* L.	Grasslands	Common
Soft Chess, Blando Brome		
**Cynosurus echinatus* L.	Ruderal	Common
Hedgehog, Dogtail		
**Dactylis glomerata* L.	Grasslands	Occasional
Orchard Grass		
**Festuca bromoides* L.	Ruderal, Moist Flats become Dry	Common
Six-weeks Fescue (=*Vulpia bromoides)*		
Festuca microstachys Nutt.	Grasslands, Ruderal	Common
NCN (=*Vulpia microstachys)*		
**Festuca myuros* L.	Grasslands	Common
Rattail Fescue,Zorro Annual Fescue (=*Vulpia myuros)*		
**Festuca perennis* (L.) Columubus & Sm.	Grasslands	Common
Perennial Rye Grass (=*Lolium multiflorum, L. perenne)*		
**Holcus lanatus* L.	Grasslands, Ruderal	Common
Velvet Grass		
Hordeum brachyantherum Nevski subsp. *brachyantherum*	Grasslands	Occasional
Meadow Barley		
**Phalaris aquatica* L.	Grasslands	Common
Harding Grass		
**Poa annua* L.	Grasslands	Common
Annual Bluegrass		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--MONOCOTYLEDONAE-SEDGES AND RUSHES

CYPERACEAE Sedge Family

Genus / Common Name	Habitat Type	Abundance
@*Caryx praegracilis* Boott	Moist areas	Occasional
Black Creeper or Freway Sedge, Clustered Sedge		
Eleocharis macrostachya Britton	Riparian, Aquatic	Common
Spike Rush		
Schoenoplectus californicus (Mey.) Sojak	Palustrine	Occasional
Southernbull Rush.California Tule (=*Scirpus)*		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

JUNCACEAE		
Juncus effusus L. *pacificus*	Seeps, Shorelines,Marshes	Common
Rush		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--MONOCOTYLEDONAE-HERBS

AGAVACEAE Centuray Plant Family		
Chlorogalum *pomeridianum* (DC.) Kunth var. *pomeridianum*	Woodlands, Grasslands	Common
Soap Plant		
AMARYLLIDACEAE Amaryllis Family		
Narcissus pseudonarcissus L.	Ruderal, Escape	Occasional
Daffodil		
IRIDACEAE Iris Family		
Iris douglasiana Herb.	Open Grassland, Meadows	Common
Iris		
**Iris pseudoacoris* L.	Riparian	Common
Yellow Iris		

Fauna Species Observed in the Vicinity of the Project Site

The nomenclature for the animals found on the project site and in the immediate vicinity follows: Mc Ginnis –1984, for the fresh water fishes; Stebbins -1985, for the reptiles and amphibians; and Udvardy and Farrand – 1998, for the birds; and Jameson and Peeters -1988 for the mammals.

AMPHIBIA AND REPTILIA **ORDER** **Common Name**	**Genus**	**Observed**
ANURA		
Bullfrog	*Rana catesbeiana*	X
SQUAMATA		
Western Fence Lizard	*Sceloporus occidentalis*	X

AVES **ORDER** **Common Name**	**Genus**	**Observed**
AVES		
Acorn Woodpecker	*Melanerpes fomicivorus*	
American Robin	*Turdus migratorius*	X
Anna's Hummingbird	*Calypte anna*	X
Bufflehead	*Bucephala albeola*	X
Black Phoebe	*Sayornis nigricans*	X
California Quail	*Callipepla californica*	X
Common Crow	*Corvus brachyrhynchos*	X
Canada Goose	*Branta canadensis*	X
European Starling	*Sturnus vulgaris*	X
Green-winged Teal	*Anas crecca*	X
Red-tailed Hawk	*Cathartes aura*	X
Red-winged Blackbird	*Agelaius phoeniceus*	X
Scrub Jay	*Aphelocoma coerulescens*	X
Spotted Towhee	*Pipilo erythrophthalmus*	X
Wild Turkey	*Meleagris gallopavo*	X

MAMMALS ORDER Common Name	Genus	Observed
CARNIVORA		
Coyote	*Canis latrans*	Scat
CERVIDAE		
Black-tailed Deer	*Odocoileus hemionus*	Sight
RODENTIA		
Pocket Gopher	*Thomomys bottae*	Sight

APPENDIX B

Definitions used in Report and Regulatory Requirements

Definitions (Not all are relevant to this project)

Absolute Cover. The percentage of ground covered by the vertical projection of the plant crowns of a species or defined set of plants as viewed from above The absolute cover of herbaceous plants includes any standing (attached to a living palnt, and not lying on the grouns) plant parts, whether alive or dead; this deviniton escludes litter and other searated plant material. The cover may include mosses, lichens and recognizable cryptogamic crusts.

Alliance. A classification unit of vegetation containing one or more associations and defined by one or more diagnostic species, often of high cover, in the uppermost layer or the layer with the highest canopy cover. Alliance reflect regional to subregional climates, substrates, hydrology and disturbance regimes.

Association. A vegetation classification unit defined by a diagnostic species, a characteristic range of species composition physiognomy, and distinctive habitat conditions. Associations reflect local topo-edaphic climates, substrates, hydrology, and disturbance regimes.

Best Management Practices. Best management practices represent the construction or agricultural practices that are consistent with regulatory laws or industry standards which are prudent and consistent with site conditions.

Confidence Interval. The California Department of Fish and Game (DFW) California Natural Diversity Data Base (CNDDB) uses map polygon projections for indicating potential for occurrence of special-status plant populations around a recorded occurrence.

Critical Habitat. Critical habitat is by definition a designated by U.S. Fish and Wildlife Service as essential for the existence of a particular population of species. The U.S. Fish and Wildlife Service designates critical habitat for special-status species as an area or region within which a species may be found. "Critical habitat" is defined as areas essential for the "conservation" of the species in question.

Dominance. The extent to which a species or growth form has a strong influence in a stand because of its size abundance or cover.

Habitat Fragmentation. The issue of habitat fragmentation is of concern locally, nationally, and globally. The term habitat fragmentation refers to the loss of connections within the biosphere such that the movement, genetic exchange, and dispersal of native populations is restricted or prevented. Anthropogenic habitat fragmentation can be the result of a road construction, logging, agriculture, or urban growth. The practice of retaining or planning for "Corridors" is an attempt to address this issue. Corridors that allow movement of wildlife through and around a site include stream and riparian areas and also areas that connect two or more sites of critical wildlife habitat.

Habitat Types. Habitat types are used by DFW to categorize elements of nature associated with the physical and biological conditions in an area. These are of particular importance for the wildlife they support, and they are important as indicators of the potential for special-status species.

Relative Cover. A measure of the cover of a species in relation to that of other species within a set area or sample of vegetation. This is usually calculated for species that occur in the same layer (stratum) of vegetation, and this measure can be calculated across a group of samples.

Riparian Corridor. Riparian corridors can be defined as the stream channel between the low-water and high-water marks plus the terrestrial landscape above the high water-mark (where vegetation may be influenced by elevated water tables or extreme flooding and by the ability of the soils to hold water; Naiman, et. al. 1993).

Riparian Corridor or Riparian Ecosystem. Riparian ecosystems occupy the ecotone between upland and lotic aquatic realms. Riparian corridors can be defined as the stream channel between the low- and high-water marks plus the terrestrial landscape above the high water-mark (where vegetation may be influenced by elevated water tables or extreme flooding and by the ability of the soils to hold water; Naiman, et. al. 1993).

Ruderal Habitat. Ruderal habitat is characterized by disturbance and the establishment and dominance of non-native introduced weed species. Ruderal plant communities are a function of or result of agricultural or logging practices. This habitat is typically found along graded roads, erosional surfaces or sites influenced by agricultural animal populations.

Sensitive Habitat. DFW Natural Diversity Data Base uses environmentally sensitive plant communities for plant populations that are rare or threatened in nature. Sensitive habitat is defined as any area in which plant or animal life or their habitats are either rare or especially valuable and any area which meets one of the following criteria: (1) habitats containing or supporting "rare and endangered" species as defined by the State Fish and Game Commission, (2) all perennial and intermittent streams and their tributaries, (3) coastal tide lands and marshes, (4) coastal and offshore areas containing breeding or nesting sites and coastal areas used by migratory and resident water-associated birds for resting areas and feeding, (5) areas used for scientific study and research concerning fish and wildlife, (6) lakes and ponds and adjacent shore habitat, (7) existing game and wildlife refuges and reserves, and (8) sand dunes. Sensitive Habitat also includes wetlands and tributaries to “Waters of the US” as defined by the Corps of Engineers (ACOE) and DFW seasonal streams DFW.

Serpentinite. Serpentinite or serpentine consists of ultramafic rock outcrops that due to the unique mineral composition support a unique flora often of endemics. Kruckeberg, 1984, indicates that the taxonomy and evolutionary responses to serpentines include "1) taxa endemic to serpentine, 2) local or regional indicator taxa, largely confined to serpentine in parts of their ranges, 3) indifferent or “bodenvag” taxa that range on and off serpentine, and 4) taxa that are excluded from serpentine.” Serpentine outcrops or serpentinites support numerous special-status plant taxa.

Special-status Species. Special-status organisms are plants or animals that have been designated by Federal or State agencies as rare, endangered, or threatened. We have also included plant species listed by the CNPS as "target organisms." The target species for the Quadrangle are discussed below. Section 15380 of the California Environmental Quality Act [CEQA (September, 1983)] has a discussion regarding non-listed (State) taxa. This section states that a plant (or animal) must be treated as Rare or Endangered even if it is not officially listed as such. If a person (or organization provides information showing that a taxa meets the State's definitions and criteria, then the taxa should be treated as such.

Standard Agricultural Practices. Standard agricultural practices are best management practices which are prudent as applied in the agricultural industry such as the use of regulated pesticides, methods of and timing of weed control, appropriate fertilizer application, irrigation management, frost protection, erosion control and soil conservation and management, and dust control among other practices.

Streams. The DFW definition of stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports wildlife, fish, or other aquatic life. This includes watercourses having a surface or subsurface flow that support or have supported riparian vegetation. DFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife.

Target organisms. Special-status species that are listed by: the California Department of Fish and recorded in the Natural Diversity Data Base for the Quadrangle and surrounding Quadrangles of the project site; the California Native Plant Society for the habitat present on the project site Quadrangle and surrounding Quadrangles; Federal Endangered and Threatened Species that Occur in the U.S.G.S. 7 1/2 Minute Quadrangle; our experience with the local flora and fauna; any species identified by local individuals that are considered to be rare in the region; and DFW Five Mile radius CNDDB Rarefind 3 search.

Wetlands. Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Many surface waters and wetlands in California meet the criteria for waters of the United States, including intermittent streams and seasonal lakes and wetlands.

Waters of the U.S. The term "Waters of the United States" refers to all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters, including interstate wetlands; all other waters such as interstate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds; the use degradation or destruction of which could affect interstate or foreign commerce including any such waters [among which include], all impediments of waters otherwise defined as waters of the United States under this definition.

Waters of the State. The term "Waters of the State" Section 13050 (e) of the California Water Code defines "waters of the State as " any surface water or groundwater, including saline waters, within the boundaries of the state."

Vernal Pools. Vernal pools are a type of seasonal wetland distinct for California and the western US. Typically they are associated with seasonal rainfall or "Mediterranean climate" and have a distinct flora and fauna, an impermeable or slowly permeable substrate and contain standing water for a portion of the year. They are characterized by a variable aquatic and dry regime with standing water during the spring plant growth regime. They have a high degree of endemism of flora and fauna.

Regulatory Permits

Federal Regulations

Federal Endangered Species Act Pursuant to the federal Endangered Species Act (ESA), the U.S. Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration (NOAA), have authority over projects that may affect the continued existence of a species that is federally listed as threatened or endangered. Section 9 of ESA prohibits the take of a federally listed species; take is defined, in part, as killing, harming, or harassment and includes habitat modification or degradation where it actually results in death or injury to wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

Section 404 of the Clean Water Act Section 404 of the Clean Water Act establishes a requirement to obtain a permit before any activity that involves any discharge of dredged or fill material into "waters of the United States," including wetlands. Waters of the United States include navigable waters of the United States, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries.

Army Corps of Engineers (ACOE) regulates and issues 404 permits for activities that involve the discharge of dredged or fill materials into waters of the United States. A Water Quality Certification 401 permit must also be obtain from the appropriate state agency stating that the fill is consistent with the state's water quality standards and criteria. In California, the authority to grant water quality certification is delegated by the State Water Board to the nine Regional Water Quality Control Boards (RWQCB).

State Regulations

California Endangered Species Act Pursuant to the California Endangered Species Act (CESA) and Section 2081 of the Fish and Game Code, a permit from Department of Fish and Game (DFW) is required for projects that could result in the take of a state listed threatened or endangered species. Under CESA, "take" is defined as an activity that would directly or indirectly kill an individual of a species, but the definition does not include "harm" or "harass," as the ESA does. As a result, the threshold for a take under CESA is higher than that under the ESA.

California Fish and Game Code Section 1600 – Lake and Streambed Alteration Permit. All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by DFW pursuant to Section 1600 of the California Fish and Game Code. Section 1600 states that it is unlawful for any person, government agency, state, local, or any public utility to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake or deposit or dispose of waste, debris, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake without first notifying DFW of such activity.

Porter-Cologne Water Quality Control Act Under the Porter-Cologne Water Quality Control Act, "waters of the state" fall under the jurisdiction of the RWQCB. Under the act, the RWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control non-point and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters of the state must meet waste discharge requirements of the RWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the Clean Water Act.

APPENDIX C.

California Native Plant Society Inventory of Special-Status Plants for the Quadrangle and Surrounding Quadrangles

DFW CNDDB Rare Find $ Special-status Species Listed for the Quadrangle and Surrounding Quadrangles

California Wildlife Habitat Relationship System Species Summary Report by Habitat Present

CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

v7-13may 5-7-13

Status: search results - Thu May 23 2013 15:10 ET c

Your Quad Selection: Glen Ellen (501D) 3812235, Petaluma River (484A) 3812225, Petaluma (484B) 3812226, Rutherford (500B) 3812244, Sonoma (500C) 3812234, Sears Point (483B) 3812224, Kenwood (501A) 3812245, Santa Rosa (501B) 3812246, Cotati (501C) 3812236

scientific	common	family	CNPS
Allium peninsulare var. franciscanum	Franciscan onion	Alliaceae	List 1B.2
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Poaceae	List 1B.1
Amorpha californica var. napensis	Napa false indigo	Fabaceae	List 1B.2
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	List 1B.2
Arctostaphylos bakeri ssp. bakeri	Baker's manzanita	Ericaceae	List 1B.1
Arctostaphylos canescens ssp. sonomensis	Sonoma canescent manzanita	Ericaceae	List 1B.2
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	Ericaceae	List 1B.1
Astragalus claranus	Clara Hunt's milk-vetch	Fabaceae	List 1B.1
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	List 1B.2
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	List 1B.2
Blennosperma bakeri	Sonoma sunshine	Asteraceae	List 1B.1

Brodiaea leptandra	narrow-anthered brodiaea	Themidaceae	List 1B.2
California macrophylla	round-leaved filaree	Geraniaceae	List 1B.1
Carex albida	Sonoma white sedge	Cyperaceae	List 1B.1
Ceanothus confusus	Rincon Ridge ceanothus	Rhamnaceae	List 1B.1
Ceanothus divergens	Calistoga ceanothus	Rhamnaceae	List 1B.2
Ceanothus purpureus	holly-leaved ceanothus	Rhamnaceae	List 1B.2
Ceanothus sonomensis	Sonoma ceanothus	Rhamnaceae	List 1B.2
Centromadia parryi ssp. parryi	pappose tarplant	Asteraceae	List 1B.2
Chloropyron maritimum ssp. palustre	Point Reyes bird's-beak	Orobanchaceae	List 1B.2
Chloropyron molle ssp. molle	soft bird's-beak	Orobanchaceae	List 1B.2
Chorizanthe valida	Sonoma spineflower	Polygonaceae	List 1B.1
Delphinium bakeri	Baker's larkspur	Ranunculaceae	List 1B.1
Delphinium luteum	golden larkspur	Ranunculaceae	List 1B.1
Downingia pusilla	dwarf downingia	Campanulaceae	List 2.2
Erigeron biolettii	streamside daisy	Asteraceae	List 3
Erigeron greenei	Greene's narrow-leaved daisy	Asteraceae	List 1B.2

Eriogonum luteolum var. caninum	Tiburon buckwheat	Polygonaceae	List 1B.2
Fritillaria liliacea	fragrant fritillary	Liliaceae	List 1B.2
Hemizonia congesta ssp. congesta	white seaside tarplant	Asteraceae	List 1B.2
Hesperolinon congestum	Marin western flax	Linaceae	List 1B.1
Horkelia tenuiloba	thin-lobed horkelia	Rosaceae	List 1B.2
Lasthenia burkei	Burke's goldfields	Asteraceae	List 1B.1
Lasthenia conjugens	Contra Costa goldfields	Asteraceae	List 1B.1
Layia septentrionalis	Colusa layia	Asteraceae	List 1B.2
Legenere limosa	legenere	Campanulaceae	List 1B.1
Leptosiphon jepsonii	Jepson's leptosiphon	Polemoniaceae	List 1B.2
Lessingia hololeuca	woolly-headed lessingia	Asteraceae	List 3
Limnanthes vinculans	Sebastopol meadowfoam	Limnanthaceae	List 1B.1
Lupinus sericatus	Cobb Mountain lupine	Fabaceae	List 1B.2
Micropus amphibolus	Mt. Diablo cottonweed	Asteraceae	List 3.2
Microseris paludosa	marsh microseris	Asteraceae	List 1B.2
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	List 1B.1

Navarretia leucocephala ssp. plieantha	many-flowered navarretia	Polemoniaceae	List 1B.2
Penstemon newberryi var. sonomensis	Sonoma beardtongue	Plantaginaceae	List 1B.3
Plagiobothrys mollis var. vestitus	Petaluma popcorn-flower	Boraginaceae	List 1A
Pleuropogon hooverianus	North Coast semaphore grass	Poaceae	List 1B.1
Polygonum marinense	Marin knotweed	Polygonaceae	List 3.1
Rhynchospora globularis	round-headed beaked-rush	Cyperaceae	List 2.1
Sidalcea calycosa ssp. rhizomata	Point Reyes checkerbloom	Malvaceae	List 1B.2
Sidalcea oregana ssp. valida	Kenwood Marsh checkerbloom	Malvaceae	List 1B.1
Trifolium amoenum	two-fork clover	Fabaceae	List 1B.1
Trifolium hydrophilum	saline clover	Fabaceae	List 1B.2
Triquetrella californica	coastal triquetrella	Pottiaceae	List 1B.2
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	List 2.3

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Adela oplerella Opler's longhorn moth	IILEE0G040	None	None	G2G3	S2S3	
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S2	SSC
Allium peninsulare var. franciscanum Franciscan onion	PMLIL021R1	None	None	G5T2	S2.2	1B.2
Alopecurus aequalis var. sonomensis Sonoma alopecurus	PMPOA07012	Endangered	None	G5T1Q	S1	1B.1
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SSC
Amorpha californica var. napensis Napa false indigo	PDFAB08012	None	None	G4T2	S2.2	1B.2
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G2?	S2?	1B.2
Andrena blennospermatis Blennosperma vernal pool andrenid bee	IIHYM35030	None	None	G2	S2	
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Arctostaphylos canescens ssp. sonomensis Sonoma canescent manzanita	PDERI04066	None	None	G3G4T2	S2.1	1B.2
Arctostaphylos stanfordiana ssp. decumbens Rincon Ridge manzanita	PDERI041G4	None	None	G3T1	S1	1B.1
Astragalus claranus Clara Hunt's milk-vetch	PDFAB0F240	Endangered	Threatened	G1	S1	1B.1
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Balsamorhiza macrolepis big-scale balsamroot	PDAST11061	None	None	G2	S2	1B.2
Blennosperma bakeri Sonoma sunshine	PDAST1A010	Endangered	Endangered	G1	S1	1B.1
Brodiaea leptandra narrow-anthered brodiaea	PMLIL0C022	None	None	G2G3	S2S3.2	1B.2
Caecidotea tomalensis Tomales isopod	ICMAL01220	None	None	G2	S2	
Calicina diminua Marin blind harvestman	ILARAU8040	None	None	G1	S1	
California macrophylla round-leaved filaree	PDGER01070	None	None	G2	S2	1B.1
Carex albida white sedge	PMCYP030D0	Endangered	Endangered	G1	S1	1B.1

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Ceanothus confusus Rincon Ridge ceanothus	PDRHA04220	None	None	G2	S2.2	1B.1
Ceanothus divergens Calistoga ceanothus	PDRHA04240	None	None	G2	S2.2	1B.2
Ceanothus purpureus holly-leaved ceanothus	PDRHA04160	None	None	G2	S2	1B.2
Ceanothus sonomensis Sonoma ceanothus	PDRHA04420	None	None	G2	S2.2	1B.2
Centromadia parryi ssp. parryi pappose tarplant	PDAST4R0P2	None	None	G4T1	S1	1B.2
Chloropyron maritimum ssp. palustre Point Reyes bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2.2	1B.2
Chloropyron molle ssp. molle soft bird's-beak	PDSCR0J0D2	Endangered	Rare	G2T1	S1	1B.2
Chorizanthe valida Sonoma spineflower	PDPGN040V0	Endangered	Endangered	G1	S1	1B.1
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2S3	SSC
Cypseloides niger black swift	ABNUA01010	None	None	G4	S2	SSC
Danaus plexippus monarch butterfly	IILEPP2010	None	None	G5	S3	
Delphinium luteum golden larkspur	PDRAN0B0Z0	Endangered	Rare	G1	S1	1B.1
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	G2	S2	2.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erigeron greenei Greene's narrow-leaved daisy	PDAST3M5G0	None	None	G2	S2	1B.2
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T2	S2	SSC
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S2	FP

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Hemizonia congesta ssp. congesta white seaside tarplant	PDAST4R065	None	None	G5T2T3	S2S3	1B.2
Hesperolinon congestum Marin western flax	PDLIN01060	Threatened	Threatened	G2	S2	1B.1
Horkelia tenuiloba thin-lobed horkelia	PDROS0W0E0	None	None	G2	S2.2	1B.2
Hydrochara rickseckeri Ricksecker's water scavenger beetle	IICOL5V010	None	None	G1G2	S1S2	
Hydroporus leechi Leech's skyline diving beetle	IICOL55040	None	None	G1?	S1?	
Lasthenia burkei Burke's goldfields	PDAST5L010	Endangered	Endangered	G1	S1	1B.1
Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G4T1	S1	FP
Layia septentrionalis Colusa layia	PDAST5N0F0	None	None	G2	S2.2	1B.2
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2.2	1B.1
Leptosiphon jepsonii Jepson's leptosiphon	PDPLM09140	None	None	G2	S2	1B.2
Limnanthes vinculans Sebastopol meadowfoam	PDLIM02090	Endangered	Endangered	G1	S1	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G3	S2S3	
Lupinus sericatus Cobb Mountain lupine	PDFAB2B3J0	None	None	G2	S2.2	1B.2
Melospiza melodia samuelis San Pablo song sparrow	ABPBXA301W	None	None	G5T2?	S2?	SSC
Microseris paludosa marsh microseris	PDAST6E0D0	None	None	G2	S2.2	1B.2
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Northern Vernal Pool Northern Vernal Pool	CTT44100CA	None	None	G2	S2.1	
Oncorhynchus mykiss irideus steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2Q	S2	
Penstemon newberryi var. sonomensis Sonoma beardtongue	PDSCR1L483	None	None	G4T1	S2	1B.3

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Plagiobothrys mollis var. vestitus Petaluma popcornflower	PDBOR0V0Q2	None	None	G4?TX	SX	1A
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	G2	S2	SSC
Polygonum marinense Marin knotweed	PDPGN0L1C0	None	None	G2Q	S2	3.1
Rallus longirostris obsoletus California clapper rail	ABNME05016	Endangered	Endangered	G5T1	S1	FP
Rana boylii foothill yellow-legged frog	AAABH01050	None	None	G3	S2S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G4T2T3	S2S3	SSC
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2S3	
Sidalcea calycosa ssp. rhizomata Point Reyes checkerbloom	PDMAL11012	None	None	G5T2	S2.2	1B.2
Sidalcea oregana ssp. valida Kenwood Marsh checkerbloom	PDMAL110K5	Endangered	Endangered	G5T1	S1	1B.1
Sorex ornatus sinuosus Suisun shrew	AMABA01103	None	None	G5T1	S1	SSC
Speyeria zerene myrtleae Myrtle's silverspot	IILEPJ6089	Endangered	None	G5T1	S1	
Streptanthus hesperidis green jewel-flower	PDBRA2G510	None	None	G2	S2	1B.2
Syncaris pacifica California freshwater shrimp	ICMAL27010	Endangered	Endangered	G1	S1	
Talanites ubicki Ubick's gnaphosid spider	ILARA98030	None	None	G1	S1	
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Trifolium amoenum showy rancheria clover	PDFAB40040	Endangered	None	G1	S1	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G1	S1	1B.2
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2G3	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Valley Needlegrass Grassland Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G5	S2.3	2.3

Record Count: 86

CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS SYSTEM 5/23/2013
Supported by
CALIFORNIA INTERAGENCY WILDLIFE TASK GROUP
and maintained by the
CALIFORNIA DEPARTMENT OF FISH AND GAME
Database Version: 8.2 (2008)

SPECIES SUMMARY REPORT

	3=California Endangered	7=California Species of Special Concern	11=BLM Sensitive
	4=California Threatened	8=Federally-Proposed Endangered	12=USFS Sensitive
1=Federal Endangered	5=California Fully Protected	9=Federally-Proposed Threatened	13=CDF Sensitive
2=Federal Threatened	6=California Protected	10=Federal Candidate	14=Harvest

Note: Any given status code for a species may apply to the full species or to only one or more subspecies or distinct population segments.

ID	SPECIES NAME	STATUS
B117	NORTHERN GOSHAWK	7 11 12 13
B121	SWAINSON'S HAWK	4 12
B272	LONG-EARED OWL	7
M117	DEER MOUSE	7
R046	RUBBER BOA	4 12
R053	STRIPED RACER	2 4
R057	GOPHER SNAKE	7
R059	CALIFORNIA MOUNTAIN KINGSNAKE	7 12
R061	COMMON GARTER SNAKE	1 3 5 7

Total Number of Species: 9

JRA Electrical Engineers, Inc

May 7, 2013

Mr. Steve Martin
SMA, Inc.
130 South Main Street, Suite 201
Sebastopol, CA 95472
(707) 824-9730

Proposal for Engineering Services
Dry Creek Residence
1280 Dry Creek Road
Healdsburg, CA

Dear Steve:

JRA is pleased to present this Proposal for electrical engineering services for the above referenced project. The project consists of a new residence located in Healdsburg. This Proposal is based upon the preliminary information and drawings prepared by SMA, Inc. dated 04/19/2013. The scope of services that we propose to provide is as follows:

1. Visit the project site to verify the existing conditions and determine the origination points for power, telecom, and signal systems.
2. Attend and participate in meetings with the Project Team members during the design process; the objective being to develop the concept and scope of the electrical systems at the schematic design phase in order to facilitate the electrical needs of the project.
3. Design and engineering for new power, lighting, telephone and CATV to the above project. Preparation of the load data and service request information for the serving utility company. Establish contact with and coordinate planning of the service entrance facilities with the respective utility companies.
4. Perform electrical load calculations and design the power distribution feeders throughout. Layout and design of branch circuits and panelboards for receptacles, mechanical equipment, and other utilization equipment.
5. Design and layout of interior lighting and exterior site lighting. Design of automatic lighting controls for the interior and exterior lighting systems.
6. Coordination of the special system requirements. We will show the required conduits and power provisions to be installed under the electrical contract as requested by the selected system consultant.
7. Preparation of the electrical construction drawings and specifications. Drawings will be prepared in *AutoCAD 2011* format. Specifications will be prepared in *Microsoft Word 2007* format. Architectural backgrounds will be provided in digital format by your office for our use in preparing the electrical drawings. Drawings and specifications will be made available to your office in hardcopy reproducible format.
8. We will provide the necessary lighting fixture information and plan sheets as required for Title 24. Preparation of the actual Title 24 energy compliance documentation is included in this proposal.

9. Progress sets of drawings for your use in coordinating the project will be provided at the customary stages (schematic design, design development, and final stages). Production blueprinting for permit submittal, bidding, and construction is **not included** in this proposal.
10. Expenses such as mileage, printing and postage are not included in the fee stated above, and will be billed at our cost not to exceed $1,500.00.

We propose to provide the above services for the stipulated not exceed sum of **Seven Thousand Three Hundred Dollars ($7,300.00)**. Invoices will be sent to your office monthly on a percentage completion basis in accordance with the following table:

Design Development	$ 2,920.00
Construction Documents	$ 4,380.00
Total	$ **7,300.00**

Construction Administration will be billed to your office monthly on an hourly basis.

Engineering services outside the scope of this Proposal can be provided upon request, and will be billed as additional services on an hourly basis as follow:

Principal	$140.00
Staff Engineer	$125.00
Designer	$100.00
CAD Drafter	$ 77.00

Payment Due
Invoices shall be submitted by the Consultant monthly, upon completion of each phase, are due upon presentation and shall be considered past due if not paid with 30 calendar days of the due date.

Interest
If payment in full is not received by the Consultant within 30 calendar days of the due date, invoices shall bear interest at one-and-one-half (1.5) percent (or the maximum rate allowable by law, whichever is less) of the PAST DUE amount per month, which shall be calculated from the invoice due date. Payment thereafter shall first be applied to accrued interest and then to the unpaid principal.

Collection Costs
If the Client fails to make payments when due and the Consultant incurs any costs in order to collect overdue sums from the Client, the Client agrees that all such collection costs incurred shall immediately become due and payable to the Consultant. Collections costs shall include, without limitation, legal fees, collection agency fees and expenses, court costs, collection bonds and reasonable Consultant staff costs at standard billing rates for the Consultant's time spent in efforts to collect. This obligation of the Client to pay the Consultant's collection costs shall survive the term of this Agreement or any earlier termination by either party.

Suspension of Services

If the Client fails to make payments when due or otherwise is in breach of this Agreement, the Consultant may suspend performance of services upon (10) calendar days notice to the Client. The Consultant shall have no liability whatsoever to the Client for any costs or damages as a result of such suspension caused by any breach of this Agreement by the Client. Upon payment in full by the Client, the Consultant shall resume services under this Agreement, and the time schedule and compensation shall be equitably adjusted to compensate for the period of suspension plus any other reasonable time and expense necessary for the Consultant to resume performance.

Ownership of Documents:
All documents produced by JRA under this agreement shall remain the property of JRA and may not used by the Client for any other endeavor without the written consent of JRA.

Limitation of Liability:
The Client agrees that to the fullest extent permitted by the law, JRA total liability to the client for any and all injuries, claims, losses, expenses, damages or claim expenses arising out of this agreement from any cause or causes, shall not exceed $1,000,000.00. We carry Professional Liability Insurance in the amount of $2,000,000.00 per claim, $3,000,000.00 per year aggregate; a certificate of insurance is available upon request.

If this proposal is acceptable to you, we can begin work on this project at your earliest convenience. We look forward to working with you on this project. Should you have any questions or need clarification of this Proposal, please call us at your convenience.

Sincerely,
JRA Electrical Engineers, Inc.

Paul Jeffery

Paul Jeffery
Principal

Accepted By,
SMA, Inc.

Steve Martin
Principal

WARNER MECHANICAL ENGINEERING

May 6, 2013

Mr. Steve Martin, PE
Steve Martin Associates, Inc.
130 S. Main St., Ste. 201
Sebastopol, California 95472

Subject: **BCRS Residence**
1280 Dry Creek Rd, Healdsburg, CA
Mechanical Engineering Design Services Fee Proposal

Dear Steve,

I am pleased to provide you with this proposal for the above project.

Project Scope

The project consists of a new 2-story, 6,310 square foot residence.

This proposal is based on the Design Development drawings dated April 19, 2013 (received May 2, 2013) including: C1 Overall Site Plan; A6 Building Floor Plan (1st Floor only); A7 Exterior Elevations.

Fees

Services for this project shall be a fixed lump sum amount. Services rendered beyond the agreed scope of work will be billed at my standard hourly rate of $130.00/Hr. Travel to meetings, printing and delivery of deliverables are included in this fee. Please indicate which optional services are required below:

SERVICES		
HVAC	8,000	
T-24	1,500	
PLUMBING	4,500	
FIRE	4,500	
	$18,500	TOTAL

OPTIONAL SERVICES		(Y/N)*
RADIANT	3,000	
H.R.V.	1,500	
W.H.F.	1,500	
SOLAR	2,500	
G.I.	750	
		GRAND TOTAL

Areas of Service

I will provide the following professional services related to the design of the Main Residence mechanical systems.

A. HVAC Design:
1. Forced air mechanical heating, ventilation and cooling system design, up to 6 zones
2. Environmental exhaust systems, including: bathroom, kitchen, laundry and mechanical room
3. Fire place flues
4. (optional) Whole house fan ventilation system (WHF)
5. (optional) Heat recovery ventilation system (HRV)

Warner Mechanical Engineering
707.322.0676
jwarner@wme-consulting.com

6. (optional) Radiant Heating, all rooms in Main residence

B. Title-24 energy compliance
   1. Performance method including: envelope, mechanical & lighting

C. Plumbing Design, including:
   1. Sanitary sewer and vent systems
   2. Natural or Propane gas piping systems
   3. Domestic hot, hot water return and cold water systems
   4. Coordination of storm drainage gutter and down spout/leader sizes
   5. (optional) Solar-thermal domestic water heating (SOLAR)
   6. (optional) Grease interceptor (GI)

D. Fire Protection
   1. Design-Build performance specification
   2. Fire riser diagram
   3. Preliminary (design development for coordination only) head & piping layout

Basic Services

A. Schematic Design
   1. Attend one project meeting with owner, architect and consultants to complete this phase of the project.
   2. Establish design intent, scope of project, schedule, budget, coordination parameters, code constraints and document quality standards with design team.
   3. Develop preliminary systems approach, with alternative design concepts where appropriate, to determine desirable system type and configuration. This consists of descriptive input to compare advantages and disadvantages of alternative concepts for consideration and approval by the owner.
   4. Prepare systems descriptions for comparative purposes and outline mechanical (HVAC & Radiant) specification for budgeting.
   5. Develop preliminary mechanical equipment space requirements.
   6. Coordinate mechanical design with other project consultants as required.

B. Design Development
   1. Attend one project meeting with owner, architect and consultants to complete this phase of the project.
   2. Provide one set of 50% design development coordination drawings.
   3. Coordinate mechanical design with other project consultants as required.

C. Construction Documents
   1. After Owner approval of the system approach and the design development drawings prepare detailed construction documents including all drawings, specifications and detail drawings necessary for construction.
   2. Provide one set of permit submittal drawings.
   3. Attend one project meeting with owner, architect and consultants to complete this phase of the project.
   4. Coordinate mechanical design with other project consultants as required.
   5. CEC Title-24 mechanical energy compliance documentation.

D. Bidding
   1. Respond to requests for information with responses through the architect.
   2. Issues clarifications with responses through the architect.

E. Construction Administration
   1. Review of contractor bids and alternates.
   2. Review all mechanical shop drawings, submittals and samples for compliance with the contract documents.
   3. Issue clarifications through the architect.
   4. Provide three (3) site visits and prepare a written report of each visit plus follow up on punch list items as needed.

Warner Mechanical Engineering
707.322.0676
jwarner@wme-consulting.com

Assumptions

A. Architect shall provide CADD backgrounds, including sheet title blocks, in AutoCAD drawing (.dwg) format.
B. Full set of full-size complete architectural and engineering prints will be issued to WME prior to starting any work at no cost to Warner Mechanical Engineering.
C. A permit submittal set of drawings will be issued to the architect at the end of May 2013 (date TBD).
D. Delivery contingent on starting May 10, 2013
E. Kitchen hoods and fire places will be selected by the architect.
F. Contractor submittals and shop drawings will include not less than one full-size printed set for our review and records. Photocopying and printing of submittals, if required, will be by others.
G. The mechanical scope of work is limited to within 5 feet of the building.
H. The electrical engineer will provide analysis of the electrical utility services and the design of new electrical upgrades for the support of mechanical equipment.
I. The structural engineer will provide analysis and design for the anchorage and support of mechanical equipment.
J. The structural engineer shall review seismic supports details provided by the contractor and verify that seismic attachments are within allowed loads.
K. The architect will provide analysis and design of mechanical equipment screening and roof and wall penetration water proofing details.
L. An acoustical engineer will provide necessary analysis, review and design input for the mechanical system to perform according to expectations.
M. Applicable codes will be the 2010 California Building Codes.
N. The performance method will be used to demonstrate Title-24 energy compliance.
O. Fees assume a maximum design period of two (2) months.
P. Fire sprinkler system design work is from the base of the rise including overhead piping.
Q. Fire sprinkler system design assumes adequate water supply to meet calculated demand.

Exclusions

A. Design Services beyond those stated in Basic Services.
B. Redesign resulting from code changes or changes in code interpretations after issuance of the construction documents.
C. Additional work caused by project requirements which differs from the assumptions contained in this proposal.
D. Redesign as a result of significant changes implemented after approval of the documents or start of next phase of design. This includes changes during the design development and construction phases required to accommodate contractor substitutions or contractor value engineering and concealed conditions.
E. Detailed in-floor radiant heating tubing layouts.
F. Life cycle cost analysis.
G. Detailed construction cost estimates, quantity takeoffs and the review of Contractor value engineering designs or change orders.
H. Preparing documents for owner-requested alternate bids, separate equipment prebids, out-of-sequence services, "fast track" construction methods, and/or multiple subcontracts.
I. Preparation of Record Drawings and Record Specifications.
J. Preparation of documents for appearance before, and negotiation of variances or alternate compliance methods with, authorities having jurisdiction.
K. Filing for permits with authorities having jurisdiction.
L. Preparation of maintenance and operations manuals, witnessing the testing of equipment and preparation of written report of results.
M. Commissioning services or attendance at additional meetings/site visits requested by the Commissioning Authority.
N. System design, analysis, documentation, meeting(s), and other services performed as part of LEED certification or other green design certification programs.
O. Fire alarm system design, fire protection system underground piping, hydrants, fire pump, water storage, hydraulic calculations, pipe sizing and shop drawings are not included in this proposal.

Warner Mechanical Engineering
707.322.0676
jwarner@wme-consulting.com

Other Terms and Conditions

Please refer to the attached Standard Engagement Letter.

Thank you,

Jeff Warner, PE
Principal Engineer/Owner

Enc: WME Standard Engagement Letter
P.S. Please return a signed copy of this letter and the Standard Engagement Letter.

Accept by: May 10, 2013

Company Name: ______________________

By (Printed Name): ______________________

Title: ______________________

Signature/Date: ______________________

SMA Steve Martin Associates, Inc.
130 South Main Street, Suite 201
Sebastopol, CA 95472
707-824-9730
707-824-9707 (fax)

606 Alamo Pintada Road #3-221
Solvang, CA 93463
805-541-9730

RECEIVED
AUG 22 2013
PERMIT AND RESOURCE MANAGEMENT DEPARTMENT
COUNTY OF SONOMA

TRANSMITTAL

Project: **Belden Barns Winery**
Project No.: 2011014

Date: August 20, 2013

To: **Melinda Grosch**
County of Sonoma PRMD
2550 Ventura Avenue
Santa Rosa, CA 95401

Site:
APN# 049-030-010
5561 Sonoma Mountain Road
Santa Rosa, CA 95404

SENT VIA: ☐ **Email** ☐ **Overnight** ☐ **Regular Mail** ☒ **Drop-off**

Copies	Date	Description
1	*08/19/13*	*W-Trans – Traffic Study for Belden Barns*

TRANSMITTED: ☐ **For approval** ☒ **For your use** ☐ **As requested** ☐ **For review & comment**

Dear Melinda,

See attached hard copy of the Focused Traffic Study prepared by W-Trans.

Please call if you have any questions or need additional information.

Sincerely,

Jeannie

Jeannie VandeWeg
Project Administrator

w-trans

August 19, 2013

Whitlock & Weinberger
Transportation, Inc.

490 Mendocino Avenue
Suite 201
Santa Rosa, CA 95401

voice 707.542.9500
fax 707.542.9590
web www.w-trans.com

Mr. Steve Martin
Steve Martin Associates
130 South Main Street, Suite 201
Sebastopol, CA 95472

Focused Traffic Study for the Belden Barns Winery Project

Dear Mr. Martin;

As requested, Whitlock & Weinberger Transportation, Inc. (W-Trans) has prepared a traffic analysis relative to the proposed winery to be located at 5561 Sonoma Mountain Road in the County of Sonoma. The purpose of this letter is to address the likely trip generation of the proposed project as well as adequacy of the parking supply. The traffic study was completed in accordance with the Traffic Study Guidelines established by the County of Sonoma.

Project Description

The proposed Belden Barns Winery project consists of the development of a winery capable of producing 10,000 cases of wine and 10,000 pounds of cheese annually together with a tasting room that would be open daily. It is anticipated that 5,000 cases of wine would be produced from grapes grown on site, while the remaining 5,000 cases will come from grapes grown at local vineyards. It is also anticipated that half of the cheese will be made from milk produced by cows, sheep and goats raised on the property, while the other half of the milk will be imported. Participation in up to ten special events is proposed annually. The tasting room is proposed to be open from 10:00 a.m. to 5:00 p.m. daily, while winery operations would typically be between 7:00 a.m. and 6:00 p.m. Access to the project will be via an existing driveway on the south side of Sonoma Mountain Road approximately 1.5 miles east of Pressley Road.

Existing Conditions

Sonoma Mountain Road is classified as a Rural Minor Collector in the *Sonoma County General Plan 2020*. East of Pressley Road and in the vicinity of the project site, Sonoma Mountain Road is narrow, approximately 20 feet wide, running east-west with no center line or edge line striping. Travel speed and traffic count data was obtained using machine counters on April 26-30, 2012, west of the project site. Based on the data collected, Sonoma Mountain Road has an average daily traffic (ADT) volume of approximately 360 vehicles during weekdays and 340 vehicles during weekend days.

Although there is no posted speed limit for Sonoma Mountain Road near the proposed winery's frontage, the *prima facie* speed limit is 55 mph. However, based on speed data collected, the 85th percentile speed for traffic approaching the driveway was found to be approximately 40 mph. Therefore, 40 mph was utilized for analysis purposes.

A 20-acre vineyard currently exists on the site, of which four acres are being re-planted. Additionally, three single family houses and a guest house exist on the site. Of the three single family houses, one is proposed to be demolished and replaced with a new single family house/hospitality building, one will be removed and replaced by two new residences attached to the winery building while the remaining residential unit will remain unchanged. The existing guest house will also remain unchanged. The site also has an existing barn and dance hall that are proposed to be renovated.

Collision History

The collision history for the study segment of Sonoma Mountain Road from Pressley Road to the project driveway was reviewed to determine any trends or patterns that indicate a safety risk that may be exacerbated by the addition of project traffic. The average annual collision rate was calculated based on records for January 2006 through December 2010 obtained through the California Highway Patrol and published in their *Statewide Integrated Traffic Records System* (SWITRS) reports.

The 1.5-mile segment of Sonoma Mountain Road had two reported collisions over the five-year study period for a calculated collision rate of 1.97 collisions/million vehicle miles (c/mvm). The statewide average collision rate for a rural two-lane road with a speed limit of less than 55 mph is 2.24 c/mvm. The calculated collision rate is lower than the statewide average for similar roadway segments, indicating that the roadway is operating within normal safety parameters. A copy of the spreadsheet showing the derivation of actual and statewide collision rates is enclosed.

Trip Generation

The County's Winery Trip Generation form, which is enclosed, was completed in order to determine the proposed winery site's trip generation potential under both existing and proposed conditions. This form includes details relative to the anticipated production of cheese as well as the winery operation, and indicates that the winery will have a staff of eight persons who would be expected to generate an average of three trip ends each, or 24 trip ends total, per weekday. Truck traffic is expected to contribute an average of one trip end per weekday.

In addition, the tasting room will have one employee, generating an average of three trips per day. An average of 42 visitors per day is expected for tasting, with a high of 60 tasters during the summertime months and a low of about 30 visitors during December. Based on the average vehicle occupancy of 2.5 visitors per vehicle, 33 daily trips are expected due to tasting. Data collected by W-Trans at a local Sonoma County Winery was used to develop factors for winery tasting room trips made during both the p.m. and weekend midday peak hour. These winery driveway counts were collected one week every month for a year and indicate that 10 percent of the daily generated winery trips occur during the p.m. peak hour and 13 percent during the weekend midday peak.

For purposes of estimating the number of trips associated with the three existing single family houses, *Trip Generation*, 8th Edition, Institute of Transportation Engineers, 2008, was used. Based on rates for Single Family Detached Housing (Land Use #210), a residence is expected to generate an average of about ten daily trips. Trips associated with the three existing single family houses are already included in existing background volumes and were therefore not considered to be new trips; however, these trips were included in the analysis of driveway operations. Since the existing guest house is not occupied on a consistent basis, it was not included in the trip generation estimate for existing conditions.

As shown in Table 1, the proposed winery project would be expected to generate an average of 71 new trip ends per day, including 13 trips during the weekday p.m. peak hour and six during the weekend midday peak hour.

Table 1
Trip Generation Summary

Trip Type	Unit	Daily		Weekday PM Peak			Weekend Midday Peak		
		Rate	Trips	Trips	In	Out	Trips	In	Out
Existing									
Single Family Home	3	9.57	30	3	3	0	3	3	0
Proposed									
Winery Employees	8	3	24	8	0	8	0	0	0
Truck Traffic	n/a	n/a	1	0	0	0	0	0	0
Tasting Visitors	42	0.8	33	3	1	2	4	2	2
Tasting Employees	1	3	3	1	0	1	1	1	0
Single Family Home	4	9.57	40	4	4	0	4	4	0
Total Proposed Trips			*101*	*16*	*5*	*11*	*9*	*7*	*2*
Total New Trips			**71**	**13**	**2**	**11**	**6**	**4**	**2**

Note: Trip generation does not include special events

Special Events

A total of ten special events are proposed at the project site. As indicated on the enclosed "Event Schedule" forms, two 200-person winery events per year are proposed along with three 100-person winery events and five 60-person winery events. It was assumed that a maximum sized 200-person event would require a staff of ten. Using an occupancy of 2.5 persons per vehicle for guests and solo occupancy for staff, a maximum sized 200-person event would be expected to generate 180 trip ends at the driveway, including 90 inbound trips at the start of the event and 90 outbound trips upon its conclusion.

Site Access

Access to the project will be provided via an existing driveway on Sonoma Mountain Road. Based on Sonoma County Fire Safe Standards, the driveway would need to be 20 feet wide for two-way access; however, the driveway width may be reduced to ten feet wide with a minimum vertical clearance of 15 feet if turnouts are provided every 400 feet or approximately midway if the total driveway is less than 800 feet long. Based on the site plan provided it is understood that the driveway will retain its existing width of 12 feet, while the roadway segment providing access to the new winery building is proposed to be 16 feet wide. It is therefore recommended that all internal roadways either be widened to a 20-foot cross section or include the appropriate number of turnouts to meet standards established by Sonoma County.

Sight Distance

Sight distance from the project's driveway on Sonoma Mountain Road was evaluated based on criterion contained in *A Policy on Geometric Design on Highways and Streets* published by American Association of State Highway and Transportation Officials (AASHTO). These guidelines recommend sight distances at intersections, including stopping sight distances for drivers traveling along the major approaches, and sight distances for drivers of vehicles stopped on the minor street approaches and driveways. These recommendations are based upon approach travel speeds, and take into account which direction a vehicle would turn onto the major approach, with greater sight distance needed for the more time-consuming task of turning left compared to turning right.

For a 40-mph design speed, sight distance to the west of at least 385 feet is needed to complete an outbound left turn. From the location of the existing driveway, sight distance to the west extends to approximately 200 feet west of the driveway. The sight lines are obstructed by vegetation along the south side of the road west of the project driveway. If this vegetation can be cleared, it is expected that adequate sight lines would be achieved. Therefore, it is recommended that vegetation along the south side of Sonoma Mountain Road west of the project driveway to be cleared to achieve at least 385 feet of sight distance. .

To complete an outbound left turn, which is expected to be the predominant movement for project traffic, 445 feet of sight distance is required, but clear sight lines of only approximately 400 feet are available. The sight lines are obstructed by vegetation along the north side of the road located approximately 400 feet east of the project driveway. If this vegetation can be cleared, it is expected that adequate sight lines would be achieved. Therefore, it is recommended that vegetation along the north side of Sonoma Mountain Road approximately 400 feet east of the project driveway be cleared to achieve at least 445 feet of sight distance.

Also measured was the stopping sight distance along the westbound Sonoma Mountain Road approach to determine if there is adequate sight distance available for a driver to react to a vehicle stopped in the through lane while waiting to complete an inbound left-turn movement. This would require 305 feet of sight distance, and 400 feet is available, which is adequate for speeds of up to 45 mph.

Any planned vegetation or frontage improvements that may be installed as a component of the project should be low lying or located back from the roadway to avoid further reducing sight lines.

Turn Lane Warrants

The need for turn lane channelization on Sonoma Mountain Road at the project driveway was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as an update of the methodology developed by the Washington State Department of Transportation.

Including all existing residential traffic and agricultural traffic, it is estimated that approximately 17 trips would occur during the weekday p.m. peak hour, of which up to five could be inbound trips, while during the weekend midday peak hour ten are expected to occur including eight inbound trips. Despite current traffic volumes on Sonoma Mountain Road being fairly evenly split in the eastbound and westbound directions, it is expected that the majority, if not all, of inbound project-related trips would access the site via eastbound right turns. However, to provide a worst-case scenario it was assumed that all inbound trips would access the site via a westbound left-turn.

Based on the prevailing speed of 40 mph, and current Sonoma Mountain Road segment volumes near the driveway, a left-turn lane would **not** be warranted during either the weekday p.m. or weekend midday peak periods.

Because inbound right turns are expected to dominate, analysis was performed that indicates that assuming all inbound trips are eastbound right turns, which is likely; neither a right turn lane nor taper would be warranted. Copies of the turn lane warrant calculation sheets are enclosed.

Internal Circulation

The ability for drivers of large vehicles to maneuver through the site was examined using the AutoTURN analysis software to simulate vehicle turning movements. Through discussions with the applicant, it is understood that the largest truck expected to access the site would be a bottling line truck. A heavy-duty ten-wheel truck was used to simulate the bottling line truck.

Based on the AutoTURN analysis it was determined that bottling line trucks would be able to enter and exit the site without the need for widening at the existing driveway location. On-site roadways are also expected to be sufficient to accommodate the circulation of the evaluated bottling line truck. Drivers of these larger trucks will need to utilize the truck turnaround area located south of the existing barn to complete the full circuit. A figure of the site plan showing maneuvering of the evaluated bottling line truck is enclosed.

Parking Adequacy

Daily Operations

The project site plan shows a total of 96 on-site spaces, including 16 permanent spaces for staff and visitors and 80 temporary spaces for attendees of special events.

Assuming that each employee drives to work in their own vehicle, nine spaces would be needed to accommodate the employees associated with daily winery and tasting room operations. Data collected by W-Trans to develop winery tasting room rates was also used to develop the parking demand for the project. Based on this information, it was assumed that an average of 25 percent of the 17 daily vehicles associated with the tasting room visitors, or five vehicles, would be parked on-site during any single hour; therefore, a maximum of 14 spaces might be needed to accommodate the typical daily parking demand.

The project as proposed provides a total of 16 permanent parking spaces, which would accommodate the typical guest and employee parking demand, with a surplus of two spaces.

Special Events

A maximum-sized special event with 200 guests would be expected to generate need for 80 parking spaces, plus an additional ten spaces for employees for a combined total of 90 parking spaces. Assuming that typical daily operations, such as tasting room visitors, would cease during participation of a maximum-sized special event, the proposed 96 permanent and temporary parking spaces would be able to accommodate the demand for event parking.

Conclusions and Recommendations

- The 40-mph speed was utilized for analysis purposes and was established with speed data collected near the project site's driveway. It was determined that the 85th percentile speed for traffic approaching the driveway was 40 mph.
- The 1.5-mile segment of Sonoma Mountain Road from Pressley Road to the project driveway has a collision rate that is lower than the average rate for similar facilities statewide.
- The proposed project would generate an average of 71 new daily trip ends over existing levels, which includes 13 trips during the weekday p.m. peak hour and six during the weekend midday peak hour.

- Ten special events are proposed annually with attendance levels ranging from 60 to 200 people.
- It is recommended that all internal roadways be widened to a 20-foot cross section or else the appropriate number of turnouts should be constructed to meet standards established by Sonoma County.
- Sight distance at the project driveway is adequate for outbound right-turn and inbound left-turn movements, but is inadequate for outbound left-turn movements until vegetation is cleared.
- If vegetation is removed along the south side of Sonoma Mountain Road west of the project driveway, it is expected that adequate sight distance could be achieved for the outbound left-turn movement.
- If vegetation is removed along the north side of Sonoma Mountain Road approximately 400 feet east of the project driveway, it is expected that adequate sight distance could be achieved for the outbound left-turn movement.
- Under the conservative assumption that all inbound trips would be made via left turns, a westbound left-turn lane is not warranted on Sonoma Mountain Road at the project driveway.
- Neither an eastbound right-turn lane nor taper are warranted on Sonoma Mountain Road at the project driveway.
- It is expected that the proposed site configuration will accommodate a heavy-duty 10-wheel bottling line truck.
- The proposed parking supply will be adequate to meet expected demands for employees, tasting room visitors and special event attendees.

Thank you for giving W-Trans the opportunity to provide these services. Please call if you have any questions.

Sincerely,

Sam Lam
Transportation Engineer

REGISTERED PROFESSIONAL ENGINEER
DALENE J. WHITLOCK
TR001552
Exp. 9/30/14
TRAFFIC
STATE OF CALIFORNIA

Dalene J. Whitlock, PE, PTOE
Principal

DJW/scl/SOX441.L1

Enclosures: Collision Rate Spreadsheet
Belden Barns Winery Trip Generation Form
Special Event Schedule Form
Turn Lane Warrants
Vehicle Maneuvering Drawing

SEGMENT COLLISION RATE CALCULATIONS

Belden Barns Winery

Location: Sonoma Mountain Rd from Pressley Rd to the Project Driveway

Date of Count: Friday, April 27, 2012
ADT: 370

Number of Collisions: 2
Number of Injuries: 1
Number of Fatalities: 0
Start Date: January 1, 2006
End Date: December 31, 2010
Number of Years: 5

Highway Type: Conventional 2 lanes or less
Area: Rural
Design Speed: <=55
Terrain: Rolling/Mountain

Segment Length: 1.5 miles
Direction: East/West

$$\frac{\text{NUMBER OF COLLISIONS x 1 MILLION}}{\text{ADT x 365 DAYS PER YEAR x SEGMENT LENGTH x NUMBER OF YEARS}}$$

$$\frac{2 \times 1{,}000{,}000}{370 \times 365 \times 1.5 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Segment	1.97 c/mvm	0.0%	50.0%
Statewide Average*	2.24 c/mvm	2.2%	46.0%

ADT = average daily traffic volume
c/mvm = collisions per million vehicle miles
* *2007 Collision Data on California State Highways*, Caltrans

Winery Trip Generation

Winery: Belden Barns Winery
Location: 5561 Sonoma Mountain Road
Annual Full Production: 10000 cases of wine & 10,000 lbs of cheese

WINERY OPERATIONS

Employee traffic using passenger vehicles, in average ADT

Item Description	Employees				Trips			
	Existing	Proposed (year round)	Proposed (harvest period)	Proposed (bottling period)	Existing	Proposed (year round)	Proposed (harvest period)	Proposed (bottling period)
Winery Production	0	6	12	--	0	18	36	--
Cellar / Storage	0	0	0	--	0	0	0	--
Administrative	0	2	4	--	0	6	12	--
Sales	0	0	0	--	0	0	0	--
Bottling	0	0	--	0	0	0	--	0
Other staff (describe):					0	0	0	0
Totals	**0**	**8**	**16**	**0**	**0**	**24**	**48**	**0**

Truck traffic associated with winery operations (average ADT)

Item Description		Existing	Proposed
Grape Importation Truck loads per year: Dates of Activity:	 7; 7 truck(s) at 12 tons/truck August through October	0.00	0.05
Juice Importation Truck loads per year: Dates of Activity:	 None	0.00	0.00
Juice/Fruit Exportation Truck loads per year: Dates of Activity:	 None	0.00	0.00
Pomace Disposal Truck loads per year: Dates of Activity: Disposed:	 0; and 0 truck(s) at 0 tons/truck August through October on-site	0.00	0.00
Bottle Delivery Truck loads per year: Dates of Activity:	 5 truck(s) at 1904 cases/truck January through June	0.00	0.04
Barrel Delivery Truck loads per year: Dates of Activity:	 1 truck(s) at 100 barrels/truck July through September	0.00	0.01
Finished Wine Transportation to storage/sales Truck loads per year: Dates of Activity:	 10 truck(s) at 984 cases/truck January through December	0.00	0.08
Less Backhauls Truck loads per year: Dates of Activity:	 -3 truck(s) January through December	0.00	-0.02
Miscellaneous trips Truck loads per year: Dates of Activity:	 122 trucks January through December	0.00	0.92
Totals		**0.00**	**1.08**

VINEYARD OPERATIONS

Employee trips associated with vineyard operations (in average ADT)

Item Description	Employees		Trips	
	Existing	Proposed	Existing	Proposed
Vineyard Maintenance: Year Round	1	1	3	3
Vineyard Maintenance: Peak Season	0	0	0	0
Totals	**1**	**1**	**3**	**3**

Winery Trip Generation

TASTING ROOM OPERATIONS

Item Description	Persons		Trips	
	Existing	Proposed	Existing	Proposed
Average Tasting Room Visitors	0	42	0	33
Tasting Room Employees	0	1	0	3
Totals	**0**	**43**	**0**	**36**

	Tasting Room		Production	
	Existing	Proposed	Existing	Proposed
Months of Operation	N/A	Year Round	N/A	Year Round
Days of Operation - Non-Harvest Season	N/A	Daily	N/A	Monday - Friday
Days of Operation - Harvest Season	N/A	Daily	N/A	Daily
Hours of Operation - Non-Harvest Season	N/A	10:00am-5:00pm	N/A	7:00 am-6:00 pm
Hours of Operation - Harvest Season	N/A	10:00 am - 5:00 pm	N/A	6:00 am-8:00 pm

MISCELLANEOUS OTHER TRAFFIC GENERATORS

Item Description	Existing	Proposed
Event Traffic Special Events	0	2
Other Trips (If Applicable) None		
Totals	**0**	**2**

SUMMARY (During Non-Harvest Period)

Item Description	Existing	Proposed
Winery Operations (employees)	0	24
Winery and Cheese Operations (truck traffic)	0	1
Vineyard Operations (employees)	3	3
Tasting Room Traffic (employees and visitors)	0	36
Event Traffic (employee and visitors)	0	2
Miscellaneous other traffic generators	0	0
Totals	**3**	**66**

Variation in ADT during the coarse of a typical full production year (Proposed Trips)

Month	January	February	March	April	May	June
Total Trips	57	57	68	65	66	72

Month	July	August	September	October	November	December
Total Trips	81	102	93	105	61	57

Notes:
Employees - Assume 3 ADT per employee
Visitors - Assume 2.5 person per vehicle occupancy

EVENT SCHEDULE

(Please complete a separate form for each type of event)

Name of Facility: Belden Barns Winery **PRMD File Number: ________**
Type of event shown on this sheet: Special Event - 200 Guests

Estimated total number of events of this type on ▼	January	February	March	April	May	June	July	August	September	October	November	December
Weekdays (Mon – Thurs)												
Fridays			1									
Saturdays												
Sundays										1		

Estimated activity for typical (max?) event	? to 10 a.m.	10 a.m. to 9 p.m.	11 to 12 a.m.	12 to 1 p.m.	1 to 2 p.m.	2 to 3 p.m.	3 to 4 p.m.	4 to 5 p.m.	5 to 6 p.m.	6 to 7 p.m.	7 to 8 p.m.	12 to 10 p.m.
For weekday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												
For Friday events		**Inbound**										**Outbound**
# guests / event		200										200
# employees / event		10										10
# guest vehicles / event		80										80
# employees / vehicles		1										1
For Saturday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												
For Sunday events		**Inbound**										**Outbound**
# guests / event		200										200
# employees / event		10										10
# guest vehicles / event		80										80
# employees / vehicles		1										1

EVENT SCHEDULE

(Please complete a separate form for each type of event)

Name of Facility: Belden Barns Winery **PRMD File Number: ________**
Type of event shown on this sheet: Special Event – 100 Guests

Estimated total number of events of this type on ▼	January	February	March	April	May	June	July	August	September	October	November	December
Weekdays (Mon – Thurs)												
Fridays			1									
Saturdays						1						
Sundays										1		

Estimated activity for typical (max?) event	? to 10 a.m.	10 a.m. to 9 p.m.	11 to 12 a.m.	12 to 1 p.m.	1 to 2 p.m.	2 to 3 p.m.	3 to 4 p.m.	4 to 5 p.m.	5 to 6 p.m.	6 to 7 p.m.	7 to 8 p.m.	12 to 10 p.m.
For weekday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												
For Friday events		**Inbound**										**Outbound**
# guests / event		100										100
# employees / event		7										7
# guest vehicles / event		50										50
# employees / vehicles		1										1
For Saturday events		**Inbound**										**Outbound**
# guests / event		100										100
# employees / event		7										7
# guest vehicles / event		50										50
# employees / vehicles		1										1
For Sunday events		**Inbound**										**Outbound**
# guests / event		100										100
# employees / event		7										7
# guest vehicles / event		50										50
# employees / vehicles		1										1

EVENT SCHEDULE

(Please complete a separate form for each type of event)

Name of Facility: Belden Barns Winery **PRMD File Number: ________**

Type of event shown on this sheet: Special Event - 60 Guests

Estimated total number of events of this type on ▼	January	February	March	April	May	June	July	August	September	October	November	December
Weekdays (Mon – Thurs)												
Fridays	1									1		
Saturdays				1								1
Sundays							1					

Estimated activity for typical (max?) event	? to 10 a.m.	10 a.m. to 9 p.m.	11 to 12 a.m.	12 to 1 p.m.	1 to 2 p.m.	2 to 3 p.m.	3 to 4 p.m.	4 to 5 p.m.	5 to 6 p.m.	6 to 7 p.m.	7 to 8 p.m.	12 to 10 p.m.
For weekday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												
For Friday events		**Inbound**										**Outbound**
# guests / event		60										60
# employees / event		4										4
# guest vehicles / event		24										24
# employees / vehicles		1										1
For Saturday events		**Inbound**										**Outbound**
# guests / event		60										60
# employees / event		4										4
# guest vehicles / event		24										24
# employees / vehicles		1										1
For Sunday events		**Inbound**										**Outbound**
# guests / event		60										60
# employees / event		4										4
# guest vehicles / event		24										24
# employees / vehicles		1										1

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Sonoma Mountain Road at Belden Barns Winery Driveway
Study Scenario: Existing plus Project - Weekday PM Peak Hour

Direction of Analysis Street: East/West

Cross Street Intersects: From the South

Sonoma Mountain Rd
Eastbound Volumes (veh/hr)
Through Volume = 183
Right Turn Volume = 5

Sonoma Mountain Rd
Westbound Volumes (veh/hr)
190 = Through Volume
5 = Left Turn Volume

Eastbound Speed Limit: 40 mph
Eastbound Configuration: 2 Lanes - Undivided

Belden Barns Winery Driveway

Westbound Speed Limit: 40 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	1012.6
Advancing Volume	Va =	188
If AV<Va then warrant is met		No

Right Turn Lane Warranted: NO

Eastbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

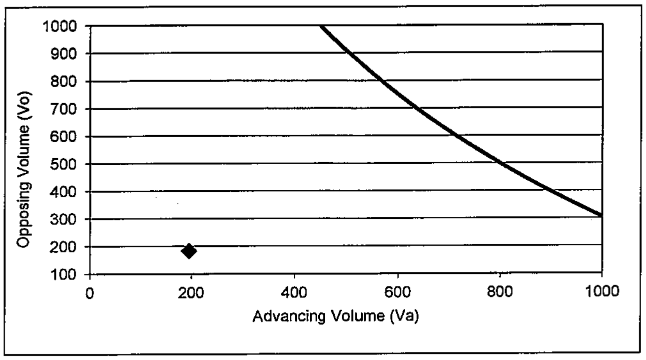
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	188
If AV<Va then warrant is met		-

Right Turn Taper Warranted: NO

Westbound Left Turn Lane Warrants

Percentage Left Turns %lt	2.6 %
Advancing Volume Threshold AV	1151 veh/hr

If AV<Va then warrant is met



◆ Study Intersection
—— Two lane roadway warrant threshold for: 40 mph
Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: Sonoma Mountain Road at Belden Barns Winery Driveway
Study Scenario: Existing plus Project - Weekend Midday Peak Hour

Direction of Analysis Street: East/West

Cross Street Intersects: From the South

Sonoma Mountain Rd
Eastbound Volumes (veh/hr)
Through Volume = 177
Right Turn Volume = 8

Sonoma Mountain Rd
Westbound Volumes (veh/hr)
207 = Through Volume
8 = Left Turn Volume

Eastbound Speed Limit: 40 mph
Eastbound Configuration: 2 Lanes - Undivided

Belden Barns Winery Driveway

Westbound Speed Limit: 40 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Right Turn Lane Warrants

1. Check for right turn volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	990.1
Advancing Volume	Va =	185
If AV<Va then warrant is met		No

Right Turn Lane Warranted: NO

Eastbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

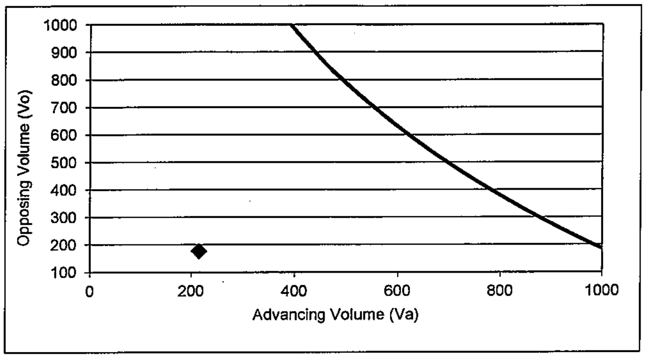
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	185
If AV<Va then warrant is met		-

Right Turn Taper Warranted: NO

Westbound Left Turn Lane Warrants

Percentage Left Turns %lt	3.7 %
Advancing Volume Threshold AV	1009 veh/hr

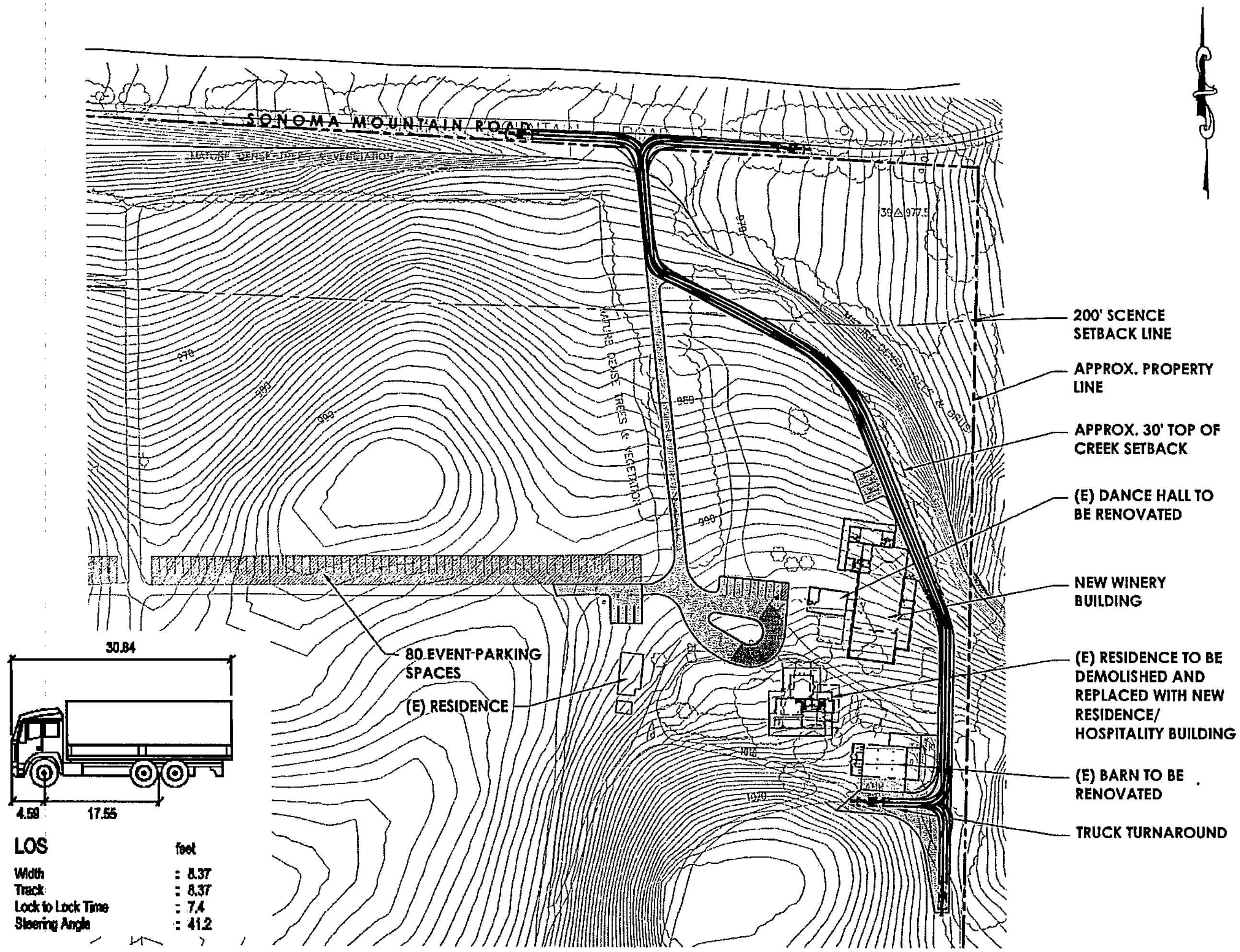
If AV<Va then warrant is met



◆ Study Intersection
——— Two lane roadway warrant threshold for: 40 mph
Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: NO

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, January 1997.
The right turn lane and taper analysis is based on work conducted by Cottrell in 1981.
The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.



w-trans
Whitlock & Weinberger Transportation, Inc
490 Mendocino Ave, Suite 201
Santa Rosa, CA
(707)542-9500 Fax (707)542-9590

Belden Barn Winery AutoTURN Analysis

DRAWN: SL	SCALE: 1"=200'
DESIGN:	DATE: 5/23/12
SHEET 1 of 1 SHEETS	JOB NO.

REESE & ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS

134 LYSTRA COURT
TELEPHONE (707) 528-3078

SANTA ROSA, CA 95403
FACSIMILE (707) 528-2837

May 24, 2013

Job No. 539.1.3

Steiner Vineyards LLC
c/o Steve Martin Associates, Inc.
130 S. Main Street, Suite 201
Sebastopol, CA 95403

Report
Preliminary Geologic Evaluation
Belden Barns Winery and Farmstead
Santa Rosa, California

This letter presents the results of our preliminary geologic/geotechnical evaluation concerning the suitability of the currently proposed development from a geologic standpoint. The project site is located at 5560 Sonoma Mountain Road, in Sonoma County, California.

Located within the hillsides of Sonoma Mountain, the property contains six existing structures. Based on project plans prepared by Steve Martin Associates, Inc. (SMA), the structures consist of an existing main residence, guest house, family farm dwelling, barn, dance hall and employee unit. The plans indicate that the guest house and family farm dwelling will remain. The barn and dance hall will be renovated, while the existing main residence will be demolished and replaced with a new residence/hospitality building. Also, a new winery building with employee units is proposed. The proposed development would be served by a new winery road setback about 30 feet from an existing seasonal creek channel. The proposed winery and farmstead is shown on Plate 1.

PURPOSE AND SCOPE

This evaluation is intended to characterize, in a preliminary manner, the geologic and geotechnical conditions and hazards as they relate to the proposed development. The principle focus was on the possible presence and extent of landsliding. To accomplish this purpose, the following tasks were performed:

- Review of selected published geologic literature including available geotechnical engineering reports, fault and landslide maps pertinent to the project area. References reviewed are listed in the references section.

- Review of stereo-paired aerial photographs of the site and vicinity. Photos reviewed are listed in the references section.

- A geologic reconnaissance of the site and surrounding area to map the surface geologic conditions at the site.

Upon completion of our field work, geologic analyses were performed to develop preliminary conclusions and recommendations concerning:

1. The geologic setting and geologic hazards pertinent to the site.

2. Conclusions regarding the potential for geologic hazards, including landsliding and faulting to affect the proposed project.

3. Conceptual geotechnical engineering recommendations for site development.

4. Supplemental geotechnical engineering services.

BACKGROUND

During February and March 2002, Giblin Associates (GA) was on-site and performed geologic reconnaissance and was in the process of performing a soil investigation with particular focus on slope stability at a proposed new residence building site, for a different owner. Twenty test pits were excavated to explore subsurface conditions at possible building envelopes. Approximate test pit locations are shown on the attached Plate 1. Following the subsurface investigation, a memorandum was issued that contained a summary of their observations and geologic conclusions to date. The memorandum was dated with a revision of July 11, 2002. Our principal engineer and geologist served as project managers for GA during the investigation and co-authored that memorandum.

SITE CONDITIONS

General Site Description

The project site is located on the northwest flanks of Sonoma Mountain and the south portion of the Bennett Valley area. The property begins along the south side of Sonoma Mountain Road and extends about 1,850 feet south. Elevations on the property extend from about 880 to 1,080 feet above sea level. The proposed development is located within the northeast portion of the property within very gently sloping terrain. Located further south, the property ascends and consists of a series of low, hummocky knolls planted with vineyards. Further to the southwest, an irrigation pond is present.

Geology

During our site reconnaissance and review of GA's site exploration, rock materials of the Petaluma Formation were encountered beneath a relatively thin cover of soil. Published maps indicate the property is underlain by the poorly-consolidated, sedimentary rocks of the Pliocene-age Petaluma Formation (Fox, 1973). Based on the test pits excavated by GA, the Petaluma Formation appears comprised predominantly of weak mudstone, claystone and minor amounts of friable sandstone. Our review of published geologic maps, GA's field notes and interpretation of air photos indicates that bedding in the site vicinity strikes slightly north of west with moderate (30 degree) southerly dips.

Faulting and Seismicity

The project site is within the California Coast Ranges, a region of high seismic activity. In historic times numerous moderate and occasional large magnitude earthquakes have affected this region. Notable earthquakes that have caused major damage to Santa Rosa include the magnitude 7.9 California Earthquake of 1906 on the San Andreas fault (21 miles southwest of the site) and the 1969 Santa Rosa earthquakes on the Rodgers Creek fault. The 1969 earthquakes were of moderate magnitude with earthquake epicenters located near downtown Santa Rosa. In addition to the San Andreas and Rodgers Creek faults, several other faults in the region including the Green Valley (22½ miles to the northeast) and the West Napa (13 miles northeast) are considered capable of generating moderate to large earthquakes.

No active faults are recognized within the project area. The closest active fault to the project is the Rodgers Creek fault located approximately 1.9 miles southwest of the project site.

Landslides and Slope Stability

Published geologic and slope stability maps provide several differing interpretations of landslides in the project area. The published maps available are small-scale and these types of maps typically rely heavily on interpretation of topographic features from aerial photographs supported by limited field mapping. The slope stability map accompanying Special Report 120 (1980) depicts a possible large, deep-seated landslide extending from the ridgeline (contour line 1,200 feet) just south of the proposed project area, as shown on the attached Plate 2.

Geologic maps published in 2003 (CGS, 2003) and 1973 (Fox and Sims) do not show any landslides that affect the property or adjacent areas. The fourth map reviewed (CDMG, 1971) depicts a landslide originating near the top of a ridgeline south of Sonoma Mountain Road and extending north into the southeast corner of the subject property (see Plate 2).

During our reconnaissance and review of the previous test pits performed by GA, the two low knolls located south of the barn at elevations about 1068 and 1056 feet are underlain by very weak, diatomaceous siltstone. The siltstone rocks are broken and weathered to the consistency of soil. Furthermore, the materials contained near vertical fractures 9 feet deep filled with topsoil. A contact was observed in Test Pit 19 between the broken rocks and what appeared to be in-place sandstone materials of the Petaluma Formation. It was reported that the contact was an approximate 3- to 6-inch thick plastic clay layer with a mat of roots. Also, the orientation of the contact was downward to the north consistent with a landslide slip surface.

GA then went on to excavate further test pits at the knoll located just above the existing barn at elevation 1,026 feet. This knoll was underlain by highly weathered sandstone, claystone, siltstone and conglomerate of the Petaluma Formation. Bedding was observed in the test pits that had a consistent east/west strike and moderate southerly dip. These materials were judged to be in-place.

Following viewing and interpretation of air photos, our site visit and based on GA's test pits, the presence of two moderately large landslides was confirmed. The first landslide appears to be a relatively old earthflow-type slide that originates near elevation 1,200 feet and extends in the northwest direction, through the south and southwest portions of the property and possibly includes the irrigation pond, as shown on Plates 1 and 2. The other slide appears to be a younger earthflow near the south portion of the property. Our interpretative landslide map of the property is shown on Plate 2.

DISCUSSION AND PRELIMINARY CONCLUSIONS

The conceptual project plan prepared by SMA is considered feasible from an engineering geologic and geotechnical standpoint. The most significant geologic hazards and geotechnical constraints that affect the site include the following:

- A potential for very strong seismic shaking
- The presence of two landslides on the property
- Weak compressible soils and highly expansive clays

Seismic Ground Shaking

The proximity of the site to the active Rodgers Creek fault indicates that this fault is the design fault for the site. Estimates of expected ground shaking at the site from that fault's characteristic 7.0 magnitude earthquake would range from very strong to violent. Based on this potential, we conclude that the proposed structures should be designed and constructed in strict accordance with current building codes.

Slope Instability

Two landslides are present on the property, as shown on the attached Plate 1. However, these slides are located about 340 feet upslope of the proposed improvements. We conclude that these slides are a sufficient distance away from the proposed improvements such that no mitigations measures are warranted. Furthermore, air photos and geologic maps reviewed for this investigation and the materials encountered in GA's test pits provide strong evidence that the proposed winery and farmstead site has not been subjected to past landsliding as shown on the slope stability map accompanying Special Report 120.

Weak Compressible Soil and Expansive Clays

Test Pit 12 of GA's subsurface investigation encountered about 2 feet of weak porous soils underlain by about 3½ feet of highly expansive clays. Our experience indicates that weak porous soils can undergo considerable strength loss and settlement when subjected to loads, particularly when saturated. Also, expansive clays can shrink and swell with seasonal variation in moisture content and can heave and distress lightly loaded footings and slabs. Therefore, we conclude that the weak, porous natural and expansive clays would not be suitable for foundation, slab or fill support in their present condition.

Satisfactory foundation support for structures can be obtained from a system of drilled piers and grade beams; however, spread footings bottomed on properly compacted fill could also be used. Where spread footings bottomed at minimum depth and conventional slab-on-grade floors are desired, it will be necessary to remove the existing porous soils for their full depth, and cover any expansive soils with a moisture confining blanket of approved on-site materials of low expansion potential or imported nonexpansive fill. If drilled piers and grade beams are used in conjunction with wood floors supported on joists above grade, removal of weak porous upper soils and expansive clays would not be needed. Alternatively, post-tensioned or mat slab foundations could also be considered for foundation support.

Supplemental Geotechnical Engineering Services

A detailed geotechnical investigation should be performed at the site to further evaluate the site conditions and to provide design level criteria for proposed improvements including site grading, foundation and retaining wall design, roadway pavement support and geotechnical engineering drainage.

We trust this report provides you with the information you need at this time. If you have any questions or we can be of further assistance, please give us a call. The following plates are attached and complete this report.

Plate 1 Site Plan Depicting Proposed Winery and Farmstead and Interpretative Geologic Map

Plate 2 Interpretative Landslide Map of the Property and Surrounding Area

Yours Very Truly,

REESE & ASSOCIATES

Brian F. Piazza
Staff Geologist

REGISTERED PROFESSIONAL ENGINEER
JEFFREY K. REESE
No. C 047753
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STATE OF CALIFORNIA

Jeffrey K. Reese
Civil Engineer No. 47753

BFP/JKR:nay/ra/Job No. 539.1.3
Copies Submitted: 3

REFERENCES

Association of Bay Area Governments, April 1995, The San Francisco Bay Area – On Shaky Ground, Publication No. P95001EQK

California Division of Mines and Geology, February 1998, *Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada*, to be used with the 1997 Uniform Building Code.

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Geologic Map and Map Database of Western Sonoma, Northernmost Marin, and Southernmost Mendocino Counties, California, by M. C. Blake, Jr., R. W. Graymer, and R. E. Stamski, U.S. Geological Survey, Miscellaneous Field Studies Map MF-2402.

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"Preliminary Geologic Map of Eastern Sonoma County and Western Napa County, California," by K. F. Fox, Jr., J. D. Sims, J. A. Bartow, and E. J. Helley, 1973.

Dwyer, M. J. and others, 1976, *Reconnaissance Photointerpretation Map of Landslides in 24 Selected 7.5 Minute Quadrangles in Lake, Napa, Solano and Sonoma Counties, California*, U.S. Geological Survey Open File Map.

Memorandum, Summary of Observations and Conclusions, Bachman Residence, Sonoma County, California, dated May 13, 2002 (revised July 11, 2002), by Giblin Associates.

Air Photos

4-21-1971, 3088-101 and 102, black and white
05-03-1961, CSH 21B-144 and 145, 169 and 170 black and white

PCL XL error

Subsystem: KERNEL

Error: IllegalOperatorSequence

Operator: SetPageScale

Position: 1662

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606 Alamo Pintada Road #3-221
Solvang, CA 93463
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RECEIVED
SEP 03 2013
PERMIT AND RESOURCE MANAGEMENT DEPARTMENT
COUNTY OF SONOMA

TRANSMITTAL

Project: **Belden Barns Winery**
Project No.: 2011014

Date: Septem[illegible]

To: **Melinda Grosch**
County of Sonoma PRMD
2550 Ventura Avenue
Santa Rosa, CA 95401

Site:
APN# 049-030-010
5561 Sonoma Mountain Road
Santa Rosa, CA 95404

SENT VIA: ☐ **Email** ☐ **Overnight** ☐ **Regular Mail** ☒ **Drop-off**

Copies	Date	Description
1	*08/2013*	*Geology & Ground Water Study by E. H. Boudreau*

TRANSMITTED: ☐ **For approval** ☒ **For your use** ☐ **As requested** ☐ **For review & comment**

Dear Melinda,

See attached hard copy of the Geology & Ground Water Study prepared by E. H. Boudreau.

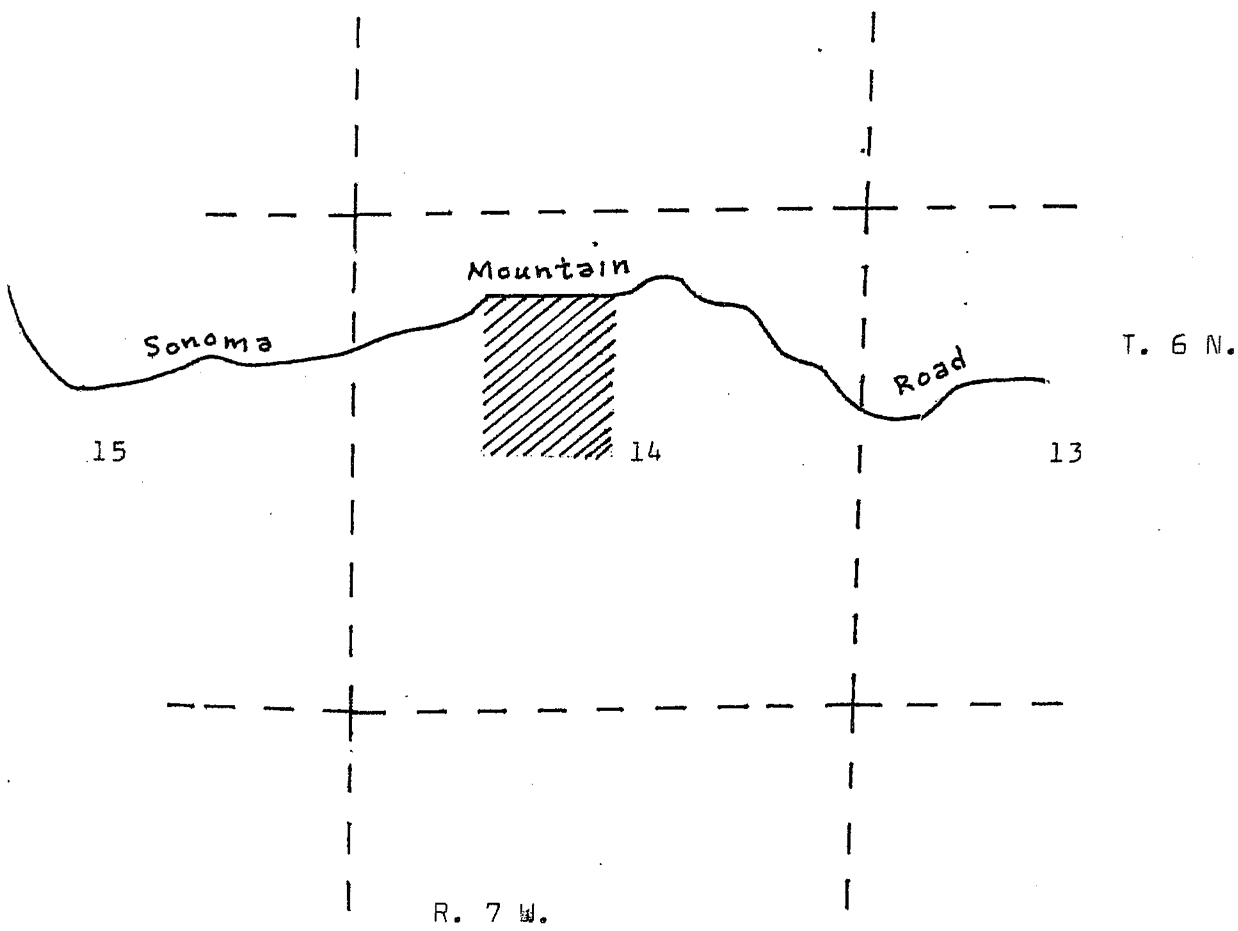
Please call if you have any questions or need additional information.

Sincerely,

Jeannie VandeWeg
Project Administrator

cc: File

GEOLOGY
&
GROUND WATER POTENTIAL
BELDEN PROPERTY
5560 Sonoma Mountain Road
Santa Rosa, California



E. H. Boudreau
Registered Geologist #3000
1209 Beattie Lane
Sebastopol, CA 95472

August 2013

INTRODUCTION

The 55-acre Belden property is located about 5 miles southeast of Santa Rosa on the south side of Sonoma Mountain Road in the northwest quarter of section 14, T. 6 N., R. 7 W., MDB&M. There are now 20 acres of vines and 2 homes on the property, along with a very good well for the homes and a reservoir for irrigation. Plans are to erect a winery that will produce 10,000 cases of wine per year; in addition to the wine 10,000 pounds of cheese and a quantity of vegetables, eggs and fruits will be produced. The Sonoma County Permit & Resource Management Department wants to know if the property can produce sufficient water for the planned operations, and how wells on neighboring properties might be affected by Belden's increase of water use. I am the geologist who has been hired to answer PRMD' questions, and this report contains my observations on the geology, ground water and wells, along with my conclusions.

GENERAL GEOLOGY

The property is situated in the heart of the Sonoma Mountains, with property elevations ranging between about 900 to 1080 feet above sea level. Soil cover and landslides mask most of the bedrock and its details from view, but there are enough outcros and drillers' logs to give a rough picture of the geologic situation. Some information on the surface geology of the region is shown on maps included with the California Division of Mines & Geology's Special Report 120, on a scale of one mile to the inch.

Figure 1 in this report shows the property boundaries, topography, and the sites of wells and dry holes, along with the location of the geologic cross section that cuts through it in a north 28 degrees east direction that is Figure 2. Figure 2 shows the possible relationships of the rocks at depth, as projected from available information.

There are 4 geologic units underlying the property, and they vary with respect to age, origin, thickness and lateral extent, structure, and water-bearing characteristics. From youngest to oldest they are landslides, the Glen Ellen Formation, the Sonoma Volcanics, and the Franciscan Formation.

Landslides

Landslides are masses of loose soil and portions of bedrock that have moved down-slope under the influence of gravity.

Glen Ellen Formation

The Glen Ellen is made up of continental sediments, mostly clay. There are some beds of sand. Maximum thickness about 400 feet.

Sonoma Volcanics

Underlying the Glen Ellen, and outcropping in the southwest corner of the property, with a great area outcropping to the south of the property, is the Mesozoic-age group of lavas and beds of tuff (volcanic ash) of the Sonoma Volcanics. This unit underlies much of eastern Sonoma and western Napa counties. It formed on an old landsurface from about 3 to 10 million years ago, and it could be over 1,000 feet thick. In between volcanic eruptions some beds of sediments were deposited.

Structure

During their long histories the rocks have been strongly deformed and broken during episodes of folding and faulting caused by stresses in Earth's crust. These actions, along with the non-uniform character of the rocks, have resulted in such a complex arrangement of the rocks that it is impossible to make exact predictions of the conditions at depth.

GROUND WATER & WELLS

All ground water in the area is derived from local rainfall that has percolated into the ground, and it exists in small pore spaces and small, open fractures in the zone of water-saturated rock below the water table. Depth to the water table varies with local geologic, topographic and hydrologic conditions. (In the Belden well I measured it at 75 feet.) Movement of the water is from high areas down to lower ones, with the levels being highest in the spring and lowest in the fall.

Belden Well

The Belden well was drilled by a previous owner after he had 3 dry holes drilled, whose depths were about 100 feet. Figure 3 is a diagram of the well, using information from the driller's log. It was drilled with air-rotary equipment to 715 feet and cased to 670. A blow test showed it to produce 500 gpm. Static level was at 120 feet when it was drilled in December 2001, while it was at 75 feet in August 2013. From 410 to 715 is in the Sonoma Volcanics, mostly lava, which was noted as "fractured" from 600 to 672.

Neighbors' Wells

There are 3 property owners to the north of Belden, across Sonoma Mountain Road. I sent each of them a questionnaire about their wells and water useage, along with a stamped, self-addressed envelope. Only one, Raghu, replied. Also, I sent their addresses and AP numbers to the California Department of Water Resources, along with a signed PRMD form authorizing me to request drillers' logs of wells and dry holes on their properties. DWR sent me one driller's log, for the Cutler property. PRMD wants well information on neighbors' properties out to 300 feet from Belden.

Most of Raghu's answers are illegible. His present well gives 52 gpm, and 2 of his wells have gone dry since 2000. The water is high in iron, which probably contributed to plugging of the wells. No logs.

Figure 4 is a diagram of the Cutler well. It was drilled with air-rotary equipment in June 1980 to 270 feet, and cased to that depth. It is all in the Glen Ellen. Except for 30 feet of sand, the rock was clay. Static was at 65 feet, and it pumped 13 gpm for 4 hours with the pumping level at 150 feet.

Ground Water Principles

A well is successful when it penetrates permeable rock below the water table and usable amounts of water flow through the rock and into the well. The yield of the well depends on the amount of permeable rock present and its degree of permeability. If permeable rock is present, then the methods used in drilling, equipping, and developing the well often have a strong influence on its maximum yield, its operating characteristics, and its useful lifespan.

Permeability is a measure of the ease with which water moves through rock, and it is dependent on the amount and size of the pore spaces, or other openings, in the rock, and on how interconnected they are. The amount of water that a rock contains may have no bearing at all on how much it will yield, as a damp clay or shale can be more than 20% water by weight and still yield almost none of it to a well because the water is held in the rock by capillary forces. Clean sand and gravel have good permeability because of the great amount of pore space between the grains and the relatively large size of the pores.

As many formations are so highly consolidated (a result of original composition, cementation, and/or compaction), they have very little primary, or inter-granular, porosity and permeability such as occur in loose sand and gravel. Successful wells in these formations usually have penetrated zones in the harder and more brittle types of rock (such as sandstone, chert, lava, some tuffs, granitics, and some metamorphics) in which faulting and/or fracturing have created some secondary porosity and permeability in the form of small, open fractures.

Usually, shale, serpentine, and clayey tuff do not contain open fractures because their softer and semi-plastic natures cause the breaks present in them to be squeezed shut by the pressure of the overlying rock; so, these rocks yield little or no water to wells.

There is no way outside of drilling to locate the exact positions of water-bearing fractures and to measure their yields, as the fracture pattern can be very erratic. The yield of a well in consolidated rock depends on the number, width, and extent of the fractures penetrated, and a dry hole will result if there are no open fractures. Many wells in such hard rock yield only a few gallons per minute, but there are some that produce hundreds.

Initial yields will decrease with sustained pumping if the permeable rock is only a small mass surrounded by impermeable rock (such as clay or shale) that blocks recharge of the pore spaces or fractures. At most, fractures make up only a few percent of the total volume of the rock, but that can be a large amount.

When exploring in essentially massive rock for small water-bearing fractures, a depth of about 300 feet is considered to be the point of diminishing returns for a domestic-type well. This is because the increasing pressure tends to seal off deep fractures.

It is impossible in advance of drilling to predict exactly how much usable water will be found beneath the surface, although with enough of the right information on the geologic conditions some rather accurate estimates can be made. As a great many wells have been drilled in the different formations in California, the general ranges in their water-bearing potential are known.

With favorable geology being what governs the availability of water in the ground, it follows that the most practical exploration technique that can be used in searching for usable amounts of it is to try to drill into the most potentially permeable rock available, and to avoid drilling in obviously impermeable rock. In complex situations, such as exist in many of the formations (either because of the way they were formed of mixtures of impermeable and permeable or potentially permeable rock, or because of intricate structure caused by folding and/or faulting), deciding to drill involves taking more or less of a risk; so, the new information being developed as the drilling proceeds must be studied and interpreted right along to see if further drilling is warrented.

If the rock is strong enough to stand in an open hole, then the air-rotary (using compressed air to remove the rock chips) is to be preferred over the mud-rotary (circulating a stream of water to which clay has been added) method of drilling. With air, the locations, yields, and quality of the water-bearing zones can be known. Also, there is no risk of plugging the pore spaces or fractures with drilling mud and thus sealing off part of the water.

If mud must be used because of caving conditions in the hole, then it is best to use a self-destructing chemical mud rather than the commonly used bentonite clay. Before the well is cased, geophysical logs can be run to identify the permeable zones (gamma-ray or resistivity logs). A careful record should be kept of the rocktypes and their locations in the well, as with signs of water, so that the well can be properly designed. Periodic bail-testing of the well will help to identify permeable zones and their yields if mud is used to drill with.

Drilling mud should be flushed out with clean water before gravel packing, and development work should continue until the yield ceases to increase.

For maximum efficiency in sand and gravel, well screen should be used instead of perforated casing. Screen provides more open area, and the slot openings can be matched to the size of the sand or gravel. Also, it allows for a quicker and more thorough job of development.

Belden Water Use

Water for the vineyard of 20 acres having 20,000 vines using one gallon of water per day for 150 days in the year comes to 3,000,000 gallons per year, or 9.2 acre-feet. All of this water is surface water from the pond on the property.

Three people live in the newest home, which has no landscaping. Average water use per person in Sonoma County is 150 gallons per day, and so this is a ground water use of 0.5 acre-foot per year of ground water.

Neighbors' Water Use

For the 3 neighbors, 9 people could use 1.5 acre-feet of ground water per year for household purposes, although Raghu says he uses his well only for irrigation, but gave no figure for that.

Belden Proposed Water Use

Belden projects his peak yearly water use (domestic sanitary and process waste water flows) to be about 1.5 acre-feet per year, which will be gotten from the well.

Neighbors' Proposed Water Use

The neighbors did not supply any information.

Ground Water In Storage

Rainfall in the study area is about 2.5 acre-feet per year, or 138 acre-feet for the Belden property. If only 10% of this were available for ground water recharge this would be 14 acre-feet, 7 times highest use.

The 37 feet of sand and pumice in the Glen Ellen could be 20% water, for 385 acre-feet under the 55 acres. For the 225 feet of fractured lava with 5% water in storage, that comes to 260 acre-feet. Total water in storage to the depth of the Belden well about 645 acre-feet.

Inflow from the great area of Sonoma Volcanics to the south, and along Matanzas Creek, could amount to much more.

During the 1976-77 drought all the towns on surface water had to go on water rationing, while all the towns on ground water had no rationing.

SUMMARY & CONCLUSIONS

The Belden property is underlain by aquifers in the Glen Ellen Formation and the Sonoma Volcanics that might hold about 645 acre-feet of water. More water could probably be developed by drilling deeper in the Sonoma Volcanics The water level in the Belden well has not dropped since it was drilled in 2001. The proposed increase in ground water is a mere 1.5 acre-feet. I do not see any problem with ground water availability related to the wine and cheese making in the future, for both Belden and his neighbors.

E. H. Boudreau
Registered Geologist
#3000

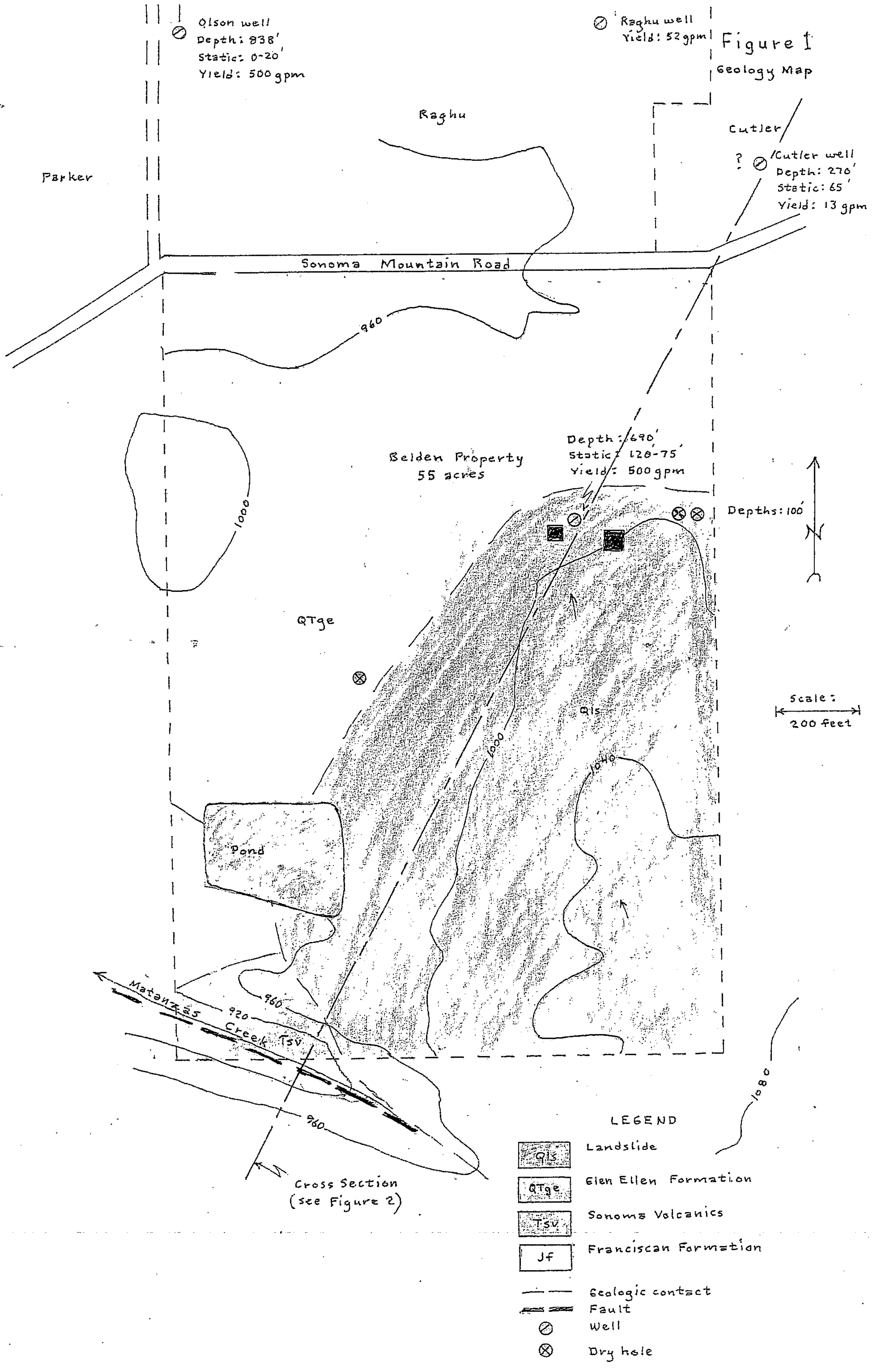

Olson well
Depth: 838'
Static: 0-20'
Yield: 500 gpm
Raghu well
Yield: 52 gpm
Figure 1
Geology Map
Raghu
Cutler
Cutler well
Depth: 270'
Static: 65'
Yield: 13 gpm
Parker
Sonoma Mountain Road
960
Depth: 690'
Static: 120-75'
Yield: 500 gpm
Belden Property
55 acres
1000
Depths: 100'
N
QTge
Qls
Scale:
200 feet
1040
Pond
Matanzas Creek
920
Tsv
1080
Cross Section
(see Figure 2)
LEGEND
Qls Landslide
QTge Glen Ellen Formation
Tsv Sonoma Volcanics
Jf Franciscan Formation
Geologic contact
Fault
Well
Dry hole

Figure 2
Cross Section

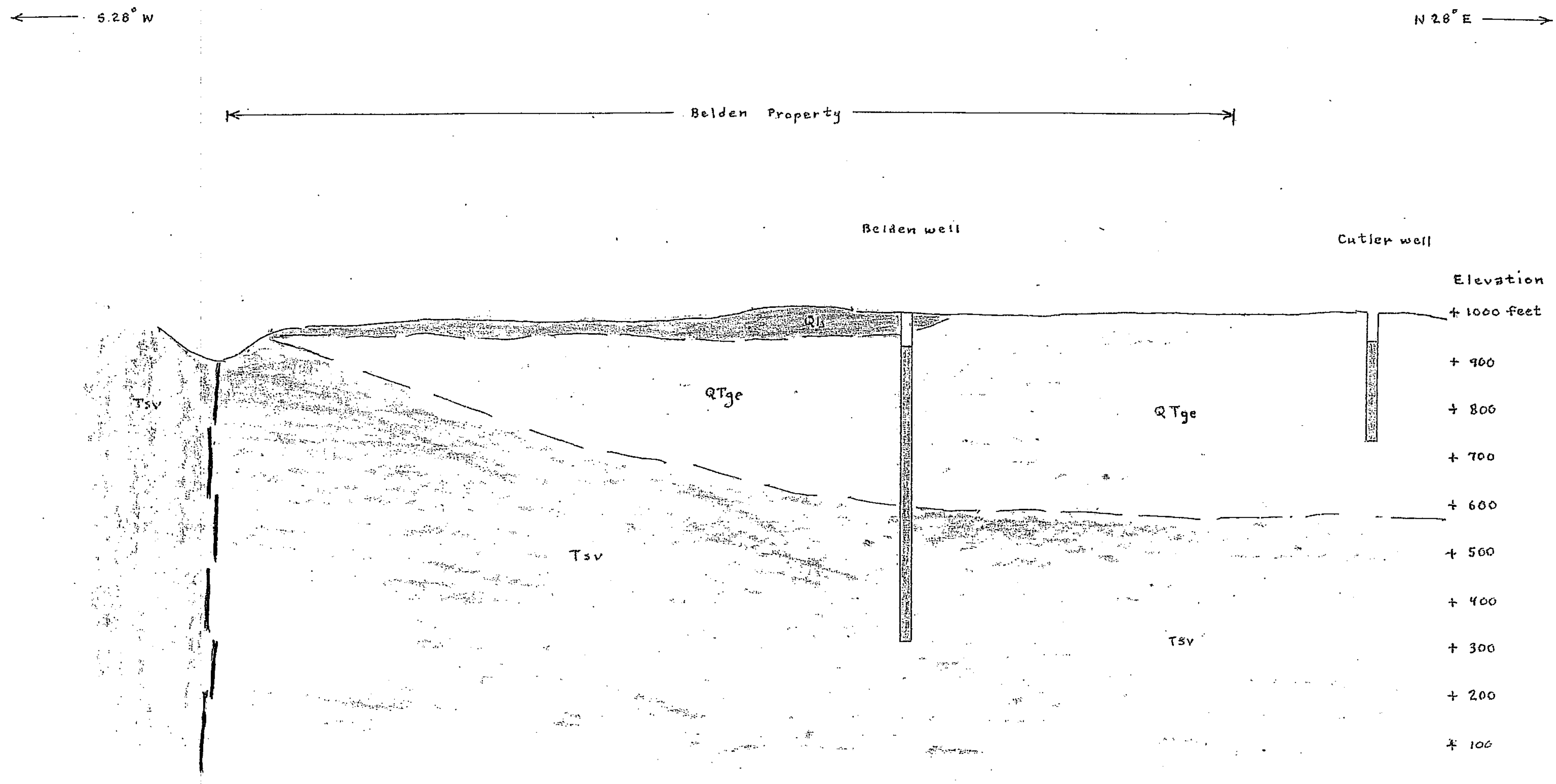


Figure 3

Well Diagram

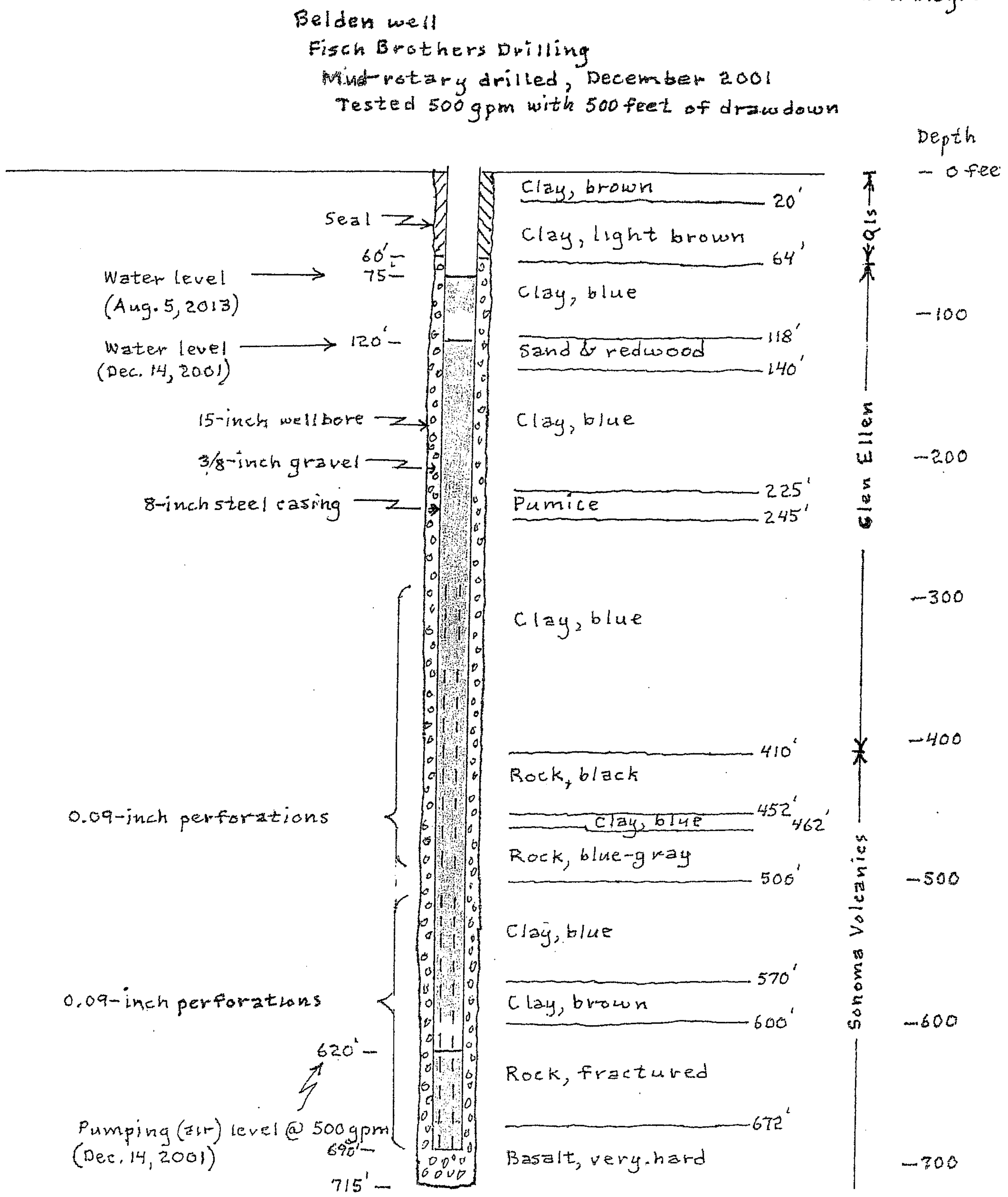
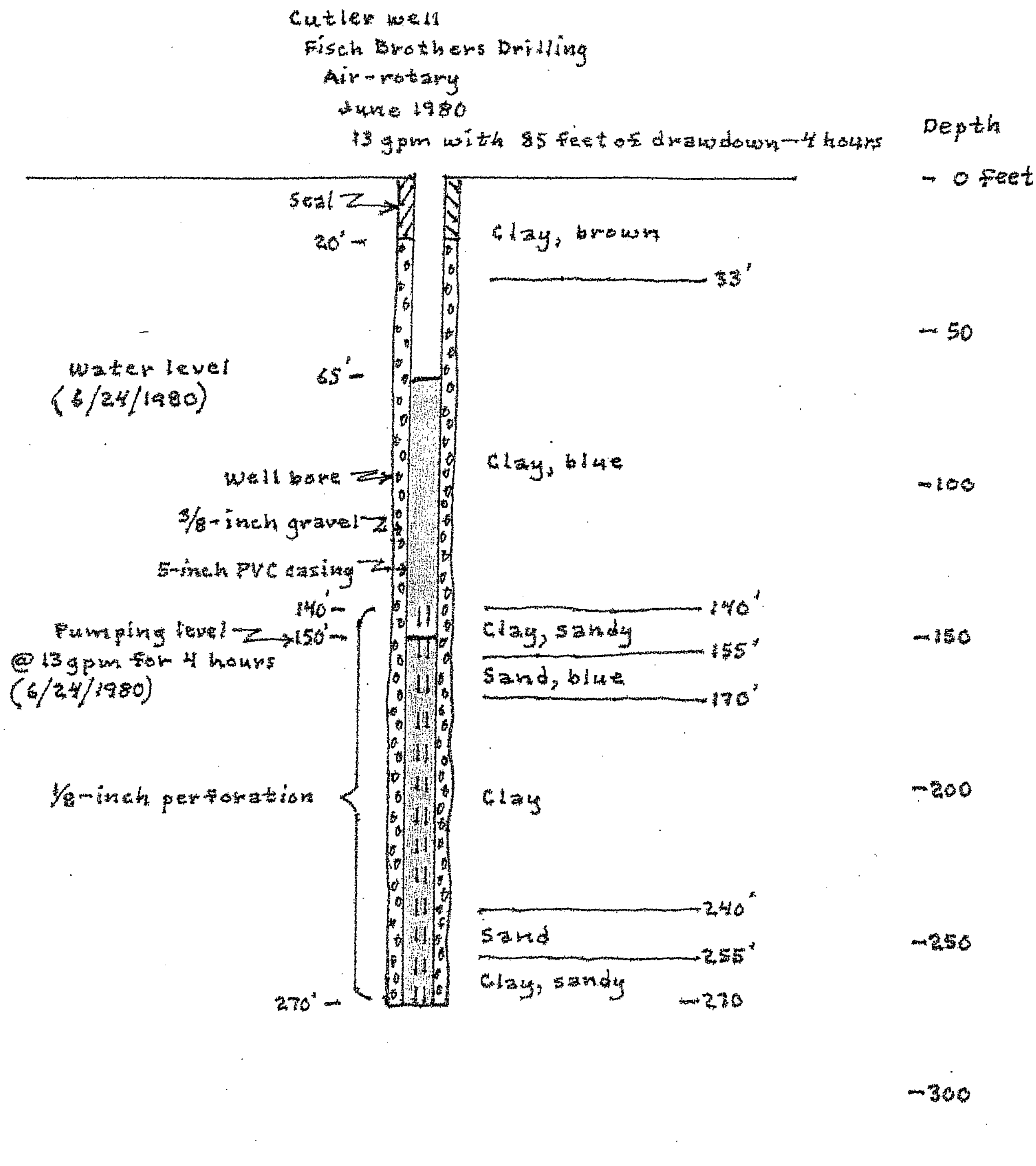


Figure 4
Well Diagram



August 16, 2013

E. H. Boudreau
1209 Beattie Lane
Sebastopol, CA 95472

California Department of Water Resources
3500 Industrial Blvd.
West Sacramento, CA 95691

Dear Sirs:

Please send me copies of all the drillers' logs you have for wells and dry holes on the below listed properties, all of which are located in section 14, T. 6 N., R. 7 W., MDB&M.

5412	Sonoma	Mountain	Road,	Santa	Rosa, CA	AP#049-030-061
5545	"	"	"	"	"	049-030-095
5561	"	"	"	"	"	049-030-010
5650	"	"	"	"	"	055-130-012
5650	"	"	"	"	"	049-030-096

Sincerely,

E. H. Boudreau
Registered Geologist
#3000

STATE OF CALIFORNIA – CALIFORNIA NATURAL RESOURCES AGENCY

EDMUND G. BROWN JR., *Governor*

DEPARTMENT OF WATER RESOURCES
NORTH CENTRAL REGION OFFICE
3500 INDUSTRIAL BOULEVARD
WEST SACRAMENTO, CA 95691

August 20, 2013

Mr. Eugene H. Boudreau
1209 Beattie Lane
Sebastopol, California 95472

Dear Mr. Boudreau:

In response to your request, enclosed are copies of the Well Completion Reports for the wells at the following project:

Belden Barns Winery & Farmstead
Well Completion Report Numbers: 808728, 084200.

If you need additional information or have any questions, please contact Oleg Yakimov at (916) 376-9612 or fax (916) 376-9676.

Sincerely,

Dean R. Crippen

Dean R. Crippen, P.E., Chief
Groundwater Supply Assessment
And Special Studies Section

Enclosure

August 16, 2013

E. H. Boudreau
1209 Beattie Lane
Sebastopol, CA 95472
Tel. (707) 824-8241

Dear Sir:

Nathan Belden, your neighbor at 5561 Sonoma Mountain Road, plans to build and operate a small winery on his property, along with some other activities. (See enclosed proposal.) Water for his vineyard comes from a pond, and a 690-foot well that tested 500 gpm will serve the other activities and residential use.

The Sonoma County Planning Department wants to know if he has enough water to support his proposed operations, and I am the geologist who has been hired to do the study, and as PRMD also wants to know how wells on neighboring properties might be affected by increased water use on the Belden property I have to collect information on them. So, I am sending you this questionaire, with a self-addressed envelope, in hopes that you will fill it out and return it to me. My report will be available to the public when it is finished and submitted to PRMD.

Sincerely,

E. H. Boudreau

Registered Geologist #3000

WATER WELL INFORMATION

Well owner: Address:

Number of wells, dry holes, abandoned wells, and springs on the property (Please locate on accompanying map):

Well use: Household   Irrigation   Livestock

Number of people served by well or wells:

Approximate amount of water used per year:

Years wells and dry holes were drilled:

Name of well drilling company:

Are drillers' logs available for the wells and dry holes? (If so, please enclose copies.)

Well data:

- Total depth: Cased depth: Method of drilling:
- Static level (water table) when drilled:
- Dates of other static level measurements, and levels:
- Well yield in gallons per minute when drilled:
- Present well yield:
- Water quality:
- Redevelopment work done on well, and results:
- Reasons for abandoning any wells:
- Seasonal fluctuation in the water table over the years:

May I measure the water level in your well? (Call 824-8241)

Comments:

How has your well performed during droughts?

Notes: Drillers' logs of wells and dry holes are on file with the county Permit & Resources Management Department in Santa Rosa, and also with the California Department of Water Resources in Sacramento. Contact DWR at (916) 227-7632 and talk to Ann Roth. Also, well drillers have copies of the logs.

October 11, 2013

E. H. Boudreau
1209 Beattie Lane
Sebastopol, CA 95472

Sonoma County Permit & Resource Management Dept.
2550 Ventura Avenue
Santa Rosa, CA 95403

Sirs:

PRMD says that my report of August 2013 for the Belden property does not have information on water use for the vineyard and the proposed winery, cheese factory, vegetable garden, fruits and animals.

First, the vineyard is irrigated with water from an pond that captures surface water. The pond covers an area of about 1.5 acres. Ground water is not pumped for the vineyard.

Second, the winery will use about 0.4 acre-foot of water per year, about which about half might percolate down into the ground water, from which it was pumped.

Third, the cheese factory will generate about 0.06 acre-foot of water per year, of which about half might percolate down into the ground water, from which it will come. Most of the milk will come from off-site.

Fourth, the garden and orchard might use one or two acre-feet per year. Two homes an acre-foot.

Fifth, the pasture would support 2 cows and 10 sheep, at 10 gpd for each cow and one gpd for each sheep, or 0.03 acre-foot per year.

So ground water net use could be about 2.26 acre-feet per year, as against an estimated 14 acre-feet of recharge on the property. 3.26 AF max.

Matanzas Creek is 1400 feet to the south of the Belden well, so I don't any interference with its flow from pumping of the Belden well.

E. H. Boudreau
Regestered Geologist
#3000

APPENDIX C

Air Quality Modeling

Belden Barns

Sonoma-San Francisco County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Manufacturing	10.94	1000sqft	0.21	10,940.00	0
Other Asphalt Surfaces	1.60	Acre	1.60	69,696.00	0
Single Family Housing	4.00	Dwelling Unit	0.08	1,877.00	11
Supermarket	3.03	1000sqft	0.10	3,030.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 75

Climate Zone 4 **Operational Year** 2018

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 559.32 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 Intensity adjusted based on PG&E 25% Renewables by Dec 31 2016

Land Use - Acreage and SF revised to match Project details

Construction Phase - Construction duration set to match conservative 12 month schedule

Trips and VMT - Adjusted worker and vendor trucks to match Project information. Soil hauling triplength reduced since balanced on-site

Demolition - 6,555 SF of existing buildings to be demolished

Grading - 3.1 acres disturbed during grading. 2,100 CY balanced on-site

Architectural Coating - Modified Non-res interior and exterior areas based on minimal coatings for Parking uses.

Vehicle Trips - Special Event Peak Day assumed to be Saturdays. Traffic trips based on TIA. Increased Customer triplength for the Hospitality use to 30 miles.

Woodstoves - Gas fireplaces assumed only

Area Coating - Adjusted NonRes SF

Energy Use - Adjusted electricity use to match the Project energy. Natural gas updated to 2013 Title 24

Water And Wastewater - Indoor/outdoor water based on Project information

Construction Off-road Equipment Mitigation - Water exposed area and 15 mph vehicle speed on unpaved roads

Waste Mitigation - 75% waste diversion consistent with AB 341 (not mitigation)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	41,833.00	8,111.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	125,499.00	20,961.00
tblAreaCoating	Area_Nonresidential_Exterior	41833	8111
tblAreaCoating	Area_Nonresidential_Interior	125499	20961
tblConstructionPhase	NumDays	200.00	166.00
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	4.00	100.00
tblConstructionPhase	PhaseEndDate	11/2/2017	11/1/2017
tblConstructionPhase	PhaseEndDate	11/15/2017	10/19/2017
tblConstructionPhase	PhaseStartDate	10/20/2017	10/19/2017
tblConstructionPhase	PhaseStartDate	11/2/2017	10/6/2017
tblEnergyUse	LightingElect	3.52	5.05
tblEnergyUse	LightingElect	1,608.84	1,381.78
tblEnergyUse	LightingElect	7.65	2.32
tblEnergyUse	NT24E	3.70	5.30
tblEnergyUse	NT24E	5,095.49	4,376.34
tblEnergyUse	NT24E	30.13	9.12
tblEnergyUse	T24E	1.81	2.60
tblEnergyUse	T24E	368.61	316.59
tblEnergyUse	T24E	4.99	1.51
tblEnergyUse	T24NG	20.74	15.56
tblEnergyUse	T24NG	29,406.10	22,054.58
tblEnergyUse	T24NG	17.56	13.17
tblFireplaces	NumberGas	2.20	4.00

tblFireplaces	NumberWood	1.80	0.00
tblGrading	AcresOfGrading	37.50	3.10
tblGrading	MaterialExported	0.00	2,100.00
tblLandUse	LandUseSquareFeet	7,200.00	1,877.00
tblLandUse	LotAcreage	0.25	0.21
tblLandUse	LotAcreage	1.30	0.08
tblLandUse	LotAcreage	0.07	0.10
tblProjectCharacteristics	CO2IntensityFactor	641.35	559.32
tblProjectCharacteristics	OperationalYear	2014	2018
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	14.00	1.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblTripsAndVMT	WorkerTripNumber	7.00	10.00
tblVehicleTrips	CC_TL	7.30	30.00
tblVehicleTrips	ST_TR	1.49	4.57
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	ST_TR	177.59	64.36
tblVehicleTrips	SU_TR	0.62	4.57
tblVehicleTrips	SU_TR	8.77	9.52

tblVehicleTrips	SU_TR	166.44	11.55
tblVehicleTrips	WD_TR	3.82	4.57
tblVehicleTrips	WD_TR	9.57	9.52
tblVehicleTrips	WD_TR	102.24	11.55
tblWater	IndoorWaterUseRate	2,529,875.00	138,750.00
tblWater	IndoorWaterUseRate	260,616.10	489,100.00
tblWater	IndoorWaterUseRate	373,502.69	64,835.00
tblWater	OutdoorWaterUseRate	0.00	530,020.00
tblWater	OutdoorWaterUseRate	164,301.46	0.00
tblWater	OutdoorWaterUseRate	11,551.63	0.00
tblWoodstoves	NumberCatalytic	0.14	0.00
tblWoodstoves	NumberNoncatalytic	0.14	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	3.0071	28.9231	22.8598	0.0270	5.8939	1.7529	7.2932	2.9787	1.6404	4.2661	0.0000	2,724.0650	2,724.0650	0.6351	0.0000	2,737.4019
2017	23.0780	33.7246	27.7076	0.0432	4.6531	2.1368	5.7215	2.5136	2.0353	3.4964	0.0000	4,062.5370	4,062.5370	0.8826	0.0000	4,081.0721
Total	**26.0851**	**62.6477**	**50.5674**	**0.0702**	**10.5470**	**3.8897**	**13.0146**	**5.4923**	**3.6758**	**7.7625**	**0.0000**	**6,786.6021**	**6,786.6021**	**1.5177**	**0.0000**	**6,818.4740**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	3.0071	28.9231	22.8598	0.0270	2.7041	1.7529	4.1034	1.3542	1.6404	2.6415	0.0000	2,724.0650	2,724.0650	0.6351	0.0000	2,737.4019
2017	23.0780	33.7246	27.7076	0.0432	2.1496	2.1368	3.2180	1.1460	2.0353	2.1471	0.0000	4,062.5370	4,062.5370	0.8826	0.0000	4,081.0721
Total	**26.0851**	**62.6477**	**50.5674**	**0.0702**	**4.8538**	**3.8897**	**7.3214**	**2.5001**	**3.6758**	**4.7886**	**0.0000**	**6,786.6020**	**6,786.6020**	**1.5177**	**0.0000**	**6,818.4740**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.98**	**0.00**	**43.75**	**54.48**	**0.00**	**38.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Area	1.8994	3.8700e-003	0.3344	2.0000e-005		8.0800e-003	8.0800e-003		8.0100e-003	8.0100e-003	0.0000	99.4212	99.4212	2.4900e-003	1.8100e-003	100.0351
Energy	0.0122	0.1090	0.0798	6.6000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003		132.9156	132.9156	2.5500e-003	2.4400e-003	133.7245
Mobile	1.7291	4.2334	19.4933	0.0274	2.0160	0.0570	2.0730	0.5391	0.0522	0.5913		2,529.0624	2,529.0624	0.1371		2,531.9413
Total	**3.6406**	**4.3463**	**19.9076**	**0.0281**	**2.0160**	**0.0735**	**2.0895**	**0.5391**	**0.0686**	**0.6077**	**0.0000**	**2,761.3991**	**2,761.3991**	**0.1421**	**4.2500e-003**	**2,765.7010**

Mitigated Operational

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Area	1.8994	3.8700e-003	0.3344	2.0000e-005		8.0800e-003	8.0800e-003		8.0100e-003	8.0100e-003	0.0000	99.4212	99.4212	2.4900e-003	1.8100e-003	100.0351
Energy	0.0122	0.1090	0.0798	6.6000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003		132.9156	132.9156	2.5500e-003	2.4400e-003	133.7245
Mobile	1.7291	4.2334	19.4933	0.0274	2.0160	0.0570	2.0730	0.5391	0.0522	0.5913		2,529.0624	2,529.0624	0.1371		2,531.9413
Total	**3.6406**	**4.3463**	**19.9076**	**0.0281**	**2.0160**	**0.0735**	**2.0895**	**0.5391**	**0.0686**	**0.6077**	**0.0000**	**2,761.3991**	**2,761.3991**	**0.1421**	**4.2500e-003**	**2,765.7010**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2016	10/21/2016	5	15	
2	Site Preparation	Site Preparation	10/22/2016	10/25/2016	5	2	
3	Grading	Grading	10/26/2016	3/14/2017	5	100	
4	Building Construction	Building Construction	3/15/2017	11/1/2017	5	166	
5	Paving	Paving	10/6/2017	10/19/2017	5	10	
6	Architectural Coating	Architectural Coating	10/19/2017	11/1/2017	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 3.1

Acres of Paving: 0

Residential Indoor: 3,801; Residential Outdoor: 1,267; Non-Residential Indoor: 20,961; Non-Residential Outdoor: 8,111 (Architectural

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37

Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	125	0.42
Paving	Paving Equipment	1	8.00	130	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	10.00	0.00	30.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	10.00	1.00	263.00	12.40	6.60	0.25	LD_Mix	HDT_Mix	HHDT
Building Construction	7	24.00	1.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4302	0.0000	0.4302	0.0651	0.0000	0.0651			0.0000			0.0000

Off-Road	2.9066	28.2579	21.4980	0.0245		1.7445	1.7445		1.6328	1.6328		2,487.1296	2,487.1296	0.6288		2,500.3343
Total	**2.9066**	**28.2579**	**21.4980**	**0.0245**	**0.4302**	**1.7445**	**2.1747**	**0.0651**	**1.6328**	**1.6979**		**2,487.1296**	**2,487.1296**	**0.6288**		**2,500.3343**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0544	0.6010	0.7593	1.4700e-003	0.0347	7.5400e-003	0.0422	9.4900e-003	6.9300e-003	0.0164		147.5545	147.5545	1.1000e-003		147.5775
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0461	0.0641	0.6025	1.0700e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		89.3809	89.3809	5.2000e-003		89.4901
Total	**0.1005**	**0.6652**	**1.3618**	**2.5400e-003**	**0.1290**	**8.3700e-003**	**0.1374**	**0.0345**	**7.6900e-003**	**0.0422**		**236.9355**	**236.9355**	**6.3000e-003**		**237.0676**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1936	0.0000	0.1936	0.0293	0.0000	0.0293			0.0000			0.0000
Off-Road	2.9066	28.2579	21.4980	0.0245		1.7445	1.7445		1.6328	1.6328	0.0000	2,487.1296	2,487.1296	0.6288		2,500.3343
Total	**2.9066**	**28.2579**	**21.4980**	**0.0245**	**0.1936**	**1.7445**	**1.9381**	**0.0293**	**1.6328**	**1.6621**	**0.0000**	**2,487.1296**	**2,487.1296**	**0.6288**		**2,500.3343**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0544	0.6010	0.7593	1.4700e-003	0.0347	7.5400e-003	0.0422	9.4900e-003	6.9300e-003	0.0164		147.5545	147.5545	1.1000e-003		147.5775
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0461	0.0641	0.6025	1.0700e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		89.3809	89.3809	5.2000e-003		89.4901
Total	**0.1005**	**0.6652**	**1.3618**	**2.5400e-003**	**0.1290**	**8.3700e-003**	**0.1374**	**0.0345**	**7.6900e-003**	**0.0422**		**236.9355**	**236.9355**	**6.3000e-003**		**237.0676**

3.3 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.7996	0.0000	5.7996	2.9537	0.0000	2.9537			0.0000			0.0000
Off-Road	2.4428	25.7718	16.5144	0.0171		1.3985	1.3985		1.2866	1.2866		1,781.0872	1,781.0872	0.5372		1,792.3693
Total	**2.4428**	**25.7718**	**16.5144**	**0.0171**	**5.7996**	**1.3985**	**7.1981**	**2.9537**	**1.2866**	**4.2403**		**1,781.0872**	**1,781.0872**	**0.5372**		**1,792.3693**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0461	0.0641	0.6025	1.0700e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		89.3809	89.3809	5.2000e-003		89.4901
Total	**0.0461**	**0.0641**	**0.6025**	**1.0700e-003**	**0.0943**	**8.3000e-004**	**0.0951**	**0.0250**	**7.6000e-004**	**0.0258**		**89.3809**	**89.3809**	**5.2000e-003**		**89.4901**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6098	0.0000	2.6098	1.3292	0.0000	1.3292			0.0000			0.0000
Off-Road	2.4428	25.7718	16.5144	0.0171		1.3985	1.3985		1.2866	1.2866	0.0000	1,781.0872	1,781.0872	0.5372		1,792.3693
Total	**2.4428**	**25.7718**	**16.5144**	**0.0171**	**2.6098**	**1.3985**	**4.0083**	**1.3292**	**1.2866**	**2.6158**	**0.0000**	**1,781.0872**	**1,781.0872**	**0.5372**		**1,792.3693**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0461	0.0641	0.6025	1.0700e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		89.3809	89.3809	5.2000e-003		89.4901
Total	**0.0461**	**0.0641**	**0.6025**	**1.0700e-003**	**0.0943**	**8.3000e-004**	**0.0951**	**0.0250**	**7.6000e-004**	**0.0258**		**89.3809**	**89.3809**	**5.2000e-003**		**89.4901**

3.4 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5518	0.0000	4.5518	2.4866	0.0000	2.4866			0.0000			0.0000
Off-Road	1.9908	21.0361	13.6704	0.0141		1.1407	1.1407		1.0494	1.0494		1,462.8468	1,462.8468	0.4413		1,472.1130
Total	**1.9908**	**21.0361**	**13.6704**	**0.0141**	**4.5518**	**1.1407**	**5.6925**	**2.4866**	**1.0494**	**3.5360**		**1,462.8468**	**1,462.8468**	**0.4413**		**1,472.1130**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0403	0.0654	0.7052	8.0000e-005	1.0900e-003	3.1000e-004	1.4000e-003	2.9000e-004	2.8000e-004	5.7000e-004		6.7434	6.7434	1.7000e-004		6.7470
Vendor	0.0151	0.0922	0.2018	2.1000e-004	6.0000e-003	1.3500e-003	7.3500e-003	1.7100e-003	1.2400e-003	2.9500e-003		21.3289	21.3289	1.8000e-004		21.3326
Worker	0.0461	0.0641	0.6025	1.0700e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		89.3809	89.3809	5.2000e-003		89.4901
Total	**0.1015**	**0.2218**	**1.5095**	**1.3600e-003**	**0.1014**	**2.4900e-003**	**0.1039**	**0.0270**	**2.2800e-003**	**0.0293**		**117.4533**	**117.4533**	**5.5500e-003**		**117.5696**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					2.0483	0.0000	2.0483	1.1190	0.0000	1.1190			0.0000			0.0000
Off-Road	1.9908	21.0361	13.6704	0.0141		1.1407	1.1407		1.0494	1.0494	0.0000	1,462.8468	1,462.8468	0.4413		1,472.1130
Total	**1.9908**	**21.0361**	**13.6704**	**0.0141**	**2.0483**	**1.1407**	**3.1890**	**1.1190**	**1.0494**	**2.1684**	**0.0000**	**1,462.8468**	**1,462.8468**	**0.4413**		**1,472.1130**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0403	0.0654	0.7052	8.0000e-005	1.0900e-003	3.1000e-004	1.4000e-003	2.9000e-004	2.8000e-004	5.7000e-004		6.7434	6.7434	1.7000e-004		6.7470
Vendor	0.0151	0.0922	0.2018	2.1000e-004	6.0000e-003	1.3500e-003	7.3500e-003	1.7100e-003	1.2400e-003	2.9500e-003		21.3289	21.3289	1.8000e-004		21.3326
Worker	0.0461	0.0641	0.6025	1.0700e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		89.3809	89.3809	5.2000e-003		89.4901
Total	**0.1015**	**0.2218**	**1.5095**	**1.3600e-003**	**0.1014**	**2.4900e-003**	**0.1039**	**0.0270**	**2.2800e-003**	**0.0293**		**117.4533**	**117.4533**	**5.5500e-003**		**117.5696**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5518	0.0000	4.5518	2.4866	0.0000	2.4866			0.0000			0.0000
Off-Road	1.8844	19.7889	13.1786	0.0141		1.0661	1.0661		0.9808	0.9808		1,439.1894	1,439.1894	0.4410		1,448.4496
Total	**1.8844**	**19.7889**	**13.1786**	**0.0141**	**4.5518**	**1.0661**	**5.6179**	**2.4866**	**0.9808**	**3.4674**		**1,439.1894**	**1,439.1894**	**0.4410**		**1,448.4496**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0323	0.0615	0.6558	8.0000e-005	1.0200e-003	2.6000e-004	1.2800e-003	2.7000e-004	2.3000e-004	5.1000e-004		6.5887	6.5887	1.7000e-004		6.5923
Vendor	0.0127	0.0827	0.1865	2.1000e-004	6.0000e-003	1.1600e-003	7.1600e-003	1.7100e-003	1.0700e-003	2.7800e-003		20.9538	20.9538	1.7000e-004		20.9573
Worker	0.0401	0.0568	0.5253	1.0700e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		85.9526	85.9526	4.7000e-003		86.0512
Total	**0.0850**	**0.2010**	**1.3676**	**1.3600e-003**	**0.1013**	**2.2000e-003**	**0.1035**	**0.0270**	**2.0100e-003**	**0.0290**		**113.4952**	**113.4952**	**5.0400e-003**		**113.6008**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.0483	0.0000	2.0483	1.1190	0.0000	1.1190			0.0000			0.0000
Off-Road	1.8844	19.7889	13.1786	0.0141		1.0661	1.0661		0.9808	0.9808	0.0000	1,439.1894	1,439.1894	0.4410		1,448.4496
Total	**1.8844**	**19.7889**	**13.1786**	**0.0141**	**2.0483**	**1.0661**	**3.1144**	**1.1190**	**0.9808**	**2.0998**	**0.0000**	**1,439.1894**	**1,439.1894**	**0.4410**		**1,448.4496**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0323	0.0615	0.6558	8.0000e-005	1.0200e-003	2.6000e-004	1.2800e-003	2.7000e-004	2.3000e-004	5.1000e-004		6.5887	6.5887	1.7000e-004		6.5923
Vendor	0.0127	0.0827	0.1865	2.1000e-004	6.0000e-003	1.1600e-003	7.1600e-003	1.7100e-003	1.0700e-003	2.7800e-003		20.9538	20.9538	1.7000e-004		20.9573
Worker	0.0401	0.0568	0.5253	1.0700e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		85.9526	85.9526	4.7000e-003		86.0512
Total	**0.0850**	**0.2010**	**1.3676**	**1.3600e-003**	**0.1013**	**2.2000e-003**	**0.1035**	**0.0270**	**2.0100e-003**	**0.0290**		**113.4952**	**113.4952**	**5.0400e-003**		**113.6008**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9546	19.1088	14.3110	0.0220		1.2257	1.2257		1.1823	1.1823		2,034.2860	2,034.2860	0.4268		2,043.2497
Total	**2.9546**	**19.1088**	**14.3110**	**0.0220**		**1.2257**	**1.2257**		**1.1823**	**1.1823**		**2,034.2860**	**2,034.2860**	**0.4268**		**2,043.2497**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0127	0.0827	0.1865	2.1000e-004	6.0000e-003	1.1600e-003	7.1600e-003	1.7100e-003	1.0700e-003	2.7800e-003		20.9538	20.9538	1.7000e-004		20.9573
Worker	0.0962	0.1364	1.2607	2.5600e-003	0.2263	1.8700e-003	0.2282	0.0600	1.7100e-003	0.0617		206.2863	206.2863	0.0113		206.5230
Total	**0.1089**	**0.2191**	**1.4472**	**2.7700e-003**	**0.2323**	**3.0300e-003**	**0.2354**	**0.0617**	**2.7800e-003**	**0.0645**		**227.2401**	**227.2401**	**0.0114**		**227.4803**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9546	19.1088	14.3110	0.0220		1.2257	1.2257		1.1823	1.1823	0.0000	2,034.2860	2,034.2860	0.4268		2,043.2497
Total	**2.9546**	**19.1088**	**14.3110**	**0.0220**		**1.2257**	**1.2257**		**1.1823**	**1.1823**	**0.0000**	**2,034.2860**	**2,034.2860**	**0.4268**		**2,043.2497**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0127	0.0827	0.1865	2.1000e-004	6.0000e-003	1.1600e-003	7.1600e-003	1.7100e-003	1.0700e-003	2.7800e-003		20.9538	20.9538	1.7000e-004		20.9573
Worker	0.0962	0.1364	1.2607	2.5600e-003	0.2263	1.8700e-003	0.2282	0.0600	1.7100e-003	0.0617		206.2863	206.2863	0.0113		206.5230
Total	**0.1089**	**0.2191**	**1.4472**	**2.7700e-003**	**0.2323**	**3.0300e-003**	**0.2354**	**0.0617**	**2.7800e-003**	**0.0645**		**227.2401**	**227.2401**	**0.0114**		**227.4803**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day									lb/day					
Off-Road	1.1857	12.0981	9.0308	0.0133		0.7333	0.7333		0.6755	0.6755		1,347.6575	1,347.6575	0.4052		1,356.1677
Paving	0.4192					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6049**	**12.0981**	**9.0308**	**0.0133**		**0.7333**	**0.7333**		**0.6755**	**0.6755**		**1,347.6575**	**1,347.6575**	**0.4052**		**1,356.1677**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0401	0.0568	0.5253	1.0700e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		85.9526	85.9526	4.7000e-003		86.0512
Total	**0.0401**	**0.0568**	**0.5253**	**1.0700e-003**	**0.0943**	**7.8000e-004**	**0.0951**	**0.0250**	**7.1000e-004**	**0.0257**		**85.9526**	**85.9526**	**4.7000e-003**		**86.0512**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1857	12.0981	9.0308	0.0133		0.7333	0.7333		0.6755	0.6755	0.0000	1,347.6575	1,347.6575	0.4052		1,356.1677
Paving	0.4192					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6049**	**12.0981**	**9.0308**	**0.0133**		**0.7333**	**0.7333**		**0.6755**	**0.6755**	**0.0000**	**1,347.6575**	**1,347.6575**	**0.4052**		**1,356.1677**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0401	0.0568	0.5253	1.0700e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		85.9526	85.9526	4.7000e-003		86.0512
Total	**0.0401**	**0.0568**	**0.5253**	**1.0700e-003**	**0.0943**	**7.8000e-004**	**0.0951**	**0.0250**	**7.1000e-004**	**0.0257**		**85.9526**	**85.9526**	**4.7000e-003**		**86.0512**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category						lb/day								lb/day		
Archit. Coating	17.9972					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**18.3296**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0401	0.0568	0.5253	1.0700e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		85.9526	85.9526	4.7000e-003		86.0512
Total	**0.0401**	**0.0568**	**0.5253**	**1.0700e-003**	**0.0943**	**7.8000e-004**	**0.0951**	**0.0250**	**7.1000e-004**	**0.0257**		**85.9526**	**85.9526**	**4.7000e-003**		**86.0512**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.9972					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**18.3296**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0401	0.0568	0.5253	1.0700e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		85.9526	85.9526	4.7000e-003		86.0512

Total	0.0401	0.0568	0.5253	1.0700e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		85.9526	85.9526	4.7000e-003		86.0512

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.7291	4.2334	19.4933	0.0274	2.0160	0.0570	2.0730	0.5391	0.0522	0.5913		2,529.0624	2,529.0624	0.1371		2,531.9413
Unmitigated	1.7291	4.2334	19.4933	0.0274	2.0160	0.0570	2.0730	0.5391	0.0522	0.5913		2,529.0624	2,529.0624	0.1371		2,531.9413

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Manufacturing	50.00	50.00	50.00	145,963	145,963
Other Asphalt Surfaces	0.00	0.00	0.00		
Single Family Housing	38.08	38.08	38.08	85,008	85,008
Supermarket	35.00	195.01	35.00	213,609	213,609
Total	123.07	283.09	123.07	444,580	444,580

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Manufacturing	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3
Supermarket	9.50	30.00	7.30	6.50	74.50	19.00	34	30	36

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.472729	0.077244	0.179984	0.154078	0.062420	0.009378	0.018098	0.009047	0.002570	0.002555	0.008498	0.000540	0.002859

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0122	0.1090	0.0798	6.6000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003		132.9156	132.9156	2.5500e-003	2.4400e-003	133.7245
NaturalGas Unmitigated	0.0122	0.1090	0.0798	6.6000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003		132.9156	132.9156	2.5500e-003	2.4400e-003	133.7245

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	306.098	3.3000e-003	0.0282	0.0120	1.8000e-004		2.2800e-003	2.2800e-003		2.2800e-003	2.2800e-003		36.0115	36.0115	6.9000e-004	6.6000e-004	36.2307
Supermarket	157.394	1.7000e-003	0.0154	0.0130	9.0000e-005		1.1700e-003	1.1700e-003		1.1700e-003	1.1700e-003		18.5169	18.5169	3.5000e-004	3.4000e-004	18.6296

Manufacturing	666.291	7.1900e-003	0.0653	0.0549	3.9000e-004		4.9600e-003	4.9600e-003		4.9600e-003	4.9600e-003		78.3872	78.3872	1.5000e-003	1.4400e-003	78.8642
Total		**0.0122**	**0.1090**	**0.0798**	**6.6000e-004**		**8.4100e-003**	**8.4100e-003**		**8.4100e-003**	**8.4100e-003**		**132.9156**	**132.9156**	**2.5400e-003**	**2.4400e-003**	**133.7245**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.306098	3.3000e-003	0.0282	0.0120	1.8000e-004		2.2800e-003	2.2800e-003		2.2800e-003	2.2800e-003		36.0115	36.0115	6.9000e-004	6.6000e-004	36.2307
Supermarket	0.157394	1.7000e-003	0.0154	0.0130	9.0000e-005		1.1700e-003	1.1700e-003		1.1700e-003	1.1700e-003		18.5169	18.5169	3.5000e-004	3.4000e-004	18.6296
Manufacturing	0.666291	7.1900e-003	0.0653	0.0549	3.9000e-004		4.9600e-003	4.9600e-003		4.9600e-003	4.9600e-003		78.3872	78.3872	1.5000e-003	1.4400e-003	78.8642
Total		**0.0122**	**0.1090**	**0.0798**	**6.6000e-004**		**8.4100e-003**	**8.4100e-003**		**8.4100e-003**	**8.4100e-003**		**132.9156**	**132.9156**	**2.5400e-003**	**2.4400e-003**	**133.7245**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.8994	3.8700e-003	0.3344	2.0000e-005		8.0800e-003	8.0800e-003		8.0100e-003	8.0100e-003	0.0000	99.4212	99.4212	2.4900e-003	1.8100e-003	100.0351
Unmitigated	1.8994	3.8700e-003	0.3344	2.0000e-005		8.0800e-003	8.0800e-003		8.0100e-003	8.0100e-003	0.0000	99.4212	99.4212	2.4900e-003	1.8100e-003	100.0351

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8306					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	9.0600e-003	0.0000	4.9000e-004	0.0000		6.2600e-003	6.2600e-003		6.1900e-003	6.1900e-003	0.0000	98.8235	98.8235	1.8900e-003	1.8100e-003	99.4250
Landscaping	0.0104	3.8700e-003	0.3340	2.0000e-005		1.8200e-003	1.8200e-003		1.8200e-003	1.8200e-003		0.5976	0.5976	6.0000e-004		0.6102
Total	**1.8994**	**3.8700e-003**	**0.3344**	**2.0000e-005**		**8.0800e-003**	**8.0800e-003**		**8.0100e-003**	**8.0100e-003**	**0.0000**	**99.4212**	**99.4212**	**2.4900e-003**	**1.8100e-003**	**100.0351**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8306					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	9.0600e-003	0.0000	4.9000e-004	0.0000		6.2600e-003	6.2600e-003		6.1900e-003	6.1900e-003	0.0000	98.8235	98.8235	1.8900e-003	1.8100e-003	99.4250
Landscaping	0.0104	3.8700e-003	0.3340	2.0000e-005		1.8200e-003	1.8200e-003		1.8200e-003	1.8200e-003		0.5976	0.5976	6.0000e-004		0.6102
Total	**1.8994**	**3.8700e-003**	**0.3344**	**2.0000e-005**		**8.0800e-003**	**8.0800e-003**		**8.0100e-003**	**8.0100e-003**	**0.0000**	**99.4212**	**99.4212**	**2.4900e-003**	**1.8100e-003**	**100.0351**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Belden Barns

Sonoma-San Francisco County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Manufacturing	10.94	1000sqft	0.21	10,940.00	0
Other Asphalt Surfaces	1.60	Acre	1.60	69,696.00	0
Single Family Housing	4.00	Dwelling Unit	0.08	1,877.00	11
Supermarket	3.03	1000sqft	0.10	3,030.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	75
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	559.32	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 Intensity adjusted based on PG&E 25% Renewables by Dec 31 2016

Land Use - Acreage and SF revised to match Project details

Construction Phase - Construction duration set to match conservative 12 month schedule

Trips and VMT - Adjusted worker and vendor trucks to match Project information. Soil hauling triplength reduced since balanced on-site

Demolition - 6,555 SF of existing buildings to be demolished

Grading - 3.1 acres disturbed during grading. 2,100 CY balanced on-site

Architectural Coating - Modified Non-res interior and exterior areas based on minimal coatings for Parking uses.

Vehicle Trips - Special Event Peak Day assumed to be Saturdays. Traffic trips based on TIA. Increased Customer triplength for the Hospitality use to 30 miles.

Woodstoves - Gas fireplaces assumed only

Area Coating - Adjusted NonRes SF

Energy Use - Adjusted electricity use to match the Project energy. Natural gas updated to 2013 Title 24

Water And Wastewater - Indoor/outdoor water based on Project information

Construction Off-road Equipment Mitigation - Water exposed area and 15 mph vehicle speed on unpaved roads

Waste Mitigation - 75% waste diversion consistent with AB 341 (not mitigation)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	41,833.00	8,111.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	125,499.00	20,961.00
tblAreaCoating	Area_Nonresidential_Exterior	41833	8111
tblAreaCoating	Area_Nonresidential_Interior	125499	20961
tblConstructionPhase	NumDays	200.00	166.00
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	4.00	100.00
tblConstructionPhase	PhaseEndDate	11/2/2017	11/1/2017
tblConstructionPhase	PhaseEndDate	11/15/2017	10/19/2017
tblConstructionPhase	PhaseStartDate	10/20/2017	10/19/2017
tblConstructionPhase	PhaseStartDate	11/2/2017	10/6/2017
tblEnergyUse	LightingElect	3.52	5.05
tblEnergyUse	LightingElect	1,608.84	1,381.78
tblEnergyUse	LightingElect	7.65	2.32
tblEnergyUse	NT24E	3.70	5.30
tblEnergyUse	NT24E	5,095.49	4,376.34
tblEnergyUse	NT24E	30.13	9.12
tblEnergyUse	T24E	1.81	2.60
tblEnergyUse	T24E	368.61	316.59
tblEnergyUse	T24E	4.99	1.51
tblEnergyUse	T24NG	20.74	15.56
tblEnergyUse	T24NG	29,406.10	22,054.58
tblEnergyUse	T24NG	17.56	13.17
tblFireplaces	NumberGas	2.20	4.00

tblFireplaces	NumberWood	1.80	0.00
tblGrading	AcresOfGrading	37.50	3.10
tblGrading	MaterialExported	0.00	2,100.00
tblLandUse	LandUseSquareFeet	7,200.00	1,877.00
tblLandUse	LotAcreage	0.25	0.21
tblLandUse	LotAcreage	1.30	0.08
tblLandUse	LotAcreage	0.07	0.10
tblProjectCharacteristics	CO2IntensityFactor	641.35	559.32
tblProjectCharacteristics	OperationalYear	2014	2018
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	14.00	1.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblTripsAndVMT	WorkerTripNumber	7.00	10.00
tblVehicleTrips	CC_TL	7.30	30.00
tblVehicleTrips	ST_TR	1.49	4.57
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	ST_TR	177.59	64.36
tblVehicleTrips	SU_TR	0.62	4.57
tblVehicleTrips	SU_TR	8.77	9.52

tblVehicleTrips	SU_TR	166.44	11.55
tblVehicleTrips	WD_TR	3.82	4.57
tblVehicleTrips	WD_TR	9.57	9.52
tblVehicleTrips	WD_TR	102.24	11.55
tblWater	IndoorWaterUseRate	2,529,875.00	138,750.00
tblWater	IndoorWaterUseRate	260,616.10	489,100.00
tblWater	IndoorWaterUseRate	373,502.69	64,835.00
tblWater	OutdoorWaterUseRate	0.00	530,020.00
tblWater	OutdoorWaterUseRate	164,301.46	0.00
tblWater	OutdoorWaterUseRate	11,551.63	0.00
tblWoodstoves	NumberCatalytic	0.14	0.00
tblWoodstoves	NumberNoncatalytic	0.14	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	2.9964	28.8782	22.6365	0.0271	5.8939	1.7529	7.2932	2.9787	1.6404	4.2661	0.0000	2,731.5950	2,731.5950	0.6351	0.0000	2,744.9315
2017	23.0744	33.6721	27.6711	0.0436	4.6531	2.1368	5.7214	2.5136	2.0353	3.4964	0.0000	4,093.1490	4,093.1490	0.8826	0.0000	4,111.6840
Total	**26.0707**	**62.5503**	**50.3077**	**0.0707**	**10.5470**	**3.8897**	**13.0146**	**5.4923**	**3.6757**	**7.7625**	**0.0000**	**6,824.7439**	**6,824.7439**	**1.5177**	**0.0000**	**6,856.6155**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2016	2.9964	28.8782	22.6365	0.0271	2.7041	1.7529	4.1034	1.3542	1.6404	2.6415	0.0000	2,731.5950	2,731.5950	0.6351	0.0000	2,744.9315
2017	23.0744	33.6721	27.6711	0.0436	2.1496	2.1368	3.2179	1.1460	2.0353	2.1471	0.0000	4,093.1490	4,093.1490	0.8826	0.0000	4,111.6840
Total	**26.0707**	**62.5503**	**50.3077**	**0.0707**	**4.8538**	**3.8897**	**7.3213**	**2.5001**	**3.6757**	**4.7886**	**0.0000**	**6,824.7439**	**6,824.7439**	**1.5177**	**0.0000**	**6,856.6155**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.98**	**0.00**	**43.75**	**54.48**	**0.00**	**38.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.8994	3.8700e-003	0.3344	2.0000e-005		8.0800e-003	8.0800e-003		8.0100e-003	8.0100e-003	0.0000	99.4212	99.4212	2.4900e-003	1.8100e-003	100.0351
Energy	0.0122	0.1090	0.0798	6.6000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003		132.9156	132.9156	2.5500e-003	2.4400e-003	133.7245
Mobile	1.6440	3.7607	18.1165	0.0291	2.0160	0.0567	2.0727	0.5391	0.0519	0.5910		2,684.8258	2,684.8258	0.1371		2,687.7039
Total	**3.5556**	**3.8735**	**18.5308**	**0.0298**	**2.0160**	**0.0732**	**2.0892**	**0.5391**	**0.0684**	**0.6074**	**0.0000**	**2,917.1626**	**2,917.1626**	**0.1421**	**4.2500e-003**	**2,921.4636**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.8994	3.8700e-003	0.3344	2.0000e-005		8.0800e-003	8.0800e-003		8.0100e-003	8.0100e-003	0.0000	99.4212	99.4212	2.4900e-003	1.8100e-003	100.0351
Energy	0.0122	0.1090	0.0798	6.6000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003		132.9156	132.9156	2.5500e-003	2.4400e-003	133.7245
Mobile	1.6440	3.7607	18.1165	0.0291	2.0160	0.0567	2.0727	0.5391	0.0519	0.5910		2,684.8258	2,684.8258	0.1371		2,687.7039
Total	**3.5556**	**3.8735**	**18.5308**	**0.0298**	**2.0160**	**0.0732**	**2.0892**	**0.5391**	**0.0684**	**0.6074**	**0.0000**	**2,917.1626**	**2,917.1626**	**0.1421**	**4.2500e-003**	**2,921.4636**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2016	10/21/2016	5	15	
2	Site Preparation	Site Preparation	10/22/2016	10/25/2016	5	2	
3	Grading	Grading	10/26/2016	3/14/2017	5	100	
4	Building Construction	Building Construction	3/15/2017	11/1/2017	5	166	
5	Paving	Paving	10/6/2017	10/19/2017	5	10	
6	Architectural Coating	Architectural Coating	10/19/2017	11/1/2017	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 3.1

Acres of Paving: 0

Residential Indoor: 3,801; Residential Outdoor: 1,267; Non-Residential Indoor: 20,961; Non-Residential Outdoor: 8,111 (Architectural

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37

Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	125	0.42
Paving	Paving Equipment	1	8.00	130	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	10.00	0.00	30.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	10.00	1.00	263.00	12.40	6.60	0.25	LD_Mix	HDT_Mix	HHDT
Building Construction	7	24.00	1.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.4302	0.0000	0.4302	0.0651	0.0000	0.0651			0.0000			0.0000

Off-Road	2.9066	28.2579	21.4980	0.0245		1.7445	1.7445		1.6328	1.6328		2,487.1296	2,487.1296	0.6288		2,500.3343
Total	**2.9066**	**28.2579**	**21.4980**	**0.0245**	**0.4302**	**1.7445**	**2.1747**	**0.0651**	**1.6328**	**1.6979**		**2,487.1296**	**2,487.1296**	**0.6288**		**2,500.3343**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0444	0.5687	0.5326	1.4700e-003	0.0347	7.5200e-003	0.0422	9.4900e-003	6.9100e-003	0.0164		147.9080	147.9080	1.0800e-003		147.9307
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0455	0.0516	0.6060	1.1600e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		96.5574	96.5574	5.2000e-003		96.6665
Total	**0.0898**	**0.6203**	**1.1386**	**2.6300e-003**	**0.1290**	**8.3500e-003**	**0.1373**	**0.0345**	**7.6700e-003**	**0.0422**		**244.4654**	**244.4654**	**6.2800e-003**		**244.5972**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1936	0.0000	0.1936	0.0293	0.0000	0.0293			0.0000			0.0000
Off-Road	2.9066	28.2579	21.4980	0.0245		1.7445	1.7445		1.6328	1.6328	0.0000	2,487.1296	2,487.1296	0.6288		2,500.3343
Total	**2.9066**	**28.2579**	**21.4980**	**0.0245**	**0.1936**	**1.7445**	**1.9381**	**0.0293**	**1.6328**	**1.6621**	**0.0000**	**2,487.1296**	**2,487.1296**	**0.6288**		**2,500.3343**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0444	0.5687	0.5326	1.4700e-003	0.0347	7.5200e-003	0.0422	9.4900e-003	6.9100e-003	0.0164		147.9080	147.9080	1.0800e-003		147.9307
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0455	0.0516	0.6060	1.1600e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		96.5574	96.5574	5.2000e-003		96.6665
Total	**0.0898**	**0.6203**	**1.1386**	**2.6300e-003**	**0.1290**	**8.3500e-003**	**0.1373**	**0.0345**	**7.6700e-003**	**0.0422**		**244.4654**	**244.4654**	**6.2800e-003**		**244.5972**

3.3 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.7996	0.0000	5.7996	2.9537	0.0000	2.9537			0.0000			0.0000
Off-Road	2.4428	25.7718	16.5144	0.0171		1.3985	1.3985		1.2866	1.2866		1,781.0872	1,781.0872	0.5372		1,792.3693
Total	**2.4428**	**25.7718**	**16.5144**	**0.0171**	**5.7996**	**1.3985**	**7.1981**	**2.9537**	**1.2866**	**4.2403**		**1,781.0872**	**1,781.0872**	**0.5372**		**1,792.3693**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0455	0.0516	0.6060	1.1600e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		96.5574	96.5574	5.2000e-003		96.6665
Total	**0.0455**	**0.0516**	**0.6060**	**1.1600e-003**	**0.0943**	**8.3000e-004**	**0.0951**	**0.0250**	**7.6000e-004**	**0.0258**		**96.5574**	**96.5574**	**5.2000e-003**		**96.6665**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6098	0.0000	2.6098	1.3292	0.0000	1.3292			0.0000			0.0000
Off-Road	2.4428	25.7718	16.5144	0.0171		1.3985	1.3985		1.2866	1.2866	0.0000	1,781.0872	1,781.0872	0.5372		1,792.3693
Total	**2.4428**	**25.7718**	**16.5144**	**0.0171**	**2.6098**	**1.3985**	**4.0083**	**1.3292**	**1.2866**	**2.6158**	**0.0000**	**1,781.0872**	**1,781.0872**	**0.5372**		**1,792.3693**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0455	0.0516	0.6060	1.1600e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		96.5574	96.5574	5.2000e-003		96.6665
Total	**0.0455**	**0.0516**	**0.6060**	**1.1600e-003**	**0.0943**	**8.3000e-004**	**0.0951**	**0.0250**	**7.6000e-004**	**0.0258**		**96.5574**	**96.5574**	**5.2000e-003**		**96.6665**

3.4 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5518	0.0000	4.5518	2.4866	0.0000	2.4866			0.0000			0.0000
Off-Road	1.9908	21.0361	13.6704	0.0141		1.1407	1.1407		1.0494	1.0494		1,462.8468	1,462.8468	0.4413		1,472.1130
Total	**1.9908**	**21.0361**	**13.6704**	**0.0141**	**4.5518**	**1.1407**	**5.6925**	**2.4866**	**1.0494**	**3.5360**		**1,462.8468**	**1,462.8468**	**0.4413**		**1,472.1130**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0270	0.0638	0.4035	8.0000e-005	1.0900e-003	2.8000e-004	1.3700e-003	2.9000e-004	2.5000e-004	5.4000e-004		7.2083	7.2083	1.5000e-004		7.2114
Vendor	0.0114	0.0881	0.1268	2.2000e-004	6.0000e-003	1.3300e-003	7.3300e-003	1.7100e-003	1.2200e-003	2.9400e-003		21.5118	21.5118	1.7000e-004		21.5154
Worker	0.0455	0.0516	0.6060	1.1600e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		96.5574	96.5574	5.2000e-003		96.6665
Total	**0.0838**	**0.2035**	**1.1362**	**1.4600e-003**	**0.1014**	**2.4400e-003**	**0.1038**	**0.0270**	**2.2300e-003**	**0.0293**		**125.2774**	**125.2774**	**5.5200e-003**		**125.3932**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					2.0483	0.0000	2.0483	1.1190	0.0000	1.1190			0.0000			0.0000
Off-Road	1.9908	21.0361	13.6704	0.0141		1.1407	1.1407		1.0494	1.0494	0.0000	1,462.846 8	1,462.846 8	0.4413		1,472.113 0
Total	**1.9908**	**21.0361**	**13.6704**	**0.0141**	**2.0483**	**1.1407**	**3.1890**	**1.1190**	**1.0494**	**2.1684**	**0.0000**	**1,462.846 8**	**1,462.846 8**	**0.4413**		**1,472.113 0**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0270	0.0638	0.4035	8.0000e-005	1.0900e-003	2.8000e-004	1.3700e-003	2.9000e-004	2.5000e-004	5.4000e-004		7.2083	7.2083	1.5000e-004		7.2114
Vendor	0.0114	0.0881	0.1268	2.2000e-004	6.0000e-003	1.3300e-003	7.3300e-003	1.7100e-003	1.2200e-003	2.9400e-003		21.5118	21.5118	1.7000e-004		21.5154
Worker	0.0455	0.0516	0.6060	1.1600e-003	0.0943	8.3000e-004	0.0951	0.0250	7.6000e-004	0.0258		96.5574	96.5574	5.2000e-003		96.6665
Total	**0.0838**	**0.2035**	**1.1362**	**1.4600e-003**	**0.1014**	**2.4400e-003**	**0.1038**	**0.0270**	**2.2300e-003**	**0.0293**		**125.2774**	**125.2774**	**5.5200e-003**		**125.3932**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.5518	0.0000	4.5518	2.4866	0.0000	2.4866			0.0000			0.0000
Off-Road	1.8844	19.7889	13.1786	0.0141		1.0661	1.0661		0.9808	0.9808		1,439.189 4	1,439.189 4	0.4410		1,448.449 6
Total	**1.8844**	**19.7889**	**13.1786**	**0.0141**	**4.5518**	**1.0661**	**5.6179**	**2.4866**	**0.9808**	**3.4674**		**1,439.189 4**	**1,439.189 4**	**0.4410**		**1,448.449 6**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0218	0.0599	0.3542	8.0000e-005	1.0200e-003	2.3000e-004	1.2600e-003	2.7000e-004	2.1000e-004	4.8000e-004		7.0463	7.0463	1.5000e-004		7.0495
Vendor	9.7300e-003	0.0790	0.1127	2.1000e-004	6.0000e-003	1.1500e-003	7.1500e-003	1.7100e-003	1.0600e-003	2.7700e-003		21.1342	21.1342	1.6000e-004		21.1376
Worker	0.0399	0.0457	0.5338	1.1500e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		92.8689	92.8689	4.7000e-003		92.9675
Total	**0.0715**	**0.1846**	**1.0007**	**1.4400e-003**	**0.1013**	**2.1600e-003**	**0.1035**	**0.0270**	**1.9800e-003**	**0.0290**		**121.0494**	**121.0494**	**5.0100e-003**		**121.1546**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.0483	0.0000	2.0483	1.1190	0.0000	1.1190			0.0000			0.0000
Off-Road	1.8844	19.7889	13.1786	0.0141		1.0661	1.0661		0.9808	0.9808	0.0000	1,439.1894	1,439.1894	0.4410		1,448.4496
Total	**1.8844**	**19.7889**	**13.1786**	**0.0141**	**2.0483**	**1.0661**	**3.1144**	**1.1190**	**0.9808**	**2.0998**	**0.0000**	**1,439.1894**	**1,439.1894**	**0.4410**		**1,448.4496**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0218	0.0599	0.3542	8.0000e-005	1.0200e-003	2.3000e-004	1.2600e-003	2.7000e-004	2.1000e-004	4.8000e-004		7.0463	7.0463	1.5000e-004		7.0495
Vendor	9.7300e-003	0.0790	0.1127	2.1000e-004	6.0000e-003	1.1500e-003	7.1500e-003	1.7100e-003	1.0600e-003	2.7700e-003		21.1342	21.1342	1.6000e-004		21.1376
Worker	0.0399	0.0457	0.5338	1.1500e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		92.8689	92.8689	4.7000e-003		92.9675
Total	**0.0715**	**0.1846**	**1.0007**	**1.4400e-003**	**0.1013**	**2.1600e-003**	**0.1035**	**0.0270**	**1.9800e-003**	**0.0290**		**121.0494**	**121.0494**	**5.0100e-003**		**121.1546**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9546	19.1088	14.3110	0.0220		1.2257	1.2257		1.1823	1.1823		2,034.2860	2,034.2860	0.4268		2,043.2497
Total	**2.9546**	**19.1088**	**14.3110**	**0.0220**		**1.2257**	**1.2257**		**1.1823**	**1.1823**		**2,034.2860**	**2,034.2860**	**0.4268**		**2,043.2497**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.7300e-003	0.0790	0.1127	2.1000e-004	6.0000e-003	1.1500e-003	7.1500e-003	1.7100e-003	1.0600e-003	2.7700e-003		21.1342	21.1342	1.6000e-004		21.1376
Worker	0.0958	0.1097	1.2810	2.7700e-003	0.2263	1.8700e-003	0.2282	0.0600	1.7100e-003	0.0617		222.8854	222.8854	0.0113		223.1220
Total	**0.1055**	**0.1887**	**1.3937**	**2.9800e-003**	**0.2323**	**3.0200e-003**	**0.2353**	**0.0617**	**2.7700e-003**	**0.0645**		**244.0195**	**244.0195**	**0.0114**		**244.2596**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.9546	19.1088	14.3110	0.0220		1.2257	1.2257		1.1823	1.1823	0.0000	2,034.2860	2,034.2860	0.4268		2,043.2497
Total	**2.9546**	**19.1088**	**14.3110**	**0.0220**		**1.2257**	**1.2257**		**1.1823**	**1.1823**	**0.0000**	**2,034.2860**	**2,034.2860**	**0.4268**		**2,043.2497**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	9.7300e-003	0.0790	0.1127	2.1000e-004	6.0000e-003	1.1500e-003	7.1500e-003	1.7100e-003	1.0600e-003	2.7700e-003		21.1342	21.1342	1.6000e-004		21.1376
Worker	0.0958	0.1097	1.2810	2.7700e-003	0.2263	1.8700e-003	0.2282	0.0600	1.7100e-003	0.0617		222.8854	222.8854	0.0113		223.1220
Total	**0.1055**	**0.1887**	**1.3937**	**2.9800e-003**	**0.2323**	**3.0200e-003**	**0.2353**	**0.0617**	**2.7700e-003**	**0.0645**		**244.0195**	**244.0195**	**0.0114**		**244.2596**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Off-Road	1.1857	12.0981	9.0308	0.0133		0.7333	0.7333		0.6755	0.6755		1,347.6575	1,347.6575	0.4052		1,356.1677
Paving	0.4192					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6049**	**12.0981**	**9.0308**	**0.0133**		**0.7333**	**0.7333**		**0.6755**	**0.6755**		**1,347.6575**	**1,347.6575**	**0.4052**		**1,356.1677**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0399	0.0457	0.5338	1.1500e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		92.8689	92.8689	4.7000e-003		92.9675
Total	**0.0399**	**0.0457**	**0.5338**	**1.1500e-003**	**0.0943**	**7.8000e-004**	**0.0951**	**0.0250**	**7.1000e-004**	**0.0257**		**92.8689**	**92.8689**	**4.7000e-003**		**92.9675**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1857	12.0981	9.0308	0.0133		0.7333	0.7333		0.6755	0.6755	0.0000	1,347.6575	1,347.6575	0.4052		1,356.1677
Paving	0.4192					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6049**	**12.0981**	**9.0308**	**0.0133**		**0.7333**	**0.7333**		**0.6755**	**0.6755**	**0.0000**	**1,347.6575**	**1,347.6575**	**0.4052**		**1,356.1677**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0399	0.0457	0.5338	1.1500e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		92.8689	92.8689	4.7000e-003		92.9675
Total	**0.0399**	**0.0457**	**0.5338**	**1.1500e-003**	**0.0943**	**7.8000e-004**	**0.0951**	**0.0250**	**7.1000e-004**	**0.0257**		**92.8689**	**92.8689**	**4.7000e-003**		**92.9675**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.9972					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**18.3296**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0399	0.0457	0.5338	1.1500e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		92.8689	92.8689	4.7000e-003		92.9675
Total	**0.0399**	**0.0457**	**0.5338**	**1.1500e-003**	**0.0943**	**7.8000e-004**	**0.0951**	**0.0250**	**7.1000e-004**	**0.0257**		**92.8689**	**92.8689**	**4.7000e-003**		**92.9675**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	17.9972					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**18.3296**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0399	0.0457	0.5338	1.1500e-003	0.0943	7.8000e-004	0.0951	0.0250	7.1000e-004	0.0257		92.8689	92.8689	4.7000e-003		92.9675

Total	**0.0399**	**0.0457**	**0.5338**	**1.1500e-003**	**0.0943**	**7.8000e-004**	**0.0951**	**0.0250**	**7.1000e-004**	**0.0257**		**92.8689**	**92.8689**	**4.7000e-003**		**92.9675**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.6440	3.7607	18.1165	0.0291	2.0160	0.0567	2.0727	0.5391	0.0519	0.5910		2,684.8258	2,684.8258	0.1371		2,687.7039
Unmitigated	1.6440	3.7607	18.1165	0.0291	2.0160	0.0567	2.0727	0.5391	0.0519	0.5910		2,684.8258	2,684.8258	0.1371		2,687.7039

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Manufacturing	50.00	50.00	50.00	145,963	145,963
Other Asphalt Surfaces	0.00	0.00	0.00		
Single Family Housing	38.08	38.08	38.08	85,008	85,008
Supermarket	35.00	195.01	35.00	213,609	213,609
Total	123.07	283.09	123.07	444,580	444,580

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Manufacturing	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3
Supermarket	9.50	30.00	7.30	6.50	74.50	19.00	34	30	36

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.472729	0.077244	0.179984	0.154078	0.062420	0.009378	0.018098	0.009047	0.002570	0.002555	0.008498	0.000540	0.002859

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0122	0.1090	0.0798	6.6000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003		132.9156	132.9156	2.5500e-003	2.4400e-003	133.7245
NaturalGas Unmitigated	0.0122	0.1090	0.0798	6.6000e-004		8.4200e-003	8.4200e-003		8.4200e-003	8.4200e-003		132.9156	132.9156	2.5500e-003	2.4400e-003	133.7245

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	306.098	3.3000e-003	0.0282	0.0120	1.8000e-004		2.2800e-003	2.2800e-003		2.2800e-003	2.2800e-003		36.0115	36.0115	6.9000e-004	6.6000e-004	36.2307
Supermarket	157.394	1.7000e-003	0.0154	0.0130	9.0000e-005		1.1700e-003	1.1700e-003		1.1700e-003	1.1700e-003		18.5169	18.5169	3.5000e-004	3.4000e-004	18.6296

Manufacturing	666.291	7.1900e-003	0.0653	0.0549	3.9000e-004		4.9600e-003	4.9600e-003		4.9600e-003	4.9600e-003		78.3872	78.3872	1.5000e-003	1.4400e-003	78.8642
Total		**0.0122**	**0.1090**	**0.0798**	**6.6000e-004**		**8.4100e-003**	**8.4100e-003**		**8.4100e-003**	**8.4100e-003**		**132.9156**	**132.9156**	**2.5400e-003**	**2.4400e-003**	**133.7245**

<u>Mitigated</u>

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.306098	3.3000e-003	0.0282	0.0120	1.8000e-004		2.2800e-003	2.2800e-003		2.2800e-003	2.2800e-003		36.0115	36.0115	6.9000e-004	6.6000e-004	36.2307
Supermarket	0.157394	1.7000e-003	0.0154	0.0130	9.0000e-005		1.1700e-003	1.1700e-003		1.1700e-003	1.1700e-003		18.5169	18.5169	3.5000e-004	3.4000e-004	18.6296
Manufacturing	0.666291	7.1900e-003	0.0653	0.0549	3.9000e-004		4.9600e-003	4.9600e-003		4.9600e-003	4.9600e-003		78.3872	78.3872	1.5000e-003	1.4400e-003	78.8642
Total		**0.0122**	**0.1090**	**0.0798**	**6.6000e-004**		**8.4100e-003**	**8.4100e-003**		**8.4100e-003**	**8.4100e-003**		**132.9156**	**132.9156**	**2.5400e-003**	**2.4400e-003**	**133.7245**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.8994	3.8700e-003	0.3344	2.0000e-005		8.0800e-003	8.0800e-003		8.0100e-003	8.0100e-003	0.0000	99.4212	99.4212	2.4900e-003	1.8100e-003	100.0351
Unmitigated	1.8994	3.8700e-003	0.3344	2.0000e-005		8.0800e-003	8.0800e-003		8.0100e-003	8.0100e-003	0.0000	99.4212	99.4212	2.4900e-003	1.8100e-003	100.0351

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8306					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	9.0600e-003	0.0000	4.9000e-004	0.0000		6.2600e-003	6.2600e-003		6.1900e-003	6.1900e-003	0.0000	98.8235	98.8235	1.8900e-003	1.8100e-003	99.4250
Landscaping	0.0104	3.8700e-003	0.3340	2.0000e-005		1.8200e-003	1.8200e-003		1.8200e-003	1.8200e-003		0.5976	0.5976	6.0000e-004		0.6102
Total	**1.8994**	**3.8700e-003**	**0.3344**	**2.0000e-005**		**8.0800e-003**	**8.0800e-003**		**8.0100e-003**	**8.0100e-003**	**0.0000**	**99.4212**	**99.4212**	**2.4900e-003**	**1.8100e-003**	**100.0351**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.8306					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	9.0600e-003	0.0000	4.9000e-004	0.0000		6.2600e-003	6.2600e-003		6.1900e-003	6.1900e-003	0.0000	98.8235	98.8235	1.8900e-003	1.8100e-003	99.4250
Landscaping	0.0104	3.8700e-003	0.3340	2.0000e-005		1.8200e-003	1.8200e-003		1.8200e-003	1.8200e-003		0.5976	0.5976	6.0000e-004		0.6102
Total	**1.8994**	**3.8700e-003**	**0.3344**	**2.0000e-005**		**8.0800e-003**	**8.0800e-003**		**8.0100e-003**	**8.0100e-003**	**0.0000**	**99.4212**	**99.4212**	**2.4900e-003**	**1.8100e-003**	**100.0351**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Belden Barns

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Manufacturing	10.94	1000sqft	0.21	10,940.00	0
Other Asphalt Surfaces	1.60	Acre	1.60	69,696.00	0
Single Family Housing	4.00	Dwelling Unit	0.08	1,877.00	11
Supermarket	3.03	1000sqft	0.10	3,030.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 75

Climate Zone 4 **Operational Year** 2018

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 559.32 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - CO2 Intensity adjusted based on PG&E 25% Renewables by Dec 31 2016

Land Use - Acreage and SF revised to match Project details

Construction Phase - Construction duration set to match conservative 12 month schedule

Trips and VMT - Adjusted worker and vendor trucks to match Project information. Soil hauling triplength reduced since balanced on-site

Demolition - 6,555 SF of existing buildings to be demolished

Grading - 3.1 acres disturbed during grading. 2,100 CY balanced on-site

Architectural Coating - Modified Non-res interior and exterior areas based on minimal coatings for Parking uses.

Vehicle Trips - Special Event Peak Day assumed to be Saturdays. Traffic trips based on TIA. Increased Customer triplength for the Hospitality use to 30 miles.

Woodstoves - Gas fireplaces assumed only

Area Coating - Adjusted NonRes SF

Energy Use - Adjusted electricity use to match the Project energy. Natural gas updated to 2013 Title 24

Water And Wastewater - Indoor/outdoor water based on Project information

Construction Off-road Equipment Mitigation - Water exposed area and 15 mph vehicle speed on unpaved roads

Waste Mitigation - 75% waste diversion consistent with AB 341 (not mitigation)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	41,833.00	8,111.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	125,499.00	20,961.00
tblAreaCoating	Area_Nonresidential_Exterior	41833	8111
tblAreaCoating	Area_Nonresidential_Interior	125499	20961
tblConstructionPhase	NumDays	200.00	166.00
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	NumDays	4.00	100.00
tblConstructionPhase	PhaseEndDate	11/2/2017	11/1/2017
tblConstructionPhase	PhaseEndDate	11/15/2017	10/19/2017
tblConstructionPhase	PhaseStartDate	10/20/2017	10/19/2017
tblConstructionPhase	PhaseStartDate	11/2/2017	10/6/2017
tblEnergyUse	LightingElect	3.52	5.05
tblEnergyUse	LightingElect	1,608.84	1,381.78
tblEnergyUse	LightingElect	7.65	2.32
tblEnergyUse	NT24E	3.70	5.30
tblEnergyUse	NT24E	5,095.49	4,376.34
tblEnergyUse	NT24E	30.13	9.12
tblEnergyUse	T24E	1.81	2.60
tblEnergyUse	T24E	368.61	316.59
tblEnergyUse	T24E	4.99	1.51
tblEnergyUse	T24NG	20.74	15.56
tblEnergyUse	T24NG	29,406.10	22,054.58
tblEnergyUse	T24NG	17.56	13.17
tblFireplaces	NumberGas	2.20	4.00

tblFireplaces	NumberWood	1.80	0.00
tblGrading	AcresOfGrading	37.50	3.10
tblGrading	MaterialExported	0.00	2,100.00
tblLandUse	LandUseSquareFeet	7,200.00	1,877.00
tblLandUse	LotAcreage	0.25	0.21
tblLandUse	LotAcreage	1.30	0.08
tblLandUse	LotAcreage	0.07	0.10
tblProjectCharacteristics	CO2IntensityFactor	641.35	559.32
tblProjectCharacteristics	OperationalYear	2014	2018
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.25
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripLength	7.30	6.60
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	14.00	1.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	8.00	10.00
tblTripsAndVMT	WorkerTripNumber	36.00	24.00
tblTripsAndVMT	WorkerTripNumber	13.00	10.00
tblTripsAndVMT	WorkerTripNumber	7.00	10.00
tblVehicleTrips	CC_TL	7.30	30.00
tblVehicleTrips	ST_TR	1.49	4.57
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	ST_TR	177.59	64.36
tblVehicleTrips	SU_TR	0.62	4.57
tblVehicleTrips	SU_TR	8.77	9.52

tblVehicleTrips	SU_TR	166.44	11.55
tblVehicleTrips	WD_TR	3.82	4.57
tblVehicleTrips	WD_TR	9.57	9.52
tblVehicleTrips	WD_TR	102.24	11.55
tblWater	IndoorWaterUseRate	2,529,875.00	138,750.00
tblWater	IndoorWaterUseRate	260,616.10	489,100.00
tblWater	IndoorWaterUseRate	373,502.69	64,835.00
tblWater	OutdoorWaterUseRate	0.00	530,020.00
tblWater	OutdoorWaterUseRate	164,301.46	0.00
tblWater	OutdoorWaterUseRate	11,551.63	0.00
tblWoodstoves	NumberCatalytic	0.14	0.00
tblWoodstoves	NumberNoncatalytic	0.14	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0749	0.7527	0.5466	5.9000e-004	0.2400	0.0420	0.2819	0.1287	0.0388	0.1675	0.0000	54.6715	54.6715	0.0145	0.0000	54.9769
2017	0.4045	2.1947	1.7328	2.5500e-003	0.2494	0.1343	0.3837	0.1302	0.1282	0.2583	0.0000	215.2599	215.2599	0.0455	0.0000	216.2161
Total	**0.4794**	**2.9473**	**2.2794**	**3.1400e-003**	**0.4894**	**0.1763**	**0.6657**	**0.2588**	**0.1670**	**0.4258**	**0.0000**	**269.9314**	**269.9314**	**0.0601**	**0.0000**	**271.1930**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2016	0.0749	0.7527	0.5466	5.9000e-004	0.1098	0.0420	0.1518	0.0584	0.0388	0.0972	0.0000	54.6715	54.6715	0.0145	0.0000	54.9768
2017	0.4045	2.1947	1.7328	2.5500e-003	0.1243	0.1343	0.2586	0.0618	0.1282	0.1899	0.0000	215.2596	215.2596	0.0455	0.0000	216.2159
Total	**0.4794**	**2.9473**	**2.2794**	**3.1400e-003**	**0.2341**	**0.1763**	**0.4104**	**0.1202**	**0.1670**	**0.2872**	**0.0000**	**269.9311**	**269.9311**	**0.0601**	**0.0000**	**271.1927**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**52.17**	**0.00**	**38.35**	**53.57**	**0.00**	**32.56**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3441	3.5000e-004	0.0301	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.3308	0.3308	5.0000e-005	1.0000e-005	0.3335
Energy	2.2200e-003	0.0199	0.0146	1.2000e-004		1.5400e-003	1.5400e-003		1.5400e-003	1.5400e-003	0.0000	74.0682	74.0682	3.1200e-003	9.6000e-004	74.4320
Mobile	0.1444	0.3479	1.5761	2.3500e-003	0.1640	4.8600e-003	0.1688	0.0440	4.4500e-003	0.0485	0.0000	196.8706	196.8706	0.0107	0.0000	197.0949
Waste						0.0000	0.0000		0.0000	0.0000	7.1615	0.0000	7.1615	0.4232	0.0000	16.0494
Water						0.0000	0.0000		0.0000	0.0000	0.2198	1.4216	1.6413	0.0226	5.5000e-004	2.2868
Total	**0.4906**	**0.3682**	**1.6208**	**2.4700e-003**	**0.1640**	**6.5800e-003**	**0.1706**	**0.0440**	**6.1700e-003**	**0.0502**	**7.3813**	**272.6911**	**280.0724**	**0.4597**	**1.5200e-003**	**290.1966**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3441	3.5000e-004	0.0301	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.3308	0.3308	5.0000e-005	1.0000e-005	0.3335
Energy	2.2200e-003	0.0199	0.0146	1.2000e-004		1.5400e-003	1.5400e-003		1.5400e-003	1.5400e-003	0.0000	74.0682	74.0682	3.1200e-003	9.6000e-004	74.4320
Mobile	0.1444	0.3479	1.5761	2.3500e-003	0.1640	4.8600e-003	0.1688	0.0440	4.4500e-003	0.0485	0.0000	196.8706	196.8706	0.0107	0.0000	197.0949
Waste						0.0000	0.0000		0.0000	0.0000	1.7904	0.0000	1.7904	0.1058	0.0000	4.0124
Water						0.0000	0.0000		0.0000	0.0000	0.2198	1.4216	1.6413	0.0226	5.5000e-004	2.2864
Total	**0.4906**	**0.3682**	**1.6208**	**2.4700e-003**	**0.1640**	**6.5800e-003**	**0.1706**	**0.0440**	**6.1700e-003**	**0.0502**	**2.0101**	**272.6911**	**274.7012**	**0.1423**	**1.5200e-003**	**278.1591**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**72.77**	**0.00**	**1.92**	**69.05**	**0.00**	**4.15**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2016	10/21/2016	5	15	
2	Site Preparation	Site Preparation	10/22/2016	10/25/2016	5	2	
3	Grading	Grading	10/26/2016	3/14/2017	5	100	
4	Building Construction	Building Construction	3/15/2017	11/1/2017	5	166	
5	Paving	Paving	10/6/2017	10/19/2017	5	10	
6	Architectural Coating	Architectural Coating	10/19/2017	11/1/2017	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 3.1

Acres of Paving: 0

Residential Indoor: 3,801; Residential Outdoor: 1,267; Non-Residential Indoor: 20,961; Non-Residential Outdoor: 8,111 (Architectural

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Rubber Tired Dozers	1	7.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	174	0.41
Grading	Rubber Tired Dozers	1	6.00	255	0.40
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Building Construction	Cranes	1	6.00	226	0.29
Building Construction	Forklifts	1	6.00	89	0.20

Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	125	0.42
Paving	Paving Equipment	1	8.00	130	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	10.00	0.00	30.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	10.00	1.00	263.00	12.40	6.60	0.25	LD_Mix	HDT_Mix	HHDT
Building Construction	7	24.00	1.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Fugitive Dust					3.2300e-003	0.0000	3.2300e-003	4.9000e-004	0.0000	4.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0218	0.2119	0.1612	1.8000e-004		0.0131	0.0131		0.0123	0.0123	0.0000	16.9221	16.9221	4.2800e-003	0.0000	17.0120
Total	**0.0218**	**0.2119**	**0.1612**	**1.8000e-004**	**3.2300e-003**	**0.0131**	**0.0163**	**4.9000e-004**	**0.0123**	**0.0127**	**0.0000**	**16.9221**	**16.9221**	**4.2800e-003**	**0.0000**	**17.0120**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7000e-004	4.4400e-003	4.8300e-003	1.0000e-005	2.5000e-004	6.0000e-005	3.1000e-004	7.0000e-005	5.0000e-005	1.2000e-004	0.0000	1.0053	1.0053	1.0000e-005	0.0000	1.0055
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	4.4000e-004	4.3100e-003	1.0000e-005	6.8000e-004	1.0000e-005	6.8000e-004	1.8000e-004	1.0000e-005	1.9000e-004	0.0000	0.6137	0.6137	4.0000e-005	0.0000	0.6144
Total	**6.9000e-004**	**4.8800e-003**	**9.1400e-003**	**2.0000e-005**	**9.3000e-004**	**7.0000e-005**	**9.9000e-004**	**2.5000e-004**	**6.0000e-005**	**3.1000e-004**	**0.0000**	**1.6190**	**1.6190**	**5.0000e-005**	**0.0000**	**1.6199**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.4500e-003	0.0000	1.4500e-003	2.2000e-004	0.0000	2.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0218	0.2119	0.1612	1.8000e-004		0.0131	0.0131		0.0123	0.0123	0.0000	16.9221	16.9221	4.2800e-003	0.0000	17.0120
Total	**0.0218**	**0.2119**	**0.1612**	**1.8000e-004**	**1.4500e-003**	**0.0131**	**0.0145**	**2.2000e-004**	**0.0123**	**0.0125**	**0.0000**	**16.9221**	**16.9221**	**4.2800e-003**	**0.0000**	**17.0120**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7000e-004	4.4400e-003	4.8300e-003	1.0000e-005	2.5000e-004	6.0000e-005	3.1000e-004	7.0000e-005	5.0000e-005	1.2000e-004	0.0000	1.0053	1.0053	1.0000e-005	0.0000	1.0055
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	4.4000e-004	4.3100e-003	1.0000e-005	6.8000e-004	1.0000e-005	6.8000e-004	1.8000e-004	1.0000e-005	1.9000e-004	0.0000	0.6137	0.6137	4.0000e-005	0.0000	0.6144
Total	**6.9000e-004**	**4.8800e-003**	**9.1400e-003**	**2.0000e-005**	**9.3000e-004**	**7.0000e-005**	**9.9000e-004**	**2.5000e-004**	**6.0000e-005**	**3.1000e-004**	**0.0000**	**1.6190**	**1.6190**	**5.0000e-005**	**0.0000**	**1.6199**

3.3 Site Preparation - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8000e-003	0.0000	5.8000e-003	2.9500e-003	0.0000	2.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4400e-003	0.0258	0.0165	2.0000e-005		1.4000e-003	1.4000e-003		1.2900e-003	1.2900e-003	0.0000	1.6158	1.6158	4.9000e-004	0.0000	1.6260
Total	**2.4400e-003**	**0.0258**	**0.0165**	**2.0000e-005**	**5.8000e-003**	**1.4000e-003**	**7.2000e-003**	**2.9500e-003**	**1.2900e-003**	**4.2400e-003**	**0.0000**	**1.6158**	**1.6158**	**4.9000e-004**	**0.0000**	**1.6260**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	6.0000e-005	5.7000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0818	0.0818	0.0000	0.0000	0.0819
Total	**4.0000e-005**	**6.0000e-005**	**5.7000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0818**	**0.0818**	**0.0000**	**0.0000**	**0.0819**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.6100e-003	0.0000	2.6100e-003	1.3300e-003	0.0000	1.3300e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4400e-003	0.0258	0.0165	2.0000e-005		1.4000e-003	1.4000e-003		1.2900e-003	1.2900e-003	0.0000	1.6158	1.6158	4.9000e-004	0.0000	1.6260
Total	**2.4400e-003**	**0.0258**	**0.0165**	**2.0000e-005**	**2.6100e-003**	**1.4000e-003**	**4.0100e-003**	**1.3300e-003**	**1.2900e-003**	**2.6200e-003**	**0.0000**	**1.6158**	**1.6158**	**4.9000e-004**	**0.0000**	**1.6260**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	6.0000e-005	5.7000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0818	0.0818	0.0000	0.0000	0.0819
Total	**4.0000e-005**	**6.0000e-005**	**5.7000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0818**	**0.0818**	**0.0000**	**0.0000**	**0.0819**

3.4 Grading - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2276	0.0000	0.2276	0.1243	0.0000	0.1243	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0478	0.5049	0.3281	3.4000e-004		0.0274	0.0274		0.0252	0.0252	0.0000	31.8497	31.8497	9.6100e-003	0.0000	32.0515
Total	**0.0478**	**0.5049**	**0.3281**	**3.4000e-004**	**0.2276**	**0.0274**	**0.2550**	**0.1243**	**0.0252**	**0.1495**	**0.0000**	**31.8497**	**31.8497**	**9.6100e-003**	**0.0000**	**32.0515**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-004	1.5600e-003	0.0133	0.0000	3.0000e-005	1.0000e-005	3.0000e-005	1.0000e-005	1.0000e-005	1.0000e-005	0.0000	0.1527	0.1527	0.0000	0.0000	0.1528
Vendor	3.1000e-004	2.1900e-003	3.9300e-003	1.0000e-005	1.4000e-004	3.0000e-005	1.7000e-004	4.0000e-005	3.0000e-005	7.0000e-005	0.0000	0.4667	0.4667	0.0000	0.0000	0.4668
Worker	1.0200e-003	1.4100e-003	0.0138	3.0000e-005	2.1600e-003	2.0000e-005	2.1800e-003	5.8000e-004	2.0000e-005	5.9000e-004	0.0000	1.9637	1.9637	1.1000e-004	0.0000	1.9661
Total	**2.1300e-003**	**5.1600e-003**	**0.0310**	**4.0000e-005**	**2.3300e-003**	**6.0000e-005**	**2.3800e-003**	**6.3000e-004**	**6.0000e-005**	**6.7000e-004**	**0.0000**	**2.5831**	**2.5831**	**1.1000e-004**	**0.0000**	**2.5856**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Fugitive Dust					0.1024	0.0000	0.1024	0.0560	0.0000	0.0560	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0478	0.5049	0.3281	3.4000e-004		0.0274	0.0274		0.0252	0.0252	0.0000	31.8497	31.8497	9.6100e-003	0.0000	32.0515
Total	**0.0478**	**0.5049**	**0.3281**	**3.4000e-004**	**0.1024**	**0.0274**	**0.1298**	**0.0560**	**0.0252**	**0.0811**	**0.0000**	**31.8497**	**31.8497**	**9.6100e-003**	**0.0000**	**32.0515**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-004	1.5600e-003	0.0133	0.0000	3.0000e-005	1.0000e-005	3.0000e-005	1.0000e-005	1.0000e-005	1.0000e-005	0.0000	0.1527	0.1527	0.0000	0.0000	0.1528
Vendor	3.1000e-004	2.1900e-003	3.9300e-003	1.0000e-005	1.4000e-004	3.0000e-005	1.7000e-004	4.0000e-005	3.0000e-005	7.0000e-005	0.0000	0.4667	0.4667	0.0000	0.0000	0.4668
Worker	1.0200e-003	1.4100e-003	0.0138	3.0000e-005	2.1600e-003	2.0000e-005	2.1800e-003	5.8000e-004	2.0000e-005	5.9000e-004	0.0000	1.9637	1.9637	1.1000e-004	0.0000	1.9661
Total	**2.1300e-003**	**5.1600e-003**	**0.0310**	**4.0000e-005**	**2.3300e-003**	**6.0000e-005**	**2.3800e-003**	**6.3000e-004**	**6.0000e-005**	**6.7000e-004**	**0.0000**	**2.5831**	**2.5831**	**1.1000e-004**	**0.0000**	**2.5856**

3.4 Grading - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2276	0.0000	0.2276	0.1243	0.0000	0.1243	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0490	0.5145	0.3426	3.7000e-004		0.0277	0.0277		0.0255	0.0255	0.0000	33.9459	33.9459	0.0104	0.0000	34.1643
Total	**0.0490**	**0.5145**	**0.3426**	**3.7000e-004**	**0.2276**	**0.0277**	**0.2553**	**0.1243**	**0.0255**	**0.1498**	**0.0000**	**33.9459**	**33.9459**	**0.0104**	**0.0000**	**34.1643**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.0000e-004	1.5900e-003	0.0132	0.0000	3.0000e-005	1.0000e-005	3.0000e-005	1.0000e-005	1.0000e-005	1.0000e-005	0.0000	0.1617	0.1617	0.0000	0.0000	0.1618
Vendor	2.9000e-004	2.1300e-003	3.8900e-003	1.0000e-005	1.5000e-004	3.0000e-005	1.8000e-004	4.0000e-005	3.0000e-005	7.0000e-005	0.0000	0.4967	0.4967	0.0000	0.0000	0.4968
Worker	9.7000e-004	1.3500e-003	0.0131	3.0000e-005	2.3400e-003	2.0000e-005	2.3600e-003	6.2000e-004	2.0000e-005	6.4000e-004	0.0000	2.0458	2.0458	1.1000e-004	0.0000	2.0481
Total	**1.9600e-003**	**5.0700e-003**	**0.0301**	**4.0000e-005**	**2.5200e-003**	**6.0000e-005**	**2.5700e-003**	**6.7000e-004**	**6.0000e-005**	**7.2000e-004**	**0.0000**	**2.7041**	**2.7041**	**1.1000e-004**	**0.0000**	**2.7066**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1024	0.0000	0.1024	0.0560	0.0000	0.0560	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0490	0.5145	0.3426	3.7000e-004		0.0277	0.0277		0.0255	0.0255	0.0000	33.9458	33.9458	0.0104	0.0000	34.1643
Total	**0.0490**	**0.5145**	**0.3426**	**3.7000e-004**	**0.1024**	**0.0277**	**0.1301**	**0.0560**	**0.0255**	**0.0815**	**0.0000**	**33.9458**	**33.9458**	**0.0104**	**0.0000**	**34.1643**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	7.0000e-004	1.5900e-003	0.0132	0.0000	3.0000e-005	1.0000e-005	3.0000e-005	1.0000e-005	1.0000e-005	1.0000e-005	0.0000	0.1617	0.1617	0.0000	0.0000	0.1618
Vendor	2.9000e-004	2.1300e-003	3.8900e-003	1.0000e-005	1.5000e-004	3.0000e-005	1.8000e-004	4.0000e-005	3.0000e-005	7.0000e-005	0.0000	0.4967	0.4967	0.0000	0.0000	0.4968
Worker	9.7000e-004	1.3500e-003	0.0131	3.0000e-005	2.3400e-003	2.0000e-005	2.3600e-003	6.2000e-004	2.0000e-005	6.4000e-004	0.0000	2.0458	2.0458	1.1000e-004	0.0000	2.0481
Total	**1.9600e-003**	**5.0700e-003**	**0.0301**	**4.0000e-005**	**2.5200e-003**	**6.0000e-005**	**2.5700e-003**	**6.7000e-004**	**6.0000e-005**	**7.2000e-004**	**0.0000**	**2.7041**	**2.7041**	**1.1000e-004**	**0.0000**	**2.7066**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2452	1.5860	1.1878	1.8200e-003		0.1017	0.1017		0.0981	0.0981	0.0000	153.1743	153.1743	0.0321	0.0000	153.8492
Total	**0.2452**	**1.5860**	**1.1878**	**1.8200e-003**		**0.1017**	**0.1017**		**0.0981**	**0.0981**	**0.0000**	**153.1743**	**153.1743**	**0.0321**	**0.0000**	**153.8492**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.2000e-004	6.7800e-003	0.0124	2.0000e-005	4.8000e-004	1.0000e-004	5.8000e-004	1.4000e-004	9.0000e-005	2.3000e-004	0.0000	1.5856	1.5856	1.0000e-005	0.0000	1.5859
Worker	7.4000e-003	0.0104	0.1003	2.1000e-004	0.0180	1.5000e-004	0.0181	4.7800e-003	1.4000e-004	4.9200e-003	0.0000	15.6736	15.6736	8.5000e-004	0.0000	15.6915

Total	8.3200e-003	0.0171	0.1127	2.3000e-004	0.0184	2.5000e-004	0.0187	4.9200e-003	2.3000e-004	5.1500e-003	0.0000	17.2593	17.2593	8.6000e-004	0.0000	17.2773

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2452	1.5860	1.1878	1.8200e-003		0.1017	0.1017		0.0981	0.0981	0.0000	153.1741	153.1741	0.0321	0.0000	153.8490
Total	**0.2452**	**1.5860**	**1.1878**	**1.8200e-003**		**0.1017**	**0.1017**		**0.0981**	**0.0981**	**0.0000**	**153.1741**	**153.1741**	**0.0321**	**0.0000**	**153.8490**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.2000e-004	6.7800e-003	0.0124	2.0000e-005	4.8000e-004	1.0000e-004	5.8000e-004	1.4000e-004	9.0000e-005	2.3000e-004	0.0000	1.5856	1.5856	1.0000e-005	0.0000	1.5859
Worker	7.4000e-003	0.0104	0.1003	2.1000e-004	0.0180	1.5000e-004	0.0181	4.7800e-003	1.4000e-004	4.9200e-003	0.0000	15.6736	15.6736	8.5000e-004	0.0000	15.6915
Total	**8.3200e-003**	**0.0171**	**0.1127**	**2.3000e-004**	**0.0184**	**2.5000e-004**	**0.0187**	**4.9200e-003**	**2.3000e-004**	**5.1500e-003**	**0.0000**	**17.2593**	**17.2593**	**8.6000e-004**	**0.0000**	**17.2773**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9300e-003	0.0605	0.0452	7.0000e-005		3.6700e-003	3.6700e-003		3.3800e-003	3.3800e-003	0.0000	6.1129	6.1129	1.8400e-003	0.0000	6.1515
Paving	2.1000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.0300e-003**	**0.0605**	**0.0452**	**7.0000e-005**		**3.6700e-003**	**3.6700e-003**		**3.3800e-003**	**3.3800e-003**	**0.0000**	**6.1129**	**6.1129**	**1.8400e-003**	**0.0000**	**6.1515**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.6000e-004	2.5200e-003	1.0000e-005	4.5000e-004	0.0000	4.5000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3934	0.3934	2.0000e-005	0.0000	0.3939
Total	**1.9000e-004**	**2.6000e-004**	**2.5200e-003**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3934**	**0.3934**	**2.0000e-005**	**0.0000**	**0.3939**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.9300e-003	0.0605	0.0452	7.0000e-005		3.6700e-003	3.6700e-003		3.3800e-003	3.3800e-003	0.0000	6.1129	6.1129	1.8400e-003	0.0000	6.1515
Paving	2.1000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**8.0300e-003**	**0.0605**	**0.0452**	**7.0000e-005**		**3.6700e-003**	**3.6700e-003**		**3.3800e-003**	**3.3800e-003**	**0.0000**	**6.1129**	**6.1129**	**1.8400e-003**	**0.0000**	**6.1515**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.6000e-004	2.5200e-003	1.0000e-005	4.5000e-004	0.0000	4.5000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3934	0.3934	2.0000e-005	0.0000	0.3939
Total	**1.9000e-004**	**2.6000e-004**	**2.5200e-003**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3934**	**0.3934**	**2.0000e-005**	**0.0000**	**0.3939**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0900					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6600e-003	0.0109	9.3400e-003	1.0000e-005		8.7000e-004	8.7000e-004		8.7000e-004	8.7000e-004	0.0000	1.2766	1.2766	1.3000e-004	0.0000	1.2795
Total	**0.0917**	**0.0109**	**9.3400e-003**	**1.0000e-005**		**8.7000e-004**	**8.7000e-004**		**8.7000e-004**	**8.7000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.3000e-004**	**0.0000**	**1.2795**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	2.6000e-004	2.5200e-003	1.0000e-005	4.5000e-004	0.0000	4.5000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3934	0.3934	2.0000e-005	0.0000	0.3939
Total	**1.9000e-004**	**2.6000e-004**	**2.5200e-003**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3934**	**0.3934**	**2.0000e-005**	**0.0000**	**0.3939**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0900					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6600e-003	0.0109	9.3400e-003	1.0000e-005		8.7000e-004	8.7000e-004		8.7000e-004	8.7000e-004	0.0000	1.2766	1.2766	1.3000e-004	0.0000	1.2795
Total	**0.0917**	**0.0109**	**9.3400e-003**	**1.0000e-005**		**8.7000e-004**	**8.7000e-004**		**8.7000e-004**	**8.7000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.3000e-004**	**0.0000**	**1.2795**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Worker	1.9000e-004	2.6000e-004	2.5200e-003	1.0000e-005	4.5000e-004	0.0000	4.5000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.3934	0.3934	2.0000e-005	0.0000	0.3939
Total	**1.9000e-004**	**2.6000e-004**	**2.5200e-003**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**	**0.0000**	**0.3934**	**0.3934**	**2.0000e-005**	**0.0000**	**0.3939**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1444	0.3479	1.5761	2.3500e-003	0.1640	4.8600e-003	0.1688	0.0440	4.4500e-003	0.0485	0.0000	196.8706	196.8706	0.0107	0.0000	197.0949
Unmitigated	0.1444	0.3479	1.5761	2.3500e-003	0.1640	4.8600e-003	0.1688	0.0440	4.4500e-003	0.0485	0.0000	196.8706	196.8706	0.0107	0.0000	197.0949

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Manufacturing	50.00	50.00	50.00	145,963	145,963
Other Asphalt Surfaces	0.00	0.00	0.00		
Single Family Housing	38.08	38.08	38.08	85,008	85,008
Supermarket	35.00	195.01	35.00	213,609	213,609
Total	123.07	283.09	123.07	444,580	444,580

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Manufacturing	9.50	7.30	7.30	59.00	28.00	13.00	92	5	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3
Supermarket	9.50	30.00	7.30	6.50	74.50	19.00	34	30	36

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.472729	0.077244	0.179984	0.154078	0.062420	0.009378	0.018098	0.009047	0.002570	0.002555	0.008498	0.000540	0.002859

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	52.0625	52.0625	2.7000e-003	5.6000e-004	52.2924
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	52.0625	52.0625	2.7000e-003	5.6000e-004	52.2924
NaturalGas Mitigated	2.2200e-003	0.0199	0.0146	1.2000e-004		1.5400e-003	1.5400e-003		1.5400e-003	1.5400e-003	0.0000	22.0057	22.0057	4.2000e-004	4.0000e-004	22.1396
NaturalGas Unmitigated	2.2200e-003	0.0199	0.0146	1.2000e-004		1.5400e-003	1.5400e-003		1.5400e-003	1.5400e-003	0.0000	22.0057	22.0057	4.2000e-004	4.0000e-004	22.1396

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Single Family Housing	111726	6.0000e-004	5.1500e-003	2.1900e-003	3.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	5.9621	5.9621	1.1000e-004	1.1000e-004	5.9984
Supermarket	57448.8	3.1000e-004	2.8200e-003	2.3700e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	3.0657	3.0657	6.0000e-005	6.0000e-005	3.0843
Manufacturing	243196	1.3100e-003	0.0119	0.0100	7.0000e-005		9.1000e-004	9.1000e-004		9.1000e-004	9.1000e-004	0.0000	12.9779	12.9779	2.5000e-004	2.4000e-004	13.0569
Total		**2.2200e-003**	**0.0199**	**0.0146**	**1.2000e-004**		**1.5400e-003**	**1.5400e-003**		**1.5400e-003**	**1.5400e-003**	**0.0000**	**22.0057**	**22.0057**	**4.2000e-004**	**4.1000e-004**	**22.1396**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	111726	6.0000e-004	5.1500e-003	2.1900e-003	3.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	5.9621	5.9621	1.1000e-004	1.1000e-004	5.9984
Supermarket	57448.8	3.1000e-004	2.8200e-003	2.3700e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	3.0657	3.0657	6.0000e-005	6.0000e-005	3.0843
Manufacturing	243196	1.3100e-003	0.0119	0.0100	7.0000e-005		9.1000e-004	9.1000e-004		9.1000e-004	9.1000e-004	0.0000	12.9779	12.9779	2.5000e-004	2.4000e-004	13.0569
Total		**2.2200e-003**	**0.0199**	**0.0146**	**1.2000e-004**		**1.5400e-003**	**1.5400e-003**		**1.5400e-003**	**1.5400e-003**	**0.0000**	**22.0057**	**22.0057**	**4.2000e-004**	**4.1000e-004**	**22.1396**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Manufacturing	141673	35.9429	1.8600e-003	3.9000e-004	36.1016
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	24298.8	6.1647	3.2000e-004	7.0000e-005	6.1919

Supermarket	39238.5	9.9549	5.2000e-004	1.1000e-004	9.9989
Total		**52.0626**	**2.7000e-003**	**5.7000e-004**	**52.2924**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Manufacturing	141673	35.9429	1.8600e-003	3.9000e-004	36.1016
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	24298.8	6.1647	3.2000e-004	7.0000e-005	6.1919
Supermarket	39238.5	9.9549	5.2000e-004	1.1000e-004	9.9989
Total		**52.0626**	**2.7000e-003**	**5.7000e-004**	**52.2924**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3441	3.5000e-004	0.0301	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.3308	0.3308	5.0000e-005	1.0000e-005	0.3335
Unmitigated	0.3441	3.5000e-004	0.0301	0.0000		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.3308	0.3308	5.0000e-005	1.0000e-005	0.3335

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	9.0000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3341					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.0000e-005	0.0000	0.0000	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.2820	0.2820	1.0000e-005	1.0000e-005	0.2837
Landscaping	9.4000e-004	3.5000e-004	0.0301	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	0.0488	0.0488	5.0000e-005	0.0000	0.0498
Total	**0.3441**	**3.5000e-004**	**0.0301**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.3307**	**0.3307**	**6.0000e-005**	**1.0000e-005**	**0.3335**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	9.0000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3341					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.0000e-005	0.0000	0.0000	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.2820	0.2820	1.0000e-005	1.0000e-005	0.2837
Landscaping	9.4000e-004	3.5000e-004	0.0301	0.0000		1.6000e-004	1.6000e-004		1.6000e-004	1.6000e-004	0.0000	0.0488	0.0488	5.0000e-005	0.0000	0.0498
Total	**0.3441**	**3.5000e-004**	**0.0301**	**0.0000**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.3307**	**0.3307**	**6.0000e-005**	**1.0000e-005**	**0.3335**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.6413	0.0226	5.5000e-004	2.2864
Unmitigated	1.6413	0.0226	5.5000e-004	2.2868

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Manufacturing	0.13875 / 0.53002	0.7051	4.5600e-003	1.1000e-004	0.8361
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.4891 / 0	0.8266	0.0160	3.8000e-004	1.2809
Supermarket	0.064835 / 0	0.1096	2.1200e-003	5.0000e-005	0.1698
Total		**1.6413**	**0.0227**	**5.4000e-004**	**2.2868**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
Manufacturing	0.13875 / 0.53002	0.7051	4.5500e-003	1.1000e-004	0.8360
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.4891 / 0	0.8266	0.0160	3.8000e-004	1.2807
Supermarket	0.064835 / 0	0.1096	2.1200e-003	5.0000e-005	0.1698
Total		**1.6413**	**0.0226**	**5.4000e-004**	**2.2864**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.7904	0.1058	0.0000	4.0124
Unmitigated	7.1615	0.4232	0.0000	16.0494

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Manufacturing	13.57	2.7546	0.1628	0.0000	6.1732
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4.62	0.9378	0.0554	0.0000	2.1017
Supermarket	17.09	3.4691	0.2050	0.0000	7.7745
Total		**7.1615**	**0.4232**	**0.0000**	**16.0494**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Manufacturing	3.3925	0.6887	0.0407	0.0000	1.5433
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	1.155	0.2345	0.0139	0.0000	0.5254
Supermarket	4.2725	0.8673	0.0513	0.0000	1.9436
Total		**1.7904**	**0.1058**	**0.0000**	**4.0124**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

CalEEMod Version: CalEEMod.2013.2.2

Date: 1/14/2016 4:03 PM

Belden Barns

Sonoma-San Francisco County, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demolition	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	No Change	0	1	No Change	0.00
Cement and Mortar Mixers	Diesel	No Change	0	1	No Change	0.00
Concrete/Industrial Saws	Diesel	No Change	0	1	No Change	0.00
Cranes	Diesel	No Change	0	1	No Change	0.00
Forklifts	Diesel	No Change	0	1	No Change	0.00
Generator Sets	Diesel	No Change	0	1	No Change	0.00
Graders	Diesel	No Change	0	2	No Change	0.00

Pavers	Diesel	No Change	0	1	No Change	0.00
Paving Equipment	Diesel	No Change	0	1	No Change	0.00
Rollers	Diesel	No Change	0	1	No Change	0.00
Rubber Tired Dozers	Diesel	No Change	0	3	No Change	0.00
Tractors/Loaders/Backhoes	Diesel	No Change	0	7	No Change	0.00
Welders	Diesel	No Change	0	3	No Change	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Unmitigated tons/yr							Unmitigated mt/yr					
Air Compressors	1.66000E-003	1.09300E-002	9.34000E-003	1.00000E-005	8.70000E-004	8.70000E-004	0.00000E+000	1.27663E+000	1.27663E+000	1.30000E-004	0.00000E+000	1.27946E+000
Cement and Mortar Mixers	2.20000E-004	1.38000E-003	1.16000E-003	0.00000E+000	6.00000E-005	6.00000E-005	0.00000E+000	1.71850E-001	1.71850E-001	2.00000E-005	0.00000E+000	1.72230E-001
Concrete/Industrial Saws	4.85000E-003	3.46700E-002	2.83100E-002	5.00000E-005	2.60000E-003	2.60000E-003	0.00000E+000	4.03243E+000	4.03243E+000	3.90000E-004	0.00000E+000	4.04062E+000
Cranes	4.03400E-002	4.78890E-001	1.71580E-001	3.50000E-004	2.13500E-002	1.96400E-002	0.00000E+000	3.25979E+001	3.25979E+001	9.99000E-003	0.00000E+000	3.28077E+001
Forklifts	1.31300E-002	1.13690E-001	7.77600E-002	9.00000E-005	9.38000E-003	8.63000E-003	0.00000E+000	8.82406E+000	8.82406E+000	2.70000E-003	0.00000E+000	8.88084E+000
Generator Sets	4.73200E-002	3.70530E-001	3.13200E-001	5.50000E-004	2.49300E-002	2.49300E-002	0.00000E+000	4.69122E+001	4.69122E+001	3.80000E-003	0.00000E+000	4.69920E+001
Graders	3.79300E-002	3.85220E-001	1.87970E-001	2.40000E-004	2.16400E-002	1.99100E-002	0.00000E+000	2.24727E+001	2.24727E+001	6.83000E-003	0.00000E+000	2.26162E+001
Pavers	1.35000E-003	1.51200E-002	1.06300E-002	2.00000E-005	7.40000E-004	6.80000E-004	0.00000E+000	1.57175E+000	1.57175E+000	4.80000E-004	0.00000E+000	1.58186E+000
Paving Equipment	1.41000E-003	1.60800E-002	1.26800E-002	2.00000E-005	8.00000E-004	7.40000E-004	0.00000E+000	1.86132E+000	1.86132E+000	5.70000E-004	0.00000E+000	1.87330E+000
Rollers	1.36000E-003	1.26900E-002	8.71000E-003	1.00000E-005	9.20000E-004	8.50000E-004	0.00000E+000	1.06432E+000	1.06432E+000	3.30000E-004	0.00000E+000	1.07117E+000
Rubber Tired Dozers	5.58700E-002	6.23100E-001	4.70380E-001	4.10000E-004	2.89700E-002	2.66600E-002	0.00000E+000	3.81931E+001	3.81931E+001	1.16000E-002	0.00000E+000	3.84366E+001
Tractors/Loaders/Backhoes	4.36700E-002	4.18800E-001	3.22810E-001	4.20000E-004	3.17600E-002	2.92100E-002	0.00000E+000	3.90520E+001	3.90520E+001	1.19000E-002	0.00000E+000	3.93020E+001
Welders	1.24720E-001	4.33440E-001	4.76260E-001	6.40000E-004	3.18200E-002	3.18200E-002	0.00000E+000	4.68669E+001	4.68669E+001	1.01400E-002	0.00000E+000	4.70800E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Mitigated tons/yr							Mitigated mt/yr					
Air Compressors	1.66000E-003	1.09300E-002	9.34000E-003	1.00000E-005	8.70000E-004	8.70000E-004	0.00000E+000	1.27663E+000	1.27663E+000	1.30000E-004	0.00000E+000	1.27946E+000
Cement and Mortar Mixers	2.20000E-004	1.38000E-003	1.16000E-003	0.00000E+000	6.00000E-005	6.00000E-005	0.00000E+000	1.71850E-001	1.71850E-001	2.00000E-005	0.00000E+000	1.72230E-001

Concrete/Industrial Saws	4.85000E-003	3.46700E-002	2.83100E-002	5.00000E-005	2.60000E-003	2.60000E-003	0.00000E+000	4.03242E+000	4.03242E+000	3.90000E-004	0.00000E+000	4.04062E+000
Cranes	4.03400E-002	4.78890E-001	1.71580E-001	3.50000E-004	2.13500E-002	1.96400E-002	0.00000E+000	3.25979E+001	3.25979E+001	9.99000E-003	0.00000E+000	3.28076E+001
Forklifts	1.31300E-002	1.13690E-001	7.77600E-002	9.00000E-005	9.38000E-003	8.63000E-003	0.00000E+000	8.82405E+000	8.82405E+000	2.70000E-003	0.00000E+000	8.88082E+000
Generator Sets	4.73200E-002	3.70530E-001	3.13200E-001	5.50000E-004	2.49300E-002	2.49300E-002	0.00000E+000	4.69122E+001	4.69122E+001	3.80000E-003	0.00000E+000	4.69919E+001
Graders	3.79300E-002	3.85220E-001	1.87970E-001	2.40000E-004	2.16400E-002	1.99100E-002	0.00000E+000	2.24727E+001	2.24727E+001	6.83000E-003	0.00000E+000	2.26162E+001
Pavers	1.35000E-003	1.51200E-002	1.06300E-002	2.00000E-005	7.40000E-004	6.80000E-004	0.00000E+000	1.57174E+000	1.57174E+000	4.80000E-004	0.00000E+000	1.58186E+000
Paving Equipment	1.41000E-003	1.60800E-002	1.26800E-002	2.00000E-005	8.00000E-004	7.40000E-004	0.00000E+000	1.86132E+000	1.86132E+000	5.70000E-004	0.00000E+000	1.87330E+000
Rollers	1.36000E-003	1.26900E-002	8.71000E-003	1.00000E-005	9.20000E-004	8.50000E-004	0.00000E+000	1.06432E+000	1.06432E+000	3.30000E-004	0.00000E+000	1.07117E+000
Rubber Tired Dozers	5.58700E-002	6.23100E-001	4.70380E-001	4.10000E-004	2.89700E-002	2.66600E-002	0.00000E+000	3.81931E+001	3.81931E+001	1.16000E-002	0.00000E+000	3.84366E+001
Tractors/Loaders/Backhoes	4.36700E-002	4.18800E-001	3.22810E-001	4.20000E-004	3.17500E-002	2.92100E-002	0.00000E+000	3.90520E+001	3.90520E+001	1.19000E-002	0.00000E+000	3.93019E+001
Welders	1.24720E-001	4.33440E-001	4.76260E-001	6.40000E-004	3.18200E-002	3.18200E-002	0.00000E+000	4.68669E+001	4.68669E+001	1.01400E-002	0.00000E+000	4.70799E+001

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Air Compressors	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Cement and Mortar Mixers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Concrete/Industrial Saws	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	2.47989E-006	2.47989E-006	0.00000E+000	0.00000E+000	0.00000E+000
Cranes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.22707E-006	1.22707E-006	0.00000E+000	0.00000E+000	1.21923E-006
Forklifts	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.13327E-006	1.13327E-006	0.00000E+000	0.00000E+000	2.25204E-006
Generator Sets	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.27898E-006	1.27898E-006	0.00000E+000	0.00000E+000	1.27681E-006
Graders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	8.89967E-007	8.89967E-007	0.00000E+000	0.00000E+000	1.32648E-006
Pavers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	6.36233E-006	6.36233E-006	0.00000E+000	0.00000E+000	0.00000E+000
Paving Equipment	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Rollers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Rubber Tired Dozers	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.04731E-006	1.04731E-006	0.00000E+000	0.00000E+000	1.04067E-006
Tractors/Loaders/Backhoes	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	3.14861E-004	0.00000E+000	0.00000E+000	1.28034E-006	1.28034E-006	0.00000E+000	0.00000E+000	1.27220E-006
Welders	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	1.28022E-006	1.28022E-006	0.00000E+000	0.00000E+000	1.06202E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
No	Replace Ground Cover of Area Disturbed	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
Yes	Water Exposed Area	PM10 Reduction	55.00	PM2.5 Reduction	55.00	Frequency (per day)	2.00
No	Unpaved Road Mitigation	Moisture Content %	0.00	Vehicle Speed (mph)	15.00		
No	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Architectural Coating	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Architectural Coating	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Building Construction	Roads	0.02	0.00	0.02	0.00	0.00	0.00
Demolition	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.55
Demolition	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Grading	Fugitive Dust	0.46	0.25	0.20	0.11	0.55	0.55
Grading	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Fugitive Dust	0.00	0.00	0.00	0.00	0.00	0.00
Paving	Roads	0.00	0.00	0.00	0.00	0.00	0.00
Site Preparation	Fugitive Dust	0.01	0.00	0.00	0.00	0.55	0.55
Site Preparation	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.02
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting:

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value 3
No	Land Use	Increase Density	0.00			
No	Land Use	Increase Diversity	0.11	0.34		
No	Land Use	Improve Walkability Design	0.00			
No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			
No	Land Use	Integrate Below Market Rate Housing	0.00			
	Land Use	Land Use SubTotal	0.00			
No	Neighborhood Enhancements	Improve Pedestrian Network				
No	Neighborhood Enhancements	Provide Traffic Calming Measures				
No	Neighborhood Enhancements	Implement NEV Network	0.00			

	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.00			
No	Parking Policy Pricing	Limit Parking Supply	0.00			
No	Parking Policy Pricing	Unbundle Parking Costs	0.00			
No	Parking Policy Pricing	On-street Market Pricing	0.00			
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00			
No	Transit Improvements	Expand Transit Network	0.00			
No	Transit Improvements	Increase Transit Frequency	0.00			
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.00			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"				
No	Commute	Workplace Parking Charge				
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program				
	Commute	Commute Subtotal	0.00			
No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.00			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	

No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	150.00
No	Use Low VOC Paint (Non-residential Interior)	100.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy		
No	Use Reclaimed Water		
No	Use Grey Water		
No	Install low-flow bathroom faucet	32.00	

No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction		
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape		

Solid Waste Mitigation

Mitigation Measures	Input Value
Institute Recycling and Composting Services Percent Reduction in Waste Disposed	75.00

CalEEMod Outputs

Existing Scenario - Winter, Summer, Annual, and Mitigation

Belden Barns - Existing

Sonoma-San Francisco County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	3.00	Dwelling Unit	0.97	6,000.00	9

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 75

Climate Zone 4 **Operational Year** 2015

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 641.35 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Land Use - Existing housing assumed to be 6,000 SF (main residence and 4,270 SF of homes to be demolished)

Vehicle Trips - Changed trip rate to match TIA

Energy Use - Adjusted electricity use to match the energy information provided.

Water And Wastewater - Indoor/outdoor water based on information provided.

Waste Mitigation - 75% waste diversion consistent with AB 341 (not mitigation)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Residential_Exterior	4,050.00	0.00
tblArchitecturalCoating	ConstArea_Residential_Interior	12,150.00	0.00
tblEnergyUse	LightingElect	1,608.84	2,383.07
tblEnergyUse	NT24E	5,095.49	7,547.60
tblEnergyUse	T24E	368.61	546.00

tblLandUse	LandUseSquareFeet	5,400.00	6,000.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2015
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	SU_TR	8.77	9.52
tblVehicleTrips	WD_TR	9.57	9.52
tblWater	IndoorWaterUseRate	195,462.08	489,100.00
tblWater	OutdoorWaterUseRate	123,226.09	87,840.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.5384	0.0745	6.7932	2.2900e-003		0.9181	0.9181		0.9181	0.9181	95.4355	41.2104	136.6458	0.0796	7.6900e-003	140.7017
Energy	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
Mobile	0.1376	0.2709	1.3358	1.8600e-003	0.1352	3.3400e-003	0.1385	0.0361	3.0600e-003	0.0392		167.1767	167.1767	8.7700e-003		167.3609
Total	**5.6790**	**0.3721**	**8.1404**	**4.3200e-003**	**0.1352**	**0.9236**	**1.0588**	**0.0361**	**0.9233**	**0.9594**	**95.4355**	**242.5044**	**337.9399**	**0.0891**	**8.3200e-003**	**342.3876**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	5.5384	0.0745	6.7932	2.2900e-003		0.9181	0.9181		0.9181	0.9181	95.4355	41.2104	136.6458	0.0796	7.6900e-003	140.7017
Energy	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
Mobile	0.1376	0.2709	1.3358	1.8600e-003	0.1352	3.3400e-003	0.1385	0.0361	3.0600e-003	0.0392		167.1767	167.1767	8.7700e-003		167.3609
Total	**5.6790**	**0.3721**	**8.1404**	**4.3200e-003**	**0.1352**	**0.9236**	**1.0588**	**0.0361**	**0.9233**	**0.9594**	**95.4355**	**242.5044**	**337.9399**	**0.0891**	**8.3200e-003**	**342.3876**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	0.1376	0.2709	1.3358	1.8600e-003	0.1352	3.3400e-003	0.1385	0.0361	3.0600e-003	0.0392		167.1767	167.1767	8.7700e-003		167.3609
Unmitigated	0.1376	0.2709	1.3358	1.8600e-003	0.1352	3.3400e-003	0.1385	0.0361	3.0600e-003	0.0392		167.1767	167.1767	8.7700e-003		167.3609

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	28.56	28.56	28.56	63,756	63,756
Total	28.56	28.56	28.56	63,756	63,756

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.473156	0.077101	0.180447	0.153254	0.061890	0.009298	0.018424	0.009367	0.002574	0.002539	0.008564	0.000535	0.002852

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
NaturalGas Unmitigated	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	289.997	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
Total		**3.1300e-003**	**0.0267**	**0.0114**	**1.7000e-004**		**2.1600e-003**	**2.1600e-003**		**2.1600e-003**	**2.1600e-003**		**34.1173**	**34.1173**	**6.5000e-004**	**6.3000e-004**	**34.3249**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0.289997	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
Total		**3.1300e-003**	**0.0267**	**0.0114**	**1.7000e-004**		**2.1600e-003**	**2.1600e-003**		**2.1600e-003**	**2.1600e-003**		**34.1173**	**34.1173**	**6.5000e-004**	**6.3000e-004**	**34.3249**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.5384	0.0745	6.7932	2.2900e-003		0.9181	0.9181		0.9181	0.9181	95.4355	41.2104	136.6458	0.0796	7.6900e-003	140.7017
Unmitigated	5.5384	0.0745	6.7932	2.2900e-003		0.9181	0.9181		0.9181	0.9181	95.4355	41.2104	136.6458	0.0796	7.6900e-003	140.7017

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0231					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1284					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.3787	0.0715	6.5410	2.2700e-003		0.9167	0.9167		0.9167	0.9167	95.4355	40.7647	136.2002	0.0792	7.6900e-003	140.2464
Landscaping	8.0700e-003	2.9700e-003	0.2521	1.0000e-005		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003		0.4457	0.4457	4.6000e-004		0.4554
Total	**5.5384**	**0.0745**	**6.7932**	**2.2800e-003**		**0.9181**	**0.9181**		**0.9181**	**0.9181**	**95.4355**	**41.2104**	**136.6458**	**0.0796**	**7.6900e-003**	**140.7018**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0231					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1284					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.3787	0.0715	6.5410	2.2700e-003		0.9167	0.9167		0.9167	0.9167	95.4355	40.7647	136.2002	0.0792	7.6900e-003	140.2464
Landscaping	8.0700e-003	2.9700e-003	0.2521	1.0000e-005		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003		0.4457	0.4457	4.6000e-004		0.4554
Total	**5.5384**	**0.0745**	**6.7932**	**2.2800e-003**		**0.9181**	**0.9181**		**0.9181**	**0.9181**	**95.4355**	**41.2104**	**136.6458**	**0.0796**	**7.6900e-003**	**140.7018**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Belden Barns - Existing

Sonoma-San Francisco County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	3.00	Dwelling Unit	0.97	6,000.00	9

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 75

Climate Zone 4 **Operational Year** 2015

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 641.35 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Land Use - Existing housing assumed to be 6,000 SF (main residence and 4,270 SF of homes to be demolished)

Vehicle Trips - Changed trip rate to match TIA

Energy Use - Adjusted electricity use to match the energy information provided.

Water And Wastewater - Indoor/outdoor water based on information provided.

Waste Mitigation - 75% waste diversion consistent with AB 341 (not mitigation)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Residential_Exterior	4,050.00	0.00
tblArchitecturalCoating	ConstArea_Residential_Interior	12,150.00	0.00
tblEnergyUse	LightingElect	1,608.84	2,383.07
tblEnergyUse	NT24E	5,095.49	7,547.60
tblEnergyUse	T24E	368.61	546.00

tblLandUse	LandUseSquareFeet	5,400.00	6,000.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2015
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	SU_TR	8.77	9.52
tblVehicleTrips	WD_TR	9.57	9.52
tblWater	IndoorWaterUseRate	195,462.08	489,100.00
tblWater	OutdoorWaterUseRate	123,226.09	87,840.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Area	5.5384	0.0745	6.7932	2.2900e-003		0.9181	0.9181		0.9181	0.9181	95.4355	41.2104	136.6458	0.0796	7.6900e-003	140.7017
Energy	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
Mobile	0.1308	0.2410	1.1845	1.9700e-003	0.1352	3.3200e-003	0.1385	0.0361	3.0400e-003	0.0392		177.3720	177.3720	8.7700e-003		177.5561
Total	**5.6723**	**0.3422**	**7.9890**	**4.4300e-003**	**0.1352**	**0.9236**	**1.0587**	**0.0361**	**0.9233**	**0.9594**	**95.4355**	**252.6997**	**348.1352**	**0.0891**	**8.3200e-003**	**352.5828**

Mitigated Operational

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Area	5.5384	0.0745	6.7932	2.2900e-003		0.9181	0.9181		0.9181	0.9181	95.4355	41.2104	136.6458	0.0796	7.6900e-003	140.7017
Energy	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
Mobile	0.1308	0.2410	1.1845	1.9700e-003	0.1352	3.3200e-003	0.1385	0.0361	3.0400e-003	0.0392		177.3720	177.3720	8.7700e-003		177.5561
Total	**5.6723**	**0.3422**	**7.9890**	**4.4300e-003**	**0.1352**	**0.9236**	**1.0587**	**0.0361**	**0.9233**	**0.9594**	**95.4355**	**252.6997**	**348.1352**	**0.0891**	**8.3200e-003**	**352.5828**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.1308	0.2410	1.1845	1.9700e-003	0.1352	3.3200e-003	0.1385	0.0361	3.0400e-003	0.0392		177.3720	177.3720	8.7700e-003		177.5561
Unmitigated	0.1308	0.2410	1.1845	1.9700e-003	0.1352	3.3200e-003	0.1385	0.0361	3.0400e-003	0.0392		177.3720	177.3720	8.7700e-003		177.5561

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	28.56	28.56	28.56	63,756	63,756
Total	28.56	28.56	28.56	63,756	63,756

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.473156	0.077101	0.180447	0.153254	0.061890	0.009298	0.018424	0.009367	0.002574	0.002539	0.008564	0.000535	0.002852

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
NaturalGas Unmitigated	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	289.997	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
Total		**3.1300e-003**	**0.0267**	**0.0114**	**1.7000e-004**		**2.1600e-003**	**2.1600e-003**		**2.1600e-003**	**2.1600e-003**		**34.1173**	**34.1173**	**6.5000e-004**	**6.3000e-004**	**34.3249**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0.289997	3.1300e-003	0.0267	0.0114	1.7000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003		34.1173	34.1173	6.5000e-004	6.3000e-004	34.3249
Total		**3.1300e-003**	**0.0267**	**0.0114**	**1.7000e-004**		**2.1600e-003**	**2.1600e-003**		**2.1600e-003**	**2.1600e-003**		**34.1173**	**34.1173**	**6.5000e-004**	**6.3000e-004**	**34.3249**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.5384	0.0745	6.7932	2.2900e-003		0.9181	0.9181		0.9181	0.9181	95.4355	41.2104	136.6458	0.0796	7.6900e-003	140.7017
Unmitigated	5.5384	0.0745	6.7932	2.2900e-003		0.9181	0.9181		0.9181	0.9181	95.4355	41.2104	136.6458	0.0796	7.6900e-003	140.7017

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0231					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1284					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.3787	0.0715	6.5410	2.2700e-003		0.9167	0.9167		0.9167	0.9167	95.4355	40.7647	136.2002	0.0792	7.6900e-003	140.2464
Landscaping	8.0700e-003	2.9700e-003	0.2521	1.0000e-005		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003		0.4457	0.4457	4.6000e-004		0.4554

Total	5.5384	0.0745	6.7932	2.2800e-003		0.9181	0.9181		0.9181	0.9181	95.4355	41.2104	136.6458	0.0796	7.6900e-003	140.7018

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0231					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1284					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	5.3787	0.0715	6.5410	2.2700e-003		0.9167	0.9167		0.9167	0.9167	95.4355	40.7647	136.2002	0.0792	7.6900e-003	140.2464
Landscaping	8.0700e-003	2.9700e-003	0.2521	1.0000e-005		1.3500e-003	1.3500e-003		1.3500e-003	1.3500e-003		0.4457	0.4457	4.6000e-004		0.4554
Total	**5.5384**	**0.0745**	**6.7932**	**2.2800e-003**		**0.9181**	**0.9181**		**0.9181**	**0.9181**	**95.4355**	**41.2104**	**136.6458**	**0.0796**	**7.6900e-003**	**140.7018**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Belden Barns - Existing

Sonoma-San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	3.00	Dwelling Unit	0.97	6,000.00	9

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 75

Climate Zone 4 **Operational Year** 2015

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 641.35 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Land Use - Existing housing assumed to be 6,000 SF (main residence and 4,270 SF of homes to be demolished)

Vehicle Trips - Changed trip rate to match TIA

Energy Use - Adjusted electricity use to match the energy information provided.

Water And Wastewater - Indoor/outdoor water based on information provided.

Waste Mitigation - 75% waste diversion consistent with AB 341 (not mitigation)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Residential_Exterior	4,050.00	0.00
tblArchitecturalCoating	ConstArea_Residential_Interior	12,150.00	0.00
tblEnergyUse	LightingElect	1,608.84	2,383.07
tblEnergyUse	NT24E	5,095.49	7,547.60
tblEnergyUse	T24E	368.61	546.00

tblLandUse	LandUseSquareFeet	5,400.00	6,000.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2015
tblVehicleTrips	ST_TR	10.08	9.52
tblVehicleTrips	SU_TR	8.77	9.52
tblVehicleTrips	WD_TR	9.57	9.52
tblWater	IndoorWaterUseRate	195,462.08	489,100.00
tblWater	OutdoorWaterUseRate	123,226.09	87,840.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0461	6.1000e-004	0.0502	3.0000e-005		4.1400e-003	4.1400e-003		4.1400e-003	4.1400e-003	0.4241	0.1527	0.5767	9.7000e-004	2.0000e-005	0.6040
Energy	5.7000e-004	4.8800e-003	2.0800e-003	3.0000e-005		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	14.7919	14.7919	5.2000e-004	1.9000e-004	14.8614
Mobile	0.0231	0.0471	0.2223	3.4000e-004	0.0235	6.0000e-004	0.0241	6.3100e-003	5.5000e-004	6.8700e-003	0.0000	27.7716	27.7716	1.4500e-003	0.0000	27.8020
Waste						0.0000	0.0000		0.0000	0.0000	0.7673	0.0000	0.7673	0.0454	0.0000	1.7196
Water						0.0000	0.0000		0.0000	0.0000	0.1552	0.8593	1.0145	0.0160	3.8000e-004	1.4692
Total	**0.0697**	**0.0526**	**0.2746**	**4.0000e-004**	**0.0235**	**5.1300e-003**	**0.0287**	**6.3100e-003**	**5.0800e-003**	**0.0114**	**1.3465**	**43.5755**	**44.9220**	**0.0643**	**5.9000e-004**	**46.4561**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0461	6.1000e-004	0.0502	3.0000e-005		4.1400e-003	4.1400e-003		4.1400e-003	4.1400e-003	0.4241	0.1527	0.5767	9.7000e-004	2.0000e-005	0.6040
Energy	5.7000e-004	4.8800e-003	2.0800e-003	3.0000e-005		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	14.7919	14.7919	5.2000e-004	1.9000e-004	14.8614
Mobile	0.0231	0.0471	0.2223	3.4000e-004	0.0235	6.0000e-004	0.0241	6.3100e-003	5.5000e-004	6.8700e-003	0.0000	27.7716	27.7716	1.4500e-003	0.0000	27.8020
Waste						0.0000	0.0000		0.0000	0.0000	0.1918	0.0000	0.1918	0.0113	0.0000	0.4299
Water						0.0000	0.0000		0.0000	0.0000	0.1552	0.8593	1.0145	0.0160	3.8000e-004	1.4689
Total	**0.0697**	**0.0526**	**0.2746**	**4.0000e-004**	**0.0235**	**5.1300e-003**	**0.0287**	**6.3100e-003**	**5.0800e-003**	**0.0114**	**0.7711**	**43.5755**	**44.3466**	**0.0303**	**5.9000e-004**	**45.1662**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**42.74**	**0.00**	**1.28**	**52.93**	**0.00**	**2.78**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0231	0.0471	0.2223	3.4000e-004	0.0235	6.0000e-004	0.0241	6.3100e-003	5.5000e-004	6.8700e-003	0.0000	27.7716	27.7716	1.4500e-003	0.0000	27.8020
Unmitigated	0.0231	0.0471	0.2223	3.4000e-004	0.0235	6.0000e-004	0.0241	6.3100e-003	5.5000e-004	6.8700e-003	0.0000	27.7716	27.7716	1.4500e-003	0.0000	27.8020

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	28.56	28.56	28.56	63,756	63,756
Total	28.56	28.56	28.56	63,756	63,756

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.473156	0.077101	0.180447	0.153254	0.061890	0.009298	0.018424	0.009367	0.002574	0.002539	0.008564	0.000535	0.002852

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	9.1434	9.1434	4.1000e-004	9.0000e-005	9.1786
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	9.1434	9.1434	4.1000e-004	9.0000e-005	9.1786
NaturalGas Mitigated	5.7000e-004	4.8800e-003	2.0800e-003	3.0000e-005		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	5.6485	5.6485	1.1000e-004	1.0000e-004	5.6829
NaturalGas Unmitigated	5.7000e-004	4.8800e-003	2.0800e-003	3.0000e-005		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	5.6485	5.6485	1.1000e-004	1.0000e-004	5.6829

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	105849	5.7000e-004	4.8800e-003	2.0800e-003	3.0000e-005		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	5.6485	5.6485	1.1000e-004	1.0000e-004	5.6829
Total		**5.7000e-004**	**4.8800e-003**	**2.0800e-003**	**3.0000e-005**		**3.9000e-004**	**3.9000e-004**		**3.9000e-004**	**3.9000e-004**	**0.0000**	**5.6485**	**5.6485**	**1.1000e-004**	**1.0000e-004**	**5.6829**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	105849	5.7000e-004	4.8800e-003	2.0800e-003	3.0000e-005		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	5.6485	5.6485	1.1000e-004	1.0000e-004	5.6829
Total		**5.7000e-004**	**4.8800e-003**	**2.0800e-003**	**3.0000e-005**		**3.9000e-004**	**3.9000e-004**		**3.9000e-004**	**3.9000e-004**	**0.0000**	**5.6485**	**5.6485**	**1.1000e-004**	**1.0000e-004**	**5.6829**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	31430	9.1434	4.1000e-004	9.0000e-005	9.1786
Total		**9.1434**	**4.1000e-004**	**9.0000e-005**	**9.1786**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	31430	9.1434	4.1000e-004	9.0000e-005	9.1786

Total		**9.1434**	**4.1000e-004**	**9.0000e-005**	**9.1786**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0461	6.1000e-004	0.0502	3.0000e-005		4.1400e-003	4.1400e-003		4.1400e-003	4.1400e-003	0.4241	0.1527	0.5767	9.7000e-004	2.0000e-005	0.6040
Unmitigated	0.0461	6.1000e-004	0.0502	3.0000e-005		4.1400e-003	4.1400e-003		4.1400e-003	4.1400e-003	0.4241	0.1527	0.5767	9.7000e-004	2.0000e-005	0.6040

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.2200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0234					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0177	3.4000e-004	0.0275	3.0000e-005		4.0200e-003	4.0200e-003		4.0200e-003	4.0200e-003	0.4241	0.1163	0.5404	9.4000e-004	2.0000e-005	0.5668
Landscaping	7.3000e-004	2.7000e-004	0.0227	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004	0.0000	0.0364	0.0364	4.0000e-005	0.0000	0.0372
Total	**0.0461**	**6.1000e-004**	**0.0502**	**3.0000e-005**		**4.1400e-003**	**4.1400e-003**		**4.1400e-003**	**4.1400e-003**	**0.4241**	**0.1527**	**0.5767**	**9.8000e-004**	**2.0000e-005**	**0.6040**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.2200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0234					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0177	3.4000e-004	0.0275	3.0000e-005		4.0200e-003	4.0200e-003		4.0200e-003	4.0200e-003	0.4241	0.1163	0.5404	9.4000e-004	2.0000e-005	0.5668
Landscaping	7.3000e-004	2.7000e-004	0.0227	0.0000		1.2000e-004	1.2000e-004		1.2000e-004	1.2000e-004	0.0000	0.0364	0.0364	4.0000e-005	0.0000	0.0372
Total	**0.0461**	**6.1000e-004**	**0.0502**	**3.0000e-005**		**4.1400e-003**	**4.1400e-003**		**4.1400e-003**	**4.1400e-003**	**0.4241**	**0.1527**	**0.5767**	**9.8000e-004**	**2.0000e-005**	**0.6040**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.0145	0.0160	3.8000e-004	1.4689
Unmitigated	1.0145	0.0160	3.8000e-004	1.4692

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.4891 / 0.08784	1.0145	0.0160	3.8000e-004	1.4692
Total		**1.0145**	**0.0160**	**3.8000e-004**	**1.4692**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.4891 / 0.08784	1.0145	0.0160	3.8000e-004	1.4689
Total		**1.0145**	**0.0160**	**3.8000e-004**	**1.4689**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e

	MT/yr			
Unmitigated	0.7673	0.0454	0.0000	1.7196
Mitigated	0.1918	0.0113	0.0000	0.4299

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	3.78	0.7673	0.0454	0.0000	1.7196
Total		**0.7673**	**0.0454**	**0.0000**	**1.7196**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	0.945	0.1918	0.0113	0.0000	0.4299
Total		**0.1918**	**0.0113**	**0.0000**	**0.4299**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

CalEEMod Version: CalEEMod.2013.2.2

Date: 1/14/2016 3:21 PM

Belden Barns - Existing

Sonoma-San Francisco County, Mitigation Report

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.02
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting:

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value 3
No	Land Use	Increase Density	0.00			
No	Land Use	Increase Diversity	-0.01	0.13		
No	Land Use	Improve Walkability Design	0.00			

No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			
No	Land Use	Integrate Below Market Rate Housing	0.00			
	Land Use	Land Use SubTotal	0.00			
No	Neighborhood Enhancements	Improve Pedestrian Network				
No	Neighborhood Enhancements	Provide Traffic Calming Measures				
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.00			
No	Parking Policy Pricing	Limit Parking Supply	0.00			
No	Parking Policy Pricing	Unbundle Parking Costs	0.00			
No	Parking Policy Pricing	On-street Market Pricing	0.00			
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00			
No	Transit Improvements	Expand Transit Network	0.00			
No	Transit Improvements	Increase Transit Frequency	0.00			
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.00			
No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"				
No	Commute	Workplace Parking Charge				
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	

No	Commute	Provide Ride Sharing Program				
	Commute	Commute Subtotal	0.00			
No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.00			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	150.00
No	Use Low VOC Paint (Non-residential Interior)	100.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	% Electric Lawnmower	
No	% Electric Leafblower	
No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00

DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy		
No	Use Reclaimed Water		
No	Use Grey Water		
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	
No	Turf Reduction		
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape		

Solid Waste Mitigation

Mitigation Measures	Input Value
Institute Recycling and Composting Services Percent Reduction in Waste Disposed	75.00

APPENDIX D

Biological Assessment, Dudek Update, and CRLF Survey Memo

BIOLOGICAL ASSESSMENT

Belden Barns - Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404
APN 049-030-010

Prepared
By
Kjeldsen Biological Consulting

For
Belden Barns Winery and Farmstead

May 24, 2013

BIOLOGICAL ASSESSMENT
Belden Barns Winery and Farmstead
5560 Sonoma Mountain Road
Sonoma County

PROJECT NAME:	Belden Barns Winery and Farmstead APN 049-030-010 5560 Sonoma Mountain Road Santa Rosa, CA 95404 Sonoma County
PROJECT COORDINATOR:	Steve Martin Associates, Inc 130 South Main St. Suite 201 Sebastopol, CA 95472
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PERIOD OF SURVEY:	Spring-Summer 2013

BIOLOGICAL ASSESSMENT
Belden Barns Winery and Farmstead
5560 Sonoma Mountain Road
Santa Rosa, CA 95404

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EXECUTIVE SUMMARY

This study was conducted at the request of Belden Barns Winery and Farmstead, as background information for project permits from the Sonoma County Permit and Resource Management Department.

The project proposes the construction of a winery within an existing ranch complex (improved entrance, new winery road, improved driveway, new turnaround and parking spaces, winery building, replacement of residence, existing barn renovation and truck turnaround). The property is located southeast of the city of Santa Rosa, within the northwest edge of the USGS Glen Ellen Quadrangle, at 5560 Sonoma Mountain Road.

The purpose of this report is to identify biological resources that may be affected by the proposed project. The fieldwork studied the proposed project envelope and surrounding environment. The findings presented below are the results of fieldwork conducted in 2013 by Kjeldsen Biological Consulting:

- The project footprint is within a developed landscape that has had decades of different agricultural endeavors (the habitat of the project footprint is ruderal agricultural grassland that has been routinely disked and mowed). The proposed project site is at the old ranch headquarters that consists of residence, employee unit and agricultural barns and infrastructure;
- The project is <u>not</u> located within the designated area of the U.S.F.W.S. Sonoma California Tiger Salamander, Proposed Critical Habitat Unit 1 -Santa Rosa Plain.
- The project is not located in the designated area of the U.S.F.W.S Programmatic Biological Opinion (PBO) for the U.S. Army Corps of Engineers for Projects that May Affect Listed Plant Species on the Santa Rosa Plain;
- No habitat for special-status plant or animal species was identified on the project site. We find that it is unlikely that the proposed project would impact any of the special-status plants known for the Quadrangle or the region based on the habitat present and historic use within and associated with the project footprint;
- The proposed project will not significantly reduce habitat for any local special-status animals;
- No raptor activity or nests were observed on or near the proposed project site;
- The project footprint drains by sheet flow into an unnamed tributary of Matanzas Creek;

- A man made reservoir is near the project site. The reservoir is separated from the project;
- The project sewer system and storm water drainage will be conveyed to an engineered disposal system with in existing vineyards. There is no reason to expect any hydrologic or significant impacts to aquatic life in the watershed;
- There are no indications of the presence of Sensitive Natural Communities regulated by the California Department of Fish and Game or US Fish and Wildlife are present within or directly associated with the project footprint;
- The new access road is adjacent to an unnamed drainage with riparian vegetation. The project proposes a 30 ft setback;
- The proposed project will not substantially interfere with native wildlife species, wildlife corridors, or native wildlife nursery sites;
- The footprint of the project will not significantly contribute to habitat loss or habitat fragmentation; and
- The flora and fauna observed on and near the site are included as an Appendix.

Assessment of Impacts

The property and project site conditions are such that there is no reason to expect any impacts to special-status species on site or off site provided Best Management Practices are implemented. The primary biological concern is the protection and prevention of sediment release from the construction phase of the project. Standard Erosion control measures and BMPs will protect resource on site during and post-construction. No natural habitat will be removed or impacted by the proposed project.

Riparian vegetation along the drainage has the potential to be impacted if the proposed road or construction is proposed under the drip line of trees.

Recommendations

All project construction activities must be limited to the project footprint. Best Management Practices including silt and erosion control measures must be implemented to prevent off-site movement of sediment and dust during and post construction.

Construction fencing should be considered for installation along the edge of the new winery access road adjacent to the drainage along the buffer zone. No construction should be allowed under the canopy of the riparian zone adjacent to the proposed project. Construction fencing will ensure that no construction equipment, fill, staging or storage occurs in this area.

Project construction has the potential for disturbing raptors during breeding/bird nesting season (March 1 through July 31). A pre-construction survey of potential nesting raptor habitat within 500 feet of earthmoving activities should be conducted is construction begins during this time. Surveys should be conducted within 14 days prior to groundbreaking activities associated with road construction. If active nests are found during preconstruction surveys the project applicant should consult with the California Department of Fish and Game and obtain approval for appropriate buffers or delay construction until it is determined that all young have fledged.

BIOLOGICAL ASSESSMENT
Belden Barns Winery and Farmstead

A. PROJECT DESCRIPTION

A.1 Introduction

This study was conducted at the request of Belden Barns Winery and Farmstead, as background information for project permits from the Sonoma County Permit and Resource Management Department.

The property consists of vineyards and ranch infrastructure with landscape plantings, reservoir,agricultural grasslands and a small portion of upland oak woodlands. The project proposes improvement of existing house and infrastructure (improved entrance, new winery road, improved driveway, new turnaround and parking spaces, winery building, replacement of residence, existing barn renovation and truck turnaround.

The property is located 5560 Sonoma Mountain Road southeast of the city of Santa Rosa. The parcel is within the northwest edge of the USGS Glen Ellen Quadrangle. The surrounding land use consists of vineyards, rural residential housing, pasturelands and upland oak woodlands. Plate I provides a site and location map of the property. Plate III provides an aerial photograph of the property and Plate V presents the site plan for the project.)

A.2 Purpose

The purpose of this report is to identify biological resources that may be affected by the proposed project as listed below:

- To determine the presence of potential habitat for special-status species which would be impacted by the proposed project, including habitat types which may have the potential for supporting special-status species (target species that are known for the region, the Quadrangle and surrounding Quadrangles);
- To identify the presence of special-status plant species and assess the potential impact of the project on sensitive plants or sensitive plant habitat;
- To identify if the project will have a substantial adverse effect on Sensitive Habitats or Communities regulated by the California Department of Fish and Game;
- To identify and assess potential impacts to Federal or State protected wetlands as defined by Section 404 of the Clean Water Act; and
- To determine if the project will substantially interfere with native wildlife species, wildlife corridors, and or native wildlife nursery sites.

A.3 Definitions

Definitions related to or used in this report are attached in Appendix B.

B SURVEY METHODOLOGY

B.1 Project Scoping

The scoping for the project considered location and type of habitat and or vegetation types present on the property or associated with potential special-status plant species known for the Quadrangles, surrounding Quadrangles the County or the region. Our scoping also considered records in the most recent version of the Department of Fish and Wildlife California Natural Diversity Data Base (DFW CNDDB Rare Find-4), Biogeographic Information and Observation System Online mapping tool, and the California Native Plant Society (CNPS) Electronic Inventory of Rare or Endangered Plants. "Target" special-status species are those listed by the State, the Federal Government or the California Native Plant Society or considered threatened in the region. Our scoping is also a function of our familiarity with the local flora and fauna as well as previous projects on other properties in the area.

The California Wildlife Habitat Relationships (WHR) System (Department of Fish and Wildlife) query was run to determine through habitat what potential species could be present on the project site.

Tables II and III present DFW CNDDB Rare Find-3 species within five miles. We also considered species which are known for the nine surrounding Quadrangles, and would potentially be present based on habitat present on site.

B.2 Field Survey Methodology

Site plans and background materials for the project were provided by Steve Martin Associates, Inc. Fieldwork was conducted by walking the project footprint and the surrounding area on the property with two personnel (Chris K. Kjeldsen, and Daniel T. Kjeldsen). Our fieldwork analyzed the project site and surrounding habitat for special-status organisms or the presence of suitable habitat, which would support special-status organisms. The findings presented below are the results of fieldwork conducted on March 14, April 18, and May16, 2013 by Kjeldsen Biological Consulting.

Plants Field surveys were conducted recording and identifying all species on the site and in the near proximity. Transects through the proposed project sites were made methodically by foot. Transects were established and scrutinized to cover topographic and vegetation variations within the study area. The Intuitive Controlled approach calls for the qualified surveyor to conduct a survey of the area by walking through it and around its perimeters, and closely examining portions where target species are especially likely to occur. The open nature of the site, historic and on going agricultural practices, and small size of the proposed development footprint facilitated our field studies.

The fieldwork for identifying special-status plant species is based on our knowledge and many years of experience in conducting special-status plant species surveys in the region. Plants were identified in the field or reference material was collected, when necessary, for verification using laboratory examination with a binocular microscope and reference materials. Herbarium specimens from plants collected on the project site were made when relevant. Voucher material for selected individuals is in the possession of the authors. All plants observed (living and/or remains from last season's growth) were recorded in field notes.

Typically, blooming examples are required for identification however; it is not the only method for identifying the presence of or excluding the possibility of rare plants. Vegetative morphology and dried flower or fruit morphology, which may persist long after the blooming period, may also be used. Skeletal remains from previous season's growth can also be used for identification. Some species do not flower each year or only flower at maturity and therefore must be identified from vegetative characteristics. Algae, fungi, mosses, lichens, ferns, Lycophyta and Sphenophyta have no flowers and there are representatives from these groups that are now considered to be special-status species, which require non-blooming identification. For some plants unique features such as the aromatic oils present are key indicator. For some trees and shrubs with unique vegetative characteristics flowering is not needed for proper identification. The vegetative evaluation as a function of field experience can be used to identify species outside of the blooming period to verify or exclude the possibility of special-status plants in a study area.

Habitat is also a key characteristic for consideration of special-status species in a study area. Many special-status species are rare in nature because of their specific and often very narrow habitat or environmental requirements. Their presence is limited by specific environmental conditions such as: hydrology, microclimate, soils, nutrients, interspecific and intraspecific competition, and aspect or exposure. In some situations special-status species particularly annuals may not be present each year and in this case one has to rely on skeletal material from previous years. A site evaluation based on habitat or environmental conditions is therefore a reliable method for including or excluding the possibility of special-status species in an area.

Animals were identified in the field by their sight, sign, or call. Our field techniques consisted of surveying the area with binoculars and walking the perimeter of the project site. Existing site conditions were used to identify habitat, which could potentially support special status species. All animal life was recorded and is presented in Appendix A.

Trees were surveyed to determine whether occupied raptor nests were present within the proximity of the project site (i.e., within a minimum 500 feet of the areas to be disturbed). Surveys consisted of scanning the trees on the property (500 ft +) with binoculars searching for nest or bird activity. Our search was conducted from the property and by walking under existing trees looking for droppings or nest scatter from nests that may be present that were not observable by binoculars.

Potential bat breeding habitat was surveyed for within 200 feet of the proposed project, by looking for roosting habitat in buildings that were accessible, rock outcrops, tree crevasses, and evidence of roosting.

Aerial photos were reviewed to look at the habitat surrounding the site and the potential for wildlife movement, or wildlife corridors from adjoining properties onto or through the site.

Wetlands The project site was reviewed to determine from existing environmental conditions with a combination of vegetation, soils, and hydrologic information if seasonal wetlands were present. Wetlands were evaluated using the ACOE's three-parameter approach: Vegetation, Hydrology, and Soils. Tributaries to Waters of the US are determined by the evaluation of continuity and "ordinary high water mark".

C RESULTS / FINDINGS

Our results and findings are based on our fieldwork, literature search, and the background material available for the project.

C.1 Biological Setting

The site is located in the North Coast Range Mountains, a geographic subdivision of the larger California Floristic Province (Hickman, 1993), which is strongly influenced by the Pacific Ocean. The region is in a climate Zone "Ocean influenced Northern and Central California" characterized as an area with ocean or cold air influence. The climate of the region is characterized by hot, dry summers and cool, wet winters, with precipitation that varies regionally from less than 30 to more than 60 inches per year. This climate regime is referred to as a "Mediterranean Climate". The average annual temperature ranges from 45 to 90 degrees Fahrenheit. The variations of abiotic conditions including geology results in a high level of biological diversity per unit area.

The photographs (Figures 1 to 5) below illustrate the study site.

Figure 1. Existing driveway that will be improved. Planted Cypress. The view is to the north from the ranch headquarters. The new winery access road will be constructed in the ruderal grassland on the right.

Figure 2. View to the west of the existing vineyards. The event parking will be located at the end of the existing gravel road along the vineyard access road in view.

Figure 3. Site for the proposed the new Winery Building.

Figure 4. The new winery access road will be constructed in the grasslands with a 30 ft setback from the creek with riparian vegetation on the right. View is to the north.

Figure 5. Winery location will be within the grasslands in the foreground. The buildings on the right will be renovated as well as the barn in the background.

C.2 Habitat Types Present

The vegetation of California has been considered to be a mosaic, with major changes present from one area to another, often with distinct changes within short distances. The variation in vegetation is a function of topography, geology, climate and biotic factors. It is generally convenient to refer to the vegetation associates on a site as a plant community or alliance. Biologists use habitat types or biotic communities for the plant and animals that are associated with a particular vegetation type in a region. Typically plant communities are identified or characterized by the dominant vegetation form or plant species present. There have been numerous community classification schemes proposed by different authors using different systems for the classification of vegetation. A basic premise for the designation of plant communities or associations is that in nature there are distinct plant populations occupying a site that are stable at any one time (climax community is a biotic association, that in the absence of disturbance maintains a stable assemblage over long periods of time). There is also evidence that vegetation on the site is part of a continuum without well-defined boundaries.

It is generally convenient to refer to the vegetation associates on a site as a plant community. There have been numerous plant community classification schemes proposed by different authors. There is also evidence that the vegetation in nature may part of a continuum without well-defined boundaries. For practical purposes and site descriptions plant communities/associations/alliances or habitat types are used. The 2009 Manual of California Vegetation (Sawyer) is the preferred system at present but much of the literature i.e. California Native Plant Society and CNDDB) use different systems.

The project footprint is entirely within a developed landscape that has been in agriculture use for decades. The footprint is either within or on hardscape or agricultural grasslands. The agricultural grasslands are classified according to Sawyer 2009 as Grassland Semi-Natural Herbaceous Stands with Herbaceous Layer (Annual Grasslands).

Grassland Semi-Natural Herbaceous Stands with Herbaceous Layer
Semi-Natural Herbaceous Grasslands are a result of decades of grazing and the introduction of non-native grasses and herbs. Sawyer uses the term “Semi-natural Stands to refer to non-native introduced plants that have become established and coexist with native species. Semi-natural stands are those dominated by non-native species that have become naturalized primarily as a result of historic agricultural practices and fire suppression or management practices for weed abatement and fire suppression. This includes what can be termed weeds, aliens, exotics or invasive plants in agricultural and nonagricultural settings. The Semi-natural Herbaceous Stand present within the proposed project is described below.

***Avena (barbata, fatua*)** Semi-Natural Herbaceous Stands Wild oats grasslands. *Avena barbata* or *A. fatua* is dominant or co-dominant in the herbaceous layer. Emergent trees and shrubs may be present at low cover. Herbs <1.2 m; cover is open to continuous. Stands are present in waste places, rangelands, and openings in woodlands. The membership rules require *Avena ssp.* to be> 75% relative cover; other non-native <5% absolute cover, if present, in the herbaceous layer. *Avena* species are cool-season, annual grasses from Eurasia. These annual grasslands are common in the region.

The species observed on or near the project site are included as an attachment (Appendix A).

C.3 Special-Status Species

The flora and fauna observed during our study are presented in Appendix A.

The DFW CNDDB does not show any records of special-status species of plants or animals for the project study site.

Tables I and II below list the "target" special status plants and animals known from the near vicinity of the project site. The tables provide the habitat associated with the taxon, seasonality of plant species and justification for concluding absence on the project site. Several species are associated with habitat present on portions of the site as noted in the table. Our scoping as presented above also includes the species shown in Appendix C.

The project is not located in the designated area of the U.S.F.W.S. Programmatic Biological Opinion (PBO) for the U.S. Army Corps of Engineers for Projects that May the Three Endangered Plant Species on the Santa Rosa Plain (Map provided by the U.S. Fish and Wildlife Service July 21, 2005). There are no wetlands, vernal pools, or seasonal drainages associated with the proposed project, and no habitat which would contain topographic, hydrologic, and geographic conditions of suitable habitat.

Plants

Table I. Analysis of potential "target" special-status plant species. The taxa included in the table are selected based on the DFW CNDDB Rare Find 3 records for species known to occur within five miles of the project site (Plate II).

Scientific Name Common Name	Habitat Type or Plant Alliance	Habitat Present On Site	Flower Period	Species Observed	Justification for Concluding Absence on Project Site
Allium peninsulare var. *franciscanum* Franciscan Onion	Cismontane woodland, Valley and Foothill Grassland/Clay often Serpentinite.	No	May-June	No	Absence of requisite edaphic conditions. Historic agricultural use precludes presence.
Alopercus aequalis var. *sonomensis* Sonoma Alopercus	Marshes and Swamps	No	May-July	No	Absence of requisite mesic habitat or substrate on project site.
Amorpha californica var. *napensis* Napa False Indigo	Cismontane Woodland	No	April-July	No	Absence of typical habitat and vegetation associates.
Balsamorhiza macrolepis var. macrolepis Big-scale Balsamroot	Chaparral, Cismontane Woodland, Valley and Foothill Grassland	No	March-June	No	Historic use of site precludes presence.

Scientific Name Common Name	Habitat Type or Plant Alliance	Habitat Present On Site	Flower Period	Species Observed	Justification for Concluding Absence on Project Site
Blennosperma bakeri Sonoma Sunshine	Valley and Foothill Grassland, Vernal Pools	No	March-May	No	Absence of requisite mesic habitat.
Brodiaea leptandra Narrow-anthered California Brodiaea	Broadleaved Upland Forest, Chaparral	No	May-July	No	Requisite microhabitat, edaphic requirements, native vegetation associates not present.
Ceanothus divergens Calistoga Ceanothus	Chaparral, Serpentinite or Volcanic-Rocky.	No	May-Sep.	No	Absence of typical habitat and vegetation associates.
Ceanothus sonomensis Sonoma Ceanothus	Chaparral, Serpentinite or rocky Volcanic	No	Feb.-March	No	Absence of typical habitat and vegetation associates.
Centromadia parryi ssp. *parryi* Pappose Tarplant	Grassland salt or alkaline marshes	No	March-June	No	Requisite mesic conditions absent.
Downingia pusilla Dwarf Downingia	Wetlands	No	March -May	No	Absence of requisite mesic habitat or substrate on project site precludes presence.
Fritillaria liliacea Fragrant Fritillary	Open Grasslands	No	Feb.-April	No	Historic agricultural use precludes presence
Legenere limosa Legenere	Vernal Pools	No	April-June	No	Absence of requisite mesic habitat.
Leptosiphon jepsonii Jepson's Leptosiphon	Chaparral, Cismontane Woodland, Valley and Foothill Grassland.	No	April-May	No	Requisite habitat absent on the site. Absence of requisite mesic habitat.
Navarretia leucocephala ssp. *bakeri* Baker's Navarretia	Meadows and Seeps Cismontane Woodland, Valley Foothill Grassland, Vernal Pools	No	May-July	No	Absence of typical habitat and vegetation associates.
Pleuropogon hooverianus North Coast Semaphore Grass	Broadleaved Upland Forest, meadows and seeps, marshes and swamps	No	May-Aug.	No	Mesic habitat not present on project site.

Scientific Name Common Name	Habitat Type or Plant Alliance	Habitat Present On Site	Flower Period	Species Observed	Justification for Concluding Absence on Project Site
Sidalcea oregana ssp. *valida* Kenwood Marsh Checkerbloom	Meadows and seeps, Riparian scrub mesic	No	June-Aug.	No	Requisite mesic habitat absent.
Trifolium amoenum Showy Rancheria Clover Two-fork Clover	Valley and Foothill Grassland	No	April-June	No	Historical use of the site precludes presence. This species is vulnerable to livestock grazing.
Trifolium hydrophilum Saline Clover	Marshes and Swamps Grassland	No	April-June	No	Absence of mesic habitat required for presence.
Viburnum ellipticum Oval-leaved Viburnum	Chaparral, Cismontane Woodland, Lower Coniferous Forest	No	May-June	No	Requisite habitat absent on the site or in the immediate vicinity.

The only special-status plant that is close to the project (approximately 1 mile west) is the North Coast Semaphore Grass. This grass is found in wetlands (meadows and seeps, marshes and swamps) which are not present on or near the project site. The project site is located within developed landscape or within ruderal semi-natural grassland. Special-status plant species associated with native grasslands are reasonably precluded from presence as a result of historic use of the area.

We found no evidence for the presence of the above referenced special-status species or any other special-status species known for the region. Based on habitat present associated with the proposed project, historic use, and vegetation observed on or near the project footprint we conclude that it is unlikely that any of the species shown in the table above, or known for the region, would be present, or have the potential to occurred on the project site.

The Valley and Foothill Grassland as per CNPS classification on the project site has been disturbed as a result of past agricultural uses. As shown above the Sawyer Classification considers the site to be Semi-natural grassland herbaceous alliance. There were no indications of undisturbed (non-invaded with European weed species) native grasslands present.

It is unlikely that proposed project would have a substantial impact to special-status plant species, either directly or through habitat modifications based on the lack of habitat required for their presence and the historical use of the project site.

Animals

Plate II illustrates the records of special-status animal species, which are present within a five-mile radius of the study site. There are no records of special-status animals for the project site. Table II below provides information and findings relating to the special-status animals within the vicinity of the project site.

Table II. Analysis of special-status animals for the area. The taxa included in the table are selected based on DFW CNDDB records within five miles of the project (Appendix B, C, and Plate II).

Scientific Name **Common Name**	**Species Habitat**	**Habitat Present On the Project Site**	**Obs. on or Near Project Site**	**Justification for Concluding Absence on Project Site**
Agelaius tricolor Tricolored Blackbird	Tule Marshes	No	No	Lack of habitat.
Ambystoma californiense California Tiger Salamander	Ephemeral Breeding pools with upland oak woodlands for estivation	No	No	Project is not within known range. No potential habitat on site.
Antrozous pallidus Pallid Bat	Roosts in Caves, buildings, woodlands, arid regions	No	No	No rock outcrops, bridges, large mature trees, or riparian vegetation removed by project. No signs of significant bat activity observed.
Athene cunicularia Burrowing Owl	Low lying grasslands	No	No	Lack of habitat. Species not observed.
Caecidotea tomalensis Tomales Isopod	Aquatic	No	No	Lack of suitable habitat. No aquatic habitat impacted.
Coccyzus americanus occidentalis Western Yellow-billed Cuckoo	Riparian Forest and Woodlands along Permanent Streams	No	No	Requisite habitat absent. Not associated with Project. Drainage is intermittent.
Emys marmorata Western Pond Turtle	Slow moving water or ponds	No	No	Reservoir on property contains potential habitat. Distance (Approx. 800 feet) precluded presence on project site. Species was not observed.
Hydrochara rickseckeri Ricksecker's Water Scavenger Beetle	Shallow Water, creeks ponds	No	No	Requisite aquatic habitat absent. Drainage is intermittent.
Hydroporus leechi Leech's Skyline Diving Beetle	Ponds	No	No	Requisite aquatic habitat absent. Drainage is intermittent.

Scientific Name Common Name	Species Habitat	Habitat Present On the Project Site	Obs. on or Near Project Site	Justification for Concluding Absence on Project Site
Oncorhynchus mykiss irideus Steelhead-central California Coast	Aquatic	No	No	Lack of aquatic habitat.
Rana boylii Foothill Yellow-legged Frog	Streams with pools	No	No	Lack of habitat precludes presence.
Rana draytonii California Red-legged Frog	Creeks, Rivers, Permanent flowing water.	No	No	Lack of habitat on project site. (Approx. 800 feet from potential habitat)
Syncaris pacifica California Freshwater Shrimp	Creeks and Estuaries below 300 ft.	No	No	Requisite habitat required for presence lacking.

Species with potential for presence near the project site are addressed below.

The project is not located within the designated area of the U.S.F.W.S. Sonoma California Tiger Salamander, Proposed Critical Habitat. Unit 1 -Santa Rosa Plain.

Western Pond Turtle *(Emys marmorata)*. The western pond turtle is found throughout California and is listed by the State as a Species of Concern. It does not have Federal status. Suitable habitat consists of any permanent or nearly permanent body of water or slow moving stream with suitable refuge, basking sites and nesting sites. Refuge sites include partially submerged logs or rocks or mats of floating vegetation. Basking sites can be partially submerged rocks or logs, as well as shallow-sloping banks with little or no cover. Nesting occurs in sandy banks or in soils up to 100 meters away from aquatic habitat. The existing reservoir is not associated with the project and is approximately 800 feet form project activities. It was surveyed for pond turtles and we found no evidence for presence. If western pond turtle were present in the reservoir it is unlikely that they would move into or use habitat which will be impacted by the proposed project.

California Red-legged Frog *(Rana draytonii)* The California red-legged frog inhabits permanent or nearly permanent water sources (quiet streams, marshes, and reservoirs). They are highly aquatic and prefer shorelines with extensive vegetation. There are two recorded occurrences DFW CNDDB within 5- miles of the property. The closest is approximately 1.5 miles to the south and 2 miles to the north. The reservoir on the property contains limited habitat for this species. The unnamed drainage on the east side of the property is seasonal which reasonably precludes presence of this species. The reservoir contains bullfrogs and has year round water. These two factors do not eliminate the possibility for the occurrence but significantly reduce the potential for survival of this species. The project site is not near the reservoir and does not contain habitat which would support this species. If frogs were present is would be unlikely that they would move into or use habitat which will be impacted by the proposed project. No aquatic or upland habitat for this species will be impacted by the proposed project. We find that project will not have any adverse effects on California red-legged frogs should they be in the area.

Bats Any structure may support roosting bats or temporary roosts, no evidence of the presence of bats was found in the buildings on the property. Removal or remodeling of existing ranch buildings will not significantly impact roosting bats.

Pallid Bat (*Antrozous pallidus*): The Pallid Bat occupies a wide variety of habitats, such as grasslands, shrublands, and forested areas of oak and pine, but prefer rocky outcrops. The pallid bat roosts in caves, mines, crevices, and occasionally in hollow trees or buildings. They forage over open country. The large barn on the property is very open with large bay boors and therefore does not contain suitable roosting habitat. No roosts or evidence of their presence was observed during our field survey. The CNDDB lists a sighting of the bat approximately 2 miles east of project. The proposed project will not have a significant impact on this species.

Based on habitat associated with the proposed project site we conclude that it is unlikely that any of the species shown in the table above, or others known for the region, would occur on the site given history of disturbance, and lack of proper hydrology/topography. It is unlikely that the project would negatively impact special-status animals or have any significant habitat loss for special-status animal species.

C.4 Discussion of Sensitive Habitat Types

The sensitive habitat types identified by the DFW CNDDB for the quadrangles and surrounding quadrangles are the following; Coastal and Valley Freshwater Marsh, Northern Vernal Pool and Valley Needle Grass Grassland. The above referenced habitat types are not present on the project site. See Plate IV for the location of Biological Resources associated with the property.

• Riparian Vegetation

Riparian habitat and vegetation are by all standards considered sensitive. Riparian Vegetation functions to control water temperature, regulate nutrient supply (biofilters), bank stabilization, rate of runoff, wildlife habitat (shelter and food), release of allochthonous material, release of woody debris which functions as habitat and slow nutrient release, and protection for aquatic organisms. Riparian vegetation is also a moderator of water temperature has a cascade effect in that it relates to oxygen availability.

<u>The proposed project does not include any removal of riparian vegetation.</u> The riparian vegetation along the unnamed drainage on the east side of the property should be protected and avoided.

• Seasonal Wetland

Seasonal wetland generally denotes areas where the soil is seasonally saturated and/or inundated by fresh water for a significant portion of the wet season, and then seasonally dries during the dry season. To be classified as "Wetland," the duration of saturation and/or inundation must be long enough to cause the soils and vegetation to become altered and adapted to the wetland conditions. Varying degrees of pooling or ponding, and saturation will produce different edaphic and vegetative responses. These soil and vegetative clues, as well as hydrological features, are used to define the wetland type. Seasonal wetlands typically take the form of shallow depressions and swales that may be intermixed with a variety of upland habitat types. Seasonal wetlands fall under the jurisdiction of the U.S. Army Corps of Engineers.

<u>There are no seasonal wetlands associated with the footprint of the proposed project.</u>

• "Waters of the State"
"Waters of the State" include drainages which are characterized by the presence of definable bed and bank that meet ACOE, and RWQCB definitions and or jurisdiction. Any discharge of storm water into "Waters of the State" will require ACOE, DFW, and RWQCB permits. The project as designed will handle all storm water on-site.

The present conditions show that the project footprint drains by sheet flow into an unnamed tributary of Matanzas Creek. This is seasonal drainage on the east side of the property that conveys storm water to a roadside ditch thence Matanzas Creek which is part of the Russian River water shed.

Any impact to the bed and or bank of this drainage will require agency consultation and permits from the California Department of Fish and Wildlife, U.S. Army Corps of Engineers, and Regional Water Quality Control Boards for impacts to "Waters of the State".

<u>The project as proposed will not impact any "Waters of the State."</u>

• Migratory Corridors or Habitat Links
Wildlife Corridors are natural areas interspersed within developed areas that are important for animal movement, increasing genetic variation in plant and animal populations, reduction of population fluctuations, retention of predators of agricultural pests and for movement of wildlife and plant populations. Wildlife corridors have been demonstrated to not only increase the range of vertebrates including avifauna between patches of habitat but also facilitate two key plant-animal interactions: pollination and seed dispersal. Corridors and also preserve watershed connectivity. Corridor users can be grouped into two types: passage species and corridor dwellers. The data from various studies indicate that wildlife corridors should be a minimum of 100 feet wide to provide adequate movement for passage species and corridor dwellers in the landscape.

<u>The project will not negatively impact any migratory corridor or interrupt habitat linkage</u>.

• Trees
The project footprint is within a developed landscape or ruderal grasslands. No trees are proposed to be removed along the entrance road.

<u>One small native oak trees will be impacted by the proposed project.</u>

• Vernal Pools
Vernal pools are a type of seasonal wetland distinct for California and the western US. Typically they are associated with seasonal rainfall or "Mediterranean climate" and have a distinct flora and fauna, an impermeable or slowly permeable substrate and contain standing water for a portion of the

year. They are characterized by a variable aquatic and dry regime with standing water during the spring plant growth regime. They have a high degree of endemism of flora and fauna.

<u>The project is not associated with any vernal pools.</u>

• Nesting or Breeding Habitat, or Unique Plant Distributions or Populations
Wildlife and bird nesting and breeding habitat as well as unique plant distributions or populations are protected and must be considered. Disruption or loss may require mitigation. The eucalyptus trees along Sonoma Mountain Road have the potential to support raptor nesting.

<u>No nesting raptors were observed within the study area. We found no unique animal or plant populations associated with the project</u>.

D. POTENTIAL BIOLOGICAL IMPACTS

The project footprint is within a developed landscape or routinely disturbed agricultural lands, and as such will not significantly contribute to habitat loss or habitat fragmentation.

D.1 Analysis of Potential Impacts to Special-status Species

The habitat impacted by the proposed project is such that there is little reason to expect impacts to special-status species on-site or off-site. Any potential off-site impacts will be less than significant with the use of standard erosion control measures and construction best management practices.

There is no reason to expect any significant negative impacts to special-status species, or locally significant biological resources by the proposed project.

D.2 Analysis of Potential Impacts on Sensitive Habitat

The sensitive habitat types identified in the DFW CNDDB are not present or associated with the property.

The primary concern is the avoidance and protection of the riparian corridor and seasonal drainage on the east side of the property, which is a local biological resource. Construction equipment or grading underneath the canopy of trees has the potential to damage or kill the tree.

The 30-foot buffer zone setback and installation of construction fencing along the drip line during the construction phase of the project will protect this resource.

The project will not significantly impact any nesting or breeding habitats for wildlife in the area if recommendations stated below are followed. The project will not impact any potential seasonal wetlands, riparian habitat, or vernal pools.

D.3 Potential Off-site Impacts

There will be no significant off-site impacts to biological resources that are known for the region. Any off-site impacts will be less than significant provided best management and erosion control practices are followed.

D.4 Potential Cumulative Impacts

On a local or regional scale it is anticipated that any cumulative effects will be negligible or un-quantifiable. The project footprint is within previously disturbed sites, and will not significantly contribute to habitat loss or habitat fragmentation. There is no reason to expect any species exclusion, isolation or extinction. There are no potential significant impacts to migratory corridors or wildlife nursery sites associated with the proposed project.

E. RECOMMENDATIONS TO AVOID IMPACTS

E.1 Significance

The significance of potential impacts is a function of the scope and scale of the proposed project within the existing Federal, State and Local regulations and management practices. The determination of significance of impacts to biological resources consists of an understanding of the project as proposed and an evaluation of the context in which the impact may occur. The extent and degree of any impact on-site or off–site must be evaluated consistent with known or expected site conditions. Therefore, the significance of potential impacts is assessed relevant to a site-specific scale and the larger regional context.

The project's effect on onsite or regional biological resources is considered to be significant if the project results in:

- Alteration of unique characteristics of the area, such as sensitive plant communities and habitats (i.e. serpentine habitat, wetlands, riparian habitat);
- Adverse impacts to special-status plant and animal species;
- Adverse impacts to important or vulnerable resources as determined by scientific opinion or resource agency concerns (i.e. sensitive biotic communities, special status habitats; e.g. wetlands);
- Loss of critical breeding, feeding or roosting habitat; and
- Interference with migratory routes or habitat connectivity.

E.2 Recommendations

All project construction activities must be limited to the project footprint. Best Management Practices including silt and erosion control measures must be implemented to prevent off-site movement of sediment and dust during and post construction.

Construction fencing should be considered for installation along the edge of the new winery access road adjacent to the drainage along the buffer zone. No construction should be allowed under the canopy of the riparian zone adjacent to the proposed project. Construction fencing will ensure that no construction equipment, fill, staging or storage occurs in this area.

Project construction has the potential for disturbing raptors during breeding/bird nesting season (March 1 through July 31). A pre-construction survey of potential nesting raptor habitat within 500 feet of earthmoving activities should be conducted is construction begins during this time. Surveys should be conducted within 14 days prior to groundbreaking activities associated with road construction. If active nests are found during preconstruction surveys the project applicant should consult with the California Department of Fish and Game and obtain approval for appropriate buffers or delay construction until it is determined that all young have fledged.

F. SUMMARY

Our floristic survey did not identify any evidence for or reason to believe that special-status species known for the Quadrangle, surrounding Quadrangles, the property, or the region would be impacted by the project. The proposed project site does not contain vegetation associates, habitat or edaphic conditions, which would support special-status species.

We find that the project will not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.

With the project avoiding any construction or grading beneath the canopy of the riparian vegetation along the drainage on the east side of the project, we find that the project will not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the CDFW or USFWS.

We find that the project will not a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means.

We find that the project will not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. The project site does not contain any unique habitat, or unique plant or animal populations.

We find that the project will not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances.

We conclude that the proposed project with the implementation of Best Management Practices and recommendations presented above will not result in any potentially significant adverse biological impacts to the environment on site or off site.

Should you have any questions, please do not hesitate to contact us at:

Telephone (707) 544-3091,
Fax (707) 575-8030
Email kjeldsen@sonic.net

Kjeldsen Biological Consulting

G. LITERATURE CITED / REFERENCES

G.1 Literature Cited / References

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G.2 Names and Qualifications of Field Investigators.

Chris K. Kjeldsen, Ph.D., Botany, Oregon State University, Corvallis, Oregon. He has over thirty-five years of professional experience in the study of California flora. He was a member of the Sonoma County Planning Commission and Board of Zoning (1972 to 1976). He has over thirty years of experience in managing and conducting environmental projects involving impact assessment and preparation of compliance documents, Biological Assessments, DFW Habitat Assessments, DFW SB 34 Mitigation projects, COE Mitigation projects and State Parks and Recreation Biological Resource Studies. Experience includes conducting special-status species surveys, jurisdictional wetland delineations, general biological surveys, 404 and 1601-1603 permitting, and consulting on various projects. A full resume is available upon request. He has a valid DFW collecting permit.

Daniel T. Kjeldsen, B. S., Natural Resource Management, California Polytechnic State University, San Luis Obispo, California. He spent l994 to l996 in the Peace Corps managing natural resources in Honduras, Central America. His work for the Peace Corps in Central America focused on watershed inventory, mapping and the development and implementation of a protection plan. He has over ten years of experience in conducting Biological Assessments, DFW Habitat Assessments, ACOE wetland delineations, wetland rehabilitation, and development of and implementation of mitigation projects and mitigation monitoring. He has received 3.2 continuing education units MCLE 27 hours in Determining Federal Wetlands Jurisdiction from the University of California Berkeley Extension. Attended Wildlife Society Workshop Falconiformes of Northern California Natural History and Management California Tiger Salamander 2003, Natural History and Management of Bats Symposium 2005, Western Pond Turtle Workshop 2007, and Western Section Bat Workshop 2011. Laguna Foundation & The Wildlife Project Rare Pond Species Survey Techniques 2009. A full resume is available upon request.

Plate I. Site / Location Map (Glen Ellen Quadrangle)

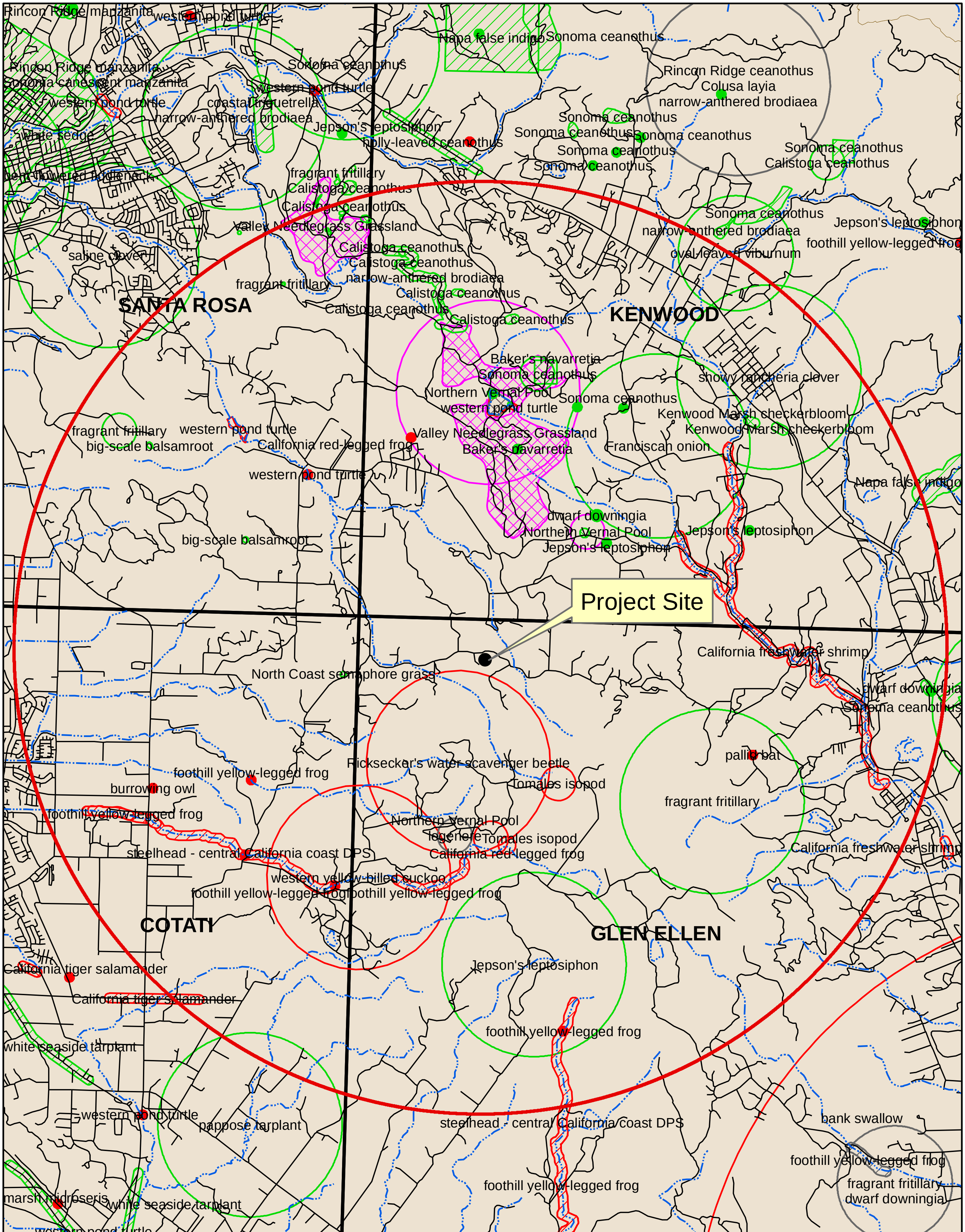

Plate II DFG CNDDB 5-Mile Search

0 0.5 1 2 Miles

(Data Date May 2013)

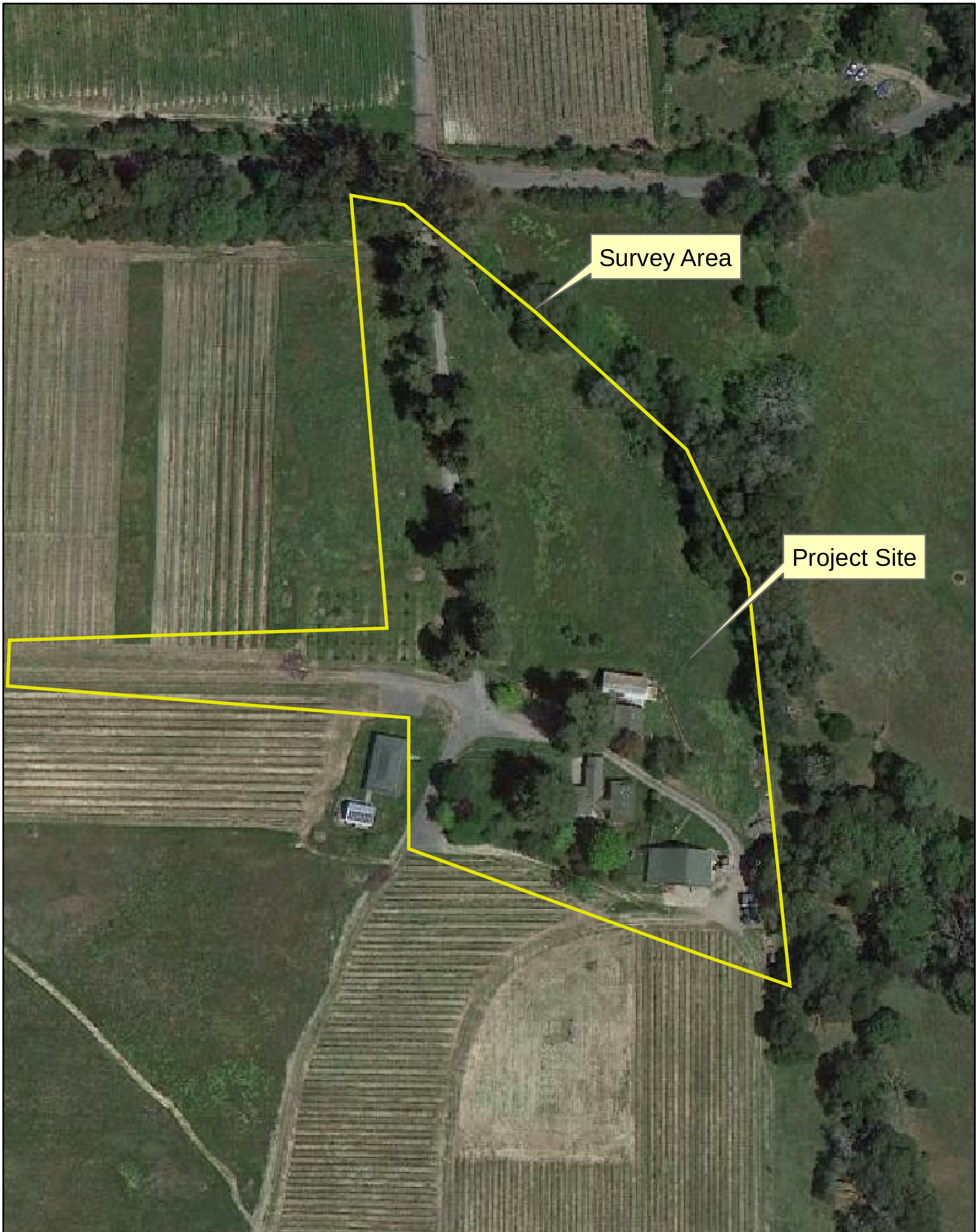

Plate III. Aerial Photo

Plate IV. Biological Resources Map

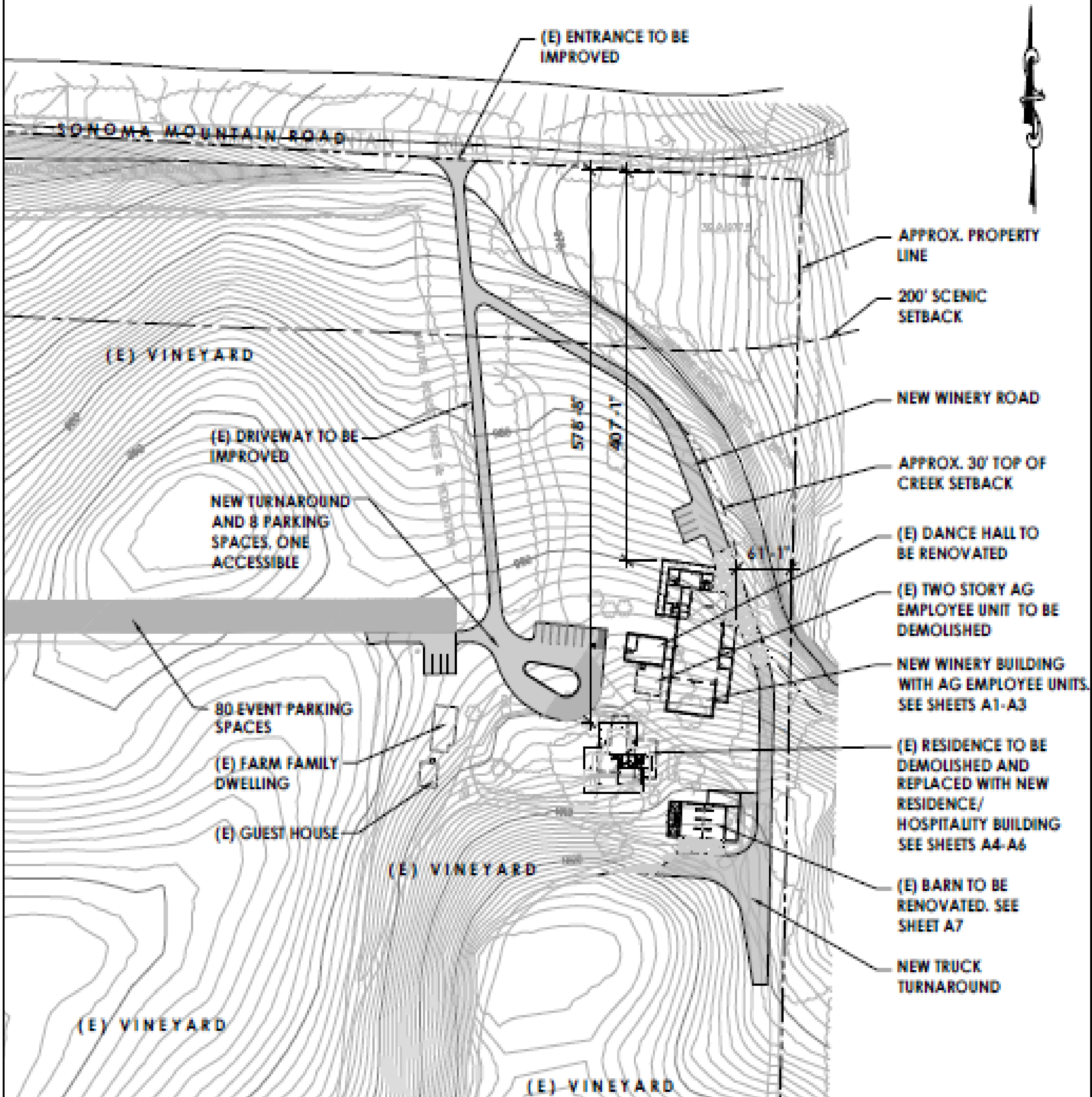

Plate V. Project Site Map

APPENDIX A

FLORA AND FAUNA

Plant Species Observed in the Vicinity of the Project Site

(Landscape plantings are not included unless they appear to have become naturalized and regenerating on site)

The nomenclature for the list of plants found on the project study areas and the immediate vicinity follows: Brodo, Irwin M., Sylvia Duran Sharnoff and Stephen Sharnoff, 2001, for the lichens; Arora - l985, for the fungi; S Norris and Shevrock - 2004, for the mosses; Doyle and Stotler - 2006 for liverworts and hornworts and Hickman-1993, for the vascular plants.

Habitat type indicates the general associated occurrence of the taxon on the project site or in nature.
Abundance refers to the relative number of individuals on the project site or in the region.

MAJOR PLANT GROUP Family Genus Common Name	Habitat Type	Abundance

NCN = No Common Name, * = Non-native, @= Voucher Specimen

FUNGI

Basidiomycota- Club Fungi

POLYPORACEAE

Genus / Common Name	Habitat Type	Abundance
Schizophyllum commune Split-gill	On Dead Wood	Common
Trametes versicolor Turkey Tail	On Dead Wood	Common

MOSSES

MINACEAE

Genus / Common Name	Habitat Type	Abundance
Alsia californica (W.J.Hooker&Arnott) Sullivant NCN	Coastal Forests On Trees	Common
Dendroalsia abietina (Hook.) Brit. NCN	On Trees	Common
Funaria hygrometrica Hedw. NCN	Ruderal, Burned Areas	Common
Hedwigia stellata Hedenas NCN	Grasslands on Rocks	Common
Homalothecium nuttallii (Wilson) Jaeger NCN	Epiphytic on Trees	Common
Orthotrichum lyellii Hook & Tayl. NCN	Trees, Upper Canopy	Common
Scleropodium touretii (Brid.) L Koch. NCN	On Tree Trunks	Common

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

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LICHENS

FOLIOSE

Genus / Common Name	Habitat Type	Abundance
Flavoparmelia caperata (L.) Hale	On Trees	Common
NCN		
Flavopunctilia flaventor (Stirt.) Hale	On Trees	Common
NCN		
Parmotrema perlatum (Osbeck) Hale & Ahti=*P. chinense*	On Trees	Common
NCN		
Phaeophysica decolor (Kashiw.) Essl.	On Rocks	Common
NCN		
Physcia adscendens (Fr.) H. Olivier	On Trees	Common
NCN		
Xanthoparmelia cumberlandia (Gyeln.) Hale	On Rocks	Common
NCN		
Xanthoparmelia mexicana (Gyeln.) Hale	On Rocks	Common
NCN		

FRUTICOSE

Genus / Common Name	Habitat Type	Abundance
Cladonia ssp.	On Soil	Common
NCN		
Cladonia fimbriata (L.) Fr.	On Soil	Occasional
Pixie Cups		
Evernia prunastri (L.) Ach.	On Trees	Common
NCN		
Ramalina farinacea (L.) Ach.	On Trees	Common
NCN		
Usnea intermedia=U. arizonica	On Trees	Common
NCN		

CRUSTOSE

Genus / Common Name	Habitat Type	Abundance
Caloplaca bolacina (Tuck.) Herre	On Rocks	Common
NCN		
Leicidia atrobrunnea (Ramond ex Lam. & DC.) Schaer.	On Rocks	Common
NCN		
Leicidia tessellata Flörke	On Rocks With Rings of Aapothecia	Common
NCN		
Ochrolechia orgonensis H. Magn.	On Bark	Common
NCN		
Pertusaria californica Dibben	On Trees	Common
NCN		
Thelomma californicum (Tuck.) Tibell	On Fence Posts	Common
Lobed Nipple Lichen		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

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VASCULAR PLANTS FERNS

AZOLLACEAE

Genus / Common Name	Habitat Type	Abundance
Azolla microphylla Kaulf	Aquatic	Common
Mexican Mosquito Fern, Duckweed Fern		

DRYOPTERIDACEAE

Genus / Common Name	Habitat Type	Abundance
Dryotpteris arguta (Kaulf.) Maxon	Roiparian	Common
Coastal Wood Fern		

PTERIDACEAE

Genus / Common Name	Habitat Type	Abundance
Pentagramma triangularis (Kaulf.)G.Yatsk. subsp. *triangularis*	Riparian	Common
Goldback Fern		

WOODSIACEAE

Genus / Common Name	Habitat Type	Abundance
Athyrium filix-fema (L.) Roth	Riparian	Common
Western Lady Fern		

VASCULAR PLANTS DIVISION CONIFEROPHYTA--GYMNOSPERMS

CUPRESSACEAE

Genus / Common Name	Habitat Type	Abundance
Hesperocyparis macrocarpa (Hartw.)Bartel	Domestic Introduction	Occasional
Monterey Cypress		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--DICOTYLEDONAE- TREES

MAGNOLIIDS

LAURACEAE

Genus / Common Name	Habitat Type	Abundance
Umbellularia californica (Hook.&Arn.) Nutt.	Riparian	Occasional
California Laurel, Sweet Bay, Pepperwood, California Bay		

EUDICOTS

BETULACEAE Birch Family

Genus / Common Name	Habitat Type	Abundance
Alnus rhombifolia Nutt.	Riparian	Common
White Alder		

FABACEAE Legume Family

Genus / Common Name	Habitat Type	Abundance
**Acacia melanoxylon* R. Br.	Escape	Occasional
Black Wood Acacia		

FAGACEAE Oak Family

Genus / Common Name	Habitat Type	Abundance
**Castanea dentate* Borkh.	Domestic	Common
Chestnut		
Quercus agrifolia Nee	Riparian	Common
Live Oak		
Quercus garryana Hook.	Riparian	Common
Oregon Oak		

MAJOR PLANT GROUP **Family** **Genus** **Common Name**	**Habitat Type**	**Abundance**

NCN = No Common Name, * = Non-native, @= Voucher Specimen

Quercus kelloggii Newb.	Riparian	Common
Black Oak		
Quercus lobata Nee.	Riparian	Common
Valley Oak		
JUGLANDACEAE Walnut Family		
**Juglans nigra* L.	Ruderal Escape	Common
Black Walnut		
MORACEAE Mulberry Family		
**Ficus carica* L.	Ruderal Escape	Occasional
Fig		
MYRTACEAE Myrtle family		
**Eucalyptus globulus* Labill	Ruderal Escape	Occasional
Blue Gum		
OLEACEAE Olive Family		
**Ligustrum* ssp.	Domestic Ruderal	Occasional
Privet		
**Olea europaea* L.	Domestic Ruderal	Occasional
Olive		
ROSACEAE Rose Family		
**Malus sylvestris* Mill.	Escape	Occasional
Apple		
**Prunus domestica* L.	Escape, Ruderal	Occasional
Prune		
**Prunus cerasifera* Ehrh.	Escape, Ruderal	Occasional
Cherry Plum		
**Pyrus communis* (L.)	Escape or Domestic	Occasional
Pear		
SALICACEAE Willow Family		
Salix laevigata Bebb.	Riparian	Common
Red Willow		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--DICOTYLEDONAE-SHRUBS AND WOODY VINES

EUDICOTS

ANACARDIACEAE Sumac Family		
Toxicodendron diversilobum (Torry&Gray) E.Green	Riparian	Common
Poison Oak		
APOCYANACEAE Dogbane Family		
**Nerium oleander* L.	Domestic Introduction	Common
Oleander		

MAJOR PLANT GROUP **Family** **Genus** **Common Name**	**Habitat Type**	**Abundance**

NCN = No Common Name, * = Non-native, @= Voucher Specimen

**Vinca major* L. Periwinkle	Riparian, Ruderal	Common
ARALIACEAE Ginsing Family		
**Hedra helix* L. English Ivy	Ruderal	Occasional
ASTERACEAE (Compositae) Sunflower Family		
Baccharis pilularis deCandolle Coyote Brush	Grasslands	Common
CAPRIFOLIACEAE Honeysuckle Family		
**Lonicera japonica* Murray Japanese Honeysuckle	Escape, Shrub/Scrub	Occasional
*Symphoricarpos albu*s (L.) SF Blake *var. laevigatus* Snowberry	Riparian	Common
LAMIACEAE Mint Family		
**Lavandula staechas* L. Lavender	Roadside Wafe	Occasional
**Rosmarinus officinalis* L. Rosemary	Domestic Introduction	Occasional
OLEACEAE Olive Family		
**Ligustrum* ssp. Privet	Domestic Escape	Occasional
**Syringa* ssp. Lilac	Domestic Escape	Occasional
ROSACEAE Rose Family		
**Cotoneaster pannosus* Franchet. Cotoneaster	Ruderal	Common
Heteromeles arbutifolia (Lind.) M. Rome. Christmas Berry, Toyon	Edge of Riparian	Common
**Rubus armeniacus* Focke Himalayan Blackberry	Ruderal	Common

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--DICOTYLEDONAE-HERBS

APIACEAE (Umbelliferae) Carrot Family		
**Dacus carota*L. Wild Carrot, Queen Anne's Lace	Ruderal Grasslands	Common
**Foeniculum vulgare* Mill. Fennel	Ruderal	Common

MAJOR PLANT GROUP		
Family		
Genus	Habitat Type	Abundance
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

ASTERACEAE (Compositae) Sunflower Family		
Achillea millefolium L.	Ruderal	Common
Yarrow		
**Anthemis cotula* L.	Ruderal	Common
Mayweed, Stinkweed, Dog-fennel		
**Carduus pycnocephalus* L.subsp.*pycnocephalus*	Grasslands	Common
Italian Thistle		
**Centaurea solstitalis* L.	Grasslands, Ruderal	Common
Yellow Star Thistle		
**Circium vulgare* (Savi) Ten.	Grasslands, Ruderal	Common
Bull Thistle		
**Helminthotheca echioides* (L.) Holub	Ruderal	Common
Ox-tongue (=*Picris echioides)*		
**Hypochaeris glabra* L.	Ruderal	Common
Cat's Ear		
**Hypochaeris radicata* L.	Ruderal	Common
Harry Cat’s Ear		
**Lactuca serriola* L.	Ruderal	Occasional
Prickly Lettuce		
**Matricaria discoidea* DC.	Ruderal	Common
Pineapple Weed, Rayless Chamomile = *Chamomilla suavolens)*		
**Senecio vulgaris* L.	Ruderal	Occasional
NCN		
**Silybum marianum* (L.) Gaertn.	Ruderal	Common
Milk Thistle		
**Sonchus asper* (L.) Hill var. *asper*	Ruderal	Common
Prickly Sow Thistle		
**Sonchus oleraceus* L.	Ruderal	Common
Common Sow Thistle		
**Taraxacum officinale* F.H.Wigg	Ruderal	Common
Dandelion		
BRASSICACEAE Mustard Family		
**Brassica nigra* (L.) Koch	Ruderal	Common
Black Mustard		
**Capsella bursa-pastoris* L.	Ruderal	Common
Shepherd's Purse		
**Cardamine hirsuta* L.	Ruderal	Common
Bitter-cress		
Cardamine oligosperma Nutt.	Ruderal	Common
Bitter-cress		

MAJOR PLANT GROUP

Family

Genus / **Common Name**	**Habitat Type**	**Abundance**

NCN = No Common Name, * = Non-native, @= Voucher Specimen

Hirschfeldia incana (L.) Lagr.-Fossat	Ruderal	Common
Summer Mustard		
Raphanus sativus L.	Ruderal	Common
Wild Radish		
EUPHORBIACEAE Spurge Family		
Croton setigerus Hook.	Ruderal	Common
Turkey Mullein, Dove Weed (=*Eremocarpus setigerus)*		
FABACEAE (Leguminosae) Legum Family		
Acmispon micranthus (Torr.&A. Gray)	Grasslands, Ruderal	Common
Small Flowered Lotus (= *Lotus micranthus)*		
Lathyrus odoratus L.	Ruderal Escape	Occasional
Sweet Pea		
Lotus corniculatus L.	Grasslands, Ruderal	Common
Birdfoot Trefoil		
Medicago arabica (L.) Huds	Ruderal	Common
Spotted Bur Clover		
Trifolium hirtum All.	Ruderal	Common
Rose Clover		
Vicia americana Wild. subsp. *americana*	Grassland	Common
American Vetch		
Vicia faba L.	Ruderal	Common
Broad Bean, Faba Bean		
Vicia sativa L. subsp. *nigra*	Grasslands, Ruderal	Common
Narrow Leaved-vetch		
Vicia villosa Roth. subsp. *varia*	Ruderal	Common
Hairy Vetch, Winter Vetch, Lana Vetch		
GERANIACEAE Geranium Family		
Erodium botrys (Cav.) Bertol.	Grasslands	Common
Broadleaf Filaree, Long-beaked Filaree		
Geranium dissectum L.	Grasslands	Common
Common Geranium		
Geranium molle L.	Grasslands	Common
Dove's Foot Geranium		
LAMIACEAE (Labiatae) Mint Family		
Stachys ajugoides Benth.	Moist Open Places	Occasional
Hedge-nettle		
MALVACEAE Mallow Family		
Malva parviflora L.	Ruderal	Common
Cheeseweed, Mallow		

MAJOR PLANT GROUP
Family

Genus / Common Name	Habitat Type	Abundance

NCN = No Common Name, * = Non-native, @= Voucher Specimen

Calandrinia ciliata Ruiz& Pav. DC.	Grasslands	Common
Red Maids		
Claytonia perfoliata Willd. ssp. *perfoliata*	Woodlands, Riparian	Common
Miners Lettuce		
MYRSINACEAE Myrsinaceae Family		
**Anagallis arvensis* L.	Ruderal	Common
Scarlet Pimpernel		
ONAGRACEAE Evening-primrose Family		
Clarkia purpurea (Curtis) Nels.&Macbr. subsp. *viminea*	Grasslands	Common
NCN		
Epilobium brachycarpum C.Presl	Ruderal Dry Areas	Common
Willow Herb		
OXILIDACEAE Oxalis Family		
**Oxalis pes-caprae* L.	Ruderal	Common
Bermuda Buttercup		
PAPAVERACEAE Poppy Family		
Eschscholzia californica Cahm.	Grasslands	Common
California Poppy		
PLANTAGINACEAE Plantain Family		
**Plantago lanceolata* L.	Ruderal	Common
English Plantain		
POLYGONACEAE Buckwheat Family		
**Polygonum agyrocoleon* Kunze	Ruderal Wet Ground	Occasional
Persian Wireweed		
**Rumex acetosella* L.	Ruderal	Common
Sheep Sorrel		
**Rumex crispus* L.	Ruderal	Common
Curly Dock		
RUBIACEAE Madder Family		
Galium aparine L.	Riparian, Ruderal	Common
Goose Grass		
URTICACEAE		
Urtica dioica L. subsp. *holosericea*	Riparian	Common
Stinging Nettle		
VISCACEAE Misteltoe Family		
Phoradendron serotinum (Raf.) Johnst. subsp. *tomentosum*	Riparian	Common
Oak Mistletoe		

MAJOR PLANT GROUP		
Family		
Genus	Habitat Type	Abundance
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--MONOCOTYLEDONAE-GRASSES

POACEAE Grass Family

Genus / Common Name	Habitat Type	Abundance
**Avena fatua* L.	Grasslands	Common
Wild Oat		
**Bromus diandrus* Roth	Ruderal, Grasslands	Common
Ripgut Grass		
**Bromus hordeaceus* L.	Grasslands	Common
Soft Chess, Blando Brome		
**Cynosurus echinatus* L.	Ruderal	Common
Hedgehog, Dogtail		
**Dactylis glomerata* L.	Grasslands	Occasional
Orchard Grass		
**Festuca bromoides* L.	Ruderal, Moist Flats become Dry	Common
Six-weeks Fescue *(=Vulpia bromoides)*		
Festuca microstachys Nutt.	Grasslands, Ruderal	Common
NCN (=*Vulpia microstachys)*		
**Festuca myuros* L.	Grasslands	Common
Rattail Fescue,Zorro Annual Fescue (=*Vulpia myuros)*		
**Festuca perennis* (L.) Columubus & Sm.	Grasslands	Common
Perennial Rye Grass (=*Lolium multiflorum, L. perenne)*		
**Holcus lanatus* L.	Grasslands, Ruderal	Common
Velvet Grass		
Hordeum brachyantherum Nevski subsp. *brachyantherum*	Grasslands	Occasional
Meadow Barley		
**Phalaris aquatica* L.	Grasslands	Common
Harding Grass		
**Poa annua* L.	Grasslands	Common
Annual Bluegrass		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--MONOCOTYLEDONAE-SEDGES AND RUSHES

CYPERACEAE Sedge Family

Genus / Common Name	Habitat Type	Abundance
@*Caryx praegracilis* Boott	Moist areas	Occasional
Black Creeper or Freway Sedge, Clustered Sedge		
Eleocharis macrostachya Britton	Riparian, Aquatic	Common
Spike Rush		
Schoenoplectus californicus (Mey.) Sojak	Palustrine	Occasional
Southernbull Rush.California Tule (=*Scirpus)*		

MAJOR PLANT GROUP		
Family		
Genus	**Habitat Type**	**Abundance**
Common Name		

NCN = No Common Name, * = Non-native, @= Voucher Specimen

JUNCACEAE

Juncus effusus L. *pacificus*	Seeps, Shorelines,Marshes	Common
Rush		

VASCULAR PLANTS DIVISION ANTHOPHYTA --ANGIOSPERMS
CLASS--MONOCOTYLEDONAE-HERBS

AGAVACEAE Centuray Plant Family

Chlorogalum *pomeridianum* (DC.) Kunth var. *pomeridianum*	Woodlands, Grasslands	
Soap Plant		Common

AMARYLLIDACEAE Amaryllis Family

Narcissus pseudonarcissus L.	Ruderal, Escape	Occasional
Daffodil		

IRIDACEAE Iris Family

Iris douglasiana Herb.	Open Grassland, Meadows	Common
Iris		
**Iris pseudoacoris* L.	Riparian	Common
Yellow Iris		

Fauna Species Observed in the Vicinity of the Project Site

The nomenclature for the animals found on the project site and in the immediate vicinity follows: Mc Ginnis –1984, for the fresh water fishes; Stebbins -l985, for the reptiles and amphibians; and Udvardy and Farrand – 1998, for the birds; and Jameson and Peeters -l988 for the mammals.

AMPHIBIA AND REPTILIA ORDER Common Name	Genus	Observed
ANURA		
Bullfrog	*Rana catesbeiana*	X
SQUAMATA		
Western Fence Lizard	*Sceloporus occidentalis*	X

AVES ORDER Common Name	Genus	Observed
AVES		
Acorn Woodpecker	*Melanerpes fomicivorus*	
American Robin	*Turdus migratorius*	X
Anna's Hummingbird	*Calypte anna*	X
Bufflehead	*Bucephala albeola*	X
Black Phoebe	*Sayornis nigricans*	X
California Quail	*Callipepla californica*	X
Common Crow	*Corvus brachyrhynchos*	X
Canada Goose	*Branta canadensis*	X
European Starling	*Sturnus vulgaris*	*X*
Green-winged Teal	*Anas crecca*	X
Red-tailed Hawk	*Cathartes aura*	X
Red-winged Blackbird	*Agelaius phoeniceus*	X
Scrub Jay	*Aphelocoma coerulescens*	X
Spotted Towhee	*Pipilo erythrophthalmus*	X
Wild Turkey	*Meleagris gallopavo*	X

MAMMALS **ORDER**		
Common Name	**Genus**	**Observed**
CARNIVORA		
Coyote	*Canis latrans*	Scat
CERVIDAE		
Black-tailed Deer	*Odocoileus hemionus*	Sight
RODENTIA		
Pocket Gopher	*Thomomys bottae*	Sight

APPENDIX B

Definitions used in Report and Regulatory Requirements

Definitions (Not all are relevant to this project)

Absolute Cover. The percentage of ground covered by the vertical projection of the plant crowns of a species or defined set of plants as viewed from above The absolute cover of herbaceous plants includes any standing (attached to a living palnt, and not lying on the grouns) plant parts, whether alive or dead; this deviniton escludes litter and other searated plant material. The cover may include mosses, lichens and recognizable cryptogamic crusts.

Alliance. A classification unit of vegetation containing one or more associations and defined by one or more diagnostic species, often of high cover, in the uppermost layer or the layer with the highest canopy cover. Alliance reflect regional to subregional climates, substrates, hydrology and disturbance regimes.

Association. A vegetation classification unit defined by a diagnostic species, a characteristic range of species composition physiognomy, and distinctive habitat conditions. Associations reflect local topo-edaphic climates, substrates, hydrology, and disturbance regimes.

Best Management Practices. Best management practices represent the construction or agricultural practices that are consistent with regulatory laws or industry standards which are prudent and consistent with site conditions.

Confidence Interval. The California Department of Fish and Game (DFW) California Natural Diversity Data Base (CNDDB) uses map polygon projections for indicating potential for occurrence of special-status plant populations around a recorded occurrence.

Critical Habitat. Critical habitat is by definition a designated by U.S. Fish and Wildlife Service as essential for the existence of a particular population of species. The U.S. Fish and Wildlife Service designates critical habitat for special-status species as an area or region within which a species may be found. "Critical habitat" is defined as areas essential for the "conservation" of the species in question.

Dominance. The extent to which a species or growth form has a strong influence in a stand because of its size abundance or cover.

Habitat Fragmentation. The issue of habitat fragmentation is of concern locally, nationally, and globally. The term habitat fragmentation refers to the loss of connections within the biosphere such that the movement, genetic exchange, and dispersal of native populations is restricted or prevented. Anthropogenic habitat fragmentation can be the result of a road construction, logging, agriculture, or urban growth. The practice of retaining or planning for "Corridors" is an attempt to address this issue. Corridors that allow movement of wildlife through and around a site include stream and riparian areas and also areas that connect two or more sites of critical wildlife habitat.

Habitat Types. Habitat types are used by DFW to categorize elements of nature associated with the physical and biological conditions in an area. These are of particular importance for the wildlife they support, and they are important as indicators of the potential for special-status species.

Relative Cover. A measure of the cover of a species in relation to that of other species within a set area or sample of vegetation. This is usually calculated for species that occur in the same layer (stratum) of vegetation, and this measure can be calculated across a group of samples.

Riparian Corridor. Riparian corridors can be defined as the stream channel between the low-water and high-water marks plus the terrestrial landscape above the high water-mark (where vegetation may be influenced by elevated water tables or extreme flooding and by the ability of the soils to hold water; Naiman, et. al. 1993).

Riparian Corridor or Riparian Ecosystem. Riparian ecosystems occupy the ecotone between upland and lotic aquatic realms. Riparian corridors can be defined as the stream channel between the low- and high-water marks plus the terrestrial landscape above the high water-mark (where vegetation may be influenced by elevated water tables or extreme flooding and by the ability of the soils to hold water; Naiman, et. al. 1993).

Ruderal Habitat. Ruderal habitat is characterized by disturbance and the establishment and dominance of non-native introduced weed species. Ruderal plant communities are a function of or result of agricultural or logging practices. This habitat is typically found along graded roads, erosional surfaces or sites influenced by agricultural animal populations.

Sensitive Habitat. DFW Natural Diversity Data Base uses environmentally sensitive plant communities for plant populations that are rare or threatened in nature. Sensitive habitat is defined as any area in which plant or animal life or their habitats are either rare or especially valuable and any area which meets one of the following criteria: (1) habitats containing or supporting "rare and endangered" species as defined by the State Fish and Game Commission, (2) all perennial and intermittent streams and their tributaries, (3) coastal tide lands and marshes, (4) coastal and offshore areas containing breeding or nesting sites and coastal areas used by migratory and resident water-associated birds for resting areas and feeding, (5) areas used for scientific study and research concerning fish and wildlife, (6) lakes and ponds and adjacent shore habitat, (7) existing game and wildlife refuges and reserves, and (8) sand dunes. Sensitive Habitat also includes wetlands and tributaries to “Waters of the US” as defined by the Corps of Engineers (ACOE) and DFW seasonal streams DFW.

Serpentinite. Serpentinite or serpentine consists of ultramafic rock outcrops that due to the unique mineral composition support a unique flora often of endemics. Kruckeberg, 1984, indicates that the taxonomy and evolutionary responses to serpentines include ”1) taxa endemic to serpentine, 2) local or regional indicator taxa, largely confined to serpentine in parts of their ranges, 3) indifferent or “bodenvag” taxa that range on and off serpentine, and 4) taxa that are excluded from serpentine.” Serpentine outcrops or serpentinites support numerous special-status plant taxa.

Special-status Species. Special-status organisms are plants or animals that have been designated by Federal or State agencies as rare, endangered, or threatened. We have also included plant species listed by the CNPS as "target organisms." The target species for the Quadrangle are discussed below. Section 15380 of the California Environmental Quality Act [CEQA (September, 1983)] has a discussion regarding non-listed (State) taxa. This section states that a plant (or animal) must be treated as Rare or Endangered even if it is not officially listed as such. If a person (or organization provides information showing that a taxa meets the State's definitions and criteria, then the taxa should be treated as such.

Standard Agricultural Practices. Standard agricultural practices are best management practices which are prudent as applied in the agricultural industry such as the use of regulated pesticides, methods of and timing of weed control, appropriate fertilizer application, irrigation management, frost protection, erosion control and soil conservation and management, and dust control among other practices.

Streams. The DFW definition of stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports wildlife, fish, or other aquatic life. This includes watercourses having a surface or subsurface flow that support or have supported riparian vegetation. DFW's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife.

Target organisms. Special-status species that are listed by: the California Department of Fish and recorded in the Natural Diversity Data Base for the Quadrangle and surrounding Quadrangles of the project site; the California Native Plant Society for the habitat present on the project site Quadrangle and surrounding Quadrangles; Federal Endangered and Threatened Species that Occur in the U.S.G.S. 7 1/2 Minute Quadrangle; our experience with the local flora and fauna; any species identified by local individuals that are considered to be rare in the region; and DFW Five Mile radius CNDDB Rarefind 3 search.

Wetlands. Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Many surface waters and wetlands in California meet the criteria for waters of the United States, including intermittent streams and seasonal lakes and wetlands.

Waters of the U.S. The term "Waters of the United States" refers to all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; all interstate waters, including interstate wetlands; all other waters such as interstate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds; the use degradation or destruction of which could affect interstate or foreign commerce including any such waters [among which include], all impediments of waters otherwise defined as waters of the United States under this definition.

Waters of the State. The term "Waters of the State" Section 13050 (e) of the California Water Code defines “waters of the State as “ any surface water or groundwater, including saline waters, within the boundaries of the state.”

Vernal Pools. Vernal pools are a type of seasonal wetland distinct for California and the western US. Typically they are associated with seasonal rainfall or “Mediterranean climate” and have a distinct flora and fauna, an impermeable or slowly permeable substrate and contain standing water for a portion of the year. They are characterized by a variable aquatic and dry regime with standing water during the spring plant growth regime. They have a high degree of endemism of flora and fauna.

Regulatory Permits

Federal Regulations

Federal Endangered Species Act Pursuant to the federal Endangered Species Act (ESA), the U.S. Fish and Wildlife Service (FWS) and the National Oceanic and Atmospheric Administration (NOAA), have authority over projects that may affect the continued existence of a species that is federally listed as threatened or endangered. Section 9 of ESA prohibits the take of a federally listed species; take is defined, in part, as killing, harming, or harassment and includes habitat modification or degradation where it actually results in death or injury to wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

Section 404 of the Clean Water Act Section 404 of the Clean Water Act establishes a requirement to obtain a permit before any activity that involves any discharge of dredged or fill material into “waters of the United States,” including wetlands. Waters of the United States include navigable waters of the United States, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries.

Army Corps of Engineers (ACOE) regulates and issues 404 permits for activities that involve the discharge of dredged or fill materials into waters of the United States. A Water Quality Certification 401 permit must also be obtain from the appropriate state agency stating that the fill is consistent with the state’s water quality standards and criteria. In California, the authority to grant water quality certification is delegated by the State Water Board to the nine Regional Water Quality Control Boards (RWQCB).

State Regulations

California Endangered Species Act Pursuant to the California Endangered Species Act (CESA) and Section 2081 of the Fish and Game Code, a permit from Department of Fish and Game (DFW) is required for projects that could result in the take of a state listed threatened or endangered species. Under CESA, “take” is defined as an activity that would directly or indirectly kill an individual of a species, but the definition does not include “harm” or “harass,” as the ESA does. As a result, the threshold for a take under CESA is higher than that under the ESA.

California Fish and Game Code Section 1600 – Lake and Streambed Alteration Permit. All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by DFW pursuant to Section 1600 of the California Fish and Game Code. Section 1600 states that it is unlawful for any person, government agency, state, local, or any public utility to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake or deposit or dispose of waste, debris, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake without first notifying DFW of such activity.

Porter-Cologne Water Quality Control Act Under the Porter-Cologne Water Quality Control Act, "waters of the state" fall under the jurisdiction of the RWQCB. Under the act, the RWQCB must prepare and periodically update water quality control basin plans. Each basin plan sets forth water quality standards for surface water and groundwater, as well as actions to control non-point and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters of the state must meet waste discharge requirements of the RWQCB, which may be issued in addition to a water quality certification or waiver under Section 401 of the Clean Water Act.

APPENDIX C.

California Native Plant Society Inventory of Special-Status Plants for the Quadrangle and Surrounding Quadrangles

DFW CNDDB Rare Find $ Special-status Species Listed for the Quadrangle and Surrounding Quadrangles

California Wildlife Habitat Relationship System Species Summary Report by Habitat Present

Inventory of Rare and Endangered Plants

CNPS California Native Plant Society

v7-13may 5-7-13

Status: search results - Thu, May. 23, 2013 15:10 ET c

Your Quad Selection: Glen Ellen (501D) 3812235, Petaluma River (484A) 3812225, Petaluma (484B) 3812226, Rutherford (500B) 3812244, Sonoma (500C) 3812234, Sears Point (483B) 3812224, Kenwood (501A) 3812245, Santa Rosa (501B) 3812246, Cotati (501C) 3812236

scientific	common	family	CNPS
Allium peninsulare var. franciscanum	Franciscan onion	Alliaceae	List 1B.2
Alopecurus aequalis var. sonomensis	Sonoma alopecurus	Poaceae	List 1B.1
Amorpha californica var. napensis	Napa false indigo	Fabaceae	List 1B.2
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	List 1B.2
Arctostaphylos bakeri ssp. bakeri	Baker's manzanita	Ericaceae	List 1B.1
Arctostaphylos canescens ssp. sonomensis	Sonoma canescent manzanita	Ericaceae	List 1B.2
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	Ericaceae	List 1B.1
Astragalus claranus	Clara Hunt's milk-vetch	Fabaceae	List 1B.1
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	List 1B.2
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	List 1B.2
Blennosperma bakeri	Sonoma sunshine	Asteraceae	List 1B.1

Brodiaea leptandra	narrow-anthered brodiaea	Themidaceae	List 1B.2
California macrophylla	round-leaved filaree	Geraniaceae	List 1B.1
Carex albida	Sonoma white sedge	Cyperaceae	List 1B.1
Ceanothus confusus	Rincon Ridge ceanothus	Rhamnaceae	List 1B.1
Ceanothus divergens	Calistoga ceanothus	Rhamnaceae	List 1B.2
Ceanothus purpureus	holly-leaved ceanothus	Rhamnaceae	List 1B.2
Ceanothus sonomensis	Sonoma ceanothus	Rhamnaceae	List 1B.2
Centromadia parryi ssp. parryi	pappose tarplant	Asteraceae	List 1B.2
Chloropyron maritimum ssp. palustre	Point Reyes bird's-beak	Orobanchaceae	List 1B.2
Chloropyron molle ssp. molle	soft bird's-beak	Orobanchaceae	List 1B.2
Chorizanthe valida	Sonoma spineflower	Polygonaceae	List 1B.1
Delphinium bakeri	Baker's larkspur	Ranunculaceae	List 1B.1
Delphinium luteum	golden larkspur	Ranunculaceae	List 1B.1
Downingia pusilla	dwarf downingia	Campanulaceae	List 2.2
Erigeron biolettii	streamside daisy	Asteraceae	List 3
Erigeron greenei	Greene's narrow-leaved daisy	Asteraceae	List 1B.2

Eriogonum luteolum var. caninum	Tiburon buckwheat	Polygonaceae	List 1B.2
Fritillaria liliacea	fragrant fritillary	Liliaceae	List 1B.2
Hemizonia congesta ssp. congesta	white seaside tarplant	Asteraceae	List 1B.2
Hesperolinon congestum	Marin western flax	Linaceae	List 1B.1
Horkelia tenuiloba	thin-lobed horkelia	Rosaceae	List 1B.2
Lasthenia burkei	Burke's goldfields	Asteraceae	List 1B.1
Lasthenia conjugens	Contra Costa goldfields	Asteraceae	List 1B.1
Layia septentrionalis	Colusa layia	Asteraceae	List 1B.2
Legenere limosa	legenere	Campanulaceae	List 1B.1
Leptosiphon jepsonii	Jepson's leptosiphon	Polemoniaceae	List 1B.2
Lessingia hololeuca	woolly-headed lessingia	Asteraceae	List 3
Limnanthes vinculans	Sebastopol meadowfoam	Limnanthaceae	List 1B.1
Lupinus sericatus	Cobb Mountain lupine	Fabaceae	List 1B.2
Micropus amphibolus	Mt. Diablo cottonweed	Asteraceae	List 3.2
Microseris paludosa	marsh microseris	Asteraceae	List 1B.2
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	List 1B.1

Navarretia leucocephala ssp. plieantha	many-flowered navarretia	Polemoniaceae	List 1B.2
Penstemon newberryi var. sonomensis	Sonoma beardtongue	Plantaginaceae	List 1B.3
Plagiobothrys mollis var. vestitus	Petaluma popcorn-flower	Boraginaceae	List 1A
Pleuropogon hooverianus	North Coast semaphore grass	Poaceae	List 1B.1
Polygonum marinense	Marin knotweed	Polygonaceae	List 3.1
Rhynchospora globularis	round-headed beaked-rush	Cyperaceae	List 2.1
Sidalcea calycosa ssp. rhizomata	Point Reyes checkerbloom	Malvaceae	List 1B.2
Sidalcea oregana ssp. valida	Kenwood Marsh checkerbloom	Malvaceae	List 1B.1
Trifolium amoenum	two-fork clover	Fabaceae	List 1B.1
Trifolium hydrophilum	saline clover	Fabaceae	List 1B.2
Triquetrella californica	coastal triquetrella	Pottiaceae	List 1B.2
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	List 2.3

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Adela oplerella Opler's longhorn moth	IILEE0G040	None	None	G2G3	S2S3	
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	None	G2G3	S2	SSC
Allium peninsulare var. franciscanum Franciscan onion	PMLIL021R1	None	None	G5T2	S2.2	1B.2
Alopecurus aequalis var. sonomensis Sonoma alopecurus	PMPOA07012	Endangered	None	G5T1Q	S1	1B.1
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	SSC
Amorpha californica var. napensis Napa false indigo	PDFAB08012	None	None	G4T2	S2.2	1B.2
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G2?	S2?	1B.2
Andrena blennospermatis Blennosperma vernal pool andrenid bee	IIHYM35030	None	None	G2	S2	
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Arctostaphylos canescens ssp. sonomensis Sonoma canescent manzanita	PDERI04066	None	None	G3G4T2	S2.1	1B.2
Arctostaphylos stanfordiana ssp. decumbens Rincon Ridge manzanita	PDERI041G4	None	None	G3T1	S1	1B.1
Astragalus claranus Clara Hunt's milk-vetch	PDFAB0F240	Endangered	Threatened	G1	S1	1B.1
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T2	S2	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S2	SSC
Balsamorhiza macrolepis big-scale balsamroot	PDAST11061	None	None	G2	S2	1B.2
Blennosperma bakeri Sonoma sunshine	PDAST1A010	Endangered	Endangered	G1	S1	1B.1
Brodiaea leptandra narrow-anthered brodiaea	PMLIL0C022	None	None	G2G3	S2S3.2	1B.2
Caecidotea tomalensis Tomales isopod	ICMAL01220	None	None	G2	S2	
Calicina diminua Marin blind harvestman	ILARAU8040	None	None	G1	S1	
California macrophylla round-leaved filaree	PDGER01070	None	None	G2	S2	1B.1
Carex albida white sedge	PMCYP030D0	Endangered	Endangered	G1	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Ceanothus confusus Rincon Ridge ceanothus	PDRHA04220	None	None	G2	S2.2	1B.1
Ceanothus divergens Calistoga ceanothus	PDRHA04240	None	None	G2	S2.2	1B.2
Ceanothus purpureus holly-leaved ceanothus	PDRHA04160	None	None	G2	S2	1B.2
Ceanothus sonomensis Sonoma ceanothus	PDRHA04420	None	None	G2	S2.2	1B.2
Centromadia parryi ssp. parryi pappose tarplant	PDAST4R0P2	None	None	G4T1	S1	1B.2
Chloropyron maritimum ssp. palustre Point Reyes bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2.2	1B.2
Chloropyron molle ssp. molle soft bird's-beak	PDSCR0J0D2	Endangered	Rare	G2T1	S1	1B.2
Chorizanthe valida Sonoma spineflower	PDPGN040V0	Endangered	Endangered	G1	S1	1B.1
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Candidate	Endangered	G5T3Q	S1	
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2S3	SSC
Cypseloides niger black swift	ABNUA01010	None	None	G4	S2	SSC
Danaus plexippus monarch butterfly	IILEPP2010	None	None	G5	S3	
Delphinium luteum golden larkspur	PDRAN0B0Z0	Endangered	Rare	G1	S1	1B.1
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	G2	S2	2.2
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erigeron greenei Greene's narrow-leaved daisy	PDAST3M5G0	None	None	G2	S2	1B.2
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T2	S2	SSC
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S2	FP

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Hemizonia congesta ssp. congesta white seaside tarplant	PDAST4R065	None	None	G5T2T3	S2S3	1B.2
Hesperolinon congestum Marin western flax	PDLIN01060	Threatened	Threatened	G2	S2	1B.1
Horkelia tenuiloba thin-lobed horkelia	PDROS0W0E0	None	None	G2	S2.2	1B.2
Hydrochara rickseckeri Ricksecker's water scavenger beetle	IICOL5V010	None	None	G1G2	S1S2	
Hydroporus leechi Leech's skyline diving beetle	IICOL55040	None	None	G1?	S1?	
Lasthenia burkei Burke's goldfields	PDAST5L010	Endangered	Endangered	G1	S1	1B.1
Lasthenia conjugens Contra Costa goldfields	PDAST5L040	Endangered	None	G1	S1	1B.1
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G4T1	S1	FP
Layia septentrionalis Colusa layia	PDAST5N0F0	None	None	G2	S2.2	1B.2
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2.2	1B.1
Leptosiphon jepsonii Jepson's leptosiphon	PDPLM09140	None	None	G2	S2	1B.2
Limnanthes vinculans Sebastopol meadowfoam	PDLIM02090	Endangered	Endangered	G1	S1	1B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G3	S2S3	
Lupinus sericatus Cobb Mountain lupine	PDFAB2B3J0	None	None	G2	S2.2	1B.2
Melospiza melodia samuelis San Pablo song sparrow	ABPBXA301W	None	None	G5T2?	S2?	SSC
Microseris paludosa marsh microseris	PDAST6E0D0	None	None	G2	S2.2	1B.2
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Northern Vernal Pool Northern Vernal Pool	CTT44100CA	None	None	G2	S2.1	
Oncorhynchus mykiss irideus steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2Q	S2	
Penstemon newberryi var. sonomensis Sonoma beardtongue	PDSCR1L483	None	None	G4T1	S2	1B.3

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Plagiobothrys mollis var. vestitus Petaluma popcornflower	PDBOR0V0Q2	None	None	G4?TX	SX	1A
Pleuropogon hooverianus North Coast semaphore grass	PMPOA4Y070	None	Threatened	G2	S2	1B.1
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	G2	S2	SSC
Polygonum marinense Marin knotweed	PDPGN0L1C0	None	None	G2Q	S2	3.1
Rallus longirostris obsoletus California clapper rail	ABNME05016	Endangered	Endangered	G5T1	S1	FP
Rana boylii foothill yellow-legged frog	AAABH01050	None	None	G3	S2S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G4T2T3	S2S3	SSC
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2S3	
Sidalcea calycosa ssp. rhizomata Point Reyes checkerbloom	PDMAL11012	None	None	G5T2	S2.2	1B.2
Sidalcea oregana ssp. valida Kenwood Marsh checkerbloom	PDMAL110K5	Endangered	Endangered	G5T1	S1	1B.1
Sorex ornatus sinuosus Suisun shrew	AMABA01103	None	None	G5T1	S1	SSC
Speyeria zerene myrtleae Myrtle's silverspot	IILEPJ6089	Endangered	None	G5T1	S1	
Streptanthus hesperidis green jewel-flower	PDBRA2G510	None	None	G2	S2	1B.2
Syncaris pacifica California freshwater shrimp	ICMAL27010	Endangered	Endangered	G1	S1	
Talanites ubicki Ubick's gnaphosid spider	ILARA98030	None	None	G1	S1	
Taxidea taxus American badger	AMAJF04010	None	None	G5	S4	SSC
Trifolium amoenum showy rancheria clover	PDFAB40040	Endangered	None	G1	S1	1B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G1	S1	1B.2
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2G3	S2S3	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Valley Needlegrass Grassland Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G5	S2.3	2.3

Record Count: 86

CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS SYSTEM
Supported by
CALIFORNIA INTERAGENCY WILDLIFE TASK GROUP
and maintained by the
CALIFORNIA DEPARTMENT OF FISH AND GAME
Database Version: 8.2 (2008)

SPECIES SUMMARY REPORT

	3=California Endangered	7=California Species of Special Concern	11=BLM Sensitive
	4=California Threatened	8=Federally-Proposed Endangered	12=USFS Sensitive
1=Federal Endangered	5=California Fully Protected	9=Federally-Proposed Threatened	13=CDF Sensitive
2=Federal Threatened	6=California Protected	10=Federal Candidate	14=Harvest

Note: Any given status code for a species may apply to the full species or to only one or more subspecies or distinct population segments.

ID	SPECIES NAME	STATUS								
B117	NORTHERN GOSHAWK						7	11	12	13
B121	SWAINSON'S HAWK				4				12	
B272	LONG-EARED OWL						7			
M117	DEER MOUSE						7			
R046	RUBBER BOA				4				12	
R053	STRIPED RACER		2		4					
R057	GOPHER SNAKE						7			
R059	CALIFORNIA MOUNTAIN KINGSNAKE						7		12	
R061	COMMON GARTER SNAKE	1		3		5	7			

Total Number of Species: 9

DUDEK

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January 2016

Ms. Laura Peltz
Senior Environmental Specialist
Sonoma County Permit and Resource Management Department
2550 Ventura Avenue
Santa Rosa, CA 95403

Subject: Biological Constraints Evaluation within the Belden Barns Property in Sonoma County, Santa Rosa, California

Dear Ms. Peltz:

This memo provides the results of a biological resources constraints evaluation conducted within the Belden Barns property (property) on October 6, 2015 by Dudek Biologist Laura Burris. This memo describes methods for a literature review, field visit, and the results of the field visit including vegetation communities within the property, special-status species occurrences within the general vicinity, potential for special-status species to occur on the property, and any potential constraints to development associated with biological resources or wetlands on the property.

PROJECT DESCRIPTION

The proposed Belden Barns project involves construction and operation of a winemaking, farmstead food production, and farmstead product and wine tasting facility on a 55-acre property located at 5561 Sonoma Mountain Road in Sonoma County. The farmstead products would include fresh/preserved vegetables/fruits, eggs, charcuterie and cheeses. The proposed project would include three primary uses with supporting uses and structures: (1) creamery and winery facility, (2) farmstead and wine tasting room, and (3) agricultural promotional events. The project would also expand the existing vegetable garden and fruit orchard by 2 acres, reintroduce livestock grazing on approximately 6 acres, and construct an animal barn near the middle of the southern property boundary adjacent to existing vineyards.

SITE LOCATION AND ENVIRONMENTAL SETTING

The property is located in the North Coast Range Mountains approximately 5.5 miles east-northeast of the City of Rohnert Park, California.

The property consists primarily of vineyards and ranch infrastructure with landscape plantings, agricultural grasslands, a small amount of oak woodland, and a pond used for irrigation purposes. There are several existing buildings on the property, including residences and a barn. The property is located in rolling hills east of the Santa Rosa Plain with elevations ranging from approximately 920 feet above mean sea level (AMSL) in the southwestern corner of the property to about 1075 feet AMSL in the southeastern corner of the property. Surrounding land uses include vineyards, residential homes on large parcels, and open space.

METHODS

Dudek biologist Laura Burris conducted a survey of the property on October 6, 2015. Habitat areas evaluated as part of this assessment included the overall property; however, the focus of the assessment was the areas proposed for potential development.

Prior to fieldwork, a list of potentially occurring special status species was generated from review of the California Natural Diversity Database (CNDDB) (CDFW 2015), the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2015), and the U.S. Fish and Wildlife Service (USFWS) lists of federal endangered and threatened species (USFWS 2015) for all or some combination of the following U.S. Geological Survey 7.5-minute quadrangles: Santa Rosa, Kenwood, Rutherford, Cotati, Glen Ellen, Sonoma, Petaluma, Petaluma River, and Sears Point.

The potential for occurrence of those species identified in the records search were then evaluated based on the habitat requirements of each species relative to the observed existing conditions, results of previous general and focused habitat assessments and surveys for plants and animals conducted in the spring and summer of 2013 (Kjeldsen Biological Consultants), and a site visit conducted by a Dudek biologist on October 6, 2015. Other sources used included existing biological literature of the region identified by the CDFW or the USFWS.

RESULTS

The following results are based on a review of available project documents, results of the records searches, and information obtained during the field reconnaissance survey.

Vegetation Communities and Associated Wildlife Habitats

The communities identified on the project site are broadly classified, whenever possible, into alliances and associations as described in *A Manual of California Vegetation* (Sawyer et al., 2009). The project footprint is entirely within a developed landscape that has been in agriculture use for decades. The footprint is either within or on hardscape or agricultural grassland. *A Manual of California Vegetation* identifies the agricultural grassland as grassland semi-natural herbaceous stands with herbaceous layer (annual grassland). One un-named drainage flows through the property and is located east of the proposed development area. This drainage supports a riparian vegetation community. The main vegetation communities and associated wildlife habitats are described below.

Grasslands

Semi-Natural Herbaceous Stands with Herbaceous Layer

Semi-natural herbaceous grasslands are a result of decades of grazing and the introduction of non-native grasses and herbs. Semi-natural stands are those dominated by non-native species that have become naturalized primarily as a result of historic agricultural practices and fire suppression or management practices for weed abatement and fire suppression. Grasslands are found throughout the project site. This community occurs on portions of the northeastern corner, as well as throughout the middle and southwestern regions of the property. Semi-natural grasslands are comprised of primarily non-native species with native species forming only a small percentage of the herbaceous cover. A study of the project site by Kjeldsen Biological Consulting (2013) found the grassland on the project site is co-dominated by *Avena barbata* and *A. fatua* (wild oats). Common non-native grasses and forbs found in the annual grassland on the project site include species such as annual bluegrass (*Poa annua*), birdfoot trefoil (*Lotus corniculatus*), broadleaf filaree (*Erodium botrys*), bull thistle (*Cirsium vulgare*), bur clover (*Medicago polymorpha*), cat's ear (*Hypochaeris glabra* and *H. radicata*), common geranium (*Geranium dissectum and G. molle*), harding grass (*Phalaris aquatica*), narrow leaved-vetch (*Vicia sativa*), orchard grass (*Dactylis glomerata*), rattail fescue (*Festuca myuros*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), velvet grass (*Holcus lanatus*), and yellow star thistle (*Centaurea solstitialis*). Native grasses and forbs found on the project site include species such as American vetch (*Vicia americana*), California poppy (*Eschscholzia californica*), coyote brush (*Baccharis pilularis*), meadow barley (*Hordeum brachyantherum*), purple clarkia (*Clarkia purpurea*), and red maids (*Calandrinia ciliata*).

Animal species that typically inhabit grassland habitats are those that have adapted to dry conditions. These are grazing species, burrowing species, and their predators; insects and spiders are abundant. Some species forage in grassland and retreat to the protective cover of other habitats for shelter and nesting, while others disperse through this habitat. Animal species generally found in annual grassland habitats include mammals, such as black-tailed jackrabbit (*Lepus californicus*), pocket gopher (*Thomomys bottae*), coyote (*Canis latrans*), and red-tailed hawk (*Buteo jamaicensis*). Reptiles are also frequently found in grassland habitats, such as gopher snake (*Pituophis catenifer*), Northern Pacific rattlesnake (*Crotalus oreganus oreganus*), and western fence lizard (*Sceloporus occidentalis*).

Riparian Habitat

An unnamed ephemeral drainage runs through the property on the east end near the proposed development which contains riparian habitat. Riparian vegetation functions to control water temperature, regulate nutrient supply (biofilters), bank stabilization, rate of runoff, wildlife habitat (shelter and food), release of allochthonous material, release of woody debris which functions as habitat and slow nutrient release, and protection for aquatic organisms. The riparian habitat on site is located around the unnamed drainage on the northeast portion of the property. The overstory is dominated by the coast live oak (*Quercus agrifolia*) with Himalayan blackberry (*Rubus armeniacus*) and periwinkle (*Vinca major*) composing the dominant understory.

South Fork Matanzas Creek is located along the southwestern edge of the property. The riparian corridor associated with this creek is similar to that along the unnamed drainage; however, it is larger in size and nonnative vegetation such as Himalayan blackberry and periwinkle are less prevalent in the understory.

Animal species that inhabit riparian areas include a variety of aquatic, semi-aquatic and terrestrial species. Streamside vegetation provides habitat and food sources for many land species while the water provides reproductive habitat and food sources for many aquatic species. Animal species generally found in riparian habitats include birds such as quail (*Callipepla californica*), tricolored blackbird (*Agelaius tricolor*), amphibians such as the California red legged frog (*Rana draytonii*), and reptiles such as the western pond turtle (*Emys marmorata*).

Developed

Developed areas found on the project site include those that are used for agriculture and rural residential purposes. Each of these types of developments is described below.

<u>Agriculture</u>

Agricultural areas on the Belden Barns Farmstead and Winery project site are limited to vineyards, fruit orchards, and vegetable plots. These agricultural areas are comprised of primarily non-native species including apples (*Malus sylvestris*), figs (*Ficus carica*), pears (*Pyrus communis*), prunes and plums (*Prunus domestica* and *P. cerasifera*), olives (*Olea* *europaea*), and wine grapes (*Vitis vinifera*). Grasses and forbs, such as those found in the grasslands (described above), occur between the rows of vines, fruits, and vegetables.

Vineyards, fruit orchards, and vegetable plots provide foraging habitat for bats such as pallid bats (*Antrozous pallidus*), and birds such as songbirds (Passeriformes). Many animal species adapted to this habitat forage here and retreat to surrounding habitats for shelter and nesting.

Irrigation Pond

A pond currently utilized for irrigation of the vineyards, orchards, and gardens occurs in the grasslands at the southeastern portion of the site. This man-made agricultural pond is relatively large (approximately 375 feet long by 300 feet wide) with an apparent maximum water depth of about 15 to 20 feet and an apparent average depth of about 10 to 12 feet. The banks of the pond support emergent vegetation such as bulrush (*Schoenoplectus acutus*), rushes (*Juncus* spp.), and common knotweed (*Persicaria hydropiperoides*). This pond and the surrounding vegetation may be utilized by birds, western pond turtle (*Actinemys marmorata*), and amphibians such as California red-legged frog and bullfrog.

Rural Residential

The property has a history of serving as a retreat center, farm, or as a vineyard. The site is currently developed with an agricultural complex which was fairly typical of the early twentieth century. There are three dwellings, an old barn, and some accessory structures. The proposed project would replace existing structures and construct additional structures in the already developed parts of the northeast corner of the property. The residences in this area are surrounded by cultivated vegetation commonly associated with landscaping. Some of these species include cypress trees (*Hesperocyparis macrocarpa*), ivy (*Hedera helix*), Japanese honeysuckle (*Lonicera japonica*), lavender (*Lavandula staechas*), lilac (*Syringa* spp.), oleander (*Nerium oleander*) and roses (*Rosa* spp.). The vegetation can provide suitable nesting habitat for various bird species, such as songbirds or scrub jays (*Aphelocoma coerulescens*). Man-made buildings, such as the existing animal barn, provide roosting habitat for various bat species, such as the pallid bat (*Antrozous pallidus*).

Sensitive Natural Communities

Sensitive natural communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. The CDFW CNDDB identifies sensitive habitat types for the quadrangles and surrounding quadrangles as coastal and valley freshwater marsh, northern vernal pool, and valley needle grass grassland. None of these habitat types were present on the project site at the time of the site survey.

In addition to the sensitive natural communities as described in the CNDDB, wetlands and other waters, and riparian habitat and vegetation are considered sensitive communities. The surveys found no seasonal wetlands associated with the footprint of the proposed project. An unnamed drainage runs through the property on the east end near the proposed development and eventually drains to South Fork Matanzas Creek, which would be considered a "water of the state" and a "water of the United States". Because the unnamed tributary is hydrologically connected to South Fork Matanzas Creek, it may also be considered jurisdictional under the Clean Water Act.

Special-status Plant Species

Based on review of the databases, other information sources, and conditions documented during the site visit, 74 special-status plant species were documented as occurring or potentially occurring in the vicinity of the project site, and having varying potential for occurrence within the vegetation communities present on the site (Attachment 1). Of these species, four had a moderate potential to occur on the project site and include: Bent-flowered fiddleneck (*Amsinckia lunaris*), Big-scale balsamroot (*Balsamohiza macrolepis*), Narrow-anthered brodiaea (*Brodiaea leptandra*), and fragrant fritillary (*Fritiallaria liliacea*). The remaining special-status plants are not expected to occur on the project site—species ranked with "no" or "low" potential—for varying reasons such as the absence of suitable habitat requirements for the species, the distance to known occurrences, and/or the species distribution ranges, and are not discussed further.

Although the grassland onsite provides potentially suitable habitat for these special-status plant species, the annual grassland is highly disturbed by past agricultural activities and provides very marginal habitat for these species. The site visit conducted in October, 2015 were conducted outside the time period when these plants would be evident and identifiable. However, botanical surveys conducted in the spring and summer of 2013, which were within the period when these special-status plant species would be evident and identifiable, did not find evidence of any special-status plant species.

Special-status Animal Species

Based on results of surveys, review of the databases and other information sources, 46 special-status animal species have been documented as occurring or potentially occurring in the vicinity of the project site and having varying potential for occurrence within the habitats present on the site (Attachment 1). Of these species, five are considered to have a moderate to high potential for occurring and include California red-legged frog (*Rana draytonii*), western pond turtle (*Emys marmorata*), Ferruginous hawk (*Buteo regalis*), pallid bat (*Antrozous pallidus*), and American badger (*Taxidea taxus*). The remaining special-status animals are not expected to occur on the project site—species ranked with “no” or “low” potential—for varying reasons such as the absence of essential habitat requirements for the species, the distance to known occurrences and/or the species distribution ranges, and/or the limited availability of suitable habitat, and are not discussed further.

The irrigation pond provides potentially suitable aquatic habitat for California red-legged frog and western pond turtle. The surrounding grassland provides potentially suitable upland habitat for these species, as well as potentially suitable habitat for American badger and foraging habitat for ferruginous hawk and pallid bat. None of these species or sign of these species (such as active dens for American badger) were observed during the site visit. Although they were not observed during the survey, there is still moderate potential for California red-legged frog to occur within the irrigation pond. To avoid potential impacts to this species, avoidance and minimizations measures are recommended for project construction, below.

Recommended Avoidance and Minimization Measures

If construction activities are scheduled to occur during the breeding season for birds (February 1 through August 31), preconstruction surveys by a biologist of all potential nesting habitat within 500 feet of construction activities, where accessible, shall be conducted. Surveys should be conducted within 14 days prior to construction. If active nests are found during the preconstruction survey, a no-disturbance buffer shall be created around active nests until it is determined by a qualified biologist that all young have fledged or the nest is no longer active. Buffers shall be established based on species of bird in conjunction with the California Department of Fish and Wildlife.

A preconstruction survey for roosting bats shall be conducted prior to demolition of the barn. The survey shall be conducted by a qualified biologist during a time when bats would be expected to be present and active. If roosting bats are present, appropriate exclusion devices shall be installed to prevent roosting bats from being in the facility when demolition occurs.

Since California red-legged frog could potentially be present in the pond, a buffer area of 75 feet around the pond is recommended to provide sufficient refugia for frogs around the perimeter of the pond. It is also recommended that vegetation within this 75 foot buffer area remain in a relatively natural state (i.e., no mowing or vegetation removal, spraying, or other ground disturbance/maintenance activities). Additionally, the area between the pond and the South Fork Matanzas Creek in the southwestern corner of the property should remain as grassland habitat since this is the most likely path for frogs to use when dispersing from the pond (if present). However, light livestock grazing in this area would be an acceptable practice and would not interfere with movement of frogs to and from the pond.

The pond should also be managed to support the potential presence (breeding, etc.) and continued existence of California red-legged frog (if present) on the property. To ensure that the pond is managed to protect California red-legged frog, water withdrawal from the pond should not occur from December through May 1 each year to avoid stranding eggs above the water line, and to avoid entrainment of tadpoles through the intake water structure at the eastern end of the pond. Additionally, the intake pipe will be fitted with a passive intake screen (with a mesh size of ¼ inch) that allows withdrawal of water at a low, uniform velocity. Water velocities of 10 cm/s or less at the intake screen should eliminate the potential for entrainment of tadpoles into the water system if present.

For the protection of riparian areas, and in accordance to County Code Section 7-14.5, setbacks of at least 30 feet from the stream shall be established and demarcated in fencing prior to construction. No construction shall take place within this setback.

SUMMARY/CONCLUSIONS

The irrigation pond provides potentially suitable breeding habitat for California red-legged frog and wester pond turtle. There is potential for nesting birds to be present if construction takes place during the nesting bird season. There is one drainage that is potentially jurisdictional within the project area. Implementation of the avoidance and mitigation measures and management activities described above should be sufficient to protect the pond and any associated special-status species (if present), as well as stream corridors.

If you have any questions regarding this report, please contact me via telephone at 916.835.9671 or email at lburris@dudek.com.

Sincerely,

Laura Burris

Laura Burris
Biologist

Att. 1 – Special-status Species Database Search Results

REFERENCES

CDFG (California Department of Fish and Game). 2010. List of Vegetation Alliances and Associations: Natural Communities List Arranged Alphabetically by Life Form. September 2010. Accessed September 11 2015. http://www.dfg.ca.gov/biogeodata/vegcamp/natural_comm_list.asp.

CDFW (California Department of Fish and Wildlife). 2015. California Natural Diversity Database (CNDDB) Rarefind Version 5 (Commercial Subscription). Sacramento, California: CDFW, wildlife and habitat data analysis branch. Accessed September 11 2015.

CNPS (California Native Plant Society). 2015. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society. Sacramento, California. Website http://www.rareplants.cnps.org. Accessed on September 11, 2015.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A manual of California Vegetation, Second Edition*. California Native Plant Society, Sacramento, CA.

USFWS (U.S. Fish and Wildlife Service). 2015. “Belden Barns IPaC Trust Resource Report.” Generated September 11, 2015.

ATTACHMENT 1

Special-status Species Database Search Results

Query Criteria: Quad is (Glen Ellen (3812235) or Kenwood (3812245) or Petaluma (3812226) or Petaluma River (3812225) or Rutherford (3812244) or Santa Rosa (3812246) or Sears Point (3812224) or Sonoma (3812234))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Adela oplerella Opler's longhorn moth	G2 S2	None None		400 400	14 S:1	0	0	0	0	0	1	1	0	1	0	0
Agelaius tricolor tricolored blackbird	G2G3 S1S2	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	10 10	560 S:1	1	0	0	0	0	0	0	1	1	0	0
Allium peninsulare var. franciscanum Franciscan onion	G5T1 S1	None None	Rare Plant Rank - 1B.2	30 600	21 S:3	0	0	1	0	0	2	2	1	3	0	0
Alopecurus aequalis var. sonomensis Sonoma alopecurus	G5T1Q S1	Endangered None	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	1,180 1,180	21 S:1	1	0	0	0	0	0	0	1	1	0	0
Ambystoma californiense California tiger salamander	G2G3 S2S3	Threatened Threatened	CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	85 120	1132 S:27	3	7	8	2	1	6	1	26	26	1	0
Ammodramus savannarum grasshopper sparrow	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	2,150 2,150	18 S:1	1	0	0	0	0	0	0	1	1	0	0
Amorpha californica var. napensis Napa false indigo	G4T2 S2	None None	Rare Plant Rank - 1B.2 SB_RSABG-Rancho Santa Ana Botanic Garden	500 1,600	69 S:15	2	2	1	0	0	10	8	7	15	0	0
Amsinckia lunaris bent-flowered fiddleneck	G2? S2?	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive		64 S:1	0	0	0	0	0	1	1	0	1	0	0
Andrena blennospermatis Blennosperma vernal pool andrenid bee	G2 S2	None None		90 110	15 S:2	0	0	0	0	0	2	2	0	2	0	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Antrozous pallidus pallid bat	G5 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	45 730	402 S:11	1	3	0	2	2	3	2	9	9	1	1
Aquila chrysaetos golden eagle	G5 S3	None None	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected CDFW_WL-Watch List IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,800 1,800	312 S:1	1	0	0	0	0	0	0	1	1	0	0
Arctostaphylos stanfordiana ssp. decumbens Rincon Ridge manzanita	G3T1 S1	None None	Rare Plant Rank - 1B.1	300 800	12 S:6	0	0	2	1	1	2	3	3	5	0	1
Astragalus claranus Clara Hunt's milk-vetch	G1 S1	Endangered Threatened	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	330 770	6 S:3	0	2	0	0	1	0	1	2	2	1	0
Astragalus tener var. tener alkali milk-vetch	G2T2 S2	None None	Rare Plant Rank - 1B.2	30 30	65 S:1	0	0	0	0	1	0	1	0	0	0	1
Athene cunicularia burrowing owl	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	-1 260	1870 S:9	0	5	3	0	1	0	3	6	8	1	0
Balsamorhiza macrolepis big-scale balsamroot	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	890 1,230	43 S:3	2	0	0	0	0	1	1	2	3	0	0
Blennosperma bakeri Sonoma sunshine	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	30 330	25 S:12	0	7	2	0	3	0	3	9	9	1	2
Bombus caliginosus obscure bumble bee	G4? S1S2	None None	IUCN_VU-Vulnerable	150 2,500	178 S:2	0	0	0	0	0	2	2	0	2	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Brodiaea leptandra narrow-anthered brodiaea	G3? S3?	None None	Rare Plant Rank - 1B.2	650 1,932	29 S:8	0	2	0	0	0	6	6	2	8	0	0
Buteo regalis ferruginous hawk	G4 S3S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	2,250 2,250	103 S:1	0	1	0	0	0	0	0	1	1	0	0
Buteo swainsoni Swainson's hawk	G5 S3	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	120 140	2394 S:2	0	0	1	0	1	0	1	1	1	1	0
Caecidotea tomalensis Tomales isopod	G2 S2	None None		1,640 2,120	6 S:2	1	0	0	0	0	1	2	0	2	0	0
Calicina diminua Marin blind harvestman	G1 S1	None None		150 150	1 S:1	0	0	0	0	0	1	1	0	1	0	0
California macrophylla round-leaved filaree	G3? S3?	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden		162 S:1	0	0	0	0	0	1	1	0	1	0	0
Ceanothus confusus Rincon Ridge ceanothus	G1 S1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	510 2,700	33 S:9	1	1	1	0	0	6	3	6	9	0	0
Ceanothus divergens Calistoga ceanothus	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	350 1,900	23 S:12	3	1	1	0	0	7	9	3	12	0	0
Ceanothus masonii Mason's ceanothus	G1 S1	None Rare	Rare Plant Rank - 1B.2	700 700	8 S:1	0	1	0	0	0	0	0	1	1	0	0
Ceanothus purpureus holly-leaved ceanothus	G2 S2	None None	Rare Plant Rank - 1B.2	475 475	43 S:1	0	0	0	0	0	1	1	0	1	0	0
Ceanothus sonomensis Sonoma ceanothus	G2 S2	None None	Rare Plant Rank - 1B.2	475 2,600	30 S:27	3	1	0	1	0	22	19	8	27	0	0
Centromadia parryi ssp. parryi pappose tarplant	G3T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	10 10	29 S:1	0	0	0	0	0	1	1	0	1	0	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	G4?T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	4 4	68 S:1	1	0	0	0	0	0	1	0	1	0	0
Chloropyron molle ssp. molle soft salty bird's-beak	G2T1 S1	Endangered Rare	Rare Plant Rank - 1B.2	5 5	27 S:3	0	0	0	0	3	0	3	0	0	3	0
Chorizanthe valida Sonoma spineflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	30 30	6 S:1	0	0	0	0	1	0	1	0	0	1	0
Coastal Brackish Marsh Coastal Brackish Marsh	G2 S2.1	None None			30 S:2	0	0	0	0	0	2	2	0	2	0	0
Coccyzus americanus occidentalis western yellow-billed cuckoo	G5T3Q S1	Threatened Endangered	BLM_S-Sensitive NABCI_RWL-Red Watch List USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	600 600	155 S:1	0	0	0	0	0	1	1	0	1	0	0
Corynorhinus townsendii Townsend's big-eared bat	G3G4 S2	None Candidate Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	30 120	619 S:2	1	0	0	0	0	1	1	1	2	0	0
Cypseloides niger black swift	G4 S2	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern NABCI_YWL-Yellow Watch List USFWS_BCC-Birds of Conservation Concern	2,500 2,500	46 S:1	0	0	0	0	0	1	1	0	1	0	0
Danaus plexippus pop. 1 monarch - California overwintering population	G4T2T3 S2S3	None None	USFS_S-Sensitive		332 S:1	0	0	0	0	0	1	1	0	1	0	0
Delphinium luteum golden larkspur	G1 S1	Endangered Rare	Rare Plant Rank - 1B.1 SB_UCBBG-UC Berkeley Botanical Garden	150 150	11 S:1	0	0	0	0	0	1	1	0	1	0	0
Downingia pusilla dwarf downingia	GU S2	None None	Rare Plant Rank - 2B.2	10 700	127 S:5	0	0	0	1	0	4	3	2	5	0	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Elanus leucurus white-tailed kite	G5 S3S4	None None	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern	120 120	158 S:1	0	1	0	0	0	0	0	1	1	0	0
Emys marmorata western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	12 2,240	1146 S:27	3	10	9	1	0	4	2	25	27	0	0
Eremophila alpestris actia California horned lark	G5T3Q S3	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	2,275 2,275	82 S:1	1	0	0	0	0	0	0	1	1	0	0
Erigeron greenei Greene's narrow-leaved daisy	G2 S2	None None	Rare Plant Rank - 1B.2	400 400	12 S:1	0	0	0	0	0	1	1	0	1	0	0
Eriogonum luteolum var. caninum Tiburon buckwheat	G5T2 S2	None None	Rare Plant Rank - 1B.2	550 550	26 S:2	1	0	0	0	0	1	0	2	2	0	0
Fritillaria liliacea fragrant fritillary	G2 S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	150 750	77 S:11	0	2	1	1	2	5	6	5	9	2	0
Geothlypis trichas sinuosa saltmarsh common yellowthroat	G5T3 S3	None None	CDFW_SSC-Species of Special Concern USFWS_BCC-Birds of Conservation Concern	0 9	111 S:15	2	1	2	0	0	10	12	3	15	0	0
Haliaeetus leucocephalus bald eagle	G5 S2	Delisted Endangered	BLM_S-Sensitive CDF_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	315 315	318 S:1	1	0	0	0	0	0	1	0	1	0	0
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	G5T1T2 S1S2	None None	Rare Plant Rank - 1B.2	442 442	33 S:2	0	0	0	0	0	2	1	1	2	0	0
Hesperolinon congestum Marin western flax	G2 S2	Threatened Threatened	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	200 560	26 S:3	0	2	0	0	0	1	0	3	3	0	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Horkelia tenuiloba thin-lobed horkelia	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_RSABG-Rancho Santa Ana Botanic Garden	1,230 1,230	27 S:1	0	0	0	0	0	1	1	0	1	0	0
Hydrochara rickseckeri Ricksecker's water scavenger beetle	G2? S2?	None None		1,500 1,500	13 S:1	0	0	0	0	0	1	1	0	1	0	0
Hydroporus leechi Leech's skyline diving beetle	G1? S1?	None None		1,180 1,180	13 S:1	0	0	0	0	0	1	1	0	1	0	0
Lasthenia burkei Burke's goldfields	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	100 442	34 S:4	0	3	0	0	0	1	0	4	4	0	0
Lasthenia conjugens Contra Costa goldfields	G1 S1	Endangered None	Rare Plant Rank - 1B.1 SB_UCBBG-UC Berkeley Botanical Garden	280 280	33 S:1	0	1	0	0	0	0	0	1	1	0	0
Laterallus jamaicensis coturniculus California black rail	G3G4T1 S1	None Threatened	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_NT-Near Threatened NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	0 10	241 S:8	2	1	1	0	0	4	2	6	8	0	0
Layia septentrionalis Colusa layia	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive		46 S:1	0	0	0	0	0	1	1	0	1	0	0
Legenere limosa legenere	G2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	1,400 1,400	78 S:1	0	0	0	0	1	0	1	0	0	0	1
Leptosiphon jepsonii Jepson's leptosiphon	G3 S3	None None	Rare Plant Rank - 1B.2	180 1,200	39 S:10	0	0	0	0	0	10	5	5	10	0	0
Lilium pardalinum ssp. pitkinense Pitkin Marsh lily	G5T1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_BerrySB-Berry Seed Bank		4 S:1	0	0	0	0	1	0	1	0	0	1	0
Limnanthes vinculans Sebastopol meadowfoam	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden	80 105	45 S:8	1	2	0	2	0	3	2	6	8	0	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Linderiella occidentalis California linderiella	G2G3 S2S3	None None	IUCN_NT-Near Threatened	100 100	425 S:2	0	0	0	0	0	2	2	0	2	0	0
Lupinus sericatus Cobb Mountain lupine	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	900 1,860	45 S:4	0	0	1	1	0	2	2	2	4	0	0
Melospiza melodia samuelis San Pablo song sparrow	G5T2? S2?	None None	CDFW_SSC-Species of Special Concern USFWS_BCC-Birds of Conservation Concern	0 10	41 S:12	5	1	0	0	0	6	7	5	12	0	0
Myotis thysanodes fringed myotis	G4 S3	None None	BLM_S-Sensitive IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	210 210	84 S:1	0	0	0	0	0	1	1	0	1	0	0
Myotis volans long-legged myotis	G5 S3	None None	IUCN_LC-Least Concern WBWG_H-High Priority	210 210	117 S:1	0	0	0	0	0	1	1	0	1	0	0
Myotis yumanensis Yuma myotis	G5 S4	None None	BLM_S-Sensitive IUCN_LC-Least Concern WBWG_LM-Low-Medium Priority	210 210	260 S:1	0	0	0	0	0	1	1	0	1	0	0
Navarretia leucocephala ssp. bakeri Baker's navarretia	G4T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	200 1,320	58 S:6	1	1	0	0	1	3	3	3	5	1	0
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	G3 S3.2	None None			53 S:3	0	0	0	0	0	3	3	0	3	0	0
Northern Vernal Pool Northern Vernal Pool	G2 S2.1	None None		20 1,400	20 S:5	0	0	0	0	0	5	5	0	5	0	0
Oncorhynchus mykiss irideus steelhead - central California coast DPS	G5T2T3Q S2S3	Threatened None	AFS_TH-Threatened	380 400	39 S:3	0	2	0	0	0	1	0	3	3	0	0
Penstemon newberryi var. sonomensis Sonoma beardtongue	G4T1 S2	None None	Rare Plant Rank - 1B.3	2,600 2,600	11 S:1	0	1	0	0	0	0	0	1	1	0	0
Plagiobothrys mollis var. vestitus Petaluma popcornflower	G4?TX SX	None None	Rare Plant Rank - 1A	20 20	1 S:1	0	0	0	0	1	0	1	0	0	1	0

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Pleuropogon hooverianus North Coast semaphore grass	G2 S2	None Threatened	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_BerrySB-Berry Seed Bank SB_RSABG-Rancho Santa Ana Botanic Garden	460 460	26 S:1	1	0	0	0	0	0	0	1	1	0	0
Pogonichthys macrolepidotus Sacramento splittail	GNR S3	None None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern IUCN_EN-Endangered	1 1	15 S:1	0	0	0	0	0	1	0	1	1	0	0
Polygonum marinense Marin knotweed	G2Q S2	None None	Rare Plant Rank - 3.1	5 5	32 S:1	0	0	0	0	0	1	1	0	1	0	0
Rallus longirostris obsoletus California clapper rail	G5T1 S1	Endangered Endangered	CDFW_FP-Fully Protected NABCI_RWL-Red Watch List	2 18	94 S:9	0	2	3	0	0	4	7	2	9	0	0
Rana boylii foothill yellow-legged frog	G3 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened USFS_S-Sensitive	30 2,100	810 S:17	6	3	2	0	0	6	4	13	17	0	0
Rana draytonii California red-legged frog	G2G3 S2S3	Threatened None	CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable	10 2,230	1374 S:27	4	12	10	0	0	1	1	26	27	0	0
Reithrodontomys raviventris salt-marsh harvest mouse	G1G2 S1S2	Endangered Endangered	CDFW_FP-Fully Protected IUCN_EN-Endangered	1 8	141 S:9	0	5	0	0	0	4	3	6	9	0	0
Riparia riparia bank swallow	G5 S2	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	25 25	296 S:1	0	0	0	0	0	1	1	0	1	0	0
Sidalcea calycosa ssp. rhizomata Point Reyes checkerbloom	G5T2 S2	None None	Rare Plant Rank - 1B.2	30 30	31 S:1	0	0	0	0	0	1	1	0	1	0	0
Sidalcea oregana ssp. valida Kenwood Marsh checkerbloom	G5T1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_UCBBG-UC Berkeley Botanical Garden	400 400	2 S:1	0	0	1	0	0	0	0	1	1	0	0

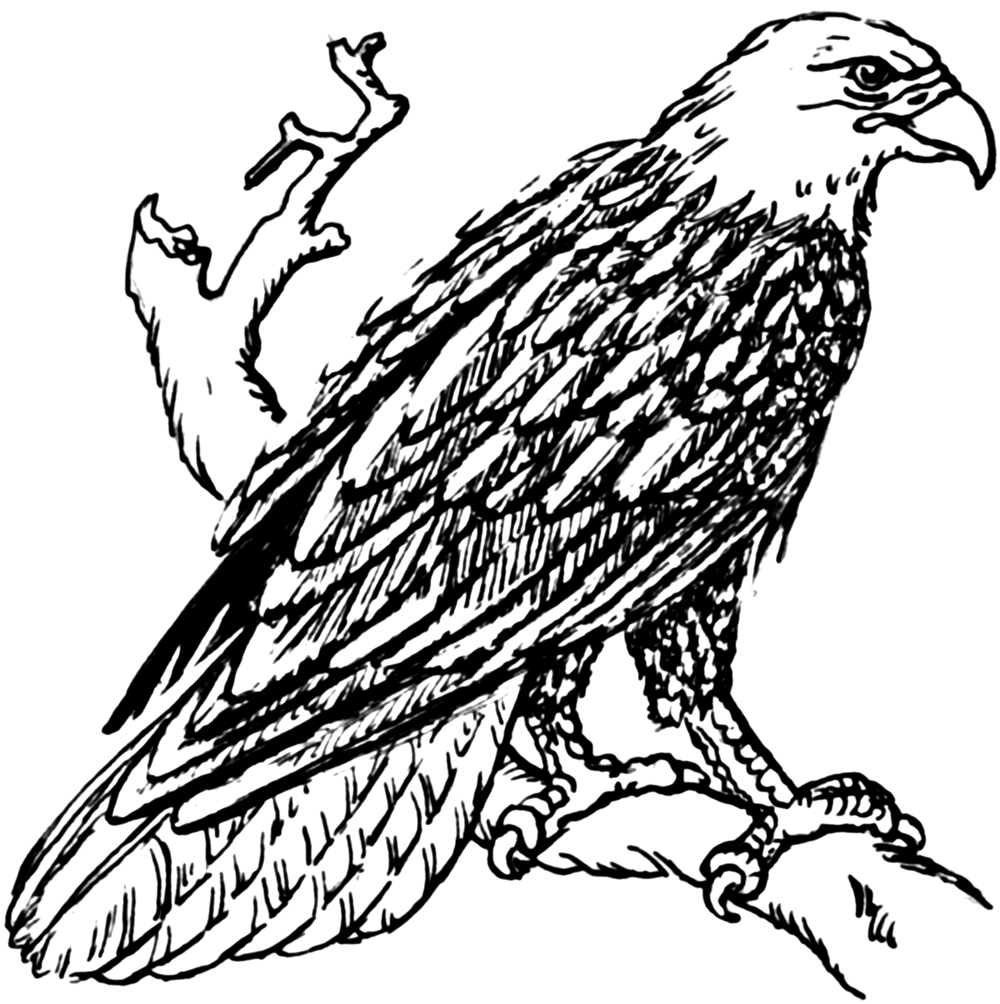
Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks A	B	C	D	X	U	Population Status Historic > 20 yr	Recent <= 20 yr	Presence Extant	Poss. Extirp.	Extirp.
Sorex ornatus sinuosus Suisun shrew	G5T1T2Q S1S2	None None	CDFW_SSC-Species of Special Concern	20 20	15 S:2	0	1	0	0	0	1	1	1	2	0	0
Speyeria zerene sonomensis Sonoma zerene fritillary	G5T1 S1	None None		200 200	1 S:1	0	0	0	0	0	1	0	1	1	0	0
Spirinchus thaleichthys longfin smelt	G5 S1	Candidate Threatened	CDFW_SSC-Species of Special Concern	0 0	45 S:1	0	0	0	0	0	1	0	1	1	0	0
Streptanthus hesperidis green jewelflower	G2 S2	None None	Rare Plant Rank - 1B.2		19 S:1	0	0	0	0	0	1	1	0	1	0	0
Syncaris pacifica California freshwater shrimp	G1 S1	Endangered Endangered	IUCN_EN-Endangered	100 300	18 S:6	3	2	1	0	0	0	1	5	6	0	0
Talanites ubicki Ubick's gnaphosid spider	G1 S1	None None		150 150	1 S:1	0	0	0	0	0	1	1	0	1	0	0
Taxidea taxus American badger	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	200 2,200	478 S:3	0	0	1	0	0	2	1	2	3	0	0
Trifolium amoenum two-fork clover	G1 S1	Endangered None	Rare Plant Rank - 1B.1 SB_RSABG-Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture	160 300	26 S:3	0	0	0	0	0	3	3	0	3	0	0
Trifolium hydrophilum saline clover	G2 S2	None None	Rare Plant Rank - 1B.2	5 100	49 S:4	0	0	1	0	2	1	2	2	2	1	1
Triquetrella californica coastal triquetrella	G2 S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	328 328	13 S:1	0	0	0	0	0	1	0	1	1	0	0
Tryonia imitator mimic tryonia (=California brackishwater snail)	G2 S2	None None	IUCN_DD-Data Deficient	6 6	39 S:1	0	0	0	0	0	1	1	0	1	0	0
Valley Needlegrass Grassland Valley Needlegrass Grassland	G3 S3.1	None None		835 1,200	45 S:2	0	0	0	0	0	2	2	0	2	0	0
Viburnum ellipticum oval-leaved viburnum	G4G5 S3?	None None	Rare Plant Rank - 2B.3		38 S:2	0	0	0	0	0	2	2	0	2	0	0

U.S. Fish & Wildlife Service

Beldon Barns

IPaC Trust Resource Report

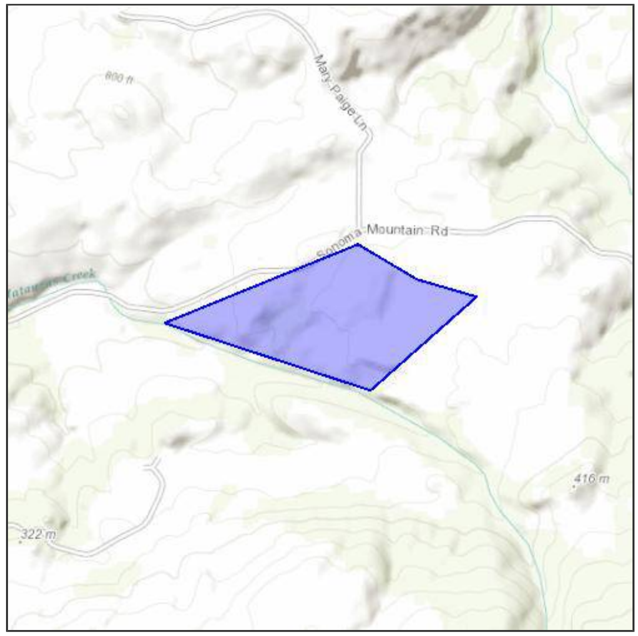
Generated September 11, 2015 12:59 PM MDT



US Fish & Wildlife Service

IPaC Trust Resource Report

Project Description



NAME

Beldon Barns

PROJECT CODE

DQ3W2-OBYNV-A3LAW-227JC-WNEC2U

LOCATION

Sonoma County, California

DESCRIPTION

No description provided

U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

Sacramento Fish And Wildlife Office
Federal Building
2800 COTTAGE WAY, ROOM W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the Endangered Species Program and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under Section 7 of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an Official Species List from the regulatory documents section.

Amphibians

California Red-legged Frog Rana draytonii **Threatened**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=D02D

Birds

California Least Tern Sterna antillarum browni **Endangered**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B03X

Northern Spotted Owl Strix occidentalis caurina **Threatened**

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B08B

Yellow-billed Cuckoo Coccyzus americanus **Threatened**

CRITICAL HABITAT
There is **proposed** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06R

Crustaceans

California Freshwater Shrimp Syncaris pacifica **Endangered**

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=K01W

Fishes

Delta Smelt Hypomesus transpacificus — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E070

Steelhead Oncorhynchus (=Salmo) mykiss — Threatened

CRITICAL HABITAT
There is **final** critical habitat designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=E08D

Flowering Plants

Burke's Goldfields Lasthenia burkei — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1XU

Sonoma Sunshine Blennosperma bakeri — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q1TO

Insects

San Bruno Elfin Butterfly Callophrys mossii bayensis — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=I00Q

Mammals

Salt Marsh Harvest Mouse Reithrodontomys raviventris — Endangered

CRITICAL HABITAT
No critical habitat has been designated for this species.

https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A03Y

Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008

Bell's Sparrow Amphispiza belli — Bird of conservation concern
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HE

Black Oystercatcher Haematopus bachmani — Bird of conservation concern
Year-round

Black Rail Laterallus jamaicensis — Bird of conservation concern
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09A

Burrowing Owl Athene cunicularia — Bird of conservation concern
Year-round

Costa's Hummingbird Calypte costae — Bird of conservation concern
Season: Breeding

Fox Sparrow Passerella iliaca — Bird of conservation concern
Season: Wintering

Least Bittern Ixobrychus exilis — Bird of conservation concern
Season: Breeding

Lesser Yellowlegs Tringa flavipes — Bird of conservation concern
Season: Wintering

Lewis's Woodpecker Melanerpes lewis — Bird of conservation concern
Season: Wintering

Loggerhead Shrike Lanius ludovicianus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY

Long-billed Curlew Numenius americanus — Bird of conservation concern
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06S

Nuttall's Woodpecker Picoides nuttallii — Bird of conservation concern
Year-round

Oak Titmouse Baeolophus inornatus — Bird of conservation concern
Year-round

Olive-sided Flycatcher Contopus cooperi **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU

Short-billed Dowitcher Limnodromus griseus **Bird of conservation concern**
Season: Wintering

Short-eared Owl Asio flammeus **Bird of conservation concern**
Season: Wintering
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD

Swainson's Hawk Buteo swainsoni **Bird of conservation concern**
Season: Breeding
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B070

Tricolored Blackbird Agelaius tricolor **Bird of conservation concern**
Year-round
https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06P

Refuges

Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

Wetlands

Impacts to NWI wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Freshwater Pond

PUBHh 3.3 acres

DUDEK

853 LINCOLN WAY, SUITE #208
AUBURN, CALIFORNIA 95603
T 530.887.8500 F 530.885.8372

April 6, 2016

Ms. Laura Peltz
Senior Environmental Specialist
Sonoma County Permit and Resource Management Department
2550 Ventura Avenue
Santa Rosa, CA 95403

Subject: ***California Red-Legged Frog (Rana draytonii) Habitat Assessment for the Irrigation Pond and Adjacent Environment within the Belden Barns Property in Sonoma County, Santa Rosa, California***

Dear Ms. Peltz:

This memo provides an assessment of the irrigation pond and adjacent upland habitat within the Belden Barns property (property) relative to providing habitat for the California red-legged frog (*Rana draytonii*). This memo describes vegetation communities within the property, California red-legged frog (CRF) occurrences within the general vicinity, results of the habitat assessment (irrigation pond and adjacent environment), potential for CRF to occur on the property, and any potential constraints to development associated with potential CRF habitat on the property.

PROJECT DESCRIPTION

The proposed Belden Barns project involves construction and operation of a winemaking, farmstead food production, and farmstead product and wine tasting facility on a 55-acre property located at 5561 Sonoma Mountain Road in Sonoma County. The farmstead products would include fresh/preserved vegetables/fruits, eggs, charcuterie and cheeses. The proposed project would include three primary uses with supporting uses and structures: (1) creamery and winery facility, (2) farmstead and wine tasting room, and (3) agricultural promotional events. The project would also expand the existing vegetable garden and fruit orchard by 2 acres, reintroduce livestock grazing on approximately 6 acres, and construct an animal barn near the middle of the southern property boundary adjacent to existing vineyards.

SITE LOCATION AND ENVIRONMENTAL SETTING

The property is located in the North Coast Range Mountains approximately 5.5 miles east-northeast of the City of Rohnert Park, California.

The property consists primarily of vineyards and ranch infrastructure with landscape plantings, agricultural grasslands, a small amount of oak woodland, and a pond used for irrigation purposes. There are several existing buildings on the property, including residences and a barn. The property is located in rolling hills east of the Santa Rosa Plain with elevations ranging from approximately 920 feet above mean sea level (AMSL) in the southwestern corner of the property to about 1075 feet AMSL in the southeastern corner of the property. Surrounding land uses include vineyards, residential homes on large parcels, and open space.

CALIFORNIA RED-LEGGED FROG OCCURRENCE RECORDS

There are 19 documented occurrences of CRF within 5 miles of the property (CNDDB 2003, February 2016 update). The closest records are located approximately 1.2 miles northeast, 1.5 miles south, and 1.6 miles southeast of the property. Additional occurrence records are located greater than 2 miles south of the site; 2.5 miles southeast, 2.8 miles south-southeast, 3.8 miles south-southeast, 2.7 miles south-southwest, 4.1 miles south-southeast, 4.2 miles south-southeast, and 4.5 miles south-southeast of the property. Additionally, critical habitat for this species has been designated 2 miles north and 1.3 miles south of the property.

METHODS

Dudek senior aquatic ecologist Craig Seltenrich conducted a CRF habitat assessment within the property boundaries on March 14, 2016. Habitat areas evaluated as part of this assessment included the overall property; however, the focus of the assessment was the irrigation pond located in the southwestern portion of the property, surrounding upland habitat within approximately 300 feet of the irrigation pond, the South Fork Matanzas Creek adjacent to the southern property boundary, and the ephemeral drainage located along a portion of the eastern property boundary.

Habitat evaluations were conducted by walking the perimeter of the pond and the adjacent uplands, along a portion of the South Fork Matanzas Creek and the ephemeral drainage, and recording general and specific habitat conditions (e.g., habitat type and location, vegetation, habitat parameters, upland habitat information). Additionally, photographs were taken to document habitat conditions and potential suitability for CRF.

The habitat assessment for CRF was based primarily on habitat requirements as described in the United States Fish and Wildlife Service (USFWS), February 18, 1997 document on CRF ecology and distribution (USFWS 1997), the revised guidance on site assessments and field surveys for CRF (USFWS 2005), and on the CRF recovery plan (USFWS 2002). Aquatic habitats or potential aquatic habitats and adjacent uplands were evaluated by assessing their potential to support breeding, foraging activities, provide refuge and/or aestivation habitat, and as dispersal corridors for adult and juvenile frogs. In addition, habitats were also evaluated based on personal knowledge and experience with CRF in northern and central California. Information collected during the site survey and from project environmental documents included data on the following site characteristics:

- Terrain – elevation and topography
- Land use – historic and current for property and adjacent lands
- Plant communities
- Upland habitat
- Aquatic habitat types and aquatic features – vegetation present, water surface area and depth, approximate drying date of water body
- Potential underground refugia
- Potential forage habitat
- Potential breeding habitat

The California Natural Diversity Data Base (CNDDB 2003, February 2016 update) was queried for CRF occurrences within five miles of the property (Glen Ellen USGS 7.5-minute quadrangle). Wetland habitats evaluated during the field surveys included the irrigation pond (perennial), the South Fork Matanzas Creek located in the southwestern corner of the property and the ephemeral drainage in the northeastern corner of the site.

RESULTS

The following results are based on a review of available project documents, information obtained during the field reconnaissance survey,

Upland Vegetation Communities and Land Cover Types

The majority of the property has been in agricultural use for decades, and a large percentage of the site is planted in vineyards. Most of the remainder of the site consists of non-native annual grassland that also contains some ruderal species and native grasses, primarily wild oat (*Avena* spp.), although riparian vegetation is also present along the South Fork Matanzas Creek at the southern property boundary and an unnamed tributary to South Fork Matanzas Creek located in the northeastern and northern portion of the site along Sonoma Mountain Road. In general, riparian areas are dominated by the coast live oak (*Quercus agrifolia*) with Himalayan blackberry (*Rubus armeniacus*) and periwinkle (*Vinca major*) composing the dominant understory. A garden and orchard are also present on the site.

Aquatic Habitats

Three aquatic habitats are present within the property boundaries, including the South Fork Matanzas Creek in the southwestern corner of the property, an ephemeral drainage in the northern and northeastern portion of the property, and a large irrigation pond also located in the southwestern corner of the property.

Seasonal Drainages

Two seasonal drainages occur within the property. Both of these drainages are relatively narrow and contain a fairly dense riparian corridor. South Fork Matanzas Creek, located in the southwestern corner of the property, is a moderate gradient drainage and the unnamed drainage in the northeastern portion of the property is fairly low gradient. Water was flowing in both drainages during the March 14, 2016 site visit.

Irrigation Pond and Adjacent Uplands

The man-made agricultural pond is relatively large (approximately 375 feet long by 300 feet wide) with an apparent maximum water depth of about 15 to 20 feet and an apparent average depth of about 10 to 12 feet. Shallow water habitat was present around the perimeter of the pond and appeared to average about 3 feet deep. At the time of the site assessment, the pond was 100% inundated and about 0.5 cubic foot per second (cfs) was flowing out of the pond through a culvert located along the southern bank of the pond. Emergent vegetation consisted of cattails (*Typha* sp.), which occurs in a ring (approximately 10 to 18 feet wide) around the pond (totaling about 15% of the pond area), and rushes (*Juncus* sp.?) along the pond margin. Submerged vegetation did not appear to be present in the pond; however, this may be due primarily to poor water visibility and not to lack of presence. Approximately 85% of the surface of the pond was covered with floating *Azola* sp., and only about 15% of the pond surface consisted of open water. Pond substrates could not be evaluated due to poor water visibility, although the bottom of the pond likely consisted of similar substrates to the banks of the pond (mud). The moderately steep banks were vegetated with grasses (some of which were bunch grasses), Himalayan blackberry, *Rumex* sp., and a few scattered trees.

Upland habitat around the irrigation pond (for a distance of about 100 feet) consists primarily of grasses and ruderal vegetation, coyote brush (*Baccharis pilularis*), and a few shrubs and trees. Additionally, since the majority of the site is relatively open, there are no apparent barriers to CRF movement in any direction on the property.

Potential for Presence of CRF

Based on the site habitat assessment, the irrigation pond appears to provide suitable breeding habitat for CRF, although this species was not observed. During the site assessment, American bullfrog juveniles (*Rana catesbeiana*) were observed in several locations around the pond, although the numbers of frogs did not indicate a large population was present. Even though the pond contains bullfrogs, the pond is fairly large and there is a substantial amount of complex habitat (primarily associated with abundant vegetative cover) around the margin of the pond that could provide refugia for CRF from predatory bullfrogs. Bullfrogs and CRF have been documented co-existing in aquatic habitats that contain complex cover (Storer 1925, Hayes and Tennant 1985, Rathbun 1998, Cook and Jennings 2007, D'Amore, et al 2009). Potentially suitable underground refugia are also present in the vicinity of the pond, and both ground squirrel and pocket gopher burrows were common in the uplands immediately surrounding the pond.

It is unknown if CRF are present in the irrigation pond or utilize the pond for breeding or for summer refugia. Due to the abundance of vegetation and complex cover habitat within and along the pond banks, conducting formal CRF surveys may be insufficient to determine presence/absence of the frog. Consequently, conservation measures to protect the irrigation pond and adjacent upland habitat should be implemented during construction and operation of proposed improvements to the property as part of the Belden Barns Farmstead and Winery project.

POTENTIAL CONSTRAINTS TO DEVELOPMENT

The irrigation pond provides potentially suitable breeding habitat for CRF, and as a result, the pond and the immediate upland habitat surrounding the pond (buffer area) should be protected to ensure that the species (if present) and its habitat are not negatively affected by activities at the pond or in the upland habitat surrounding the pond. Additionally, management of the pond should also reflect the potential presence of CRF relative to water withdrawal and vegetation management (including aquatic plants) in the vicinity of the pond.

Proposed project activities associated with the farmstead and winery facilities are not anticipated to have a negative effect on the irrigation pond or potentially suitable habitat for CRF, the surrounding upland buffer area, or CRF (if present). Additionally, the proposed increased crop production and livestock grazing activities, including the new animal barn, are considered relatively benign and would be located a sufficient distance from the irrigation pond and surrounding buffer area; therefore, they are not expected to conflict with the irrigation pond and potential CRF habitat or the species itself.

Recommended Mitigation Measures

Since CRF could potentially be present in the pond, a buffer area of 75 feet around the pond is recommended to provide sufficient refugia for frogs around the perimeter of the pond. It is also recommended that vegetation within this 75 foot buffer area remain in a relatively natural state (i.e., no mowing or vegetation removal, spraying, or other ground disturbance/maintenance activities). Additionally, the area between the pond and the South Fork Matanzas Creek in the southwestern corner of the property should remain as grassland habitat since this is the most likely path for frogs to use when dispersing from the pond (if present). However, light livestock grazing in this area would be an acceptable practice and would not interfere with movement of frogs to and from the pond.

The pond should also be managed to support the potential presence (breeding, etc.) and continued existence of CRF (if present) on the property. To ensure that the pond is managed to protect CRF, water withdrawal from the pond should not occur from December through May 1 each year to avoid stranding eggs above the water line, and to avoid entrainment of tadpoles through the intake water structure at the eastern end of the pond. Additionally, the intake pipe will be fitted with a passive intake screen (with a mesh size of ¼ inch) that allows withdrawal of water at a low, uniform velocity. Since the effect of water velocity varies inversely with tadpole size, sustained swimming in water velocities as low as 10 centimeters/second can cause tadpoles approaching metamorphosis to be displaced. According to field and laboratory studies conducted on another Ranid species, the foothill yellow-legged frog (*Rana boylii*), larger tadpoles can maintain position for short periods in water velocities of 10 cm/s (0.33 ft/sec) or less, with a maximum median velocity of 20 cm/s (0.65 feet/s) (Kupferberg 2011). Based on this information, water velocities of 10 cm/s or less at the intake screen should eliminate the potential for entrainment of tadpoles into the water system if present. CRF tadpole metamorphosis generally occurs in late summer, although some tadpoles may not metamorphose until the next spring or summer.

SUMMARY/CONCLUSIONS

The irrigation pond provides potentially suitable breeding habitat for CRF even with the presence of bullfrogs. Even though CRF have not been observed in the pond and formal surveys have not been conducted, numerous CRF occurrence records are present within five miles of the property and as a result, this species could be present in the pond now or sometime in the future. Even though current activities on the property do not appear to be having a negative effect on the irrigation pond or the immediate area surrounding the pond, proposed improvements associated with the Belden Barns Farmstead and Winery project could have impacts in the future. Implementation of the mitigation measures and management activities described above should be sufficient to protect the pond and adjacent upland habitat and CRF (if present).

If you have any questions regarding this report, please contact me via telephone at 530.217.8216 or email at cseltenrich@dudek.com.

Sincerely,

Craig Seltenrich
Senior Aquatic Ecologist

REFERENCES

Cook, D. G. and M. R. Jennings. 2007. Microhabitat use of the California red-legged frog (*Rana draytonii*) and introduced bullfrog (*Rana catesbeiana*) in a seasonal marsh. Herpetologica 63:430-440.

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APPENDIX E

Preliminary Geologic Evaluation

REESE CONSULTING GEOTECHNICAL
& ASSOCIATES ENGINEERS

134 LYSTRA COURT — SANTA ROSA, CA 95403
TELEPHONE (707) 528-3078 — FACSIMILE (707) 528-2837

May 24, 2013

Job No. 539.1.3

Steiner Vineyards LLC
c/o Steve Martin Associates, Inc.
130 S. Main Street, Suite 201
Sebastopol, CA 95403

Report
Preliminary Geologic Evaluation
Belden Barns Winery and Farmstead
Santa Rosa, California

This letter presents the results of our preliminary geologic/geotechnical evaluation concerning the suitability of the currently proposed development from a geologic standpoint. The project site is located at 5560 Sonoma Mountain Road, in Sonoma County, California.

Located within the hillsides of Sonoma Mountain, the property contains six existing structures. Based on project plans prepared by Steve Martin Associates, Inc. (SMA), the structures consist of an existing main residence, guest house, family farm dwelling, barn, dance hall and employee unit. The plans indicate that the guest house and family farm dwelling will remain. The barn and dance hall will be renovated, while the existing main residence will be demolished and replaced with a new residence/hospitality building. Also, a new winery building with employee units is proposed. The proposed development would be served by a new winery road setback about 30 feet from an existing seasonal creek channel. The proposed winery and farmstead is shown on Plate 1.

PURPOSE AND SCOPE

This evaluation is intended to characterize, in a preliminary manner, the geologic and geotechnical conditions and hazards as they relate to the proposed development. The principle focus was on the possible presence and extent of landsliding. To accomplish this purpose, the following tasks were performed:

- Review of selected published geologic literature including available geotechnical engineering reports, fault and landslide maps pertinent to the project area. References reviewed are listed in the references section.

- Review of stereo-paired aerial photographs of the site and vicinity. Photos reviewed are listed in the references section.

- A geologic reconnaissance of the site and surrounding area to map the surface geologic conditions at the site.

Upon completion of our field work, geologic analyses were performed to develop preliminary conclusions and recommendations concerning:

1. The geologic setting and geologic hazards pertinent to the site.

2. Conclusions regarding the potential for geologic hazards, including landsliding and faulting to affect the proposed project.

3. Conceptual geotechnical engineering recommendations for site development.

4. Supplemental geotechnical engineering services.

BACKGROUND

During February and March 2002, Giblin Associates (GA) was on-site and performed geologic reconnaissance and was in the process of performing a soil investigation with particular focus on slope stability at a proposed new residence building site, for a different owner. Twenty test pits were excavated to explore subsurface conditions at possible building envelopes. Approximate test pit locations are shown on the attached Plate 1. Following the subsurface investigation, a memorandum was issued that contained a summary of their observations and geologic conclusions to date. The memorandum was dated with a revision of July 11, 2002. Our principal engineer and geologist served as project managers for GA during the investigation and co-authored that memorandum.

SITE CONDITIONS

General Site Description

The project site is located on the northwest flanks of Sonoma Mountain and the south portion of the Bennett Valley area. The property begins along the south side of Sonoma Mountain Road and extends about 1,850 feet south. Elevations on the property extend from about 880 to 1,080 feet above sea level. The proposed development is located within the northeast portion of the property within very gently sloping terrain. Located further south, the property ascends and consists of a series of low, hummocky knolls planted with vineyards. Further to the southwest, an irrigation pond is present.

Geology

During our site reconnaissance and review of GA's site exploration, rock materials of the Petaluma Formation were encountered beneath a relatively thin cover of soil. Published maps indicate the property is underlain by the poorly-consolidated, sedimentary rocks of the Pliocene-age Petaluma Formation (Fox, 1973). Based on the test pits excavated by GA, the Petaluma Formation appears comprised predominantly of weak mudstone, claystone and minor amounts of friable sandstone. Our review of published geologic maps, GA's field notes and interpretation of air photos indicates that bedding in the site vicinity strikes slightly north of west with moderate (30 degree) southerly dips.

Faulting and Seismicity

The project site is within the California Coast Ranges, a region of high seismic activity. In historic times numerous moderate and occasional large magnitude earthquakes have affected this region. Notable earthquakes that have caused major damage to Santa Rosa include the magnitude 7.9 California Earthquake of 1906 on the San Andreas fault (21 miles southwest of the site) and the 1969 Santa Rosa earthquakes on the Rodgers Creek fault. The 1969 earthquakes were of moderate magnitude with earthquake epicenters located near downtown Santa Rosa. In addition to the San Andreas and Rodgers Creek faults, several other faults in the region including the Green Valley (22½ miles to the northeast) and the West Napa (13 miles northeast) are considered capable of generating moderate to large earthquakes.

No active faults are recognized within the project area. The closest active fault to the project is the Rodgers Creek fault located approximately 1.9 miles southwest of the project site.

Landslides and Slope Stability

Published geologic and slope stability maps provide several differing interpretations of landslides in the project area. The published maps available are small-scale and these types of maps typically rely heavily on interpretation of topographic features from aerial photographs supported by limited field mapping. The slope stability map accompanying Special Report 120 (1980) depicts a possible large, deep-seated landslide extending from the ridgeline (contour line 1,200 feet) just south of the proposed project area, as shown on the attached Plate 2.

Geologic maps published in 2003 (CGS, 2003) and 1973 (Fox and Sims) do not show any landslides that affect the property or adjacent areas. The fourth map reviewed (CDMG, 1971) depicts a landslide originating near the top of a ridgeline south of Sonoma Mountain Road and extending north into the southeast corner of the subject property (see Plate 2).

During our reconnaissance and review of the previous test pits performed by GA, the two low knolls located south of the barn at elevations about 1068 and 1056 feet are underlain by very weak, diatomaceous siltstone. The siltstone rocks are broken and weathered to the consistency of soil. Furthermore, the materials contained near vertical fractures 9 feet deep filled with topsoil. A contact was observed in Test Pit 19 between the broken rocks and what appeared to be in-place sandstone materials of the Petaluma Formation. It was reported that the contact was an approximate 3- to 6-inch thick plastic clay layer with a mat of roots. Also, the orientation of the contact was downward to the north consistent with a landslide slip surface.

GA then went on to excavate further test pits at the knoll located just above the existing barn at elevation 1,026 feet. This knoll was underlain by highly weathered sandstone, claystone, siltstone and conglomerate of the Petaluma Formation. Bedding was observed in the test pits that had a consistent east/west strike and moderate southerly dip. These materials were judged to be in-place.

Following viewing and interpretation of air photos, our site visit and based on GA's test pits, the presence of two moderately large landslides was confirmed. The first landslide appears to be a relatively old earthflow-type slide that originates near elevation 1,200 feet and extends in the northwest direction, through the south and southwest portions of the property and possibly includes the irrigation pond, as shown on Plates 1 and 2. The other slide appears to be a younger earthflow near the south portion of the property. Our interpretative landslide map of the property is shown on Plate 2.

DISCUSSION AND PRELIMINARY CONCLUSIONS

The conceptual project plan prepared by SMA is considered feasible from an engineering geologic and geotechnical standpoint. The most significant geologic hazards and geotechnical constraints that affect the site include the following:

- A potential for very strong seismic shaking
- The presence of two landslides on the property
- Weak compressible soils and highly expansive clays

Seismic Ground Shaking

The proximity of the site to the active Rodgers Creek fault indicates that this fault is the design fault for the site. Estimates of expected ground shaking at the site from that fault's characteristic 7.0 magnitude earthquake would range from very strong to violent. Based on this potential, we conclude that the proposed structures should be designed and constructed in strict accordance with current building codes.

Slope Instability

Two landslides are present on the property, as shown on the attached Plate 1. However, these slides are located about 340 feet upslope of the proposed improvements. We conclude that these slides are a sufficient distance away from the proposed improvements such that no mitigations measures are warranted. Furthermore, air photos and geologic maps reviewed for this investigation and the materials encountered in GA's test pits provide strong evidence that the proposed winery and farmstead site has not been subjected to past landsliding as shown on the slope stability map accompanying Special Report 120.

Weak Compressible Soil and Expansive Clays

Test Pit 12 of GA's subsurface investigation encountered about 2 feet of weak porous soils underlain by about 3½ feet of highly expansive clays. Our experience indicates that weak porous soils can undergo considerable strength loss and settlement when subjected to loads, particularly when saturated. Also, expansive clays can shrink and swell with seasonal variation in moisture content and can heave and distress lightly loaded footings and slabs. Therefore, we conclude that the weak, porous natural and expansive clays would not be suitable for foundation, slab or fill support in their present condition.

Satisfactory foundation support for structures can be obtained from a system of drilled piers and grade beams; however, spread footings bottomed on properly compacted fill could also be used. Where spread footings bottomed at minimum depth and conventional slab-on-grade floors are desired, it will be necessary to remove the existing porous soils for their full depth, and cover any expansive soils with a moisture confining blanket of approved on-site materials of low expansion potential or imported nonexpansive fill. If drilled piers and grade beams are used in conjunction with wood floors supported on joists above grade, removal of weak porous upper soils and expansive clays would not be needed. Alternatively, post-tensioned or mat slab foundations could also be considered for foundation support.

Supplemental Geotechnical Engineering Services

A detailed geotechnical investigation should be performed at the site to further evaluate the site conditions and to provide design level criteria for proposed improvements including site grading, foundation and retaining wall design, roadway pavement support and geotechnical engineering drainage.

Steiner Vineyards LLC
c/o Steve Martin Associates, Inc.
May 24, 2013
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We trust this report provides you with the information you need at this time. If you have any questions or we can be of further assistance, please give us a call. The following plates are attached and complete this report.

Plate 1 Site Plan Depicting Proposed Winery and Farmstead and Interpretative Geologic Map

Plate 2 Interpretative Landslide Map of the Property and Surrounding Area

Yours Very Truly,

REESE & ASSOCIATES

Brian F. Piazza
Staff Geologist

Jeffrey K. Reese
Civil Engineer No. 47753

BFP/JKR:nay/ra/Job No. 539.1.3
Copies Submitted: 3

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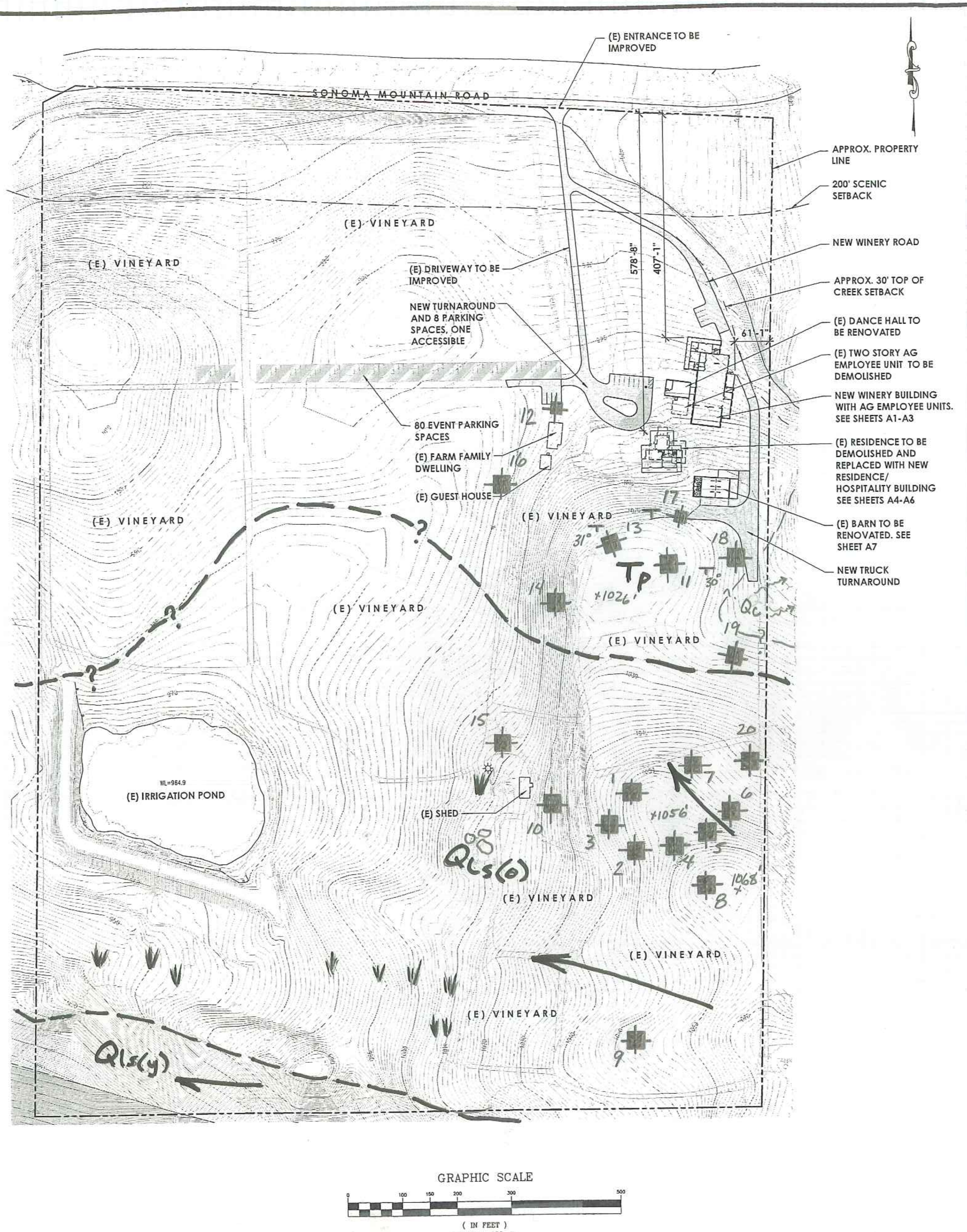
4-21-1971, 3088-101 and 102, black and white
05-03-1961, CSH 21B-144 and 145, 169 and 170 black and white



EXPLANATION

Geologic Units

Qc – colluvium; soil deposits on slopes may be subject to creep. Mapped where estimated to be 5 feet or greater in thickness.

Qls(y) – Landslide Deposits (young)

Qls(o) – Landslide Deposits (old)

Tp- Petaluma Formation, diatomaceous siltstone, sandstone and mudstone.

Symbols

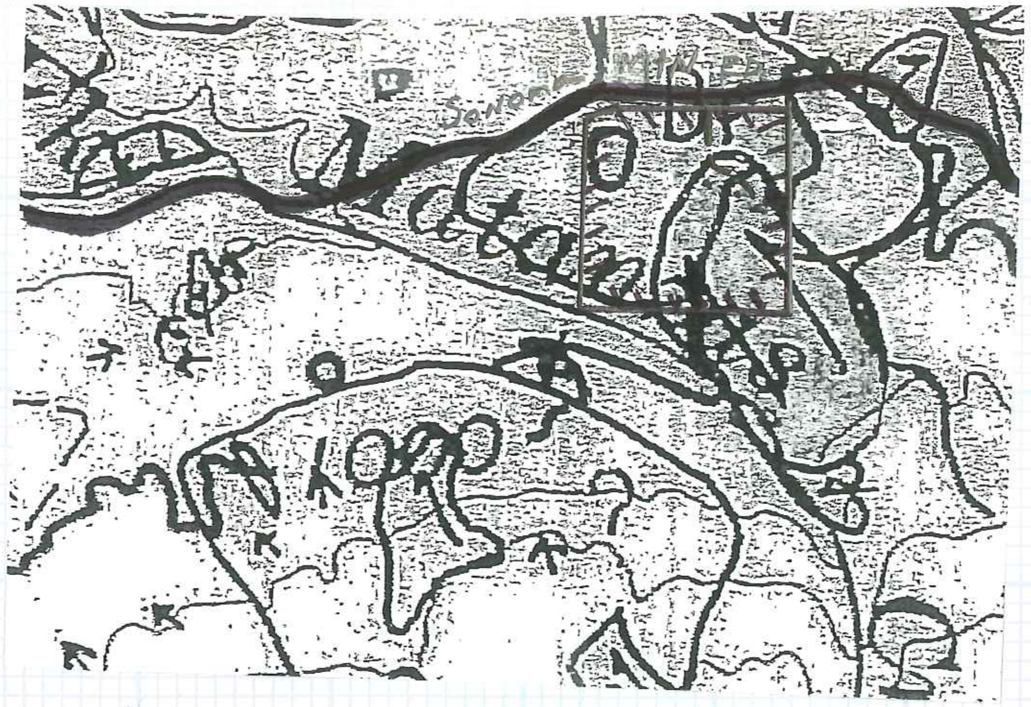
Approximate location of contact between geologic units Queried where uncertain

Approximate location of exploratory test pits by others (Giblin Associates, 2002)

Springs

Cobbles and Boulder stockpile

REESE & ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS	Job No: 539.1.3 Date: 05-17-13 Appr: BFP	SITE PLAN DEPICTING PROPOSED WINERY & FARMSTEAD & INTERPRETATIVE GEOLOGIC MAP BELDEN BARNS WINERY AND FARMSTEAD 5560 SONOMA MOUNTAIN ROAD SANTA ROSA, CALIFORNIA	PLATE 1



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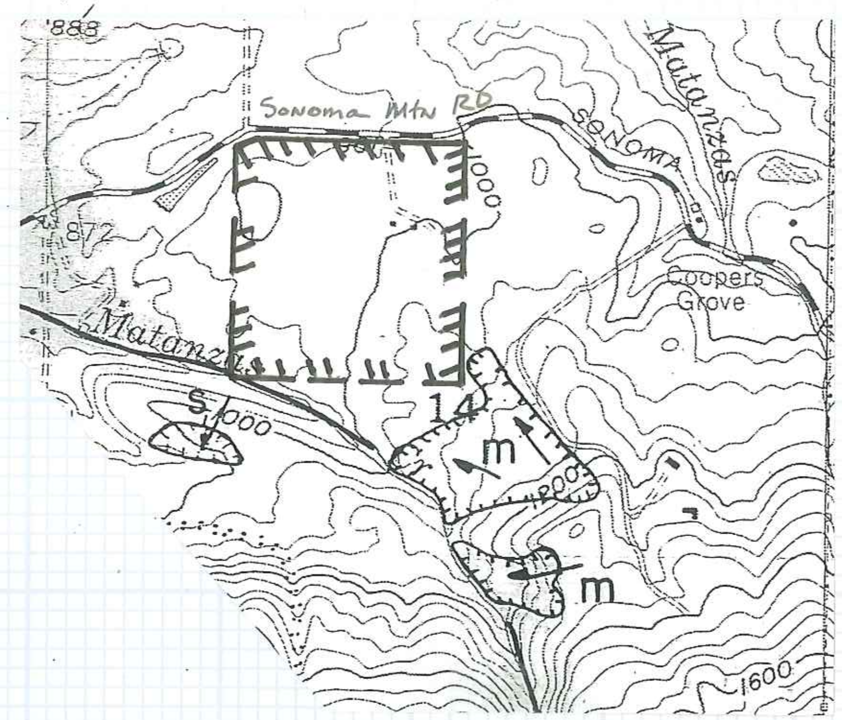

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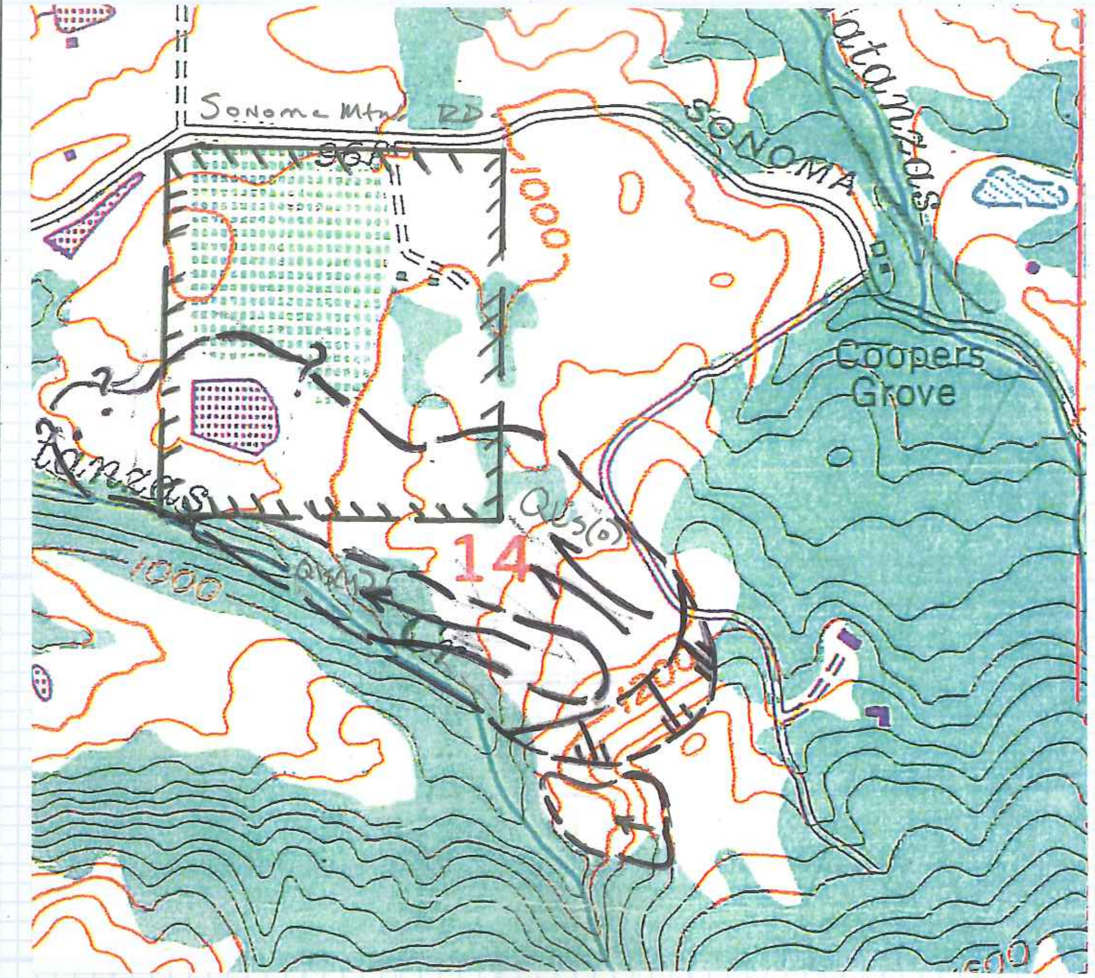
FROM CALIFORNIA DIVISION
OF MINES AND GEOLOGY, 1971



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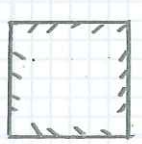
AIR PHOTO INTERPRETATION

KEY



Subject Property

SLIDE

REESE & ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS	Job No: 539.1.3 Date: 05-17-13 Appr: BFP	INTERPRETATIVE LANDSLIDE MAP OF THE PROPERTY AND SURROUNDING AREA BELDEN BARNS WINERY AND FARMSTEAD 5560 SONOMA MOUNTAIN ROAD SANTA ROSA, CALIFORNIA	PLATE 2

APPENDIX F

Groundwater Resources Technical Report

Groundwater Resources Technical Report
Belden Barns Farmstead and Winery Project

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MAY 2016

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1 INTRODUCTION

Groundwater resources play an important role in supporting the natural environment, rural communities, and agriculture, especially in unincorporated Sonoma County where many property owners rely exclusively on groundwater for irrigation and/or domestic uses. Both the *Sonoma County General Plan 2020 (Water Resources Element)* and the *Santa Rosa Plain Watershed Groundwater Management Plan* recognize the importance of managing groundwater as a valuable and limited shared resource, and both include a number of policies intended to protect the quality and quantity of groundwater from the cumulative effects of development (County of Sonoma 2008, Santa Rosa Plain Basin Advisory Panel 2014). Consistent with these planning documents and the requirements of the California Environmental Quality Act (CEQA), this report is being prepared for the Sonoma County Permit and Resource Management Department (PRMD) to evaluate whether the proposed uses on the site would have adverse impacts with regard to depletion of groundwater in storage, interference with neighboring wells, adjacent surface water depletion and/or groundwater quality.

1.1 Project Overview

The proposed Belden Barns Farmstead and Winery project (proposed project) involves winemaking, hospitality, and farmstead food production on a 55-acre parcel located at 5561 Sonoma Mountain Road in Sonoma County (County) (Figure 1). The farmstead products would include fresh/preserved vegetables/fruits, eggs, charcuterie, and cheeses. The proposed project would include three primary uses with supporting spaces and structures: (1) creamery and winery facility, (2) farmstead and wine tasting room, and (3) agricultural promotional events.

1.2 Background / Previous Studies

An earlier version of the proposed project was previously evaluated in an Initial Study and Mitigated Negative Declaration (MND) in 2013, which included a site-specific groundwater study prepared by E.H. Boudreau (2013) as an appendix to the MND. Though the County adopted the MND and approved a conditional use permit for the project in 2014, a neighborhood group (Friends of Sonoma Mountain Road) filed a lawsuit challenging the approval. The lawsuit was settled pursuant to the terms of a Settlement Agreement, dated June 17, 2015. Among other terms, the Settlement Agreement requires the County to prepare an environmental impact report (EIR) for the proposed project. This groundwater report has been prepared to provide supplemental groundwater analysis in support of the EIR.

1.3 Scope of Work

Dudek's scope of work for this assessment included the following components:

- **Research of the site's geology and groundwater conditions**. An understanding of the existing hydrologic, climatic, and groundwater conditions at the site was developed through review of published literature, geologic maps and soils data, project-specific technical reports, County well permits, and well completion reports submitted to the California Department of Water Resources (DWR).
- **Field inventory of water wells on site and on adjacent parcels**. Dudek conducted a well inventory on November 4, 2015, and subsequently on November 13, 2015, the purpose of which was to document the location, condition, accessibility, uses, and depth to groundwater for the on-site well and for off-site wells whose owners agreed to participate in the study. Pressure transducers, which were set to record groundwater levels at 15-minute intervals, were installed in the project well and two off-site wells.
- **A 24-hour pump test and groundwater level monitoring**: On December 10, 2015, through December 11, 2015, Dudek conducted a pump test of the project well, discharging water at the currently installed pump's maximum capacity of 23 gallons per minute (GPM) over a 24-hour period. During this period, manual groundwater level measurements were made in the project well and off-site wells on five adjacent properties. For wells with pressure transducers installed, groundwater levels were monitored over a 2-month period inclusive of the 24-hour pump test.
- **Water balance evaluation**: Dudek prepared a water balance over a simulated period of 30 years for two scenarios: (1) the project-only scenario, using the project parcel as the analysis area, and (2) a cumulative scenario, using a 962-acre area corresponding to the contributing watershed of a portion of the South Fork Matanzas Creek. Groundwater demands within the watershed were estimated based on review of existing land use, dwelling units and cultivated areas present; future groundwater demands were estimated by projecting anticipated growth allowed under the County's General Plan.
- **Well-interference evaluation**: The Theis semi-log approximation solution was used to model drawdown by distance from the project well, using aquifer parameters derived from regional groundwater studies. Estimates of groundwater drawdown at the nearest residential wells induced by project pumping at 60 days, 1 year, and 5 years was estimated using the Cooper–Jacob approximation of the Theis Non-Equilibrium Flow Equation.

- **Impacts of pumping on surface water**: The hydrogeologic setting and the results of the well interference evaluation were used to evaluate the potential effects of the projects use of groundwater on surface water features such as the South Fork Matanzas Creek.

1.4 Limitations

Groundwater systems located in upland regions of Sonoma County are typically complex, and available data permits only a general assessment of groundwater conditions and delineation of aquifers. This analysis is based on limited available data and relies significantly on interpretation of data from disparate sources and of disparate quality. Well completion reports used for this assessment were those made available through a request to the Sonoma County PRMD (0.5-mile radius) and DWR (by Public Land Survey System Section, Township, and Range). It is important to note that the data collected does not include logs for wells with undetermined locations, or wells for which no log was submitted. Furthermore, a reliable measure of the aquifer parameters for the underlying formations could not be determined from the 24-hour pump test that was conducted, due to the limited capacity of the currently installed pump and lack of definitive groundwater level response in an observation well required to estimate the coefficient of storage. Instead, aquifer parameters were estimated based on published information for regional aquifers and from site-specific data collected in similar nearby areas.

The 24-hour pump test data allows for site-specific calculation of an average transmissivity of the project well specific to the screened interval and the expected pumping rate, which was used in the well interference analysis. The water balance and groundwater in storage analyses included in this report rely on assumptions about aquifer conditions and specific yield derived from regional studies. Typical of reports of this scope and nature, there is uncertainty associated with the quantitative analysis and modeling, even though they are based on the best available data and reflect standard professional practice.

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2 PROJECT DESCRIPTION

2.1 Location and Land Use

The 55-acre project site is located at 5561 Sonoma Mountain Road in southeastern Sonoma County (Assessor's Parcel Number 049-030-010) approximately 5.5 miles west of Glen Ellen and 7 miles east of the City of Rohnert Park (Figure 1). The site is currently developed with three dwellings, an old barn, and some accessory structures. One of the dwellings replaced a previous dwelling and is used as the owner's primary residence. The site is currently planted with 22 acres of wine grapes, pasture, fruit orchard, and vegetable plot. Current vineyard operations require 12 employees to commute to and from the project site each day for the 8–10 week harvest season. There is an agricultural reservoir on site in the pasture area that provides irrigation water from surface water sources for the existing crops on the site in compliance with State Water Resources Control Board (SWRCB) Division of Water Rights License for Diversion and Use of Water (Licenses 11198 and 13138) (SWRCB 2015). Groundwater is not used to fill the reservoir.

The project site has a General Plan designation of Land Intensive Agriculture 40-acre density. The zoning designation is LIA (Land Intensive Agriculture) with an SR (Scenic Resources) combining district and Riparian Corridor (RC) combining district. The LIA district allows a range of agricultural processing and promotional activities, at a density of 40 acres per dwelling unit and a 40-acre minimum parcel size. Crop production and harvesting are allowed in this district by right, whereas agricultural processing and promotional activities, tasting rooms, and agricultural promotional events are allowed with a use permit. The project is in compliance with the setback, lot coverage, and parking requirements of the zoning LIA district.

The project site is located in the hills to the southeast of Santa Rosa at the base of the northwest flank of Sonoma Mountain. The project vicinity consists of a large lot, rural area with mixed pasture land and vineyards. The properties to the east and south, approximately 226-acre and 169-acre parcels, respectively, are owned by County of Sonoma and are part of North Sonoma Mountain Regional Park and Open Space Preserve . The properties immediately to the north and west of the project site, across Sonoma Mountain Road, are developed with agricultural uses, while all other surrounding properties are developed with low-density residential uses. The properties in the surrounding area are designated Diverse Agriculture, Resources and Rural Development, Rural Residential, and Land Intensive Agriculture in the General Plan with densities ranging from 15 acres to 40 acres per dwelling unit.

2.2 Project Components

The proposed project would include a wine and cheese production facility, a hospitality building (tasting room), replacement of existing Agricultural Employee housing, expanded vegetable garden and orchard, and new livestock. The proposed project also would include various agricultural events throughout the year, with the largest event to occur during the fall harvest season with a maximum of 200 participants. Additional details are as follows:

Production Facility. The proposed production facility (winery building) would consist of a new creamery and winery facility capable of producing 10,000 pounds of cheese and 10,000 cases of wine per year. The production facility would replace the existing barn located in the southeast portion of the farm building complex. Peak production for the facility would be during harvest season, which is typically late August through mid-October.

Tasting Room Building. The proposed tasting room (hospitality building) would be a one story 3,033 square feet (sf) structure. The hospitality building would include a by-appointment-only tasting room, farmstead product processing, a commercial kitchen, restrooms, and support space for the direct sales of wine, cheese, farmstead products, and incidental items from the local area. The driveway, parking, and entrance area fronting the building would have landscaping

Agricultural Promotional Events. The proposed project would include eight agricultural promotional events per year with varying participant levels. The agricultural promotional events would feature food, wine, and other products produced on the site or in the local area and would be held in the farm building complex area. The sanitary wastewater system would be designed to handle flows from the largest agricultural promotional event of up to 200 people; however, the existing portable toilets on site would also be used during events.

Agricultural Employee Housing. A new, approximately 1,877-square-foot agricultural employee unit would be constructed to replace an existing legal nonconforming 1,780-squarre-foot building currently being used for agricultural employee housing, which would be demolished.

Crop Production (excluding grapes). The project would expand the existing vegetable garden from 1 to 2 acres and the fruit orchard from 1 to 2 acres.

Livestock and Grazing. The proposed project would include up to two milk cows, five milk sheep, chickens, and four pigs. The animals would be housed and grazed on approximately 6 acres. A pole barn is proposed for the livestock in the southern portion of the site.

Employees. The project would include five full-time and four part-time employees for most of the year. Seven additional full-time employees would be on site during the grape harvest season and bottling.

The project does not involve expansion of vineyard plantings or a change in the source of water used for vineyard irrigation, which will continue to be from the on-site reservoir. The reservoir is 2.2 acres and holds up to 18 acre-feet of water (USGS 2015, SWRCB 2015).

2.3 On-Site Well and Groundwater Demands

The water-related components of the project are further described below, including the characteristics of the project well, the proposed water infrastructure, and a comparison of existing versus proposed groundwater demands.

2.3.1 Project Well (Well A-1)

The existing on-site well, hereafter referred to as the project well, or "Well A-1," is located at the end of the entrance driveway in the northeastern quadrant of the project parcel. It was installed in December 2001 and currently supplies the domestic uses on site. The well is 715 feet deep and consists of an 8-inch steel casing, a bentonite seal from the surface down to 60 feet below ground surface (bgs), and a combined 360 feet of perforations at discrete intervals between 290 and 715 feet bgs. The well is equipped with 2-inch drop pipe, a 2-horsepower/230-volt pump, and a flow meter that was installed in October 2015. Piping from the well connects to two locations on site: (1) a shed on the eastern edge of the property that houses booster pumps and water treatment units (with three 5,000-gallon water storage tanks adjacent to the shed) and (2) the irrigation reservoir, though the well is not used to fill the reservoir.

The DWR well completion report for Well A-1 reported a yield of 500 GPM during a 7-hour airlift test conducted in 2001.[1] Airlift tests typically overestimate the long-term production rate of a well by a factor of two, which means that Well A-1 is theoretically capable of producing 250 GPM with the proper equipment.[2] However, the pump test performed as part of this investigation indicates the current production capacity is 23 GPM, a rate that is constrained by the size of the pump.

2.3.2 Proposed Water Infrastructure

Well A-1 would serve the project's domestic, sanitary, and process groundwater demands. No new well nor any well upgrade or reconstruction is proposed. However, the project would reconstruct the water storage, distribution and treatment systems on site to serve the proposed

---

1 Well completion reports gathered for the report contain confidential information protected under the Information Practices Act of 1977, and thus are provided to Sonoma County PRMD under separate cover.

2 The rule-of-thumb for maximum sustainable production rate is typically half of the yield reported for airlift test shown on the well completion log. Aquifer pump testing is required to verify the maximum sustainable production rate of a well.

facilities and uses. Separate systems would be provided for the domestic/sanitary water, landscape/livestock water, and emergency fire suppression water. Each system is as follows:

- The domestic water system would include a 10,000-gallon water storage tank that would be filled with groundwater from the existing well. This tank would store water used for the winery building, hospitality building, and residences' domestic use.
- The landscape/livestock system would include a 10,000-gallon storage tank that would be filled with groundwater from the existing well. This tank would store water for landscape irrigation and livestock water. This water would also be available for irrigation of the gardens and orchard. It is expected that 20% of the water for the gardens and orchard would be served by groundwater, with the remaining demand served by the irrigation reservoir.
- The fire protection storage system would consist of four 10,000-gallon storage tanks (40,000 gallons total) that would retain water to be accessed by fire crews in the event of a fire emergency. This would be a one-time demand.

All six storage tanks with a total storage of 60,000 gallons would be located on the east side of the winery building, approximately 10 feet west of the property line. Well A-1 would supply water to the storage tanks only as needed. The controls would be set to allow each tank system to be filled at a time. The domestic, landscape, and fire systems would each have a dedicated booster pumps to supply intended use.

2.3.3 Groundwater Demand

The project parcel's total proposed well water demand, including existing and proposed uses, is expected to be approximately 3.54 acre-feet per year (AFY), representing the groundwater needs for the winery production facility, tasting room, on-site residences, ornamental landscaping, orchard, vegetable garden, and livestock uses (Table 1). The project's contribution to the total is 1.77 AFY. The assumptions underlying the groundwater demands are as follows (SMA 2014, SMA 2016):

- **Domestic use**: The groundwater demand for domestic use is based on a typical rate of 0.75 AFY/dwelling unit. The groundwater demand associated with on-site residential use is not expected to change because the agricultural employee housing will replace an existing legal nonconforming unit, and the vacant residence will be torn down to build the tasting room building. Thus, two residential units are occupied under both current and proposed conditions. As past water use on the property has not been metered, the water use estimate is based on the middle of the range of household water use (0.5 – 1 AFY) from the groundwater pilot study of the Bennett Valley area (Kleinfelder 2003). Given the well meter installed to carry out this study recorded a domestic water use of 25,450 gallons (0.08 acre-feet) over a 69-day period, and that the irrigation needs for the orchard and vegetable garden are accounted for separately (next bullet), the typical rate used is likely an overestimate.

- **Orchard and Vegetable Garden**: The existing orchard and vegetable garden, each 1 acre in size, will both increase to 2 acres in size. The groundwater demand is based on an 8-month irrigation season (April through November). For the orchard, the estimate is based on 300 trees/acre and average daily water need of 3 gallons/tree. For the vegetable garden, the estimate is based on an average row spacing of 6 feet, an average plant spacing of 1.5 feet, and an average of 1 hour of watering per day at a rate of 0.185 gallons per hour. Approximately 20% of the demand would be served by groundwater from Well A-1, with the remaining demand served by the on-site pond.
- **Sanitary Water:** Sanitary water will consist of typical employee and visitor groundwater demands from restrooms, laboratory facilities, and the tasting room. These demands were calculated based on the maximum number of visitors and employees allowed during an average weekday, an average weekend day, an average weekend day with event, a harvest peak day, and a harvest weekend day with event. The groundwater demands for full-time employees, part-time employees, tasting room visitors, and event guests were assumed to be 15 gallons per day (GPD), 7.5 GPD, 2.5 GPD, and 5 GPD, respectively.
- **Process Water**: Process groundwater demands are from typical winery processing activities including crushing; fermentation; barrel storage and bottling; and tank, barrel, equipment, and floor cleaning. The project would allow 150 tons of grapes to be crushed, produced, and bottled on site (corresponding to a maximum of 10,000 cases of wine), and 10,000 pounds of cheese produced on site. The groundwater demands for the production facility assumes a groundwater demand of 5 gallons of water per gallon of wine produced and 1.5 gallons of water per gallon of milk processed. Given each case of wine corresponds to 2.4 gallons of wine, the annual groundwater demand for wine production is anticipated to be 120,000 gallons.[3] Given each pound of cheese requires 10 pounds (1.25 gallons) of milk, and 1.5 gallons of water is required to process 1 gallon of milk, the annual groundwater demand for cheese production is anticipated to be 18,750 gallons.[4] Thus, the total annual groundwater demand for the production facility is 138,750 gallons, or 0.43 acre-feet.

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3 Annual Wine Production = (2.4 gallons/case x 10,000 cases) x 5.0 gallons water/gallon wine = 120,000 gallons

4 Annual Cheese Production = ([10,000 pounds x 10 pounds milk/pound cheese] / [8 pounds/gallon]) x 1.5 gallons of process water/gallon milk = 18,750 gallons

- **Landscape**: The groundwater demand for the landscaping is based on the Preliminary Landscape Plan prepared by for the project, which calculated landscape groundwater demands according to project plans and per Sonoma County water-efficient landscape regulations (SMA 2016).
- **Livestock**: The groundwater demand for livestock is based on up to two milk cows (20 gallons/day/cow), five milk sheep (1–2 gallons/day/sheep), chickens (0.5 liters/day/chicken), and four pigs (1–2 gallons/day/pig). In estimating water for livestock, the upper end of the range was used.

Surface water from the on-site reservoir would continue to serve as the source for irrigation of the on-site vineyards and would not be from the groundwater well. Vineyard demand is not included in Table 1. The reservoir would also supply 80% of the water needed for the orchard and vegetable garden; only the portion that will come from the well is included in Table 1.

As shown in Table 1, the well groundwater demand of the existing and proposed uses (3.54 AFY) represents an increase of 1.77 AFY, or about double the current estimated well groundwater demand of 1.76 AFY on the site. It is estimated that the well groundwater demand for the proposed project represents roughly 10% of Well A-1's existing production capacity, with the maximum running time for the pump being that necessary to fill each 10,000-gallon storage tank consecutively.[5] The water system would be designed to allow only one tank to fill at a time. The maximum continuous pumping time is therefore roughly 14.5 hours,[6] with a total of about 116 individual storage tank fill-ups in a year.[7] Given the well equipment and proposed storage, Well A-1 in its current condition has more than adequate capacity necessary to meet the project's groundwater demand (by a factor of 10).

5 Well A-1 production capacity = (23 gpm) * (525,600 min/year) * (1 af / 325,851 gal) = 37.1 afy; Well groundwater demand as percent of capacity = 3.54 afy / 37.1afy = 0.095 (or 10% rounded).

6 Time to fill two water storage tanks consecutively: (20,000 gallons / 23 gpm) * (1 hr / 60 min) = 14.5 hours. The four 10,000 gallon fire water tanks would be filled once when constructed, and only refilled in the event of a fire.

7 Number of individual tank fills: 3.54 af * (325,851 gal/af) * (1 / 10,000 gal) = 115.4

Table 1
Groundwater Demands

Type of Use	Average Day GPD)	Peak Day (GPD)	Annual Groundwater Demand (Gallons)	Annual Groundwater Demand (Acre-Feet)
Existing Uses				
Domestic use	1,200	1,340	489,100	1.50
Orchard (1 acre)[a]	180	180	43,920	0.13
Vegetable garden (1 acre)[a]	180	180	43,920	0.13
TOTAL	**1,560**	**1,700**[b]	**576,940**	**1.76**
Proposed Uses[c]				
Domestic use	1,200	1,340	489,100	1.50
Orchard (2 acres) [a]	360	360	87,840	0.27
Vegetable garden (2 acres) [a]	360	360	87,840	0.27
Sanitary water	178	355	64,835	0.20
Process water	380	1,712	138,750	0.43
Landscape (+/- 1 acre)	1,854	2,000	263,488	0.81
Livestock	63	63	22,995	0.07
TOTAL	**4,395**	**6,190**[b]	**1,154,848**	**3.54**
Net Increase				
Domestic use	0	0	0	0.00
Orchard (2 acres)[a]	180	180	43,920	0.13
Vegetable garden (2 acres)[a]	180	180	43,920	0.13
Sanitary water	178	355	64,835	0.20
Process water	380	1,712	138750	0.43
Landscape (+/- 1 acre)	1,854	2,000	263,488	0.81
Livestock	63	63	22,995	0.07
TOTAL	**2,835**	**4,490**[b]	**577,908**	**1.77**

Source: SMA 2016.
Notes:
[a] The annual demands given for the orchards and vegetable gardens consist of 20% of the total irrigation demand. The remainder is to be provided by the irrigation reservoir which is supplied with surface runoff..
[b] Peak days do not overlap, so this total is an artificially high number.
[c] Note the one-time use of 40,000 gallons to fill the fire suppression tanks are not included in this table because they are not ongoing annual demands. The tanks would be refilled following fire emergencies when they are put to use.

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3 PHYSICAL SETTING

3.1 Climate

The climate for the study area is generally Mediterranean, with cool, wet winters, warm, dry summers, and a strong coastal influence on climate that moderates temperature extremes (USGS 2013). The region is subject to marine influence and fog intrusion. Daily minimum and maximum temperatures, averaged monthly, varied from 34 degrees Fahrenheit (^{o}F) to 90^{o}F for a 12- to 22-year period based on data from several weather stations in the region and the Russian River watershed (i.e., Santa Rosa, Windsor, Petaluma East, Bennett Valley, Hopland, and Sanel Valley). Based on the California Irrigation Management Information System (CIMIS) data for the Bennett Valley (Station 158) for years 2002 through 2014, average annual potential evapotranspiration (ET) has varied between 42 and 46 inches, with an average reference evapotranspiration (ETo) of 44 inches. ETo is based on potential evapotranspiration (ET) from turf grass/alfalfa crop, which assumes a continuous source of moisture and does not consider plant dormancy. Therefore, ETo is an overestimation of actual ET, which varies with the vegetation type since some plants consume significantly more water than others. The location of CIMIS Station 158 is shown in Figure 2.

The climate station with the longest-running record (1906–2013) is in the City of Santa Rosa, which reports an average annual precipitation of 30 inches, most of which (98%) falls within the months of October through May. The location of the Santa Rosa meteorological station is shown in Figure 2. Historically, January is the wettest month, with an average precipitation of 6.4 inches, followed by February and December, with average precipitation of 5.3 and 5.2 inches, respectively (USGS 2013). There is significant year-to-year variation in the region, with multiyear droughts having affected the region in the late 1970s, in the late 1980s and early 90s, and the last 4 years.

Though the timing and frequency of precipitation on the project site is similar to that of Santa Rosa, the project site tends to receive greater rainfall amounts from each weather system compared to Santa Rosa due to the effects of orographic lift (i.e., greater elevation). The Parameter-elevation Regressions on Independent Slopes Model (PRISM), shown in Figure 2, provides an estimate of spatial and temporal variability in precipitation in response to (1) distance from moisture sources, (2) average storm track, (3) aspect of land surface in relation to storm track, and (4) effect of altitude on adiabatic cooling of moisture-laden air masses. According to PRISM, mean annual precipitation on the site is about 48 inches per year (Figure 2). The Sonoma County Water Agency isohyetal map shows a somewhat lesser average for the project site, with an estimated average precipitation of 42 inches per year (SCWA 1983). Although there are no climate stations on-site or in the immediate vicinity, based on the above, average annual precipitation can be reasonably expected to be between 42 and 48 inches. The water balance analysis in Section 7 assumes 42 inches per year.

3.2 Topography

The project site is located at the southern end of the Bennett Valley, in a transition zone between the valley floor and Sonoma Mountain. Elevations rise to the east and south towards the crest of Sonoma Mountain, whose peak is 2,300 feet above mean sea level (amsl), and descend to the northwest in the direction of Bennett Valley, whose floor is roughly 500 feet amsl. Based on review of high-resolution topographic data, elevations on the property extend from a high of 1,070 feet amsl in the southeastern corner to a low of 910 feet amsl in the southwestern corner along the South Fork Matanzas Creek (UNM and NASA 2013). The majority of the site ranges in elevation from 950 to 1,020 feet amsl with slope gradients of less than 10%. Localized areas of the site, such as the small hill on the northwestern corner of the site and the gully along the South Fork Matanzas Creek have slope gradients that are between 10% and 50% (UNM and NASA 2013).

The property sits on a local high point between the South Fork Matanzas Creek immediately to the south, and Matanzas Creek (main stem) about 0.5 mile to the northeast. Well A-1 is located on the crest of a subtle topographic divide on site. To the north and east of this divide, drainage flows into a small drainage ditch that cuts across the northeastern corner of the site and continues west along Sonoma Mountain Road before discharging into the South Fork Matanzas Creek. To the south and west of the divide, comprising the majority of the site, drainage sheet flows directly to an on-site irrigation reservoir and/or the South Fork Matanzas Creek, which cuts across the southwest corner of the parcel.

3.3 Watersheds, Soils, and Land Cover

Regionally, the project site is within the 254-square-mile Mark West Creek watershed and the 56-square-mile Upper Santa Rosa Creek sub-watershed, as mapped by the USGS Watershed Boundary Dataset (USGS 2015). Drainage on the project site is collected by the South Fork Matanzas Creek before eventually joining Santa Rosa Creek approximately 7.5 miles northwest of the project site. From there Santa Rosa Creek continues to flow west and north, eventually joining Mark West Creek and the Russian River on the west side of the Santa Rosa Plain (USGS 2015). The Russian river flows through the Coast Ranges for approximately 13 miles to the west before it outlets to the Pacific Ocean.

Table 2
USGS Watersheds

HUC/Basin No.	Watershed Name	Size (sq. mi.)
180101	Northern California Coastal accounting unit	10,474
18010110	Russian River cataloguing unit	1,484
1801011007	Mark West Creek watershed	254
180101100702	Upper Santa Rosa Creek sub-watershed	56

Source: USGS 2015.
Notes: HUC = hydrologic unit code; sq. mi. = square miles

3.3.1 Watershed Delineation

ArcMap was used to determine the shape and size of the project's watershed at a finer scale, based on LiDAR-derived digital elevation model with a 0.5-meter resolution (UNM and NASA 2013). As shown in Figure 3, a watershed was delineated to encompass the whole site, at a point where an unnamed ephemeral drainage meets the South Fork Matanzas Creek. This watershed is about 962 acres and extends to higher terrain at the peak of Sonoma Mountain, to the south and southeast of the project site (Figure 3). An understanding of the infiltration and runoff characteristics within the project's watershed is important in determining the potential recharge to the underlying aquifers from precipitation. The available surface-water records indicate that a high percentage of streamflow at the mouth of Matanzas Creek is generated as overland flow, with a relatively fast response time to the larger storm events (USGS 2013). It should be noted that recharge to the underlying aquifer may extend to areas outside the watershed, but that delineation of the watershed is the most practical terrain-based means of approximating the recharge area for analytical purposes.

3.3.2 Land Uses

The land cover within the watershed is predominantly comprised of undeveloped open space, with a mix of grazing land, vineyards, and rural residential properties concentrated along Sonoma Mountain Road and rural side roads. Due to the rural and undeveloped nature of the watershed, it is minimally impacted by impervious surfaces, which are limited to paved public roadways and building footprints (such as residences, barns, and outbuildings). Approximately 0.2% of the watershed as a whole is estimated to be covered by impervious surfaces (USGS 2016). Based on review of aerial photographs, there are approximately 46 acres of cultivated land and 21 rural residences within the watershed, primarily concentrated at the north end of the watershed, around the project site (Figure 3). Land use designations within the watershed consist of 67% (645 acres) "RRD100" (Resources and Rural Development), 15% (146 acres) "RR15" (Rural Residential), 5% (52 acres) "DA20" (Diverse Agriculture), and 12% (120 acres) “LIA40” (Land Intensive Agriculture). South and east of the project site is the North Sonoma Mountain Regional Park and Open Space Preserve, which has trailhead, picnicking, and equestrian facilities. Agricultural uses become more common and contiguous a couple miles further to the north and northeast within the Bennett Valley, which is outside of the project’s delineated watershed.

3.3.3 Soils

Based on review of U.S. Department of Agriculture (USDA) soil survey, the surface soils on site consist of the Goulding clay loam and Spreckels loam (USDA 2016). The soils that makeup the project’s delineated watershed consist of the Goulding clay loam, Spreckels loam, Toomes rocky loam, Goulding-Toomes complex, and Raynor clay (USDA 2016). These soils are generally well drained, but have moderate to high runoff potential due to high clay content. The clay rich soils are derived from a mix of marine sedimentary deposits and volcanic material. Table 3 shows the soil units present within the watershed and properties that are important in characterizing when recharge occurs, including their ability to hold water (soil moisture content) and their runoff potential (hydrologic groups). As shown in Figure 3, nearly the entire watershed is comprised of hydrologic soil groups C and D, which have runoff ratings of moderate to very high (USDA 2016).

3.4 Geologic Setting

The geology of the project site and vicinity is essential in understanding the movement and behavior of groundwater. A literature review was conducted to develop an understanding of the geologic setting, including the site-specific groundwater study by Boudreau (2013), the site-specific geotechnical report (Reese and Associates 2013), and several regional geologic maps (CGS 2010, USGS and CGS 2006, CGS 2003, CDMG 1980).

Table 3
Soil Properties within the 962-Acre Project Watershed

Soil Map Unit	Map Unit Name	Acres within Watershed	Hydrologic Group1 (A – D)	Soil Moisture Content2 (Inches)
GgE	Goulding clay loam, 15% to 30% slopes	47.9	C	2.68
GgF	Goulding clay loam, 30% to 50% slopes	61.0	D	2.34
GgG	Goulding clay loam, 50% to 75% slopes	101.3	D	2.34
GID	Goulding cobbly clay loam, 5% to 15% slopes	62.3	C	2.13
GIE	Goulding cobbly clay loam, 15% to 30% slopes	182.0	D	1.89
GIF	Goulding cobbly clay loam, 30% to 50% slopes	53.2	D	1.89
GoF	Goulding-Toomes complex, 9% to 50% slopes	27.6	C	2.68
RaC	Raynor clay, 2% to 9% slopes	27.7	C	7.86
RaD	Raynor clay, 9% to 15% slopes	10.5	C	6.15
RcD	Raynor clay, seeped, 2% to 15% slopes	41.1	C	7.86
RnA	Riverwash[3]	4.6	A	1.8
SkC	Spreckels loam, 2% to 9% slopes	13.9	D	4.59
SkD	Spreckels loam, 9% to 15% slopes	137.7	D	4.59
SkE	Spreckels loam, 15% to 30% slopes	38.8	D	4.59
SkE2	Spreckels loam, 15% to 30% slopes, eroded	12.6	D	4.63
SkF	Spreckels loam, 30% to 50% slopes	0.1	D	4.59
ToE	Toomes rocky loam, 2% to 30% slopes	45.9	D	1.95
ToG	Toomes rocky loam, 30% to 75% slopes	83.1	D	1.95
W	Water (*on-site irrigation reservoir*)	2.1	—	—

Source: USDA 2016.
Notes:
1 Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups (A – D) according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long duration storms. Group A soil have the highest infiltration rates (low runoff potential), and Group D soils have the lowest infiltration rates (high runoff potential).
2 Soil moisture content was calculated by multiplying representative values for the thickness (in) of each soil horizon by the available water capacity (in/in) of the horizon.
3 The soil survey does not assign a hydrologic group to riverwash, but is given Group A here because it typically consists of sand and gravel.

3.4.1 Regional Faults and Folds

The site is located between the Rodgers Creek Fault, located about 1.5 miles to the west-southwest, the Bennett Valley Fault, located about 0.7 mile to the northeast, and an unnamed fault about 500 feet to the south (USGS and CGS 2006). The Rodgers Creek Fault is a Holocene-active fault that is an important branch of the larger San Andreas Fault system connecting, by means of right steps, the Hayward Fault to the south and the Maacama Fault to the north. The Bennett Valley Fault and unnamed fault are older Quaternary faults (less than 1.6 million years old) with no evidence of movement in the recent geologic past (USGS and CGS 2006). The trace of the unnamed fault to the south of the project site is roughly coincident with the break in slope that marks the base of Sonoma Mountain. Unlike the Bennett Valley and Rodgers Creek Faults, which are predominantly strike-slip faults, the unnamed fault is a south-dipping reverse fault (Allen, pers. comm., 2016, USGS 2007).

The geologic strata in the Bennett Valley and Sonoma Mountain are neither flat-lying nor consistently oriented (CGS 2010, CGS 2003). Several maps show an east–west oriented anticline passing through or near the project site, with strata that are oriented roughly east to west, parallel to the trace of the unnamed fault. On-site geologic reconnaissance by Reese and Associates (2013) found bedding orientations to strike slightly north of west, with dips to the south at angles of roughly 30 degrees. Bedding orientations shown on geologic maps strike in a similar direction but dip in the opposite (northerly) direction (USGS 2007, CGS 2010). These folds are interpreted to be associated with compressional episodes starting in the Pliocene epoch and continuing to the present (Wagner et al. 2011).

Geologic structures such as fault planes or zones can either be a barrier or conduit for groundwater flow, depending on age, orientation, mineralization along the fault, and the juxtaposition of aquifers or aquitards along the fault. Though the Rodgers Creek Fault has been shown to be a barrier to groundwater flow in places, there is no data to indicate one way or another how the fault south of the project site interacts with groundwater (USGS 2013). This analysis does not treat the unnamed fault as either a conduit or barrier to groundwater.

3.4.2 Geologic Units and Stratigraphy

The geologic mapping reviewed for this study revealed numerous differing interpretations of the site's geology, with respect to both the spatial distribution and naming of geologic units (Reese and Associates 2013, Boudreau 2013, Kleinfelder 2003, CGS 2003, USGS 2007, CDMG 1980, CGS 2010, Wagner et al. 2011). The apparent discrepancies reflect (1) the differing scope/purpose and geographic scale of the various sources; (2) a general scarcity of surface outcrops in the vicinity from which to establish stratigraphic relationships; and (3) an evolving understanding of the area's geologic history and changing nomenclature. For the purpose of this report, the Geologic Map of the Glen Ellen 7.5′ Quadrangle, Sonoma County, California (CGS 2003) and the Preliminary Geologic Map of the Napa 30′ x 60′ Quadrangle, California (CGS 2010) are used to map and describe the geology of the project site and vicinity. The CGS (2003) map is older, but is at a finer scale (1:24,000), whereas the map by Wagner and Guttierez (CGS 2010) is the most recent publicly available map of the area, but has a coarser scale (1:100,000). Together, they represent the best available published geologic maps of the vicinity.

Beneath the alluvial fans, stream channels, and landslide deposits that reflect surficial geologic processes of the recent past, the project site and much of Bennett Valley is underlain by the Upper

Petaluma Formation (*PMpu*) (CGS 2003). The Upper Petaluma Formation is a Pliocene sedimentary unit reflective of lacustrine, wetland, and (to lesser extent) fluvial environments. It is characterized by clay, shale, sandstone, and conglomerate, nodular limestone and diatomite, and is interbedded with tuffs and tephra of the Sonoma Volcanics (*Tsv*) (Wagner et al. 2011). In the project area, the Upper Petaluma Formation exhibits more freshwater diatomite, lignite, and petrified wood characteristic of lacustrine and wetland environments than the lower members of the Petaluma Formation. The Sonoma Volcanics make up the bulk of Sonoma Mountain and partly overlaps in age with the Upper Petaluma Formation in the region. The Glen Ellen Formation (*QTge*), also mapped in the vicinity, differs from the Petaluma Formation in age (it is younger and lies stratigraphically above the Petaluma Formation) and in its depositional environment (it is predominantly continental in origin). The Glen Ellen Formation consists of fluvial origin clay-rich stratified deposits of poorly sorted, loosely consolidated sand, silt, and gravel.

Figure 4 shows the geologic units mapped within the project parcel are diatomite (*Tdi*), alluvial fan deposits (*Qf*), and the Glen Ellen Formation (*QPge*). Additionally, the Upper Petaluma Formation (*PMpu*) is mapped about a 0.25 mile west of the site within the channel of the South Fork Matanzas Creek, and the Sonoma Volcanics (*Tsv*) is mapped south of the unnamed east-to-west trending fault. Though Figure 4 shows diatomite as a geologic unit distinct from the Upper Petaluma Formation, it is considered a diatomite-rich member of the Upper Petaluma Formation (Wagner et al. 2011, Allen, pers. comm., 2016). The alluvial fan deposits (*Qf*) mapped on site occupies most of the area and obscures the underlying geology. However, the Upper Petaluma Formation (*PMpu*) is presumed to shallowly underlie the alluvial fan deposit shown on Figure 4. The CGS (2003) map indicates the Upper Petaluma Formation, not the Glen Ellen Formation, underlies the vicinity to the north. In either case, the project site and vicinity is shown to be underlain by a gently folded diatomaceous section of the Upper Petaluma Formation. Table 4 summarizes the geologic units present on site and the immediate vicinity.

Table 4
Geologic Formations Occurring in the Project Area

Symbol	Unit/Formation Name	Age	Description and Notes
Qf	Alluvial Fan Deposits	Late Pleistocene and Holocene	Unconsolidated stream channel deposits, stream terrace deposits, alluvial fan deposits, and flood plain deposits composed of boulders, cobbles, gravel, and sand. Where mapped, these are considered surficial deposits comprising a thin layer on top of bedrock units. Maps by CGS (2003) and Wagner and Gutierrez (CGS 2010) suggest the site is underlain by an alluvial fan, whereas other sources attribute the near surface materials to old landslide deposits.
Qols	Landslide Deposits	Quaternary	Several large massive landslides are mapped in the vicinity, including a portion of the project site. Landslide deposits are typically poorly sorted with lithologies reflecting their source material. CDMG (1980) and Reese and Associates (2013) attribute the topography on site (low hummocky knolls) to landslide deposits. Reese and Associates (2013) refined the location of the landslide mapped by CDMG based on site-specific review of aerials, topography, and exploratory soil trenches, and described the deposits as consisting primarily of weak diatomaceous siltstone.
QTge	Glen Ellen Formation	Pleistocene – Late Pliocene	Glenn Ellen formation consists of fluvial origin clay-rich stratified deposits of poorly sorted, loosely consolidated sand, silt, and gravel interbedded with minor beds of matrix-supported conglomerate (composed of basalt, andesite, obsidian clasts, and silicic tuffs). The groundwater report by Boudreau (2013) and Wagner and Gutierrez (CGS 2010) assign the site and/or adjacent areas to the Glen Ellen Formation.
PMpu	Upper Petaluma Formation	Pliocene	Lacustrine, wetland, and some continental deposits of clay, shale, sandstone, and conglomerate, nodular limestone and diatomite, with interbedded tuffs. Upper section contains tuffaceous sandstone and gravel interbedded with diatomite and lignite, and in many places is interbedded with tuffs and tephra of the Sonoma Volcanics. In most areas, the formation is composed predominantly of clay and other fine-grained materials. The on-site geologic reconnaissance by Reese and Associates (2013) and several regional geologic maps attribute the subsurface materials to the Petaluma Formation.
Tsv	Sonoma Volcanics	Pliocene – Miocene	The Sonoma Volcanics consist of a thick sequence of continental volcanic and volcaniclastic rocks including basalt, andesite, and rhyolite lavas interbedded with tuffs, lahar deposits, debris avalanche deposits, mudflow units, reworked tuffs, sedimentary breccia deposits derived from volcanic rocks, and lacustrine deposits. All sources attribute the steep terrain south of the Project site to the Sonoma Volcanics.

Sources: CDMG 1908, CGS 2003, CGS 2010, Reese and Associates 2013.

3.5 Regional Groundwater Occurrence and Trends

The *Hydrologic and Geochemical Characterization of the Santa Rosa Plain Watershed* study (USGS 2013) provides a compilation of literature and well records concerning the principal aquifers underlying the Santa Rosa Plain and contributing watersheds. USGS (2013) describes the Petaluma Formation as an aquifer of minimal and variable water-bearing capacity—widely distributed, but with a relatively low productivity that is tapped for water when no better option is available at a particular location. Because of the complicated interfingering stratigraphic relations of the Petaluma Formation, Glen Ellen Formation, and Sonoma Volcanics, some wells can pass from one formation into another more than once. The interfingering of the three formations can also place relatively impermeable lavas or clay beds above more permeable sand or gravel beds, producing confined or semi-confined groundwater conditions (USGS 2013).

The water bearing properties of Sonoma Volcanics are described by USGS (2013) as highly heterogeneous, since welded tuff, mafic/basaltic lavas, and other unfractured volcanic rocks have very low specific yields and hydraulic conductivities, whereas coarse tephra, air-fall tuffs/pumice, and rubble zones between lava flows can have very high specific yields and hydraulic conductivities. Fractured welded tuffs and lavas have low porosity and, therefore, store little water, but, in some cases, these units have relatively high transmissivity values where the fracture network is extensive. For these reasons, the wells that penetrate the Sonoma Volcanics can produce very different yields. The typical range is 10 to 50 GPM, though some wells may yield under 10 GPM or may be dry, while others may yield a few hundred GPM where thick air-fall pumice units are penetrated (USGS 2013).

The specific yield and transmissivity values for the principal hydrogeological units in the region, including the Glen Ellen Formation, Petaluma Formation, and Sonoma Volcanics are shown in Table 5. The high degree of variability in specific yields and transmissivities reported by USGS (2013) and shown in Table 5 is due to the high degree of geologic heterogeneity even within formations, and because many wells may pass through and draw water from more than one unit. For many of the wells included in the USGS study, the materials penetrated could not be confidently assigned to particular geologic formations. The most reliable estimation of aquifer properties are from the limited number of aquifer tests that followed established procedures, most of which are large-capacity public-supply wells used for municipal water systems. The transmissivity values derived from these tests are provided in parentheticals in Table 5. Besides reporting aquifer properties, the USGS (2015) also presents groundwater level contour maps of the region, which indicates the groundwater gradient in the Bennett Valley is to the north and west, generally following the topographic gradient. However, these maps are not at a fine enough scale to reliably represent groundwater trends in the project vicinity.

Table 5
Reported Specific Yield and Transmissivity Values

Lithology	Specific Yield (%)	Transmissivity (feet[a]/day)
Glen Ellen	3 – 7	2,630 – 12,098[a] (5,870[b])
Petaluma Formation	3 – 7	130 – 1,600
Sonoma Volcanics	0 – 15	0.8 – 5,300 (500[c])

Source: USGS 2013.
Notes:
[a] Range of values estimated based on hydraulic conductivities reported by USGS (5 to 23 feet/day) and saturated aquifer thickness penetrated by Well A-1 (526 feet). Transmissivity = hydraulic conductivity x saturated aquifer thickness.
[b] Result from an aquifer test in a 500-foot-deep well east of Windsor using established procedure (Jacob method).
[c] Results from a 72-hour aquifer test performed in 1975 on a 739-foot-deep well located in Bennett Valley.

On a more local scale, the *Pilot Study of Groundwater Conditions in the Joy Road, Mark West Springs, and Bennett Valley Areas* prepared by Kleinfelder (2003) examined precipitation, groundwater level, well construction, and land use trends in the Bennett Valley and found evidence of declining groundwater levels over time, though not nearly at the same rate of increase of population growth in the area. Development pressures and associated groundwater well pumping was considered to be the primary factor driving this trend, as precipitation trends had been relatively flat over time. Groundwater demands within the 7-square-mile study area (which is inclusive of the project site) were estimated to be 215 AFY and 288 AFY for agriculture and residential uses, respectively. Kleinfelder also found that newer wells were being drilled at deeper depths, which is suggestive of declining groundwater levels, but could also reflect a migration of drilling sites from low-lying valley sites to higher elevations and ridge tops. Kleinfelder (2003) indicates that "the most significant constraint on the availability of groundwater in the Bennett Valley Study Area is the concentration of groundwater users on the poor aquifer materials of the Petaluma Formation. The formation consists mostly of fine-grained materials that offer very poor yield to wells. The successful wells in the Petaluma Formation are those that intersect the few beds of sand gravel or cobble." Bennett Valley residents and community leaders have reported a number of well failures, wells that go dry seasonally, and properties where sufficient water supplies could not be developed (Kleinfelder 2003).

The PRMD has developed a four-tier classification system, based on geologic information and water yields, to designate general areas of groundwater availability. Class 1 areas are Major Groundwater Basins; Class 2 areas are Major Natural Recharge Areas; Class 3 areas are Marginal Groundwater Availability Areas; and Class 4 areas are Areas with Low or Highly Variable Water Yield. The proposed project is within a Class 3 area as depicted on the PRMD Groundwater Availability Map (County of Sonoma 2004), due to the variable water yield of the Petaluma Formation and Sonoma Volcanics. The heterogeneous nature of the underlying aquifer materials makes well yields in any one place challenging to predict, with wells proximal to each other often yielding very different quantities of water.

3.6 Groundwater Quality

USGS (2013) indicates chloride, total dissolved solids, nitrate, arsenic, boron, iron, and manganese are water-quality constituents of potential concern in the region. Water quality testing data from 2005 (general water quality parameters and inorganic minerals) and 2013 (arsenic and bacteriological constituents) of raw water from Well A-1 was provided by the owner. The results from 2005 indicate the California drinking water maximum concentration level (MCLs) established under the Safe Drinking Water Act are exceeded for turbidity, iron, manganese, aluminum, and color. The results from 2013 indicate no exceedance of MCLs for arsenic and no detection of coliform bacteria or *E. Coli*. Residents in the vicinity reported hard water, and indications of high iron levels were observed during the well survey. Water quality parameters measured in the field included temperature (77.9 ºF), pH (7.76), electrical conductivity (388 µS/cm [microSiemens per centimeter]), turbidity (3.08 NTU [Nephelometric Turbidity Units]) and total dissolved solids (193 ppm [parts per million]).

To update the laboratory testing from 2005 and 2013, Dudek collected a sample of the well water on December 11, 2015, and submitted it to a certified laboratory for analysis of general mineral, inorganic minerals, and bacteriological constituents for comparison to California drinking water primary MCLs and secondary MCLs. Color, turbidity, manganese, and iron exceeded secondary MCLs. All other constituents, including priority metals, fecal coliform, and *E. coli*, were not detected, or were detected in concentrations below regulatory drinking water limits. Table 6 shows the secondary MCL exceedances, the results for the constituents of concern cited by USGS (2013), and bacteriological constituents. The full suite of compounds and the analytical results are provided in Appendix A.

Table 6
Water Quality Testing Results for Project Well

Constituent	Analytical method	Units	Result	California Drinking Water MCLs
Secondary MCL Exceedances				
Iron	EPA 200.7	μg/L	**1,700**	300[a]
Manganese	EPA 200.8	μg/L	**150**	50[a]
Color	SM2120 B-2001	Color Units	**89**	15[a]
Turbidity	SM2130 B-2001	NTU	**11.5**	5[a]
Selected Constituents of Concern				
Chloride	EPA 300.1	mg/L	5.0	250/500/600[b]
Total Dissolved Solids	SM2540 C-1997	mg/L	244	500/100/1,500[a, b]
Nitrate as N	EPA 300.1	mg/L	< 0.10	45 (10 as N)
Nitrite as N	EPA 300.1	mg/L	< 0.10	1 (as N)
Arsenic	EPA 200.8	μg/L	< 2.0	10
Bacteria				
E. Coli	SM9223B	MPN/100ml	<1	A positive result for fecal coliform or E. coli samples is an acute MCL violation[c]
Total Coliform	SM9223B	MPN/100ml	<1	More than 1 sample per month is total coliform positive[c]

Source: Appendix A
Notes: μg/L = micrograms per liter; NTU = Nephelometric Turbidity Units; mg/L = milligram per liter; MPN = Most Probable Number
Results for undetected constituents are indicated as less than the laboratory reporting limit.
a Secondary MCLs.
b Recommended/Upper/Short Term Secondary MCLs.
c MCL applies after disinfection.

4 WELL INVENTORY

4.1 Well Records Review

To gather records on water wells in the area, Dudek requested well permits, dry weather yield certifications, and well completion reports on file with the County within a 0.5-mile radius of the project well. In addition, Dudek requested from DWR, through the County, well completion reports for all Public Land Survey System township and range sections within a 1-mile radius of the project well.[8] The County's records date back to 1973 and are stored by address. Though the search included review of previously listed addresses, the records received may not be all-inclusive due to address changes and parcel mergers, splits, and parcel retirements. Furthermore, DWR files well completion reports by Public Land Survey System, and location information is typically limited to address and Assessor's Parcel Number. The location information on DWR well completion reports may now be outdated for older wells. For these reasons, lack of identified records may not indicate absence of a well within the search radius.

Personal information in well records is confidential, and therefore these records are provided to PRMD under separate cover. It should be noted that well logs are now publicly available from DWR. DWR is in the process of redacting the personal information with the goal of making all well completion reports publicly available online at no charge within the next year.

4.2 Well Survey

Well information was gathered via an owner questionnaire and two field visits conducted on November 4, 2015, and subsequently on November 13, 2015.[9] Dudek contacted seven property owners within a 1,000-foot radius of the project well or within 300 feet of the parcel boundary to request access to their wells. Dudek was granted access by five property owners located along Sonoma Mountain Road to allow documentation of the location, condition, accessibility, uses, and depth to groundwater for their well(s). The property to the south and east of the project site is part of the Sonoma Mountain Regional Park and Open Space Preserve. According to the County, the public facilities are not served by running water, and the park has no wells but has springs (Peltz, pers. comm. 2015).

Four existing water wells are identified on the project site, Well A-1 (the project well, described in Section 2.3.1), and four dry holes (Boudreau 2013). On November 4, 2015, Dudek conducted a 25-minute informal pump test of Well A-1, and observed that the groundwater

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8 The scope of the well record review was a 0.5 mile radius, but a 1-mile radius was requested to ensure access to more distant well records, if needed.

9 Written owner permissions and questionnaire responses are also confidential and provided to PRMD under separate cover.

level drawdown within the well stabilized at 80.10 feet below top of casing (btoc) after 5 minutes, or a drawdown of about 6.3 feet below the initial static groundwater level of 73.79 feet btoc. A flow/discharge meter on Well A-1 that was recently installed by the owner (October 2015) indicated the discharge rate during the test to be approximately 23 GPM.

A total of seven wells were identified on the five off-site properties which permitted access to Dudek. The off-site wells surveyed are described below in order of distance from Well A-1:

- **Wells C-1 and C-2**: Wells C-1 and C-2 are the closest off-site wells to the project well, are 15 feet apart from each other, and are located 714 and 716 feet north–northeast of Well A-1, respectively. Well C-1, which is the owner's active well used for domestic purposes, consists of a 4-inch-diameter nominal steel casing, a 1-inch-diameter drop pipe, and a ¾-inch access port, and is reported by the owners to be 210 feet deep and equipped with a 1- to 1.5-horsepower pump. No well completion report was located in the records search for Well C-1. Well C-2, which was abandoned due to excessive sand, consists of a 5-inch-diameter capped polyvinyl chloride (PVC) casing with no pump or drop pipe, and is 270 feet deep according to the record review. Dudek deployed an In-Situ Level Troll 400 pressure transducer in Well C-2 by saw-cutting the PVC pipe below the well cap. The well cap was replaced on the following visit with fitted PVC pipe and a removable cap. The initial groundwater levels of Wells C-1 and C-2, measured on November 4, 2015, were 78.83 and 76.12 feet btoc, respectively. The difference in depth to groundwater at these wells is attributed to the different surface elevation measuring points (wellhead surface elevations measuring points were not surveyed for this study).
- **Well B-1**: Well B-1 is located 1,224 feet northeast of Well A-1. Well B-1 is used for domestic purposes and is reported to yield 8 GPM. It consists of a 6.25-inch-diameter (outside) steel casing, 1.25-inch drop pipe, and a 0.5-inch access port; is equipped with a ¾-horsepower pump; and was originally 155 feet deep as determined from the well completion report. In 1995, shearing in the well occurred at a depth of 138 feet, and a new pump was set to a depth of 111 feet. The initial groundwater level of Well B-1, as measured on November 13, 2015, was 67.27 feet btoc.
- **Wells K-1 and K-2**: Wells K-1 and K-2 are approximately 75 feet apart from each other, and are located 1,501 and 1,577 feet west of Well A-1, respectively. Well K-1 is reported by the owner to be the active well used for domestic and occasional irrigation purposes. It was measured to have an 8-inch-diameter (outside) PVC casing, a 1.25-inch diameter drop pipe, and a 3/4-inch access port. It has a 10-horsepower (230V 3 phase) well pump set to 294 feet, and is shown on the well completion report to be 577 feet deep. Well K-2 consists of an 8-inch-diameter PVC casing, a 4-inch diameter drop pipe, and a 1-inch access port, and is shown on the well completion report to be 740 feet deep. Dudek

deployed an In-Situ Level Troll 400 pressure transducer in Well K-2. The initial groundwater levels of Wells K-1 and K-2, measured on November 13, 2015, were 64.75 and 35.31 feet btoc, respectively.

- **Well L-1**: Well L-1 is located 1,686 feet west of Well A-1. Well L-1 is shared for domestic purposes by two parcels and is (uncertainly) reported by the owner to be 80 feet deep and to yield approximately 15 GPM. It has a 9-inch-diameter (outside) steel casing, a 2.75-inch-diameter drop pipe, a 3/4-inch access port, and a 1 horsepower pump. No well completion report was located in the records search for Well L-1. The initial groundwater level of Well L-1, as measured on November 13, 2015, was 58.56 feet btoc.
- **Well P-1**: Well P-1 is located 1,973 feet northwest of Well A-1. Well P-1 is used for domestic purposes and is (uncertainly) reported by the owner to be 85 feet deep and to yield approximately 2.5 GPM. It has a 9-inch-diameter (outside) steel casing, a 1.25-inch diameter drop pipe, a ¾-inch access port, and a ¾ horsepower pump. No well completion report was located in the records search for Well P-1. The initial groundwater level of Well P-1, as measured on November 13, 2015, was 91.51 feet btoc.

4.3 Summary

Table 7 provides the results of the well inventory based on review of DWR well completion reports, county well permits, and a field survey of on-site and neighboring wells. Information regarding all wells with the "X" prefix is solely from well completion reports and County records and were not located in the field. Figure 5 depicts the location of the wells, which are approximate for those not observed in the field.

Table 7
Well Inventory

Well No.	Distance (ft.)/Direction from Well A-1	Elevation (ft. amsl)[a]	Well Depth (ft. btoc)[b]	Screened Interval(s) (ft. btoc)	Yield (GPM)[b, e]	Depth To Water (ft. btoc) (Date)	Well Use	Year Drilled
On-Site (Project) Well								
A-1	—	994	690	290-330; 350-490; 510-690	500	73.79 (11/4/15)	Domestic	2001
Surveyed Off-Site Wells								
C-1	714/NNE	989	210[c]	—	—	78.83 (11/4/15)	Domestic	—
C-2	716/NNE	988	270	140-270	13	76.12 (11/4/15)	Abandoned	1980
B-1	1,224/W	980	155	95-100; 135-155	10	67.27 (11/13/15)	Domestic	1974
K-1	1,501/W	961	577	337-357; 377-397; 437-457; 477-497; 557-577	42	64.75 (11/13/15)	Domestic/ Irrigation	1997
K-2	1,577/W	954	740	280-300; 400-460; 480-520; 600-740	300	35.31 (11/13/15)	Standby/ Irrigation	2009
L-1	1,686/W	941	80[c]	—	15[c]	58.56 (11/13/15)	Domestic	—
P-1	1,973/NW	896	85[c]	—	2.5[c]	91.51 (11/13/15)	Domestic	—
Other Off-Site Wells[f]								
X-1	1,240/N	980	620	180-240, 340-360, 460-500	30	140 (7/17/2008)	Irrigation	2008
X-2	1,467/NW	925	840	558-578, 628-658, 673-683, 710-730, 797-837	350	—	Irrigation	1993
X-3	2,431/WNW	778	> 400[d]	No Records	22	49 (10/13/2008)	—	—
X-4	2,493/NNE	856	138	50-60, 123-133	15	15 (9/27/1978)	Domestic	1978
X-5	2,907/WSW	900	338	100-120, 310-330	10	110 (9/24/1979)	Domestic	1979
X-6	2,292/NW	937	760	270-290, 390-410, 510-530, 630-750	30	120 (10/5/2007)	Domestic	2007
X-7	5,136/NE	1,134	800	400-800	15	3 (8/2/1994)	Domestic	1994
X-8	1,839/WSW	900	50	35-50	20	14 (5/14/1968)	Domestic	1968
X-9	2,713/SE	1,297	215	115-215	50	50 (8/12/2005)	Domestic	2005

Notes:
ft. = feet; amsl = above mean sea level; btoc = below top of casing; GPM = gallons per minute
[a] Elevations are derived from a geographic information system (GIS) of 0.5-meter digital LiDAR.
[b] Unless otherwise noted, determined through DWR well completion reports, County well permits, or work receipts from drillers.
[c] Owner-reported value.
[d] Water yield certification indicates pump is set at 400 feet btoc.
[e] May not reflect long term yield or actual pumping capacity.
[f] Off-site wells not surveyed were located using well permit sketches, and where sketches unavailable, Assessor's Parcel Number centroid. Well X-2 location derived from Boudreau (2013) report.

Wells in the area were originally developed by Weeks Drilling & Pump Company, Yeager Well Drilling & Pumps, Fisch Brothers Drilling Inc., and Les Peterson Drilling & Pump Inc. The wells surveyed are constructed with steel or PVC casings that vary between 4 and 9 inches outside diameter, have drop pipes that vary in size from 1 to 4 inches, and are outfitted with access ports that vary in size between 0.5 – 1 inch (none have sounding tubes). Dudek used an electronic water level meter to collect manual groundwater levels in each well visited with an accessible access port. Groundwater levels measured during the first site visits ranged between 35 and 91 feet btoc, and were gathered at times when the well's pumps were inactive but it is uncertain whether the groundwater levels represent the static groundwater level or recovering groundwater level from recent pumping. Wells C-2 and K-2 had large enough access ports to equip them with In-Situ Level Troll 400 pressure transducers, which were set up to record groundwater levels at 15-minute intervals for long-term groundwater monitoring.

The DWR well completion reports reviewed indicate a consistent lithologic pattern in which brown and yellow clays predominate in the first 30 to 100 feet bgs, with blue clay layers predominating down to the bottom depth of the well, or for deep wells, anywhere between 380 and 880 feet bgs. Sand, gravel and occasional ash layers also were recorded within the blue clays but were found in comparatively thin layers. In deeper wells, the blue clays transitioned to predominantly ash, pumice, and unidentified volcanic rocks. The deepest wells reviewed encountered hard fractured rocks and basalt near their bottom depths (generally between 600 and 800 feet bgs). Reported well yields range from 10 to 500 GPM, with a median of 30 GPM. Reported static groundwater levels range from 3 to 140 feet bgs with a median of 64 feet bgs. The total screened intervals of the wells range from 15 to 400 feet with a median of 120 feet.

The records collected show a trend of deepening wells with time, as well as increasing yield with depth (n=14). Furthermore, correlation of the well locations with ground elevations indicate that the groundwater elevation generally follows the topographic gradient, which is to the north, and also shows an increasing depth to water in the same direction.

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5 HYDROGEOLOGIC CROSS SECTION

Elevation data, geologic mapping, and the results of the record review and well survey were compiled to create a hydrogeologic cross section, shown in Figure 6, along a 1-mile north–northwest trending line, shown in Figure 5. The hydrogeologic cross section depicts the screened intervals and groundwater levels of wells within roughly 1,000 feet of the cross section line, and illustrates the subsurface extent of the Petaluma Formation and Sonoma Volcanics. The highest yielding wells in the area are those that are deep enough to penetrate the volcanic material. Shallower wells obtain water from sandy or gravelly layers within the Petaluma Formation, or from volcanic ash and pumice that is interbedded within the Petaluma Formation.

The unnamed fault exposes the Sonoma Volcanics at the surface within the higher elevation terrain to the south and southeast. Given the Sonoma Volcanics makes up the bulk of Sonoma Mountain and the higher terrain of the watershed, it represents an aquifer that is regional in nature and may have a higher potentiometric surface (pressure head- the level water rises in a well) than the aquifer associated with the Petaluma Formation. For example, a groundwater level recorded in Well X-6, which draws from the Sonoma Volcanics, was 3 feet bgs when the well was constructed in 1993. The cross section indicates that recharge to the Sonoma Volcanics likely occurs in the higher elevations of the watershed, resulting in a higher potentiometric surface than the Petaluma Formation. As indicated in Section 3.4.1, groundwater within the Sonoma Volcanics is under a confined or semi-confined condition. The Petaluma Formation is more local in nature, getting recharged in the local area where it is mapped at the surface.

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6 PROJECT WELL TESTING AND WATER LEVEL MONITORING

6.1 Well Monitoring

Groundwater levels were monitored over an approximately 2-month period in the project well (Well A-1) and two off-site wells (Well C-2 and K-2) using In-Situ Level Troll 400 pressure transducers set up to record groundwater levels at 15-minute intervals. In addition, manual groundwater level measurements were conducted in all other off-site wells surveyed (Wells C-1, B-1, K-1, L-1, and P-1) during the monitoring period. Table 8 summarizes the data collected over the monitoring period, which was 69 days for Wells A-1, C-1, and C-2, and was 60 days for Wells B-1, K-1, K-2, L-1, and P-1. An In-Situ BaroTroll was stored in a shed that houses booster pumps and water treatment equipment, and was set to take readings simultaneously with the pressure transducers. Data from the barometric logger was used to normalize pressure transducer data for variations in atmospheric pressure.

Table 8
Groundwater Level Data Summary

Well	Start Date	End Date	In Situ Level Troll 400 Pressure Transducer Data	Manual Readings[b]
Well A-1	11/4/15	1/12/16	Data logged at 15-minute intervals during monitoring period, and at 1-minute intervals during the 24-hour pump test.	104
Well C-2	11/4/15	1/12/16	Data logged at 15-minute intervals during monitoring period, and at 1-minute intervals during the 24-hour pump test.	10
Well K-2	11/13/15	1/12/16	Data logged at 15-minute intervals during monitoring period, and at 1-minute intervals during the 24-hour pump test.	8
Well C-1	11/4/15	1/12/16	N/A[a]	6
Well B-1	11/13/15	1/12/16	N/A[a]	9
Well K-1	11/13/15	1/12/16	N/A[a]	5
Well L-1	11/13/15	1/12/16	N/A[a]	7
Well P-1	11/13/15	1/12/16	N/A[a]	5
Barometric Logger	11/4/15	1/12/16	Data logged at 15-minute intervals during monitoring period, and at 1-minute intervals during the 24-hour pump test.	N/A

Notes:
[a] Access ports are of inadequate size to fit the In-Situ Level Troll 400 pressure transducers.
[b] Frequent manual measurements of Well A-1 were taken during the well pump test, and manual measurements of other wells were taken at the beginning of the period, the end of the period, and as allowed by logistics.

Pressure transducer data continuously monitors groundwater levels and allows for differentiation of static groundwater level trends from short-term drawdown/recovery patterns produced by in-well pumping and/or localized pumping. Though not all off-site wells could be equipped with pressure transducers, those that were are considered representative of the range of well depths for off-site wells. Well C-2, which along with Well C-1 is the closest off-site well, is considered representative of shallow domestic wells that only tap the Petaluma Formation, whereas Well K- 2 is considered representative of deep domestic/agricultural wells that tap primarily the Sonoma Volcanics.

Data collected via manual groundwater level readings may not accurately reflect the static groundwater level in cases where the pump in the well is active (in which case the data would reflect the pumping groundwater level), or was recently active (in which case the data would reflect some part of the recovery curve). The activity of the well pump was noted where possible when collecting manual data. The owners of the off-site wells were not asked to cease pumping or to change their pumping patterns for this study. However, repeated manual readings are adequate to establish a static groundwater level when similar levels are consistently observed.

6.2 Pump Test Procedures

In addition, to simulate project pumping demands during peak demand periods and to characterize the hydraulic properties of the aquifer, Dudek performed a 24-hour constant rate pump test of Well A-1 beginning December 10, 2015, at 13:15 and ending on December 11, 2015, at 13:15. Using an in-line flow meter, Dudek determined that Well A-1 pumped at an average rate of 23.4 GPM, discharging 33,730 gallons to the on-site irrigation reservoir (located approximately 850 feet southwest of Well A-1). Immediately prior to the pump test, the pressure transducers in the on-site well (Well A-1) and two neighboring wells (Wells C-2 and K-2), as well as the barometric logger, were reconfigured to record groundwater levels at 1-minute intervals. Manual groundwater level measurements in Well A-1 were recorded at a frequency approximately corresponding to Table 9. Multiple manual groundwater level measurements were obtained in the off-site wells—one prior, at least one during, and one after the pump test.

Table 9
Groundwater Level and Flow Rate Monitoring Frequency for On-Site Well A-1

Time Since Pumping Started	Monitoring Frequency
0 to 10 minutes	30 seconds
>10 to 30 minutes	2 minutes
>30 minutes to 2 hours	10 minutes
>2 hours to 12 hours	30 minutes
>12 to 24 hours	1 hour

6.3 Groundwater Level Trends and Pump Test Responses

Figures 7A through 14A show hydrographs of the groundwater level data collected over the associated monitoring interval along with hourly precipitation. Figures 7B through 14B isolate the portion of the hydrographs for the 24-hour pump test only. An error occurred in configuring the pressure transducers in Wells C-2 and K-2, which resulted in a transducer data gap for the first 12 hours of the pump test (Figures 8B and 9B). This gap was partially filled by manual groundwater level readings.

Upon commencement of site well pumping, a cone of depression in the groundwater table (unconfined aquifer) or potentiometric surface (confined aquifer) forms around the well. The cone of depression has the shape of an inverted cone and propagates from the pumping well. As pumping continues, more water is derived from aquifer storage at greater distances from the pumping well. The cone of depression expands until steady-state conditions or equilibrium occurs when the flow of the aquifer equals the pumping rate or sufficient leakage occurs through overlying formations to equal the pumping rate. The transducer data for Well C-2 and K-2 capture the groundwater levels for the latter part of the 24-hour pump test when groundwater level response is expected to be greatest in these wells. For this reason, and because manual readings partially filled the transducer data gap, this data gap does not invalidate test results.

The range of groundwater levels and trends observed (if any) are discussed in the following sections.

6.3.1 Well A-1

Static groundwater levels within the project well ranged from 74.35 feet btoc at the beginning of the monitoring period to 65.38 feet btoc at the end of the period, showing increasing groundwater levels over the entire monitoring period (Figure 7A). The rate of increase remained generally constant, flattening slightly in the latter half of the period, with no clear correlation with rainfall patterns. Transducer data shows in-well pumping or localized pumping caused short-lived groundwater level declines of up to 6.7 feet (but more typically in the range of 2 – 4 feet). In-well pumping occurred anywhere from a couple times a day to once every few days. In all cases, the pumping declines typically recovered to the initial static groundwater level almost immediately upon cessation of pumping (i.e., 100% recovery was observed during the 24-hour pump test to occur within 5 minutes). Three groundwater level declines of about 1 foot, which appear to be unassociated with in-well pumping, were observed early in the monitoring period. The flow meter installed indicates a total of 59,210 gallons was pumped from the well over the monitoring period.

During the 24-hour pump test, drawdown in the well stabilized at 6.6 feet below the initial groundwater level, remaining essentially flat for the duration of the test (Figure 7B). By the end of the pump test, drawdown was 6.9 feet below the initial groundwater level, indicating a slight decrease over the 24-hour period. Groundwater levels recovered to 100% of the initial groundwater level within 5 minutes of shutting off the well pump.

6.3.2 Well C-2

Static groundwater levels within Well C-2 ranged from 75.44 to 76.12 feet btoc, remaining nearly constant over the entire monitoring period (Figure 8A). Groundwater levels increased by several tenths of a foot following precipitation events, and then returned to the initial static groundwater level within about a day. Transducer data shows pumping, likely from the owner's active well (Well C-1, located 15 feet away), caused groundwater level declines of up to 6.4 feet five times during the monitoring period, which took up to 12 hours to recover to the initial static groundwater level. The periodic water level declines observed in abandoned Well C-2 (Figure 8A) provide a classic example of data that confirms a well interference effect. In this case, however, it is intermittent pumping from the owner's proximal active well (Well C-1) that causes the effect.

During the 24-hour pump test of Well A-1 located 716 feet to the SSW, no drawdown was observed in Well C-2 (Figure 8B). The trend of the transducer data remained flat. Manual readings show a range of about 0.4 foot, showing a slight increase in the first part of the test period, and a slight decrease following the end of the Well A-1 pump test. No correlation with active pumping in Well A-1 was observed.

6.3.3 Well K-2

Static groundwater levels within Well K-2 ranged from 35.31 feet btoc at the beginning of the monitoring period to 26.72 feet btoc at the end of the period, showing a gradual increase (Figure 9A). The rate of increase remained generally constant, flattening slightly in the latter half of the period, with no clear correlation with rainfall patterns. Transducer data shows in-well pumping caused short-lived groundwater level declines of up to 8.8 feet anywhere from a couple times a day to once every 10 days. In all cases, the declines typically recovered to the initial static groundwater level within 15 minutes.

During the 24-hour pump test of Well A-1, a slight groundwater level decline of roughly 0.5 feet was observed during the 24-hour pump test period (Figure 9B). This slight groundwater level decrease was also reflected in manual measurements.

6.3.4 Well C-1

Manual groundwater levels measurements within Well C-1 ranged from 78.83 to 78.36 feet btoc, remaining nearly constant over the entire monitoring period (Figure 10A). During the 24-hour pump test of Well A-1, no notable groundwater level changes were observed in Well C-1 (Figure 10B).

6.3.5 Well B-1

Manual groundwater levels measurements within Well B-1 ranged from 67.23 to 100.22 feet btoc (Figure 11A). The active/inactive status of the well pump could not be determined, but the groundwater level of 100 feet btoc is considered to be the pumping groundwater level based on actively recovering groundwater levels observed at 80 feet btoc on November 13, 2015. Therefore, the static groundwater level trend observed was nearly constant.

During the 24-hour pump test of Well A-1, only static and in-well pumping groundwater levels were observed in Well B-1 (Figure 11B). No declines in static groundwater levels were overserved.

6.3.6 Well K-1

Manual groundwater levels measurements within Well K-1 ranged from 64.33 to 64.75 feet btoc, remaining nearly constant over the entire monitoring period (Figure 12A). During the 24-hour pump test of Well A-1, no notable groundwater level changes were observed in Well K-1 (Figure 12B).

6.3.7 Well L-1

Manual groundwater level measurements within Well L-1 ranged from 57.98 to 58.56 feet btoc, remaining nearly constant over the entire monitoring period (Figure 13A). During the 24-hour pump test of Well A-1, no notable groundwater level changes were observed in Well L-1 (Figure 13B).

6.3.8 Well P-1

Manual groundwater levels measurements within Well P-1 ranged from 91.51 to 112.19 feet btoc (Figure 14A). Well P-1 was being pumped during three of the five measurements taken. Though the static groundwater level is believed to be 91.51 feet btoc, insufficient data was collected to determine a groundwater level trend within Well P-1. During the 24-hour pump test of Well A-1, groundwater levels measured decreased slightly from 109.25 to 112.19, though these are attributed to Well P-1 being actively pumped (Figure 14B).

6.4 Hydraulic Properties of the Aquifer

The 24-hour pump test of Well A-1, as equipped, could not achieve a high enough pumping rate to determine the transmissivity or storage coefficient of the aquifer (i.e., "stress test"). As indicated in Section 2.3.1, the well is equipped with an undersized well pump and drop pipe, and hence only 10% of the theoretical yield of the well could be achieved.

However, based on the 24-hour pump test data, an average transmissivity of the project well at a production rate of 23 GPM could be determined. Aquifer transmissivity (the rate at which water flows through a vertical strip of the aquifer 1-foot wide and extending through the full saturated thickness, under a hydraulic gradient of 1 or 100%) is calculated using the Cooper–Jacob approximation to the Theis equation (Cooper and Jacob 1953) as follows:

$$T = \frac{2.303\,Q}{4\,\pi\,\Delta s}$$

Where:

T = transmissivity (feet^2/day) [multiply by 7.48 to get units of GPD/foot]
Q = average pumping rate (feet^2/day) [multiply GPM by 193]
π = pi (3.14)
Δs = difference in drawdown over one log cycle (feet)

The transmissivity (T) calculated for Well A-1 is 2,740 feet^2/day or 20,496 gallons per day/foot (GPD/foot) (Figure 15). Additionally, using the change in drawdown over 1 log cycle, the projected drawdown after 1 year (assuming non-stop pumping and no recharge) would be 7.7 feet within Well A-1. Additional drawdown within Well A-1 beyond that observed during the test is therefore projected to have been less than 1 foot, had the test continued for a whole year. Given the groundwater demand for the proposed project represents roughly 10% of Well A-1's existing production capacity, the projected drawdown after 1 year would be 0.77 feet assuming no recharge to the aquifer.

The aquifer coefficient of storage (also called storativity) is the volume of water released from storage per unit decline in hydraulic head in the aquifer per unit area of the aquifer. In unconfined aquifers, storativity is the same as specific yield of the aquifer. In confined aquifers, storativity is the result of the compression of the aquifer and expansion of the confined water when the head (pressure) is reduced during pumping. The coefficient of storage is dimensionless. Values of storativity for unconfined aquifers range from 0.01 to 0.3; values for confined aquifers range from 10-5 to 10-3 (Driscoll 1986 [pg. 210]). Due to well losses and inefficiency of the pumping well, an observation well that responds to pumping is required to calculate the coefficient of storage. As no observation wells definitively responded to the site well pumping, a site-specific coefficient of storage was unable to be calculated. Thus, reported values for the coefficient of storage for the geologic formations underlying the project site obtained from literature review were used to estimate groundwater in storage.

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7 PROJECT IMPACT ANALYSIS

The following sections evaluate whether the project's use of well water is expected to have an adverse impact with respect to groundwater in storage (e.g., water balance analysis), effects on neighboring wells (well interference analysis), surface water impacts, or water quality concerns. Appendix G of the CEQA checklist indicates criteria under which the project would have a significant impact on the environment. The analysis presented herein includes findings relevant to the following items in Appendix G of the CEQA checklist, i.e., whether the project would:

- Violate any water quality standards or waste discharge requirements? (Issue IX.a)
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing or planned land uses for which permits have been granted)? (Issue IX.b)
- Have sufficient water supplies to serve the project from existing […] resources? (Issue XVII.d)
- Have a substantial adverse effect on any riparian habitat […]? (Issue IV.b)

7.1 Water Balance Analysis

There are a variety of approaches that can be taken when analyzing project effects on total groundwater in storage, with the most appropriate methods depending on the type and characteristics of the aquifer being studied. Groundwater can occur in both thick saturated portions of unconsolidated sand and gravel where it resides in the pore spaces between sediments (primary porosity and permeability), or within cemented/consolidated rock where free groundwater primarily occurs within open fractures (secondary porosity and permeability). The project area has aquifers of both types, and a very complex geology owing in large part to its location between the Rogers Creek Fault to the west, the Bennett Valley Fault to the east and an unnamed fault to the south. As discussed in Section 3.4 and shown in Figure 6, water-bearing layers within the Petaluma Formation are likely to be sloped and folded in the project area, and there is no way within the scope of this study to know the exact orientation, pervasiveness, and/or connectivity of fractures within the solid rocks of the Sonoma Volcanics.

A soil moisture balance method was used to evaluate rainfall recharge for the project parcel as well as the project watershed associated with Well A-1 (as established in Section 3.3). The calculation assumes no net flow of groundwater into or out of the study area from larger distances occurs in response to local groundwater pumping drawdown. Rainfall, runoff, evapotranspiration, and groundwater recharge was calculated in monthly intervals using historical rainfall data for a span of 30 years, which includes historical periods of elevated rainfall and drought. Pumping-induced changes to the volume of groundwater in storage over the 30-year period were evaluated for the project-only (parcel-level) and cumulative scenarios (watershed-level) as described in Section 7.1.3. By comparing the cumulative depletion in storage to the maximum volume of water potentially available as groundwater storage, a determination as to the project's potential to deplete the aquifer can be made (i.e., a net deficit in aquifer volume).

7.1.1 Groundwater Recharge

Groundwater recharge for the project parcel as well as the project watershed (as established in Section 3.3) was estimated using a monthly soil-moisture balance approach. Groundwater recharge occurs when the amount of rainfall entering the area exceeds the amount subsequently lost to runoff and evapotranspiration and once the soil moisture capacity is met. The monthly recharge equation is as follows:

$$\mathbf{Recharge(\mathit{i}) = PPT(\mathit{i}) - RO(\mathit{i}) - PET(\mathit{i}) - (SMC\text{-}SM(\mathit{i}))}$$

Where:

Recharge(i) = Recharge during month i
PPT(i) = Rainfall during month i
RO(i) = Runoff during month i
PET(i) = Potential Evapotranspiration during month i
SMC = Soil Moisture Capacity
SM(i) = Soil Moisture at beginning of month i

Excel spreadsheets were developed for data input, groundwater recharge calculations, and the comparison of the cumulative effect on groundwater in storage.

7.1.2 Data Compilation

The data required to provide groundwater recharge estimates were obtained from various sources and are discussed as follows.

7.1.2.1 Precipitation

Monthly rainfall data for a 30-year period—January 1983 through December 2012—were used in this analysis. The data were collected at a gauging station located in Santa Rosa, with a long-term (1906–present) quality-controlled record. This record of precipitation was corrected for orographic enhancement by increasing the monthly rainfall totals by 40% to match the difference in annual average precipitation between Santa Rosa (30 inches/year) and the project site (42 inches/year) (see Section 3.1 and Figure 2).

7.1.2.2 Evapotranspiration

Reference evapotranspiration (ETo) data are provided by CIMIS throughout the state of California. CIMIS maintains a number of weather stations statewide that provide the meteorological parameters used to calculate published reference ETo values. These ETo values are dependent on parameters including incident solar radiation, vapor pressure, air temperature, and cloud cover. The ETo values published by CIMIS and used in this analysis overestimate actual rates of evapotranspiration at the project site because the CIMIS ETo is a calculated water need for well-watered grass rather than for non-irrigated native vegetation and soil. The monthly record of ETo from the Bennett Valley (CIMIS Station 158, shown in Figure 2) was used to estimate ETo at the site. However, the record only begins in 2000. To fill in the record prior to 2000, monthly average ETo from the Santa Rosa station prior to the year 2000 was extrapolated to the Bennett Valley Station based on the average monthly difference between the two stations.

7.1.2.3 Soil Moisture Capacity

Soil moisture capacity or water-holding capacity is the capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point (USDA 2015). Soil water-holding capacity is dependent on the soil type and site-specific soil properties, including rock fragments, organic matter, bulk density, osmotic pressure, texture, and rooting depth (USDA 2015). The soil moisture content was calculated by multiplying representative values for the thickness (inches) of each soil horizon by the available water capacity (inch/inch) of the horizon, as approximated by USDA (2016). The soil moisture capacity for each soil unit in the watershed is provided in Table 3.

7.1.2.4 Runoff

Because there are no stream gaging stations in close proximity to the project site and due to the limited size of the groundwater resource study area for this project, runoff must be estimated. The estimated runoff values used in this analysis are derived from the Natural Resources Conservation Service curve number method (CNM). The CNM was designed to estimate runoff for watersheds in which no direct measurement was available. The CNM is based on a simplified infiltration model of runoff and empirical approximations.

In order to compute runoff (Q) using the CNM, two parameters must be known: precipitation (P) and the maximum soil moisture retention after runoff has begun (S), based on the following relationship.

$$\mathbf{Q = (P-0.2S)^2/(P+0.8S)}$$

The monthly precipitation data used is the 30-year period (January 1983–December 2012) of record for the Santa Rosa station, increased by 40% to correct for orographic enhancement. The maximum soil moisture retention (S) is a function of soil type, with all soils having been classified into one of four hydrologic groups, A through D. Soils are classified by the USDA's Natural Resource Conservation Service into four hydrologic soil groups based on the soil's runoff potential. The four hydrologic soils groups are A, B, C, and D. Group A generally has the smallest runoff potential and highest infiltration rates; and group D has the greatest runoff potential, lowest infiltration rates, and lowest soil moisture retention. The soils within the project watershed fall into hydrologic groups C (23%) and D (77%), as shown in Table 3.

The CNM requires the selection of a curve number based on a combination of soil conditions, land use (ground cover), and hydrologic conditions to assign a runoff factor to the area. These runoff factors, called runoff curve numbers (CNs), indicate the runoff potential of an area. The higher the CN, the higher the runoff potential. Based a predominantly undeveloped watershed, with pasture and agricultural uses, CNs developed for soil groups C and D are 79 and 84, respectively (BakerAECOM 2011).

The maximum soil moisture retention (S) is calculated from the curve numbers based on the following relationship:

$$\mathbf{S = 1000/CN-10}$$

Using the monthly precipitation record and the assigned curve numbers, anticipated monthly runoff values for the project area were calculated for the 30-year period of record of the precipitation data.

The runoff calculated for the 55-acre parcel-only study area is approximately 474 inches over the 30-year simulation period (January 1983 through December 2012), or 16 inches per year. Over the same simulated period, average annual rainfall is approximately 44 inches per year. Thus, the runoff is approximately 36% of the rainfall for this study. The runoff percentage of rainfall calculated for the 962-acre watershed area is nearly the same due to a similar distribution of soil types.

7.1.3 Groundwater Demand

Groundwater demand was evaluated for existing and proposed conditions for two different study areas:

- **Scenario 1A**: Existing groundwater demand within the 55-acre project parcel.
- **Scenario 1B**: Proposed groundwater demand within the 55-acre project parcel.
- **Scenario 2A**: Existing cumulative groundwater demands within the 962-acre project watershed.
- **Scenario 2B**: Proposed cumulative groundwater demands within the 962-acre project watershed.

These scenarios are provided in Table 10.

Table 10
Groundwater Demand Scenarios

Land Use	Quantity	Groundwater Demand Per Unit (acre-feet/year)	Total Groundwater Demand (acre-feet/year)	Total Groundwater Demand Over 30 Years
Scenario 1A – Existing Conditions, 55-Acre Parcel				
Belden Barns, Existing	1	1.77	1.77	53
Total Existing Project Groundwater Demand			**1.77**	**53**
Scenario 1B – Proposed Conditions, 55-Acre Parcel				
Belden Barns, Proposed	1	3.54	3.54	106
Total Existing and Proposed Project Groundwater Demand			**3.54**	**106**
Scenario 2A – Existing Conditions, 962-acre Watershed				
Belden Barns, existing demand	1	1.77	1.77	53
Dwelling Units, estimated	21	0.75	15.75	473
Vineyard Uses, estimated (acres)	25	0.33	8.25	248
Total Existing Project Groundwater Demand			**25.77**	**773**
Scenario 2B– Proposed Conditions, 962-acre Watershed				
Belden Barns, proposed demand	1	3.54	3.54	106
Dwelling Units, estimated	31	0.5	15.5	465
Vineyard Uses, estimated (acres)	300	0.33	99.00	2,970
Total Existing and Proposed Project Groundwater Demand			**125.79**	**3,774**

The groundwater demands for Scenarios 1A and 1B are from Table 1.

The groundwater demands for Scenario 2A was based on a count of existing residences and a sum of irrigated agriculture within the watershed, as determined from the most recent aerial photograph (March 27, 2015) available in ArcMap. The vineyard on the project parcel (21 acres) was subtracted from the total acres of vineyard uses in the watershed (46 acres) because it is known to be irrigated from surface water captured in the on-site irrigation reservoir rather than groundwater. The domestic groundwater demand of 0.75 AFY per dwelling unit is based on the range of 0.5 – 1 AFY for rural residences provided in the pilot study of the Bennett Valley by Kleinfelder (2003). The groundwater demand for vineyard uses of 4 acre-inches per year (or 0.33 AFY) is also taken from the Kleinfelder (2003) study, and assumes all new vineyards would be irrigated with groundwater.

The groundwater demands for Scenario 2B were based on assumed buildout of general plan land uses. According to the Kleinfelder (2003) study, the Bennett Valley area is developed to about 69% of the maximum buildout allowable by zoning. Therefore, the number of dwelling units was adjusted upwards to reach 100%.[10] The acreage of agriculture that could be developed in the cumulative scenario was estimated based on the following criteria:

- Not within the North Sonoma Mountain Regional Park and Open Space Preserve. This area is reserved for recreation and open space uses, so vineyard development in these areas is not reasonably foreseeable.
- Not within an area zoned for rural residential development. This is the only general plan land use designation in the watershed where vineyard development is not an allowed use.
- Not in areas exceeding a 50% slope. Vineyard development on slopes exceeding 50% is prohibited under the Grading, Drainage, and Vineyard and Orchard Site Development Ordinance (VESCO).

Of the remaining area, 20% was subtracted of the remaining total to account for homes, roads, and environmental buffer space (e.g. streams, sensitive habitats, etc.). Based on application of these criteria in GIS, the total available for vineyard development in the watershed was estimated to be 300 acres. The associated groundwater demand assumes that all vineyard development in the cumulative scenario (except for that on the project site) is irrigated by groundwater. It is highly unlikely that all the available area within the watershed will be developed as vineyards given other constraints and suitability factors, but this allows for a conservative analysis.

A large portion of the project's watershed is part of the North Sonoma Mountain Regional Park and Open Space Preserve. The park's conservation easement restricts uses to those that maintain the scenic, natural, agricultural, recreational and educational values, including the mosaic of redwood groves, oak woodlands, bay forests, grasslands, creeks, wetlands, springs, and plant communities that the area supports. The conservation easement allows limited development, including up to three residences and structures/improvements associated with outdoor recreation

[10] Dwelling units in Scenario 2B = (21 * 100)/69 = 31 (rounded up)

and associated utilities, but only within specified building envelopes. Development of springs or groundwater to support recreation or limited grazing (for the purposes of fire hazard reduction or invasive plant removal) is a reasonably foreseeable use, but would be subject to a Master Plan process and reviewed under a separate CEQA process. Intensive groundwater demands are not anticipated, as future uses must be consistent with the conservation values of the park. Estimating a groundwater demand for future unknown uses would be speculative, but can be reasonably expected to be negligible in comparison to the cumulative groundwater demand estimate in Table 10.

7.1.4 Groundwater in Storage

The groundwater storage capacity was calculated using estimates of the saturated thickness of the two hydrologic units (Petaluma Formation and Sonoma Volcanics) underlying the 55-acre project parcel (for Scenarios 1A and 1B), as well as the 962-acre watershed (for Scenarios 2A and 2B). For the parcel-level analysis, the saturated thicknesses of the both units was determined based on the total thickness of each unit penetrated by Well A-1, as determined from the well completion report, minus the depth to water. For the watershed analysis, the area was divided into two zones corresponding to the surface contact between the Petaluma Formation and the Sonoma Volcanics (this dividing line is shown in Figure 3). The saturated thickness of the Petaluma Formation was determined by taking the average thickness of the Petaluma Formation for all wells shown in Table 7, minus the average depth to water of those wells. The saturated thickness of the Sonoma Volcanics was determined by the average thickness penetrated by wells.

The estimated specific yields for each hydrologic unit were obtained from Table 5, with the low end of the range (0.03) used for the Petaluma Formation, and the middle part of the range (0.075) used for the Sonoma Volcanics[11]. By multiplying the acreage of the study area by the estimated specific yield and by the saturated thickness for each hydrogeologic unit, the total groundwater in storage each study area was determined. The estimated maximum groundwater in storage is 1,813 acre-feet for the 55-acre study area and 23,804 acre-feet for the watershed. Boudreau (2013) estimated 645 acre-feet of groundwater in storage for the 55-acre area Because the estimates of specific yield derived from literature are for the entire formation, inclusive of both water bearing (i.e., pumice, ash, tuff, and sand/gravel) and non-water bearing strata (i.e., clay, shale, and diatomite), the appropriate application of the specific yield is to its entire saturated thickness.

[11] The low end of the range of the specific yield estimates for the Petaluma Formation was used because of the significant fraction of clay layers present in well logs, and the mid-range of the specific yield estimates for the Sonoma Volcanics was used because it appears fairly high yielding in the region.

Table 11
Groundwater Storage Estimates

Hydrogeologic Unit	Estimated Area (Acres)	Estimated Specific yield	Assumed Saturated Thickness (feet)	Estimated Maximum Groundwater in Storage (acre-feet)
55-Acre Parcel (Scenarios 1A and 1B)				
Petaluma Formation	55	0.03	336	554
Sonoma Volcanics	55	0.075	305	1,258
Estimated Maximum Groundwater Storage Capacity (acre-feet)				**1,813**
962-acre Watershed (Scenarios 2A and 2B)				
Petaluma Formation (Area 1)	285	0.03	298	2,548
Sonoma Volcanics (Area 1, subsurface)	285	0.075	87	1,860
Sonoma Volcanics (Area 2)	677	0.075	382	19,396
Estimated Maximum Groundwater Storage Capacity (acre-feet)				**23,804**

7.1.5 Long-Term Groundwater Availability

Long-term groundwater availability was evaluated using the calculated groundwater recharge, the estimated groundwater demand detailed in three scenarios (described in Section 7.3), and the calculated maximum groundwater storage capacity (Section 7.4). The volume of groundwater in storage varies depending on the rate of recharge and the volume of water pumped from storage (water demand). The project has an estimated annual groundwater demand of 3.54 AFY, which was assumed to be extracted evenly over the course of the year. Though demands would be higher in the late summer and early fall, apportioning the demand by month makes a negligible difference in the results.

Figures 16 and 17 present the amount of groundwater in storage over a 30-year record of precipitation/recharge for Scenario 1 and Scenario 2, respectively. As shown in these figures and Table 12, the recharge substantially exceeds pumping, such that the aquifers remain at or near full storage capacity over the 30-year period modeled. Thus, the timing/seasonality of the project's yearly demand is not an important factor in the overall results of the water budget over 30 years. An analysis of the pumping parameter indicates that only at a groundwater demand of greater than 30 AFY (for the project-only scenario) does recharge not make up for pumping during the driest years. For the cumulative scenario, watershed demands have to reach roughly 450 AFY for the same to be true. Therefore, the analysis shows that in the long term for both project only and cumulative conditions, adequate groundwater is available.

Table 12
Groundwater in Storage by Scenario for Well A-1

	Scenario 1A Existing Conditions	Scenario 1B Proposed Conditions	Scenario 2A Existing Conditions	Scenario 2B Proposed Conditions
Minimum (acre-feet)	1,811	1,809	23,780	23,694
Maximum (acre-feet)	1,813	1,813	23,804	23,804
Minimum Groundwater in Storage Over 30-year Period, as a percent of maximum	**99.9**	**99.8**	**99.9**	**99.5**

7.2 Well Interference Analysis

The drawdown in pumping wells caused by withdrawals from other pumping wells is referred to as well interference. Groundwater extraction from a single supply well can impact neighboring wells if the areas of pumping influence (also known as the cone of depression) generated by each well intersect to cause a localized lowering of the groundwater elevation. While seasonal fluctuation or drought-related decline in groundwater levels is expected, additional drawdown caused by excessive pumping in one or more neighboring wells can draw the groundwater levels in the aquifer to a depth that reduces well yield or damages nearby wells. Typically, drawing groundwater to a level below the top of a well intake screen can cause cavitation, corrosion, and loss of suction. If the Project were to result in the lowering of the groundwater surface in a neighboring well below the seasonal low leading to loss of yield or exposure of the top of the well screen, the impact would be considered significant.

While the water balance analysis discussed above addresses the larger question of the total quantity of groundwater within the site or watershed area, the results would not indicate whether pumping could induce a groundwater level decline in adjacent pumping wells. The well interference analysis is a more localized analysis based on the theoretical mechanism of transient flow of groundwater to a pumping well. An estimate of groundwater drawdown at the nearest residential well induced by project pumping at 60 days, 1 year, and 5 years was estimated using the Cooper–Jacob approximation of the Theis Non-Equilibrium Flow Equation (Cooper and Jacob 1953, USGS 1962).

This requires quantification of aquifer parameters such as transmissivity and specific yield, discussed below.

$$s = \frac{264\,Q}{T} \log_{10} \frac{0.3\,Tt}{r^2 S}$$

Where:

s = predicted drawdown (feet)
Q = average pumping rate (GPM)
T = Transmissivity (GPD/foot)
t = time (days)
r = distance from pumping well (feet)
S = coefficient of storage (dimensionless)

The Theis equation is widely used to estimate flow over distance and time through a porous medium and is the standard for assessing well interference. Though the assumptions of the equation do not apply exactly to the aquifer conditions at the project site, it is an appropriate method to illustrate theoretical drawdown by distance, and is considered conservative over longer periods of time because it does not account for recharge to the aquifer. It also assumes vertically connected aquifers; it should be noted that there is strong evidence that Well A-1 is screened in a different aquifer than the shallower domestic wells in the area. What this indicates is that the results of the analysis are likely to be most valid for wells that draw from the same formation/aquifer as the project well.

Drawdown by distance from Well A-1 was modeled using the average transmissivity of the project well at a production rate of 23.4 gallons per minute (i.e., 2,740 ft^2/day as determined in Section 6.1 above). A coefficient of storage of 0.075 was used in this analysis, as it is the middle of the range of specific yields listed for the Sonoma Volcanics in Table 5. The distances modeled correspond to the distances of each off-site well to Well A-1. Table 13 indicates projected drawdown at select distances from the pumping well using the Cooper–Jacob approximation of the Theis non-equilibrium flow equation. The scenario modeled is conservative, as it assumes continuous pumping of the well 24 hours per day, 7 days per week (24/7), and no recharge. In actuality, the maximum well pumping time was determined to be 14.5 hours for the project parcel uses.

As indicated in Table 13, the highest off-site drawdown occurs at Well C-2 after 5 years of continuous pumping from Well A-1. Less than a foot of drawdown under the most conservative assumptions and under an unrealistic pumping scenario (i.e., 24/7 at 23 GPM) is not sufficient to cause a drop in groundwater level below the well screen or pump. The estimated maximum drawdown, which would occur in well C-1, is not considered significant as it consists of a negligible fraction of the total saturated interval of the well.

Table 13
Distance – Drawdown Analysis Results

Distance from Pumping Well A-1 (feet)	60-Day Drawdown (S=0.075)[a]	End Year 1 Drawdown[d] (S=0.075)	End Year 5 Drawdown[d] (S=0.075)
714 (Well C-2)[a]	0.30	0.53	0.74
1224 (Well B-1)	0.18	0.40	0.60
1,501 (Well K-2)[a]	0.12	0.33	0.54
1,686 (Well L-1)	0.11	0.31	0.52
1,973 (Well P-1)	0.08	0.28	0.48

Note: [a] These drawdown values are considered equally valid for Wells C-1 and K-1 due to close proximity.

7.3 Surface Water Interactions

Surface waters in the vicinity of the project site include the South Fork Matanzas Creek, an ephemeral drainage that crosses the site and parallels Sonoma Mountain Road, an on-site irrigation pond, and several off-site ponds used for both decorative and irrigation purposes. Springs are common in the area and may be an important source of water feeding ponds. The upper sections Matanzas Creek, including the south fork, are classified as perennial streams, although, by late summer and fall, flows diminish to less than 2 cubic-feet per second throughout much of the drainage and can completely dry up in multi-year droughts (USGS 2013). Most of the streamflow is runoff generated in response to rainfall, with about 90% of the total annual discharge volume from October through May. Mirroring precipitation patterns, streamflow in Matanzas Creek is highly variable, not only on a seasonal basis but also from year to year. Groundwater discharge or "daylighting" constitutes a minor fraction of the total stream flow, but likely constitutes an appreciable portion of the summer baseflow, when present.

Due to the relatively minor groundwater demand, the depth at which Well A-1 is screened, and the lateral extent and groundwater gradient of the target aquifer, impacts of project pumping on surface waters is expected to be negligible or non-existent. Groundwater daylighting in streams and spring discharges occur in the near-surface zones of the Petaluma Formation, whereas the project's well is screened in the Sonoma Volcanics and the very lowest part of the Petaluma Formation (see Figure 6). Water well monitoring described in Section 6 provides strong evidence that each formation comprises two different aquifer systems. Well logs show repeating clay layers (aquitards) between the screened depths of Well A-1 and the surface. This indicates that project pumping influences—though minor in both extent and magnitude, as shown in Table 13—would not be expressed at the surface.

7.4 Groundwater Quality

To update the groundwater quality results for current conditions, Dudek collected a sample of the well water at the end of the 24-hour pump test on December 11, 2015, and submitted it to McCampbell Analytical Laboratories for analysis of general mineral, inorganic minerals, and bacteriological constituents for comparison to California drinking water primary and secondary MCLs. The results of the testing are provided in Section 3.6, which shows that the groundwater does not exceed any primary MCLs. However, color, turbidity, manganese, and iron exceeded secondary MCLs.

All existing or new on-site water wells and transient non-community water systems are required to apply for and maintain a state water system permit as an approved potable water supply for the food facility areas. The water system permit would be reviewed and issued by the SWRCB Division of Drinking Water and submitted to PRMD as a condition of project approval. The applicant will be required to install a suitable water treatment system to ensure all drinking water standards are met.

Furthermore, the applicant proposes an on-site wastewater treatment system that will be required to meet County standards and to obtain coverage under the North Coast Regional Water Quality Control Board Order No. R1-2002-0012, *General Waste Discharge Requirements (WDRs) for Discharges of Winery Waste to Land*. Coverage under the general WDR or conditional waiver will require the applicant to implement a monitoring and reporting program and submit reports either annually or semiannually to the North Coast Regional Water Quality Control Board describing its inspection, maintenance, and monitoring activities. The monitoring and reporting program requires the applicant to describe process, production, and wastewater monitoring information including but not limited to the following: (1) the type and volume or raw material being processed; (2) the dates of peak processing season; (3) the wastewater to wine production ratio; (4) the gallons of process wastewater discharged daily to the disposal system (reported in gallons per day (GPD)), as averaged over a calendar month in which peak production was taking place; and (5) septic tank and leachfield inspection and monitoring results.

Given existing data indicates the groundwater sample did not exceed primary MCLs as well as the actions required by applicable permits and approvals, the project is not expected to result in any water-quality related impacts.

8 SUMMARY AND CONCLUSIONS

The project parcel's total proposed groundwater demand, including project uses, is expected to be approximately 3.54 AFY (Table 1). Based on the project's groundwater demand and the time to fill up two 10,000-gallon storage tanks consecutively, the maximum continuous pumping time of Well A-1 would be approximately 14.5 hours at 23 GPM.

Data confirms the project site and related watershed is underlain by two distinct aquifer systems: the Petaluma Formation and the Sonoma Volcanics. Though there is some interfingering of the two hydrogeologic units, groundwater level trends observed over a 2-month period for wells screened in the Petaluma formation versus those screened in the Sonoma Volcanics show distinct trends despite their close proximity to one-another. While groundwater levels in shallow wells screened solely in the Petaluma Formation remained largely constant over the monitoring period, both Well A-1 and Well K-2, which are screened primarily in the Sonoma Volcanics, showed a similar increasing trend. Based on the nature of the watershed, boring log lithologies, and groundwater level records, the Sonoma Volcanics aquifer appears to operate under semi-confined or confined conditions. The two aquifers appear to be wholly or partially hydrologically disconnected.

Groundwater level trends observed in the Petaluma Formation indicate it is near 100% of its storage capacity. The groundwater level trend in Well C-2 (which penetrates the Petaluma Formation) remained flat over a 2-month period, showing no long-term response to significant rainfall. Slight increases in groundwater level following storm events were minor in magnitude and short lived, suggesting that infiltrating water is being discharged to streams during the wet season and that the aquifer is at its saturation point. Furthermore, the predominantly clayey nature of the Petaluma Formation likely limits vertical movement of groundwater, with sub-horizontal movement of groundwater occurring within the sand, gravel, ash, and pumice layers tapped by wells. Overall, water in the basal parts of the Petaluma Formation in the Project area is disconnected from surface water flows.

Groundwater level trends observed in the Sonoma Volcanics show evidence of pumping influences in the greater region. The groundwater level trends in Well A-1 and K-2, screened primarily in the Sonoma Volcanics, showed increasing groundwater levels over the 2-month period monitored. The smooth, gradual increase in groundwater levels had little correlation with rainfall patterns, and was occurring at depths unlikely to have been recharged so rapidly from recent rains. The water trend observed suggests groundwater levels could be recovering from off-site pumping, possibly seasonal (late summer and fall) irrigation in southern Bennett Valley.

No appreciable off-site response to the 24-hour constant-rate pump test of the project well (Well A-1) was observed. The project well was drawn down by an average of 6.7 feet during the 24-hour pump test (at an average rate of 23.4 GPM) and recovered to 100% of its original level within 5 minutes of ending the test. In off-site Well K-2, a groundwater level decline of about 0.5 feet occurred simultaneously with the 24-hour pump test. Aside from Well K-1, which was not equipped with a pressure transducer, Well K-2 is the only other monitored well that penetrates the Sonoma Volcanics formation. The maximum water decline in Well K-2 of 0.5 feet over the course of the 24-hour test is minor (representing less than 0.06% of the water column in the well), may reflect in-well pumping or pumping from Well K-1, and approaches the equipment margin of error (which is 0.1 feet). For other off-site wells, water levels remained constant over the 24-hour test period, or represented in-well pumping levels.

Calculations of drawdown versus distance from the project well, using the Cooper–Jacob approximation of the Theis non-equilibrium flow equation, shows no appreciable drawdown at any off-site well (Table 12). The maximum drawdown at the closest off-site well was calculated to be 0.74 feet after a period of 5 years, assuming no recharge and continuous pumping of the project well at its maximum capacity. Less than a foot of drawdown is not sufficient to cause the groundwater level to drop below a screened interval or substantially impact yield of off-site wells. This degree of drawdown, and the fact that Well A-1 is screened in the Sonoma Volcanics, which is overlain by significant thickness of clay within the Petaluma Formation and hydrologically disconnected from surface flow in South Fork Matanzas Creek means that pumping from Well A-1 would also not have impacts with respect to surface water.

Based on the water balance analysis, recharge substantially exceeds groundwater extraction within the project parcel and the watershed analyzed for the cumulative scenario. Precipitation, evapotranspiration, runoff, groundwater extraction, and recharge within the watershed was simulated over a 30-year period, assuming actual meteorological conditions (including drought) and buildout of general plan land uses. Over that period, simulated withdrawals from the aquifer never caused a significant decrease[12] or net deficit of the total groundwater in storage (Table 13). The water balance method used assumes recharge occurs over the whole surface of the study area and that groundwater moves downward to add to the storage in the aquifer. Although these assumptions are an over-simplification of the actual behavior of groundwater within the watershed, the soil moisture balance method is effective at showing the magnitude of difference between yearly recharge and the current and proposed groundwater demands, and provides a conservative estimate of cumulative impacts.

Overall, the results show the proposed project would not substantially deplete the aquifer of result in well interference sufficient in magnitude to affect the productivity of off-site wells or result in a decrease in surface water flows.

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[12] The minimum groundwater in storage over a 30-year period in the cumulative scenario, as a percent of maximum, was 99.5%.

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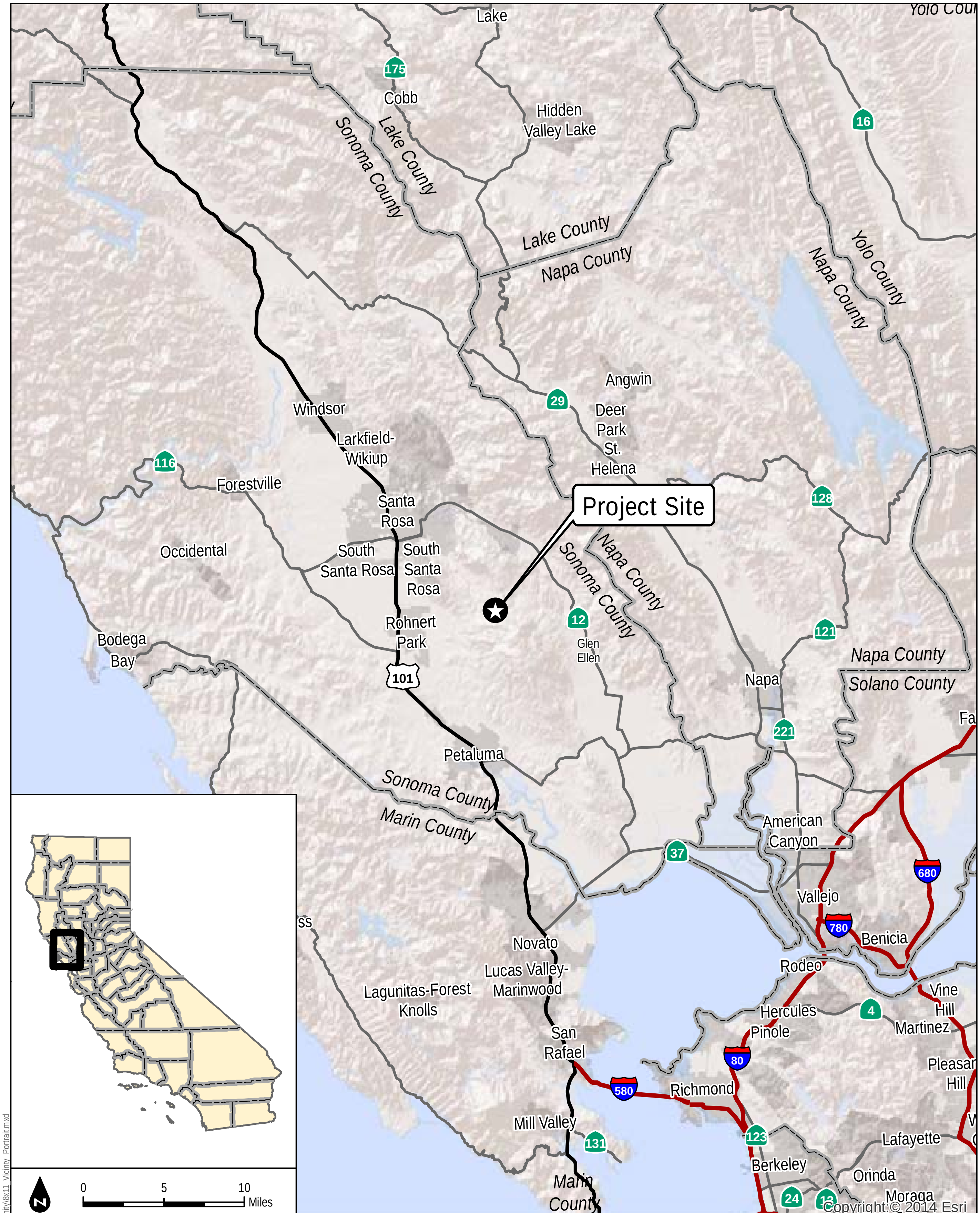

FIGURE 1

Regional Map

Belden Barns Farmstead and Winery Groundwater Resources Technical Report

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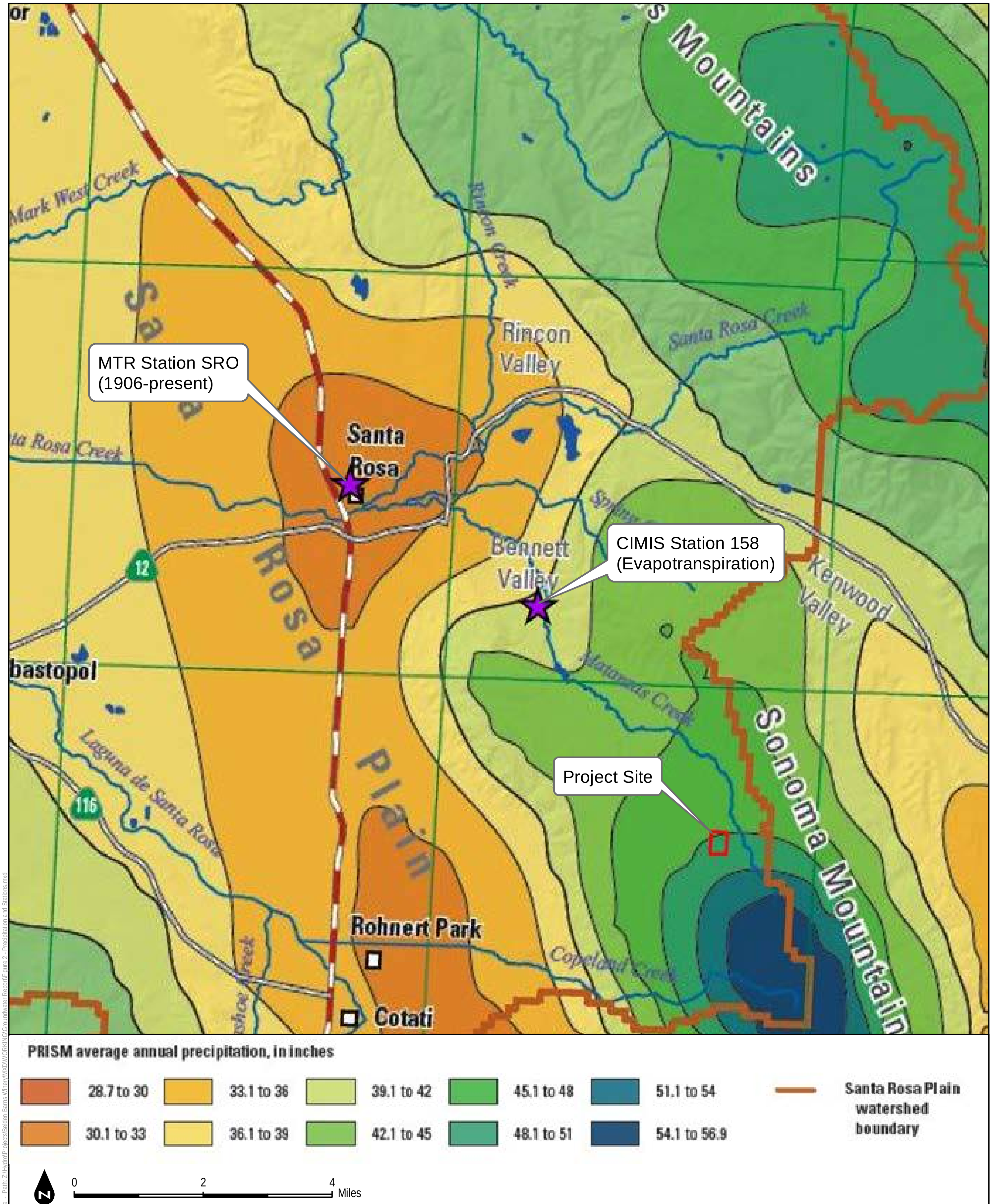

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SOURCE: USGS 2013

FIGURE 2

Average Annual Precipitation and Meteorological Stations

Belden Barns and Winery Project Groundwater Resources Technical Report

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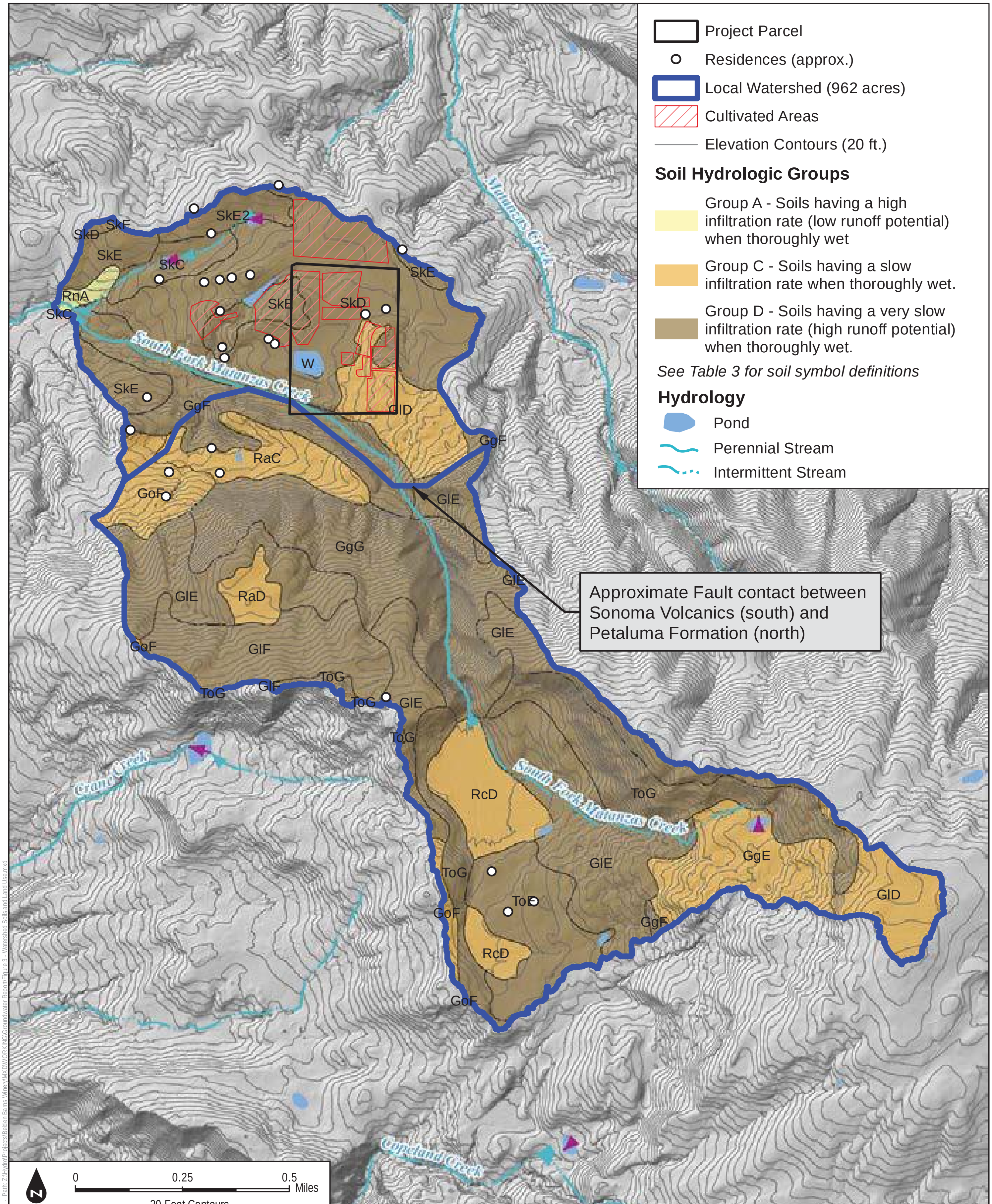

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SOURCE: USDA 2015, UNM and NASA 2013.

FIGURE 3

Watershed Soils and Land Use

Belden Barns Farmstead and Winery Project - Groundwater Resources Technical Report

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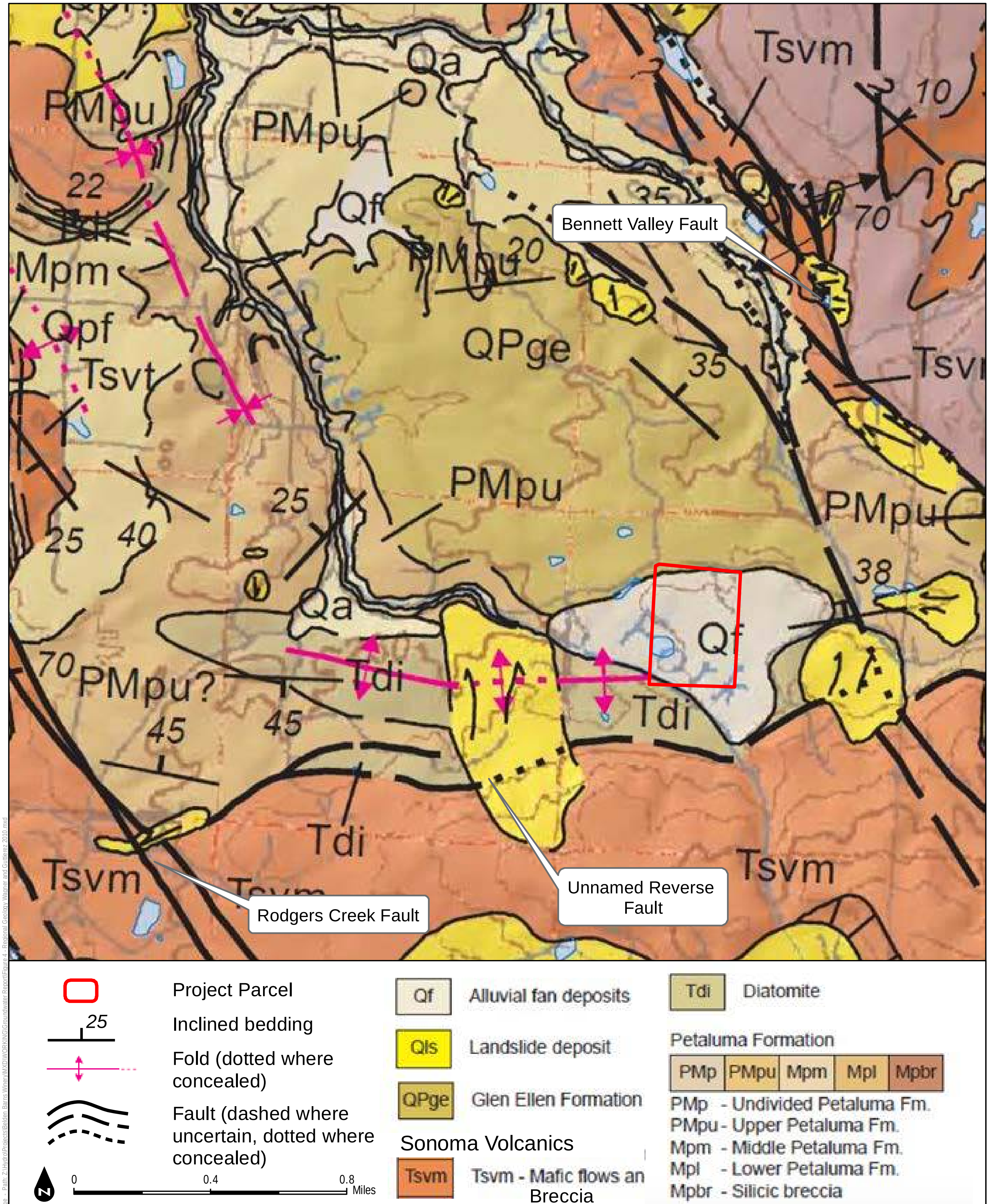

SOURCE: Wager and Guttierez 2010

FIGURE 4

Regional Geologic Setting

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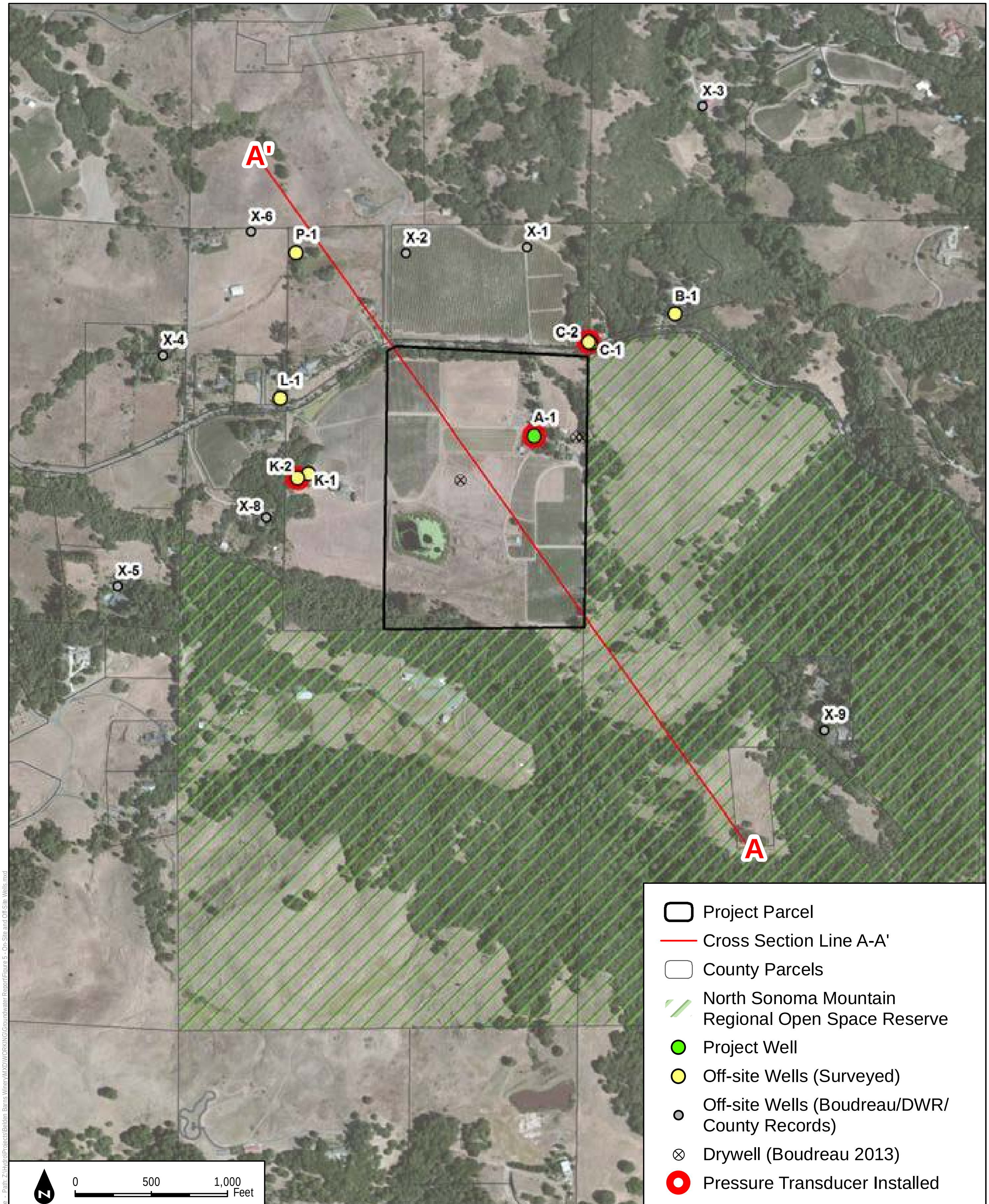

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SOURCE: Dudek Site Visits 11/4/15 and 11/13/15; DWR Well Logs; Boudreau 2013.

FIGURE 5

On-Site and Off-Site Wells

Belden Barns and Winery Project Groundwater Resources Technical Report

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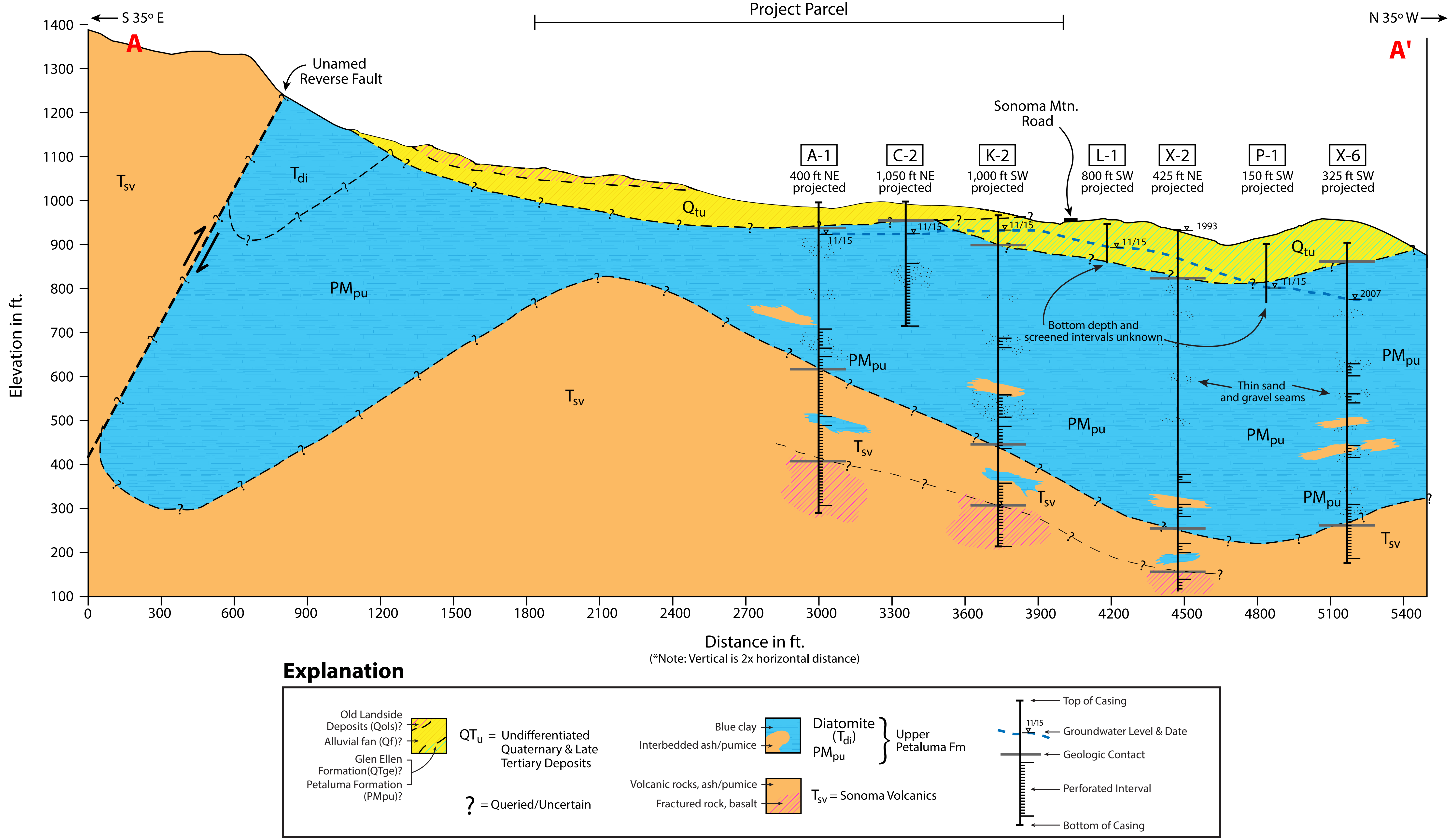

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SOURCES: Dudek 2016, CGS 2003, Wagner and Gutierrez 2010

FIGURE 6

Interpretive Geologic Cross Section, Looking Southwest

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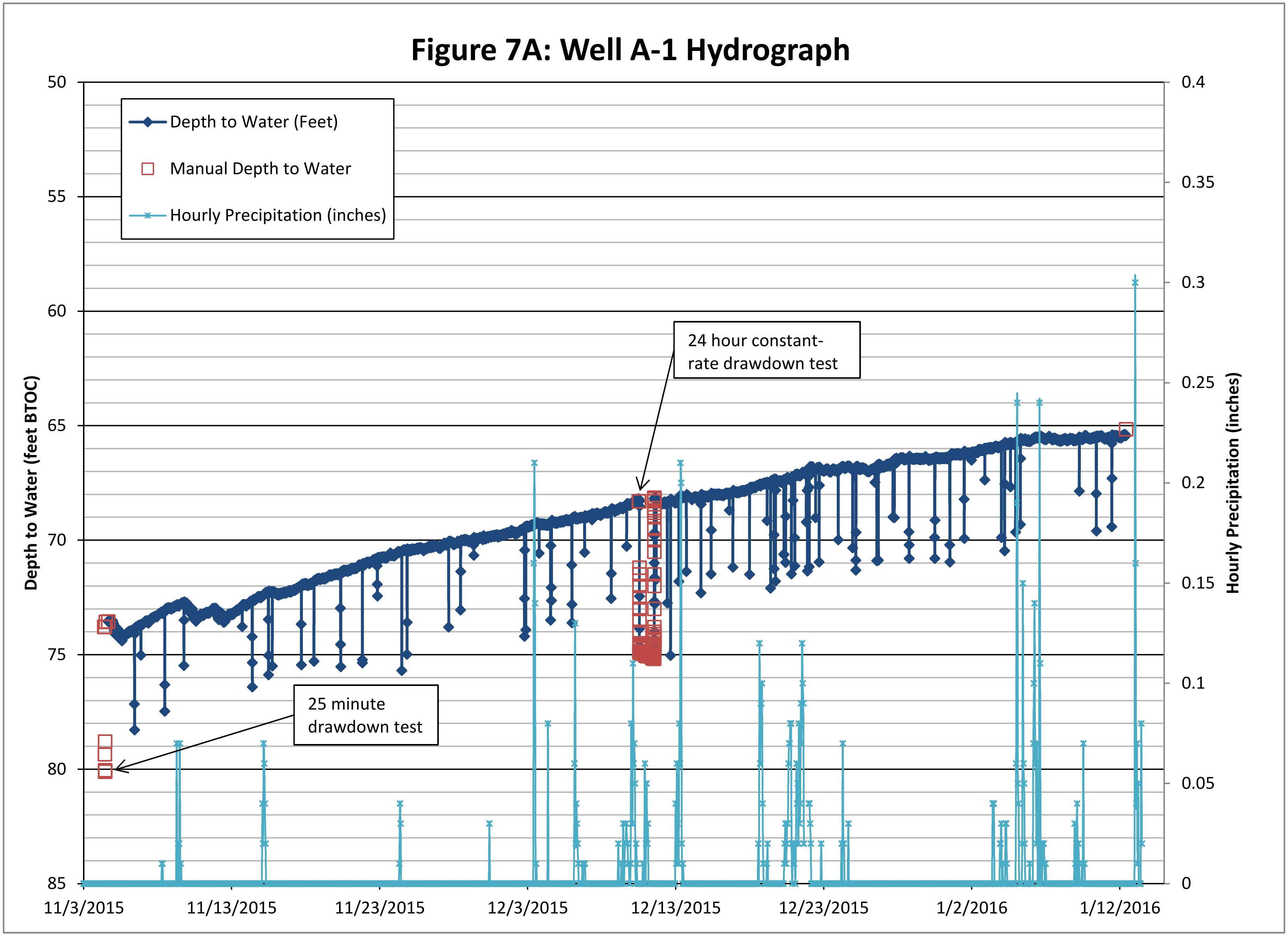
Figure 7A: Well A-1 Hydrograph
Depth to Water (Feet)
Manual Depth to Water
Hourly Precipitation (inches)
24 hour constant-rate drawdown test
25 minute drawdown test
Depth to Water (feet BTOC)
Hourly Precipitation (inches)
50
55
60
65
70
75
80
85
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
11/3/2015
11/13/2015
11/23/2015
12/3/2015
12/13/2015
12/23/2015
1/2/2016
1/12/2016

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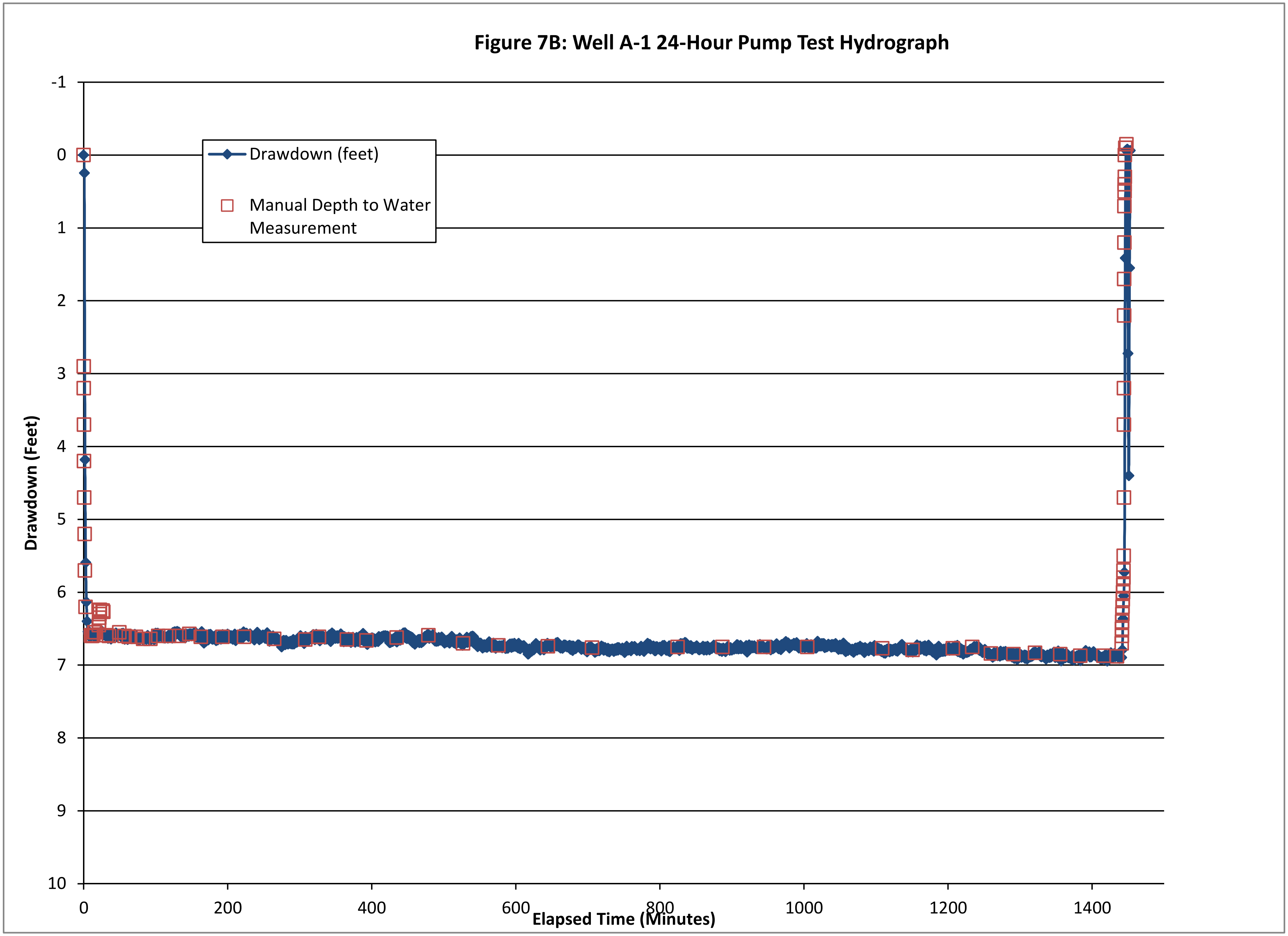

Figure 7B: Well A-1 24-Hour Pump Test Hydrograph
Drawdown (feet)
Manual Depth to Water Measurement
Drawdown (Feet)
Elapsed Time (Minutes)
-1
0
1
2
3
4
5
6
7
8
9
10
0
200
400
600
800
1000
1200
1400

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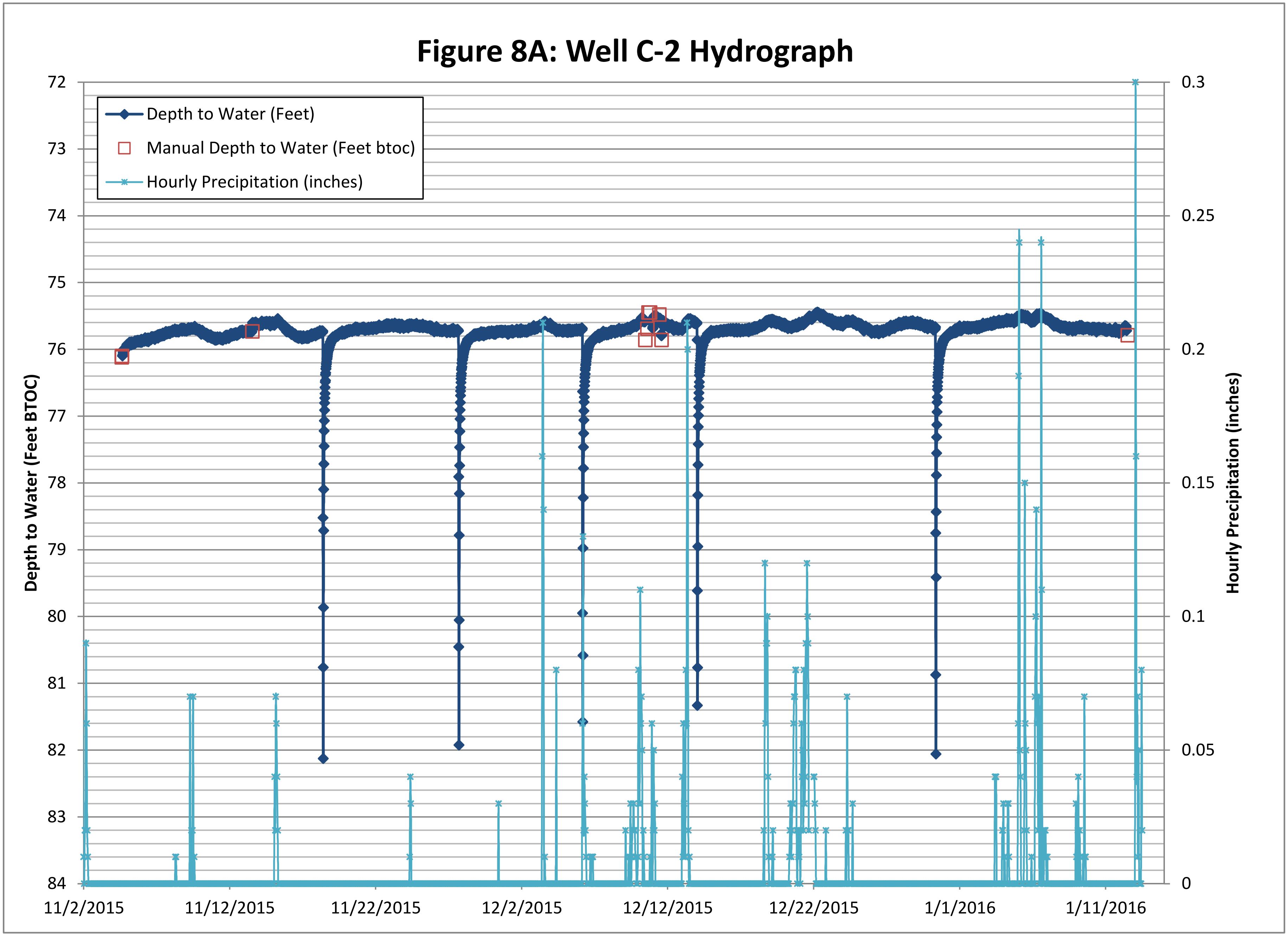
Figure 8A: Well C-2 Hydrograph
Depth to Water (Feet)
Manual Depth to Water (Feet btoc)
Hourly Precipitation (inches)
Depth to Water (Feet BTOC)
Hourly Precipitation (inches)
72
73
74
75
76
77
78
79
80
81
82
83
84
0.3
0.25
0.2
0.15
0.1
0.05
0
11/2/2015
11/12/2015
11/22/2015
12/2/2015
12/12/2015
12/22/2015
1/1/2016
1/11/2016

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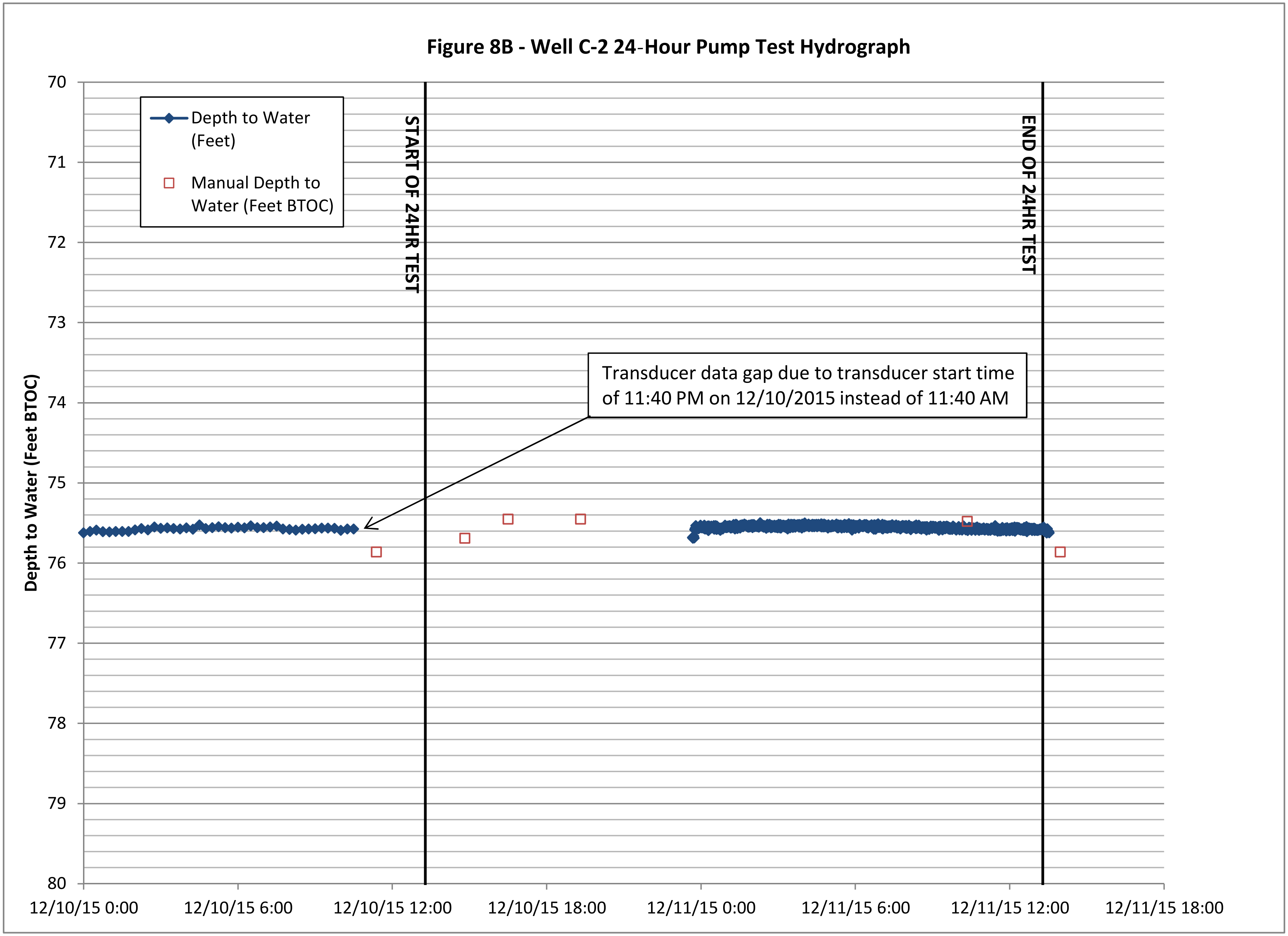

Figure 8B - Well C-2 24-Hour Pump Test Hydrograph
Depth to Water (Feet)
Manual Depth to Water (Feet BTOC)
START OF 24HR TEST
END OF 24HR TEST
Transducer data gap due to transducer start time of 11:40 PM on 12/10/2015 instead of 11:40 AM
Depth to Water (Feet BTOC)
70
71
72
73
74
75
76
77
78
79
80
12/10/15 0:00
12/10/15 6:00
12/10/15 12:00
12/10/15 18:00
12/11/15 0:00
12/11/15 6:00
12/11/15 12:00
12/11/15 18:00

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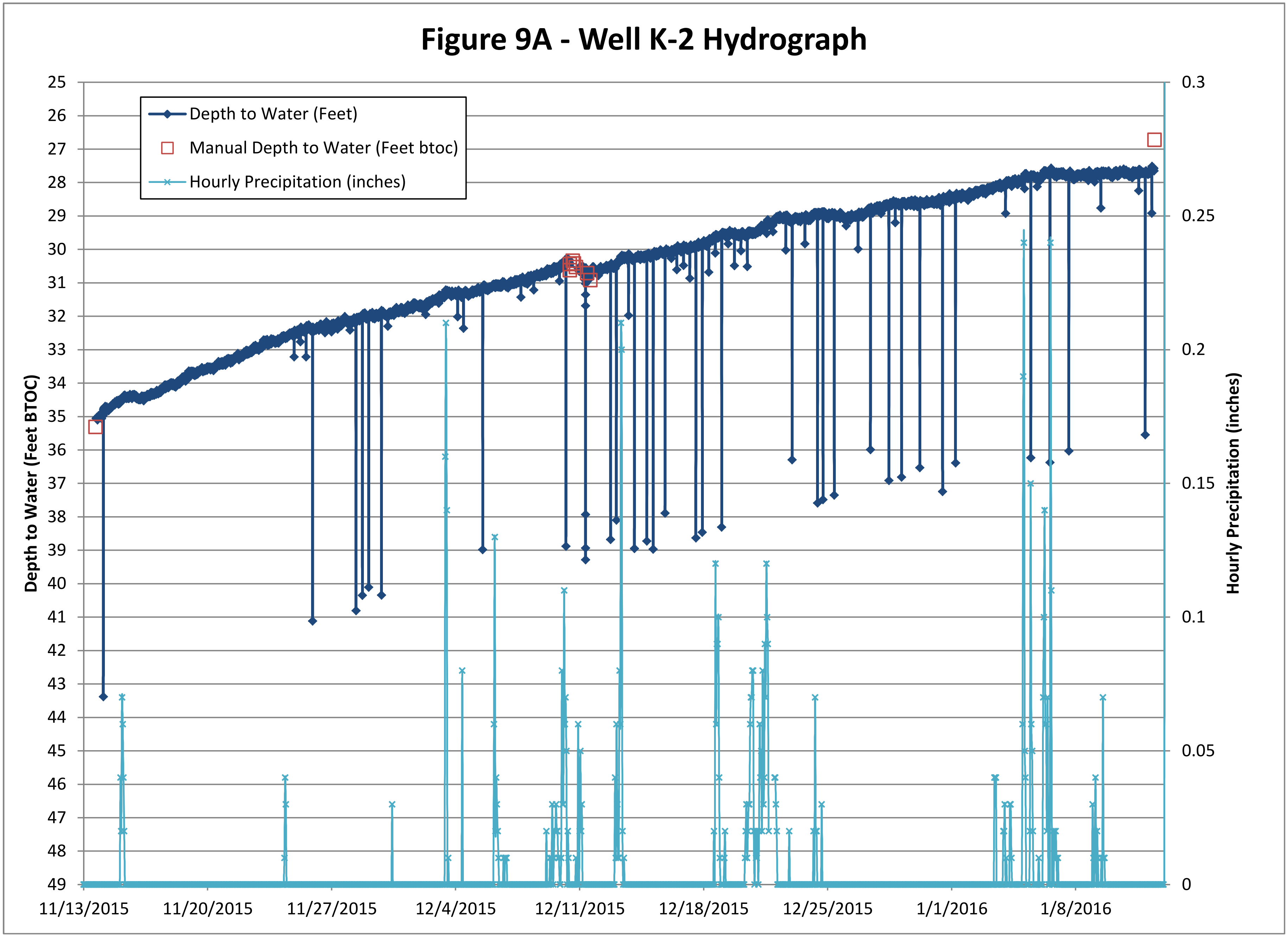

Figure 9A - Well K-2 Hydrograph
Depth to Water (Feet)
Manual Depth to Water (Feet btoc)
Hourly Precipitation (inches)
Depth to Water (Feet BTOC)
Hourly Precipitation (inches)
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
0.3
0.25
0.2
0.15
0.1
0.05
0
11/13/2015
11/20/2015
11/27/2015
12/4/2015
12/11/2015
12/18/2015
12/25/2015
1/1/2016
1/8/2016

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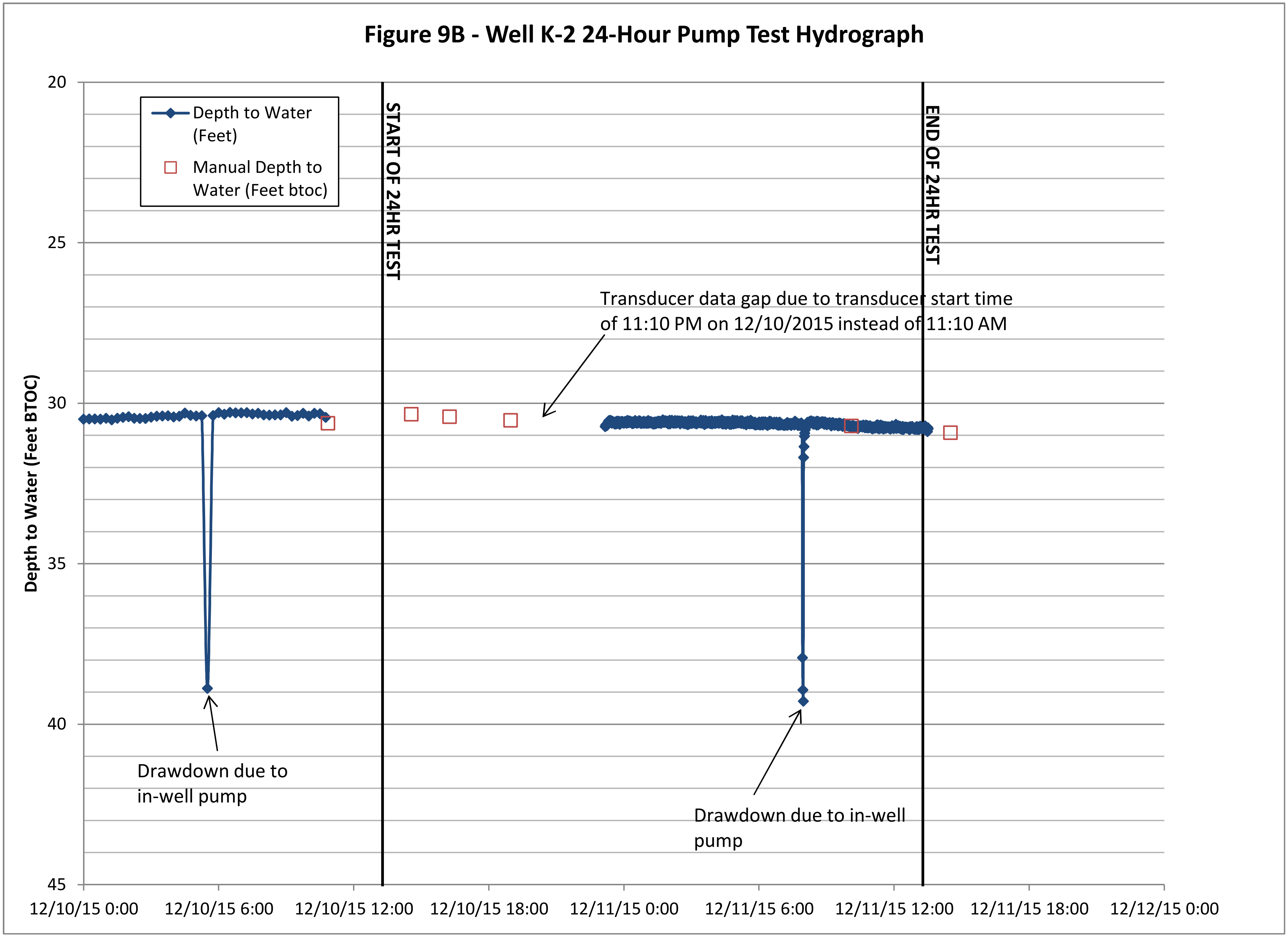

Figure 9B - Well K-2 24-Hour Pump Test Hydrograph
Depth to Water (Feet BTOC)
20
25
30
35
40
45
Depth to Water (Feet)
Manual Depth to Water (Feet btoc)
START OF 24HR TEST
END OF 24HR TEST
Transducer data gap due to transducer start time of 11:10 PM on 12/10/2015 instead of 11:10 AM
Drawdown due to in-well pump
Drawdown due to in-well pump
12/10/15 0:00
12/10/15 6:00
12/10/15 12:00
12/10/15 18:00
12/11/15 0:00
12/11/15 6:00
12/11/15 12:00
12/11/15 18:00
12/12/15 0:00

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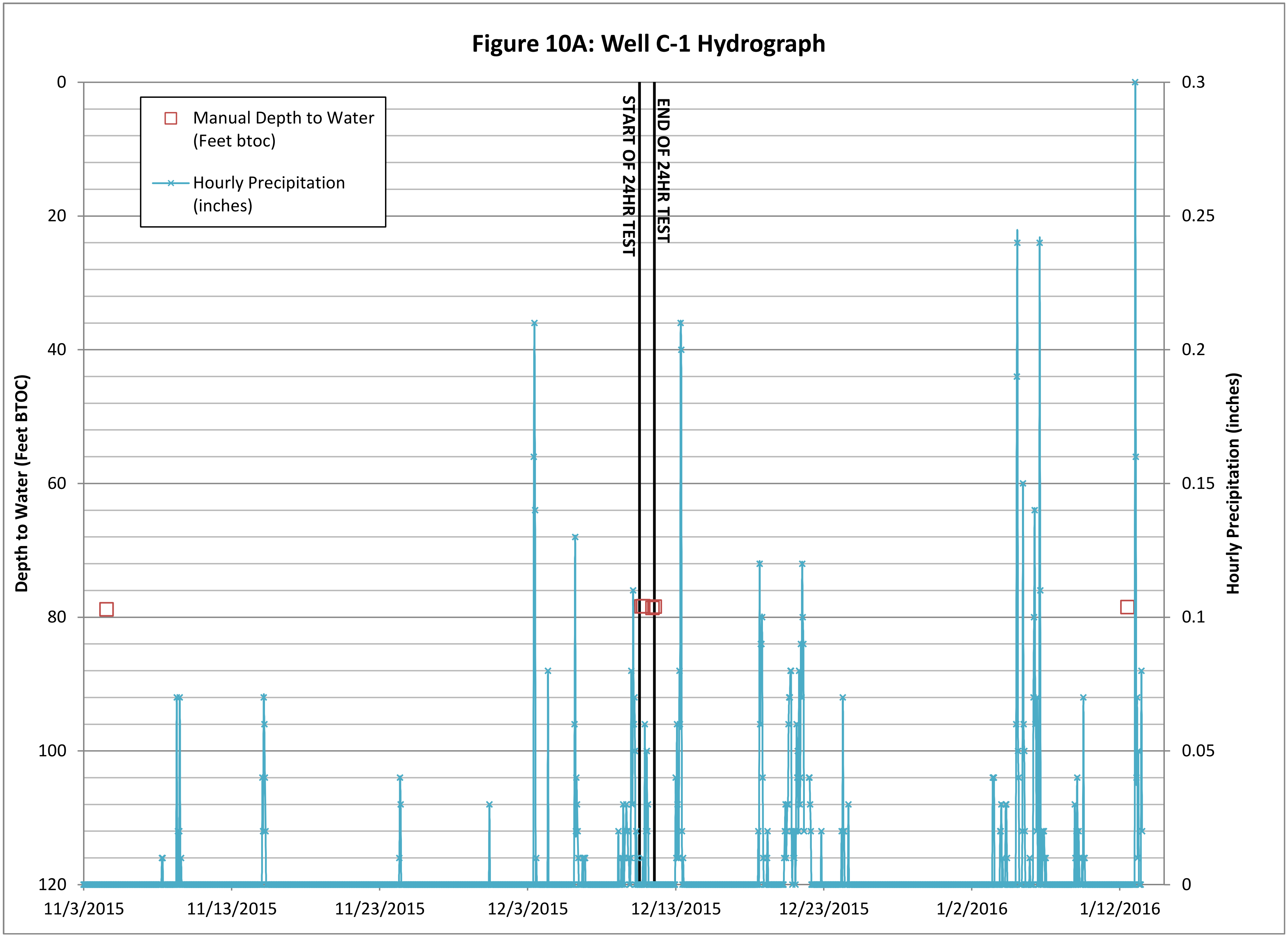
Figure 10A: Well C-1 Hydrograph
Manual Depth to Water (Feet btoc)
Hourly Precipitation (inches)
START OF 24HR TEST
END OF 24HR TEST
Depth to Water (Feet BTOC)
Hourly Precipitation (inches)
0
20
40
60
80
100
120
0.3
0.25
0.2
0.15
0.1
0.05
0
11/3/2015
11/13/2015
11/23/2015
12/3/2015
12/13/2015
12/23/2015
1/2/2016
1/12/2016

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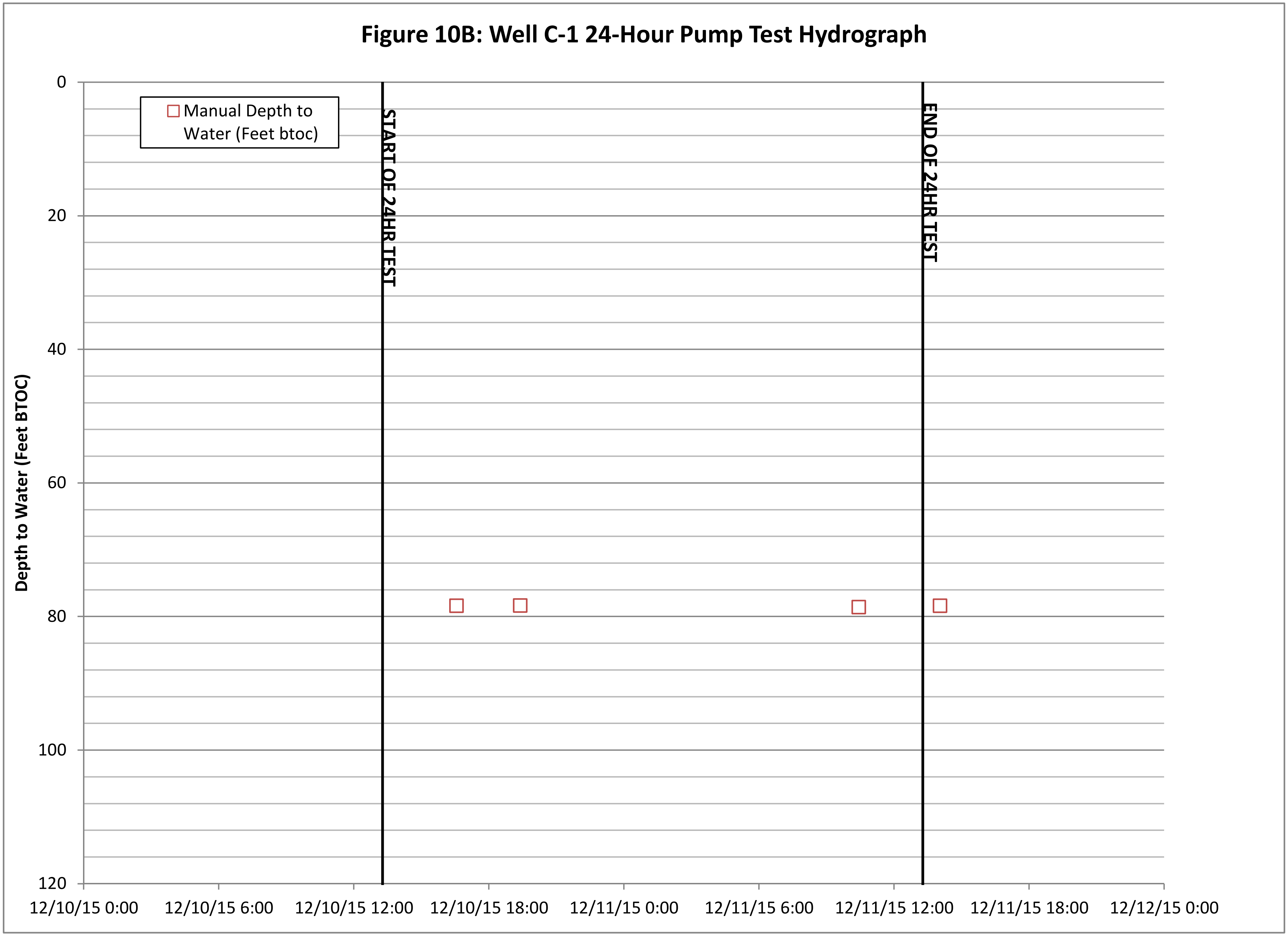
Figure 10B: Well C-1 24-Hour Pump Test Hydrograph
Manual Depth to Water (Feet btoc)
START OF 24HR TEST
END OF 24HR TEST
Depth to Water (Feet BTOC)
0
20
40
60
80
100
120
12/10/15 0:00
12/10/15 6:00
12/10/15 12:00
12/10/15 18:00
12/11/15 0:00
12/11/15 6:00
12/11/15 12:00
12/11/15 18:00
12/12/15 0:00

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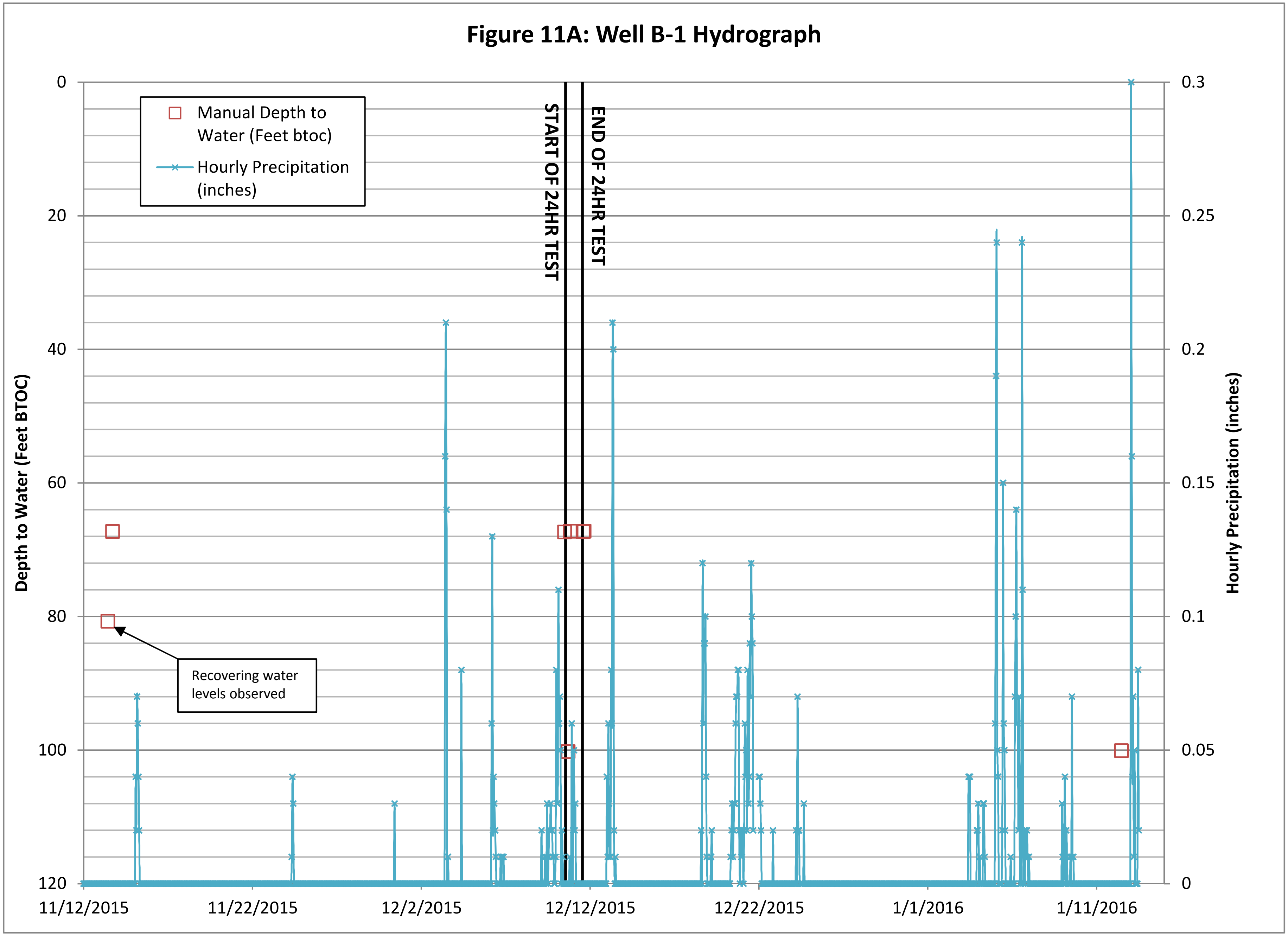

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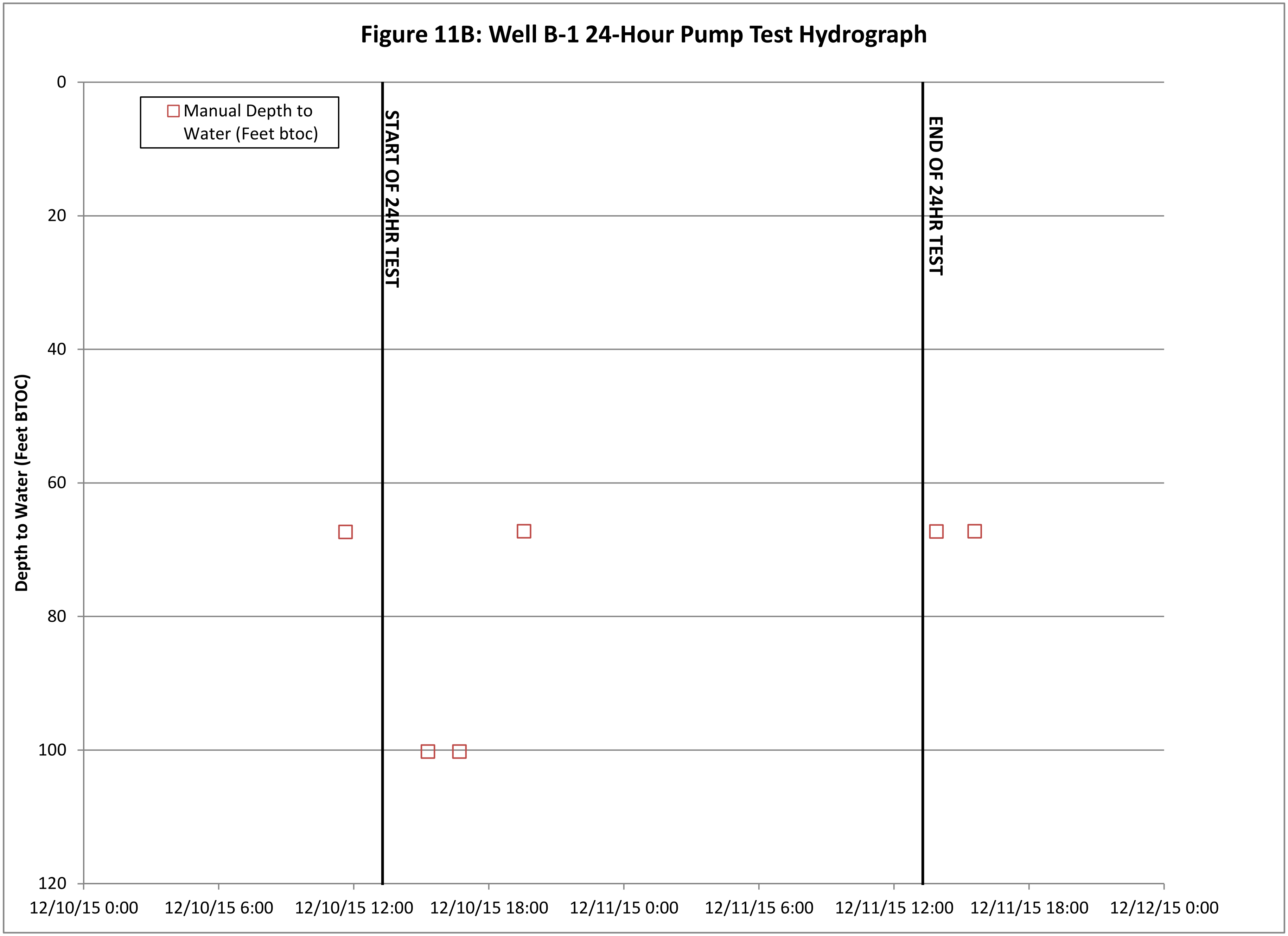

Figure 11B: Well B-1 24-Hour Pump Test Hydrograph
Manual Depth to Water (Feet btoc)
START OF 24HR TEST
END OF 24HR TEST
Depth to Water (Feet BTOC)
0
20
40
60
80
100
120
12/10/15 0:00
12/10/15 6:00
12/10/15 12:00
12/10/15 18:00
12/11/15 0:00
12/11/15 6:00
12/11/15 12:00
12/11/15 18:00
12/12/15 0:00

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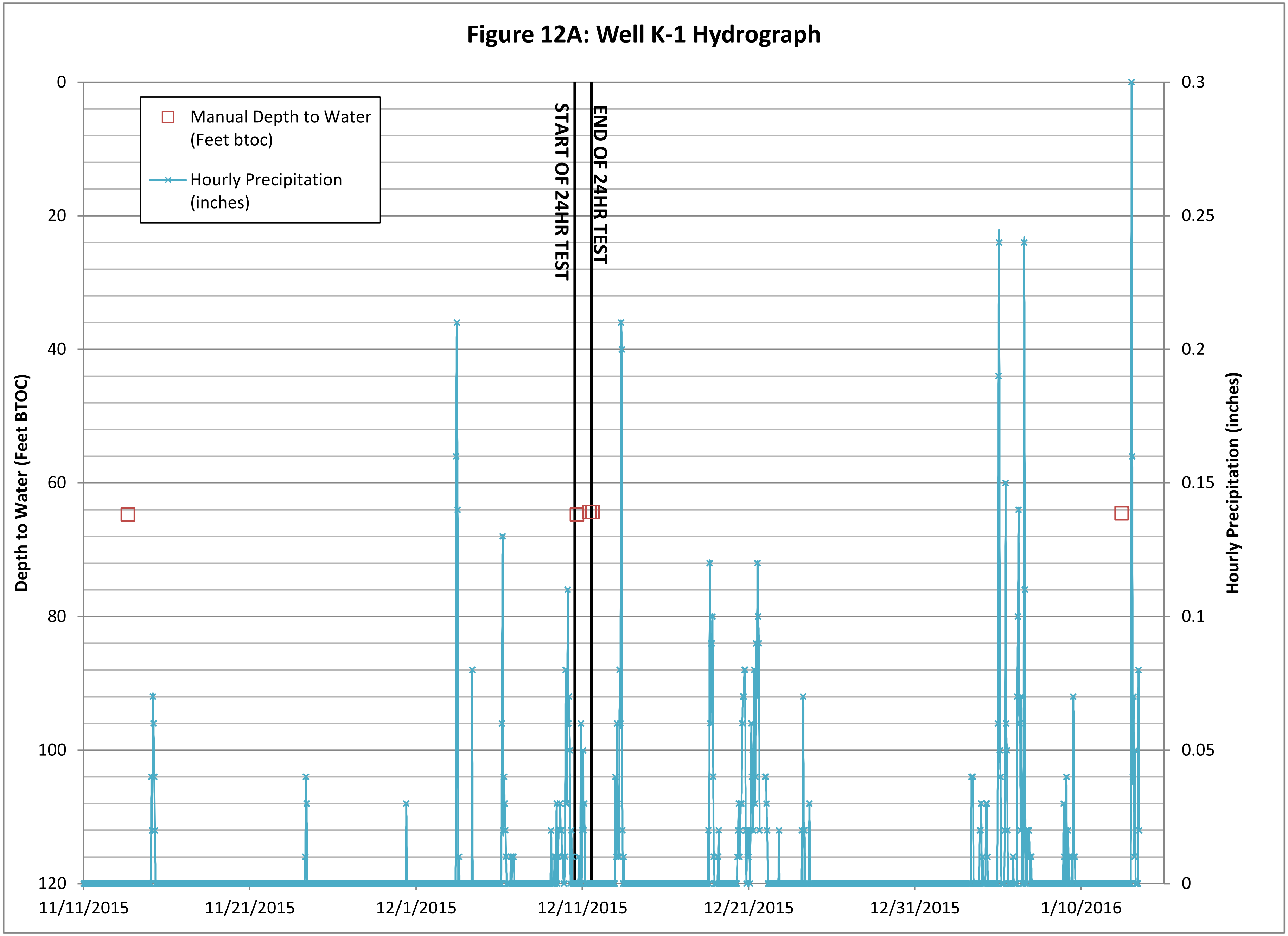
Figure 12A: Well K-1 Hydrograph
Manual Depth to Water (Feet btoc)
Hourly Precipitation (inches)
START OF 24HR TEST
END OF 24HR TEST
Depth to Water (Feet BTOC)
Hourly Precipitation (inches)
0
20
40
60
80
100
120
0.3
0.25
0.2
0.15
0.1
0.05
0
11/11/2015
11/21/2015
12/1/2015
12/11/2015
12/21/2015
12/31/2015
1/10/2016

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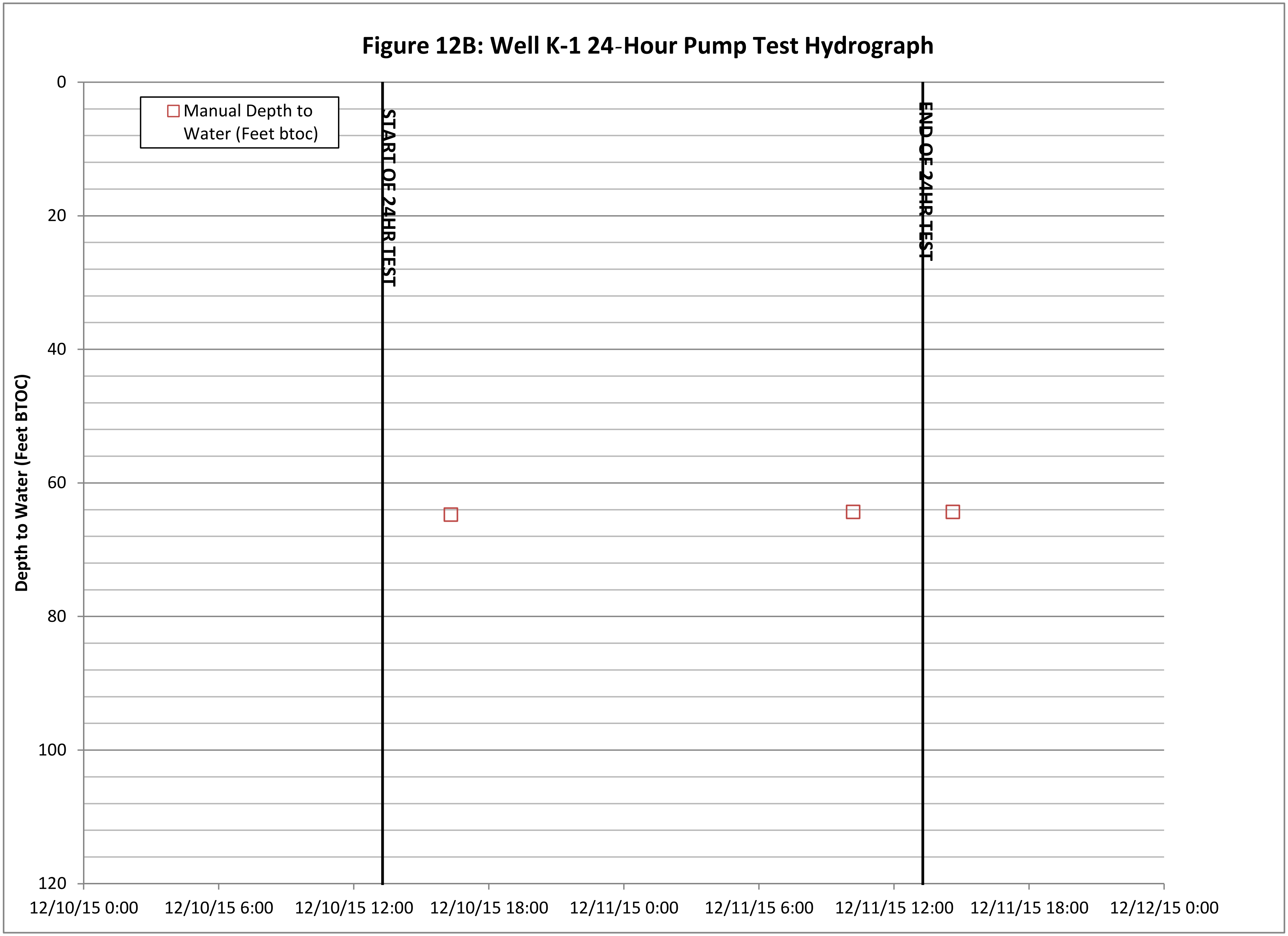

Figure 12B: Well K-1 24-Hour Pump Test Hydrograph
Manual Depth to Water (Feet btoc)
START OF 24HR TEST
END OF 24HR TEST
Depth to Water (Feet BTOC)
0
20
40
60
80
100
120
12/10/15 0:00
12/10/15 6:00
12/10/15 12:00
12/10/15 18:00
12/11/15 0:00
12/11/15 6:00
12/11/15 12:00
12/11/15 18:00
12/12/15 0:00

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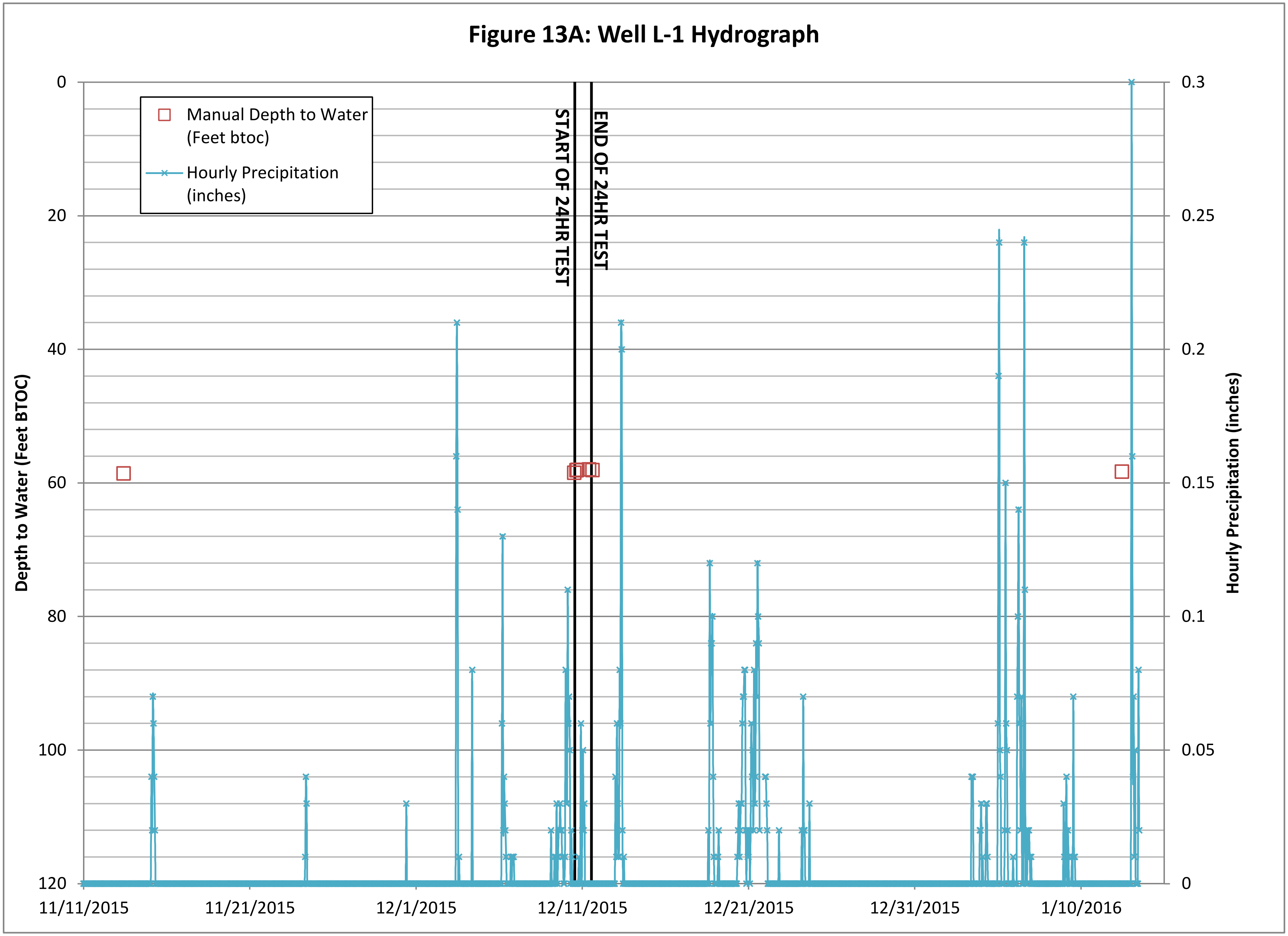

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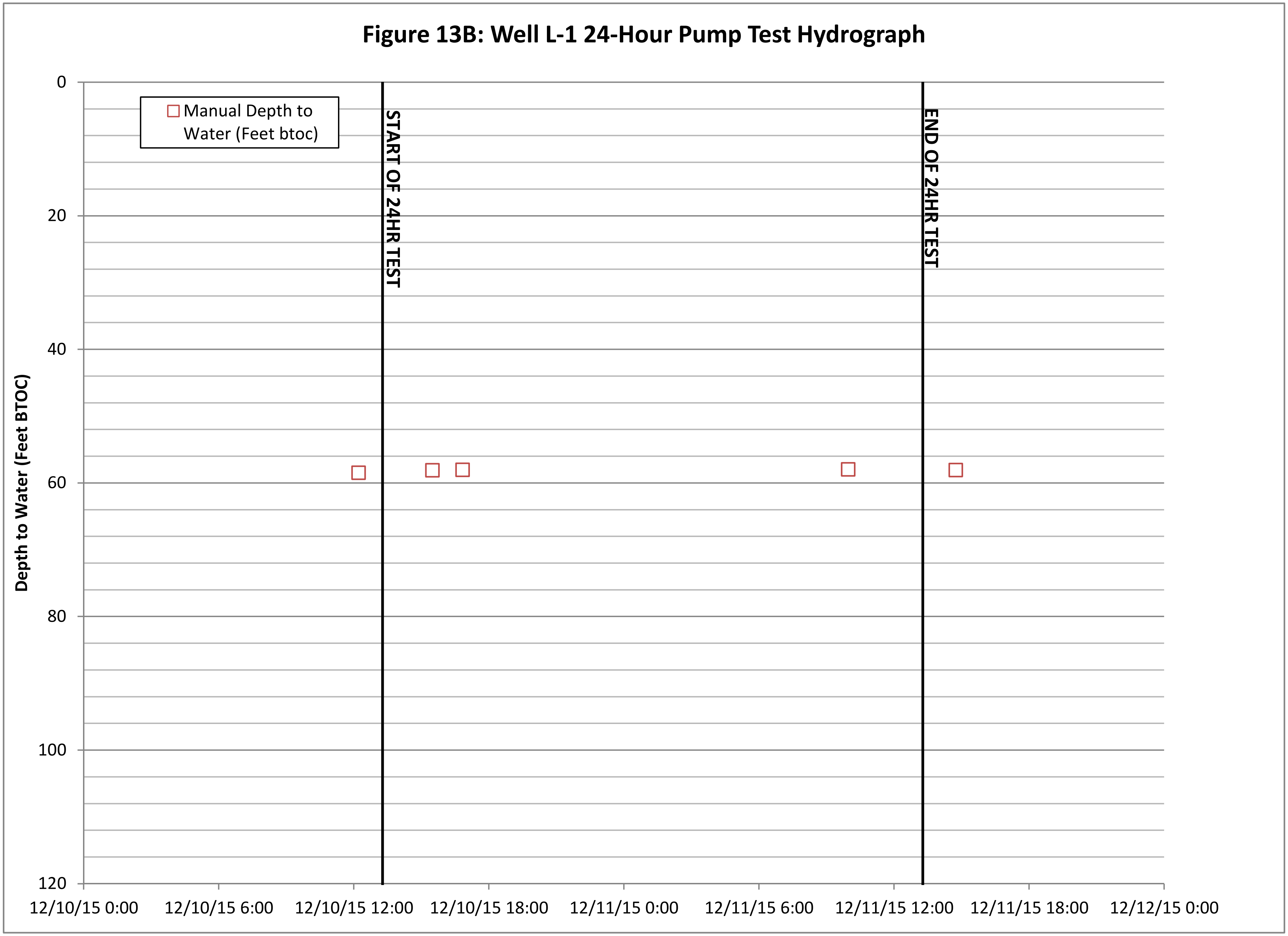

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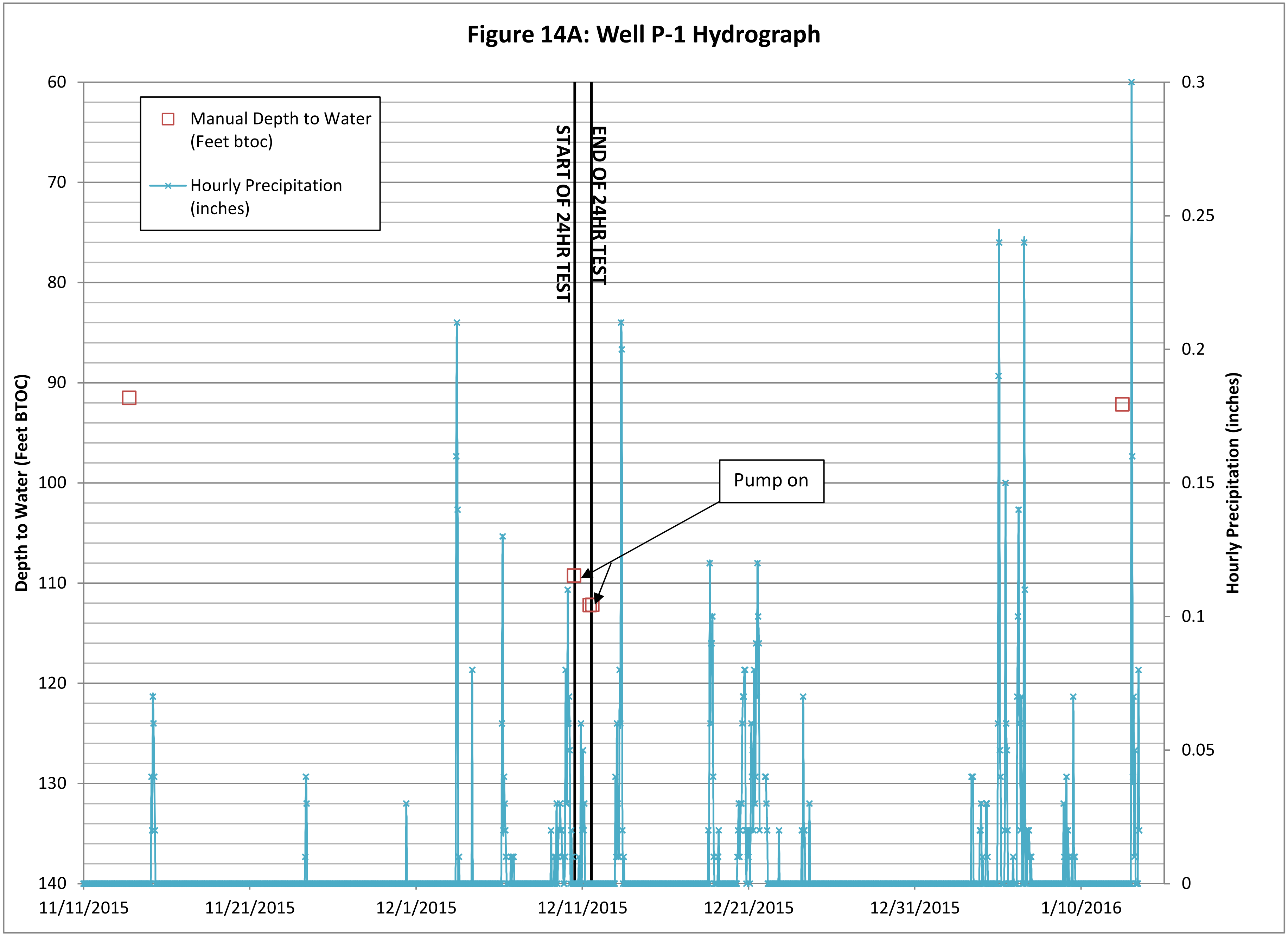

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May 2016

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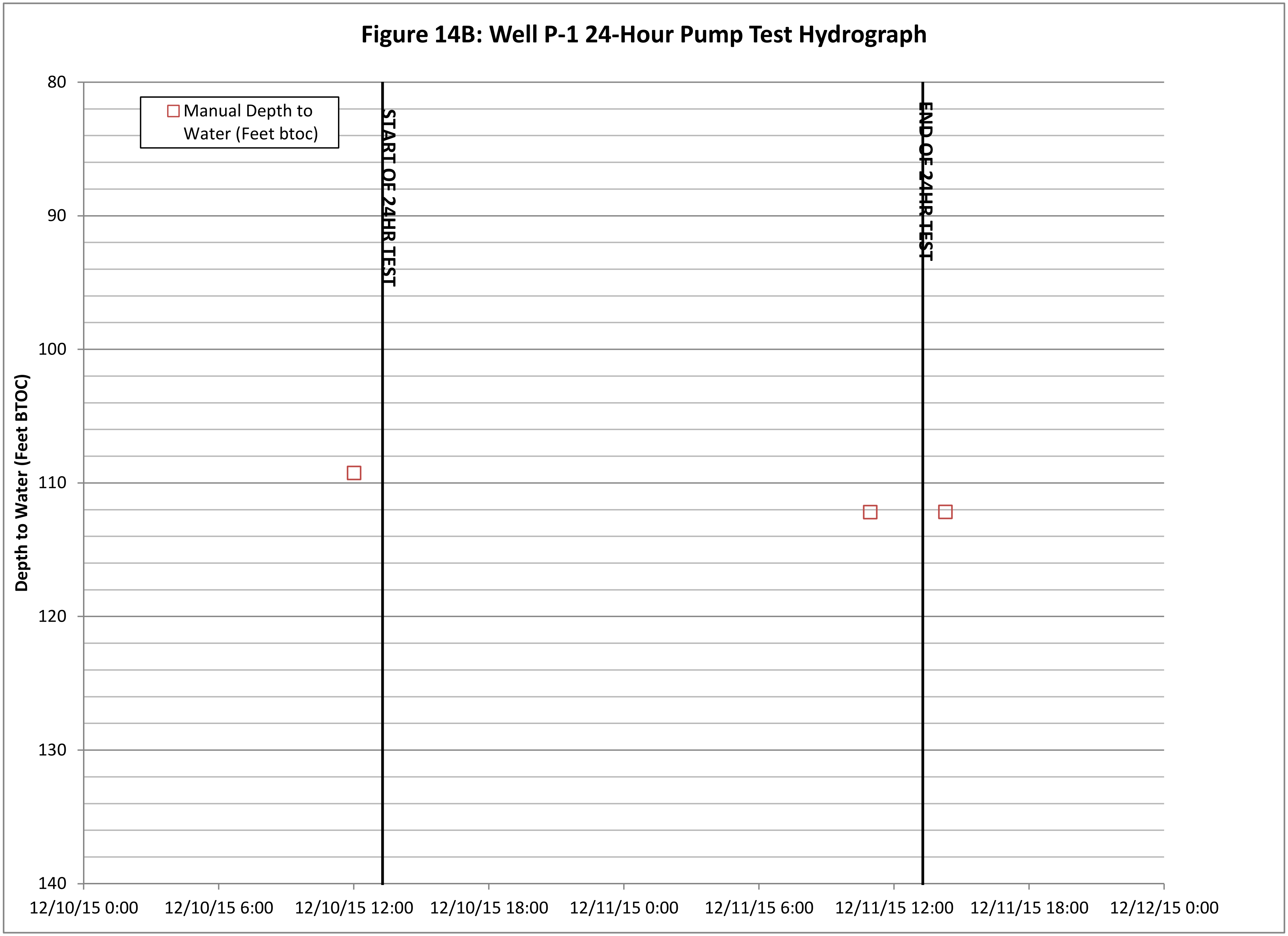

Figure 14B: Well P-1 24-Hour Pump Test Hydrograph
Manual Depth to Water (Feet btoc)
START OF 24HR TEST
END OF 24HR TEST
Depth to Water (Feet BTOC)
80
90
100
110
120
130
140
12/10/15 0:00
12/10/15 6:00
12/10/15 12:00
12/10/15 18:00
12/11/15 0:00
12/11/15 6:00
12/11/15 12:00
12/11/15 18:00
12/12/15 0:00

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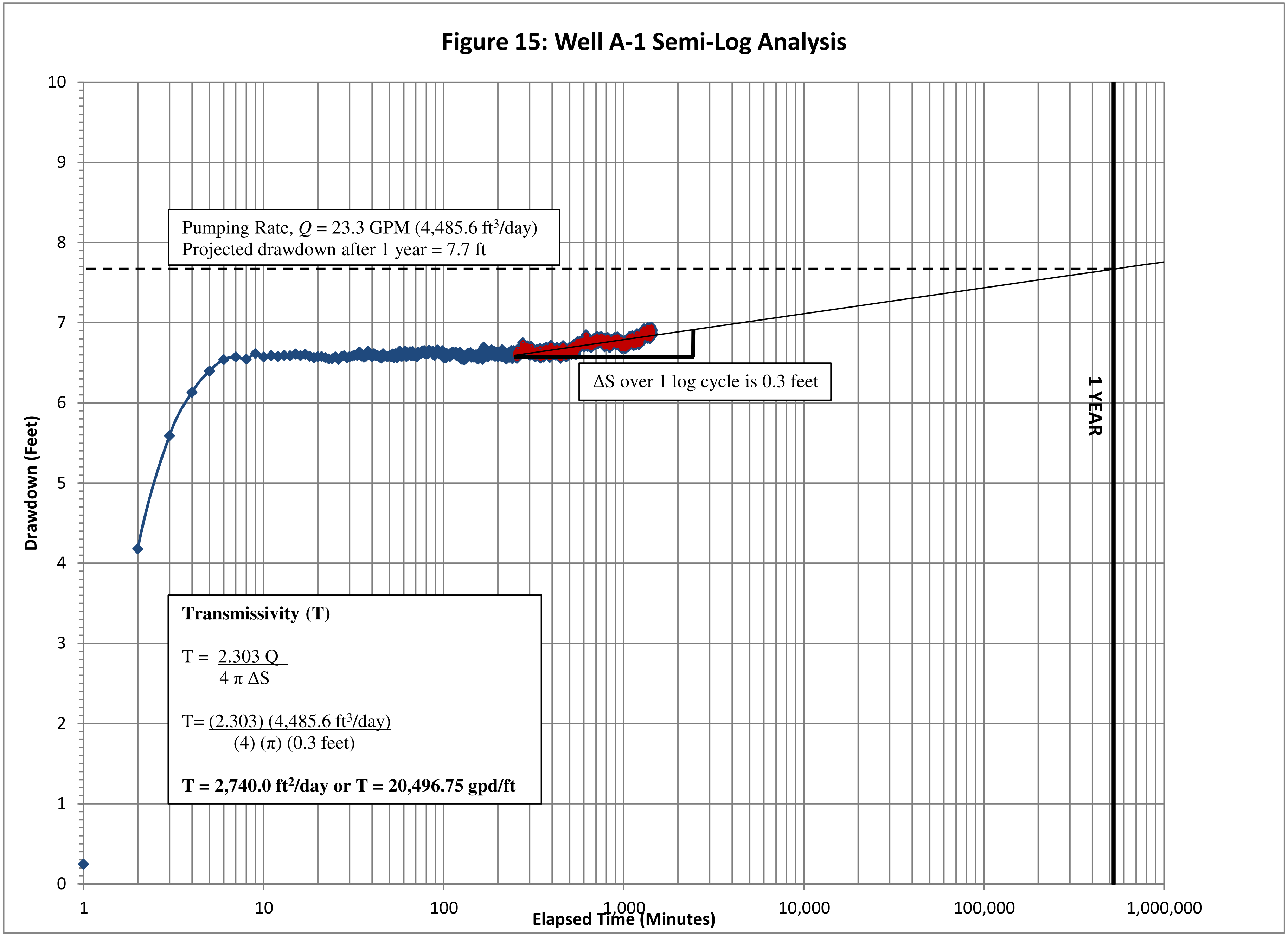
Figure 15: Well A-1 Semi-Log Analysis
Pumping Rate, Q = 23.3 GPM (4,485.6 ft3/day)
Projected drawdown after 1 year = 7.7 ft
ΔS over 1 log cycle is 0.3 feet
1 YEAR
Transmissivity (T)
T = 2.303 Q / 4 π ΔS
T= (2.303) (4,485.6 ft3/day) / (4) (π) (0.3 feet)
T = 2,740.0 ft2/day or T = 20,496.75 gpd/ft
Drawdown (Feet)
Elapsed Time (Minutes)
0
1
2
3
4
5
6
7
8
9
10
1
10
100
1,000
10,000
100,000
1,000,000

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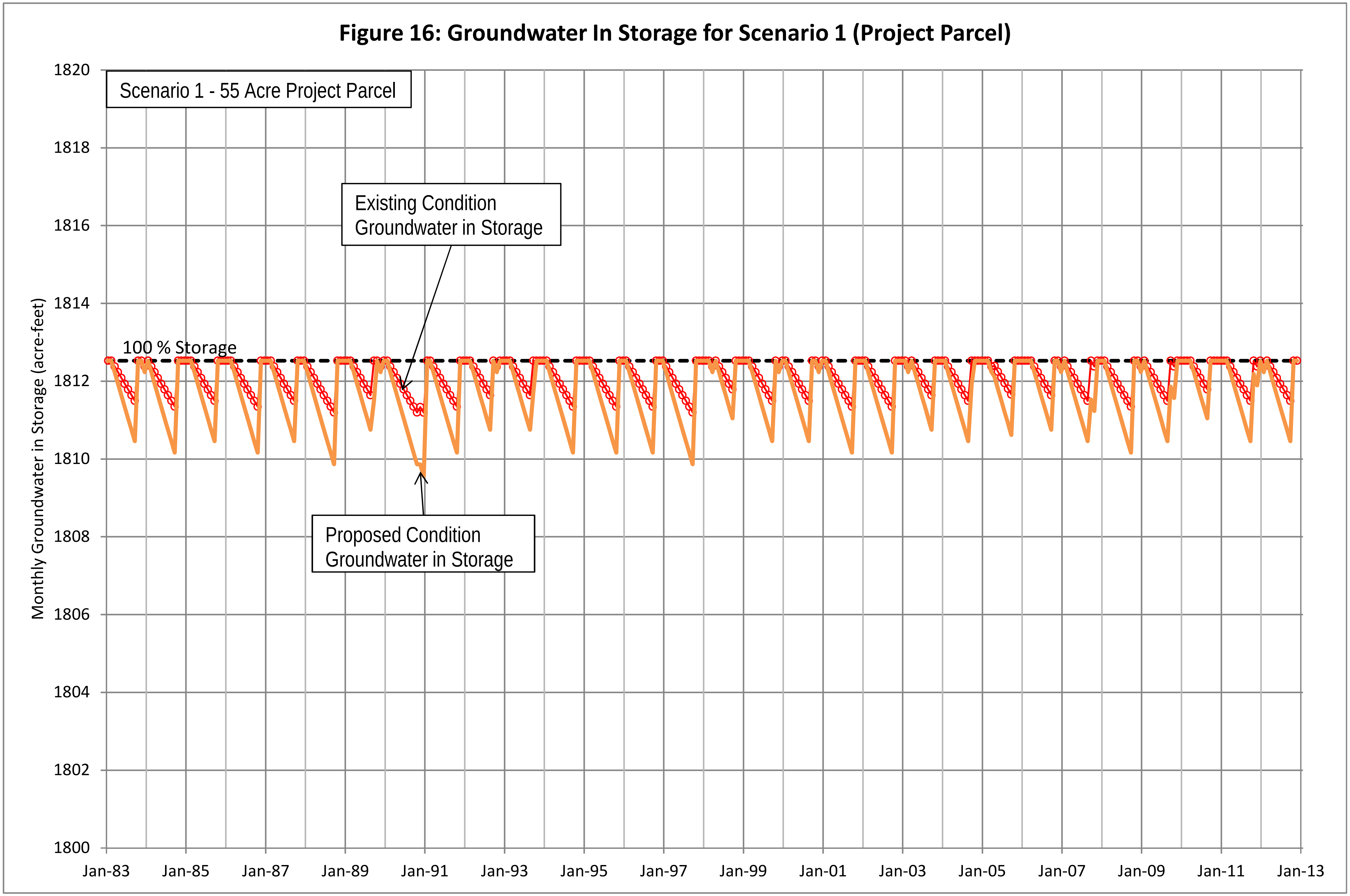

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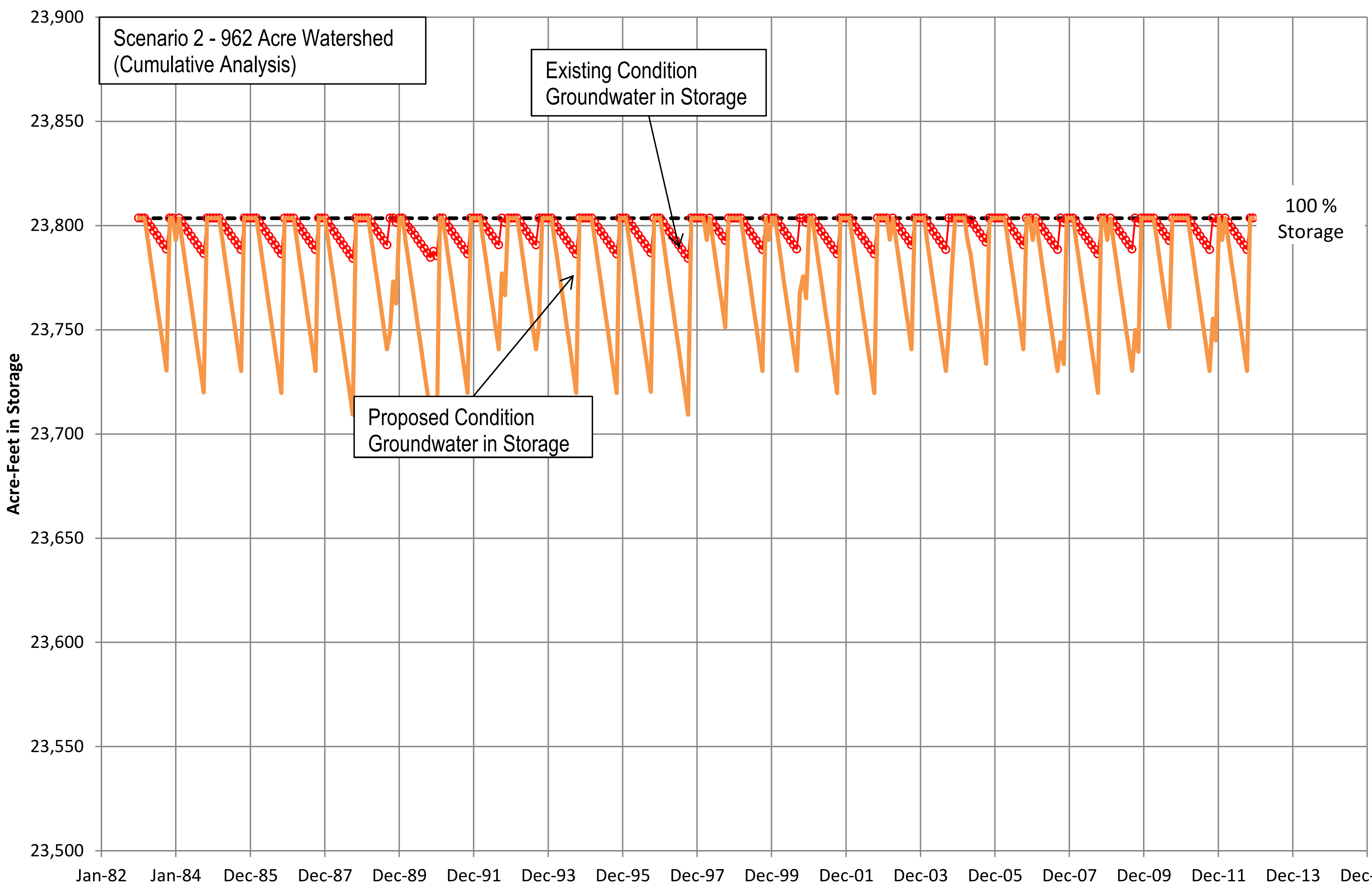
Figure 17: Groundwater In Storage for Scenario 2 (Watershed)



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APPENDIX A

Well A-1 Tabulated Water Quality Data

Microbiology

Constituent	Analytical Method	Units	Well A-1 Groundwater (Sample from December 11, 2015)	California Drinking Water MCLs
Fecal Coliform	SM9221E	MPN/100ml	Absent	More than 1 sample per month is total coliform positive
E. coli	SM9223B	MPN	Absent	A positive result for fecal coliform or E. coli samples is an acute MCL violation

MPN = Most Probable Number.

1. MCL applies after disinfection .

General Mineral Analyses

Constituent	Analytical Method	Units	Well A-1 Groundwater (Sample from December 11, 2015)	California Drinking Water MCLs
Cations				
Total Hardness	EPA 200.8	mg $CaCO_3$/L	149	--
Calcium	EPA 200.8	mg/L	24	--
Magnesium	EPA 200.8	mg/L	17	--
Sodium	EPA 200.8	ug/L	25,000	--
Potassium	EPA 300.0	ug/L	4700	--
Total Cations	Calculated	me/L	3.9	--
Anions				
Total Alkalinity	SM2320 B-1997	mg $CaCO_3$/L	178	--
Hydroxide	SM2320 B-1997	mg $CaCO_3$/L	< 1.00	--
Carbonate	SM2320 B-1997	mg $CaCO_3$/L	< 1.00	--
Bicarbonate	SM2320 B-1997	mg $CaCO_3$/L	178	--
Chloride	EPA 300.1	mg/L	5.0	250/500/600[b]
Sulfate	EPA 300.1	mg/L	17	250/500/600[b]
Fluoride	EPA 300.1	mg/L	0.22	--
Nitrate as N	EPA 300.1	mg/L	< 0.10	45 (10 as N)
Nitrate as NO3-	EPA 300.1	mg/L	< 0.45	45 (10 as N)
Nitrite as N	EPA 300.1	mg/L	< 0.10	1 (as N)
Nitrite as NO2-	EPA 300.1	mg/L	< 0.33	--
Nitrate and Nitrite as N	EPA 300.1	mg/L	< 0.20	10 (as N)
Total Anions	Calculated	me/L	3.4	
Aggregate Properties				
pH	SM25400H+B	pH Units	7.56	6.5 – 8.5[a]
Specific Conductivity	SM2510 B-1997	umhos/cm	351	900/1,600/2,200 [a, b] (µS/cm)[c]
Solids				
Total Dissolved Solids	SM2540 C-1997	mg/L	244	500/100/1,500 [a, b]
General Physical				
Color	SM2120 B-2001	Color Units	89	15 [a]

Odor	SM2150 B	T.O.N @ 60°C	< 1.0	3 [a]
Turbidity	SM2130 B-2001	NTU	11.5	5 [a]

a. Secondary MCLs.

b. Recommended/Upper/Short Term Secondary MCLs.

c. Umhos/cm = µS/cm.

Inorganic Chemicals

Constituent	Analytical method	Units	Well A-1 Groundwater (Sample from December 11, 2015)	California Drinking Water MCLs
Aluminum	EPA 200.8	ug/L	< 50	1,000
Antimony	EPA 200.8	ug/L	< 6.0	6
Arsenic	EPA 200.8	ug/L	< 2.0	10
Barium	EPA 200.8	ug/L	< 100	1,000
Beryllium	EPA 200.8	ug/L	< 1.0	4
Cadmium	EPA 200.8	ug/L	< 1.0	5
Chromium (Total)	EPA 200.8	ug/L	< 10	50
Cobalt	EPA 200.8	ug/L	< 0.50	--
Copper	EPA 200.8	ug/L	< 10	1,300[b]
Iron	EPA 200.7	ug/L	1700	300[a]
Lead	EPA 200.8	ug/L	< 5.0	15[b]
Manganese	EPA 200.8	ug/L	150	50
Mercury	EPA 200.8	ug/L	< 1.0	0.002
Molybdenum	EPA 200.8	ug/L	1.7	--
Nickel	EPA 200.8	ug/L	< 10	0.1
Potassium	EPA 200.8	ug/L	4700	--
Silver	EPA 200.8	ug/L	< 10	100[a]
Selenium	EPA 200.8	ug/L	< 5.0	50
Thallium	EPA 200.8	ug/L	< 1.0	2
Vanadium	EPA 200.8	ug/L	< 3.0	--
Zinc	EPA 200.8	ug/L	< 50	5,000[a]

a. Secondary MCLs.

b. Values referred to as MCLs for lead and copper are not actually MCLs; instead, they are called "Action Levels" under the lead and copper rule.

c. Convert nitrate to nitrate-nitrogen: x mg/L nitrate (NO_3) X 0.226 = y mg/L nitrate nitrogen (NO_3 – N).

Field Water Quality Measurements

Sample Date/Time	Temperature (°F)	pH	Conductivity (µS/cm)	Turbidity (NTU)	TDS (ppm)
12/11/2015 8:28	78.4	7.81	392	3.19	196
12/11/2015 8:40	78.3	7.76	391	2.84	195
12/11/2015 8:45	78.6	7.75	394	2.68	195
12/11/2015 10:17	77.3	7.82	384		193
12/11/2015 10:48	77.1	7.8	386		190
12/11/2015 11:18	77.5	7.79	385	3.8	190
12/11/2015 11:50	78	7.56	384	2.9	192
Average	77.89	7.76	388	3.08	193

Well A-1 Water Quality Analytical Report

McCampbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder:	1512517	**Amended:**	01/22/2016

Report Created for: DUDEK

44 Montgomery Street, Suite 1560
San Francisco, CA 94104

Project Contact: Dylan Duverge
Project P.O.:
Project Name: 9182; Belden Barns

Project Received: 12/11/2015

Analytical Report reviewed & approved for release on 12/22/2015 by:

Angela Rydelius,
Laboratory Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.

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Glossary of Terms & Qualifier Definitions

Client: DUDEK
Project: 9182; Belden Barns
WorkOrder: 1512517

Glossary Abbreviation

95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 μm filtered and acidified water sample)
DLT	Dilution Test
DUP	Duplicate
EDL	Estimated Detection Limit
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)

Analytical Qualifiers

H	samples were analyzed out of holding time

Quality Control Qualifiers

F1	MS/MSD recovery and/or RPD is out of acceptance criteria; LCS validated the prep batch.

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Case Narrative

Client: DUDEK **Work Order:** 1512517

Project: 9182; Belden Barns December 28, 2015

Scaling Indices by SM2330B Calculations

Sample ID: A-1 (1512517-001E

Langelier Index (LSI)=-0.26401228
Ryznar Stability Index (RSI)= 8.088024559
Puckorius Scaling Index (PSI)= 7.811159255

Angela Rydelius, Lab Manager

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	E300.1
Date Prepared:	12/11/15-12/16/15	**Analytical Method:**	E300.1
Project:	9182; Belden Barns	**Unit:**	mg/L

Inorganic Anions by IC

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001C**	**Water**	**12/11/2015 09:00**	**IC3**	**114083**

Analytes	Result	RL	DF	Date Analyzed
Chloride	**5.0**	1.0	10	12/16/2015 18:10
Fluoride	**0.22**	0.10	1	12/11/2015 16:12
Nitrate as N	ND	0.10	1	12/11/2015 16:12
Nitrate as NO_3^-	ND	0.45	1	12/11/2015 16:12
Nitrite as N	ND	0.10	1	12/11/2015 16:12
Nitrite as NO_2^-	ND	0.33	1	12/11/2015 16:12
Nitrate & Nitrite as N	ND	0.20	1	12/11/2015 16:12
Sulfate	**17**	1.0	10	12/16/2015 18:10

Surrogates	REC (%)	Limits	Date Analyzed
Formate	94	85-115	12/11/2015 16:12

Analyst(s): TD

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SSSA V5 Pt3; H.Petersen, 2000
Date Prepared:	12/24/15	**Analytical Method:**	E200.8
Project:	9182; Belden Barns	**Unit:**	mg/L

Dissolved Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	1512517-001E	Water	12/11/2015 09:00	ICP-MS1	114641

Analytes	Result	RL	DF	Date Analyzed
Calcium	**24**	0.10	1	12/24/2015 13:37
Magnesium	**17**	0.020	1	12/24/2015 13:37
Sodium	**24**	0.10	1	12/24/2015 13:37

Analyst(s): DB

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	E200.7
Date Prepared:	12/15/15	**Analytical Method:**	E200.7
Project:	9182; Belden Barns	**Unit:**	µg/L

Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	1512517-001E	Water	12/11/2015 09:00	ICP-JY	114240

Analytes	Result	RL	DF	Date Analyzed
Iron	**1700**	20	1	12/15/2015 15:57

Analyst(s): BBO

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SM2320 B-1997
Date Prepared:	12/16/15	**Analytical Method:**	SM2320 B-1997
Project:	9182; Belden Barns	**Unit:**	mg $CaCO_3$/L

Total & Speciated Alkalinity as Calcium Carbonate

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	1512517-001E	Water	12/11/2015 09:00	Titrino	114304

Analytes	Result	RL	DF	Date Analyzed
Total Alkalinity	**178**	1.00	1	12/16/2015 12:28
Carbonate	ND	1.00	1	12/16/2015 12:28
Bicarbonate	**178**	1.00	1	12/16/2015 12:28
Hydroxide	ND	1.00	1	12/16/2015 12:28

Analyst(s): HN

CDPH ELAP 1644 ♦ NELAP 4033ORELAP

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SM2120 B-2001
Date Prepared:	12/11/15	**Analytical Method:**	SM2120 B-2012
Project:	9182; Belden Barns	**Unit:**	Color Units

Apparent Color (Unfiltered)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	1512517-001D	Water	12/11/2015 09:00	WetChem	114138

Analytes	Result	RL	DF	Date Analyzed
Apparent Color	**89**	2.0	1	12/11/2015 21:15

Analyst(s): RB

Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SM9221E (A-1)
Date Prepared:	12/11/15	**Analytical Method:**	SM9221E
Project:	9182; Belden Barns	**Unit:**	MPN/100ml

Fecal Coliform in Drinking Water

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001B**	**Water**	**12/11/2015 09:00**	**MICROBIOLOGY**	**114098**

Analytes	Result	RL	DF	95% Interval	Date Analyzed
Fecal Coliform	ND	2.0	1	---	12/11/2015 13:41

Analyst(s): AB

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	E200.8
Date Prepared:	12/11/15	**Analytical Method:**	E200.8
Project:	9182; Belden Barns	**Unit:**	mg $CaCO_3$/L

Hardness by SM2340B Calculation

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001E**	**Water**	**12/11/2015 09:00**	**ICP-MS1**	**114122**

Analytes	Result	RL	DF	Date Analyzed
Hardness	**149**	0.332	1	12/15/2015 10:24

Analyst(s): AC

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	E200.8
Date Prepared:	12/11/15	**Analytical Method:**	E200.8
Project:	9182; Belden Barns	**Unit:**	µg/L

Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001E**	**Water**	**12/11/2015 09:00**	**ICP-MS1**	**114122**

Analytes	Result	RL	DF	Date Analyzed
Aluminum	ND	50	1	12/15/2015 10:24
Antimony	ND	6.0	1	12/15/2015 10:24
Arsenic	ND	2.0	1	12/15/2015 10:24
Barium	ND	100	1	12/15/2015 10:24
Beryllium	ND	1.0	1	12/15/2015 10:24
Cadmium	ND	1.0	1	12/15/2015 10:24
Calcium	**27,000**	100	1	12/15/2015 10:24
Chromium	ND	10	1	12/15/2015 10:24
Cobalt	ND	0.50	1	12/15/2015 10:24
Copper	ND	10	1	12/15/2015 10:24
Lead	ND	5.0	1	12/15/2015 10:24
Magnesium	**20,000**	20	1	12/15/2015 10:24
Manganese	**150**	20	1	12/15/2015 10:24
Mercury	ND	1.0	1	12/15/2015 10:24
Molybdenum	**1.7**	0.50	1	12/15/2015 10:24
Nickel	ND	10	1	12/15/2015 10:24
Potassium	**4700**	20	1	12/15/2015 10:24
Selenium	ND	5.0	1	12/15/2015 10:24
Silver	ND	10	1	12/15/2015 10:24
Sodium	**25,000**	100	1	12/15/2015 10:24
Thallium	ND	1.0	1	12/15/2015 10:24
Vanadium	ND	3.0	1	12/15/2015 10:24
Zinc	ND	50	1	12/15/2015 10:24

Analyst(s): AC

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SM2150B
Date Prepared:	12/11/15	**Analytical Method:**	SM2150B
Project:	9182; Belden Barns	**Unit:**	TON @ 60°C

Threshold Odor Test

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001D**	**Water**	**12/11/2015 09:00**	**WetChem**	**114137**

Analytes	Result	RL	DF	Date Analyzed
TON	ND	1.0	1	12/11/2015 21:15

Analyst(s): RB

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SM4500H+B-2000
Date Prepared:	12/11/15	**Analytical Method:**	SM4500H+B-2000
Project:	9182; Belden Barns	**Unit:**	±, pH units @ 25°C

pH

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	1512517-001E	Water	12/11/2015 09:00	WetChem	114135

Analytes	Result	Qualifiers	Accuracy	DF	Date Analyzed
pH	**7.56**	H	0.05	1	12/11/2015 20:40

Analyst(s): RB

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SSSA V5 Pt3; H.Petersen, 2000
Date Prepared:	12/24/15	**Analytical Method:**	SSSA V5 Pt3; H.Petersen, 2000
Project:	9182; Belden Barns	**Unit:**	meq/L

Dissolved Sodium Adsorption Ratio (SAR)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001E**	**Water**	**12/11/2015 09:00**	**ICP-MS1**	**114641**

Analytes	Result	RL	DF	Date Analyzed
SAR	**0.91**	0.076	1	12/24/2015 13:37

Analyst(s): DB

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SM2510 B-1997
Date Prepared:	12/15/15	**Analytical Method:**	SM2510 B-1997
Project:	9182; Belden Barns	**Unit:**	µmhos/cm @ 25°C

Specific Conductivity at 25°C

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001E**	**Water**	**12/11/2015 09:00**	**WetChem**	**114246**

Analytes	Result	RL	DF	Date Analyzed
Specific Conductivity	**351**	10.0	1	12/15/2015 16:05

Analyst(s): AL

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SM9223B
Date Prepared:	12/11/15	**Analytical Method:**	SM9223B
Project:	9182; Belden Barns	**Unit:**	MPN/100ml

Total Coliform / E. Coli, Enumeration

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001A**	**Water**	**12/11/2015 09:00**	**MICROBIOLOGY**	**114050**

Analytes	Result	RL	DF	95% Interval	Date Analyzed
Total Coliform	ND	1.0	1	---	12/11/2015 13:31
E. Coli	ND	1.0	1	---	12/11/2015 13:31

Analyst(s): AB

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SM2540 C-1997
Date Prepared:	12/15/15	**Analytical Method:**	SM2540 C-1997
Project:	9182; Belden Barns	**Unit:**	mg/L

Total Dissolved Solids

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001E**	**Water**	**12/11/2015 09:00**	**WetChem**	**114284**

Analytes	Result	RL	DF	Date Analyzed
Total Dissolved Solids	**244**	10.0	1	12/15/2015 22:05

Analyst(s): AL

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Analytical Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Received:	12/11/15 12:32	**Extraction Method:**	SM2130 B-2001
Date Prepared:	12/11/15	**Analytical Method:**	SM2130 B-2001
Project:	9182; Belden Barns	**Unit:**	NTU

Turbidity

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
A-1	**1512517-001D**	**Water**	**12/11/2015 09:00**	**WetChem**	**114139**

Analytes	Result	RL	DF	Date Analyzed
Turbidity	**11.5**	0.100	1	12/11/2015 20:30

Analyst(s): AL

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Quality Control Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/11/15 - 12/13/15	**BatchID:**	114083
Date Analyzed:	12/11/15 - 12/13/15	**Extraction Method:**	E300.1
Instrument:	IC3	**Analytical Method:**	E300.1
Matrix:	Water	**Unit:**	mg/L
Project:	9182; Belden Barns	**Sample ID:**	MB/LCS-114083 1512495-002DMS/MSD

QC Summary Report for E300.1

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Chloride	ND	0.959	0.10	1	-	96	85-115
Fluoride	ND	0.935	0.10	1	-	94	85-115
Nitrate as N	ND	0.948	0.10	1	-	95	85-115
Nitrate as $NO3^-$	ND	4.20	0.45	4.4	-	95	85-115
Nitrite as N	ND	0.952	0.10	1	-	95	85-115
Nitrite as $NO2^-$	ND	3.13	0.33	3.3	-	95	85-115
Sulfate	ND	0.947	0.10	1	-	95	85-115
Surrogate Recovery							
Formate	0.0952	0.0986		0.10	95	99	85-115

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Chloride	8.50	8.52	1	7.4	115	117,F1	85-115	0.242	15
Fluoride	1.04	1.06	1	0.15	90	92	85-115	2.23	15
Nitrate as N	NR	NR	1	6.891	NR	NR	85-115	NR	15
Nitrate as $NO3^-$	NR	NR	4.4	30.52	NR	NR	85-115	NR	15
Nitrite as N	0.928	0.953	1	ND	85	87	85-115	2.70	15
Nitrite as $NO2^-$	3.05	3.13	3.3	ND	84,F1	87	85-115	2.70	15
Sulfate	36.1	36.1	1	35	121,F1	121,F1	85-115	0	15
Surrogate Recovery									
Formate	0.0950	0.0954	0.10		95	95	85-115	0	10

QA/QC Officer

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Quality Control Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/15/15	**BatchID:**	114240
Date Analyzed:	12/15/15	**Extraction Method:**	E200.7
Instrument:	ICP-JY	**Analytical Method:**	E200.7
Matrix:	Water	**Unit:**	µg/L
Project:	9182; Belden Barns	**Sample ID:**	MB/LCS-114240 1512327-001AMS/MSD

QC Summary Report for Metals

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Iron	ND	968	20	1000	-	97	85-115

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Iron	1180	1200	1000	174.5	100	103	70-130	2.11	20

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Quality Control Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/16/15	**BatchID:**	114304
Date Analyzed:	12/16/15	**Extraction Method:**	SM2320 B-1997
Instrument:	Titrino	**Analytical Method:**	SM2320 B-1997
Matrix:	Water	**Unit:**	mg $CaCO_3$/L
Project:	9182; Belden Barns		

QC Summary Report for Alkalinity

SampID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1512517-001E	178	1	180	1	1.23	<20

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Quality Control Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/11/15	**BatchID:**	114138
Date Analyzed:	12/11/15	**Extraction Method:**	SM2120 B-2001
Instrument:	WetChem	**Analytical Method:**	SM2120 B-2012
Matrix:	Water	**Unit:**	Color Units
Project:	9182; Belden Barns		

QC Report for Apparent Color (Unfiltered)

SampID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1512517-001D	89	1	90	1	1.12	<20

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Quality Control Report

Client: DUDEK
Date Prepared: 12/11/15
Date Analyzed: 12/11/15
Instrument: MICROBIOLOGY
Matrix: Drinking Water
Project: 9182; Belden Barns

WorkOrder: 1512517
BatchID: 114098
Extraction Method: SM9221E (A-1)
Analytical Method: SM9221E
Unit: MPN/100ml

QC Summary Report for SM9221E (Fecal Coliform)

SampID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1512517-001B	ND	1	ND	1	N/A	<50

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Quality Control Report

Client: DUDEK
Date Prepared: 12/11/15
Date Analyzed: 12/15/15
Instrument: ICP-MS1
Matrix: Drinking Water
Project: 9182; Belden Barns

WorkOrder: 1512517
BatchID: 114122
Extraction Method: E200.8
Analytical Method: E200.8
Unit: µg/L
Sample ID: MB/LCS-114122
1512517-001EMS/MSD

QC Summary Report for Hardness

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Calcium	ND	5330	100	5000	-	107	70-130
Magnesium	ND	545	20	500	-	109	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Calcium	NR	NR	5000	26,740	NR	NR	70-130	NR	20
Magnesium	NR	NR	500	19,950	NR	NR	70-130	NR	20

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http://www.mccampbell.com / E-mail: main@mccampbell.com

Quality Control Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/11/15	**BatchID:**	114122
Date Analyzed:	12/15/15	**Extraction Method:**	E200.8
Instrument:	ICP-MS1	**Analytical Method:**	E200.8
Matrix:	Drinking Water	**Unit:**	µg/L
Project:	9182; Belden Barns	**Sample ID:**	MB/LCS-114122 1512517-001EMS/MSD

QC Summary Report for Metals

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Aluminum	ND	515	50	500	-	103	70-130
Antimony	ND	52.8	6.0	50	-	106	85-115
Arsenic	ND	53.0	2.0	50	-	106	85-115
Barium	ND	522	100	500	-	104	85-115
Beryllium	ND	50.9	1.0	50	-	102	85-115
Cadmium	ND	52.5	1.0	50	-	105	85-115
Calcium	ND	5330	100	5000	-	107	70-130
Chromium	ND	54.1	10	50	-	108	85-115
Copper	ND	52.2	10	50	-	104	85-115
Lead	ND	53.9	5.0	50	-	108	85-115
Magnesium	ND	545	20	500	-	109	70-130
Manganese	ND	544	20	500	-	109	70-130
Mercury	ND	1.22	1.0	1.25	-	98	85-115
Molybdenum	ND	49.9	0.50	50	-	100	85-115
Nickel	ND	53.9	10	50	-	108	85-115
Potassium	ND	538	20	500	-	108	70-130
Selenium	ND	54.3	5.0	50	-	109	85-115
Silver	ND	50.0	10	50	-	100	85-115
Sodium	ND	5370	100	5000	-	107	70-130
Thallium	ND	49.6	1.0	50	-	99	85-115
Zinc	ND	560	50	500	-	112	85-115

(Cont.)

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Quality Control Report

Client: DUDEK
Date Prepared: 12/11/15
Date Analyzed: 12/15/15
Instrument: ICP-MS1
Matrix: Drinking Water
Project: 9182; Belden Barns

WorkOrder: 1512517
BatchID: 114122
Extraction Method: E200.8
Analytical Method: E200.8
Unit: µg/L
Sample ID: MB/LCS-114122
1512517-001EMS/MSD

QC Summary Report for Metals

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Aluminum	480	484	500	ND	96	97	70-130	0.851	20
Antimony	53.5	52.5	50	ND	107	105	85-115	1.79	20
Arsenic	49.7	50.0	50	ND	98	99	85-115	0.421	20
Barium	557	549	500	ND	103	102	85-115	1.36	20
Beryllium	52.2	50.8	50	ND	104	102	85-115	2.76	20
Cadmium	50.7	49.0	50	ND	101	98	85-115	3.49	20
Calcium	NR	NR	5000	26,740	NR	NR	70-130	NR	20
Chromium	49.7	49.5	50	ND	99	99	85-115	0	20
Copper	54.3	54.9	50	ND	91	92	85-115	1.23	20
Lead	53.8	52.4	50	ND	104	102	85-115	2.62	20
Magnesium	NR	NR	500	19,950	NR	NR	70-130	NR	20
Manganese	647	630	500	150.5	99	96	70-130	2.65	20
Mercury	1.21	1.20	1.25	ND	97	96	85-115	0.580	20
Molybdenum	50.6	50.3	50	1.748	98	97	85-115	0.496	20
Nickel	48.7	49.1	50	ND	97	97	85-115	0	20
Potassium	NR	NR	500	4705	NR	NR	70-130	NR	20
Selenium	49.8	49.4	50	ND	99	98	85-115	0.746	20
Silver	47.5	46.8	50	ND	95	94	85-115	1.31	20
Sodium	NR	NR	5000	25,180	NR	NR	70-130	NR	20
Thallium	48.1	47.6	50	ND	96	95	85-115	1.00	20
Zinc	505	491	500	ND	101	98	85-115	2.81	20

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Quality Control Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/11/15	**BatchID:**	114135
Date Analyzed:	12/11/15	**Extraction Method:**	SM4500H+B-2000
Instrument:	WetChem	**Analytical Method:**	SM4500H+B-2000
Matrix:	Water	**Unit:**	±, pH units @ 25°C
Project:	9182; Belden Barns		

QC Summary Report for pH

SampID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	Precision	Acceptance Criteria
1512517-001E	7.56	1	7.55	1	0.01	0.1

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/15/15	**BatchID:**	114246
Date Analyzed:	12/15/15	**Extraction Method:**	SM2510 B-1997
Instrument:	WetChem	**Analytical Method:**	SM2510 B-1997
Matrix:	Water	**Unit:**	µmhos/cm @ 25°C
Project:	9182; Belden Barns		

QC Summary Report for Specific Conductivity

SampID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1512517-001E	351	1	351	1	0.057	<2

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Quality Control Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/10/15 - 12/11/15	**BatchID:**	114050
Date Analyzed:	12/10/15 - 12/11/15	**Extraction Method:**	SM9223B
Instrument:	MICROBIOLOGY	**Analytical Method:**	SM9223B
Matrix:	Drinking Water	**Test Method:**	SM9223B (Total Coliform & E. Coli)
Project:	9182; Belden Barns		

QC Summary Report for Total Coliform & E. Coli

Lab ID	Analyte	Reporting Units	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1512517-001A	Total Coliform	MPN/100ml	ND	1	ND	1	N/A	<70
	E. Coli	MPN/100ml	ND	1	ND	1	N/A	<70

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Quality Control Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/15/15	**BatchID:**	114284
Date Analyzed:	12/15/15	**Extraction Method:**	SM2540 C-1997
Instrument:	WetChem	**Analytical Method:**	SM2540 C-1997
Matrix:	Water	**Unit:**	mg/L
Project:	9182; Belden Barns		

QC Summary Report for Total Dissolved Solids

SampID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1512459-001C	350	1	328	2	6.49	<20

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Quality Control Report

Client:	DUDEK	**WorkOrder:**	1512517
Date Prepared:	12/11/15	**BatchID:**	114139
Date Analyzed:	12/11/15	**Extraction Method:**	SM2130 B-2001
Instrument:	WetChem	**Analytical Method:**	SM2130 B-2001
Matrix:	Water	**Unit:**	NTU
Project:	9182; Belden Barns		

QC Summary Report for Turbidity

SampID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1512517-001D	11.5	1	11.6	1	0.866	<10

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Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1512517 **ClientCode: DKSF** **QuoteID: 5573**

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Report to:
Dylan Duverge
DUDEK
44 Montgomery Street, Suite 1560
San Francisco, CA 94104
(415) 321-5313 FAX:

Email: dduverge@dudek.com
cc/3rd Party:
PO:
ProjectNo: 9182; Belden Barns

Bill to:
Accounts Payable
DUDEK
44 Montgomery Street, Suite 1560
San Francisco, CA 94104

Requested TAT: **5 days;**

Date Received: **12/11/2015**
Date Logged: **12/11/2015**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
1512517-001	A-1	Water	12/11/2015 9:00	☐	C	E	E	E	D	B	E	E	D	E	D	E

Test Legend:

1	300_1_W	2	Alk(spe)_W	3	ALKIMET_DW	4	ALKIMETMS_DW(mg/L)
5	COLOR_App_W	6	FECOLI_DW	7	HARDMS_DIGEST_DW	8	METALSMS_DIGEST_DW
9	ODOR_W	10	PH_W	11	PRCALCULATION	12	PRScalingIndiceCalculation

The following SampIDs: 001D, 001E contain testgroup.

Prepared by: Maria Venegas

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1512517 **ClientCode: DKSF** **QuoteID: 5573**

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Report to:
Dylan Duverge
DUDEK
44 Montgomery Street, Suite 1560
San Francisco, CA 94104
(415) 321-5313 FAX:

Email: dduverge@dudek.com
cc/3rd Party:
PO:
ProjectNo: 9182; Belden Barns

Bill to:
Accounts Payable
DUDEK
44 Montgomery Street, Suite 1560
San Francisco, CA 94104

Requested TAT: **5 days;**

Date Received: **12/11/2015**
Date Logged: **12/11/2015**

Lab ID	Client ID	Matrix	Collection Date	Hold	13	14	15	16	17	18	19	20	21	22	23	24
					Requested Tests (See legend below)											
1512517-001	A-1	Water	12/11/2015 9:00	☐	E	E	A	E	D							

Test Legend:

13	SAR_DW	14	SC_W	15	TCEC-Enum_DW	16	TDS_W
17	TURBIDITY_W	18		19		20	
21		22		23		24	

The following SampIDs: 001D, 001E contain testgroup.

Prepared by: Maria Venegas

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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WORK ORDER SUMMARY

Client Name: DUDEK | **QC Level:** | **Work Order:** 1512517
Project: 9182; Belden Barns | **Client Contact:** Dylan Duverge | **Date Logged:** 12/11/2015
Comments: | **Contact's Email:** dduverge@dudek.com

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1512517-001A	A-1	Water	SM9223B (Total Coliform & E. Coli)	2	120ML w/ Na2S2O3	☐	12/11/2015 9:00	5 days	Trace	☐	
1512517-001B	A-1	Water	SM9221E (Fecal Coliform)	2	120ML w/ Na2S2O3	☐	12/11/2015 9:00	5 days	Trace	☐	
1512517-001C	A-1	Water	E300.1 (Inorganic Anions) <Chloride, Fluoride, Nitrate & Nitrite as N, Nitrate as N, Nitrate as $NO3^-$, Nitrite as N, Nitrite as $NO2^-$, Sulfate>	1	125mL HDPE, unprsv.	☐	12/11/2015 9:00	5 days	Trace	☐	
1512517-001D	A-1	Water	General Physical	1	125mL HDPE, unprsv.	☐	12/11/2015 9:00	5 days	Trace	☐	
				1	500mL CG, Pre-Cl	☐			Trace	☐	
				1	500mL HDPE, unprsv.	☐			Trace	☐	
1512517-001E	A-1	Water		1	250mL HDPE w/ HNO3	☐	12/11/2015 9:00	5 days	Trace	☐	
			SM2510B (Specific Conductivity)			☐		5 days	Trace	☐	
			SSSA V5 Pt3; H.Petersen, 2000 (SAR)			☐		5 days	Trace	☐	
				1	250mL HDPE w/ HNO3	☐		5 days	Trace	☐	
			E200.8 (Metals) <Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Thallium, Vanadium, Zinc>			☐		5 days	Trace	☐	
			SM2340B (Hardness)			☐		5 days	Trace	☐	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

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WORK ORDER SUMMARY

Client Name: DUDEK
Project: 9182; Belden Barns
Comments:

QC Level:
Client Contact: Dylan Duverge
Contact's Email: dduverge@dudek.com

Work Order: 1512517
Date Logged: 12/11/2015

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1512517-001E	A-1	Water		1	250mL HDPE w/ HNO3	☐	12/11/2015 9:00	5 days	Trace	☐	
			E200.7 (Alkali Metals) <Iron>			☐		5 days	Trace	☐	
				1	250mL HDPE w/ HNO3	☐		5 days	Trace	☐	
				1	500mL HDPE, unprsv.	☐			Trace	☐	
				1	500mL HDPE, unprsv.	☐			Trace	☐	

NOTES: **- STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).**

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.

1512517

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CHAIN OF CUSTODY RECORD

TURN AROUND TIME: RUSH ☐ 1 DAY ☐ 2 DAY ☐ 3 DAY ☐ 5 DAY ☐ 10 DAY ☒

GeoTracker EDF ☐ PDF ☐ EDD ☐ Write On (DW) ☐ EQuIS ☐

Effluent Sample Requiring "J" flag ☐ UST Clean Up Fund Project ☐ ; Claim #______

Report To: Dylan Duverge
Bill To:
Company: Dudek
Tele: (760) 213-9067
E-Mail: dylan.duverge@dudek.com
Project #: 9182
Project Name: Belden Barns
Project Location: Santa Rosa CA
Purchase Order#
Sampler Signature: [signature]

SAMPLE ID	Location/ Field Point Name	SAMPLING Date	SAMPLING Time	# Containers	MATRIX Ground Water	Waste Water	Drinking Water	Sea Water	Soil	Air	Sludge	Other	METHOD PRESERVED HCL	HNO3	Other	Analysis Request
A-1		12/11/15	9:00	11	X											X See bottle order form

Analysis Request columns: BTEX & TPH as Gas (8021/ 8015) MTBE; TPH as Diesel (8015); Total Petroleum Oil & Grease (1664 / 5520 E/B&F); Total Petroleum Hydrocarbons (418.1); EPA 505/ 608 / 8081 (Cl Pesticides); EPA 608 / 8082 PCB's ; Aroclors / Congeners; EPA 507 / 8141 (NP Pesticides); EPA 515 / 8151 (Acidic Cl Herbicides); EPA 524.2 / 624 / 8260 (VOCs); EPA 525.2 / 625 / 8270 (SVOCs); EPA 8270 SIM / 8310 (PAHs / PNAs); CAM 17 Metals (200.8 / 6020); LUFT 5 Metals (200.8 / 6020); Metals (200.8 / 6020); Lab to Filter sample for Dissolved metals analysis; See bottle order form

Analysis	Method	TAT	Matrix
General Physical (Color, Odor, & Turbidity)	Various	5 days	Water
SM2340B (Hardness)	E200.8	5 days	Water
E200.8 (Metals)*	E200.8	5 days	Water
SM2320B (Alkalinity) (Bicarbonate, Carbonate, Hydroxide,	SM2320 B-1997	5 days	Water
E300.1 (Inorganic Anions) Cl, SO4, Fl, NO2, NO3	E300.1	5 days	Water
SM4500H+B (pH)	SM4500H+B-200	5 days	Water
SM2510B (Specific Conductivity)	SM2510 B-1997	5 days	Water
SM2540C (TDS)	SM2540 C-1997	5 days	Water
SSSA V5 Pt3; H.Petersen, 2000 (SAR)	SSSA V5 Pt3; H.	5 days	Water
SM9223B (Total Coliform & E. Coli)	SM9223B	5 days	Drinking Water
SM9221E (Fecal Coliform)	SM9221E	5 days	Drinking Water
Langlier Index @ 25 C Calculation Fee			
Aggressive Index Calculation Fee			
Adjusted Sodium Adsorption Ratio Calculation Fee			
E200.7 (Alkali Metals) Iron	E200.7	5 days	Water

**MAI clients MUST disclose any dangerous chemicals known to be prese... ...iet, gloved, open air, sample handling by MAI staff. Non-disclosure incurs an immediate $250 surcharge and the client is subject to full legal liability for harm suffered. Thank you for your understanding ...

*** If metals are requested for water samples and the water type is not specified on the chain of custody, then MAI will default to metals by E200.8.

Relinquished By:	Date:	Time:	Received By:
[signature]	12/11/15	9:13a	[signature]
[signature]	12-11-15	1135	[signature]

ICE/t° 2.2
GOOD CONDITION____
HEAD SPACE ABSENT____
DECHLORINATED IN LAB____
APPROPRIATE CONTAINERS____
PRESERVED IN LAB____

PRESERVATION____ VOAS O&G METALS OTHER pH<2____

COMMENTS:

HAZARDOUS:

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Sample Receipt Checklist

Client Name:	**DUDEK**	Date and Time Received:	**12/11/2015 11:35**
Project Name:	**9182; Belden Barns**	Date Logged:	**12/11/2015**
WorkOrder №:	**1512517** Matrix: Water	Received by:	Maria Venegas
Carrier:	Benjamin Yslas (MAI Courier)	Logged by:	Maria Venegas

Chain of Custody (COC) Information

	Yes	No	NA
Chain of custody present?	☑	☐	
Chain of custody signed when relinquished and received?	☑	☐	
Chain of custody agrees with sample labels?	☑	☐	
Sample IDs noted by Client on COC?	☑	☐	
Date and Time of collection noted by Client on COC?	☑	☐	
Sampler's name noted on COC?	☑	☐	

Sample Receipt Information

	Yes	No	NA
Custody seals intact on shipping container/cooler?	☐	☐	☑
Shipping container/cooler in good condition?	☑	☐	
Samples in proper containers/bottles?	☑	☐	
Sample containers intact?	☑	☐	
Sufficient sample volume for indicated test?	☑	☐	

Sample Preservation and Hold Time (HT) Information

	Yes	No	NA
All samples received within holding time?	☐	☑	
Sample/Temp Blank temperature	Temp: 2.2°C		☐
Water - VOA vials have zero headspace / no bubbles?	☐	☐	☑
Sample labels checked for correct preservation?	☑	☐	
pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)?	☑	☐	☐
Samples Received on Ice?	☑	☐	

(Ice Type: WET ICE)

UCMR3 Samples:

	Yes	No	NA
Total Chlorine tested and acceptable upon receipt for EPA 522?	☐	☐	☑
Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539?	☐	☐	☑

** NOTE: If the "No" box is checked, see comments below.*

Comments: Method SM4500H+B (pH) was received passed its 0.01-day holding time.

APPENDIX G

Noise Report

NOISE ASSESSMENT TECHNICAL REPORT
for the
Proposed Belden Barns Farmstead and Winery
Sonoma County, California

Prepared for:

Sonoma County Permit and
Resource Management Department
2550 Ventura Avenue
Santa Rosa, California 95403

Prepared by:

DUDEK
465 Magnolia Avenue
Larkspur, California 94939
Contact: Jonathan Leech

MAY 2016

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Page No.

APPENDICES

FIGURES

TABLES

ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulation
CNEL	community noise equivalent level
dB	decibel
dBA	A-weighted decibel
DOT	U.S. Department of Transportation
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
Hz	hertz
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
L_{min}	minimum sound level
L_{max}	maximum sound level
L_{xx}	percentile exceeded sound level
RMS	root mean square
SR	State Route
VdB	vibration decibels

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Noise Assessment Technical Report for the Proposed Belden Barns Farmstead and Winery

1 INTRODUCTION

1.1 Purpose

This technical noise report evaluates noise effects of the project including noise generation potential associated with construction and operation of the Belden Barns Farmstead and Winery (Project). Noise generation sources from future implementation of the project include traffic, normal operations and special event activities, mechanical equipment, and short-term construction operations.

1.2 Project Location and Description

1.2.1 Location, Setting, Surrounding Uses

The 55-acre project site is located at 5561 Sonoma Mountain Road in southeastern Sonoma County [Assessor's Parcel Number (APN) 049-030-010] approximately 5½ miles west of Glen Ellen and 7 miles east of the City of Rohnert Park (see Figures 1 and 2).

The site is currently developed with an agricultural complex which was fairly typical of the early 20th Century. There are three dwellings, an old barn and some accessory structures. The site is currently planted in 25 acres of wine grapes, pasture, fruit orchard and vegetable plot. There is an agricultural reservoir on site in the pasture area. Figure 3 provides an aerial view of the site, including the existing structures and other features of the property. There is an ephemeral drainage on the easterly side of the property which drains into South Fork Matanzas Creek.

The project site has a General Plan designation of Land Intensive Agriculture 40-acre density. The zoning designation is LIA (Land Intensive Agriculture) with a SR (Scenic Resources) combining district. The LIA district allows a range of agricultural processing and promotional activities, at a density of 40-acres per dwelling unit and a 40-acre minimum parcel size. Crop production and harvesting are allowed in this district by right, whereas agricultural processing and promotional activities, tasting rooms, and agricultural promotional events are allowed with a use permit. The project is in compliance with the setback, lot coverage, and parking requirements of the LIA district.

The project site is also located within the boundary of the Bennett Valley Area Plan, which is consistent with the County General Plan. The Bennett Valley Area Plan recognizes that agriculture is the primary use in the LIA district and that residential uses are permitted to support agricultural operations. The proposed project includes a farmstead with process facilities and tasting room for products produced primarily on site. The proposed residences would be for agricultural employee housing.

The project site is located in the hills to the southeast of Santa Rosa at the base of Sonoma Mountain. The project area is a large lot, rural area with mixed pasture land and vineyards. The properties to the east and south, approximately 226-acre and 169-acre parcels, respectively, are owned by the County of Sonoma and are part of North Sonoma Mountain Regional Park and Open Space Preserve. The properties immediately to the north and west of the project site, across Sonoma Mountain Road are developed with agricultural uses, while all other surrounding properties are developed with low density residential uses. The properties in the surrounding area are designated Diverse Agriculture, Resources and Rural Development, Rural Residential, and Land Intensive Agriculture in the General Plan with densities ranging from 15 acres to 40 acres per dwelling unit.

1.2.2 Proposed Operations and Features

The proposed project would include a new cheese making, winemaking, farmstead food production facility, and tasting room on the 55-acre project site. A description of the proposed uses of the site is provided below.

Primary Uses

Production Facility. The proposed production facility (creamery and winery building) shown on Figure 4 would consist of a new creamery and winery facility capable of producing 10,000 pounds of cheese and 10,000 cases of wine per year. The regular production hours would be 7:00 a.m. to 6:00 p.m., Monday through Friday. Wine production harvest hours would be 6:00 a.m. to 10:00 p.m., seven days per week, during the harvest season, which is typically late August through mid-October. Fruit for the wine would come predominately from the project site with some fruit coming from the surrounding area. Milk for the creamery would come from on-site livestock as well as from other dairies in the surrounding area. Milk deliveries to the site would be made biweekly by truck. Farmstead products would be sold on site and shipped from the site to wholesalers or retailers weekly by truck.

The production facility would be a new approximately 10,941 square foot (SF), two-story building. The first floor would be approximately 8,796 SF and would be used for barrel storage, fermentation, winery production, the cheese creamery, and support spaces. The second floor would be approximately 2,145 SF and would include space for administration, lab, and private tasting facilities. The production facility would replace the existing barn located in the southeast portion of the farm building complex. To minimize visual impacts to the area, the new production building is sited in the area of an existing approximately 28 foot high barn. It is also nestled into the grade to reduce building exposure and allow for natural earth cooling. The ridge line of the new winery building will be approximately 6.7 feet lower than the ridge line of the existing barn (winery ridge elevation - 1035.3, barn ridge elevation – 1042.0).

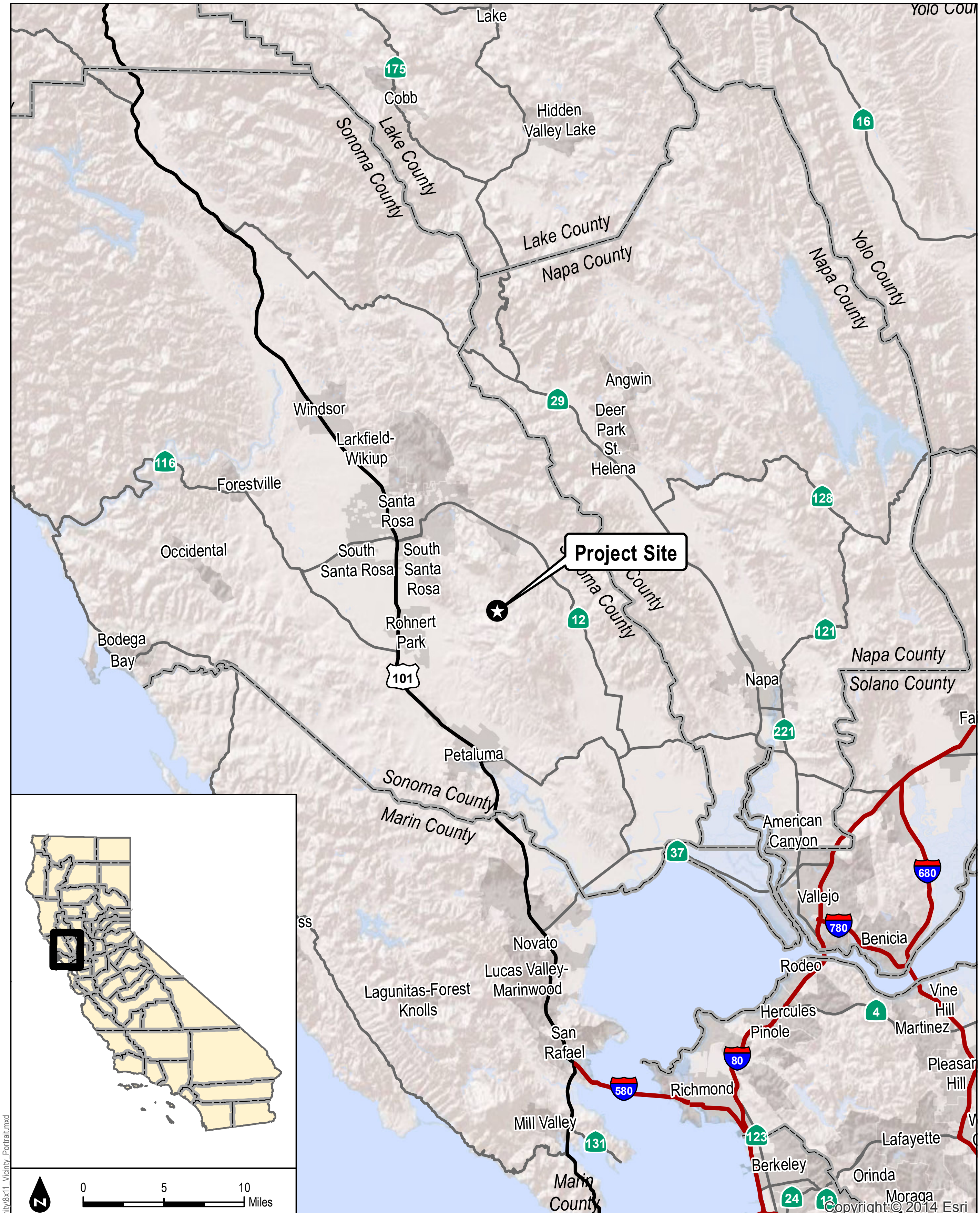

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FIGURE 1
Regional Map

Belden Barns Farmstead & Winery

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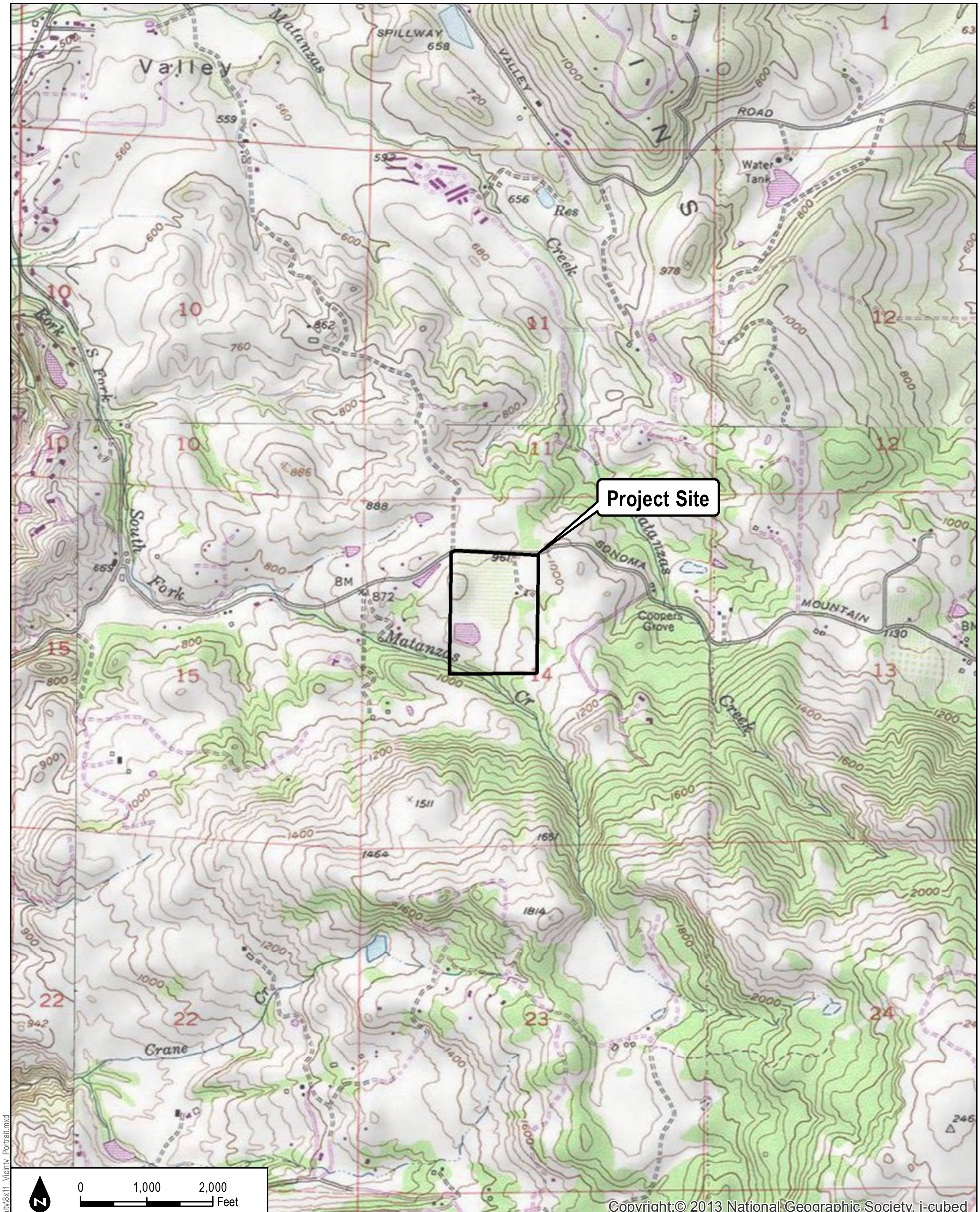

SOURCE: USGS 7.5-Minute Series Glen Ellen Quadrangle.

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FIGURE 2

Vicinity Map

Belden Barns Farmstead & Winery

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SOURCE: Bing Maps, 2016

FIGURE 3

Property Boundary and Existing Structures

Belden Barns Farmstead & Winery

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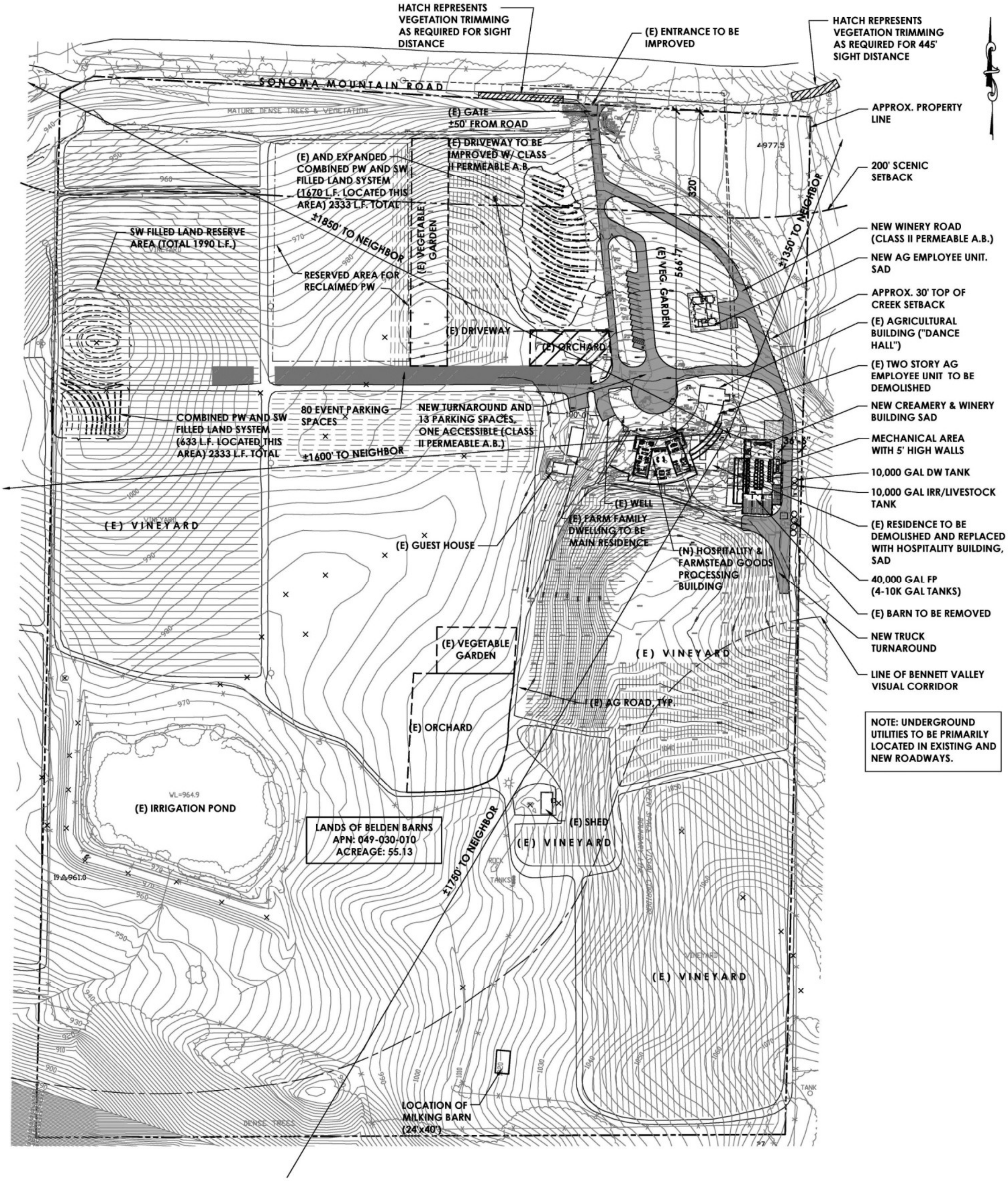

SOURCE: Wade Design Architects

FIGURE 4

Proposed Site Plan

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Belden Barns Farmstead & Winery

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Tasting Room. The proposed tasting and farmstead goods processing building (hospitality building) would be a one story 3,033 sf structure. The building would include a by-appointment-only tasting room, tasting areas, tax paid casegoods storage, farmstead product processing, a commercial kitchen, restrooms, and support space for the direct sales of wine, cheese, farmstead products, and incidental items from the local area. The proposed tasting room hours would be 11:00 a.m. to 5:00 p.m., seven days per week. The tasting room would be the primary hospitality space for all products produced on site.

Agricultural Promotional Events. The proposed project would include eight agricultural promotional events per year with varying participant levels as set forth in Table 1 below. The agricultural promotional events would feature food, wine, and other products produced on the site or in the local area and would be held in the indoor and outdoor portions of the farm building complex area. Events would end by 9:30 p.m. with clean up being completed by 10:00 p.m. There would be no outdoor amplified music at any event. Event parking would be provided on site as shown in Figure 4, with parking guides present to facilitate parking when event participants arrive. The proposed project would include a sanitary wastewater management system, designed to handle flows from the largest agricultural promotional event of up to 200 people; however, the existing portable toilets on site would also be used during events.

Table 1
Proposed Belden Barns Events

Event	Time Period	Maximum Participants
Spring Wine & Farm Event	March – May	150
Summer Wine & Farm Event	June – August	150
Fall Wine & Farm Event	September – October	200
Winter Wine & Farm Event	November – February	150
Wine & Farm Event or Wedding	June – October	125
Wine Club Members' Pick Up Event	Anytime	100
Wine Club Members Only Event	Anytime	60
Tasting & Dinner for Distributors	Anytime	60

Supporting Uses and Structures

Agricultural Employee Housing. A new approximately 1,877 SF agricultural employee housing unit would be constructed to replace an existing legal non-conforming 1,780 SF building currently being used for agricultural employee housing, which would be demolished.

Landscaping. The project will include new and enhanced landscaping around the proposed tasting room, agricultural employee housing unit, and the existing residence. The landscaping would include very low water use trees such as coast live oak, canyon live oak, blue oak, interior live oak, and oracle oak, along the driveway, parking areas and each building. The agricultural employee unit would be surrounded by landscape areas with trees, shrubs, and groundcover. Similar landscaping would be provided between the existing residence and the proposed tasting room. The tasting room would be surrounded by decomposed granite areas on the south and east, and would have a small lawn area, totaling approximately 1,646 square feet, to the west. There would also be a small section of no-mow meadow grass on a terrace to the east of the tasting room building.

Crop Production (excluding grapes). The project would expand the existing vegetable garden from one to two acres and the fruit orchard from one to two acres.

Livestock and Grazing. The proposed project would include up to two milk cows, five milk sheep, chickens, and four pigs. The animals would be housed and grazed on approximately six acres, as shown on Figure 4. A pole barn is proposed for the livestock in the southeast portion of the site, also shown on Figure 4.

Employees. The project would include five full-time and four part-time employees for most of the year. Seven additional full-time employees would be on site during the grape harvest season and bottling. Current vineyard operations require 12 employees to commute to and from the project site each day for the 8-10 week harvest season.

Utilities and Equipment

The proposed project would also include installation of fire protection hydrants, electrical and telecom, and water and gas piping. All utilities would be placed underground and would be located within existing or proposed roadway and parking areas.

The project would also include on-site outdoor mechanical equipment. The winery building (production facility) would include an air-cooled refrigeration unit, variable refrigerate volume conditioning unit, and water pumps. This equipment would be located on the east side of the winery building and would be surrounded by a 5-foot-high wall.

Access and Parking

The project site would continue to be accessed via the private driveway off of Sonoma Mountain Road. The project would include minor improvements to the existing entrance on Sonoma Mountain Road and driveway, as well as clearing of vegetation for approximately 400 feet east of the entrance along the property line to increase sight distance for cars traveling on Sonoma Mountain Road.

The project applicants would ask all guests to access the site from the south or west (Santa Rosa or Rohnert Park) and would specifically ask guests not to travel from Glen Ellen via the eastern portion of Sonoma Mountain Road.

All parking for day-to-day activities and promotional events would be provided on site, as shown on Figure 4.

Construction

Construction of the proposed project is anticipated to occur over 12–18 months. The first stages of construction would involve grading of approximately 3.1 acres of the site. The proposed earth work would balance on site and would not require import or export of soil. During the approximately 6-month site grading period, there would be approximately 40 truck deliveries total and an average of 5 worker vehicles per day.

Standard construction methods would be employed for all proposed building construction. During the 12–18 month construction phase there would be a total of approximately 50 concrete trucks and 30 materials delivery trucks. An average of 10–12 workers would be on site daily working 8–10 hours per day.

1.3 Noise Background and Terminology

Fundamentals of Environmental Noise

Vibrations, traveling as waves through air from a source, exert a force perceived by the human ear as sound. Sound pressure level (referred to as sound level) is measured on a logarithmic scale in decibels (dB) that represent the fluctuation of air pressure above and below atmospheric pressure. Frequency, or pitch, is a physical characteristic of sound and is expressed in units of cycles per second or hertz (Hz). The normal frequency range of hearing for most people extends from about 20 to 20,000 Hz. The human ear is more sensitive to middle and high frequencies, especially when the noise levels are quieter. As noise levels get louder, the human ear starts to hear the frequency spectrum more evenly. To accommodate for this phenomenon, a weighting system to evaluate how loud a noise level is to a human was developed. The frequency weighting called “A” weighting is typically used for quieter noise levels which de-emphasizes the low frequency components of the sound in a manner similar to the response of a human ear. This A-weighted sound level is called the “noise level” and is referenced in units of dBA.

Since sound is measured on a logarithmic scale, a doubling of sound energy results in a 3 dBA increase in the noise level. Changes in a community noise level of less than 3 dBA are not typically noticed by the human ear. Changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. A 5 dBA increase is readily noticeable (EPA 1973). The human ear perceives a 10 dBA increase in sound level as a doubling of the sound level (i.e., 65 dBA sounds twice as loud as 55 dBA to a human ear).

An individual's noise exposure occurs over a period of time; however, noise level is a measure of noise at a given instant in time. Community noise sources vary continuously, being the product of many noise sources at various distances, all of which constitute a relatively stable background or ambient noise environment. The background, or ambient, noise level gradually changes throughout a typical day, corresponding to distant noise sources, such as traffic volume, as well as changes in atmospheric conditions.

Noise levels are generally higher during the daytime and early evening when traffic (including airplanes), commercial, and industrial activity is the greatest. However, noise sources experienced during nighttime hours when background levels are generally lower can be potentially more conspicuous and irritating to the receiver. In order to evaluate noise in a way that considers periodic fluctuations experienced throughout the day and night, a concept termed "community noise equivalent level" (CNEL) was developed, wherein noise measurements are weighted, added, and averaged over a 24-hour period to reflect magnitude, duration, frequency, and time of occurrence. A complete definition of CNEL is provided below.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (L_{xx}), the day–night sound level (L_{dn}), and the CNEL. Below are brief definitions of these measurements and other terminology used in this report.

- ***Decibel*** (dB) is a unitless measure of sound on a logarithmic scale which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
- ***A-weighted decibel*** (dBA) is an overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- ***Equivalent sound level*** (L_{eq}) is the constant level that, over a given time period, transmits the same amount of acoustic energy as the actual time-varying sound. Equivalent sound levels are the basis for both the day–night average sound levels (L_{dn}) and community noise equivalent level (CNEL) scales.

- ***Maximum sound level*** (L_{max}) is the maximum sound level measured during the measurement period.
- ***Minimum sound level*** (L_{min}) is the minimum sound level measured during the measurement period.
- ***Percentile-exceeded sound level*** (L_{xx}) is the sound level exceeded x percent of a specific time period. L10 is the sound level exceeded 10% of the time.
- ***Day–night average sound level*** (L_{dn}). The L_{dn} is a 24-hour average A-weighted sound level with a 10 dB penalty added to the nighttime hours from 10:00 p.m. to 7:00 a.m. The 10 dB penalty is applied to account for increased noise sensitivity during the nighttime hours. Resulting values from application of L_{dn} versus CNEL rarely differ by more than 1 dB (see definition below), and therefore these two methods of describing average noise levels are often considered interchangeable.
- ***Community noise equivalent level*** (CNEL) The CNEL is the average equivalent A-weighted sound level during a 24-hour day. CNEL accounts for the increased noise sensitivity during the evening hours (7 p.m. to 10 p.m.) and nighttime hours (10 p.m. to 7 a.m.) by adding 5 dB to the sound levels in the evening and 10 dB to the sound levels at night. CNEL and L_{dn} are often considered equivalent descriptors.

Exterior Noise Distance Attenuation

Noise sources are classified in two forms: (1) point sources, such as stationary equipment or a group of construction vehicles and equipment working within a spatially limited area at a given time, and (2) line sources, such as a roadway with a large number of pass-by sources (motor vehicles). Sound generated by a point source typically diminishes (attenuates) at a rate of 6.0 dBA for each doubling of distance from the source to the receptor at acoustically “hard” sites and at a rate of 7.5 dBA for each doubling of distance from source to receptor at acoustically “soft” sites. Sound generated by a line source (i.e., a roadway) typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling distance, for hard and soft sites, respectively. Sound levels can also be attenuated by man-made or natural barriers. For the purpose of sound attenuation discussion, a “hard” or reflective site does not provide any excess ground-effect attenuation and is characteristic of asphalt or concrete ground surfaces, as well as very hard-packed soils. An acoustically “soft” or absorptive site is characteristic of unpaved loose soil or vegetated ground. For this analysis, attenuation rates corresponding to “hard” sites were conservatively used.

Structural Noise Attenuation

Sound levels can also be attenuated by man-made or natural barriers. Solid walls or slopes associated with elevation differences typically reduce noise levels by 5 to 10 dBA (U.S. DOT

1980). Structures can also provide noise reduction by insulating interior spaces from outdoor noise. The outside-to-inside noise attenuation provided by typical structures in California ranges between 17 to 30 dBA with open and closed windows, respectively, as shown in Table 2.

Table 2
Outside-to-Inside Noise Attenuation (dBA)

Building Type	Open Windows	Closed Windows[a]
Residences	17	25
Schools	17	25
Churches	20	30
Hospitals/Offices/Hotels	17	25
Theaters	17	25

Source: Transportation Research Board, National Research Council, 2000.
[a] As shown, structures with closed windows can attenuate exterior noise by a minimum of 25 to 30 dBA. This typically requires inclusion of a forced-ventilation system, central air conditioning and self-closing doors in order to ensure that doors and windows can be kept shut.

Fundamentals of Vibration

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. The response of humans to vibration is very complex. However, it is generally accepted that human response is best approximated by the vibration velocity level associated with the vibration occurrence.

Heavy equipment operation, including stationary equipment that produces substantial oscillation or construction equipment that causes percussive action against the ground surface, may be perceived by building occupants as perceptible vibration. It is also common for ground-borne vibration to cause windows, pictures on walls, or items on shelves to rattle. Although the perceived vibration from such equipment operation can be intrusive to building occupants, the vibration is seldom of sufficient magnitude to cause even minor cosmetic damage to buildings.

When evaluating human response, ground-borne vibration is usually expressed in terms of root mean square (RMS) vibration velocity. RMS is defined as the average of the squared amplitude of the vibration signal. As for sound, it is common to express vibration amplitudes in terms of decibels defined as:

$$L_v = 20 \log \left(\frac{v_{rms}}{v_{ref}} \right)$$

where vrms is the RMS vibration velocity amplitude in inches/second and vref is the decibel reference of 1x10-6 inches/second.

To avoid confusion with sound decibels, the abbreviation VdB is used for vibration decibels. The vibration threshold of perception for most people is around 65 VdB. Vibration levels in the 70 to 75 VdB range are often noticeable but generally deemed acceptable, and levels in excess of 80 VdB are often considered unacceptable (FTA 2006).

1.4 Noise Regulation and Management

1.4.1 Federal

Federal Aviation Administration (FAA) Standards

Enforced by the Federal Aviation Administration, Code of Federal Regulation (CFR) Title 14, Part 150 prescribes the procedures, standards and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disapproving those programs. Title 14 also identifies those land uses which are normally compatible with various levels of exposure to noise by individuals. The FAA has determined that interior sound levels up to 45 dBA L_{dn} (or CNEL) are acceptable within residential buildings. The FAA also considers residential land uses to be compatible with exterior noise levels at or less than 65 dBA L_{dn} (or CNEL).

Federal Highway Administration (FHWA) Standards

CFR Title 23, Part 772 sets procedures for the abatement of highway traffic noise and construction noise. Title 23 is implemented by the Federal Department of Transportation (DOT) Highway Administration (FHWA). The purpose of this regulation is to provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways. All highway projects which are developed in conformance with this regulation shall be deemed to be in conformance with the DOT-FHWA Noise Standards. Title 23 establishes a 67 dBA $L_{eq(h)}$ standard applicable to federal highway projects for evaluating impacts to land uses including residences, recreational uses, hotels, hospitals, and libraries [23 CFR Chapter 1, Part 772, Section 772.19].

Federal Transit Administration and Federal Railroad Administration Standards

Although the FTA standards are intended for federally funded mass transit projects, the impact assessment procedures and criteria included in the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (May 2006) are routinely used for projects proposed by local jurisdictions. The FTA and Federal Railroad Administration (FRA) have published guidelines for assessing the impacts of ground-borne vibration associated with rail projects, which have been applied by other jurisdictions to other types of projects. The FTA measure of the threshold of architectural damage for conventional sensitive structures is 0.2 inch/second perturbation projection vector (PPV).

1.4.2 State

California Noise Control Act of 1973

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, declares that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also identifies a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

California Noise Insulation Standards (CCR Title 24)

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for hotels, motels, dormitories, and multi-family residential buildings (CCR Title 24, Part 2). Title 24 establishes standards for interior room noise (attributable to outside noise sources). The regulations also specify that acoustical studies must be prepared whenever a multi-family residential building or structure is proposed to be located in an area with CNEL (or L_{dn}) of 60 dBA or greater. Such acoustical analysis must demonstrate that the residence has been designed to limit intruding noise to an interior CNEL (or L_{dn}) of at least 45 dBA (California's Title 24 Noise Standards, Chap. 2-35). The County of Sonoma applies the interior noise criterion of CNEL 45 dBA for single family residences, in addition to multi-family residential structures.

1.4.3 Sonoma County

Sonoma County General Plan, Noise Element

The Noise Element of the Sonoma County General Plan 2020 (Adopted 2008) provides background information pertaining to Wineries and Special Events, which are germane for consideration with regard to the proposed project. This background information is provided below.

Wineries

Noise produced at wineries can be of concern during the “crush” season, when trucks deliver grapes to the wineries, and forklifts transfer grapes into the wineries. Truck deliveries associated with bulk wine or bottled wine can also be a source of noise complaint from adjacent residential uses. Noise producing equipment used at wineries includes air compressors, grape presses, exhaust fans, chillers and bottling plants. Use of this equipment and other related activities may create noise levels above and different from the ambient noise environment. File data indicate that average hourly noise levels from properly muffled vehicles and equipment operating at wineries are typically less than 60 dB at a distance of 300 feet from the source. Nearby residents may complain about the noise from these activities, but given the seasonal nature of winery activities, noise impacts from normal winery operations are usually considered to be less than significant.

Special Events

Special events, both single and ongoing, include such activities as festivals and concerts, which may include the use of amplified sound systems. Often located at wineries, these activities can produce unacceptable noise levels, especially during evening hours, and the associated traffic problems may heighten public concern about the noise producing activity.

Given the potential conflicts due to noise associated with events, concerts, and other such activities, noise will continue to be considered in the review process for proposals which allow special events.

Noise Element Policies

The Noise Element of the Sonoma County General Plan 2020 establishes policies aimed at protecting noise sensitive land uses from elevated noise generated by transportation and non-transportation sources. The following policies from the Noise Element are applicable to the proposed project.

Policy NE-1a: Designate areas within Sonoma County as noise impacted if they are exposed to existing or projected exterior noise levels exceeding 60 dB L_{dn}, 60 dB CNEL, or the performance standards of Table NE-2.*

Policy NE-1b: Avoid noise sensitive land use development in noise impacted areas unless effective measures are included to reduce noise levels. For noise due to traffic on public roadways, railroads and airports, reduce exterior noise to 60 dB L_{dn} or less in outdoor activity areas and interior noise levels to 45 dB L_{dn} or less with windows and doors closed. Where it is not possible to meet this 60 dB

L_{dn} standard using a practical application of the best available noise reduction technology, a maximum level of up to 65 dB L_{dn} may be allowed but interior noise level shall be maintained so as not to exceed 45 dB L_{dn}. For uses such as Single Room Occupancy, Work-Live, Mixed Use Projects, and Caretaker Units, exterior noise levels above 65 dB L_{dn} or the Table NE-2 standards may be considered if the interior standards of 45 dB L_{dn} can be met. For schools, libraries, offices, and other similar uses, the interior noise standard shall be 45 dB L_{eq} in the worst case hour when the building is in use.*

Policy NE-1c: Control non-transportation related noise from new projects. The total noise level resulting from new sources shall not exceed the standards in Table NE-2 as measured at the exterior property line of any adjacent noise sensitive land use. Limit exceptions to the following:

1. If the ambient noise level exceeds the standard in Table NE-2, adjust the standard to equal the ambient level, up to a maximum of 5 dBA above the standard, provided that no measurable increase (i.e., +/- 1.5 dBA) shall be allowed
2. Reduce the applicable standards in Table NE-2 by five dBA for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises, such as pile drivers and dog barking at kennels
3. Reduce the applicable standards in Table NE-2 by 5 decibels if the proposed use exceeds the ambient level by 10 or more decibels
4. For short term noise sources which are permitted to operate no more than six days per year, such as concerts or race events, the allowable noise exposures shown in Table NE-2 may be increased by 5 dB. These events shall be subject to a noise management plan including provisions for maximum noise level limits, noise monitoring, complaint response and allowable hours of operation. The plan shall address potential cumulative noise impacts from all events in the area.
5. Noise levels may be measured at the location of the outdoor activity area of the noise sensitive land use, instead of the exterior property line of the adjacent noise sensitive land use where:
   a. the property on which the noise sensitive use is located has already been substantially developed pursuant to its existing zoning, and

b. there is available open land on those noise sensitive lands for noise attenuation.

This exception may not be used on vacant properties which are zoned to allow noise sensitive uses.*

Table NE- 2
[from Sonoma County Noise Element]
Maximum Allowable Exterior Noise Exposures for Non-transportation Noise Sources

Hourly Noise Metric, dBA [1]	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
L50 (30 minutes in any hour)	50	45
L25 (15 minutes in any hour)	55	50
L08 (4 minutes 48 seconds in any hour)	60	55
L02 (72 seconds in any hour)	65	60

1 The sound level exceeded n% of the time in any hour. For example, the L50 is the value exceeded 50% of the time or 30 minutes in any hour; this is the median noise level. The L02 is the sound level exceeded 1 minute in any hour.

Policy NE-1d: Consider requiring an acoustical analysis prior to approval of any discretionary project involving a potentially significant new noise source or a noise sensitive land use in a noise impacted area. The analysis shall:

1. Be the responsibility of the applicant,
2. Be prepared by a qualified acoustical consultant,
3. Include noise measurements adequate to describe local conditions,
4. Include estimated noise levels in terms of L_{dn} and/or the standards of Table NE-2 for existing and projected future (20 years hence) conditions, based on accepted engineering data and practices, with a comparison made to the adopted policies of the Noise Element. Where low frequency noise (ex: blasting) would be generated, include assessment of noise levels and vibration using the most appropriate measuring technique to adequately characterize the impact,
5. Recommend measures to achieve compliance with this Element. Where the noise source consists of intermittent single events, address the effects of maximum noise levels on sleep disturbance,
6. Include estimates of noise exposure after these measures have been implemented, and

7. Be reviewed by the Permit and Resource Management Department and found to be in compliance with PRMD guidelines for the preparation of acoustical analyses.*

Policy NE-1f: Require development projects that do not include or affect residential uses or other noise sensitive uses to include noise mitigation measures where necessary to maintain noise levels compatible with activities planned for the project site and vicinity.

Policy NE-1m: Consider requiring the monitoring of noise levels for discretionary projects to determine if noise levels are in compliance with required standards. The cost of monitoring shall be the responsibility of the applicant.*

* Mitigation Policy

2 EXISTING NOISE CONDITIONS

The project vicinity is rural in nature and the primary noise source is vehicular traffic on local roadways. No major industrial uses, airports or large institutions are located in the project vicinity. The nearest freeway is U.S. 101, located approximately 5.7 miles to the west, and the nearest public airport is the Petaluma Municipal Airport, located approximately 7.5 miles to the south. In order to characterize noise levels associated with the existing facility, local traffic noise and the other noise sources in the project area, a series of long-term and short-term noise measurements were conducted.

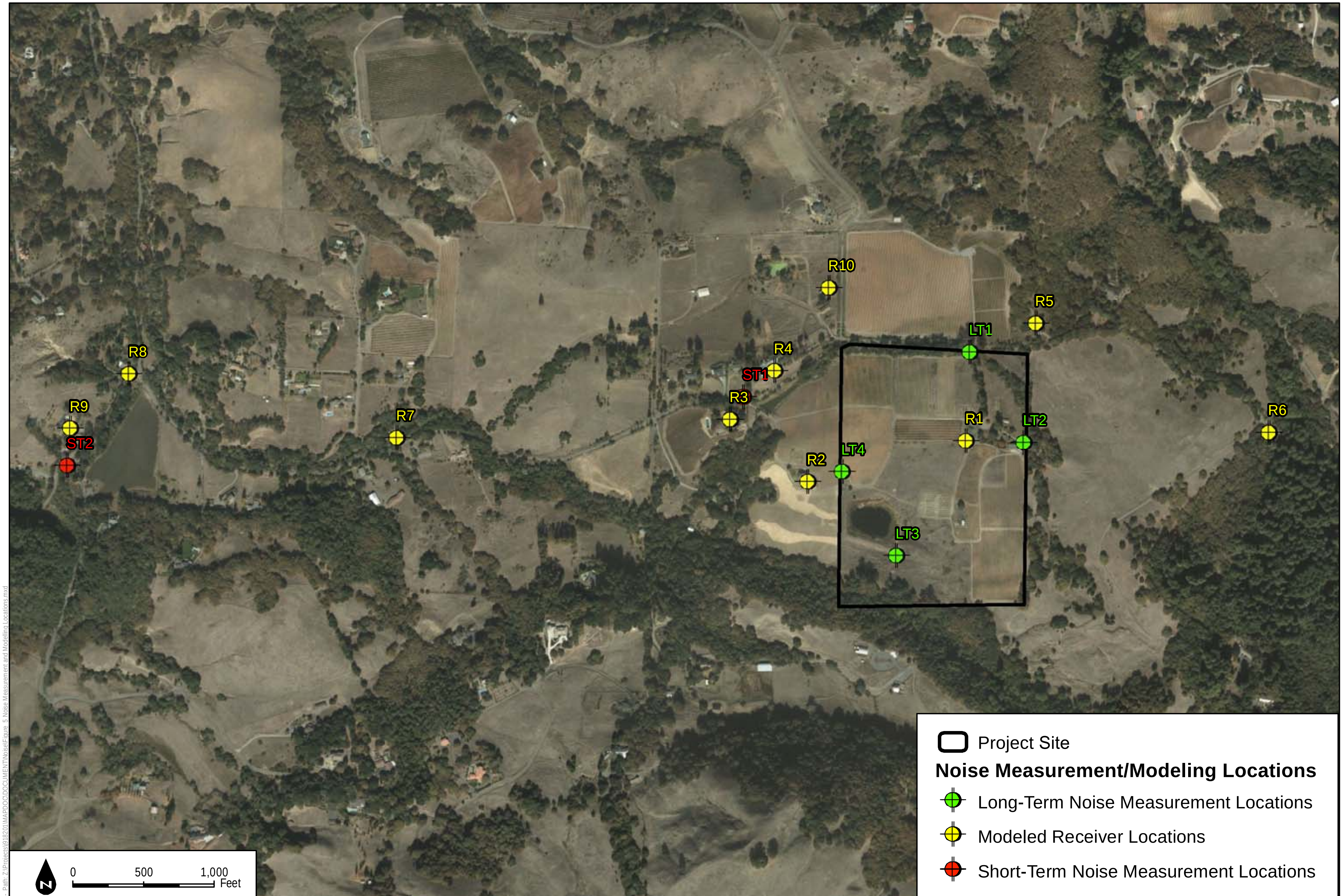
Four long-term measurements (ranging from 16 to 110 hours in duration) were conducted on-site using three SoftdB Piccolo and one Larson Davis LD-700 digital integrating sound level meters (SLMs). These devices are classified as Type II (general purpose) SLMs by the American National Standards Institute (ANSI). The calibration of the SLMs was verified in the field prior to and following the measurements using a Larson Davis Model CAL200 acoustical calibrator, the SLM microphones were adjusted to a height of approximately 5 feet above local ground, and the microphones were covered with a foam windscreen designed for this purpose during the measurements, in accordance with ANSI standards for community noise measurements.

The long-term noise measurement data is summarized in Table 3, and the noise measurement locations are shown in Figure 5. The reader is referred to Appendix A for data tables with the recorded hourly average noise levels (L_{eq}) at each site throughout the measurement periods, statistical noise levels at two of the four onsite measurement locations, and the calculation of L_{dn} from the recorded hourly average values. As shown in Table 3, the cumulative hourly average noise levels ranged from approximately 36 dBA L_{eq} near the southern project boundary to 50 dBA L_{eq} at the northern project boundary. The measured 24-hour weighted L_{dn} noise levels ranged from approximately 45 dBA at the western project boundary to 55 dBA L_{dn} at the northern project boundary. Measured noise levels were consistent with rural agricultural/residential land uses. The loudest on-site noise levels were at LT1, which was immediately adjacent to Sonoma Mountain Road. The loudest hourly noise level recorded at LT1 was 59 dBA L_{eq}, whereas at the other three on-site locations the loudest hourly noise levels ranged from 40 to 48 dBA L_{dn}. At LT1, in which the measurement duration encompassed a period from Thursday through Sunday, it is noted that the average weekend noise levels were approximately the same (within 1 to 2 decibels) as the weekday noise levels. Thursday and Friday's measured 24-hour noise levels were 55 and 54 dBA L_{dn}, respectively, while both Saturday and Sunday had measured 24-hour noise levels of 53 dBA L_{dn}. L_{50} noise levels ranged from 37 dBA during nighttime hours (10 PM to 7 AM) to 43 dBA daytime (7 AM to 10 PM).

Table 3
Long-Term Noise Measurement Data Summary (dBA)

Measurement #: Location	Start Date & Time	Stop Date & Time	Cumulative Hourly Average Level (L_{eq})	L_{dn}	Loudest Hour (L_{eq})	Quietest Hour (L_{eq})	L_{50}	L_{25}	L_{8}	L_{2}
LT1: Northern project site boundary	10/7/2015 10:40	10/11/2015 23:40	49.7	54 - 55 Thurs - Fri, 53 Sat & Sun	59.1	37.4	--	--	--	--
LT2: Eastern project site boundary	10/6/2015 9:30	10/7/2015 9:30	41.2	45.8	48.2	37.0	41 Daytime 37 Nighttime	43 Daytime 39 Nighttime	45 Daytime 39 Nighttime	49 Daytime 41 Nighttime
LT3: Near southern project site boundary	10/6/2015 9:00	10/7/2015 0:00	35.5	n/a *	40.0	31.0	--	--	–	--
LT4: Western project site boundary	10/6/2015 9:15	10/7/2015 9:15	40.8	45.1	46.5	36.8	43 Daytime 37 Nighttime	47 Daytime 37 Nighttime	49 Daytime 39 Nighttime	53 Daytime 41 Nighttime

* Not applicable; less than 24 hours of noise measurement data collected.



DUDEK

SOURCE: Bing Maps, 2016

FIGURE 5

Noise Measurement and Modeling Locations

Belden Barns Farmstead & Winery

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In addition to the four on-site long-term noise measurements, short-term noise measurements were also conducted at two off-site locations (shown in Figure 5); a noise measurement (ST1) was conducted adjacent to Sonoma Mountain Road approximately 700 feet west of the project site, and a noise measurement (ST2) was conducted adjacent to Pressley Road, approximately 800 feet south of Sonoma Mountain Road. Both short-term noise measurements were conducted using a Larson Davis LD-820 SLM (ANSI Type I) using ANSI-recommended noise measurement practices as described above. Each of the noise measurements was 30 minutes in duration, and the vehicle traffic was manually counted simultaneously with the measurement, for use in calibration of the traffic noise model. The resulting noise and traffic count data is summarized in Table 4.

Table 4
Short-Term Noise Measurement Data Summary (dBA)

Site	Description	Measurement Date & Time	Traffic Counts	L_{eq}[1]	L_{max}[2]	L_{min}[3]
ST1	5400 Sonoma Mountain Road: West of project site, adjacent to residences north of Sonoma Mountain Road	10/6/2015 11:15 – 11:45	21 autos, 1 medium truck	59	82	26
ST2	4000 Pressley Road; Southwest pf project site, adjacent to residences east of Pressley Road, north of Sonoma Mountain Road	10/6/2015 12:09 – 12:39	28 autos	57	76	29

Notes:
1 Equivalent Continuous Sound Level (time-average sound level)
2 Maximum noise level
3 Minimum noise level

As shown in Table 4, the noise measurements (conducted within 8 – 20 feet of the edge of shoulder) ranged from 57 to 59 dBA L_{eq}.

2.1 Transportation Noise

Roadways

Vehicular traffic along vicinity roadways is typically a primary contributor to the overall noise environment in any urban (or, for the most part, rural) neighborhood. Using current traffic data and employing the Federal Highway Administration's Traffic Noise Model (TNM version 2.5, FHWA 2004), Dudek modeled the traffic noise levels associated with noise-sensitive receivers[1] located near the project site and adjacent to segments of Sonoma Mountain Road and Pressley

1 Noise-sensitive receivers are land uses associated with outdoor and/or indoor activities that may be subject to significant interference or stress from noise sources not within their control (i.e., from nearby transportation noise sources or adjacent on-site noise sources). They generally include residential land uses, hospitals, schools and libraries. The noise-sensitive receivers for this project (consisting entirely of residential land uses) were identified initially through review of aerial photographs of the surrounding area, and verified during field noise measurements.

Road which will be impacted by project-related trips. In order to estimate the 24-hour weighted average level (L_{dn}), 10 percent of the volumes were assigned to the respective roadways. Both weekday and weekend traffic volumes were modeled. Table 5 presents the results of the noise modeling for existing traffic on selected area roadways. The reader is referred to Appendix B for the traffic noise modeling input and output data.

Table 5
Existing Traffic Noise Levels (dBA L_{dn})

Receiver	Land Use / Roadway	Volume[1] (weekday)	Volume[1] (weekend)	Posted Speed	Existing Weekday L_{dn}	Existing Weekend L_{dn}
R1	Project site / Sonoma Mountain Road north of project site	351	276	40	30	30
R2	Residence & farm / Sonoma Mountain Road west of project site	351	276	40	28	28
R3	Residence & farm / Sonoma Mountain Road west of project site	351	276	40	49	48
R4	Residence / Sonoma Mountain Road west of project site	351	276	40	43	43
R5	Residence / Sonoma Mountain Road east of project site	439	385	40	45	44
R6	Residence / Sonoma Mountain Road east of project site	439	385	40	46	45
R7	Residence / Sonoma Mountain Road west of project site	351	276	40	46	45
R8	Residence / Sonoma Mountain Road (North of Pressley Road) west of project site	922	880	40	53	53
R9	Pressley Road South of Sonoma Mountain Road	667	550	30	45	45

Notes:
1 TJKM. *Traffic Impact Analysis for the Belden Barns Winery*. March 24, 2016.

As shown in Table 3, modeled existing traffic noise levels are relatively low, ranging from approximately 28 dBA L_{dn} (at receiver R2) to 53 dBA L_{dn} (at R8) during both the weekdays and weekends.

2.2 Non-Transportation Noise

The ambient noise levels recorded at the eastern, southern and western property lines[2] from existing operations are well within the allowable community noise exposure levels for noise-sensitive land uses, including the adjacent residential uses. The measurements were conducted during typical operations (i.e., there was not a special event occurring during the measurements), and therefore the measured sound levels account for typical existing daily activities, and standard mechanical equipment operation.

[2] At the northern property boundary, the noise levels (as represented by LT1) were dominated by noise from Sonoma Mountain Road. LT1, therefore, is not representative of noise levels from the existing on-site facility.

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3 SIGNIFICANCE CRITERIA

Based on the criteria identified in Appendix G of the CEQA Guidelines, the proposed project would have a significant impact on noise if it would result in:

1. The exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. The exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

3.1 Significant Changes In Ambient Noise Levels

Some guidance regarding the determination of a substantial permanent increase in ambient noise levels in the project vicinity above existing levels is provided by the 1992 findings of the Federal Interagency Committee on Noise (FICON), which assessed the annoyance effects of changes in ambient noise levels resulting from aircraft operations. The FICON recommendations are based upon studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. Annoyance is a qualitative measure of the adverse reaction of people to noise that generates speech interference, sleep disturbance, or interference with the desire for a tranquil environment.

The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of L_{dn}. The changes in noise exposure that are shown in Table 6 are expected to result in equal changes in annoyance at sensitive land uses. Although the FICON recommendations were specifically developed to address aircraft noise impacts, they are used in this analysis to define a substantial increase in community noise levels related to all transportation noise sources and permanent non-transportation noise sources.

Table 6
Measures of Substantial Increase for Community Noise Sources

Ambient Noise Level Without Project (L_{dn})	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels by:
<60 dB	+ 5 dB or more
60-65 dB	+ 3 dB or more
>65 dB	+ 2 dB or more

3.2 Adjustments[3] to Applicable Sonoma County Noise Standards

Based upon the ambient noise measurement results (Section 2), no upward adjustment to the applicable Sonoma County noise standards are warranted, because the measured and modeled existing ambient noise levels were below the standards contained in Table NE-2. A 5 dB reduction of the County's permissible noise standard is applied for the analysis of on-site event noise (specifically the outdoor wine-tasting and music components), per Policy NE-1C(2). No other adjustments to the Sonoma County noise standards were applied in the analysis[4].

3.3 Vibration Significance Criteria

Impacts related to excessive ground-borne vibration would be significant if the project results in the exposure of persons to or generation of excessive ground-borne vibration equal to or in excess of 0.2 inches/second PPV. Construction activities within 200 feet and pile driving within 600 feet would be potentially disruptive to vibration-sensitive operations (Caltrans 2002).

3 Adjustments based upon Policy NE-1C, reproduced in Section 1.4.3.

4 Based upon the subsequent analysis (Section 4), further adjustments such as per Policy NE-1C(3) were not warranted because the project would not exceed the ambient noise level by 10 decibels or more.

4 IMPACTS AND MITIGATION

4.1 Transportation Noise Exposure

4.1.1 Impact Analysis

Roadway Noise

The primary noise-related effect that most projects produce is a potential for on-site and off-site increases in traffic, which is the main source of noise in most urban and rural areas. Acoustical calculations were performed for existing traffic levels (presented in Section 2.1) as traffic is often a major contributor to the ambient or community noise level, and it is helpful therefore to quantify existing traffic related noise levels.

The proposed project would generate traffic along adjacent roadways, including Sonoma Mountain Road and Pressley Road. Potential noise effects from vehicular traffic were assessed using FHWA's Traffic Noise Model, version 2.5. Consistent with the Traffic Impact Analysis, information used in the model included the Existing (i.e., baseline conditions), Existing Plus Project, Cumulative, and Cumulative Plus Project traffic volumes and speeds. Two scenarios were modeled in both the TIA and for this noise analysis: Scenario 1: Harvest Season, and Scenario 2: Special Events. Scenario 3: Non-Harvest Season, was not modeled in the TIA by agreement with County staff because Scenarios 1 and 2 would create higher traffic volumes and would therefore provide a more conservative analysis. Noise levels were modeled at representative on-site and off-site noise-sensitive receivers for both weekday and weekend scenarios. The receivers (R1 through R10), which represent noise-sensitive receivers with the most potential to be impacted by project-related traffic noise, are shown in Figure 5.

The information provided from this modeling was compared to the noise impact significance criteria in Policy NE-1b (i.e., a 60 dBA L_{dn} noise standard for noise-sensitive land uses) and the FICON thresholds for noise increase (i.e., a 5 dBA increase in an ambient noise environment of less than 60 dBA L_{dn}, a 3 dBA noise increase in an ambient noise environment of 60 - 65 dBA L_{dn} and a 2 dBA increase in an ambient noise environment of more than 65 dBA L_{dn}) to assess whether project traffic noise would cause a significant impact and, if so, where. The results of the comparisons are presented in Table 7 for the weekday scenarios, and Table 8 for the weekend scenarios.

As shown in Table 7, modeled existing with project and cumulative with project weekday traffic noise levels would range from 29 dBA L_{dn} at receiver R2 to 54 dBA L_{dn} at R8; modeled cumulative with project noise levels would range from 33 dBA L_{dn} at R1 to 55 dBA L_{dn} at R8.

The proposed project would increase the weekday noise levels by 1 dBA or less (rounded to whole numbers) along the study area roadways.

As shown in Table 8, modeled existing with project weekend traffic noise levels would range from 28 dBA L_{dn} at receiver R2 to 53 dBA L_{dn} at R8; modeled cumulative with project noise levels would range from 34 dBA L_{dn} at receivers R1 and R2 to 55 dBA L_{dn} at R8. The proposed project would increase the weekend noise levels by up to 4 dBA[5] or less (rounded to whole numbers) along the study area roadways. Noise levels with the project would remain below the County's noise standard of 60 dBA L_{dn} at all of the representative receivers under all of the scenarios analyzed. Additionally, the maximum noise increase (4 decibels) would be less than the threshold for a substantial increase in noise levels. Therefore, the proposed project would not result in significant noise increases or cause an exceedance of applicable noise standards at any of the off-site noise-sensitive receptors. Traffic noise impacts would be less than significant.

[5] At receivers R2, R 4 and R7 (representing residences along Sonoma Mountain Road west of the project site) the cumulative weekend L_{dn} is predicted to increase by up to 4 decibels under Option 2 (Special Events).

Table 7
Project-Related Traffic Noise – Weekdays (dBA L_{dn})

Receiver	Land Use / Roadway	Existing	Existing + Scenario 1	Existing + Scenario 2	Noise Increase (dB)	Cumulative	Cumulative + Scenario 1	Cumulative + Scenario 2	Noise Increase (dB)
R1	Project site / Sonoma Mountain Road north of project site	30	31	n/a	1	34	34	n/a	0
R2	Residence & farm / Sonoma Mountain Road west of project site	28	29	n/a	1	34	34	n/a	0
R3	Residence & farm / Sonoma Mountain Road west of project site	49	50	n/a	1	52	53	n/a	1
R4	Residence / Sonoma Mountain Road west of project site	43	44	n/a	1	47	48	n/a	1
R5	Residence / Sonoma Mountain Road east of project site	45	45	n/a	0	48	48	n/a	0
R6	Residence / Sonoma Mountain Road east of project site	46	46	n/a	0	49	49	n/a	0
R7	Residence / Sonoma Mountain Road west of project site	46	47	n/a	1	50	51	n/a	1

Table 7
Project-Related Traffic Noise – Weekdays (dBA L_{dn})

Receiver	Land Use / Roadway	Existing	Existing + Scenario 1	Existing + Scenario 2	Noise Increase (dB)	Cumulative	Cumulative + Scenario 1	Cumulative + Scenario 2	Noise Increase (dB)
R8	Residence / Sonoma Mountain Road (North of Pressley Road) west of project site	53	54	n/a	1	56	56	n/a	0
R9	Residence / Pressley Road South of Sonoma Mountain Road	45	45	n/a	0	47	47	n/a	0
R10	Residence / Sonoma Mountain Road (West of Sonoma Ridge Road) northwest of project site	38	38	n/a	0	42	42	n/a	0

Notes: n/a – not applicable; Scenario 2 (Special Events) would not occur on weekdays

Table 8
Project-Related Traffic Noise – Weekends (dBA L_{dn})

Receiver	Land Use / Roadway	Existing	Existing + Scenario 1	Existing + Scenario 2	Maximum Noise Increase (dB)	Cumulative	Cumulative + Scenario 1	Cumulative + Scenario 2	Maximum Noise Increase (dB)
R1	Project site / Sonoma Mountain Road north of project site	30	30	30	0	33	34	34	1
R2	Residence & farm / Sonoma Mountain Road west of project site	28	28	29	1	30	34	34	4
R3	Residence & farm / Sonoma Mountain Road west of project site	48	49	49	1	50	52	53	3
R4	Residence / Sonoma Mountain Road west of project site	43	43	44	1	44	47	48	4
R5	Residence / Sonoma Mountain Road east of project site	44	45	45	1	47	48	48	1
R6	Residence / Sonoma Mountain Road east of project site	45	45	46	1	49	49	49	0
R7	Residence / Sonoma Mountain Road west of project site	45	46	46	1	47	50	51	4
R8	Residence / Sonoma Mountain Road (North of Pressley Road) west of project site	53	53	53	0	55	55	55	0

Table 8
Project-Related Traffic Noise – Weekends (dBA L_{dn})

Receiver	Land Use / Roadway	Existing	Existing + Scenario 1	Existing + Scenario 2	Maximum Noise Increase (dB)	Cumulative	Cumulative + Scenario 1	Cumulative + Scenario 2	Maximum Noise Increase (dB)
R9	Residence /Pressley Road South of Sonoma Mountain Road	45	45	45	0	46	47	47	1
R10	Residence / Sonoma Mountain Road (West of Sonoma Ridge Road) northwest of project site	37	38	38	1	39	41	42	3

4.2 On-Site Operations Noise

4.2.1 Impact Analysis

The implementation of the project would also result in changes to existing noise levels on the project site by adding new stationary sources of noise and by improving or adding new activity areas (i.e., the hospitality building) such that outdoor area use may increase. These sources may affect noise-sensitive vicinity land uses off the project site. The following analysis evaluates noise from exterior mechanical equipment retrofits, and also noise from special event activities.

Mechanical Equipment Noise and On-Site Vehicle Noise

Implementation of the proposed project would result in the addition of large commercial chiller to the project site, a Variable Refrigerate Volume conditioning unit, electrical transformer, and water pumps. This equipment would be located on the eastern side of the winery building, and surrounded by a 5 foot high solid wall. The winery building would be located approximately 600 feet from the nearest residential property line and approximately 750 feet from the nearest residence (both located to the north/northeast). The next-nearest residences are located to the west and northwest of the project site. The winery building would be located approximately 1,450 feet away from the residential property lines and approximately 1,600 feet from the residences. Based upon product noise emission levels provided by the applicant for the loudest piece of equipment, the chiller would result in a sound power level[6] (L_w) of 87 dBA. The following equation for a sound source in a free field with a reflecting plane[7] (Diehl, 1973) was used to estimate the noise levels from the chiller equipment at the nearest noise-sensitive land uses:

$$L_p = L_{50} = L_w - 20*Log(R) + 2.5$$

Where:
L_p is sound pressure level in A-weighted decibels (dBA)
L_{50} is the sound level exceeded 50 percent or more of the time[8] in dBA
L_w is sound power level, in dBA
R is distance from source to receiver, in feet

6 Sound power is the rate at which sound energy is emitted, reflected, transmitted or received, per unit time. The SI unit of sound power is the watt (W). Because it is the power of the sound force on a surface of the medium of propagation of the sound wave, there is no reference distance associated with this metric.

7 Assumes a perfectly reflective ground surface, which is not the case for this project but is used as a conservative measure in order to account for so-called “amphitheater effects” associated with the project’s hillside setting.

8 Because the chiller noise would be operating on a continuous, or steady-state basis, the sound pressure level would be equivalent to the L_{50}. The chiller noise would be mechanical but not tonal in nature. No reduction of the County noise standard is applicable.

The estimated noise levels from the mechanical equipment are summarized in Table 9, and the calculation sheets for the mechanical equipment and other on-site noise sources are contained in Appendix C. The equipment would be surrounded on 3 sides by a 5-foot high solid wall and on the 4th side by winery building, and thus the noise levels from the mechanical equipment would be reduced a minimum of 5 decibels by virtue of the direct line-of-sight being broken (Beranek & Ver, 1992)). The results in Table 9 reflect this additional noise reduction[9]. As shown, the estimated noise levels would be well below the County of Sonoma noise standards for daytime and nighttime non-transportation noise. Noise levels would range from approximately 20 to 29 dBA L_{50}. Therefore, noise levels from the on-site mechanical equipment would be less than significant.

Other noise sources would include periodic on-site vehicle noise from truck deliveries and the like; however, these would be of a relatively small number; per the project's Traffic Impacts Analysis, net-total non-harvest truck trips during non-harvest season would average out to 0.3 truck trips per day (i.e., less than 1 truck trip every 3 days), and 3.14 truck trips per day during harvest season. Additionally, occasional noise from backup alarms on forklifts and trucks would occur. Most forklift noise would occur within the barrel room inside the winery. Exterior forklift and truck back-up alarms associated with the winery building would coincide with barrel, grape bin and case good (bottle) delivery, and would occur on a very limited basis (approximately 10 days a year or less). Moreover, the exterior forklift noise and truck movement / backup alarm noise would be shielded at the nearest residences to the north by the intervening winery structure, because the winery building equipment entrance and loading area will be facing south. Because of this and the infrequent nature of these sources, these noise levels would be less than significant.

Table 9
Estimated Noise Levels from Mechanical Equipment Noise

Receiver Location	Distance (Ft)	L_{50} (dBA)	Applicable Noise Standard (L_{50})[10]		Noise Standard Exceeded?
Nearest Neighbors' Property Line (N-NE)	600	29	50 (7 a.m. to 10 p.m.)	45 (10 p.m. to 7 a.m.)	No
Nearest Neighbors (N-NE)	750	27	50 (7 a.m. to 10 p.m.)	45 (10 p.m. to 7 a.m.)	No
Next-Nearest Neighbors' Property Line (W & NW)	1450	21	50 (7 a.m. to 10 p.m.)	45 (10 p.m. to 7 a.m.)	No
Next-Nearest Neighbors (W & NW)	1600	20	50 (7 a.m. to 10 p.m.)	45 (10 p.m. to 7 a.m.)	No

9 Note: In order to be effective the wall should have a surface density of at least four pounds per square foot, and be free of openings and cracks (with the exception of expansion joints gaps and other construction techniques, which could create an opening or crack). The wall may be constructed of masonry or other weather-resistant material.

10 Sonoma County Noise Element, Table NE-2

Special Event Noise

During the eight proposed agricultural promotional events throughout the year, the number of participants would range from a maximum of 60 to 200 [11]. The events would feature food, wine, and other products produced on the site or in the local area and would be held in the indoor and outdoor portions of the farm building complex area. Events would end by 9:30 p.m. with clean up being completed by 10:00 p.m. There would be no outdoor amplified music at any event.

Event parking would be provided on site as shown in Figure 4, with parking guides present to facilitate parking when event participants arrive. Based upon reference sound levels from the literature for a raised male voice (65 dBA at 3.28 feet[12]) and a string quartet (sound power level of 95 dBA[13]), the resultant noise levels at nearby residential land uses were estimated, as shown in Table 10. Note that this is a very conservative estimate, as it is highly unlikely that the raised male voices at an event as proposed for this project would be sustained for 30 minutes or more during any one-hour period. Additionally, a typical event would have some combination of male and female guests, and the noise levels would be lower for this reason as well. As shown in Table 10, the conservative estimate for noise levels for the maximum-attendance scenario (200 guests) would range from 38 dBA L_{50} at the third-nearest residences, located approximately 1,400 feet to the northwest, to 45 dBA L_{50} at the nearest residential property line, 600 feet to the north/northeast. For a scenario with 60 guests, the estimates range from approximately 43 L_{50} to 36 dBA L_{50}. These noise levels would be below the applicable County of Sonoma noise standard for activities taking place between the hours of 7 a.m. and 10 p.m. of 50 dBA L_{50}. Furthermore, these noise levels, although they may be audible at nearby residences in light of the relatively low ambient noise levels, are unlikely to be of a level typically considered intrusive or disturbing. The noise from on-site events would be less than significant.

[11] During non-special event days, up to 42 by-appointment-only visitors per day to the facility are anticipated for tasting wine and for purchase of wine, cheese, etc., based upon the Traffic Impact Analysis. Because there would be substantially more visitors during special events, on-site noise from tasting room visitors are not analyzed further.

[12] Harris, 1979.

[13] Kahle, 1995. Sound power is the rate at which sound energy is emitted, reflected, transmitted or received, per unit time. The SI unit of sound power is the watt (W). Because it is the power of the sound force on a surface of the medium of propagation of the sound wave, there is no reference distance associated with this metric.

Table 10
On-Site Event Noise

Assuming Max. 200 people all male raised voice					
Receiver Description	*Receiver Distance (feet)*	*Raised Male Voices (dBA L_{50})*	*String Quartet (dBA L_{50})*	*Combined (dBA L_{50})*	*Applicable Standard (45 dBA L_{50}[14]) Exceeded?*
Nearest Residences (R5) Property Line (North/Northeast)	600	42.8	41.9	45	No
Nearest Residences (R5) (North/Northeast)	780	40.5	39.7	43	No
2nd-Nearest Residences (R2) Property Line (West)	1070	37.7	36.9	40	No
2nd-Nearest Residences (R2) (West)	1325	35.9	35.1	38	No
3rd-Nearest Residences (R10) Property Line (Northwest)	1230	36.5	35.7	39	No
3rd-Nearest Residences (R10) (Northwest)	1400	35.4	34.6	38	No
Assuming Max. 60 people all male raised voice					
Receiver Description	*Receiver Distance (feet)*	*Raised Male Voices (dBA L_{50})*	*String Quartet (dBA L_{50})*	*Combined (dBA L_{50})*	*Applicable Standard (50 dBA L_{50}) Exceeded?*
Nearest Residences (R5) Property Line (North/Northeast)	600	37.5	41.9	43	No
Nearest Residences (R5) (North/Northeast)	780	35.3	39.7	41	No
2nd-Nearest Residences (R2) Property Line (West)	1070	32.5	36.9	38	No
2nd-Nearest Residences (R2) (West)	1325	30.7	35.1	36	No
3rd-Nearest Residences (R10) Property Line (Northwest)	1230	31.3	35.7	37	No
3rd-Nearest Residences (R10) (Northwest)	1400	30.2	34.6	36	No

Parking Lot Activity

Noise sources from parking lots include car alarms, door slams, radios, and tire squeals. These sources typically range from about 30 to 66 dBA at a distance of 100 feet (30 to 63 dBA not including lot sweeper noise, which is not applicable for this project) (Gordon Bricken & Associates 1996), and are generally short-term and intermittent.

[14] - Daytime (7 AM to 10 PM) noise standard reduced 5 dB to account for predominant speech and music sounds.

Using the instantaneous parking lot noises of 30 to 63 dBA, composite L_{50} and L_{02} noise levels were calculated using estimated durations and quantities for each of the parking lot noise sources; the L_{50} noise level is anticipated to be 59 dBA and the L_{02} noise level is anticipated to be 63 dBA at a distance of 100 feet... As shown in Table 11, when propagated out to the nearest residential properties, the L_{02} noise levels are estimated to range from approximately 44 to 47 dBA L_{02}. As shown in Table 12, when combined with the crowd and music noise, the resultant L_{50} noise levels would range from approximately 42 dBA L_{50} to 47 dBA L_{50}. The combined noise levels would not exceed the County's applicable noise standard. Therefore, noise generated from parking lots would be less than significant.

Table 11
Parking Lot Noise (dBA L_{02})

Receiver Description	Receiver Distance to Parking Lot (feet)	Parking Lot Noise	Applicable Standard (65 dBA L_{02}) Exceeded?
Nearest Residences (R2) Property Line (West)	600	47	No
Nearest Residences (R2) (West)	780	45	No
2nd-Nearest Residences (R5) Property Line (East/Northeast)	650	47	No
2nd-Nearest Residences (R5) (East/Northeast)	850	44	No
3rd-Nearest Residences (R10) Property Line (Northwest)	700	46	No
3rd-Nearest Residences (R10) (Northwest)	900	44	No

Table 12
Parking Lot Noise (dBA L_{50})

Receiver Description	Receiver Distance to Parking Lot (feet)	Parking Lot Noise	Crowd and Music Noise	Combined (dBA L_{50})	Applicable Standard (50 dBA L_{50}) Exceeded?
Nearest Residences (R2) Property Line (West)	600	43.5	40.4	45	No
Nearest Residences (R2) (West)	780	41.3	38.5	43	No
2nd-Nearest Residences (R5) Property Line (East/Northeast)	650	42.8	45.4	47	No
2nd-Nearest Residences (R5) (East/Northeast)	850	40.5	43.1	45	No
3rd-Nearest Residences (R10) Property Line (Northwest)	700	42.2	39.1	44	No
3rd-Nearest Residences (R10) (Northwest)	900	40.0	38.0	42	No

4.2.2 Mitigation Measures

The proposed Belden Barns project implementation would not result in a significant operational noise impact; therefore, no mitigation is required.

Significance After Mitigation

Mitigation is not required because impacts would be less than significant without mitigation.

4.3 Construction Noise

4.3.1 Impact Analysis

Construction of the proposed project would generate noise that could expose nearby receptors to elevated noise levels that may disrupt communication and routine activities. The magnitude of the impact would depend on the type of construction activity, equipment, duration of the construction, distance between the noise source and receiver, and intervening structures. This section of the report discusses the noise levels calculated to result from construction of the project, at nearby sensitive receptors (i.e., residences).

It is anticipated that construction of the proposed project would take approximately 12–18 months. Equipment that would be in operation during construction would include rubber-tired dozers, backhoes, graders, forklifts, compressors, paving equipment, and welders. The typical maximum noise levels for various pieces of construction equipment at a distance of 50 feet are presented in Table 13, Construction Equipment Maximum Noise Levels. Note that the equipment noise levels presented in Table 12 are maximum noise levels. Typically, construction equipment operates in alternating cycles of full power and low power, producing average noise levels less than the maximum noise level. The average sound level of construction activity also depends on the amount of time that the equipment operates and the intensity of the construction activities during that time.

Table 13
Construction Equipment Maximum Noise Levels

Equipment Type	"Typical" Equipment dBA at 50 feet	"Quiet" Equipment* dBA at 50 feet
Air compressor	81	71
Backhoe	85	80
Concrete pump	82	80
Concrete vibrator	76	70
Crane	83	75
Truck	88	80
Dozer	87	83
Generator	78	71

Table 13
Construction Equipment Maximum Noise Levels

Equipment Type	"Typical" Equipment dBA at 50 feet	"Quiet" Equipment* dBA at 50 feet
Loader	84	80
Paver	88	80
Pneumatic tools	85	75
Water pump	76	71
Power hand saw	78	70
Shovel	82	80
Trucks	88	83

Source: FTA 2006

* Estimated levels obtainable by selecting quieter procedures or machines and implementing noise-control features requiring no major redesign or extreme cost.

The maximum noise levels at 50 feet for typical equipment would range up to 88 decibels (dB) for the type of equipment normally used for this type of construction project, although the hourly noise levels would vary. Construction noise in a well-defined area typically attenuates at approximately 6 dB per doubling of distance. Project construction would take place at distances ranging from approximately 780 to 1,600 feet from adjacent, existing noise-sensitive uses.

The Federal Highway Administration's (FHWA) Roadway Construction Noise Model (RCNM) (FHWA 2008) was used to estimate construction noise levels at the nearest occupied noise-sensitive land uses. Although the model was funded and promulgated by the FHWA, the RCNM is often used for non-roadway projects, because the same types of construction equipment used for roadway projects are also used for other project types. Input variables for the RCNM consist of the receiver/land use types, the equipment type and number of each (e.g., two graders, a loader, a tractor), the duty cycle for each piece of equipment (e.g., percentage of hours the equipment typically works per day), and the distance from the noise-sensitive receiver. No topographical or structural shielding was assumed in the modeling. The RCNM has default duty-cycle values for the various pieces of equipment, which were derived from an extensive study of typical construction activity patterns. Those default duty-cycle values were used for this noise analysis.

Using the FHWA's RCNM construction noise model and construction information (types and number of construction equipment by phase), the estimated noise levels from construction were calculated for a representative range of distances, as presented in Table 14, Construction Noise Model Results Summary. The RCNM inputs and outputs are provided in Appendix D.

Table 14
Construction Noise Model Results Summary

RCNM Results Summary			
	L_{eq} (dBA)		
Case Description:	*Residence to the northeast - 780'*	*Residence to the west - 1300'*	*Residences to the northwest - 1600'*
Demolition	62	58	56
Site Preparation	60	55	53
Grading	60	55	53
Building Construction	59	55	53
Paving	60	56	54
Architectural Coatings	51	46	45

Note: L_{eq} = equivalent continuous sound level

As presented in Table 14, the highest noise levels are predicted to occur during demolition, when noise levels from construction activities would be approximately 62 dBA equivalent continuous sound level (L_{eq}) at the nearest existing residences, approximately 780 feet away. These are relatively low levels for construction noise because of the distance to the nearest noise-sensitive land uses. However, they would be louder than existing ambient noise levels based upon the field noise measurements. Although the noise levels would likely not interfere with speech or other activities, they could result in some annoyance.

The County currently has no thresholds of significance for construction noise; however, the County provides recommendations for some measures that should be considered in cases where sensitive receptors may be impacted. Measures to be considered include limiting hours of construction to avoid the early morning and evening hours (such as 7am to 7pm weekdays and 7am to 5pm weekends), limiting construction activities on Sundays and holidays, and the use of sound blankets for particularly loud activities such as pile driving. The proposed project would not involve pile driving or other particularly loud activities, and use of sound blankets or temporary noise barriers is not a practical solution because of the nearest receivers are relatively distant and in a number of directions). In order to ensure that noise impacts are minimized to the extent practical, the mitigation measures outlined in **MM-NO-1** are provided.

4.3.2 Mitigation Measures

MM-NO-1 In order to reduce impacts related to construction noise from the proposed project, prior to issuance of grading permits the following measures shall be incorporated by the County of Sonoma as conditions on permits, as deemed necessary:

- Hours of construction would be limited to the hours of 7 a.m. to 7 p.m. on weekdays, 7 a.m. to 5 p.m. on Saturdays, and no construction would take place on Sundays or Federal holidays.
- All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers.
- Construction noise reduction methods, such as shutting off idling equipment, maximizing the distance between construction equipment staging areas and occupied sensitive receptor areas, and using electric air compressors and similar power tools rather than diesel equipment, shall be used.
- During construction, stationary construction equipment shall be placed such that noise is directed away from or shielded from sensitive noise receivers.
- During construction, stockpiling and vehicle staging areas shall be located far from noise-sensitive receptors.

Significance After Mitigation With implementation of these measures, construction noise would be less than significant.

4.4 Construction Vibration

4.4.1 Impact Analysis

The main concern associated with ground-borne vibration is annoyance; however, in extreme cases, vibration can cause damage to buildings, particularly those that are old or otherwise fragile. Some common sources of ground-borne vibration are trains, as well as construction activities such as blasting, pile-driving, and heavy earth-moving equipment. The primary source of ground-borne vibration occurring as part of this project is construction activity; no major vibration-generating sources would be introduced as part of project operation.

According to Caltrans, the highest measured vibration level during highway construction was 2.88 inches/second PPV at 10 feet from a pavement breaker. Other typical construction activities and equipment, such as D-8 and D-9 Caterpillars, earthmovers, and trucks have not exceeded 0.10 inches/second PPV at 10 feet. Vibration sensitive instruments and operations may require special consideration during construction. Vibration criteria for sensitive equipment and operations are not defined and are often case-specific. As a guide, major construction activity within 200 feet and pile driving within 600 feet may be potentially disruptive to sensitive operations (Caltrans 2002). No pile driving is anticipated to be necessary for project development.

The demolition and construction activities on the project site would have virtually no potential to expose vicinity off-site residences to ground-borne vibration, because construction activities would take place well beyond 200 feet away from off-site residences. In addition, the construction activity would not include blasting or pile driving, and would, therefore, not result in a significant impact from ground-borne vibration.

4.4.2 Mitigation Measures

Construction activities would not result in a significant ground-borne vibration impact; therefore, no mitigation is required.

Significance After Mitigation

Mitigation is not required because impacts would be less than significant without mitigation.

5 REFERENCES

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APPENDIX A

Ambient Noise Measurement Data

DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT: Belden Barn EIR PROJECT #: 9182
SITE ID: Sonoma Mountain Road #1
SITE ADDRESS: 5400 Sonoma Mountain Road OBSERVER(S): JUL / AG
START DATE: 10/6 END DATE: 10/6
START TIME: 11:15 END TIME: 11:45

METEOROLOGICAL CONDITIONS

TEMP: 74° F HUMIDITY: 50 % R.H. WIND: CALM LIGHT MODERATE
WINDSPD: < 1 MPH DIR. N NE S SE S SW W NW VARIABLE STEADY GUSTY
SKY: SUNNY CLEAR OVRCAST PRTLY CLDY FOG RAIN

ACOUSTIC MEASUREMENTS

MEAS. INSTRUMENT: LD 820 TYPE 1 2 SERIAL #: 1534
CALIBRATOR: CAL ~~[illegible]~~ 200 SERIAL #: 4490
CALIBRATION CHECK PRE-TEST: 114 dBA SPL POST-TEST: 114 dBA SPL WINDSCRN: ✓

SETTINGS: A-WTD SLOW FAST FRONTAL RANDOM ANSI OTHER:

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
1	11:15	11:45	58.7	82.0	26.4	29.6	35.5	55.4	L1: 72.4

COMMENTS

SOURCE INFO AND TRAFFIC COUNTS

PRIMARY NOISE SOURCE: TRAFFIC AIRCRAFT RAIL INDUSTRIAL OTHER:
ROADWAY TYPE: 2 Lane Artery DIST. TO RDWY C/L OR EOP: 18.5'
TRAFFIC COUNT DURATION: 30 MIN SPEED / MIN SPEED

COUNT 1 (OR RDWY 1) DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB
AUTOS	21			
MED TRKS	1			
HVY TRKS				
BUSES				
MOTRCLS				

IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE: X

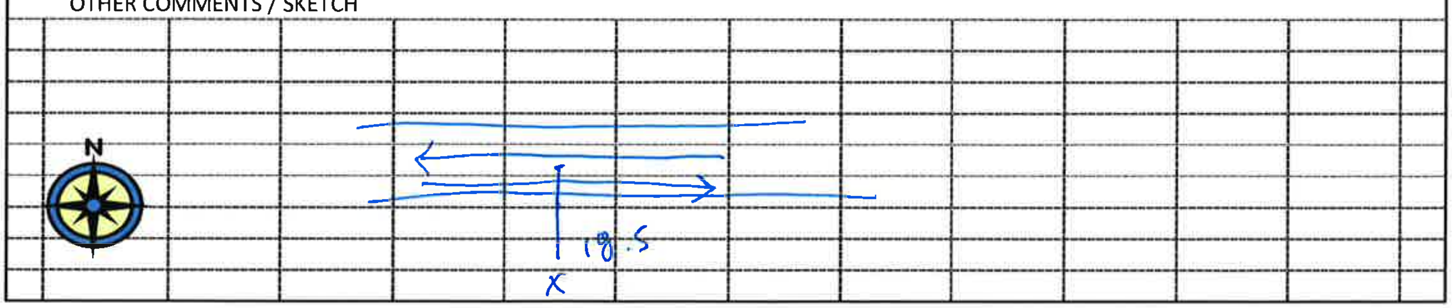
COUNT 2 (OR RDWY 2)	NB/EB	SB/WB	NB/EB	SB/WB

SPEEDS ESTIMATED BY: RADAR / DRIVING THE PACE 30 mph
POSTED SPEED LIMIT SIGNS SAY: 30 mph

OTHER NOISE SOURCES (BACKGROUND): DIST. AIRCRAFT RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL DIST. KIDS PLAYING DIST. CONVRSTNS / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE
OTHER: Aircraft @ 11:42 AM for 1 min.

DESCRIPTION / SKETCH

TERRAIN: HARD SOFT MIXED FLAT OTHER:
PHOTOS
OTHER COMMENTS / SKETCH



DUDEK

FIELD NOISE MEASUREMENT DATA

PROJECT	BELDEN BARNS EIR	PROJECT #	9182
SITE ID	# PRESLEY RD. #2		
SITE ADDRESS	4000 PRESLEY RD.	OBSERVER(S)	JVL / AG
START DATE	10-6	END DATE	10-6-15
START TIME	12:09 pm	END TIME	12:39

METEOROLOGICAL CONDITIONS

TEMP 78° F HUMIDITY 49 % R.H. WIND **CALM** LIGHT MODERATE
WINDSPD 1 MPH DIR. N NE S SE S SW W NW VARIABLE STEADY GUSTY
SKY **SUNNY** CLEAR OVRCAST PRTLY CLDY FOG RAIN

ACOUSTIC MEASUREMENTS

MEAS. INSTRUMENT LD 820 TYPE **1** 2 SERIAL # 1534
CALIBRATOR CAL 200 SERIAL # 4496
CALIBRATION CHECK PRE-TEST 114 dBA SPL POST-TEST 114 dBA SPL WINDSCRN ✓

SETTINGS **A-WTD** **SLOW** FAST **FRONTAL** RANDOM ANSI OTHER:

REC. #	BEGIN	END	Leq	Lmax	Lmin	L90	L50	L10	OTHER (SPECIFY METRIC
1	12:09	12:39	57	75.8	28.9	31.6	37.6	58.6	L1: 70.2

COMMENTS

SOURCE INFO AND TRAFFIC COUNTS

PRIMARY NOISE SOURCE **TRAFFIC** AIRCRAFT RAIL INDUSTRIAL OTHER:

ROADWAY TYPE: 2 LANE ARTERY DIST. TO RDWY C/L OR **EOP**: 8'

TRAFFIC COUNT DURATION: 30 MIN SPEED MIN SPEED

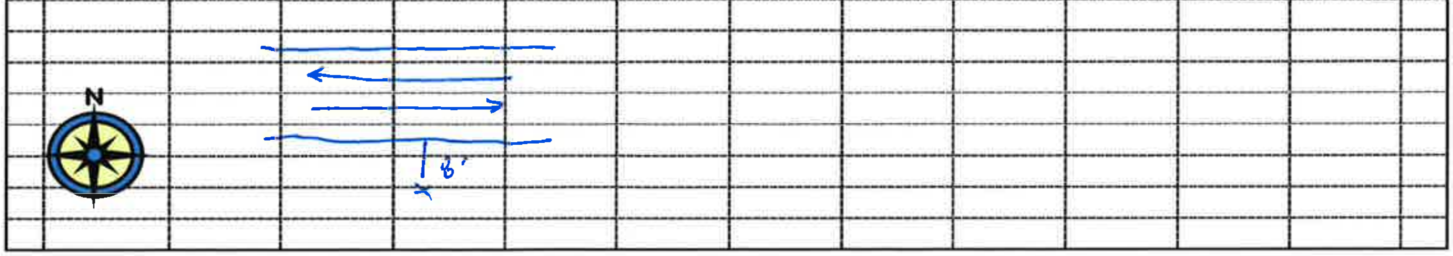
COUNT 1 (OR RDWY 1) DIRECTION	NB/EB	SB/WB	NB/EB	SB/WB	IF COUNTING BOTH DIRECTIONS AS ONE, CHECK HERE	COUNT 2 (OR RDWY 2) NB/EB	SB/WB	NB/EB	SB/WB
AUTOS	28				X				
MED TRKS									
HVY TRKS									
BUSES									
MOTRCLS									

SPEEDS ESTIMATED BY: RADAR / **DRIVING THE PACE** 30 mph
POSTED SPEED LIMIT SIGNS SAY: 30 mph

OTHER NOISE SOURCES (BACKGROUND): **DIST. AIRCRAFT** RUSTLING LEAVES DIST. BARKING DOGS BIRDS DIST. INDUSTRIAL
DIST. KIDS PLAYING **DIST. CONVRSTNS** / YELLING DIST. TRAFFIC (LIST RDWYS BELOW) DISTD GARDENERS/LANDSCAPING NOISE
OTHER: CONVERSATION @ 12:12 FOR 1 MIN. AIRCRAFT @ 12:35 FOR 45 SECONDS

DESCRIPTION / SKETCH

TERRAIN **HARD** SOFT MIXED FLAT OTHER:
PHOTOS
OTHER COMMENTS / SKETCH



LT 1_ Belden Barns

Rec 2 to 111

	Date hh:mm:ss	Leq	Lmax	Lmin
Wednesda	10/7/2015 10:40	47.8	71	37.8
	10/7/2015 11:40	48.6	75.9	34.9
	10/7/2015 12:40	50.5	75.9	34.9
	10/7/2015 13:40	48.9	72.7	37.8
	10/7/2015 14:40	49.3	69.8	38.9
	10/7/2015 15:40	51.4	71.8	39.2
	10/7/2015 16:40	57.8	76.8	37.8
	10/7/2015 17:40	48.7	70.9	37.8
	10/7/2015 18:40	47.3	70.4	37.8
	10/7/2015 19:40	45.7	69.4	39.3
	10/7/2015 20:40	44.9	69.8	37.9
	10/7/2015 21:40	44.6	71.8	37.9
	10/7/2015 22:40	44.9	67.7	41.7
	10/7/2015 23:40	44.5	70.4	40.8
Thursday	10/8/2015 0:40	46.5	67.3	37.9
	10/8/2015 1:40	40.8	63	37.9
	10/8/2015 2:40	40.7	42.4	39.4
	10/8/2015 3:40	41.2	65.2	39.3
	10/8/2015 4:40	43.6	68.8	37.2
	10/8/2015 5:40	46.2	71.5	34.9
	10/8/2015 6:40	48.7	71.7	34.9
	10/8/2015 7:40	53.3	77.2	37.7
	10/8/2015 8:40	49.2	76.5	37.6
	10/8/2015 9:40	51.9	71.3	37.8
	10/8/2015 10:40	49.5	77	37
	10/8/2015 11:40	57	79.2	34.9
	10/8/2015 12:40	59.1	78.5	34.9
	10/8/2015 13:40	48.4	73.3	34.9
	10/8/2015 14:40	49.4	70.4	34.9
	10/8/2015 15:40	50.9	71.3	37.8
	10/8/2015 16:40	47.1	68.6	35.3
	10/8/2015 17:40	53.4	78.2	36.8
	10/8/2015 18:40	46.4	68	34.9
	10/8/2015 19:40	46.8	66.5	42.5
	10/8/2015 20:40	47	72.3	42.7
	10/8/2015 21:40	46.7	75	42.3
	10/8/2015 22:40	44.8	69.4	41.7
	10/8/2015 23:40	44.4	68.1	40.6
Friday	10/9/2015 0:40	42.1	67.3	37.9
	10/9/2015 1:40	41.4	66	37.9
	10/9/2015 2:40	43.9	65.9	37.9
	10/9/2015 3:40	42.8	60.3	39.4
	10/9/2015 4:40	43.1	68.5	37.9
	10/9/2015 5:40	46.8	69.4	37.6

	10/9/2015 6:40	51.1	73.9	37.8
	10/9/2015 7:40	51.4	70.4	37.8
	10/9/2015 8:40	51.9	79.8	37.7
	10/9/2015 9:40	49.7	72.6	37.9
	10/9/2015 10:40	50.5	76.1	37.9
	10/9/2015 11:40	48.2	71.1	37.3
	10/9/2015 12:40	51.3	69	37.4
	10/9/2015 13:40	50.5	70.6	34.9
	10/9/2015 14:40	54.1	76.1	38.1
	10/9/2015 15:40	53.5	81.4	39.7
	10/9/2015 16:40	50	72.2	37.9
	10/9/2015 17:40	53.5	76.1	37.8
	10/9/2015 18:40	48.4	72.7	37.7
	10/9/2015 19:40	47.1	73.1	41.6
	10/9/2015 20:40	44.5	66.1	42.2
	10/9/2015 21:40	45.7	66.9	42.4
	10/9/2015 22:40	45.5	68.8	43.5
	10/9/2015 23:40	43.8	46.9	42.5
Saturday	10/10/2015 0:40	44.3	69.1	41.4
	10/10/2015 1:40	41.8	44	40.7
	10/10/2015 2:40	39.2	42.5	37.8
	10/10/2015 3:40	37.7	41.2	37.8
	10/10/2015 4:40	39.1	65.4	34.9
	10/10/2015 5:40	38.7	67	34.9
	10/10/2015 6:40	46	67.7	34.9
	10/10/2015 7:40	49.8	74.1	37.8
	10/10/2015 8:40	52.8	77.8	37.8
	10/10/2015 9:40	48.2	71.5	37.9
	10/10/2015 10:40	50.7	76.8	37.9
	10/10/2015 11:40	50.4	74.4	37.8
	10/10/2015 12:40	49.9	67.4	38.5
	10/10/2015 13:40	53	70.1	40.6
	10/10/2015 14:40	54.2	70.1	41.4
	10/10/2015 15:40	55	72.1	41.9
	10/10/2015 16:40	53.1	69.9	39.6
	10/10/2015 17:40	53.7	83.8	37.8
	10/10/2015 18:40	47.1	71.3	37.8
	10/10/2015 19:40	43.8	68.2	37.9
	10/10/2015 20:40	46.1	71.2	39.5
	10/10/2015 21:40	44.7	66.8	40.8
	10/10/2015 22:40	44.5	67.1	41.6
	10/10/2015 23:40	42.7	64.8	39.7
Sunday	10/11/2015 0:40	46.6	77.1	39.6
	10/11/2015 1:40	40	42.5	37.9
	10/11/2015 2:40	42.9	72.5	37.9
	10/11/2015 3:40	38.9	46.3	37.8
	10/11/2015 4:40	39.4	63.3	37.8

10/11/2015 5:40	37.4	49.7	34.9
10/11/2015 6:40	46.2	69.6	34.9
10/11/2015 7:40	51.9	71.9	36.6
10/11/2015 8:40	45.5	66.2	36.3
10/11/2015 9:40	48.7	70.8	37.6
10/11/2015 10:40	47.9	68.7	37.8
10/11/2015 11:40	52.2	77.6	35.2
10/11/2015 12:40	52.1	75.7	34.9
10/11/2015 13:40	48.7	74.6	34.9
10/11/2015 14:40	50.2	75.9	37.7
10/11/2015 15:40	49.2	68.7	37.8
10/11/2015 16:40	50	72.8	37.9
10/11/2015 17:40	54.2	81.1	37.2
10/11/2015 18:40	51.6	80.1	36.7
10/11/2015 19:40	46.1	69.6	39.6
10/11/2015 20:40	45	69.6	40.6
10/11/2015 21:40	43.3	63.6	40.8
10/11/2015 22:40	42.9	64.9	39.5
10/11/2015 23:40	40.6	63.8	37.9

LT-2

Rec 1 to 25	Slow Response		dBA weighting		2.0 dB resc
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin
10/6/2015 9:30	1.0 hour	46.4	82	71.8	36.6
10/6/2015 10:30	1.0 hour	45.5	81.1	70.8	36.6
10/6/2015 11:30	1.0 hour	43.7	79.3	62.4	36.5
10/6/2015 12:30	1.0 hour	41.7	77.3	67.4	33.7
10/6/2015 13:30	1.0 hour	39.7	75.3	59.5	33.7
10/6/2015 14:30	1.0 hour	43.6	79.2	55.2	38.4
10/6/2015 15:30	1.0 hour	42.4	78	63.7	36.6
10/6/2015 16:30	1.0 hour	42.3	77.9	65.3	36.6
10/6/2015 17:30	1.0 hour	43.7	79.3	64.4	36.5
10/6/2015 18:30	1.0 hour	39	74.6	58.9	33.7
10/6/2015 19:30	1.0 hour	38.7	74.3	53.7	36.7
10/6/2015 20:30	1.0 hour	38.7	74.3	54.1	36.7
10/6/2015 21:30	1.0 hour	39.1	74.7	47	38.2
10/6/2015 22:30	1.0 hour	38.5	74.1	52.9	38.1
10/6/2015 23:30	1.0 hour	38.6	74.2	45	36.7
10/7/2015 0:30	1.0 hour	37.9	73.5	43.6	36.6
10/7/2015 1:30	1.0 hour	37.8	73.4	48.4	36.7
10/7/2015 2:30	1.0 hour	37.6	73.2	43.4	36.6
10/7/2015 3:30	1.0 hour	37.3	72.9	38.6	36.7
10/7/2015 4:30	1.0 hour	37.3	72.9	50.9	36.6
10/7/2015 5:30	1.0 hour	37	72.6	42.4	36.4
10/7/2015 6:30	1.0 hour	39.1	74.7	57.6	36.6
10/7/2015 7:30	1.0 hour	39.8	75.4	62	36.6
10/7/2015 8:30	1.0 hour	41.1	76.7	60.8	36.7
10/7/2015 9:30	26.6 min	48.2	80.2	70	36.7

LT-3

	Slow Response		dBA weighting	
Date hh:mm	LeqPeriod	Leq	Lmax	Lmin
10/6/2015 9:00	1.0 hour	35	55.5	25
10/6/2015 10:00	1.0 hour	35	54.5	28.5
10/6/2015 11:00	1.0 hour	32.5	50	28
10/6/2015 12:00	1.0 hour	32.5	51.5	28
10/6/2015 13:00	1.0 hour	33	49.5	28
10/6/2015 14:00	1.0 hour	39.5	58	28.5
10/6/2015 15:00	1.0 hour	37	52.5	29.5
10/6/2015 16:00	1.0 hour	40	61	29
10/6/2015 17:00	1.0 hour	34	57	28.5
10/6/2015 18:00	1.0 hour	40	65.5	29
10/6/2015 19:00	1.0 hour	32.5	39	31
10/6/2015 20:00	1.0 hour	32	38	30.5
10/6/2015 21:00	1.0 hour	32	36	30.5
10/6/2015 22:00	1.0 hour	31	42	29.5
10/6/2015 23:00	1.0 hour	31	46.5	29
10/7/2015 0:00	1.0 hour	31	42.5	28.5

LT-4

Rec 1 to 25	Slow Response		dBA weighting		2.0 dB resc
Date hh:mm:ss	LeqPeriod	Leq	SEL	Lmax	Lmin
10/6/2015 9:15	1.0 hour	45	80.6	73.7	37.7
10/6/2015 10:15	1.0 hour	39.5	75.1	54.5	37.6
10/6/2015 11:15	1.0 hour	39.3	74.9	56.6	34.9
10/6/2015 12:15	1.0 hour	40.3	75.9	56.8	34.9
10/6/2015 13:15	1.0 hour	39.6	75.2	51.3	36
10/6/2015 14:15	1.0 hour	46.5	82.1	59.8	37.9
10/6/2015 15:15	1.0 hour	44.7	80.3	59.4	37.9
10/6/2015 16:15	1.0 hour	44.6	80.2	63.8	37.9
10/6/2015 17:15	1.0 hour	40.9	76.5	55.2	37.8
10/6/2015 18:15	1.0 hour	43.2	78.8	67.1	37.7
10/6/2015 19:15	1.0 hour	38.5	74.1	55.8	37.9
10/6/2015 20:15	1.0 hour	38.2	73.8	45.9	37.8
10/6/2015 21:15	1.0 hour	38.1	73.7	47.3	37.8
10/6/2015 22:15	1.0 hour	37.9	73.5	54.1	37.7
10/6/2015 23:15	1.0 hour	37.7	73.3	44.6	37.6
10/7/2015 0:15	1.0 hour	37.3	72.9	47	36.8
10/7/2015 1:15	1.0 hour	37.6	73.2	47.2	35.6
10/7/2015 2:15	1.0 hour	37.3	72.9	46.6	37.5
10/7/2015 3:15	1.0 hour	37.2	72.8	53.2	37.3
10/7/2015 4:15	1.0 hour	36.8	72.4	40.6	36.7
10/7/2015 5:15	1.0 hour	37.2	72.8	44.4	37.1
10/7/2015 6:15	1.0 hour	37.3	72.9	51.3	37.4
10/7/2015 7:15	1.0 hour	37.4	73	48.1	34.9
10/7/2015 8:15	1.0 hour	38.2	73.8	55	34.9
10/7/2015 9:15	21.1 min	42.8	73.8	65	37.7

APPENDIX B

FHWA Traffic Model
Noise Calculation Worksheets

Dudek **12 April 2016**
M Greene / J Leech **TNM 2.5**

INPUT: ROADWAYS
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Calibration**

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average	
		point54	54	34,561,508.0	13,934,163.0	939.63				Average	
		point55	55	34,561,512.0	13,934,283.0	934.38				Average	
		point56	56	34,561,632.0	13,934,416.0	928.81				Average	
		point57	57	34,561,632.0	13,934,485.0	923.56				Average	
		point58	58	34,561,580.0	13,934,555.0	918.31				Average	
		point59	59	34,561,340.0	13,934,824.0	913.06				Average	
		point60	60	34,561,168.0	13,935,094.0	907.48				Average	
		point61	61	34,561,008.0	13,935,451.0	902.23					
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average	
		point63	63	34,562,412.0	13,934,139.0	958.01					
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average	
		point65	65	34,562,500.0	13,932,968.0	994.09					
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average	
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average	
		point96	96	34,567,276.0	13,932,589.0	1,138.45					
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average	
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average	
		point99	99	34,566,824.0	13,935,195.0	1,092.52					
Sonoma Mtn Rd E of Presley Rd	18.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average	
		point5	5	34,557,248.0	13,932,625.0	683.40				Average	
		point6	6	34,557,316.0	13,932,595.0	691.27				Average	
		point7	7	34,557,332.0	13,932,592.0	698.82				Average	
		point8	8	34,557,356.0	13,932,564.0	706.69				Average	
		point9	9	34,557,456.0	13,932,556.0	714.24				Average	
		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	

		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	
		point77	77	34,564,384.0	13,933,123.0	946.52				Average	
		point67	67	34,564,444.0	13,932,976.0	944.88				Average	

		point80	80	34,564,496.0	13,932,872.0	944.88				Average	
		point81	81	34,564,540.0	13,932,843.0	959.65				Average	
		point82	82	34,564,884.0	13,932,648.0	974.41				Average	
		point83	83	34,565,084.0	13,932,628.0	989.17				Average	
		point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
		point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
		point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
		point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
		point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
		point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
		point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
		point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
		point92	92	34,566,724.0	13,932,644.0	1,122.05					
Presley Road	8.0	point102	102	34,556,884.0	13,932,995.0	676.00				Average	
		point106	106	34,556,552.0	13,932,543.0	692.33				Average	
		point107	107	34,556,220.0	13,932,090.0	708.67				Average	
		point103	103	34,555,888.0	13,931,638.0	725.00					
Sonoma Mtn Rd N of Project Site	20.0	point110	110	34,561,508.0	13,933,497.0	944.90				Average	
		point111	111	34,562,452.0	13,933,494.0	964.60					

Dudek **12 April 2016**
M Greene / J Leech **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Calibration**

Roadway	Points												
Name	Name	No.	Segment										
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	42	30	2	30	0	0	0	0	0	0
	point5	5	42	30	2	30	0	0	0	0	0	0
	point6	6	42	30	2	30	0	0	0	0	0	0
	point7	7	42	30	2	30	0	0	0	0	0	0
	point8	8	42	30	2	30	0	0	0	0	0	0
	point9	9	42	30	2	30	0	0	0	0	0	0

	point10	10	42	30	2	30	0	0	0	0	0	0
	point11	11	42	30	2	30	0	0	0	0	0	0
	point4	4	42	30	2	30	0	0	0	0	0	0
	point13	13	42	30	2	30	0	0	0	0	0	0
	point14	14	42	30	2	30	0	0	0	0	0	0
	point15	15	42	30	2	30	0	0	0	0	0	0
	point16	16	42	30	2	30	0	0	0	0	0	0
	point17	17	42	30	2	30	0	0	0	0	0	0
	point18	18	42	30	2	30	0	0	0	0	0	0
	point19	19	42	30	2	30	0	0	0	0	0	0
	point20	20	42	30	2	30	0	0	0	0	0	0
	point21	21	42	30	2	30	0	0	0	0	0	0
	point22	22	42	30	2	30	0	0	0	0	0	0
	point23	23	42	30	2	30	0	0	0	0	0	0
	point24	24	42	30	2	30	0	0	0	0	0	0
	point25	25	42	30	2	30	0	0	0	0	0	0
	point26	26	42	30	2	30	0	0	0	0	0	0
	point27	27	42	30	2	30	0	0	0	0	0	0
	point28	28	42	30	2	30	0	0	0	0	0	0
	point29	29	42	30	2	30	0	0	0	0	0	0
	point30	30	42	30	2	30	0	0	0	0	0	0
	point33	33	42	30	2	30	0	0	0	0	0	0
	point34	34	42	30	2	30	0	0	0	0	0	0
	point35	35	42	30	2	30	0	0	0	0	0	0
	point36	36	42	30	2	30	0	0	0	0	0	0
	point37	37	42	30	2	30	0	0	0	0	0	0
	point38	38	42	30	2	30	0	0	0	0	0	0
	point39	39	42	30	2	30	0	0	0	0	0	0
	point40	40	42	30	2	30	0	0	0	0	0	0
	point32	32										
Sonoma Mtn Rd E of Johnstone Rd	point66	66	0	0	0	0	0	0	0	0	0	0
	point68	68	0	0	0	0	0	0	0	0	0	0
	point69	69	0	0	0	0	0	0	0	0	0	0
	point70	70	0	0	0	0	0	0	0	0	0	0
	point71	71	0	0	0	0	0	0	0	0	0	0
	point72	72	0	0	0	0	0	0	0	0	0	0
	point73	73	0	0	0	0	0	0	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes **9182**

		point74	74	0	0	0	0	0	0	0	0	0	0
		point75	75	0	0	0	0	0	0	0	0	0	0
		point76	76	0	0	0	0	0	0	0	0	0	0
		point77	77	0	0	0	0	0	0	0	0	0	0
		point67	67	0	0	0	0	0	0	0	0	0	0
		point80	80	0	0	0	0	0	0	0	0	0	0
		point81	81	0	0	0	0	0	0	0	0	0	0
		point82	82	0	0	0	0	0	0	0	0	0	0
		point83	83	0	0	0	0	0	0	0	0	0	0
		point84	84	0	0	0	0	0	0	0	0	0	0
		point85	85	0	0	0	0	0	0	0	0	0	0
		point86	86	0	0	0	0	0	0	0	0	0	0
		point87	87	0	0	0	0	0	0	0	0	0	0
		point88	88	0	0	0	0	0	0	0	0	0	0
		point89	89	0	0	0	0	0	0	0	0	0	0
		point90	90	0	0	0	0	0	0	0	0	0	0
		point91	91	0	0	0	0	0	0	0	0	0	0
		point92	92										
Presley Road		point102	102	56	30	0	0	0	0	0	0	0	0
		point106	106	56	30	0	0	0	0	0	0	0	0
		point107	107	56	30	0	0	0	0	0	0	0	0
		point103	103										
Sonoma Mtn Rd N of Project Site		point110	110	0	0	0	0	0	0	0	0	0	0
		point111	111										

Dudek **12 April 2016**
M Greene / J Leech **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Calibration**

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Receiver1	1	1	34,560,792.0	13,933,004.0	941.60	5.00	8.00	66	10.0	8.0	
Receiver2	2	1	34,561,012.0	13,933,312.0	971.13	5.00	8.00	66	10.0	8.0	
Receiver3	3	1	34,558,472.0	13,932,790.0	741.47	5.00	8.00	66	10.0	8.0	
Receiver4	4	1	34,562,856.0	13,933,643.0	967.85	5.00	8.00	66	10.0	8.0	
Receiver5	5	1	34,561,428.0	13,933,732.0	941.60	5.00	8.00	66	10.0	8.0	
Receiver6	6	1	34,561,420.0	13,934,444.0	954.72	5.00	8.00	66	10.0	8.0	
Receiver7	7	1	34,564,504.0	13,932,966.0	931.76	5.00	8.00	66	10.0	8.0	
Receiver8	8	1	34,567,108.0	13,932,457.0	1,118.77	5.00	8.00	66	10.0	8.0	
Receiver9	9	1	34,562,416.0	13,932,938.0	994.09	5.00	8.00	66	10.0	8.0	
Receiver10	10	1	34,561,284.0	13,932,594.0	954.72	5.00	8.00	66	10.0	8.0	
Sonoma Mtn Rd #1	14	1	34,561,008.0	13,933,156.0	931.00	5.00	58.70	66	10.0	8.0	Y
Presley Rd #2	16	1	34,556,212.0	13,932,071.0	710.00	5.00	59.00	66	10.0	8.0	Y

Dudek | **12 April 2016**
M Greene / J Leech | **TNM 2.5**
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 9182
RUN: Belden Barns - Calibration
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver2	2	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver3	3	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver4	4	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver5	5	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver6	6	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver7	7	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver8	8	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver9	9	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Receiver10	10	1	8.0	0.0	66	0.0	10	inactive	0.0	0.0	8	0.0
Sonoma Mtn Rd #1	14	1	58.7	56.4	66	-2.3	10	----	56.4	0.0	8	-8.0
Presley Rd #2	16	1	59.0	58.1	66	-0.9	10	----	58.1	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	12	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek **12 April 2016**
M Greene / J Leech **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Ex ADT Vols Wkdy**

Roadway	Points		Segment									
Name	Name	No.	Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Sonoma Mtn Rd N of Project Site	point1	1	34	40	1	40	0	0	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	34	40	1	40	0	0	0	0	0	0
	point5	5	34	40	1	40	0	0	0	0	0	0
	point6	6	34	40	1	40	0	0	0	0	0	0
	point7	7	34	40	1	40	0	0	0	0	0	0

	point8	8	34	40	1	40	0	0	0	0	0	0
	point9	9	34	40	1	40	0	0	0	0	0	0
	point10	10	34	40	1	40	0	0	0	0	0	0
	point11	11	34	40	1	40	0	0	0	0	0	0
	point4	4	34	40	1	40	0	0	0	0	0	0
	point13	13	34	40	1	40	0	0	0	0	0	0
	point14	14	34	40	1	40	0	0	0	0	0	0
	point15	15	34	40	1	40	0	0	0	0	0	0
	point16	16	34	40	1	40	0	0	0	0	0	0
	point17	17	34	40	1	40	0	0	0	0	0	0
	point18	18	34	40	1	40	0	0	0	0	0	0
	point19	19	34	40	1	40	0	0	0	0	0	0
	point20	20	34	40	1	40	0	0	0	0	0	0
	point21	21	34	40	1	40	0	0	0	0	0	0
	point22	22	34	40	1	40	0	0	0	0	0	0
	point23	23	34	40	1	40	0	0	0	0	0	0
	point24	24	34	40	1	40	0	0	0	0	0	0
	point25	25	34	40	1	40	0	0	0	0	0	0
	point26	26	34	40	1	40	0	0	0	0	0	0
	point27	27	34	40	1	40	0	0	0	0	0	0
	point28	28	34	40	1	40	0	0	0	0	0	0
	point29	29	34	40	1	40	0	0	0	0	0	0
	point30	30	34	40	1	40	0	0	0	0	0	0
	point33	33	34	40	1	40	0	0	0	0	0	0
	point34	34	34	40	1	40	0	0	0	0	0	0
	point35	35	34	40	1	40	0	0	0	0	0	0
	point36	36	34	40	1	40	0	0	0	0	0	0
	point37	37	34	40	1	40	0	0	0	0	0	0
	point38	38	34	40	1	40	0	0	0	0	0	0
	point39	39	34	40	1	40	0	0	0	0	0	0
	point40	40	34	40	1	40	0	0	0	0	0	0
	point32	32										
Sonoma Mtn Rd E of Johnstone Rd	point66	66	43	40	1	40	0	0	0	0	0	0
	point68	68	43	40	1	40	0	0	0	0	0	0
	point69	69	43	40	1	40	0	0	0	0	0	0
	point70	70	43	40	1	40	0	0	0	0	0	0
	point71	71	43	40	1	40	0	0	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes **9182**

		point72	72	43	40	1	40	0	0	0	0	0	0
		point73	73	43	40	1	40	0	0	0	0	0	0
		point74	74	43	40	1	40	0	0	0	0	0	0
		point75	75	43	40	1	40	0	0	0	0	0	0
		point76	76	43	40	1	40	0	0	0	0	0	0
		point77	77	43	40	1	40	0	0	0	0	0	0
		point67	67	43	40	1	40	0	0	0	0	0	0
		point80	80	43	40	1	40	0	0	0	0	0	0
		point81	81	43	40	1	40	0	0	0	0	0	0
		point82	82	43	40	1	40	0	0	0	0	0	0
		point83	83	43	40	1	40	0	0	0	0	0	0
		point84	84	43	40	1	40	0	0	0	0	0	0
		point85	85	43	40	1	40	0	0	0	0	0	0
		point86	86	43	40	1	40	0	0	0	0	0	0
		point87	87	43	40	1	40	0	0	0	0	0	0
		point88	88	43	40	1	40	0	0	0	0	0	0
		point89	89	43	40	1	40	0	0	0	0	0	0
		point90	90	43	40	1	40	0	0	0	0	0	0
		point91	91	43	40	1	40	0	0	0	0	0	0
		point92	92										
Pressley Rd		point100	100	65	30	1	30	1	30	0	0	0	0
		point101	101	65	30	1	30	1	30	0	0	0	0
		point102	102										
Sonoma Mtn Rd N of Presley Rd		point105	105	89	40	2	40	1	40	0	0	0	0
		point106	106										

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: ROADWAYS
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Ex ADT Vols Wkdy**

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average	
		point2	2	34,562,452.0	13,933,494.0	964.57					
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average	
		point54	54	34,561,508.0	13,934,163.0	939.63				Average	
		point55	55	34,561,512.0	13,934,283.0	934.38				Average	
		point56	56	34,561,632.0	13,934,416.0	928.81				Average	
		point57	57	34,561,632.0	13,934,485.0	923.56				Average	
		point58	58	34,561,580.0	13,934,555.0	918.31				Average	
		point59	59	34,561,340.0	13,934,824.0	913.06				Average	
		point60	60	34,561,168.0	13,935,094.0	907.48				Average	
		point61	61	34,561,008.0	13,935,451.0	902.23					
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average	
		point63	63	34,562,412.0	13,934,139.0	958.01					
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average	
		point65	65	34,562,500.0	13,932,968.0	994.09					
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average	
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average	
		point96	96	34,567,276.0	13,932,589.0	1,138.45					
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average	
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average	
		point99	99	34,566,824.0	13,935,195.0	1,092.52					
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average	
		point5	5	34,557,248.0	13,932,625.0	683.40				Average	
		point6	6	34,557,316.0	13,932,595.0	691.27				Average	
		point7	7	34,557,332.0	13,932,592.0	698.82				Average	
		point8	8	34,557,356.0	13,932,564.0	706.69				Average	
		point9	9	34,557,456.0	13,932,556.0	714.24				Average	

		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	
		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	

		point77	77	34,564,384.0	13,933,123.0	946.52				Average	
		point67	67	34,564,444.0	13,932,976.0	944.88				Average	
		point80	80	34,564,496.0	13,932,872.0	944.88				Average	
		point81	81	34,564,540.0	13,932,843.0	959.65				Average	
		point82	82	34,564,884.0	13,932,648.0	974.41				Average	
		point83	83	34,565,084.0	13,932,628.0	989.17				Average	
		point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
		point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
		point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
		point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
		point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
		point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
		point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
		point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
		point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0	point100	100	34,556,884.0	13,932,995.0	676.00				Average	
		point101	101	34,556,552.0	13,932,543.0	692.30				Average	
		point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0	point105	105	34,556,888.0	13,933,004.0	676.00				Average	
		point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Ex ADT Vols Wkdy**

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0	8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0	8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0	8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0	8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0	8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0	8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0	8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0	8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0	8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0	8.0	Y

Dudek | **16 May 2016**
M Greene / J Leech | **TNM 2.5**
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Ex ADT Vols Wkdy**
BARRIER DESIGN: **INPUT HEIGHTS**
ATMOSPHERICS: **68 deg F, 50% RH**

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0.0	30.2	66	30.2	10	----	30.2	0.0	8	-8.0
R2	2	1	0.0	28.3	66	28.3	10	----	28.3	0.0	8	-8.0
R3	3	1	0.0	49.0	66	49.0	10	----	49.0	0.0	8	-8.0
R4	4	1	0.0	43.3	66	43.3	10	----	43.3	0.0	8	-8.0
R5	7	1	0.0	45.0	66	45.0	10	----	45.0	0.0	8	-8.0
R6	9	1	0.0	45.7	66	45.7	10	----	45.7	0.0	8	-8.0
R7	10	1	0.0	46.0	66	46.0	10	----	46.0	0.0	8	-8.0
R8	13	1	0.0	53.4	66	53.4	10	----	53.4	0.0	8	-8.0
R9	15	1	0.0	45.2	66	45.2	10	----	45.2	0.0	8	-8.0
R10	17	1	0.0	37.7	66	37.7	10	----	37.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek					**16 May 2016**							
M Greene / J Leech					**TNM 2.5**							
INPUT: ROADWAYS							**Average pavement type shall be used unless**					
PROJECT/CONTRACT:	**9182**						**a State highway agency substantiates the use**					
RUN:	**BldnBrns ADT Ex wProj Opt1Wkdy**						**of a different type with the approval of FHWA**					
Roadway		**Points**										
Name	**Width**	**Name**	**No.**	**Coordinates (pavement)**			**Flow Control**			**Segment**		
				X	**Y**	**Z**	**Control Device**	**Speed Constraint**	**Percent Vehicles Affected**	**Pvmt Type**	**On Struct?**	
	ft			ft	ft	ft		mph	%			
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average		
		point2	2	34,562,452.0	13,933,494.0	964.57						
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average		
		point54	54	34,561,508.0	13,934,163.0	939.63				Average		
		point55	55	34,561,512.0	13,934,283.0	934.38				Average		
		point56	56	34,561,632.0	13,934,416.0	928.81				Average		
		point57	57	34,561,632.0	13,934,485.0	923.56				Average		
		point58	58	34,561,580.0	13,934,555.0	918.31				Average		
		point59	59	34,561,340.0	13,934,824.0	913.06				Average		
		point60	60	34,561,168.0	13,935,094.0	907.48				Average		
		point61	61	34,561,008.0	13,935,451.0	902.23						
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average		
		point63	63	34,562,412.0	13,934,139.0	958.01						
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average		
		point65	65	34,562,500.0	13,932,968.0	994.09						
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average		
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average		
		point96	96	34,567,276.0	13,932,589.0	1,138.45						
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average		
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average		
		point99	99	34,566,824.0	13,935,195.0	1,092.52						
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average		
		point5	5	34,557,248.0	13,932,625.0	683.40				Average		
		point6	6	34,557,316.0	13,932,595.0	691.27				Average		
		point7	7	34,557,332.0	13,932,592.0	698.82				Average		
		point8	8	34,557,356.0	13,932,564.0	706.69				Average		
		point9	9	34,557,456.0	13,932,556.0	714.24				Average		

		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	
		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	

			point77	77	34,564,384.0	13,933,123.0	946.52				Average	
			point67	67	34,564,444.0	13,932,976.0	944.88				Average	
			point80	80	34,564,496.0	13,932,872.0	944.88				Average	
			point81	81	34,564,540.0	13,932,843.0	959.65				Average	
			point82	82	34,564,884.0	13,932,648.0	974.41				Average	
			point83	83	34,565,084.0	13,932,628.0	989.17				Average	
			point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
			point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
			point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
			point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
			point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
			point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
			point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
			point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
			point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0		point100	100	34,556,884.0	13,932,995.0	676.00				Average	
			point101	101	34,556,552.0	13,932,543.0	692.30				Average	
			point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0		point105	105	34,556,888.0	13,933,004.0	676.00				Average	
			point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek			**16 May 2016**	
M Greene / J Leech			**TNM 2.5**	

INPUT: TRAFFIC FOR LAeq1h Volumes

PROJECT/CONTRACT: **9182**

RUN: **BldnBrns ADT Ex wProj Opt1Wkdy**

Roadway	**Points**											
Name	**Name**	**No.**	**Segment**									
			Autos		**MTrucks**		**HTrucks**		**Buses**		**Motorcycles**	
			V	**S**	**V**	**S**	**V**	**S**	**V**	**S**	**V**	**S**
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Sonoma Mtn Rd N of Project Site	point1	1	41	40	1	40	0	0	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	41	40	1	40	0	0	0	0	0	0
	point5	5	41	40	1	40	0	0	0	0	0	0
	point6	6	41	40	1	40	0	0	0	0	0	0
	point7	7	41	40	1	40	0	0	0	0	0	0

		point8	8	41	40	1	40	0	0	0	0	0	0
		point9	9	41	40	1	40	0	0	0	0	0	0
		point10	10	41	40	1	40	0	0	0	0	0	0
		point11	11	41	40	1	40	0	0	0	0	0	0
		point4	4	41	40	1	40	0	0	0	0	0	0
		point13	13	41	40	1	40	0	0	0	0	0	0
		point14	14	41	40	1	40	0	0	0	0	0	0
		point15	15	41	40	1	40	0	0	0	0	0	0
		point16	16	41	40	1	40	0	0	0	0	0	0
		point17	17	41	40	1	40	0	0	0	0	0	0
		point18	18	41	40	1	40	0	0	0	0	0	0
		point19	19	41	40	1	40	0	0	0	0	0	0
		point20	20	41	40	1	40	0	0	0	0	0	0
		point21	21	41	40	1	40	0	0	0	0	0	0
		point22	22	41	40	1	40	0	0	0	0	0	0
		point23	23	41	40	1	40	0	0	0	0	0	0
		point24	24	41	40	1	40	0	0	0	0	0	0
		point25	25	41	40	1	40	0	0	0	0	0	0
		point26	26	41	40	1	40	0	0	0	0	0	0
		point27	27	41	40	1	40	0	0	0	0	0	0
		point28	28	41	40	1	40	0	0	0	0	0	0
		point29	29	41	40	1	40	0	0	0	0	0	0
		point30	30	41	40	1	40	0	0	0	0	0	0
		point33	33	41	40	1	40	0	0	0	0	0	0
		point34	34	41	40	1	40	0	0	0	0	0	0
		point35	35	41	40	1	40	0	0	0	0	0	0
		point36	36	41	40	1	40	0	0	0	0	0	0
		point37	37	41	40	1	40	0	0	0	0	0	0
		point38	38	41	40	1	40	0	0	0	0	0	0
		point39	39	41	40	1	40	0	0	0	0	0	0
		point40	40	41	40	1	40	0	0	0	0	0	0
		point32	32										
Sonoma Mtn Rd E of Johnstone Rd		point66	66	45	40	1	40	0	0	0	0	0	0
		point68	68	45	40	1	40	0	0	0	0	0	0
		point69	69	45	40	1	40	0	0	0	0	0	0
		point70	70	45	40	1	40	0	0	0	0	0	0
		point71	71	45	40	1	40	0	0	0	0	0	0

	point72	72	45	40	1	40	0	0	0	0	0	0
	point73	73	45	40	1	40	0	0	0	0	0	0
	point74	74	45	40	1	40	0	0	0	0	0	0
	point75	75	45	40	1	40	0	0	0	0	0	0
	point76	76	45	40	1	40	0	0	0	0	0	0
	point77	77	45	40	1	40	0	0	0	0	0	0
	point67	67	45	40	1	40	0	0	0	0	0	0
	point80	80	45	40	1	40	0	0	0	0	0	0
	point81	81	45	40	1	40	0	0	0	0	0	0
	point82	82	45	40	1	40	0	0	0	0	0	0
	point83	83	45	40	1	40	0	0	0	0	0	0
	point84	84	45	40	1	40	0	0	0	0	0	0
	point85	85	45	40	1	40	0	0	0	0	0	0
	point86	86	45	40	1	40	0	0	0	0	0	0
	point87	87	45	40	1	40	0	0	0	0	0	0
	point88	88	45	40	1	40	0	0	0	0	0	0
	point89	89	45	40	1	40	0	0	0	0	0	0
	point90	90	45	40	1	40	0	0	0	0	0	0
	point91	91	45	40	1	40	0	0	0	0	0	0
	point92	92										
Pressley Rd	point100	100	68	30	1	30	1	30	0	0	0	0
	point101	101	68	30	1	30	1	30	0	0	0	0
	point102	102										
Sonoma Mtn Rd N of Presley Rd	point105	105	90	40	2	40	1	40	0	0	0	0
	point106	106										

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: **9182**
RUN: **BldnBrns ADT Ex wProj Opt1Wkdy**

Receiver Name	**No.**	**#DUs**	**Coordinates (ground) X**	**Y**	**Z**	**Height above Ground**	**Input Sound Levels and Criteria Existing LAeq1h**	**Impact Criteria LAeq1h**	**Sub'l**	**NR Goal**	**Active in Calc.**
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0	8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0	8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0	8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0	8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0	8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0	8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0	8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0	8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0	8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0	8.0	Y

Dudek | **16 May 2016**
M Greene / J Leech | **TNM 2.5**
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 9182
RUN: BldnBrns ADT Ex wProj Opt1Wkdy
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0.0	30.6	66	30.6	10	----	30.6	0.0	8	-8.0
R2	2	1	0.0	28.9	66	28.9	10	----	28.9	0.0	8	-8.0
R3	3	1	0.0	49.7	66	49.7	10	----	49.7	0.0	8	-8.0
R4	4	1	0.0	44.0	66	44.0	10	----	44.0	0.0	8	-8.0
R5	7	1	0.0	45.2	66	45.2	10	----	45.2	0.0	8	-8.0
R6	9	1	0.0	45.9	66	45.9	10	----	45.9	0.0	8	-8.0
R7	10	1	0.0	46.7	66	46.7	10	----	46.7	0.0	8	-8.0
R8	13	1	0.0	53.6	66	53.6	10	----	53.6	0.0	8	-8.0
R9	15	1	0.0	45.4	66	45.4	10	----	45.4	0.0	8	-8.0
R10	17	1	0.0	38.4	66	38.4	10	----	38.4	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: ROADWAYS
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Cumltv ADT Vols Wkdy**

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average	
		point2	2	34,562,452.0	13,933,494.0	964.57					
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average	
		point54	54	34,561,508.0	13,934,163.0	939.63				Average	
		point55	55	34,561,512.0	13,934,283.0	934.38				Average	
		point56	56	34,561,632.0	13,934,416.0	928.81				Average	
		point57	57	34,561,632.0	13,934,485.0	923.56				Average	
		point58	58	34,561,580.0	13,934,555.0	918.31				Average	
		point59	59	34,561,340.0	13,934,824.0	913.06				Average	
		point60	60	34,561,168.0	13,935,094.0	907.48				Average	
		point61	61	34,561,008.0	13,935,451.0	902.23					
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average	
		point63	63	34,562,412.0	13,934,139.0	958.01					
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average	
		point65	65	34,562,500.0	13,932,968.0	994.09					
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average	
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average	
		point96	96	34,567,276.0	13,932,589.0	1,138.45					
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average	
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average	
		point99	99	34,566,824.0	13,935,195.0	1,092.52					
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average	
		point5	5	34,557,248.0	13,932,625.0	683.40				Average	
		point6	6	34,557,316.0	13,932,595.0	691.27				Average	
		point7	7	34,557,332.0	13,932,592.0	698.82				Average	
		point8	8	34,557,356.0	13,932,564.0	706.69				Average	
		point9	9	34,557,456.0	13,932,556.0	714.24				Average	

		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	
		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	

			point77	77	34,564,384.0	13,933,123.0	946.52				Average	
			point67	67	34,564,444.0	13,932,976.0	944.88				Average	
			point80	80	34,564,496.0	13,932,872.0	944.88				Average	
			point81	81	34,564,540.0	13,932,843.0	959.65				Average	
			point82	82	34,564,884.0	13,932,648.0	974.41				Average	
			point83	83	34,565,084.0	13,932,628.0	989.17				Average	
			point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
			point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
			point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
			point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
			point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
			point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
			point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
			point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
			point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0		point100	100	34,556,884.0	13,932,995.0	676.00				Average	
			point101	101	34,556,552.0	13,932,543.0	692.30				Average	
			point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0		point105	105	34,556,888.0	13,933,004.0	676.00				Average	
			point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek **12 April 2016**
M Greene / J Leech **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Cumltv ADT Vols Wkdy**

Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Sonoma Mtn Rd N of Project Site	point1	1	56	40	1	40	1	40	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	56	40	1	40	1	40	0	0	0	0
	point5	5	56	40	1	40	1	40	0	0	0	0
	point6	6	56	40	1	40	1	40	0	0	0	0
	point7	7	56	40	1	40	1	40	0	0	0	0

	point8	8	56	40	1	40	1	40	0	0	0	0
	point9	9	56	40	1	40	1	40	0	0	0	0
	point10	10	56	40	1	40	1	40	0	0	0	0
	point11	11	56	40	1	40	1	40	0	0	0	0
	point4	4	56	40	1	40	1	40	0	0	0	0
	point13	13	56	40	1	40	1	40	0	0	0	0
	point14	14	56	40	1	40	1	40	0	0	0	0
	point15	15	56	40	1	40	1	40	0	0	0	0
	point16	16	56	40	1	40	1	40	0	0	0	0
	point17	17	56	40	1	40	1	40	0	0	0	0
	point18	18	56	40	1	40	1	40	0	0	0	0
	point19	19	56	40	1	40	1	40	0	0	0	0
	point20	20	56	40	1	40	1	40	0	0	0	0
	point21	21	56	40	1	40	1	40	0	0	0	0
	point22	22	56	40	1	40	1	40	0	0	0	0
	point23	23	56	40	1	40	1	40	0	0	0	0
	point24	24	56	40	1	40	1	40	0	0	0	0
	point25	25	56	40	1	40	1	40	0	0	0	0
	point26	26	56	40	1	40	1	40	0	0	0	0
	point27	27	56	40	1	40	1	40	0	0	0	0
	point28	28	56	40	1	40	1	40	0	0	0	0
	point29	29	56	40	1	40	1	40	0	0	0	0
	point30	30	56	40	1	40	1	40	0	0	0	0
	point33	33	56	40	1	40	1	40	0	0	0	0
	point34	34	56	40	1	40	1	40	0	0	0	0
	point35	35	56	40	1	40	1	40	0	0	0	0
	point36	36	56	40	1	40	1	40	0	0	0	0
	point37	37	56	40	1	40	1	40	0	0	0	0
	point38	38	56	40	1	40	1	40	0	0	0	0
	point39	39	56	40	1	40	1	40	0	0	0	0
	point40	40	56	40	1	40	1	40	0	0	0	0
	point32	32										
Sonoma Mtn Rd E of Johnstone Rd	point66	66	70	40	1	40	1	40	0	0	0	0
	point68	68	70	40	1	40	1	40	0	0	0	0
	point69	69	70	40	1	40	1	40	0	0	0	0
	point70	70	70	40	1	40	1	40	0	0	0	0
	point71	71	70	40	1	40	1	40	0	0	0	0

	point72	72	70	40	1	40	1	40	0	0	0	0
	point73	73	70	40	1	40	1	40	0	0	0	0
	point74	74	70	40	1	40	1	40	0	0	0	0
	point75	75	70	40	1	40	1	40	0	0	0	0
	point76	76	70	40	1	40	1	40	0	0	0	0
	point77	77	70	40	1	40	1	40	0	0	0	0
	point67	67	70	40	1	40	1	40	0	0	0	0
	point80	80	70	40	1	40	1	40	0	0	0	0
	point81	81	70	40	1	40	1	40	0	0	0	0
	point82	82	70	40	1	40	1	40	0	0	0	0
	point83	83	70	40	1	40	1	40	0	0	0	0
	point84	84	70	40	1	40	1	40	0	0	0	0
	point85	85	70	40	1	40	1	40	0	0	0	0
	point86	86	70	40	1	40	1	40	0	0	0	0
	point87	87	70	40	1	40	1	40	0	0	0	0
	point88	88	70	40	1	40	1	40	0	0	0	0
	point89	89	70	40	1	40	1	40	0	0	0	0
	point90	90	70	40	1	40	1	40	0	0	0	0
	point91	91	70	40	1	40	1	40	0	0	0	0
	point92	92										
Pressley Rd	point100	100	106	30	2	30	1	30	0	0	0	0
	point101	101	106	30	2	30	1	30	0	0	0	0
	point102	102										
Sonoma Mtn Rd N of Presley Rd	point105	105	148	40	3	40	2	40	0	0	0	0
	point106	106										

Dudek						**16 May 2016**						
M Greene / J Leech						**TNM 2.5**						
INPUT: RECEIVERS												
PROJECT/CONTRACT:	**9182**											
RUN:	**Belden Barns - Cumltv ADT Vols Wkdy**											
Receiver												
Name	**No.**	**#DUs**	**Coordinates (ground)**			**Height**	**Input Sound Levels and Criteria**					**Active**
			X	**Y**	**Z**	**above**	**Existing**	**Impact Criteria**			**NR**	**in**
						Ground	**LAeq1h**	**LAeq1h**	**Sub'l**		**Goal**	**Calc.**
			ft	ft	ft	ft	dBA	dBA	dB		dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0		8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0		8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0		8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0		8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0		8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0		8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0		8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0		8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0		8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0		8.0	Y

Dudek | 16 May 2016
M Greene / J Leech | TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 9182
RUN: Belden Barns - Cumltv ADT Vols Wkdy
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h (dBA)	No Barrier LAeq1h Calculated (dBA)	No Barrier LAeq1h Crit'n (dBA)	Increase over existing Calculated (dB)	Increase over existing Crit'n Sub'l Inc (dB)	Type Impact	With Barrier Calculated LAeq1h (dBA)	Noise Reduction Calculated (dB)	Noise Reduction Goal (dB)	Calculated minus Goal (dB)
R1	1	1	0.0	34.1	66	34.1	10	----	34.1	0.0	8	-8.0
R2	2	1	0.0	33.7	66	33.7	10	----	33.7	0.0	8	-8.0
R3	3	1	0.0	52.4	66	52.4	10	----	52.4	0.0	8	-8.0
R4	4	1	0.0	47.2	66	47.2	10	----	47.2	0.0	8	-8.0
R5	7	1	0.0	47.8	66	47.8	10	----	47.8	0.0	8	-8.0
R6	9	1	0.0	49.0	66	49.0	10	----	49.0	0.0	8	-8.0
R7	10	1	0.0	50.3	66	50.3	10	----	50.3	0.0	8	-8.0
R8	13	1	0.0	55.6	66	55.6	10	----	55.6	0.0	8	-8.0
R9	15	1	0.0	47.1	66	47.1	10	----	47.1	0.0	8	-8.0
R10	17	1	0.0	41.6	66	41.6	10	----	41.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min (dB)	Noise Reduction Avg (dB)	Noise Reduction Max (dB)
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek 16 May 2016
M Greene / J Leech TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 9182
RUN: BldnBrns ADTCm w Proj Opt1Wkdy

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average	
		point2	2	34,562,452.0	13,933,494.0	964.57					
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average	
		point54	54	34,561,508.0	13,934,163.0	939.63				Average	
		point55	55	34,561,512.0	13,934,283.0	934.38				Average	
		point56	56	34,561,632.0	13,934,416.0	928.81				Average	
		point57	57	34,561,632.0	13,934,485.0	923.56				Average	
		point58	58	34,561,580.0	13,934,555.0	918.31				Average	
		point59	59	34,561,340.0	13,934,824.0	913.06				Average	
		point60	60	34,561,168.0	13,935,094.0	907.48				Average	
		point61	61	34,561,008.0	13,935,451.0	902.23					
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average	
		point63	63	34,562,412.0	13,934,139.0	958.01					
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average	
		point65	65	34,562,500.0	13,932,968.0	994.09					
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average	
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average	
		point96	96	34,567,276.0	13,932,589.0	1,138.45					
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average	
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average	
		point99	99	34,566,824.0	13,935,195.0	1,092.52					
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average	
		point5	5	34,557,248.0	13,932,625.0	683.40				Average	
		point6	6	34,557,316.0	13,932,595.0	691.27				Average	
		point7	7	34,557,332.0	13,932,592.0	698.82				Average	
		point8	8	34,557,356.0	13,932,564.0	706.69				Average	
		point9	9	34,557,456.0	13,932,556.0	714.24				Average	

		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	
		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	

			point77	77	34,564,384.0	13,933,123.0	946.52				Average	
			point67	67	34,564,444.0	13,932,976.0	944.88				Average	
			point80	80	34,564,496.0	13,932,872.0	944.88				Average	
			point81	81	34,564,540.0	13,932,843.0	959.65				Average	
			point82	82	34,564,884.0	13,932,648.0	974.41				Average	
			point83	83	34,565,084.0	13,932,628.0	989.17				Average	
			point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
			point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
			point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
			point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
			point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
			point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
			point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
			point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
			point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0		point100	100	34,556,884.0	13,932,995.0	676.00				Average	
			point101	101	34,556,552.0	13,932,543.0	692.30				Average	
			point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0		point105	105	34,556,888.0	13,933,004.0	676.00				Average	
			point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Cumltv ADT Vols Wkdy**

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
Sonoma Mtn Rd N of Project Site	point1	1	56	40	1	40	1	40	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	56	40	1	40	1	40	0	0	0	0
	point5	5	56	40	1	40	1	40	0	0	0	0
	point6	6	56	40	1	40	1	40	0	0	0	0
	point7	7	56	40	1	40	1	40	0	0	0	0

		point8	8	56	40	1	40	1	40	0	0	0	0
		point9	9	56	40	1	40	1	40	0	0	0	0
		point10	10	56	40	1	40	1	40	0	0	0	0
		point11	11	56	40	1	40	1	40	0	0	0	0
		point4	4	56	40	1	40	1	40	0	0	0	0
		point13	13	56	40	1	40	1	40	0	0	0	0
		point14	14	56	40	1	40	1	40	0	0	0	0
		point15	15	56	40	1	40	1	40	0	0	0	0
		point16	16	56	40	1	40	1	40	0	0	0	0
		point17	17	56	40	1	40	1	40	0	0	0	0
		point18	18	56	40	1	40	1	40	0	0	0	0
		point19	19	56	40	1	40	1	40	0	0	0	0
		point20	20	56	40	1	40	1	40	0	0	0	0
		point21	21	56	40	1	40	1	40	0	0	0	0
		point22	22	56	40	1	40	1	40	0	0	0	0
		point23	23	56	40	1	40	1	40	0	0	0	0
		point24	24	56	40	1	40	1	40	0	0	0	0
		point25	25	56	40	1	40	1	40	0	0	0	0
		point26	26	56	40	1	40	1	40	0	0	0	0
		point27	27	56	40	1	40	1	40	0	0	0	0
		point28	28	56	40	1	40	1	40	0	0	0	0
		point29	29	56	40	1	40	1	40	0	0	0	0
		point30	30	56	40	1	40	1	40	0	0	0	0
		point33	33	56	40	1	40	1	40	0	0	0	0
		point34	34	56	40	1	40	1	40	0	0	0	0
		point35	35	56	40	1	40	1	40	0	0	0	0
		point36	36	56	40	1	40	1	40	0	0	0	0
		point37	37	56	40	1	40	1	40	0	0	0	0
		point38	38	56	40	1	40	1	40	0	0	0	0
		point39	39	56	40	1	40	1	40	0	0	0	0
		point40	40	56	40	1	40	1	40	0	0	0	0
		point32	32										
Sonoma Mtn Rd E of Johnstone Rd		point66	66	70	40	1	40	1	40	0	0	0	0
		point68	68	70	40	1	40	1	40	0	0	0	0
		point69	69	70	40	1	40	1	40	0	0	0	0
		point70	70	70	40	1	40	1	40	0	0	0	0
		point71	71	70	40	1	40	1	40	0	0	0	0

	point72	72	70	40	1	40	1	40	0	0	0	0
	point73	73	70	40	1	40	1	40	0	0	0	0
	point74	74	70	40	1	40	1	40	0	0	0	0
	point75	75	70	40	1	40	1	40	0	0	0	0
	point76	76	70	40	1	40	1	40	0	0	0	0
	point77	77	70	40	1	40	1	40	0	0	0	0
	point67	67	70	40	1	40	1	40	0	0	0	0
	point80	80	70	40	1	40	1	40	0	0	0	0
	point81	81	70	40	1	40	1	40	0	0	0	0
	point82	82	70	40	1	40	1	40	0	0	0	0
	point83	83	70	40	1	40	1	40	0	0	0	0
	point84	84	70	40	1	40	1	40	0	0	0	0
	point85	85	70	40	1	40	1	40	0	0	0	0
	point86	86	70	40	1	40	1	40	0	0	0	0
	point87	87	70	40	1	40	1	40	0	0	0	0
	point88	88	70	40	1	40	1	40	0	0	0	0
	point89	89	70	40	1	40	1	40	0	0	0	0
	point90	90	70	40	1	40	1	40	0	0	0	0
	point91	91	70	40	1	40	1	40	0	0	0	0
	point92	92										
Pressley Rd	point100	100	106	30	2	30	1	30	0	0	0	0
	point101	101	106	30	2	30	1	30	0	0	0	0
	point102	102										
Sonoma Mtn Rd N of Presley Rd	point105	105	148	40	3	40	2	40	0	0	0	0
	point106	106										

Dudek | **16 May 2016**
M Greene / J Leech | **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: 9182
RUN: BldnBrns ADTCm w Proj Opt1Wkdy

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0	8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0	8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0	8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0	8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0	8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0	8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0	8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0	8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0	8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0	8.0	Y

Dudek — **16 May 2016**

M Greene / J Leech — **TNM 2.5**

Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 9182

RUN: BldnBrns ADTCm w Proj Opt1Wkdy

BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0.0	34.2	66	34.2	10	----	34.2	0.0	8	-8.0
R2	2	1	0.0	33.9	66	33.9	10	----	33.9	0.0	8	-8.0
R3	3	1	0.0	52.7	66	52.7	10	----	52.7	0.0	8	-8.0
R4	4	1	0.0	47.5	66	47.5	10	----	47.5	0.0	8	-8.0
R5	7	1	0.0	47.9	66	47.9	10	----	47.9	0.0	8	-8.0
R6	9	1	0.0	49.1	66	49.1	10	----	49.1	0.0	8	-8.0
R7	10	1	0.0	50.6	66	50.6	10	----	50.6	0.0	8	-8.0
R8	13	1	0.0	55.7	66	55.7	10	----	55.7	0.0	8	-8.0
R9	15	1	0.0	47.2	66	47.2	10	----	47.2	0.0	8	-8.0
R10	17	1	0.0	41.8	66	41.8	10	----	41.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: ROADWAYS
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Ex ADT Vols Wknd**

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average	
		point2	2	34,562,452.0	13,933,494.0	964.57					
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average	
		point54	54	34,561,508.0	13,934,163.0	939.63				Average	
		point55	55	34,561,512.0	13,934,283.0	934.38				Average	
		point56	56	34,561,632.0	13,934,416.0	928.81				Average	
		point57	57	34,561,632.0	13,934,485.0	923.56				Average	
		point58	58	34,561,580.0	13,934,555.0	918.31				Average	
		point59	59	34,561,340.0	13,934,824.0	913.06				Average	
		point60	60	34,561,168.0	13,935,094.0	907.48				Average	
		point61	61	34,561,008.0	13,935,451.0	902.23					
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average	
		point63	63	34,562,412.0	13,934,139.0	958.01					
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average	
		point65	65	34,562,500.0	13,932,968.0	994.09					
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average	
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average	
		point96	96	34,567,276.0	13,932,589.0	1,138.45					
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average	
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average	
		point99	99	34,566,824.0	13,935,195.0	1,092.52					
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average	
		point5	5	34,557,248.0	13,932,625.0	683.40				Average	
		point6	6	34,557,316.0	13,932,595.0	691.27				Average	
		point7	7	34,557,332.0	13,932,592.0	698.82				Average	
		point8	8	34,557,356.0	13,932,564.0	706.69				Average	
		point9	9	34,557,456.0	13,932,556.0	714.24				Average	

			point10	10	34,557,632.0	13,932,538.0	722.11				Average	
			point11	11	34,557,840.0	13,932,525.0	729.66				Average	
			point4	4	34,557,888.0	13,932,538.0	737.20				Average	
			point13	13	34,558,020.0	13,932,544.0	745.08				Average	
			point14	14	34,558,052.0	13,932,561.0	741.47				Average	
			point15	15	34,558,192.0	13,932,625.0	744.75				Average	
			point16	16	34,558,492.0	13,932,759.0	754.59				Average	
			point17	17	34,558,580.0	13,932,797.0	764.44				Average	
			point18	18	34,558,676.0	13,932,825.0	783.46				Average	
			point19	19	34,558,792.0	13,932,830.0	791.01				Average	
			point20	20	34,558,872.0	13,932,830.0	798.88				Average	
			point21	21	34,558,964.0	13,932,808.0	806.43				Average	
			point22	22	34,559,048.0	13,932,762.0	814.30				Average	
			point23	23	34,559,128.0	13,932,723.0	821.85				Average	
			point24	24	34,559,200.0	13,932,687.0	829.72				Average	
			point25	25	34,559,300.0	13,932,664.0	837.27				Average	
			point26	26	34,559,456.0	13,932,661.0	844.82				Average	
			point27	27	34,559,560.0	13,932,661.0	852.69				Average	
			point28	28	34,559,612.0	13,932,672.0	860.24				Average	
			point29	29	34,560,008.0	13,932,833.0	868.11				Average	
			point30	30	34,560,228.0	13,932,953.0	875.66				Average	
			point33	33	34,560,324.0	13,933,000.0	883.53				Average	
			point34	34	34,560,388.0	13,933,040.0	891.08				Average	
			point35	35	34,560,452.0	13,933,046.0	898.62				Average	
			point36	36	34,560,556.0	13,933,054.0	906.50				Average	
			point37	37	34,560,704.0	13,933,074.0	914.04				Average	
			point38	38	34,560,868.0	13,933,087.0	921.92				Average	
			point39	39	34,560,976.0	13,933,122.0	929.46				Average	
			point40	40	34,561,160.0	13,933,250.0	937.34				Average	
			point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0		point66	66	34,562,456.0	13,933,497.0	964.57				Average	
			point68	68	34,562,744.0	13,933,476.0	962.93				Average	
			point69	69	34,562,788.0	13,933,488.0	960.96				Average	
			point70	70	34,563,144.0	13,933,611.0	959.32				Average	
			point71	71	34,563,276.0	13,933,624.0	957.35				Average	
			point72	72	34,563,496.0	13,933,634.0	955.71				Average	
			point73	73	34,563,608.0	13,933,581.0	953.74				Average	
			point74	74	34,563,952.0	13,933,299.0	952.10				Average	
			point75	75	34,564,188.0	13,933,256.0	950.13				Average	
			point76	76	34,564,296.0	13,933,212.0	948.49				Average	

		point77	77	34,564,384.0	13,933,123.0	946.52				Average	
		point67	67	34,564,444.0	13,932,976.0	944.88				Average	
		point80	80	34,564,496.0	13,932,872.0	944.88				Average	
		point81	81	34,564,540.0	13,932,843.0	959.65				Average	
		point82	82	34,564,884.0	13,932,648.0	974.41				Average	
		point83	83	34,565,084.0	13,932,628.0	989.17				Average	
		point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
		point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
		point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
		point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
		point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
		point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
		point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
		point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
		point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0	point100	100	34,556,884.0	13,932,995.0	676.00				Average	
		point101	101	34,556,552.0	13,932,543.0	692.30				Average	
		point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0	point105	105	34,556,888.0	13,933,004.0	676.00				Average	
		point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Ex ADT Vols Wknd**

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
Sonoma Mtn Rd N of Project Site	point1	1	27	40	1	40	0	0	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	27	40	1	40	0	0	0	0	0	0
	point5	5	27	40	1	40	0	0	0	0	0	0
	point6	6	27	40	1	40	0	0	0	0	0	0
	point7	7	27	40	1	40	0	0	0	0	0	0

	point8	8	27	40	1	40	0	0	0	0	0	0
	point9	9	27	40	1	40	0	0	0	0	0	0
	point10	10	27	40	1	40	0	0	0	0	0	0
	point11	11	27	40	1	40	0	0	0	0	0	0
	point4	4	27	40	1	40	0	0	0	0	0	0
	point13	13	27	40	1	40	0	0	0	0	0	0
	point14	14	27	40	1	40	0	0	0	0	0	0
	point15	15	27	40	1	40	0	0	0	0	0	0
	point16	16	27	40	1	40	0	0	0	0	0	0
	point17	17	27	40	1	40	0	0	0	0	0	0
	point18	18	27	40	1	40	0	0	0	0	0	0
	point19	19	27	40	1	40	0	0	0	0	0	0
	point20	20	27	40	1	40	0	0	0	0	0	0
	point21	21	27	40	1	40	0	0	0	0	0	0
	point22	22	27	40	1	40	0	0	0	0	0	0
	point23	23	27	40	1	40	0	0	0	0	0	0
	point24	24	27	40	1	40	0	0	0	0	0	0
	point25	25	27	40	1	40	0	0	0	0	0	0
	point26	26	27	40	1	40	0	0	0	0	0	0
	point27	27	27	40	1	40	0	0	0	0	0	0
	point28	28	27	40	1	40	0	0	0	0	0	0
	point29	29	27	40	1	40	0	0	0	0	0	0
	point30	30	27	40	1	40	0	0	0	0	0	0
	point33	33	27	40	1	40	0	0	0	0	0	0
	point34	34	27	40	1	40	0	0	0	0	0	0
	point35	35	27	40	1	40	0	0	0	0	0	0
	point36	36	27	40	1	40	0	0	0	0	0	0
	point37	37	27	40	1	40	0	0	0	0	0	0
	point38	38	27	40	1	40	0	0	0	0	0	0
	point39	39	27	40	1	40	0	0	0	0	0	0
	point40	40	27	40	1	40	0	0	0	0	0	0
	point32	32										
Sonoma Mtn Rd E of Johnstone Rd	point66	66	37	40	1	40	0	0	0	0	0	0
	point68	68	37	40	1	40	0	0	0	0	0	0
	point69	69	37	40	1	40	0	0	0	0	0	0
	point70	70	37	40	1	40	0	0	0	0	0	0
	point71	71	37	40	1	40	0	0	0	0	0	0

		point72	72	37	40	1	40	0	0	0	0	0	0
		point73	73	37	40	1	40	0	0	0	0	0	0
		point74	74	37	40	1	40	0	0	0	0	0	0
		point75	75	37	40	1	40	0	0	0	0	0	0
		point76	76	37	40	1	40	0	0	0	0	0	0
		point77	77	37	40	1	40	0	0	0	0	0	0
		point67	67	37	40	1	40	0	0	0	0	0	0
		point80	80	37	40	1	40	0	0	0	0	0	0
		point81	81	37	40	1	40	0	0	0	0	0	0
		point82	82	37	40	1	40	0	0	0	0	0	0
		point83	83	37	40	1	40	0	0	0	0	0	0
		point84	84	37	40	1	40	0	0	0	0	0	0
		point85	85	37	40	1	40	0	0	0	0	0	0
		point86	86	37	40	1	40	0	0	0	0	0	0
		point87	87	37	40	1	40	0	0	0	0	0	0
		point88	88	37	40	1	40	0	0	0	0	0	0
		point89	89	37	40	1	40	0	0	0	0	0	0
		point90	90	37	40	1	40	0	0	0	0	0	0
		point91	91	37	40	1	40	0	0	0	0	0	0
		point92	92										
Pressley Rd		point100	100	53	30	1	30	1	30	0	0	0	0
		point101	101	53	30	1	30	1	30	0	0	0	0
		point102	102										
Sonoma Mtn Rd N of Presley Rd		point105	105	85	40	2	40	1	40	0	0	0	0
		point106	106										

Dudek						**16 May 2016**					
M Greene / J Leech						**TNM 2.5**					
INPUT: RECEIVERS											
PROJECT/CONTRACT:	**9182**										
RUN:	**Belden Barns - Ex ADT Vols Wknd**										
Receiver											
Name	**No.**	**#DUs**	**Coordinates (ground)**			**Height**	**Input Sound Levels and Criteria**				**Active**
			X	**Y**	**Z**	**above**	**Existing**	**Impact Criteria**		**NR**	**in**
						Ground	**LAeq1h**	**LAeq1h**	**Sub'l**	**Goal**	**Calc.**
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0	8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0	8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0	8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0	8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0	8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0	8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0	8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0	8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0	8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0	8.0	Y

Dudek
M Greene / J Leech

16 May 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 9182
RUN: Belden Barns - Ex ADT Vols Wknd
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0.0	29.6	66	29.6	10	----	29.6	0.0	8	-8.0
R2	2	1	0.0	27.5	66	27.5	10	----	27.5	0.0	8	-8.0
R3	3	1	0.0	48.1	66	48.1	10	----	48.1	0.0	8	-8.0
R4	4	1	0.0	42.5	66	42.5	10	----	42.5	0.0	8	-8.0
R5	7	1	0.0	44.4	66	44.4	10	----	44.4	0.0	8	-8.0
R6	9	1	0.0	45.2	66	45.2	10	----	45.2	0.0	8	-8.0
R7	10	1	0.0	45.2	66	45.2	10	----	45.2	0.0	8	-8.0
R8	13	1	0.0	53.1	66	53.1	10	----	53.1	0.0	8	-8.0
R9	15	1	0.0	44.7	66	44.7	10	----	44.7	0.0	8	-8.0
R10	17	1	0.0	36.9	66	36.9	10	----	36.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: ROADWAYS
PROJECT/CONTRACT: **9182**
RUN: **BldnBrns ADTVols Ex w Proj Opt1 Wkn**

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average	
		point2	2	34,562,452.0	13,933,494.0	964.57					
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average	
		point54	54	34,561,508.0	13,934,163.0	939.63				Average	
		point55	55	34,561,512.0	13,934,283.0	934.38				Average	
		point56	56	34,561,632.0	13,934,416.0	928.81				Average	
		point57	57	34,561,632.0	13,934,485.0	923.56				Average	
		point58	58	34,561,580.0	13,934,555.0	918.31				Average	
		point59	59	34,561,340.0	13,934,824.0	913.06				Average	
		point60	60	34,561,168.0	13,935,094.0	907.48				Average	
		point61	61	34,561,008.0	13,935,451.0	902.23					
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average	
		point63	63	34,562,412.0	13,934,139.0	958.01					
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average	
		point65	65	34,562,500.0	13,932,968.0	994.09					
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average	
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average	
		point96	96	34,567,276.0	13,932,589.0	1,138.45					
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average	
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average	
		point99	99	34,566,824.0	13,935,195.0	1,092.52					
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average	
		point5	5	34,557,248.0	13,932,625.0	683.40				Average	
		point6	6	34,557,316.0	13,932,595.0	691.27				Average	
		point7	7	34,557,332.0	13,932,592.0	698.82				Average	
		point8	8	34,557,356.0	13,932,564.0	706.69				Average	
		point9	9	34,557,456.0	13,932,556.0	714.24				Average	

		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	
		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	

		point77	77	34,564,384.0	13,933,123.0	946.52				Average	
		point67	67	34,564,444.0	13,932,976.0	944.88				Average	
		point80	80	34,564,496.0	13,932,872.0	944.88				Average	
		point81	81	34,564,540.0	13,932,843.0	959.65				Average	
		point82	82	34,564,884.0	13,932,648.0	974.41				Average	
		point83	83	34,565,084.0	13,932,628.0	989.17				Average	
		point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
		point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
		point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
		point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
		point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
		point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
		point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
		point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
		point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0	point100	100	34,556,884.0	13,932,995.0	676.00				Average	
		point101	101	34,556,552.0	13,932,543.0	692.30				Average	
		point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0	point105	105	34,556,888.0	13,933,004.0	676.00				Average	
		point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **9182**
RUN: **BldnBrns ADTVols Ex w Proj Opt1 Wkn**

Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Sonoma Mtn Rd N of Project Site	point1	1	34	40	1	40	0	0	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	34	40	1	40	0	0	0	0	0	0
	point5	5	34	40	1	40	0	0	0	0	0	0
	point6	6	34	40	1	40	0	0	0	0	0	0
	point7	7	34	40	1	40	0	0	0	0	0	0

		point8	8	34	40	1	40	0	0	0	0	0	0
		point9	9	34	40	1	40	0	0	0	0	0	0
		point10	10	34	40	1	40	0	0	0	0	0	0
		point11	11	34	40	1	40	0	0	0	0	0	0
		point4	4	34	40	1	40	0	0	0	0	0	0
		point13	13	34	40	1	40	0	0	0	0	0	0
		point14	14	34	40	1	40	0	0	0	0	0	0
		point15	15	34	40	1	40	0	0	0	0	0	0
		point16	16	34	40	1	40	0	0	0	0	0	0
		point17	17	34	40	1	40	0	0	0	0	0	0
		point18	18	34	40	1	40	0	0	0	0	0	0
		point19	19	34	40	1	40	0	0	0	0	0	0
		point20	20	34	40	1	40	0	0	0	0	0	0
		point21	21	34	40	1	40	0	0	0	0	0	0
		point22	22	34	40	1	40	0	0	0	0	0	0
		point23	23	34	40	1	40	0	0	0	0	0	0
		point24	24	34	40	1	40	0	0	0	0	0	0
		point25	25	34	40	1	40	0	0	0	0	0	0
		point26	26	34	40	1	40	0	0	0	0	0	0
		point27	27	34	40	1	40	0	0	0	0	0	0
		point28	28	34	40	1	40	0	0	0	0	0	0
		point29	29	34	40	1	40	0	0	0	0	0	0
		point30	30	34	40	1	40	0	0	0	0	0	0
		point33	33	34	40	1	40	0	0	0	0	0	0
		point34	34	34	40	1	40	0	0	0	0	0	0
		point35	35	34	40	1	40	0	0	0	0	0	0
		point36	36	34	40	1	40	0	0	0	0	0	0
		point37	37	34	40	1	40	0	0	0	0	0	0
		point38	38	34	40	1	40	0	0	0	0	0	0
		point39	39	34	40	1	40	0	0	0	0	0	0
		point40	40	34	40	1	40	0	0	0	0	0	0
		point32	32										
Sonoma Mtn Rd E of Johnstone Rd		point66	66	40	40	1	40	0	0	0	0	0	0
		point68	68	40	40	1	40	0	0	0	0	0	0
		point69	69	40	40	1	40	0	0	0	0	0	0
		point70	70	40	40	1	40	0	0	0	0	0	0
		point71	71	40	40	1	40	0	0	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes **9182**

		point72	72	40	40	1	40	0	0	0	0	0	0
		point73	73	40	40	1	40	0	0	0	0	0	0
		point74	74	40	40	1	40	0	0	0	0	0	0
		point75	75	40	40	1	40	0	0	0	0	0	0
		point76	76	40	40	1	40	0	0	0	0	0	0
		point77	77	40	40	1	40	0	0	0	0	0	0
		point67	67	40	40	1	40	0	0	0	0	0	0
		point80	80	40	40	1	40	0	0	0	0	0	0
		point81	81	40	40	1	40	0	0	0	0	0	0
		point82	82	40	40	1	40	0	0	0	0	0	0
		point83	83	40	40	1	40	0	0	0	0	0	0
		point84	84	40	40	1	40	0	0	0	0	0	0
		point85	85	40	40	1	40	0	0	0	0	0	0
		point86	86	40	40	1	40	0	0	0	0	0	0
		point87	87	40	40	1	40	0	0	0	0	0	0
		point88	88	40	40	1	40	0	0	0	0	0	0
		point89	89	40	40	1	40	0	0	0	0	0	0
		point90	90	40	40	1	40	0	0	0	0	0	0
		point91	91	40	40	1	40	0	0	0	0	0	0
		point92	92										
Pressley Rd		point100	100	57	30	1	30	1	30	0	0	0	0
		point101	101	57	30	1	30	1	30	0	0	0	0
		point102	102										
Sonoma Mtn Rd N of Presley Rd		point105	105	86	40	2	40	1	40	0	0	0	0
		point106	106										

Dudek						**16 May 2016**						
M Greene / J Leech						**TNM 2.5**						
INPUT: RECEIVERS												
PROJECT/CONTRACT:	**9182**											
RUN:	**BldnBrns ADTVols Ex w Proj Opt1 Wkn**											
Receiver												
Name	**No.**	**#DUs**	**Coordinates (ground)**			**Height**	**Input Sound Levels and Criteria**					**Active**
			X	**Y**	**Z**	**above**	**Existing**	**Impact Criteria**			**NR**	**in**
						Ground	**LAeq1h**	**LAeq1h**	**Sub'l**		**Goal**	**Calc.**
			ft	ft	ft	ft	dBA	dBA	dB		dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0		8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0		8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0		8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0		8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0		8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0		8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0		8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0		8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0		8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0		8.0	Y

Dudek | **16 May 2016**
M Greene / J Leech | **TNM 2.5**
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 9182
RUN: BldnBrns ADTVols Ex w Proj Opt1 Wkn
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0.0	30.1	66	30.1	10	----	30.1	0.0	8	-8.0
R2	2	1	0.0	28.2	66	28.2	10	----	28.2	0.0	8	-8.0
R3	3	1	0.0	49.0	66	49.0	10	----	49.0	0.0	8	-8.0
R4	4	1	0.0	43.3	66	43.3	10	----	43.3	0.0	8	-8.0
R5	7	1	0.0	44.7	66	44.7	10	----	44.7	0.0	8	-8.0
R6	9	1	0.0	45.4	66	45.4	10	----	45.4	0.0	8	-8.0
R7	10	1	0.0	46.0	66	46.0	10	----	46.0	0.0	8	-8.0
R8	13	1	0.0	53.2	66	53.2	10	----	53.2	0.0	8	-8.0
R9	15	1	0.0	44.9	66	44.9	10	----	44.9	0.0	8	-8.0
R10	17	1	0.0	37.7	66	37.7	10	----	37.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: ROADWAYS
PROJECT/CONTRACT: **9182**
RUN: **BldnBrns ADT Ex w Proj Opt2 Wkn**

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average	
		point2	2	34,562,452.0	13,933,494.0	964.57					
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average	
		point54	54	34,561,508.0	13,934,163.0	939.63				Average	
		point55	55	34,561,512.0	13,934,283.0	934.38				Average	
		point56	56	34,561,632.0	13,934,416.0	928.81				Average	
		point57	57	34,561,632.0	13,934,485.0	923.56				Average	
		point58	58	34,561,580.0	13,934,555.0	918.31				Average	
		point59	59	34,561,340.0	13,934,824.0	913.06				Average	
		point60	60	34,561,168.0	13,935,094.0	907.48				Average	
		point61	61	34,561,008.0	13,935,451.0	902.23					
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average	
		point63	63	34,562,412.0	13,934,139.0	958.01					
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average	
		point65	65	34,562,500.0	13,932,968.0	994.09					
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average	
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average	
		point96	96	34,567,276.0	13,932,589.0	1,138.45					
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average	
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average	
		point99	99	34,566,824.0	13,935,195.0	1,092.52					
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average	
		point5	5	34,557,248.0	13,932,625.0	683.40				Average	
		point6	6	34,557,316.0	13,932,595.0	691.27				Average	
		point7	7	34,557,332.0	13,932,592.0	698.82				Average	
		point8	8	34,557,356.0	13,932,564.0	706.69				Average	
		point9	9	34,557,456.0	13,932,556.0	714.24				Average	

		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	
		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	

			point77	77	34,564,384.0	13,933,123.0	946.52				Average	
			point67	67	34,564,444.0	13,932,976.0	944.88				Average	
			point80	80	34,564,496.0	13,932,872.0	944.88				Average	
			point81	81	34,564,540.0	13,932,843.0	959.65				Average	
			point82	82	34,564,884.0	13,932,648.0	974.41				Average	
			point83	83	34,565,084.0	13,932,628.0	989.17				Average	
			point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
			point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
			point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
			point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
			point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
			point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
			point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
			point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
			point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0		point100	100	34,556,884.0	13,932,995.0	676.00				Average	
			point101	101	34,556,552.0	13,932,543.0	692.30				Average	
			point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0		point105	105	34,556,888.0	13,933,004.0	676.00				Average	
			point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **9182**
RUN: **BldnBrns ADT Ex w Proj Opt2 Wkn**

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
Sonoma Mtn Rd N of Project Site	point1	1	38	40	1	40	0	0	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	38	40	1	40	0	0	0	0	0	0
	point5	5	38	40	1	40	0	0	0	0	0	0
	point6	6	38	40	1	40	0	0	0	0	0	0
	point7	7	38	40	1	40	0	0	0	0	0	0

	point8	8	38	40	1	40	0	0	0	0	0	0
	point9	9	38	40	1	40	0	0	0	0	0	0
	point10	10	38	40	1	40	0	0	0	0	0	0
	point11	11	38	40	1	40	0	0	0	0	0	0
	point4	4	38	40	1	40	0	0	0	0	0	0
	point13	13	38	40	1	40	0	0	0	0	0	0
	point14	14	38	40	1	40	0	0	0	0	0	0
	point15	15	38	40	1	40	0	0	0	0	0	0
	point16	16	38	40	1	40	0	0	0	0	0	0
	point17	17	38	40	1	40	0	0	0	0	0	0
	point18	18	38	40	1	40	0	0	0	0	0	0
	point19	19	38	40	1	40	0	0	0	0	0	0
	point20	20	38	40	1	40	0	0	0	0	0	0
	point21	21	38	40	1	40	0	0	0	0	0	0
	point22	22	38	40	1	40	0	0	0	0	0	0
	point23	23	38	40	1	40	0	0	0	0	0	0
	point24	24	38	40	1	40	0	0	0	0	0	0
	point25	25	38	40	1	40	0	0	0	0	0	0
	point26	26	38	40	1	40	0	0	0	0	0	0
	point27	27	38	40	1	40	0	0	0	0	0	0
	point28	28	38	40	1	40	0	0	0	0	0	0
	point29	29	38	40	1	40	0	0	0	0	0	0
	point30	30	38	40	1	40	0	0	0	0	0	0
	point33	33	38	40	1	40	0	0	0	0	0	0
	point34	34	38	40	1	40	0	0	0	0	0	0
	point35	35	38	40	1	40	0	0	0	0	0	0
	point36	36	38	40	1	40	0	0	0	0	0	0
	point37	37	38	40	1	40	0	0	0	0	0	0
	point38	38	38	40	1	40	0	0	0	0	0	0
	point39	39	38	40	1	40	0	0	0	0	0	0
	point40	40	38	40	1	40	0	0	0	0	0	0
	point32	32										
Sonoma Mtn Rd E of Johnstone Rd	point66	66	41	40	1	40	0	0	0	0	0	0
	point68	68	41	40	1	40	0	0	0	0	0	0
	point69	69	41	40	1	40	0	0	0	0	0	0
	point70	70	41	40	1	40	0	0	0	0	0	0
	point71	71	41	40	1	40	0	0	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes **9182**

	point72	72	41	40	1	40	0	0	0	0	0	0
	point73	73	41	40	1	40	0	0	0	0	0	0
	point74	74	41	40	1	40	0	0	0	0	0	0
	point75	75	41	40	1	40	0	0	0	0	0	0
	point76	76	41	40	1	40	0	0	0	0	0	0
	point77	77	41	40	1	40	0	0	0	0	0	0
	point67	67	41	40	1	40	0	0	0	0	0	0
	point80	80	41	40	1	40	0	0	0	0	0	0
	point81	81	41	40	1	40	0	0	0	0	0	0
	point82	82	41	40	1	40	0	0	0	0	0	0
	point83	83	41	40	1	40	0	0	0	0	0	0
	point84	84	41	40	1	40	0	0	0	0	0	0
	point85	85	41	40	1	40	0	0	0	0	0	0
	point86	86	41	40	1	40	0	0	0	0	0	0
	point87	87	41	40	1	40	0	0	0	0	0	0
	point88	88	41	40	1	40	0	0	0	0	0	0
	point89	89	41	40	1	40	0	0	0	0	0	0
	point90	90	41	40	1	40	0	0	0	0	0	0
	point91	91	41	40	1	40	0	0	0	0	0	0
	point92	92										
Pressley Rd	point100	100	59	30	1	30	1	30	0	0	0	0
	point101	101	59	30	1	30	1	30	0	0	0	0
	point102	102										
Sonoma Mtn Rd N of Presley Rd	point105	105	84	40	2	40	1	40	0	0	0	0
	point106	106										

Dudek 16 May 2016
M Greene / J Leech TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 9182
RUN: BldnBrns ADT Ex w Proj Opt2 Wkn

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0	8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0	8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0	8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0	8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0	8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0	8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0	8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0	8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0	8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0	8.0	Y

Dudek 16 May 2016
M Greene / J Leech TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 9182
RUN: BldnBrns ADT Ex w Proj Opt2 Wkn
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0.0	30.3	66	30.3	10	----	30.3	0.0	8	-8.0
R2	2	1	0.0	28.6	66	28.6	10	----	28.6	0.0	8	-8.0
R3	3	1	0.0	49.4	66	49.4	10	----	49.4	0.0	8	-8.0
R4	4	1	0.0	43.7	66	43.7	10	----	43.7	0.0	8	-8.0
R5	7	1	0.0	44.8	66	44.8	10	----	44.8	0.0	8	-8.0
R6	9	1	0.0	45.5	66	45.5	10	----	45.5	0.0	8	-8.0
R7	10	1	0.0	46.4	66	46.4	10	----	46.4	0.0	8	-8.0
R8	13	1	0.0	53.3	66	53.3	10	----	53.3	0.0	8	-8.0
R9	15	1	0.0	45.0	66	45.0	10	----	45.0	0.0	8	-8.0
R10	17	1	0.0	38.1	66	38.1	10	----	38.1	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: ROADWAYS
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Cumltv ADT Vols Wknd**

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average	
		point2	2	34,562,452.0	13,933,494.0	964.57					
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average	
		point54	54	34,561,508.0	13,934,163.0	939.63				Average	
		point55	55	34,561,512.0	13,934,283.0	934.38				Average	
		point56	56	34,561,632.0	13,934,416.0	928.81				Average	
		point57	57	34,561,632.0	13,934,485.0	923.56				Average	
		point58	58	34,561,580.0	13,934,555.0	918.31				Average	
		point59	59	34,561,340.0	13,934,824.0	913.06				Average	
		point60	60	34,561,168.0	13,935,094.0	907.48				Average	
		point61	61	34,561,008.0	13,935,451.0	902.23					
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average	
		point63	63	34,562,412.0	13,934,139.0	958.01					
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average	
		point65	65	34,562,500.0	13,932,968.0	994.09					
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average	
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average	
		point96	96	34,567,276.0	13,932,589.0	1,138.45					
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average	
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average	
		point99	99	34,566,824.0	13,935,195.0	1,092.52					
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average	
		point5	5	34,557,248.0	13,932,625.0	683.40				Average	
		point6	6	34,557,316.0	13,932,595.0	691.27				Average	
		point7	7	34,557,332.0	13,932,592.0	698.82				Average	
		point8	8	34,557,356.0	13,932,564.0	706.69				Average	
		point9	9	34,557,456.0	13,932,556.0	714.24				Average	

		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	
		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	

			point77	77	34,564,384.0	13,933,123.0	946.52				Average	
			point67	67	34,564,444.0	13,932,976.0	944.88				Average	
			point80	80	34,564,496.0	13,932,872.0	944.88				Average	
			point81	81	34,564,540.0	13,932,843.0	959.65				Average	
			point82	82	34,564,884.0	13,932,648.0	974.41				Average	
			point83	83	34,565,084.0	13,932,628.0	989.17				Average	
			point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
			point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
			point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
			point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
			point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
			point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
			point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
			point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
			point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0		point100	100	34,556,884.0	13,932,995.0	676.00				Average	
			point101	101	34,556,552.0	13,932,543.0	692.30				Average	
			point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0		point105	105	34,556,888.0	13,933,004.0	676.00				Average	
			point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Cumltv ADT Vols Wknd**

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
Sonoma Mtn Rd N of Project Site	point1	1	44	40	1	40	0	0	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	44	40	1	40	0	0	0	0	0	0
	point5	5	44	40	1	40	0	0	0	0	0	0
	point6	6	44	40	1	40	0	0	0	0	0	0
	point7	7	44	40	1	40	0	0	0	0	0	0

	point8	8	44	40	1	40	0	0	0	0	0	0
	point9	9	44	40	1	40	0	0	0	0	0	0
	point10	10	44	40	1	40	0	0	0	0	0	0
	point11	11	44	40	1	40	0	0	0	0	0	0
	point4	4	44	40	1	40	0	0	0	0	0	0
	point13	13	44	40	1	40	0	0	0	0	0	0
	point14	14	44	40	1	40	0	0	0	0	0	0
	point15	15	44	40	1	40	0	0	0	0	0	0
	point16	16	44	40	1	40	0	0	0	0	0	0
	point17	17	44	40	1	40	0	0	0	0	0	0
	point18	18	44	40	1	40	0	0	0	0	0	0
	point19	19	44	40	1	40	0	0	0	0	0	0
	point20	20	44	40	1	40	0	0	0	0	0	0
	point21	21	44	40	1	40	0	0	0	0	0	0
	point22	22	44	40	1	40	0	0	0	0	0	0
	point23	23	44	40	1	40	0	0	0	0	0	0
	point24	24	44	40	1	40	0	0	0	0	0	0
	point25	25	44	40	1	40	0	0	0	0	0	0
	point26	26	44	40	1	40	0	0	0	0	0	0
	point27	27	44	40	1	40	0	0	0	0	0	0
	point28	28	44	40	1	40	0	0	0	0	0	0
	point29	29	44	40	1	40	0	0	0	0	0	0
	point30	30	44	40	1	40	0	0	0	0	0	0
	point33	33	44	40	1	40	0	0	0	0	0	0
	point34	34	44	40	1	40	0	0	0	0	0	0
	point35	35	44	40	1	40	0	0	0	0	0	0
	point36	36	44	40	1	40	0	0	0	0	0	0
	point37	37	44	40	1	40	0	0	0	0	0	0
	point38	38	44	40	1	40	0	0	0	0	0	0
	point39	39	44	40	1	40	0	0	0	0	0	0
	point40	40	44	40	1	40	0	0	0	0	0	0
	point32	32										
Sonoma Mtn Rd E of Johnstone Rd	point66	66	61	40	1	40	1	40	0	0	0	0
	point68	68	61	40	1	40	1	40	0	0	0	0
	point69	69	61	40	1	40	1	40	0	0	0	0
	point70	70	61	40	1	40	1	40	0	0	0	0
	point71	71	61	40	1	40	1	40	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes **9182**

		point72	72	61	40	1	40	1	40	0	0	0	0
		point73	73	61	40	1	40	1	40	0	0	0	0
		point74	74	61	40	1	40	1	40	0	0	0	0
		point75	75	61	40	1	40	1	40	0	0	0	0
		point76	76	61	40	1	40	1	40	0	0	0	0
		point77	77	61	40	1	40	1	40	0	0	0	0
		point67	67	61	40	1	40	1	40	0	0	0	0
		point80	80	61	40	1	40	1	40	0	0	0	0
		point81	81	61	40	1	40	1	40	0	0	0	0
		point82	82	61	40	1	40	1	40	0	0	0	0
		point83	83	61	40	1	40	1	40	0	0	0	0
		point84	84	61	40	1	40	1	40	0	0	0	0
		point85	85	61	40	1	40	1	40	0	0	0	0
		point86	86	61	40	1	40	1	40	0	0	0	0
		point87	87	61	40	1	40	1	40	0	0	0	0
		point88	88	61	40	1	40	1	40	0	0	0	0
		point89	89	61	40	1	40	1	40	0	0	0	0
		point90	90	61	40	1	40	1	40	0	0	0	0
		point91	91	61	40	1	40	1	40	0	0	0	0
		point92	92										
Pressley Rd		point100	100	87	30	2	30	1	30	0	0	0	0
		point101	101	87	30	2	30	1	30	0	0	0	0
		point102	102										
Sonoma Mtn Rd N of Presley Rd		point105	105	141	40	3	40	1	40	0	0	0	0
		point106	106										

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: **9182**
RUN: **Belden Barns - Cumltv ADT Vols Wknd**

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0	8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0	8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0	8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0	8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0	8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0	8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0	8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0	8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0	8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0	8.0	Y

Dudek 16 May 2016
M Greene / J Leech TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 9182
RUN: Belden Barns - Cumltv ADT Vols Wknd
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0.0	32.5	66	32.5	10	----	32.5	0.0	8	-8.0
R2	2	1	0.0	29.5	66	29.5	10	----	29.5	0.0	8	-8.0
R3	3	1	0.0	49.9	66	49.9	10	----	49.9	0.0	8	-8.0
R4	4	1	0.0	44.3	66	44.3	10	----	44.3	0.0	8	-8.0
R5	7	1	0.0	47.3	66	47.3	10	----	47.3	0.0	8	-8.0
R6	9	1	0.0	48.7	66	48.7	10	----	48.7	0.0	8	-8.0
R7	10	1	0.0	46.9	66	46.9	10	----	46.9	0.0	8	-8.0
R8	13	1	0.0	55.0	66	55.0	10	----	55.0	0.0	8	-8.0
R9	15	1	0.0	46.4	66	46.4	10	----	46.4	0.0	8	-8.0
R10	17	1	0.0	38.7	66	38.7	10	----	38.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: ROADWAYS
PROJECT/CONTRACT: **9182**
RUN: **BldnBrns ADT Cum wProj Opt1Wknd**

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average	
		point2	2	34,562,452.0	13,933,494.0	964.57					
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average	
		point54	54	34,561,508.0	13,934,163.0	939.63				Average	
		point55	55	34,561,512.0	13,934,283.0	934.38				Average	
		point56	56	34,561,632.0	13,934,416.0	928.81				Average	
		point57	57	34,561,632.0	13,934,485.0	923.56				Average	
		point58	58	34,561,580.0	13,934,555.0	918.31				Average	
		point59	59	34,561,340.0	13,934,824.0	913.06				Average	
		point60	60	34,561,168.0	13,935,094.0	907.48				Average	
		point61	61	34,561,008.0	13,935,451.0	902.23					
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average	
		point63	63	34,562,412.0	13,934,139.0	958.01					
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average	
		point65	65	34,562,500.0	13,932,968.0	994.09					
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average	
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average	
		point96	96	34,567,276.0	13,932,589.0	1,138.45					
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average	
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average	
		point99	99	34,566,824.0	13,935,195.0	1,092.52					
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average	
		point5	5	34,557,248.0	13,932,625.0	683.40				Average	
		point6	6	34,557,316.0	13,932,595.0	691.27				Average	
		point7	7	34,557,332.0	13,932,592.0	698.82				Average	
		point8	8	34,557,356.0	13,932,564.0	706.69				Average	
		point9	9	34,557,456.0	13,932,556.0	714.24				Average	

		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	
		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	

			point77	77	34,564,384.0	13,933,123.0	946.52				Average	
			point67	67	34,564,444.0	13,932,976.0	944.88				Average	
			point80	80	34,564,496.0	13,932,872.0	944.88				Average	
			point81	81	34,564,540.0	13,932,843.0	959.65				Average	
			point82	82	34,564,884.0	13,932,648.0	974.41				Average	
			point83	83	34,565,084.0	13,932,628.0	989.17				Average	
			point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
			point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
			point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
			point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
			point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
			point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
			point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
			point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
			point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0		point100	100	34,556,884.0	13,932,995.0	676.00				Average	
			point101	101	34,556,552.0	13,932,543.0	692.30				Average	
			point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0		point105	105	34,556,888.0	13,933,004.0	676.00				Average	
			point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: **9182**
RUN: **BldnBrns ADT Cum wProj Opt1Wknd**

Roadway Name	Points Name	No.	Segment Autos V veh/hr	Autos S mph	MTrucks V veh/hr	MTrucks S mph	HTrucks V veh/hr	HTrucks S mph	Buses V veh/hr	Buses S mph	Motorcycles V veh/hr	Motorcycles S mph
Sonoma Mtn Rd N of Project Site	point1	1	51	40	1	40	1	40	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	51	40	1	40	1	40	0	0	0	0
	point5	5	51	40	1	40	1	40	0	0	0	0
	point6	6	51	40	1	40	1	40	0	0	0	0
	point7	7	51	40	1	40	1	40	0	0	0	0

		point8	8	51	40	1	40	1	40	0	0	0	0
		point9	9	51	40	1	40	1	40	0	0	0	0
		point10	10	51	40	1	40	1	40	0	0	0	0
		point11	11	51	40	1	40	1	40	0	0	0	0
		point4	4	51	40	1	40	1	40	0	0	0	0
		point13	13	51	40	1	40	1	40	0	0	0	0
		point14	14	51	40	1	40	1	40	0	0	0	0
		point15	15	51	40	1	40	1	40	0	0	0	0
		point16	16	51	40	1	40	1	40	0	0	0	0
		point17	17	51	40	1	40	1	40	0	0	0	0
		point18	18	51	40	1	40	1	40	0	0	0	0
		point19	19	51	40	1	40	1	40	0	0	0	0
		point20	20	51	40	1	40	1	40	0	0	0	0
		point21	21	51	40	1	40	1	40	0	0	0	0
		point22	22	51	40	1	40	1	40	0	0	0	0
		point23	23	51	40	1	40	1	40	0	0	0	0
		point24	24	51	40	1	40	1	40	0	0	0	0
		point25	25	51	40	1	40	1	40	0	0	0	0
		point26	26	51	40	1	40	1	40	0	0	0	0
		point27	27	51	40	1	40	1	40	0	0	0	0
		point28	28	51	40	1	40	1	40	0	0	0	0
		point29	29	51	40	1	40	1	40	0	0	0	0
		point30	30	51	40	1	40	1	40	0	0	0	0
		point33	33	51	40	1	40	1	40	0	0	0	0
		point34	34	51	40	1	40	1	40	0	0	0	0
		point35	35	51	40	1	40	1	40	0	0	0	0
		point36	36	51	40	1	40	1	40	0	0	0	0
		point37	37	51	40	1	40	1	40	0	0	0	0
		point38	38	51	40	1	40	1	40	0	0	0	0
		point39	39	51	40	1	40	1	40	0	0	0	0
		point40	40	51	40	1	40	1	40	0	0	0	0
		point32	32										
Sonoma Mtn Rd E of Johnstone Rd		point66	66	64	40	1	40	1	40	0	0	0	0
		point68	68	64	40	1	40	1	40	0	0	0	0
		point69	69	64	40	1	40	1	40	0	0	0	0
		point70	70	64	40	1	40	1	40	0	0	0	0
		point71	71	64	40	1	40	1	40	0	0	0	0

INPUT: TRAFFIC FOR LAeq1h Volumes **9182**

		point72	72	64	40	1	40	1	40	0	0	0	0
		point73	73	64	40	1	40	1	40	0	0	0	0
		point74	74	64	40	1	40	1	40	0	0	0	0
		point75	75	64	40	1	40	1	40	0	0	0	0
		point76	76	64	40	1	40	1	40	0	0	0	0
		point77	77	64	40	1	40	1	40	0	0	0	0
		point67	67	64	40	1	40	1	40	0	0	0	0
		point80	80	64	40	1	40	1	40	0	0	0	0
		point81	81	64	40	1	40	1	40	0	0	0	0
		point82	82	64	40	1	40	1	40	0	0	0	0
		point83	83	64	40	1	40	1	40	0	0	0	0
		point84	84	64	40	1	40	1	40	0	0	0	0
		point85	85	64	40	1	40	1	40	0	0	0	0
		point86	86	64	40	1	40	1	40	0	0	0	0
		point87	87	64	40	1	40	1	40	0	0	0	0
		point88	88	64	40	1	40	1	40	0	0	0	0
		point89	89	64	40	1	40	1	40	0	0	0	0
		point90	90	64	40	1	40	1	40	0	0	0	0
		point91	91	64	40	1	40	1	40	0	0	0	0
		point92	92										
Pressley Rd		point100	100	91	30	2	30	1	30	0	0	0	0
		point101	101	91	30	2	30	1	30	0	0	0	0
		point102	102										
Sonoma Mtn Rd N of Presley Rd		point105	105	114	40	2	40	1	40	0	0	0	0
		point106	106										

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: **9182**
RUN: **BldnBrns ADT Cum wProj Opt1Wknd**

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria Existing LAeq1h	Impact Criteria LAeq1h	Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0	8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0	8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0	8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0	8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0	8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0	8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0	8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0	8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0	8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0	8.0	Y

Dudek | 16 May 2016
M Greene / J Leech | TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 9182
RUN: BldnBrns ADT Cum wProj Opt1Wknd
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0.0	33.9	66	33.9	10	----	33.9	0.0	8	-8.0
R2	2	1	0.0	33.5	66	33.5	10	----	33.5	0.0	8	-8.0
R3	3	1	0.0	52.1	66	52.1	10	----	52.1	0.0	8	-8.0
R4	4	1	0.0	46.9	66	46.9	10	----	46.9	0.0	8	-8.0
R5	7	1	0.0	47.5	66	47.5	10	----	47.5	0.0	8	-8.0
R6	9	1	0.0	48.8	66	48.8	10	----	48.8	0.0	8	-8.0
R7	10	1	0.0	50.2	66	50.2	10	----	50.2	0.0	8	-8.0
R8	13	1	0.0	54.6	66	54.6	10	----	54.6	0.0	8	-8.0
R9	15	1	0.0	46.6	66	46.6	10	----	46.6	0.0	8	-8.0
R10	17	1	0.0	41.3	66	41.3	10	----	41.3	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Dudek					**16 May 2016**							
M Greene / J Leech					**TNM 2.5**							
INPUT: ROADWAYS							**Average pavement type shall be used unless**					
PROJECT/CONTRACT:	**9182**						**a State highway agency substantiates the use**					
RUN:	**BldnBrnsADT Cm w Proj Opt2 Wkn**						**of a different type with the approval of FHWA**					
Roadway		**Points**										
Name	**Width**	**Name**	**No.**	**Coordinates (pavement)**			**Flow Control**			**Segment**		
				X	**Y**	**Z**	**Control Device**	**Speed Constraint**	**Percent Vehicles Affected**	**Pvmt Type**	**On Struct?**	
	ft			ft	ft	ft		mph	%			
Sonoma Mtn Rd N of Project Site	20.0	point1	1	34,561,508.0	13,933,497.0	944.88				Average		
		point2	2	34,562,452.0	13,933,494.0	964.57						
Sonoma Ridge Rd	20.0	point53	53	34,561,504.0	13,933,510.0	944.88				Average		
		point54	54	34,561,508.0	13,934,163.0	939.63				Average		
		point55	55	34,561,512.0	13,934,283.0	934.38				Average		
		point56	56	34,561,632.0	13,934,416.0	928.81				Average		
		point57	57	34,561,632.0	13,934,485.0	923.56				Average		
		point58	58	34,561,580.0	13,934,555.0	918.31				Average		
		point59	59	34,561,340.0	13,934,824.0	913.06				Average		
		point60	60	34,561,168.0	13,935,094.0	907.48				Average		
		point61	61	34,561,008.0	13,935,451.0	902.23						
Johnstone Rd N of Project	20.0	point62	62	34,562,440.0	13,933,520.0	964.57				Average		
		point63	63	34,562,412.0	13,934,139.0	958.01						
Johnstone Rd / Project Entrance	20.0	point64	64	34,562,452.0	13,933,484.0	964.57				Average		
		point65	65	34,562,500.0	13,932,968.0	994.09						
Sonoma Mtn Rd E of Mtn Meadow Ln	20.0	point94	94	34,566,736.0	13,932,654.0	1,122.05				Average		
		point95	95	34,567,172.0	13,932,608.0	1,131.89				Average		
		point96	96	34,567,276.0	13,932,589.0	1,138.45						
Mountain Meadow Ln	20.0	point97	97	34,566,724.0	13,932,661.0	1,122.05				Average		
		point98	98	34,566,776.0	13,935,072.0	1,092.52				Average		
		point99	99	34,566,824.0	13,935,195.0	1,092.52						
Sonoma Mtn Rd E of Presley Rd	20.0	point3	3	34,556,896.0	13,932,981.0	675.85				Average		
		point5	5	34,557,248.0	13,932,625.0	683.40				Average		
		point6	6	34,557,316.0	13,932,595.0	691.27				Average		
		point7	7	34,557,332.0	13,932,592.0	698.82				Average		
		point8	8	34,557,356.0	13,932,564.0	706.69				Average		
		point9	9	34,557,456.0	13,932,556.0	714.24				Average		

		point10	10	34,557,632.0	13,932,538.0	722.11				Average	
		point11	11	34,557,840.0	13,932,525.0	729.66				Average	
		point4	4	34,557,888.0	13,932,538.0	737.20				Average	
		point13	13	34,558,020.0	13,932,544.0	745.08				Average	
		point14	14	34,558,052.0	13,932,561.0	741.47				Average	
		point15	15	34,558,192.0	13,932,625.0	744.75				Average	
		point16	16	34,558,492.0	13,932,759.0	754.59				Average	
		point17	17	34,558,580.0	13,932,797.0	764.44				Average	
		point18	18	34,558,676.0	13,932,825.0	783.46				Average	
		point19	19	34,558,792.0	13,932,830.0	791.01				Average	
		point20	20	34,558,872.0	13,932,830.0	798.88				Average	
		point21	21	34,558,964.0	13,932,808.0	806.43				Average	
		point22	22	34,559,048.0	13,932,762.0	814.30				Average	
		point23	23	34,559,128.0	13,932,723.0	821.85				Average	
		point24	24	34,559,200.0	13,932,687.0	829.72				Average	
		point25	25	34,559,300.0	13,932,664.0	837.27				Average	
		point26	26	34,559,456.0	13,932,661.0	844.82				Average	
		point27	27	34,559,560.0	13,932,661.0	852.69				Average	
		point28	28	34,559,612.0	13,932,672.0	860.24				Average	
		point29	29	34,560,008.0	13,932,833.0	868.11				Average	
		point30	30	34,560,228.0	13,932,953.0	875.66				Average	
		point33	33	34,560,324.0	13,933,000.0	883.53				Average	
		point34	34	34,560,388.0	13,933,040.0	891.08				Average	
		point35	35	34,560,452.0	13,933,046.0	898.62				Average	
		point36	36	34,560,556.0	13,933,054.0	906.50				Average	
		point37	37	34,560,704.0	13,933,074.0	914.04				Average	
		point38	38	34,560,868.0	13,933,087.0	921.92				Average	
		point39	39	34,560,976.0	13,933,122.0	929.46				Average	
		point40	40	34,561,160.0	13,933,250.0	937.34				Average	
		point32	32	34,561,504.0	13,933,483.0	944.88					
Sonoma Mtn Rd E of Johnstone Rd	20.0	point66	66	34,562,456.0	13,933,497.0	964.57				Average	
		point68	68	34,562,744.0	13,933,476.0	962.93				Average	
		point69	69	34,562,788.0	13,933,488.0	960.96				Average	
		point70	70	34,563,144.0	13,933,611.0	959.32				Average	
		point71	71	34,563,276.0	13,933,624.0	957.35				Average	
		point72	72	34,563,496.0	13,933,634.0	955.71				Average	
		point73	73	34,563,608.0	13,933,581.0	953.74				Average	
		point74	74	34,563,952.0	13,933,299.0	952.10				Average	
		point75	75	34,564,188.0	13,933,256.0	950.13				Average	
		point76	76	34,564,296.0	13,933,212.0	948.49				Average	

			point77	77	34,564,384.0	13,933,123.0	946.52				Average	
			point67	67	34,564,444.0	13,932,976.0	944.88				Average	
			point80	80	34,564,496.0	13,932,872.0	944.88				Average	
			point81	81	34,564,540.0	13,932,843.0	959.65				Average	
			point82	82	34,564,884.0	13,932,648.0	974.41				Average	
			point83	83	34,565,084.0	13,932,628.0	989.17				Average	
			point84	84	34,565,168.0	13,932,595.0	1,003.94				Average	
			point85	85	34,565,268.0	13,932,484.0	1,018.70				Average	
			point86	86	34,565,388.0	13,932,228.0	1,033.46				Average	
			point87	87	34,565,452.0	13,932,180.0	1,048.23				Average	
			point88	88	34,565,500.0	13,932,162.0	1,062.99				Average	
			point89	89	34,565,936.0	13,932,206.0	1,077.76				Average	
			point90	90	34,566,240.0	13,932,316.0	1,092.52				Average	
			point91	91	34,566,536.0	13,932,603.0	1,107.28				Average	
			point92	92	34,566,724.0	13,932,644.0	1,122.05					
Pressley Rd	20.0		point100	100	34,556,884.0	13,932,995.0	676.00				Average	
			point101	101	34,556,552.0	13,932,543.0	692.30				Average	
			point102	102	34,556,220.0	13,932,090.0	708.70					
Sonoma Mtn Rd N of Presley Rd	20.0		point105	105	34,556,888.0	13,933,004.0	676.00				Average	
			point106	106	34,556,976.0	13,934,492.0	665.00					

Dudek			**16 May 2016**									
M Greene / J Leech			**TNM 2.5**									
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:	**9182**											
RUN:	**BldnBrnsADT Cm w Proj Opt2 Wkn**											
Roadway	**Points**											
Name	**Name**	**No.**	**Segment**									
			Autos		**MTrucks**		**HTrucks**		**Buses**		**Motorcycles**	
			V	**S**	**V**	**S**	**V**	**S**	**V**	**S**	**V**	**S**
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Sonoma Mtn Rd N of Project Site	point1	1	63	40	1	40	1	40	0	0	0	0
	point2	2										
Sonoma Ridge Rd	point53	53	0	0	0	0	0	0	0	0	0	0
	point54	54	0	0	0	0	0	0	0	0	0	0
	point55	55	0	0	0	0	0	0	0	0	0	0
	point56	56	0	0	0	0	0	0	0	0	0	0
	point57	57	0	0	0	0	0	0	0	0	0	0
	point58	58	0	0	0	0	0	0	0	0	0	0
	point59	59	0	0	0	0	0	0	0	0	0	0
	point60	60	0	0	0	0	0	0	0	0	0	0
	point61	61										
Johnstone Rd N of Project	point62	62	0	0	0	0	0	0	0	0	0	0
	point63	63										
Johnstone Rd / Project Entrance	point64	64	0	0	0	0	0	0	0	0	0	0
	point65	65										
Sonoma Mtn Rd E of Mtn Meadow Ln	point94	94	0	0	0	0	0	0	0	0	0	0
	point95	95	0	0	0	0	0	0	0	0	0	0
	point96	96										
Mountain Meadow Ln	point97	97	0	0	0	0	0	0	0	0	0	0
	point98	98	0	0	0	0	0	0	0	0	0	0
	point99	99										
Sonoma Mtn Rd E of Presley Rd	point3	3	63	40	1	40	1	40	0	0	0	0
	point5	5	63	40	1	40	1	40	0	0	0	0
	point6	6	63	40	1	40	1	40	0	0	0	0
	point7	7	63	40	1	40	1	40	0	0	0	0

		point8	8	63	40	1	40	1	40	0	0	0	0
		point9	9	63	40	1	40	1	40	0	0	0	0
		point10	10	63	40	1	40	1	40	0	0	0	0
		point11	11	63	40	1	40	1	40	0	0	0	0
		point4	4	63	40	1	40	1	40	0	0	0	0
		point13	13	63	40	1	40	1	40	0	0	0	0
		point14	14	63	40	1	40	1	40	0	0	0	0
		point15	15	63	40	1	40	1	40	0	0	0	0
		point16	16	63	40	1	40	1	40	0	0	0	0
		point17	17	63	40	1	40	1	40	0	0	0	0
		point18	18	63	40	1	40	1	40	0	0	0	0
		point19	19	63	40	1	40	1	40	0	0	0	0
		point20	20	63	40	1	40	1	40	0	0	0	0
		point21	21	63	40	1	40	1	40	0	0	0	0
		point22	22	63	40	1	40	1	40	0	0	0	0
		point23	23	63	40	1	40	1	40	0	0	0	0
		point24	24	63	40	1	40	1	40	0	0	0	0
		point25	25	63	40	1	40	1	40	0	0	0	0
		point26	26	63	40	1	40	1	40	0	0	0	0
		point27	27	63	40	1	40	1	40	0	0	0	0
		point28	28	63	40	1	40	1	40	0	0	0	0
		point29	29	63	40	1	40	1	40	0	0	0	0
		point30	30	63	40	1	40	1	40	0	0	0	0
		point33	33	63	40	1	40	1	40	0	0	0	0
		point34	34	63	40	1	40	1	40	0	0	0	0
		point35	35	63	40	1	40	1	40	0	0	0	0
		point36	36	63	40	1	40	1	40	0	0	0	0
		point37	37	63	40	1	40	1	40	0	0	0	0
		point38	38	63	40	1	40	1	40	0	0	0	0
		point39	39	63	40	1	40	1	40	0	0	0	0
		point40	40	63	40	1	40	1	40	0	0	0	0
		point32	32										
Sonoma Mtn Rd E of Johnstone Rd		point66	66	65	40	1	40	1	40	0	0	0	0
		point68	68	65	40	1	40	1	40	0	0	0	0
		point69	69	65	40	1	40	1	40	0	0	0	0
		point70	70	65	40	1	40	1	40	0	0	0	0
		point71	71	65	40	1	40	1	40	0	0	0	0

	point72	72	65	40	1	40	1	40	0	0	0	0
	point73	73	65	40	1	40	1	40	0	0	0	0
	point74	74	65	40	1	40	1	40	0	0	0	0
	point75	75	65	40	1	40	1	40	0	0	0	0
	point76	76	65	40	1	40	1	40	0	0	0	0
	point77	77	65	40	1	40	1	40	0	0	0	0
	point67	67	65	40	1	40	1	40	0	0	0	0
	point80	80	65	40	1	40	1	40	0	0	0	0
	point81	81	65	40	1	40	1	40	0	0	0	0
	point82	82	65	40	1	40	1	40	0	0	0	0
	point83	83	65	40	1	40	1	40	0	0	0	0
	point84	84	65	40	1	40	1	40	0	0	0	0
	point85	85	65	40	1	40	1	40	0	0	0	0
	point86	86	65	40	1	40	1	40	0	0	0	0
	point87	87	65	40	1	40	1	40	0	0	0	0
	point88	88	65	40	1	40	1	40	0	0	0	0
	point89	89	65	40	1	40	1	40	0	0	0	0
	point90	90	65	40	1	40	1	40	0	0	0	0
	point91	91	65	40	1	40	1	40	0	0	0	0
	point92	92										
Pressley Rd	point100	100	93	30	2	30	1	30	0	0	0	0
	point101	101	93	30	2	30	1	30	0	0	0	0
	point102	102										
Sonoma Mtn Rd N of Presley Rd	point105	105	139	40	3	40	1	40	0	0	0	0
	point106	106										

Dudek **16 May 2016**
M Greene / J Leech **TNM 2.5**

INPUT: RECEIVERS
PROJECT/CONTRACT: **9182**
RUN: **BldnBrnsADT Cm w Proj Opt2 Wkn**

Receiver Name	**No.**	**#DUs**	**Coordinates (ground) X**	**Y**	**Z**	**Height above Ground**	**Input Sound Levels and Criteria Existing LAeq1h**	**Impact Criteria LAeq1h**	**Sub'l**	**NR Goal**	**Active in Calc.**
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	1	1	34,562,416.0	13,932,938.0	994.09	5.00	0.00	66	10.0	8.0	Y
R2	2	1	34,561,284.0	13,932,594.0	954.72	5.00	0.00	66	10.0	8.0	Y
R3	3	1	34,560,792.0	13,933,004.0	941.60	5.00	0.00	66	10.0	8.0	Y
R4	4	1	34,561,012.0	13,933,312.0	971.13	5.00	0.00	66	10.0	8.0	Y
R5	7	1	34,562,856.0	13,933,643.0	967.85	5.00	0.00	66	10.0	8.0	Y
R6	9	1	34,564,504.0	13,932,966.0	931.76	5.00	0.00	66	10.0	8.0	Y
R7	10	1	34,558,472.0	13,932,790.0	741.47	5.00	0.00	66	10.0	8.0	Y
R8	13	1	34,556,820.0	13,933,018.0	690.00	5.00	0.00	66	10.0	8.0	Y
R9	15	1	34,556,460.0	13,932,615.0	715.00	5.00	0.00	66	10.0	8.0	Y
R10	17	1	34,561,364.0	13,933,672.0	941.00	5.00	0.00	66	10.0	8.0	Y

Dudek
M Greene / J Leech

16 May 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: 9182
RUN: BldnBrnsADT Cm w Proj Opt2 Wkn
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1	1	1	0.0	34.1	66	34.1	10	----	34.1	0.0	8	-8.0
R2	2	1	0.0	33.9	66	33.9	10	----	33.9	0.0	8	-8.0
R3	3	1	0.0	52.7	66	52.7	10	----	52.7	0.0	8	-8.0
R4	4	1	0.0	47.5	66	47.5	10	----	47.5	0.0	8	-8.0
R5	7	1	0.0	47.5	66	47.5	10	----	47.5	0.0	8	-8.0
R6	9	1	0.0	48.8	66	48.8	10	----	48.8	0.0	8	-8.0
R7	10	1	0.0	50.6	66	50.6	10	----	50.6	0.0	8	-8.0
R8	13	1	0.0	55.2	66	55.2	10	----	55.2	0.0	8	-8.0
R9	15	1	0.0	46.8	66	46.8	10	----	46.8	0.0	8	-8.0
R10	17	1	0.0	41.8	66	41.8	10	----	41.8	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	10	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX C

Mechanical Equipment and Noise Calculation Worksheets for Proposed Equipment

On-Site Noise (Mechanical Noise - Chiller)

Per pg.1.12, Harris, Handbook of Acoustical Noise Measurements and Noise Control:

Lp=Lw-20*Log(R)-10.9+C, in meters - true for spherical spreading

Per Diehl, pg. 80:

Lp=Ld=Lw-20*Log(R)+2.5, in feet - true for a free field above a reflecting plane.

Lp =Lw-20*Log(R)-0.5, in feet - in a free field without a reflecting plane

Reference: Acoustic Summary for CH-1 (Chiller for the winery, the noisiest piece of equipqment per project applicant).
Per Diehl, 1973 (Diehl, George M., ed. 1973. Machinery Acoustics. John Wiley & Sons, Inc. New York, NY)

Lp=Ld=Lw-20*Log(R)+2.5, in feet - true for a free field above a reflecting plane.

L_w (dBA)	Distance (Ft)	L_p (dBA)	
87.0	600.0	33.9	Nearest Neighbors' Property Line (N-NE)
87.0	750.0	32.0	Nearest Neighbors (N-NE)
87.0	1450.0	26.3	Next-Nearest Neighbors' Propety Line (W & NW)
87.0	1600.0	25.4	Next-Nearest Neighbors (W & NW)
87.0	1750	24.6	Neighbors S-SW

On-Site Noise

Primary Criteria: 50 dBA L_{50} (7 a.m. to 10 p.m.) at nearest residence.

Raised male voice at 1 m. 65 dBA at 3.28 feet

Reference: Harris, 1979

String Quartet 95 dBA PWL

Reference: Kahle, 1995

Applicable standard: 50 dBA L50 Daytime
45 dBA L50 Nighttime

Assuming Max. 200 people all male raised voice					
Receiver Description	**Receiver Distance (feet)**	**Raised Male Voices (dBA L_{50})**	**String Quartet (dBA L_{50})**	**Combined(dBA L_{50})**	**Applicable Standard (45 dBA L_{50}[1]) Exceeded?**
Nearest Resi's N/NE P/L	600	42.8	41.9	45	No
Nearest Resi's N/NE Residence	780	40.5	39.7	43	No
2nd-Nearest Resi's W P/L	1070	37.7	36.9	40	No
2nd-Nearest Resi's W Residence	1325	35.9	35.1	38	No
3rd-Nearest Resi's NW P/L	1230	36.5	35.7	39	No
3rd-Nearest Resi's NW Residence	1400	35.4	34.6	38	No
Assuming Max. 60 people all male raised voice					
Receiver Description	**Receiver Distance (feet)**	**Raised Male Voices (dBA L_{50})**	**String Quartet (dBA L_{50})**	**Combined(dBA L_{50})**	**Applicable Standard (45 dBA L_{50}[1]) Exceeded?**
Nearest Resi's N/NE P/L	600	37.5	41.9	43	No
Nearest Resi's N/NE Residence	780	35.3	39.7	41	No
2nd-Nearest Resi's W P/L	1070	32.5	36.9	38	No
2nd-Nearest Resi's W Residence	1325	30.7	35.1	36	No
3rd-Nearest Resi's NW P/L	1230	31.3	35.7	37	No
3rd-Nearest Resi's NW Residence	1400	30.2	34.6	36	No

1 - Daytime (7 AM to 10 PM) noise standard reduced 5 dB to account for predominant speech and music sounds

Parking Lot Noise
Using Calculated L50 of 59.1 dBA at 100 feet (ref. Gordon Bricken 1996)

Receiver Description	Receiver Distance to Parking Lot (feet)	Parking Lot Noise	Crowd and Music Noise	Combined(dBA L_{50})	Applicable Standard (50 dBA L_{50}) Exceeded?
Nearest Resi's W P/L	600	43.5	40.4	45	No
Nearest Resi's W/SW Residence	780	41.3	38.5	43	No
2nd-Nearest Resi's E/NE P/L	650	42.8	45.4	47	No
2nd-Nearest Resi's E/NE Residence	850	40.5	43.1	45	No
3rd-Nearest Resi's NW P/L	700	42.2	39.1	44	No
3rd-Nearest Resi's NW Residence	900	40.0	38.0	42	No

Parking Lot Noise Sources at 100 Feet							
Source	**Level (dBA)**	**Assumed duration (seconds) per car**	**Quantity per Hour**	**Total Duration (seconds)**	**ction of Ho**	**For Leq / L50**	**For L02**
Autos at 14 mph	44	3600	1	3600	1.00	44.0	
Sweepers	66	0	0	0	0.00	0.0	
Car Alarm Signal	63	120	5	600	0.17	55.2	
Car Alarm Chirp	48	0.1	80	8	0.00	21.5	
Car Horns	63	5	10	50	0.01	44.4	63.0
Door Slams	58	0.1	80	8	0.00	31.5	
Talking	30	60	50	3000	0.83	29.2	
Radios	58	120	20	2400	0.67	56.2	
Tire Squeals	60	0.1	10	1	0.00	24.4	

Source: Gordon Bricken & Associates, 1996. Estimates based on actual noise measurements taken at various parking lots.

Total	**59.1**	**63.0**

APPENDIX D

Roadway Construction Noise Model (RCNM)

Input and Results Data Sheets

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 4/7/2016
Case Descr Belden Barns - Case 1, Demolition

---- Receptor #1 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Nearest Re	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	780	0
Dozer	No	40		81.7	780	0
Front End Loader	No	40		79.1	780	0
Backhoe	No	40	80		780	0
Tractor	No	40	84		780	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	65.7	58.7	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	57.8	53.8	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	55.2	51.3	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	56.1	52.2	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	60.1	56.2	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.7	62.3	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Resi to the	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	1300	0
Dozer	No	40		81.7	1300	0
Front End Loader	No	40		79.1	1300	0
Backhoe	No	40	80		1300	0
Tractor	No	40	84		1300	0

	Results							
	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	61.3	54.3	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	53.4	49.4	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	50.8	46.8	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	51.7	47.7	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	55.7	51.7	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.3	57.9	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Resi's to th	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	1600	0
Dozer	No	40		81.7	1600	0
Front End Loader	No	40		79.1	1600	0
Backhoe	No	40	80		1600	0
Tractor	No	40	84		1600	0

	Results							
	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	59.5	52.5	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	51.6	47.6	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	49	45	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	49.9	45.9	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	53.9	49.9	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.5	56.1	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 4/7/2016
Case Descr Belden Barns - Case 2, Site Preparation

---- Receptor #1 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Re	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		780	0
Dozer	No	40		81.7	780	0
Front End Loader	No	40		79.1	780	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	61.1	57.2	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	57.8	53.8	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	55.2	51.3	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.1	59.5	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Descriptio	Land Use	Baselines (dBA) Daytime	Evening	Night
Resi to the	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		1300	0
Dozer	No	40		81.7	1300	0
Front End Loader	No	40		79.1	1300	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	56.7	52.7	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	53.4	49.4	N/A	N/A	N/A	N/A	N/A	N/A

Front End Loader	50.8	46.8	N/A	N/A	N/A	N/A	N/A	N/A
Total	56.7	55.1	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptioi	Land Use	Daytime	Evening	Night
Resi's to th	Residentia	55	50	45

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Grader	No	40	85		1600	0
Dozer	No	40		81.7	1600	0
Front End Loader	No	40		79.1	1600	0

			Results					
	Calculated (dBA)			Noise Limits (dBA)				
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	54.9	50.9	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	51.6	47.6	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	49	45	N/A	N/A	N/A	N/A	N/A	N/A
Total	54.9	53.3	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 4/7/2016
Case Descr Belden Barns - Case 3, Grading

---- Receptor #1 ----

		Baselines (dBA)		
Descriptioı	Land Use	Daytime	Evening	Night
Nearest Re	Residentia	55	50	45

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Grader	No	40	85		780	0
Dozer	No	40		81.7	780	0
Front End Loader	No	40		79.1	780	0

			Results					
	Calculated (dBA)			Noise Limits (dBA)				
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	61.1	57.2	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	57.8	53.8	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	55.2	51.3	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.1	59.5	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptioı	Land Use	Daytime	Evening	Night
Resi to the	Residentia	55	50	45

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Grader	No	40	85		1300	0
Dozer	No	40		81.7	1300	0
Front End Loader	No	40		79.1	1300	0

			Results					
	Calculated (dBA)			Noise Limits (dBA)				
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	56.7	52.7	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	53.4	49.4	N/A	N/A	N/A	N/A	N/A	N/A

Front End Loader		50.8	46.8	N/A	N/A	N/A	N/A	N/A	N/A
	Total	56.7	55.1	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptioı	Land Use	Daytime	Evening	Night
Resi's to th	Residentia	55	50	45

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Grader	No	40	85		1600	0
Dozer	No	40		81.7	1600	0
Front End Loader	No	40		79.1	1600	0

			Results					
	Calculated (dBA)			Noise Limits (dBA)				
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	54.9	50.9	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	51.6	47.6	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	49	45	N/A	N/A	N/A	N/A	N/A	N/A
Total	54.9	53.3	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 4/7/2016
Case Descr Belden Barns - Case 4, Building Construction

---- Receptor #1 ----

		Baselines (dBA)		
Descriptioı	Land Use	Daytime	Evening	Night
Nearest Re	Residentia	55	50	45

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crane	No	16		80.6	780	0
Man Lift	No	20		74.7	780	0
Generator	No	50		80.6	780	0
Tractor	No	40	84		780	0
Welder / Torch	No	40		74	780	0
Welder / Torch	No	40		74	780	0
Welder / Torch	No	40		74	780	0

			Results					
	Calculated (dBA)			Noise Limits (dBA)				
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	56.7	48.7	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	50.8	43.8	N/A	N/A	N/A	N/A	N/A	N/A
Generator	56.8	53.8	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	60.1	56.2	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	50.1	46.2	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	50.1	46.2	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	50.1	46.2	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.1	59.4	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptioı	Land Use	Daytime	Evening	Night
Resi to the	Residentia	55	50	45

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Crane	No	16		80.6	1300	0
Man Lift	No	20		74.7	1300	0

Generator	No	50		80.6	1300	0
Tractor	No	40	84		1300	0
Welder / Torch	No	40		74	1300	0
Welder / Torch	No	40		74	1300	0
Welder / Torch	No	40		74	1300	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	52.3	44.3	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	46.4	39.4	N/A	N/A	N/A	N/A	N/A	N/A
Generator	52.3	49.3	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	55.7	51.7	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	45.7	41.7	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	45.7	41.7	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	45.7	41.7	N/A	N/A	N/A	N/A	N/A	N/A
Total	55.7	55	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Resi's to th	Residentia	55	50	45

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	1600	0
Man Lift	No	20		74.7	1600	0
Generator	No	50		80.6	1600	0
Tractor	No	40	84		1600	0
Welder / Torch	No	40		74	1600	0
Welder / Torch	No	40		74	1600	0
Welder / Torch	No	40		74	1600	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	50.4	42.5	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	44.6	37.6	N/A	N/A	N/A	N/A	N/A	N/A
Generator	50.5	47.5	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	53.9	49.9	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	43.9	39.9	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	43.9	39.9	N/A	N/A	N/A	N/A	N/A	N/A

Welder / Torch	43.9	39.9	N/A	N/A	N/A	N/A	N/A	N/A
Total	53.9	53.2	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 4/7/2016
Case Descr Belden Barns - Case 5, Paving

---- Receptor #1 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Nearest Re	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	780	0
Paver	No	50		77.2	780	0
Pumps	No	50		80.9	780	0
Roller	No	20		80	780	0
Tractor	No	40	84		780	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	54.9	51	N/A	N/A	N/A	N/A	N/A	N/A
Paver	53.4	50.3	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	57.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A
Roller	56.1	49.1	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	60.1	56.2	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.1	59.9	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Resi to the	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	1300	0
Paver	No	50		77.2	1300	0
Pumps	No	50		80.9	1300	0
Roller	No	20		80	1300	0
Tractor	No	40	84		1300	0

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	50.5	46.5	N/A	N/A	N/A	N/A	N/A	N/A
Paver	48.9	45.9	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	52.6	49.6	N/A	N/A	N/A	N/A	N/A	N/A
Roller	51.7	44.7	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	55.7	51.7	N/A	N/A	N/A	N/A	N/A	N/A
Total	55.7	55.5	N/A	N/A	N/A	N/A	N/A	N/A

Results

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptio	Land Use	Daytime	Evening	Night
Resi's to th	Residentia	55	50	45

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	1600	0
Paver	No	50		77.2	1600	0
Pumps	No	50		80.9	1600	0
Roller	No	20		80	1600	0
Tractor	No	40	84		1600	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	48.7	44.7	N/A	N/A	N/A	N/A	N/A	N/A
Paver	47.1	44.1	N/A	N/A	N/A	N/A	N/A	N/A
Pumps	50.8	47.8	N/A	N/A	N/A	N/A	N/A	N/A
Roller	49.9	42.9	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	53.9	49.9	N/A	N/A	N/A	N/A	N/A	N/A
Total	53.9	53.7	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 4/7/2016
Case Descr Belden Barns - Case 6, Architectural Coating

---- Receptor #1 ----

Descriptioı	Land Use	Baselines (dBA) Daytime	Evening	Night
Nearest Re	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	780	0
Compressor (air)	No	40		77.7	780	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Man Lift	50.8	43.8	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	53.8	49.8	N/A	N/A	N/A	N/A	N/A	N/A
Total	53.8	50.8	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Descriptioı	Land Use	Baselines (dBA) Daytime	Evening	Night
Resi to the	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	1300	0
Compressor (air)	No	40		77.7	1300	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Man Lift	46.4	39.4	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	49.4	45.4	N/A	N/A	N/A	N/A	N/A	N/A
Total	49.4	46.4	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptioı	Land Use	Daytime	Evening	Night
Resi's to th	Residentia	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	1600	0
Compressor (air)	No	40		77.7	1600	0

Results

	Calculated (dBA)		Noise Limits (dBA)					
			Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Man Lift	44.6	37.6	N/A	N/A	N/A	N/A	N/A	N/A
Compressor (air)	47.6	43.6	N/A	N/A	N/A	N/A	N/A	N/A
Total	47.6	44.6	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX H

Traffic Study

Draft Report

Traffic Impact Analysis for the Belden Barns Farmstead and Winery

Sonoma County, California

May 31, 2016

TJKM Transportation Consultants

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Tables

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EXECUTIVE SUMMARY

This report summarizes the results of the Traffic Impact Analysis (TIA) for the proposed Belden Barns Farmstead and Winery. The project site is located at 5561 Sonoma Mountain Road on a 55-acre parcel in southeastern Sonoma County, approximately five and a half miles west of Glen Ellen and seven miles east of the City of Rohnert Park.

The project applicant proposes to construct a winery that would produce 10,000 cases of wine and 10,000 pounds of cheese annually, and would include an on-site tasting room, hospitality and food production facility, and an agricultural employee unit.

The existing site consists of an agricultural complex, which includes three dwellings units, an old barn, supporting accessory structures and an agricultural reservoir. Additionally, there are 20 acres of wine grapes and a pasture, fruit orchard, and vegetable plot currently. The proposed winery would replace the existing barn located in the southeast portion of the agricultural complex.

The report includes evaluations and recommendations concerning traffic safety, pedestrian and bicyclist safety, project site access and on-site circulation, and queuing analysis at the driveway and selected study intersections.

To evaluate the impacts on the transportation infrastructure due to the addition of traffic from the proposed project, three study intersections were evaluated during the weekday morning (a.m.) peak hour, weekday evening (p.m.) peak hour and weekend peak hour under four study scenarios.

The study intersections were evaluated under *No Project* and *plus Project* scenarios for Existing and Cumulative Conditions. Under the *plus Project* scenarios, project impacts were determined for two scenarios:

- Scenario 1 – Based on vehicle trips expected to be generated by the proposed project during the Harvest Season
- Scenario 2 – Based on vehicle trips expected to be generated by the proposed project during weekend Special Events

For the purposes of this analysis, potential traffic operational impacts from the proposed project are identified based on established transportation impacts thresholds for Sonoma County.

Project Trip Generation

Harvest Season
The proposed project is forecasted to generate 19 net vehicle trips during the weekday a.m. peak hour, 31 net vehicle trips during the weekday p.m. peak hour and 34 net vehicle trips during the weekend peak hour.

Special Events
The proposed project is expected to generate up to 80 net vehicle trips during the weekend peak hour. Special events will not be held on weekdays.

Non-Harvest Season
The proposed project is expected to generate 11 net vehicle trips during the a.m. peak hour, 20 net vehicle trips during the p.m. peak hour and 27 net vehicle trips during the weekend peak hour.

Existing Traffic Conditions

Under Existing Conditions, all study intersections are currently operating at levels of service (LOS) D or better, which is acceptable under Sonoma County standards.

Existing plus Project Traffic Conditions

Under Existing plus Project Conditions, all the study intersections are projected to continue to operate at LOS D and better, which is acceptable under Sonoma County standards.

Cumulative Traffic Conditions

Under Cumulative (Year 2040) Conditions without the project, all the study intersections are projected to operate at LOS D or better, which is acceptable under Sonoma County standards.

Cumulative (Year 2040) plus Project Traffic Conditions

Under Cumulative plus Project Conditions, all the study intersections are projected to continue to operate at LOS D and better, which is acceptable under Sonoma County standards.

Pedestrian, Bicycle and Transit Impacts

Sonoma Mountain Road is a local road with two travel lanes (one per direction). Motor vehicles and bicycles share each travel lane. No sidewalks are provided along Sonoma Mountain Road. There are no transit facilities in the immediately vicinity of the site. The proposed project does not conflict with existing and planned pedestrian or bicycle facilities.

There is a regional park access directly off Sonoma Mountain Road that is used by local residents, sometimes walking on the side of the road. The sufficient parking supply of 96 parking spaces on site would not affect pedestrian and bicycle circulation. The proposed project is expected to increase vehicular traffic on Sonoma Mountain Road by 6%; hence, there would not be a significant change from existing conditions. Although not required to mitigate project impacts, the County may consider installing an additional “Share the Road” sign east of the Pressley Road intersection. The impact of the proposed project to the pedestrian and bicycle facilities is ***less-than-significant.***

Traffic Safety Analysis

The collision rate for the studied segments of Sonoma Mountain Road is less than the statewide average for similar roads.

It is recommended that the project applicant provide a clear line of sight of approximately 305 feet on both the sides of the entrance along the property line by clearing or pruning vegetation.

The curves with the most limited sight distance are located on Sonoma Mountain Road. There were locations of restricted sight distance identified along Sonoma Mountain Road. Advisory signs are present, and TJKM recommends extra signs at curves with narrow lane widths.

TJKM also recommends the driveway apron should be overlaid with asphalt concrete (AC) pavement to improve the existing combination of pavement and crushed rock. Project construction-related trips are expected to have minimal effects, if any, on the existing peak hour traffic operations of Sonoma Mountain Road and Pressley Road. During the anticipated 12 to 18 month construction phase, a total of 50 concrete trucks and 30 material delivery trucks trips are expected. However, all truck trips are expected to occur outside typical existing weekday commute peak periods of 7:00-9:00 a.m. and 4:00-6:00 p.m. in the immediate area.

As the alignment of Sonoma Mountain Road east of the project includes locations having sub-standard pavement widths, the project applicant will request that guests travel to the project site from the south or west (Santa Rosa or Rohnert Park) via Bennett Valley Road to Sonoma Mountain Road and not from Glen Ellen via Warm Springs Road and the eastern portion of Sonoma Mountain Road.

Queuing and Driveway Analysis

The proposed project is not anticipated to result in significant impacts to left-turn or right-turn queues at study intersections. The 95th percentile queue at the outbound approach of the project driveway is expected to be les that 25 feet, while the 95th percentile inbound queue would be 25 feet (inbound right turn) and 25 feet (inbound left turn). Therefore, the proposed project is not anticipated to result in significant impacts at the project driveway.

On-Site Circulation

TJKM evaluated the project site plan for adequacy of site circulation and access including delivery trucks and emergency vehicles. Based on the evaluation, the proposed on-site vehicle circulation is adequate and should not result in significant traffic operations issues.

Parking

Based on the project site plan, 96 parking spaces will be provided for the proposed project including 80 event parking spaces and one Americans with Disabilities Act (ADA) compliant parking space. Estimated peak parking demand on site would be 96 vehicles during the proposed 200-person special event which includes 80 visitors and 16 employees.

The parking supply as currently proposed will be adequate to meet expected demand for employee and visitor parking during the proposed special events. The parking supply as currently proposed would not potentially result in impacts to emergency vehicle access during special events.

Emergency Vehicle Access

Impacts to emergency vehicle access could occur if visitors or employees were to park on driveway aisles providing emergency vehicle access to the site. The project applicant should specify that “no parking” is permitted along the access driveway between Sonoma Mountain Parkway and the on-site buildings and special event areas. Appropriate signage and/or curb makings should be installed to clearly prohibit parking on those sections of the internal drive aisles.

Recommendations

TJKM recommends the installation of stop signs exiting the project driveways with appropriate pavement delineation and signing to enhance safety and operations at the driveway exit.

TJKM also recommends that an additional “Share the Road” or “Bicycles on Road” sign be installed in the eastbound direction on Sonoma Mountain Road east of the Pressley Road intersection.

Table ES I summarizes peak hour traffic levels of service at the study intersections for all the scenarios.

Table ES I: Intersection Levels of Service Summary

ID	Intersection	Peak Hour	Existing Conditions		Existing plus Project Conditions - Scenario 1		Existing plus Project Conditions - Scenario 2		Cumulative Conditions		Cumulative plus Project Conditions - Scenario 1		Cumulative plus Project Conditions - Scenario 2	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Pressley Road/Sonoma Mountain Road	AM.	8.9	A	8.9	A	-	-	9.2	A	9.2	A	-	-
		P.M.	8.8	A	9.0	A	-	-	9.1	A	9.3	A	-	-
		Weekend	8.9	A	9.1	A	9.2	A	9.3	A	9.5	A	9.6	A
2	Warm Springs Road/Sonoma Mountain Road	AM.	10.7	B	10.8	B	-	-	12.9	B	13.1	B	-	-
		P.M.	9.5	A	9.5	A	-	-	10.7	B	10.6	B	-	-
		Weekend	9.0	A	9.1	A	9.0	A	9.5	A	9.7	A	9.6	A
3	Sonoma Mountain Road/Bennett Valley Road	AM.	12.4	B	12.6	B	-	-	20.5	C	20.9	C	-	-
		P.M.	13.0	B	13.2	B	-	-	22.5	C	23.4	C	-	-
		Weekend	11.9	B	12.0	B	12.2	B	17.9	C	18.4	C	18.9	C

INTRODUCTION

This report summarizes the results of the TIA for the proposed Belden Barns Farmstead and Winery located at 5561 Sonoma Mountain Road on a 55-acre land in southeastern Sonoma County, approximately 5.5 miles west of Glen Ellen and seven miles east of the City of Rohnert Park. The project applicant proposes to construct a winery that would produce 10,000 cases of wine and 10,000 pounds of cheese annually, and would include an on-site tasting room, hospitality and food production facility, and an agricultural employee unit. The existing site consists of an agricultural complex, which includes three dwellings units, an old barn, supporting accessory structures and an agricultural reservoir. Additionally, there are 20 acres of wine grapes and a pasture, fruit orchard, and vegetable plot currently planted. The proposed winery would replace the existing barn located in the southeast portion of the agricultural complex. **Figure 1** illustrates the location of the study area and the project site plan is shown in **Figure 2.**

The proposed project would include eight agricultural promotional events per year with varying participant levels, with a maximum attendance level of 200 people. The agricultural promotional events will be held on weekends only (Saturday or Sunday) indoors and outdoors in the farm building complex area.

Based on the information provided by the project applicant, it is estimated that the proposed winery would attract approximately 42 visitors/day during the non-harvest season and approximately 60 visitors/day during the harvest season. All parking for day-to-day activities and promotional events is proposed to be provided on site. The project site would continue to be accessed via the private driveway off Sonoma Mountain Road.

STUDY INTERSECTION AND SCENARIOS

TJKM evaluated traffic conditions at the study intersections during typical weekday and weekend peak travel periods. The peak periods for weekday travel occur between 7:00-9:00 a.m. and 4:00-6:00 p.m. and the peak period for weekend travel occur between 12:30-2:30 p.m. on Saturday. TJKM evaluated the following three intersections in accordance with the standards set forth by the transportation impact criteria of the County of Sonoma and in consultation with the County staff:

1. Pressley Road/Sonoma Mountain Road
2. Warm Springs Road/Sonoma Mountain Road
3. Bennett Valley Road/Sonoma Mountain Road

TJKM also collected 24-hour bidirectional traffic volumes for a seven-day period during the month of October/November along the following three roadway segments:

- Sonoma Mountain Road, west of Sonoma Ridge Road
- Sonoma Mountain Road, east of 5312 Sonoma Mountain Road
- Pressley Road, south of Sonoma Mountain Road

The study intersections were evaluated under *No Project* and *plus Project* scenarios for Existing and Cumulative Conditions. Project trip generation forecasts were determined for three scenarios:

- Scenario 1 – Trips expected to be generated by the proposed project during the Harvest Season
- Scenario 2 – Trips expected to be generated by the proposed project during Special Events

- Scenario 3 – Trips expected to be generated by the proposed project during the Non-Harvest Season

In consultation with the County's staff, it was agreed to analyze scenario 1 and 2 only as they represent the worst-case scenario.

Roadway and intersection operations were evaluated under the following four study scenarios:

Existing Conditions: This scenario evaluates existing traffic and roadway conditions based on existing traffic counts, lane geometries and field surveys.

Existing plus Project Conditions: This scenario adds traffic generated by the proposed project to existing traffic conditions.

Cumulative Conditions: This scenario evaluates traffic and roadway conditions based on projected traffic demands at the study intersections and roadway segments under cumulative year 2040.

Cumulative plus Project Conditions: This scenario is similar to Cumulative Conditions but with traffic from the proposed project added to the projected demands under Cumulative 2040 Conditions.

Vicinity Map

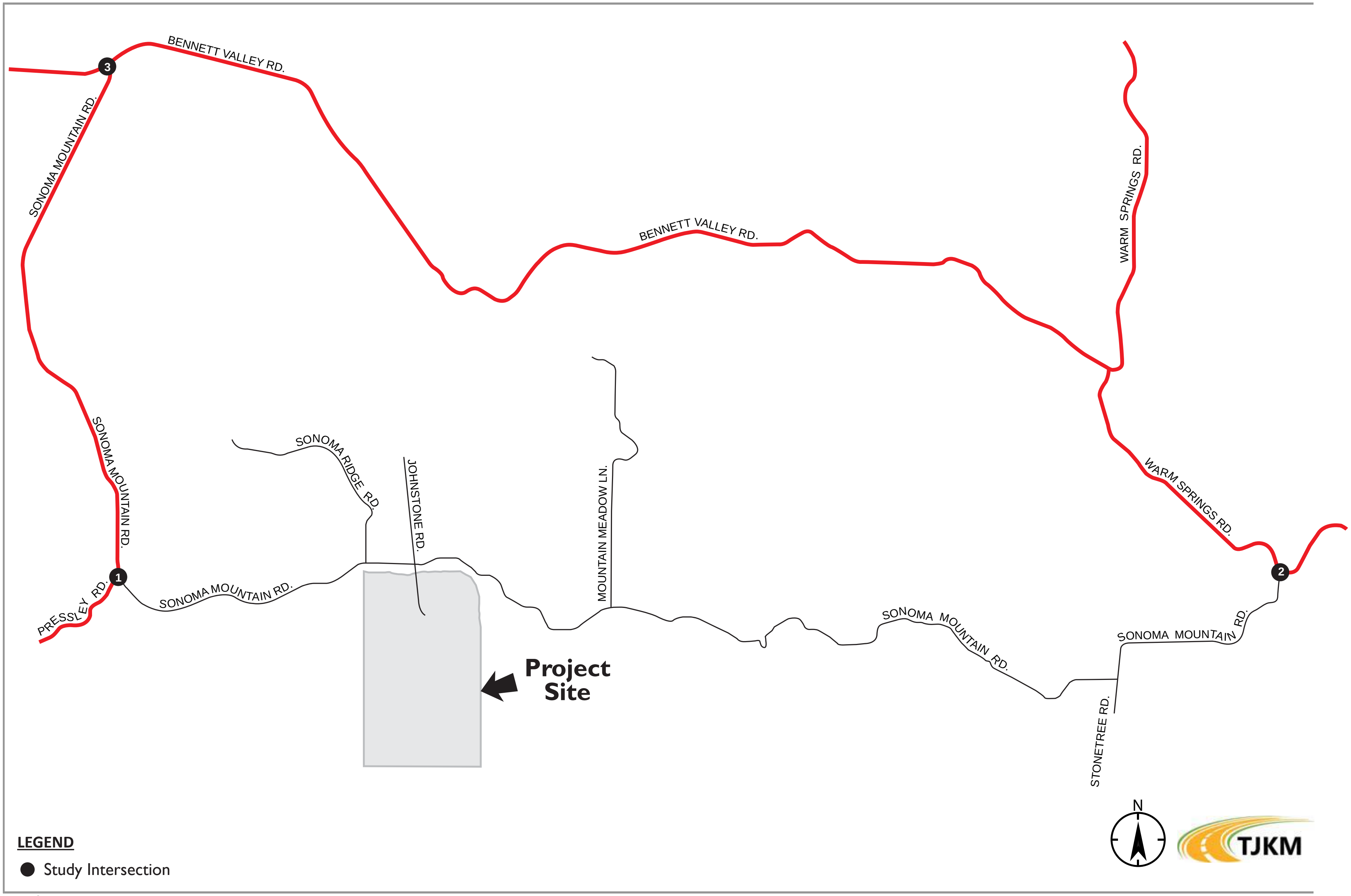

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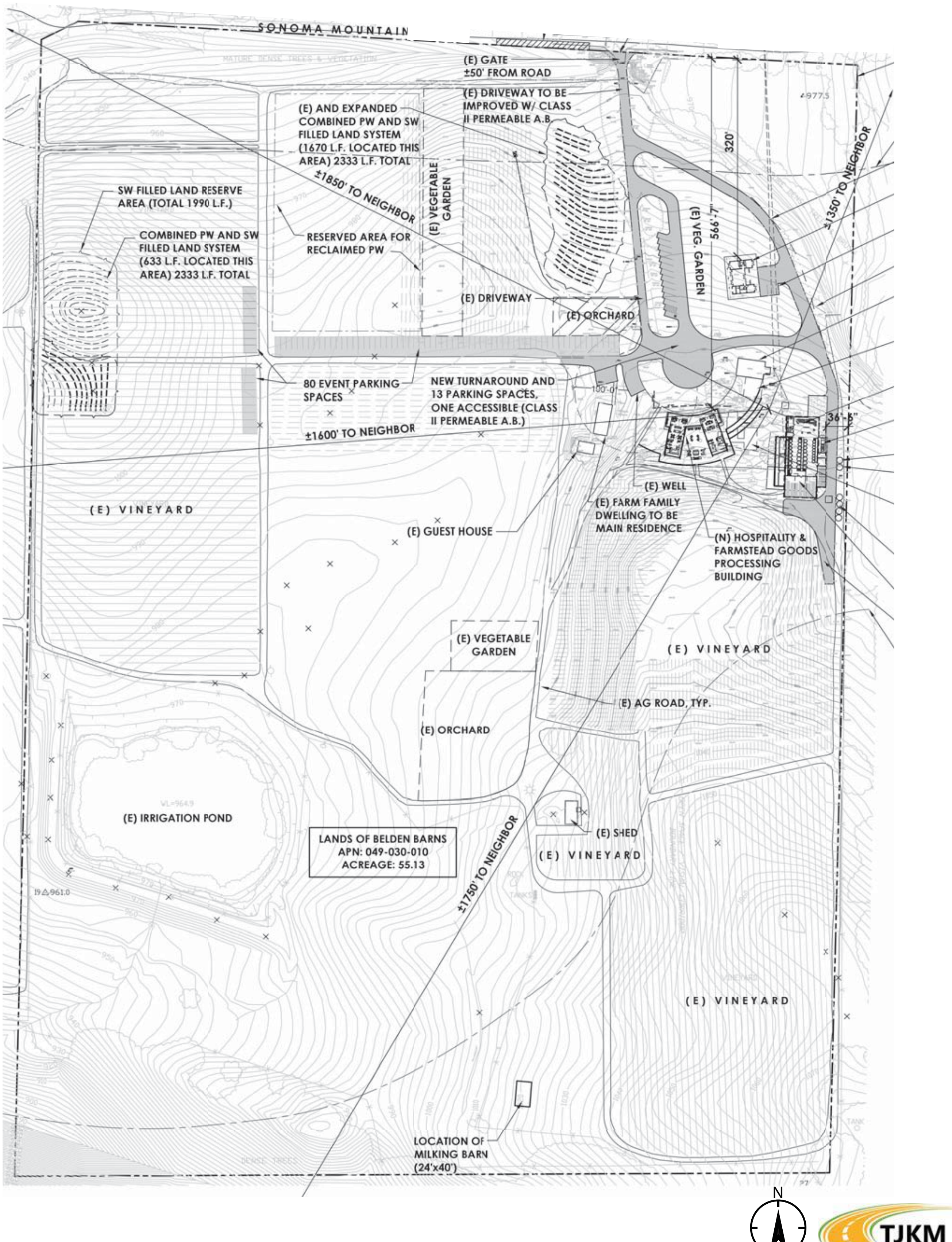
Figure 1

Site Plan



Source: Steve Martin Associates, Inc.

Figure 2

STUDY METHODOLOGY

LEVEL OF SERVICE ANALYSIS METHODOLOGY

LOS is a qualitative measure that describes motor vehicle operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. The LOS generally describes these conditions in terms of such factors as speed and travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. The operational LOS are given letter designations from A to F, with A representing the best operating conditions for motor vehicles (free-flow) and F the worst (severely congested flow with high delays). Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets.

Unsignalized Intersections

The study intersections are stop sign controlled (unsignalized) and were analyzed using the 2010 Highway Capacity Manual (HCM) Operations Methodology for Unsignalized intersections described in Chapter 19 (HCM 2010). LOS ratings for intersections are based on the average control delay expressed in seconds per vehicle. At side street stop sign controlled intersections or two-way stop sign intersections, the control delay is calculated for each movement, not for the intersection as a whole and the intersection LOS is based on the worst approach. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The weighted average delay for the entire intersections is the basis for determining LOS at all-way stop controlled intersections. The average control delay for unsignalized intersections was calculated using Synchro analysis software and was correlated to a LOS designation. At an unsignalized intersection, most of the major street traffic is undelayed, and by definition have acceptable conditions. The major street left-turn movements and the minor street movements are all susceptible to delay of varying degrees. Generally, the higher the major street traffic volumes, the higher the delay for the minor movements. HCM 2010 definitions for delay and LOS at unsignalized intersections are presented in **Table 1**

Table 1: Unsignalized Intersection Delay and LOS Definitions

Control Delay (Sec/Veh)	V/C ≤ 1.0	V/C > 1.0
≤10	A	F
>10 – 15	B	F
>15 – 25	C	F
>25 – 35	D	F
>35 – 50	E	F
>50	F	F

Source: Highway Capacity Manual 2010, Chapter 19 (Transportation Research Board, 2010)

SIGNIFICANT IMPACT CRITERIA/LEVEL OF SERVICE STANDARDS

Based on the *County of Sonoma Guidelines for Traffic Studies, t*he Project would also be considered to result in having a significant transportation impact if it results in any of the following Conditions:

County Roadway Operations: According to Sonoma County's traffic impact study guidelines, the County's standard for roadway segments is to maintain LOS C on the County roadway system as defined in the Sonoma County General Plan. The project would have a significant traffic impact if the project's traffic would cause a road currently operating at an acceptable LOS to operate at an unacceptable level (i.e. LOS D, E or F), based on average daily traffic volume.

County Intersections: The County standard for intersections is LOS D or better at build out of the General Plan. The guidelines also state that a project would have a significant traffic impact if the project's traffic would cause an intersection currently operating at an acceptable (LOS D or better) to operate below the standard (LOS E or F). Furthermore, if the intersection currently operates or is projected to operate below the County standard (LOS E or F), the project's impact is significant and cumulatively considerable if it causes the delay to increase by five seconds or more (average delay for signalized intersections) when comparing baseline and project conditions. Therefore, any study intersection exceeding these standards will be considered impacted and subsequently evaluated for mitigation.

Parking: Proposed on-site parking supply would not be adequate to accommodate parking demand.

Alternative Transportation: The project provides inadequate facilities for alternative transportation modes (e.g., bus turnouts, bicycle racks, pedestrian pathways) and/or the project creates potential conflicts with adopted policies, plans or programs supporting alternative transportation.

Emergency Access: The project site would have inadequate emergency access.

Vehicle Queues: The addition of project traffic causes the 95th percentile queue length to exceed roadway turn lane storage capacity.

On-site Roads and Frontage Improvements: Proposed on-site circulation and street frontage would not meet the County's minimum standards for roadway or driveway design, or potentially result in safety hazards, as determined by the County in consultation with a registered traffic engineer.

Road Hazards: Project traffic results in substantial increases in potential hazards due to a design feature (e.g., sharp curves or dangerous intersections) or any perceived incompatible uses (e.g., farm equipment).

Signal Warrants: The addition of the project's vehicle or pedestrian traffic causes an intersection to meet or exceed Caltrans or CA-MUTCD signal warrant criteria.

Turn Lanes: The addition of project traffic causes an intersection to meet or exceed criteria for provision of a right or left turn lane on an intersection approach.

Sight Lines: The project constructs an unsignalized intersection (including driveways) or adds traffic to an existing unsignalized intersection approach that does not have adequate sight lines based upon Caltrans criteria for state highway intersections and AASHTO criteria for County roadway intersections.

EXISTING CONDITIONS

ROADWAY NETWORK

The proposed project is located in southeastern Sonoma County approximately 5.5 miles west of the town of Glen Ellen and 7 miles east of the City of Rohnert Park.

Sonoma Mountain Road is a two-lane local road. The road extends approximately 7.6 miles from Bennett Valley Road, southeast of the City of Santa Rosa to Warm Springs Road northwest of the Town of Glen Ellen. Within the immediate vicinity of the project, the road is narrow, approximately 18-20 feet wide with no center lane or edge striping. There are no speed limits posted east of Pressley Road, making the section near the proposed winery frontage prima facie 55 miles per hour (mph). However, advisory speed limits of 20 mph are posted on the Sonoma Mountain Road near the proposed winery frontage. Based on a previous study conducted by W-trans, the 85th percentile speed for traffic approaching the driveway was found to be approximately 40 mph. Therefore, 40 mph was utilized for analysis purposes. Average daily motor vehicle traffic (ADT) along the roadway within the immediate vicinity of the project is 363 motor vehicles per day (vpd). Based on peak hour bicycle volumes the daily bicycle volume is very low on weekdays but increases to an estimated 170 bicycles on weekends.

Pressley Road is a two-lane local road within the vicinity of the project. Pressley Road extends 2.8 miles between Roberts Road, east of the City of Rohnert Park and terminates at Sonoma Mountain Road near the project vicinity. Pressley Road is a rural roadway with varied topography and multiple horizontal and vertical curves with posted speed limit of 30 mph near Sonoma Mountain Road. At the curves, adequate warning signs with advisory speeds of 10 mph to 15 mph are posted. Pressley Road has two 12-feet travel lanes, a centerline stripe with little or no shoulders provided. ADT along the roadway segment is 609 vehicles per day (vpd).

Warm Springs Road is a two-lane rural collector that extends approximately 5.3 miles between State Route (SR) 12 in the Town of Kenwood and Arnold Drive in the Town of Glen Ellen. Warm Springs Road has two 10 to 12 feet travel lanes with variable width shoulders. The posted speed limit is 30 mph.

Bennett Valley Road is identified as a rural major collector in the 2020 Sonoma County General plan. Bennett Valley Road extends approximately 10.7 miles between Santa Rosa and Warm Springs Road in Glen Ellen. Bennett Valley Road has a two 12-feet travel lanes with variable shoulder widths. The posted speed limit varies along Bennett Valley Road, ranging from 35 to 55 miles per hour.

EXISTING PEAK HOUR TRAFFIC VOLUMES

TJKM collected the bicycle, pedestrian and motor vehicle turning movement counts at the study intersections during a.m. and p.m. peak periods for a typical weekday and weekend peak periods on December 8-13, 2015, and February 3-13, 2016. The peak periods for weekday were observed between 7:00-9:00 a.m. and 4:00-6:00 p.m. and the peak period for weekend was observed to be between 12:30-2:30 p.m. on a Saturday.

TJKM also collected 24-hour bidirectional traffic volumes for a seven day period during the month of October/November along the following three roadway segments:

- Sonoma Mountain Road, west of Sonoma Ridge Road

- Sonoma Mountain Road, east of 5312 Sonoma Mountain Road
- Pressley Road, south of Sonoma Mountain Road

EXISTING PEDESTRIAN FACILITIES

Walkability is defined as the ability to travel easily and safely between various origins and destinations without having to rely on automobiles or other motorized travel. The ideal “walkable” community includes wide sidewalks, a mix of land uses such as residential, employment, and shopping opportunities, a limited number of conflict points with vehicle traffic, and easy access to transit facilities, and services.

Pedestrian facilities consist of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access the destinations such as institutions, businesses, public transportation, and recreation facilities.

In the project vicinity, no sidewalks are provided. However, pedestrians walking on the travel lane along the Sonoma Mountain Road to access the Sonoma Valley Regional Park were observed during the field visit.

EXISTING BICYCLE FACILITIES

Bicycle facilities include the following:

- Bike Paths (Class I) – Paved trails that are separated from roadways
- Bike Lanes (Class II) – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs
- Bike Routes (Class III) – Designated roadways for bicycle use by signs and markings may or may not include additional pavement width for cyclists

Based on the Sonoma County General Plan adopted on September 2008, Sonoma Mountain Road is proposed to be a Class III Bike Route. “Share the Road” bicycle warning signs are posted along the Sonoma Mountain Road. Based on the peak period data collection at each of the study intersections, no bicycle trips were observed during the weekday AM and PM peak hours; however, a total of 17 bicyclists were counted during the Saturday peak hour on Sonoma Mountain Road.

EXISTING TRANSIT FACILITIES

No transit facilities are present in the immediate vicinity of the project.

FIELD OBSERVATION

TJKM conducted a field visit during the month of December 2015 to assess current roadway geometric conditions along the study corridor to observe overall transportation characteristics.

Sonoma Mountain Road is characterized by narrow roadway widths, steep hillsides and embankments along roadway edges, rolling terrain, sharp horizontal and vertical curves, lack of paved shoulders, and trees and vines located directly along the roadway edge. Pavement widths for the roadway vary, with some sections as narrow as 11 feet and others as wide as 22 feet.

Pressley Road is a two lane local road that is designated as a scenic corridor in the Sonoma County General plan. Pressley Road has 12-foot travel lanes and a centerline stripe. Little or no shoulders are provided on Pressley Road. The intersection of Sonoma Mountain Road/Pressley Road is a “tee” intersection with a stop sign on Presley Road. A double yellow centerline stripe is provided at all three approaches of this intersection.

Bennett Valley Road has two 12-foot travel lanes with variable shoulder width. Sonoma Mountain Road/Bennett Valley Road is a "tee" intersection with a stop sign on Sonoma Mountain Road. The posted speed limit on Bennett Valley Road in the vicinity of the intersection is 45 mph.

Driveway Access to the project will be provided via an existing driveway on Sonoma Mountain Road. It is a single lane driveway, which is approximately 12 feet wide with asphalt pavement.

COLLISION HISTORY

The collision history for the entire length of Sonoma Mountain Road was evaluated since there is the potential for the public to access the Belden Barns Farmstead and Winery property from either side of Sonoma Mountain Road. Collisions reported along the study roadway segment of Sonoma Mountain Road were obtained from the Statewide Integrated Traffic Records System (SWITRS) database for a period of five years from January 2011 to December 2015. Most recent statewide collision averages for 2012 were obtained from the Caltrans. The Caltrans average accident rate is 1.14 collisions per million vehicle miles (c/mvm) for rural conventional highway with 2 lanes or less, rolling terrain, and a speed limit less than or equal to 55 mph. There were three reported collisions on Sonoma Mountain Road from Bennett Valley Road to Warm Springs Road during this study period.

For the analysis of the crash data, the 7.6-mile segment of Sonoma Mountain Road from Bennett Valley Road to Warm Springs Road was broken up into following two segments:

- Sonoma Mountain Road from Bennett Valley Road to Pressley Road
- Sonoma Mountain Road from Pressley road to Warm Springs Road

Summaries of accident data along the roadway segment is presented in **Table 2.**

Table 2: Collision Data – Sonoma Mountain Road

Location	Number of Collisions			Length (miles)	ADT[1]	MVM[2]	Actual Collision Rate[3]			Caltrans Average Collision Rate[4]		
	Fatal	Injury	Total				Total Rate (C/MVM)[5]	Injury (%)	Fatal (%)	Total Rate (C/MVM)	Injury (%)	Fatal (%)
Sonoma Mountain road from Bennet Valley Road to Pressley Road	0	1	2	2.19	625	2.50	0.80	50	0.00	1.14	44.8	2.2
Sonoma Mountain Road from Pressley road to Warm Springs Road	0	1	1	5.41	346	3.42	0.29	100	0.00	1.14	44.8	2.2

Source: SWITRS
Notes:
[1]ADT = Average daily Traffic
[2]MVM = Million Vehicle Miles
MVM = ADT*365 days*length*5 Years/1,000,000
[3]Accident Rate (Rse) = A*1,000,000/ADT*365 days*Length*5 Years
[4]2012 Collision data on California State Highways, Caltrans
[5]c/mvm = Collisions per million vehicle miles

The breakdown as shown in Table 2 shows that the two different segments of Sonoma Mountain Road each have noticeably lower than average collision rates when compared to the statewide average rate.

INTERSECTION LEVEL OF SERVICES ANALYSIS – EXISTING CONDITIONS

The existing operations of the study intersections were evaluated for the highest one-hour volume during the weekday morning and evening peak periods and weekend peak period. TJKM collected existing intersection turning movement volumes at the study intersections during the weekday a.m. peak period (7:00-9:00 a.m.), weekday p.m. peak period (4:00-6:00 p.m.) and weekend peak period (12:30-1:30 p.m.) on December 8-13, 2015 and February 3-13, 2016.

Though the turning movement counts were conducted during the winter months, the difference between the ADT counts and turning movement counts calculated were not found to be substantial. Hence, based on the consultation with the County's staff, it was decided to not apply any seasonal adjustment factor. The existing a.m., p.m., and weekend peak hour volumes for the study intersections are shown in **Figure 3**, and the raw counts are contained in **Appendix A**. For the intersection analysis, the Peak Hour Factors (PHF) based on the collected counts were used. The calculation of the PHF is described below:

Peak Hour Factor Calculation
The PHF is the hourly volume during the maximum-volume hour of the day divided by the peak 15-minute flow rate within the peak hour, a measure of traffic demand fluctuations within the peak hour. PHF values were calculated for the a.m., p.m., and weekend peak for all the approaches at each study intersection using the following formula:

$$PHF = \frac{V}{[4 \times V15]}$$

Where
V = peak hour volume (vph)
V15 = volume during the peak 15 minutes of flow (vehicles/15 minutes)

E.g.: Evaluation for PHF of 0.75 for eastbound movement during the a.m. peak hour between 7:15-8:15 a.m. is shown below:

- Hourly volume = 27 vehicles
- Volume during the peak 15 minutes of flow = 9 vehicles

$$PHF = \frac{27}{[4 \times 9]} = 0.75$$

The results of the Existing Conditions LOS Analysis using Synchro Software for the Existing Conditions are shown in **Table 3**. HCM 2010 Methodology was followed to analyze the study intersections. Currently all intersections operate at acceptable LOS D or better under existing conditions. Detailed calculations are contained in **Appendix B**.

Table 3: Intersection Levels of Service – Existing Conditions

ID	Intersection	Intersection Control	A.M. Peak Hour		P.M. Peak Hour		Weekend Peak Hour	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Pressley Road/Sonoma Mountain Road	One-way Stop	8.9	A	8.8	A	8.9	A
2	Warm Springs Road/Sonoma Mountain Road	One-way Stop	10.7	B	9.5	A	9.0	A
3	Sonoma Mountain Road/Bennett Valley Road	One-way Stop	12.4	B	13.0	B	11.9	B

Notes:
Control delay for the worst movement is presented for side-street stop controlled intersections.
LOS = Level of Service

Existing Conditions - Traffic Volumes, Lane Geometry and Controls

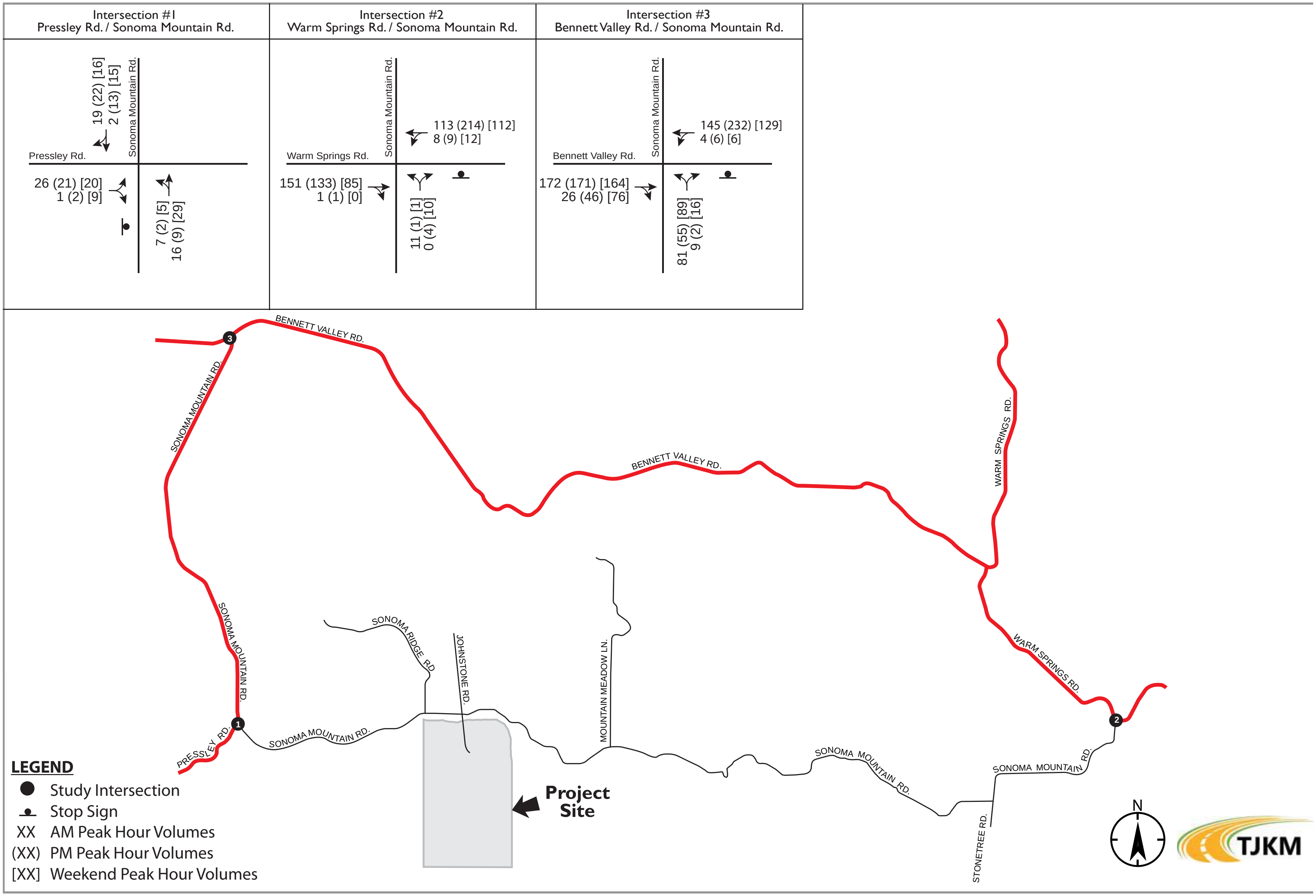


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Figure 3

EXISTING PLUS PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project on the roadway system in the immediate vicinity of the proposed project. The method used to evaluate traffic impacts is described and the results of the LOS calculations for Existing plus Project Conditions are summarized in this section. To determine if the additional traffic from the proposed project would result in significant impacts, TJKM used a four-step process:

1. Trip Generation - the amount of vehicle traffic entering/exiting the proposed Project was projected.
2. Trip Distribution – trip distribution percentages were developed based on the knowledge of the area, proposed land use and similar studies conducted within the vicinity of the project.
3. Trip Assignment – additional vehicular traffic from the proposed project was then assigned to specific roadways segments and intersections based on the trip distribution percentages.
4. Impact Analysis – was conducted to determine if the additional trips would result in any impact at the study intersections.

PROJECT DESCRIPTION

The proposed project would include a new winemaking, tasting and farmstead food production facility on the 55-acre project site. A description of the proposed uses of the site is provided below.

Primary Uses

Production Facility: The proposed production facility (winery building) would consist of a new creamery and winery facility capable of producing 10,000 pounds of cheese and 10,000 cases of wine per year. The regular production hours would be 7:00 a.m. to 6:00 p.m., Monday through Friday. Wine production harvest hours would be 6:00 a.m. to 10:00 p.m., seven days per week, during the harvest season, which is typically late August through mid-October. Fruit for the wine would come predominately from the project site with some fruit coming from the surrounding area. Milk for the creamery would come from onsite livestock as well as from other dairies in the surrounding area. Milk deliveries to the site would be made biweekly by truck. Farmstead products would be sold onsite and shipped from the site to wholesalers or retailers weekly by truck.

The production facility would be a new approximately 10,941 sf, two-story building. The first floor would be approximately 8,796 sf and would be used for barrel storage, fermentation, winery production, the cheese creamery, and support spaces. The second floor would be approximately 2,145 sf and would include space for administration, lab, and private tasting facilities. The production facility would replace the existing barn located in the southeast portion of the farm building complex.

Farmstead and Wine Tasting Room: The proposed farmstead and wine tasting room would be a by-appointment-only tasting room for the direct sales of wine, cheese, farmstead products, and incidental items from the local area. The proposed tasting room hours would be 11:00 a.m. to 5:00 p.m., seven days per week.

The tasting room would be the primary hospitality space for all products produced onsite. The 3,033 sf space would include a commercial kitchen.

Special Events: The proposed project would include eight agricultural promotional events per year with varying participant levels. Proposed Belden Barns Farmstead and Winery Events provided by the project applicant is attached in **Appendix C**. The agricultural promotional events would feature food, wine, and other products produced on the site or in the local area and would be held in the farm building complex area. Events would end by 9:30 p.m. with clean up being completed by 10:00 p.m. There would be no outdoor amplified music at any event. Event parking would be provided onsite with parking guides present to facilitate parking when event participants arrive.

TRIP GENERATION

TJKM estimated project trip generation for the proposed project based on data provided by the project applicant and data provided by the County (variation in ADT over the course of entire year). The data provided by the project applicant estimated the anticipated daily truck trips and passenger car trips during non-harvest season and harvest season. The data provided by the County is based on winery facilities in Sonoma County, provides the estimated daily trips expected per month over the course of an entire year by employees, visitors, and trucks and is summarized in **Table 4**. Data provided by the project applicant attached in **Appendix C**.

Table 4: Variation in ADT over the Course of Entire Year

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug[1]	Sep[1]	Oct[1]	Nov	Dec
Employees	27	27	27	27	27	27	27	48	48	48	27	27
Visitors	34	34	34	34	34	34	34	48	48	48	34	34
Trucks	3.14	3.36	3.36	3.36	3.44	3.44	3.44	3.62	3.32	3.32	3.14	3.14
Total[2]	64	64	64	64	64	64	64	100	99	99	64	64

Source: County of Sonoma Data for winery facilities, email from the County staff to Dudek, February, 2016.
Notes:
1) Months in bold represent harvest season conditions
2) Total values rounded to the nearest whole number

Based on the information provided by the project applicant and the County and after consultation with the County staff, the following trip generation forecasts were prepared:

1. Truck Trip Generation for harvest season and non-harvest season.
2. Daily Trip Generation (Trucks and Passenger Cars) from which peak hour trips were forecasted during the weekday a.m. peak hour, weekday p.m. peak hour, and weekend peak hour for non-harvest season, harvest season and proposed special events.

Truck Trip Generation

Table 5 summarizes the truck trip generation forecast. The proposed project is expected to generate approximately three to four truck trips per day throughout the year. 88 trips for off-hauling grapes which currently occur on site during the harvest season were not included as the project proposes to eliminate them.

Table 5: Proposed Project Truck Trip Generation Forecast

Proposed Project Truck Trips		Truck Loads	Daily
Truck Traffic			
	Non-Harvest Season		
	Pomace Disposal (On Site)	0	0.00
	Bottle Delivery (02/01 to 08/31)[1]	5	0.06
	Finished Wine Transportation & Storage (02/01 to 08/31)[2]	7	0.08
	Barrel Delivery (06/01 to 08/31)[3]	3	0.08
	Miscellaneous Deliveries (02/01 to 08/31)[4]	6	0.08
Net-Total Truck Trips During Non - Harvest Season			**0.30**
	Harvest Season		
	Grape Importation (08/01 to 10/31)[5]	8	0.18
Net-Total Truck Trips During Harvest Season			**0.18**
	Trucks Year Round		
	Milk Importation[6]	96/year	0.76
	Cheese Transportation[7]	48/year	0.38
	Miscellaneous Visitors, UPS, Mail, Garbage, etc.	0	2.00
Net-Total Year Round Truck Trips			**3.14**
Average Daily Truck Trips – Non Harvest Season			**3.44**
Average Daily Truck Trips – Harvest Season			**3.32**

Notes:
Above Table for Informational purpose only
1) Bottle Delivery - Five Truck Loads between the months of February and August
Number of Days between Feb 1st and Aug 31st = 213 days
Number of working days (weekdays) = 157 days
Daily Trips (In and Out) = (5/157)*2 = 0.06
2) Finished Wine Transportation & Storage - Seven Truckloads between the months of February and August
Number of Days between Feb 1st and Aug 31st = 213 days
Number of working days (weekdays) = 157 days
3) Barrel delivery - Three Truckloads between the months of June and August
Number of Days between June 1st and Aug 31st = 92 days
Number of working days (weekdays) = 73 days
4) Miscellaneous Deliveries (e.g., Corks, Labels) - Six Truckloads during the months of February and August.
Number of Days between Feb 1st and Aug 31st = 213 days
Number of working days (weekdays) = 157 days
5) Grape Importation - 8 Truckloads between the months of August and October
Number of Days between Aug 1st and Oct 31st = 92
Number of working days (excluding holidays) = 90 days
6) Milk Importation - Two Truckloads per week annually.
96 truckloads per year. This equals 0.76 daily trips (0.38*2)
7) Cheese Transportation - One Truckload per week annually
48 truckloads per year. This equals 0.38 daily trips (0.19*2)

Total Daily Vehicle Trips

Table 6 summarizes the daily trip generation forecast during the non-harvest, harvest season and special events. Daily trips consist of the trips expected to be generated by winery employees, trucks, tasting visitors, and special event visitors. The proposed project is expected to generate 63 vehicle trips per day during the non-harvest season, 99 vehicle trips per day during the harvest season, and 211 vehicle trips per day during special events.

Table 6: Proposed Project Daily Vehicle Trip Generation Forecast

No.	Daily Vehicle Trips	Quantity	Daily	
			Rate	Vehicle Trips
Non-Harvest Season				
1	**Winery Employees**			
	Winery Production and Storage	2	3.00	6
	Cheese making	2	3.00	6
	Administrative	1	3.00	3
	Tasting Room	4	3.00	12
2	**Truck Trips**			2
3	**Tasting Visitors**	42 visitors/day	0.80	34
Total Non-Harvest Season				**63**
Harvest Season (August to October) - Scenario 1				
4	**Winery Employees**			
	Harvest Season employees	16	3.00	48
5	**Truck Trips**			3
6	**Tasting Visitors**	60 visitors/day	0.80	48
Total Harvest Season - Scenario 1				**99**
Special Events - Scenario 2				
7	**Visitors**	200 visitors/event	0.80	160
8	**Trucks Trips**			3
9	**Employees**	16	3.00	48
Total Special Events - Scenario 2				**211**

Notes:
1) Non-Harvest Season
Number of tasting visitors = 42 persons/day; Vehicle occupancy = 2.5 persons/vehicle; total vehicular trips = (42/2.5)*2 = 34 vehicular trips/day;
2) Harvest Season
Number of tasting visitors = 60 persons/day; Vehicle occupancy = 2.5 persons/vehicle; total vehicular trips = (60/2.5)*2 = 48 vehicular trips/day;
Special event visitors = maximum 200 - visitor special event on a Saturday with all inbound arrivals occurring during Saturday Afternoon peak hour; vehicle occupancy = 2.5 person/vehicle; total vehicular trips = 200/2.5 = 80 vehicular trips/event

Peak Hour trip Generation

Table 7 summarizes the weekday a.m., weekday p.m., and weekend peak hour trip generation forecasts. The peak hour forecasts are based on a "worst case" scenario in which a high percentage of daily trips would occur during a single hour.

The project trip estimates were determined for following three scenarios:

1. ***Non-Harvest Season***

The proposed project is expected to have approximately 42 visitors per day during the non-harvest season. The visitors are expected to generate 11 vehicle trips during the weekday a.m. peak hour and 20 vehicle trips during the weekday p.m. peak hour and 27 vehicle trips during weekend peak hour.

2. ***Harvest Season (Scenario 1)***

The proposed project is expected to have approximately 60 visitors per day during the harvest season. The visitors are expected to generate 19 vehicle trips during the a.m. peak hour and 31 vehicle trips during the p.m. peak hour and 34 vehicle trips during weekend peak hour.

3. ***Special Events (Scenario 2)***

The proposed project proposes eight special events on only weekend with variable participant levels. For a maximum of 200-person special event on site, the project is expected to generate 80 vehicle trips during the weekend peak hour.

In consultation with the County's staff, traffic analysis was evaluated for scenario 1 and 2, only as they represent.

Table 7: Proposed Project Peak Hour Vehicle Trip Generation Forecast

No.	Peak Hour Vehicle Trips	AM Peak Hour			PM Peak Hour			Weekend Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Non-Harvest Season										
1	**Winery Employees**									
	Winery Production and Storage	2	0	2	0	2	2	1	1	2
	Cheese making	2	0	2	0	2	2	1	1	2
	Administrative	1	0	1	0	1	1	1	1	2
	Tasting Room	4	0	4	0	4	4	2	2	4
2	**Truck Trips**	2	0	2	0	2	2	0	0	0
3	**Tasting Visitors**	0	0	0	4	5	9	8	9	17
Total Non-Harvest Season Trips		11	0	**11**	4	16	**20**	13	14	**27**
Harvest Season (August to October) - Scenario 1										
4	**Winery Employees**									
	Harvest Season employees	16	0	16	0	16	16	5	5	10
5	**Truck Trips**	3	0	3	0	3	3	0	0	0
6	**Tasting Visitors**	0	0	0	6	6	12	12	12	24
Total Harvest Season - Scenario 1		19	0	**19**	6	25	**31**	17	17	**34**
Special Events - Scenario 2										
7	**Visitors**	N/A						80	0	**80**
8	**Trucks Trips**							0	0	0
9	**Employees**							0	0	0
Total Special Events - Scenario 2								80	0	**80**

Notes:
1) Non-Harvest Season
Weekend employee peak hour trips assumption - 10 lunch time vehicle trips
Weekend peak hour tasting visitor trips = Assumed 50% of the daily trips
Weekday peak hour tasting visitor trips = Assumed 50% of the weekend trips
During the a.m. peak hour, zero visitor trips are assumed since wineries typically open after 11:00 am.
2) Harvest Season
For weekend peak hour a total of 10 employee lunch time vehicle trips are assumed.
Weekend peak hour tasting visitor trips = Assumed 50% of the daily trips
Weekday peak hour tasting visitor trips = Assumed 50% of the weekend trips
Special event visitors = maximum 200 - visitor special event on a Saturday with all inbound arrivals occurring during Saturday Afternoon peak hour; vehicle occupancy = 2.5 person/vehicle; total vehicular trips = 200/2.5 = 80 vehicular trips/event

Trip Distribution and Assignment

Trip distribution is the process of determining the proportion of vehicles that would travel between the proposed project and various destinations in the vicinity of the study area. Trip assignment is the process of determining the various paths vehicles would take from the project site to each destination.

TJKM developed trip distribution percentages for project traffic based on existing traffic patterns, and based on regional travel time patterns. Regional travel time patterns indicates that majority of the winery visitors would travel from San Francisco, Oakland and San Jose via US Highway 101 corridor, thus arriving and departing to and from the west on Sonoma Mountain Road. Based on the regional travel time patterns, the distribution assumptions for the proposed project are summarized below:

- 75 percent to/from west side of the proposed project site (40 percent of the total 75 percent to/from Sonoma Mountain Road from Bennett Valley Road and Pressley Road. 35 percent of the total 75 percent to/from Pressley Road.)
- 25 percent to/from east side of the project site (20 percent of the total 25 percent to/from Warm Springs Road east of Sonoma Mountain Road. Five percent of the total 25 percent to/from Warm Springs Road between Sonoma Mountain Road and Bennett Valley Road)

The proposed trip distribution and assignment for harvest season is shown in **Figure 4a** and proposed trip distribution and assignment during the proposed special events is shown in **Figure 4b**. For each analysis scenario, the assigned project trips were added to the "no project" traffic volumes in order to determine "plus project" turning movements at the study intersections and roadway segments.

INTERSECTION LEVELS OF SERVICE – EXISTING PLUS PROJECT CONDITIONS

The intersection LOS analysis results for Existing plus Project Conditions are summarized in **Table 8**. Detailed calculation sheets for Existing plus Project Conditions are contained in **Appendix D**. The results indicated that all of the study intersections would continue to operate at acceptable LOS D or better with the addition of the traffic generated from the proposed project. The addition of project traffic would result in very little change to average delay. The proposed project is projected not to have any impacts at the study intersections under Existing plus Project Conditions with the addition of the additional traffic from the proposed project.

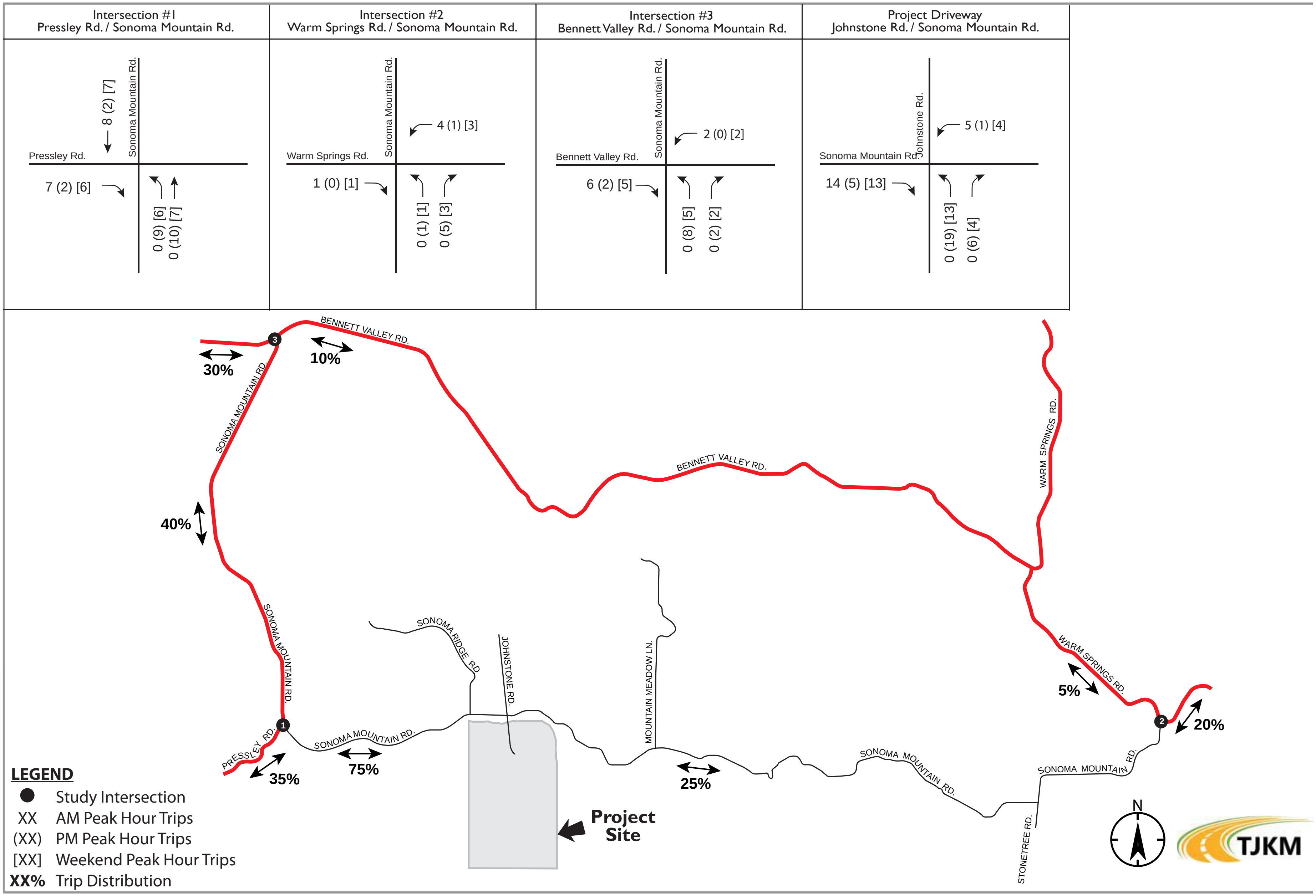
Peak hour turning movement volumes under Existing plus Project Conditions for Scenario 1 are illustrated in **Figure 5a** and peak hour turning movement volumes under Existing plus project Conditions for Scenario 2 are illustrated in **Figure 5b.**

Table 8: Intersection Levels of Service – Existing plus Project Conditions

ID	Intersection	Peak Hour	Existing Conditions		Existing plus Project Conditions - Scenario 1		Existing plus Project Conditions - Scenario 2	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Pressley Road/ Sonoma Mountain Road	A.M.	8.9	A	8.9	A	-	-
		P.M.	8.8	A	9.0	A	-	-
		Weekend	8.9	A	9.1	A	9.2	A
2	Warm Springs Road/ Sonoma Mountain Road	A.M.	10.7	B	10.8	B	-	-
		P.M.	9.5	A	9.5	A	-	-
		Weekend	9.0	A	9.1	A	9.0	A
3	Sonoma Mountain Road/ Bennett Valley Road	A.M.	12.4	B	12.6	B	-	-
		P.M.	13.0	B	13.2	B	-	-
		Weekend	11.9	B	12.0	B	12.2	B

Notes:
1. Control delay for the worst movement is presented for side-street stop controlled intersections.
2. LOS = Level of Service

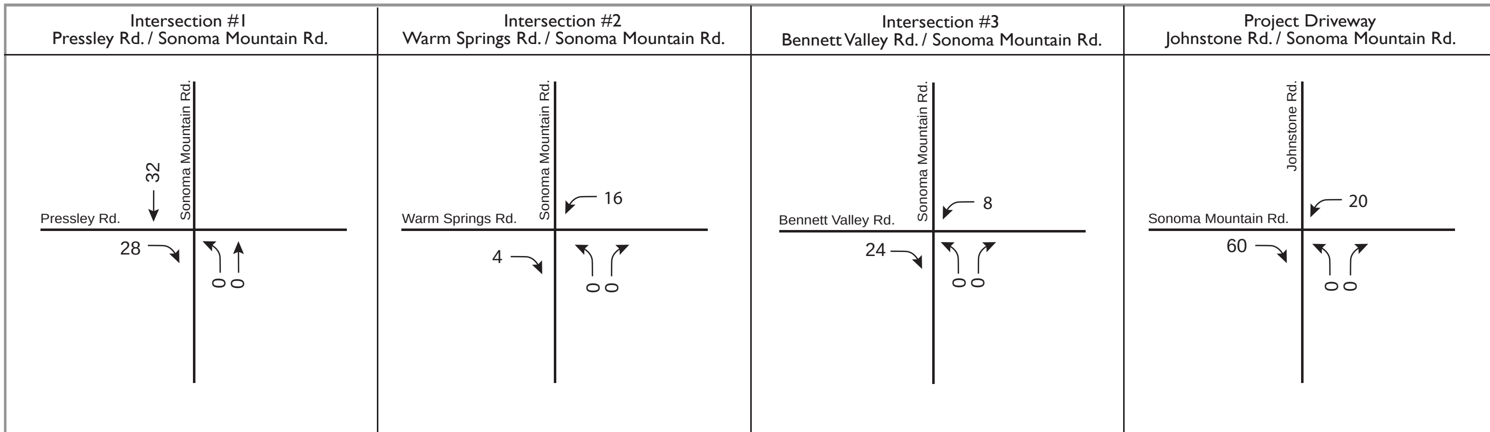
Trip Assignment and Distribution - Scenario 1

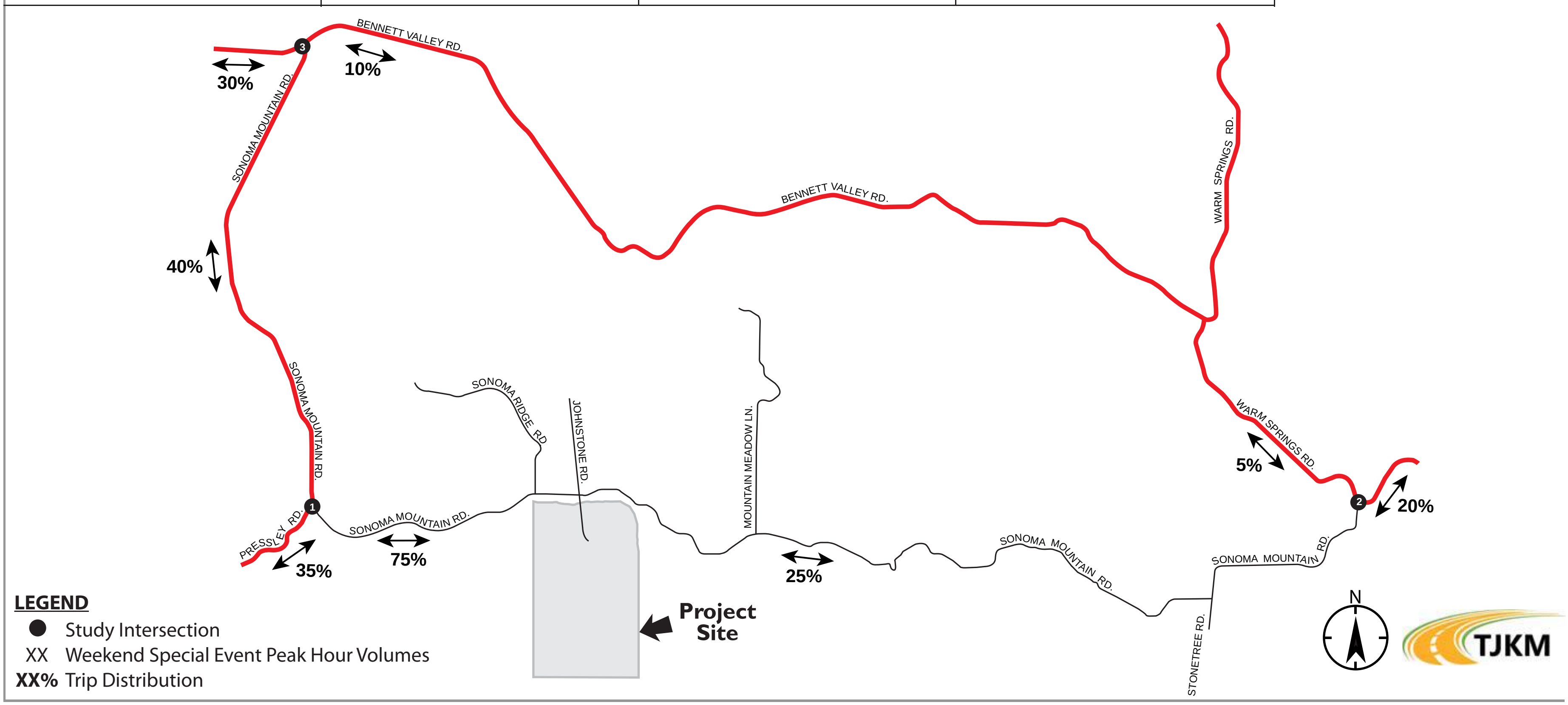


117-113

Figure 4a

Trip Assignment and Distribution - Scenario 2





Existing Plus Project Conditions - Traffic Volumes, Lane Geometry and Controls - Scenario 1

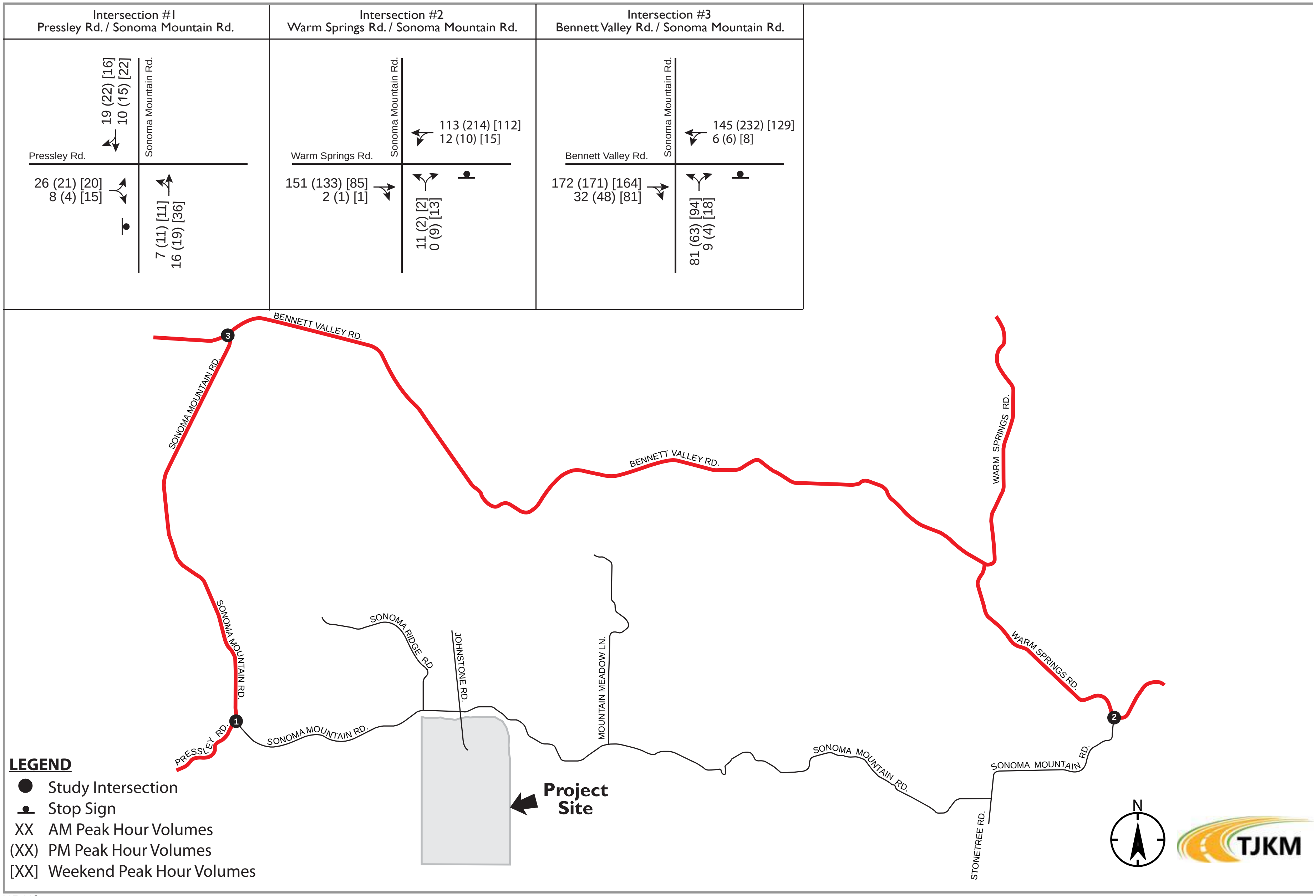


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Figure 5a

Existing Plus Project Conditions - Traffic Volumes, Lane Geometry and Controls - Scenario 2

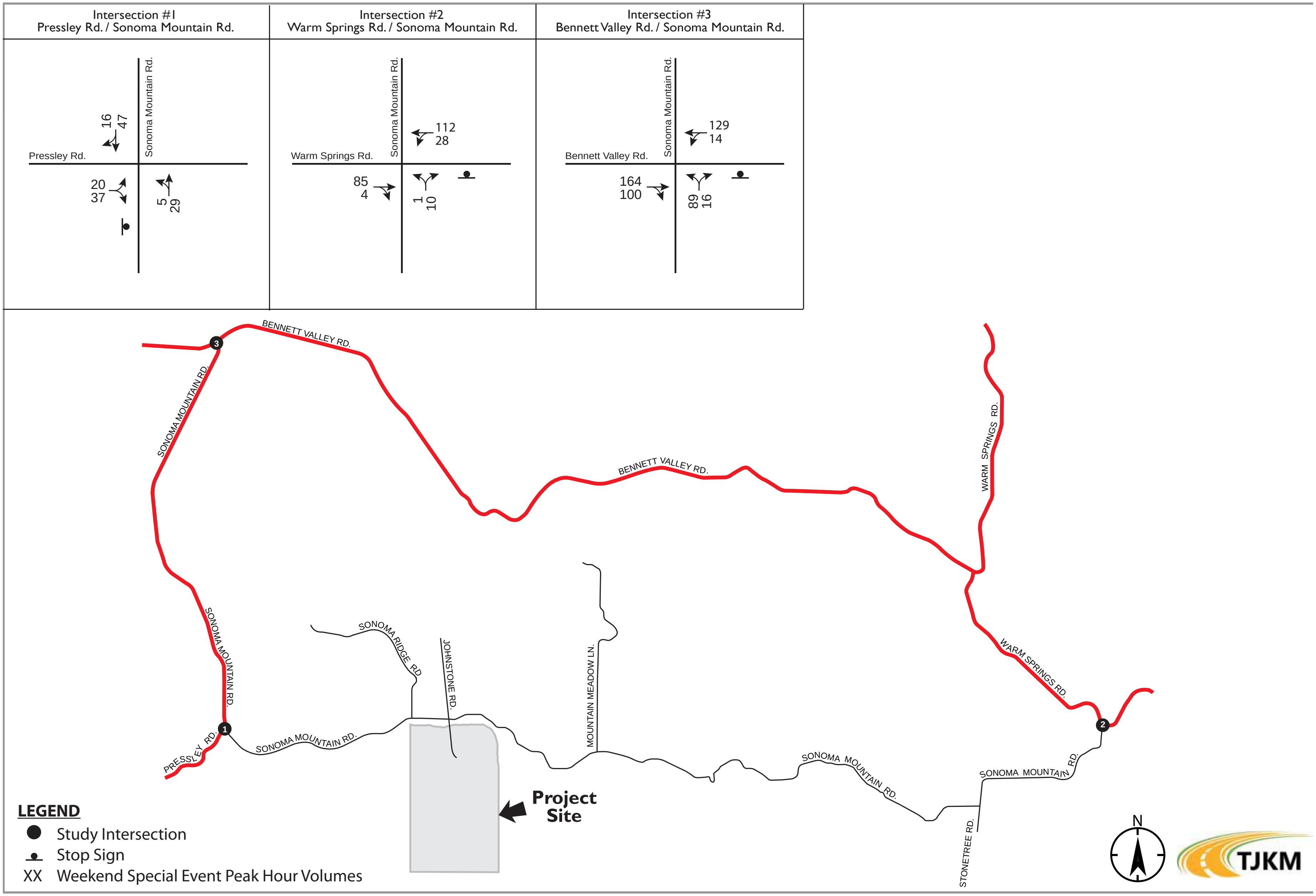

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Figure 5b

CUMULATIVE CONDITIONS

This section details expected traffic conditions at the study intersections under Cumulative (No Project) Conditions. This analysis scenario is defined as baseline conditions without the proposed project in year 2040. This scenario is similar to the Existing Conditions, but with a projected growth rate of two percent per year applied over 25 years to project traffic demands for the Horizon Year 2040.

The Cumulative No Project (or cumulative baseline) traffic volumes were based on the Sonoma County Transportation Authority (SCTA) model forecasted rate of two percent annual growth for 25 years applied to Existing traffic volumes. TJKM calculated the growth rate using the SCTA model volumes for the 2040 Horizon Year and comparing it to 2010 volumes. The growth rate calculations were checked and accepted by the County Staff.

INTERSECTION LEVEL OF SERVICE ANALYSIS – CUMULATIVE CONDITIONS

The intersection LOS analysis results for Cumulative Conditions are summarized in **Table 9**. Detailed calculation sheets for Cumulative Conditions are contained in **Appendix E**. Under Cumulative (Year 2040) Conditions without project, all of the study intersections are projected to continue to operate at LOS D or better.

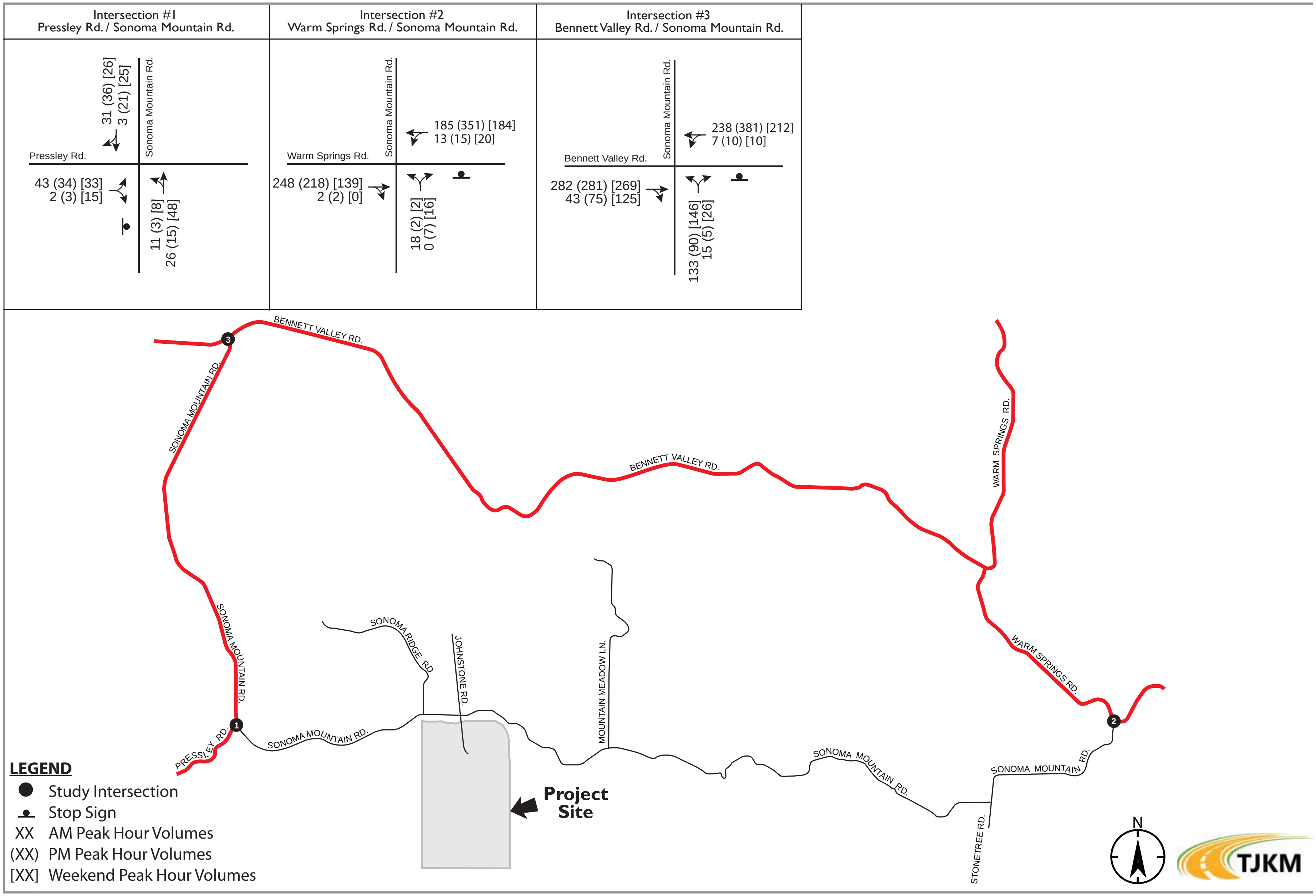
Figure 6 shows projected turning movement volumes at all of the study intersections for Cumulative Conditions.

Table 9: Intersection Level of Service – Cumulative No Project Conditions

ID	Intersection	Intersection Control	A.M. Peak Hour		P.M. Peak Hour		Weekend Peak Hour	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Pressley Road/ Sonoma Mountain Road	One-way Stop	9.2	A	9.1	A	9.3	A
2	Warm Springs Road/ Sonoma Mountain Road	One-way Stop	12.9	B	10.7	B	9.5	A
3	Sonoma Mountain Road/ Bennett Valley Road	One-way Stop	20.5	C	22.5	C	17.9	C

Notes:
1. Control delay for the worst movement is presented for side-street stop controlled intersections.
2. LOS = Level of Service

Cumulative Conditions - Traffic Volumes, Lane Geometry and Controls



117-113

Figure 6

CUMULATIVE PLUS PROJECT CONDITIONS

This scenario reflects Cumulative (Year 2040) Conditions with the addition of forecasted vehicle trip generation from the proposed project. Under Cumulative (Year 2040) plus Project Conditions, TJKM used the same project trip generation, distribution, and assignment assumed under Existing plus Project Conditions, since the project applicant envisions that the winery will have the same annual production and 200-person maximum special event in the future**.**

INTERSECTION LEVEL OF SERVICE ANALYSIS – CUMULATIVE PLUS PROJECT CONDITIONS

The intersection LOS analysis results for Cumulative plus Project Conditions are summarized in **Table 10**. Detailed calculation sheets for Cumulative plus Project Conditions are contained in **Appendix** F. The results indicated that all of the study intersections would continue to operate at acceptable LOS D or better with the addition of the traffic generated from the proposed project. The proposed project is projected not to have any impacts at the study intersections under Cumulative plus Project Conditions with the addition of the traffic projected to be generated from the proposed project.

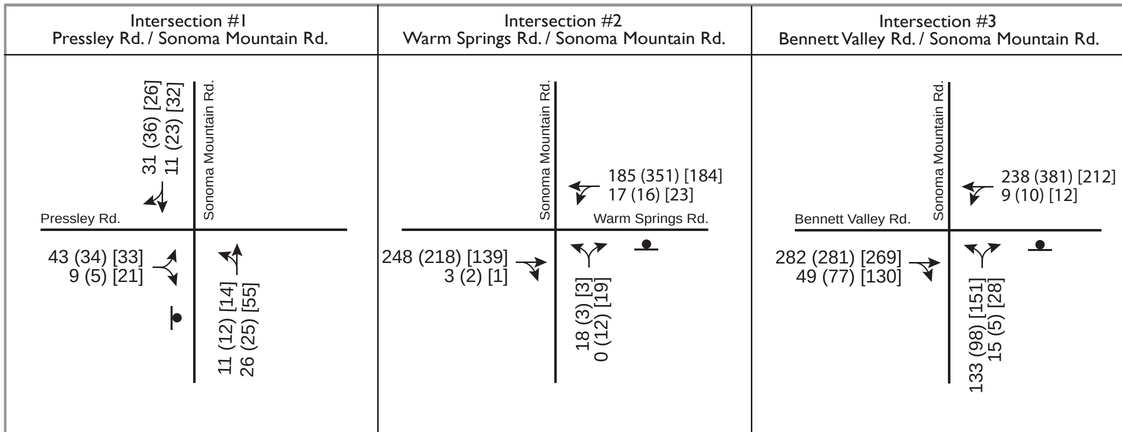
The Cumulative plus Project volumes, lane geometries, and controls for harvest season is illustrated in **Figure 7a** and Cumulative plus Project Demands, lane geometries, and controls for the proposed special events is illustrated in **Figure 7b.**

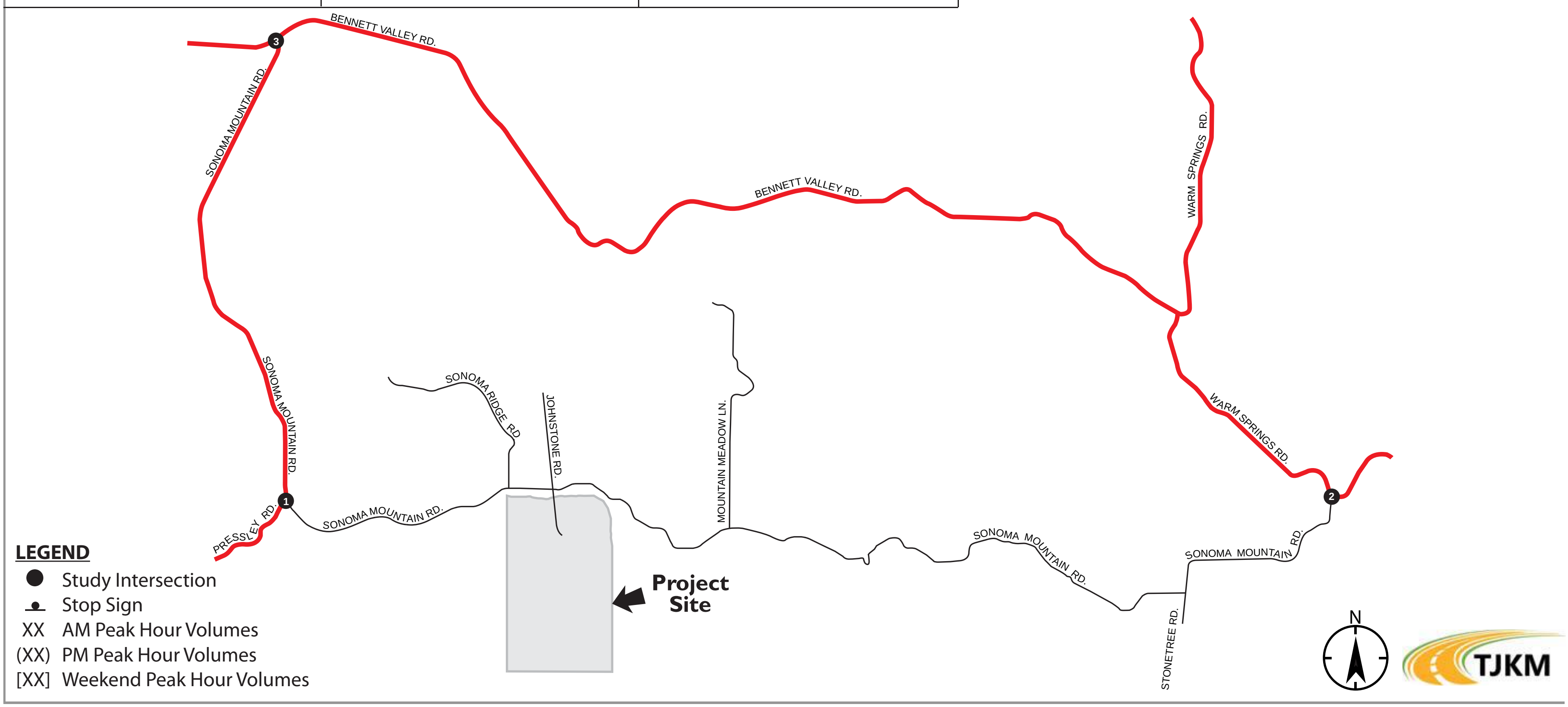
Table 10: Intersection Levels of Service – Cumulative plus Project Conditions

ID	Intersection	Peak Hour	Cumulative Conditions		Cumulative plus Project Conditions - Scenario 1		Cumulative plus Project Conditions - Scenario 2	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Pressley Road/ Sonoma Mountain Road	A.M.	9.2	A	9.2	A	-	-
		P.M.	9.1	A	9.3	A	-	-
		Weekend	9.3	A	9.5	A	9.6	A
2	Warm Springs Road/ Sonoma Mountain Road	A.M.	12.9	B	13.1	B	-	-
		P.M.	10.7	B	10.6	B	-	-
		Weekend	9.5	A	9.7	A	9.6	A
3	Sonoma Mountain Road/ Bennett Valley Road	A.M.	20.5	C	20.9	C	-	-
		P.M.	22.5	C	23.4	C	-	-
		Weekend	17.9	C	18.4	C	18.9	C

Notes:
1. Control delay for the worst movement is presented for side-street stop controlled intersections.
2. LOS = Level of Service

Cumulative Plus Project Conditions - Traffic Volumes, Lane Geometry and Controls - Scenario 1

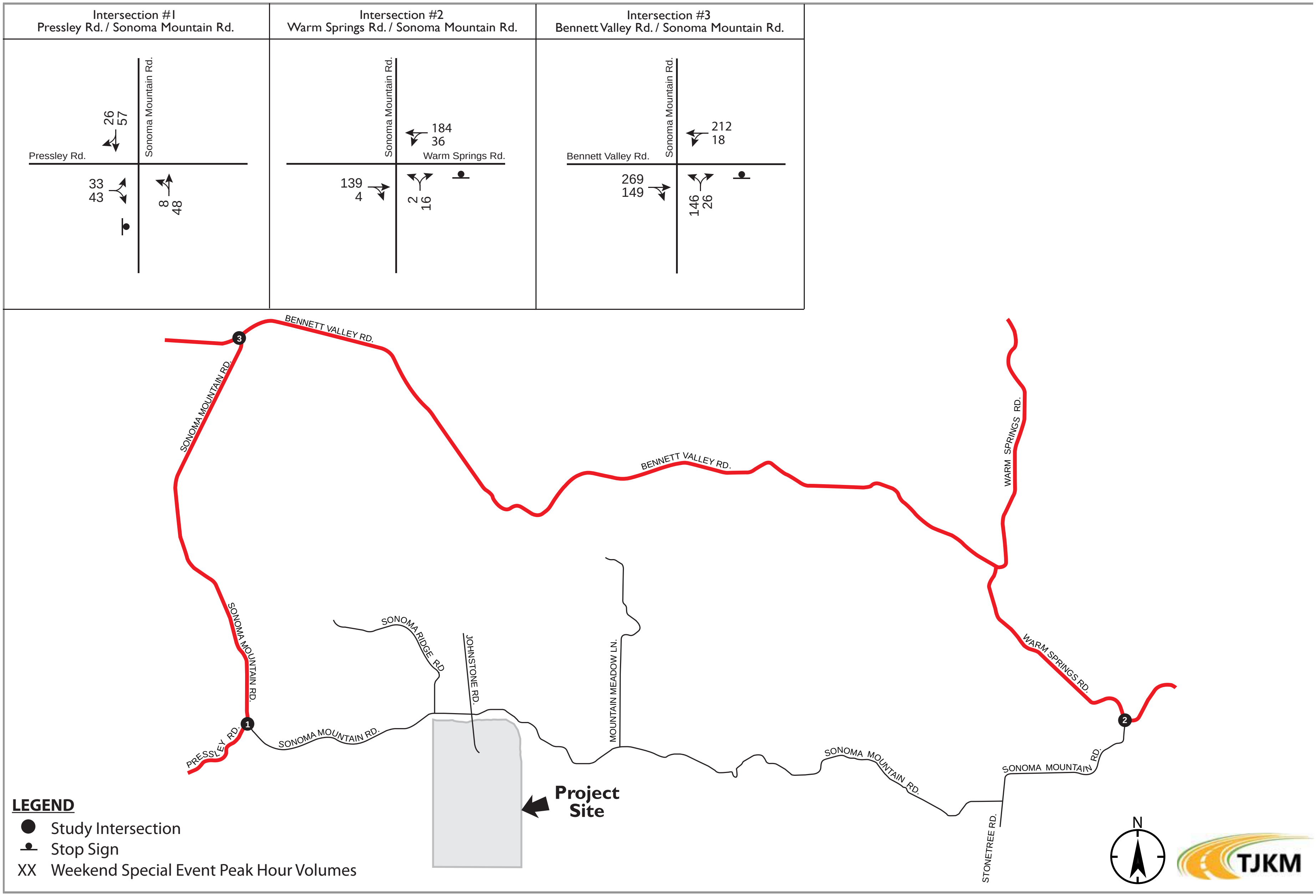




117-113

Figure 7a

Cumulative Plus Project Conditions - Traffic Volumes, Lane Geometry and Controls - Scenario 2



117-113

Figure 7b

ROADWAY SEGMENT LEVEL OF SERVICE

TJKM evaluated daily traffic operations for the study roadway segments along Sonoma Mountain Road and Pressley Road using the Sonoma County General Plan definitions for the rural roads, given the rural geometric, population, and existing traffic volume characteristics of Sonoma Mountain Road.

For daily traffic operations in the Sonoma County, LOS is determined based on the rural roadway classification and the ADT of a given roadway segment. The Sonoma County General Plan classifies two-lane rural roads with good geometrics (as defined by the AASHTO Green Book) to be operating at LOS C up to 5,000 daily vehicles, and at LOS D up to 5,600 daily vehicles. Where a rural roadway is effectively one lane wide, ADT for LOS C is up to 1,200 daily vehicles, and up to 1,400 daily vehicles for LOS D.

According to Sonoma County's traffic impact study guidelines, the County's standard for roadway segments is to maintain LOS C on the County roadway system as defined in the Sonoma County General Plan. The project would have a significant traffic impact if the project's traffic would cause a road currently operating at an acceptable level of service to operate at an unacceptable level (i.e. LOS D, E, or F).

Table 11 summarizes the results of a roadway segment analysis. This analysis was conducted based on the daily traffic volumes collected during the months of October and November 2015. ADT along the study roadway segments is illustrated in **Figure 8a** for Existing Conditions**, 8b** for Existing plus Project Conditions**, 8c** for Cumulative Conditions, **and 8d** for Cumulative plus Project Conditions. ADT values shown in the figures were calculated by averaging over the total weekdays and total weekends. Raw counts for Existing Conditions are contained in **Appendix A**.

Based on the analysis, the project impacts to roadway segments would be ***less than significant***. Each of the roadway segments would continue operating acceptably at LOS C or better with the addition of Project traffic.

Table 11: Roadway Segment Analysis

ID	Roadway Segment	Width (feet)	Day	Existing Conditions		Existing plus Project Conditions - Scenario 1		Existing plus Project Conditions - Scenario 2		Cumulative Conditions		Cumulative plus Project Condition - Scenario 1		Cumulative plus Project Condition - Scenario 2	
				Volume (ADT)¹	LOS²	Volume (ADT)¹	LOS²	Volume (ADT)¹	LOS²	Volume (ADT)¹	LOS²	Volume (ADT)¹	LOS²	Volume (ADT)¹	LOS²
1	Pressley Road south of Sonoma Mountain Road	18	Weekday	667	A	702	A	-	-	1,094	B	1,129	B	-	-
			Weekend	550	A	585	A	624	A	902	B	937	B	976	B
2	Sonoma Mountain Road, east of 5312 Sonoma Mountain Road	18	Weekday	439	A	464	A	-	-	720	C	745	C	-	-
			Weekend	385	A	410	A	438	A	632	B	657	B	684	B
3	Sonoma Mountain Road, west of Sonoma Ridge Road	18	Weekday	351	A	425	A	-	-	576	B	651	B	-	-
			Weekend	276	A	351	A	434	A	453	A	528	B	686	B

Notes:
1. ADT = Average daily Traffic
2. LOS = Level of Service

Existing Conditions Average Daily Traffic

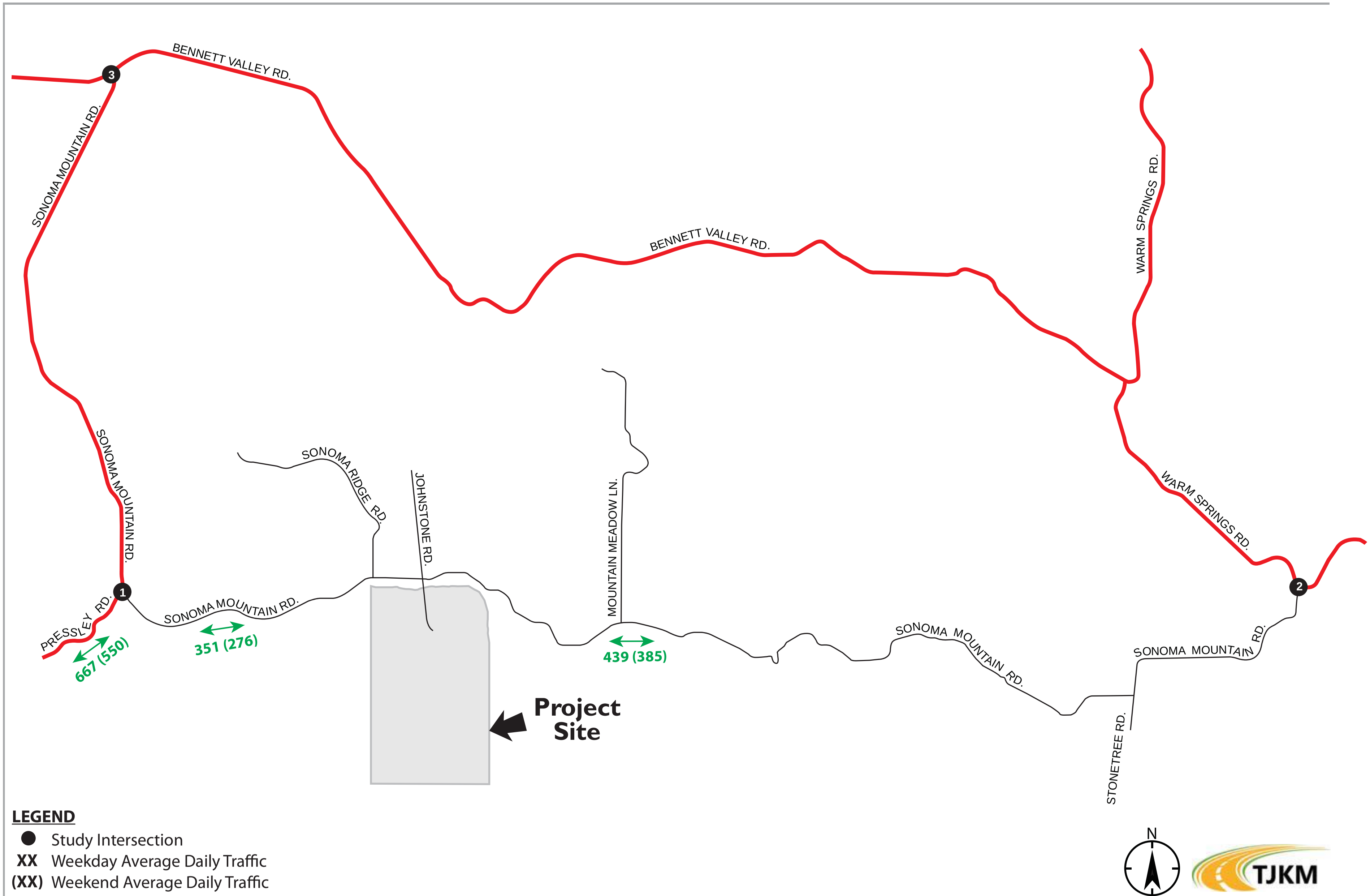


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Figure 8a

Existing plus Project Conditions Average Daily Traffic

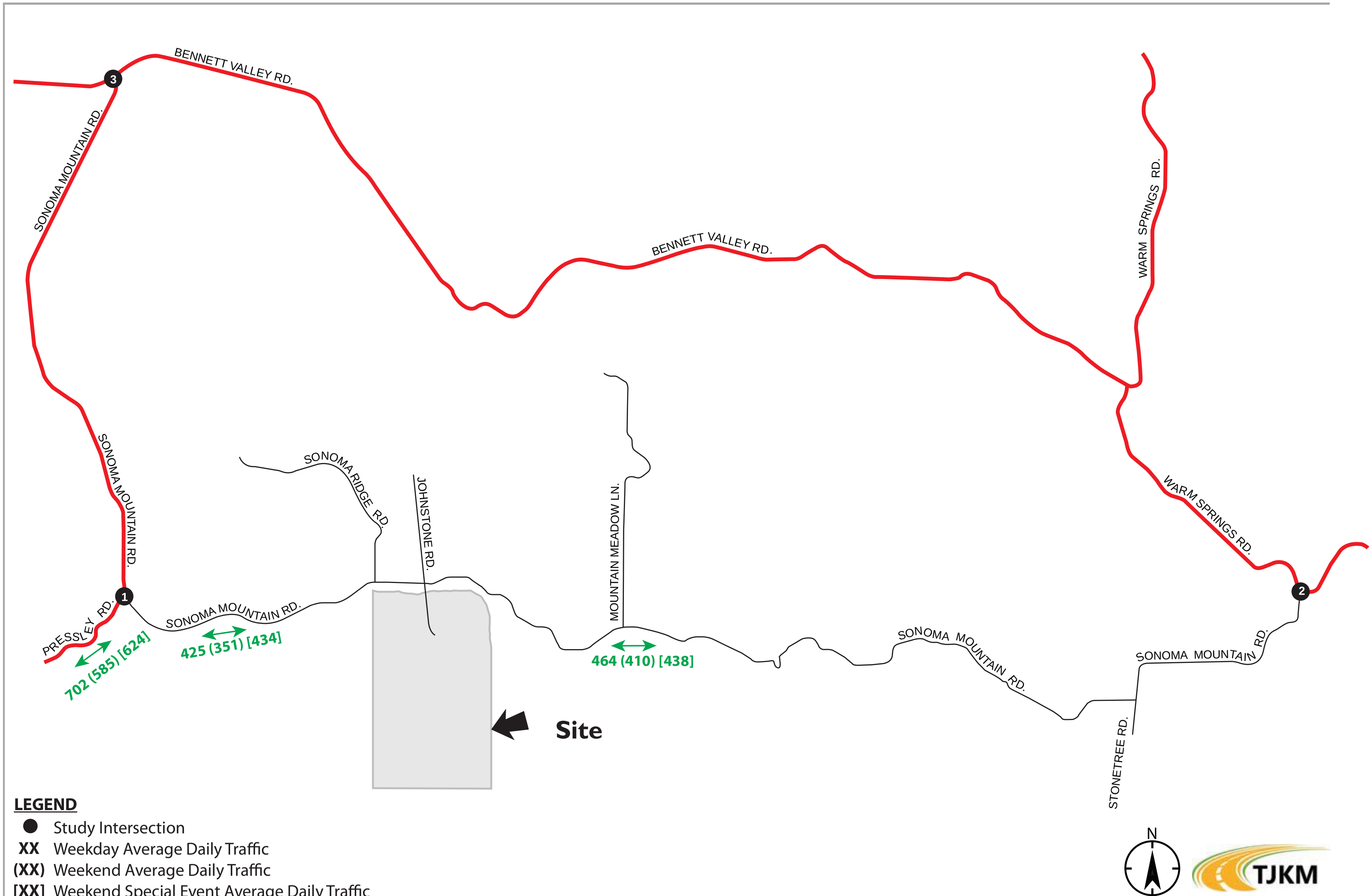

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Figure 8b

Cumulative Conditions Average Daily Traffic

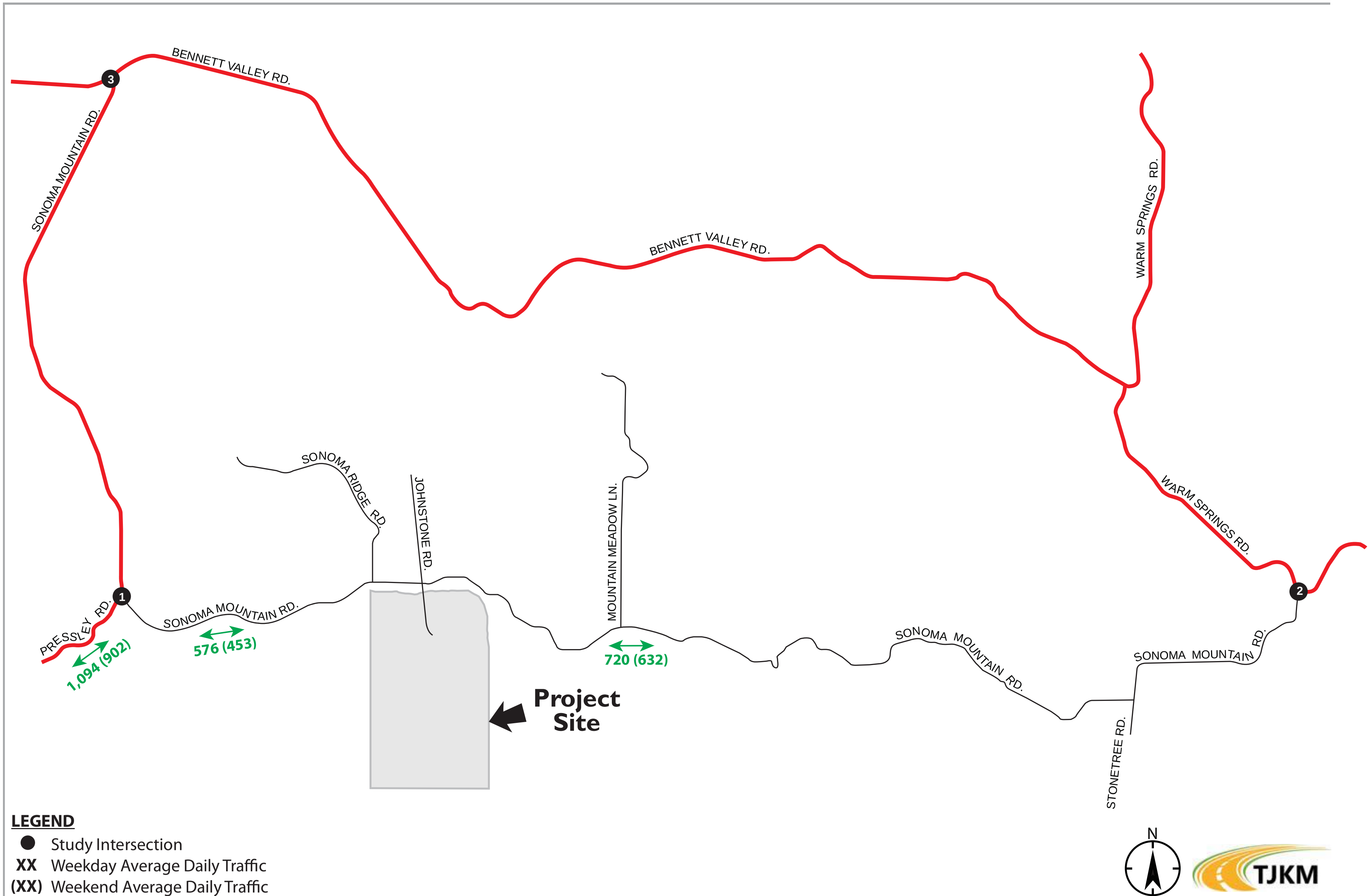

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Figure 8c

Cumulative plus Project Conditions Average Daily Traffic

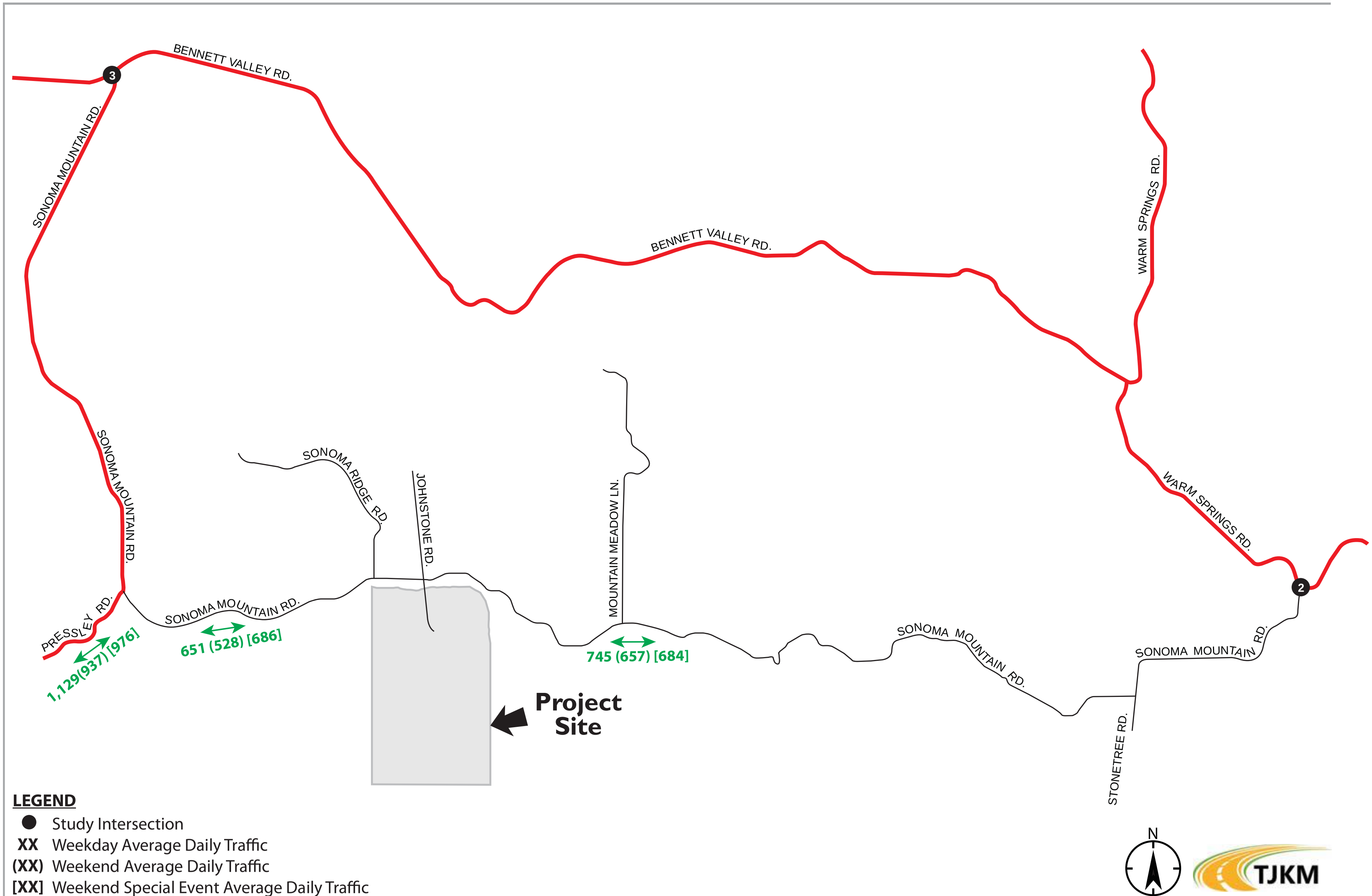

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Figure 8d

TRAFFIC SAFETY ANALYSIS

TJKM conducted an expanded investigation of the potential for the proposed winery to cause significant road degradation and safety issues. The following roadway segments were included as part of this analysis:

- Sonoma Mountain Road, between Bennett Valley Road and Pressley Road
- Sonoma Mountain Road, between Pressley Road and Sonoma Ridge Road
- Sonoma Mountain Road, between Sonoma Ridge Road and Mountain Meadow Lane
- Sonoma Mountain Road, between Mountain Meadow Lane and Waldruhe Heights
- Sonoma Mountain Road, between Waldruhe Heights and Warm Springs Road
- Roberts/Pressley Road, between Petaluma Hill Road and Sonoma Mountain Road

The safety concerns and the adverse effects on Sonoma Mountain Road and Pressley Road caused by the additional trips expected to be generated by the proposed winery is discussed in the following section.

EXISTING CONDITIONS FIELD OBSERVATIONS

TJKM conducted field observations during December 2015 and observed following conditions:

Sonoma Mountain Road

Sonoma Mountain Road from Pressley Road to Warm Springs Road does not have a posted speed limit. Advisory signs of 20 mph and 10 mph are posted along the roadway. Based on a speed survey conducted by W-Trans in a previous study, the 85th percentile speed for traffic approaching the driveway was found to be approximately 40 mph. However, slower speeds are generally expected on the narrow section and curves along the roadway.

Sight Distance - During the field visit conducted, potential locations were identified along Sonoma Mountain Road, which could hinder sight distance for the drivers due to a combination of horizontal curves, vertical curves, and vegetation and trees adjacent to the roadway. **Figure 9** shows the identified locations along Sonoma Mountain Road. **Table 12** below summarizes the 39 identified locations broken down between the study segments along Sonoma Mountain Road. Detailed description of the sight distance limitations at the identified locations is attached in **Appendix G**.

Table 12: Limited Sight Distance Locations - Sonoma Mountain Road

Roadway Segment	Location Numbers	Roadway Width (ft)	Minimum Measured Sight Distance	Reasons for Sight Distance Obstruction
Between Bennet Valley Road and Pressley Road	N/A			N/A
Between Pressley Road and Sonoma Ridge Road	1 to 2	<17	Most curves have 170 to 290 ft	Vegetation, Hill, Vertical Curve, Horizontal Curve
Between Sonoma Ridge Road and Mountain Meadow Lane	2 to 14	11 to 17	Most Curves have 120 to 240 ft	Vegetation, Hill, Vertical Curve, Horizontal Curve
Between Mountain Meadow Lane and Waldruhe Heights	14 to 20	14 to 17	Most Curves have 95 to 160 ft	Vegetation, Hill, Vertical Curve, Horizontal Curve
Between Waldruhe Heights and Warm Springs Road	20 to 39	12.5 to 18	Most Curves have 125 to 185 ft	Vegetation, Hill

<u>Narrow Pavements</u> – The pavement width ranges between 11-20 feet along Sonoma Mountain Road. As per *A Policy on Geometric Design of Highways and Streets (AASHTO)*, the lane width typically varies from 9-10 feet for similarly classified roads having comparable volumes and design speed. Though sufficient warning signs regarding the reduced pavement width and reduced speed limit are provided, narrow pavements may cause vehicles to not pass safely considering the topography.

<u>No Paved Shoulder</u> – The entire segment of Sonoma Mountain Road does not have a paved shoulder. The shoulders are made up of dirt that is not well compacted and might be challenging for vehicles pulling off the road specifically on bad weather days. In addition, unpaved shoulders often develop deep ruts due to tire wear or erosion.

<u>Blind Curves</u> – Sonoma Mountain Road is too narrow in some places for two vehicles to pass easily and has many sharp horizontal curves that limit how far in advance motorists can identify approaching traffic. Due to its topography, Sonoma Mountain Road has a number of horizontal and vertical curves that can create blind spots in the road based on a motorist's position. Trying to pass oncoming vehicles could result in a collision if one motorist fails to yield to the other. For example, **Figure 9** shows a steep slope on curve number 14 on the north side and a steep slope upward on the south side of the road. Curve numbers 16, 17, and 18 are other examples that make up a sweeping curve with limited sight distance. Curve number 29 has a sharp turn with a driveway on the south side and trees on the north side of the road.

<u>Elevation Changes</u> – At certain locations, uphill and downhill segments on Sonoma Mountain Road may put increased demands on vehicle brakes. There is also a possibility of skidding during adverse weather conditions while descending roads with steep grades. For example, curve number 17, 18, 31, and 33 include elevation changes of approximately 3%.

<u>Pavement Condition</u> –

Sonoma Mountain Road east of the Pressley Road intersection has multiple locations with damaged pavement, potholes, alligator cracking, etc.

Project Traffic Impacts on Sonoma Mountain Road
The proposed project is expected to generate 63 daily trips during non-harvest season, 99 daily trips during harvest season, and 211 daily trips during special events. The primary access concern is the narrow width and horizontal curves of Sonoma Mountain Road that leads to the project driveway. Though the traffic generated from the proposed project does not significantly impact Sonoma Mountain Road in terms of traffic operations (i.e. Level of Service), it could present challenges for drivers unfamiliar with the road conditions east of the project site. To reduce such concerns, the project applicant states that they will request all guests travel to the project site only from the south or west (Santa Rosa or Rohnert Park) via Bennett Valley Road to Sonoma Mountain Road and not from Glen Ellen via Warm Springs Road and the eastern portion of Sonoma Mountain Road.

Impacts on Pedestrian Facilities
An impact to pedestrians would occur if the proposed project would disrupt existing pedestrian facilities, or create inconsistencies with planned pedestrian facilities or adopted pedestrian system plans, guidelines, policies or standards conflict as per Sonoma County. As there are no existing pedestrian facilities near the project site, the proposed project is ***not expected to create any impact***.

Impacts on Bicycle Facilities

An impact to bicyclists would occur if the proposed project would disrupt existing bicycle facilities, or conflict or create inconsistencies with adopted bicycle system plans, guidelines, policies or standards as per the County of Sonoma.

Based on the Sonoma County General Plan adopted in September 2008, Sonoma Mountain Road is proposed to be a Class III Bike Route. “Share the Road” bicycle signs are posted on Sonoma Mountain Road. The proposed project is expected to increase vehicular traffic on Sonoma Mountain Road by 6%; hence, there would not be a significant change from existing conditions. Although not required to mitigate project impacts, the County may consider installing an additional “Share the Road” or “Bicycles on Road” sign east of the Pressley Road intersection.

<u>Picture below show existing conditions along Sonoma Mountain Road</u>

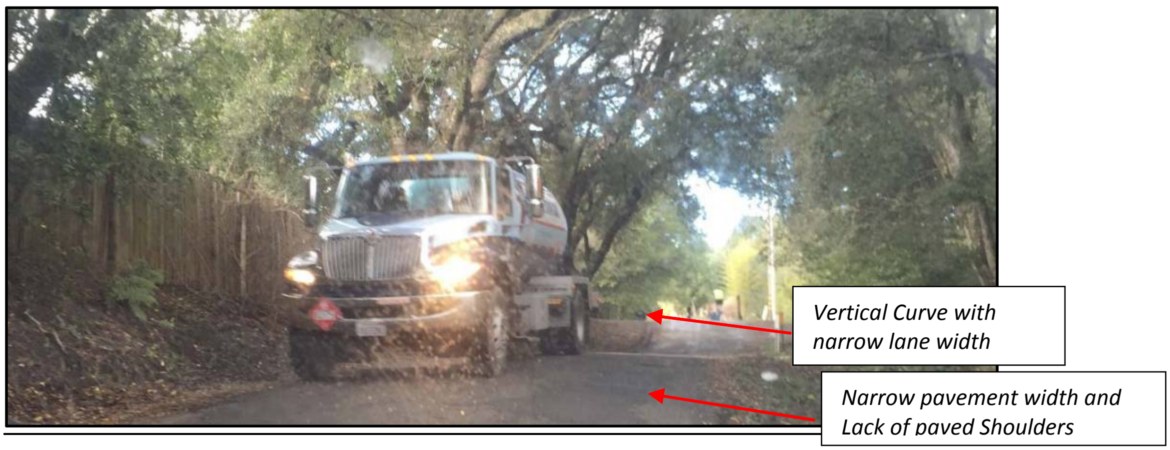


Photo 1 – Narrow pavement and vegetation on both sides of the road limits ability of vehicles to pass.

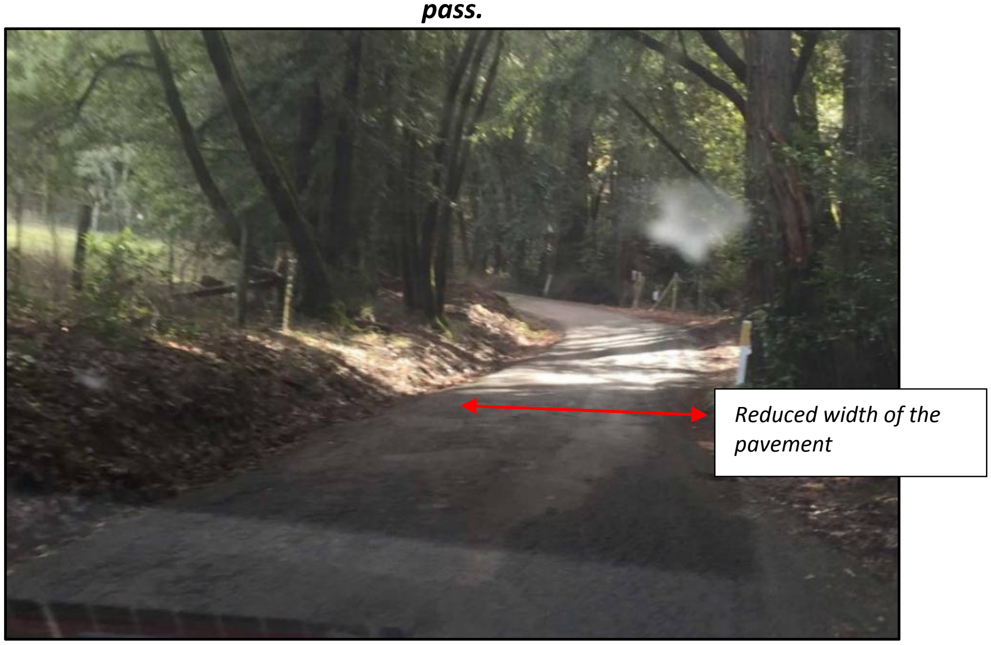


Photo 2 – Narrow Pavement Width

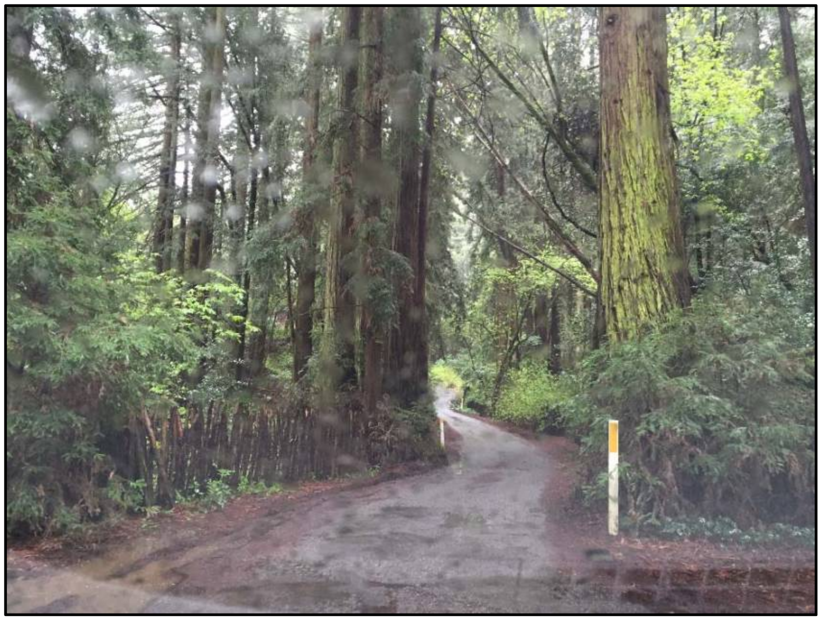


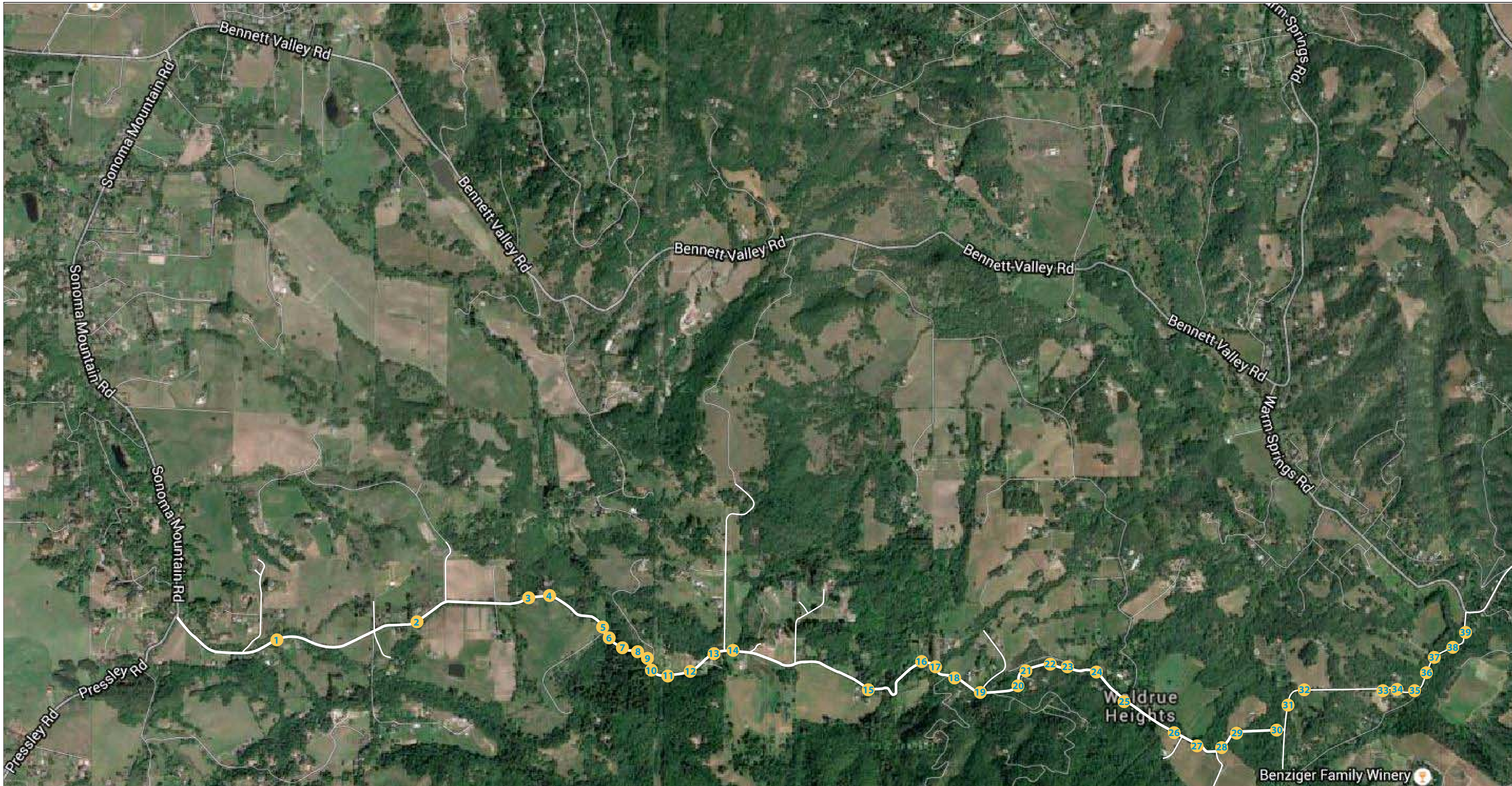
Photo 3 – Narrow pavement and vegetation on both sides of the Sonoma Mountain Road

Photo 4 – Damaged Road Surface Condition

Pressley Road

Pressley Road is a two-lane local road. Pressley Road extends 2.8 miles between Roberts Road, east of the City of Rohnert Park and terminates at Sonoma Mountain Road near the project vicinity. Pressley Road is a rural roadway with varied topography and multiple horizontal and vertical curves with posted speed limit of 30 mph near Sonoma Mountain Road. At the curves, adequate warning signs with advisory speeds of 10 mph to 15 mph are posted. Pressley Road has two 12-feet travel lanes, a centerline stripe with little or no shoulders provided.

Limited Sight Distance Locations



LEGEND

X Limited Sight Distance Location

Figure 9

DRIVEWAY SIGHT DISTANCE ANALYSIS

Evaluation of sight distance was conducted based on sight distance criteria contained in the American Association of State Highway and Transportation Officials (AASHTO) *reference A Policy on Geometric Design of Highways and Streets*, also known as the AASHTO Green Book. As defined in the AASHTO Green Book, sight distance is the length of roadway ahead that is visible to a driver. Available sight distance should be adequate for a vehicle traveling at or near the roadway design speed to come to a complete stop before reaching a stationary object in its path, for example a vehicle turning out of a driveway.

Existing Sight Distance

The project site is accessed via the project driveway on Sonoma Mountain Road. TJKM conducted its field review of sight distance on December 2015. To complete an outbound left turn, which is expected to be a predominant movement for project traffic, 305 feet of sight distance is required based on the 85th percentile speed limit of 40 mph on Sonoma Mountain Road. Clear sight lines of approximately 280 feet are available based on the visual observations and measurements. Hence, it is recommended the project applicant remove vegetation in order to provide approximately 305 feet of clear sight distance to the west.

To complete an outbound right turn 305 feet of sight distance is required based on the speed limit of 40 mph on Sonoma Mountain Road. Clear sight lines of approximately 270 feet is available based on the visual observations and measurements. Hence it is recommended project applicant remove vegetation in order to provide a clear sight distance of 305 feet to the east.

There would be a concern for the ability of westbound drivers on Sonoma Mountain Road coming out of the horizontal curve approaching the project driveway to perceive and brake for any vehicles that are stopped in the roadway, waiting to turn left into the proposed winery. This situation could occur and be particularly acute during winery special events. Effective available stopping sight distance of 305 feet is required and 270 feet is available, resulting in a potential safety concern.

Photo 4 – Outbound Left-Turn from Driveway

Photo 5 – Outbound Right Turn from Driveway

Existing plus Project Sight Distance

The project site would continue to be accessed via the project driveway off Sonoma Mountain Road. Planned vegetation removal described by the project applicant[1] indicates that planned vegetation removal will provide 445 feet of sight distance to the east and 385 feet of sight distance to the west. Planned vegetation removal document provided by project applicant is attached in **Appendix C**.

Expected Project Construction Traffic

TJKM additionally reviewed the project applicant's anticipated construction schedule to determine the level of construction-related project traffic that is expected to be generated during winery construction. Construction, from soil excavation and structure demolition to winery and tasting room construction and furnishings, is expected to last approximately 12-18 months. Construction-related vehicle trips will consist of two components – construction workers and trucks.

The first stages of construction would involve demolition of existing structures and grading of approximately 3.1 acres of the site. The final site grading would include erosion prevention/sediment control features and would use best management practices to prevent erosion and sediment travel from disturbed areas on the site. The proposed earthwork would balance onsite elevations and would not require import or export of soil. It is estimated that during the approximately six-month site grading period, there would be approximately 40-truck deliveries total and an average of five worker vehicles per day. Standard construction methods would be employed for all proposed building construction. During the 12-18 month of building construction phase there would be a total of approximately 50 concrete trucks and 30 materials delivery trucks. An average of 10-12 workers would be onsite daily working 8-10 hours per day.

[1] Steve Martin, P.E., Vegetation and tree removal along Sonoma Mountain Road near project driveway, February 5, 2016.

These construction related trips are expected to be spread over a typical day and occur mostly outside the weekday peak periods. As a result, construction truck trips are not expected to have a significant effect on existing area traffic operations.

TRAFFIC INDEX ANALYSIS AND PAVEMENT DETERIORATION

TRAFFIC INDEX ANALYSIS

Traffic Index (TI) is a measure of the number of Equivalent Single Axle Loads (ESAL) expected on a traffic lane over the pavement design life of the facility. TI is determined by projecting the ESALs to estimate total accumulated traffic loading during the pavement design life. A method of judging the effect of increased truck traffic on pavement conditions is to compare TI values for existing conditions versus existing-plus-Project conditions. The County considers a project to have a undesirable effect to road wear if it would increase heavy truck traffic volumes that would increase the TI by more than 1.5 on roadways built to accommodate heavy truck traffic, and by more than 0.5 on other roadways.

Table 613.3A and Table 613.3C from Chapter 610 in Highway Design Manual was referenced to calculate TI. For purposes of conservative analysis, it was assumed that trucks would make up 10% of the average daily volumes. The daily volumes were projected by a growth rate of two percent per year for a Cumulative Year 2040. Based on the consultation with the County's staff, only trucks of vehicle type with three axles were analyzed. **Table 13** below summarizes the results of TI analysis for Sonoma Mountain Road near the vicinity of the project. TI analysis and calculations are provided in **Appendix H**.

Table 13: Traffic Index Analysis

Roadway Segment	*Existing Conditions*			*Existing Plus Project Conditions*		
	ESAL	*TI Based on Caltrans Procedure*	*TI Calculated*	*ESAL*	*TI Based on Caltrans Procedure*	*TI Calculated*
Sonoma Mountain Road, West of Sonoma Ridge Road	136,896	7.0	7.1	166,336	7.5	7.3
Sonoma Mountain Road, East of 5312 Sonoma Mountain Road	183,264	7.5	7.4	190,624	7.5	7.4

Notes:
1. ESAL = Equivalent Single Axle Load;
2. TI = Traffic Index

The applicable TI significance threshold for Sonoma Mountain road is an increase of more than 0.5. As shown in **Table 13**, the proposed project would increase the TI on the roadway segments analyzed by 0.5, which is ***not a significant impact***.

PAVEMENT DETERIORATION

The performance of pavement is typically influenced by the loading magnitude, configuration and the number of load repetitions by heavy vehicles. A visual inspection was conducted by TJKM on Sonoma Mountain Road during the field observation to identify where the surface has deteriorated. During the survey of the section evidences of surface distress such as alligator cracking, transverse (thermal) cracking, and longitudinal cracking were found. Given the relatively low traffic volumes on the Sonoma Mountain Road, existing pavement quality may be due to inadequate base on maintenance.

The Sonoma County 2015 Section PCI/RSL[2] Listing indicates that section of the Sonoma Mountain Road between Bennett Valley Road and Pressley Road (Functional Class L-Local) had a PCI rating ranging from 0 to 53, and an RSL ranging from less than one year to 13 years.[3]

The section of Sonoma Mountain Road between Pressley Road and Warm Springs Road (Functional Class L-Local) had a PCI rating ranging from 0 to 22, and a RSL of less than one year as indicated in the Sonoma County 2015 Section PCI/RSL Listing.

The section of Pressley Road between Roberts Road and Sonoma Mountain Road (Functional Class L-Local) had a PCI rating ranging from 56 to 82, and a RSL ranging from less than 13 years to 26 years as indicated in the Sonoma County 2015 Section PCI/RSL Listing.

Sonoma County has a two-year pavement preservation program that funds road repair/reconstruction, with priority given to the most heavily-travelled and economically-important roads. Sonoma Mountain Road is not included in the current two-year program, and is only expected to receive continued pothole patching. The Sonoma County 2015 Section PCI/RSL Listings data is contained in **Appendix I**.

The project is not anticipated to increase heavy truck volumes that would result in an increased TI of more than 0.5. Therefore, the project is not anticipated to result in undesirable effects on road wear.

2 PCI = Pavement Condition Index; RSL = Remaining Service Life.

3 The PCI provides a numerical rating for the condition of road segments within the road network, where zero is the worst possible condition, and 100 is the best.

QUEUING AND DRIVEWAY ANALYSIS

QUEUING ANALYSIS AT SELECTED STUDY INTERSECTIONS

TJKM conducted a vehicle queuing and storage analysis for all exclusive left turn pockets at study intersections where project traffic is added under plus project conditions. The 95th percentile (maximum) queues were analyzed using Synchro software. Detailed calculations are included in the LOS appendices corresponding to each analysis scenario. **Table 1** summarizes the 95th percentile queue lengths at selected study intersections under all study scenarios. As shown, under all scenarios the 95th percentile queue would not exceed one to two vehicle length. Based on the queuing analysis conducted it is projected that the proposed project will not have any significant impact on the left-turn queues at the study intersections.

Table 14: 95th Percentile Queues at Study Intersections

ID	Intersection	Lane Group	Peak Hour	Existing Conditions	Existing plus Project		Cumulative Conditions	Cumulative plus project Conditions	
					Scenario 1	Scenario 2		Scenario 1	Scenario 2
1	Pressley Road/Sonoma Mountain Road	EBL	A.M.	25’	25’	-	25’	25’	-
			P.M.	25’	25’	-	25’	25’	-
			Weekend	25’	25’	25’	25’	25’	25’
2	Warm Springs Road/Sonoma Mountain Road	NBL	A.M.	25’	25’	-	25’	25’	-
			P.M.	25’	25’	-	25’	25’	-
			Weekend	25’	25’	25’	25’	25’	25’
3	Sonoma Mountain Road/Bennett Valley Road	NBL	A.M.	25’	25’	-	50’	50’	-
			P.M.	25’	25’	-	50’	50’	-
			Weekend	25’	25’	25’	50’	50’	50’

Notes:
Storage length and 95th percentile queue is expressed in feet per lane
Queue length assumed to be 25 feet per vehicle

QUEUING AND LEVEL OF SERVICE AT PROJECT DRIVEWAY

TJKM conducted a vehicle queuing and LOS analysis at the proposed project driveways on Sonoma Mountain Road. The 95th percentile (maximum) queues were analyzed using Synchro software for the project driveway. **Table 15** summarizes the 95th percentile queue lengths at the project driveway under Existing plus Project and Cumulative plus Project scenario. It should be noted that for the driveway analysis total project trips were assigned on the proposed driveway. Under Existing plus Project Conditions and Cumulative plus Project conditions, the 95th percentile queueing at the outbound approach of project driveway is expected to be minimal and would not have a significant impact on the left and right turn queues.

Table 15: 95th Percentile Queues at Project Driveway

ID	Intersection	Lane Group	Peak Hour	Existing plus Project		Cumulative plus Project Conditions	
				Scenario 1	Scenario 2	Scenario 1	Scenario 2
1	Project Driveway/ Sonoma Mountain Road	NBL	A.M.	0’	-	0’	-
			P.M.	25’	-	25’	-
			Weekend	25’	0’	25’	0’

Notes:
Storage length and 95th percentile queue is expressed in feet per lane
Car length assumed to be 25 feet

ON-SITE CIRCULATION

This section analyzes site access and internal circulation for vehicles based on the site plan presented on **Figure 2**. TJKM reviewed internal and external access for the project site for vehicles.

TJKM reviewed the proposed project site plan to evaluate on-site access to the project. The proposed project's access will be via the driveway on Sonoma Mountain Road.

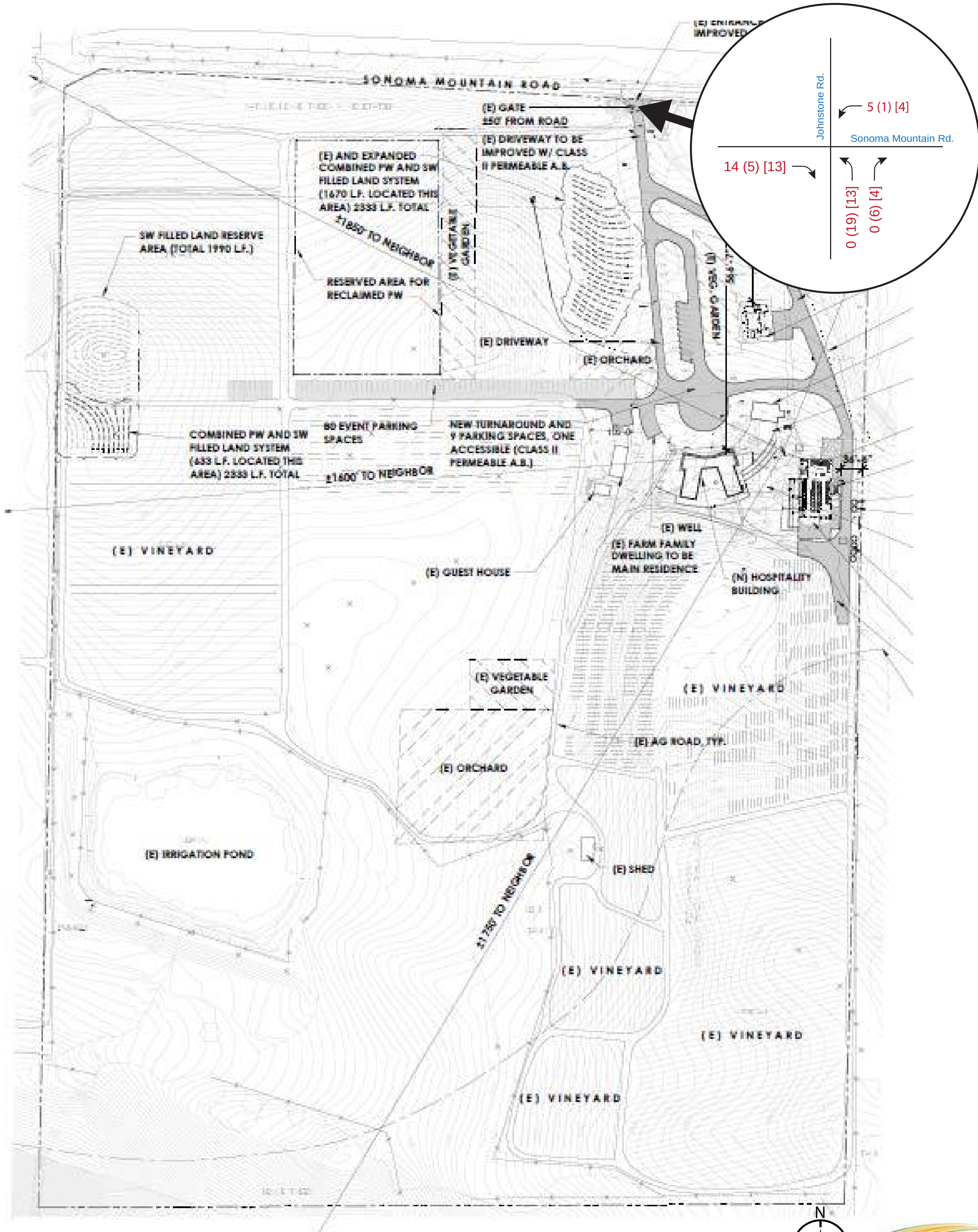
The proposed access on Sonoma Mountain Road is approximately 1.3 miles to the east of the intersection of Pressley Road/Sonoma Mountain Road and 4.5 miles to the west of the intersection of Warms Springs Road/Sonoma Mountain Road and will have a full access. Based on the evaluation, the access driveway is expected to be adequate for passenger vehicles accessing the site and the project driveway is expected to operate at an acceptable LOS. In addition, the 95th percentile queueing at the outbound approach of project driveway is expected to be minimal. **Figure 10a** shows the project trips at the driveways for Scenario 1 and **Figure 10b** shows the project trips at the driveways for Scenario 2.

TJKM also examined the project site plan (**Figure 2**) in order to evaluate the adequacy of on-site circulation for vehicles, refueling trucks, delivery trucks, and emergency vehicles. The internal circulation was reviewed for issues related to queueing, turning radii, and safety and circulation aisles. All circulation aisles accommodate two-way travel and the turning radii is adequate for delivery trucks. Emergency vehicles will access the project via the same existing driveway.

Based on the project site plan, 96 parking spaces will be provided for the proposed project including one ADA compliant parking space. Estimated peak parking vehicles on site would be 96 vehicles during the 200-person special events, which includes 80 visitors and 16 vehicles for employees. This parking supply will be adequate to meet expected demands for employees and tasting room visitors during the proposed special events.

The proposed on-site vehicle circulation is adequate for the proposed special events and would not result in traffic operations issues on-site that would result in significant impacts on County streets. Installation of Stop control exiting the project driveway with appropriate pavement delineation to enhance traffic safety and operations at the driveway is also recommended.

Project Site Access & Circulation - Scenario 1



Note: Project only trips are illustrated

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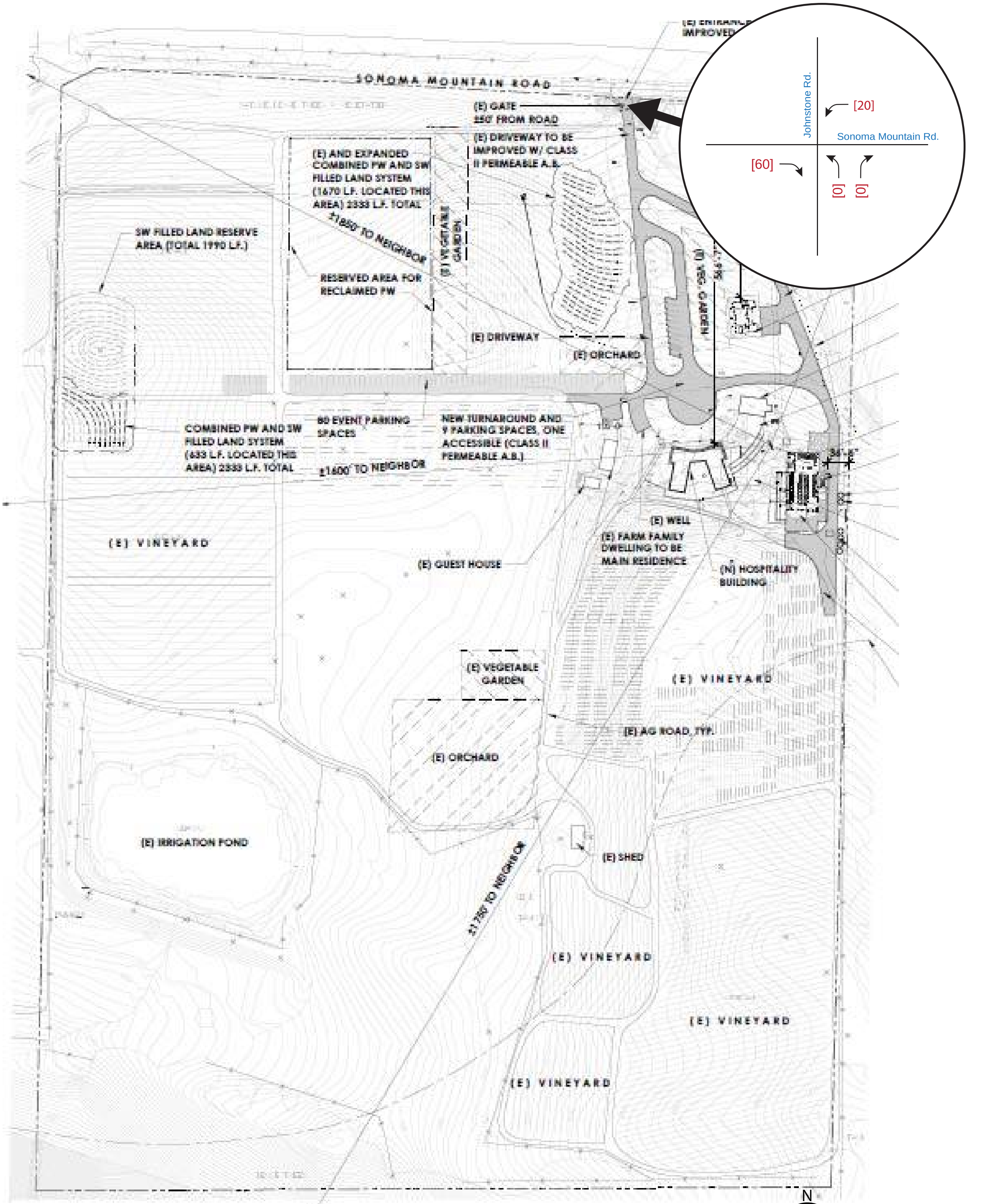
117-113

Figure 10a

Project Site Access & Circulation - Scenario 2



Note: Weekend special event project only trips are illustrated

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Figure 10b

CONCLUSIONS AND RECOMMENDATION

Existing Traffic Conditions

Under Existing Conditions, all study intersections are currently operating at levels of service (LOS) D or better, which is acceptable under Sonoma County standards.

Existing plus Project Traffic Conditions

Under Existing plus Project Conditions, all the study intersections are projected to continue to operate at LOS D and better, which is acceptable under Sonoma County standards.

Cumulative Traffic Conditions

Under Cumulative (Year 2040) Conditions without the project, all the study intersections are projected to operate at LOS D or better, which is acceptable under Sonoma County standards.

Cumulative (Year 2040) plus Project Traffic Conditions

Under Cumulative plus Project Conditions, all the study intersections are projected to continue to operate at LOS D and better, which is acceptable under Sonoma County standards.

Pedestrian, Bicycle and Transit Impacts

Sonoma Mountain Road is a local road with two travel lanes (one per direction). Motor vehicles and bicycles share each travel lane. No sidewalks are provided along Sonoma Mountain Road. There are no transit facilities in the immediately vicinity of the site. The proposed project does not conflict with existing and planned pedestrian or bicycle facilities.

There is a regional park access directly off Sonoma Mountain Road that is used by local residents, sometimes walking on the side of the road. The sufficient parking supply of 96 parking spaces on site would not affect pedestrian and bicycle circulation. The proposed project is expected to increase vehicular traffic on Sonoma Mountain Road by 6%; hence, there would not be a significant change from existing conditions. Although not required to mitigate project impacts, the County may consider installing an additional "Share the Road" sign east of the Pressley Road intersection. The impact of the proposed project to the pedestrian and bicycle facilities is ***less-than-significant.***

Traffic Safety Analysis

The collision rate for the studied segments of Sonoma Mountain Road is less than the statewide average for similar roads.

It is recommended that the project applicant provide a clear line of sight of approximately 305 feet on both the sides of the entrance along the property line by clearing or pruning vegetation.

The curves with the most limited sight distance are located on Sonoma Mountain Road. There were locations of restricted sight distance identified along Sonoma Mountain Road. Advisory signs are present, and TJKM recommends extra signs at curves with narrow lane widths. TJKM also recommends the driveway apron should be overlaid with asphalt concrete (AC) pavement to improve the existing combination of pavement and crushed rock. Project construction-related trips are expected to have minimal effects, if any, on the existing peak hour traffic operations of Sonoma Mountain Road and Pressley Road. During the anticipated 12 to 18 month construction phase, a total of 50 concrete trucks and 30 material delivery trucks trips are expected. However, all truck trips are expected to occur outside typical existing weekday commute peak periods of 7:00-9:00 a.m. and 4:00-6:00 p.m. in the immediate area.

As the alignment of Sonoma Mountain Road east of the project includes locations having sub-standard pavement widths, the project applicant will request that guests travel to the project site from the south or west (Santa Rosa or Rohnert Park) via Bennett Valley Road to Sonoma Mountain Road and not from Glen Ellen via Warm Springs Road and the eastern portion of Sonoma Mountain Road.

Queuing and Driveway Analysis

The proposed project is not anticipated to result in significant impacts to left-turn or right-turn queues at study intersections. The 95^{th} percentile queue at the outbound approach of the project driveway is expected to be les that 25 feet, while the 95^{th} percentile inbound queue would be 25 feet (inbound right turn) and 25 feet (inbound left turn). Therefore, the proposed project is not anticipated to result in significant impacts at the project driveway.

On-Site Circulation

TJKM evaluated the project site plan for adequacy of site circulation and access including delivery trucks and emergency vehicles. Based on the evaluation, the proposed on-site vehicle circulation is adequate and should not result in significant traffic operations issues.

Parking

Based on the project site plan, 96 parking spaces will be provided for the proposed project including 80 event parking spaces and one Americans with Disabilities Act (ADA) compliant parking space. Estimated peak parking demand on site would be 96 vehicles during the proposed 200-person special event which includes 80 visitors and 16 employees.

The parking supply as currently proposed will be adequate to meet expected demand for employee and visitor parking during the proposed special events. The parking supply as currently proposed would not potentially result in impacts to emergency vehicle access during special events.

Emergency Vehicle Access

Impacts to emergency vehicle access could occur if visitors or employees were to park on driveway aisles providing emergency vehicle access to the site. The project applicant should specify that "no parking" is permitted along the access driveway between Sonoma Mountain Parkway and the on-site buildings and special event areas. Appropriate signage and/or curb makings should be installed to clearly prohibit parking on those sections of the internal drive aisles.

Recommendations

TJKM recommends the installation of stop signs exiting the project driveways with appropriate pavement delineation and signing to enhance safety and operations at the driveway exit.

TJKM also recommends that an additional "Share the Road" or "Bicycles on Road" sign be installed in the eastbound direction on Sonoma Mountain Road east of the Pressley Road intersection.

Table 16 below summarizes peak hour levels of service at the study intersections for all the scenarios.

Table 16: Intersection Levels of Service Summary

ID	Intersection	Peak Hour	Existing Conditions		Existing plus Project Conditions - Scenario 1		Existing plus Project Conditions - Scenario 2		Cumulative Conditions		Cumulative plus Project Conditions - Scenario 1		Cumulative plus Project Conditions - Scenario 2	
			Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]	Average Delay[1]	LOS[2]
1	Pressley Road/Sonoma Mountain Road	AM.	8.9	A	8.9	A	-	-	9.2	A	9.2	A	-	-
		P.M.	8.8	A	9.0	A	-	-	9.1	A	9.3	A	-	-
		Weekend	8.9	A	9.1	A	9.2	A	9.3	A	9.5	A	9.6	A
2	Warm Springs Road/Sonoma Mountain Road	AM.	10.7	B	10.8	B	-	-	12.9	B	13.1	B	-	-
		P.M.	9.5	A	9.5	A	-	-	10.7	B	10.6	B	-	-
		Weekend	9.0	A	9.1	A	9.0	A	9.5	A	9.7	A	9.6	A
3	Sonoma Mountain Road/Bennett Valley Road	AM.	12.4	B	12.6	B	-	-	20.5	C	20.9	C	-	-
		P.M.	13.0	B	13.2	B	-	-	22.5	C	23.4	C	-	-
		Weekend	11.9	B	12.0	B	12.2	B	17.9	C	18.4	C	18.9	C

STUDY PARTICIPANTS

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Colin Burgett	Transportation Planner
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Persons and Agencies Consulted

Heather Ivey, AICP	Dudek
Laura Peltz	Sonoma County
Andrew Manalastas	Sonoma County

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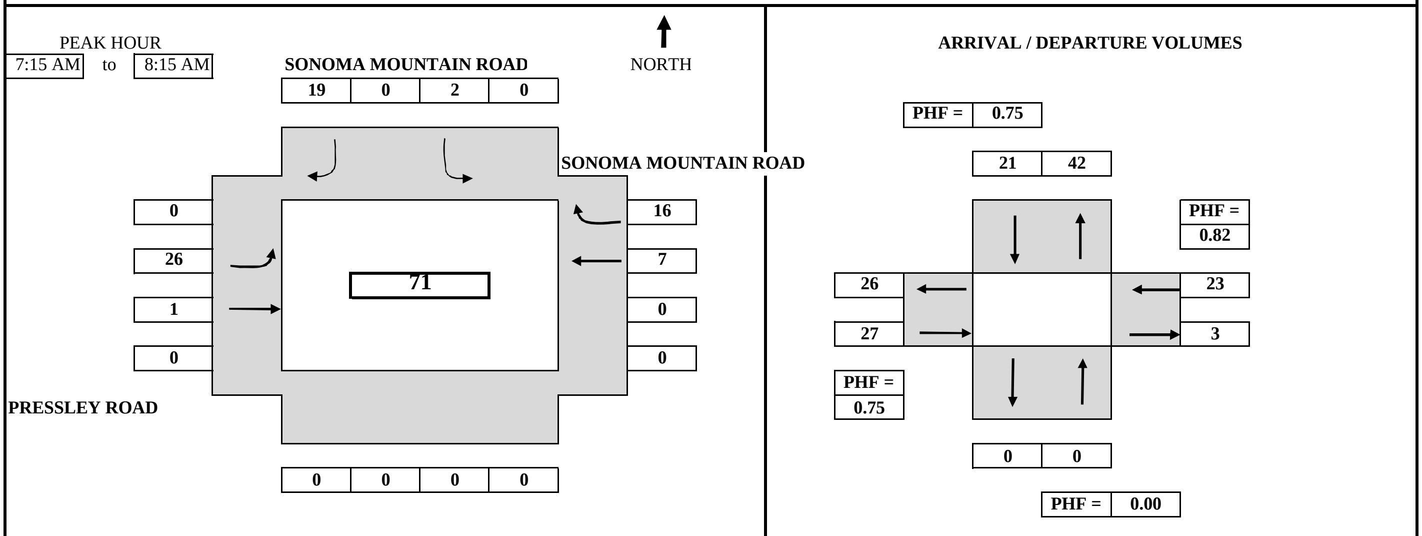
Appendix A - Traffic Counts

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/8/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**SURVEY TIME:**	**7:00 AM**	**TO**	**9:00 AM**
E-W APPROACH:	**PRESSLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**	**FILE:**	**3512138-1AM**



TIME		PERIOD	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
7:00 AM	to	7:15 AM						0		0		3	4				2	2	**11**
7:15 AM	to	7:30 AM						0		7		12	4				3	7	**33**
7:30 AM	to	7:45 AM						0		10		19	4				4	13	**50**
7:45 AM	to	8:00 AM						2		14		24	4				8	16	**68**
8:00 AM	to	8:15 AM						2		19		29	5				9	18	**82**
8:15 AM	to	8:30 AM						4		21		30	8				10	23	**96**
8:30 AM	to	8:45 AM						7		24		34	8				11	26	**110**
8:45 AM	to	9:00 AM						10		27		41	8				12	29	**127**
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	0	0	0	0	0	0	0	0	3	4	0	0	0	2	2	**11**
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	7	0	9	0	0	0	0	1	5	**22**
7:30 AM	to	7:45 AM	0	0	0	0	0	0	0	3	0	7	0	0	0	0	1	6	**17**
7:45 AM	to	8:00 AM	0	0	0	0	0	2	0	4	0	5	0	0	0	0	4	3	**18**
8:00 AM	to	8:15 AM	0	0	0	0	0	0	0	5	0	5	1	0	0	0	1	2	**14**
8:15 AM	to	8:30 AM	0	0	0	0	0	2	0	2	0	1	3	0	0	0	1	5	**14**
8:30 AM	to	8:45 AM	0	0	0	0	0	3	0	3	0	4	0	0	0	0	1	3	**14**
8:45 AM	to	9:00 AM	0	0	0	0	0	3	0	3	0	7	0	0	0	0	1	3	**17**
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	0	0	0	0	2	0	14	0	24	4	0	0	0	8	16	**68**
7:15 AM	to	8:15 AM	0	0	0	0	0	2	0	19	0	26	1	0	0	0	7	16	**71**
7:30 AM	to	8:30 AM	0	0	0	0	0	4	0	14	0	18	4	0	0	0	7	16	**63**
7:45 AM	to	8:45 AM	0	0	0	0	0	7	0	14	0	15	4	0	0	0	7	13	**60**
8:00 AM	to	9:00 AM	0	0	0	0	0	8	0	13	0	17	4	0	0	0	4	13	**59**

PEAK HOUR SUMMARY

7:15 AM to 8:15 AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	2	0	19	0	26	1	0	0	0	7	16	**71**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.68	0.00	0.72	0.25	0.00	0.00	0.00	0.44	0.67	OVERALL
PHF BY APPROACH	0.00				0.75				0.75				0.82				0.81
BICYCLE	0				0				0				0				**0**
PEDESTRIAN	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				0				**0**

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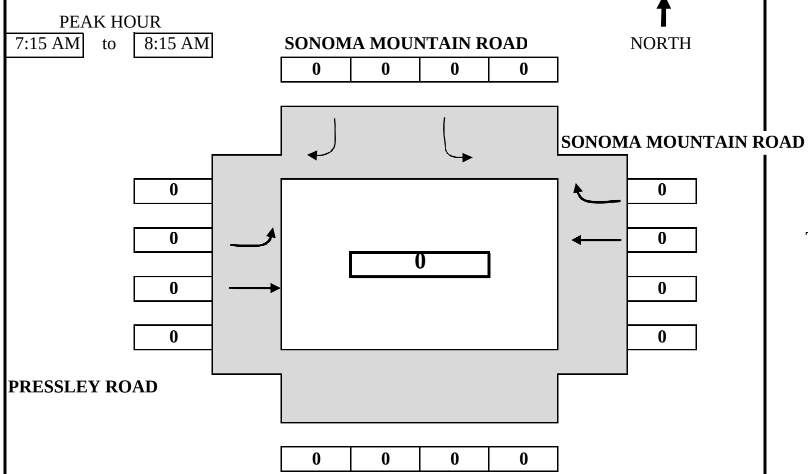
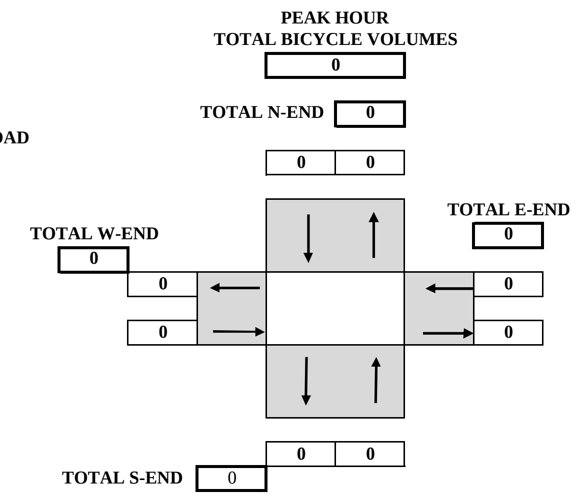
B.A.Y.M.E.T.R.I.C.S.

BICYCLE TURNING MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/8/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**SURVEY TIME:**	**7:00 AM**	**TO**	**9:00 AM**
E-W APPROACH:	**PRESSLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**	**FILE:**	**3512138-1AM**





TIME From	PERIOD To		NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
7:00 AM	to	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	to	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	to	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	to	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	to	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	to	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	to	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	to	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	to	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	to	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	to	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	to	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	to	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	to	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	to	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	to	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	to	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

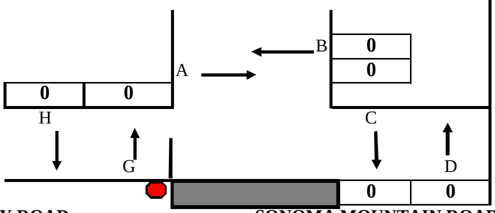
7:15 AM to 8:15 AM					
APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

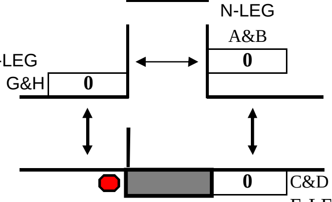
PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/8/2015**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**DAY:**	**TUESDAY**
E-W APPROACH:	**PRESSLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**
SURVEY PERIOD	**7:00 AM TO 9:00 AM**	**FILE:**	**3512138-1AM**

PEAK HOUR
07:15 AM TO 08:15 AM **SONOMA MOUNTAIN ROAD**



PRESSLEY ROAD **SONOMA MOUNTAIN ROAD**

PEAK HOUR
TOTAL PEDESTRIAN VOLUMES
0



LEGEND:
- CROSSWALK
- SIDEWALK
- STOP CONTROL LINE
- STOP

BY LEG:	
N-LEG	**0**
S-LEG	**0**
E-LEG	**0**
W-LEG	**0**

BY DIRECTION:	
NB(D+G)	**0**
SB(C+H)	**0**
EB(A+F)	**0**
WB(B+E)	**0**

TIME PERIOD			**NORTH X-WALK**		**EAST X-WALK**		**SOUTH X-WALK**		**WEST X-WALK**		
From		**To**	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***	***TOTAL***
SURVEY DATA											
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	1	***1***
TOTAL BY PERIOD											
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	0	***0***
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	0	***0***
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	0	***0***
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	1	***1***
HOURLY TOTALS											
07:00 AM	---	08:00 AM	0	0	0	0	0	0	0	0	***0***
07:15 AM	---	08:15 AM	0	0	0	0	0	0	0	0	***0***
07:30 AM	---	08:30 AM	0	0	0	0	0	0	0	0	***0***
07:45 AM	---	08:45 AM	0	0	0	0	0	0	0	0	***0***
08:00 AM	---	09:00 AM	0	0	0	0	0	0	0	1	***1***

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

12:00 AM to 12:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

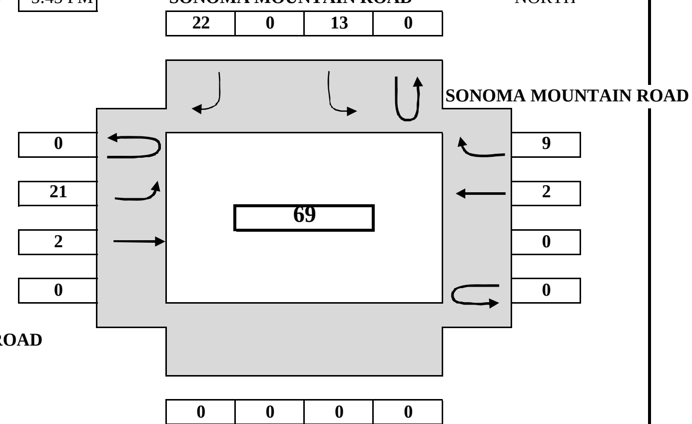
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

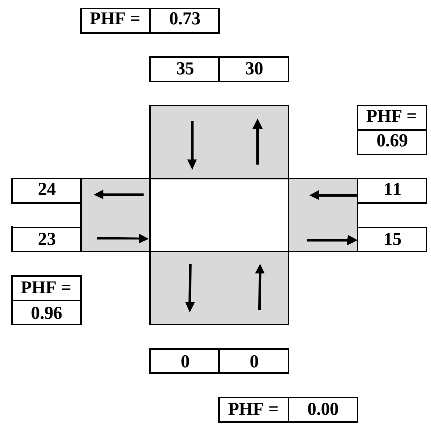
PROJECT:	BELDEN BARNS WINERY TRAFFIC COUNTS	SURVEY DATE:	12/8/2015	DAY:	TUESDAY
N-S APPROACH:	SONOMA MOUNTAIN ROAD	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	PRESSLEY ROAD	JURISDICTION:	SONOMA COUNTY	FILE:	3512138-1PM

PEAK HOUR

4:45 PM to 5:45 PM



ARRIVAL / DEPARTURE VOLUMES



TIME From		PERIOD To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
4:00 PM	to	4:15 PM						3		3		4	0				0	5	**15**
4:15 PM	to	4:30 PM						7		11		6	1				1	7	**33**
4:30 PM	to	4:45 PM						11		15		8	2				2	8	**46**
4:45 PM	to	5:00 PM						14		19		13	3				3	11	**63**
5:00 PM	to	5:15 PM						17		24		19	3				3	12	**78**
5:15 PM	to	5:30 PM						21		28		24	3				4	15	**95**
5:30 PM	to	5:45 PM						24		37		29	4				4	17	**115**
5:45 PM	to	6:00 PM						27		39		34	7				4	20	**131**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	0	0	0	0	3	0	3	0	4	0	0	0	0	0	5	**15**
4:15 PM	to	4:30 PM	0	0	0	0	0	4	0	8	0	2	1	0	0	0	1	2	**18**
4:30 PM	to	4:45 PM	0	0	0	0	0	4	0	4	0	2	1	0	0	0	1	1	**13**
4:45 PM	to	5:00 PM	0	0	0	0	0	3	0	4	0	5	1	0	0	0	1	3	**17**
5:00 PM	to	5:15 PM	0	0	0	0	0	3	0	5	0	6	0	0	0	0	0	1	**15**
5:15 PM	to	5:30 PM	0	0	0	0	0	4	0	4	0	5	0	0	0	0	1	3	**17**
5:30 PM	to	5:45 PM	0	0	0	0	0	3	0	9	0	5	1	0	0	0	0	2	**20**
5:45 PM	to	6:00 PM	0	0	0	0	0	3	0	2	0	5	3	0	0	0	0	3	**16**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	0	0	0	0	14	0	19	0	13	3	0	0	0	3	11	**63**
4:15 PM	to	5:15 PM	0	0	0	0	0	14	0	21	0	15	3	0	0	0	3	7	**63**
4:30 PM	to	5:30 PM	0	0	0	0	0	14	0	17	0	18	2	0	0	0	3	8	**62**
4:45 PM	to	5:45 PM	0	0	0	0	0	13	0	22	0	21	2	0	0	0	2	9	**69**
5:00 PM	to	6:00 PM	0	0	0	0	0	13	0	20	0	21	4	0	0	0	1	9	**68**

PEAK HOUR SUMMARY

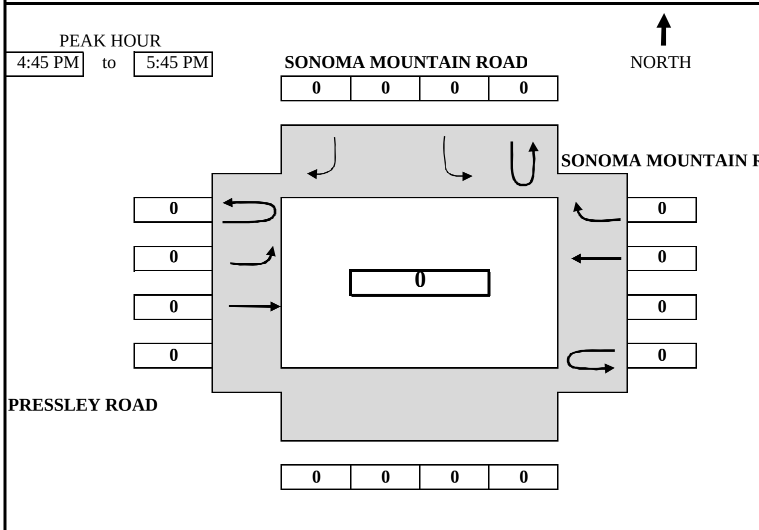
4:45 PM to 5:45 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	0	0	0	0	13	0	22	0	21	2	0	0	0	2	9	**69**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.61	0.00	0.88	0.50	0.00	0.00	0.00	0.50	0.75	OVERALL
PHF BY APPROACH	0.00				0.73				0.96				0.69				0.86
BICYCLE	0				0				0				0				**0**
PEDESTRIAN	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				0				**0**

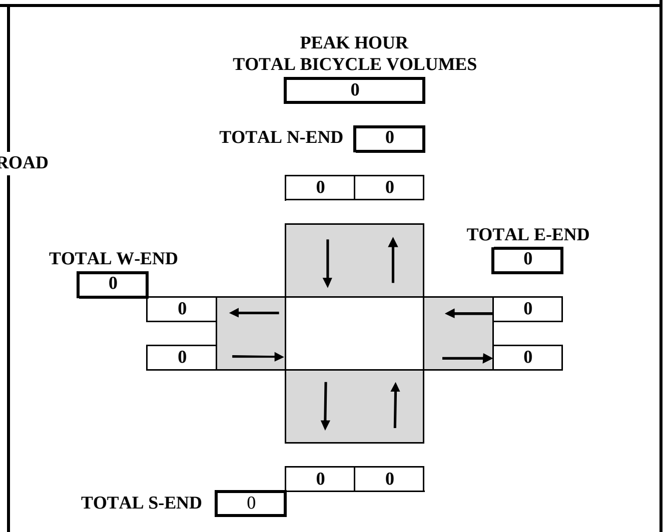
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

BICYCLE TURNING MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/8/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**SURVEY TIME:**	**4:00 PM**	**TO**	**6:00 PM**
E-W APPROACH:	**PRESSLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**	**FILE:**	**3512138-1PM**





TIME PERIOD From	To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																		
4:00 PM	to 4:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**1**
4:15 PM	to 4:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	**2**
4:30 PM	to 4:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	**2**
4:45 PM	to 5:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	**2**
5:00 PM	to 5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	**2**
5:15 PM	to 5:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	**2**
5:30 PM	to 5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	**2**
5:45 PM	to 6:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	**2**
TOTAL BY PERIOD																		
4:00 PM	to 4:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**1**
4:15 PM	to 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**
4:30 PM	to 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	to 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	to 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	to 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	to 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	to 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS																		
4:00 PM	to 5:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	**2**
4:15 PM	to 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**
4:30 PM	to 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	to 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	to 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

4:45 PM to 5:45 PM					
APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	0	0	0	0	**0**

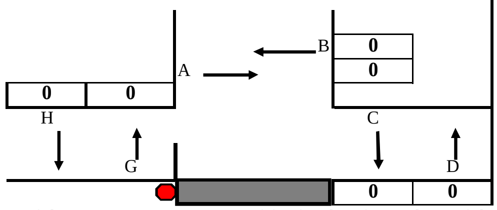
B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/8/2015**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**DAY:**	**TUESDAY**
E-W APPROACH:	**PRESSLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**
SURVEY PERIOD	**4:00 PM TO 6:00 PM**	**FILE:**	**3512138-1PM**

PEAK HOUR

04:45 PM TO 05:45 PM **SONOMA MOUNTAIN ROAD**

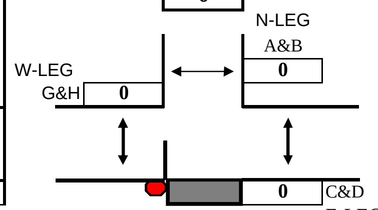


PRESSLEY ROAD **SONOMA MOUNTAIN ROAD**

PEAK HOUR

TOTAL PEDESTRIAN VOLUMES

0



LEGEND:

- CROSSWALK
- SIDEWALK
- STOP CONTROL LINE
- STOP

BY LEG:	
N-LEG	**0**
S-LEG	**0**
E-LEG	**0**
W-LEG	**0**

BY DIRECTION:	
NB(D+G)	**0**
SB(C+H)	**0**
EB(A+F)	**0**
WB(B+E)	**0**

TIME PERIOD			**NORTH X-WALK**		**EAST X-WALK**		**SOUTH X-WALK**		**WEST X-WALK**		
From		**To**	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***	***TOTAL***
SURVEY DATA											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	1	*1*
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	1	*1*
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	1	*1*
05:00 PM	---	05:15 PM	0	0	0	0	0	0	0	1	*1*
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	1	*1*
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	1	*1*
05:45 PM	---	06:00 PM	0	0	0	0	0	0	0	1	*1*
TOTAL BY PERIOD											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	1	*1*
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	---	05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	---	06:00 PM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS											
04:00 PM	---	05:00 PM	0	0	0	0	0	0	0	1	*1*
04:15 PM	---	05:15 PM	0	0	0	0	0	0	0	1	*1*
04:30 PM	---	05:30 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	---	05:45 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	---	06:00 PM	0	0	0	0	0	0	0	0	*0*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

12:00 AM to 12:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

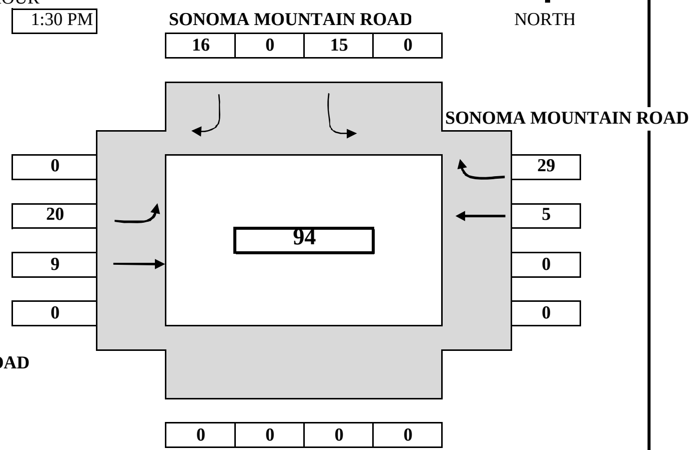
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

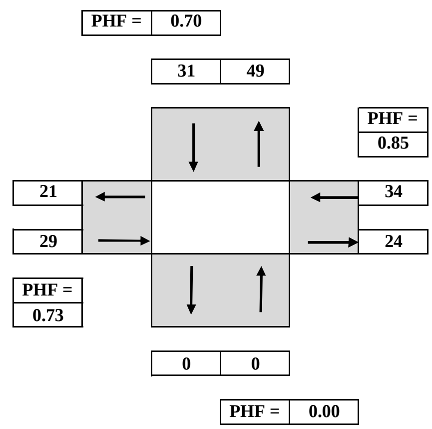
PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/12/2015**	**DAY:**	**SATURDAY**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**SURVEY TIME:**	**12:30 PM**	**TO**	**2:30 PM**
E-W APPROACH:	**PRESSLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**	**FILE:**	**3512138-1SAT**

PEAK HOUR

12:30 PM to 1:30 PM



ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From	to	To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
12:30 PM	to	12:45 PM						5		6		8	2				3	7	**31**
12:45 PM	to	1:00 PM						9		10		11	4				3	12	**49**
1:00 PM	to	1:15 PM						12		12		15	7				3	21	**70**
1:15 PM	to	1:30 PM						15		16		20	9				5	29	**94**
1:30 PM	to	1:45 PM						20		19		20	11				5	30	**105**
1:45 PM	to	2:00 PM						23		24		23	12				8	33	**123**
2:00 PM	to	2:15 PM						24		27		26	14				10	36	**137**
2:15 PM	to	2:30 PM						31		32		29	18				12	38	**160**
TOTAL BY PERIOD																			
12:30 PM	to	12:45 PM	0	0	0	0	0	5	0	6	0	8	2	0	0	0	3	7	**31**
12:45 PM	to	1:00 PM	0	0	0	0	0	4	0	4	0	3	2	0	0	0	0	5	**18**
1:00 PM	to	1:15 PM	0	0	0	0	0	3	0	2	0	4	3	0	0	0	0	9	**21**
1:15 PM	to	1:30 PM	0	0	0	0	0	3	0	4	0	5	2	0	0	0	2	8	**24**
1:30 PM	to	1:45 PM	0	0	0	0	0	5	0	3	0	0	2	0	0	0	0	1	**11**
1:45 PM	to	2:00 PM	0	0	0	0	0	3	0	5	0	3	1	0	0	0	3	3	**18**
2:00 PM	to	2:15 PM	0	0	0	0	0	1	0	3	0	3	2	0	0	0	2	3	**14**
2:15 PM	to	2:30 PM	0	0	0	0	0	7	0	5	0	3	4	0	0	0	2	2	**23**
HOURLY TOTALS																			
12:30 PM	to	1:30 PM	0	0	0	0	0	15	0	16	0	20	9	0	0	0	5	29	**94**
12:45 PM	to	1:45 PM	0	0	0	0	0	15	0	13	0	12	9	0	0	0	2	23	**74**
1:00 PM	to	2:00 PM	0	0	0	0	0	14	0	14	0	12	8	0	0	0	5	21	**74**
1:15 PM	to	2:15 PM	0	0	0	0	0	12	0	15	0	11	7	0	0	0	7	15	**67**
1:30 PM	to	2:30 PM	0	0	0	0	0	16	0	16	0	9	9	0	0	0	7	9	**66**

PEAK HOUR SUMMARY

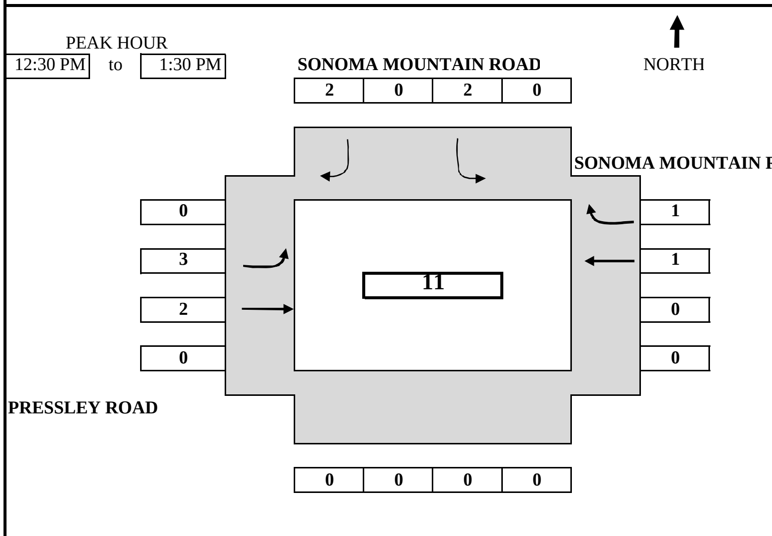
12:30 PM to 1:30 PM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	0	0	0	0	15	0	16	0	20	9	0	0	0	5	29	**94**
PHF BY MOVEMENT	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.67	0.00	0.63	0.75	0.00	0.00	0.00	0.42	0.81	OVERALL
PHF BY APPROACH	0.00				0.70				0.73				0.85				0.76
BICYCLE	0				4				5				2				**11**
PEDESTRIAN	0				1				0				0				**1**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				1				**1**

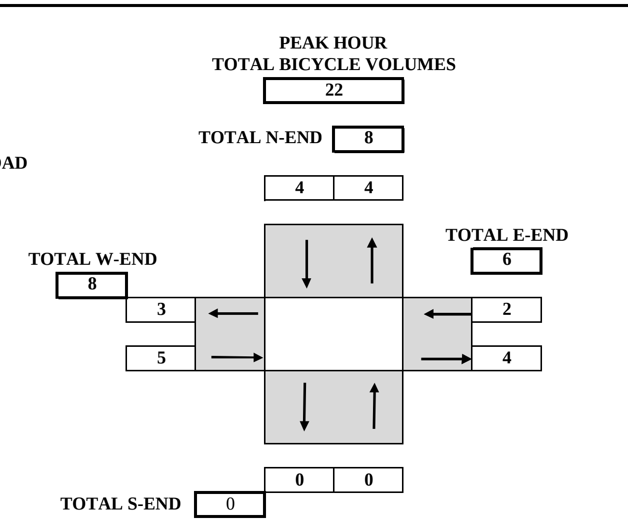
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

BICYCLE TURNING MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/12/2015**	**DAY:**	**SATURDAY**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**SURVEY TIME:**	**12:30 PM**	**TO**	**2:30 PM**
E-W APPROACH:	**PRESSLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**	**FILE:**	**3512138-1SAT**





TIME From		PERIOD To	NORTHBOUND U-TURN	NB LEFT	NB THRU	NB RIGHT	SOUTHBOUND U-TURN	SB LEFT	SB THRU	SB RIGHT	EASTBOUND U-TURN	EB LEFT	EB THRU	EB RIGHT	WESTBOUND U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
12:30 PM	to	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**
12:45 PM	to	1:00 PM	0	0	0	0	0	2	0	0	0	3	0	0	0	0	0	1	**6**
1:00 PM	to	1:15 PM	0	0	0	0	0	2	0	1	0	3	0	0	0	0	0	1	**7**
1:15 PM	to	1:30 PM	0	0	0	0	0	2	0	2	0	3	2	0	0	0	1	1	**11**
1:30 PM	to	1:45 PM	0	0	0	0	0	2	0	5	0	3	2	0	0	0	1	2	**15**
1:45 PM	to	2:00 PM	0	0	0	0	0	2	0	5	0	3	2	0	0	0	1	2	**15**
2:00 PM	to	2:15 PM	0	0	0	0	0	2	0	5	0	3	2	0	0	0	1	2	**15**
2:15 PM	to	2:30 PM	0	0	0	0	0	2	0	5	0	3	2	0	0	0	2	3	**17**
TOTAL BY PERIOD																			
12:30 PM	to	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**
12:45 PM	to	1:00 PM	0	0	0	0	0	2	0	0	0	3	0	0	0	0	0	0	**5**
1:00 PM	to	1:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
1:15 PM	to	1:30 PM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	1	0	**4**
1:30 PM	to	1:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	**4**
1:45 PM	to	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:00 PM	to	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:15 PM	to	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	**2**
HOURLY TOTALS																			
12:30 PM	to	1:30 PM	0	0	0	0	0	2	0	2	0	3	2	0	0	0	1	1	**11**
12:45 PM	to	1:45 PM	0	0	0	0	0	2	0	5	0	3	2	0	0	0	1	1	**14**
1:00 PM	to	2:00 PM	0	0	0	0	0	0	0	5	0	0	2	0	0	0	1	1	**9**
1:15 PM	to	2:15 PM	0	0	0	0	0	0	0	4	0	0	2	0	0	0	1	1	**8**
1:30 PM	to	2:30 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	1	2	**6**

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12:30 PM to 1:30 PM					
APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	0	4	5	2	**11**

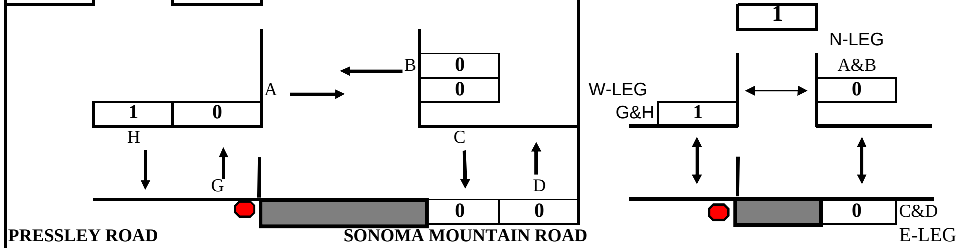
B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	BELDEN BARNS WINERY TRAFFIC COUNTS	SURVEY DATE:	12/12/2015
N-S APPROACH:	SONOMA MOUNTAIN ROAD	DAY:	SATURDAY
E-W APPROACH:	PRESSLEY ROAD	JURISDICTION:	SONOMA COUNTY
SURVEY PERIOD	12:30 PM TO 2:30 PM	FILE:	3512138-1SAT

PEAK HOUR
12:30 PM TO 01:30 PM

PEAK HOUR
TOTAL PEDESTRIAN VOLUMES



LEGEND:
- CROSSWALK
- SIDEWALK
- STOP CONTROL LINE
- STOP

BY LEG:	
N-LEG	0
S-LEG	0
E-LEG	0
W-LEG	1

BY DIRECTION:	
NB(D+G)	0
SB(C+H)	1
EB(A+F)	0
WB(B+E)	0

TIME PERIOD			NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From		To	A	B	C	D	E	F	G	H	TOTAL
SURVEY DATA											
12:30 PM	---	12:45 PM	0	0	0	0	0	0	0	1	1
12:45 PM	---	01:00 PM	0	0	0	0	0	0	0	1	1
01:00 PM	---	01:15 PM	0	0	0	0	0	0	0	1	1
01:15 PM	---	01:30 PM	0	0	0	0	0	0	0	1	1
01:30 PM	---	01:45 PM	0	0	0	0	0	0	0	1	1
01:45 PM	---	02:00 PM	0	0	0	0	0	0	0	1	1
02:00 PM	---	02:15 PM	0	0	0	0	0	0	0	1	1
02:15 PM	---	02:30 PM	0	0	0	0	0	0	0	1	1
TOTAL BY PERIOD											
12:30 PM	---	12:45 PM	0	0	0	0	0	0	0	1	1
12:45 PM	---	01:00 PM	0	0	0	0	0	0	0	0	0
01:00 PM	---	01:15 PM	0	0	0	0	0	0	0	0	0
01:15 PM	---	01:30 PM	0	0	0	0	0	0	0	0	0
01:30 PM	---	01:45 PM	0	0	0	0	0	0	0	0	0
01:45 PM	---	02:00 PM	0	0	0	0	0	0	0	0	0
02:00 PM	---	02:15 PM	0	0	0	0	0	0	0	0	0
02:15 PM	---	02:30 PM	0	0	0	0	0	0	0	0	0
HOURLY TOTALS											
12:30 PM	---	01:30 PM	0	0	0	0	0	0	0	1	1
12:45 PM	---	01:45 PM	0	0	0	0	0	0	0	0	0
01:00 PM	---	02:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	---	02:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	---	02:30 PM	0	0	0	0	0	0	0	0	0

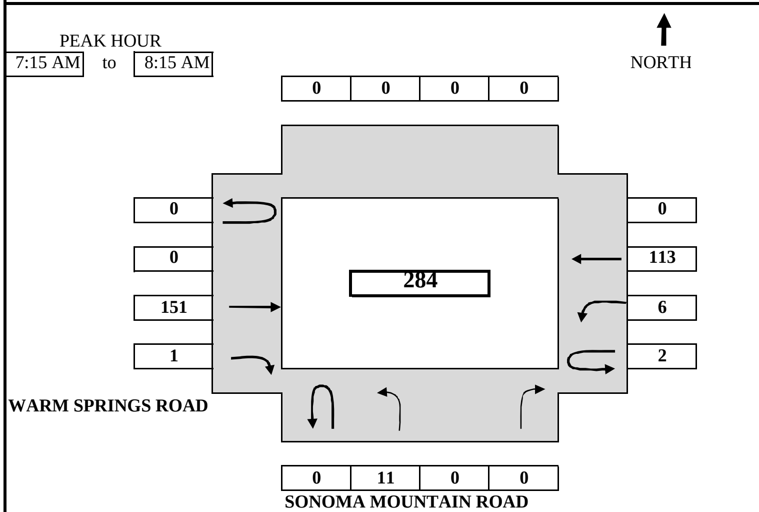
Tel : (510) 232-1271 *Fax: (510) 232-1272*

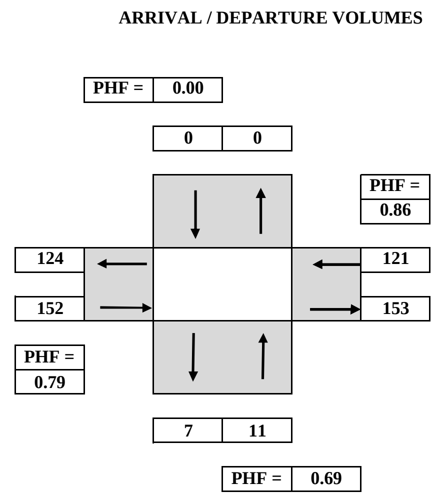
12:00 AM to 12:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	1	0	0	**1**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	1	**1**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/8/2015**	**DAY:**	**TUESDAY**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**SURVEY TIME:**	**7:00 AM**	**TO**	**9:00 AM**
E-W APPROACH:	**WARM SPRINGS ROAD**	**JURISDICTION:**	**SONOMA COUNTY**	**FILE:**	**3512138-3AM**





TIME From		PERIOD To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
7:00 AM	to	7:15 AM		3		1							22	0	0	2	15		**43**
7:15 AM	to	7:30 AM		4		1							55	0	0	3	42		**105**
7:30 AM	to	7:45 AM		8		1							93	0	0	5	75		**182**
7:45 AM	to	8:00 AM		11		1							141	0	0	6	102		**261**
8:00 AM	to	8:15 AM		14		1							173	1	2	8	128		**327**
8:15 AM	to	8:30 AM		17		1							198	2	2	11	145		**376**
8:30 AM	to	8:45 AM		20		2							223	2	2	15	173		**437**
8:45 AM	to	9:00 AM		23		3							251	3	2	18	192		**492**
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	3	0	1	0	0	0	0	0	0	22	0	0	2	15	0	**43**
7:15 AM	to	7:30 AM	0	1	0	0	0	0	0	0	0	0	33	0	0	1	27	0	**62**
7:30 AM	to	7:45 AM	0	4	0	0	0	0	0	0	0	0	38	0	0	2	33	0	**77**
7:45 AM	to	8:00 AM	0	3	0	0	0	0	0	0	0	0	48	0	0	1	27	0	**79**
8:00 AM	to	8:15 AM	0	3	0	0	0	0	0	0	0	0	32	1	2	2	26	0	**66**
8:15 AM	to	8:30 AM	0	3	0	0	0	0	0	0	0	0	25	1	0	3	17	0	**49**
8:30 AM	to	8:45 AM	0	3	0	1	0	0	0	0	0	0	25	0	0	4	28	0	**61**
8:45 AM	to	9:00 AM	0	3	0	1	0	0	0	0	0	0	28	1	0	3	19	0	**55**
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	11	0	1	0	0	0	0	0	0	141	0	0	6	102	0	**261**
7:15 AM	to	8:15 AM	0	11	0	0	0	0	0	0	0	0	151	1	2	6	113	0	**284**
7:30 AM	to	8:30 AM	0	13	0	0	0	0	0	0	0	0	143	2	2	8	103	0	**271**
7:45 AM	to	8:45 AM	0	12	0	1	0	0	0	0	0	0	130	2	2	10	98	0	**255**
8:00 AM	to	9:00 AM	0	12	0	2	0	0	0	0	0	0	110	3	2	12	90	0	**231**

PEAK HOUR SUMMARY

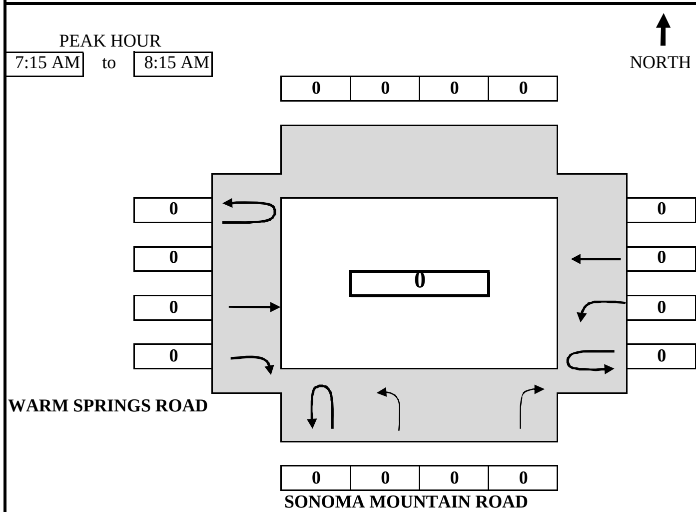
7:15 AM to 8:15 AM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	11	0	0	0	0	0	0	0	0	151	1	2	6	113	0	**284**
PHF BY MOVEMENT	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.25	0.25	0.75	0.86	0.00	OVERALL
PHF BY APPROACH	0.69				0.00				0.79				0.86				0.90
BICYCLE	0				0				0				0				**0**
PEDESTRIAN	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				0				**0**

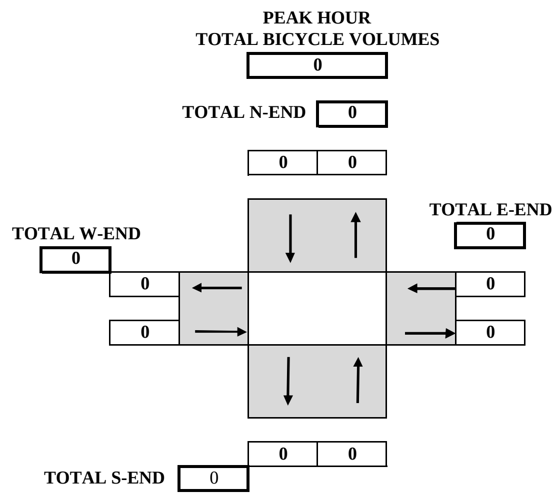
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

BICYCLE TURNING MOVEMENT SUMMARY

PROJECT:	BELDEN BARNS WINERY TRAFFIC COUNTS	SURVEY DATE:	12/8/2015	DAY:	TUESDAY
N-S APPROACH:	SONOMA MOUNTAIN ROAD	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	WARM SPRINGS ROAD	JURISDICTION:	SONOMA COUNTY	FILE:	3512138-3AM





TIME PERIOD From		To	NORTHBOUND U-TURN	NB LEFT	NB THRU	NB RIGHT	SOUTHBOUND U-TURN	SB LEFT	SB THRU	SB RIGHT	EASTBOUND U-TURN	EB LEFT	EB THRU	EB RIGHT	WESTBOUND U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
7:00 AM	to	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	to	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	to	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	to	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	to	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	to	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	to	9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	to	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	to	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	to	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	to	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	to	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	to	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	to	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	to	8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	to	8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	to	9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:15 AM to 8:15 AM					
APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	0	0	0	0	**0**

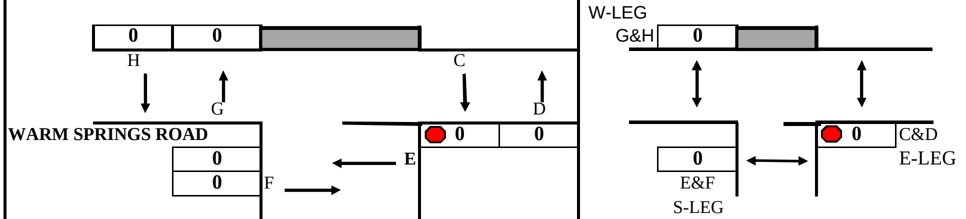
B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/8/2015**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**DAY:**	**TUESDAY**
E-W APPROACH:	**WARM SPRINGS ROAD**	**JURISDICTION:**	**SONOMA COUNTY**
SURVEY PERIOD	**7:00 AM TO 9:00 AM**	**FILE:**	**3512138-3AM**

PEAK HOUR 07:15 AM TO 08:15 AM

PEAK HOUR TOTAL PEDESTRIAN VOLUMES **0**



LEGEND:
- CROSSWALK
- SIDEWALK
- STOP CONTROL LINE
- STOP

BY LEG:	
N-LEG	**0**
S-LEG	**0**
E-LEG	**0**
W-LEG	**0**

BY DIRECTION:	
NB(D+G)	**0**
SB(C+H)	**0**
EB(A+F)	**0**
WB(B+E)	**0**

TIME PERIOD From		To	NORTH X-WALK A	B	EAST X-WALK C	D	SOUTH X-WALK E	F	WEST X-WALK G	H	TOTAL
SURVEY DATA											
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD											
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS											
07:00 AM	---	08:00 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	---	08:15 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	---	08:30 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	---	08:45 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	---	09:00 AM	0	0	0	0	0	0	0	0	*0*

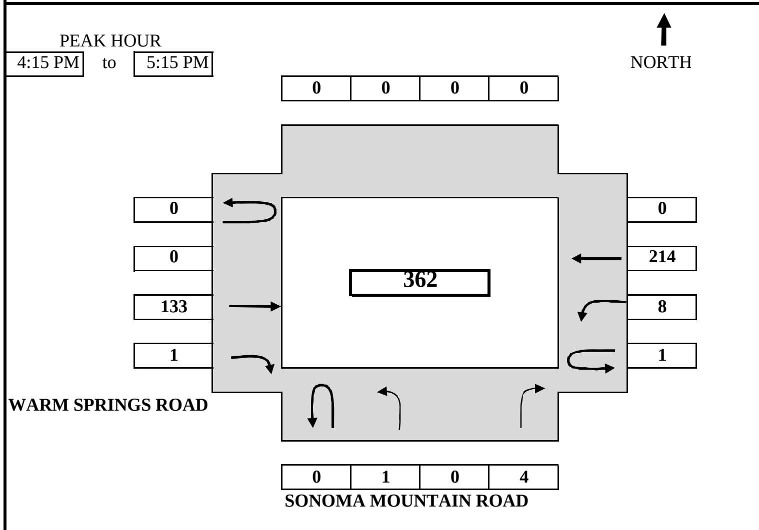
Tel : (510) 232-1271 *Fax: (510) 232-1272*

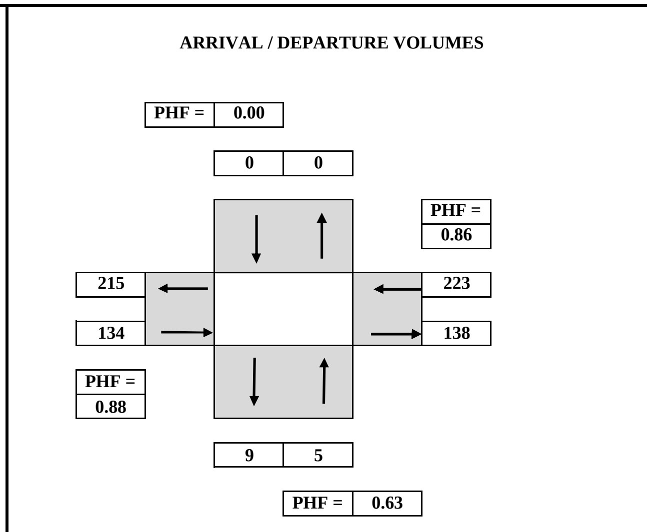
12:00 AM to 12:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	BELDEN BARNS WINERY TRAFFIC COUNTS	SURVEY DATE:	12/8/2015	DAY:	TUESDAY
N-S APPROACH:	SONOMA MOUNTAIN ROAD	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	WARM SPRINGS ROAD	JURISDICTION:	SONOMA COUNTY	FILE:	3512138-3PM





TIME From		PERIOD To	NORTHBOUND U-TURN	NORTHBOUND LEFT	NORTHBOUND THRU	NORTHBOUND RIGHT	SOUTHBOUND U-TURN	SOUTHBOUND LEFT	SOUTHBOUND THRU	SOUTHBOUND RIGHT	EASTBOUND U-TURN	EASTBOUND LEFT	EASTBOUND THRU	EASTBOUND RIGHT	WESTBOUND U-TURN	WESTBOUND LEFT	WESTBOUND THRU	WESTBOUND RIGHT	TOTAL
SURVEY DATA																			
4:00 PM	to	4:15 PM		0		3							31	2	1	3	50		**90**
4:15 PM	to	4:30 PM		0		5							66	3	2	6	90		**172**
4:30 PM	to	4:45 PM		0		5							94	3	2	7	154		**265**
4:45 PM	to	5:00 PM		0		7							126	3	2	9	214		**361**
5:00 PM	to	5:15 PM		1		7							164	3	2	11	264		**452**
5:15 PM	to	5:30 PM		1		10							193	4	2	18	294		**522**
5:30 PM	to	5:45 PM		1		16							220	4	2	21	333		**597**
5:45 PM	to	6:00 PM		2		20							249	4	2	25	374		**676**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	0	0	3	0	0	0	0	0	0	31	2	1	3	50	0	**90**
4:15 PM	to	4:30 PM	0	0	0	2	0	0	0	0	0	0	35	1	1	3	40	0	**82**
4:30 PM	to	4:45 PM	0	0	0	0	0	0	0	0	0	0	28	0	0	1	64	0	**93**
4:45 PM	to	5:00 PM	0	0	0	2	0	0	0	0	0	0	32	0	0	2	60	0	**96**
5:00 PM	to	5:15 PM	0	1	0	0	0	0	0	0	0	0	38	0	0	2	50	0	**91**
5:15 PM	to	5:30 PM	0	0	0	3	0	0	0	0	0	0	29	1	0	7	30	0	**70**
5:30 PM	to	5:45 PM	0	0	0	6	0	0	0	0	0	0	27	0	0	3	39	0	**75**
5:45 PM	to	6:00 PM	0	1	0	4	0	0	0	0	0	0	29	0	0	4	41	0	**79**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	0	0	7	0	0	0	0	0	0	126	3	2	9	214	0	**361**
4:15 PM	to	5:15 PM	0	1	0	4	0	0	0	0	0	0	133	1	1	8	214	0	**362**
4:30 PM	to	5:30 PM	0	1	0	5	0	0	0	0	0	0	127	1	0	12	204	0	**350**
4:45 PM	to	5:45 PM	0	1	0	11	0	0	0	0	0	0	126	1	0	14	179	0	**332**
5:00 PM	to	6:00 PM	0	2	0	13	0	0	0	0	0	0	123	1	0	16	160	0	**315**

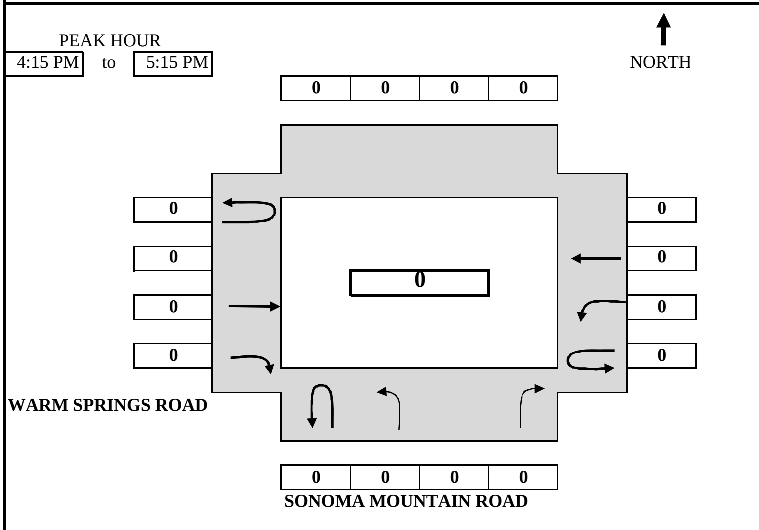
PEAK HOUR SUMMARY

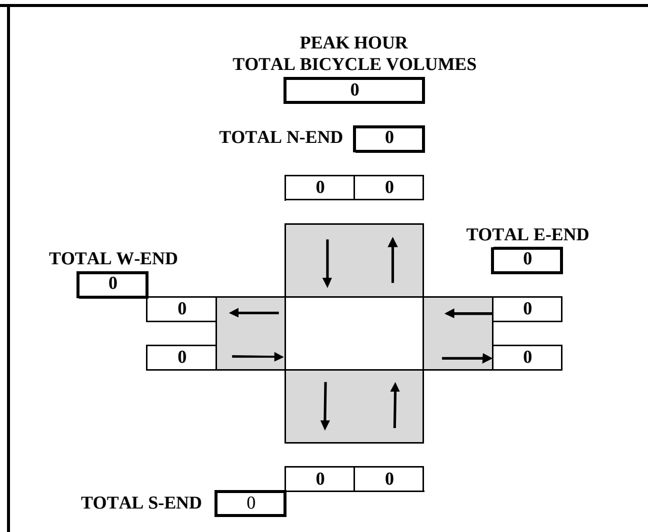
4:15 PM to 5:15 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	1	0	4	0	0	0	0	0	0	133	1	1	8	214	0	**362**
PHF BY MOVEMENT	0.00	0.25	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.25	0.25	0.67	0.84	0.00	OVERALL
PHF BY APPROACH	0.63				0.00				0.88				0.86				0.94
BICYCLE	0				0				0				0				**0**
PEDESTRIAN	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				0				**0**

B.A.Y.M.E.T.R.I.C.S.

BICYCLE TURNING MOVEMENT SUMMARY

PROJECT:	BELDEN BARNS WINERY TRAFFIC COUNTS	SURVEY DATE:	12/8/2015	DAY:	TUESDAY
N-S APPROACH:	SONOMA MOUNTAIN ROAD	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	WARM SPRINGS ROAD	JURISDICTION:	SONOMA COUNTY	FILE:	3512138-3PM





TIME From		PERIOD To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
4:00 PM	to	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
4:15 PM	to	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
4:30 PM	to	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
4:45 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
5:00 PM	to	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
5:15 PM	to	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
5:30 PM	to	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
5:45 PM	to	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
4:15 PM	to	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	to	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	to	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	to	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	to	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	to	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
4:15 PM	to	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	to	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:45 PM	to	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	to	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

4:15 PM to 5:15 PM					
APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	0	0	0	0	**0**

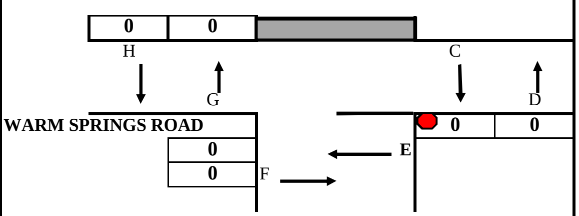
B.A.Y.M.E.T.R.I.C.S.

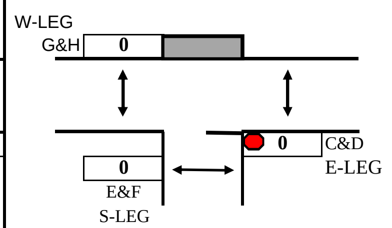
PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/8/2015**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**DAY:**	**TUESDAY**
E-W APPROACH:	**WARM SPRINGS ROAD**	**JURISDICTION:**	**SONOMA COUNTY**
SURVEY PERIOD	**4:00 PM TO 6:00 PM**	**FILE:**	**3512138-3PM**

PEAK HOUR
04:15 PM TO 05:15 PM

PEAK HOUR
TOTAL PEDESTRIAN VOLUMES
0





LEGEND:
- CROSSWALK
- SIDEWALK
- STOP CONTROL LINE
- STOP

BY LEG:	
N-LEG	0
S-LEG	0
E-LEG	0
W-LEG	0

BY DIRECTION:	
NB(D+G)	0
SB(C+H)	0
EB(A+F)	0
WB(B+E)	0

TIME PERIOD			**NORTH X-WALK**		**EAST X-WALK**		**SOUTH X-WALK**		**WEST X-WALK**		
From		**To**	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***	***TOTAL***
SURVEY DATA											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	---	05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	---	06:00 PM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	---	05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	---	06:00 PM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS											
04:00 PM	---	05:00 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	05:15 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	---	05:30 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	---	05:45 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	---	06:00 PM	0	0	0	0	0	0	0	0	*0*

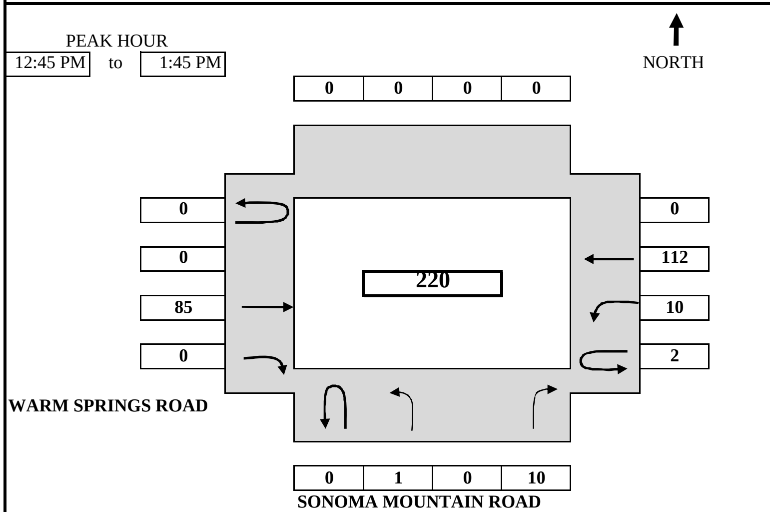
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

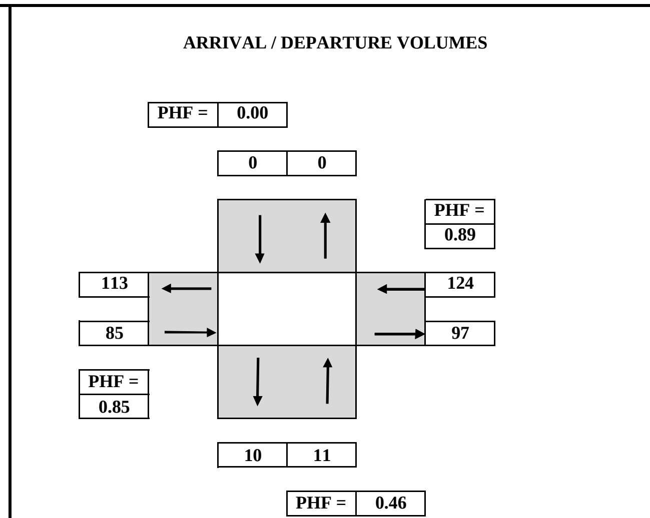
12:00 AM to 12:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/12/2015**	**DAY:**	**SATURDAY**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**SURVEY TIME:**	**12:30 PM**	**TO**	**2:30 PM**
E-W APPROACH:	**WARM SPRINGS ROAD**	**JURISDICTION:**	**SONOMA COUNTY**	**FILE:**	**3512138-3SAT**





TIME PERIOD From		To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
12:30 PM	to	12:45 PM		1		7							15	0	0	5	24		**52**
12:45 PM	to	1:00 PM		1		9							33	0	0	8	53		**104**
1:00 PM	to	1:15 PM		2		14							58	0	2	10	78		**164**
1:15 PM	to	1:30 PM		2		15							81	0	2	12	104		**216**
1:30 PM	to	1:45 PM		2		17							100	0	2	15	136		**272**
1:45 PM	to	2:00 PM		2		19							127	0	2	17	151		**318**
2:00 PM	to	2:15 PM		3		21							148	0	3	20	169		**364**
2:15 PM	to	2:30 PM		4		24							167	0	4	22	184		**405**
TOTAL BY PERIOD																			
12:30 PM	to	12:45 PM	0	1	0	7	0	0	0	0	0	0	15	0	0	5	24	0	**52**
12:45 PM	to	1:00 PM	0	0	0	2	0	0	0	0	0	0	18	0	0	3	29	0	**52**
1:00 PM	to	1:15 PM	0	1	0	5	0	0	0	0	0	0	25	0	2	2	25	0	**60**
1:15 PM	to	1:30 PM	0	0	0	1	0	0	0	0	0	0	23	0	0	2	26	0	**52**
1:30 PM	to	1:45 PM	0	0	0	2	0	0	0	0	0	0	19	0	0	3	32	0	**56**
1:45 PM	to	2:00 PM	0	0	0	2	0	0	0	0	0	0	27	0	0	2	15	0	**46**
2:00 PM	to	2:15 PM	0	1	0	2	0	0	0	0	0	0	21	0	1	3	18	0	**46**
2:15 PM	to	2:30 PM	0	1	0	3	0	0	0	0	0	0	19	0	1	2	15	0	**41**
HOURLY TOTALS																			
12:30 PM	to	1:30 PM	0	2	0	15	0	0	0	0	0	0	81	0	2	12	104	0	**216**
12:45 PM	to	1:45 PM	0	1	0	10	0	0	0	0	0	0	85	0	2	10	112	0	**220**
1:00 PM	to	2:00 PM	0	1	0	10	0	0	0	0	0	0	94	0	2	9	98	0	**214**
1:15 PM	to	2:15 PM	0	1	0	7	0	0	0	0	0	0	90	0	1	10	91	0	**200**
1:30 PM	to	2:30 PM	0	2	0	9	0	0	0	0	0	0	86	0	2	10	80	0	**189**

PEAK HOUR SUMMARY

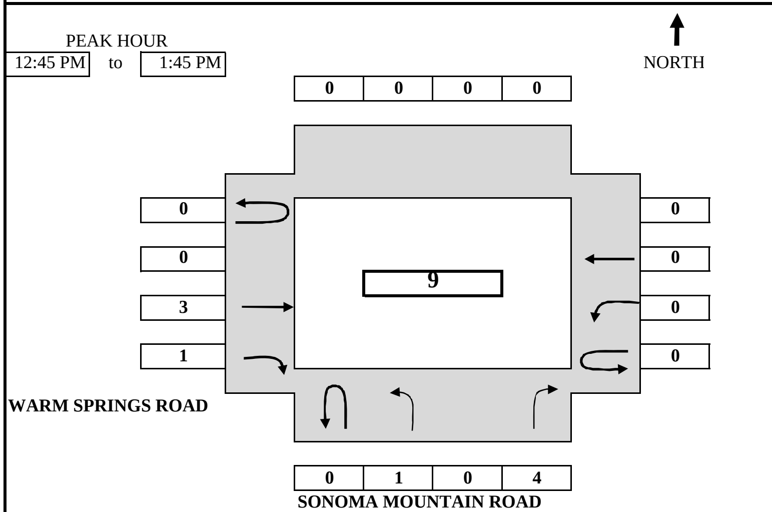
12:45 PM to 1:45 PM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	1	0	10	0	0	0	0	0	0	85	0	2	10	112	0	**220**
PHF BY MOVEMENT	0.00	0.25	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.25	0.83	0.88	0.00	OVERALL
PHF BY APPROACH	0.46				0.00				0.85				0.89				0.92
BICYCLE	5				0				4				0				**9**
PEDESTRIAN	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				0				**0**

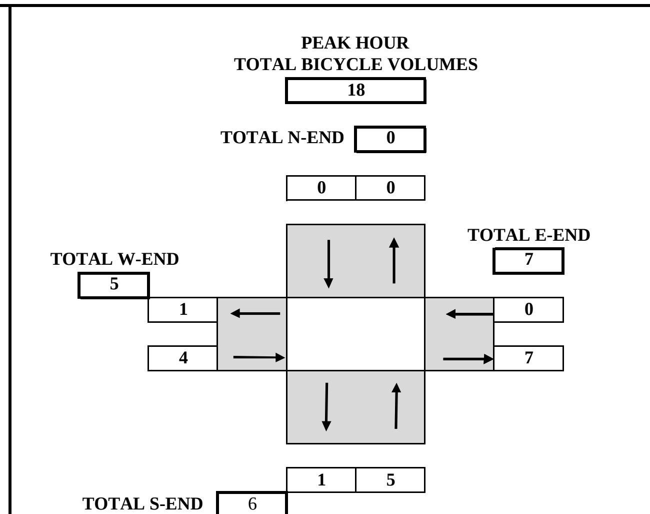
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

BICYCLE TURNING MOVEMENT SUMMARY

PROJECT:	BELDEN BARNS WINERY TRAFFIC COUNTS	SURVEY DATE:	12/12/2015	DAY:	SATURDAY
N-S APPROACH:	SONOMA MOUNTAIN ROAD	SURVEY TIME:	12:30 PM	TO	2:30 PM
E-W APPROACH:	WARM SPRINGS ROAD	JURISDICTION:	SONOMA COUNTY	FILE:	3512138-3SAT





TIME	PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
12:30 PM	to	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
12:45 PM	to	1:00 PM	0	0	0	2	0	0	0	0	0	0	1	2	0	0	0	0	**5**
1:00 PM	to	1:15 PM	0	1	0	2	0	0	0	0	0	0	1	2	0	0	0	0	**6**
1:15 PM	to	1:30 PM	0	1	0	4	0	0	0	0	0	0	1	2	0	0	0	0	**8**
1:30 PM	to	1:45 PM	0	1	0	4	0	0	0	0	0	0	3	2	0	0	0	0	**10**
1:45 PM	to	2:00 PM	0	1	0	6	0	0	0	0	0	0	4	4	0	0	0	0	**15**
2:00 PM	to	2:15 PM	0	1	0	6	0	0	0	0	0	0	4	4	0	0	0	0	**15**
2:15 PM	to	2:30 PM	0	1	0	6	0	0	0	0	0	0	4	6	0	0	0	0	**17**
TOTAL BY PERIOD																			
12:30 PM	to	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
12:45 PM	to	1:00 PM	0	0	0	2	0	0	0	0	0	0	1	1	0	0	0	0	**4**
1:00 PM	to	1:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
1:15 PM	to	1:30 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**
1:30 PM	to	1:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	**2**
1:45 PM	to	2:00 PM	0	0	0	2	0	0	0	0	0	0	1	2	0	0	0	0	**5**
2:00 PM	to	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:15 PM	to	2:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	**2**
HOURLY TOTALS																			
12:30 PM	to	1:30 PM	0	1	0	4	0	0	0	0	0	0	1	2	0	0	0	0	**8**
12:45 PM	to	1:45 PM	0	1	0	4	0	0	0	0	0	0	3	1	0	0	0	0	**9**
1:00 PM	to	2:00 PM	0	1	0	4	0	0	0	0	0	0	3	2	0	0	0	0	**10**
1:15 PM	to	2:15 PM	0	0	0	4	0	0	0	0	0	0	3	2	0	0	0	0	**9**
1:30 PM	to	2:30 PM	0	0	0	2	0	0	0	0	0	0	3	4	0	0	0	0	**9**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

12:45 PM to 1:45 PM					
APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	5	0	4	0	**9**

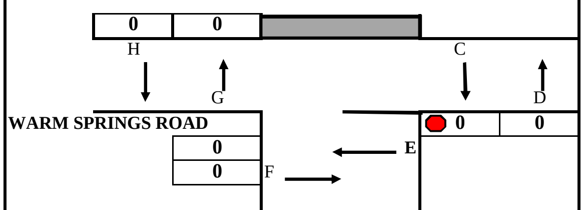
B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNS WINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**12/12/2015**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**DAY:**	**SATURDAY**
E-W APPROACH:	**WARM SPRINGS ROAD**	**JURISDICTION:**	**SONOMA COUNTY**
SURVEY PERIOD	**12:30 PM TO 2:30 PM**	**FILE:**	**3512138-3SAT**

PEAK HOUR

12:45 PM TO 01:45 PM



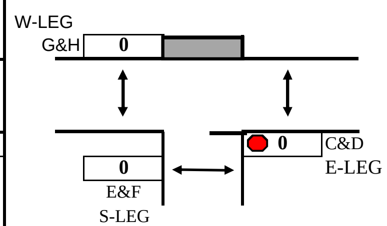
LEGEND:

- CROSSWALK
- SIDEWALK
- STOP CONTROL LINE
- STOP

PEAK HOUR

TOTAL PEDESTRIAN VOLUMES

0



BY LEG:	
N-LEG	**0**
S-LEG	**0**
E-LEG	**0**
W-LEG	**0**

BY DIRECTION:	
NB(D+G)	**0**
SB(C+H)	**0**
EB(A+F)	**0**
WB(B+E)	**0**

TIME PERIOD			**NORTH X-WALK**		**EAST X-WALK**		**SOUTH X-WALK**		**WEST X-WALK**		
From		**To**	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***	***TOTAL***
SURVEY DATA											
12:30 PM	---	12:45 PM	0	0	0	0	0	0	0	0	*0*
12:45 PM	---	01:00 PM	0	0	0	0	0	0	0	0	*0*
01:00 PM	---	01:15 PM	0	0	0	0	0	0	0	0	*0*
01:15 PM	---	01:30 PM	0	0	0	0	0	0	0	0	*0*
01:30 PM	---	01:45 PM	0	0	0	0	0	0	0	0	*0*
01:45 PM	---	02:00 PM	0	0	0	0	0	0	0	0	*0*
02:00 PM	---	02:15 PM	0	0	0	0	0	0	0	0	*0*
02:15 PM	---	02:30 PM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD											
12:30 PM	---	12:45 PM	0	0	0	0	0	0	0	0	*0*
12:45 PM	---	01:00 PM	0	0	0	0	0	0	0	0	*0*
01:00 PM	---	01:15 PM	0	0	0	0	0	0	0	0	*0*
01:15 PM	---	01:30 PM	0	0	0	0	0	0	0	0	*0*
01:30 PM	---	01:45 PM	0	0	0	0	0	0	0	0	*0*
01:45 PM	---	02:00 PM	0	0	0	0	0	0	0	0	*0*
02:00 PM	---	02:15 PM	0	0	0	0	0	0	0	0	*0*
02:15 PM	---	02:30 PM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS											
12:30 PM	---	01:30 PM	0	0	0	0	0	0	0	0	*0*
12:45 PM	---	01:45 PM	0	0	0	0	0	0	0	0	*0*
01:00 PM	---	02:00 PM	0	0	0	0	0	0	0	0	*0*
01:15 PM	---	02:15 PM	0	0	0	0	0	0	0	0	*0*
01:30 PM	---	02:30 PM	0	0	0	0	0	0	0	0	*0*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

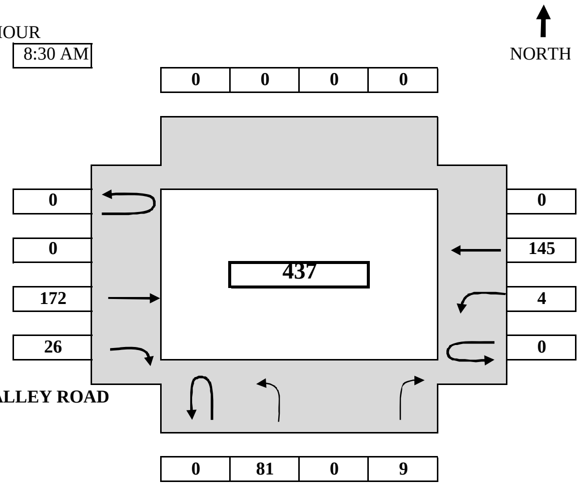
12:00 AM to 12:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	BELDEN BARNSWINERY TRAFFIC COUNTS	**SURVEY DATE:**	**2/3/2016**	**DAY:**	**WEDNESDAY**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**SURVEY TIME:**	**7:00 AM**	**TO**	**9:00 AM**
E-W APPROACH:	**BENNETT VALLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**	**FILE:**	**3602016-AM**

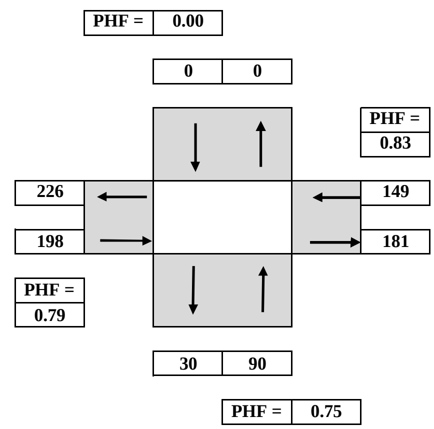
PEAK HOUR
7:30 AM to 8:30 AM



BENNETT VALLEY ROAD

SONOMA MOUNTAIN ROAD

ARRIVAL / DEPARTURE VOLUMES



TIME PERIOD From		To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
7:00 AM	to	7:15 AM		8		0							28	4		0	15		**55**
7:15 AM	to	7:30 AM		25		1							56	8		2	55		**147**
7:30 AM	to	7:45 AM		53		3							94	16		5	97		**268**
7:45 AM	to	8:00 AM		74		5							150	23		5	136		**393**
8:00 AM	to	8:15 AM		90		6							187	28		6	169		**486**
8:15 AM	to	8:30 AM		106		10							228	34		6	200		**584**
8:30 AM	to	8:45 AM		124		13							280	41		6	240		**704**
8:45 AM	to	9:00 AM		136		14							314	51		6	273		**794**
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	8	0	0	0	0	0	0	0	0	28	4	0	0	15	0	**55**
7:15 AM	to	7:30 AM	0	17	0	1	0	0	0	0	0	0	28	4	0	2	40	0	**92**
7:30 AM	to	7:45 AM	0	28	0	2	0	0	0	0	0	0	38	8	0	3	42	0	**121**
7:45 AM	to	8:00 AM	0	21	0	2	0	0	0	0	0	0	56	7	0	0	39	0	**125**
8:00 AM	to	8:15 AM	0	16	0	1	0	0	0	0	0	0	37	5	0	1	33	0	**93**
8:15 AM	to	8:30 AM	0	16	0	4	0	0	0	0	0	0	41	6	0	0	31	0	**98**
8:30 AM	to	8:45 AM	0	18	0	3	0	0	0	0	0	0	52	7	0	0	40	0	**120**
8:45 AM	to	9:00 AM	0	12	0	1	0	0	0	0	0	0	34	10	0	0	33	0	**90**
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	74	0	5	0	0	0	0	0	0	150	23	0	5	136	0	**393**
7:15 AM	to	8:15 AM	0	82	0	6	0	0	0	0	0	0	159	24	0	6	154	0	**431**
7:30 AM	to	8:30 AM	0	81	0	9	0	0	0	0	0	0	172	26	0	4	145	0	**437**
7:45 AM	to	8:45 AM	0	71	0	10	0	0	0	0	0	0	186	25	0	1	143	0	**436**
8:00 AM	to	9:00 AM	0	62	0	9	0	0	0	0	0	0	164	28	0	1	137	0	**401**

PEAK HOUR SUMMARY

7:30 AM to 8:30 AM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	81	0	9	0	0	0	0	0	0	172	26	0	4	145	0	**437**
PHF BY MOVEMENT	0.00	0.72	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.81	0.00	0.33	0.86	0.00	OVERALL
PHF BY APPROACH	0.75				0.00				0.79				0.83				0.87
BICYCLE	0				0				0				0				**0**
PEDESTRIAN	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				0				**0**

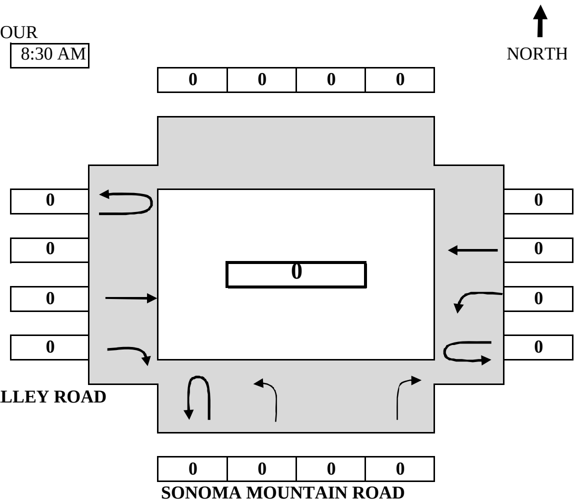
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

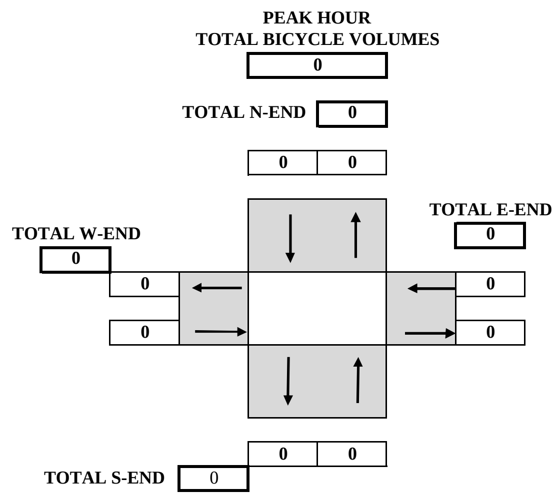
B.A.Y.M.E.T.R.I.C.S.

BICYCLE TURNING MOVEMENT SUMMARY

PROJECT:	BELDEN BARNSWINERY TRAFFIC COUNTS	SURVEY DATE:	2/3/2016	DAY:	WEDNESDAY
N-S APPROACH:	SONOMA MOUNTAIN ROAD	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	BENNETT VALLEY ROAD	JURISDICTION:	SONOMA COUNTY	FILE:	3602016-AM

PEAK HOUR
7:30 AM to 8:30 AM





TIME PERIOD From		To	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	THRU	RIGHT	EASTBOUND U-TURN	LEFT	THRU	RIGHT	WESTBOUND U-TURN	LEFT	THRU	RIGHT	TOTAL
SURVEY DATA																			
7:00 AM	to	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	to	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	to	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	to	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	to	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	to	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	to	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	to	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	to	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	to	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:15 AM	to	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:30 AM	to	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:45 AM	to	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:15 AM	to	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:30 AM	to	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
7:45 AM	to	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
8:00 AM	to	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

7:30 AM to 8:30 AM

APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	0	0	0	0	**0**

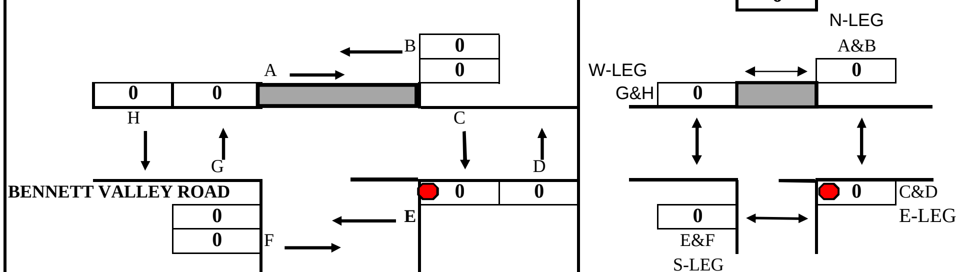
B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	BELDEN BARNSWINERY TRAFFIC COUNTS	SURVEY DATE:	2/3/2016
N-S APPROACH:	SONOMA MOUNTAIN ROAD	DAY:	WEDNESDAY
E-W APPROACH:	BENNETT VALLEY ROAD	JURISDICTION:	SONOMA COUNTY
SURVEY PERIOD	7:00 AM TO 9:00 AM	FILE:	3602016-AM

PEAK HOUR
07:30 AM TO 08:30 AM

PEAK HOUR
TOTAL PEDESTRIAN VOLUMES
0



LEGEND: SONOMA MOUNTAIN ROAD
- CROSSWALK
- SIDEWALK
- STOP CONTROL LINE
- STOP

BY LEG:		BY DIRECTION:	
N-LEG	0	NB(D+G)	0
S-LEG	0	SB(C+H)	0
E-LEG	0	EB(A+F)	0
W-LEG	0	WB(B+E)	0

TIME PERIOD From		To	NORTH X-WALK A	B	EAST X-WALK C	D	SOUTH X-WALK E	F	WEST X-WALK G	H	TOTAL
SURVEY DATA											
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD											
07:00 AM	---	07:15 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	---	07:30 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	---	07:45 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	---	08:15 AM	0	0	0	0	0	0	0	0	*0*
08:15 AM	---	08:30 AM	0	0	0	0	0	0	0	0	*0*
08:30 AM	---	08:45 AM	0	0	0	0	0	0	0	0	*0*
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS											
07:00 AM	---	08:00 AM	0	0	0	0	0	0	0	0	*0*
07:15 AM	---	08:15 AM	0	0	0	0	0	0	0	0	*0*
07:30 AM	---	08:30 AM	0	0	0	0	0	0	0	0	*0*
07:45 AM	---	08:45 AM	0	0	0	0	0	0	0	0	*0*
08:00 AM	---	09:00 AM	0	0	0	0	0	0	0	0	*0*

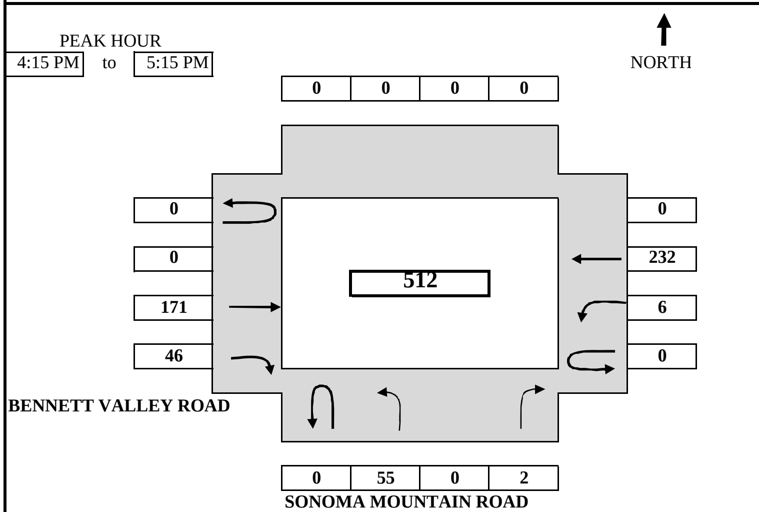
Tel : (510) 232-1271 *Fax: (510) 232-1272*

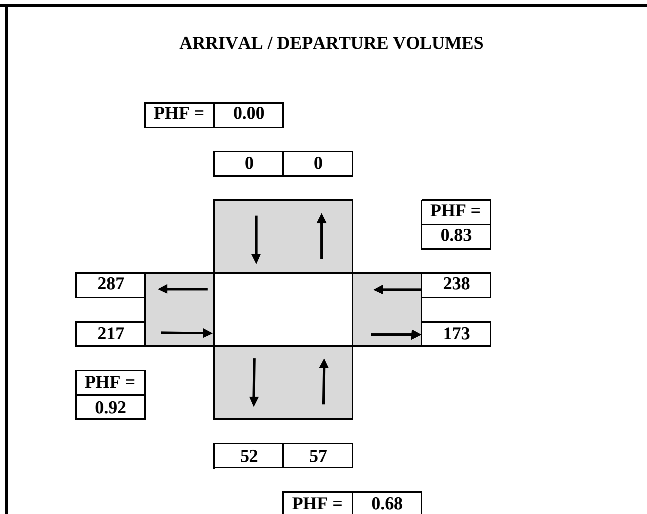
12:00 AM to 12:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNSWINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**2/3/2016**	**DAY:**	**WEDNESDAY**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**SURVEY TIME:**	**4:00 PM**	**TO**	**6:00 PM**
E-W APPROACH:	**BENNETT VALLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**	**FILE:**	**3602016-PM**





TIME From	PERIOD To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																		
4:00 PM to	4:15 PM		10		2							28	14		2	53		**109**
4:15 PM to	4:30 PM		22		3							73	28		4	110		**240**
4:30 PM to	4:45 PM		43		3							111	37		5	181		**380**
4:45 PM to	5:00 PM		54		3							152	51		7	235		**502**
5:00 PM to	5:15 PM		65		4							199	60		8	285		**621**
5:15 PM to	5:30 PM		83		5							238	78		9	335		**748**
5:30 PM to	5:45 PM		98		5							269	86		10	388		**856**
5:45 PM to	6:00 PM		110		5							300	96		12	439		**962**
TOTAL BY PERIOD																		
4:00 PM to	4:15 PM	0	10	0	2	0	0	0	0	0	0	28	14	0	2	53	0	**109**
4:15 PM to	4:30 PM	0	12	0	1	0	0	0	0	0	0	45	14	0	2	57	0	**131**
4:30 PM to	4:45 PM	0	21	0	0	0	0	0	0	0	0	38	9	0	1	71	0	**140**
4:45 PM to	5:00 PM	0	11	0	0	0	0	0	0	0	0	41	14	0	2	54	0	**122**
5:00 PM to	5:15 PM	0	11	0	1	0	0	0	0	0	0	47	9	0	1	50	0	**119**
5:15 PM to	5:30 PM	0	18	0	1	0	0	0	0	0	0	39	18	0	1	50	0	**127**
5:30 PM to	5:45 PM	0	15	0	0	0	0	0	0	0	0	31	8	0	1	53	0	**108**
5:45 PM to	6:00 PM	0	12	0	0	0	0	0	0	0	0	31	10	0	2	51	0	**106**
HOURLY TOTALS																		
4:00 PM to	5:00 PM	0	54	0	3	0	0	0	0	0	0	152	51	0	7	235	0	**502**
4:15 PM to	5:15 PM	0	55	0	2	0	0	0	0	0	0	171	46	0	6	232	0	**512**
4:30 PM to	5:30 PM	0	61	0	2	0	0	0	0	0	0	165	50	0	5	225	0	**508**
4:45 PM to	5:45 PM	0	55	0	2	0	0	0	0	0	0	158	49	0	5	207	0	**476**
5:00 PM to	6:00 PM	0	56	0	2	0	0	0	0	0	0	148	45	0	5	204	0	**460**

PEAK HOUR SUMMARY

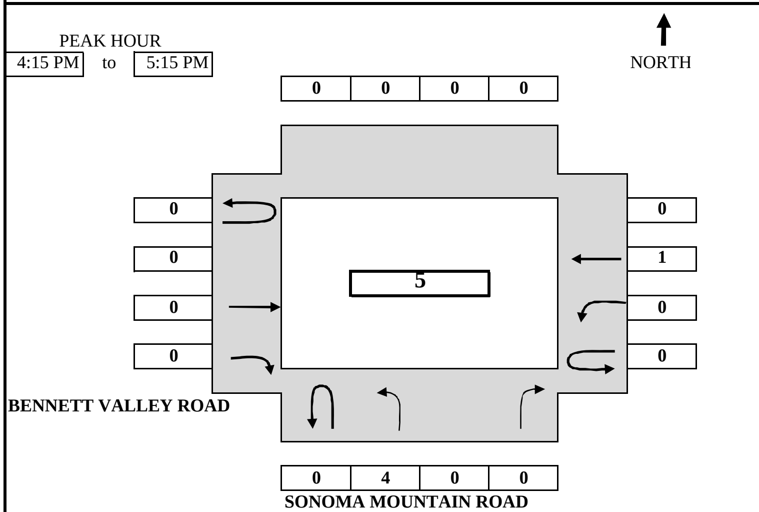
4:15 PM to 5:15 PM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
	NORTHBOUND				**SOUTHBOUND**				**EASTBOUND**				**WESTBOUND**				
VOLUME	0	55	0	2	0	0	0	0	0	0	171	46	0	6	232	0	**512**
PHF BY MOVEMENT	0.00	0.65	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.82	0.00	0.75	0.82	0.00	OVERALL
PHF BY APPROACH	0.68				0.00				0.92				0.83				0.91
BICYCLE	4				0				0				1				**5**
PEDESTRIAN	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				0				**0**

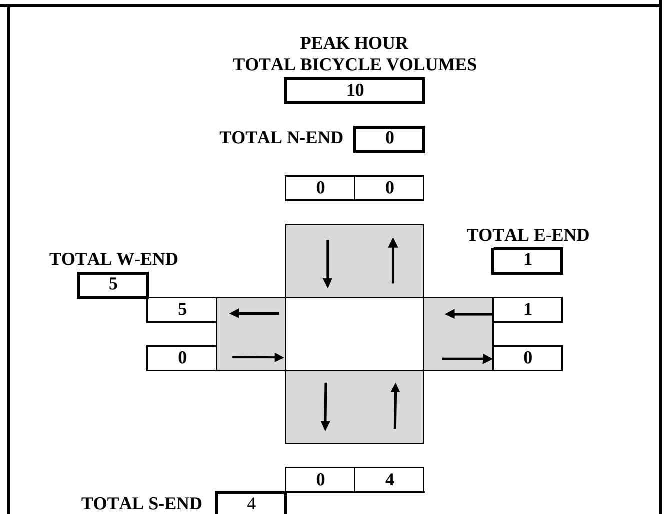
TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

B.A.Y.M.E.T.R.I.C.S.

BICYCLE TURNING MOVEMENT SUMMARY

PROJECT:	BELDEN BARNSWINERY TRAFFIC COUNTS	SURVEY DATE:	2/3/2016	DAY:	WEDNESDAY
N-S APPROACH:	SONOMA MOUNTAIN ROAD	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W APPROACH:	BENNETT VALLEY ROAD	JURISDICTION:	SONOMA COUNTY	FILE:	3602016-PM





TIME	PERIOD		NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	to	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	to	4:45 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
4:45 PM	to	5:00 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
5:00 PM	to	5:15 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
5:15 PM	to	5:30 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
5:30 PM	to	5:45 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
5:45 PM	to	6:00 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:15 PM	to	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
4:30 PM	to	4:45 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
4:45 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	to	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:15 PM	to	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:30 PM	to	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:45 PM	to	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
4:15 PM	to	5:15 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
4:30 PM	to	5:30 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**5**
4:45 PM	to	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
5:00 PM	to	6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

4:15 PM to 5:15 PM					
APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	4	0	0	1	**5**

B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNSWINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**2/3/2016**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**DAY:**	**WEDNESDAY**
E-W APPROACH:	**BENNETT VALLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**
SURVEY PERIOD	**4:00 PM TO 6:00 PM**	**FILE:**	**3602016-PM**

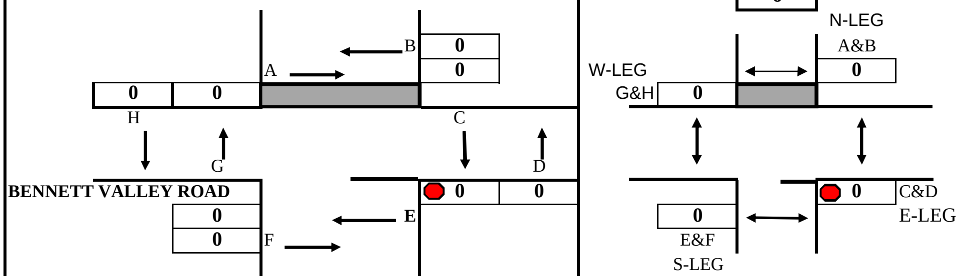
PEAK HOUR

04:15 PM TO 05:15 PM

PEAK HOUR

TOTAL PEDESTRIAN VOLUMES

0



LEGEND: **SONOMA MOUNTAIN ROAD**

- CROSSWALK
- SIDEWALK
- STOP CONTROL LINE
- STOP

BY LEG:	
N-LEG	**0**
S-LEG	**0**
E-LEG	**0**
W-LEG	**0**

BY DIRECTION:	
NB(D+G)	**0**
SB(C+H)	**0**
EB(A+F)	**0**
WB(B+E)	**0**

TIME PERIOD			**NORTH X-WALK**		**EAST X-WALK**		**SOUTH X-WALK**		**WEST X-WALK**		
From		**To**	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***	***TOTAL***
SURVEY DATA											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	---	05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	---	06:00 PM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	04:30 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	---	05:15 PM	0	0	0	0	0	0	0	0	*0*
05:15 PM	---	05:30 PM	0	0	0	0	0	0	0	0	*0*
05:30 PM	---	05:45 PM	0	0	0	0	0	0	0	0	*0*
05:45 PM	---	06:00 PM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS											
04:00 PM	---	05:00 PM	0	0	0	0	0	0	0	0	*0*
04:15 PM	---	05:15 PM	0	0	0	0	0	0	0	0	*0*
04:30 PM	---	05:30 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	---	05:45 PM	0	0	0	0	0	0	0	0	*0*
05:00 PM	---	06:00 PM	0	0	0	0	0	0	0	0	*0*

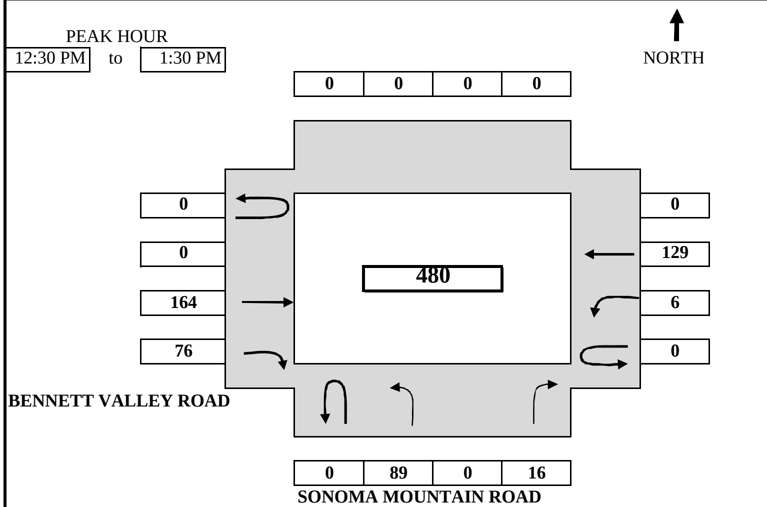
Tel : (510) 232-1271 ***Fax: (510) 232-1272***

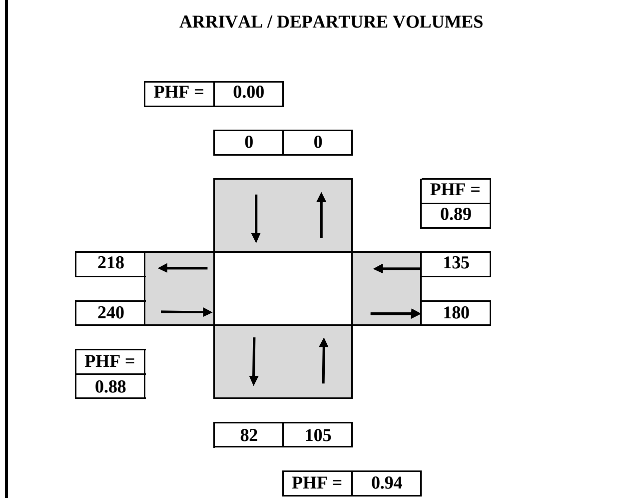
12:00 AM to 12:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	BELDEN BARNSWINERY TRAFFIC COUNTS	SURVEY DATE:	2/13/2016	DAY:	SATURDAY
N-S APPROACH:	SONOMA MOUNTAIN ROAD	SURVEY TIME:	12:30 PM	TO	2:30 PM
E-W APPROACH:	BENNETT VALLEY ROAD	JURISDICTION:	SONOMA COUNTY	FILE:	3602016-SAT





TIME From		PERIOD To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
S U R V E Y D A T A																			
12:30 PM	to	12:45 PM		23		3					0		41	16		1	29		**113**
12:45 PM	to	1:00 PM		47		7					0		85	28		3	65		**235**
1:00 PM	to	1:15 PM		69		11					0		124	48		5	99		**356**
1:15 PM	to	1:30 PM		89		16					0		164	76		6	129		**480**
1:30 PM	to	1:45 PM		113		18					0		198	86		6	148		**569**
1:45 PM	to	2:00 PM		125		21					1		228	99		7	176		**657**
2:00 PM	to	2:15 PM		138		22					1		263	106		9	204		**743**
2:15 PM	to	2:30 PM		149		26					1		293	116		12	230		**827**
T O T A L B Y P E R I O D																			
12:30 PM	to	12:45 PM	0	23	0	3	0	0	0	0	0	0	41	16	0	1	29	0	**113**
12:45 PM	to	1:00 PM	0	24	0	4	0	0	0	0	0	0	44	12	0	2	36	0	**122**
1:00 PM	to	1:15 PM	0	22	0	4	0	0	0	0	0	0	39	20	0	2	34	0	**121**
1:15 PM	to	1:30 PM	0	20	0	5	0	0	0	0	0	0	40	28	0	1	30	0	**124**
1:30 PM	to	1:45 PM	0	24	0	2	0	0	0	0	0	0	34	10	0	0	19	0	**89**
1:45 PM	to	2:00 PM	0	12	0	3	0	0	0	0	1	0	30	13	0	1	28	0	**88**
2:00 PM	to	2:15 PM	0	13	0	1	0	0	0	0	0	0	35	7	0	2	28	0	**86**
2:15 PM	to	2:30 PM	0	11	0	4	0	0	0	0	0	0	30	10	0	3	26	0	**84**
H O U R L Y T O T A L S																			
12:30 PM	to	1:30 PM	0	89	0	16	0	0	0	0	0	0	164	76	0	6	129	0	**480**
12:45 PM	to	1:45 PM	0	90	0	15	0	0	0	0	0	0	157	70	0	5	119	0	**456**
1:00 PM	to	2:00 PM	0	78	0	14	0	0	0	0	1	0	143	71	0	4	111	0	**422**
1:15 PM	to	2:15 PM	0	69	0	11	0	0	0	0	1	0	139	58	0	4	105	0	**387**
1:30 PM	to	2:30 PM	0	60	0	10	0	0	0	0	1	0	129	40	0	6	101	0	**347**

P E A K H O U R S U M M A R Y

12:30 PM to 1:30 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	89	0	16	0	0	0	0	0	0	164	76	0	6	129	0	**480**
PHF BY MOVEMENT	0.00	0.93	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.68	0.00	0.75	0.90	0.00	OVERALL
PHF BY APPROACH	0.94				0.00				0.88				0.89				0.97
BICYCLE	0				0				1				1				**2**
PEDESTRIAN	0				0				0				0				**0**
	N-LEG				**S-LEG**				**E-LEG**				**W-LEG**				
PEDESTRIAN BY LEG:	0				0				0				0				**0**

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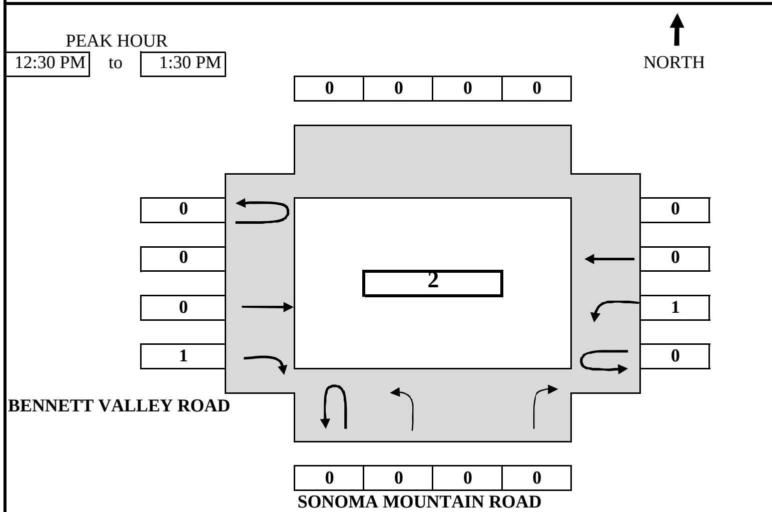
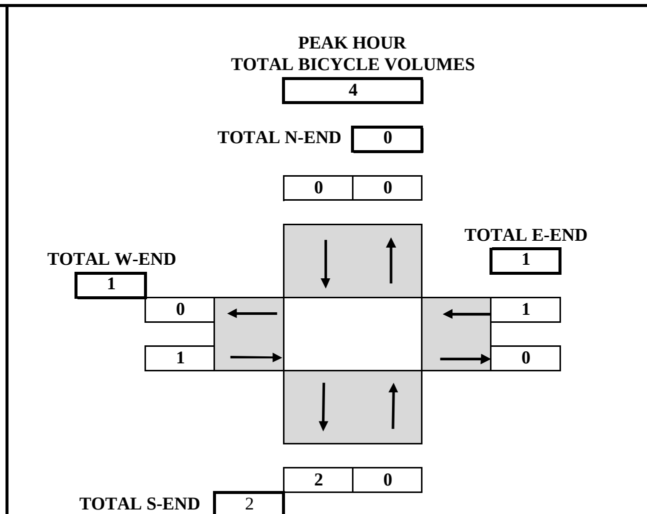
B.A.Y.M.E.T.R.I.C.S.

BICYCLE TURNING MOVEMENT SUMMARY

PROJECT:	BELDEN BARNSWINERY TRAFFIC COUNTS	SURVEY DATE:	2/13/2016	DAY:	SATURDAY
N-S APPROACH:	SONOMA MOUNTAIN ROAD	SURVEY TIME:	12:30 PM	TO	2:30 PM
E-W APPROACH:	BENNETT VALLEY ROAD	JURISDICTION:	SONOMA COUNTY	FILE:	3602016-SAT





TIME From		PERIOD To	NORTHBOUND U-TURN	NORTHBOUND LEFT	NORTHBOUND THRU	NORTHBOUND RIGHT	SOUTHBOUND U-TURN	SOUTHBOUND LEFT	SOUTHBOUND THRU	SOUTHBOUND RIGHT	EASTBOUND U-TURN	EASTBOUND LEFT	EASTBOUND THRU	EASTBOUND RIGHT	WESTBOUND U-TURN	WESTBOUND LEFT	WESTBOUND THRU	WESTBOUND RIGHT	TOTAL
SURVEY DATA																			
12:30 PM	to	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
12:45 PM	to	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 PM	to	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:15 PM	to	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	**2**
1:30 PM	to	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	**2**
1:45 PM	to	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	**3**
2:00 PM	to	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	**3**
2:15 PM	to	2:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	0	**4**
TOTAL BY PERIOD																			
12:30 PM	to	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
12:45 PM	to	1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:00 PM	to	1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:15 PM	to	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	**2**
1:30 PM	to	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1:45 PM	to	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
2:00 PM	to	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2:15 PM	to	2:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**1**
HOURLY TOTALS																			
12:30 PM	to	1:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	**2**
12:45 PM	to	1:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	**2**
1:00 PM	to	2:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	**3**
1:15 PM	to	2:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	**3**
1:30 PM	to	2:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	**2**

TEL: (510) 232 - 1271 FAX: (510) 232 - 1272

12:30 PM to 1:30 PM					
APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	0	0	1	1	**2**

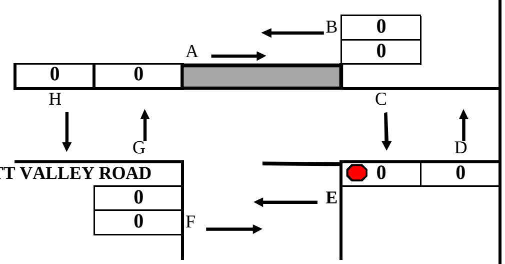
B.A.Y.M.E.T.R.I.C.S.

PEDESTRIAN MOVEMENT SUMMARY

PROJECT:	**BELDEN BARNSWINERY TRAFFIC COUNTS**	**SURVEY DATE:**	**2/13/2016**
N-S APPROACH:	**SONOMA MOUNTAIN ROAD**	**DAY:**	**SATURDAY**
E-W APPROACH:	**BENNETT VALLEY ROAD**	**JURISDICTION:**	**SONOMA COUNTY**
SURVEY PERIOD	**12:30 PM TO 2:30 PM**	**FILE:**	**3602016-SAT**

PEAK HOUR

12:30 PM TO 01:30 PM



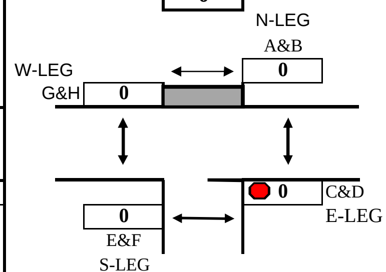
LEGEND:

- CROSSWALK
- SIDEWALK
- STOP CONTROL LINE
- STOP

PEAK HOUR

TOTAL PEDESTRIAN VOLUMES

0



BY LEG:	
N-LEG	**0**
S-LEG	**0**
E-LEG	**0**
W-LEG	**0**

BY DIRECTION:	
NB(D+G)	**0**
SB(C+H)	**0**
EB(A+F)	**0**
WB(B+E)	**0**

TIME PERIOD			**NORTH X-WALK**		**EAST X-WALK**		**SOUTH X-WALK**		**WEST X-WALK**		
From		**To**	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***	***TOTAL***
SURVEY DATA											
12:30 PM	---	12:45 PM	0	0	0	0	0	0	0	0	*0*
12:45 PM	---	01:00 PM	0	0	0	0	0	0	0	0	*0*
01:00 PM	---	01:15 PM	0	0	0	0	0	0	0	0	*0*
01:15 PM	---	01:30 PM	0	0	0	0	0	0	0	0	*0*
01:30 PM	---	01:45 PM	0	0	0	0	0	0	0	0	*0*
01:45 PM	---	02:00 PM	0	0	0	0	0	0	0	0	*0*
02:00 PM	---	02:15 PM	0	0	0	0	0	0	0	0	*0*
02:15 PM	---	02:30 PM	0	0	0	0	0	0	0	0	*0*
TOTAL BY PERIOD											
12:30 PM	---	12:45 PM	0	0	0	0	0	0	0	0	*0*
12:45 PM	---	01:00 PM	0	0	0	0	0	0	0	0	*0*
01:00 PM	---	01:15 PM	0	0	0	0	0	0	0	0	*0*
01:15 PM	---	01:30 PM	0	0	0	0	0	0	0	0	*0*
01:30 PM	---	01:45 PM	0	0	0	0	0	0	0	0	*0*
01:45 PM	---	02:00 PM	0	0	0	0	0	0	0	0	*0*
02:00 PM	---	02:15 PM	0	0	0	0	0	0	0	0	*0*
02:15 PM	---	02:30 PM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS											
12:30 PM	---	01:30 PM	0	0	0	0	0	0	0	0	*0*
12:45 PM	---	01:45 PM	0	0	0	0	0	0	0	0	*0*
01:00 PM	---	02:00 PM	0	0	0	0	0	0	0	0	*0*
01:15 PM	---	02:15 PM	0	0	0	0	0	0	0	0	*0*
01:30 PM	---	02:30 PM	0	0	0	0	0	0	0	0	*0*

Tel : (510) 232-1271 ***Fax: (510) 232-1272***

12:00 AM to 12:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	0	0	0	0	**0**
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	0	0	0	0	**0**

B A Y M E T R I C S

ADT COUNTS IN SANTA ROSA

Date / Day	31-Oct-15 Saturday				1-Nov-15 Sunday **				2-Nov-15 Monday				3-Nov-15 Tuesday				4-Nov-15 Wednesday				5-Nov-15 Thursday				6-Nov-15 Friday			
Location	1. Sonoma Mountain Road, west of Sonoma Ridge Road																											
Direction	EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB	
Time	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
1215	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1230	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1	0
1245	1	1	0	1	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	2	1	2	0	2	0	1
100	0	1	0	1	1	2	0	0	1	1	0	0	2	2	0	0	0	0	0	0	0	1	0	2	0	2	0	1
115	0	1	0	1	0	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	1	2	0	2	0	2	0	1
130	1	2	0	0	1	2	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	2	0	1	0	0	0	0
145	0	1	0	0	2	4	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0
200	1	2	0	0	1	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
215	0	2	0	0	0	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
230	0	1	0	0	0	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
245	0	1	0	0	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
300	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	2	0	0	0	0	0	0
315	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0
330	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0
345	2	3	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
400	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	1	1	2	2	1	1
415	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	1
430	0	2	0	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	1	2	0	2	0	1
445	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	2	0	2	0	1
500	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
515	1	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0
530	0	2	0	0	0	0	0	0	0	0	2	2	1	1	0	0	0	1	0	0	0	0	2	2	0	0	0	0
545	0	2	0	0	0	0	0	0	0	0	0	2	0	1	2	2	0	1	0	0	0	0	0	2	0	0	0	0
600	1	2	0	0	1	1	0	0	0	0	0	2	0	1	0	2	1	2	0	0	1	1	0	2	0	0	0	0
615	0	1	0	0	1	2	0	0	1	1	0	2	1	2	0	2	1	2	0	0	1	2	0	2	1	1	1	1
630	0	1	0	0	0	2	0	0	0	1	2	2	0	1	1	3	0	2	1	1	1	3	0	0	0	1	0	1
645	0	1	0	0	0	2	0	0	1	2	0	2	1	2	1	2	0	2	0	1	0	3	0	0	1	2	1	2
700	0	0	0	0	2	3	0	0	1	3	0	2	1	3	1	3	2	3	0	1	0	2	2	2	2	4	1	3
715	0	0	1	1	0	2	0	0	3	5	1	3	1	3	1	4	2	4	2	3	1	2	1	3	3	6	1	3
730	1	1	0	1	0	2	1	1	1	6	5	6	5	8	3	6	1	5	5	7	3	4	2	5	2	8	5	8
745	0	1	0	1	1	3	0	1	1	6	0	6	1	8	6	11	7	12	1	8	1	5	5	10	2	9	1	8
800	2	3	2	3	0	1	0	1	1	6	3	9	2	9	8	18	5	15	4	12	2	7	2	10	1	8	6	13
815	1	4	0	2	0	1	2	3	2	5	7	15	4	12	5	22	7	20	1	11	2	8	6	15	2	7	1	13
830	3	6	3	5	1	2	3	5	1	5	2	12	1	8	4	23	2	21	3	9	1	6	6	19	2	7	3	11
845	2	8	1	6	0	1	0	5	2	6	6	18	3	10	6	23	5	19	2	10	4	9	1	15	2	7	3	13
900	2	8	3	7	2	3	2	7	4	9	1	16	1	9	4	19	1	15	4	10	0	7	2	15	3	9	4	11
915	2	9	3	10	0	3	1	6	3	10	2	11	3	8	1	15	3	11	4	13	3	8	2	11	3	10	3	13
930	0	6	3	10	1	3	0	3	3	12	2	11	1	8	5	16	4	13	2	12	5	12	6	11	4	12	4	14
945	1	5	2	11	1	4	4	7	3	13	1	6	3	8	3	13	2	10	9	19	1	9	3	13	4	14	4	15
1000	7	10	3	11	0	2	4	9	2	11	4	9	5	12	2	11	4	13	4	19	2	11	3	14	3	14	2	13
1015	2	10	3	11	0	2	1	9	3	11	5	12	10	19	6	16	2	12	1	16	1	9	1	13	1	12	2	12
1030	0	10	2	10	1	2	0	9	6	14	5	15	7	25	4	15	4	12	5	19	3	7	2	9	1	9	2	10
1045	5	14	4	12	4	5	1	6	1	12	2	16	0	22	1	13	4	14	1	11	2	8	0	6	7	12	6	12
1100	2	9	4	13	3	8	6	8	1	11	3	15	5	22	4	15	0	10	2	9	2	8	3	6	2	11	4	14
1115	3	10	1	11	3	11	5	12	5	13	7	17	2	14	5	14	4	12	5	13	3	10	4	9	6	16	7	19
1130	3	13	1	10	2	12	1	13	1	8	3	15	2	9	5	15	1	9	12	20	2	9	1	8	1	16	2	19
1145	2	10	1	7	14	22	1	13	4	11	3	16	2	11	3	17	0	5	3	22	1	8	2	10	0	9	6	19
1200	3	11	5	8	2	21	3	10	3	13	1	14	4	10	4	17	4	9	1	21	1	7	3	10	5	12	2	17
1215	4	12	3	10	4	22	4	9	0	8	5	12	2	10	1	13	1	6	0	16	6	10	0	6	5	11	4	14
1230	3	12	10	19	2	22	4	12	3	10	4	13	3	11	1	9	4	9	2	6	1	9	6	11	3	13	2	14
1245	3	13	5	23	3	11	6	17	4	10	1	11	3	12	8	14	3	12	3	6	1	9	1	10	7	20	7	15
1300	0	10	1	19	4	13	0	14	2	9	1	11	1	9	1	11	1	9	5	10	3	11	4	11	5	20	3	16
1315	2	8	7	23	4	13	5	15	5	14	4	10	1	8	2	12	2	10	2	12	0	5	3	14	6	21	4	16
1330	2	7	6	19	1	12	1	12	5	16	2	8	2	7	2	13	1	7	3	13	1	5	1	9	4	22	1	15
1345	0	4	11	25	9	18	5	11	1	13	3	10	4	8	0	5	1	5	3	13	4	8	2	10	3	18	4	12
1400	4	8	2	26	1	15	1	12	6	17	3	12	4	11	7	11	5	9	1	9	1	6	3	9	1	14	2	11
1415	3	9	4	23	1	12	1	8	7	19	3	11	6	16	3	12	6	13	5	12	3	9	7	13	9	17	4	11
1430	5	12	4	21	2	13	2	9	6	20	7	16	2	16	6	16	4	16	3	12	2	10	4	16	3	16	4	14
1445	3	15	1	11	1	5	0	4	2	21	5	18	3	15	5	21	6	21	1	10	5	11	2	16	3	16	3	13
1500	5	16	2	11	5	9	0	3	9	24	2	17	1	12	2	16	5	21	2	11	3	13	1	14	5	20	9	20
1515	4	17	7	14	2	10	1	3	3	20	1	15	2	8	3	16	5	20	3	9	7	17	0	7	5	16	8	24
1530	3	15	7	17	4	12	3	4	4	18	2	10	7	13	2	12	6	22	9	15	5	20	1	4	4	17	6	26
1545	3	15	4	20	2	13	4	8	8	24	6	11	5	15	4	11	5	21	1	15	6	21	4	6	3	17	5	28
1600	3	13	2	20	1	9	0	8	3	18	6	15	3	17	5	14	6	22	6	19	6	24	6	11	3	15	5	24
1615	3	12	0	13	3	10	1	8	4	19	4	18	12	27	4	15	3	20	4	20	1	18	3	14	5	15	3	19
1630	0	9	5	11	1	7	1	6	2	17	3	19	3	23	1	14	1	15	3	14	6	19	6	19	7	18	0	13
1645	2	8	2	9	5	10	4	6	1	10	2	15	2	20	5	15	1	11	4	17	3	16	5	20	4	19	6	14
1700	9	14	3	10	5	14	0	6	5	12	6	15	4	21	2	12	4	9	2	13	3	13	6	20	2	18	1	10
1715	0	11	4	14	0	11	1	6	2	10	1	12	2	11	0	8	4	10	1	10	4	16	1	18	4	17	1	8
1730	4	15	2	11	2	12	0	5	9	17	0	9	2	10	1	8	6	15	4	11	3	13	0	12	2	12	1	9
1745	5	18	1	10	3	10	3	4	5	21	3	10	2	10	2	5	3	17	3	10	9	19	5	12	1	9	0	3
1800	7	16	0	7	1	6	1	5	1	17	2	6	3	9	0	3	3	16	3	11	4	20	1	7	4	11	3	5
1815	1	17	2	5	3	9	1	5	4	19	4	9	1	8	0	3	6	18	1	11	8	24	2	8	4	11	2	6
1830	3	16	2	5	6	13	1	6	4	14	1	10	6	12	4	6	1	13	0	7	4	25	2	10	0	9	1	6
1845	3	14	0	4	2	12	0	3	1	10	0	7	1	11	1	5	6	16	1	5	2	18	1	6	3	11	0	6
1900	2	9	2	6	2	13	0	2	1	10	1	6	1	9	2	7	5	18	0	2	7	21	1	6	4	11	1	4
1915	6	14	3	7	0	10	0	1	1	7	0	2	5	13	0	7	3	15	0	1	0	13	0	4	2	9	0	2
1930	2	13	2	7	1	5	0	0	5	8	3	4	6	13	1	4	5	19	2	3	0	9	1	3	0	9	1	2
1945	1	11	0	7	0	3	0	0	1	8	0	4	2	14	1	4	4	17	0	2	2	9	2	4	2	8	0	2
2000	2	11	1	6	1	2	0	0	1	8	0	3	1	14	0	2	0	12	1	3	2	4	0	3	3	7	0	1
2015	3	8	0	3	1	3	0	0	1	8	0	3	3	12	0	2	0	9	0	3	1	5	0	3	2	7	1	2
2030	0	6	1	2	1	3	1	1	1	4	1	1	3	9	1	2	0	4	1	2	1	6	3	5	0	7	0	1
2045	2	7	0	2	1	4	0	1	1	4	0	1	0	7	0	1	4	4	0	2	1	5	0	3	1	6	0	1
2100	5	10	3	4	0	3	0	1	1	4	0	1	1	7	0	1	0	4	0	1	0	3	2	5	3	6	0	1
2115	2	9	0	4	1	3	0	1	2	5	0	1	1	5	0	1	3	7	0	1	1	3	0	5	3	7	0	0
2130	1	10	0	3	0	2	0	0	4	8	0	0	0	2	2	2	1	8	0	0	1	3	1	3	8	15	3	3
2145	3	11	0	3	1	2	0	0	2	9	0	0	2	4	0	2	2	6	0	0	1	3	0	3	1	15	0	3
2200	0	6	0	0	0	2	0	0	1	9	0	0	3	6	0	2	1	7	1	1	3	6	1	2	1	13	1	4
2215	3	7	0	0	0	1	0	0	1	8	0	0	2	7	0	2	1	5	0	1	1	6	0	2	2	12	0	4
2230	2	8	1	1	0	1	0	0	0	4	0	0	1	8	0	0	2	6	0	1	1	6	0	1	0	4	1	2
2245	2	7	1	2	0	0	0	0	0	2	0	0	0	6	0	0	0	4	0	1	2	7	0	1	1	4	0	2
2300	2	9	0	2	1	1	0	0	2	3	0	0	1	4	0	0	1	4	0	0	0	4	0	0	0	3	0	1
2315	1	7	1	3	1	2	1	1	0	2	2	2	2	4	1	1	0	3	0	0	3	6	0	0	1	2	0	1
2330	0	5	0	2	0	2	0	1	0	2	0	2	0	3	0	1	2	3	0	0	2	7	0	0	0	2	1	1
2345	1	4	0	1	0	2	0	1	0	2	0	2	0	3	0	1	0	3	1	1	1	6	1	1	0	1	0	1
TOTAL	174	N/A	155	N/A	136	N/A	88	N/A	185	N/A	156	N/A	191	N/A	167	N/A	200	N/A	154	N/A	179	N/A	152	N/A	201	N/A	171	N/A
AM		9		11		4		7		13		18		12		23		21		19		12		19		14		15
NOON		15		26		22		17		21		18		25		21		21		22		11		16		22		19
PM		18		20		14		8		24		19		27		16		22		20		25		20		20		28
EVEN		11		6		4		1		9		3		14		2		12		3		7		5		15		4

Telephone: (510) 232-1271 Fax: (510) 232-1272

** Daylight saving time end on 2:00AM, Sunday. Data are set back one hour to 1:00AM.

B A Y M E T R I C S

ADT COUNTS IN SANTA ROSA

Date / Day	31-Oct-15 Saturday				1-Nov-15 Sunday **				2-Nov-15 Monday				3-Nov-15 Tuesday				4-Nov-15 Wednesday				5-Nov-15 Thursday				6-Nov-15 Friday			
Location	2. Sonoma Mountain Road, east of 5312 Sonoma Mountain Road																											
Direction	EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB		EB		WB	
Time	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1215	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
1230	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1245	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	2
100	0	1	0	1	2	3	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0	1	3
115	0	1	1	1	1	3	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	0	0	3
130	0	0	0	1	0	3	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	3
145	0	0	1	2	0	3	0	1	0	0	0	0	0	0	0	1	1	1	0	0	0	0	1	2	0	0	0	1
200	0	0	0	2	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0
215	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
230	0	0	0	1	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
245	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0
300	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	1	1	0	0	1	2	1	1	1	1
315	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	2	0	1	0	1
330	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	3	1	2	1	2
345	0	1	0	2	1	1	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	1	1	3	4	6	0	2
400	0	1	0	2	0	1	0	0	0	0	0	0	0	1	1	2	0	1	1	1	0	1	0	2	2	7	7	8
415	0	0	0	2	0	1	0	0	0	0	1	1	0	1	0	2	0	1	1	2	2	3	5	7	0	7	9	17
430	0	0	1	1	0	1	0	0	0	0	0	1	1	2	0	2	1	2	0	2	1	3	2	8	2	8	3	19
445	0	0	1	2	0	0	0	0	1	1	0	1	0	1	2	3	3	4	2	4	3	6	2	9	1	5	8	27
500	0	0	1	3	0	0	0	0	0	1	1	2	1	2	4	6	2	6	6	9	1	7	6	15	3	6	1	21
515	0	0	0	3	1	1	1	1	0	1	1	2	0	2	6	12	3	9	4	12	3	8	3	13	3	9	4	16
530	1	1	0	2	0	1	0	1	0	1	2	4	2	3	3	15	5	13	3	15	3	10	6	17	1	8	6	19
545	0	1	0	1	0	1	0	1	1	1	6	10	3	6	5	18	7	17	8	21	1	8	6	21	2	9	9	20
600	0	1	0	0	1	2	0	1	1	2	7	16	2	7	6	20	7	22	4	19	3	10	3	18	2	8	3	22
615	0	1	0	0	1	2	1	1	0	2	4	19	5	12	11	25	2	21	2	17	1	8	5	20	3	8	4	22
630	0	0	0	0	0	2	1	2	1	3	1	18	3	13	2	24	2	18	6	20	4	9	4	18	7	14	2	18
645	0	0	1	1	0	2	1	3	1	3	10	22	3	13	6	25	0	11	4	16	3	11	6	18	3	15	2	11
700	0	0	0	1	6	7	3	6	3	5	4	19	3	14	3	22	6	10	3	15	2	10	3	18	2	15	4	12
715	1	1	0	1	2	8	4	9	2	7	6	21	0	9	6	17	5	13	5	18	2	11	3	16	4	16	4	12
730	0	1	2	3	2	10	6	14	2	8	5	25	3	9	3	18	3	14	8	20	1	8	2	14	5	14	3	13
745	1	2	0	2	1	11	2	15	0	7	5	20	1	7	7	19	3	17	3	19	3	8	4	12	1	12	5	16
800	4	6	3	5	3	8	1	13	5	9	3	19	7	11	4	20	3	14	4	20	2	8	2	11	2	12	2	14
815	1	6	5	10	0	6	3	12	2	9	4	17	5	16	7	21	6	15	5	20	2	8	2	10	3	11	5	15
830	1	7	7	15	1	5	2	8	0	7	3	15	10	23	4	22	2	14	4	16	2	9	5	13	2	8	7	19
845	1	7	3	18	1	5	6	12	2	9	3	13	3	25	4	19	2	13	3	16	0	6	6	15	1	8	4	18
900	2	5	3	18	1	3	5	16	6	10	7	17	2	20	7	22	3	13	8	20	1	5	3	16	2	8	5	21
915	2	6	2	15	2	5	6	19	4	12	3	16	2	17	7	22	1	8	9	24	2	5	3	17	2	7	6	22
930	6	11	6	14	5	9	2	19	3	15	5	18	3	10	4	22	4	10	5	25	5	8	3	15	5	10	4	19
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1000	0	11	6	18	4	15	6	19	3	12	6	24	5	11	6	21	3	9	1	19	2	10	5	15	3	11	3	17
1015	5	14	7	23	13	26	6	19	1	9	4	25	4	13	2	16	4	12	0	10	2	10	3	15	3	12	2	13
1030	2	10	10	27	6	27	6	23	4	10	1	21	2	12	3	15	2	10	7	12	3	8	3	15	2	9	5	14
1045	4	11	2	25	4	27	1	19	2	10	3	14	2	13	7	18	2	11	4	12	3	10	1	12	3	11	3	13
1100	3	14	4	23	5	28	5	18	1	8	7	15	1	9	0	12	1	9	3	14	2	10	7	14	2	10	5	15
1115	6	15	3	19	3	18	8	20	5	12	5	16	1	6	3	13	1	6	2	16	4	12	8	19	6	13	7	20
1130	2	15	4	13	5	17	6	20	2	10	0	15	0	4	4	14	3	7	3	12	3	12	5	21	3	14	3	18
1145	5	16	6	17	2	15	9	28	6	14	6	18	3	5	1	8	7	12	3	11	5	14	4	24	2	13	6	21
1200	5	18	6	19	3	13	1	24	3	16	5	16	4	8	8	16	4	15	7	15	3	15	0	17	3	14	1	17
1215	4	16	10	26	4	14	3	19	3	14	4	15	6	13	5	18	4	18	7	20	8	19	7	16	4	12	8	18
1230	6	20	3	25	2	11	2	15	7	19	5	20	4	17	4	18	5	20	3	20	8	24	8	19	3	12	3	18
1245	2	17	8	27	3	12	8	14	5	18	5	19	1	15	9	26	5	18	2	19	7	26	2	17	2	12	12	24
1300	1	13	8	29	2	11	7	20	8	23	6	20	1	12	7	25	2	16	8	20	4	27	6	23	4	13	4	27
1315	2	11	9	28	1	8	2	19	4	24	6	22	3	9	7	27	8	20	6	19	3	22	9	25	5	14	6	25
1330	3	8	3	28	2	8	7	24	7	24	7	24	6	11	8	31	5	20	7	23	5	19	8	25	3	14	3	25
1345	6	12	8	28	1	6	0	16	6	25	1	20	6	16	6	28	1	16	8	29	2	14	9	32	4	16	2	15
1400	3	14	5	25	5	9	3	12	2	19	4	18	2	17	6	27	0	14	3	24	4	14	5	31	4	16	3	14
1415	2	14	2	18	5	13	3	13	7	22	8	20	10	24	5	25	2	8	5	23	4	15	4	26	4	15	7	15
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1445	5	15	7	19	1	14	4	15	4	15	6	26	3	17	6	20	6	12	3	15	3	16	7	18	7	16	8	21
1500	0	12	8	22	6	15	2	14	2	15	5	27	2	17	5	19	6	18	4	16	6	18	1	14	3	15	13	31
1515	6	16	4	24	6	16	3	14	0	8	4	23	0	7	1	15	3	19	4	15	5	19	6	16	6	17	4	28
1530	2	13	7	26	2	15	3	12	2	8	8	23	1	6	4	16	2	17	5	16	3	17	5	19	0	16	4	29
1545	2	10	5	24	3	17	6	14	2	6	4	21	3	6	2	12	4	15	2	15	4	18	2	14	4	13	8	29
1600	2	12	5	21	4	15	2	14	8	12	3	19	2	6	4	11	0	9	3	14	5	17	3	16	2	12	5	21
1615	5	11	1	18	2	11	0	11	3	15	1	16	3	9	0	10	5	11	3	13	1	13	0	10	5	11	4	21
1630	5	14	7	18	2	11	4	12	2	15	3	11	4	12	5	11	4	13	1	9	0	10	2	7	6	17	9	26
1645	1	13	4	17	1	9	3	9	6	19	4	11	1	10	1	10	8	17	2	9	4	10	2	7	1	14	1	19
1700	4	15	4	16	2	7	2	9	3	14	1	9	2	10	3	9	6	23	2	8	1	6	2	6	6	18	1	15
1715	3	13	6	21	3	8	2	11	1	12	1	9	3	10	2	11	3	21	2	7	2	7	1	7	0	13	6	17
1730	5	13	3	17	4	10	8	15	1	11	0	6	4	10	2	8	1	18	0	6	0	7	3	8	2	9	2	10
1745	4	16	3	16	1	10	1	13	3	8	8	10	5	14	0	7	1	11	0	4	1	4	1	7	3	11	3	12
1800	6	18	5	17	1	9	0	11	6	11	3	12	3	15	0	4	3	8	1	3	0	3	2	7	1	6	3	14
1815	1	16	5	16	0	6	0	9	0	10	0	11	4	16	1	3	2	7	1	2	1	2	0	6	0	6	3	11
1830	1	12	5	18	1	3	1	2	1	10	0	11	1	13	2	3	2	8	2	4	1	3	1	4	3	7	0	9
1845	1	9	6	21	0	2	0	1	1	8	3	6	0	8	0	3	1	8	5	9	4	6	0	3	1	5	2	8
1900	1	4	2	18	2	3	0	1	1	3	0	3	1	6	1	4	2	7	0	8	1	7	2	3	4	8	2	7
1915	1	4	0	13	1	4	2	3	1	4	0	3	2	4	1	4	0	5	2	9	1	7	0	3	0	8	1	5
1930	2	5	3	11	1	4	1	3	2	5	0	3	0	3	3	5	1	4	0	7	2	8	1	3	1	6	2	7
1945	0	4	1	6	0	4	0	3	1	5	2	2	5	8	0	5	1	4	0	2	1	5	1	4	0	5	1	6
2000	1	4	2	6	0	2	0	3	1	5	1	3	1	8	1	5	1	3	0	2	0	4	0	2	3	4	0	4
2015	3	6	2	8	1	2	0	1	1	5	1	4	2	8	0	4	1	4	0	0	3	6	1	3	1	5	2	5
2030	1	5	4	9	0	1	0	0	0	3	0	4	1	9	0	1	0	3	0	0	1	5	2	4	2	6	1	4
2045	1	6	0	8	0	1	1	1	1	3	1	3	0	4	0	1	2	4	0	0	0	4	1	4	3	9	2	5
2100	2	7	1	7	0	1	0	1	0	2	0	2	1	4	3	3	0	3	1	1	0	4	0	4	1	7	1	6
2115	0	4	0	5	0	0	0	1	1	2	0	1	0	2	0	3	1	3	0	1	0	1	0	3	3	9	2	6
2130	1	4	1	2	0	0	0	1	1	3	1	2	0	1	0	3	0	3	0	1	2	2	1	2	2	9	0	5
2145	1	4	2	4	0	0	1	1	0	2	1	2	0	1	0	3	1	2	0	1	0	2	0	1	1	7	1	4
2200	2	4	2	5	1	1	0	1	0	2	0	2	0	0	0	0	0	2	2	2	0	2	0	1	2	8	1	4
2215	4	8	0	5	0	1	1	2	0	1	0	2	0	0	0	0	0	1	0	2	0	2	0	1	0	5	0	2
2230	1	8	1	5	0	1	0	2	1	1	1	2	0	0	0	0	0	1	0	2	0	0	1	1	1	4	1	3
2245	0	7	0	3	0	1	0	1	1	2	0	1	0	0	0	0	0	0	1	3	0	0	0	1	0	3	0	2
2300	0	5	1	2	0	0	0	1	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	2	1	2
2315	1	2	0	2	1	1	0	0	1	3	1	2	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0	2
2330	0	1	1	2	0	1	0	0	0	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0	1
2345	0	1	0	2	1	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1
TOTAL	166	N/A	261	N/A	157	N/A	186	N/A	172	N/A	246	N/A	178	N/A	250	N/A	203	N/A	232	N/A	179	N/A	239	N/A	202	N/A	296	N/A
AM		13		18		12		19		15		25		25		25		22		26		11		20		16		22
NOON		20		29		28		28		25		26		24		31		20		29		27		32		16		27
PM		18		26		17		15		19		27		17		19		23		16		19		19		18		31
EVEN		8		9		2		3		5		4		9		5		4		3		6		4		9		6

Telephone: (510) 232-1271 **Fax: (510) 232-1272**

** Daylight saving time end on 2:00AM, Sunday. Data are set back one hour to 1:00AM.

B A Y M E T R I C S

ADT COUNTS IN SANTA ROSA

Date / Day	31-Oct-15 Saturday				1-Nov-15 Sunday **				2-Nov-15 Monday				3-Nov-15 Tuesday				4-Nov-15 Wednesday				5-Nov-15 Thursday				6-Nov-15 Friday			
Location	3. Pressley Road, south of Sonoma Mountain Road																											
Direction	NB		SB		NB		SB		NB		SB		NB		SB		NB		SB		NB		SB		NB		SB	
Time	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN	15 MIN	60 MIN
1200	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1215	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
1230	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1245	0	3	0	3	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1
100	0	2	1	4	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
115	1	3	0	3	2	3	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	2	0	1
130	0	1	0	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1
145	2	3	2	3	0	2	0	3	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	1	0	0
200	1	4	0	2	0	2	0	1	0	0	0	0	0	0	0	0	1	2	0	0	0	1	0	1	1	2	0	0
215	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	1	2	0	0	3	4	0	0
230	0	3	0	2	0	0	0	0	0	0	0	0	1	1	0	0	0	3	0	0	1	3	0	0	1	5	1	1
245	0	1	0	0	0	0	1	1	1	1	0	0	1	2	0	0	1	3	0	0	1	3	0	0	1	6	1	2
300	0	0	2	2	1	1	0	1	1	2	0	0	1	3	0	0	2	4	0	0	3	6	2	2	2	7	0	2
315	0	0	1	3	1	2	0	1	0	2	0	0	1	4	0	0	1	4	0	0	0	5	0	2	1	5	1	3
330	1	1	0	3	0	2	0	1	0	2	0	0	0	3	0	0	1	5	3	3	0	4	0	2	3	7	1	3
345	0	1	0	3	0	2	0	0	0	1	1	1	1	3	1	1	0	4	0	3	1	4	2	4	2	8	6	8
400	1	2	0	1	0	1	0	0	1	1	0	1	2	4	1	2	2	4	0	3	2	3	3	5	7	13	10	18
415	0	2	0	0	0	0	0	0	1	2	0	1	0	3	0	2	2	5	1	4	3	6	4	9	8	20	3	20
430	0	1	0	0	0	0	0	0	1	3	0	1	1	4	1	3	0	4	4	5	1	7	3	12	4	21	8	27
445	1	2	0	0	0	0	0	0	1	4	0	0	2	5	1	3	1	5	8	13	5	11	5	15	7	26	14	35
500	0	1	0	0	0	0	0	0	2	5	1	1	1	4	5	7	6	9	3	16	9	18	9	21	2	21	7	32
515	0	1	0	0	3	3	0	0	3	7	0	1	2	6	5	12	4	11	2	17	6	21	7	24	5	18	3	32
530	0	1	1	1	0	3	0	0	2	8	6	7	4	9	3	14	5	16	7	20	6	26	6	27	8	22	2	26
545	0	0	0	1	1	4	1	1	2	9	5	12	4	11	3	16	6	21	10	22	5	26	4	26	13	28	13	25
600	0	0	0	1	0	4	0	1	4	11	3	14	5	15	9	20	3	18	8	27	6	23	5	22	9	35	7	25
615	0	0	0	1	0	1	1	2	2	10	2	16	4	17	3	18	3	17	6	31	2	19	10	25	7	37	7	29
630	1	1	1	1	0	1	1	3	5	13	9	19	4	17	8	23	7	19	6	30	11	24	14	33	6	35	4	31
645	2	3	1	2	1	1	1	3	5	16	7	21	2	15	11	31	5	18	11	31	4	23	9	38	8	30	5	23
700	2	5	2	4	2	3	5	8	4	16	6	24	7	17	7	29	6	21	11	34	7	24	8	41	10	31	6	22
715	0	5	1	5	2	5	3	10	1	15	7	29	3	16	6	32	3	21	6	34	10	32	2	33	9	33	4	19
730	2	6	4	8	4	9	4	13	8	18	5	25	5	17	3	27	7	21	6	34	7	28	4	23	9	36	2	17
745	2	6	2	9	1	9	4	16	2	15	9	27	4	19	5	21	6	22	8	31	2	26	4	18	4	32	4	16
800	4	8	4	11	1	8	7	18	8	19	3	24	3	15	8	22	2	18	2	22	10	29	5	15	5	27	4	14
815	1	9	5	15	0	6	3	18	3	21	6	23	3	15	7	23	3	18	5	21	4	23	6	19	9	27	4	14
830	8	15	3	14	9	11	8	22	2	15	2	20	3	13	3	23	4	15	5	20	2	18	7	22	4	22	5	17
845	4	17	2	14	9	19	4	22	0	13	4	15	7	16	6	24	4	13	3	15	3	19	8	26	3	21	8	21
900	5	18	4	14	6	24	4	19	5	10	9	21	5	18	5	21	10	21	6	19	5	14	3	24	7	23	5	22
915	6	23	5	14	4	28	5	21	5	12	4	19	6	21	5	19	8	26	6	20	3	13	6	24	6	20	6	24
930	8	23	5	16	2	21	5	18	3	13	6	23	2	20	5	21	3	25	1	16	5	16	3	20	4	20	2	21
945	2	21	4	18	7	19	6	20	4	17	3	22	1	14	7	22	6	27	7	20	2	15	3	15	4	21	5	18
1000	9	25	8	22	6	19	20	36	3	15	2	15	7	16	3	20	3	20	3	17	8	18	4	16	5	19	4	17
1015	5	24	7	24	12	27	5	36	5	15	5	16	2	12	3	18	2	14	4	15	5	20	1	11	3	16	3	14
1030	12	28	7	26	4	29	10	41	2	14	8	18	3	13	2	15	6	17	2	16	2	17	2	10	4	16	2	14
1045	4	30	7	29	3	25	5	40	7	17	2	17	5	17	1	9	5	16	5	14	6	21	10	17	6	18	8	17
1100	1	22	8	29	11	30	4	24	8	22	5	20	3	13	2	8	5	18	1	12	5	18	4	17	5	18	3	16
1115	6	23	10	32	7	25	3	22	7	24	5	20	4	15	3	8	6	22	2	10	5	18	2	18	6	21	9	22
1130	1	12	7	32	5	26	9	21	5	27	3	15	5	17	5	11	4	20	6	14	6	22	5	21	2	19	6	26
1145	7	15	5	30	6	29	3	19	11	31	5	18	1	13	4	14	4	19	10	19	3	19	9	20	7	20	4	22
1200	3	17	9	31	0	18	12	27	7	30	4	17	5	15	5	17	2	16	3	21	3	17	7	23	7	22	4	23
1215	8	19	4	25	4	15	1	25	4	27	5	17	4	15	6	20	7	17	10	29	4	16	2	23	6	22	7	21
1230	8	26	5	23	5	15	2	18	0	22	10	24	4	14	7	22	2	15	7	30	4	14	10	28	0	20	7	22
1245	9	28	6	24	5	14	6	21	4	15	9	28	4	17	5	23	4	15	6	26	6	17	6	25	7	20	9	27
1300	9	34	6	21	4	18	4	13	7	15	7	31	3	15	8	26	11	24	3	26	12	26	8	26	6	19	8	31
1315	3	29	7	24	4	18	2	14	11	22	8	34	7	18	4	24	5	22	5	21	5	27	7	31	13	26	4	28
1330	6	27	8	27	1	14	2	14	5	27	7	31	3	17	5	22	12	32	6	20	8	31	8	29	8	34	3	24
1345	5	23	13	34	3	12	5	13	2	25	2	24	7	20	6	23	10	38	8	22	15	40	6	29	3	30	6	21
1400	1	15	5	33	1	9	8	17	7	25	6	23	15	32	4	19	4	31	2	21	6	34	6	27	8	32	6	19
1415	0	12	4	30	4	9	4	19	9	23	4	19	8	33	9	24	7	33	3	19	11	40	11	31	7	26	4	19
1430	3	9	6	28	5	13	4	21	8	26	9	21	8	38	10	29	9	30	6	19	12	44	3	26	7	25	1	17
1445	5	9	7	22	4	14	4	20	3	27	8	27	11	42	5	28	9	29	9	20	6	35	6	26	13	35	10	21
1500	8	16	1	18	2	15	4	16	8	28	8	29	7	34	5	29	11	36	4	22	8	37	10	30	17	44	5	20
1515	10	26	5	19	4	15	4	16	7	26	3	28	11	37	6	26	11	40	8	27	6	32	6	25	8	45	8	24
1530	13	36	10	23	4	14	8	20	7	25	9	28	8	37	8	24	5	36	7	28	2	22	6	28	7	45	5	28
1545	14	45	5	21	4	14	0	16	5	27	8	28	4	30	4	23	7	34	8	27	4	20	4	26	9	41	6	24
1600	10	47	10	30	7	19	3	15	7	26	3	23	7	30	11	29	2	25	4	27	8	20	5	21	9	33	7	26
1615	4	41	5	30	1	16	2	13	9	28	5	25	5	24	5	28	4	18	5	24	2	16	3	18	8	33	7	25
1630	7	35	7	27	7	19	3	8	7	28	2	18	6	22	8	28	2	15	1	18	3	17	3	15	14	40	7	27
1645	8	29	8	30	4	19	3	11	6	29	3	13	4	22	11	35	2	10	5	15	3	16	2	13	5	36	9	30
1700	4	23	6	26	3	15	2	10	9	31	3	13	3	18	5	29	2	10	5	16	5	13	3	11	10	37	7	30
1715	9	28	7	28	2	16	1	9	1	23	9	17	4	17	9	33	5	11	5	16	4	15	2	10	5	34	10	33
1730	4	25	7	28	4	13	6	12	1	17	2	17	6	17	5	30	1	10	2	17	1	13	0	7	10	30	4	30
1745	5	22	6	26	2	11	2	11	6	17	2	16	5	18	4	23	4	12	6	18	4	14	1	6	3	28	4	25
1800	2	20	5	25	1	9	1	10	1	9	1	14	4	19	2	20	5	15	3	16	2	11	1	4	3	21	8	26
1815	3	14	3	21	3	10	2	11	4	12	2	7	3	18	4	15	1	11	1	12	1	8	2	4	7	23	2	18
1830	1	11	6	20	3	9	3	8	2	13	1	6	0	12	5	15	1	11	0	10	2	9	4	8	3	16	4	18
1845	2	8	3	17	2	9	0	6	3	10	3	7	1	8	0	11	0	7	2	6	1	6	3	10	2	15	2	16
1900	4	10	5	17	2	10	1	6	3	12	1	7	5	9	4	13	1	3	2	5	3	7	1	10	1	13	1	9
1915	0	7	1	15	0	7	1	5	2	10	1	6	0	6	3	12	2	4	5	9	2	8	2	10	1	7	5	12
1930	1	7	4	13	1	5	2	4	1	9	0	5	3	9	2	9	4	7	1	10	4	10	4	10	2	6	5	13
1945	2	7	2	12	1	4	1	5	2	8	4	6	2	10	2	11	1	8	3	11	0	9	2	9	3	7	6	17
2000	2	5	2	9	1	3	1	5	0	5	0	5	2	7	2	9	3	10	0	9	0	6	1	9	6	12	2	18
2015	2	7	0	8	2	5	2	6	1	4	2	6	0	7	1	7	1	9	1	5	1	5	1	8	2	13	3	16
2030	4	10	1	5	1	5	4	8	1	4	1	7	1	5	1	6	1	6	3	7	0	1	2	6	0	11	1	12
2045	0	8	2	5	0	4	1	8	3	5	0	3	1	4	0	4	1	6	1	5	0	1	1	5	2	10	1	7
2100	3	9	2	5	0	3	0	7	0	5	1	4	0	2	2	4	0	3	1	6	0	1	0	4	2	6	0	5
2115	1	8	1	6	3	4	0	5	0	4	0	2	2	4	0	3	1	3	1	6	1	1	1	4	1	5	2	4
2130	5	9	0	5	1	4	1	2	0	3	0	1	1	4	0	2	1	3	0	3	0	1	0	2	0	5	2	5
2145	4	13	5	8	0	4	1	2	1	1	0	1	1	4	0	2	0	2	1	3	0	1	1	2	1	4	5	9
2200	0	10	3	9	0	4	1	3	0	1	0	0	1	5	0	0	0	2	1	3	1	2	1	3	1	3	1	10
2215	2	11	7	15	1	2	0	3	0	1	2	2	0	3	0	0	0	1	0	2	1	2	2	4	2	4	1	9
2230	2	8	0	15	0	1	1	3	1	2	0	2	0	2	0	0	0	0	0	2	1	3	1	5	1	5	1	8
2245	2	6	1	11	1	2	1	3	0	1	0	2	0	1	0	0	1	1	0	1	1	4	0	4	1	5	0	3
2300	4	10	1	9	1	3	0	2	0	1	0	2	0	0	0	0	1	2	0	0	0	3	0	3	1	5	1	3
2315	0	8	1	3	0	2	1	3	0	1	2	2	0	0	0	0	0	2	0	0	0	2	0	1	0	3	0	2
2330	3	9	2	5	1	3	0	2	0	0	0	2	1	1	1	1	0	2	0	0	0	1	0	0	1	3	1	2
2345	2	9	1	5	0	2	1	2	1	1	1	3	0	1	0	1	0	1	0	0	0	0	0	0	1	3	0	2
TOTAL	309	N/A	327	N/A	221	N/A	244	N/A	290	N/A	291	N/A	292	N/A	325	N/A	312	N/A	322	N/A	332	N/A	335	N/A	446	N/A	390	N/A
AM		23		18		28		22		21		29		21		32		27		34		32		41		37		31
NOON		34		34		30		41		31		34		42		29		38		30		44		31		35		31
PM		47		30		19		20		31		29		37		35		40		28		37		30		45		33
EVEN		13		15		5		8		5		7		7		9		10		9		6		9		13		18

Telephone: (510) 232-1271 **Fax: (510) 232-1272**

** Daylight saving time end on 2:00AM, Sunday. Data are set back one hour to 1:00AM.

TJKM
Transportation
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Appendix B - Existing Conditions LOS Calculation Worksheets

Intersection						
Int Delay, s/veh	4.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	26	1	7	16	2	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	82	82	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	1	9	20	3	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	52	15	28	0	-	0
Stage 1	15	-	-	-	-	-
Stage 2	37	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	957	1065	1585	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	951	1065	1585	-	-	-
Mov Cap-2 Maneuver	951	-	-	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1585	-	955	-	-
HCM Lane V/C Ratio	0.005	-	0.038	-	-
HCM Control Delay (s)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	151	1	8	113	11	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	86	86	69	69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	191	1	9	131	16	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	192	0	342	192
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	150	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1381	-	654	850
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	878	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1381	-	649	850
Mov Cap-2 Maneuver	-	-	-	-	649	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	872	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	649	-	-	1381	-
HCM Lane V/C Ratio	0.025	-	-	0.007	-
HCM Control Delay (s)	10.7	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	172	26	4	145	81	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	83	83	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	218	33	5	175	108	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	251	0	418	234
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	184	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1314	-	591	805
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1314	-	589	805
Mov Cap-2 Maneuver	-	-	-	-	589	-
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	845	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	605	-	-	1314	-
HCM Lane V/C Ratio	0.198	-	-	0.004	-
HCM Control Delay (s)	12.4	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	21	2	2	9	13	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	69	69	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	2	3	13	18	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	52	33	48	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	19	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	957	1041	1559	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	1004	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	955	1041	1559	-	-	-
Mov Cap-2 Maneuver	955	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	1002	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1559	-	962	-	-
HCM Lane V/C Ratio	0.002	-	0.025	-	-
HCM Control Delay (s)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	133	1	9	214	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	86	86	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	151	1	10	249	2	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	152	0	422	152
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	270	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1429	-	588	894
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	775	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1429	-	583	894
Mov Cap-2 Maneuver	-	-	-	-	583	-
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	769	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	808	-	-	1429	-
HCM Lane V/C Ratio	0.01	-	-	0.007	-
HCM Control Delay (s)	9.5	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	171	46	6	232	55	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	83	83	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	186	50	7	280	81	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	236	0	505	211
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	294	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1331	-	527	829
Stage 1	-	-	-	-	824	-
Stage 2	-	-	-	-	756	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1331	-	524	829
Mov Cap-2 Maneuver	-	-	-	-	524	-
Stage 1	-	-	-	-	824	-
Stage 2	-	-	-	-	751	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	531	-	-	1331	-
HCM Lane V/C Ratio	0.158	-	-	0.005	-
HCM Control Delay (s)	13	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	20	9	5	29	15	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	85	85	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	12	6	34	21	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	79	33	44	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	924	1041	1564	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	976	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	920	1041	1564	-	-	-
Mov Cap-2 Maneuver	920	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	972	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1564	-	954	-	-
HCM Lane V/C Ratio	0.004	-	0.042	-	-
HCM Control Delay (s)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	85	0	12	112	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	89	89	46	46
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	0	13	126	2	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	100	0	253	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	153	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1493	-	736	956
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	875	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1493	-	729	956
Mov Cap-2 Maneuver	-	-	-	-	729	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	867	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	930	-	-	1493	-
HCM Lane V/C Ratio	0.026	-	-	0.009	-
HCM Control Delay (s)	9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	164	76	6	129	89	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	89	89	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	186	86	7	145	95	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	273	0	388	230
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	158	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1290	-	616	809
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	871	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1290	-	612	809
Mov Cap-2 Maneuver	-	-	-	-	612	-
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	866	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	636	-	-	1290	-
HCM Lane V/C Ratio	0.176	-	-	0.005	-
HCM Control Delay (s)	11.9	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

TJKM Transportation Consultants

Appendix C - Project Applicant Data

ATTACHMENT 6

TRIP GENERATION SHEETS

WINERY TRIP GENERATION

Winery: Belden Barns Location: 5561 Sonoma Mtn Road
Annual Full Production (cases): 10,000

Please note: ADT means Average Daily Trips. For purposes of this form, provide traffic generation information in one-way trips. This means that a single round trip is counted as two (2) trips (ADT) i.e., a vehicle driving to the winery is counted as one trip. The same vehicle leaving the site is counted as a second trip.

Attach pages as necessary to more fully describe any of the items or circumstances found below.

WINERY OPERATIONS

WINERY Operations - Employee traffic using passenger vehicles, in average ADT

Item Description	Existing ADT		Proposed* (year round) ADT		Proposed* (harvest period) ADT		Proposed* (bottling period) ADT	
	# of employees	# of trips by employees	# of employees	# of trips by employees	# of employees	# of trips by employees	# of employees	# of trips by employees
Winery production (1 employees X 3 = 3 ADT)			1	3				
Cellar / Storage (1 employees X 3 = 3 ADT)			1	3				
Administrative (___ employees X 3 = ___ ADT)								
Sales (___ employees X 3 = ___ ADT)								
Bottling/Harvest (7 employees X 3 = 21 ADT)					7	21	7	21
Other staff (describe): ________________								
Totals			2	6	7	21	7	21

WINERY Operations - Truck traffic associated with winery operations (average ADT)

Item Description	Existing	Proposed*
Grape and juice importation (A) Truck loads per year: 8 Dates of activity 9/1 to 10/30 Vehicle type: ______	0	8 / Year 0.14 / Day
Pomace disposal On-site Truck loads per year: ______ Dates of activity __/__ to __/__ Vehicle type: ______	0	0
Bottle Delivery Truck loads per year: 5 Dates of activity: 2/1 to 8/30 Vehicle type: ______, # of Cases: 1,904	0	5 / year 0.03 / Day
Barrel Delivery (B) Truck loads per year: 3 Dates of activity 6/1 to 8/30 Vehicle type: ______, # of Barrels 33	0	3 / year 0.03 / Day
Miscellaneous Deliveries (e.g.,corks, labels) Truck loads per year: 6 Dates of activity 2/1 to 8/30 Vehicle type: ______, # of Cases: 10,000	2/year	6 / year 0.03 / Day
Finished wine transportation to storage /sales (C) Truck loads per year: 7 Dates of activity 2/1 to 8/30 Vehicle type: ______, # of Cases: 1,000	0	7 / year 0.04 / Day
Miscellaneous visitors, UPS, mail, garbage, etc., list items included: ______	0	1
Totals	0.0	1.27

*** "Proposed" shall mean existing traffic + new traffic if expansion is approved**

(A) At 10,000 case production. Importing 3,000 cases of fruit = 50 tons
6 tons per load = 8 loads / 8 weeks / 7 days = 0.14 ADT

(B) At 10,000 cases production we require 100 new barrels p/year.

(C) At 10,000 cases and 60% direct to consumer (with 50% on site and 50% off site) / 40% distribution going off site.

VINEYARD OPERATIONS

Employee trips associated with vineyard operations (growing of grapes in average ADT)

Item Description	**Existing**	**Proposed**
Vineyard maintenance (year round) (multiply # of employees X 3 for ADT)	6	6
Vineyard maintenance (part time during peak season, (multiply # of employees X 3 for ADT) Dates of activity: __/__ to __/__	6	6
Totals	12	12

TASTING ROOM OPERATIONS - TRIPS

Item Description	**Existing**	**Proposed**
Tasting room visitors 42 visitors, divide by 2.5 people per vehicle to arrive at ADT X 2 = Trips 17 x 2 = 34	0	34
Tasting room employees (multiply # of employees X 3 for ADT) 4 (2 Full time / 2 Part time)	0	12
Other		
Totals	0	46

TASTING ROOM OPERATIONS - DAYS / HOURS

Months of operation, (Attach an explanation of how the operation varies seasonally)		Year Round
Days of operation (e.g., 7 days a week, weekends only, etc.)		7 Days a Week
Hours of operation - Non-harvest season		11am - 5pm
Hours of operation - Harvest season		11am - 5pm

Project: Belden Barns

Cheese Truck Trips

Item Description

Item Description	Existing	Proposed
Milk Importation (Conservatively Assume All Milk Imported) Truck Loads Per Year: 2 Per Week = 104 Dates of Activity: Year Round Vehicle Type: Ford F-150 or Equivelant	0	104 Annually 0.28/Day
Finished Cheese Transportation to Storage/Sales Truck Loads Per Year: 1 Per Week = 52 Dates of Activity: Year Round Vehicle Type: Ford F-150 or Equivelant	0	52 Annually 0.14/Day

MISCELLANEOUS OTHER TRAFFIC GENERATORS

Item Description	Existing	Proposed
Event Traffic (please transfer data from attached form)	128 Vehicles Annually 0.4 / Day	434 Vehicles Annually 1.2 / Day
Other (please describe):		
Totals		

SUMMARY (During Non-harvest period)

Item Description	Existing	Proposed
Employee traffic associated with winery operations	0	6
Truck traffic associated with winery operations	0	1.3
Employee traffic associated with vineyard operations	6	6
Tasting Room Traffic (employee and visitors)	0	46
Event Traffic	0.4	1.2
Miscellaneous Other traffic generators 1 Cheese Employees 2(1FTE/1PTE) 2 Cheese hauling 3 Where needed Part time Employee	0 0 0	6 0.5 3
Totals	6.4	70.0

Variation in ADT during the course of a typical full production year

Month	Jan	Feb	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Totals												

Proposed

EVENTS MATRIX TRIP GENERATION SCHEDULE

(Please complete a separate form for each type of event)

Name of Facility: Belden Barns PRMD File Number: ______________

Type of event shown on this sheet: Ag Promotional Night (submits separate sheets for events significantly different in nature)

Estimated total number of events of this type on c	January	February	March	April	May	June	July	August	September	October	November	December
Weekdays (Mon – Thur)												
Fridays												
Saturdays				1				1				
Sundays												

Estimated activity for typical (max?) event	? to 10 a.m.	10 to 11 a.m.	11 to 12 a.m.	12 to 1 p.m.	1 to 2 p.m.	2 to 3 p.m.	3 to 4 p.m.	4 to 5 p.m.	5 to 6 p.m.	6 to 7 p.m.	7 to 8 p.m.	8 p.m. to ?
For weekday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												
For Friday events												
# guests / event				60				60				
# employees / event				5				5				
# guest vehicles / event				24				24				
# employees / vehicles				4				4				
For Saturday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												
For Sunday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												

Proposed

EVENTS MATRIX TRIP GENERATION SCHEDULE

(Please complete a separate form for each type of event)

Name of Facility: Belden Barns **PRMD File Number:** ______________

Type of event shown on this sheet: Ag Promotional DAY (submits separate sheets for events significantly different in nature)

Estimated total number of events of this type on c	January	February	March	April	May	June	July	August	September	October	November	December
Weekdays (Mon – Thur)												
Fridays												
Saturdays			1		1	1	1		1		1	
Sundays												

Estimated activity for typical (max?) event	? to 10 a.m.	10 to 11 a.m.	11 to 12 a.m.	12 to 1 p.m.	1 to 2 p.m.	2 to 3 p.m.	3 to 4 p.m.	4 to 5 p.m.	5 to 6 p.m.	6 to 7 p.m.	7 to 8 p.m.	8 p.m. to ?

For weekday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												

For Friday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												

For Saturday events												
# guests / event			150		100	125	150		200		150	
# employees / event			5		5	10	5		5		5	
# guest vehicles / event			60		40	50	60		80		60	
# employees / vehicles			4		4	8	4		4		4	

For Sunday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												

EXISTING

EVENTS MATRIX TRIP GENERATION SCHEDULE

(Please complete a separate form for each type of event)

Name of Facility: Belden Barns **PRMD File Number:** ____________

Type of event shown on this sheet: Ag Promotional **(submits separate sheets for events significantly different in nature)**

Estimated total number of events of this type on c	January	February	March	April	May	June	July	August	September	October	November	December
Weekdays (Mon – Thur)												
Fridays												
Saturdays			1						1			
Sundays												

Estimated activity for typical (max?) event	? to 10 a.m.	10 to 11 a.m.	11 to 12 a.m.	12 to 1 p.m.	1 to 2 p.m.	2 to 3 p.m.	3 to 4 p.m.	4 to 5 p.m.	5 to 6 p.m.	6 to 7 p.m.	7 to 8 p.m.	8 p.m. to ?
For weekday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												
For Friday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												
For Saturday events												
# guests / event			200						100			
# employees / event			5						5			
# guest vehicles / event			80						40			
# employees / vehicles			4						4			
For Sunday events												
# guests / event												
# employees / event												
# guest vehicles / event												
# employees / vehicles												

Table: Variation in ADT Over the Course of Entire Year												
	Jan	Feb	Mar	Apr	May	Jun	Jul	**Aug[1]**	**Sep[1]**	**Oct[1]**	Nov	Dec
Employees	27	27	27	27	27	27	27	48	48	48	27	27
Visitors	34	34	34	34	34	34	34	48	48	48	34	34
Trucks	2.14	2.38	2.38	2.38	2.38	2.47	2.47	2.65	2.32	2.32	2.14	2.14
Total2	63	63	63	63	63	63	63	99	98	98	63	63

Notes:

[1]Months in bold represent harvest season conditions.

[2]Total values rounded to the nearest whole number.

Appendix D - Existing plus Project LOS Calculation Worksheets

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	26	8	7	16	10	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	82	82	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	11	9	20	13	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	63	26	39	0	-	0
Stage 1	26	-	-	-	-	-
Stage 2	37	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	943	1050	1571	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	937	1050	1571	-	-	-
Mov Cap-2 Maneuver	937	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	979	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1571	-	961	-	-
HCM Lane V/C Ratio	0.005	-	0.047	-	-
HCM Control Delay (s)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	151	2	12	113	11	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	86	86	69	69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	191	3	14	131	16	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	194	0	351	192
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	159	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1379	-	646	850
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	870	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1379	-	639	850
Mov Cap-2 Maneuver	-	-	-	-	639	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	860	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	639	-	-	1379	-
HCM Lane V/C Ratio	0.025	-	-	0.01	-
HCM Control Delay (s)	10.8	-	-	7.6	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	172	32	6	145	81	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	83	83	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	218	41	7	175	108	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	258	0	427	238
Stage 1	-	-	-	-	238	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1307	-	584	801
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	843	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1307	-	580	801
Mov Cap-2 Maneuver	-	-	-	-	580	-
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	838	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	596	-	-	1307	-
HCM Lane V/C Ratio	0.201	-	-	0.006	-
HCM Control Delay (s)	12.6	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	4	14	5	9	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	15	5	10	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	20	0	33	12
Stage 1	-	-	-	-	12	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1596	-	980	1069
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	1002	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1596	-	977	1069
Mov Cap-2 Maneuver	-	-	-	-	977	-
Stage 1	-	-	-	-	1011	-
Stage 2	-	-	-	-	999	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1596	-
HCM Lane V/C Ratio	-	-	-	0.003	-
HCM Control Delay (s)	0	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	21	4	11	19	15	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	69	69	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	4	16	28	21	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	95	36	51	0	-	0
Stage 1	36	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	905	1037	1555	-	-	-
Stage 1	986	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	896	1037	1555	-	-	-
Mov Cap-2 Maneuver	896	-	-	-	-	-
Stage 1	986	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	2.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1555	-	916	-	-
HCM Lane V/C Ratio	0.01	-	0.028	-	-
HCM Control Delay (s)	7.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	133	1	10	214	2	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	86	86	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	151	1	12	249	3	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	152	0	424	152
Stage 1	-	-	-	-	152	-
Stage 2	-	-	-	-	272	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1429	-	587	894
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1429	-	581	894
Mov Cap-2 Maneuver	-	-	-	-	581	-
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	766	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	814	-	-	1429	-
HCM Lane V/C Ratio	0.021	-	-	0.008	-
HCM Control Delay (s)	9.5	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	171	48	6	232	63	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	83	83	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	186	52	7	280	93	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	238	0	506	212
Stage 1	-	-	-	-	212	-
Stage 2	-	-	-	-	294	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1329	-	526	828
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	756	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1329	-	523	828
Mov Cap-2 Maneuver	-	-	-	-	523	-
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	751	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	535	-	-	1329	-
HCM Lane V/C Ratio	0.184	-	-	0.005	-
HCM Control Delay (s)	13.2	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	14	5	1	10	19	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	5	1	11	21	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	21	0	31	18
Stage 1	-	-	-	-	18	-
Stage 2	-	-	-	-	13	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1595	-	983	1061
Stage 1	-	-	-	-	1005	-
Stage 2	-	-	-	-	1010	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1595	-	982	1061
Mov Cap-2 Maneuver	-	-	-	-	982	-
Stage 1	-	-	-	-	1005	-
Stage 2	-	-	-	-	1009	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1000	-	-	1595	-
HCM Lane V/C Ratio	0.027	-	-	0.001	-
HCM Control Delay (s)	8.7	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	20	15	11	36	22	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	85	85	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	21	13	42	31	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	111	43	54	0	-	0
Stage 1	43	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	886	1027	1551	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	878	1027	1551	-	-	-
Mov Cap-2 Maneuver	878	-	-	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	946	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1551	-	936	-	-
HCM Lane V/C Ratio	0.008	-	0.051	-	-
HCM Control Delay (s)	7.3	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	85	1	15	112	2	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	89	89	46	46
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	1	17	126	4	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	101	0	261	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	160	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1491	-	728	954
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	869	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1491	-	719	954
Mov Cap-2 Maneuver	-	-	-	-	719	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	859	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	9.1
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	914	-	-	1491	-
HCM Lane V/C Ratio	0.036	-	-	0.011	-
HCM Control Delay (s)	9.1	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	164	81	8	129	94	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	89	89	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	186	92	9	145	100	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	278	0	395	232
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1285	-	610	807
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	866	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1285	-	605	807
Mov Cap-2 Maneuver	-	-	-	-	605	-
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	859	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	630	-	-	1285	-
HCM Lane V/C Ratio	0.189	-	-	0.007	-
HCM Control Delay (s)	12	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	24	13	4	12	13	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	14	4	13	14	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	40	0	55	33
Stage 1	-	-	-	-	33	-
Stage 2	-	-	-	-	22	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1570	-	953	1041
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	1001	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1570	-	950	1041
Mov Cap-2 Maneuver	-	-	-	-	950	-
Stage 1	-	-	-	-	989	-
Stage 2	-	-	-	-	998	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	970	-	-	1570	-
HCM Lane V/C Ratio	0.019	-	-	0.003	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	20	37	5	29	47	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	85	85	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	51	6	34	67	23

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	125	79	90	0	-	0
Stage 1	79	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	870	981	1505	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	976	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	867	981	1505	-	-	-
Mov Cap-2 Maneuver	867	-	-	-	-	-
Stage 1	944	-	-	-	-	-
Stage 2	972	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1505	-	938	-	-
HCM Lane V/C Ratio	0.004	-	0.083	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	85	4	28	112	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	89	89	46	46
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	5	31	126	2	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	105	0	291	102
Stage 1	-	-	-	-	102	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1486	-	700	953
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	843	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1486	-	685	953
Mov Cap-2 Maneuver	-	-	-	-	685	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	824	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	920	-	-	1486	-
HCM Lane V/C Ratio	0.026	-	-	0.021	-
HCM Control Delay (s)	9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	164	100	14	129	89	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	89	89	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	186	114	16	145	95	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	300	0	419	243
Stage 1	-	-	-	-	243	-
Stage 2	-	-	-	-	176	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1261	-	591	796
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	855	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1261	-	583	796
Mov Cap-2 Maneuver	-	-	-	-	583	-
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	843	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	608	-	-	1261	-
HCM Lane V/C Ratio	0.184	-	-	0.012	-
HCM Control Delay (s)	12.2	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	0	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	24	60	20	12	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	65	22	13	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	91	0	116	59
Stage 1	-	-	-	-	59	-
Stage 2	-	-	-	-	57	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1504	-	880	1007
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	966	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1504	-	867	1007
Mov Cap-2 Maneuver	-	-	-	-	867	-
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	952	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.6	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1504	-
HCM Lane V/C Ratio	-	-	-	0.014	-
HCM Control Delay (s)	0	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Appendix E - Cumulative Conditions LOS Calculations Worksheets

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	43	2	11	26	3	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	82	82	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	3	13	32	4	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	84	25	45	0	-	0
Stage 1	25	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	918	1051	1563	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	911	1051	1563	-	-	-
Mov Cap-2 Maneuver	911	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	956	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1563	-	916	-	-
HCM Lane V/C Ratio	0.009	-	0.066	-	-
HCM Control Delay (s)	7.3	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	248	2	13	185	18	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	86	86	69	69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	314	3	15	215	26	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	316	0	560	315
Stage 1	-	-	-	-	315	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1244	-	489	725
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	796	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1244	-	482	725
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	785	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	482	-	-	1244	-
HCM Lane V/C Ratio	0.054	-	-	0.012	-
HCM Control Delay (s)	12.9	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	282	43	7	238	133	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	83	83	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	357	54	8	287	177	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	411	0	688	384
Stage 1	-	-	-	-	384	-
Stage 2	-	-	-	-	304	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1148	-	412	664
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1148	-	409	664
Mov Cap-2 Maneuver	-	-	-	-	409	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	742	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	20.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	426	-	-	1148	-
HCM Lane V/C Ratio	0.463	-	-	0.007	-
HCM Control Delay (s)	20.5	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.4	-	-	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	34	3	3	15	21	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	69	69	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	3	4	22	29	49

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	83	53	78	0	-	0
Stage 1	53	-	-	-	-	-
Stage 2	30	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	919	1014	1520	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	916	1014	1520	-	-	-
Mov Cap-2 Maneuver	916	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	990	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1520	-	923	-	-
HCM Lane V/C Ratio	0.003	-	0.042	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	218	2	15	351	2	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	86	86	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	248	2	17	408	3	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	250	0	692	249
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	443	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1316	-	410	790
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	647	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1316	-	403	790
Mov Cap-2 Maneuver	-	-	-	-	403	-
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	651	-	-	1316	-
HCM Lane V/C Ratio	0.022	-	-	0.013	-
HCM Control Delay (s)	10.7	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	281	75	10	381	90	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	83	83	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	305	82	12	459	132	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	387	0	829	346
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	483	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1171	-	340	697
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	620	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1171	-	335	697
Mov Cap-2 Maneuver	-	-	-	-	335	-
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	611	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	22.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	341	-	-	1171	-
HCM Lane V/C Ratio	0.401	-	-	0.01	-
HCM Control Delay (s)	22.5	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.9	-	-	0	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	33	15	8	48	25	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	85	85	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	21	9	56	36	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	129	54	73	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	75	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	865	1013	1527	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	948	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	860	1013	1527	-	-	-
Mov Cap-2 Maneuver	860	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	942	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1527	-	903	-	-
HCM Lane V/C Ratio	0.006	-	0.073	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	139	0	20	184	2	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	89	89	46	46
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	164	0	22	207	4	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	164	0	416	164
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1414	-	593	881
Stage 1	-	-	-	-	865	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1414	-	582	881
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	865	-
Stage 2	-	-	-	-	776	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	833	-	-	1414	-
HCM Lane V/C Ratio	0.047	-	-	0.016	-
HCM Control Delay (s)	9.5	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	269	125	10	212	146	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	89	89	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	306	142	11	238	155	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	448	0	638	377
Stage 1	-	-	-	-	377	-
Stage 2	-	-	-	-	261	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1112	-	441	670
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	783	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1112	-	436	670
Mov Cap-2 Maneuver	-	-	-	-	436	-
Stage 1	-	-	-	-	694	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	17.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	460	-	-	1112	-
HCM Lane V/C Ratio	0.398	-	-	0.01	-
HCM Control Delay (s)	17.9	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.9	-	-	0	-

TJKM Transportation Consultants

Appendix F - Cumulative plus Project LOS Calculation Worksheets

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	43	9	11	26	11	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	82	82	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	12	13	32	15	41

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	94	35	56	0	-	0
Stage 1	35	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	906	1038	1549	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	898	1038	1549	-	-	-
Mov Cap-2 Maneuver	898	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	955	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	2.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1549	-	919	-	-
HCM Lane V/C Ratio	0.009	-	0.075	-	-
HCM Control Delay (s)	7.3	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	248	3	17	185	18	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	86	86	69	69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	314	4	20	215	26	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	318	0	571	316
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	255	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1242	-	482	724
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	788	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1242	-	473	724
Mov Cap-2 Maneuver	-	-	-	-	473	-
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	774	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	473	-	-	1242	-
HCM Lane V/C Ratio	0.055	-	-	0.016	-
HCM Control Delay (s)	13.1	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	282	49	9	238	133	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	83	83	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	357	62	11	287	177	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	419	0	696	388
Stage 1	-	-	-	-	388	-
Stage 2	-	-	-	-	308	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1140	-	408	660
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	745	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1140	-	404	660
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	737	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	20.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	421	-	-	1140	-
HCM Lane V/C Ratio	0.469	-	-	0.01	-
HCM Control Delay (s)	20.9	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.4	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	6	14	5	15	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	15	5	16	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	22	0	41	14
Stage 1	-	-	-	-	14	-
Stage 2	-	-	-	-	27	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1593	-	970	1066
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	996	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1593	-	967	1066
Mov Cap-2 Maneuver	-	-	-	-	967	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	993	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1593	-
HCM Lane V/C Ratio	-	-	-	0.003	-
HCM Control Delay (s)	0	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	34	5	12	25	23	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	69	69	73	73
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	5	17	36	32	49

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	127	56	81	0	-	0
Stage 1	56	-	-	-	-	-
Stage 2	71	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	868	1011	1517	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	952	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	858	1011	1517	-	-	-
Mov Cap-2 Maneuver	858	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	942	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	2.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1517	-	875	-	-
HCM Lane V/C Ratio	0.011	-	0.046	-	-
HCM Control Delay (s)	7.4	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	218	2	16	351	3	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	86	86	63	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	248	2	19	408	5	19

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	250	0	694	249
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1316	-	409	790
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	646	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1316	-	401	790
Mov Cap-2 Maneuver	-	-	-	-	401	-
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	634	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	662	-	-	1316	-
HCM Lane V/C Ratio	0.036	-	-	0.014	-
HCM Control Delay (s)	10.6	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	281	77	10	381	98	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	83	83	68	68
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	305	84	12	459	144	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	389	0	830	347
Stage 1	-	-	-	-	347	-
Stage 2	-	-	-	-	483	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1170	-	340	696
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	620	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1170	-	335	696
Mov Cap-2 Maneuver	-	-	-	-	335	-
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	611	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	23.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	344	-	-	1170	-
HCM Lane V/C Ratio	0.44	-	-	0.01	-
HCM Control Delay (s)	23.4	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.2	-	-	0	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	23	5	1	17	19	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	5	1	18	21	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	30	0	49	28
Stage 1	-	-	-	-	28	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1583	-	960	1047
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	1002	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1583	-	959	1047
Mov Cap-2 Maneuver	-	-	-	-	959	-
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	1001	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	8.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	979	-	-	1583	-
HCM Lane V/C Ratio	0.028	-	-	0.001	-
HCM Control Delay (s)	8.8	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	33	21	14	55	32	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	85	85	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	29	16	65	46	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	162	64	83	0	-	0
Stage 1	64	-	-	-	-	-
Stage 2	98	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	829	1000	1514	-	-	-
Stage 1	959	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	820	1000	1514	-	-	-
Mov Cap-2 Maneuver	820	-	-	-	-	-
Stage 1	959	-	-	-	-	-
Stage 2	916	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	882	-	-
HCM Lane V/C Ratio	0.011	-	0.084	-	-
HCM Control Delay (s)	7.4	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	139	1	23	184	3	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	89	89	46	46
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	164	1	26	207	7	41

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	165	0	422	164
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	258	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1413	-	588	881
Stage 1	-	-	-	-	865	-
Stage 2	-	-	-	-	785	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1413	-	576	881
Mov Cap-2 Maneuver	-	-	-	-	576	-
Stage 1	-	-	-	-	865	-
Stage 2	-	-	-	-	769	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	9.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	822	-	-	1413	-
HCM Lane V/C Ratio	0.058	-	-	0.018	-
HCM Control Delay (s)	9.7	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	269	130	12	212	151	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	89	89	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	306	148	13	238	161	30

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	453	0	645	380
Stage 1	-	-	-	-	380	-
Stage 2	-	-	-	-	265	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1108	-	437	667
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	779	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1108	-	431	667
Mov Cap-2 Maneuver	-	-	-	-	431	-
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	768	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	18.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	456	-	-	1108	-
HCM Lane V/C Ratio	0.418	-	-	0.012	-
HCM Control Delay (s)	18.4	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2	-	-	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	40	13	4	20	13	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	14	4	22	14	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	58	0	81	51
Stage 1	-	-	-	-	51	-
Stage 2	-	-	-	-	30	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1546	-	921	1017
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	993	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1546	-	918	1017
Mov Cap-2 Maneuver	-	-	-	-	918	-
Stage 1	-	-	-	-	971	-
Stage 2	-	-	-	-	990	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	8.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	940	-	-	1546	-
HCM Lane V/C Ratio	0.02	-	-	0.003	-
HCM Control Delay (s)	8.9	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	33	43	8	48	57	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	73	73	85	85	70	70
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	45	59	9	56	81	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	175	100	119	0	-	0
Stage 1	100	-	-	-	-	-
Stage 2	75	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	815	956	1469	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	948	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	810	956	1469	-	-	-
Mov Cap-2 Maneuver	810	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	942	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1469	-	887	-	-
HCM Lane V/C Ratio	0.006	-	0.117	-	-
HCM Control Delay (s)	7.5	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	139	4	36	184	2	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	89	89	46	46
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	164	5	40	207	4	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	168	0	454	166
Stage 1	-	-	-	-	166	-
Stage 2	-	-	-	-	288	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1410	-	564	878
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	761	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1410	-	546	878
Mov Cap-2 Maneuver	-	-	-	-	546	-
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	737	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	822	-	-	1410	-
HCM Lane V/C Ratio	0.048	-	-	0.029	-
HCM Control Delay (s)	9.6	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	269	149	18	212	146	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	89	89	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	306	169	20	238	155	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	475	0	669	390
Stage 1	-	-	-	-	390	-
Stage 2	-	-	-	-	279	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1087	-	423	658
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1087	-	414	658
Mov Cap-2 Maneuver	-	-	-	-	414	-
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	752	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	18.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	439	-	-	1087	-
HCM Lane V/C Ratio	0.417	-	-	0.019	-
HCM Control Delay (s)	18.9	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	40	60	20	20	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	65	22	22	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	109	0	141	76
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	65	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1481	-	852	985
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	958	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1481	-	839	985
Mov Cap-2 Maneuver	-	-	-	-	839	-
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	944	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.7	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1481	-
HCM Lane V/C Ratio	-	-	-	0.015	-
HCM Control Delay (s)	0	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

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Appendix G - Limited Sight Distance Locations

Limited Sight Distance on Sonoma Mountain Road			
Location Number	***Minimum Measured Sight Distance (ft)***	***Roadway Width (ft)***	***Reason for Blocked Sight Lines***
1	265	16	Hill
2	210	17	Vegetation
3	210	20	Vegetation
4	215	15	Vegetation
5	135	17	Hill, vegetation
6	108	15	Vegetation
7	128	13	Vegetaion
8	167	10	Vegetation
9	115	12	Vegetation
10	130	11	Vegetation
11	140	16	Vegetation
12	120	12	Vegetation
13	175	16	Vegetation
14	150	16	Hill
15	160	15	Hill, vegetation
16	160	15	Trees
17	145	14	Hill
18	160	15.5	Hill/Crest
19	160	15	Vegetation
20	125	16	Trees
21	125	14.5	Hill/Vegetation
22	150	14	Hill
23	135	12.5	Hill
24	185	16	Hill
25	180	16	Vegetation
26	145	13	Hill
27	130	15	Vegetation
28	125	14	Vegetation
29	133	16	Vegetation
30	120	12	vegetation
31	115	13	Hill
32	120	13	Hil
33	113	15	Vegetation
34	119	15	vegetation
35	130	15	Hill
36	165	13	Hill
37	120	13	Vegetation
38	173	16	Vegetation
39	146	15	Vegetation

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Appendix H - Traffic Index Analysis

ADT Vehicle Classification Counts
Sonoma Mountain Road, East of Sonoma Mountain Road

Existing Classification Count - 10/2015

Vehicle Types	Eastbound	Westbound	Totals	Percent
Passenger Cars	182	266	448	90.0%
2-axle trucks	-	-	0	0.0%
3-axle trucks	20	30	50	10.0%
4-axle trucks	-	-	0	0.0%
5-axle trucks	-	-	0	0.0%
	202	296	498	100.0%

Existing Plus Project

Vehicle Types	Eastbound	Westbound	Totals	Percent
Passenger Cars	206	290	496	90.5%
2-axle trucks	-	-	0	0.0%
3-axle trucks	21	31	52	9.5%
4-axle trucks	-	-	0	0.0%
5-axle trucks	-	-	0	0.0%
	227	321	548	100.0%

Existing Conditions
20 Year Traffic Index

Sonoma Mountain Road, East of Sonoma Mountain Road

Existing Classification Count - 10/2015 498

Vehicle Type	***ESAL 20 Year Constants***	***Expanded Average Daily Trucks***	***Total 20 Year ESAL***
2-axle trucks	1,380	0	-
3-axle trucks	3,680	50	183,264
4-axle trucks	5,880	0	-
5-axle trucks (or more)	13,780	0	-
Totals			183,264
Traffic Index (Rounded to nearest 0.5 per caltrans procedure)			**7.5**
Traffic Index (calculated)			**7.4**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Existing Plus Project Conditions
20 Year Traffic Index

Sonoma Mountain Road, East of Sonoma Mountain Road

Total estimated average daily traffic (ADT) = 548

Vehicle Type	***ESAL 20 Year Constants***	***Expanded Average Daily Trucks***	***Total 20 Year ESAL***
2-axle trucks	1,380	0	-
3-axle trucks	3,680	52	190,624
4-axle trucks	5,880	0	-
5-axle trucks (or more)	13,780	0	-
Totals			190,624
Traffic Index (Rounded to nearest 0.5 per caltrans procedure)			**7.5**
Traffic Index (calculated)			**7.4**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

ADT Vehicle Classification Counts
Sonoma Mountain Road, West of Sonoma Ridge Road

Existing Classification Count - 10/2015

Vehicle Types	Eastbound	Westbound	Totals	Percent
Passenger Cars	181	154	335	90.0%
2-axle trucks	-	-	0	0.0%
3-axle trucks	20	17	37	10.0%
4-axle trucks	-	-	0	0.0%
5-axle trucks	-	-	0	0.0%
	201	171	372	100.0%

Existing Plus Project

Vehicle Types	Eastbound	Westbound	Totals	Percent
Passenger Cars	253	226	479	91.4%
2-axle trucks	-	-	0	0.0%
3-axle trucks	24	21	45	8.6%
4-axle trucks	-	-	0	0.0%
5-axle trucks	-	-	0	0.0%
	277	247	524	100.0%

Source: TJKM

Existing Conditions
20 Year Traffic Index

Sonoma Mountain Road, West of Sonoma Ridge Road

Total estimated average daily traffic (ADT) = 372

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks*	*Total 20 Year ESAL*
2-axle trucks	1,380	0	-
3-axle trucks	3,680	37	136,896
4-axle trucks	5,880	0	-
5-axle trucks (or more)	13,780	0	-
Totals			136,896
Traffic Index (Rounded to nearest 0.5 per Caltrans procedure)			**7.0**
Traffic Index (calculated)			**7.1**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

Existing Plus Project Conditions
20 Year Traffic Index

Sonoma Mountain Road, West of Sonoma Ridge Road

Total estimated average daily traffic (ADT) = 524

Vehicle Type	*ESAL 20 Year Constants*	*Expanded Average Daily Trucks*	*Total 20 Year ESAL*
2-axle trucks	1,380	0	-
3-axle trucks	3,680	45	166,336
4-axle trucks	5,880	0	-
5-axle trucks (or more)	13,780	0	-
Totals			166,336
Traffic Index (Rounded to nearest 0.5 per caltrans procedure)			**7.5**
Traffic Index (calculated)			**7.3**

Obtain TI for 20 Year Design from Table 613.3C, Caltrans Design Manual

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Appendix I – The Sonoma County Data on Section PCI/RSL Listing

Street ID	Section ID	Road Name	From	To	Length	Width	Area	Functional Class	Surface Type	Current PCI	Remaining Life
8801B	1713	PORTER CREEK RD	END BRIDGE 20C-112	POSTWOOD LN	4,580	36	164,880	MaC - Major Collector (5)	O - AC/AC	90	28.66
8801B	1800	PORTER CREEK RD	POSTWOOD LN	WILSON RD (CAMP NEWMAN)	3,696	36	133,056	MaC - Major Collector (5)	O - AC/AC	91	28.98
8801B	1877	PORTER CREEK RD	WILSON RD	PETRIFIED FOREST RD / CALISTOGA RD	7,867	28	220,276	MaC - Major Collector (5)	O - AC/AC	84	27.61
88083	1000	POSTWOOD LN	PORTER CREEK RD	END	1,109	21	23,289	L - Local (7)	A - AC	0	0
67001A	1136	PRESSLEY RD	ROBERTS RD	PARK	1,584	22	34,848	L - Local (7)	O - AC/AC	82	26.07
67001A	1166	PRESSLEY RD	CRANE CREEK PARK	PARK ENTRANCE	3,221	23	74,083	L - Local (7)	O - AC/AC	74	25.54
67001A	1227	PRESSLEY RD	PARK ENTRANCE	CATTLE GUARD	1,689	23	38,847	L - Local (7)	O - AC/AC	56	13.97
67001A	1259	PRESSLEY RD	CHIP SEAL ENDS	PM 13.59	5,280	20	105,600	L - Local (7)	O - AC/AC	59	15.73
67001A	1359	PRESSLEY RD	PM 13.59	SONOMA MOUNTAIN RD	3,538	20	70,760	L - Local (7)	A - AC	56	12.53
10012	1000	PRESTON DEPOT RD	END	N CLOVERDALE	686	15	10,290	L - Local (7)	O - AC/AC	20	0
20001	1000	PRESTON DR	GEYSERS RD.	END OF LOOP	1,795	15	26,925	L - Local (7)	A - AC	19	0
78083	1000	PRICE AVE	MERCED AVE	SOUTH WRIGHT RD	2,798	23	64,354	L - Local (7)	A - AC	38	4.71
68067	2000	PRIMROSE AVE	WILFRED AVE	SCENIC AVE	4,752	20	95,040	L - Local (7)	A - AC	16	0
68086	1000	PRIMROSE AVE	END	TODD RD	2,112	16	33,792	L - Local (7)	A - AC	0	0
68086	1040	PRIMROSE AVE	TODD RD	BELLEVUE AVE	5,386	27	145,422	L - Local (7)	A - AC	64	17.75
56167	1000	PROSPECT DR	GROVE ST	SPRING DR	1,478	23	33,994	L - Local (7)	A - AC	9	0
79100	1000	PROSSER RD	END	END	422	25	10,550	L - Local (7)	A - AC	18	0
55029	1000	PUEBLO AVE	END	NAPA RD.	1,478	25	36,950	L - Local (7)	A - AC	3	0
47004	1000	PURRINGTON RD	I ST	MOUNTAIN VIEW AVE	2,165	20	43,300	L - Local (7)	A - AC	8	0
58005	1000	PURVINE RD	SPRING HILL RD	2640' N/O SPRING HILL	2,640	16	42,240	L - Local (7)	A - AC	0	0
58005	1050	PURVINE RD	2640' N/O SPRING HILL	MIDDLE TWO ROCK RD	4,910	15	73,650	L - Local (7)	A - AC	0	0
77002	1000	PYTHIAN RD	HWY 12	ROAD NARROWS	1,214	34	41,276	L - Local (7)	A - AC	40	5.39
77002	1023	PYTHIAN RD	ROAD NARROWS	END	1,848	19	35,112	L - Local (7)	A - AC	85	29.17
58022	1000	QUEENS LN	END (WEST)	END (EAST)	2,482	12	29,784	L - Local (7)	A - AC	0	0
69039	1000	RAGLE RD	COVERT LN	MILL STATION RD	2,165	22	47,630	MaC - Major Collector (5)	O - AC/AC	64	14.11
09016	1000	RAILROAD AVE	HWY 128	END PAVEMENT	2,534	18	45,612	L - Local (7)	A - AC	6	0
56046	2000	RAILROAD AVE	WALNUT AVE	VERANO AVE	1,887	19	35,853	L - Local (7)	A - AC	20	0
56047	3000	RAILROAD AVE	VERANO AVE	CRAIG AVE	1,848	36	66,528	MaC - Major Collector (5)	A - AC	51	5.6
56047	3034	RAILROAD AVE	CRAIG AVE	BOYES BLVD	2,165	25	54,125	MaC - Major Collector (5)	A - AC	34	1.79

Street ID	Section ID	Road Name	From	To	Length	Width	Area	Functional Class	Surface Type	Current PCI	Remaining Life
71034	1000	RIVER WAY	MESA GRANDE TERRACE	MOSCOW RD	686	9	6,174	L - Local (7)	A - AC	0	0
80091	1000	RIVERLANDS RD	RIVERLANDS RD	DRAKE RD	422	15	6,330	L - Local (7)	A - AC	84	28.45
80092	2000	RIVERLANDS RD	END	END	1,320	13	17,160	L - Local (7)	A - AC	82	27.18
80093	1000	RIVERLANDS RD	RIVERLANDS RD	DRAKE RD	264	15	3,960	L - Local (7)	A - AC	82	27.18
56015	1000	RIVERSIDE DR	HWY 12	PETALUMA AVE	634	43	27,262	MaC - Major Collector (5)	A - AC	70	11.7
56015	1012	RIVERSIDE DR	PETALUMA AVE	WILLOW ST	2,904	30	87,120	MaC - Major Collector (5)	A - AC	29	0.67
56015	1073	RIVERSIDE DR	WILLOW ST	VERANO AVE	898	24	21,552	L - Local (7)	A - AC	24	0
56015	1090	RIVERSIDE DR	VERANO AVE	CRAIG AVE	2,323	24	55,752	L - Local (7)	A - AC	16	0
56015	1134	RIVERSIDE DR	CRAIG AVE	BOYES BLVD	2,323	24	55,752	L - Local (7)	A - AC	13	0
56015	1178	RIVERSIDE DR	BOYES BLVD	END	1,373	36	49,428	L - Local (7)	A - AC	8	0
80087	2000	RIVERSIDE DR	BONITA AVE	END	845	29	24,505	L - Local (7)	A - AC	6	0
80088	3000	RIVERSIDE DR	END	BONITA AVE	845	16	13,520	L - Local (7)	A - AC	3	0
80116	4000	RIVERSIDE DR	HWY 116	HWY 116	1,531	14	21,434	L - Local (7)	A - AC	13	0
99028	1000	RIVERVIEW DR	END	HILLTOP	1,045	15	15,675	L - Local (7)	A - AC	34	3.14
78117B	2000	ROBERTS AVE	BEGIN PCC	ENTR SRO LIMITS	161	32	5,152	L - Local (7)	A - AC	11	0
68096	1000	ROBERTS LAKE RD	LEAVE CTY LMTS R.P.	SANTA ROSA AVE	898	36	32,328	MaC - Major Collector (5)	O - AC/AC	90	28.81
67001B	1000	ROBERTS RD	PETALUMA HILL RD	PM 11.00	5,280	28	147,840	L - Local (7)	A - AC	45	7.01
67001B	1100	ROBERTS RD	PM 11.00	LICHAU RD	1,901	27	51,327	L - Local (7)	A - AC	67	20.02
56141	1000	ROBIN AVE	LARK AVE	ARNOLD DR	950	32	30,400	L - Local (7)	A - AC	34	3.22
60055	1000	ROBIN CT	HERON DR	END	528	34	17,952	L - Local (7)	A - AC	77	24.48
68146	1000	ROBIN WAY	EDDY DR	BARBARA DR	264	33	8,712	L - Local (7)	A - AC	6	0
56056B	1007	ROBINSON RD	LEAVE CITY LIMITS	BEGIN IMPROVED RD	739	27	19,953	L - Local (7)	A - AC	13	0
56056B	1021	ROBINSON RD	BEGIN IMPROVED RD	END IMPROVED RD	370	21	7,770	L - Local (7)	A - AC	0	0
56056B	1028	ROBINSON RD	END IMPROVED RD	MICHAEL DR	845	30	25,350	L - Local (7)	A - AC	39	5.09
69033	2000	ROBINSON RD	LV SEB LIMIT (S)	ENTR SEB LIMITS (N)	475	30	14,250	L - Local (7)	A - AC	41	5.89
6802	1000	ROBLAR RD	VALLEY FORD RD	792' E/O VALLEY FORD	792	40	31,680	MiC - Minor Collector (6)	A - AC	52	6.24
6802	1015	ROBLAR RD	792' E/O VALLEY FORD	8290' E/O VALLEY FORD	7,498	22	164,956	MiC - Minor Collector (6)	A - AC	33	1.51
6802	1157	ROBLAR RD	8290' E/O VALLEY FORD	CANFIELD RD	7,392	22	162,624	MiC - Minor Collector (6)	A - AC	3	0

Section PCI/RSL Listing

Street ID	Section ID	Road Name	From	To	Length	Width	Area	Functional Class	Surface Type	Current PCI	Remaining Life
57035	1000	SONOMA MTN RD	ADOBE RD	BEGIN AC	1,320	22	29,040	L - Local (7)	A - AC	36	3.73
57035	1025	SONOMA MTN RD	BEGIN AC	END AC	1,109	29	32,161	L - Local (7)	A - AC	80	26.2
57035	1046	SONOMA MTN RD	END AC	PM 11.46	5,280	21	110,880	L - Local (7)	A - AC	52	11.22
57035	1146	SONOMA MTN RD	PM 11.46	PM 12.46	5,280	20	105,600	L - Local (7)	A - AC	0	0
57035	1246	SONOMA MTN RD	PM 12.46	END REHAB	3,379	21	70,959	L - Local (7)	A - AC	0	0
57035	1310	SONOMA MTN RD	END REHAB	PM 14.10	5,280	15	79,200	L - Local (7)	A - AC	0	0
57035	1410	SONOMA MTN RD	PM 14.10	PM 15.10	5,280	14	73,920	L - Local (7)	A - AC	0	0
57035	1510	SONOMA MTN RD	PM 15.10	END	3,326	12	39,912	L - Local (7)	A - AC	0	0
66060	2000	SONOMA MTN RD	BENNETT VALLEY RD	LA GRANDE LN	4,963	25	124,075	L - Local (7)	A - AC	48	8.03
66060	2094	SONOMA MTN RD	LA GRANDE LN	MATANZAS CR	4,013	24	96,312	L - Local (7)	O - AC/AC	53	12.42
66060	2170	SONOMA MTN RD	MATANZAS CR	PRESSLEY RD	2,587	23	59,501	L - Local (7)	A - AC	50	9.44
66060	2219	SONOMA MTN RD	PRESSLEY RD	PM 23.15	5,069	19	96,311	L - Local (7)	A - AC	0	0
66060	2315	SONOMA MTN RD	PM 23.15	BEGIN REHAB	2,165	16	34,640	L - Local (7)	A - AC	0	0
66060	2356	SONOMA MTN RD	BEGIN REHAB	END REHAB	1,320	19	25,080	L - Local (7)	A - AC	22	0
66060	2381	SONOMA MTN RD	REHAB ENDS	PM 24.86	5,544	14	77,616	L - Local (7)	A - AC	0	0
66060	2486	SONOMA MTN RD	PM 24.86	PM MARKER	3,221	17	54,757	L - Local (7)	A - AC	0	0
66060	2547	SONOMA MTN RD	PM MARKER	ENTERPRISE RD	3,326	16	53,216	L - Local (7)	A - AC	0	0
66060	2610	SONOMA MTN RD	ENTERPRISE RD	BEGIN IMPROVED RD	5,016	16	80,256	L - Local (7)	A - AC	2	0
66060	2705	SONOMA MTN RD	BEGIN IMPROVED RD	WARM SPRINGS RD	3,326	17	56,542	L - Local (7)	A - AC	0	0
55003	1000	SOUTH CENTRAL AVE	DALE AVE	STATE HIGHWAY 12	2,165	15	32,475	L - Local (7)	A - AC	0	0
55003	1041	SOUTH CENTRAL AVE	STATE HIGHWAY 12	KNOB HILL RD	2,112	13	27,456	L - Local (7)	A - AC	14	0
56004	1000	SOUTH ELY RD	BROWNS LANE	BRIDGE	2,640	20	52,800	L - Local (7)	A - AC	8	0
56004	1050	SOUTH ELY RD	BRIDGE	PETALUMA CITY LIMITS	2,957	22	65,054	L - Local (7)	A - AC	0	0
99022A	1100	SOUTH FITCH MTN RD	LV HLDSBG LIMITS	NORTH FITCH MTN RD	6,494	20	129,880	MaC - Major Collector (5)	A - AC	14	0
60029	2000E	SOUTH HARBOR WAY/EB	HERON DR	HWY 1	370	21	7,770	L - Local (7)	A - AC	71	20.69
60029	2000W	SOUTH HARBOR WAY/WB	HERON DR	HWY 1	370	21	7,770	L - Local (7)	A - AC	74	22.57
68095	1000	SOUTH MOORLAND AVE	SCENIC AVE	TODD RD	3,710	25	92,750	L - Local (7)	A - AC	70	20.16
70069	1000	SOUTH ST	ALTA WAY	VINE ST	106	11	1,166	L - Local (7)	A - AC	47	8.19
56240	951	SOUTH TEMELC CIR	HERMOSA PKWY	TEMELEC CIR	2,693	32	86,176	L - Local (7)	A - AC	28	1.13
80089B	1154	SOUTHERN AVE	WESTERN AVE	END	845	21	17,745	L - Local (7)	A - AC	37	4.42

APPENDIX J

Historic Building Evaluation

Historical Evaluation of the Belden Barns Complex
5561 Sonoma Mountain Road
Santa Rosa, Sonoma County, California

Prepared by:

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March 6, 2012

ABSTRACT

Tom Origer & Associates completed an architectural and historical evaluation of the buildings at 5561 Sonoma Mountain Road, Sonoma County, California. The study was requested by Claire Monteschio of SMA, Inc. as part of the environmental review for a proposed winery. The purpose of this study was to determine the importance of built elements of the property based on eligibility criteria for inclusion on the California Register of Historical Resources.

Historical research was conducted at the Sonoma County Recorder's Office, the office of the County Assessor, the Sonoma County Library History Annex, and various on-line databases. Buildings were examined and exterior photographs were taken. In addition to this report, Department of Parks and Recreation (DPR) forms were completed and are appended herein.

Study found that none of the buildings on the Belden Barns property meet the eligibility criteria for inclusion on the California Register. Documentation for this study is on file at Tom Origer & Associates (File No. 12-10).

Synopsis

Project:	Belden Barns Complex
Location:	5561 Sonoma Mountain Road, Sonoma County, California
Quadrangle:	Glen Ellen, California 7.5' series
Study Type:	Historical/architectural evaluation
Scope:	Property specific
Findings:	No California Register-eligible resources

Project Personnel

This report was prepared by Vicki R. Beard, who has been with Tom Origer & Associates since 1990. Ms. Beard holds a Master of Arts in cultural resources management with an emphasis in historical resources, and meets the Secretary of the Interior's standards for archaeology, history, and architectural history. Graduate coursework and applied studies included building and structure evaluation, and historical research. Post-graduate work has been completed in historical architecture through the Architecture Department at the University of California Berkeley; heritage resource management at the University of Nevada, Reno; and architectural history and historic landscapes through the National Preservation Institute, Alexandria, Virginia. Professional affiliations include the Society of California Archaeologists, Society of Architectural Historians, Northern California Chapter of the Society of Architectural Historians, and Vernacular Architecture Forum. She is also listed on the Register of Professional Archaeologists.

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INTRODUCTION

Tom Origer & Associates completed an architectural and historical evaluation of buildings on the property known as "Belden Barns" at 5561 Sonoma Mountain Road, Sonoma County, California (Figure 1). The study was requested by Claire Monteschio of SMA, Inc. as part of the environmental review for a proposed winery.

During this evaluation, buildings were examined and photographed, and primary research was completed to determine if the property met criteria for inclusion on the California Register based on the eligibility criteria set forth in Title 14 CCR, §4852. The results of the study are presented in this report and on the Department of Parks and Recreation (DPR) forms provided in Appendix A. Documentation pertaining to the study is on file at Tom Origer & Associates (File No. 12-10).

REGULATORY CONTEXT

This study adhered to requirements of the California Environmental Quality Act (CEQA), which mandates that cultural resources be considered as part of the environmental review process. This is accomplished by an inventory of resources within a study area and assessing the potential that important cultural resources could be affected by a project.

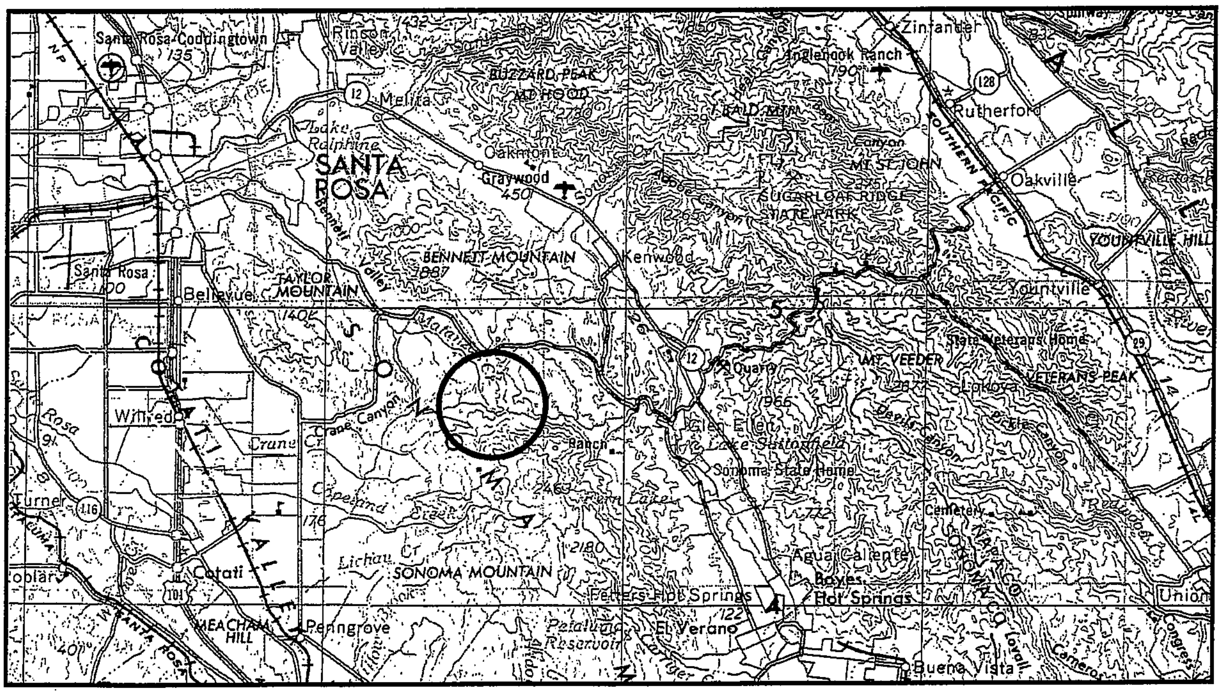


Figure 1. Project vicinity (adapted from the 1980 Santa Rosa 1:250,000-scale USGS map).

Significance Criteria

Under CEQA, when a project might affect a cultural resource (i.e., site, building, structure, object, or district) the project proponent is required to conduct an assessment to determine whether the effect may be one that is significant. Consequently, it is necessary to determine the importance of resources that could be affected. The importance of a resource is measured in terms of criteria for inclusion on the California Register (Title 14 CCR, §4852) listed below. A resource may be important if it is already listed on the California Register or a local register of historical resources, or if it meets any one of the criteria below.

1. Is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

2. Is associated with the lives of persons important to local, California, or national history.

3. Embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of a master, or possesses high artistic values.

4. Has yielded, or may be likely to yield, information important to the prehistory or history of the local area, California or the nation.

In addition to meeting one or more of the above criteria, eligibility for the California Register requires that a resource retains sufficient integrity to convey a sense of its significance or importance. Seven elements are considered key in considering a property's integrity: location, design, setting, materials, workmanship, feeling, and association.

STUDY PROCEDURES

Archival Research

This study included archival research to understand land ownership and property residents, land use, and to determine historical ties relevant to this parcel. Archival research was completed at the Sonoma County Recorder's Office, the office of the County Assessor, the Sonoma County Library History Annex, the offices of Tom Origer & Associates, and various online archives (such as Ancestry.Com and Family Search). Research results are presented in the Historical Overview and Historic Context sections of the report.

Field Survey

A field examination was conducted on February 15, 2012. All buildings were photographed and notes were made regarding style, construction techniques, and modifications. Descriptions are provided in the Property Description section of the report.

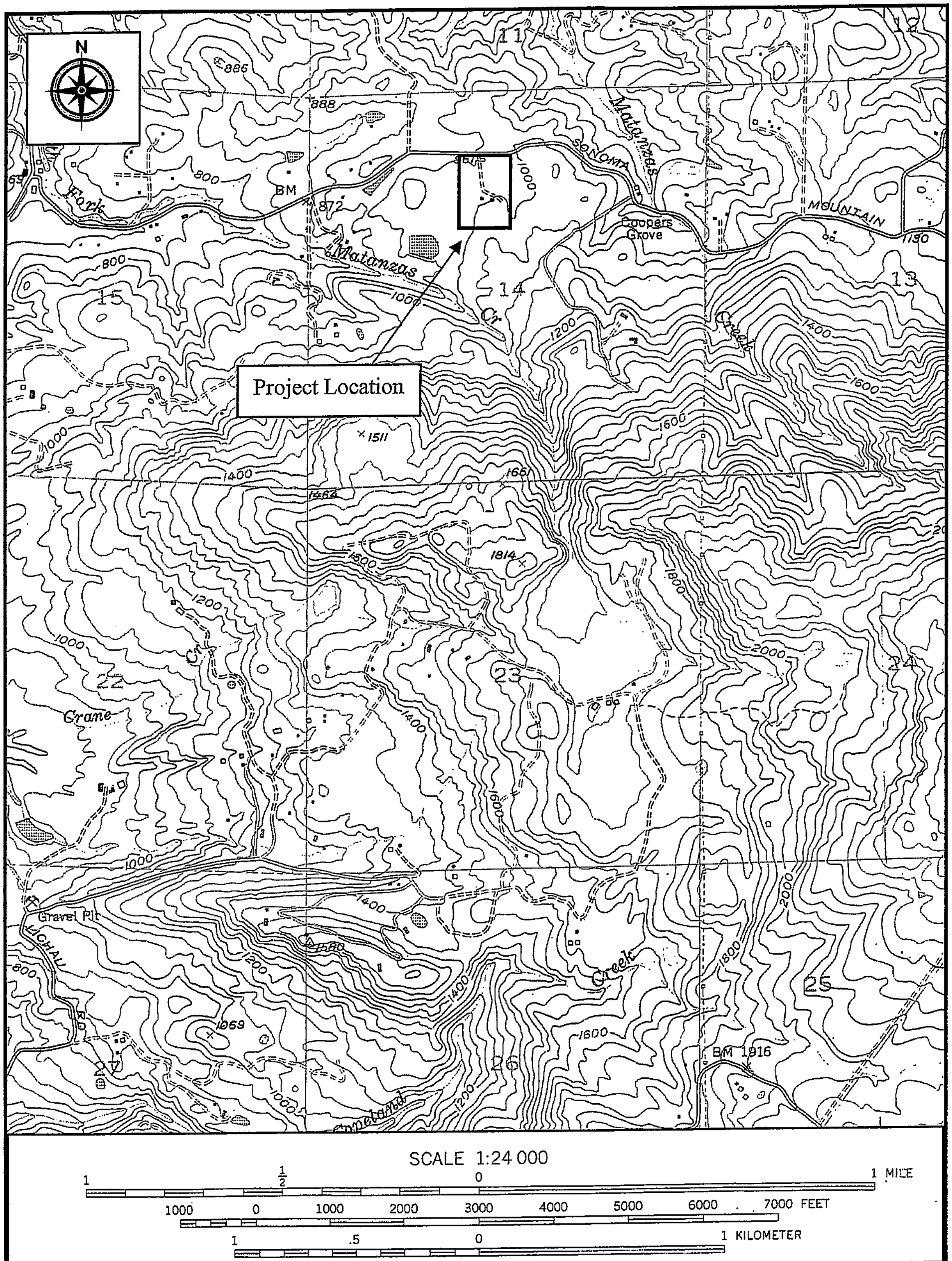


Figure 2. Study location (adapted from the USGS 1971 Glen Ellen 7.5' map).

HISTORICAL SETTING

The Belden Barns property is located in southeastern Sonoma County in the hills between Santa Rosa and Glen Ellen. The 55-acre parcel is on the south side of Sonoma Mountain, as shown on the Glen Ellen, California 7.5' USGS topographic map (Figure 2). In 1871, this parcel and the remainder of the northwest quarter of section 14 were part of a 160-acre homestead patented to Alexander Howe Sutherland (Figure 3).

Alexander Sutherland came to the United States from Edinburgh, Scotland in 1851 and was residing in Sonoma County by 1852. He and his wife, Ann, first lived in Bodega before filing for their homestead on the flanks of Sonoma Mountain. Alexander is listed in the census as a Bodega farmer in 1860, and a farmer in the Santa Rosa Township in 1880 (United States Bureau of Census [USBC] 1860, 1880a).

The 160-acre homestead was patented to Alexander in 1871 (General Land Office [GLO] 2012). The family would have been living on the property no later than 1866 because a homestead applicant was required to live on their claim for five years and improve it by building a 12-by-14 dwelling and planting crops (Gates 1968:394). Bower's (1867) shows that Sutherland claimed the quarter-section at that time, and Thompson's 1877 county atlas shows the Sutherland house at the eastern edge of the property, roughly where the existing buildings are located (Figure 3).

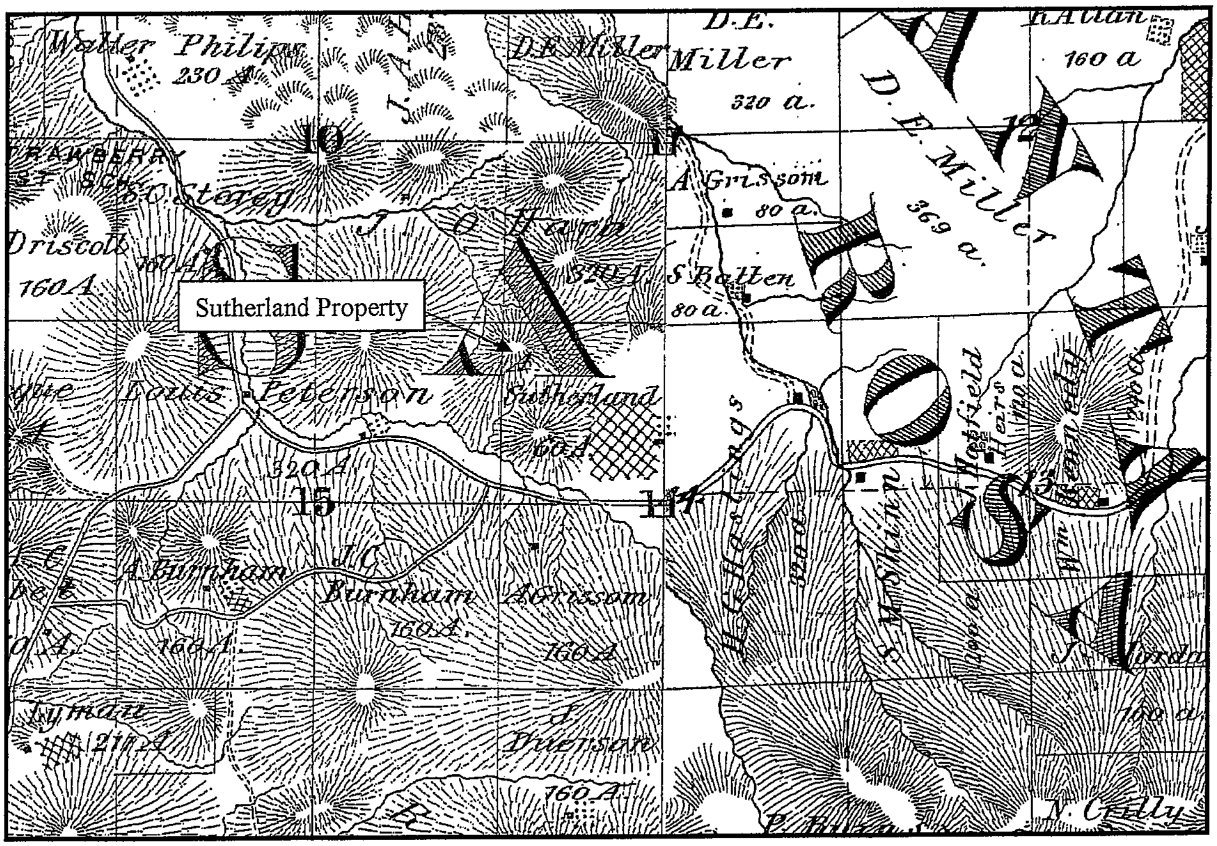


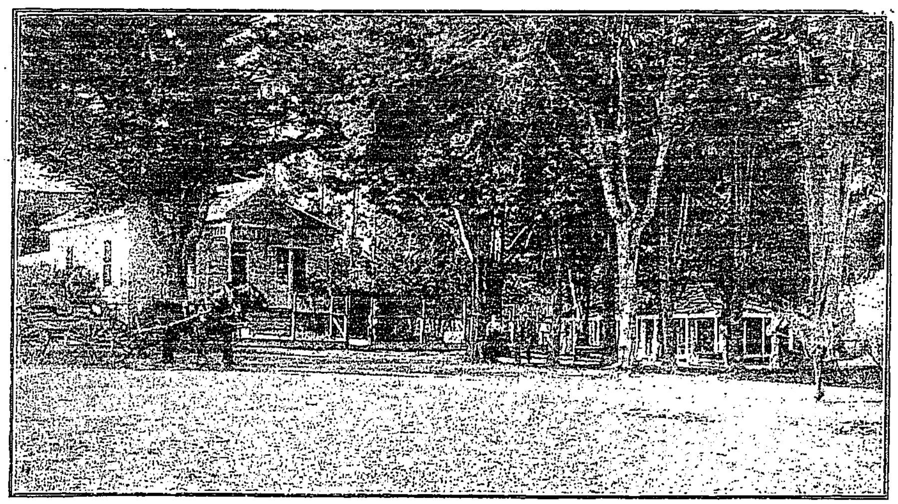
Figure 3. The Sutherland homestead shown on the 1877 Sonoma County atlas (adapted from Thompson 1877). Note the incorrect acreage indicated on the map.

The 1880 census of agricultural products shows that Sutherland's chief crops were apples and grapes (USBC 1880b). According to the census, he had two acres of orchard and 25 acres of vineyard in 1880 (USBC 1880b); however, elsewhere Sutherland is described as having 50 acres of zinfandel grapes (Peninou 1998:110). Peninou also states that "Part of the estate remained in the family through the Dry years, but the vineyards were neglected."

Ann Sutherland died in October of 1894 and Alexander never remarried. His sons Robert and James took over the property as their father aged. The portion of the property that contains the existing buildings was deeded to Robert in 1899 (Deeds book 187, page 301). The two barns and other outbuildings on the property were likely built during his ownership.

During the early 1900s, Robert advertized the farm as the "Highlands," a rural resort that was touted as "An ideal farm resort" with croquet and tennis grounds and a large amusement pavilion with a piano and phonograph (Northwestern Pacific Railroad 1909:81). The advertisement features a photograph of the family's house with a second building in the background (Figure 4). The house is no longer standing but the second building is extant and is discussed later in the report. During this period, Robert continued to be listed as a farmer in the census (USBC 1900, 1910).

Robert sold the property to Charles Mehrten in 1917 (Deeds book 356, page 95) and moved his family to McDonald Avenue in Santa Rosa (Ancestry.com 2005; USBC 1920). Four months after acquiring the property he sold it to John Irmer (Deeds book 366, page 267). Irmer and is family lived on the property for about seven years. During that time, Irmer's daughter Martha met and married George Sutherland, whose father James owned adjoining acreage.



"HIGHLANDS" THE IDEAL RURAL RESORT SANTA ROSA, SONOMA COUNTY, CALIFORNIA

Figure 4. Advertisement for the Highlands from a 1909 publication.

Ora Hassett purchased the parcel from Irmer in 1925 (Official Records book 95, page 474). There is no evidence that Hassett lived on the property. Rather, voter records for the middle years of the 20th century show a series of tenants while Irmer and Hassett owned the property, as shown in Table 1 (Ancestry.com 2008a, b, c, d). By 1930, Hassett and his wife lived in San Francisco (USBC 1930b) but owned the property until the time of his death in 1945. After Hassett, the property was owned by William Armstrong (Official Records book 217, page 342). No information was found regarding the Armstrong family. The Steiner family acquired the property during the 1960s, and David Steiner replanted a vineyard on the property in 1973 (Jordan 2008).

Table 1. Property Tenants circa 1924 to 1940

Tenant	Years	Occupation	Source
Fred & Abbie Kynoch	1924	Farmer	Voter Registration 1924
Herman& Clare Trostman	1926, 1930	Farmer; Stockman	Voter Registration 1926; Census 1930a
Clark & Fern Bradford	1932, 1934	Rancher	Voter Registration 1932, 1934
William & Edith Cussins	1938, 1940	Farmer	Voter Registration 1938, 1940

HISTORIC CONTEXT

To evaluate the significance of a resource, it is necessary to understand historic patterns and themes that are important on national, state, and local levels. National Register Bulletin 15 provides insight into the use of historic contexts.

> The significance of a historic property can be judged and explained only when it is evaluated within its historic context. Historic contexts are those patterns or trends in history by which a specific occurrence, property, or site is understood and its meaning (and ultimately its significance) within history or prehistory is made clear.

Preliminary research found that the historic contexts most applicable to the Belden Barns complex is *Sonoma County Agriculture, 1850 to 1970*, and *Recreation and Leisure 1900 to 1940*. Those contexts and the types of properties associated with them are presented below.

Sonoma County Agriculture, 1850 to 1970

The importance of agriculture to Sonoma County's economy, past and present, cannot be over emphasized. The first Euroamerican settlers found the area amenable to a variety of agrarian pursuits; chief among them was cattle ranching. Over the years, various crops and/or livestock have been economically superior, but agriculture in general has always been at the forefront of the local economy. Sonoma County agriculture, while diverse, generally has been dominated by cattle and dairy farming, poultry production, and fruit farming. Cattle and fruit (including viticulture) are most pertinent to the current study.

Cattle and Dairy Industries

The cattle and dairy industries have been important factors in Sonoma County's economic history, beginning with the Mexican era ranchos where large herds of cattle were raised for hides and tallow. In his history of four Northern California counties, newspaper publisher C.A. Menefee (1873:275) writes:

> Next to the cultivation of the soil the greatest source of wealth [in Sonoma County] is stock-raising the Northwestern part of the county is principally devoted to this industry. [...] Most of these stock ranges are so far removed from the roads and markets that no attempt is made at dairying. [...] Along the Northern Coast where the roadsteads offer shipping facilities, considerable attention is given dairying, but it is not till [sic] we get to [the] Russian River that we come into the chief dairy districts of the county. All along down the Coast from this point to Marin are large dairies, where nothing else is attended to but butter and cheese making.

In 1872, Sonoma County produced more than 762,000 pounds of butter and 356,000 pounds of cheese (Menefee 1873:352), some 62 percent and 77 percent more, respectively, than neighboring Napa, Lake, and Mendocino counties combined. By 1877, more than two million pounds of butter and 250,000 pounds of cheese were reportedly produced in the county (Thompson 1877:16). The growth of the dairy industry during the 1870s and 1880s was unparalleled by other Sonoma County agricultural industries (LeBaron *et al.* 1985:58). While the production of butter and cheese decreased around the turn of the twentieth century, milk production increased. Seemingly, "Dairying was destined to remain the chief money crop of Sonoma County well into the next century (LeBaron *et al.* 1985:58). By 1936, poultry farming overtook dairying as the county's leading agricultural industry. Still, revenue from the estimated 52,000 dairy cows reported in the county in 1936 was nearly three million dollars, keeping the dairy industry high on the county's economic ladder (Finley 1937:370).

Also important to Sonoma County's early agricultural heritage is fruit production. Fruit was initially grown for family use and possibly local grocers, but with the advent of the railroad, it became economically viable to grow and ship fruit to larger markets. At about the same time, invention of a fruit-drying machine and refrigerated railroad cars solved problems that had plagued would-be fruit farmers. Sonoma County was soon noted for its orchards and canneries.

A later addition to the county's agriculture scene was chicken farming, although it was focused primarily in the southern part of the county around Petaluma and Cotati. Chicken ranching was a mainstay of rural Sonoma County during the late nineteenth and early twentieth centuries, and many families were drawn to the area by contemporary booster literature proclaiming poultry raising to be a profitable and near effortless pursuit. During the early part of the twentieth century, small-scale family-owned chicken ranches appeared throughout the southern part of the county.

Properties associated with cattle and dairy ranching include residences, worker housing, barns, silos, pens, corrals, loading chutes, windmills, water tanks, fields, fences, and ditches.

The Sonoma County Fruit Industry

Cultivation of fruit crops was introduced in Sonoma County with the arrival of the first Europeans. The Russian settlement at Fort Ross had an orchard planted in the early 1800s, as described by historian, Stephan Watrous:

> Most long-lasting of the first horticultural efforts at Ross were the Russian experiments with fruit trees. The first peach tree, brought from San Francisco, was planted in 1814, and in 1817-18, Captain Hagemeister introduced grape stock brought from Peru and more peach trees from Monterey. Eventually the Russian orchard, located on the hillside less than a mile from Ross, included apples, peaches, grapes, cherries, and several types of pear [Watrous n.d.].

Mexican land holders were quick to plant grapes, primarily for wine making, and as immigrants from the eastern states began to arrive after 1848, most homesteads were planted with a few trees to provide fruit for personal consumption. Until the advent of the railroad in the 1870s, fruit was grown primarily for family use with any surplus possibly going to local markets. The railroad made it economically viable to ship fruit to larger markets and fruit became a cash crop with orchards planted across the landscape. At about the same time, invention of a fruit-drying machine and refrigerated railroad cars solved problems that had plagued would-be fruit farmers. Sonoma County was soon noted for its orchards and canneries.

In 1855, County Assessor Smith D. Towne reported that Sonoma County, which included Mendocino County at the time, had 6,730 fruit trees ranging from one to three years old (cited in Thompson 1877:16). Near the beginning of the county's fruit boom, a county atlas was published that included a census of fruit trees in Sonoma County (Thompson 1877:16). Thompson credits the county nearly 500,000 bearing fruit trees in the county. Among the many varieties growing in Sonoma County were apples, lemons, berries, plums, pears, cherries, nectarines, peaches, and prunes. In addition, some 15,000 almond and walnut trees (English and black) were under cultivation. As time passed, fruit production led to many fruit packing facilities in the area that created jobs for many non-farming people. Thus the fruit industry had a two-fold affect on the county's economy.

Thompson's atlas was published the same year that young Luther Burbank first hung his shingle as a nurseryman in Santa Rosa. Traveling from New England to join his two brothers in California, Burbank hoped to expand his already successful horticultural experiments. In 1923, Burbank wrote:

> I began my nursery business at Santa Rosa by raising such fruits and vegetables as gave promise of being immediately acceptable to the people of the vicinity. At that time the possibility of California as a fruit center was for the most part vaguely realized, and it was first necessary to educate Californians themselves to a recognition of the fact that in the soil and climate of their state were potentialities of greater wealth than had ever been stored in the now almost depleted gold mines [Burbank 1923:7].

In his first year as a nurseryman, Burbank's sales totaled $15.20, but he proved to be a horticultural wizard, and within ten years his sales were more than $16,000 annually. Burbank's experiments with fruits, nuts, vegetables, and flowers greatly influenced the future of agriculture, especially in Sonoma County where he developed 113 varieties of plums and prunes (Felciano and Welborn 1986).

By the turn of the 20th century, Sonoma County was a major fruit producing region especially noted for apples, plums and prunes, and pears. The bottom fell out of the fruit market during the Great Depression, but as the depression eased, fruit production rallied. Fruit remains an important industry in Sonoma County, although in recent years most of the large, once ubiquitous prune, pear, and apple orchards have given way to vineyards.

The types of resources associated with fruit production include fruit farms, orchards, and remnant orchards; processing facilities such as warehouses, dryers, packinghouses, and canneries; and transportation links such as wagon roads, railroad grades, and docks.

Viticulture

The beginning of viticulture in California dates to the Spanish and Mexican mission period with the first vineyards planted for use in making sacramental wine. Later, wine for general consumption was also being produced by the missions using grapes that became commonly known as "Mission grapes." The mission grapes grew well but generally resulted in wines notable only for their blandness (although those from the northern missions were more highly regarded). The humble beginnings of Sonoma County's wine industry can be traced to General Mariano Vallejo's continuation of the Sonoma Mission vineyards after secularization in 1834, from which he produced about 540 gallons of wine a year (Pinney 1989:259).

As settlement spread throughout California, so too did the cultivation of grapes for wine as well as for the table. In Napa County, George Yount is credited with planting the first grapes in the Napa Valley in 1838. His vines came from cuttings taken from Vallejo's vineyard in Sonoma County, and were planted on Yount's Caymus Rancho, which includes present-day St. Helena.

French winemaker Jean-Louis Vignes imported vines from Bordeaux in 1833, establishing the El Aliso vineyard and winery in what is now downtown Los Angeles. Vignes is considered by many to be the founder of California's wine industry, while others credit the more flamboyant Hungarian immigrant, Agoston Haraszthy, with that feat. Haraszthy was an unswerving proponent of California wines and championed vineyard development in northern California.

> In the early 1860s, Haraszthy traveled abroad to study winemaking in Europe's finest regions. He also collected hundreds of thousands of select vines, representing hundreds of varieties. On his return to the United States, he authored a treatise describing the best winery practices; doing everything on your own estate in order to guarantee quality at every step was one of them [Western History Productions 2006].

Among his accomplishments, Haraszthy established Sonoma's Buena Vista Winery in 1856 where he had extensive caves dug into the hillsides for storage. He used hillside planting and promoted non-irrigated vineyards. But perhaps the greatest contribution Haraszthy made to the fledgling California wine industry was his enthusiasm and belief in northern California's wine future.

Southern California was the first notable grape-growing and wine making region in California, but by the late 1870s, Sonoma and Napa counties outpaced the southlands as Italian immigrants brought their expertise to the region. The 1880s witnessed many acres of land put to vineyard that were previously used for orchards and dairylands. In the 1891 county history it is written:

> From Napa City to Calistoga there is a constant succession of vineyards and wine-cellars, showing plainly the great importance of the industry to the county. From Yountville, nine miles above Napa City to a point about midway between St. Helena and Calistoga, the whole country is given over to the vineyards, St. Helena being the center of production. The many massive stone winerys, many of them architecturally very fine, is a great surprise to the stranger [Lewis Publishing 1891].

While that account is certainly romanticized, data regarding the growth of vineyards and wine production in Northern California were presented by Thomas Pinney (1989) in his book on the history of American winemaking. Using figures from California State Board of Agriculture, Pinney shows that from 1860 to 1890, "...Los Angeles's share of the state's total [gallons of wine] sank from near two-thirds to less than a tenth; in the same span the Bay Area counties saw their share rise from little more than a tenth to near two-thirds, an almost symmetrical exchange" (Pinney 1989:311).

In 1920, the California wine industry at both ends of the state was dealt a terrible blow when the United States Congress passed the 18th amendment to the Constitution which forbid the manufacture, sale, or transportation of intoxicating liquors. While many states had already enacted statewide sanctions, the federal government's actions virtually ended all wine production, with the exception of the few winemakers who were able to obtain permits to make wines used for medicinal and sacramental purposes.

Ironically, while wine production plummeted, the state saw a dramatic increase in the number of acres put to grapes. State records show that in 1920, there were 410,000 acres of grapes growing statewide: in 1930, there were 570,000 acres of grapes with only 200,000 of those being wine grapes (Peninou 1998:264). The growers switched from premium wine grapes to grapes that traveled better as Prohibition created a new demand for these grapes in the east.

> California grape growers planted hearty, thick-skinned grapes that could be shipped easily and used for small-scale and home wine making. Much of the California wine-grape crop was shipped to Chicago and New York in newly developed refrigerated boxcars. The grapes were bought right off the

> train by wholesalers, who resold them in immigrant neighborhoods. The home-made wine was then distributed to smaller cities and towns, where it was sometimes called "dago red" [Muscatine, Amerine, and Thompson 1984].

Prohibition lasted until 1933, disrupting not only the legal production of wine but also having a far reaching affect on consumers. Pinney (1989:442) describes the daunting task vintners faced after 1933:

> The immediate question for the winemakers looking over the desolate scene left behind by the Dry years was to educate the American public in the renewed use of wine. If they were older Americans, they had forgotten what the civilized use of wine was; if they were younger, they had never known. ...a hard and bitter labor faced the American winegrowers: their vineyards were debased, their wineries decayed, their markets confused by arbitrary and unpredictable barriers, and their public ill-instructed and corrupted by the habits of a hard-drinking bootleg style.

To those factors affecting California's wine industry, add the depressed economy of the 1930s and the onset of World War II. Before Prohibition, California had more than 700 bonded wineries. That number dropped to 140 by 1933 and in 1960, nearly 30 years after the repeal of Prohibition, the number of wineries was just 271 (Peninou 1998:264). It took another 25 years (in the mid-1980s) before the number of wineries reached pre-Prohibition levels.

The resources associated with this context include vineyards, wineries, wine cellars, and other buildings and structures associated with wine production, including farmsteads, worker housing, and water conveyance systems, as well as transportation and distribution systems.

Recreation and Leisure, 1900 to 1940

Urban historian Raymond Mohl noted that "By 1900, close observers of the American city recognized that urban-industrial growth was accompanied by adverse environmental consequences. Thus the liberal reformers increasingly argued the case for altering and improving the environment for better heath, housing, and planning measures" (Mohl 1985:179). One response was the creation of suburbs at urban peripheries. These new communities drew families looking for a healthier environment, and featured lots with yards, and houses with open floor plans suggesting greater interplay with the outdoors. Suburbs were made possible by improved transit systems that took urban workers from their homes to the city and back with relative efficiency.

With the 1920 population census, the United States marked a turning point in the American experience as, for the first time, more than half the American people lived in urban rather than rural locations (United States Bureau of Census 1975, cited in Mohl 1985:8-9). Cities and towns brimmed with people in search of and working at industrial jobs, and for many the crowded urban setting proved to be unhealthy. Civic and social groups began organized efforts to improve the urban environment and the health of its inhabitants and, aided by the advent of the automobile, some of these efforts aimed at returning city folks to the great outdoors, albeit for short periods of time.

During the second decade of the 20th century, people were presented with another means to escape urban life as automobile travel became practical. While the automobile was invented during the late nineteenth century, it was not common-place in California until the 1920s because of the lack of readily available petroleum products, and a general mistrust of this new form of transportation. As it became easier to obtain gasoline and people's fear abated, popularity of the automobile grew, especially in California where there was a wealth of cheap oil. The automobile offered people unconstrained and unregulated travel opportunities, making it possible for people to escape the cities and get back to nature more frequently and efficiently without the constraints of timetables and preordained destinations. A family could load up the car for a picnic, overnight camping, or extended road trips.

Leisure travel became a popular pastime as people across the country took to the roads. In his narrative on the automobile's impact on American cities, Chester Liebs writes, "By the early 1920s, for the first time in history, it was possible to cleave through miles of scenery in a single day, with the power to start, stop, or change the sequence of onrushing images by merely stepping on a pedal and turning a wheel" (Lieb 1985:4). The autocamp and its evolution to the motel forever changed the appearance of small town America. In the early 1920s, many travelers simply stopped on the side of the road to spend the night. Over time, some of these ad hoc stopping places became favorite spots for groups of travelers and were noted in travel publications of the period. Taking advantage of the apparent need for additional services, some cities and private property owners began to offer locations with very basic amenities such as outhouses and communal shower rooms. Simple cabins were introduced followed by private toilets and bathing facilities. Beginning in the 1920s, the spot on the side of the road evolved into the motel chains that are now ubiquitous.

PROPERTY DESCRIPTION

The Belden Barns complex includes three residences (two of which appear to be dormitory-style facilities), two barns, and two outbuildings that are older than 50 years. Descriptions of these buildings are provided below, and Figure 5 shows the layout of the complex.

Building 1 is a rectangular, hipped-roof dwelling with a porch that wraps around three sides. It appears to be the building shown in the background of the Highlands advertisement (see Figure 4) but has been remodeled. At present this frame structure is clad with channel rustic siding and the windows are double-hung and fixed vinyl sashes. A photograph taken before the remodeling suggests that the building originally was a double-pen cabin with double-hung and fixed wood sashes. It also appears that the principal roof was extended over a shed-roofed addition on the south end of the building increasing its length.

Building 2 is a residence that has an older core section with several additions that were made circa 1950. The older section has a rectangular footprint and gabled roof. This part of the building is clad with cove rustic siding and has double-hung wood sashes. The front entry has been reconfigured with double doors. Attached to the north end of Building 2 is a gable-roofed addition clad with drop siding. This section has a large, fixed, multi-paned, wood-sashed window on the north end.

A gabled wing has been added at the south end of Building 2. This wing appears to be contemporaneous with the north addition as it has the same siding and also incorporates large, multi-paned windows. Attached to Building 2 by a hallway is a third section that has a gable-on-hip roof. Here the windows are primarily double-hung, aluminum sashes with a row of wood-sashed, fixed windows high on the south elevation. Sliding patio doors on the north and south ends are the entries.

Building 3 is a gable-roofed dwelling over a three-bay garage. It is probable that the residence was elevated to accommodate the garage. This building sits adjacent to Building 4 but is separated by a narrow gap. Building 3 is a frame structure with drop siding and primarily 1-over-1 double-hung, wood sashed windows. At present the entry is at the south end of the building, accessed by a wood stairway. The presence of double doors on the west elevation flanked by large, fixed windows suggests that this was once the main entry but was abandoned after the building was raised.

Building 4 is a gable-roofed barn with vertical board-and-batten siding. The roof is covered with corrugated metal sheets. Original windows are six-paned, wood sliders. A portion of the barn has been converted to a kitchen and aluminum sliders were added to the area. The rear of the barn has a small, shed-roofed addition.

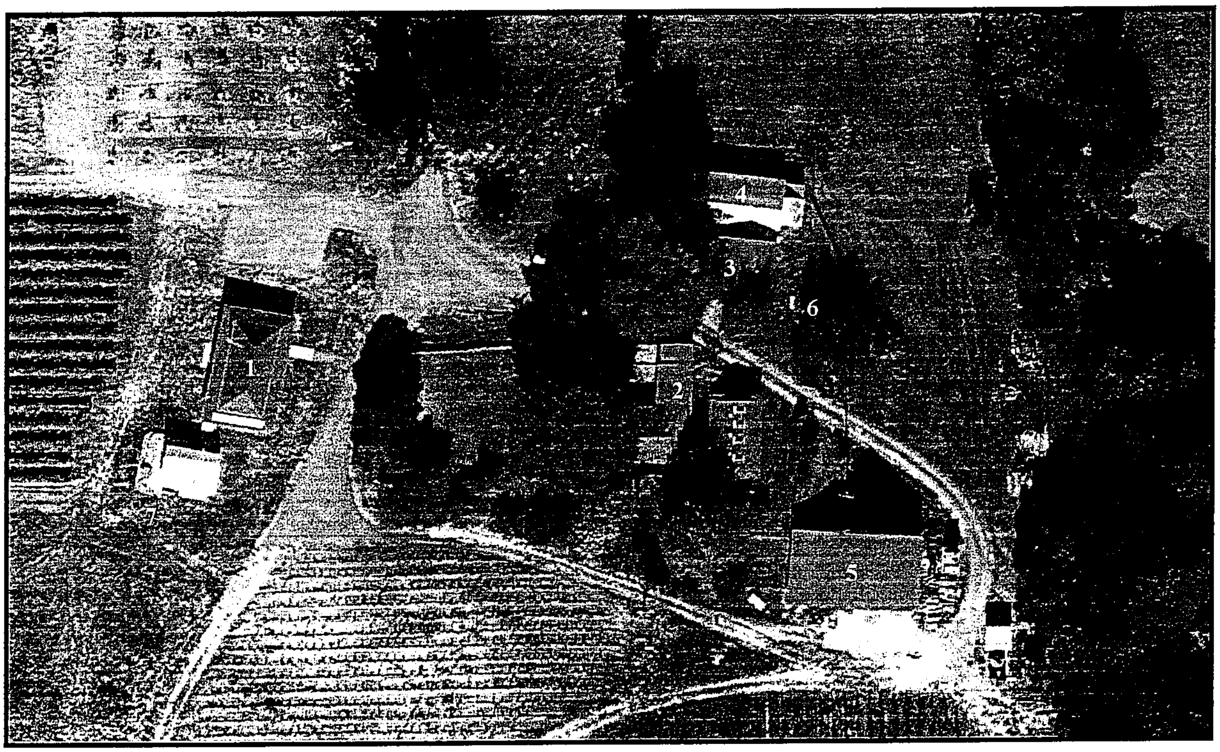


Figure 5. Aerial view of the Belden Barns complex.

Building 5 is a large, gable-roofed barn with a shed-roofed bay. Siding is vertical board-and-batten and the roof is composition shingles. The north side of the barn has a large opening with a by-pass door and two standard doorways. Small fixed windows are found high beneath the gable. The south side of the barn has two large entries and a standard doorway into the bay. Aluminum sliders have been installed on this elevation.

Building 6 is a small, gable-roofed shed with board-and-batten siding. The one original window is a sliding wood sash, and the roof has composition shingles. Building 7 is a shed-roofed outbuilding that has been remodeled recently. The board-and-batten siding appears to be new, and the by-pass door on the north side hides a modern, steel door.

CONCLUSIONS

The purpose of this evaluation was to determine the California Register eligibility of buildings on the Belden Barns property based on criteria presented earlier in this report. Paraphrased briefly, a resource acquires significance from its association with an important event or pattern in history; through its association with an important person; because it represents a particular type, period, region or method of construction, the work of a master, or possesses high artistic values; or because it contains information that can be studied to enhance our understanding of history.

In order to be eligible for the California Register, a property must meet at least one of the four eligibility criteria and retain sufficient integrity to convey a sense of its importance. As defined by the State, "Integrity is the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance" (California Office of Historic Preservation 2001:11). Seven elements are considered key in considering a property's integrity: location, design, setting, materials, workmanship, feeling, and association.

Significance Criteria

Within the context of *Sonoma County Agriculture, 1850 to 1970*, it was necessary to determine whether the property illustrates and conveys the importance of that context, and whether it retains sufficient integrity to be a good representative. The following conclusions were reached with regard to this property's eligibility for the California Register criteria as an individual resource.

Criterion 1. In order to be considered important under Criterion 1, the property needs to be able to convey its importance in events or patterns that are significant in federal, state, or local history. The Belden Barns complex is associated with both Sonoma County agriculture and recreation and leisure; however, it comprises an eclectic collection of buildings that do not convey the importance of either context in this area. Criterion 1 is not met.

Criterion 2. Under Criterion 2, a property can be significant because of its association with an important person but the association must be one that reflects the reason for the person's importance. The Sutherland family owned this property for nearly 80 years beginning in the 1860s. None of the early homestead buildings are extant. Of those that are standing, the oldest ones date to the tenure of Robert G. Sutherland at the turn of the 20th century. Although the Sutherland's had a long history in the area, they are not of particular historical note. Criterion 2 is not met.

Criterion 3. Criterion 3 speaks to the architectural significance of a property. The buildings that makeup the Belden Barns complex are not architecturally distinctive, and the property does not meet Criterion 3.

Criterion 4. Criterion 4 generally applies to archaeological resources or built resources that, through study of construction details, can provide information that cannot be obtained in other ways. These buildings possess no intrinsic qualities that could answer questions or provide important information about our history, and Criterion 4 is not met.

Conclusion

Buildings comprising the Belden Barns complex do not meet the criteria for inclusion on the California Register and are not important resources.

SUMMARY

Tom Origer & Associates completed an architectural/historical evaluation of the Belden Barns property at 5561 Sonoma Mountain Road. The study was requested by Claire Monteschio of SMA, Inc. as part of the environmental review for a proposed winery. This study found that none of the buildings comprising the Belden Barns complex appear eligible for inclusion on the California Register. No further study is warranted.

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Appendix A

Resource Documentation

PRIMARY RECORD

Primary # P-
HRI #
Trinomial:
NRHP Status Code:

Other Listings:
Review Code: **Reviewer:** **Date:**

Resource Name or #: Belden Barns Complex

P1. Other Identifier:

P2. Location: Unrestricted **a. County:** Sonoma
b. USGS 7.5' Quad: Glen Ellen **Date:** 1980
T 6 N/R 7 W; SE **1/4 of** NW **1/4 of Sec.** 14; **MDBM**
c. Address: 5561 Sonoma Mountain Road **City:** Santa Rosa **Zip:** 95404
d. UTM: Zone: 10 510940 **mE** 427440 **mN**
e. Other Locational Information:

P3a. Description: This resource consists of seven buildings comprising a complex on the Belden Barns property. The buildings include three residences (two of which appear to be dormitory-style facilities), two barns, and two outbuildings. These buildings vary in age, with the earliest dating to about the turn of the 20th century. A layout of the complex is shown in field P5 with reference numbers for each building.

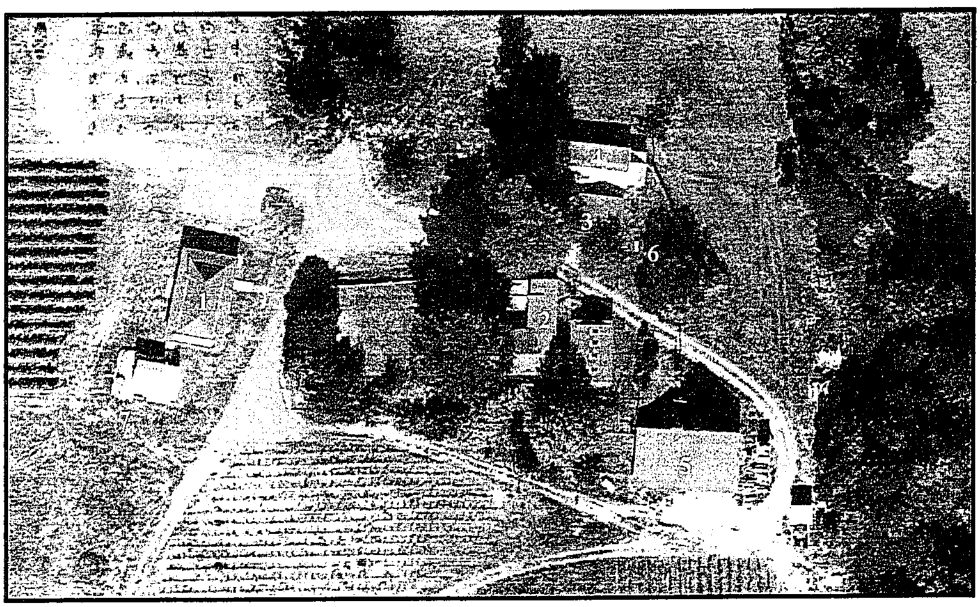
Building 1 is a rectangular, hipped-roof dwelling with a porch that wraps around three sides. It appears to be the same building shown in the background of a 1900 resort advertisement but has been remodeled in recent years. At present this frame structure is clad with channel rustic siding and the windows are double-hung and fixed vinyl sashes. A photograph taken before the remodeling suggests that the building originally was a double-pen cabin with double-hung and fixed wood sashes. It also appears that the principal roof was extended over a shed-roofed addition on the south end of the building increasing its length.

P3b. Resource Attributes: HP33 (Farm)

P4. Resources Present: Buildings

P5. Photograph or Drawing:

P5b. Description of Photo: Aerial view of the complex



P6. Date Constructed/Age and Sources:
Circa 1900 to 1950 based on historical records and field observations

P7. Owner and Address:
Nathan Belden Tr.
527 Alvarado St.
San Francisco, CA 94114

P8. Recorded by:
V. Beard
Tom Origer & Associates
P.O. Box 1531
Rohnert Park, CA 94927

P9. Date Recorded:
July 2011

P10. Type of Survey:
Property specific

P11. Report Citation:
Beard, V. 2012 *Historical Evaluation of the Belden Barns Complex 5561 Sonoma Mountain Road, Sonoma County, California.*

P12. Attachments: Building, Structure, and Object Record; Continuation Sheets; Location Map

P3a. Description: (continued from page 1)

Building 2 is a residence that has an older core section with several additions that were made circa 1950. The older section has a rectangular footprint and gabled roof. This part of the building is clad with cove rustic siding and has double-hung wood sashes. The front entry has been reconfigured with double doors. Attached to the north end of Building 2 is a gable-roofed addition clad with WP-11 wood siding. This section has a large, fixed, multi-paned, wood-sashed window on the north end.

A gabled wing has been added at the south end of Building 2. This wing appears to be contemporaneous with the north addition as it has the same siding and also incorporates large, multi-paned windows. Attached to Building 2 by a hallway is a third section that has a gable-on-hip roof. Here the windows are primarily double-hung, aluminum sashes with a row of wood-sashed, fixed windows high on the south elevation. Sliding patio doors on the north and south ends are the entries.

Building 3 is a gable-roofed dwelling over a three-bay garage. It is probable that the residence was elevated to accommodate the garage. This building sits adjacent to Building 4 but is separated by a narrow gap. Building 3 is a frame structure with drop siding and primarily 1-over-1 double-hung, wood sashed windows. At present the entry is at the south end of the building, accessed by a wood stairway. The presence of double doors on the west elevation flanked by large, fixed windows suggests that this was once the main entry but was abandoned after the building was raised.

Building 4 is a gable-roofed barn with vertical board-and-batten siding. The roof is covered with corrugated metal sheets. Original windows are six-paned, wood sliders. A portion of the barn has been converted to a kitchen and aluminum sliders were added to the area. The rear of the barn has a small, shed-roofed addition.

Building 5 is a large, gable-roofed barn with a shed-roofed bay. Siding is vertical board-and-batten and the roof is composition shingles. The north side of the barn has a large opening with a by-pass door and two standard doorways. Small fixed windows are found high beneath the gable. The south side of the barn has two large entries and a standard doorway into the bay. Aluminum sliders have been installed on this elevation.

Building 6 is a small, gable-roofed shed with board-and-batten siding. The one original window is a sliding wood sash, and the roof has composition shingles.

Building 7 is a shed-roofed outbuilding that has been remodeled recently. The board-and-batten siding appears to be new, and the by-pass door on the north side hides a modern, steel door.

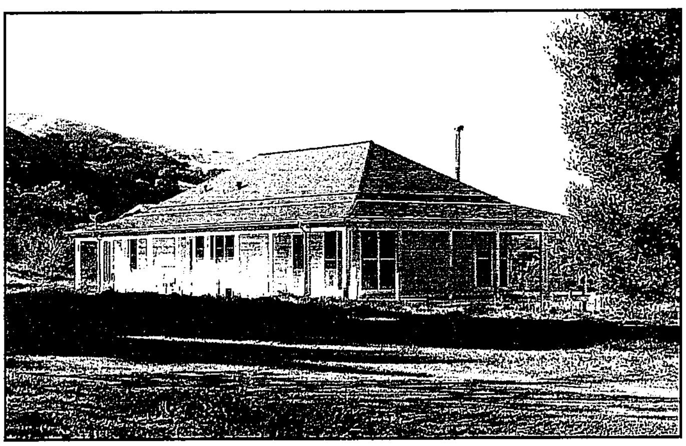


Figure 1. Building 1, east and north elevations

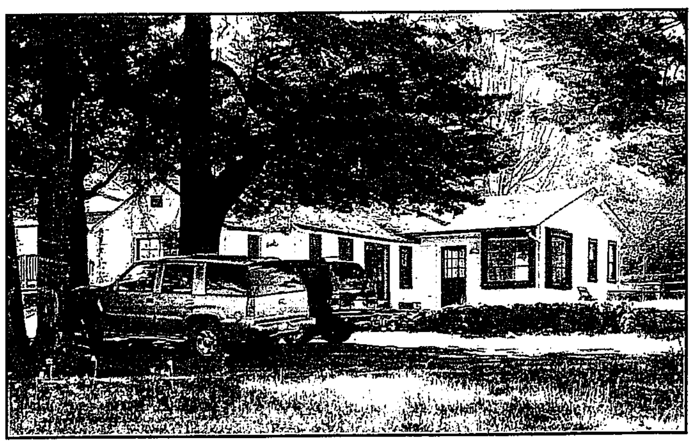


Figure 2. Building 2, west elevation.

P3a. Description: (continued from page 1)

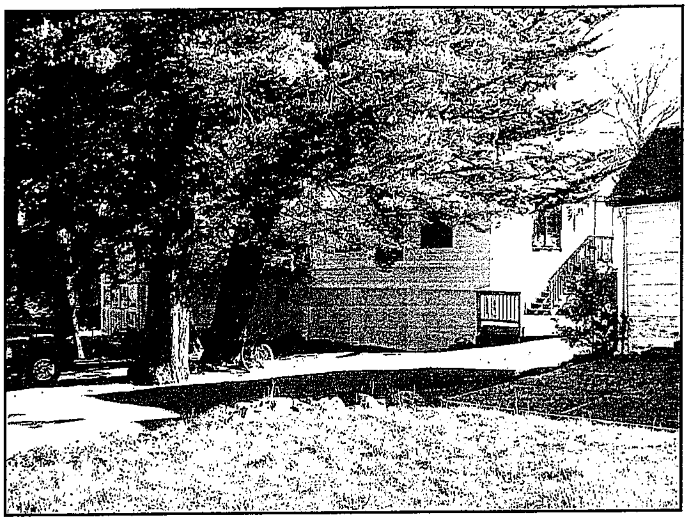


Figure 3. Building 3, west and south elevations.

Figure 4. Building 3, east elevation.

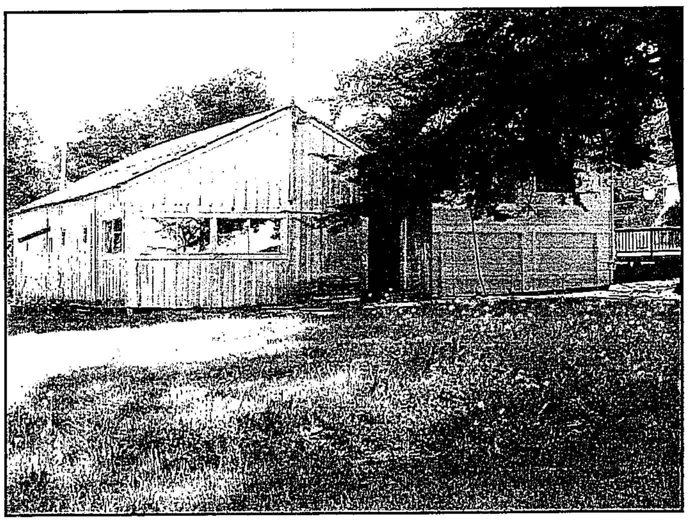


Figure 5. Building 4, north and west elevations with Building 3 at right.

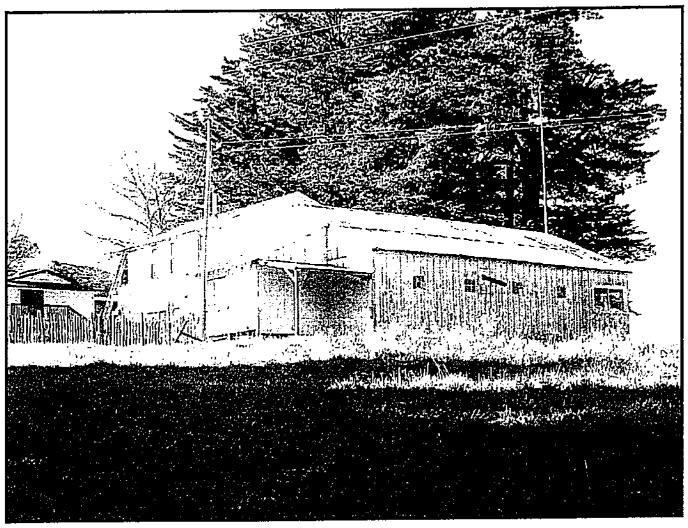


Figure 6. View southwest toward Building 4 with Building 3 in background.

P3a. Description: (continued from page 1)

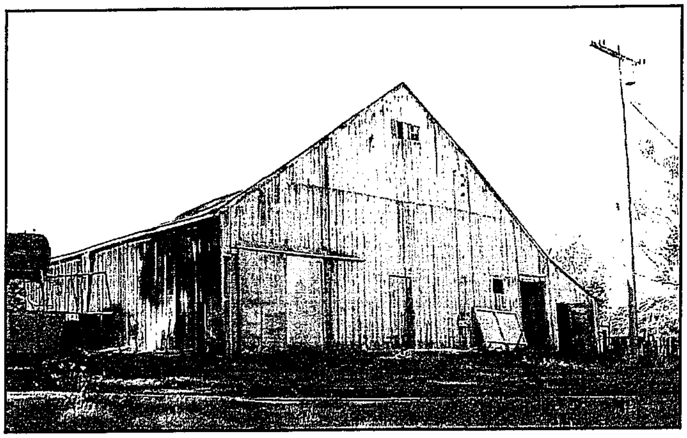


Figure 7. Building 5, east and north elevations.

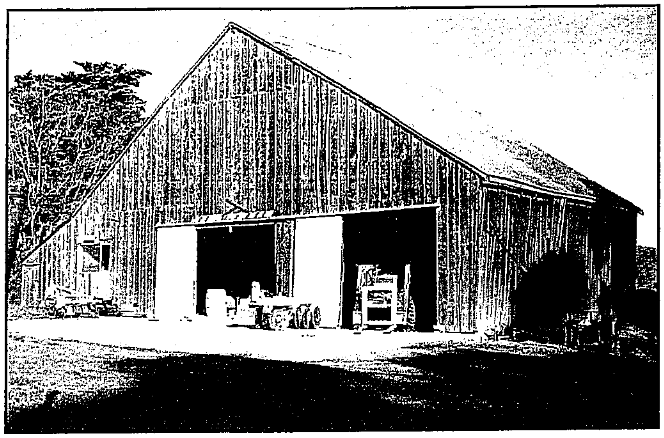


Figure 8. Building 5, south and east elevations..

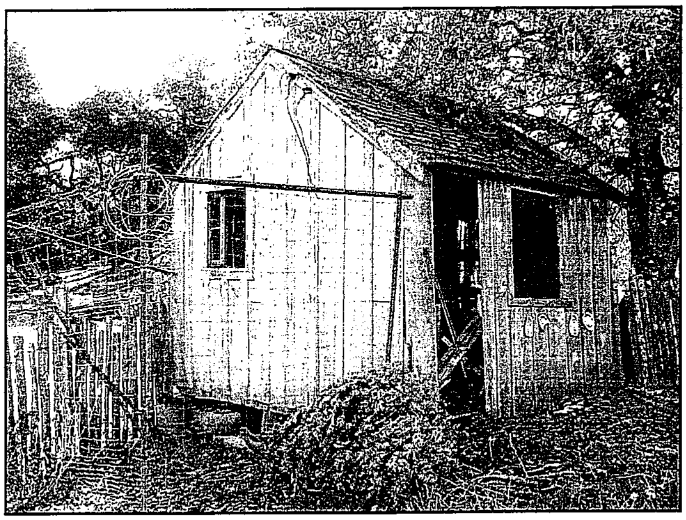


Figure 9. Building 6, north and west elevations.

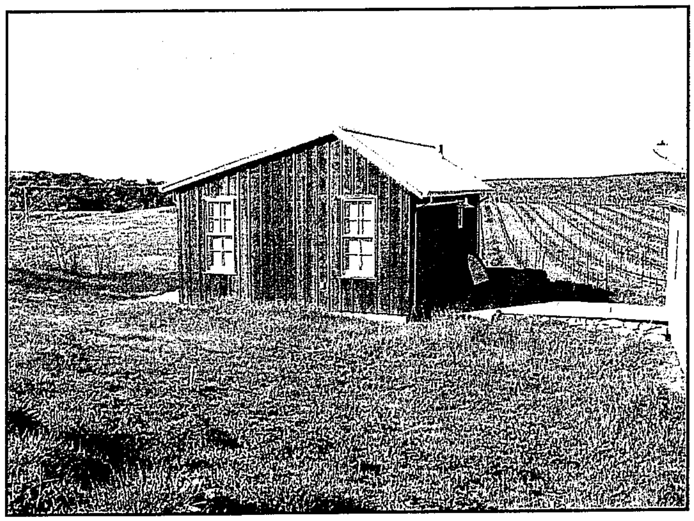


Figure 10. Building 7, east and north elevations.

BUILDING, STRUCTURE, AND OBJECT RECORD

Primary # P-
HRI #
NRHP Status Code:
Resource Name or #: Belden Barns Complex

B1. Historic Name: None known

B2. Common Name: Belden Barns

B3. Original Use: Farm housing

B4. Present Use: Vineyard support

B5. Architectural Style: NA

B6. Construction History:

B7. Moved? No **Date:** NA **Original Location:** NA

B8. Related Features:

B9a. Architect: NA

B9b. Builder:

B10. Significance: **Theme:** Sonoma County Agriculture; Recreation and Leisure **Area:** Sonoma
Period of Significance: 1850 to 1970
1900 to 1940
Property Type: Farm
Applicable Criteria: None

Context Statement

The Belden Barns complex was evaluated within the contexts of *Sonoma County Agriculture, 1850 to 1970*, and *Recreation and Leisure 1900 to 1940.*

Sonoma County Agriculture, 1850 to 1970
The importance of agriculture to Sonoma County's economy, past and present, cannot be over emphasized. The first Euroamerican settlers found the area amenable to a variety of agrarian pursuits; chief among them was cattle ranching. Over the years, various crops and/or livestock have been economically superior, but agriculture in general has always been at the forefront of the local economy. Sonoma County agriculture, while diverse, generally has been dominated by cattle and dairy farming, poultry production, and fruit farming. Cattle and fruit (including viticulture) are most pertinent to the current study.

B11. Additional Resource Attributes:

B12. References:
See Continuation Sheet page 8

B13. Remarks:

B14. Evaluator: V. Beard
Date of Evaluation: February 2012

North ⇑

B10. Significance: (continued from Page 3)

Cattle and Dairy Industries
The cattle and dairy industries have been important factors in Sonoma County's economic history, beginning with the Mexican era ranchos where large herds of cattle were raised for hides and tallow. In his history of four Northern California counties, newspaper publisher C.A. Menefee (1873:275) writes:

> Next to the cultivation of the soil the greatest source of wealth [in Sonoma County] is stock-raising the Northwestern part of the county is principally devoted to this industry. [...] Most of these stock ranges are so far removed from the roads and markets that no attempt is made at dairying. [...] Along the Northern Coast where the roadsteads offer shipping facilities, considerable attention is given dairying, but it is not till [sic] we get to [the] Russian River that we come into the chief dairy districts of the county. All along down the Coast from this point to Marin are large dairies, where nothing else is attended to but butter and cheese making.

In 1872, Sonoma County produced more than 762,000 pounds of butter and 356,000 pounds of cheese (Menefee 1873:352), some 62 percent and 77 percent more, respectively, than neighboring Napa, Lake, and Mendocino counties combined. By 1877, more than two million pounds of butter and 250,000 pounds of cheese were reportedly produced in the county (Thompson 1877:16). The growth of the dairy industry during the 1870s and 1880s was unparalleled by other Sonoma County agricultural industries (LeBaron *et al.* 1985:58). While the production of butter and cheese decreased around the turn of the twentieth century, milk production increased. Seemingly, "Dairying was destined to remain the chief money crop of Sonoma County well into the next century (LeBaron *et al.* 1985:58). By 1936, poultry farming overtook dairying as the county's leading agricultural industry. Still, revenue from the estimated 52,000 dairy cows reported in the county in 1936 was nearly three million dollars, keeping the dairy industry high on the county's economic ladder (Finley 1937:370).

Also important to Sonoma County's early agricultural heritage is fruit production. Fruit was initially grown for family use and possibly local grocers, but with the advent of the railroad, it became economically viable to grow and ship fruit to larger markets. At about the same time, invention of a fruit-drying machine and refrigerated railroad cars solved problems that had plagued would-be fruit farmers. Sonoma County was soon noted for its orchards and canneries.

A later addition to the county's agriculture scene was chicken farming, although it was focused primarily in the southern part of the county around Petaluma and Cotati. Chicken ranching was a mainstay of rural Sonoma County during the late nineteenth and early twentieth centuries, and many families were drawn to the area by contemporary booster literature proclaiming poultry raising to be a profitable and near effortless pursuit. During the early part of the twentieth century, small-scale family-owned chicken ranches appeared throughout the southern part of the county.

Properties associated with cattle and dairy ranching include residences, worker housing, barns, silos, pens, corrals, loading chutes, windmills, water tanks, fields, fences, and ditches.

The Sonoma County Fruit Industry
Cultivation of fruit crops was introduced in Sonoma County with the arrival of the first Europeans. The Russian settlement at Fort Ross had an orchard planted in the early 1800s, as described by historian, Stephan Watrous:

> Most long-lasting of the first horticultural efforts at Ross were the Russian experiments with fruit trees. The first peach tree, brought from San Francisco, was planted in 1814, and in 1817-18, Captain Hagemeister introduced grape stock brought from Peru and more peach trees from Monterey. Eventually the Russian orchard, located on the hillside less than a mile from Ross, included apples, peaches, grapes, cherries, and several types of pear [Watrous n.d.].

Mexican land holders were quick to plant grapes, primarily for wine making, and as immigrants from the eastern states began to arrive after 1848, most homesteads were planted with a few trees to provide fruit for personal consumption. Until the advent of the railroad in the 1870s, fruit was grown primarily for family use with any surplus possibly going to local markets. The railroad made it economically viable to ship fruit to larger markets and fruit became a cash crop with orchards planted across the landscape. At about the same time, invention of a fruit-drying machine and refrigerated railroad cars solved problems that had plagued would-be fruit farmers. Sonoma

County was soon noted for its orchards and canneries.

In 1855, County Assessor Smith D. Towne reported that Sonoma County, which included Mendocino County at the time, had 6,730 fruit trees ranging from one to three years old (cited in Thompson 1877:16). By the time Thompson's 1877 county atlas was published, Sonoma County alone approached 500,000 bearing fruit trees. Among the many varieties were apples, lemons, berries, plums, pears, cherries, nectarines, peaches, and prunes. In addition, some 15,000 almond and walnut trees (English and black) were under cultivation. As time passed, fruit production led to many fruit packing facilities in the area that created jobs for many non-farming people. Thus the fruit industry had a two-fold affect on the county's economy.

Thompson's atlas was published the same year that young Luther Burbank first hung his shingle as a nurseryman in Santa Rosa. Traveling from New England to join his two brothers in California, Burbank hoped to expand his already successful horticultural experiments. In 1923, Burbank wrote:

> I began my nursery business at Santa Rosa by raising such fruits and vegetables as gave promise of being immediately acceptable to the people of the vicinity. At that time the possibility of California as a fruit center was for the most part vaguely realized, and it was first necessary to educate Californians themselves to a recognition of the fact that in the soil and climate of their state were potentialities of greater wealth than had ever been stored in the now almost depleted gold mines [Burbank 1923:7].

In his first year as a nurseryman, Burbank's sales totaled $15.20, but he proved to be a horticultural wizard, and within ten years his sales were more than $16,000 annually. Burbank's experiments with fruits, nuts, vegetables, and flowers greatly influenced the future of agriculture, especially in Sonoma County where he developed 113 varieties of plums and prunes (Felciano and Welborn 1986).

By the turn of the 20th century, Sonoma County was a major fruit producing region especially noted for apples, plums and prunes, and pears. The bottom fell out of the fruit market during the Great Depression, but as the depression eased, fruit production rallied. Fruit remains an important industry in Sonoma County, although in recent years most of the large ubiquitous prune, pear, and apple orchards have given way to vineyards.

The types of resources associated with fruit production include fruit farms, orchards, and remnant orchards; processing facilities such as warehouses, dryers, packinghouses, and canneries; and transportation links such as wagon roads, railroad grades, and docks.

Vitaculture

The beginning of viticulture in California dates to the Spanish and Mexican mission period with the first vineyards planted for use in making sacramental wine. Later, wine for general consumption was also being produced by the missions using grapes that became commonly known as "Mission grapes." The mission grapes grew well but generally resulted in wines notable only for their blandness (although those from the northern missions were more highly regarded). The humble beginnings of Sonoma County's wine industry can be traced to General Mariano Vallejo's continuation of the Sonoma Mission vineyards after seculariza-tion in 1834, from which he produced about 540 gallons of wine a year (Pinney 1989:259).

As settlement spread throughout California, so too did the cultivation of grapes for wine as well as for the table. In Napa County, George Yount is credited with planting the first grapes in the Napa Valley in 1838. His vines came from cuttings taken from Vallejo's vineyard in Sonoma County, and were planted on Yount's Caymus Rancho, which includes present-day St. Helena.

French winemaker Jean-Louis Vignes imported vines from Bordeaux in 1833, establishing the El Aliso vineyard and winery in what is now downtown Los Angeles. Vignes is considered by many to be the founder of California's wine industry, while others credit the more flamboyant Hungarian immigrant, Agoston Haraszthy, with that feat. Haraszthy was an unswerving proponent of California wines and championed vineyard development in northern California.

> In the early 1860s, Haraszthy traveled abroad to study winemaking in Europe's finest regions. He also collected hundreds of thousands of select vines, representing hundreds of varieties. On his return to the United States, he authored a treatise describing the best winery practices; doing everything on your own estate in order to guarantee quality at every step was one of them [Western History Productions 2006].

Among his accomplishments, Haraszthy established Sonoma's Buena Vista Winery in 1856 where he had extensive caves dug into the hillsides for storage. He used hillside planting and promoted non-irrigated vineyards. But perhaps the greatest contribution Haraszthy made to the fledgling California wine industry was his enthusiasm and belief in northern California's wine future.

Southern California was the first notable grape-growing and wine making region in California, but by the late 1870s, Sonoma and Napa counties outpaced the southlands as Italian immigrants brought their expertise to the region. The 1880s witnessed many acres of land put to vineyard that were previously used for orchards and dairylands. In the 1891 county history it is written:

> From Napa City to Calistoga there is a constant succession of vineyards and wine-cellars, showing plainly the great importance of the industry to the county. From Yountville, nine miles above Napa City to a point about midway between St. Helena and Calistoga, the whole country is given over to the vineyards, St. Helena being the center of production. The many massive stone winerys, many of them architecturally very fine, is a great surprise to the stranger [Lewis Publishing 1891].

While that account is certainly romanticized, data regarding the growth of vineyards and wine production in Northern California were presented by Thomas Pinney (1989) in his book on the history of American winemaking. Using figures from California State Board of Agriculture, Pinney shows that from 1860 to 1890, "...Los Angeles's share of the state's total [gallons of wine] sank from near two-thirds to less than a tenth; in the same span the Bay Area counties saw their share rise from little more than a tenth to near two-thirds, an almost symmetrical exchange" (Pinney 1989:311).

In 1920, the California wine industry at both ends of the state was dealt a terrible blow when the United States Congress passed the 18th amendment to the Constitution which forbid the manufacture, sale, or transportation of intoxicating liquors. While many states had already enacted statewide sanctions, the federal government's actions virtually ended all wine production, with the exception of the few winemakers who were able to obtain permits to make wines used for medicinal and sacramental purposes.

Ironically, while wine production plummeted, the state saw a dramatic increase in the number of acres put to grapes. State records show that in 1920, there were 410,000 acres of grapes growing statewide: in 1930, there were 570,000 acres of grapes with only 200,000 of those being wine grapes (Peninou 1998:264). The growers switched from premium wine grapes to grapes that traveled better as Prohibition created a new demand for these grapes in the east.

> California grape growers planted hearty, thick-skinned grapes that could be shipped easily and used for small-scale and home wine making. Much of the California wine-grape crop was shipped to Chicago and New York in newly developed refrigerated boxcars. The grapes were bought right off the train by wholesalers, who resold them in immigrant neighborhoods. The home-made wine was then distributed to smaller cities and towns, where it was sometimes called "dago red" [Muscatine, Amerine, and Thompson 1984].

Prohibition lasted until 1933, disrupting not only the legal production of wine but also having a far reaching affect on consumers. Pinney (1989:442) describes the daunting task vintners faced after 1933:

> The immediate question for the winemakers looking over the desolate scene left behind by the Dry years was to educate the American public in the renewed use of wine. If they were older Americans, they had forgotten what the civilized use of wine was; if they were younger, they had never known. ...a hard and bitter labor faced the American winegrowers: their vineyards were debased, their wineries decayed, their markets confused by arbitrary and unpredictable barriers, and their public ill-instructed and corrupted by the habits of a hard-drinking bootleg style.

To those factors affecting California's wine industry, add the depressed economy of the 1930s and the onset of World War II. Before Prohibition, California had more than 700 bonded wineries. That number dropped to 140 by 1933 and in 1960, nearly 30 years after the repeal of Prohibition, the number of wineries was just 271 (Peninou 1998:264). It took another 25 years (in the mid-1980s) before the number of wineries reached pre-Prohibition levels.

The resources associated with this context include vineyards, wineries, wine cellars, and other buildings and structures associated with wine production, including farmsteads, worker housing, and water conveyance systems, as well as transportation and distribution systems.

Recreation and Leisure, 1900 to 1940

Urban historian Raymond Mohl noted that "By 1900, close observers of the American city recognized that urban-industrial growth was accompanied by adverse environmental consequences. Thus the liberal reformers increasingly argued the case for altering and improving the environment for better heath, housing, and planning measures" (Mohl 1985:179). One response was the creation of suburbs at urban peripheries. These new communities drew families looking for a healthier environment, and featured lots with yards, and houses with open floor plans suggesting greater interplay with the outdoors. Suburbs were made possible by improved transit systems that took urban workers from their homes to the city and back with relative efficiency.

With the 1920 population census, the United States marked a turning point in the American experience as, for the first time, more than half the American people lived in urban rather than rural locations (United States Bureau of Census 1975, cited in Mohl 1985:8-9). Cities and towns brimmed with people in search of and working at industrial jobs, and for many the crowded urban setting proved to be unhealthy. Civic and social groups began organized efforts to improve the urban environment and the health of its inhabitants and, aided by the advent of the automobile, some of these efforts aimed at returning city folks to the great outdoors, albeit for short periods of time.

During the second decade of the 20th century, people were presented with another means to escape urban life as automobile travel became practical. While the automobile was invented during the late nineteenth century, it was not common-place in California until the 1920s because of the lack of readily available petroleum products, and a general mistrust of this new form of transportation. As it became easier to obtain gasoline and people's fear abated, popularity of the automobile grew, especially in California where there was a wealth of cheap oil. The automobile offered people unconstrained and unregulated travel opportunities, making it possible for people to escape the cities and get back to nature more frequently and efficiently without the constraints of timetables and preordained destinations. A family could load up the car for a picnic, overnight camping, or extended road trips.

Leisure travel became a popular pastime as people across the country took to the roads. In his narrative on the automobile's impact on American cities, Chester Liebs writes, "By the early 1920s, for the first time in history, it was possible to cleave through miles of scenery in a single day, with the power to start, stop, or change the sequence of onrushing images by merely stepping on a pedal and turning a wheel" (Lieb 1985:4). The autocamp and its evolution to the motel forever changed the appearance of small town America. In the early 1920s, many travelers simply stopped on the side of the road to spend the night. Over time, some of these ad hoc stopping places became favorite spots for groups of travelers and were noted in travel publications of the period. Taking advantage of the apparent need for additional services, some cities and private property owners began to offer locations with very basic amenities such as outhouses and communal shower rooms. Simple cabins were introduced followed by private toilets and bathing facilities. Beginning in the 1920s, the spot on the side of the road evolved into the motel chains that are now ubiquitous.

Property History

The Belden Barns property is located in southeastern Sonoma County in the hills between Santa Rosa and Glen Ellen. The 55-acre parcel is on the south side of Sonoma Mountain, as shown on the Glen Ellen, California 7.5' USGS topographic map. In 1871, this parcel and the remainder of the northwest quarter of section 14 were part of a 160-acre homestead patented to Alexander Howe Sutherland (Figure 11).

Alexander Sutherland came to the United States from Edinburgh, Scotland in 1851 and was residing in Sonoma County by 1852. He and his wife, Ann, first lived in Bodega before filing for their homestead on the flanks of Sonoma Mountain. Alexander is listed in the census as a Bodega farmer in 1860, and a farmer in the Santa Rosa Township in 1880 (United States Bureau of Census [USBC] 1860, 1880a).

The 160-acre homestead was patented to Alexander in 1871 (General Land Office [GLO] 2012). The family would have been living on the property no later than 1866 because a homestead applicant was required to live on their claim for five years and improve it by building a 12-by-14 dwelling and planting crops (Gates 1968:394). Bower's (1867) shows that Sutherland claimed the quarter-section at that time, and Thompson's 1877 county atlas shows the Sutherland house at the eastern edge of the property, roughly where the existing buildings are located (Figure 11).

The 1880 census of agricultural products shows that Sutherland's chief crops were apples and grapes (USBC 1880b). According to the census, he had two acres of orchard and 25 acres of vineyard in 1880 (USBC 1880b); however, elsewhere Sutherland is described as having 50 acres of zinfandel grapes (Peninou 1998:110). Peninou also states that "Part of the estate remained in the family through the Dry years, but the vineyards were neglected."

Ann Sutherland died in October of 1894 and Alexander never remarried. His sons Robert and James took over the property as their father aged. The portion of the property that contains the existing buildings was deeded to Robert in 1899 (Deeds book 187, page 301). The two barns and other outbuildings on the property were likely built during his ownership.

During the early 1900s, Robert advertized the farm as the "Highlands," a rural resort that was touted as "An ideal farm resort" with croquet and tennis grounds and a large amusement pavilion with a piano and phonograph (Northwestern Pacific Railroad 1909:81). The advertisement features a photograph of the family's house with a second building in the background. The house is no longer standing but the second building is extant and is discussed later in the report. During this period, Robert continued to be listed as a farmer in the census (USBC 1900, 1910).

Robert sold the property to Charles Mehrten in 1917 (Deeds book 356, page 95) and moved his family to McDonald Avenue in Santa Rosa (Ancestry.com 2005; USBC 1920). Four months after acquiring the property he sold it to John Irmer (Deeds book 366, page 267). Irmer and is family lived on the property for about seven years. During that time, Irmer's daughter Martha met and married George Sutherland, whose father James owned adjoining acreage.

Ora Hassett purchased the parcel from Irmer in 1925 (Official Records book 95, page 474). There is no evidence that Hassett lived on the property. Rather, voter records for the middle years of the 20th century show a series of tenants while Irmer and Hassett owned the property, as shown in Table 1 (Ancestry.com 2008a, b, c, d). By 1930, Hassett and his wife lived in San Francisco (USBC 1930b) but owned the property until the time of his death in 1945. After Hassett, the property was owned by William Armstrong (Official Records book 217, page 342). No information was found regarding the Armstrong family. The Steiner family acquired the property during the 1960s, and David Steiner replant a vineyard on the property in 1973 (Jordan 2008).

Property Tenants circa 1924 to 1940

Tenant	Years	Occupation	Source
Fred & Abbie Kynoch	1924	Farmer	Voter Registration 1924
Herman& Clare Trostman	1926, 1930	Farmer;Stockman	Voter Registration 1926; Census 1930a
Clark & Fern Bradford	1932, 1934	Rancher	Voter Registration 1932, 1934
William & Edith Cussins	1938, 1940	Farmer	Voter Registration 1938, 1940

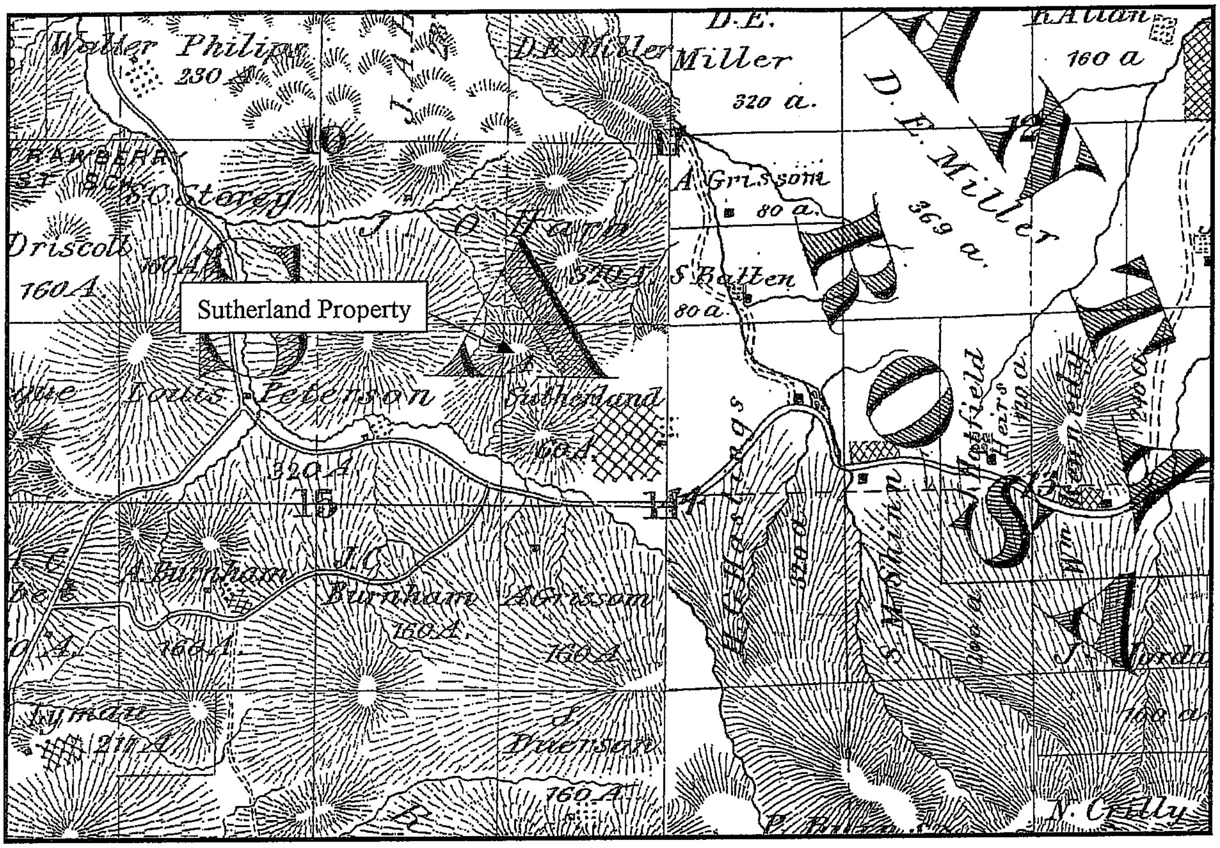


Figure 11. The Sutherland homestead shown on the 1877 Sonoma County atlas.

Statement of Significance
This building was evaluated for inclusion on the California Register of Historical Resources (California Register). Briefly, a resource eligible for the California Register is one that meets one of the following criteria.

1. Is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

2. Is associated with the lives of persons important to local, California, or national history.

3. Embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of a master, or possesses high artistic values.

4. Has yielded, or may be likely to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, eligibility to the California Register requires that a resource retain sufficient integrity to convey a sense of its significance or importance. As defined by the State, "Integrity is the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance" (California Office of Historic Preservation 2001:11). Seven elements are considered key in considering a property's integrity: location, design, setting, materials, workmanship, feeling, and association.

Within the context of *Sonoma County Agriculture, 1850 to 1970*, it was necessary to determine whether the property illustrates and conveys the importance of that context, and whether it retains sufficient integrity to be a good representative. The following conclusions were reached with regard to this property's eligibility for the California Register criteria as an individual resource.

Criterion 1. In order to be considered important under Criterion 1, the property needs to be able to convey its importance in events or patterns that are significant in federal, state, or local history. The The Belden Barns complex is associated with both Sonoma County agriculture and recreation and leisure; however, it comprises an eclectic collection of buildings that do not convey the importance of either context in this area. Criterion 1 is not met.

Criterion 2. Under Criterion 2, a property can be significant because of its association with an important person but the association must be one that reflects the reason for the person's importance. The Sutherland family owned this property for nearly 80 years beginning in the 1860s. None of the early homestead buildings are extant. Of those that are standing, the oldest ones date to the tenure of Robert G. Sutherland at the turn of the 20th century. Although the Sutherland's had a long history in the area, they are not of particular historical note. Criterion 2 is not met.

Criterion 3. Criterion 3 speaks to the architectural significance of a property. The buildings that makeup the Belden Barns complex are not architecturally distinctive, and the property does not meet Criterion 3.

Criterion 4. Criterion 4 generally applies to archaeological resources or built resources that, through study of construction details, can provide information that cannot be obtained in other ways. These buildings possess no intrinsic qualities that could answer questions or provide important information about our history, and Criterion 4 is not met.

Conclusion
Buildings comprising the Belden Barns complex do not meet the criteria for inclusion on the California Register and are not important resources.

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LOCATION MAP

Primary #: P-
HRI #:
Trinomial:
Resource Name or #: Belden Barns Complex
Date of Map: 1971

Map Name: Glen Ellen
Scale: 7.5'