

Draft

ROBLAR ROAD QUARRY

Environmental Impact Report
SCH # 2004092099

Prepared for
County of Sonoma Permit and
Resource Management Department

May 2008



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CHAPTER I

Introduction

A. Environmental Review

The project applicant, North Bay Construction, Inc., proposes to develop a quarry (Roblar Road Quarry) in southern Sonoma County, approximately five miles west of the City of Cotati. The project applicant has requested the necessary entitlements from the County of Sonoma to enable development of the quarry. Approval of this request would grant a use permit for mining for a 20-year period, under the terms of the County's Aggregate Resource Management (ARM) Plan, mining regulations, and any approval conditions that are imposed. The proposed project would disturb approximately 70 acres (including a 65-acre quarry pit) of the approximate 199-acre parcel over a 20-year mining period. The Roblar Road Quarry proposes to mine approximately 570,000 cubic yards of quarry material annually (approximately 2,260 cubic yards per day).

The California Environmental Quality Act (CEQA) requires that before a decision can be made to approve a project with potentially significant environmental effects, an EIR must be prepared that fully describes the environmental effects of the project. The EIR is a public information document for use by governmental agencies and the public to identify and evaluate potential environmental consequences of a proposed project, to recommend mitigation measures to lessen or eliminate adverse impacts, and to examine feasible alternatives to the project. The information contained in the EIR is reviewed and considered by the governing agency prior to the ultimate decision to approve, disapprove, or modify the proposed project.

CEQA requires that the Lead Agency (in this case, the County of Sonoma) shall neither approve nor implement a project as proposed unless the project's significant environmental effects have been reduced to a less-than-significant level, essentially "eliminating, avoiding, or substantially lessening" the expected impact. If the Lead Agency approves the project despite residual significant adverse impacts that cannot be mitigated to less-than-significant levels, the agency must state the reasons for its action in writing. This "Statement of Overriding Considerations" must be included in the record of project approval.

On August 4, 2004, the County sent a Notice of Preparation (NOP) to governmental agencies and organizations and persons interested in the project. The NOP is included as Appendix A. The NOP requested those agencies with regulatory authority over any aspect of the project to describe that authority and to identify the relevant environmental issues that should be addressed in the EIR. In addition, the County held a public scoping meeting on September 1, 2004, at Dunham Elementary School in Sonoma County.

During the time the Draft EIR is available for public review, written comments on the adequacy of the Draft EIR may be submitted to the County. Responses to all substantive comments received on the adequacy of the Draft EIR and submitted within the specified review period will be included and responded to in the Final EIR. Prior to approval of the project, the County must certify the Final EIR and adopt a reporting and monitoring program for mitigation measures identified in this report in accordance with the requirements of Public Resources Code Section 21081.

B. This EIR

This EIR has been prepared by the County of Sonoma as Lead Agency in conformance with the California Environmental Quality Act. This EIR is intended to provide the information and environmental analysis necessary to assist public agency decision-makers in considering all of the approvals necessary to implement the proposed project.

In conformance with CEQA, California *Public Resources Code*, Section 21000 *et. seq.*, this EIR provides objective information addressing the environmental consequences of the proposed project and possible means of reducing or avoiding its potentially significant impacts.

The guidelines for implementing CEQA help define the role of this EIR:

15121 (a) Information Document. An EIR is an informational document which will inform public agency decision-makers and the public generally of the significant environmental effect(s) of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. The public agency shall consider the information in the EIR along with other information which may be presented to the agency.

15151 Standards for Adequacy of an EIR. An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

Plans for the project have proceeded to a degree sufficient to permit environmental analysis in conformance with CEQA. Accordingly, this EIR presents reasonable assumptions (as described in Chapter III, Project Description) about the overall types and levels of activities that the County could anticipate under the proposed project and describes their attendant environmental impacts. The analyses, where necessary, are based on conservative assumptions that tend to overstate project impacts. The EIR was prepared in accordance with current State, County and other applicable agency CEQA *Guidelines* and professional standards.

The *CEQA Guidelines*, Section 15382, define a significant effect on the environment as “a substantial, or potentially substantial, adverse change in any of the physical conditions within

the area affected by the project. . .” Therefore, in identifying the significant impacts of the project, this EIR concentrates on its substantial physical effects and upon mitigation measures to avoid, reduce, or otherwise alleviate those effects.

C. Range of Alternatives

CEQA requires that a reasonable range of alternatives be discussed in an EIR. This EIR identifies and analyzes such a reasonable range of alternatives; discusses the environmental effects of each alternative; and compares the environmental effects of each alternative with the environmental setting and with the project; and addresses the relationship of each alternative to the project objectives. The determinations of the County concerning the feasibility, acceptance, or rejection of each and all alternatives considered in this EIR will be addressed and resolved in the County’s findings when it considers approval of the project, as required by CEQA.

The alternatives consist of the following:

- 1) No Project Alternative consisting of 1A) a No Project - No Subsequent Development Alternative, and 1B) a No Project – Reasonably Foreseeable Development Alternative,
- 2) Alternative Haul Route / Contracted Sales Only Alternative
- 3) Reduced Production [(285,000 cubic yards (CY)) / Reduced Size (Phases 1 and 2 Footprint) Alternative

D. Use of the EIR

The EIR provides the environmental information and evaluation necessary for the planning, construction, operation and maintenance of the project. The EIR provides the CEQA compliance documentation upon which the County’s consideration of, and action on, all applicable land use permits and other approvals (collectively, “approvals”) shall be based. These include without limitation all those approvals set forth in this EIR, as well as any additional approvals necessary or useful to such planning, construction, operation and maintenance (e.g., any use permits, grading permits, and other development-related approvals).

E. Public Participation

The California Environmental Quality Act and the County of Sonoma encourage public participation in the planning and environmental review processes. Opportunities will be provided for the public to present comments and concerns regarding the CEQA and planning process through a CEQA public review and comment period and public hearings or meetings before the Sonoma County Planning Commission, and thereafter, the Sonoma County Board of Supervisors. Written public comments may be submitted to the County of Sonoma at any time during the public review and comment period, and written and spoken comments may be presented at the public hearings.

F. Organization of the Draft EIR

The Draft EIR begins with this Introduction (Chapter I), which provides an overview that describes the intended use and organization of this EIR, and sets forth some of the assumptions critical to the environmental analysis. The chapters following the Introduction are organized as follows:

Chapter II, Summary: The Summary summarizes the EIR by providing an overview of the project, the environmental impacts that would result from the project, the mitigation measures identified to reduce or eliminate these impacts, and the alternatives to the project.

Chapter III, Project Description, provides a description of the project site and location, the project goals and objectives, the project setting, the proposed project components, an outline of the approval process, and project construction and completion.

Chapter IV, Environmental Setting, Impacts, and Mitigation: This chapter describes the existing setting, discusses the environmental impacts of the project, describes cumulative impacts, and identifies mitigation measures for the environmental impacts examined in the EIR. The issues addressed in the EIR are Land Use and Agricultural Resources; Geology, Soils and Seismicity; Hydrology and Water Quality; Biological Resources; Traffic and Circulation; Air Quality; Noise and Vibration; Hazardous Materials; Aesthetics; Public Services and Utilities; and Cultural Resources.

Chapter V, Alternatives: This chapter presents a reasonable range of alternatives to the proposed project, provides discussion of the environmental impacts associated with each alternative, compares the relative impacts of each alternative to those of the project, and discusses the relationship of the alternatives to the project objectives.

Chapter VI, Impact Overview: This chapter presents discussions of growth inducement, and summarizes discussions of cumulative impacts, unavoidable significant impacts, and effects found not to be significant.

Chapter VII, Report Preparation: This chapter lists report preparers and identifies persons and organizations consulted during report preparation (if any).

Appendices: The Appendices contain, the Notice of Preparation and a number of EIR technical supporting documents, including a Farmland Conversion Study.

References cited throughout this EIR are on file and available for public review at the Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, in Santa Rosa, unless otherwise specified herein.

CHAPTER II

Summary

A. Project Description

The project applicant, North Bay Construction, Inc., proposes to develop a quarry (Roblar Road Quarry) in southern Sonoma County, approximately five miles west of the City of Cotati. The project applicant has requested the necessary entitlements from the County of Sonoma to enable development of the quarry. Approval of this request would grant a use permit for mining for a 20-year period, under the terms of the County's Aggregate Resource Management (ARM) Plan, mining regulations, and any approval conditions that are imposed. The proposed project would disturb approximately 70 acres (including a 65-acre quarry pit) of the approximate 199-acre parcel over a 20-year mining period. The Roblar Road Quarry proposes to mine approximately 570,000 cubic yards of quarry material annually (approximately 2,260 cubic yards per day). The County of Sonoma, serving as Lead Agency responsible for administering the environmental review for the proposed project, determined that preparation of an environmental impact report (EIR) is needed for the proposed project because it has the potential to cause significant effects on the environment.

B. Environmental Impacts and Mitigation Measures

Potential environmental impacts of the project are summarized in Table II-1 at the end of this chapter. For each significant impact, the table indicates whether the impact would be mitigated to a less-than-significant level. Please refer to Chapter IV, Environmental Setting, Impacts, and Mitigation Measures, in this EIR for a complete discussion of each impact. As discussed in Chapter I, a reporting and monitoring program for all mitigation measures identified in this EIR would be prepared in accordance with the requirements of Public Resources Code Section 21081.

The proposed project, if implemented, could result in significant adverse environmental impacts. Mitigation measures proposed as part of the project, as well as measures identified by this EIR, would avoid or reduce most of the impacts to a less-than-significant level. The following significant adverse impacts would be unavoidable, even with the implementation of the mitigation measures proposed as part of the project and identified in this report:

- Impact A.1 – Effect of change in land use (introduction of active mining operations) on compatibility with residential land uses in the project vicinity.
- Impact E.8 – Potential secondary impacts from implementation of certain off-site transportation mitigation improvements.

CHAPTER II

Summary

A. Project Description

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The proposed project, if implemented, could result in significant adverse environmental impacts. Mitigation measures proposed as part of the project, as well as measures identified by this EIR, would avoid or reduce most of the impacts to a less-than-significant level. The following significant adverse impacts would be unavoidable, even with the implementation of the mitigation measures proposed as part of the project and identified in this report:

- Impact A.1 – Effect of change in land use (introduction of active mining operations) on compatibility with residential land uses in the project vicinity.
- Impact E.8 – Potential secondary impacts from implementation of certain off-site transportation mitigation improvements.

- Impact F.1 – Project emissions of NO_x.
- Impact F.7 – Project contribution to cumulative regional criteria pollutants and TACs.
- Impact I.1 – Substantial alteration in the visual character of the project site and adverse effect on views of the site from both public and private vantage points.

The following significant adverse impacts would be unavoidable if mitigation measures identified in the EIR were found to be infeasible:

- Impact E.2 – Project contribution to Long-Term Cumulative traffic volume at certain study intersections during the weekday a.m. and p.m. peak hours, and Saturday peak hour.
- Impact E.3 – Addition of substantial truck traffic to certain primary haul roads that are designated proposed bikeways and/or are regularly used by bicyclists or pedestrians, and which do not meet current County roadway design standards.
- Impact E.4 – Addition of substantial truck traffic to certain primary haul roads that do meet current County roadway design standards and/or contain limited sight distance.
- Impact E.5 – Inadequate site access.
- Impact E.6 – Project contribution to the degradation of pavement on certain public roads.
- Impact G.2 – Project increase in ambient noise levels at certain sensitive receptors on roadways used to access the quarry.
- Impact G.4 – Project contribution to increase in cumulative noise levels at certain sensitive receptors on roadways used to access the quarry.

If the County approves the project despite the identified significant and unavoidable impacts, the County must state the reasons for its action in writing. This “Statement of Overriding Considerations” must be included in the record of project approval.”

C. Alternatives

This chapter discusses the following alternatives to the proposed project: No Project Alternative consisting of 1A) a No Project - No Subsequent Development Alternative, and 1B) a No Project – Reasonably Foreseeable Development Alternative; 2) Alternative Haul Route / Contracted Sales Only Alternative, and 3) Reduced Production [(285,000 cubic yards (CY)) / Reduced Size (Phases 1 and 2 Footprint) Alternative. Of the alternatives assessed in this EIR, the alternative with the least environmental impact is the No Project – No Subsequent Development Alternative. Section 15126.6(e)(2) of the CEQA *Guidelines* state that if the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Consequently, the Alternative Haul Route / Contracted Sales Only Alternative is determined to be the environmentally superior alternative.

**TABLE II-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
A. Land Use and Planning			
Impact A.1: The proposed quarry would introduce active mining operations on a primarily undeveloped site. The effect of this change in land use on compatibility with residential land uses in the project vicinity would be a potentially significant impact.	Potentially Significant	None available beyond those identified in the EIR	Significant and Unavoidable
Impact A.2: The project would not result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, the proposed project would have no impact on these resources.	No Impact	None Required	
Impact A.3: The proposed quarry project would result in both temporary and permanent conversion of Farmland on the project site to non-agricultural use. This would be a potentially significant impact.	Potentially Significant	Implement Mitigation Measure A.4	Less than Significant
Impact A.4: The project would conflict with a Williamson Act Contract governing the project site. This would be a potentially significant impact.	Potentially Significant	Mitigation A.4: No development of the project may commence until the Williamson Act contract # 2-387-72 covering the 70-acre portion of the project site is rescinded in accordance with Government Code Section 51256, 51256.1 and 51292, and transfer of a permanent conservation easement on the 244-acre exchange site for future stewardship to an appropriate private land trust or government conservation agency is simultaneously completed.	Less than Significant
Impact A.5: The project would result in both temporary and permanent loss of Grazing Land and Farmland of Local Importance on the project site. The effect of this on the cumulative loss of farmland within Sonoma County would be less than significant.	Less than Significant	None Required	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
B. Geology, Soils, and Seismicity			
<p>Impact B.1: In the event of a major earthquake in the region, seismic ground shaking could result in injury to site workers, increase the potential for slope instability, and cause overturning of tall, non anchored, portable mining equipment. This would be a less than significant impact.</p>	<p>Less than Significant</p>	<p>None Required</p>	
<p>Impact B.2: Rock and soil slopes that are over-steepened due to proposed mining practices could fail causing landslides, bedrock slope failures, and debris flows within the project property. Potential slope failures within the project property could injure on-site workers and trigger excessive erosion. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure B.2a, as recommended in this report: Prior to placement of overburden in the proposed stockpile locations, all areas receiving material shall be cleared and stripped. Where overburden materials are placed on underlying supporting slopes steeper than 6:1 (H:V), the fill area shall be prepared by constructing horizontal benches into firm natural soil or rock. The benches shall be at least 8 feet in width, with a step of at least 4 feet between benches. Overburden stockpile material shall be placed and compacted using conventional heavy equipment. All grading work and fill placement plans shall be in a conformance with SMARO and the UBC and be approved, in writing, by a California registered Geotechnical Engineer and a California Certified Engineering Geologist.</p> <p>Mitigation Measure B.2b, as recommended by the applicant: The applicant shall construct a small sedimentation pond downstream of the toe of the Stockpile Area "B" designed and sized to minimize erosion of any soil material into Ranch Tributary and Americano Creek. The dike of the sedimentation pond shall be placed across the natural swale and the pond constructed similar to the proposed main sedimentation pond at the entrance of the quarry. The sedimentation pond design shall be developed by a Registered Civil Engineer, and submitted to PRMD for approval.</p> <p>Mitigation Measure B.2c, as recommended by the applicant: In areas where cut-slopes intercept saturated seepage zones during construction of access roads, the applicant shall install appropriate improvements into the finished slope (i.e. subsurface drains, localized slope support, or compacted fill buttresses). The final slope treatment must be designed and approved by a California registered Geotechnical Engineer and be consistent with the UBC and be in compliance with the SMARO.</p>	<p>Less than Significant</p>

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact B.3: Vegetation removal and ground disturbance associated with overburden stripping, overburden stockpiling, quarrying, and grading associated with road construction and construction of ancillary features would result in accelerated erosion and soil loss. This would be a potentially significant impact.</p>	Potentially Significant	<p>Mitigation Measure B.2d, as recommended in this report: A California registered Geotechnical Engineer shall inspect on a quarterly basis the quarry slopes during excavation (in addition to following major storms, earthquakes, or blasting) to assess bedrock fracture and joint conditions. The inspection shall require continued mapping and movement monitoring of the mining slopes to assess slope stability. If a slope condition presents risk to mine safety or the potential for erosion/siltation, repair measures shall be implemented. Engineering recommendations for slope repair or stabilization shall be approved by PRMD and incorporated into the proposed project.</p> <p>Mitigation Measure B.3a: Implement Mitigation Measure B.2b.</p> <p>Mitigation Measure B.3b, as recommended by the applicant: Re-vegetation of the site shall comply, as required, with Section 26A-11-040, part c of the SMARO. The reestablishment of protective vegetative cover greatly reduces the velocity of surface water runoff on natural soils and fill slopes. In turn, this reduced velocity sharply decreases the erosion potential of these materials to near or even below pre-development erosion rates.</p> <p>Mitigation Measure B.3c, as recommended by this report: All surface and subsurface drainage facilities, siltation retention structures, and larger cuts and fills, including overburden stockpiles, shall be inspected quarterly and after major storm events to confirm adequate performance by mine personnel. Such facilities shall be cleaned, and maintained on an annual basis and routinely inspected for erosion and slippage during the rainy season. This measure would reduce the potential for erosion-induced damage and siltation.</p>	Less than Significant
<p>Impact B.4: The use of controlled detonations (blasting) to fracture and loosen rocks during quarry operations excavation may produce vibratory ground motion capable of triggering slope displacement or failure. This would be a less than significant impact.</p>	Less than Significant	None Required.	
<p>Impact B.5: The development proposed as part of the project would not result in significant cumulative impacts with respect to geology, soils or seismicity. This would be a less than significant impact.</p>	Less than Significant	None Required.	

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
C. Hydrology and Water Quality			
<p>Impact C.1: The removal of Wilson Grove overburden material and exposure of bedrock would increase the amount of stormwater runoff leaving the site and increase peak flows in Ranch Tributary and Americano Creek. The additional flows caused by the project could lead to downstream flooding and excessive bank erosion. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure C.1a: At project approval, the applicant shall implement a baseline flow and creek stage monitoring program for the Ranch Tributary and Americano Creek. This program shall continue the flow monitoring program currently underway through the project duration, and as determined by the SCWA and the Sonoma County PRMD, through post-reclamation. The required monitoring program should include two locations of Ranch Tributary (representative of upstream and downstream conditions) and three representative locations on Americano Creek (i.e., upstream location at east property boundary, and locations upstream and downstream of Ranch Tributary). Flow and creek stage monitoring shall be conducted quarterly and following winter storm events. The applicant shall apply the data to design of stormwater discharge facilities to ensure that stormwater discharges from the site do not exceed pre-project flows in Ranch Tributary and Americano Creek. Flow and creek stage data shall also be used to determine discharge rates and shall be compiled for use in obtaining the necessary NPDES discharge permits. The Applicant shall submit baseline flow monitoring data to the Sonoma County Water Agency and Sonoma County PRMD.</p> <p>Mitigation Measure C.1b: The applicant shall prepare, for review and approval by the Sonoma County PRMD, a drainage plan that addresses stormwater runoff from the proposed quarry during active mining and post reclamation. The stormwater drainage plan must ensure that the peak stormwater and seasonal non-stormwater flows are managed to the extent that stormwater flow entering Americano Creek and Ranch Tributary from the project site does not exceed pre-project baseline flows during the 2-, 10-, 25-, 50- and 100-year storm events. The drainage plan shall include specific design criteria that ensure 1) the proposed sediment ponds operate as a stormwater runoff detention feature with the capacity to contain and manage at least a 25-year return storm and 2) alternative on-site stormwater detention strategies are implemented to ensure that stormwater flows are adequately detained so discharges to Americano Creek and Ranch Tributary do not exceed baseline discharge rates. Alternative detention strategies could include alternate detention basins, expanded use of the quarry floor for detention, or expanded use of infiltration areas for percolation and storage. The drainage plan and accompanying design calculations shall demonstrate that on-going and post-reclamation discharges to Americano Creek and Ranch Tributary would not exceed baseline discharge levels.</p>	<p>Less than Significant</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact C.2: During initial construction grading and operation of the proposed project, disturbed and unprotected soil could erode from contact with wind and water causing an increased amount of sediment and other pollutants to be carried downstream through the drainage system. This could contribute to the existing sediment loads in Ranch Tributary, Americano Creek, and Estero Americano. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure C.1c: All on-site drainage facilities shall be constructed according to Sonoma County Water Agency’s Flood Control Design Criteria and the Sonoma County PRMD standards and requirements, and shall be operated and maintained in accordance with the prepared drainage plan during operation of the quarry and post-reclamation.</p> <p>Mitigation Measure C.2a: <i>Develop Water Quality Protection Program.</i> The applicant shall develop and implement a Water Quality Protection Program (WQPP) to control sediment and pollutant runoff from the quarry during its operational life and beyond through post reclamation. All structural elements and processes shall be designed and approved by a professional civil engineer experienced in stormwater management and sediment control. The design shall meet the standards of the Sonoma County SMARO. All hydrologic and engineering calculations, including sediment trap efficiency, shall be submitted to the County for review and approval prior to commencement of project grading.</p> <p>The WQPP consists of several elements, as discussed below, to control the source of sediment and the discharge of that sediment into the adjacent receiving waters of Americano Creek and Ranch Tributary.</p> <p><i>Storm Water Pollution Prevention Plan (SWPPP)</i> As required by the SWRCB (see Regulatory Framework section above), the applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP) that adequately addresses control and reduction of stormwater laden with sediment or other pollutants. The applicant shall submit a copy of the SWPPP to the County PRMD. The applicant shall comply with requirements set forth by the RWQCB in the SWPPP Program for annual reporting and water quality sampling, which typically includes annual reports and reports of failed best management practices (BMPs). The SWPPP shall be regularly updated as BMPs are updated and new BMPs are constructed and/or the quarry operation changes. The SWPPP shall be implemented during the initial stage of quarry construction and stay in effect through the completion of reclamation.</p> <p><i>Aggressive Source Control.</i> The WQPP shall outline and describe source control measures designed to prevent erosion. Specific measures, as cited below, shall be adapted from the most current edition of the <i>Stormwater Best Management Practice Handbook for Construction</i>, published by the California Stormwater Quality Association (CASQA). Equivalent measures deemed more effective by the North Coast RWQCB may be substituted.</p>	<p>Less than Significant</p>

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<ul style="list-style-type: none"> • Reclamation or stabilization of all quarry slopes and the quarry floor (excluding the working/processing/stockpile/loading/access areas) shall be completed by October 1 of each year. Stabilization measures include hydraulic application of surface stabilizing compounds, hydroseeding, mulching, or other measures to prevent erosion. To insure accurate compliance with this condition, the applicant shall submit to the Sonoma County PRMD, a site plan or aerial photograph clearly depicting the extent of mining and reclamation on the site every five years during mining and reclamation and at the completion of reclamation; • In areas not being actively mined, bare soil shall be protected from erosion with the application of hydraulic mulch or hydroseeded; • In areas requiring temporary protection until a permanent vegetative cover can be established, bare soil shall be protected by the application of straw mulch, wood mulch, or mats; • To the extent practical, benches should be back-sloped or provided with rock or straw bale checks so that sediment is trapped on the benches rather than washed into the sediment ponds; and • Benches shall drain into adequately sized pipes or rock-lined channels that convey the runoff to the quarry floor. Outlets of pipes shall have appropriate energy dissipaters to prevent erosion at the outfall. <p>Sediment Retention Measures. The WQPP shall include specific measures to trap eroded sediment on site to prevent a discharge to receiving waters. Specific measures cited below shall be adapted from the most current edition of the CASQA Stormwater BMP handbook for construction. The applicant shall install sediment retention measures prior to winter (on or about October 15) or in areas receiving surface water runoff in the dry season (e.g. the areas receiving seepage from the quarry walls). Sediment retention measures shall be regularly inspected by quarry personnel and corrective action shall be conducted in the event that the measures fail. Inspection and performance of the sediment retention measures shall be included in the SWPPP and included in the required annual report. Equivalent measures deemed more effective by the North Coast RWQCB may be substituted.</p> <ul style="list-style-type: none"> • Silt fences, fiber rolls, and straw bale barriers shall be used on bare slopes not being actively mined to intercept and trap sediment carried by sheet flow; • The program shall include a description of the construction method for the sediment ponds, including the design storm and spillways; 	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<ul style="list-style-type: none"> • The applicant shall design the proposed sediment ponds to the maximum size practical for the available space. The sediment pond shall include a forebay to trap coarse soil particles before the runoff enters the main sediment ponds. Recognizing that the sediment ponds may not be large enough to trap very fine particles such as clay, the design shall include supplemental treatment that can be used as needed to meet the water quality discharge criteria for this project. Supplemental treatment may be chemical treatment that promotes fine particle settlement, mechanical filters to remove fine particles, or other measures approved and required by the North Coast RWCQB for this particular project; • All runoff from actively mined or reclaimed areas shall be directed through the sediment pond. Stormwater may be released from the ponds between storm events so long as the water to be released meets the discharge requirements established for this project by the RWQCB; <p>Implement Contaminant-Control BMPs. The applicant shall implement BMPs to reduce the potential for discharge of contaminants to storm water runoff. These BMPs shall be designed by a civil engineer and the design engineer shall oversee BMP installation. To minimize the introduction of contaminants which may degrade the quality of water discharged from the site, the following measures shall be taken:</p> <ul style="list-style-type: none"> • Fueling and maintenance of all rubber-tired loading, grading and support equipment shall be prohibited within 100 feet of drainage ways. Fueling and maintenance activities associated with other less mobile equipment shall be conducted with proper safeguards to prevent hazardous material releases. All refueling and maintenance of mobile vehicles and equipment shall take place in a designated area with an impervious surface and berms to contain any potential spills; • The site shall be controlled by maintaining security fencing and locking gates and posted trespass signs at all vehicular access points to the site to prevent unauthorized entry; • Runoff from the access roads shall be captured and treated either in the main sediment pond or in a separated sediment retention pond located at the base of the access road. The sediment pond shall be designed and constructed to accommodate runoff from the road during a 25-year design storm and be capable of reducing sediment load to not exceed pre-project baseline at the discharge point; and 	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<ul style="list-style-type: none"> • All chemical dust suppressants and slope stabilization chemicals or polymers, and sediment pond enhancement chemicals or polymers shall be EPA-approved and shall be used strictly according with the manufacturer's directions. An accurate accounting of the kinds and quantities of these materials used on the site shall be maintained by the operator. <p>Mitigation Measure C.2b: Develop and Implement Stormwater Monitoring Program. The applicant shall collect representative samples from all stormwater discharge outfalls (at the location where the discharge leaves the sediment pond or where the discharge leaves the site) while discharges are occurring in compliance with the requirements of General Permit (No. CAS000001) for Discharges of Storm Water Associated with Industrial Activities. Unless specific water quality goals or waste discharge limits are established for the quarry by the RWQCB, discharges shall not exceed water quality objectives outlined in the North Coast RWQCB Basin Plan. Water sampling shall be conducted by a third-party consultant and water samples shall be submitted to a California-certified analytical laboratory for analysis. The Stormwater Monitoring Program required during the project shall be consistent with the pre-project baseline sampling and analysis effort that commenced in 2007. The monitoring program shall include:</p> <ul style="list-style-type: none"> • Collection of samples at upstream and downstream of the quarry outfalls in Ranch Tributary during discharges from the site (at the same frequency as described above); • All of the semi-annual samples shall be analyzed for pH, TSS, turbidity, specific conductance, and total organic carbon (as required by the General Permit) and total and dissolved iron, manganese and petroleum, and oil and grease by a State-certified analytical laboratory (note that this sampling program shall be designed to coincide and work in concert with the water quality sampling required as part of Mitigation Measure C.4; and • The surface water quality data shall be analyzed by a qualified professional for indications of exceedance of water quality benchmarks and/or changing conditions in water quality that could indicate a potential impact to water quality conditions in Ranch Tributary. 	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>The applicant shall submit a monitoring report to the RWQCB with a copy submitted to the Sonoma County PRMD. Frequency of reporting shall be determined by the RWQCB but shall not be less frequent than twice each rainy season. The qualified water quality professional conducting the monitoring shall provide an analysis of the data and an evaluation of the overall effectiveness of the sediment control system. If the water quality objectives have been exceeded, the report shall include analysis as to the specific causes of the exceedances and recommended measures to bring the discharges into compliance.</p> <p>Mitigation Measure C.2c: Implement corrective measures to meet water quality objectives, if necessary. Once mining is underway, if annual surface water monitoring indicates that discharges from the quarry exceeded the water quality objectives, the applicant shall propose changes to the sediment control program that will improve its performance sufficiently to meet the performance criteria. Corrective action may include, but is not limited to, additional source control BMPs, expansion of the existing detention ponds, use of chemical flocculation, installation of mechanical filtration of the discharge, construction of extended wet ponds and/or treatment wetlands. The proposed changes shall be submitted to the RWQCB for comment, revised as needed to address their comments, and then implemented by the applicant. If the performance criteria are not met for two consecutive years, the County will confer with the applicant and the RWQCB and Sonoma County PRMD to determine whether further changes in the sediment control plan are likely to result in compliance. If suitable changes are not identified, then the County shall require the quarry to reduce production as needed to meet the performance criteria.</p> <p>Mitigation Measure C.2d: Maintain and repair storm damage to conveyance and water quality control systems, as necessary. The applicant shall maintain procedures to ensure prompt identification and repair of damage to the drainage and water quality control systems, especially after large storm events. The applicant shall conduct routine inspection and maintenance of the stormwater and sediment control facilities. Stormwater drainage conveyance and outfalls shall be inspected monthly during the dry season and after each rain storm between October and March. If inspections reveal that stormwater conveyance of water quality control facilities (e.g. sediment ponds, energy dissipation structures) are damaged, corrective actions shall be implemented immediately. The applicant shall immediately report, to the Sonoma County PRMD, any storm-related drainage or sediment control system failure that results in discharge of sediment to Ranch Tributary or Americano Creek. The applicant shall submit a written report within 72 hours and describe the occurrence, corrective action, and observed performance of the corrective action.</p>	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact C.3: Excavation of the proposed quarry could initiate groundwater seepage from the surrounding Wilson Grove Formation and/or the underlying fractured Tolay Volcanics. This condition would contribute to surface water runoff in the quarry that could exceed capacity of drainage and storage features proposed as part of the project. This would be a potentially significant impact.</p>	Potentially Significant	<p>Mitigation Measure C.3: The drainage plan identified in Mitigation Measure C.1 shall account for additional flows created by groundwater seepage expected to occur through the quarry walls. The plan shall consider management of seepage during operation, as well as, in the long term following reclamation and be based on conservative estimates of seepage derived from measured hydraulic conductivities in the weathered and unweathered Wilson Grove Formation and the Tolay Volcanics. The drainage plan shall include measures to ensure that the quarry wall seepage can be managed by stormwater flow conveyance structures and that these structures would no be overwhelmed during the 2-, 10-, 25-, and 100-year storm events large storm events.</p>	Less than Significant
<p>Impact C.4: Excavation of the proposed quarry could cause groundwater which may contain contaminants to enter the quarry walls as seepage. In addition, groundwater from the on-site production wells proposed to be used for quarry operations may contain contaminants. Contaminated water could degrade water quality in Ranch Tributary and Americano Creek if not properly contained and treated prior to discharge. This would be a potentially significant impact.</p>	Potentially Significant	<p>Mitigation Measure C.4a: Due to the anomalous groundwater chemistry results in monitoring well MW-2, and the potential for cross-contamination that may have occurred during the original installation of one or more of the on-site monitoring wells, the applicant shall install a new monitoring well to replace MW-2, and shall redevelop monitoring wells MW-1, MW-3, DW-1 and DW-2. In addition, a new monitoring well (hereafter named well MW-4) shall be installed on the quarry property at a location north of the proposed Phase 3 footprint, in line between wells DW-1 and DW-2. The selected driller shall be experienced in environmental drilling activities and subject to approval by the County. Site selection and installation/ redevelopment work scope shall be developed in consultation with, and approved by, the County. The County shall also provide oversight during installation/ redevelopment of the wells.</p> <p>Mitigation Measure C.4b: Split samples shall be collected under County supervision from the four on-site monitoring wells (MW-1, new MW-2, MW-3 and new MW-4) and two existing onsite production wells (wells DW-1 and DW-2) each quarter to continue to provide water quality data and provide an early warning of potential groundwater contamination, including any potential contamination that could be entering the quarry property from the Roblar Landfill property. The split samples shall go to different State-certified laboratories. Water samples shall be tested for the same suite of analytes used at the adjacent Roblar Landfill during the 2004 through 2008 monitoring events, and at the project site during the 2007/08 monitoring events. The QA/QC protocol for the sampling and analysis program shall be developed in consultation with, and approved by, the County. Quarterly water sample results shall be sent to and reviewed by the Sonoma County PRMD.</p>	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>Mitigation Measure C.4c: In conjunction with the groundwater sampling program, groundwater levels in the three onsite monitoring wells (MW-1, new MW-2, and MW-3), two existing onsite production wells (well DW-1 and DW-2), as well as the adjacent landfill property wells (R-1, R-2 and R-3) shall be measured to allow continued monitoring of groundwater levels and potential localized changes in gradient in the site vicinity.</p> <p>To ensure consistency in measured groundwater level data, prior to mining and as required, all the existing and proposed wells on the quarry and landfill properties to be used for monitoring shall be surveyed by a licensed surveyor for location and elevation, referenced to mean sea level, utilizing the North American Datum of 1988-GEOID 99 (NAVD88).</p> <p>Mitigation Measure C.4d: If sampling detects the introduction of contaminated groundwater in a production well at levels that would exceed the quarry's NPDES surface water discharge limits, the well shall be temporarily taken offline while a treatment system, capable of removing the contaminant from the water, is designed and installed. While the production well is not operating, supplemental water for quarry operations (treated, as appropriate – see Mitigation Measure C.4e) shall be supplied by the proposed sediment ponds, from storage ponds on the quarry floor. If this is not feasible, the applicant shall either temporarily provide water from an off-site source, or temporarily reduce production to limit water demand until well service is restored.</p> <p>Mitigation Measure C.4e: Prior to discharge to Ranch Tributary, the applicant shall regularly sample and analyze all water collected within the quarry for the same suite of analytes used at the adjacent Roblar Landfill during the 2004 through 2008 monitoring events, and at the project site during the 2007/08 monitoring events. The QA/QC protocol for the sampling and analysis program shall be completed by an environmental professional knowledgeable of current surface water/groundwater regulations and sampling procedures. In the event that the discharge water does contain contaminants, surface water discharge to Ranch Tributary shall cease and all discharges shall be contained. Once contained, discharged water shall be treated on-site (e.g., use of activated carbon filters and/or aeration) until concentrations of the chemicals are not detected or the concentrations are within the storm water discharge criteria set forth through the NPDES industrial discharge permit.</p>	

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact C.5: Altering approximately 30 percent of the Ranch Tributary watershed by proposed mining could decrease baseflow in Ranch Tributary and affect flows in Americano Creek. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure C.5a: The applicant shall incorporate into the final project drainage plan a hydrologic strategy that replaces potential baseflow lost due to the quarry operation. This mitigation measures requires a) continuation of the baseflow monitoring program that commenced in Spring 2007, and b) determining from that data whether substantial changes in baseflow is occurring during the operation of the quarry. If a reduction in baseflow due to project activities becomes evident through long term monitoring, the applicant shall design and install a system that passively diverts stored surface water to the Ranch Tributary to replicate pre-project base flows. If necessary, stored surface water shall be treated prior to discharge, consistent with Mitigation Measure C.4b-d. Sonoma County PRMD shall review and approve the monitoring plan and passive surface water diversion system prior to implementation. The applicant shall continue to monitor the passive delivery system to ensure consistent replacement of baseflow. The applicant shall submit quarterly reports to the Sonoma County PRMD that details system monitoring and performance.</p> <p>Mitigation Measure C.5b: If the passive water diversion system described in Mitigation Measure C.5a is required to replicate pre-project base flows in Ranch Tributary, the applicant shall incorporate surface water temperature monitoring in Ranch Tributary and Americano Creek into the base flow monitoring program. Water discharged for base flow maintenance shall comply with the <i>North Coast Water Quality Control Plan</i> Water Quality Objective for temperature, which states that water temperatures in water bodies designated for Cold Freshwater Habitat (COLD) beneficial use shall not be increased by more than 5°F above the natural receiving water temperature. If necessary, the applicant shall install a system that discharges on-site well water (treated, if necessary) instead of, or in combination with, stored water to meet the temperature objective.</p>	<p>Less than Significant</p>
<p>Impact C.6: The proposed quarry could eliminate a groundwater recharge area thereby reducing deep recharge to regional groundwater sources. This would be a less than significant impact.</p>	<p>Less than Significant</p>	<p>None Required</p>	
<p>Impact C.7: Removal of Wilson Grove overburden and excavation into the Tolay Volcanics unit through mining could adversely affect groundwater flow and quality in nearby domestic groundwater wells. This would be a less than significant impact.</p>	<p>Less than Significant</p>	<p>None Required</p>	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact C.8: The proposed project would pump groundwater from two onsite supply wells. The use of the two onsite wells could impact neighboring wells by causing periodic drawdown or lowering of local groundwater levels. This would be a less than significant impact.</p>	<p>Less than Significant</p>	<p>None Required</p>	
<p>D. Biological Resources</p>			
<p>Impact D.1: Project construction and grading activities within the proposed aggregate mining area could disturb or remove wetland and riparian habitat located on-site and directly adjacent to the southern boundary of the site. This would be a significant impact.</p>	<p>Significant</p>	<p>Mitigation Measure D.1a: To mitigate the filling or excavating of potentially jurisdictional wetlands within the proposed project area, the project proponent shall:</p> <ul style="list-style-type: none"> • Conduct a formal wetland delineation in accordance with 1987 <i>Corps of Engineers Wetlands Delineation Manual</i> and have it verified by the U.S. Army Corps of Engineers (Corps). If the Corps and/or CDFG determine that the potentially affected water-associated features are jurisdictional, then the project proponent shall obtain appropriate wetland permits and implement all conditions contained in the Section 404 Clean Water Act permit (possibly an Nationwide permit) from the Corps, Section 1603 Streambed Alteration Agreement from CDFG, and/or Section 401 water quality certification from the Regional Water Quality Control Board. • Compensate for the loss of jurisdictional wetlands at a 2:1 ratio (or as agreed to by the permitting agencies) within the project site boundary, or at a 3:1 ratio (or as agreed to by the permitting agencies) off-site within the local watershed, by creating, restoring or enhancing waters of the U.S., or contributing in-lieu funds to an existing or new restoration project preserved in perpetuity. The restoration effort shall require implementation of a five-year monitoring program with applicable performance standards, including but not limited to establishing: 80 percent survival rate of restoration plantings native to local watershed; absence of invasive plant species; absence of erosion features; and a functioning, and self-sustainable wetland system. <p>Mitigation Measure D.1b: Avoid all potential jurisdictional wetlands and riparian habitat located along the southern boundary (i.e., Ranch Tributary) and the southwestern corner (i.e., seasonal wetlands on valley floor adjacent to Americano Creek) of the property. Prior to construction activities, the project applicant shall take appropriate measures to protect the wetland and riparian habitat located in these areas. The following protection measures are to be included in the grading and Reclamation Plan:</p>	<p>Less than Significant</p>

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<ul style="list-style-type: none"> • Installation of exclusionary construction fencing along the southern property line as well as around the two seasonally wetlands identified on Figure IV.D-1 to protect these features from all project construction and operation activities; • Implementation of measures to control dust in adjacent work areas (please see comprehensive dust control program identified in Mitigation Measure F.4 in Section IV.F, Air Quality); • Maintenance of the hydrologic inputs (flow) to the seasonally wet area in the southwestern corner of the property (please see Mitigation Measure C.5 in Section IV.C, Hydrology and Water Quality); and • The project applicant shall maintain the minimum allowed 100-foot setback for quarry mining operations from stream banks (Americano Creek and Ranch Tributary) and critical habitat areas designated in the Sonoma County General Plan (Chapter 26A, County Code). <p>Mitigation Measure D.1c: Implementation of Mitigation Measure C.5 presented in Section IV.C <i>Hydrology and Water Quality</i> would monitor baseflow conditions in the potentially affected reaches of Ranch Tributary and Americano Creek to determine if quarry operations affect baseflows. If a reduction of baseflows becomes evident, the applicant shall design and install a system that would divert stored surface water from the project site to Ranch Tributary to replicate pre-project baseflows.</p>	
<p>Impact D.2: Project construction and grading activities within the proposed aggregate mining area would impact protected trees. This would be a significant impact.</p>	Significant	<p>Mitigation Measure D.2a: In accordance with Sonoma County Ordinance No. 4014, prior to the start of any clearing, stockpiling, excavation, grading, compaction, paving, change in ground elevation, or construction, the project proponent shall obtain a certified arborist to identify trees proposed for preservation (saved) and trees proposed for removal at the project site on a map. The map shall indicate the size and species of trees proposed for removal and preservation. The project proponent shall save trees identified for preservation on the project site and clearly delineate such trees by constructing short post and plank walls, or other protective fencing material, at the dripline of each tree to hold back fill. The delineation markers shall remain in place for the duration of the work. The placement of the fencing material at the dripline shall be coordinated with a certified arborist.</p>	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>Mitigation Measure D.2b: Where proposed development or other site work must encroach upon the dripline of a tree identified to be saved (see Mitigation Measure D.2a, above), special construction techniques will be required to allow the roots of remaining trees within the project site to breathe and obtain water (examples include, but are not limited to, use of hand equipment for tunnels and trenching, installation of protective fencing, allowance of only one pass through a tree's dripline). Tree wells or other techniques may be used where advisable. Permission from, and inspection by, the PRMD will be required prior to backfilling, if applicable. No burning or use of equipment with an open flame shall occur near or within the dripline (except for authorized controlled burns) of a tree identified for preservation. No parking; storage of vehicles, equipment, machinery, stockpiles of excavated soils, or construction materials; or dumping of oils or chemicals shall be allowed within the dripline of preserved trees.</p> <p>Mitigation Measure D.2c: In coordination with a landscape architect, certified arborist or qualified biologist, the project proponent shall replace all removed protected trees in accordance with the Sonoma County Tree Protection and Replacement Ordinance No. 4014 and incorporate these trees into the reclamation and erosion control plan. Arboreal Value Chart #1 shall be used to determine the number of replaced trees or amount of in-lieu fees.</p> <p>Mitigation Measure D.2d: If any protected tree (as defined in County of Sonoma Ordinance No. 4014) proposed for preservation is damaged or stressed and results in mortality due to mining operations (including changes to shallow groundwater flows), then the project proponent shall replace the protected tree in accordance with the Arboreal Value Chart. If on-site replacement is not feasible, the proponent shall pay in-lieu fees into the County of Sonoma tree replacement fund. Should pruning be required, this will be performed by a certified arborist. No more than 25 percent of a tree's canopy will be removed during the pruning of preserved trees.</p> <p>Mitigation Measure D.2e: In coordination with a landscape architect, certified arborist or qualified biologist, the project proponent shall develop and implement a five-year tree monitoring program for all replaced trees. Appropriate performance standards may include, but are not limited to establishing: a 80 percent survival rate of tree plantings and the ability to be self-sustaining at the end of five years. Additional monitoring periods may be required until the trees successfully establish.</p>	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact D.3: Project construction and grading activities within the proposed aggregate mining area would remove known habitat for California red-legged frog and potential habitat for foothill yellow-legged frog and northwestern pond turtle. This would be a significant impact.</p>	<p>Significant</p>	<p>Mitigation Measure D.3: The project proponent shall implement measures to minimize and avoid take of CRLF that would additionally benefit pond turtles and foothill yellow-legged frog, if present. The following measures are derived from the Programmatic Biological Opinion (PBO) for impacts to California red-legged frog (USFWS, 1999). Projects that impact CRLF, such as the Roblar Road Quarry project, require formal consultation with the USFWS and issuance of a Biological Opinion. The following actions will minimize impacts to these species.</p> <p>Construction-Related Measures</p> <ul style="list-style-type: none"> • A USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and their habitat, and the general measures that are being implemented to protect the CRLF as they relate to the project. • The mitigation pond shall be created and suitable for receiving relocated CRLF prior to the removal of Center Pond and surrounding upland habitat. • Following construction of the mitigation pond and no more than 14 days prior to the initiation of grading activities near Center Pond, a USFWS-approved wildlife biologist shall capture all CRLF and other special-status aquatic species and relocate them to the mitigation pond. • A USFWS-approved biologist shall be present during initial grading activities in and surrounding Center Pond until CRLF have been removed. Thereafter, an onsite person shall be designated to monitor onsite compliance with all minimization measures. The USFWS-approved biologist shall ensure that this individual receives training consistent with that outlined in the Biological Opinion. • During all phases of project operations, all trash that may attract CRLF predators shall be properly contained and removed from the site. • The fueling and maintenance of vehicles and other equipment shall occur at least 20 meters from any riparian habitat or water body. 	<p>Less than Significant</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		Pond Design, Management, and Monitoring	
		<ul style="list-style-type: none"> • The project proponent shall coordinate with the USFWS to select a suitable site for a new mitigation stockpond of equal or greater size to Center Pond within the property boundaries. The location and design of the new pond shall conform to guidelines of the USFWS Recovery Plan for CRLF (USFWS, 2002) and shall also include a permanent upland habitat buffer of no less than 250 feet around the pond. The final pond design shall be approved by the USFWS as a requirement of the project Biological Opinion. The mitigation pond should be created and functioning prior to the initiation of ground disturbing activities within 250 feet of Center Pond. • The mitigation pond shall be designed to provide CRLF breeding habitat and shall include areas with deep-water cover for adult, juvenile and metamorphic red-legged frogs and shallow areas to provide for tadpole and juvenile rearing. The pond shall be designed to pool to a depth of between 3 to 4 feet and to maintain at least 1.0 foot of standing water through September 15 during years with average rainfall. To ensure sufficient water is available to support CRLF breeding, a qualified hydrologist shall be consulted to assess the amount of water that will be available at the selected site during dry, average, and wet years. A design plan shall be prepared to include a grading plan and cross-section plan indicating pond depth and dimensions. The basin shall be contoured based on the above design, and lined with clay or a similar impervious substrate to ensure water holding capacity that meets minimum performance standards and specifications. • The mitigation pond shall be vegetated in accordance with the guidelines set forth in the Red-legged Frog Recovery Plan. Relocated vegetation shall salvage and utilize <i>native</i> emergent and aquatic vegetation from Center Pond whenever possible. Upland habitat surrounding the pond should be seeded with native grassland cover species. • An adaptive management plan shall be developed for the mitigation pond consistent with the USFWS Recovery Plan for CRLF (USFWS, 2002) and project Biological Opinion. The plan shall include a program to monitor pond performance over time and discourage the presence of non-native vegetation and bullfrogs. During the initial five year monitoring period, annual hydrologic, vegetation and wildlife surveys shall be performed to document ponding conditions, the establishment of aquatic vegetation and to monitor California red-legged frog use of the pond. 	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact D.4: Project construction and grading activities within the proposed aggregate mining area could disturb active nests of raptors and other special-status birds. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<ul style="list-style-type: none"> • The adaptive management plan shall provide provisions to quantify site conditions relative to performance standards for a period of five years, to include: <ol style="list-style-type: none"> 1. Ability to maintain standing water at a depth of at least 1.0 foot within at least 50 percent of the pond area through September 15 during a year with average rainfall. 2. Presence of CRLF in any life history stage, to be determined by egg mass surveys and focused nighttime surveys for adults and juveniles. 3. The presence of native emergent or aquatic vegetation covering at least 10 percent of the pond edge. 4. Absence of persistent, self-sustaining populations of non-native CRLF predators, particularly bullfrogs. <p>The adaptive management plan shall include contingency measures to respond to inadequate hydrologic conditions (if later identified) and provide for control of non-native vegetation and CRLF predators, if identified in the mitigation pond. If bullfrogs are identified, the preferred management method shall be manual (hand) removal using a gig or other means. This method maintains the availability of aquatic habitat for red-legged frogs and sustains aquatic vegetation. If hand removal of bullfrogs proves ineffective, the pond shall be drained and dried between October 1 and November 15 (following metamorphosis of red-legged frog tadpoles) to break the bullfrog life cycle.</p> <p>An invasive plant species management plan shall be incorporated into the adaptive management plan to provide for the management and removal of invasive aquatic vegetation, if present. The preferred management method shall be for manual (i.e., non-chemical) removal of invasive species, whenever possible.</p> <p>Pond management shall continue for the duration of the proposed project, or as required by the Biological Opinion.</p> <p>Mitigation Measure D.4a: Avoid disturbing active nests of raptors and other special-status birds through preconstruction surveys and creation of no-disturbance buffers during ground-clearing and grading activities associated with initiation of each mining phase.</p>	<p>Less than Significant</p>

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>If site preparation activities (i.e., ground clearing and grading, including removal of trees or shrubs) are scheduled to occur during the non-breeding season (September 1 through January 31), no mitigation is required.</p> <p>If site preparation activities are scheduled to occur during the breeding season (February 1 through August 31), the following measures shall be implemented to avoid potential adverse effects to nesting raptors and other special-status birds:</p> <ul style="list-style-type: none"> • A qualified wildlife biologist shall conduct preconstruction surveys of all potential nesting habitat within 500 feet of construction activities where access is available. • If active nests are found during preconstruction surveys, a no-disturbance buffer acceptable in size to CDFG shall be created around active raptor nests and nests of other special-status birds during the breeding season or until it is determined that all young have fledged. Typical buffers include 500 feet for raptors and 250 feet for other nesting special-status birds. The size of these buffer zones and types of construction activities restricted in these areas may be further modified through coordination with CDFG and will be based on existing noise and human disturbance levels at each project site. Nests initiated during construction are presumed to be unaffected and no buffer is necessary. However, the "take" of any individuals will be prohibited. • If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs within the project footprint that have been determined to be unoccupied by special-status birds or that are located outside the no-disturbance buffer for active nests may be removed. <p>Mitigation Measure D.4b: Although burrowing owls have not been reported from the immediate vicinity of the project site, the project proponent shall avoid disturbing potential burrowing owl burrows through preconstruction surveys and creation of no-disturbance buffers during ground-clearing and grading activities associated with initiation of each mining phase.</p> <ul style="list-style-type: none"> • No more than 2 weeks before grading and ground-clearing activities begin prior to each of the three mining phases, a survey for burrowing owls shall be conducted by a qualified biologist within 500 feet of the earthmoving activities. The survey shall conform to the most current protocol described by the California Burrowing Owl Consortium (presently the 1993 protocol). If burrowing owl habitat is identified during the initial survey, a complete owl survey consisting of four site visits shall be performed as detailed in the Consortium guidelines. 	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact D.5: Project construction and grading activities could result in direct impacts to American badger and the loss of annual grasslands that support this species. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<ul style="list-style-type: none"> • If occupied owl burrows are found during the surveys, a determination shall be made by a qualified burrowing owl biologist as to whether or not proposed project activities would affect the occupied burrows or disrupt reproductive behavior. If it is determined that the project would not adversely affect occupied burrows or disrupt breeding behavior, project implementation may proceed without any restriction or mitigation measures. If it is determined that the project could adversely affect occupied burrows during the August 31 through February 1 non-breeding season, the subject owls may be passively relocated from the occupied burrow(s) using one-way doors. There shall be at least two unoccupied burrows suitable for burrowing owls within 300 feet of the occupied burrow before one-way doors are installed. The unoccupied burrows shall be located 160 feet from construction activities and can be natural burrows or artificial burrows constructed according to current design specifications. Artificial burrows shall be in place at least one-week before one-way doors are installed on occupied burrows. One-way doors would be in place for a minimum of 48 hours before burrows are excavated. • If it is determined that the project would physically affect occupied burrows or disrupt reproductive behavior during the nesting season (February 1 through August 31) then avoidance is the only mitigation available (California Burrowing Owl Consortium 1993; CDFG 1995). Implementation of ground-clearing and grading activities shall be delayed within 250 feet of occupied burrows until it is determined that the subject owls are not nesting or until a qualified biologist determines that juvenile owls are self-sufficient or are no longer using the natal burrow as their primary source of shelter. <p>Mitigation Measure D.5: Avoid and minimize impacts to badgers through preconstruction surveys prior to ground clearing and grading in annual grasslands habitat or areas that are known or suspected to support badger.</p> <p>Within 30-days prior to initiation of each mining phase, a qualified biologist shall survey for badgers within 100-feet of project activities. If no evidence of badger presence is detected, no further mitigation is required. If evidence of badgers is identified, the following measures are required to avoid potential impacts to this species:</p> <ul style="list-style-type: none"> • Use exclusion techniques to passively relocate any badgers that are present in project areas or within 50 feet of project activities. When outside the project area, but within 50 feet of activities, vacated dens shall be temporarily covered using plywood sheets or similar materials. 	<p>Less than Significant</p>

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact D.6: Project construction and grading activities within the proposed aggregate mining area could disturb active roosts of special-status bat species. This would be a significant impact.</p>	<p>Potentially Significant</p>	<ul style="list-style-type: none"> • To reduce the risk of badger mortality from vehicles, the use of private (non-county operated) haul roads shall be limited to daylight hours during the March to June badger pupping season with gated access. • A 25 mile-per-hour speed limit shall be posted for roads on the site. <p>Mitigation Measure D.6: Avoid disturbing active roosts of special-status bats through preconstruction surveys and creation of no-disturbance buffers during ground-clearing and grading activities associated with initiation of each mining phase, as well as during project activities related to remodeling and/or renewed use of the existing buildings.</p> <p>Prior to construction activities (i.e., ground-clearing and grading, including removal of trees or shrubs, building remodeling, renewed building use) within 200 feet of trees or buildings potentially supporting special-status bats, a qualified bat biologist will survey for special-status bats. If no evidence of bats (i.e., direct observation, guano, staining, strong odors) is present, no further mitigation is required.</p> <p>If evidence of bats in trees on the property is observed, the following measures are required to avoid potential adverse effects special-status bats:</p> <ul style="list-style-type: none"> • A no-disturbance buffer of 100-feet, or other suitable distance determined in coordination with CDFG, will be created around active bat roosts during the breeding season (April 15 through August 15). Bat roosts initiated during construction are presumed to be unaffected, and no buffer is necessary. However, the “take” of individuals will be prohibited. • Removal of trees showing evidence of bat activity will occur during the period least likely to impact the bats as determined by a qualified bat biologist (generally between February 15 and October 15 if winter hibernacula are observed or between August 15 and April 15 if maternity roosts are present). If known bat roosting habitat is destroyed during tree removal activities, artificial bat roosts shall be constructed in an undisturbed area of the property, at least 200 feet from any project activities. The design and location of the artificial bat roost(s) shall be determined by a qualified bat biologist. <p>If evidence of bats in existing buildings on the property is observed, the following measures are required to avoid potential adverse effects special-status bats:</p>	<p>Less than Significant</p>

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<ul style="list-style-type: none"> Prior to any remodeling activities and/or renewed use of existing buildings with observed bat activity, a qualified bat biologist shall review design drawings and use plans for the building(s). The biologist shall then make a determination, in coordination with CDFG, whether the bats would need to be evicted in order to implement the remodeling/new use of the structures, or if the bats would not be affected and should remain in the structure. If eviction is deemed necessary, the bats shall be transferred to an artificial roosting site. The artificial roost shall be constructed in an undisturbed area of the property, at least 200 feet from any project activities. The design and location of the artificial bat roost(s) shall be determined by a qualified bat biologist. 	
Impact D.7: Quarry activities associated with the proposed project may result in adverse impacts to the surface hydrology and water quality of on-site and surrounding drainages, including Ranch Tributary and Americano Creek, that may impact special-status fish species known to occur downstream of the project site. This would be a potentially significant impact.	Potentially Significant	As discussed in Section IV.C <i>Hydrology and Water Quality</i> , the implementation of Mitigation Measures C.1 through C.5 would reduce potential hydrology and water quality impacts such as increased peak flows, erosion and sedimentation, water contamination, and baseflow reductions to less than significant. Therefore, the potential impacts to special-status fish species such as increased bank erosion, increased turbidity, spawning habitat degradation, stress or mortality due to water contamination, and reduction of summer and fall habitat availability and quality are not anticipated. No further mitigation is required.	Less than Significant
Impact D.8: Blasting activities associated with the proposed project could result in noise disturbance to special-status wildlife species. This would be a less-than-significant impact.	Less than Significant	None Required	
Impact D.9: Fencing of the proposed project site would result in interference with existing migratory wildlife corridor on the parcel and minor fragmentation of wildlife habitat. This would be a less-than-significant impact.	Less than Significant	None Required	
Impact D.10: The project would not result in a change in land use on the Lakeville Road easement exchange site. Therefore, the effects of the project on existing biological resources present on and adjacent to the Lakeville Road site would be less than significant.	Less than Significant	None Required	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
E. Transportation and Traffic			
<p>Impact E.1: The proposed project would contribute to Near-Term Cumulative traffic volume at study intersections during the weekday a.m. and p.m. peak-hours, and Saturday peak hour. This would be a significant impact at one study intersection.</p>	Significant	<p>Mitigation Measure E.1: Install traffic signals and associated improvements at the intersection of Roblar Road and Stony Point Road. These improvements would improve the level of service at the intersection to LOS B or better during peak hours.</p> <p>This intersection is located within the County's jurisdiction; accordingly, the implementing agency for Mitigation Measure E.1 would be Sonoma County. The County has anticipated the need for the signalization and other improvements at this intersection. The County's preliminary design includes widening all approaches to the intersection, including shoulders; lengthening the northbound left-turn lane; and adding a southbound left-turn lane (for access to the driveway across Roblar Road).</p> <p>These improvements shall be implemented prior to initiation of mining at the proposed quarry. The project applicant shall pay a fair share of the cost of the required improvements. The Sonoma County Department of Transportation and Public Works shall be responsible for preparing a cost estimate of the required improvements.</p>	Less than Significant
<p>Impact E.2: The proposed project would contribute to Long-Term Cumulative traffic volume at study intersections during the weekday a.m. and p.m. peak hours, and Saturday peak hour. This would be a significant impact at certain study intersections.</p>	Significant	<p>Mitigation Measure E.2a: In addition to the signalization and associated improvements identified in Mitigation Measure E.1, provide a dedicated right-turn lane on the southbound approach at the intersection of Stony Point at Roblar Road. This would mitigate the project's impact to a less-than-significant level (i.e., would reduce the project-generated increase in delay to less than five seconds [the threshold of significance]), but not to LOS D or better.</p> <p>This intersection is located within the County's jurisdiction; accordingly, the implementing agency for Mitigation Measure E.2a would be Sonoma County. As discussed in Mitigation Measure E.1, above, the County plans signalization and associated improvements at this intersection fiscal year 2008/09. The County's preliminary design for this intersection identifies a proposed flaring of the southbound approach that may provide room for a dedicated southbound right-turn lane. However, in the absence of final design specifications, it is unknown whether minor additional width may be needed on Stony Point Road beyond that identified in Mitigation Measure E.1 to accommodate this dedicated southbound right-turn lane.</p>	<p><i>Mitigation Measure E.2a:</i> Implementation of Mitigation Measure E.2a would reduce the identified project contribution to the cumulative intersection impact to a less-than-significant level. However, the applicant may need to acquire land from private landowners along Stony Point Road to provide sufficient right-of-way width to implement the identified roadway widening improvements. In addition, the applicant would also need to fund and implement the roadway improvements, and then dedicate any right-of-way land with the road improvements to the County. Because of the need to acquire the right-of-way, the implementation of Mitigation Measure E.2a may not be feasible. If the identified improvements in Mitigation Measures E.2a were found to be infeasible, the traffic safety impacts would be Significant and Unavoidable.</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>The applicant shall be required to pay costs associated with the redesign, potential right-of-way acquisition, and installation of improvements prior to start of mining.</p> <p>Mitigation Measure E.2b: When signal warrants are met, install traffic signals at the intersection of Stony Point Road and Railroad Avenue. The installation of a signal would improve the level of service at the intersection to LOS D or better during the peak hours.</p> <p>This intersection is located within the County's jurisdiction; accordingly, the implementing agency for Mitigation Measure E.2b would be Sonoma County. Regular (annual) monitoring and signal warrant analysis of this intersection shall be conducted until such time warrants for signalization are met. The project applicant shall pay a fair share of the cost of the required improvements. The Sonoma County Department of Transportation and Public Works shall be responsible for preparing a cost estimate of the required improvements.</p> <p>Mitigation Measure E.2c: The signal timing at the intersection of Stony Point Road at SR 116 shall be optimized to improve the capacity of the intersection. Optimization involves changing the timing of an individual traffic signal to better reflect traffic volumes, and can include changing the cycle length or reallocating green time between different phases of a traffic signal. Optimization of the signal timing would mitigate the project's impact to a less-than-significant level (i.e., would reduce the project-generated increase in delay to less than five seconds [the threshold of significance]), but not to LOS D or better.</p> <p>The intersection of Stony Point Road at SR 116 is within the jurisdiction of both Sonoma County and Caltrans. Accordingly, the implementing agencies for Mitigation Measure E.2c would be Sonoma County and Caltrans. Regular (annual) monitoring of this intersection shall be conducted until such time as the need for identified improvements is met. The project applicant shall pay a fair share of the cost of the required improvements.</p> <p>Mitigation Measure E.2d: The signal timing at the intersection of SR 116 at Old Redwood Highway shall be optimized to improve the capacity of the intersection. Optimization of the signal timing would mitigate the project's impact to a less-than-significant level (i.e., would reduce the project-generated increase in delay to less than five seconds [the threshold of significance]), but not to LOS D or better.</p>	<p><i>Mitigation Measure E.2b:</i> Implementation of Mitigation Measure E.2b would reduce the identified project contribution to the cumulative intersection impact to a less-than-significant level. However, the intersection improvement is not currently funded or planned. If these improvements are not in place once signal warrant analysis conducted as part of annual monitoring demonstrates the need for signalization is met, the intersection impact would be Significant and Unavoidable.</p> <p><i>Mitigation Measure E.2c:</i> Less than Significant</p> <p><i>Mitigation Measure E.2d:</i> Less than Significant</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact E.3: The project would add substantial truck traffic to certain primary haul roads that are designated proposed bikeways and/or are regularly used by bicyclists or pedestrians, and which do not meet current County roadway design standards. This would be a significant impact.</p>	Significant	<p>The intersection of SR 116 at Old Redwood Highway is within the jurisdiction of both Caltrans and the City of Cotati. Accordingly, the implementing agencies for Mitigation Measure E.2d would be Caltrans and the City of Cotati. Regular (annual) monitoring of this intersection shall be conducted until such time the need for identified improvements is met. The project applicant shall pay a fair share of the cost of the required improvements.</p> <p>Mitigation Measure E.3a: Improve Roblar Road and Pepper Road (between Mecham Road and Stony Point Road) to meet current County road design standards, including, but not limited to, two 12-foot wide vehicle travel lanes, two six-foot wide shoulders, and associated striping/signage to meet Class II bike facilities. These improvements shall be conducted prior to initiation of quarry mining.</p> <p>Mitigation Measure E.3b: The project applicant shall ensure that all loaded trucks are covered or maintain a six-inch free board to prevent spillage of materials onto haul routes.</p> <p>Mitigation Measure E.3c: The intersection of the proposed access road and Roblar Road shall be kept free of loose gravel and dirt that may accumulate from exiting trucks. In addition to the proposed use of tire wash and tire scraper to loosen dirt from the trucks and their tires, the applicant shall conduct regular sweeping of the intersection of the proposed access road with Roblar Road.</p>	<p>Potentially Significant and Unavoidable. Mitigation Measures E.3a-c would reduce the identified traffic safety hazard impact to a less-than-significant level. However, the roadway improvements identified in Mitigation Measure E.3a are not currently funded or planned. Furthermore, the applicant would need to acquire land from private landowners along portions of Roblar Road and Pepper Road to provide sufficient right-of-way width to implement the identified roadway widening improvements. The existing County right-of-way width on Roblar Road is 50 feet between Valley Ford Road and Orchard Station Road (roughly 4.5 miles), and 60 feet between Orchard Station Road and Stony Point Road (roughly 2 miles). The existing County right-of-way on Pepper Road east of Mecham Road is 50 feet. Some individual parcels on these roads are wider due to previously implemented road improvement projects and other land development. The minimum estimated required right-of-way width to improve the roadways to current County standards would be 60 feet, although additional right-of-way width may be needed in locations constrained by existing topography, utilities, drainage or other factors. The applicant would also need to fund and implement the roadway widening improvements, and then dedicate the right-of-way land with the roadway improvements to the County. As a consequence, the implementation of</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact E.4: The project would add substantial truck traffic to certain primary haul roads that do meet current County roadway design standards and/or contain limited sight distance. This would be a significant impact.</p>	<p>Significant</p>	<p>Mitigation Measure E.4a: Implement roadway improvements for Roblar Road identified in Mitigation Measure E.3a.</p> <p>Mitigation Measure E.4b: The County shall post warning signs on Roblar Road at key locations where sight distance may continue to be limited after implementation of Mitigation Measure E.3a.</p> <p>Mitigation Measure E.4c: The County shall post warning signs on Roblar Road 250 feet ahead of the access driveway that cautions drivers about truck traffic entering and exiting the roadway. The warning signs shall follow guidelines set forth in the <i>California Manual on Uniform Traffic Control Devices</i> (Caltrans, 2006c).</p>	<p>Mitigation Measure E.3a may not be feasible. If the improvements identified in Mitigation Measure E.3a were found to be infeasible, the traffic safety impacts would be Significant and Unavoidable.</p> <p>Potentially Significant and Unavoidable. Mitigation Measures E.4a-c would reduce the identified impacts associated with potential increases in traffic accidents to a less-than-significant level. However, as discussed above (page E-27), the roadway improvements identified in Mitigation Measure E.3a are not currently funded or planned. Furthermore, the applicant would need to acquire land from private landowners along portions of Roblar Road and Pepper Road to provide sufficient right-of-way width to implement the identified roadway widening improvements. In addition, the applicant would also need to fund and implement the roadway improvements, and then dedicate the right-of-way land with the road improvements to the County. As a consequence, the implementation of Mitigation Measure E.3a (and correspondingly, Mitigation Measure E.4a) may not be feasible. If the identified improvements in Mitigation Measures E.3a/E.4a were found to be infeasible, the traffic safety impacts would be Significant and Unavoidable.</p>
<p>Impact E.5: The proposed project would result in inadequate site access. This would be a significant impact.</p>	<p>Significant</p>	<p>Mitigation Measure E.5a: Improve Roblar Road at the proposed access point to the site to accommodate project haul trucks accessing the site. This improvement shall include a left-turn lane for project trucks on the westbound approach, and road widening on the eastbound approach to fully accommodate right-turning trucks.</p> <p>Mitigation Measure E.5b: Design the roadway cross-section to meet the design standards set forth by the American Association of State Highway and Transportation Officials (AASHTO) in <i>A Policy on Geometric Design of Highways and Streets</i>.</p>	<p>Potentially Significant and Unavoidable. Mitigation Measures E.5a-b would reduce the identified impacts associated with potential increases in traffic accidents to a less-than-significant level. The required right-of-way width for the identified improvement would be approximately 80 feet. The County may not currently own the required right-of-way width along this section of Roblar</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
Impact E.6: The proposed project could contribute to the degradation of pavement on public roads. This would be a significant impact.	Significant	<p>Mitigation Measure E.6a: The project applicant shall conduct core sampling and associated testing of Roblar Road and Pepper Road, and review as-builts if available, in order to determine the roadway thickness, and the condition of the base and subbase of the roadways. If such testing indicates the existing roadways are not designed, for and/or in a condition that would not accommodate, long-term project truck traffic, the roadways shall be improved as needed (e.g., overlays or reconstruction) per Caltrans Design Manual standards. The project applicant shall pay the full cost of road improvements, including design and construction.</p> <p>Mitigation Measure E.6b: Prior to mining, the project applicant shall enter into a <i>Roadway Maintenance Agreement</i> with Sonoma County providing their proportionate share of the responsibility to maintain the proposed haul roads.</p>	<p>Road to implement the identified improvements. The applicant may need to acquire land from an adjacent private landowner on Roblar Road to provide sufficient right-of-way width to implement the identified roadway improvements. In addition, the applicant would also need to fund and implement the roadway improvements, and then dedicate the right-of-way land with the road improvements to the County. As a consequence, Mitigation Measure E.5a-b may not be feasible. If the improvements identified in Mitigation Measure E.5a-b were found to be infeasible, the traffic safety impacts would be Significant and Unavoidable</p> <p>Potentially Significant and Unavoidable. Mitigation Measure E.6a-b would reduce the identified roadwear impacts to a less-than-significant level. However, the potential roadway improvements that may be required in Mitigation Measure E.6a are not currently funded or planned. If the improvements identified in Mitigation Measure E.6a were found to be infeasible, the road wear impact would be Significant and Unavoidable.</p>
Impact E.7: Project construction would result in temporary increases in truck traffic and construction worker traffic. This would be a potentially significant impact.	Potentially Significant	Mitigation Measure E.7: The project applicant and/or construction contractor(s) shall develop a construction management plan for review and approval by the Sonoma County Public Works Department. The plan shall include at least the following items and requirements to reduce, to the maximum extent feasible, traffic congestion during construction of this project and other nearby projects that could be simultaneously under construction:	Less than Significant

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact E.8: Implementation of Mitigation Measures E.3a/E.4a and E.5a could result in short-term and/or long-term environmental impacts on land use and agricultural resources, geology and soils, hydrology and water quality, hazardous materials, biological resources, transportation and circulation, air quality, noise, aesthetics and cultural resources. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<ul style="list-style-type: none"> • A set of comprehensive traffic control measures that include designating construction access routes and scheduling of major truck trips and deliveries to avoid peak traffic hours and designated construction access routes; and • Notification of adjacent property owners and public safety personnel regarding scheduled major deliveries. <p>Mitigation Measure E.8a: As part of the grading and construction specifications for the roadway widening, implement best management practices (BMPs) to reduce or eliminate soil erosion during construction. The contractor shall implement these BMPs and be responsible for the inspection and maintenance of the BMPs during construction. These measures shall be incorporated into the Storm Water Pollution Prevention Plan (SWPPP) for the proposed roadway widening (see Mitigation Measure E.8c, below).</p> <p>Mitigation Measure E.8b: A design level geotechnical investigation shall be required to identify site specific geologic conditions and geotechnical constraints and develop adequate engineering design criteria and remedies to reduce the potential for slope instability from cutting and filling of adjacent slopes along the roadway alignments. Methods for reducing potential slope instability effects could include, but are not limited to, slope reconstruction, earth buttress construction, or retaining structures/walls. All recommendations identified by the licensed geotechnical engineer shall be included in the final design and be incorporated into the roadway widening project.</p> <p>Mitigation Measure E.8c: Prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) before commencing with roadway widening construction. As part of this process, a Notice of Intent shall be filed with the State Water Resources Regional Control Board, in compliance with the statewide NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit). The SWPPP shall specify Best Management Practices (BMPs) to control contamination of surface flows through measures to prevent the potential discharge of pollutants from the construction area.</p> <p>The BMPs shall be designed to minimize erosion of disturbed soil areas. BMPs could include, without limitation, silt fences, gravel or sand bags, stormdrain inlet protection, soil stockpile protection, preservation of existing vegetation where feasible, use of straw mulch, dust control, and other measures. The SWPPP will also include protection and spill prevention measures for any temporary onsite storage of hazardous materials used during construction. The project applicant shall adhere to the identified BMPs as well as the waste discharge and stormwater requirements outlined in the permit.</p>	<p>Potentially Significant and Unavoidable. The above-identified mitigation measures would likely mitigate all potential significant impacts to a less than significant level. However, subsequent detailed environmental analysis and County approval would be required for the roadway widening improvements. That analysis may disclose additional impacts and/or identify additional mitigation measures to reduce impacts. However, unless and until that analysis is completed, the impacts are considered Significant and Unavoidable.</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>Mitigation Measure E.8d: The proposed storm drain system for the roadway widening improvements shall be designed in accordance with all applicable County and Sonoma County Water Agency (SCWA) drainage and flood control design standards. The drainage plan for the roadway widening improvements shall ensure the proposed drainage facilities are properly sized to accommodate projected stormflows and prevent any potential project flooding on-site and in downstream areas.</p> <p>Mitigation Measure E.8e: To mitigate the filling or excavating of potentially jurisdictional wetlands along the roadway widening alignments, the project proponent shall:</p> <ul style="list-style-type: none"> • Conduct a formal wetland delineation in accordance with 1987 <i>Corps of Engineers Wetlands Delineation Manual</i> and have it verified by the U.S. Army Corps of Engineers (Corps). If the Corps and/or CDFG determine that the potentially affected water-associated features are jurisdictional, then the project proponent shall obtain appropriate wetland permits and implement all conditions contained in the Section 404 Clean Water Act permit (possibly an Nationwide permit) from the Corps, Section 1603 Streambed Alteration Agreement from CDFG, and/or Section 401 water quality certification from the Regional Water Quality Control Board. • Compensate for the loss of jurisdictional wetlands at a 2:1 ratio (or as agreed to by the permitting agencies) within the project site boundary, or at a 3:1 ratio (or as agreed to by the permitting agencies) off-site within the local watershed, by creating, restoring or enhancing waters of the U.S., or contributing in-lieu funds to an existing or new restoration project preserved in perpetuity. The restoration effort shall require implementation of a five-year monitoring program with applicable performance standards, including but not limited to establishing: 80 percent survival rate of restoration plantings native to local watershed; absence of invasive plant species; absence of erosion features; and a functioning, and self-sustainable wetland system. <p>Mitigation Measure E.8f: Avoid all potential jurisdictional wetlands and riparian habitat located along the roadway alignments, as feasible. Prior to construction activities, the project applicant shall take appropriate measures to protect the wetland and riparian habitat located in these areas. The following protection measures are to be included in the grading and Reclamation Plan:</p> <ul style="list-style-type: none"> • Installation of exclusionary construction fencing to protect these features from all project construction and operation activities; and 	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<ul style="list-style-type: none"> • Implementation of measures to control dust in adjacent work areas (please see comprehensive dust control program identified in Mitigation Measure F.4 in Section IV.F, Air Quality). <p>Mitigation Measure E.8g: The contractor shall comply with all laws and regulations (Caltrans Standard Specifications, section 7-1.01). The contractor shall be made aware that, if there is removal of any trees on private property in conjunction with the roadway widening improvements, it must be in accordance with the following: 1) the County Tree Protection and Replacement Ordinance; 2) the Sonoma County Valley Oak Stewardship Guidelines for valley oak trees removed within the Valley Oak Habitat combining district; and 3) the Heritage or Landmark Tree Ordinance. Enforcement of this measure will be through a combination of the DTPW and PRMD staff.</p> <p>Mitigation Measure E.8h: The project proponent shall implement measures to minimize and avoid take of CRLF and CTS that would additionally benefit pond turtles and FYLF, if present. The following measures are derived from the Programmatic Biological Opinion (PBO) for impacts to California red-legged frog (USFWS, 1999). Projects that impact CRLF or CTS require formal consultation with the USFWS and issuance of a Biological Opinion. The following actions will minimize impacts to these species.</p> <ul style="list-style-type: none"> • A USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and CTS and their habitat, and the general measures that are being implemented to protect the CRLF as they relate to the roadway widening improvements. • A preconstruction survey for CTS shall be performed by a qualified biologist within 72 hours of new ground disturbances for work areas on Roblar Road between Carniglia Lane and Stony Point Road. Such surveys allow for the identification and relocation of CTS and other special status species that may be present. • A USFWS-approved biologist shall be present during initial grading activities to monitor roadway construction activities within 100 feet of creek corridors and aquatic habitat that could support CRLF. Thereafter, an onsite person shall be designated to monitor onsite compliance with all minimization measures. The USFWS-approved biologist shall ensure that this individual receives training consistent with that outlined in the Biological Opinion. 	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>Mitigation Measure E.8i: Implement Mitigation Measure D.4a and D.4b to reduce potential impacts to nesting raptors and other special-status birds.</p> <p>Mitigation Measure E.8j: Implement Mitigation Measure D.5 to reduce potential impacts to badgers.</p> <p>Mitigation Measure E.8k:</p> <ul style="list-style-type: none"> • To the extent possible, the contractor shall schedule truck trips outside of peak commute hours. • Lane closures on Roblar and Pepper Road shall occur only during the hours of 8:30 a.m. and 4:30 p.m. Outside of these hours on Monday through Friday, or on weekends, two lanes of traffic on both roads must be open. • If lengthy delays are anticipated, signs shall be posted to notify motorists that traffic will be subject to delay. • Traffic safety guidelines compatible with Section 12 of the Caltrans Standard Specifications, "Construction Area Traffic Control Devices" shall be followed during construction. Project plans and specifications shall also require that adequate signing and other precautions for public safety be provided during project construction. • For highly sensitive land uses, such as schools, fire and police, the County shall require the construction contractor to develop access plans in consultation with facility owner or administrator. The contractor shall notify the facility owner in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures. • The County shall require the contractor to provide for passage of emergency vehicles through the project site at all times. • The County shall require the contractor to maintain access to all parcels adjacent to the construction zone during construction. <p>Mitigation Measure E.8l: The following dust control measures will be included in the project:</p>	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<ul style="list-style-type: none"> • Water or dust palliative shall be sprayed on unpaved construction and staging areas during construction as directed by the County. • Trucks hauling soil, sand and other loose materials over public roads shall cover the loads, or keep the loads at least two feet below the level of the sides of the container, or shall wet the load sufficiently to prevent dust emissions. • Paved roads shall be swept as needed to remove soil that has been carried onto them from the project site. • Water or other dust palliative shall be applied to stockpiles of soil as needed to control dust. <p>Mitigation Measure E.8m: Roadway widening construction activities for this project shall be restricted as follows:</p> <ul style="list-style-type: none"> • All internal combustion engines used during construction of this project shall be operated with mufflers that meet the requirements of the State Resources Code, and, where applicable, the Vehicle Code. • 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. Only work that does not require motorized vehicles or power equipment shall be allowed on holidays. If work outside the times specified above becomes necessary, the resident engineer shall notify the PRMD Environmental Review Division as soon as practical. <p>Mitigation Measure E.8n:</p> <ul style="list-style-type: none"> • Following roadway widening and creation of any cut slopes, the County shall require the contractor to provide landscape improvements. Native shrubs and trees shall be planted to create a landscape that recalls the native landscape of the region. Plants shall be selected that require the least maintenance, and create a sustainable landscape. • If retaining walls are required as part of the roadway widening, the use of natural finishes shall be considered, if feasible. • A maintenance program, including weeding and summer watering shall be followed until plants have become established (minimum of three years). 	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact E.9: Implementation of Mitigation Measure E.2a may require minor additional roadway width on Stony Point Road beyond that planned by the County that could result in additional secondary environmental impacts. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure E.8o: If archaeological materials are discovered during project construction, construction shall cease in the immediate vicinity of the find until a qualified archaeologist is consulted to determine the significance of the find, and has recommended appropriate measures to protect the resource. Further disturbance of the resource will not be allowed until those recommendations deemed appropriate by the County have been implemented.</p> <p>Mitigation Measure E.8p: If paleontological resources or unique geologic features are discovered during project construction, construction shall cease in the immediate vicinity of the find until a qualified paleontologist or geologist is consulted to determine the significance of the find and has recommended appropriate measures to protect the resource.</p> <p>Mitigation Measure E.9: Implement adopted mitigation measures contained in the <i>Signalization of Stony Point Road at Roblar Road, Mitigated Negative Declaration and Mitigation Monitoring Program</i>, Sonoma County PRMD, October 2005.</p>	<p>Less than Significant</p>
<p>F. Air Quality</p>			
<p>Impact F.1: The proposed project would generate emissions of criteria pollutants (PM₁₀, NO_x, ROG, and CO) on the project site and along haul routes. Project-generated emissions of ROG, and CO would be less than the applicable significance thresholds; consequently, the impact of the project on these criteria pollutants would be less than significant. Project emissions of PM₁₀ would be above the applicable significance threshold; this impact would be less than significant with mitigation. Project emissions of NO_x would be above the applicable significance threshold; this would be a significant and unavoidable impact.</p>	<p>Significant for NO_x and PM₁₀</p>	<p>Mitigation Measure F.1a: The applicant shall utilize PG&E electricity to power the mobile processing plant instead of using the proposed diesel-powered generator. B switching to PG&E electricity, total project-generated annual NO_x emissions would be reduced by nearly 20 percent in 2007 and by approximately 42 percent in 2027. Furthermore, implementation of this mitigation measure by itself would avoid the significant impact of exceedance of the annual NO_x threshold in 2027 (but not, however, in 2007). The conversion from the diesel generator to PG&E electricity would also have the beneficial effect of reducing other project-generated criteria pollutants, as well eliminating the project's on-site stationary source of diesel emissions (see Impact F.3 for discussion of diesel impacts).</p> <p>The specific electrical loading and requirements of the proposed project shall be determined by PG&E after the project applicant submits a formal application for electrical service. At that time, PG&E would review the proposed project and identify what additional on- and/or off-site electrical requirements would be needed to deliver electrical service to the site.</p>	<p>Significant and Unavoidable for maximum daily emissions of NO_x for 2007 and 2027, and annual NO_x for 2007, however, Less than Significant for annual emissions of NO_x for 2027; and Less than Significant for PM₁₀.</p> <p>Collectively, implementing Mitigation Measures F.1a through F.1c would reduce annual NO_x emissions by approximately 31.7 tons per year in 2007 and by 14.9 tons per year in 2027. As a result, implementation of these mitigation measures would collectively decrease annual NO_x emissions by roughly 50 percent.</p> <p>Nevertheless, total maximum daily NO_x emissions would still exceed the daily</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>Mitigation Measure F.1b: The project applicant shall utilize 2007 model engines or newer on-site loaders, dozers, rock trucks, and water truck. As described in the EIR Project Description, the applicant proposes to utilize two dozers, two loaders, two rock trucks and one water truck on-site.</p> <p>By utilizing the latest available model dozers, loaders, rock trucks, and water truck, total project-generated annual NO_x emissions would be reduced by approximately 8 percent in 2007. The use of the latest model mobile equipment would also have beneficial effect of reducing other project-generated criteria pollutants, as well as reducing project on-site mobile diesel emissions (see Impact F.3 for discussion of diesel impacts).</p> <p>Mitigation Measure F.1c: The project applicant shall require that all quarry operator owned off-site-haul trucks, and to the extent feasible, all off-site haul trucks that would be under contract with the quarry operator, use 2003 model or newer trucks. As stated in the EIR Project Description, the applicant estimates that no less than 60 percent of total material produced at the quarry would either be directly used by the applicant or sold under contract. Of this amount, the applicant estimates that 90 percent (or approximately 54 percent of total haul trucks) could be required to use 2003 model or newer haul trucks (the remaining 10 percent would consist of smaller contractors and truck fleets, where it would be infeasible to require use of newer model trucks).</p> <p>With implementation of Mitigation Measure F.1c, the total project-generated annual NO_x emissions would be reduced by approximately 32 percent in 2007. It should be noted any higher percentage use of newer haul trucks would result in further reduction in total estimated NO_x emissions.</p> <p>The use of newer model haul trucks would also have beneficial effect of reducing other project-generated criteria pollutants, as well as reducing project haul truck diesel emissions. Notably, implementation of this measure would reduce total project-generated maximum daily PM₁₀ emissions in 2007 to a less than significant level.</p> <p>Mitigation Measure F.1d: Implement the formal comprehensive dust control program identified in Mitigation Measure F.4. The implementation of a formal comprehensive dust control program for implementation during project operation would ensure all localized PM₁₀ emissions would remain less than significant.</p>	<p>threshold through the life of the project and the annual threshold between 2007 and 2027. For this reason, the impact would remain Significant and Unavoidable.</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact F.2: The proposed project would generate localized CO emissions on roadways and at intersections in the project vicinity. The project concentrations of CO would be a less than significant impact.</p>	<p>Less than Significant</p>	<p>None Required</p>	
<p>Impact F.3: The proposed project would generate DPM emissions from off-site project haul trucks, and from on-site mobile and stationary sources during the lifetime of the quarry. This would be a less than significant impact.</p>	<p>Less than Significant</p>	<p>None Required. However, implementation of Mitigation Measure F.1a through F.1c would collectively further reduce total annual off- and on-site project DPM emissions [by approximately 0.26 tons in 2007 (a 45 percent reduction), and by 0.08 tons in 2027 (a 20 percent reduction)]. Accordingly, implementation of this mitigation would further decrease DPM exposure and associated health risk at nearby receptors and along haul routes over the project lifetime.</p>	
<p>Impact F.4: During the initial construction phase, and episodically during operation, on-site sources of fugitive dust generated by the proposed project would have the potential to contribute to local increases in PM₁₀ at nearby receptors. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure F.4: A comprehensive dust control program shall be implemented by project applicant that would include the quarry's proposed dust control measures to maintain minimal fugitive dust impacts from the project.</p> <p>Elements of the dust control program (especially during the dry season) for project components include, but are not necessarily limited to, the following:</p> <ul style="list-style-type: none"> • Water all active unpaved vehicle circulation areas daily, using reclaimed water whenever possible. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency whenever wind speeds exceed 15 miles per hour during dry conditions. • Suspend excavation activity when winds (instantaneous gusts) exceed 25 miles per hour during dry conditions. • Cover all quarry-operated trucks hauling soil, sand, and other loose materials, or require all quarry-operated trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer) or CHP standards. • Sweep paved roadways (with water sweepers using reclaimed water if possible) at the end of each day if visible soil material is carried onto adjacent paved roads. • Hydroseed or apply soil stabilizers to inactive exposed soil areas (as presented in the quarry's reclamation and water quality control plan). 	<p>Less than Significant</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact F.5: Project operations would involve the crushing of aggregate on-site, which could result in the airborne release of crystalline silica. This would be a less than significant impact.</p>	<p>Less than Significant</p>	<p>None Required</p>	
<p>Impact F.6: The proposed project would make an incremental contribution to cumulative GHG emissions (CO₂, CH₄, and N₂O) as a result of onsite generator, onroad motor vehicles, and onsite offroad equipment.</p>	<p>No accepted methodology or standards exist for determining the significance of these emissions.</p>	<p>None Required</p>	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact F.7: The proposed project, together with anticipated cumulative development in the area, would contribute to regional criteria pollutants and TACs. This would be a significant and unavoidable impact.</p>	<p>Significant and Unavoidable.</p>	<p>None Feasible</p>	<p>Significant and Unavoidable.</p>
<p>G. Noise and Vibration</p>			
<p>Impact G.1: Noise generated by mining equipment and excavation activities, and initial construction, would result in an increase in the ambient noise levels at the nearest residence(s). This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure G.1a: At the initiation of each of the three project phases and at regular intervals within each phase, noise monitoring shall be conducted by a qualified acoustical consultant at fence-line locations to the west and the northeast that are on the direct line between the path from the center of quarry operations and the nearest off-site sensitive receptor in that direction. Noise source levels of the specific equipment to be used shall be measured and specific sound levels at the residences predicted.</p> <p>If no exceedances of the Table NE-2 daytime standards are predicted, operations may proceed. Should noise levels exceed the daytime limits in Table NE-2, the quarry operator shall take measures so that quarry operations are within the limits in Table NE-2. Measures could include any combination of the following: (1) additional soundproofing to equipment (2) soundberms or other noise barriers to attenuate equipment noise, (3) sound proofing to affected occupied residences, (4) restriction on duty cycles for noisy equipment, or other recommended measures. If the operator presents evidence to the County that demonstrates that the identified measures will prevent noise levels in excess of the Table NE-2 standards, then the measures shall be implemented and mining operations may proceed within the area included in the monitoring study. Once work begins, the noise level shall be monitored for a period long enough to validate the predicted levels. Upon request by the County, the applicant shall provide additional monitoring at later times to demonstrate compliance.</p> <p>Mitigation Measure G.1b: To comply with the nighttime requirement in Table NE-2, loud operations capable of exceeding the nighttime requirement in Table NE-2 shall not occur in the 6:00 to 7:00 a.m. timeframe. This requirement shall also be reviewed during the start-up noise testing described in Mitigation Measure G.1a.</p>	<p>Less than Significant</p>
<p>Impact G.2: Traffic associated with operation of the project would result in an increase in ambient noise levels on nearby roadways used to access the quarry. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure G.2: As feasible, and if approved by the property owners, the applicant shall fund residential noise insulation upgrades on the two residences on Roblar Road between the project entrance and Valley Ford Road, sufficient to maintain existing interior noise levels with the increased truck traffic.</p>	<p>Significant and Unavoidable. Mitigation Measure G.2 would require approval of the property owners to make the residential noise insulation upgrades. Without the approval of the property owners to implement this mitigation measures, this impact would remain significant.</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact G.3: Blasting that would occur under the project would generate temporary airborne and groundborne noise and vibration. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure G.3a: The blasting plan shall ensure that ground motions do not exceed 0.5 in/s at the nearest residence. The nearest residence would be located about 600 feet northeast of the proposed mining area where rock-blasting operations might occur. To ensure that that the intensity of ground motion in this location would not exceed the 0.5 in/s limit, all blasting in the eastern edge of the proposed quarry shall be designed to assure that charges are sized to maintain a scaled distance (Ds) of 65 or greater (see Appendix F-1 in the EIR). With this limitation, maximum cumulative weight of any charges firing within any 8-milliseconds time period shall not exceed 85.2 pounds $[(600/65)^2]$. This limitation would be achieved if the applicant used delay-decked charges in 5 inch holes or reduced hole-size or the height of benches. For practical blasting purposes, the single charge in a 34-foot hole could be separated into two or three individually delayed charges, separated by stemming, to ensure the maximum charge weight-per-delay in 5-inch holes is appropriate for vibration control.</p> <p>Mitigation Measure G.3b: The applicant shall conduct monitoring of ground vibration and air-overpressure at a minimum of two locations to ensure these effects remain under threshold levels. One location should be close to the nearest residential property. The second monitoring point should be the adjacent landfill property. All monitoring equipment and practices shall conform with the standards developed by the Vibration Section of the International Society of Explosive Engineers (see Attachment 1 in Appendix F of this EIR).</p> <p>Mitigation Measure G.3c: Blasting shall be limited to daytime hours between 10:00 am. and 4:00 p.m.</p> <p>Mitigation Measure G.3d: A blasting permit shall be obtained from the Sonoma County Sheriff's Department prior to any blasting.</p> <p>Mitigation Measure G.3e: Discuss the blast monitoring program with the residents in the project area. Educate property owners as to what is being done and why. Obtain information on time periods that are sensitive to blast activity.</p> <p>Mitigation Measure G.3f: Conduct a pre-blast survey to determine the condition of existing structures, and to alert homeowners that some rattling may be expected but damage is not expected. Contacts should be provided so that damage claims and complaints can be monitored and responded to quickly.</p>	<p>Less than Significant</p>

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact G.4: Traffic associated with operation of the project would result in an increase in cumulative noise levels on roadways used to access the quarry. This would be a potentially significant impact</p>	<p>Potentially Significant</p>	<p>Mitigation Measure G.3g: Schedule blasts to occur at approximately the same time on each blast day. Include this information in public announcements.</p> <p>Mitigation Measure G.4: Implement Mitigation Measure G.2 for the two residences on Roblar Road between project entrance and Valley Ford Road.</p>	<p>As discussed in Mitigation Measure G.2, this measure would require approval of the property owners to make the residential noise insulation upgrades.</p> <p>It should also be noted that the because of the topography and setting traditional means of traffic noise abatement on project haul routes such as road side barriers is not viable. As a result the impact would remain Significant and Unavoidable as concluded in the adoption of the ARM Plan.</p>
<p>H. Hazardous Materials</p> <p>Impact H.1: Hazardous materials transported or used onsite during proposed mining and reclamation activities (i.e., petroleum products, blasting materials) could be spilled or otherwise released through improper handling or storage. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure H.1a: Prior to initiation of the project, the applicant shall prepare a Spill Prevention, Control and Counter Measure Plan (SPCCMP) in conformance with the requirements of the Code of Federal Regulations 40CFR112. A copy of the SPCCMP shall be submitted to the Sonoma County Department of Emergency Services to demonstrate completion of the mitigation.</p> <p>Mitigation Measure H.1b: If hazardous waste is generated or stored, then the operator shall comply with hazardous waste generator laws and AB2185 requirements and obtain a permit or approval from the C.U.P.A. or the participating agency. The applicant shall submit a copy of a current permit to the Permit and Resource Management Department Health Specialist to verify compliance.</p> <p>Mitigation Measure H.1c: All hazardous waste materials shall be stored, handled and managed in accordance with the approved site plan and hazardous materials plan so as to reduce the potential for any spillage.</p> <p>Mitigation Measure H.1d: No soil or other material containing hazardous or toxic waste shall be imported to the quarry.</p>	<p>Less than Significant</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
I. Aesthetics			
Impact I.1: The proposed quarry would substantially alter the visual character of the project site and adversely affect views of the site from both public and private vantage points. This would be a significant impact.	Significant	None available beyond those proposed by the project sponsor, and those identified in the ARM Plan and SMARO.	Significant and Unavoidable. Even with measures proposed by the project sponsor, and implementation of conditions contained in the ARM Plan and SMARO, visual impacts would not be reduced to a level of insignificance. It should be noted the ARM Plan also identified potential visibility of mining and processing operations for mining facilities within the County as significant and unavoidable.
Impact I.2: The project could result in the production of new sources of light and/or glare. This would be a less-than-significant impact.	Less than Significant	None Required	
Impact I.3: The proposed quarry, in conjunction with other cumulative development in the project vicinity, would alter the visual character of the project vicinity. This would be less-than-significant cumulative impact.	Less than Significant	None Required	
J. Public Services and Utilities			
Impact J.1: The proposed project would increase demand for fire protection and emergency medical services. This would be a potentially significant impact.	Potentially Significant	Mitigation Measure J.1: As part of the County's Environmental and Design Review process, prior to project approval, the GRFPD shall review the project site plans to ensure proper emergency access and fire prevention features are incorporated into the project.	Less than Significant
Impact J.2: The proposed project would require police protection and traffic enforcement services of the Sonoma County Sheriff's Department. This would be a less than significant impact.	Less than Significant	None Required	
Impact J.3. The proposed project would generate amounts of solid waste, and may involve use of recycled materials at the quarry. This would be a less than significant impact.	Less than Significant	None Required	

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
<p>Impact J.4: The proposed project, and implementation of certain mitigation, would increase demand for PG&E electricity. This would be a less than significant project and cumulative impact.</p>	<p>Less than Significant</p>	<p>None Required</p>	
<p>K. Cultural Resources</p>			
<p>Impact K.1: Land alteration proposed under the project could affect previously undiscovered cultural resources. This would be a potentially significant impact.</p>		<p>Mitigation Measure K.1a: All employees on site shall undergo a cultural resources orientation and awareness training prior to commencing work activities on site. Such training shall include familiarization with the stop work restrictions if buried archaeological remains or artifacts are uncovered. The operator shall provide Permit and Resource Management Department with a verification list of the employees completing the orientation. The training and list shall be updated by the operator as new employees are added.</p> <p>Mitigation Measure K.1b: During quarry operations, particularly initial grading and on-going clearing operations, should any undiscovered evidence of archaeological materials be encountered, work at the place of discovery shall be halted, and a qualified archaeologist shall be consulted to assess the significance of the finds. Prompt evaluations could then be made regarding the finds, and management plan consistent with CEQA and Sonoma County cultural resources management requirements could be adopted.</p> <p>Mitigation Measure K.1c: If prehistoric Native American burials are encountered, a qualified archaeologist, the Sonoma County Coroner, the California Native American Heritage Commission and local Native American Heritage Commission shall be consulted in accordance with established requirements.</p>	<p>Less than Significant</p>
<p>Impact K.2: Land alteration proposed under the project would affect paleontological resources. This would be a potentially significant impact.</p>	<p>Potentially Significant</p>	<p>Mitigation Measure K.2a: Prior to the start of construction, construction personnel involved with earth-moving activities will be informed on the appearance of fossils and the proper notification procedures. This worker training will be prepared and presented by a qualified paleontologist.</p> <p>Mitigation Measure K.2b: Prior to the initiation of quarry activities, a qualified paleontologist shall be retained to conduct a preliminary survey and surface salvage in an effort to recover, as is feasible, surface deposits (if present) in their original context. The preliminary survey shall identify and map areas of high-potential rock units, as well as low and undetermined-potential rock-units within the quarry site area—if such distinctions can be established on a micro-topographic scale versus existing geologic surveys of the area. The paleontologist shall focus the field survey in exposures of sensitive stratigraphic units within the quarry site that would be disturbed.</p>	<p>Less than Significant</p>

**TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>Mitigation Measure K.2c: Prior to the initiation of quarry activities, the consulting paleontologist shall both prepare a monitoring and mitigation program and implement the program during the excavation phase at the quarry site and for all other project-related ground disturbance. The paleontologic resource monitoring and mitigation program shall include, but not limited to, as outlined by the Society of Vertebrate Paleontology (1995):</p> <ul style="list-style-type: none"> • preconstruction coordination; • guidelines for excavation monitoring; • emergency discovery procedures; • procedures to permit the stabilization of large remains to allow for identification and permanent preservation. This includes stabilization of large remains and screen washing of fossiliferous sediments to recover significant microfossil remains; • discusses how recovered fossils would be analyzed, including (but not limited to): identification to genus/species, element, etc.; interpretation of species abundance and diversity; determination of sex ratios and the relative abundance of ontogenetic age groups; dating of remains as appropriate; evaluation of potential taphonomic factors; and comparison with other vertebrate faunas from the Sonoma County region. • Discusses how recovered significant fossils would be preserved and curated, including all associated contextual data, at a Federally recognized, accredited repository with long-term retrievable storage. • Defines a framework for regularly scheduled reporting on the project. <p>Mitigation Measure K.2d: Earth-moving quarry activities shall be monitored where this activity will disturb previously undisturbed sediment. Monitoring will not be conducted in areas where exposed sediment will be buried, but not otherwise disturbed. If high-potential and undetermined-potential areas within the quarry can be distinguished, full-time monitoring shall take place in rock units that have high paleontologic sensitivity, e.g. Wilson Grove Formation, while units of undetermined sensitivity shall be spot-checked monitored. In lieu of any rock-unit distinction on the site, the frequency and duration of the monitoring conducted shall be under the discretion of the project paleontologist.</p>	

TABLE II-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Significance Before Mitigation	Mitigation Measures	Significance After Mitigation
		<p>Mitigation Measure K.2e: Significant fossils discovered shall be salvaged. Salvage would include recovery of exposed significant paleontologic resources, removal and/or molding of exposed trackways and sampling where necessary to recover microfossil remains.</p> <p>Mitigation Measure K.2f: Upon completion of a 50% threshold of quarry excavation, as determined by Roblar Quarry managers, the project paleontologist shall prepare a progress report including a summary of the field and laboratory methods, site geology and stratigraphy, faunal list, and a brief statement of significance and relationship of the site to similar fossil localities. A similar final report shall be prepared at the 100% threshold of quarry excavation. These reports shall be distributed to the appropriate lead and cooperating agencies and any relevant scholarly publications.</p>	

CHAPTER III

Project Description

A. Project Overview

The project applicant, North Bay Construction, Inc., proposes to develop a quarry (Roblar Road Quarry) in southern Sonoma County, approximately five miles west of the City of Cotati. The project applicant has requested the necessary entitlements from the County of Sonoma to enable development of the quarry. Approval of this request would grant a use permit for mining for a 20-year period, under the terms of the County's Aggregate Resource Management (ARM) Plan, mining regulations, and any approval conditions that are imposed. The proposed project would disturb approximately 70 acres (including a 65-acre quarry pit) of the approximate 199-acre parcel over a 20-year mining period. The Roblar Road Quarry proposes to mine approximately 570,000 cubic yards of quarry material annually (approximately 2,260 cubic yards per day). The County of Sonoma, serving as Lead Agency responsible for administering the environmental review for the proposed project, determined that preparation of an environmental impact report (EIR) is needed for the proposed project because it has the potential to cause significant effects on the environment.

B. Project Objectives

Section 15124(b) of the CEQA Guidelines requires that the Project Description of an EIR contain a statement of objectives sought by the proposed project. The project sponsor's objectives include:

- To profitably develop and operate a hard rock quarry on land owned by the applicant, in reasonable proximity to Highway 101, at a site designated for aggregate production in the Sonoma County ARM Plan.
- To provide an affordable and reliable source of aggregate suitable for Portland cement concrete ("PCC"), asphalt concrete ("AC") and asphalt concrete base ("ACB") to customers in the south central portion of Sonoma County, thus minimizing transport distances and associated costs and impacts and facilitating the State and County policy of meeting local demand for high quality aggregate with local resources.
- To develop a quarry that assists the County of Sonoma in meeting its stated goals and policies of shifting aggregate production away from terrace mining to hard rock quarries, thereby avoiding the conversion of prime agricultural land on the terraces of the Russian River.

- To assist in ameliorating the PCC, AC and ACB aggregate shortage identified in a recent report of the Department of Conservation titled *CGS Special Report 175: Mineral Land Classification of Aggregate Materials in Sonoma County, California*, dated 2005.

The County's goals and objectives for aggregate resources were established in the Sonoma County ARM Plan. Relevant objectives from the ARM Plan are presented below:

- Facilitate new or expanded quarry operations at designated sites or at other locations with resources which can meet the needs for aggregate in an environmentally sound manner.
- Encourage the retention of locally produced aggregate for use within Sonoma County.

C. Project Site and Vicinity Description

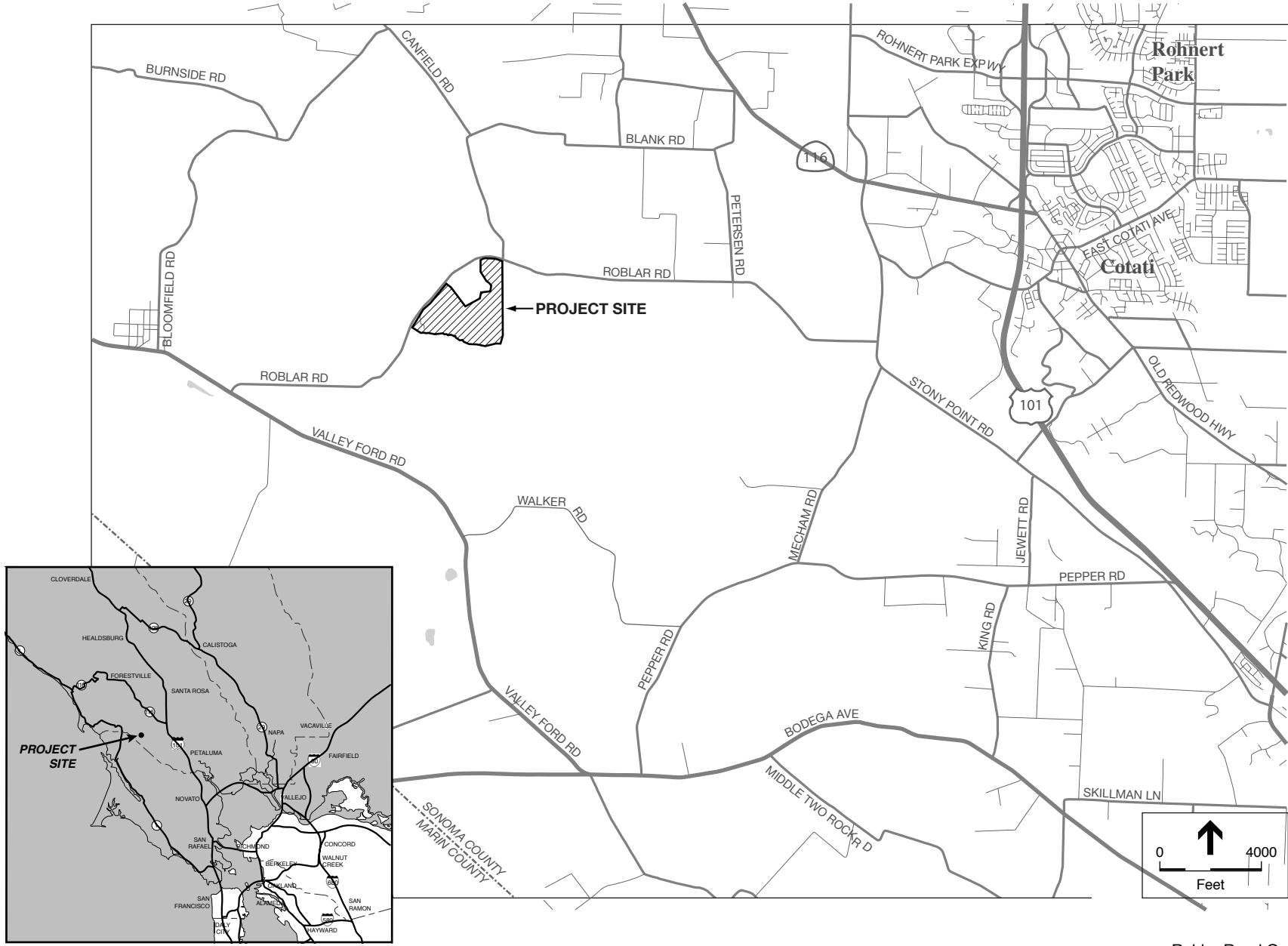
Site Description

The project site is located on two parcels totaling 198.76 acres at 7601 Roblar Road in southern Sonoma County, approximately five miles west of the City of Cotati (see Figure III-1: Regional Map). The project site is located within Township 5 North, Range 9 West, Sections 1 and 2; and Township 6 North, 9 West, Section 36 of the Two Rock Quadrangle (see Figure III-2: Site Location Map). The Assessor's Parcel Numbers (APNs) are 027-080-009 (70 acres) and -010 (128.76 acres)¹. The project site is bounded on the north by Roblar Road and the County-owned, closed Roblar Landfill, on the west by Roblar Road, on the south by a tributary to Americano Creek (hereafter, for clarity referred to in this EIR as Ranch Tributary), and on the east by privately-owned land.

Geographically, the project site is located within a long east-west trending valley that extends roughly between Cotati to the east and Bodega Bay to the west. The meandering Americano Creek forms the low point within this valley, with rolling hills rising on either side. In the project vicinity, the valley and Americano Creek trend in a northeasterly-southwesterly direction, with the project site located on the valley's southeast slopes. Depending on location, slopes within the project site face north, west or southward. Elevations on the project site range from approximately 110 feet above sea level (asl) along the property adjacent to Roblar Road to approximately 600 feet asl at the site's highest point (southeast corner). Slopes throughout the site range from approximately 10 to 30 percent.

Vegetation on the project site consists primarily of annual grasslands, with remnants of oak woodland in the northeast portion of the site, seasonal wetland area on the valley bottom adjacent to Americano Creek in the site's southwest corner, and riparian vegetation located along the drainages on and adjacent to the site (see Figure III-3, Aerial Photo). Three small seasonal drainages located on the project site flow southwesterly to the Ranch Tributary along the property south border, and ultimately to Americano Creek.

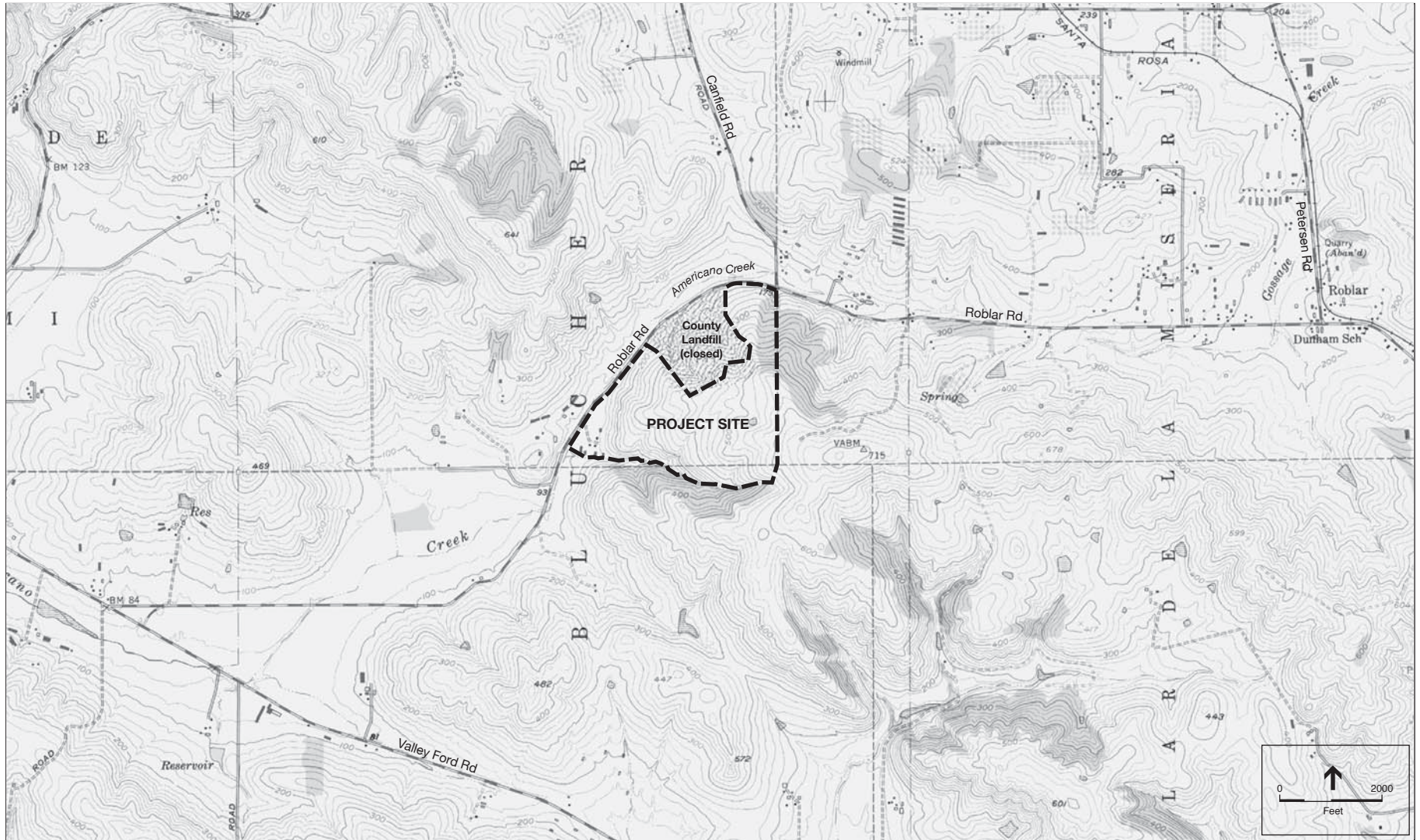
¹ The project site was previously APN 027-080-008. A lot line adjustment was completed in 2006 creating two parcels: APN 027-080-009 covering the proposed quarry and access road, and APN 027-080-010 covering the remainder of the site.



SOURCE: ESA

Roblar Road Quarry . 204334

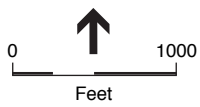
Figure III-1
Regional Map



SOURCE: USGS

Roblar Road Quarry . 204334

Figure III-2
Site Location Map



SOURCE: ESA, GlobeXplorer

Roblar Road Quarry . 204334

Figure III-3
Aerial Photo of Project Site

The project site is largely undeveloped. The project applicant currently leases the project site for livestock grazing. The site contains a ranch, including several outbuildings and an unoccupied residence near the southwest corner of the site (see Figure III-4: Existing Uses on Site). A small stock pond is located on the east side of the site. Vehicular access to the site is currently provided from Roblar Road near the southwest corner of the site. Existing unpaved roadways provide internal access between the Roblar Road entry, the ranch, the adjacent closed landfill, the stock pond, and the upper (eastern) reaches of the project site. There are two water wells on-site, located in the northeast and central-east portions of the site. An on-site septic system previously served the ranch house; this septic system was upgraded in 2007 by the project applicant. There is currently fencing enclosing the project site with some additional interior fencing primarily for cattle holding and feed areas. Electrical lines extend to the project site from Roblar Road.

Site and Vicinity Ownership

The quarry project applicant, North Bay Construction, Inc., is the current owner of the Roblar Road property. The applicant acquired the property in October 2001 as part of the larger 958-acre Roblar Ranch property.

Figure III-5 and Table III-1 present Assessors Parcel location and numbers for project site and vicinity.

**TABLE III-1
EXISTING PARCELS IN THE PROJECT VICINITY**

Assessor's Parcel Figure Key Number ^a	Assessor's Parcel Number	Assessor's Parcel Figure Key Number ^a	Assessor's Parcel Number
1	022-010-001	86	025-120-020
16	022-290-001	87	025-120-021
21	022-300-008	88	025-120-022
32	024-090-020	89	025-120-023
33	024-090-023	95	025-130-009
37	024-090-030	96	027-070-003
38	024-090-031	98	027-070-005
39	024-090-032	99	027-070-006
40	024-090-033	100	027-070-009
41	024-090-034	101	027-070-011
42	024-090-035	102	027-070-012
43	024-090-036	103	027-080-001
46	024-090-039	104	027-080-004
74	025-100-007	105	027-080-005
75	025-110-001	106	027-080-006
76	025-110-002	107a	027-080-009
77	025-110-004	107b	027-080-010
78	025-120-003	108	027-200-003
79	025-120-007	109	027-210-005
81	025-120-009	110	027-210-006
82	025-120-011	111	027-210-007
83	025-120-013	118	062-130-026
84	025-120-014	121	062-130-036
85	025-120-015	122	062-130-038

^a See accompanying Figure III-5, Assessor's Parcel Key Map, for location of parcels.

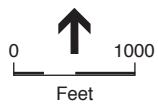
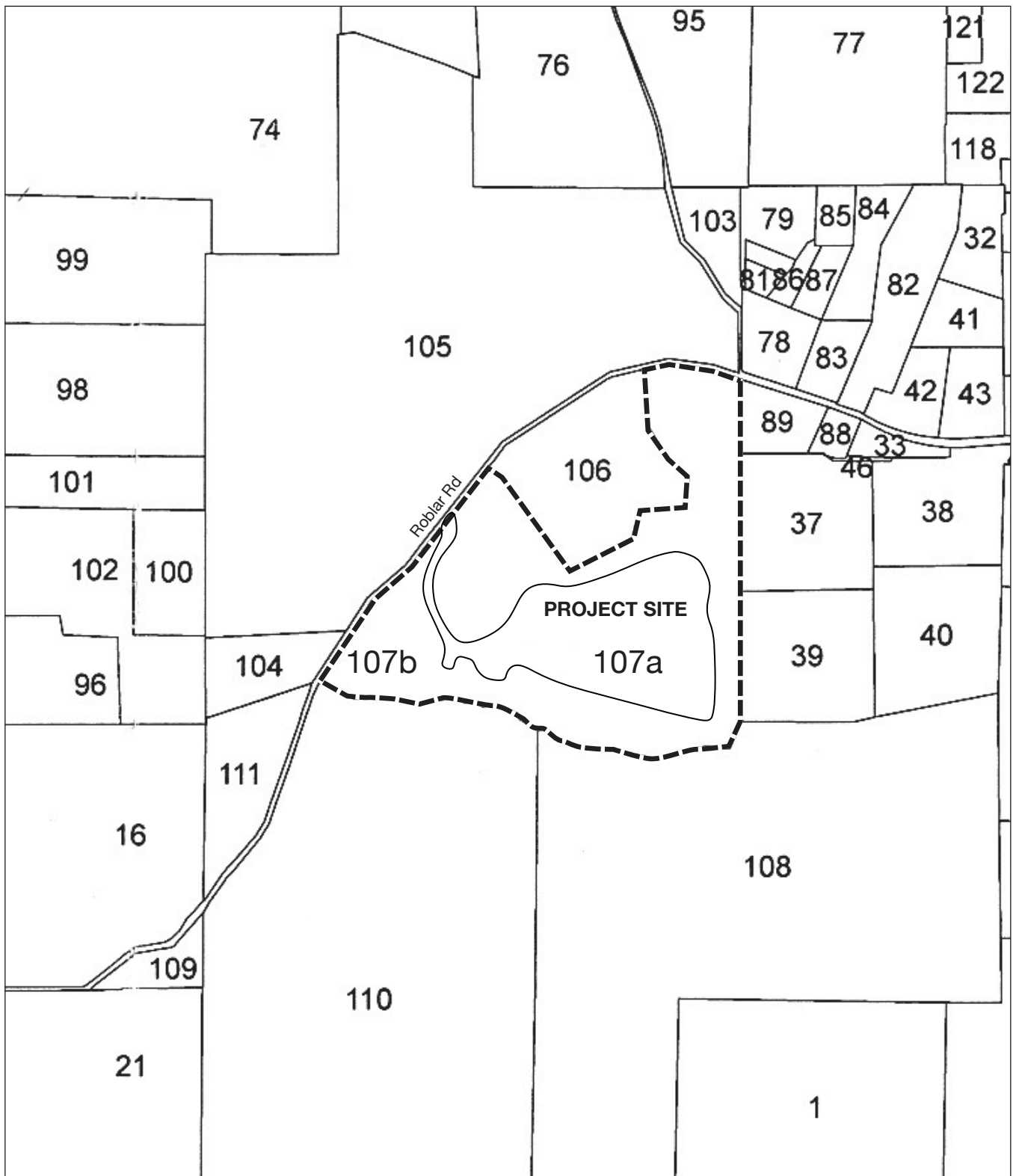
SOURCE: Sonoma County PRMD



SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure III-4
 Existing Conditions

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XX: Assessor's Parcel Number Key
 (please see Table III-1 for accompanying table to this figure)

--- Property Boundary

Roblar Road Quarry . 204334

SOURCE: County of Sonoma

Figure III-5
 Assessors Parcel Key Map

Existing Land Use Controls

The project site is identified in the Sonoma County Aggregate Resources Management (ARM) Plan as a potential quarry site. The Sonoma County General Plan designation for the project site is LEA (Land Extensive Agriculture). The project site is currently zoned LEA B6 160 Z (Land Extensive Agriculture District; B Combining District - 160-Acre/Unit; 2nd Unit Exclusion Combining District). A portion of the property is also within a Valley Oak Habitat (VOH) Combining District. The project site is currently within an agricultural preserve and under a Williamson Act contract. The project site is also located within the boundary of the Sonoma County *Petaluma Dairy Belt Area Plan*. Additional discussion of applicable land use controls for the project site and proposed project are discussed in Section IV.A, Land Use and Agricultural Resources.

Nearby Land Uses

A closed landfill (hereafter known as Roblar Landfill) is located adjacent to and north of the project site (see detailed description of landfill property below). Other adjacent land uses include livestock grazing, dairies and agricultural residential lots. Adjacent parcels to the south (Roblar Ranch) are under an agricultural conservation easement and Williamson Act contracts. Parcels directly to the north (across Roblar Road) are also under Williamson Act contracts. Further east along Roblar Road (in the community of Roblar) are a series of smaller rural residential properties and two schools (Dunham Elementary School and Quest Montessori School).

Adjacent Roblar Landfill Property

The closed Roblar Landfill is located adjacent to and north of the project site. The landfill property is characterized by three main pads which step up the slope from Roblar Road. The lowest (northernmost) pad (containing two waste cells) is situated at approximately 200 feet asl, a middle pad containing a single waste cell is located at approximately 270 feet asl, and an upper (southernmost) pad containing a single waste cell is at approximately 350 feet asl.

The landfill site was operated from 1956 through 1967 as an open burn pit. Between 1967 and 1971, the landfill site was operated as a sanitary landfill by Sonoma County. The County used a landfill technique known as trench filling, and used inert fill from an on-site source to cover the trenches. During the time the landfill site was operated as a burn pit and sanitary landfill (1956-1971), it received primarily residential and commercial waste, along with minor agricultural waste. Liquid waste was not accepted for disposal at the landfill site. The City of Santa Rosa reopened the landfill in 1972. Under the direction of the City of Santa Rosa, demolition debris was disposed of along the top of the lowest waste disposal unit, and then covered with soil. The City terminated operations in 1973 (Sonoma County, 1992). No additional waste has been accepted at the landfill since that time.

In 1981, the Sonoma County Department of Public Works performed extensive grading, drainage and revegetation work on the landfill site. This included grading and covering of all landfill areas with a two-foot thick soil layer, the installation of 350 feet of 42-inch storm drains and two

sediment ponds, and revegetation for erosion control (Sonoma County, 1987). Three groundwater monitoring wells were installed on the landfill site in 1991 (Sonoma County, 1992).

As part of the County's Stormwater Pollution Prevention Plan (SWPPP) for the landfill, the Sonoma County Department of Transportation and Public Works– Integrated Waste Division (DTPW-IWD) routinely tests surface water quality at the landfill, and submits quarterly reports to the Regional Water Quality Control Board (RWQCB). Since the Roblar Landfill is unlined, leachate is routinely removed from the landfill via an on-site leachate collection system, and transported to the Santa Rosa Treatment Plant.² This leachate is routinely tested for potential hazardous constituents. In 2004 and 2005, the Sonoma County DTPW-IWD voluntarily conducted groundwater monitoring at the three existing groundwater wells located on the landfill site. Additional details on monitoring conducted at the landfill are presented in Section IV.C, Hydrology and Water Quality.

D. Project Characteristics

The proposed project would disturb approximately 70 acres, including a 65-acre quarry pit, over a 20-year mining period. The proposed quarry operations would be developed in three phases (Phase 1 - Years 1 through 5, Phase 2 - Years 6 through 10, and Phase 3 - Years 11 through 20, respectively), with overall mining moving in an easterly direction within the site. For purposes of this EIR, the earliest year Phase 1 would be expected to commence is 2007.

A summary of quarry production, by phase, is presented in Table III-2, below. The quarry proposes to mine and process approximately 570,000 cubic yards of quarry material annually (an average of 2,260 cubic yards per day). Quarry materials would include aggregate road base, subbase, drain rock, quarry fines, fill material, riprap (rocks six inches and larger) and concrete aggregates. As these materials are processed they would be stockpiled on site for eventual loading and delivery.

**TABLE III-2
ESTIMATED ANNUAL AND TOTAL SALES PRODUCTION, BY PHASE**

Phase	Duration (Years)	Daily Production Rate (Cubic Yards)		Annual Production Rate (Cubic Yards)	Total Production in Phase (Cubic Yards)
		Average	Maximum		
1	1 through 5	2,260	3,600	570,000	2,850,000
2	6 through 10	2,260	3,600	570,000	2,850,000
3	11 through 20	2,260	3,600	570,000	<u>5,700,000</u>
					11,400,000

SOURCE: Roblar Road Quarry Surface Mining and Reclamation Plan Application, 2003.

² "Leachate" means any liquid formed by the drainage of liquids from waste or by the percolation or flow of liquid through waste. It includes any constituents extracted from the waste and dissolved or suspended in the fluid. The term ceases to apply to such liquid upon its being treated to the extent that it no longer contains any constituent of concern whose concentration exceeds the water quality objectives of ground water in the uppermost aquifer underlying the waste management unit (CCR Title 27, Section 20164).

It is anticipated that the quarry would serve, in part, potential future construction projects that would be developed and/or owned by the quarry applicant (North Bay Construction), as well as non-applicant-associated private contractors and destinations. The applicant estimates that over 90 percent of the product produced at the proposed quarry would be used in Sonoma County (including the Cities of Cotati, Petaluma, Rohnert Park, Sebastopol, and south Santa Rosa), and the balance used in the Novato area of Marin County.

As part of the project, in an effort to avoid potential effects east of the quarry within the community of Roblar, the applicant proposes to divert truck traffic west of the quarry on Roblar Road. The applicant estimates that between 60 and 80 percent of material produced at the quarry would be either be directly used by the applicant or sold under contract. All hauling conducted directly by the applicant, and all contract sales, would be conditioned such that trucks hauling materials under those contracts would be required to follow the following routes:

- To Northbound U.S. 101: Roblar Road west of site, Valley Ford Road, Pepper Road, Mecham Road, Stony Point Road, Highway 116 (Gravenstein Highway), to U.S. 101.
- From Southbound U.S. 101: Highway 116, Stony Point Road, Mecham Road, Pepper Road, Valley Ford Road, to Roblar Road west of site.
- To Southbound U.S. 101: Roblar Road west of site, Valley Ford Road, Pepper Road, to U.S. 101.
- From Northbound U.S. 101: Petaluma Boulevard, Stony Point Road, Pepper Road, Valley Ford Road, to Roblar Road west of site.

It should be noted that during preparation of this Draft EIR, the applicant requested the inclusion of a project alternative for consideration in the EIR that consists of an alternate truck haul route different from that proposed under the project. This alternate haul route is addressed in Alternative 2 in Chapter V, Alternatives, in this Draft EIR.

No specific controls are proposed as part of the project for preventing haul trucks not under contract from accessing the quarry from the east on Roblar Road. For purposes of this EIR, as a conservative approach, 60 percent of project haul trucks are assumed to be diverted west of Roblar Road, and 40 percent of project haul trucks are assumed to access the quarry from east on Roblar Road.

The applicant indicates that it would import concrete and asphalt to the site for recycling from its construction sites. Under such conditions, the applicant would schedule the inbound leg of its truck trips to import the recycled materials to the quarry, and the outbound leg for its off-hauling of aggregate materials from the quarry. Consequently, no increase in truck haul trips beyond that associated with the proposed hauling of aggregate materials is anticipated. No import of recycled materials from the general public would be allowed at the project site. The applicant estimates that between five to ten percent of total materials processed at the quarry would consist of imported recyclables. However, pursuant to the ARM Plan, the County would allow up to 20 percent of total materials processed at the quarry to consist of recyclables.

The applicant intends to continue cattle grazing during all proposed phases of mining on the portion of the project site that would not contain mining operations. It is anticipated that 80 to 100 cattle would be maintained at the site, and would be separated from the active mining operations by fencing. A description of the proposed initial grading and construction, and a description of each mine phase, is presented, below.

Phasing Characteristics

Phase 1 Initial Grading and Construction

Overview

Figure III-6 illustrates the initial grading and drainage plan for Phase 1. Phase 1 would begin with the excavation and grading of the proposed initial processing area, installation of a sediment pond and Phase 1 drainage features, and construction of the access road. Next, the proposed truck scales, office, equipment storage area and small parking lot would be constructed adjacent to the access road. Excess material from initial grading would be transferred to Stockpile Area A, located in the northeast corner of future Phases 2 and 3 mining area. Finally under this initial phase, a mobile quarry plant would be installed at the initial processing area.

It is anticipated that the existing stock pond on the site would be removed during this phase, and a new stock pond would be created on-site outside of the area of proposed quarry construction to continue to provide a water source for cattle grazing.

Figures III-7 and Figure III-8 presents four longitudinal sections of the project site, depicting the elevations of the existing grade, and proposed interim grade (including the initial processing area and stockpiles) and final grade, at specific locations.

Initial Processing Area Construction

The initial processing area (see Figure III-6) would serve as the initial location for the mobile quarry plant and associated initial processing operations (described below). This initial processing area would be located within the northwest quadrant of the Phase 1 limits, measure approximately 350 feet by 350 feet, and be situated at elevation of 370 feet asl.

Initial Sediment Pond and Drainage Installation

A sediment pond would be constructed at the west end of the Phase 1 limits, at an elevation slightly below 250 feet asl (slightly below the future quarry floor elevation), and a perimeter drainage swale system around the future Phase 1 mining area would be constructed. Further details on the construction and operation of these features are described below under Phase 1 Mining.

Access Road Construction

The proposed access road connection to Roblar Road would occur approximately 1,200 feet northeast of the existing access to the site. The access road would be level at Roblar Road, and then turn southward and steadily rise (at a grade of approximately 10 percent) to an final

elevation of approximately 250 feet asl near the office area, where the road would level off. The proposed access road would be paved for approximately 2,000 linear feet. The access road would contain two 10-foot travel lanes, plus unpaved shoulders. Slopes on either side of the access road would be graded at 2:1 (horizontal:vertical). Please see Figures III-14 and III-17 at the end of this chapter for access road cross-sections and profile.

No detailed plans of the access road connection to Roblar Road are currently available, however, the applicant has indicated the driveway would be constructed pursuant to all applicable Sonoma County Department of Transportation and Public Works design criteria.

Truck Scales, Office, Parking and Equipment Storage Area Construction

The proposed truck scales, office, parking lot, and equipment storage area would be constructed adjacent to the access road at an elevation of approximately 250 feet asl, just west of the Phase 1 area. The proposed single story office building would measure approximately 8 feet by 45 feet. A septic system, designed in accordance with the requirements of the Sonoma County Environmental Health Services Department, would be installed near the office to accommodate sanitary sewer needs of the site workers. One truck scale is proposed. The existing house on the project site would be remodeled and used by the quarry caretaker. The existing barn and workshop structures would remain and be utilized by the quarry operator.

Initial Stockpiling

It is estimated that a total of approximately 210,000 cubic yards of topsoil³ and overburden⁴ would be removed during the initial grading stage, and approximately 35,000 cubic yards would be filled, creating approximately 170,000 cubic yards of surplus cut materials. This surplus material would be transferred via truck to Stockpile Area A, to be located within the upper regions of future Phase 2 and Phase 3 mining areas (See Figure III-6). See discussion under Phase 1 Stockpiles, below, for a description of stockpile stabilization and sedimentation control features proposed.

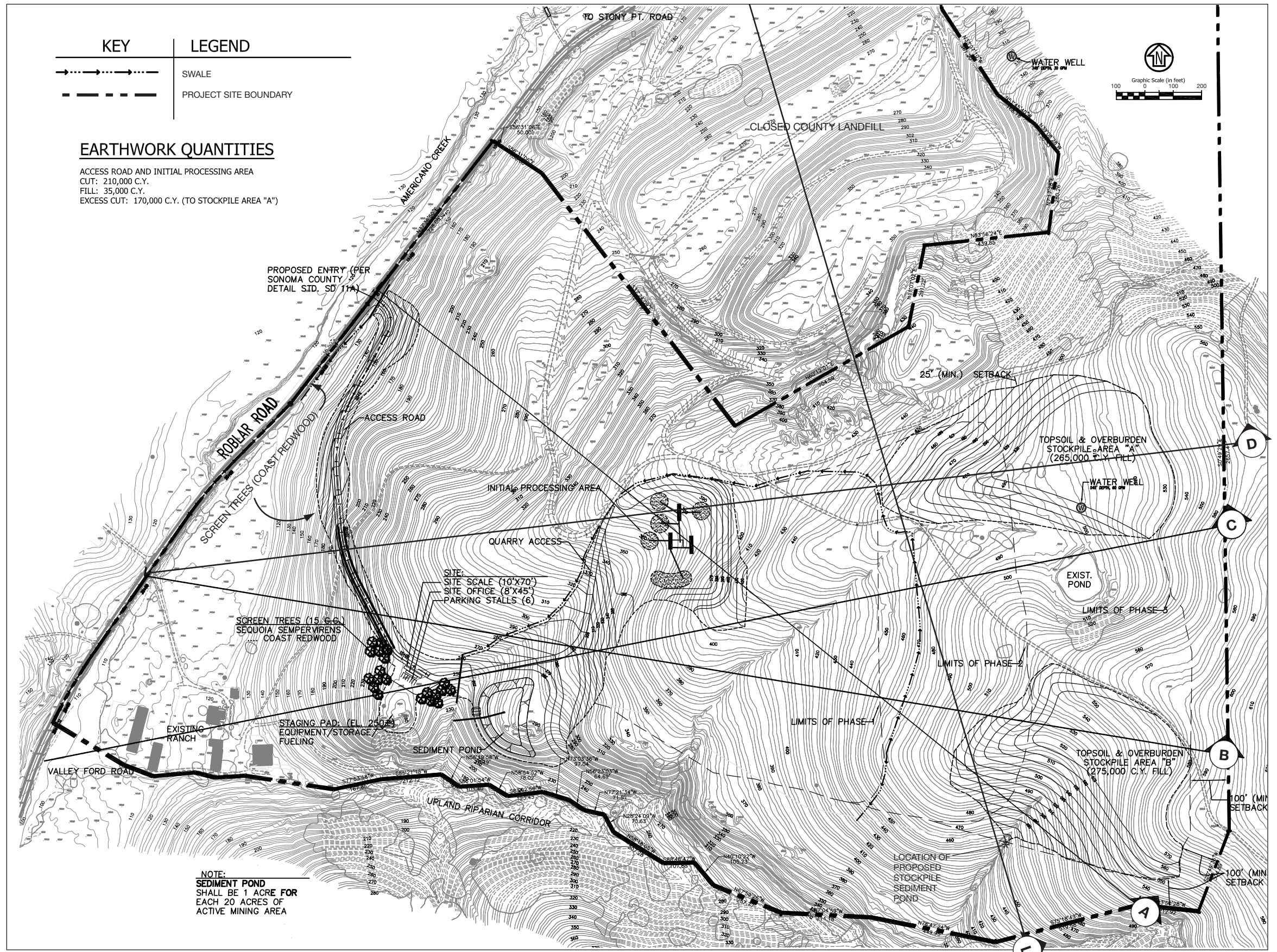
The stockpiled topsoil would be used as needed for on-site reclamation, while the stockpiled overburden would be sold as feasible.

Mobile Quarry Plant

The proposed mobile quarry plant would provide the permanent processing equipment for the quarry. However, being mobile, the location of this quarry plant would change over time. The mobile quarry plant would be first installed at the initial processing area, and moved eastward as needed, ultimately being located at the bottom-center of the Phase 1 quarry floor (250 feet asl) for the duration of the life of the quarry. The mobile quarry plant equipment would consist of a jaw crusher, cone crusher, plate feeders, screens and conveyor belts. The plant would be operated on electricity provided by a diesel engine-generator. See description of proposed processing operations under Phase 1 Mining and Processing, below. See also Equipment List and Power Needs discussion, below.

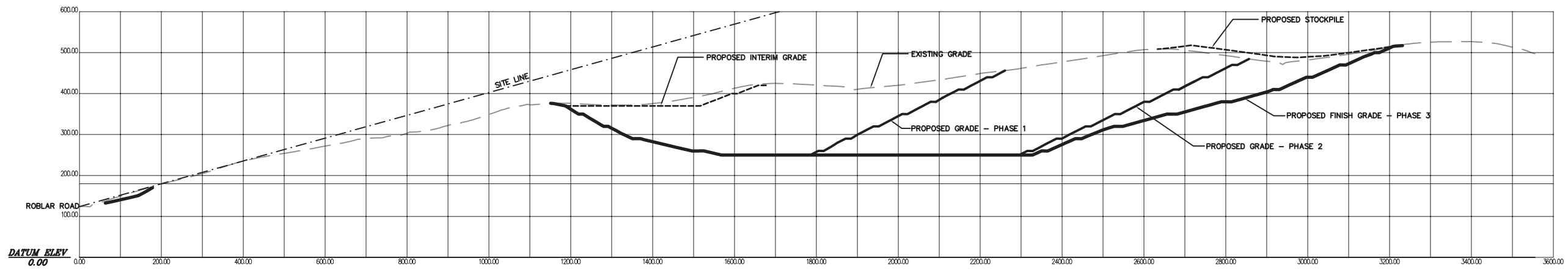
³ Topsoil refers to the surface layer of soil (including vegetation) removed from a site when excavating.

⁴ Overburden refers to the layer of materials between the topsoil and the aggregate resource being excavated.

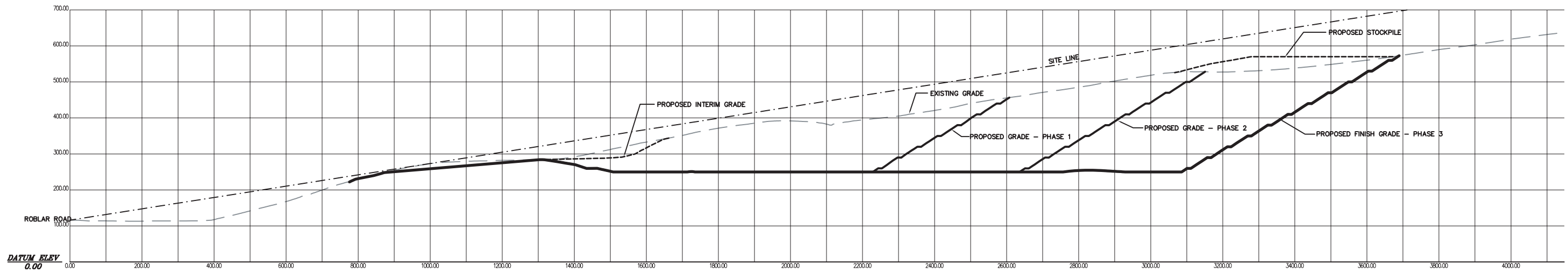


SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

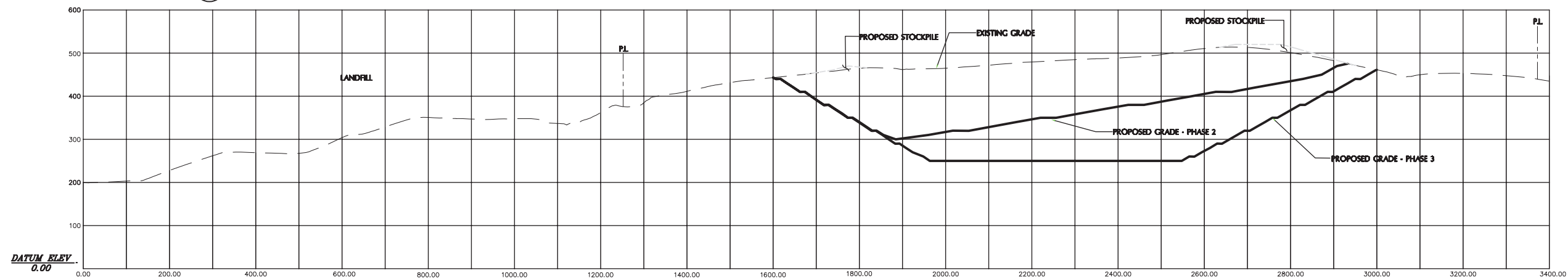
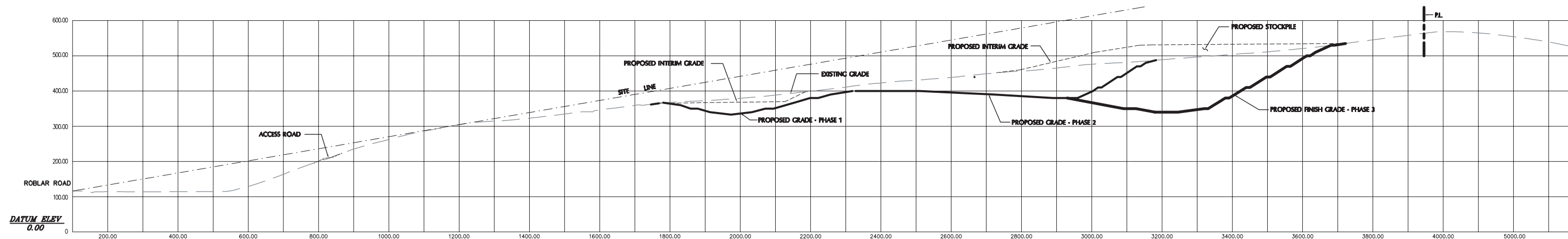
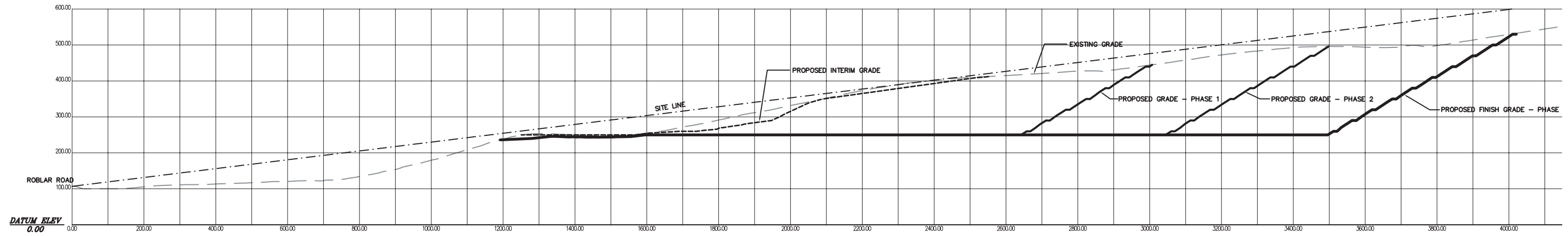
Roblar Road Quarry . 204334
Figure III-6
 Phase 1 - Initial Grading and Drainage Plan
 with Topsoil and Overburden Stockpile Areas



Longitudinal Section
Section (A)



Longitudinal Section
Section (B)



SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334

Figure III-8
Site Longitudinal Sections with
Interim and Finished Grades

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Landscaping

New trees (i.e., coast redwoods) are proposed to be planted in the vicinity of the proposed office, equipment storage area and parking lot, and along the proposed access road, to help screen views of these facilities from off-site. Coast redwoods are also proposed to be planted along the south side of Roblar Road within the project property.

Phase 1 Mining and Processing

Overview

Figure III-9 illustrates the grading and drainage plan upon completion of Phase 1 (please see Figures III-14 through III-17 at the end of this chapter for referenced cross- and longitudinal-sections D through G in this figure). Following completion of initial grading and construction activities, and concurrent with processing of initial stockpiled materials (all these activities described above), overall mining operations would begin moving in an eastward direction within the limits of the Phase 1 boundary. The active mining area at any one time would be limited to 30 acres.

To facilitate proposed mining, a series of benches would be cut into the hill slope, which would serve as roads to move machinery up the hill face. Excavation of the topsoil and underlying overburden would be accomplished with bulldozers and other earthmoving equipment. During Phase 1, the topsoil and overburden would be loaded onto large rock trucks, and moved up to, and stored at, one or two stockpile locations (A and B) in the upper east portions of the site.

Large bulldozers would be used to rip the aggregate from the point of mining and push the aggregate to the processing plant. A loader would be used to load materials to a plate feeder. The plate feeder would then feed the aggregates to a jaw crusher which would provide initial crushing of the materials. Next, the materials would go to a cone crusher, which crushes rocks to the proper size, followed by screening with dry and wet screens. The materials would then be transferred via conveyor belts into various piles of select aggregates. This variety of products would be stockpiled on the quarry floor until those materials are sold and hauled off-site.

Phase 1 Grading

The Phase 1 quarry slopes would be graded at 1½:1 (horizontal:vertical) with 10-foot wide benches at 30-foot vertical intervals. To increase worker safety, an earth berm would be constructed near the bench edge to prevent any hazard from equipment falling over bench edge. The final elevation of the quarry floor would be approximately 250 feet asl.

The setback of the proposed sediment pond, and equipment storage area from the property to the south would be approximately 100 feet, and 150 feet, respectively. The Phase 1 mine would be set back approximately 200 feet or more from the edge of County landfill property to the north, 300 feet or more from the property to the south, over 1,100 feet from Roblar Road to the west, and 1,200 feet from the property to the east.

Phase 1 Drainage and Sediment Control Operation

Storm water on the quarry slopes would be collected via 12"-18" storm drain pipes, installed on the quarry benches at 500-foot intervals. These storm drains would route flows to the quarry floor, and hence west to the proposed sediment pond. The majority of the floor of the quarry would be graded with a two percent slope to allow drainage collected within the mining area to flow out of the quarry towards the proposed sediment pond. However, portions of the quarry floor would also be reverse graded (towards the mining face) to provide additional areas within the quarry for sediment control during peak storm events.

The sediment pond would collect all storm water runoff created within the mined areas of Phase 1 (as well as future Phases 2 and 3). The proposed sediment pond would be sized such that the ratio of the surface area of the proposed sediment pond to the active mine area would be 1:20 (i.e., one acre for each 20 acres of future active mining area). The sediment pond would include an overflow structure for larger magnitude storm events. This overflow structure would discharge the water located at the highest elevation of the pond to an on-site drainage that flows south to the drainage along the property south border, and hence west to Americano Creek.

Annually, prior to each wet season, the sediment pond would be cleaned out, or more often as necessary, and made ready for runoff and sediment for the next season. Material taken from the sediment pond would be stockpiled, protected from erosion, and used for on-going reclamation as areas are quarried.

The Phase 1 perimeter drainage swale would intercept and collect all storm flows generated outside the Phase 1 limits, and route the flows to the above-described natural drainage. The drainage swale would be lined with grass and/or rip rap and set back a minimum 5-foot horizontal distance from the outer edge of the mine. Rip rap would also be added to the banks of the natural drainage which would accept the storm water discharge in order to spread and dissipate energy from this discharge.

Phase 1 Stockpiles

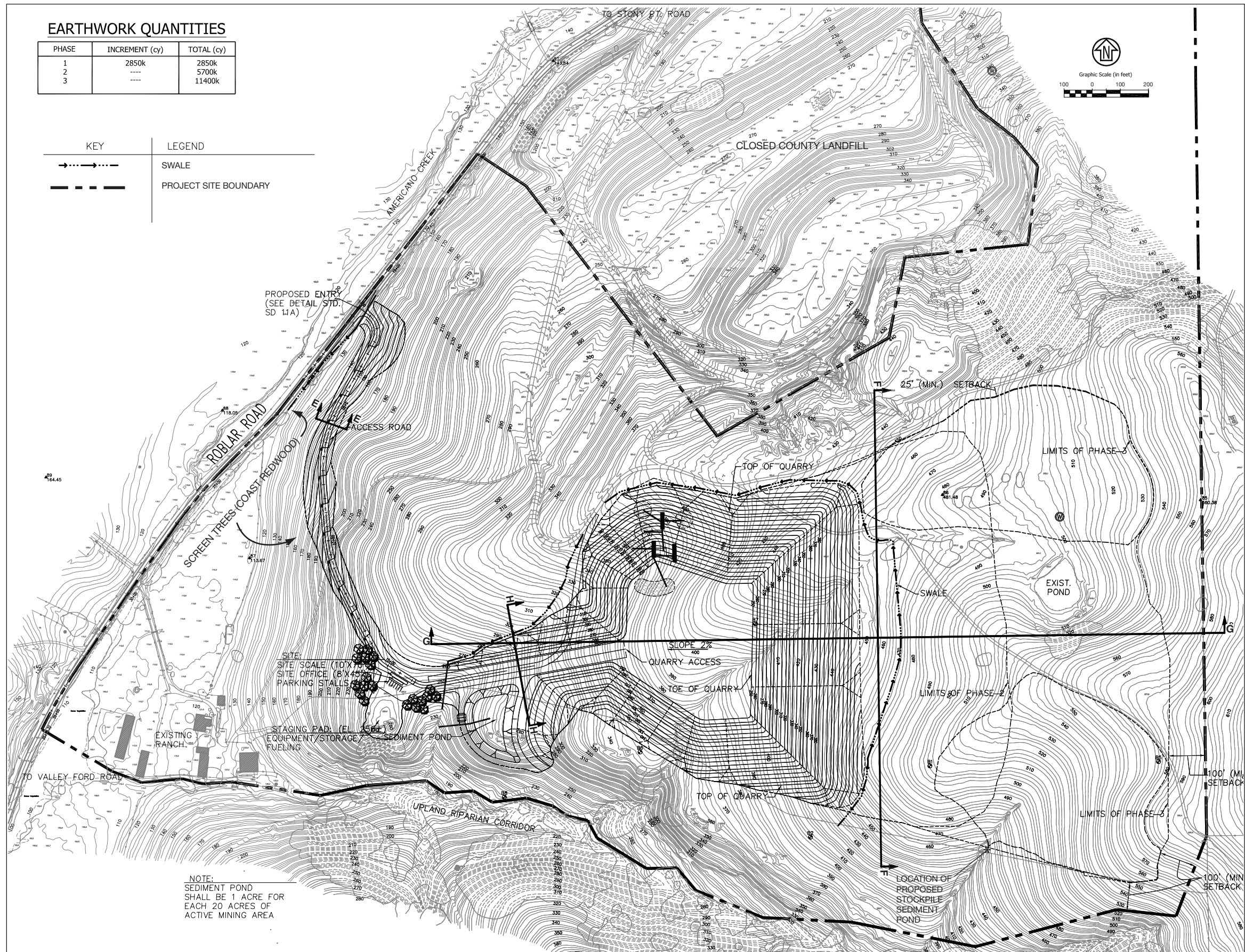
During the mining within the Phase 1 limits, all topsoil and overburden would be moved and stored at Stockpile Areas A and/or B. The stockpile slopes are proposed to be approximately 3:1. At the stockpiles potential maximum height, Stockpile A could be up to 46 feet above existing grade, and Stockpile B could be up to 54 feet above existing grade. (The maximum total change in elevation from lowest to highest point on Stockpiles A and B is estimated at approximately 74 feet, and 120 feet, respectively.)

For stability purposes, prior to placement of soil in Stockpile Areas A and B, the existing groundcover on the stockpile footprint would be cleared and stripped. In addition, where the stockpiled materials would be placed on underlying slopes steeper than 6:1, horizontal benches would first be cut into the underlying slopes, with vertical steps of approximately four feet between benches.

EARTHWORK QUANTITIES

PHASE	INCREMENT (cy)	TOTAL (cy)
1	2850k	2850k
2	---	5700k
3	---	11400k

KEY	LEGEND
	SWALE
	PROJECT SITE BOUNDARY



NOTE:
SEDIMENT POND
SHALL BE 1 ACRE FOR
EACH 20 ACRES OF
ACTIVE MINING AREA

SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure III-9
Phase 1 Grading and Drainage Plan

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Stockpiles A and B would be hydroseeded to minimize dust and erosion. Since the toe of Stockpile Area B would be located within a swale that drains to the Ranch Tributary, and hence, Americano Creek, a small sedimentation pond (herein referred to as the stockpile sediment pond) would be constructed downstream of the toe to minimize potential erosion of any stockpiled soil material into this swale. The dike of the stockpile sediment pond would be placed across the swale.

During Phase 1, the topsoil stored in Stockpile Area A and/or Stockpile Area B would be later used for reclamation planting, while the stockpiled overburden would be sold as feasible. It is anticipated that all material stockpiled during Phase 1 that would be suitable for selling would be sold and hauled off-site by the completion of Phase 1.

Phase 1 Blasting

Depending on the hardness of the rock, blasting may be required during this phase, on average once or twice a month. Explosive material used would be Ammonium Nitrate Fuel Oil (ANFO). Preliminary estimates are that each proposed blast would consist of 20-25 holes, 10 feet apart and 30 feet deep. Charges would be detonated sequentially in order to minimize shock waves and sound. In the area of the closed landfill, drill holes would be monitored by a gas detection device for methane gas. No explosives would be stored on site.

All blasting would be conducted in compliance with applicable federal and State blasting regulations. Blasting would be conducted by a qualified blasting expert pursuant to a blasting plan. The blasting plan would contain a complete description of clearing and guarding procedures; descriptions of how explosives will be safely transported and used at the site; evacuation, security and fire prevention procedures; blasting equipment list, and procedures for notification of nearby receptors.

Phase 2 Mining and Processing

Overview

Figure III-10 illustrates the grading and drainage plan upon completion of Phase 2 (please also see Figures III-14 through III-17 at the end of this chapter for referenced cross- and longitudinal-sections D through G in this figure). The second phase (Year 6 through Year 10) would consist of the harvesting of the remainder of materials within the Phase 1 limits (i.e., the east slope), in addition to mining within the Phase 2 limits. Overall mining operations would continue to move in an eastward direction.

Phase 2 Grading

As with Phase 1, the Phase 2 quarry slopes would be graded at 1½:1 (horizontal:vertical), with 10-foot wide benches at 30-foot vertical intervals. Also, similar to Phase 1, the final elevation of the quarry floor within Phase 2 would be approximately 250 feet asl, with a 2 percent slope.

Under this phase, mining within Phase 2 would be set back 200 feet or more from the edge of the County landfill property to the north, 350 feet or more from the property to the south,

approximately 1,700 feet or more from Roblar Road to the west, and 650 feet or more from the property to the east.

Phase 2 Drainage and Sediment Control Operation

Prior to mining in Phase 2, the perimeter drainage swale would be extended east to follow around the Phase 2 limits. As mining within Phase 2 occurs, in-mine drainage features would also be extended as necessary within Phase 2 limits, with storm flows continuing to be routed to the existing sediment pond for sediment control.

Phase 2 Stockpiles

During Phase 2, as mining continues eastward, the quarry floor area would continue to increase in area, and conversely, the footprint for Stockpiles A and B would decrease. Consequently, during Phase 2, the amount of topsoil and overburden that would be moved up to Stockpile Areas A and/or B would decrease over time, and the amount of those materials that could be placed on the quarry floor would increase. As under Phase 1, topsoil removed in Phase 2 would be stockpiled for later use for reclamation planting, and the overburden would be sold as feasible.

Phase 2 Blasting

As with Phase 1, depending on the hardness of the rock, blasting may be required in Phase 2, on average once or twice a month. The blasting approach, techniques and used in Phase 2 would be similar to that which would occur in Phase 1.

Phase 3 Mining and Processing

Overview

Figure III-11 illustrates the grading and drainage plan upon completion of Phase 3 (please see Figures III-14 through III-17 at the end of this chapter for referenced cross- and longitudinal-sections D through G in this figure). Phase 3 (Year 11 through Year 20) would consist of the harvesting of the remainder of materials within the Phase 2 limits (i.e., the east slope), in addition to mining within the Phase 3 limits. Overall mining operations would continue to move in an eastward direction.

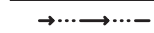

Phase 3 Grading

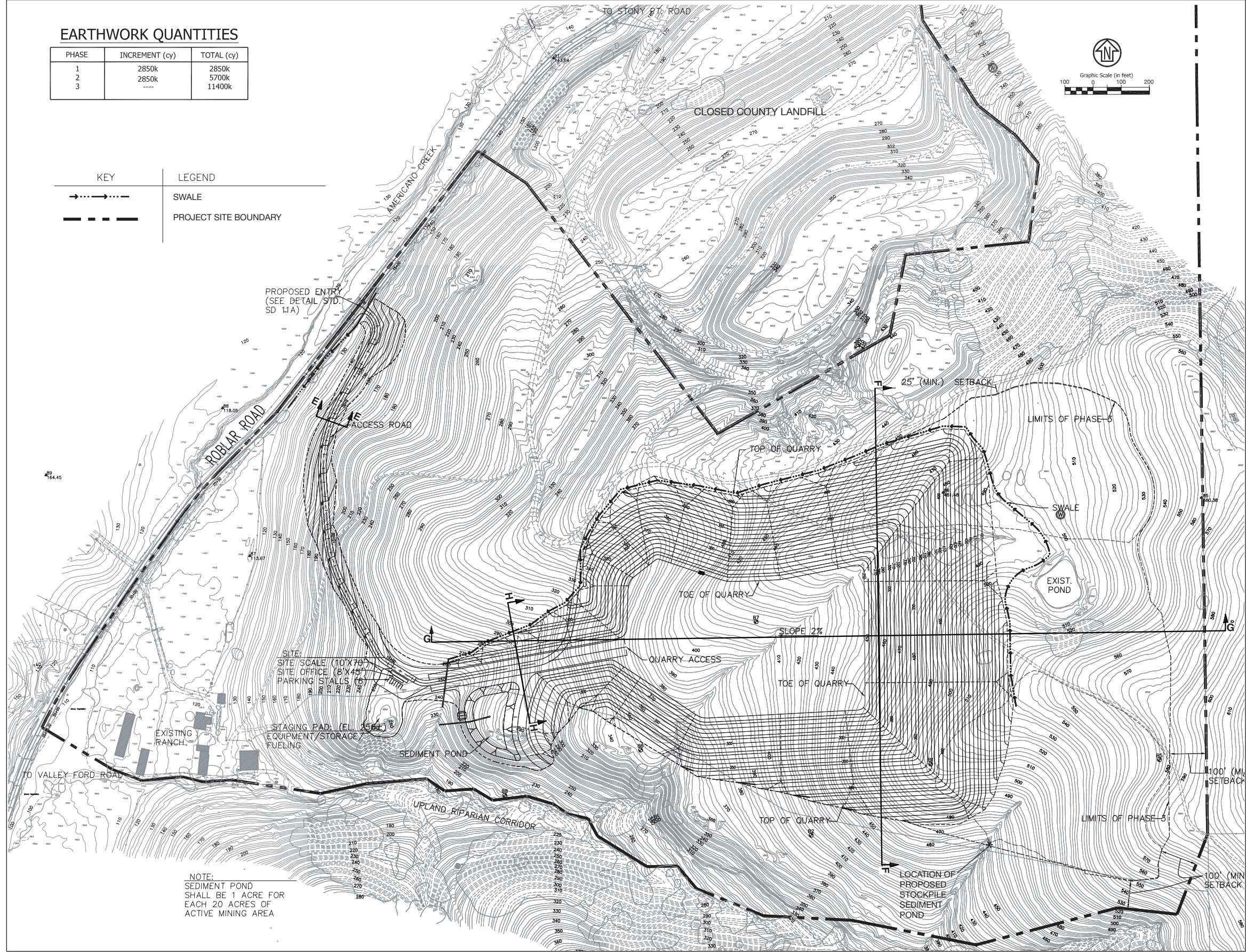
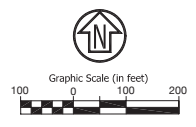
As with Phases 1 and 2, the Phase 3 quarry slopes would be graded at 1½:1 (horizontal:vertical) with 10-foot wide benches at 30-foot vertical intervals. Also, similar to Phases 1 and 2, the final elevation of the quarry floor within Phase 2 would be approximately 250 feet asl, with a 2 percent slope.

Under this phase, mining within Phase 3 would be set back 300 feet or more from edge of County landfill property to the north, 100 feet or more from the property to the south, approximately 1,800 feet or more from Roblar Road to the west, and 100 feet or more from the property to the east.

EARTHWORK QUANTITIES

PHASE	INCREMENT (cy)	TOTAL (cy)
1	2850k	2850k
2	2850k	5700k
3	---	11400k

KEY	LEGEND
	SWALE
	PROJECT SITE BOUNDARY



NOTE:
SEDIMENT POND
SHALL BE 1 ACRE FOR
EACH 20 ACRES OF
ACTIVE MINING AREA

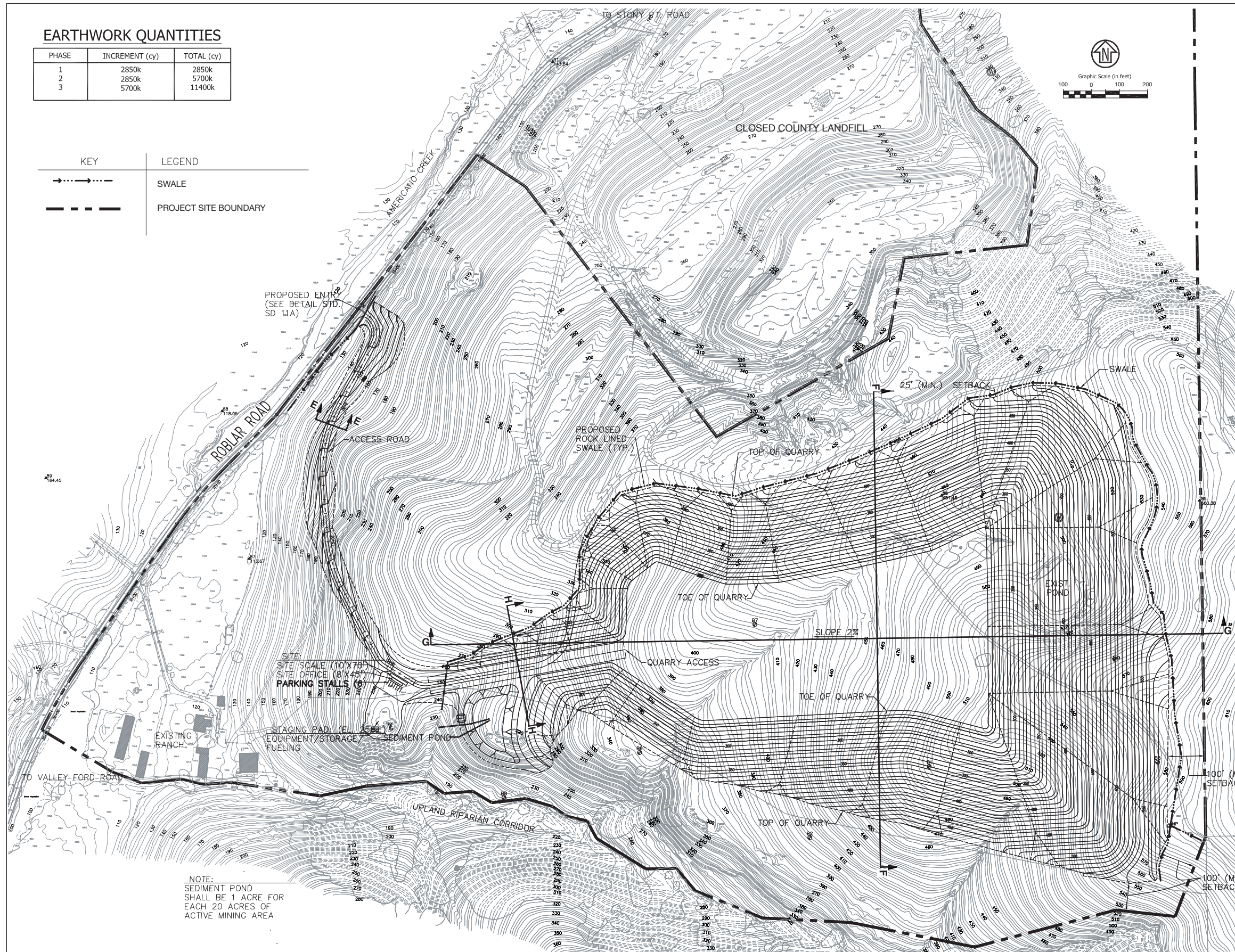
SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure III-10
Phase 2 Grading and Drainage Plan

EARTHWORK QUANTITIES

PHASE	INCREMENT (cy)	TOTAL (cy)
1	2850k	2850k
2	2850k	5700k
3	5700k	11400k

KEY	LEGEND
	SWALE
	PROJECT SITE BOUNDARY



NOTE:
SEDIMENT POND
SHALL BE 1 ACRE FOR
EACH 20 ACRES OF
ACTIVE MINING AREA

SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure III-11
Phase 3 Grading and Drainage Plan

Phase 3 Drainage and Sediment Control Operation

Prior to mining in Phase 3, the perimeter drainage swale would be extended east to follow around the Phase 3 limits. As mining within Phase 3 occurs, in-mine drainage features would also be extended as necessary within Phase 3 limits, with storm flows continuing to be routed to the existing sediment pond for sediment control.

Phase 3 Stockpiles

As mining progresses eastward in the Phase 3 limits, any remaining stockpiled materials within Stockpile Area A and/or B would be relocated to the quarry floor. New topsoil and overburden removed in Phase 3 would be stockpiled on the quarry floor. As under Phases 1 and 2, topsoil removed under Phase 3 would be saved for later use for reclamation planting, and the overburden would be sold as feasible.

Phase 3 Blasting

As with Phases 1 and 2, depending on the hardness of the rock, blasting may be required in Phase 3 (limited to once or twice a month). The blasting approach, techniques and controls used in Phase 3 would be similar to that which would occur in Phases 1 and 2.

Reclamation / Erosion Control

Reclamation would consist of visual enhancements, on-going reclamation and final reclamation. Figure III-12 illustrates the final reclamation planting plan for the quarry. Table III-3 presents the proposed plant list.

**TABLE III-3
PROPOSED PLANT LIST**

	Botanical Name	Common Name
Visual Screening	<i>Sequoia sempervirens</i>	Coast Redwood
Slope Planting	<i>Quercus agrifolia</i>	Coast Live Oak
	<i>Umbellularia californica</i>	California Bay
	<i>Aesculus californica</i>	California Buckeye
	<i>Arbutus menziesii</i>	Madrone
Erosion Control Hydroseed Mix	<i>Festuca californica</i>	California Fescue
	<i>Eschscholzia californica</i>	California Poppy
	<i>Lupinus nanus</i>	Sky Lupine
	<i>Mentzelia lindleyi</i>	Lindley's Blazingstar
	<i>Bromus mollis</i>	Blando Brome

SOURCE: Roblar Road Quarry Surface Mining and Reclamation Plan Application

As discussed above, in Phase 1, Coast redwoods are proposed to be planted in the vicinity of the proposed office, equipment storage area and parking lot and along the proposed access road to help screen views of these facilities from off-site. Coast redwoods are also proposed to be planted along the south side of Roblar Road within the project property.

On-going reclamation would include the new planting for visual screening and erosion control, the incremental planting and maintenance of mined slopes, and the maintenance of the sediment pond. The active mining area at any one time would be limited to 30 acres. As quarrying in an area is completed, reclamation would be conducted using select fill, overburden and topsoil.

Topsoil would be placed in four- to six-inch depths on the benches where sculptured cut slopes would hold the materials. All disturbed areas of the quarry would be protected from erosion by use of silt fences, hay bales, hydroseeding (prior to October 1 of each year) and other appropriate best management practices for erosion control. In addition, all topsoil and overburden stockpiles would be protected from erosion by straw covering and hydroseeding. Revegetation would primarily consist of hydroseeding, trees and other vegetative planting. All finished slopes would be reseeded. Tree planting would occur at 20-foot intervals. Irrigation would be provided for three to five years depending on the needs of the plant types. For the first three to five years, planting which has not survived would be replaced with an objective survival rate of 80 percent.

When harvesting of aggregate is completed, final reclamation would be conducted. All equipment associated with mining would be removed from the site. Building and concrete structures would be dismantled or demolished and removed from the site. The quarry floor would be ripped and scarified to loosen areas compacted by equipment. The remaining stockpiles of topsoil would be spread over the quarry floor and graded to drain. Finally the quarry floor would be hydroseeded with an erosion control grass mix.

Hours of Operation

The County mining regulations (Ordinance No. 3437) allow the hours of operation for quarries as follows: Monday through Friday 6:00 a.m. to 10:00 p.m.; Saturday, 6:00 a.m. to 4:30 p.m.; and on Sunday, no mining or processing except as authorized.

The applicant states that anticipated typical hours of operation of the proposed quarry on weekdays would be 7:00 a.m. to 5:00 p.m., with most plant operations, including loading/weighing of trucks, ceasing by 4:00 p.m., and general maintenance occurring until 5:00 p.m. The anticipated typical hours of operation of the proposed quarry on Saturdays would be 7:00 a.m. to 4:00 p.m.

The applicant indicates the quarry could operate infrequently during permitted evening hours on weekdays, such as when a quarry client requires materials for a nighttime construction project. However, under such circumstance, mining or crushing would not occur in the evening hours; evening operations would be limited to the loading and weighing of material. If it were necessary to operate outside of the hours identified in the Zoning Ordinance, written approval would be required from Sonoma County PRMD in advance.



SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure III-12
 Reclamation Planting Plan

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Employees

The quarry would employ approximately eight to ten people full time during the heavy construction season and four to six people during the winter season. Anticipated work shifts would be 7:00 a.m. to 4:00 p.m. for loading and weighing of trucks, and 7:00 to 5:00 p.m. for plant operations.

In addition, approximately two administration staff would be expected. However, these staff would work in the contractor's office located at an off-site location.

Equipment List and Power Needs

Table III-4 presents a list of all equipment proposed to be used at the quarry. The mobile quarry plant equipment would consist of a jaw crusher, cone crusher, plate feeders, screens and conveyor belts. This maximum height of the major plant components would be approximately 18 feet, however, plant conveyor belts would extend between approximately 21 and 28 feet in height.

All processing equipment would be run on electricity generated by an on-site diesel engine-generator. The diesel generator would be fully enclosed within a trailer. All vehicles associated with on-site mining operations would operate on diesel fuel. The applicant proposes to deliver diesel fuel to the project site each work day; no diesel would be stored on-site. Electricity for the proposed office building, truck scale, security lighting, and the existing ranch house would operate on electricity from PG&E.

**TABLE III-4
PROPOSED QUARRY EQUIPMENT LIST**

Equipment/Vehicles ^a	Quantity
Vehicles	
Cat D9 Dozer	1
Cat D10 Dozer	1
Cat 966 Loader	2
Cat 988 Loader	1
35-Ton Rock Trucks	2
Water Truck	1
Processing Equipment	
Plate Feeder	1
Jaw Crusher	1
Primary Cone Crusher	1
Secondary Cone Crusher	1
Initial Three Deck Screen	1
Stacker Belts	4
Engine-Generator (750 KW)	1
Truck Scale	1
Klein Water Tank (10,000 gallons)	1

^a This table only identifies those vehicles that would be operated on-site by the quarry, and does not include any independently-owned vehicles that would haul materials to and/or from the quarry.

The quarry would have an above-ground 10,000 gallon water tank at the equipment storage area. The water tank would measure approximately eight feet high and 30 feet in length, with the top of tank approximately 20 feet above ground to allow top filling of the quarry water truck.

Water Use and Dust Control

The applicant estimates the quarry would require a total of approximately 3 million gallons of water per year. Water would be used for processing operations, dust control, irrigation and landscaping, and for the office building (for drinking and septic use). The primary source for dust control would be from the two on-site wells. The capacities of these wells are 30 and 60 gallons per minute (gpm), respectively. Well water would be stored as needed in the water storage tank (described under “Equipment List,” above). When available, water collected in the proposed sediment pond would be used as appropriate to supplement water from the on-site wells for dust control and irrigation purposes.

Dust control with spray misters is proposed to be used on all processing equipment, including the jaw crushers, feeding conveyers, primary and secondary cones and stacker belt ends. Additional dust control would be provided through use of baghouses on the processing equipment.

The quarry proposes to use a water truck to routinely sprinkle down internal access roads for dust suppression from vehicle movement. In addition, the quarry proposes to install a tire wash area at the exit of the quarry site, and install tire scrapers at both the quarry exit and the proposed truck scale to loosen dirt from the trucks and their tires.

No chemical dust suppressants would be used on the processing equipment, however, magnesium chloride is proposed to be used for dust control on the entrance road of the quarry, as needed.

One of the site’s two water wells is located within the footprint of Stockpile A, as well as within the footprint of Phase 3 of the mine. This well would be raised or lowered as necessary during the quarry development to maintain use of this well during life of the quarry.

Fencing and Signage

The property would be fenced along the site perimeter. Additional fencing would be installed at locations where entry into the mining operation could pose a potential threat to public safety. “No Trespassing” signs would be posted throughout the site.

Lighting

If it were necessary to operate in the evening (see discussion of potential nighttime operations under Hours of Operation, above), the quarry would use portable lights pointing downward into the loading area. The only other light would be that at the scale house, which would be used to provide adequate visibility within the parking lot and scales. An arm-mounted cobra head luminaire would be installed atop a wooden pole with an automatic photo-electric control which would turn the fixture on and off. During the off-hours, the lighting would only be maintained at the scale house for security purposes.

Proposed Williamson Act Contract Cancellation and Land Exchange

The entire Roblar Road project site is currently within an agricultural preserve under a Williamson Act contract. Under the provisions of the Williamson Act Easement Exchange Program (WAEPP), the project applicant is seeking a land exchange that would involve rescinding an approximate 70-acre portion of the Williamson Act contract governing the project site, and concurrently placing another property within the County under an agricultural conservation easement (herein referred to as the proposed easement exchange site). The applicant purchased the proposed easement exchange site in November 2005. While the applicant would continue to retain fee title ownership of the easement exchange property, a permanent agricultural conservation easement would be transferred for future stewardship to an appropriate private land trust or government conservation agency, such as the Sonoma Land Trust (SLT) or the Sonoma County Agricultural Preservation and Open Space District (District).

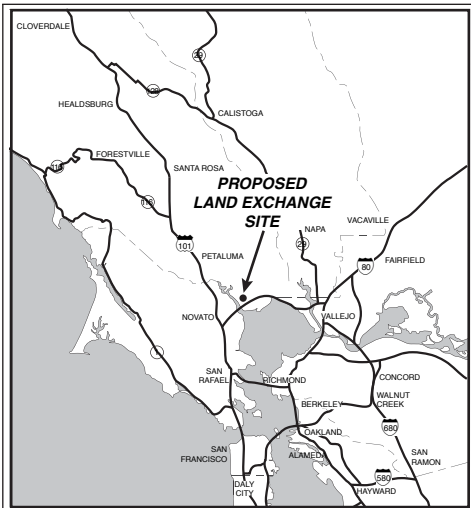
Figure III-13 presents a site location map of the proposed easement exchange site. The proposed easement exchange site is located near Lakeville Road in southern Sonoma County. The property is located approximately seven miles southeast of the Petaluma city limit, and across the Petaluma River from the Novato city limit and County of Marin. This 243.64-acre site consists of APNs 068-130-001 (230 acres) and 068-130-008 (13.64 acres). The property is bounded by marshland adjacent to the Petaluma River to the west, and sloughs along the northwest, northeast and southeast boundaries. The easement exchange site is located approximately at sea level.

The proposed easement exchange site is not currently under a Williamson Act contract, although adjacent parcels to the northeast (Sleepy Hollow Dairy) and east/south (Lower Ranch), and other nearby properties are. The project site is located near the Petaluma River Wildlife Area and the San Pablo Bay National Wildlife Refuge. The proposed easement exchange site has historically been farmed for dryland hay production. The site contains a farmhouse residence (currently occupied), large hay barn and small equipment shed. An on-site water well and septic system serve the farmhouse; the site is also served by electricity.

E. Prior Quarry Proposals on Project Site

There have been two previous quarry proposals on the project site which have been the subject of previous EIRs, although those proposals were associated with different applicants, and are not associated with the current quarry proposal. In 1986, an application was filed by Stony Point Rock Quarry, Inc. to construct a quarry at the project site. The Draft EIR for this proposal was circulated in April 1987 and a Final EIR was circulated in August 1987. However, this EIR was never certified by Sonoma County, and the project application was withdrawn following objections from the public.

In 1988, a second application was filed by Stony Point Rock Quarry, Inc., which reduced the annual production of quarried rock from the previous application. A Draft EIR was circulated in November 1989, and a Final EIR was circulated in January 1990 and supplemented in October 1990. The Sonoma County Planning Commission recommended certification of the EIR and approval of the project, however the Final EIR was not certified and the project was denied

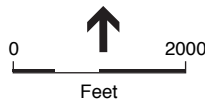


LAKEVILLE RD

PROPOSED
LAND
EXCHANGE
SITE

Petaluma River

STATE ROUTE 37



----- Approximate Property Boundary

SOURCE: USGS

Roblar Road Quarry . 204334

Figure III-13
Proposed Land Exchange Site Location Map

without prejudice by the Sonoma County Board of Supervisors in December 1990. This application was subsequently terminated, and the file was closed in September 1993.

F. Permit Requirements

This EIR is intended to provide the information and environmental analysis necessary to assist public agency decision-makers in considering all of the approvals necessary for the planning, development, construction, operation, and maintenance of the proposed project.

The County of Sonoma serves as Lead Agency for the proposed project under CEQA. As Lead Agency, the County is responsible for reviewing and certifying the adequacy of this EIR. The County will use the EIR in its decisionmaking for approving the proposed project.

Approvals that would be required from Sonoma County include:

- 1) a Zone Change to add the Mineral Resource (MR) combining zone to the base zone of Land Extensive Agricultural District (LEA) 160-acre density (B6) to APN 027-080-009 and -010
- 2) a Surface Mining Conditional Use Permit / Reclamation Plan to allow mining operation on APN 027-080-009 and -010;
- 3) Cancellation of the Agricultural Preserve Contract on APN 027-080-009; and
- 4) A permit from PRMD for grading, building and construction, and road encroachment.

Other required local approvals may include the Sonoma County Water Agency, the County Public Health Department, and the Bay Area Air Quality Management District.

Additional approvals may be required from the State Department of Conservation, State Department of Fish and Game, Regional Water Quality Control Board, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the U.S. Environmental Protection Agency (EPA).

References

(The references cited below are available at the Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, California, unless otherwise specified.)

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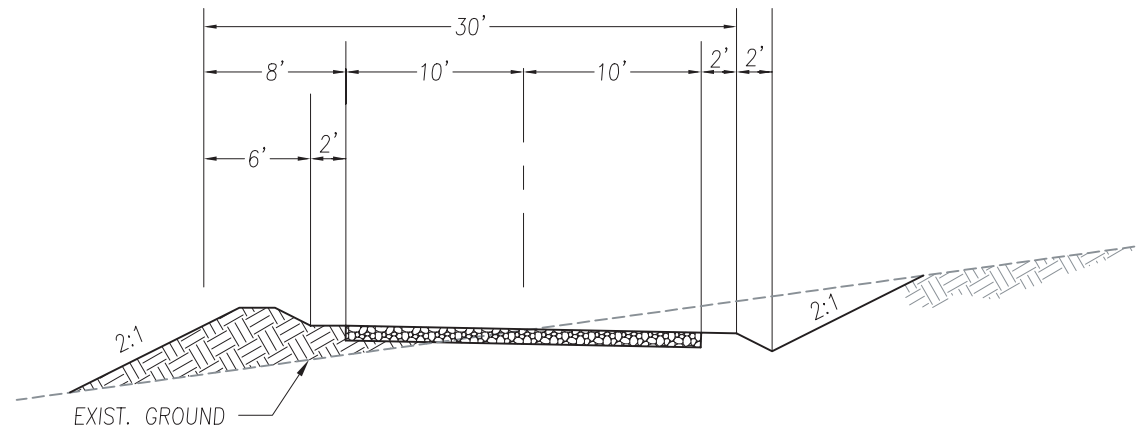
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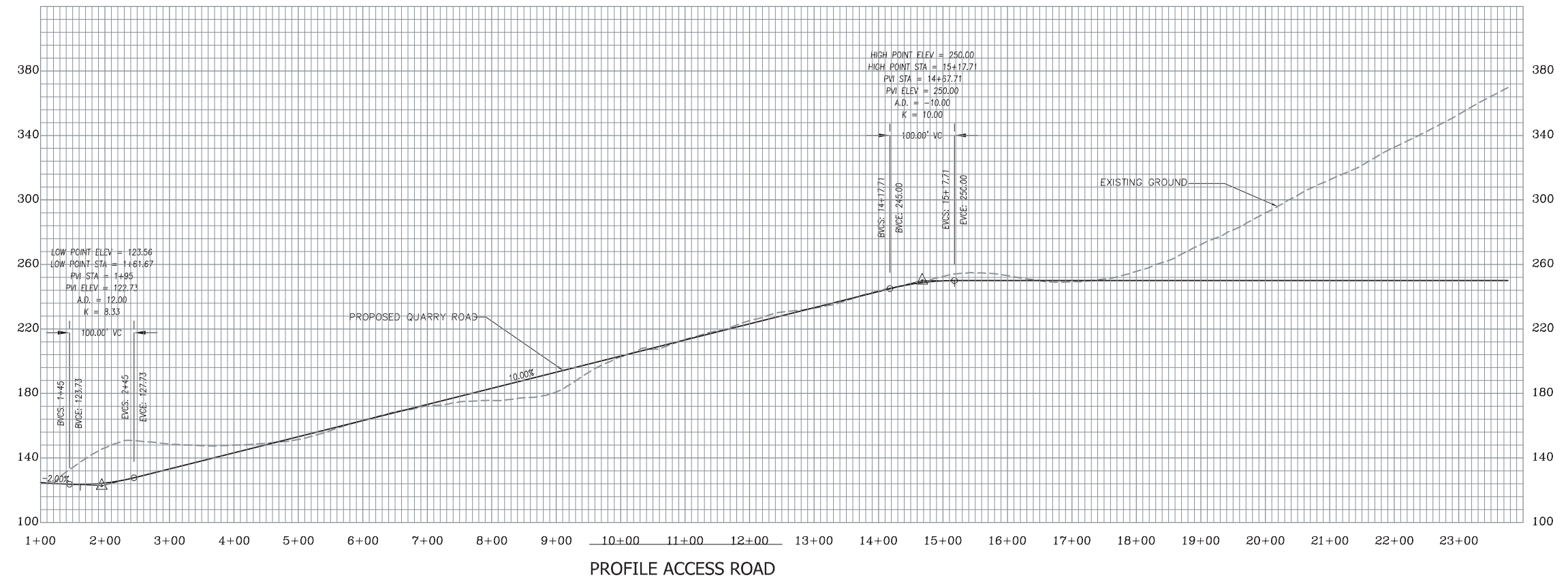
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Sonoma County, *Chapter 26- Zoning Ordinance*, revised through December 1993.

Sonoma County, *Surface Mining and Reclamation Ordinance*, December 7, 1999.

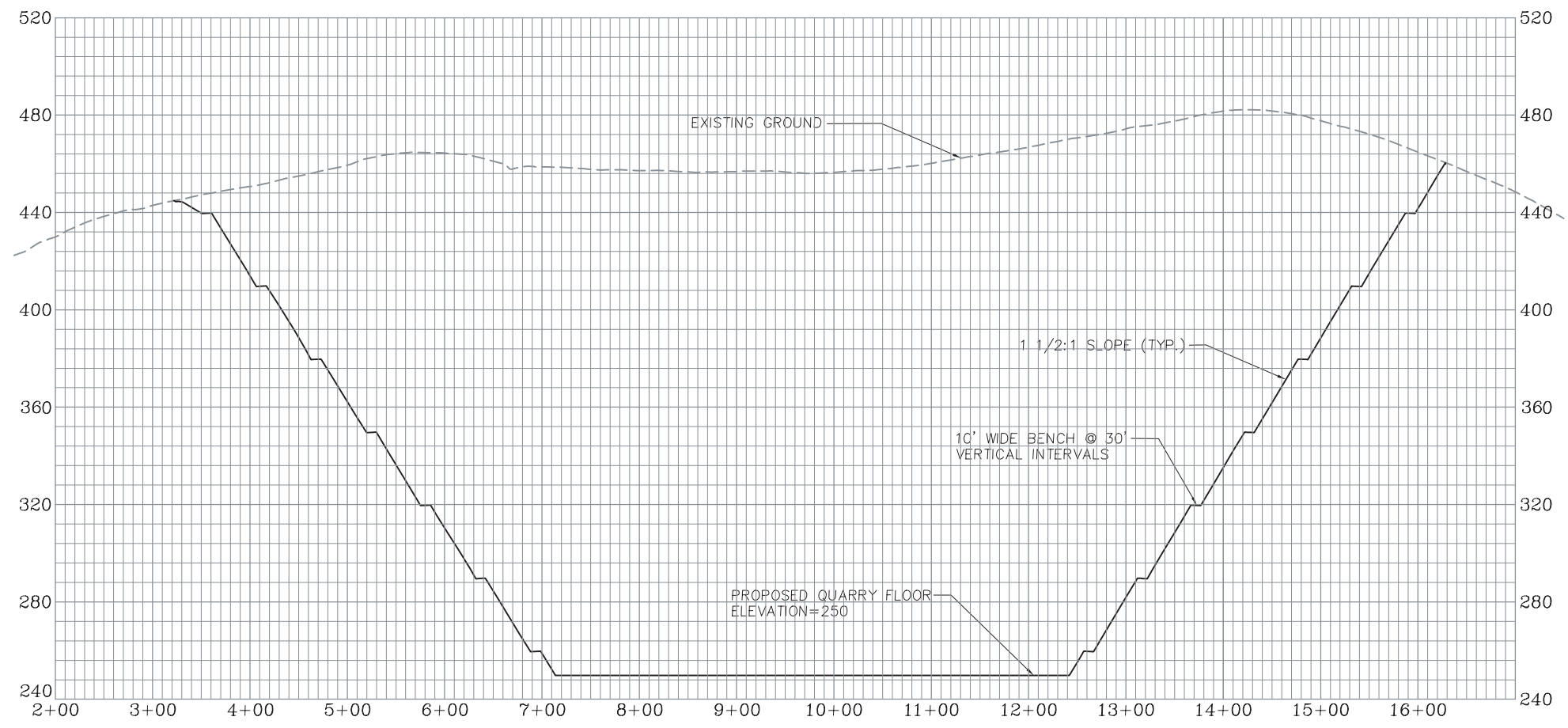


ACCESS ROAD TYPICAL CROSS-SECTION E
 (Please see Figures III-9 through III-11 for cross-section location)



SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure III-14
 Access Road Typical Cross-Section E
 and Access Road Profile

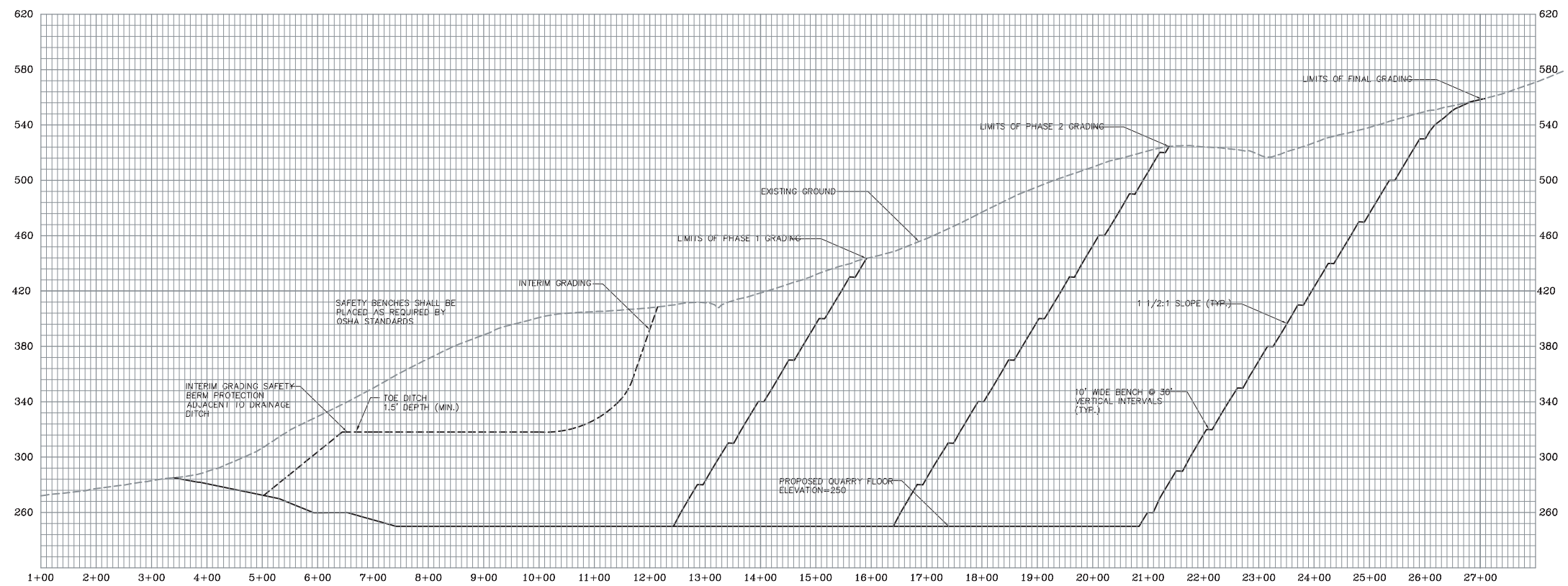


CROSS SECTION THROUGH QUARRY
 Section **F**
 (Please see Figures III-9 through III-11 for cross-section location)

Note: Vertical scale exaggerated

SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure III-15
 Cross-Section F
 Through Quarry



LONGITUDINAL SECTION THROUGH QUARRY

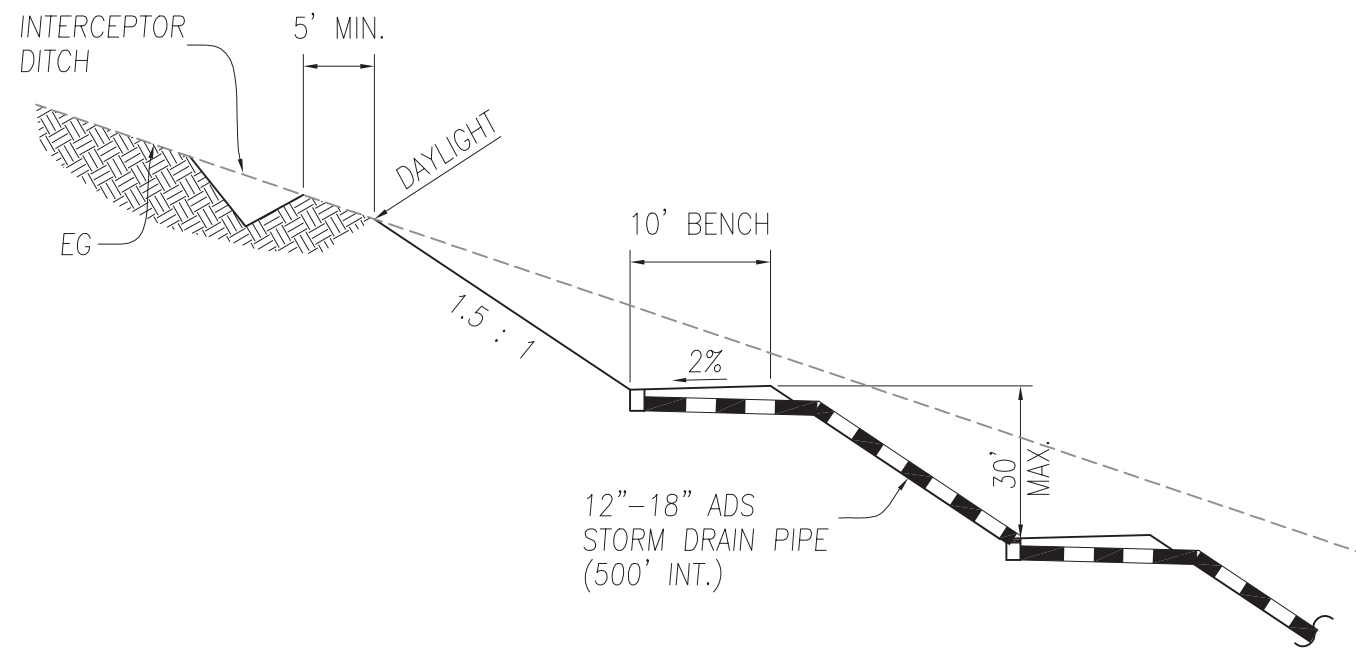
Section **G**

(Please see Figures III-9 through III-11 for cross-section location)

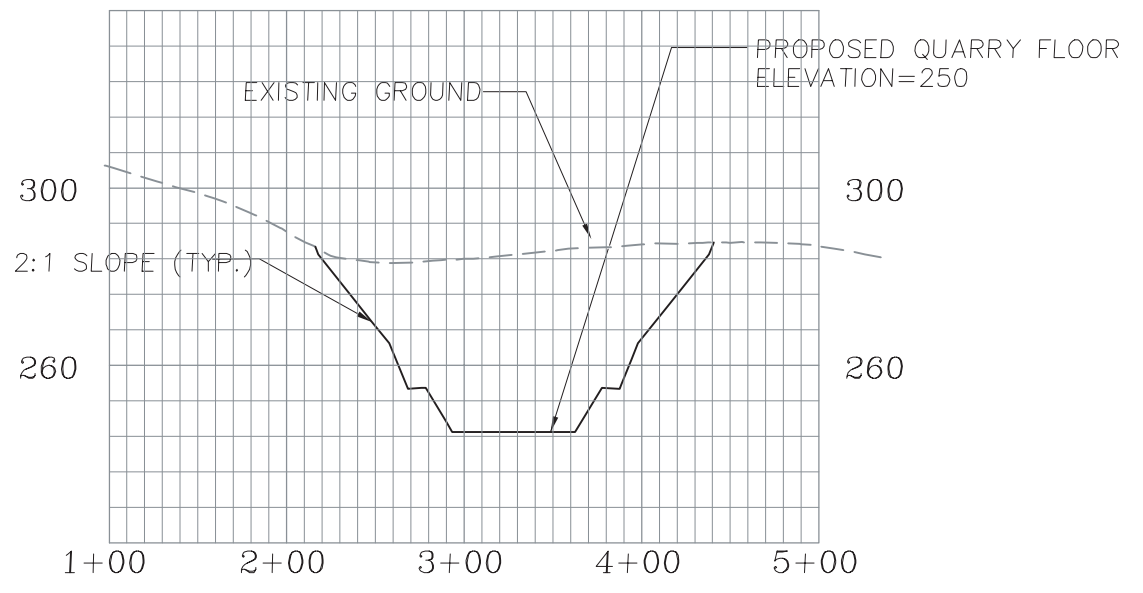
Note: Vertical scale exaggerated

SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure III-16
 Longitudinal Section G
 Through Quarry



BENCH DETAIL



SECTION THROUGH ACCESS ROAD

Section **H**

(Please see Figures III-9 through III-11 for cross-section locations)

Note: Vertical scale exaggerated

SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure III-17
 Cross Section H
 Through Access Road and Bench Detail

CHAPTER IV

Environmental Setting, Impacts and Mitigation Measures

A. Land Use and Agricultural Resources

Introduction

This section describes and discusses existing land use at the project site and vicinity, considers the compatibility of the proposed project with neighboring land uses, compliance with zoning regulations, and project consistency with relevant land use plans and policies. This section also discusses agricultural resources on the project site and vicinity and potential impacts that would result from the proposed project. Applicable County plans and policies related to land use, planning, and agriculture are presented, and potential conflicts and mitigation measures are identified. The section relies in part on a Farmland Conversion Study that was completed for the proposed project (see Appendix B).

Setting

Regional Setting

Sonoma County is the most northerly of the nine-county San Francisco Bay Area region, bordered by the Pacific Ocean to the west, Marin County and San Pablo Bay to the south, Solano, Napa and Lake Counties to the east, and Mendocino County to the north. U.S. Highway 101 (U.S. 101) is the major north-south route traveling through the county, providing access to San Francisco and Marin Counties to the south and Mendocino County to the north.

Sonoma County is the largest of the nine Bay Area counties, including just over 1,500 square miles. Its 2005 population was estimated at about 478,440, ranking as the fifth among these nine counties (State of California, 2005).

Agricultural Trends in Sonoma County

Sonoma County is well suited for agricultural cultivation as a result of its favorable climate, good soils, availability of water, dependable market demand and established farming community and infrastructure. Wine grape cultivation is Sonoma County's primary crop - accounting for more than 60 percent of the County's entire agricultural production value in 2004. Livestock and poultry (including livestock and poultry products) accounted for approximately 32 percent of the

county's total agricultural production in 2004. Sonoma's cool temperatures and long grass growing season makes it ideal for high quality cattle and milk production.

Dairy production is the county's third most important agricultural commodity. In addition to traditional cow dairies, numerous specialty goat and sheep farmers also operate within the county. There are approximately 80 cow dairies operating within in Sonoma County which generally produce top quality fresh milk (with high fat, solids and protein content). In 2004, Sonoma County produced over 75 million gallons of milk. By volume, Sonoma County produced approximately two percent of the state's total milk production.

Existing Site Descriptions

Roblar Road Property (Project Site)

Site Description

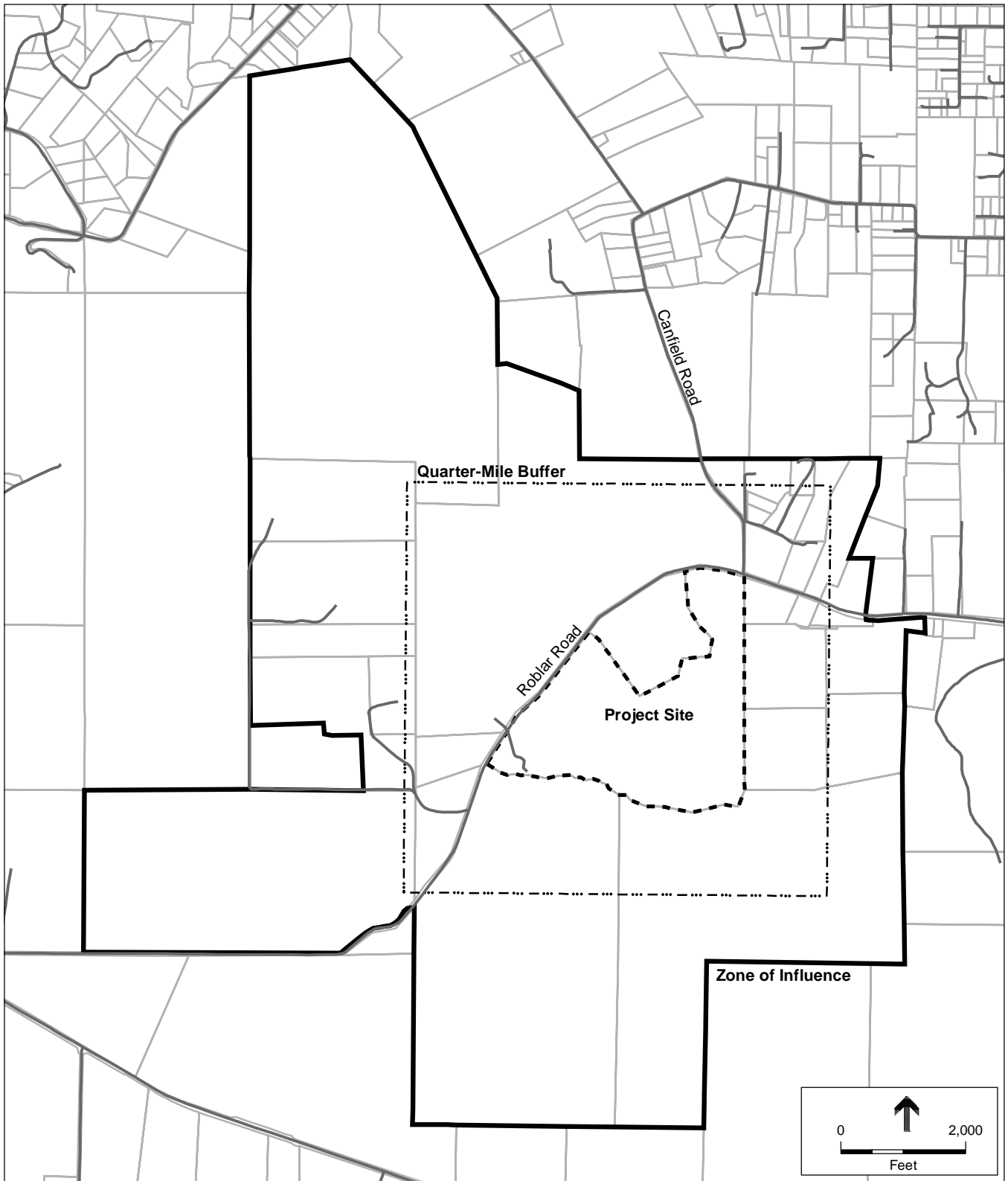
The Roblar Road property (project site) is located on two parcels totaling 198.76 acres at 7601 Roblar Road in southern Sonoma County, approximately five miles west of the City of Cotati. The Assessor's Parcel Numbers (APNs) are 027-080-009 and -010. The project site is bounded on the north by Roblar Road and the County-owned, closed Roblar Landfill; on the west by Roblar Road; on the south by Ranch Tributary (a tributary to Americano Creek); and on the east by privately-owned land.

Geographically, the project site is located within a long east-west trending valley that extends roughly between Cotati to the east and Bodega Bay to the west. The meandering Americano Creek forms the low point within this valley, with rolling hills rising on either side. In the project vicinity, the valley and Americano Creek trend in a northeasterly-southwesterly direction, with the project site located on the valley's southeast slopes. Elevations on the site range from approximately 110 feet above sea level (asl) along the property adjacent to Roblar Road to approximately 600 feet asl at the site's highest point (southeast corner). Slopes throughout the site range from approximately 10 to 30 percent.

Vegetation on the project site consists primarily of annual grasslands, with remnants of oak woodland in the northeast portion of the site, a seasonal wetland area on the valley bottom adjacent to Americano Creek in the site's southwest corner, and riparian vegetation located along the drainages on and adjacent to the site. Three small seasonal drainages located on the project site flow southwesterly to the unnamed tributary along the property south border, and ultimately to Americano Creek.

Zone of Influence

Consistent with the requirements of the California Department of Conversation (DOC) California Agricultural Land Evaluation and Site Assessment Model (LESA) methodology, a "zone of influence" was defined for the project site. As shown in Figure IV.A-1, the zone of influence includes all parcels that are located within one-quarter mile of the project site. The zone of influence for the project site comprises a total of 2,792 acres. The LESA Model was used for the



NOTE: Per California Department of Conservation (DOC) California Agricultural Land Evaluation and Site Assessment Model (LESA) methodology, the Zone of Influence is defined as all parcels with one-quarter mile of the project site.

SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry . 204334

Figure IV.A-1
Zone of Influence for Roblar Road Project Site

agricultural conversion impact analysis of the proposed project (see Impacts Section for additional details on LESA methodology and impact analysis).

Description of Nearby Properties

A closed landfill (Roblar Landfill) is located adjacent to and north of the project site. The Roblar Landfill was closed in 1973. Agricultural properties and other land uses are currently present elsewhere adjoining the project site. Other adjacent land uses include livestock grazing, dairies and agricultural residential lots. Further east along Roblar Road in the community of Roblar, outside the zone of influence (see discussion of zone of influence, above) are a series of smaller rural residential properties and two schools (Dunham Elementary School and Quest Montessori School).

Site and Vicinity Ownership

The quarry project applicant, North Bay Construction, Inc., is the current owner of the Roblar Road property. The applicant acquired the property from John and Anna Scott on October 31, 2001 as part of the larger 958-acre Roblar Ranch property. The Scotts originally placed the property under a Williamson Act contract # 2-387-72 with the County of Sonoma in March 1972. In May, 2004, the applicant sold the permanent agricultural easement rights for two southern parcels of Roblar Ranch to the Sonoma County Agricultural Preservation and Open Space District. The applicant subsequently sold the encumbered properties separately to local farmers Kenneth Wilson (APN 027-210-006) and Joseph Tresch (APN 027-210-003).

On-Site Improvements

The project site is largely undeveloped and used as dryland grazing for livestock production. The site contains a ranch, including several outbuildings and a currently unoccupied residence near the southwest corner of the site. Vehicular access to the site currently is from Roblar Road near the southwest corner of the site. Existing unpaved roadways provide internal access between the Roblar Road entry, the ranch, the adjacent closed landfill, the stock pond, and the upper (eastern) reaches of the project site. A small stock pond is located on the east side of the site. Two water wells are currently on-site, located in the northeast and central-east portions of the site. An on-site septic system previously served the ranch house; this septic system was upgraded in 2007 by the project applicant. The project site perimeter is currently fenced, with some additional interior fencing primarily for cattle holding and feed areas. Electrical lines extend to the project site from Roblar Road.

Past and Current Agricultural Uses at the Roblar Road Project Site

The Roblar Road project site has been used continuously for dryland cattle grazing for several decades. In the late 1980s and early 1990s, applications were filed to develop a quarry on the project site. Those proposals were associated with different applicants (Stony Point Rock Quarry, Inc. and former site owner), and not the current quarry proposal or applicant. Under those prior quarry applications, Stony Point Rock Quarry Inc. proposed to lease the project site from the former land owners to develop and operate a quarry. While a quarry development plan and draft

environmental compliance analyses for those quarry proposals were completed, the quarry was never approved by the County for development.

After the project site was purchased by North Bay Construction, Inc., the property has been grazed under a lease agreement to a local cattle farmer since June 2003. Under the lease terms, a maximum of 60 cows and their calves are permitted on the property. Grazing use is also limited to a maximum of 360 Animal Unit Months (AUMs) per year. Generally, cattle operators run their herds on the property two or three times a year depending on the rainfall and grassland growing conditions.

According to the project applicant, before its purchase, the entire 958-acre Roblar Ranch property (which includes the approximate 199-acre project site) supported a 300 head herd of cattle with supplemental feed used during the winter (Barella, 2005). It should be noted the project site consists of lower quality grazing land (and consequently, a lower carrying capacity) compared to other areas of the Roblar Ranch property which have higher quality grazing lands.

Lakeville Road Property (Easement Exchange Site)

Site Description

The Lakeville Road property (also referred to as the proposed easement exchange site) is located near Lakeville Road in southern Sonoma County and adjacent to the Petaluma River. The property is located approximately seven miles southeast of the Petaluma city limit (and approximately three miles southeast of the City of Petaluma Planning Area), and across the Petaluma River from the Novato city limit and County of Marin. This 243.64-acre site consists of APNs 068-130-001 (230 acres) and 068-130-008 (13.64 acres). The property is bounded by marshland adjacent to the Petaluma River to the west, and sloughs along the northwest, northeast and southeast boundaries. The easement exchange site is located approximately at sea level.

Site and Vicinity Ownership

The quarry project applicant, North Bay Construction, Inc., is the current owner of the proposed easement exchange site. The applicant purchased the property from Jens Kullberg on November 18, 2005.

On-Site Improvements

The Lakeville Road easement exchange property is farmed for dryland hay production. The site contains a farmhouse residence (currently occupied), large hay barn (5,800 square feet) and small equipment shed. An on-site water well and septic system serve the farmhouse; the site is also served by electricity.

Past and Current Agricultural Uses at the Lakeville Road Easement Exchange Site

The easement exchange property has been farmed for dryland hay production for over fifty years by the Kullberg family (previous land owner) before its recent sale to North Bay Construction, Inc. Mr. Kullberg continues to farm the property for dryland hay production under a lease agreement with the applicant. Currently, one farmer is employed at the property.

Oat hay is the property's sole crop and it is farmed without irrigation. Typically, approximately 100 acres of oat hay are planted in the mid- to late Fall and another 140 acres are planted with higher grade oat seed in the Spring (generally late February or early March depending on the weather). The Spring planting generally yields less due to its shorter growth season. No chemical fertilizers or herbicides are used on the property. However, each year, bio-soils from a local sewage treatment facility are applied to approximately half of the farm as natural crop fertilizer. Pumping of excess water is performed during the wet season to prevent ponding on the property (Kullberg, 2006).

Annually, the property typically yields at least 580 tons of oat hay which is sold to local livestock farmers and horse owners as supplemental feed. Mr. Kullberg reports typical minimum yields of three tons per acre for his Fall planting and two tons per acre for the Spring planting. During very good years, total yields of up to 1,000 tons have been achieved (Kullberg, 2006). The reported typical yields are comparable to Sonoma County averages for oat hay production which have an estimated average yield of 2.62 ton per acre (Sonoma County, 2004).

Mr. Kullberg reported good and reliable demand for his oat hay production. Oat hay is particularly favored by horse owners. Although livestock owners often prefer alfalfa feed, oat hay remains an important supplemental feed source for their herds. This is particularly the case in areas (such as Sonoma County) that have historically relied on oat hay production and which have limited potential for the economically feasible irrigated hay production necessary to grow alfalfa (Doran, 2006). As an increasing proportion of former cropland areas around Petaluma and other cities in Central Sonoma County have been lost to urbanization or grape production, dryland farming elsewhere within Sonoma become increasingly important as sources for growing hay feed to support local livestock (Doran, 2006).

Relevant Plans, Programs, and Regulations

Sonoma County General Plan

The *Sonoma County General Plan*, initially adopted in 1989, amended through 1998, is the County's current General Plan. (It should be noted an update to Sonoma County General Plan is currently undergoing environmental review). The County's General Plan is comprised of a number of plan elements, functionally grouped as follows: Land Use, Housing, Open Space, Agricultural Resources, Resource Conservation, Public Safety, Circulation and Transit, Air Transportation, Public Facilities and Services, and Noise. The *Sonoma County General Plan* contains nine sub-county planning regions. Both the project site (Roblar Road property) and proposed land exchange site (Lakeville Road property) are located within the Petaluma and Environs Planning Area of the *Sonoma County General Plan*.

A number of area plans have been developed in the County and incorporated by reference in the General Plan. See discussion of the Petaluma Dairy Belt Area Plan, below.

General Plan Land Use Designations

Roblar Road Project Site. Figure IV.A-2 presents Sonoma County General Plan land use designations for the project site and vicinity. The General Plan land use category for the project site is LEA (Land Extensive Agriculture). 2,686 of the 2,792 acres (approximately 96 percent) that comprise the zone of influence are also designated LEA. The purpose of the LEA category is “to enhance and protect lands capable of and generally best used for the production of food, fiber and plant materials.” Permitted uses in the LEA category include agricultural production, processing and other agricultural services. The LEA category also permits surface mining operations consistent with the Aggregate Resources Management Plan, subject to the standards of the County Surface Mining and Reclamation Ordinance (see below).

Parcels in the northeast corner of the zone of influence (accounting for approximately 106 acres) are designated DA (Diverse Agriculture District). This category is intended “to enhance and protect those land areas where soil, climate and water conditions support farming but where small acreage intensive farming and part-time farming activities are predominant, but where farming may not be the principal occupation of the farmer.”

Lakeville Road Easement Exchange Site. As shown in Figure IV.A-3, the easement exchange site and adjoining parcels carry a General Plan land use category of LEA (same as the Roblar Road project site). There is also a DA District (northeast of the site) and a RVSC District (Recreational Visitor Serving Commercial) across Highway 37 to the south (currently occupied by Port Sonoma Marina). The RVSC District is intended to “provide for both outdoor and recreation uses and the commercial service needs of visitors and travelers.”

General Plan Goals, Objectives and Policies

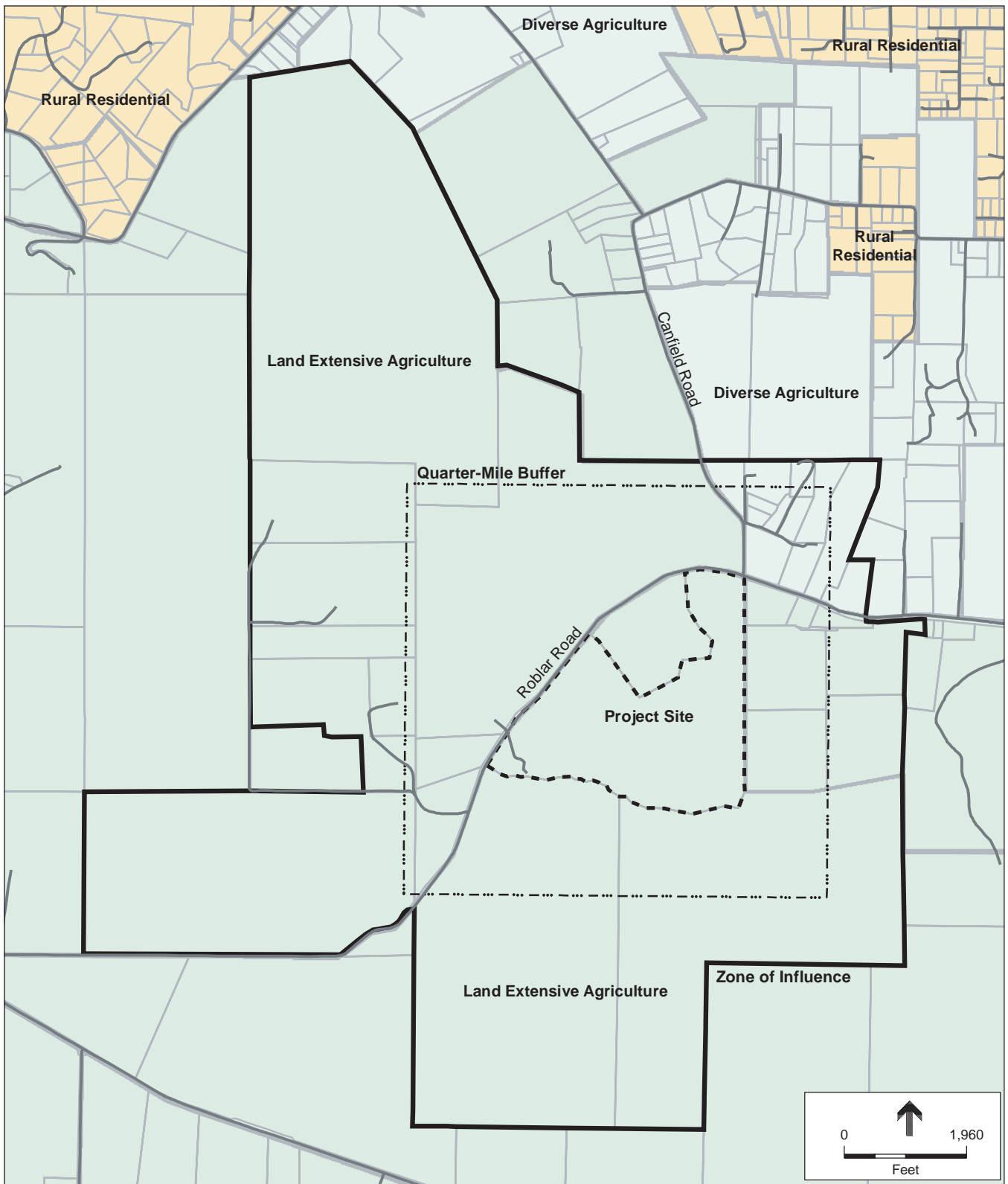
Sonoma County General Plan elements with goals and policies most pertinent to the proposed project include the Land Use, Agricultural Resources and the Resource Conservation elements, discussed below.

Land Use Element. The General Plan Land Use Element guides growth and development and use of land in the County. Following are relevant land use-related goals and objectives from that element:

Goal LU-8: Protect lands currently in agricultural production and lands with soils and other characteristics which make them potentially suitable for agricultural use. Retain large parcel sizes and avoid incompatible non-agricultural uses.

Objective LU-8.1: Avoid conversion of lands currently used for agricultural production to non-agricultural use.

Objective LU-8.4: Discourage uses in agricultural areas that are not compatible with long-term agricultural production.



SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry . 204334

Figure IV.A-2

General Plan Land Use Designations for Roblar Road Project Site and Vicinity

Legend

- Land Extensive Agriculture
- Diverse Agriculture
- Rural Residential



Legend

- Land Extensive Agriculture
- Diverse Agriculture
- Recreation / Visitor-Serving Commercial

SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry . 204334

Figure IV.A-3

General Plan Land Use Designations for Lakeville Road Easement Exchange Site and Vicinity

Agricultural Resources Element. The General Plan Agricultural Resources Element establishes policies, programs and measures that are intended to promote and protect the current and future needs of the agricultural industry within the County. Following are relevant agricultural-related goals and objectives from that element:

Objective AR-2.1: Limit intrusion of urban development into agricultural areas.

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. . .

Resources Conservation Element. The Resource Conservation Element of the General Plan provides for the conservation of natural resources including water, forests, soils, rivers, harbors, fisheries, wildlife, minerals, and other natural resources. These include:

Goal RC-11: Provide for production of aggregates to meet local needs and contribute the County's share of demand in the North Bay production-consumption region. Manage aggregate resources to avoid needless resource depletion and ensure that extraction results in the fewest environmental impacts.

Objective RC-11.1: Use the Aggregate Resources Management Plan to establish priority areas for aggregate production and to establish detailed policies, procedures, and standards for mineral extraction.

Objective RC-11.2: Minimize and mitigate the adverse environmental effects of mineral extraction and reclaim mined lands.

Policy RC-11a: Consider lands designated in the Aggregate Resources Management Plan (ARM Plan) as priority sites for aggregate production and mineral extraction and review requests for additional designations for conformity with the general plan and the ARM plan.

Policy RC-11b: Review projects for environmental impact and land use conflicts and consider the following minimum factors when approving mining permits: topsoil salvage, vegetation, fisheries and wildlife impacts, noise, erosion control, roadway conditions and capacities, reclamation and bonding, air quality, energy consumption, engineering and geological surveys, aggregate supply and replenishment, drainage, and the need for economical aggregate materials.

Policy RC-11c: Review projects which are on or near sites designated "Mineral Resources" in the ARM Plan for compatibility with future mineral extraction.

Draft Sonoma County General Plan 2020

Sonoma County is in the process of updating its existing General Plan. Applicable goals and policies from the land use element of the existing general plan listed above are proposed to be carried forth into the new general plan. Note: As of publication of this Draft EIR, the Sonoma County Board of Supervisors has not yet completed their deliberations or finalized these policies.

Sonoma County Zoning Ordinance

Roblar Road Project Site

The project site is zoned as LEA B6 160 Z (Land Extensive Agriculture District; B Combining District - 160-Acre/Unit; 2nd Unit Exclusion Combining District). The purpose of the LEA zoning designation is to enhance and protect lands best suited for permanent agricultural use and capable of relatively low production per acre of land, and to implement the provisions of the general plan and the policies of the agricultural resources element. A portion of the property is also within a Valley Oak Habitat (VOH) Combining District.

A *Mineral Resource* (MR) combining district overlay would be required for the Roblar Road quarry project site under the project. The purpose of the MR combining district overlay is to conserve and protect land that is necessary for future mineral resource production. The MR district is intended to be applied only where consistent with the aggregate resources management plan and combined with base zoning within specific general plan land use categories, including the LEA category. The MR district allows mining with the issuance of a surface mining use permit and the approval of a reclamation plan, but restricts residential and other incompatible uses. Its uses supersede those allowed in the applicable base district (Zoning Ordinance, Section 26-72-005).

Lakeville Road Easement Exchange Site

The project site is currently zoned LEA F2 (Land Extensive Agriculture District; Floodplain Combining District), with a BR zoning designation (Biotic Resource Combining District) over the western portion of the site adjacent to the Petaluma River. The purpose of the F-2 Floodplain district is to provide for the protection from hazards and damage which may result from flood waters (Zoning Ordinance, Section 26-58-005). The purpose of the BR district is to protect biotic resource communities including critical habitat areas and riparian corridors for their habitat and environmental value and to implement the provisions of the Open Space Element of the General Plan (Zoning Ordinance, Section 26-72-005).

Sonoma County Surface Mining and Reclamation Ordinance (SMARO)

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. The following sections from the ordinance are applicable to the proposed project:

Sec. 26A-09-010. General Standards for Mining Permit and Operations

- a) Use permits for surface mining shall not be approved on a parcel if the mining activity is not consistent with the zoning ordinance provisions set forth in Chapter 26 of County Code. To

be considered consistent with the Zoning Ordinance, the proposed mining sites must be (1) within a base zoning district where mining is permitted with a use permit, or 2) an area zoned with the “MR” (Mineral Resource) combining district consistent with ARM Plan policies. . . Rezoning to the “MR” zoning district shall be found consistent with the ARM Plan only in the following cases: rezoning for purposes of quarry operations are limited to the “RRD,” “DA,” and “LEA” base zoning districts . . .Rezoning to the “MR” District restricts residential and other incompatible uses normally allowed in the Base Zoning District.

- r) Compliance with other Agency and statutory requirements: Operations shall obtain any and all permits and approvals required by other agencies having jurisdiction over the mining operations and provide copies to the County. In addition, all aggregate operations shall be conducted in a manner consistent with the applicable requirements posed by other Federal and State agencies which are charged with enforcing Federal and State laws, including but not limited to, the Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), and the Federal Clean Water Act (CWA).
- s) The owners and operators of aggregate mining operations and reclamation plans shall be responsible for complying with the requirements of the State Surface Mining and Reclamation Act , and the Sonoma County ARM Plan, and all applicable chapters of County Code including, but not limited to, reimbursement of the operator’s fair-share of the County’s costs for carrying out the administration, mitigation, and monitoring activities set forth in the ARM Plan.

Sec. 26A-09-040. Quarry Mining Standards

- d) *Setbacks.* Mining operations, stockpiles, and processing operations are to be set back a minimum of twenty-five feet (25') from the MR zone boundary, the property boundary, and road easements and rights-of-way, whichever is the most restrictive. The minimum allowed setback for quarry mining operations from stream banks and critical habitat areas designated in the general plan is one hundred feet (100'). A minimum two hundred foot (200') setback is also required from the boundary of any general plan residential land use designations. Additional setbacks may be required as a result of site specific reviews in order to mitigate environmental impacts and land use conflicts.

Sec. 26A-11-010. Reclamation Plan Requirements

- a) *Requirement for reclamation of mining sites:* All areas disturbed by surface mining operations after January 1, 1976 shall require the approval, implementation, and completion of a reclamation plan. New mining permits shall not be approved until a reclamation plan for the mining site has been approved.
- b) *Findings for reclamation plan approval:* All areas disturbed by surface mining operations after January 1, 1976 shall require the approval, implementation, and completion of a reclamation plan. New mining permits shall not be approved until a reclamation plan for the mining site has been approved.
 - 1) The Reclamation Plan complies with SMARA Sections 2772 and 2773, and any other applicable provisions;
 - 2) The Reclamation Plan complies with the applicable requirements of State regulations (CCR Section 3500-3505, and 3700-3713);
 - 3) The Reclamation Plan will restore the mined lands consistent with the Sonoma County General Plan, ARM Plan, and any other applicable specific plan or resource plans;

- 4) The Reclamation Plan has been reviewed pursuant to CEQA and the County environmental review guidelines, and all significant impacts from the mining operation and the reclamation activities are mitigated to the maximum extent feasible;
- 5) The land and/or resources such as water bodies to be reclaimed will be restored to a condition that is compatible with, and blends in with, the surrounding natural environment, topography, and other resources, or that suitable off-site development will compensate for related disturbance to resource values;
- 6) Where the decision of Sonoma County decision-making body is at variance with the recommendations and objections raised by the State Department of Conservation, findings have been adopted to explain the reasons why specific comments and suggestions were not accepted.

Sonoma County Aggregate Resources Management (ARM) Plan

The Sonoma County Aggregate Resources Management Plan (ARM Plan) was last adopted in 1994. The goal of the ARM Plan is to meet the County's need for aggregate while minimizing environmental impacts and land use conflicts in a manner consistent with the requirements of CEQA, SMARA and State Mineral Resources Management policies.

The following objectives contained in the ARM Plan are relevant to the proposed project:

Objective 2: Facilitate new or expanded quarry operations at designated sites or at other locations with resources which can meet the needs for aggregate in an environmentally sound manner.

Objective 7: Change specifications, standards and practices where possible so that quarry rock will be more competitive with instream and terrace sources.

Objective 8: Reduce the need for additional aggregate through utilization of recycled and substitute materials, changes in development standards, and other means possible.

Objective 9: Encourage the retention of locally produced aggregate for use within the Sonoma County.

The ARM Plan also establishes operating and reclamation standards for hardrock quarry mining activities. These include standards for erosion control, slope and bench standards, hazardous materials control, noise standards, days and hours of operation, revegetation standards, successful reclamation standards, and other criteria. These standards have been added to the County's SMARO, and are referenced as appropriate in other sections of this EIR.

Petaluma Dairy Belt Area Plan

The Petaluma Dairy Belt Area Plan was adopted in 1985, and revised in 1993. The Petaluma Dairy Belt area is located in south and southwestern Sonoma County, along the Marin County border. The primary intent of the plan is to "delineate areas where development should occur and areas where agriculture should remain the primary use" (Sonoma County, 1993, p. 21). Area plan agriculture and mineral goals and policies pertinent to the proposed project include the following:

Agriculture Goals and Policies

1. It shall be the goal of this Area Plan to protect and maintain agricultural land for the value of its products, its economic impact on the county, its contribution to community life, and its environmental value.
 - b. Support the policies and programs providing tax and economic incentives that will ensure the long term retention of agricultural lands.
 - f. Encourage parcel sizes sufficient to provide productive, economic agricultural use.

Mineral Goals and Policies

1. It shall be the goal of this Area Plan to provide for the comprehensive planning and restoration of mineral extraction areas, such as sand and gravel deposits or quarries.
 - a. Consider inventories of mineral resources when planning or approving development.
 - b. Discourage residential, commercial, or industrial development that would be incompatible with proper mining resources.
 - c. Require that mineral extraction operations be performed in a way that is compatible with surrounding land uses and minimizes adverse effects on the environment.

Hessel Study

The Hessel Study, adopted in 1979, is a specific plan applicable to an approximately 6,000-acre area opposite Roblar Road, to the north of the project site. The specific plan area is generally located adjacent to Highway 116, about 1.5 miles west of Cotati and 4 miles southeast of Sebastopol. The Hessel Study is generally intended to retain the rural qualities of the Hessel area and to “foster dispersion of growth from the Hessel central area to outlying neighborhoods units while still retaining agriculture in the outlying areas.” Although not directly applicable to the project site, the Hessel Study recommended land use plan guidelines for adjacent development.

California Land Conservation Act (Williamson Act)

Applicable Legislation and Regulation

Since its enactment in 1965, the California Land Conservation Act (more generally known as the Williamson Act) has been the state’s premier land conservation program. The Williamson Act enables counties and cities to designate agricultural preserves that provide preferential taxation to private land owners who execute contracts restricting the use of their land within an Agricultural Preserve to agricultural or open-space uses and certain compatible uses. Agricultural landowners with properties under Williamson Act contracts are assessed taxes on the income-producing value of these property instead of their assessed market value. To qualify for the program, the landowner is required to sign a contract with the county or city agreeing to restrict the use of the land for a minimum 10-year period. The contract is renewed automatically annually unless one of the parties files for non-renewal or the contract is cancelled.

The California Department of Conservation has oversight responsibility for Williamson Act program administration and compliance. However, the local government is authorized to adopt Rules governing the administration of Agricultural Preserves. The County of Sonoma first

adopted Rules for Administering Agricultural Preserves in 1967, and which were last amended in 1989. Two different Rules were adopted, one for “Type I” preserves (prime agricultural land), and one for “Type II” preserves (non-prime agricultural land, e.g., grazing or open space).

Williamson Act Contracts in California and Sonoma County

As of January 2005, 16.6 million acres of California farmland have been enrolled under the Williamson Act which represents more than half of the state’s total 30 million acres of farmland and nearly a third of the its privately owned land. In 2005, Sonoma County had 272,272 acres of farmland under agricultural easement protection most of which was under the Williamson Act protection as nonprime farmland (230,342 acres) or as prime farmland (41,931 acres) (DOC, 2006).

Williamson Act Contracts in Roblar Road Project Site and Lakeville Road Easement Exchange Site Vicinity

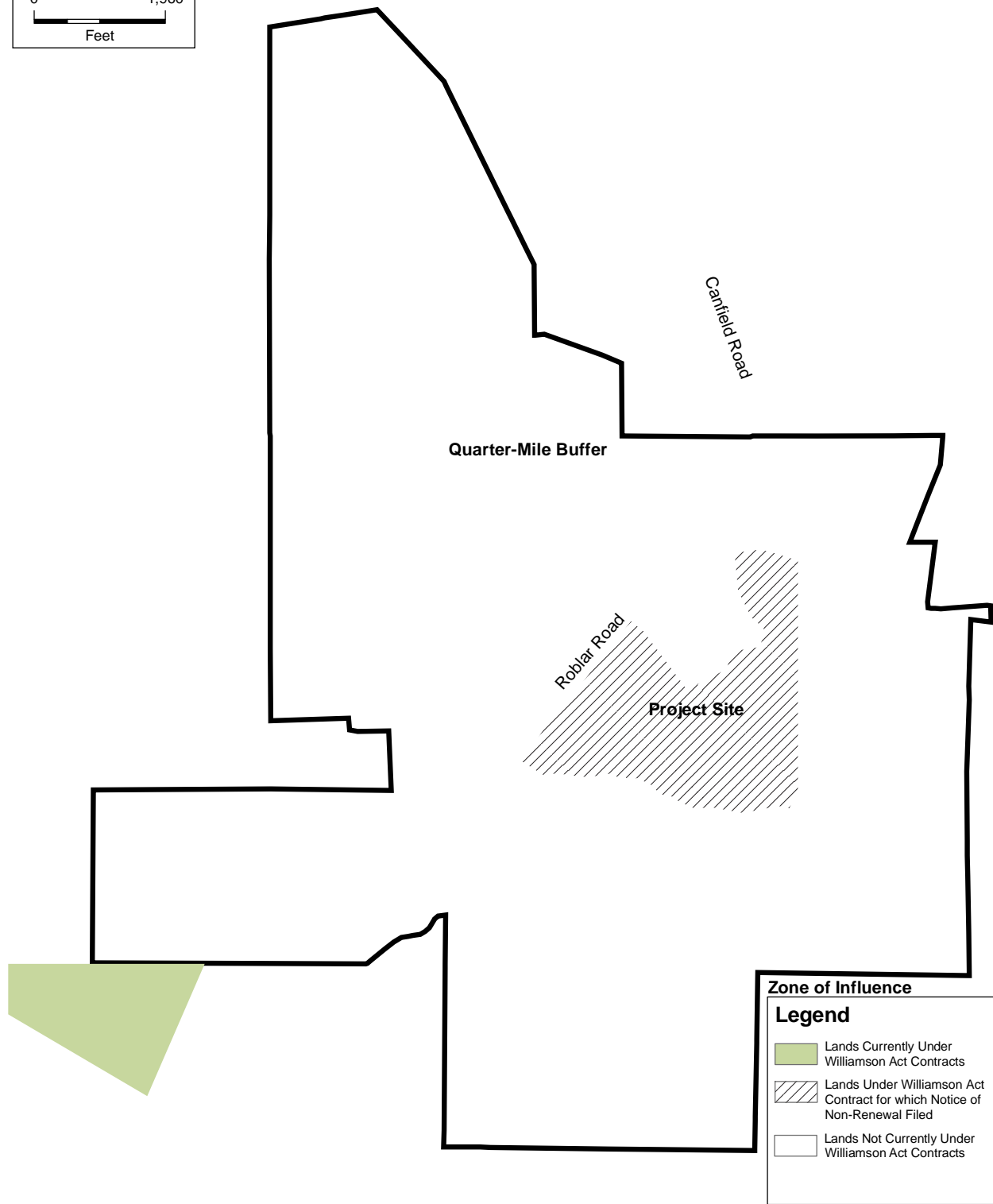
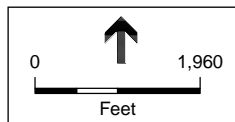
Roblar Road Project Site. Figure IV.A-4 illustrates the properties in the Roblar Road project site vicinity that are currently under Williamson Act contracts. The previous Roblar Road property owners originally entered into an approved Williamson Act contract #2-387-72 with Sonoma County dated February 28, 1972, and recorded on March 2, 1972. A Notice of Non-Renewal of the Williamson Act contract was approved by the County on November 29, 2005 and recorded on December 7, 2005. All of the other properties subject to a Williamson Act contract may be expected to remain in agricultural production for a minimum of ten years.

Lakeville Road Easement Exchange Site. Figure IV.A-5 illustrates the properties in the Lakeville Road easement exchange property vicinity that are currently under Williamson Act contracts. The easement exchange property is not currently under Williamson Act protection. The property was never placed under a Williamson Act contract primarily because its annual property tax payments were already low (based on the property’s original purchase price in the early 1950s), and because it wished to maintain its sale options by keeping the property unencumbered (Kullberg, 2006).

Agricultural Conservation Easements and Other Protected Lands

Open Space Districts and Organizations

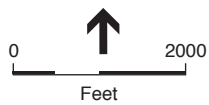
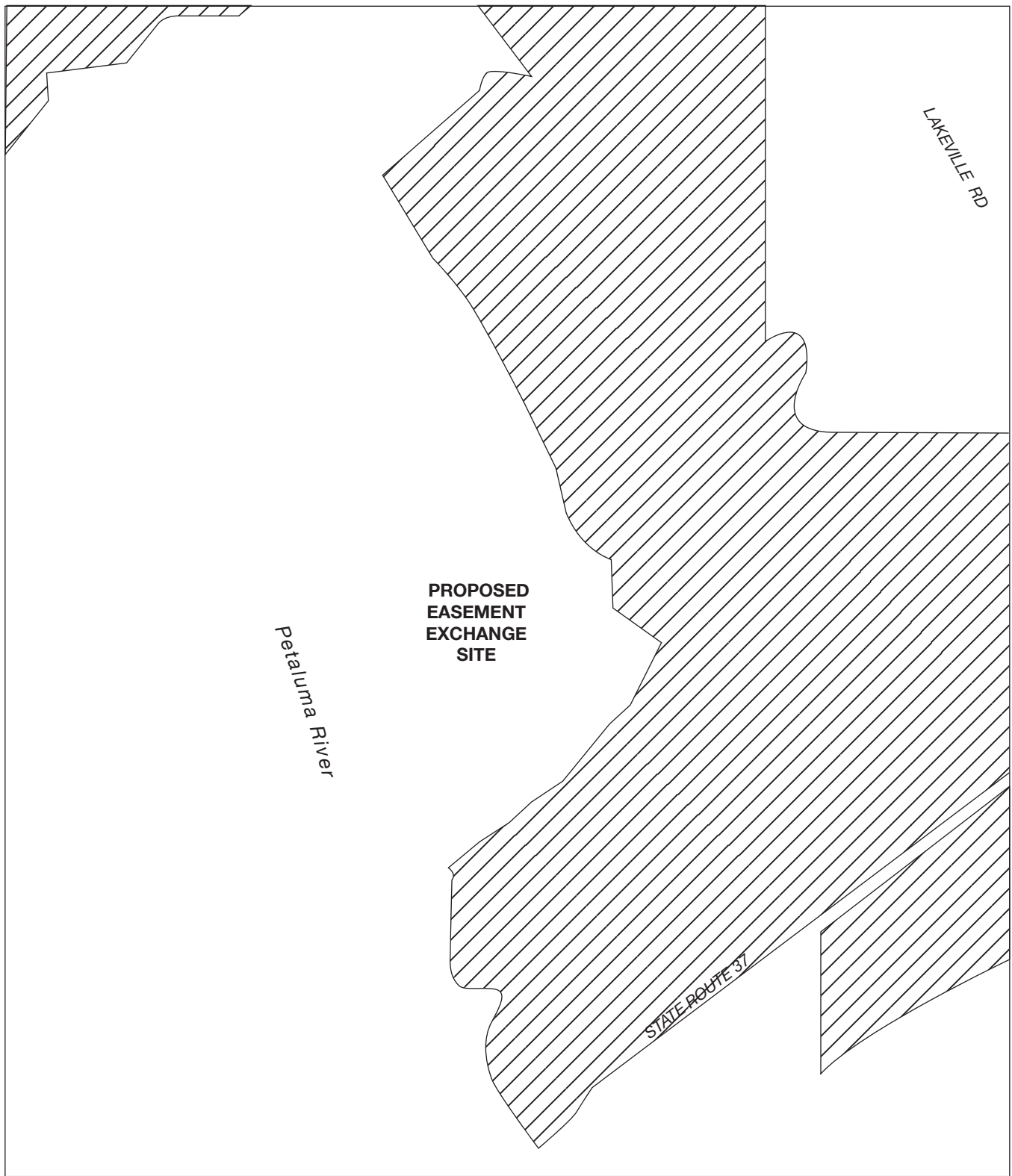
Sonoma County Agricultural Preservation and Open Space District. The Sonoma County Agricultural Preservation and Open Space District (District) was established as part of the Open Space Element of the Sonoma County General Plan to acquire and administer open space lands. The District is a public agency funded by ¼ percent sales tax in Sonoma County. However, the District is not a regulatory agency and does not have the power of eminent domain. The District acquires conservation easements through voluntary transactions with landowners, and also purchases land outright from willing sellers. The District identifies four acquisition categories: Agriculture, Greenbelts, Natural Resources and Recreation. The Agriculture Acquisition Category includes small farms, dairies, livestock ranches, vineyards and other agricultural lands that contribute to the County’s agricultural economy and provide valuable open space. The District has protected over 32,000 acres of active agricultural lands in Sonoma County.



SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry . 204334

Figure IV.A-4
Williamson Act Lands In
Roblar Road Project Site Vicinity



--- Approximate Property Boundary

□ Lands Currently Under Williamson Act Contracts

SOURCE: USGS

Roblar Road Quarry . 204334

Figure IV.A-5
Williamson Act Lands in Lakeville Road
Easement Exchange Site Vicinity

Sonoma Land Trust. The Sonoma Land Trust, founded in 1976, is a private, non-profit membership organization that has protected more than 17,000 acres in and around Sonoma County by working directly with willing landowners. The Land Trust offers stewardship, education and advice for the preservation and enhancement of agricultural, natural and open space lands.

Agricultural Conservation Easements in Vicinity of Roblar Road Project Site

Figure IV.A-6 illustrates locations of agricultural conservation easements by the Sonoma County Agricultural Preservation and Open Space District in the vicinity of the Roblar Road project site. The project applicant sold the permanent agricultural easement rights for Roblar Ranch property (south of and adjacent to the Roblar Road project site) to the District in May 2004.

Agricultural Conservation Easements and other Protected Lands in Vicinity of Lakeville Easement Exchange Site

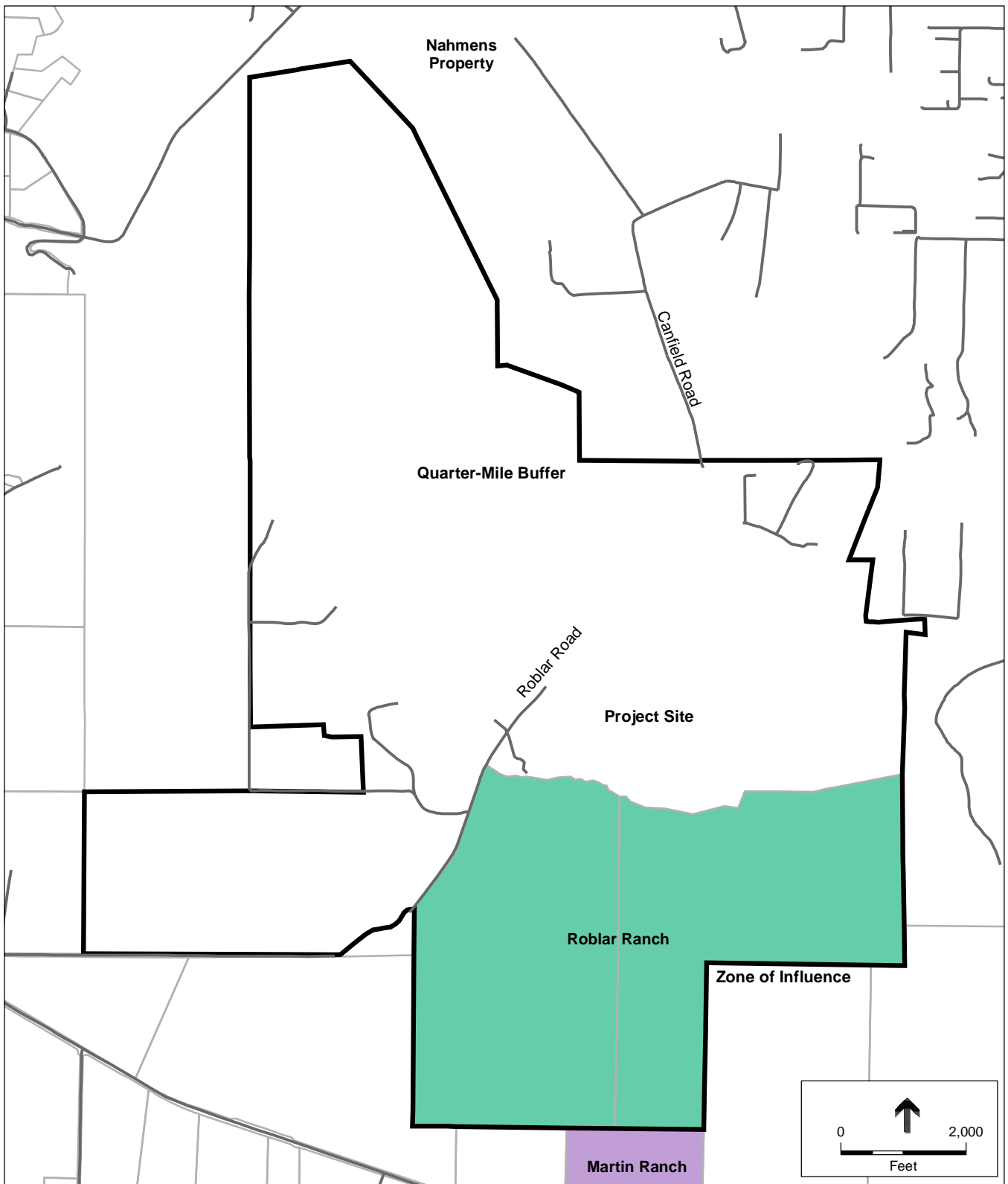
Figure IV.A-7 illustrates agricultural conservation easements and other protected lands in the vicinity of the Lakeville Road Easement Exchange site. The Sonoma Land Trust maintains an agricultural conservation easement on the adjacent property to the south (Lower Ranch). The Sonoma Land Trust also owns the North Parcel and Leonard Ranch properties, and is currently working to restore and enhance the seasonal wetlands on those properties. Under a partnership between the State Lands Commission, California Department of Fish and Game and the Sonoma Land Trust, 48 acres of formerly diked lands (Petaluma River Marsh) adjacent to, and south of, the easement exchange site were opened to tidal action and restored. The Sonoma County Agricultural Preservation and Open Space District maintains an agricultural conservation easement on the adjacent Sleepy Hollow Dairy property northeast of the exchange property.

Further south along the San Pablo Bay, the 431-acre Sonoma Baylands property was restored to tidal action in 1996 through a partnership between the California State Coastal Conservancy, the U. S. Army Corps of Engineers and the Sonoma Land Trust. As part of the restoration project, dredge material from the Port of Oakland was used to raise the subsided properties' elevation closer to its final desired marsh elevation.

Further east, the Sonoma Land Trust acquired the 2,327-acre North Point Joint Venture and Dickson Ranch properties (now collectively known as the Sears Point Restoration Project) in early 2005. The Sonoma Land Trust is currently evaluating a number of restoration approaches for that property. Together with the other neighboring and nearby conservation and restoration properties including the San Pablo Bay National Wildlife Refuge, the area represents one of the most significant restoration projects occurring throughout the San Francisco Bay.

California Department of Conservation Farmland Mapping and Monitoring Program (FMMP)

The California Department of Conservation (DOC) administers the Important Farmland Mapping and Monitoring Program (FMMP) which evaluates the quality of farmlands throughout the State of California. The suitability of the local soil resources plays a crucial part in the FMMP's farmland classifications. The FMMP uses the U.S. Department of Agriculture Natural Resource



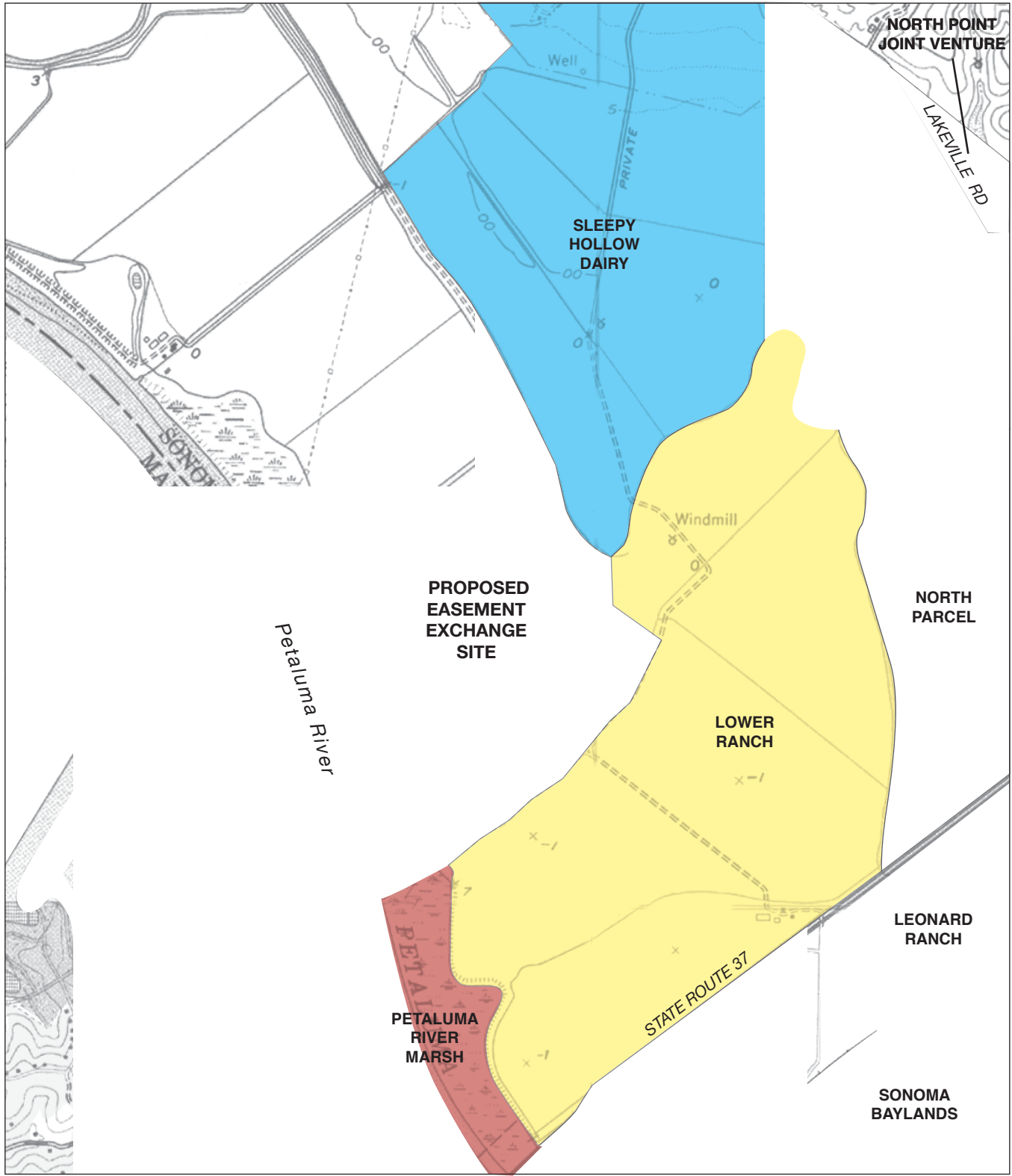
SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry . 204334

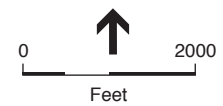
Figure IV.A-6
Agricultural Conservation Easements in
Project Site Vicinity

Legend

- Roblar Ranch
 - Martin Ranch
 - Nahmens Property
- Under agricultural conservation easement by the Sonoma County Agricultural Preservation and Open Space District



- | | | |
|---|---|---------------------------------|
| Approximate Property Boundary | Owned and Protected by Sonoma Land Trust | Marin Audobon Society Property |
| Under Agricultural Conservation Easement by the Sonoma County Agricultural Preservation and Open Space District | Future Donation to Sonoma Land Trust | State Lands Commission Property |
| Under Agricultural Conservation Easement by the Sonoma Land Trust | State Coastal Conservancy Property | |
| | California Department of Fish and Game Property | |



SOURCE: USGS, Sonoma Land Trust Roblar Road Quarry . 204334

Figure IV.A-7
Agricultural Easements and Other Protected Lands in
IV.A-20 Lakeville Road Easement Exchange Site Vicinity

Conservation Service (USDA NRCS) soil survey information, land inventory and monitoring criteria to classify most of the state's agricultural regions into five agricultural and three nonagricultural land types. Every two years, the FMMP publishes this information in its Important Farmland map series. The five agricultural land classifications are:

Prime Farmland: This consists of the land best able to sustain long-term crop production. These lands must have a developed and adequate irrigation water supply. These lands must have been used for irrigated crop farming for some period during the previous 4 years.

Farmland of Statewide Importance: These are lands with similar land use, irrigation system and physical characteristics as prime farmland but with minor shortcomings (e.g. steeper soils).

Unique Farmland. Lands with lesser quality soils used to produce California's leading agricultural cash crops. These are generally irrigated lands but can include nonirrigated orchards or vineyards.

Farmland of Local Importance. Agricultural properties determined by the county's local government to be important for the local agricultural economy.

Grazing Land. Lands most suited for livestock grazing.

Nonagricultural lands are classified as: Urban and Built-Up lands; Water (perennial water bodies greater than 40 acres); or Other Land (i.e. not included in any other mapping category).

The FMMP is an informational service only and does not constitute state regulation of local land use decisions. Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are considered valuable and any conversion of land within these categories is typically considered to be an adverse impact. The FMMP classifications for lands within Sonoma County are presented in Table IV.A-1.

FMMP Classification at Roblar Road Project Site

Figure IV.A-8 shows the DOC FMMP land classification for the project site and its zone of influence. Most of the Roblar Road project site is designated "grazing land." A small area in the southwest portion of the site (approximately 10.5 acres, or about 5% of the project site) is classified as "farmland of local importance." There is no "prime farmland," "farmland of statewide importance," or "unique farmland" within the project site.

FMMP Classification at Lakeville Road Easement Exchange Site

Figure IV.A-9 shows the FMMP land classification for the Lakeville Road easement exchange site and vicinity. The entire easement exchange site and all adjacent parcels are classified as "farmland of local importance" by the FMMP.

**TABLE IV.A-1
SONOMA COUNTY FMMP LAND CLASSIFICATION SUMMARY**

FMMP Land Classification Category	Total Acreage
Important Farmland	
Prime Farmland	36,377
Farmland of Statewide Importance	19,747
Unique Farmland	31,173
Farmland of Local Importance	74,851
Total Important Farmland	162,148
Grazing Land	421,126
Agricultural Land Total	583,274
Urban and Built-Up Land	72,848
Other Land	352,582
Water	17,354
Total Area Inventoried	1,0226,058

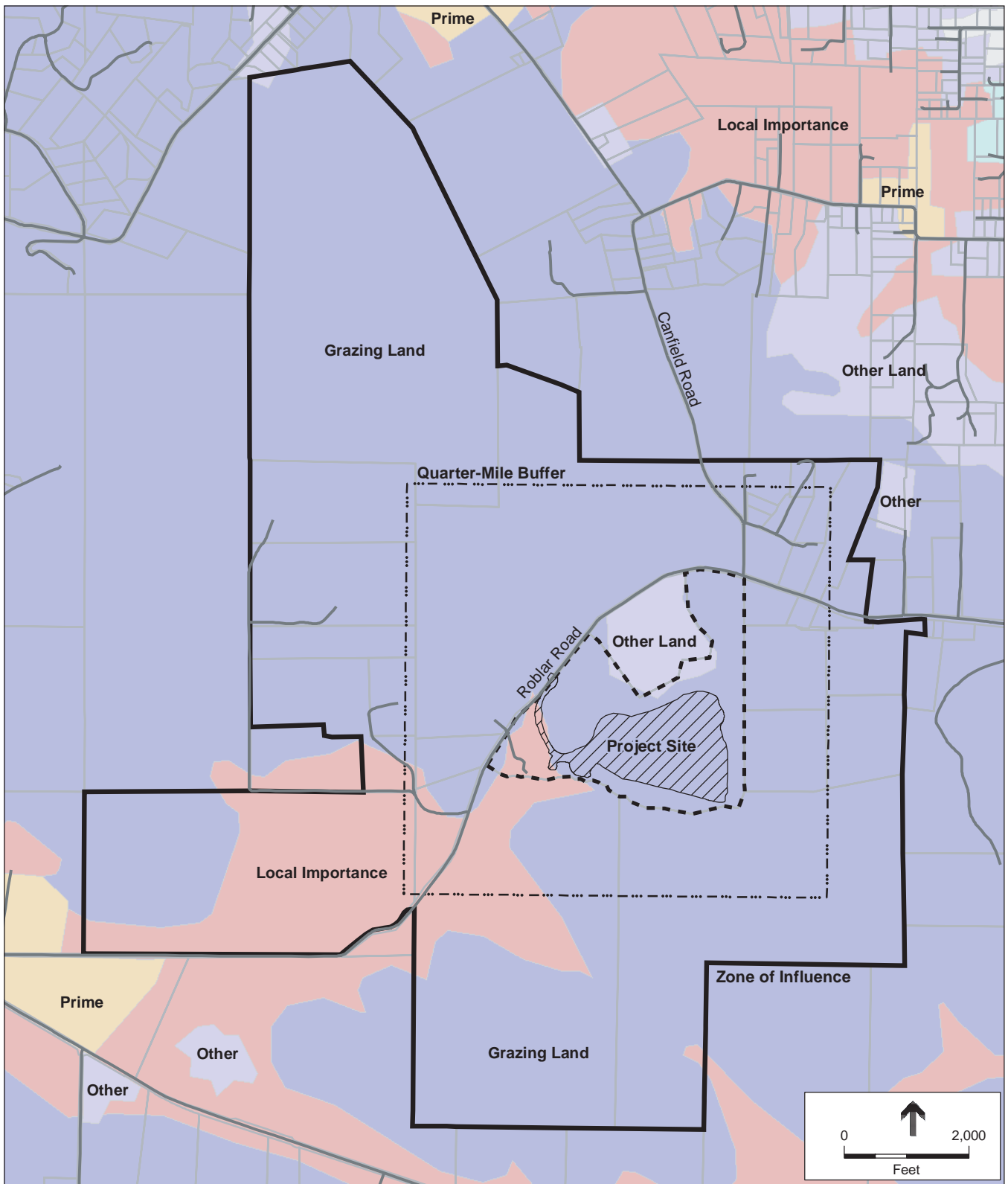
SOURCE: Department of Conservation, Farmland Mapping and Monitoring Program

Consistency with Plans and Policies

CEQA Guidelines Section 15125 (d) requires that an EIR discuss any inconsistencies between the proposed project and applicable general plans and regional plans. For purposes of this EIR, an apparent inconsistency of the project with a policy reflected in the County’s general plan documents would not, in and of itself, constitute a significant impact on the environment. Rather, the policies of the Sonoma County General Plan, the Sonoma County Zoning Ordinance, the SMARO, and the Sonoma County ARM Plan are used as sources of criteria for assessing potential environmental effects identified throughout this EIR. Ultimately, the Sonoma County Permit and Resource Management Department will make recommendations to the Sonoma County Planning Commission and Board of Supervisors regarding the consistency of the project with the General Plan and the project site’s suitability for the proposed use.

The General Plan’s land use designation of Land Extensive Agriculture (LEA) for the project site permits surface mining operations consistent with the ARM Plan, subject to the standards of the SMARO. As described below, the project would be required to meet all applicable requirements of the ARM Plan and SMARO, consequently, the proposed project would be consistent with the General Plan LEA land use designation.

When collectively considering all elements of the proposed project, the proposed project appears to be generally consistent with the General Plan Land Use and Agricultural Resources Elements goals and objectives for protecting and avoiding conversion of lands currently used for agricultural production. While the project would result in the direct temporary and permanent loss of a portion of agricultural land on the project site currently used for grazing; it also proposes to continue dryland grazing on non-quarry portions of the project site during quarry operation, would return the majority of the project site to agricultural use following reclamation, and would establish a permanent agricultural conservation on a 244-acre property near Lakeville Road as



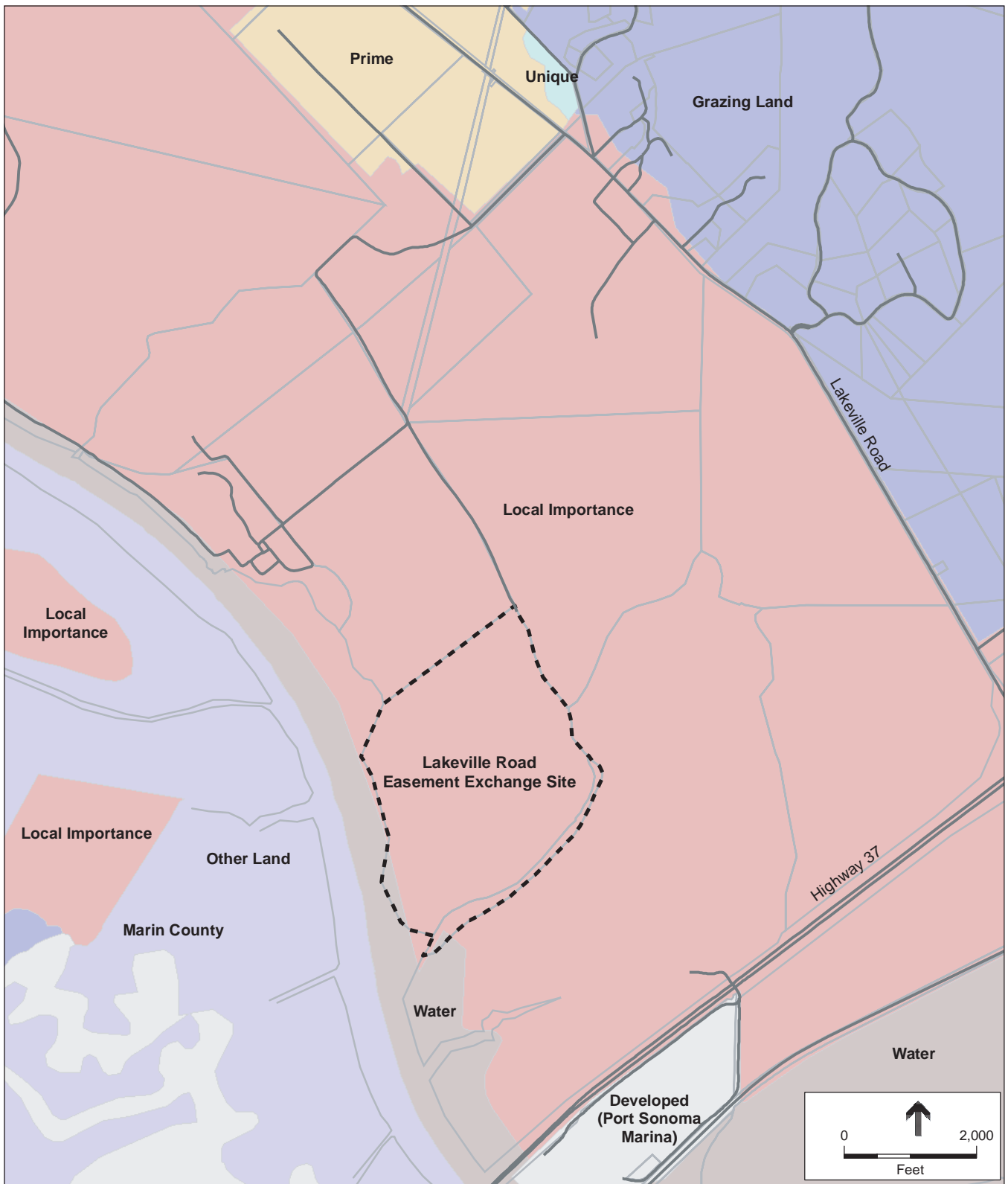
SOURCE: County of Sonoma, 2005; ESA, 2005;
 Calif. Dept. of Conservation, 2005

Legend

 Portion of Project Site Affected by Proposed Quarry

Roblar Road Quarry . 204334

Figure IV.A-8
 Important Farmland Classifications for the
 Roblar Road Project Site Vicinity



SOURCE: County of Sonoma, 2005; ESA, 2005;
Calif. Dept. of Conservation, 2005

Roblar Road Quarry . 204334

Figure IV.A-9
Important Farmland Classifications for the
Lakeville Road Easement Exchange Site Vicinity

part of an easement exchange to ensure that site would permanently remain in farming use. (Please see Impacts section for more detail.) The proposed project would be consistent with the General Plan Resource Conservation Element's Mineral Resources goal for producing aggregates to meet local needs. With respect to Mineral Resources policy for consideration of environmental effects, all potential significant physical environmental effects of the proposed project are addressed in their respective sections of this EIR. Measures are proposed either as part of the project and/or as identified throughout this EIR to minimize and mitigate adverse environmental effects of the project to the extent feasible.

The MR combining district overlay that is proposed would allow mining on the project site with the issuance of a surface mining use permit and the approval of a reclamation plan. The SMARO requires mining operations to have a surface mining use permit (or vested right), reclamation plan, and financial assurance approved prior to commencing mining operations. These requirements would be met by imposing conditions of approval for the project that require compliance with the operational and reclamation standards of the SMARO. Thus, the project appears to be consistent with the proposed MR zoning overlay designation for the site.

The project appears to be generally consistent with the ARM Plan, which identifies the Roblar Road site as a potential quarry area. The proposed project would also be generally consistent with the ARM Plan objectives noted in the Setting. The project, as designed and mitigated, would be consistent with ARM Plan objectives for developing new quarry operations at designated sites to meet the needs for aggregate in an environmentally sound manner, and providing a local source of aggregate for use within the County. Since the project would allow for import of concrete and asphalt to the site for recycling from the applicant's construction sites, it would also further the ARM Plan objective for utilization of recycled materials. The operating and reclamation standards for hardrock mining activities established in the ARM Plan have been added to the SMARO, and the conditions of approval of the project would require compliance with the operational and reclamation standards of the SMARO.

Impacts and Mitigation Measures

Significance Criteria

For the purposes of this EIR, and taking guidance from Appendix G of the CEQA *Guidelines*, impacts to land use and agricultural resources may occur if the project would result in:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect;
- Physically divide an established community;
- Conflict with any habitat conservation plan or natural community plan;
- 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;

- Conflict with existing zoning for agricultural use, or a Williamson Act contract; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use.

A project would also be considered to have a significant impact on the environment if it would cause physical changes in the environment that would be substantially incompatible with existing or planned land uses.

The project site is not located within the area of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan. Consequently, the project would have no impact on this issue; and accordingly, this issue is not discussed further in this EIR.

Project Impacts

Compatibility with Nearby Land Uses

Impact A.1: The proposed quarry would introduce active mining operations on a primarily undeveloped site. The effect of this change in land use on compatibility with residential land uses in the project vicinity would be a potentially significant impact.

The project site is primarily undeveloped except for the existing ranch complex and ancillary features, and historically has been used for grazing. The project vicinity can be characterized as rural in nature, and nearby existing residential land uses are generally clustered and separated from each other by large areas of agricultural land supporting grazing and/or dairy operations.

The project would introduce active industrial operations on the project site, disturbing approximately 70 acres of the 199-acre project site. The project would involve initial grading and construction, followed by long-term quarrying activities during the 20-year use permit, including the intermittent stripping of vegetation and top soil; on-going excavation of overburden and resource rock materials using large earthmoving equipment, and occasional blasting; on-site processing of materials, and the generation of quarry haul trucks on local roads. Substantial and permanent alterations in the topography of the mined areas on the site would occur over time as rock is excavated.

As discussed above, under Consistency with Plans and Policies, the project would be required to meet all applicable requirements of the SMARO and the ARM Plan. Applicable requirements of these documents, which when implemented would serve to minimize potential environmental impacts on nearby land uses, are discussed as appropriate throughout this EIR. The project would meet the minimum 25-foot setback from adjacent parcels required by the SMARO and ARM Plan. In fact, depending on mining phase and location on site, the proposed setbacks from the edge of mine to adjacent properties would range between 100 feet to over 1,000 feet. These setbacks would serve as a buffer between on-site operations and off-site land uses. Other proposed project design features intended to reduce incompatibilities between the project and adjacent land uses to the extent feasible include the use of dust control measures to minimize

operational dust, and planting of trees along Roblar Road, access road and equipment staging area to help screen views of project features.

All potential physical environmental effects of the proposed mining activities on surrounding land uses are addressed in their respective sections of this EIR. Sections IV.B and IV.C discuss potential changes in surface and groundwater flows and levels, and erosion and sedimentation effects on water quality in the project vicinity; Section IV.D addresses potential effects on nearby biological resources; Section IV.E, discusses potential off-site effects from project-generated truck traffic; Section IV.F and IV.G discusses potential air quality and noise impacts at nearby sensitive receptors; Section IV.H, discusses potential off-site effects from hazardous materials releases; Section IV.I discusses potential aesthetic effects of proposed mining activities; and Section IV.J discusses potential impacts to public services and utilities serving the project vicinity. Mitigation measures proposed as part of the project and identified in this EIR would mitigate or reduce potential impacts to off-site land uses to the extent feasible.

The proposed project would be generally compatible with the adjacent closed landfill property given the lack of sensitive receptors on the landfill property, and the historical industrial use and altered landform of the landfill property. As mitigated, the project would also not have any remaining short-term or long-term significant environmental impacts to agricultural land or production in the project vicinity. While the project site would result in non-agricultural equipment and structures (e.g., mobile processing plant, office) at the project site during the 20-year period that mining would occur, those facilities would be removed following final reclamation. Given the discrete concentration of land affected by quarrying on the project site, and the project sites' location adjacent to the landfill property, the proposed project would not result in any discontinuous patterns of agricultural land in project area.

However, the project would be considered comparatively less compatible in terms of use with the existing residential uses in the project vicinity, particularly given the presence of sensitive receptors on those properties. The proposed project would not divide an established residential community. Nevertheless, when considering the industrial nature and scale of the proposed development, and the collective environmental effects of operation of the proposed quarry (e.g., visual, truck traffic, noise) which would be noticeable to nearby residences over a long-term (20-year) period, the project can be considered to be incompatible with existing nearby residential uses, which would be a significant impact. Similarly, although there is currently no other planned or approved future development in project vicinity, the proposed project would have similar incompatibility should any potential future residential uses or other sensitive land uses be developed in the project vicinity during the life of the quarry.

Mitigation: None available beyond those identified in the EIR.

Significance after Mitigation: Significant and Unavoidable.

Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance

Impact A.2: The project would not result in the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, the proposed project would have no impact on these resources.

There is no “Prime farmland,” “Unique farmland” or “Farmland of Statewide Importance” as designated by the DOC FMMP farmland classification system on the project site or on adjacent parcels. Consequently, the project would not result in any temporary or permanent conversion of any areas of Prime farmland, Unique farmland or Farmland of Statewide Importance, nor would have direct or indirect effect on these farmland types elsewhere within the project vicinity.

Mitigation: None Required.

Conversion of Farmland to Non-Agricultural Use - LESA Model

Impact A.3: The proposed quarry project would result in both temporary and permanent conversion of Farmland on the project site to non-agricultural use. This would be a potentially significant impact.

During the 20 year mining period, the proposed quarry operations at the project site would directly disturb 70 acres of the approximate 199-acre property, and temporarily remove that land from dryland grazing use. As discussed in the Project Description, above, the quarry site and related infrastructure is proposed to be adequately fenced to allow dryland grazing to continue on the site’s other remaining approximate 129 acres. As proposed quarrying would proceed, and areas directly disturbed by quarrying operations would be incrementally reclaimed. Following the 20-year mining period, the quarry site would go through final reclamation. Nevertheless, the applicant estimates that following final reclamation, up to 40 percent of the 70-acre affected area (or approximately 28 acres) could still potentially be permanently lost from future productive rangeland use, due to slope gradient or other factors.

In 1993, Senate Bill 850 (Chapter 812/1993) directed the California Resources Agency “to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process (PRC Section 21095).” As a result, the DOC developed the California Land Evaluation and Site Assessment Model (LESA) as a point-based approach for rating the relative value of agricultural lands.

The LESA model has been used to assist in evaluating the impact of a project’s future impacts on agriculture. The LESA model measures two basic sets of factors: (1) Land Evaluation factors that measure the inherent soil-based qualities of land as they relate to agricultural sustainability; and (2) Site Assessment factors which consider social, economic and geographic attributes which contribute to the societal value of agricultural land. The site assessment also considers the land use of nearby properties within the project site’s zone of influence (see Figure IV.A-1 for the

limits of the zone of influence surrounding the project site). A Farmland Conversion Study completed in support of this EIR and included in Appendix B presents the LESA Model analysis worksheet tables and other applicable information. The approach used for the analysis of the proposed project conforms to the methodological guidance provided in the California Agricultural Land Evaluation and Site Assessment Model Instruction Manual (Department of Conservation, 1997). DOC staff were also consulted as needed for additional direction on use of the model. Factor scores were calculated (each with a possible maximum score of 100) and then weighted and combined to derive the Final LESA score determining the potential significance of the proposed agricultural conversion.

At the request of DOC, the LESA model was run solely for the Roblar Road project site (and not the proposed Lakeville Road easement exchange site), since the LESA model is not intended for quantitatively comparing the merits of farmland being lost as a result of a project to those of farmland being preserved as a result of an easement exchange. However, at the request of the DOC, LESA models for two different-sized study areas for the Roblar Road project site were developed, and results presented herein: Scenario 1 - the entire 199-acre Roblar Road project site (herein referred to as the full project site), and Scenario 2 - the portion of the Roblar Road project site (70 acres) that would be used for the proposed quarry, and the corresponding area proposed to be removed from Williamson Act protection (herein referred to as the affected area of site).

When considering Scenario 1: Full Project Site, the Land Evaluation weighted factor subscore for the full project site was 19.2, and the project's Site Assessment weighted factor subscore was 32.5. The LESA analysis estimates the project's Final LESA score as 51.7. However, since the Land Evaluation subscore is below the 20 point scoring threshold, the LESA model indicates that the project's agricultural conversion when considering the entire site would not be considered significant under Scenario 1.

When considering Scenario 2: Affected Area of Project Site, the Land Evaluation weighted factor subscore for the full project site was 23.7. The higher score for the impacted area (when compared with the entire project site in Model Scenario 1) reflects the higher proportion of shallower sloped, Steinbeck Loam soils within the impacted area which carry a higher class than some other soils and/or steeper sloped areas of the project site. The project's Site Assessment weighted factor subscore was 26.5. The LESA analysis estimates the project's Final LESA score 50.2. Since both the Land Evaluation and Site Assessment weighted factor subscores were greater than the 20 scoring thresholds, the LESA model indicates the project's agricultural conversion would be considered potentially significant under Scenario 2.

In both cases, the overall total LESA scores are relatively low – each are about half of the maximum potential point score of 100 and closer to the minimum potential significance threshold of 40 (which only applies if both the Land Evaluation and Site Assessment weighted factor subscores are greater than 20 points). While the LESA model is rarely used as a comparative methodology for quantifying agricultural conversion impacts, the magnitude of the LESA score does provide insight as to the type of mitigation that might be most applicable for reducing the proposed project's impact.

As discussed in detail in Impact A.4, as part of the project, the applicant proposes to participate in the DOC's Williamson Act Easement Exchange Program (WAEPP) to place a 244-acre property off Lakeville Road (purchased by the applicant in November 2005) under a permanent agricultural easement for rescission of 70 acres of grazing land currently under the existing Williamson Act contract on the Roblar Road property. The two parcels that make up the Lakeville Road property are currently used for dryland oat hay farming and are not currently under a Williamson Act contract. While the applicant would continue to retain fee title ownership of the easement exchange property, a permanent agricultural conservation easement would be transferred for future stewardship to an appropriate private land trust or government conservation agency, such as the Sonoma Land Trust or the Sonoma County Agricultural Preservation and Open Space District.

As a result, approximately 3.5 acres of permanently protected farmland would be gained at the Lakeville Road easement exchange property for each acre of the interim lost Williamson Act production at the project site during the 20-year life of the quarry (ratio of approximately 3.5:1). Furthermore, following the proposed reclamation of the project site after its 20 year period of operation, the ratio would increase to 8.7:1 of permanently protected farmland gained at the Lakeville Road easement exchange property for each acre of grazing land lost at the project site.

Based on the foregoing, while the project would result in both temporary and permanent conversion of farmland on the project site to non-agricultural use, the proposed participation in the WAEPP and the associated proposed permanent protection of farmland at the Lakeville Road easement exchange site would ensure this impact would be mitigated to a less than significant level.

Mitigation: Implement Mitigation Measure A.4, below.

Significance after Mitigation: Less than Significant.

Conflict with Williamson Act

Impact A.4: The project would conflict with a Williamson Act Contract governing the project site. This would be a potentially significant impact.

The project site is currently restricted to agricultural use under a Williamson Act contract # 2-387-72. Mining on Williamson Act contracted land is generally considered an incompatible use and not allowed pursuant to Government Code 51238.1, although under Section 51238.2, mineral extraction may be approved as a compatible use if the underlying commitment to preserve agricultural land will not be significantly impaired. The County's "Rules and Regulations for Administration of Agricultural Preserves – Type II" list quarrying operations, excluding processing operations, as an allowable compatible use on Type-II contracted land.

The proposed quarry would directly disturb 70 acres of the 199-acre site, temporarily removing that land from dryland grazing use, although dryland grazing would continue on the site's other

remaining approximate 129 acres during the 20-year life of the quarry. As proposed quarrying would proceed, areas directly disturbed by quarrying operations would be incrementally reclaimed. Following the 20-year mining period, the quarry site would go through final reclamation. Nevertheless, the applicant estimates that following final reclamation, up to 40 percent of the 70-acre affected area (or approximately 28 acres) could still potentially be permanently lost from future productive rangeland use, due to slope gradient or other factors.

Since the project would result in the permanent loss of a portion of the project site from future rangeland use, it appears the project would not fully meet the test of compatibility under Section 51238.2. Therefore, the County would not be able to permit the proposed project until the Williamson Act contract governing the property is terminated either through cancellation, expiration through non-renewal, or easement exchange.

As discussed in Chapter III, Project Description, under the provisions of the Williamson Act Easement Exchange Program (WAEPP), the project applicant is seeking a land exchange that would involve rescinding an approximate 70-acre portion of the Williamson Act contract governing the project site, and concurrently placing another property within the County under an agricultural conservation easement (244-acre Lakeville Road easement exchange site), pursuant to Government Code section 51256. The applicant purchased the proposed easement exchange site in November, 2005. The easement exchange site is located near Lakeville Road in southern Sonoma County, approximately seven miles southeast of the Petaluma city limit, and across the Petaluma River from the Novato city limit and County of Marin. The easement exchange site has historically been farmed for dryland hay production. While the applicant would continue to retain fee title ownership of the easement exchange property, a permanent agricultural conservation easement would be transferred for future stewardship to an appropriate private land trust or government conservation agency, such as the Sonoma Land Trust (SLT) or the Sonoma County Agricultural Preservation and Open Space District (District).

As discussed in the Setting, the proposed easement exchange site is not currently under a Williamson Act contract, although, adjacent parcels to the northeast (Sleepy Hollow Dairy) and east/south (Lower Ranch), and other nearby properties are. Furthermore, both the adjacent Sleepy Hollow Dairy and Lower Ranch properties are currently under agricultural conservation easements by the District and SLT, respectively. An adjacent property to the south (Petaluma River Marsh) is owned and protected by the State Lands Commission. Other protected lands in the vicinity further south include the Sonoma Baylands property owned by California State Coastal Conservancy; and further east include the North Parcel, Leonard Ranch, North Point Joint Venture and Dickson Ranch properties owned by SLT. Collectively, the area represents one of the most substantial restoration projects occurring throughout the San Francisco Bay.

Williamson Act Easement Exchange Program

Since January 1998, Williamson Act easement exchange legislation has established a voluntary rescission process by which Williamson Act contracts can under limited and special circumstances be cancelled while simultaneously dedicating a permanent agricultural conservation easement on another property. Additional detail on the Williamson Act Easement

Exchange Program's process and requirements is presented in the Farmland Conversion Study in Appendix B. However, the WAEEP's key components and issues are briefly discussed below.

Approval of the Williamson Act Easement Exchange requires establishment of a conservation easement in perpetuity to ensure the land will remain permanently in agricultural use. By transferring the property's future development rights to a suitable land trust or conservation agency, the current landowners (and any future landowners) must use the property for sustained and commercially viable agricultural production.

Among other requirements, the County Board of Supervisors must make specific findings, and the agreement must be approved by the Secretary of Resources.

To enter into the WAEEP, Government Code Section 51256 requires the County to make the following findings:

- a) The proposed agricultural conservation easement is consistent with the criteria set forth in Section 10251 of the Public Resources Code.
- b) The proposed agricultural conservation easement is evaluated pursuant to the selection criteria in Section 10252 of the Public Resources Code, and particularly subdivisions (a), (c), (e), (f), and (h), and the board or council makes a finding that the proposed easement will make a beneficial contribution to the conservation of agricultural land in its area.
- c) The land proposed to be placed under an agricultural conservation easement is of equal size or larger than the land subject to the contract to be rescinded, and is equally or more suitable for agricultural use than the land subject to the contract to be rescinded. In determining the suitability of the land for agricultural use, the city or county shall consider the soil quality and water availability of the land, adjacent land uses, and any agricultural support infrastructure.
- d) The value of the proposed agricultural conservation easement, as determined pursuant to Section 10260 of the Public Resources Code, is equal to or greater than 12.5 percent of the cancellation valuation of the land subject to the contract to be rescinded, pursuant to subdivision (a) of Section 51283. The easement value and the cancellation valuation shall be determined within 30 days before the approval of the city or county of an agreement pursuant to this section.

In addition, pursuant to Government Code Section 51282, the Board of Supervisors may grant tentative approval for cancellation of a contract if it makes one of the following findings:

- 1) The cancellation is consistent with the purposes of the Williamson Act; or
- 2) The cancellation is in the public interest.

To find that cancellation is consistent with the Williamson Act, the Board must adopt all of the following findings:

- 1) The cancellation is for land on which a notice of nonrenewal has been served.

- 2) The cancellation is not likely to result in the removal of adjacent lands from agricultural use.
- 3) The cancellation is for an alternative use which is consistent with the applicable provisions of the County general plan.
- 4) That cancellation will not result in discontinuous patterns of urban development.
- 5) There is no proximate noncontracted land which is both available and suitable for the use to which proposed for the contracted land; or, that development of the contracted land would provide more contiguous patterns of urban development than development of proximate noncontracted land.

To find that cancellation is in the public interest, the Board must adopt all of the following findings:

- 1) Other public concerns substantially outweigh the objectives of this chapter; and
- 2) There is no proximate non-contracted land which is both available and suitable for the use to which it is proposed the contracted land be put, or, that development of the contracted land would provide more contiguous patterns of urban development than development of proximate non-contracted land.

The County may not cancel a Williamson Act contract unless notice has been given and a public hearing has been held on the matter. On making the required findings, the County may grant tentative approval of the cancellation. The Clerk of the County would then record a Certificate of Tentative Cancellation in the County Recorder's Office. Final cancellation depends upon satisfying the conditions and contingencies set out in the tentative cancellation. The conditions and contingencies that the landowner must satisfy to obtain final cancellation include full payment of a cancellation fee. Under the Williamson Act, this cancellation fee is equal to 12.5% of the assessed value of the land subject to cancellation, with the assessment performed to reflect the value of the land as if free from the contract. The conditions also include the issuance of all permits necessary to start the project for the specified alternative use.

The adoption of the requisite findings by the Board of Supervisors must be based on the evidence in the record before the Board. That evidence would include this EIR, as well as information provided by the project applicant, the Department of Conservation, or other interested parties.

The rescission of the Williamson Act contract on a portion of the project site would result in a short-term loss of agricultural land (70 acres) during the 20-year life of the quarry, and a permanent loss of up to 28 acres of agricultural land following final reclamation of the project site. However, participation in the WAEEP as allowed under the Williamson Act would result in a net increase in the number of acres preserved for agricultural preservation. The creation of a conservation easement on the easement exchange site would provide a minimum 3.5 to 1 compensation for rescinding the Williamson Act contract on the project site. As a result, the project would ultimately have a long-term beneficial effect on the preservation of agricultural land in Sonoma County. Separate and apart from the Williamson Act rescission process, this EIR addresses all potential environmental impacts of the proposed project on agricultural land.

Mitigation Measure A.4: No development of the project may commence until the Williamson Act contract # 2-387-72 covering the 70-acre portion of the project site is rescinded in accordance with Government Code Section 51256, 51256.1 and 51292, and transfer of a permanent conservation easement on the 244-acre exchange site for future stewardship to an appropriate private land trust or government conservation agency is simultaneously completed.

Significance after Mitigation: Less than Significant.

Impact A.5: The project would result in both temporary and permanent loss of Grazing Land and Farmland of Local Importance on the project site. The effect of this on the cumulative loss of farmland within Sonoma County would be less than significant.

During the 20 year mining period, the proposed quarry operations at the project site would directly disturb 70 acres of the approximate 199-acre property, and temporarily remove that land from dryland grazing use. As discussed in the Project Description, above, the quarry site and related infrastructure is proposed to be adequately fenced to allow dryland grazing to continue on the site's other remaining approximate 129 acres, which would remain under Williamson Act protection.

As proposed quarrying would proceed, areas directly disturbed by quarrying operations would be incrementally reclaimed. Following the 20-year mining period, the quarry site would go through final reclamation. Nevertheless, the applicant estimates up to 40 percent of the 70-acre affected area (or approximately 28 acres) could potentially be permanently lost from future productive rangeland use. The great majority (approximately 27 acres) of the potential permanently lost 28 acres is designated by the DOC FMMP as "grazing land." A small proportion (approximately one acre) of the potential permanently lost acreage would include farmland qualifying as "Farmland of Local Importance" under DOC's FMMP.

Although the County endeavors to limit the conversion of, and preserve as feasible, the remaining agricultural land in the County, the amount of grazing land within the County has decreased by approximately 6 percent, and the amount of Farmland of Local Importance within the County has decreased approximately 30 percent, over the past 20 years. As a proportion of Sonoma County's existing 421,126 acres of grazing land, the interim loss of 70 acres of grazing land and potential permanent loss of up to 27 acres of grazing land on the project site that would occur under the project would represent less than 0.02 percent decrease to Sonoma County Grazing Land resources. Furthermore, the permanent loss of one acre of Farmland of Local Importance on the project site would represent a loss of 0.001 percent of Sonoma County's Farmland of Local Importance. These amounts would not be considered a cumulatively considerable contribution to the loss of Farmland of Local Importance and Grazing Land within the County.

As discussed in Impact A.4, above, as part of the project's easement exchange process, the applicant would establish a permanent agricultural conservation for the 244 acre Lakeville Road easement exchange property. The easement exchange site is classified by DOC's FMMP as

“Farmland of Local Importance.” The proposed establishment of an agricultural conservation easement for the Lakeville Road easement exchange site would ensure that 244 acres would permanently remain in farming use. This would thereby protect approximately 0.33 percent of Sonoma County’s current Farmland of Local Importance from potential future non-agricultural development.

For these reasons, the temporary and permanent conversion of areas of Farmland of Local Importance and Grazing Land that would occur under the project would be less than significant.

Mitigation: None Required.

References – Land Use and Agricultural Resources

(The references cited below are available at the Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, California, unless otherwise specified.)

Department of Conservation, *Mineral Land Classification of Aggregate Materials in Sonoma County, Special Report 175*, California Department of Conservation, California Geological Survey, 2005.

Department of Conservation, *The California Land Conservation (Williamson) Act 2006 Status Report*, May 2006.

Doran, M., University of California Cooperative Extension - Livestock Specialist, personal communication, January 2006.

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Sonoma County, *Aggregate Resources Management Plan and Environmental Impact Report*, 1994.

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Sonoma County, Planning Division, *Hessel Study*, January 1979.

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Sonoma County, *Chapter 26- Zoning Ordinance*, revised through December 1993.

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State of California, Department of Finance, *E-5 City / County Population and Housing Estimates, 2005, Revised 2001-2004, with 2000 DRU Benchmark*. Sacramento, California, May 2005.

B. Geology, Soils, and Seismicity

The Geology, Soils, and Seismicity section reviews the regional geologic and seismic setting and potential geologic and seismic hazards that may affect the proposed project. This discussion focuses on increased exposure of people, structures, and the environment to hazards including ground shaking, slope failure, and accelerated erosion. The settings section is followed by the analysis of impacts and discussion of necessary mitigation measures. This section relies in part on the geotechnical analysis conducted by the applicant's geotechnical engineer (John Dailey, Consulting Geotechnical Engineers) and reviewed for technical adequacy and consistency for use in this EIR by Miller Pacific Engineering Group and ESA's in-house professional geologist.

Setting

Regional Geology

Geologists refer to the region of northern and central California, which lies between the Pacific Ocean and the Great Valley, as the Coast Range Geomorphic Province (Coast Range). The regional bedrock underlying the Coast Ranges is the Franciscan Complex, a mixture of ancient seafloor sediments and volcanic rocks, which, over millions of years, have undergone alteration by heat and pressure deep within the earth. Overlying the Franciscan bedrock are geologically younger, volcanic and sedimentary rock units. The topography of the Coast Range is characterized by northwest-southeast trending mountain ridges and intervening valleys. These features were formed over millions of years by movements in the earth's crust (referred to as tectonics). The Coast Range is known for its high rate of seismic activity, active tectonics (movement of the earth's crust), extensive slope failures, and high rates of erosion.

Modern tectonic activity within the Coast Range continues to be associated with activity along the San Andreas system of faults. Regionally, this fault system is the boundary between large sections, or plates, of the earth's crust known as the North American Plate and Pacific Plate. In the San Francisco Bay Area, this boundary is a complex system of generally parallel, northwest trending faults extending from the main trace of the San Andreas along the coastline eastward to near Fairfield. This system includes several major active faults whose traces extend well into and, in some cases, beyond the North Bay Counties. These faults and their characteristics are summarized below in the Seismicity section.

Site Geology

Sources of Geologic Information

Several previous site investigations have provided information to characterize the geology beneath the project site. A primary geologic source is the recent geological/geotechnical evaluations conducted by John H. Dailey, Consulting Geotechnical Engineer (Dailey 2005). Dailey conducted subsurface exploration, laboratory testing, and engineering analysis on soil and rock samples from the project site (Dailey, 2005), a seismic analysis on the proposed overburden stockpile slopes (Dailey, 2006), and supplemental analysis of rock slope failure mechanics and

slope stability at the quarry site (Dailey, 2007). Dailey also completed a preliminary geotechnical evaluation of the site in October 2002 (Dailey, 2002). Miller Pacific Engineering Group (MPEG) provided additional subsurface exploration data from a resource investigation completed in 2004 and reviewed work by Dailey for the preparation of this EIR. The combined MPEG and Dailey subsurface exploration includes seven deep borings drilled to approximately ten feet below the proposed quarry floor (a drilled depth of up to about 250 feet), five shallower borings up to 56 feet in depth and 12 test pits excavated up to approximately 17 feet. Other geologic work included research of existing geologic literature and maps, geologic mapping of the project property, and geotechnical analyses and recommendations (Dailey 2005). Early work at the site (2001 and 2002) included a seismic refraction survey of the proposed mine area which provided subsurface information on the thickness of overburden above the resource rock and some indication of the general quality of the resource rock. The civil engineering plans of the proposed quarry, prepared by CSW/Stuber-Stroeh Engineering Group, Inc., in 2004, show the design of the mine, including depth of mining and the cut-slope configuration.

Geologic Rock Units

The rock unit exposed at the surface of the project site is the Wilson Grove formation (formerly referred to as the Merced Formation), a two to seven million year old sedimentary unit consisting primarily of fine-grained marine sandstone, conglomerate, limestone concretions and tuff (Figure IV.B-1: Site Geologic Map).¹ The Wilson Grove was laid down millions of years ago in a marine environment after much of the regional volcanic activity had ceased. Thickness of the Wilson Grove formation ranges from 2,000 feet in the central portion of the Santa Rosa Valley and thins westward. Previous geologic investigations (Dailey, 2002, 2005) indicate that the thickness of the Wilson Grove Formation beneath the project area ranges from 20 to 60 feet (Figure IV.B-2: Geologic Cross Sections). The sandstone of Wilson Grove is dense in the upper 10 to 20 feet of the unit and then becomes progressively denser with depth (Dailey, 2005). The Wilson Grove formation, which was deposited on top of the volcanics, is considered to be “overburden,” and therefore would be stripped off to gain access to the resource rock.

Underlying the Wilson Grove is hard, basalt (volcanic) rock sometimes referred to as the Tolay Volcanics. The rock is dark gray, fine grained, hard, variably fractured basaltic rock and exhibits moderate fracturing and weathering, which decreases with depth. The basalt unit would provide the resource rock for the proposed quarry. This unit of old basalt flows extends from the bottom of the Wilson Grove formation to beyond the expected depth of the proposed quarry (approximately 250 feet above mean sea level). The Franciscan Complex forms the basement rock beneath the site and underlies the volcanics. Outcrops of Franciscan rocks are located in the northwest portion of the site, along Roblar Road, and along the drainage along the southern property boundary (Figure IV.B-1).

¹ *Conglomerate* is a rock composed of cemented gravel cobbles and boulders and *tuff* is consolidated volcanic ash.

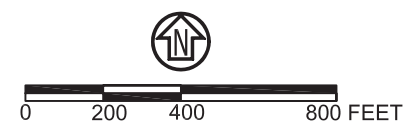
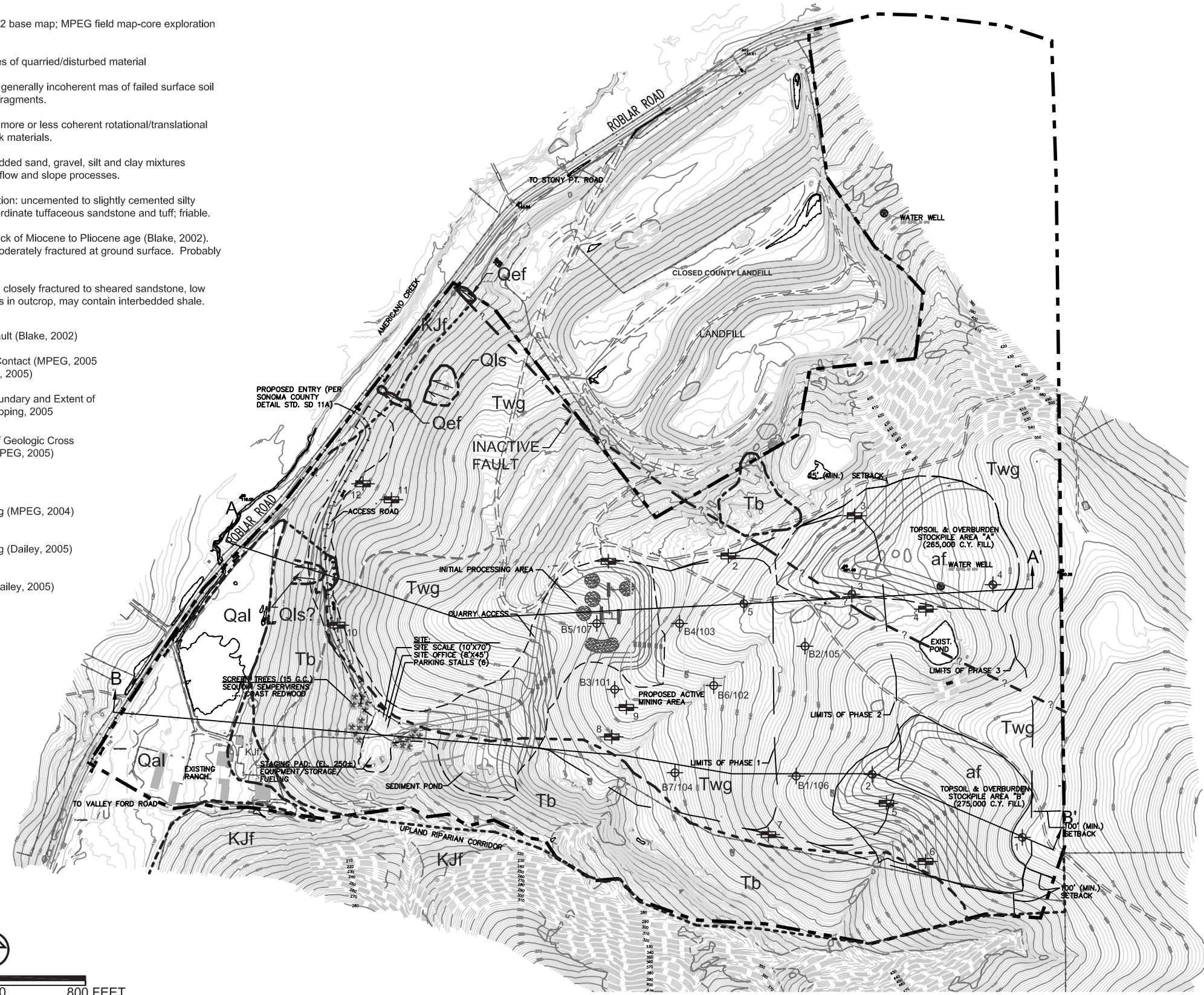
LEGEND: (from Blake, 2002 base map; MPEG field map-core exploration and surficial mapping)

- af Artificial Fill: stockpiles of quarried/disturbed material
- Qef Earthflow landslides: generally incoherent mass of failed surface soil and weathered rock fragments.
- Qls Slump Landslides: A more or less coherent rotational/translational failure of soil and rock materials.
- Qal Alluvium: crudely bedded sand, gravel, silt and clay mixtures deposited by stream flow and slope processes.
- Twg Wilson Grove Formation: uncemented to slightly cemented silty sandstone, with subordinate tuffaceous sandstone and tuff; friable.
- Tb Undivided Basaltic rock of Miocene to Pliocene age (Blake, 2002). Typically hard and moderately fractured at ground surface. Probably Tolay Volcanics.
- KJf Franciscan Complex: closely fractured to sheared sandstone, low to moderate hardness in outcrop, may contain interbedded shale.

- ? - Inactive Fault (Blake, 2002)
- - - Geologic Contact (MPEG, 2005 and Dailey, 2005)
- - - Project Boundary and Extent of MPEG Mapping, 2005

A A' Location of Geologic Cross Section (MPEG, 2005)

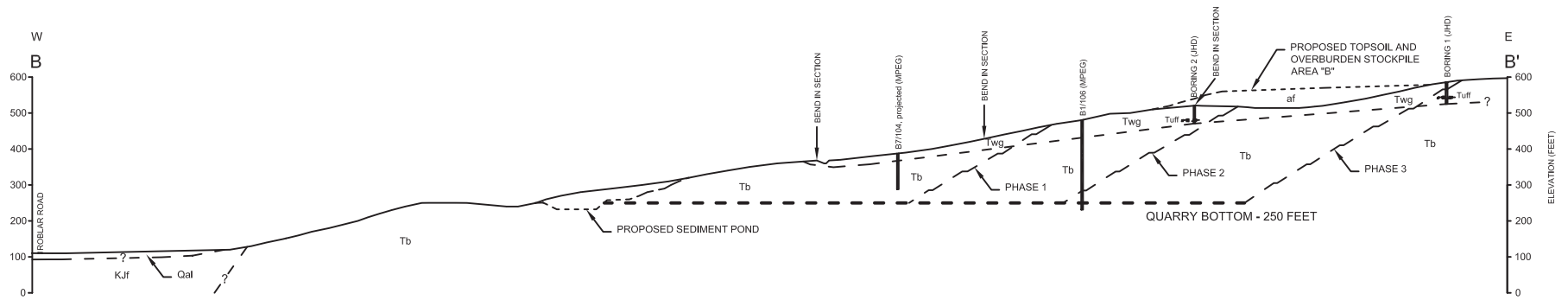
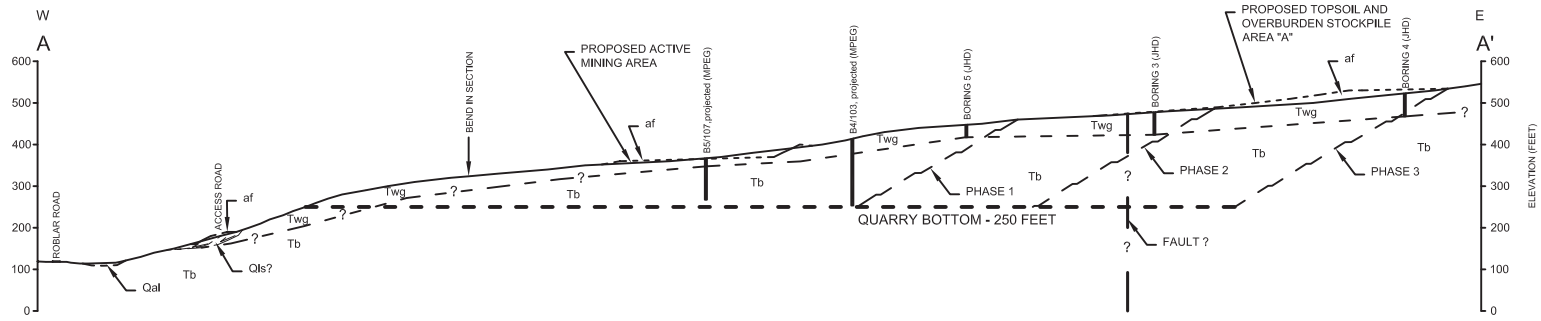
- ⊕ Test Boring (MPEG, 2004)
- ⊕ Test Boring (Dailey, 2005)
- ⊕ Test Pit (Dailey, 2005)



SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry . 204334
Figure IV.B-1
 Geologic Map

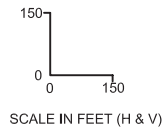
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LEGEND:

- af Artificial Fill: stockpiles of quarried/disturbed material.
- Qls Slump Landslides: A more or less coherent rotational/translational failure of soil and rock materials.
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- KJf Franciscan Complex: closely fractured to sheared sandstone, low to moderate hardness in outcrop, may contain interbedded shale.

-- -- Geologic Contact, approximate



SOURCE: Miller Pacific Engineering Group

Soils

The characterization of site soils is based on project-specific surface observation, subsurface exploration, and review of County wide mapping by U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS, 1972), formerly known as the Soil Conservation Service. Based on the generalized NRCS mapping, soils present within the project area (listed from greatest to least in aerial extent) include the following types:

- Clear Lake clay (CeB), on 2 to 5 percent slopes.
- Steinbeck loam (SnD2), on 9 to 15 percent slopes, eroded. Steinbeck loam (SnE), on 15 to 30 percent slopes.
- Steinbeck loam (SnF), on 30 to 50 percent slopes.
- Los Osos clay loam (LoF2), on 30 to 50 percent slopes, eroded.

While located within the project boundary, the Clear Lake clay (up to 60 inches thick and located on flat, poorly drained areas) occupies only a small flat area in the southwest corner of the project site, well outside of the area of proposed development. Since it is unlikely that this soil would be disturbed under the proposed project, it is not further discussed in this study.

The Steinbeck loams (SnD2, SnE, and SnF) occupy approximately 80 percent of the project site, and all of the area proposed for development. With minor variation, caused mostly by changes in slope steepness, the Steinbeck loams have similar properties. As described by the NRCS, they are moderately well drained, with clay loam subsoils and total profile thicknesses of between about 25 and 60 inches (thinner profile thickness is associated with steeper slopes). The profile is underlain by weakly cemented sandstone (Wilson Grove Formation). The fine-grained composition of Steinbeck loams causes surface runoff, especially on steep slopes, while allowing some water to infiltrate to transmit subsurface water (permeability). Because these soils allow surface water runoff, the erosion of the surface can occur and is greatest on steeper slopes. Traditionally, the Steinbeck loams and similar soil types were used mainly for range or pasture. In recent decades, Steinbeck loams have been increasingly used for vineyards. Project-specific site reconnaissance associated with this EIR verified these soil conditions.

The Los Osos clay loam occupies about 15 percent of the total project area, confined to its south and west edges. The NRCS describes this loam as well drained with clay subsoil, and a profile thickness on the order of 15 to 22 inches. Runoff is described as rapid, erosion hazard is high, and landslips (small near-surface landslides) are numerous. Field observations by MPEG during the preparation of this EIR and related subsurface exploration (Dailey, 2005) indicate that these soils have properties similar to those identified by the NRCS, but that profile thickness is somewhat greater -- up to about 36 inches. The loam is underlain by tuffaceous sediments (volcanic ash transported and deposited by stream flow) and sandstone of the Wilson Grove Formation. In the extreme northwest edge of the project property, it is underlain by fractured sandstone of the Franciscan Complex, and along the southern edge of the project, it is underlain by Tolay Volcanics. A few landslips have developed in these soils within the project boundary.

Mineral Resources

The Department of Conservation California Geological Survey (CGS) has classified lands within the San Francisco-Monterey Bay Region into Mineral Resource Zones (MRZs). The classification of MRZs is based on guidelines adopted by the California State Mining and Geology Board, as mandated by the Surface Mining and Reclamation Act (SMARA) of 1974. On the basis of drilling and testing conducted by the project applicant, an approximate 113-acre area (including the approximate 65-acre quarry area proposed by the applicant) is newly classified by the CGS (*Mineral Land Classification of Aggregate Materials in Sonoma County, Special Report 175*) as Mineral Resource Zone 2b (MRZ-2b) for PCC-, AC- and Class II-Base-grade aggregate (CGS, 2005). Mineral Resource Zone 2b is defined by CGS as areas underlain by mineral deposits where geologic information indicates that significant inferred resources are present. (An additional 186-acre area, located adjacent to and east of the above-described 113-acre area, is also classified MRZ-2b for Class II-Base-grade aggregate; this is not part of the area included in the proposed Roblar Road Quarry.)

Seismicity

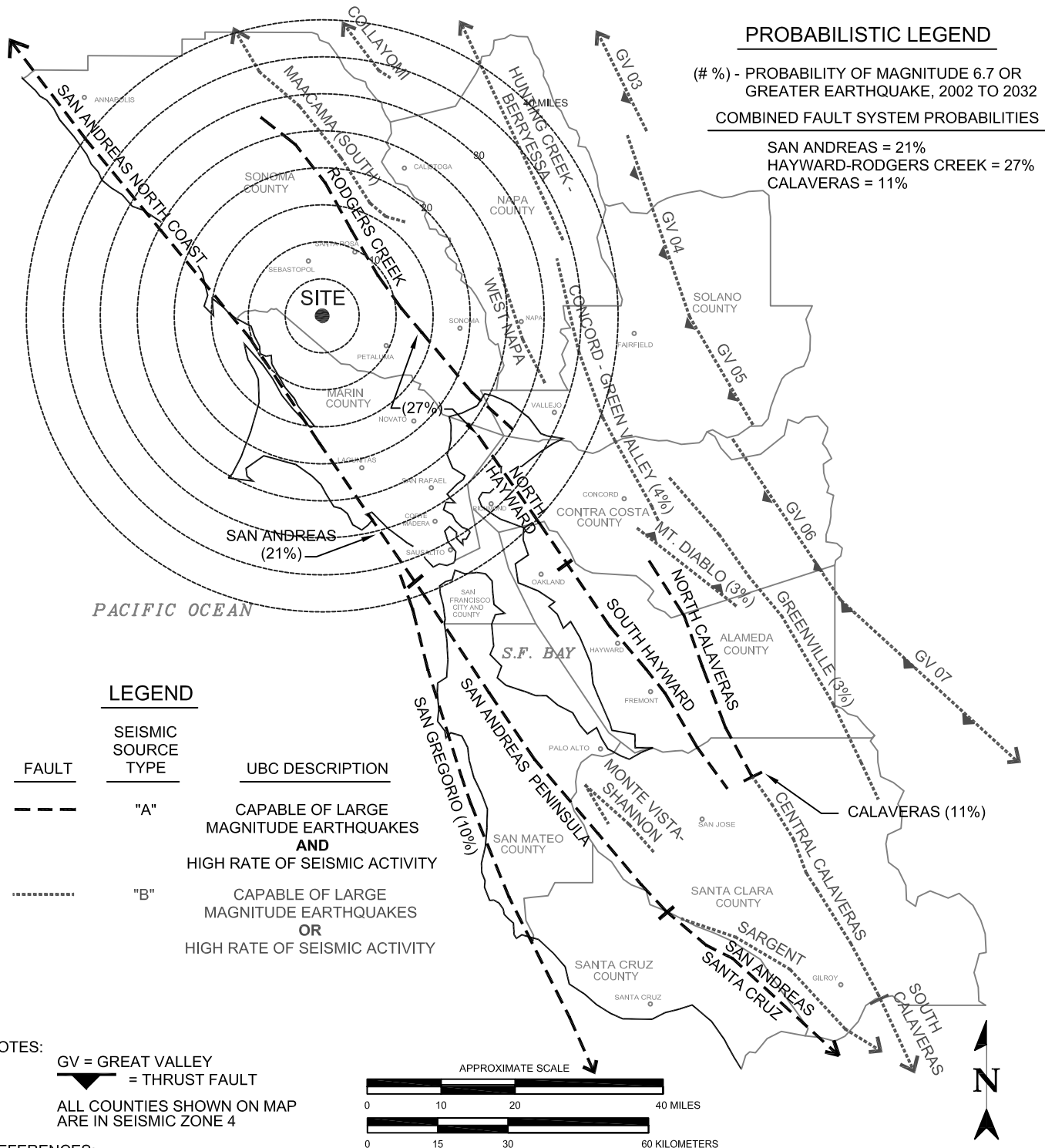
The San Francisco Bay Area region contains active faults and is considered a region of high seismic activity (Figure IV.B-3: Regional Fault Map).² The 2001 California Building Code locates the entire Bay Area within Seismic Risk Zone 4. Areas within Zone 4 are expected to experience maximum magnitudes and substantial damage during an earthquake. The U.S. Geological Survey (USGS) Working Group on California Earthquake Probabilities has evaluated the probability of one or more earthquakes of Richter magnitude 6.7 or higher occurring in the San Francisco Bay Area within the next 30 years. The result of the evaluation indicated a 62 percent likelihood that such an earthquake event will occur in the Bay Area between 2003 and 2032 (USGS, 2003).

Ground motion during an earthquake is commonly expressed with the motion parameters of acceleration, velocity, and the duration of the shaking. A common measure of ground motion is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared.

Magnitude is a measure of the energy released during an earthquake. Intensity is a measure of the ground shaking effects at a particular location. The estimated magnitudes, described as moment magnitudes (M_w), represent characteristic earthquakes on particular faults (Table IV.B-1).³ Ground movement at a given location during an earthquake will vary depending on the magnitude of the earthquake, distance from the site to the earthquake epicenter, focus of earthquake energy, and type of geologic material upon which the site rests. The composition of underlying soils, even

² An “active” fault is defined by the State of California as a fault that has had surface displacement within Holocene time (approximately the last 10,000 years).² (Hart, 1997).

³ Moment magnitude is related to the physical size of a fault rupture and movement across a fault. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event (CDMG, 1997b). The concept of “characteristic” earthquake means that we can anticipate, with reasonable certainty, the actual earthquake that can occur on a fault.



**TABLE IV.B-1
ACTIVE FAULTS IN THE PROJECT SITE VICINITY**

Fault	Distance and Direction from Project Site	Recency of Movement	Fault Classification^a	Historical Seismicity^b	Maximum Moment Magnitude Earthquake (Mw)^c
Rodgers Creek	9 miles, north-east	Historic Holocene	Active	M 6.7, 1898 M 5.6, 5.7, 1969	7.0
San Andreas, North Coast Segment	10 miles, south-west	Historic (1906; 1989 ruptures) Holocene	Active	M 7.1, 1989 M 8.25, 1906 M 7.0, 1838 Many <M 6	7.9
Maacama, South	15 miles north-east	Historic Holocene	Active	Historic active creep	6.9
Hayward, North	25 miles, south-east	Historic (1836; 1868 ruptures) Holocene	Active	M 6.8, 1868 Many <M 4.5	7.1
West Napa	25 miles east	Historic Holocene	Active	M 5.2, 2002	na
Concord–Green Valley	34 miles east	Historic (1955) Holocene	Active	Historic active creep	6.9
Calaveras, North	55 miles south-east	Historic (1861 rupture) Holocene	Active	M 5.6–M 6.4, 1861 M 4–M 4.5 swarms 1970, 1990	6.8

^a See footnote 2

^b Richter magnitude (M) and year for recent and/or large events. The Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave.

^c Moment magnitude (Mw) is related to the physical size of a fault rupture and movement across a fault. Moment magnitude provides a physically meaningful measure of the size of a faulting event (CGS, 1997). The Maximum Moment Magnitude Earthquake, derived from the joint CDMG/USGS Probabilistic Seismic Hazard Assessment for the State of California, Peterson, 1996. (USGS OFR 96-705).

Na Not available

SOURCES: Hart, 1997; Jennings, 1994; Peterson, 1996.

for sites relatively distant from an earthquake epicenter, can directly affect the ground shaking at a particular location. For instance, soft soil (i.e. Bay mud or artificial fill) can intensify ground shaking (result in higher PGAs) while bedrock beneath a site would attenuate seismic waves.

The Modified Mercalli (MM) intensity scale (Table IV.B-2) is commonly used to measure earthquake effects due to ground shaking. It is a useful scale because it describes ground motion in terms of effects observed by people during past earthquakes. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total). Intensities ranging from IV to X could cause moderate to significant structural damage.⁴ The Association of Bay Area Governments (ABAG) maintains an interactive web site tool that predicts earthquake intensities

⁴ The damage level represents the estimated overall level of damage that will occur for various MM intensity levels. Some buildings will experience substantially more damage than this overall level, and others will experience substantially less damage. Not all buildings perform identically in an earthquake. The age, material, type, method of construction, size, and shape of a building all affect its performance (ABAG, 1998a).

**TABLE IV.B-2
MODIFIED MERCALLI INTENSITY SCALE**

Intensity Value	Intensity Description	Average Peak Acceleration
I	Not felt except by a very few persons under especially favorable circumstances.	< 0.0017 g ^a
II	Felt only by a few persons at rest, especially on upper floors on buildings. Delicately suspended objects may swing.	< 0.014 g
III	Felt noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly, vibration similar to a passing truck. Duration estimated.	< 0.014 g
IV	During the day felt indoors by many, outdoors by few. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	0.014–0.04 g
V	Felt by nearly everyone, many awakened. Some dishes and windows broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles may be noticed. Pendulum clocks may stop.	0.04–0.09 g
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; and fallen plaster or damaged chimneys. Damage slight.	0.09–0.18 g
VII	Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.	0.18–0.34 g
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.	0.34–0.65 g
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.65–1.24 g
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from riverbanks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.	> 1.24 g
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	> 1.24 g
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted. Objects are thrown upward into the air.	> 1.24 g

a g (gravity) = 980 centimeters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

SOURCES: ABAG, 2003a, CGS, 2005.

within regions of the Bay Area under certain characteristic earthquake scenarios. The earthquake scenario most likely to cause the highest ground shaking intensity at the project site is an earthquake on the north coast segment of the San Andreas Fault. Such an earthquake could cause ground shaking intensities at the project site ranging from strong (MMI-VII) to very strong (MMI-VIII) shaking intensities (Table IV.B-2).

Regional Faults

The site is located within the greater San Andreas Fault System, which includes the main trace of the San Andreas fault and several other active faults throughout the region.⁵ All these faults have experienced movement within the last 150 years and all these active faults are capable of producing ground shaking. The closest faults to the project site are the Rodgers Creek and the San Andreas faults. However, the northern segment of the San Andreas Fault, the Rodgers Creek fault and the Hayward Fault are considered to be the most likely source of potentially damaging ground shaking at the project site. Other regional faults are considered “potentially active” meaning they have not exhibited displacement in the past 1.6 million years. Potentially active faults in the vicinity of the proposed project site includes the Bloomfield fault, located about ½-mile south of the project site and the Tolay fault, located over two miles to the east. Potentially active faults are not considered capable of producing large earthquakes and thus, they are not zoned as active faults by the State of California. However, potentially active faults and those faults considered primarily inactive, sometimes experience small “sympathetic” displacements if a large earthquake occurs on a local active fault.

Onsite Inactive Fault

The Dunham fault is a northwest trending, inactive fault that has been mapped extending through the northeast corner of the proposed quarry from the southeast (Dailey, 2005, Blake et. al. and Huffman, 1980) (Figure IV.B-1). However, geologic field mapping completed during the preparation of this EIR by MPEG did not find conclusive surface features that verified the existence of this fault within the project boundaries. The Dunham fault is not identified by the California Geological Survey as an active fault feature (Hart, revised 1997) and is likely an ancient shear zone not capable of generating a major earthquake. Hydrologic and groundwater analysis completed for this EIR suggest that the Dunham fault represents a barrier to groundwater or in some way influences groundwater flow. The Dunham fault and its potential influence on groundwater flow are discussed in Chapter IV.C, *Hydrology, Geology and Water Quality*.

Geologic Hazards

Based on the geologic data reviewed during the preparation of this EIR, the potential geologic hazards at the site are localized slope instability and excessive erosion. These geologic hazards are discussed below. Other potentially hazardous geologic conditions, namely settlement, subsidence, and expansive soils were found not to present a potential hazard at the project site. The dense Wilson Grove formation underlying the site would preclude a settlement or subsidence hazard, and although it is possible that some localized pockets of expansive clays and/or silts may exist on-site, they would be largely removed or mixed by site grading and overburden stripping.

⁵ The primary movement on these faults is right lateral horizontal motion, which is also referred to by geologists as strike-slip. With strike slip motion, the ground on either side of the faults moves in opposite directions.

Slope Failure Hazards

A slope failure is a mass of rock, soil, and debris displaced down a slope under the influence of gravity. Natural and manmade slopes (such as quarry slopes) fail by a variety of mechanisms. Discontinuities in bedrock such as joints, shear zones, and fractures can cause rock slides, while toppling involves overturning or rotation of rock layers. Sloughing, characterized as occasional rock falls or shallow, localized slope failures, can occur in weathered rocks. Minor slope failures can also occur locally where groundwater saturates near surface soils.

Such failures are dependent on several factors, such as slope steepness, the strength of surficial soil and bedrock deposits involved. Slope stability can depend on a number of complex variables. The geology, structure, and amount of groundwater in the slope affect slope failure potential, as do external processes (i.e., climate, topography, slope geometry, and human activity). The factors that contribute to slope movements include those that decrease the resistance in the slope materials and those that increase the stresses on the slope. The degree to which a slope will remain stable is determined by the “factor of safety,” which is determined by dividing the forces that resist movement (the shearing strength available along a sliding surface) by the shearing stresses that tend to produce failure along a surface. Slopes with a factor of safety of less than 1.0 are considered unstable. Slope failure under static forces occurs when those forces initiating failure overcome the forces resisting slope movement. Cutting into the slope and removing the lower portion (slope toe), can reduce or eliminate the slope support, thereby increasing stress on the slope. The amount/intensity of rainfall, seismic shaking, and human activities such as grading (including mining) can also influence slope stability.

Dailey mapped four small to moderate-sized landslides (combined slump-earth flows up to about 180 feet long or wide) within the project property on the moderately steep slope along the western boundary of the project site near Roblar Road (Dailey, 2005) (Figure IV.B-1). The failures appeared to correspond to a band of higher, green vegetation, indicative of seasonal springs and seeps (Dailey, 2005). Dailey also postulated that the band of small slope failures correspond to the contact between the semi-permeable sands and sandstone of the Wilson Grove formation and the presumably less permeable Franciscan Complex bedrock (Dailey, 2005). During certain times of the year, groundwater seepage from the geologic contact saturates surface soils and exacerbates slope instability. Dailey’s assessment is reasonable considering that vertical groundwater seepage through the overlying Wilson Grove would reach the more impermeable Franciscan Complex bedrock and rather than infiltrate, it would begin flowing laterally downhill until it would flow out at the surface contact. These four slides are located well outside the area planned for mining, however, they would be encountered during proposed access road construction. The potential slope failure hazard is discussed further in the impact analysis and mitigation section.

Erosion/Accelerated Erosion

Erosion is a process whereby soil and highly weathered or non-indurated rock materials are worn away and transported to another area, most commonly by either wind or water. Rates of erosion can vary depending on the competency of the eroding material and human activity. Soils containing high amounts of silt are typically more easily eroded, while coarse-grained (sand and

gravel) soils are generally less susceptible to erosion. High rates of erosion, referred to as *accelerated erosion*, are often caused by human activity and can eventually damage building foundations and roadways, as well as clog or fill surface drainage facilities (siltation ponds/catchments). Erosion, including accelerated erosion, is most likely to occur on long, moderate or steeply sloped areas with exposed soil, especially where unnatural slopes are created by cut-and-fill activities. Erosion rates are often higher during the construction phase. Typically, the soil erosion potential is reduced once the soil is graded and either covered (asphalt, concrete, structures, or other surfacing), or re-vegetated. This hazard is further discussed in the impact analysis and mitigation section.

Seismic Hazards

The principal seismic hazard that could affect the project site is strong seismic ground shaking. The potential effects of ground shaking are slope failure and damage to structures and some types of portable mining equipment such as conveyors. Other secondary seismic hazards that could be expected to occur include surface fault rupture and ground failure caused by liquefaction. While these latter hazards are not believed to be present, they are described below. The principal seismic hazards identified as present are further described along with their possible impact upon the project property.

Ground Shaking

Ground shaking may affect areas hundreds of miles distant from the earthquake's epicenter. Historic earthquakes that have caused strong ground shaking and damage in the San Francisco Bay Region include the 1906 San Francisco earthquake, with an estimated moment magnitude of 7.9, and the more recent Loma Prieta earthquake in October 1989, with a Magnitude of 6.9.

Moderate to strong ground shaking from a major earthquake originating in the San Francisco Bay Region could affect the Roblar project during its anticipated 20 year mining life. The intensity of the ground shaking at the project should be similar to that experienced by other nearby hilly locations in the general area. The possible effects of ground shaking at the project property include slope instability and damage to structures and portable mining equipment. Earthquakes on the active faults (listed in Table IV.B-1) in the region are expected to produce a range of ground shaking intensities in the general area.

A probabilistic seismic hazard (PSH) analysis predicts the level of hazard from earthquakes that seismologists and geologist believe could occur. The PSH analysis takes into consideration uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site. The PSH analysis results in a probability of exceeding a certain ground motion (See Table IV.B-2).⁶ Probabilistic seismic hazard maps (USGS, 2002) developed for California indicate that a peak ground acceleration at the project property of 0.42 g has a 10

⁶ These maps depict a 10% probability of being exceeded in 50 years. There is a 90% chance that these ground motions will NOT be exceeded. This probability level allows engineers to design buildings for larger ground motions than seismologists think will occur during a 50-year interval, making buildings safer than if they were only designed for the ground motions that are expected to occur in the 50 years. Seismic shaking maps are prepared using consensus information on historical earthquakes and faults. These levels of ground shaking are used primarily for formulating building codes and for designing buildings (CGS, 2006).

percent chance of being exceeded in 50 years (1 in 475 probability), and a peak ground acceleration of 0.61 g has a two percent chance of being exceeded in 50 years (CGS, 2006).

The amplitude and frequency of earthquake ground motions (waves) partially depends on the material through which it is moving. The earthquake force is transmitted through hard rock in short, rapid vibrations, while it becomes a long, high-amplitude motion when moving through soft ground materials, such as alluvial soil. This is often referred to as material amplification. The long, high amplitude wave motions are those that typically are the most damaging to improvements. The project property is predominantly underlain by rock that is close to the ground surface and for this reason should not experience significant material amplification. The effects of ground shaking can be minimized by implementing appropriate engineering measures. This potential hazard is further discussed in the impact analysis and mitigation section.

Liquefaction

Liquefaction is a transformation of soil from a solid to a liquefied state during which saturated soil temporarily loses strength resulting from the buildup of excess pore water pressure, especially during earthquake-induced cyclic loading. Soil susceptible to liquefaction includes loose to medium dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Soil liquefaction and associated ground failure can damage roads, pipelines, underground cables, and buildings with shallow foundations. Liquefaction can occur in areas characterized by water-saturated, cohesionless, granular materials at depths less than 40 feet (ABAG, 2003b). The site-specific subsurface exploration and geologic mapping (Dailey, 2005) did not indicate the presence of potentially liquefiable soil and therefore, the potential for liquefaction and its related ground distress is low to very low. Liquefaction is, however, discussed briefly under the potential activation of landslides by operational blasting.

Regulatory Background

The following section provides a brief summary of the federal, state, and local regulations, goals and policies for quarry mining, mining safety and protection of natural resources from open pit mining operations. This section also includes goals and policies as they pertain to aggregate quarry operations within Sonoma County.

Mine Safety and Health Administration

The Mine Safety and Health Administration (MSHA), a division of the U.S. Department of Labor, administers the provisions of the Federal Mine Safety and Health Act of 1977. MSHA develops and enforces mandatory safety and health regulations pursuant to the Code of Federal Regulations (CFR) 30 that apply to all surface and underground mines located in the U.S. through inspections, rigorous training, and providing educational programs for employers and employees in the mining industry. The ultimate purpose is to eliminate fatal accidents, reduce the frequency and severity of nonfatal accidents, minimize health hazards, and promote improved safety and health conditions in mines of the United States. Project operations would be regulated by MSHA, and periodic inspections would be performed under MSHA regulations to ensure maximum

worker safety during project operation. The proposed Roblar Road Quarry mining operations are subject to periodic safety inspections by MSHA.

Surface Mining and Reclamation Act (SMARA)

SMARA was signed into law in 1975 and went into effect in 1976, and amended. The intent of the Act is to: 1) assure reclamation of mined lands, 2) encourage production and conservation of minerals, and 3) create and maintain surface mining and reclamation policy (regulations).

One of the principal requirements of SMARA is the preparation of a Surface Mining and Reclamation Plan. This plan must be prepared by a mining applicant prior to initiation of mining activities. Once the plan is prepared and reviewed for compliance, an Environmental Impact Report must be prepared on the plan by the lead agency to identify impacts of the project and to develop adequate mitigation measures.

SMARA is administered by lead agencies (most often counties or cities) and the California Department of Conservation. Lead agency administration and enforcement is based on a lead agency-prepared (Sonoma County PRMD) ordinance based on SMARA. With respect to the proposed project, this is County Ordinance No. 5165, Surface Mining and Reclamation Ordinance (see below).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Public Resources Code, Chapter 7.8, Section 2690-2699.6) directs the Department of Conservation (California Geological Survey) to identify and map areas prone to earthquake hazards of liquefaction, earthquake-induced landslides and amplified ground shaking. The purpose of the Act is to reduce the threat to public safety and to minimize the loss of life and property by identifying and mitigating these seismic hazards. The Act was passed by the legislature following the 1989 Loma Prieta earthquake. While this Act pertains to seismic hazards, they are not the same as the fault surface rupture hazard regulated by the Alquist-Priolo Special Studies Zone Act of 1972.

As of early 2005, Seismic Hazard Zone Maps have been prepared for portions of Southern California and a small part of the San Francisco Bay Area. The intent is to first prepare the maps for areas that are undergoing the most rapid urbanization and which have recognized hazards. No maps have yet to be prepared for any part of Sonoma County.

California Building Code

The California Building Code (CBC) is another name for the body of regulations found in the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code (CBSC, 2001). The purpose of the CBC is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. Published by the International Conference of Building Officials, the Uniform Building Code (UBC) is a widely adopted model building code in the United States. The CBC incorporates by reference the UBC with necessary

California amendments. These amendments include significant building design criteria that have been tailored for California earthquake conditions (CBSC, 2001).

The project area is located within Zone 4, one of the four seismic zones designated in the United States. Zone 4 is expected to experience the greatest effects from earthquake ground shaking and therefore has the most stringent requirements for seismic design. The national model code standards adopted into Title 24 apply to all occupancies in California except for modifications.

Sonoma County Ordinances, Local Plans, and Policies

Sonoma County Surface Mining and Reclamation Ordinance

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. The following sections from the ordinance are applicable to the proposed project:

Sec. 26A-09-010. General Standards for Mining Permit and Operations

m) *Slopes and Benches*

- (1) Finished slopes shall conform to the requirements of Section 26A-11-010 (d)(2). In addition, quarries shall be subject to the applicable slope standards set forth in Section 26A-11-040.
- (2) Temporary slopes steeper than the finished slopes, in areas where finished slopes are to occur, shall be constructed and maintained in accordance with the recommendations, as approved by the director, of a geotechnical engineer or a civil engineer registered in the state of California or an engineering geologist registered and certified in the state of California. Temporary slopes shall not be created or maintained in a manner that will interfere with the construction of finished slopes conforming to subsection (m)(1) of this section, and the geotechnical engineer, civil engineer or engineering geologist shall make specific recommendations for the conservation of such temporary slopes to finished slopes.
- (3) Benches shall be provided on any working slope with a vertical elevation in excess of forty feet (40') unless otherwise recommended, as approved by the director, by a geotechnical engineer or civil engineer registered in the state of California or an engineering geologist registered and certified in the state of California. No benches are required for terrace pit slopes below the minimum water level. The bench interval shall not exceed thirty feet (30') in vertical distance. Benched slopes shall not be created or maintained in a manner which will interfere with the construction of final reclaimed slopes.

- n) *Salvage of Topsoil.* Where the reclamation plan requires resoiling of finished grade areas or offsite locations, topsoil shall be separately removed and stockpiled during the excavation

phases for later use in reclamation. A protective ground cover shall be established on topsoil stockpiles to retard erosion and runoff during the winter rainy season.

Sec. 26A-09-040. Quarry Mining Standards

- c) *Slope Stability.* The maximum allowable working slopes of the mine face shall be approved by a certified engineering geologist or a registered geotechnical engineer and specifically stated in the use permit. Any variation from the slope requirements of section 3502 (b)(3) of the state reclamation guidelines shall be specifically justified in the reclamation plan. Benches in slopes are required every twenty-five (25) to thirty (30) vertical feet for access and drainage control. Working slopes must eventually conform to final reclaimed slopes and topography. Quarries in or near fault zones may be required to incorporate additional geotechnical measures to insure worker and public safety.
- d) *Setbacks.* Mining operations, stockpiles, and processing operations are to be set back a minimum of twenty-five feet (25') from the MR zone boundary, the property boundary, and road easements and rights-of-way, whichever is the most restrictive. The minimum allowed setback for quarry mining operations from stream banks and critical habitat areas designated in the general plan is one hundred feet (100'). A minimum two hundred foot (200') setback is also required from the boundary of any general plan residential land use designations. Additional setbacks may be required as a result of site specific reviews in order to mitigate environmental impacts and land use conflicts.
- e) *Ancillary Activities.* With approval of a use permit, quarry operations may include the manufacture of concrete and asphalt products and the processing and sales of raw, processed or recycled earth materials and aggregate products. Importation of such materials may be included as ancillary uses allowed with the use permit. Existing quarries may import a maximum of twenty-five percent (25%) of the aggregate materials processed or sold in each calendar year without obtaining a new use permit. This limit does not apply to materials brought to quarries for recycling.
- f) *Water Supply.* All quarry sites must have adequate water supplies to support the operation. Sites located in Sonoma County Water Availability Zones III and IV will require analysis of the proposed water use, evaluation of the adequacy of the water supply, and mitigation of effects on water resources and nearby water users. Quarry operators may be required to monitor, survey, or report on depth and grades of excavation, groundwater levels, water use, revegetation and other subjects.
- g) *Erosion and Sediment Control.* Drainage plans and facilities must minimize slope erosion and off-site sedimentation.
- h) *Use of Explosives.* No explosives shall be used except as authorized by the use permit. Blasting activities shall be conducted by a qualified licensed blasting professional in compliance with state blasting regulations. Blasting permits shall be obtained from the Sonoma County sheriff's department. Blasting operations shall be designed to minimize adverse noise and vibration impacts on offsite residential areas. Permits may be conditioned to require notice to immediate neighbors prior to blasting. (Ord. No. 5165 § 1, 1999.)

Sec. 26A-11-010. Reclamation Plan Requirements

- d) *Reclamation Plan Standards.* Properties used for surface mining shall be reclaimed after the operation or an approved phase of the operation has been completed in accordance with the following standards:

- (2) *Final Reclaimed Slopes.* Final reclaimed slopes, abandoned spoil piles, topsoil or overburden stockpiles, and the entire mining site shall be graded and smoothed as necessary so as to control erosion, prevent the creation of potentially dangerous areas, present a natural appearance, and comply with any minimum or maximum slope standards set forth and required in the reclamation plan approval in order to leave the site in an acceptable condition adaptable to the stated post mining land use;
- (3) *Resoiling.* Mined slopes shall have soil added where needed to support the approved type of revegetation. Topsoil, overburden, aggregate processing sediment, and other native earth materials from the site and surrounding area shall be used to the maximum extent feasible in this process;

Sec. 26A-11-040. Reclamation of Quarries

- b) *Slopes.* The grades of final reclaimed slopes shall be no steeper than one and one-half (1 1/2) horizontal to one (1) vertical unless a steeper angle of repose is recommended as safe and self-supporting by a registered geotechnical engineer or civil engineer qualified in the field of soils engineering and soil mechanics. When benched slopes are proposed, the entire slope shall be no steeper than one and one-half (1 1/2) horizontal to one (1) vertical from the top of the cut to the base of the slope and no bench shall be greater in width than one-half (1/2) of the bench interval. Where slopes are formed by fill, the maximum slope shall not exceed 2:1 ratio unless an engineering analysis indicates that a steeper slope would be stable.

A geotechnical analysis by a certified engineering geologist or registered geotechnical engineer, based on the requirements set forth in the State Reclamation Guidelines, is required to demonstrate the long-term stability of all final slopes and the slope configuration needed to ensure the safety and revegetation appropriate to the end use of the mined land. As the slopes are cut, periodic inspections shall be undertaken to observe the rock material exposed and adjust the final reclamation contours as needed;

- c) *Revegetation.* Quarry sites shall be reclaimed and revegetated with planting grass mixtures approved by the Soil Conservation Service and with shrubs and trees native to the area. Mining activities shall be planned so that reclamation is an ongoing activity, thus shortening the duration of habitat loss. Slopes and benches shall be regraded and have soil added as necessary to the surface to restore pre-existing conditions as much as possible. (Ord. No. 5165 § 1, 1999.)

Sonoma County Aggregate Resource Management (ARM) Plan

By law, the State Geologist classifies or inventories mineral lands throughout the state. The State has designated certain mineral bearing areas as being of regional significance. Local agencies must 1) adopt mineral management policies which recognize mineral information provided by the State, 2) assist in the management of land use which affect areas of statewide and regional significance, and 3) emphasize the conservation and development of identified mineral deposits.

Sonoma County has adopted the Aggregate Resources Management Plan (ARM Plan), a plan for obtaining future supplies of aggregate material. This plan serves as the state-mandated mineral management policy for the county and is intended to accomplish the mandated purposes. This plan was first adopted by the County in 1980 and later updated in 1994.

A discussion of objectives contained in the ARM Plan that are relevant to the proposed project are presented in Section IV.A, Land Use, Planning and Agricultural Resources.

Sonoma County General Plan

The following policies from the Public Safety Element of the Sonoma County General Plan are relevant to the project site and/or proposed project. Note: These are draft policies recommended by the Citizens Advisory Council (CAC) as amended by the Planning Commission. As of publication of this Draft EIR, the Sonoma County Board of Supervisors has not yet completed their deliberations or finalized these policies.

- PS-1a:** Continue to utilize all available data on geologic hazards and related risks from the appropriate agencies.
- PS-1b:** Continue to utilize studies of geologic hazards prepared during the development review process.
- PS-1f:** Require and review geologic reports prior to decisions on any project which would subject property or persons to significant risks from the geologic hazards. Geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability.
- PS-1g:** Prohibit structures intended for human occupancy (or defined as a "project" in the Alquist-Priolo Special Studies Zones Act and related Administrative Code provisions) within 50 feet of the surface trace of any fault.

Draft Sonoma County General Plan 2020

Sonoma County is in the process of updating its existing General Plan. Applicable goals and policies from the public safety element of the existing general plan listed above are proposed to be carried forth into the new general plan.

Petaluma Dairy Belt Area Plan

The Petaluma Dairy Belt Area Plan was adopted in 1985, and revised in 1993. The Petaluma Dairy Belt area is located in south and southwestern Sonoma County, along the Marin County border. Area plan goals and policies as they relate to geologic hazards and soils that are pertinent to the proposed project and project site include the following:

Geologic Hazards

1. It shall be the goal of this Area Plan to protect the public from danger to life and property caused by geologic and seismic hazards.

Soils

1. It shall be the goal of this Area Plan to preserve and maintain soil resources for their economic, conservation and open space values.
 - c. Require soil conservation practices in all major development plans.

Impacts and Mitigation Measures

The following section focuses on potential project impacts related to geologic and seismic hazards. The evaluation considered project plans, current conditions at the project site, and applicable regulations and guidelines.

Significance Criteria

The significance criteria for this geologic and seismic impact analysis are adapted from the 2006 CEQA *Guidelines*, Appendix G. Based on the guidelines, geologic, seismic or soils-related impacts resulting from the proposed mining operations and/or future reclamation would be considered significant if the proposed project would:

- Expose people or structures to geologic or seismic hazards that could not be overcome by modern geotechnical engineering design and standard construction and maintenance practices. These hazards could cause substantial risk of loss, injury, or death involving:
 - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist (California Geological Survey Special Publications 42 and 117 and PRC §2690 et. seq.);
 - Strong seismic ground shaking;
 - Seismic-related ground failures, including liquefaction, lateral spreading, subsidence, collapse; or landslides.
- Result in substantial soil erosion (accelerated erosion) or loss of topsoil;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (UBC) creating substantial risks to life or property;
- 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 offsite landslide, lateral spreading, subsidence, liquefaction or collapse;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state; and
- 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.

Certain issues identified in the significance criteria are not considered impacts to the proposed project and are discussed briefly below.

Fault Rupture Hazards. Seismically-induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault. Ground rupture is considered more likely along active faults. The project site is

not underlain or in the vicinity of an active fault capable of surface ruptures. As discussed in the Setting, the Dunham Fault is not identified by the CGS as an active fault feature, but rather is likely an ancient shear zone not capable of generating a major earthquake. No faults in the area are designated by the State of California under the Alquist-Priolo Earthquake Fault Zoning act as active and susceptible to fault rupture. Fault rupture is not considered an impact to the project.

Project Location on Expansive Soil. Expansive soils, or those soils with high expandable clay contents, can over time, misalign some foundation structures or warp asphalt and concrete pavement. Proposed structures would not be placed on expansive soils because the structures would, in compliance with the CBC, be founded on engineered, non-expansive materials or weathered rock. Also, if expansive soils are present, they would likely be removed, altered, or combined during initial site clearing. Given that the site would be an active quarry and the underlying material is rock, expansive soils are not considered an impact to the project.

Loss of availability of a known mineral resource. The proposed project is the development of a hard rock quarry, which would provide a new source of aggregate suitable for Portland cement concrete, asphalt concrete and asphalt concrete base. Loss of mineral resource availability is not an impact of the project.

Loss of availability of a locally-important mineral resource recovery site. As stated above, the project would develop a new quarry for mineral resource recovery and therefore, loss of a mineral recovery site is not an impact of the project.

Project Impacts

Impact B.1: In the event of a major earthquake in the region, seismic ground shaking could result in injury to site workers, increase the potential for slope instability, and cause overturning of tall, non anchored, portable mining equipment. This would be a less than significant impact.

The project site is located in a seismically active region and could experience at least one large to major earthquake sometime within its operational life. The intensity of ground shaking at the site could vary depending on the causative earthquake fault, the distance from the fault to the site, and the geologic materials. As discussed in the Setting, the project site could experience peak ground accelerations approaching 0.42 g (10% probability of exceedance in 50 years or 1 in 475 chance of occurring each year) or Modified Mercalli Intensities ranging from strong (MI-VII) to very strong (MI-VIII). At these intensities, the earthquake would be felt by site workers and there is a potential for some damage and toppling of unsecured equipment and small landslides, especially along the access road where seepage zones are believed to have caused four small slides.

However, because the project site is underlain by massive bedrock, it is likely that the seismic waves would attenuate and reduce the amount of ground motion. While an earthquake would have the potential to result in injuries to people on the project site, the number of people affected would be few due to the remote location of the quarry and the relatively small number of daily site workers this quarry would generate.

The impact of structural damage to equipment would likely be minor and constitute a temporary delay in normal operations. The extent of damage would be limited in onsite structures and earthworks, especially those for human occupancy, because these structures would be constructed to the California Building Code's stringent seismic design criteria for the Zone 4 regions (UBC, 1997, CBC, 2001). The purpose of the CBC/UBC is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. Included in the purpose of the CBC/UBC is the reduction of risk human life and property due to seismic ground shaking.

An earthquake could trigger slope failure in the overburden stockpile slopes and to a lesser extent, the hard rock mining slopes. Geotechnical analysis determined that a proposed cut slope of 1.5:1 horizontal to vertical (H:V), with 10-foot wide benches spaced every 30 vertical feet would provide adequate stability of bedrock materials (Dailey, 2005, 2007). The stability of the proposed cut slopes is due to the high shear strength and massive nature of the volcanic source rock.

Dailey also calculated the factor of safety of cut and stockpile slopes during a major earthquake. Using a standard and accepted method to estimate slope response during an earthquake (referred to a pseudostatic analysis), Dailey conducted a stability analysis of the proposed fill slopes for Stockpile Areas A and B. In addition, a stability analysis was used to predict the factor of safety (considering the load of stockpile material) for a deep seated landslide if one were to occur in the Wilson Grove Formation beneath Stockpile Area B. The pseudostatic analytical method assumes that an earthquake imparts a force to the soil mass in the direction of the potential failure. The imposed force is assumed to be equal to the total weight of the sliding mass multiplied by a seismic coefficient of acceleration of 0.15g. The analysis computed the factor of safety for the proposed fill slope in Stockpile Area A at 2.02; and the computed factor of safety for the proposed fill slope in Stockpile Area B at 1.73. The computed factor of safety for a deep seated failure in the underlying Wilson Grove formation below Stockpile Area B is 2.31 (Dailey, 2006). These factors of safety are all well above 1.0 indicating that the stockpile slopes under seismic loading conditions experienced during an earthquake, would not trigger slope movement, and the stockpile slopes would remain stable.

In summary, the proposed project could experience at least one earthquake during the useful life of the quarry. Although the event could cause some structural damage, it is unlikely that the structures on this site would experience substantial damage or collapse. Overburden stockpile slopes would remain stable according to the geotechnical analysis. If the stockpiles did experience failure, it would likely be a localized slump rather than a large scale landslide. Earthquakes can and will occur in the region and the site may be affected, but considering the current building codes, location of the site on bedrock, and application of standard geotechnical engineering practices, the impact would be less than significant.

Mitigation: None Required.

Impact B.2: Rock and soil slopes that are over-steepened due to proposed mining practices could fail causing landslides, bedrock slope failures, and debris flows within the project property. Potential slope failures within the project property could injure on-site workers and trigger excessive erosion. This would be a potentially significant impact.

The proposed quarry would have steepened slopes in the active quarry areas, in the stockpile areas, and adjacent to the access road. Quarry operations would result in the construction of high cut slopes (up to a maximum of about 340 feet in Phase 3) and the construction of overburden fill slopes up to about 120 feet high at the stockpiles. This degree of excavation could induce slope failures depending on geologic conditions and location on the quarry property. A large failure of a cutslope on a quarry wall would have safety implications or temporarily disrupt operations on-site while slope failures within or below the overburden stockpiles could cause erosion and siltation in Americano Creek. Failures along the access roads could temporarily disrupt access to the site and could hinder internal site circulation. Any potential landslides, bedrock slope failures, or debris flow that could occur would be limited to within the project site property boundary and would not affect off-site properties.

Rock Slopes

Geotechnical studies conducted by John Dailey included a slope stability evaluation of the quarry slopes, stockpile area slopes, and access road slopes (Dailey, 2002, 2005, 2007). In general, the geotechnical evaluation concluded that the proposed 1.5:1 (H:V) quarry cut-slope with 10-foot wide benches spaced every 30 feet would have adequate stability to preclude the occurrence of a large slope failure. These slope configurations would be in compliance with the SMARO (Section 26A-09-010 (m), 26A-11-010 (2), 26A-09-040 (c), and 26A-11-040). Further, cut slopes in hard rock, such as basalt, are typically cut to 1:1 (H:V) or steeper; the slopes at the proposed quarry would be less steep at 1.5:1 (H:V) (Dailey, 2007).

The applicant's geotechnical evaluation recognizes that, based on the known characteristics of the volcanic resource rock, the quarry slopes could experience localized slope failures due to discontinuities within the rock mass. The actual behavior of the rock slope under mining conditions cannot be determined until the rock face is exposed and mining is underway. Localized slope failures are inherent in active hard rock quarrying and are typically addressed during mining operations through implementation of an on-going monitoring and maintenance program. The large movements associated with instability and failure of rock slopes are nearly always preceded by smaller ones that can be detected by sensitive instruments. Therefore, movement monitoring gives the most useful measurement of potential impending instability, and is the most commonly employed type of monitoring (Dailey, 2007).

Stockpile Slopes

Dailey (2005) completed a slope stability analysis for the two proposed stockpile fill slopes. Both stockpiles would have side slopes up to 3:1 (H:V) and would be placed on natural slopes that vary between 4:1 (H:V) and 9:1 (H:V). Stockpile A would be about 74 feet high overlying a gentle natural slope (approximately 9:1 H:V) composed of Wilson Grove formation bedrock. Stockpile B would be 120-foot high placed on slopes ranging from approximately 4:1 (H:V) to over 6:1 (H:V), also overlying the Wilson Grove formation bedrock. The slope stability analysis for the fill

slope proposed for Stockpile Area A yielded a factor of safety of 3.45 while the factor of safety for proposed fill slope at Stockpile Area B was 2.63. These factors of safety are well above 1.0 and therefore would be considered stable. In addition to computing the factors of safety for the proposed fill slopes, Dailey performed a slope stability analysis for a deep seated slope failure scenario in the Wilson Grove formation below Stockpile Area B; slope conditions beneath Stockpile B was considered a worst-case scenario. The results yielded a factor of safety of 3.72, also well above 1.0, indicating a stable slope and a low potential for a deep seated failure. Dailey (2005) provided recommendations for site preparation and slope treatment in the event that stockpile slopes are placed on natural slopes that exceed 6:1. These recommendations are presented as project specific mitigations to further reduce the potential for slope instability.

Access Road

The access road would likely cross the geologic contact between the Wilson Grove formation and the underlying Franciscan Complex bedrock. Dailey (2005) reported groundwater seepage and related slope failures along the Wilson Grove-Franciscan Complex interface. These zones of seepage could be problematic during road construction and may require installation of slope stability improvements such as subsurface drains or localized slope support.

Mitigation Measure B.2a, as recommended in this report: Prior to placement of overburden in the proposed stockpile locations, all areas receiving material shall be cleared and stripped. Where overburden materials are placed on underlying supporting slopes steeper than 6:1 (H:V), the fill area shall be prepared by constructing horizontal benches into firm natural soil or rock. The benches shall be at least 8 feet in width, with a step of at least 4 feet between benches. Overburden stockpile material shall be placed and compacted using conventional heavy equipment. All grading work and fill placement plans shall be in a conformance with SMARO and the UBC and be approved, in writing, by a California registered Geotechnical Engineer and a California Certified Engineering Geologist.

Mitigation Measure B.2b, as recommended by the applicant: The applicant shall construct a small sedimentation pond downstream of the toe of the Stockpile Area "B" designed and sized to minimize erosion of any soil material into Ranch Tributary and Americano Creek. The dike of the sedimentation pond shall be placed across the natural swale and the pond constructed similar to the proposed main sedimentation pond at the entrance of the quarry. The sedimentation pond design shall be developed by a Registered Civil Engineer, and submitted to PRMD for approval.

Mitigation Measure B.2c, as recommended by the applicant: In areas where cut-slopes intercept saturated seepage zones during construction of access roads, the applicant shall install appropriate improvements into the finished slope (i.e. subsurface drains, localized slope support, or compacted fill buttresses). The final slope treatment must be designed and approved by a California registered Geotechnical Engineer and be consistent with the UBC and be in compliance with the SMARO.

Mitigation Measure B.2d, as recommended in this report: A California registered Geotechnical Engineer shall inspect on a quarterly basis the quarry slopes during excavation (in addition to following major storms, earthquakes, or blasting) to assess bedrock fracture and joint conditions. The inspection shall require continued mapping and movement monitoring of the mining slopes to assess slope stability. If a slope condition

presents risk to mine safety or the potential for erosion/siltation, repair measures shall be implemented. Engineering recommendations for slope repair or stabilization shall be approved by PRMD and incorporated into the proposed project.

Significance after Mitigation: Less than significant.

Impact B.3: Vegetation removal and ground disturbance associated with overburden stripping, overburden stockpiling, quarrying, and grading associated with road construction and construction of ancillary features would result in accelerated erosion and soil loss. This would be a potentially significant impact.

At the project site, existing slopes in the area to be mined are mostly moderate (about 4:1 H:V to 9:1 H:V) (Dailey, 2005). These slopes are vegetated with grasses, and are not presently subject to accelerated erosion. However, accelerated erosion resulting from proposed initial grading and construction, and on-going mining activities is a potential hazard. These activities include access road construction (cut and fill slopes), sediment pond and staging area grading, overburden removal and stockpiling, and mining cut slopes to mine resource rock.

Accelerated erosion includes sheet wash, rilling, rutting, and in more extreme cases, gullying that could also lead to sloughing/sliding of incised gully sidewalls. This would primarily be caused along the tops of mining cutslopes where overlying soils are exposed by grading, and on exposed fill slopes of the overburden stockpiles. Accelerated erosion most typically occurs on bare, unprotected slopes during the wet season, particularly in response to prolonged, intense storms. The sediment resulting from erosion of proposed Stockpile Area B would be introduced into the Ranch Tributary bordering the project property on the south, which is a tributary to the nearby Americano Creek. Sediment could also be introduced into and clog engineered facilities, such as drainage ditches and culverts; be deposited at undesirable locations such as road surfaces, parking/staging areas, or working areas. Increased sedimentation would also require more frequent sediment removal from the sedimentation ponds.

Quarrying activities could accelerate erosion and could lead to structural damage and on and off site siltation. Compliance with the SMARO, as required, for erosion control in addition to the mitigation present below, would reduce this impact to less than significant.

Mitigation Measure B.3a: Implement Mitigation Measure B.2b, above.

Mitigation Measure B.3b, as recommended by the applicant: Re-vegetation of the site shall comply, as required, with Section 26A-11-040, part c of the SMARO. The reestablishment of protective vegetative cover greatly reduces the velocity of surface water runoff on natural soils and fill slopes. In turn, this reduced velocity sharply decreases the erosion potential of these materials to near or even below pre-development erosion rates.

Mitigation Measure B.3c, as recommended by this report: All surface and subsurface drainage facilities, siltation retention structures, and larger cuts and fills, including overburden stockpiles, shall be inspected quarterly and after major storm events to confirm adequate performance by mine personnel. Such facilities shall be cleaned, and maintained

on an annual basis and routinely inspected for erosion and slippage during the rainy season. This measure would reduce the potential for erosion-induced damage and siltation.

Significance after Mitigation: Less than significant.

Impact B.4: The use of controlled detonations (blasting) to fracture and loosen rocks during quarry operations excavation may produce vibratory ground motion capable of triggering slope displacement or failure. This would be a less than significant impact.

Depending on the hardness of the rock, controlled detonation (blasting) may be required on average once or twice a month. It would be necessary to use controlled detonation to assist in the rock fracturing and product removal process. This analysis evaluates whether vibration generated by controlled detonation could trigger slope displacements and failures. This analysis relies on an assessment of rock blasting impacts and recommended practices for blasting prepared for this EIR by Revey Associates, Inc. (see Appendix F-1).

Typically, controlled detonation in tunneling, mining, and quarrying is not used to clear loose rock away from an area or reduce the size of talus piles. Rather, mining operations, tunneling and pipeline contractors, and quarries commonly use controlled detonation to propagate the naturally occurring fractures and joints and generate new fractures in rock. Often, a controlled detonation is prepared by drilling several holes into the tunnel face and inserting charges deep in the rock. When detonated, the force of the charge primarily remains localized around the drill hole. Following the detonation of the charge, mechanical equipment is used to remove the rock.

Some of the energy released during controlled detonation transfers through the rock as shock waves. These stress-strain waves move through the ground at a specific acceleration and velocity, depending on the size of the explosive charge and the composition of the rock or soil. In some cases, if the charge is of sufficient size, these waves reach the ground surface above the tunnel as vibration that humans can feel.

The propagation of waves from a detonation source through the ground, in some cases, could cause slope displacement or liquefaction in some soils types. The analysis conducted in support of this EIR concludes that it is extremely unlikely that there would be an impact of controlled detonation on earthen or rock slopes adjacent to Roblar Road. The study found that at the closest distance between the blast areas and these soil slopes, and an assumed maximum charge-per-delay, the scaled distance would exceed the liquefaction threshold level by more than a factor of more than six times. It can be concluded, therefore, that blasting, conforming to the described limits, would not damage structures, utilities, and earthen or rock slopes near the proposed mining area (Revey, 2006). This impact is less than significant.

Please refer to Impact G.3 in Section IV.G, Noise and Vibration for a detailed discussion of all potential environmental effects associated with blasting.

Mitigation: None Required.

Cumulative Impacts

As discussed above, the project would result in potentially significant project-level impacts related to potentially hazardous geologic and seismic conditions. The mitigation measures described above, however, would reduce all potential impacts to less-than-significant level. Although the entire San Francisco Bay Area is located within a seismically active region with a wide range of geologic and soil conditions, these conditions can vary greatly within a short distance, making the cumulative context for potential impacts one that is more localized or even site-specific.

Impact B.5: The development proposed as part of the project would not result in significant cumulative impacts with respect to geology, soils or seismicity. This would be a less than significant impact.

Development of the proposed project, with implementation of the identified mitigation measures above, would have less than significant impacts related to exposing persons or structures to geologic, soils, or seismic hazards. The project is located within a large rural area that is predominantly undeveloped, except for scattered single-family residences on relatively large parcels. Therefore, the project, combined with existing or other foreseeable development in the area, would not result in a cumulatively significant impact by exposing people or structures to risk related to geologic hazards, soils, and/or seismic conditions.

Mitigation: None Required.

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C. Hydrology and Water Quality

Introduction

This section describes existing and project-related surface water, groundwater, and water quality conditions at the project site and vicinity. The hydrologic data and information on the project site and vicinity were obtained from field reconnaissance, surface water and groundwater monitoring, and a variety of other sources, including published and unpublished reports, and maps, as noted below. This section incorporates as appropriate the results of a hydrologic analysis of the site and vicinity, including a seep and spring survey and groundwater chemistry evaluation completed by Balance Hydrologics, Inc., surface and groundwater quality monitoring conducted on the project site and adjacent creeks by Advanced GeoEnvironmental, Inc. (AGE), and on-going surface and groundwater quality monitoring, and other testing conducted by Pacific GeoScience at the adjacent landfill property as part of the County's on-going landfill monitoring program, and additional groundwater quality testing on the landfill property by AGE in support of this EIR.

Setting

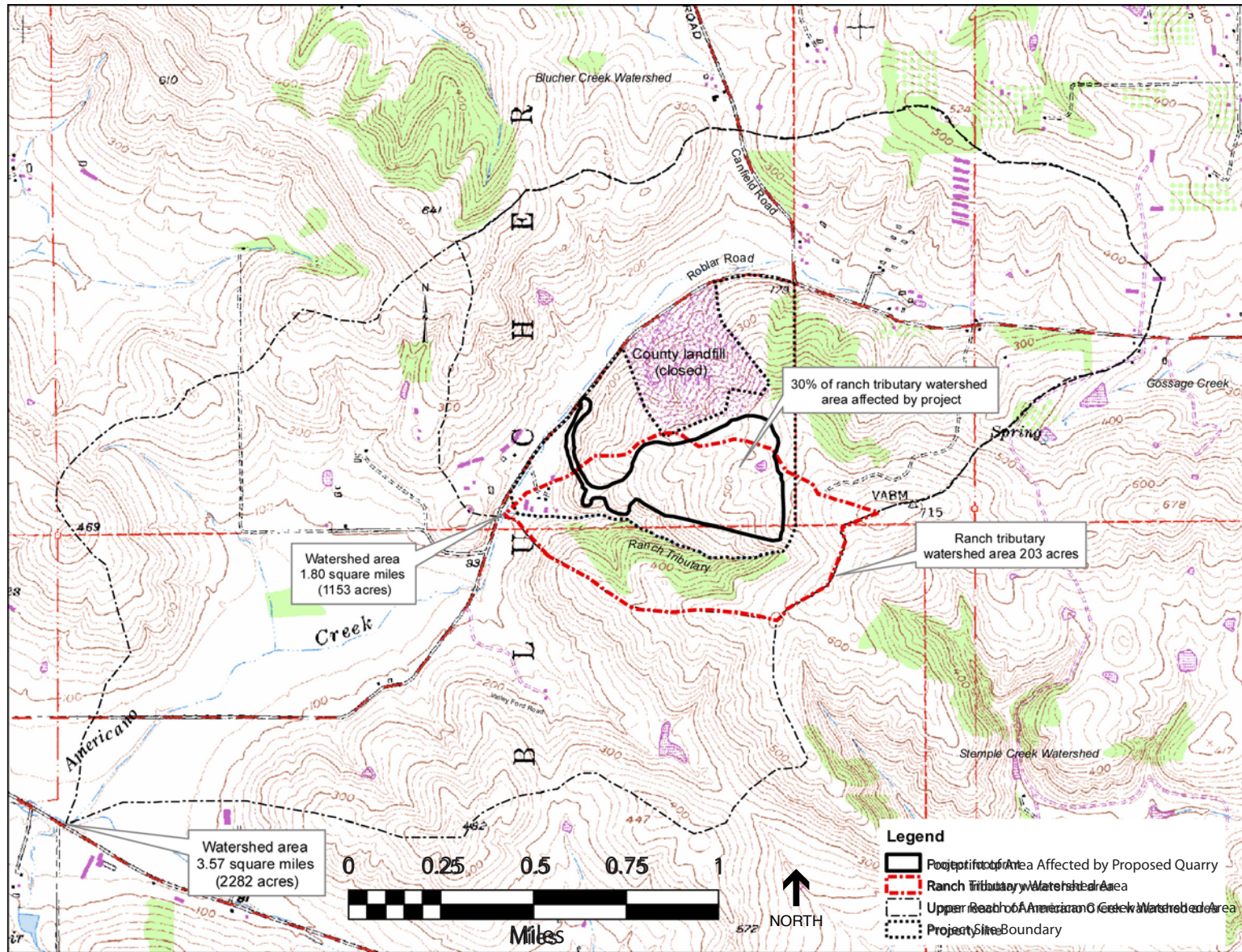
Topography

The project site is situated on hilly terrain in the uppermost reach of the Americano Creek watershed (Figure IV.C-1). Depending on location, hillslopes within the project site face north, west or southward. Slopes throughout the site range from approximately 10 to 30 percent. The highest elevation on site is near the southeastern corner, at about 600 feet above mean sea level (msl). Beyond the project boundary to the east, the hill crests at height of 725 feet msl. The lowest elevation on the project property is about 110 feet msl, located at the southwest corner near the confluence of a tributary drainage to Americano Creek (referred to in this EIR as Ranch Tributary), and the ranch buildings adjacent to Roblar Road.

Climate

The project site is located in the Mediterranean climate zone typical of central coastal California. This climate zone is characterized by cool, wet winters and hot, dry summers. The project site receives a mean annual precipitation of 26 inches to about 30 inches, which is similar to the long-term average of 30 inches at Santa Rosa. The average rainfall value is a statistical mean of rainfall totals that show a wide range of values strongly influenced by global weather patterns, such as the El Nino Southern Oscillation and prolonged periods of drought.

Influenced by marine air about 85 percent of the time, the region containing the project site is generally protected from the hot weather of the Central Valley by the interior Coast Ranges. Although the Pacific Ocean moderates temperatures, the region has a wider range than along the coast, occasionally exceeding 100 degrees Fahrenheit and sometimes falling as low as several degrees below freezing for several consecutive nights.



SOURCE: USGS, Balance Hydrologics, Inc.

Roblar Road Quarry . 204334
Figure IV.C-1
Site Vicinity and Watershed Map

Largely owing to moisture storage of soils developed on Wilson Grove formation deposits (discussed below), relative humidity of the region is generally higher than other landscapes of Franciscan-type rocks to the south. In addition, the hilly areas of the region – characteristic of the project site – are slightly more humid, cooler in the summer and milder in the winter than interior valleys, such as Santa Rosa Plain, Petaluma or Napa Valleys.

Given an estimated mean annual precipitation at the project site of 26 to 30 inches per year, an estimated regional mean annual runoff of seven inches per year (Rantz, 1974), and estimated evapotranspiration of 17 inches per year (van der Leeden and others, 1990), the estimated average annual recharge at this site is a minimum of six inches (Balance, 2006).¹

Surface Water

Americano Creek

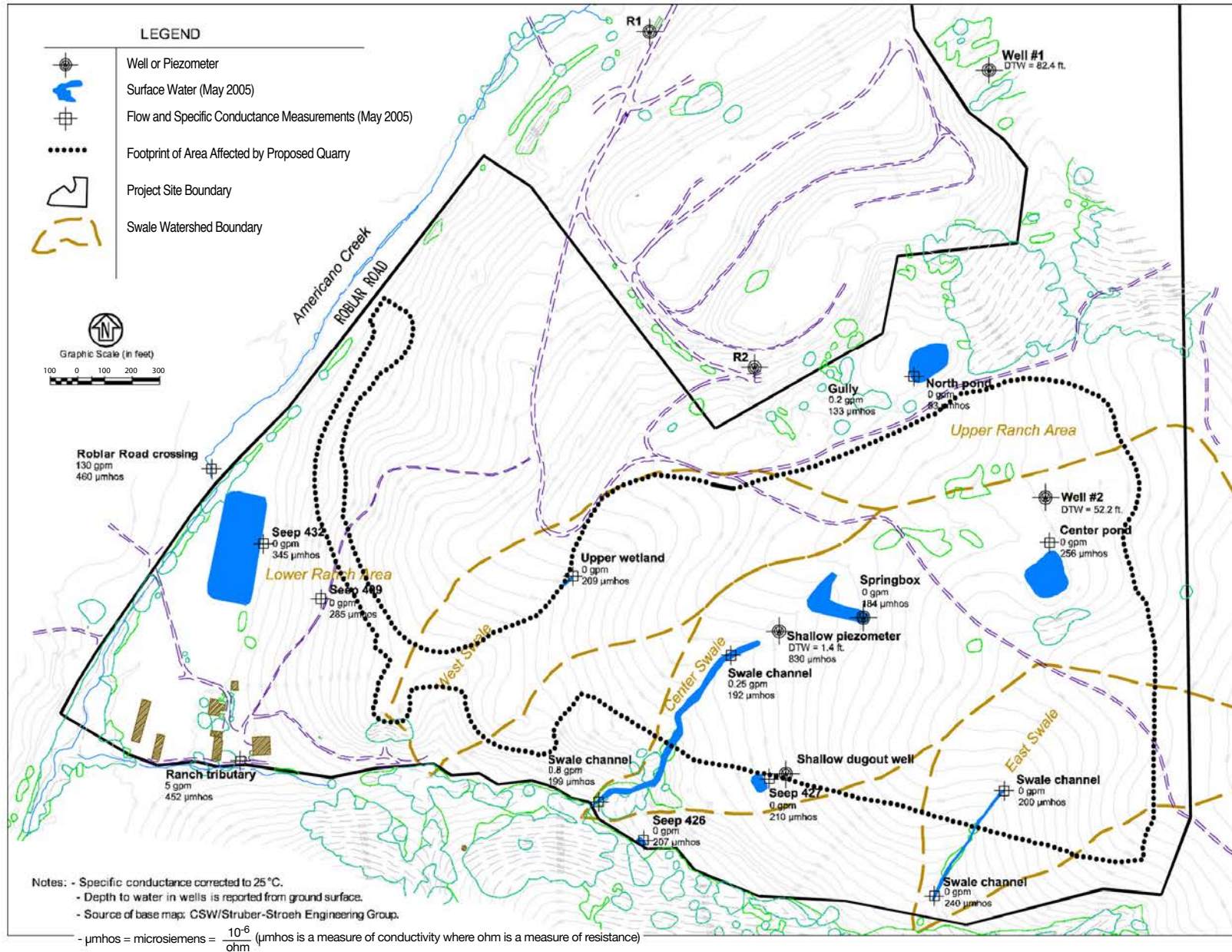
Americano Creek is a large regional creek with a 39-square-mile watershed, draining westward towards Bodega Bay through Estero Americano (Estuary of Americano Creek). The upper reach of Americano Creek flows from its headwaters, located approximately one mile east of the project site at an elevation of about 340 feet above msl, and hence, westward roughly parallel to, and north of, Roblar Road (see Figure IV.C-1). Approximately 400 feet upstream from the existing access road to the project site, Americano Creek crosses under Roblar Road and continues westward along the project site's north boundary (see Figure IV.C-2). In this reach, the creek has been channelized and extensive riprap installed to protect Roblar Road from scour. Downstream of the project, Americano Creek flows roughly southwestward to the Valley Ford Road area, where the elevation is about 60 feet msl, and hence westerly into the Estero Americano.

Seasonal flow measurements conducted in 2005 show that Americano Creek, in the vicinity of the project site, flows throughout most of the year.² In May 2005, flow in Americano Creek was measured at 0.3 to 0.5 cubic feet per second (cfs) or equivalently 135 to 224 gallons per minute (gpm) at Canfield Road, with slightly less flow measured at the Roblar Road crossing. The May 2005 sampling event occurred six days after the previous major storm event totaling over one inch of rain and represented late spring flow at the onset of the summer reduction of baseflow.³ In June 2005, Americano Creek flowed at about eight gpm at Canfield Road and about four gpm at the Roblar Road crossing. The June 2005 monitoring event was conducted after two minor storms totaling less than one inch of rain occurred earlier that month. In September

¹ Recharge was estimated by subtracting runoff and evapotranspiration from rainfall. Experience indicates that actual recharge is somewhat higher than an estimate derived from annual averages.

² Balance Hydrologics, Inc. measured flow in Americano Creek as part of the field study to support this EIR. Flow measurements were taken on three separate occasions at Canfield Road, north of the project site and at the point where Americano Creek crosses under Roblar Road, adjacent to the site.

³ Baseflow is defined as sustained or fair-weather runoff (Langbein and Iseri, 1960 *in* Wilson and Moore, 1998), composed of effluent groundwater and is considered the natural flow of a stream, unaffected by the works of man (Jackson, 1997 *in* Wilson and Moore, 1998).



SOURCE: Balance Hydrologics, Inc., CSW/Struber-Stroeh Engineering Group

Roblar Road Quarry . 204334

Figure IV.C-2
Existing Site Drainage, and Location of Seeps and Springs

2005, stream flow in Americano Creek flow remained at eight gpm at Canfield Road but no continuous flow was observed at the Roblar Road crossing.

The reduction of flow between Canfield Road and the Roblar Road crossing suggests that some stream flow may be seeping into the ground from the surface in what is referred to as “influent stream” conditions. An influent stream, also known as a “losing stream,” contributes water to the underlying saturated zone and stores that water in the stream banks (also known as bank storage). Influent stream channels lie above the water table and therefore, surface seepage occurs when the water table declines during the dry season.

Ranch Tributary

Ranch Tributary flows west along the south property boundary (Figure IV.C-2). As shown in Figure IV.C-1, the headwaters to Ranch Tributary are located southeast of the project property at an elevation of approximately 725 feet msl. Ranch Tributary empties into Americano Creek just southwest of the project site. The total watershed area drained by Ranch Tributary is approximately 203 acres.

Flow measurements recorded in the Ranch Tributary during the 2005 field study showed that Ranch Tributary discharged water to Americano Creek throughout the year, ranging from approximately five gpm (following a storm event) to approximately 3 gpm during the summer months. The flow within the tributary is a combination of surface runoff and baseflow during periods of rain (i.e., winter and early spring), and is predominantly baseflow supplied by shallow and deep groundwater during the dry periods (i.e. summer and fall). The 2005 flow measurements indicated a persistent groundwater baseflow was conveyed through the Ranch Tributary to Americano Creek. However, recent observations suggest that in drier years (e.g., 2007), Ranch Tributary does not carry flow during the summer season.

Project Site Drainage

The majority of the footprint of the proposed quarry is within the Ranch Tributary watershed, as are adjoining areas to the south and east (Figure IV.C-1). Three southwest trending ephemeral swales, referred to in this EIR as West Swale, Center Swale, and East Swale, drain the portion of the project site within the Ranch Tributary watershed (Figure IV.C-2). Surface water captured within these swales either infiltrates into the shallow soil or runs overland to discharge into the Ranch Tributary. Defined drainage channels are present in some locations within the swales. The sub-watershed of the Center Swale is approximately 45 acres.⁴ This sub-watershed contains a stock pond (named in this EIR as Center pond) at the head of the swale at an elevation of approximately 500 feet msl which collects some surface water from the surrounding slopes. The sub-watersheds of the West Swale and East Swale are comparatively smaller in area, encompassing approximately 19 acres and 17 acres, respectively. A small percentage of site runoff from the lower portion of the project site drains to a low-lying floodplain or terrace located adjacent to Americano Creek in the southwest corner of the site.

⁴ For purposes of clarity, the smaller watersheds within the larger ranch Tributary watershed are referred to in this EIR as *sub-watersheds*.

Surface water on the project site north of the Ranch Tributary watershed flows overland in a general northwest direction and down slope towards Roblar Road. Surface water runoff from this portion of the project site is drained by minor rills and gullies to Americano Creek, and is intentionally routed around the landfill in manmade drainage channels. A standing surface water feature (named in this EIR as North pond) is located on the project site north of the Ranch Tributary watershed, between the proposed quarry footprint and the Roblar Landfill property.

Surface Water Recharge Characteristics of Site Soils

Geologic properties of the site soils are discussed in detail in Section IV.B., *Geology, Soils, and Seismicity*. Figure IV.C-3 identifies soils on the project site and vicinity. Soils across the majority of the project site are derived from weathered Wilson Grove Formation and are mapped as Steinbeck Loam Series by the Natural Resources Conservation Service (NRCS) (Miller, 1972). Steinbeck soils average 36 to 45 inches deep and are moderately well-drained loams.⁵ Available water capacity (ability of a soil to hold moisture) of the soils range from approximately 6 to 7.5 inches (see Appendix C-1). The moderately high permeability and relatively low water-holding capacity of these soils facilitate recharge to ground water. Runoff and erosion occurs in these soils but would not be considered excessive compared with soils containing finer grained silts and clays.

On the steeper slopes in the south and west portions of the project site, soils are classified as Los Osos clay loam. Shallower in depth than Steinbeck loam (up to 28 inches depth on site), these soils developed on weathered bedrock. With moderately low soil permeability (approaching that of the fractured bedrock) and a water capacity of about 4.5 inches, recharge to groundwater is slow and considerably less than the Steinbeck loam. Consequently, runoff and erosion can be excessive in these soils.

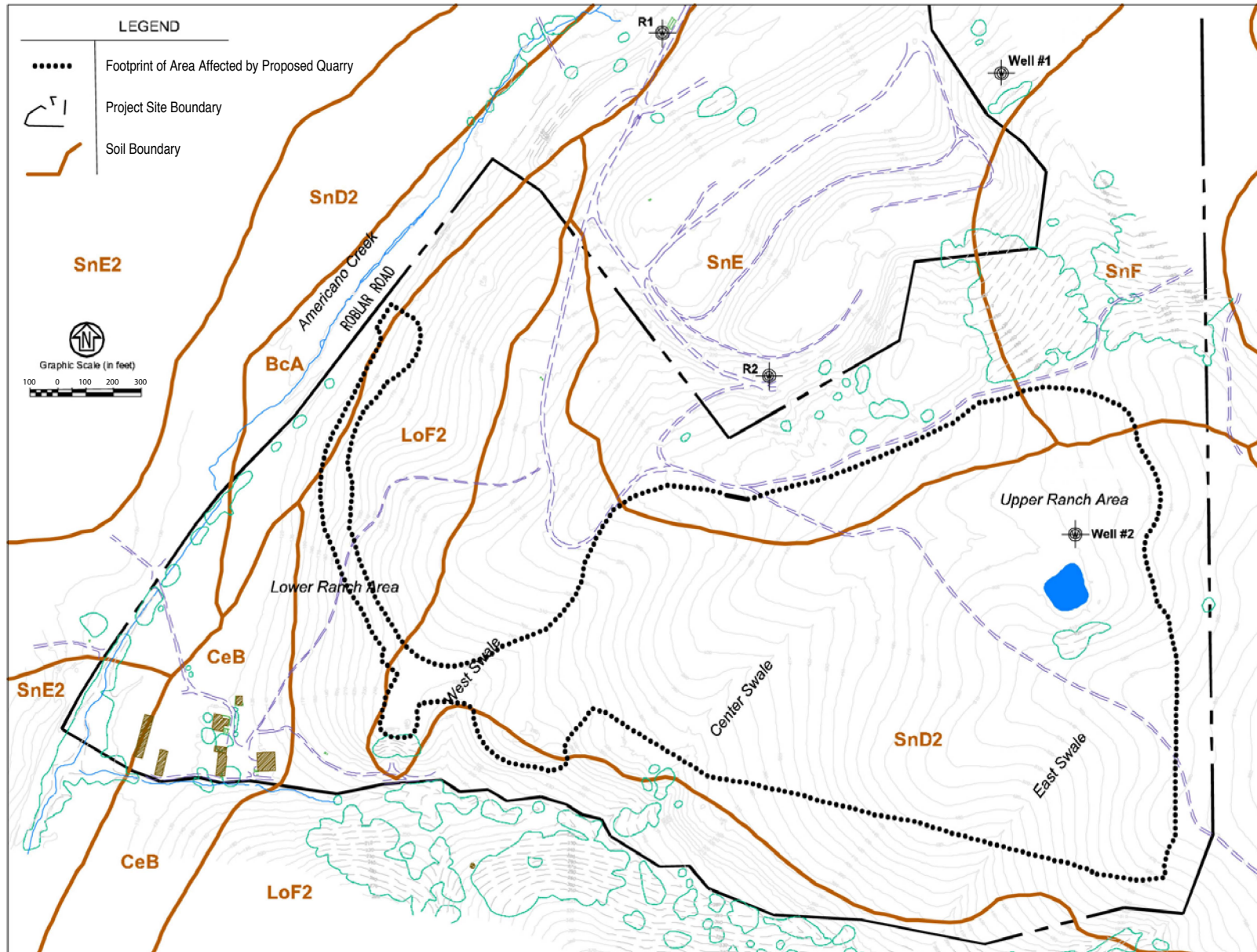
In the lower southwest corner of the property, soils consist of Blucher fine sandy loam overwash, likely inundated by occasional floods on Americano Creek, and a small area of Clear Lake clay, formed due to poor drainage conditions. The Blucher soils have limited infiltration rates, mainly because clay layers impede percolation, as evidenced by the approximately 1.5 acre area of standing surface water that seasonally overlies these soils on the west end of the project site near the ranch buildings and Roblar Road.

Seeps and Springs

Seeps and springs generally occur where groundwater discharges to the surface. On the project site, seepage to the ground surface forms wetlands and seeps and occurs at the bottom of swale channels. The occurrence and condition of onsite surface water seeps and springs were monitored during the 2005 field reconnaissance.⁶ Observations made during the field reconnaissance, as

⁵ *Well-Drained* refers to soils that have a appreciable fraction of granular materials, which allows water to readily infiltrate. Well drained soils have high permeability.

⁶ Balance Hydrologics measured flow in onsite seeps and springs, on three occasions, as part of the field study in support of this EIR. Surface water monitoring occurred on the same dates as the flow measurements in Americano Creek and the Ranch Tributary, as discussed above.



LoF2 Los Oso clay loam, on 30 to 50 percent slopes, eroded
SnD2 Steinbeck loam, on 9 to 15 percent slopes, eroded

SnE Steinbeck loam, on 15 to 30 percent slopes
SnF Steinbeck loam, on 30 to 50 percent slopes

CeB Clear Lake clay, on 2 to 5 percent slopes

SOURCE: Balance Hydrologics, Inc., CSW/Stuber-Stroeh Engineering Group

Roblar Road Quarry . 204334

Figure IV.C-3
 Site Soils

discussed below, demonstrate that persistent groundwater discharge continues through the year at the 400- to 500-foot elevation (See additional discussion in the *Groundwater Conditions* section, below).

Field Survey and Monitoring of Springs and Seeps

Seep and spring surveys of the project site were conducted in late May, late June and late September 2005. Surface water seeps and springs identified during field surveys in late May 2005 are shown in Figure IV.C-2. The field surveys identified two seeps (named Seeps 432 and 409) and the associated 1.5-acre ponded area near Roblar Road, discussed above. An upper wetland area was identified in the West Swale. Standing water was observed in the Center Swale in the swale channels and at a side-slope seep (named Seep 427). Water was also observed below a spring, as shown in Figure IV.C-2. A spring box was installed to monitor flow at the spring and one shallow groundwater observation well (piezometer) was installed between the spring box and swale channel to monitor shallow subsurface water. A small “dugout” well was installed near Seep 427 to monitor groundwater in levels near the seep. Another seep (named Seep 426) was identified just outside of the Center Swale boundary, at the foot of the slope, within the Ranch Tributary. Surface water was also observed in the East Swale within the swale channel.

The ponded area near the ranch observed in late May 2005 was completely dry by late June 2005, indicating limited shallow groundwater storage and discharge from Seeps 409 and 432. The West and East Swales dried back to a wetted spot by late June 2005, also suggesting a limited groundwater discharge. Neither the East or West Swales had flowing water in late May 2005, suggesting that they function largely as rainfall catchment and runoff features. In contrast, the lower portion of the Center Swale was flowing at 0.25 to 0.8 gallons per minute in late May 2005, and had substantial ponding and saturated soil uphill from the spring box. There was no flow in the lower Center Swale by late June 2005, but standing water and wetted soil was present, which slowly receded through the dry season. By late September 2005, standing water and wetted surface soils were found only at the Center Swale spring box, the shallow “dugout” well and in the East Swale channel.

Surface Water Quality

Americano Creek was listed in 1998 as an impaired water body under Section 303(d) of the Clean Water Act and was one of the original Critical Coastal Areas (CCA) identified by the CCA Program in 1995.⁷ (See additional discussion below in the *Regulatory Framework* section). The primary contributing factor to the impairment of theAmericano Creek/Estuary system is livestock agriculture (grazing and dairy activities), the majority of which occurs downstream near the town of Valley Ford and the headwaters to Estero Americano. Pollutants of concern in theAmericano Creek/Estuary system include nutrients and sediment plus ammonia, copper, and coliform bacteria; these constituents are common surface water pollutants associated with livestock agriculture. Sediment and contaminant sources in the upland areas of the watershed, including the

⁷ Section 303(d) of the Clean water Act (CWA) requires that each state identify water bodies or segments of water bodies that are “impaired” (i.e., not meeting one or more of the water quality standards established by the state).

project site, could include dairy runoff, natural or induced stream erosion, sediment runoff from unpaved ranch roads, and pollutant runoff from Roblar Road.

Baseline Surface Water Monitoring in Americano Creek and Ranch Tributary

In 2007, at the request of Sonoma County PRMD, the applicant implemented a baseline surface water sampling program to characterize surface water quality and conditions in Americano Creek and Ranch Tributary on and in the project vicinity. The baseline assessment established a quantitative measure of existing surface water conditions as a baseline against which project effects on surface water quality may be assessed. As a contractor to the applicant and in consultation with the County, AGE developed the baseline storm water monitoring program, collected samples, submitted those samples for analysis and prepared quarterly baseline surface water monitoring reports (AGE, 2007a, 2008a).

Six baseline surface water sampling points (named BSW-1A, BSW-1B, BSW-1C, BSW-2A, BSW-2B, and BSW-2C for purposes of this EIR- see Figure IV.C-4) were selected in Americano Creek and Ranch Tributary at locations representing surface water conditions up-gradient (including up-gradient of the Roblar Road Landfill), cross-gradient, and down-gradient of the proposed quarry. AGE collected surface water samples at each of the six sampling points on six different days during the rainy season of 2007 (between January and April) and supplemental surface water sampling at each of the six sampling points on one day in December 2007. The 42 surface water samples were analyzed for conventional chemistry parameters (chemical oxygen demand, total dissolved solids, total settleable solids, total suspended solids, turbidity, total organic carbon, oil and grease), inorganic anions (chloride, nitrate as N, and sulfate as SO_4), physical parameters (pH and specific conductance), metals (calcium, iron, magnesium), polychlorinated biphenyls (PCBs) and organochlorine pesticides.






The data obtained from the baseline surface water study represents a “snap shot” of rainy season conditions in Americano Creek and Ranch Tributary in the project site vicinity. Overall, the surface water monitoring data describes existing water quality conditions consistent with the rural agricultural setting; surface water quality appears to be influenced by runoff from Roblar Road, the surrounding geology, groundwater baseflow contribution, and upstream erosion. The data indicates stable and consistent concentrations of each analyte over the seven sampling events.

Surface Water Monitoring at Roblar Landfill Property

Historical operation of the adjacent Roblar Landfill property is discussed in Chapter III, Project Description. Waste and/or debris were received at the landfill until 1973. The landfill site was subsequently closed, and has since undergone extensive grading, drainage, and revegetation improvements. The property is currently monitored and maintained by the Sonoma County Department of Transportation and Public Works – Integrated Waste Division (DTPW-IWD).

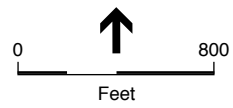
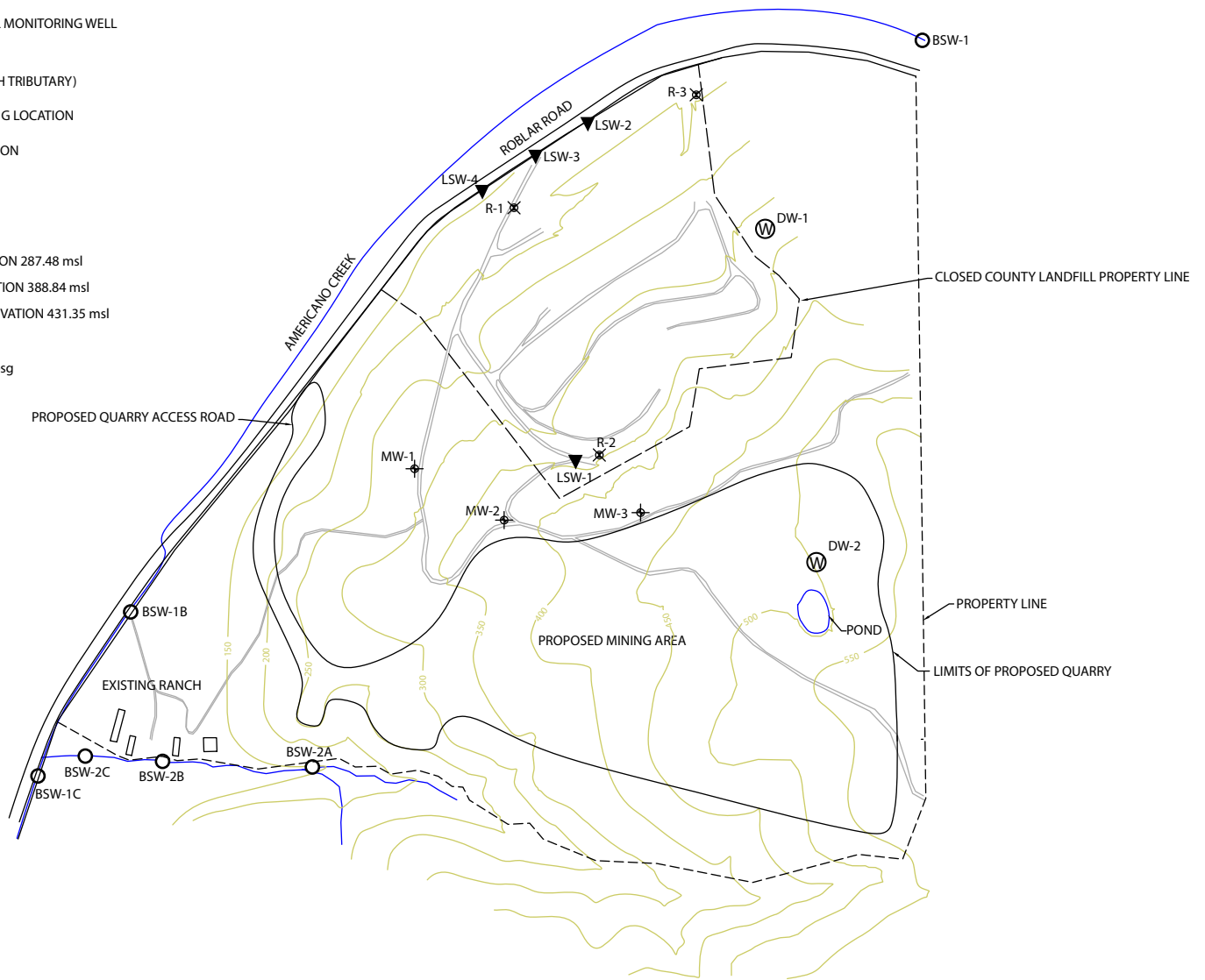
Roblar Landfill represents a potential source of surface water pollutants due to its past use as a public landfill and burn area. Moreover, existing surface runoff can contain sediments eroded from unpaved access roads, which are then discharged to Americano Creek by the landfill surface water drainage system.

LEGEND

- MW-1  MONITORING WELL LOCATION (ROBLAR ROAD QUARRY: NORTH BAY CONST.)
- DW-1  DOMESTIC WELL LOCATION (ROBLAR ROAD QUARRY: NORTH BAY CONST.)
- R-3  APPROXIMATE LOCATION OF COUNTY LANDFILL MONITORING WELL
- 500 — TOPOGRAPHIC CONTOUR LINE
- SURFACE WATER (AMERICANO CREEK and RANCH TRIBUTARY)
- LSW-1  COUNTY LANDFILL SURFACE WATER MONITORING LOCATION
- BSW-1A  BASELINE SURFACE WATER MONITORING LOCATION (AMERICANO CREEK AND RANCH TRIBUTARY)

WELL SPECIFICATIONS

- MW-1 SCREEN INTERVAL 40 - 60 feet bsg; CASING ELEVATION 287.48 msl
- MW-2 SCREEN INTERVAL 85 - 105 feet bsg; CASING ELEVATION 388.84 msl
- MW-3 SCREEN INTERVAL 94.5 - 114.5 feet bsg; CASING ELEVATION 431.35 msl
- DW-1 SCREEN INTERVAL 50 - 340 feet bsg
- DW-2 SCREEN INTERVAL 140-160; 240-280; 360-540 feet bsg
- R-1 SCREEN INTERVAL 13 -28 feet bsg
- R-2 SCREEN INTERVAL 16 - 46 feet bsg
- R-3 SCREEN INTERVAL 15 - 45 feet bsg



IV.C-10

SOURCE: Advanced GeoEnvironmental; ESA 2007

Roblar Road Quarry . 204334
Figure IV.C-4
 Location of Groundwater Wells
 and Surface Water Monitoring

As part of the County's Stormwater Pollution Prevention Plan (SWPPP) for the Roblar Landfill, the Sonoma County DTPW-IWD routinely tests surface water quality at the landfill and submits quarterly reports to the Regional Water Quality Control Board (RWQCB). Since October 2000, the County has contracted Pacific GeoScience to collect quarterly surface water samples from four surface water sampling stations. Three stations (denoted as LSW-2, LSW-3 and LSW-4 for purposes of this EIR)⁸ are located within a swale that captures surface water at the base of the landfill property, adjacent to Roblar Road. These samples do not represent flow in Americano Creek. However, during storm events, surface water from the landfill property flows to Americano Creek via a culvert beneath Roblar Road. The fourth station (denoted LSW-1) is located on the back side of the landfill (southwest corner) at an elevation approximately 200 feet higher than the other samples. LSW-1 represents upgradient landfill conditions (see Figure IV.C-4 for sampling location).⁹ The surface water samples are analyzed for the County by a certified laboratory for pesticides, PCBs, metals and general minerals.

The levels of mineral and metals in the surface water samples indicate concentrations that are indicative of naturally occurring concentrations given this geologic setting. Laboratory analysis has not detected PCBs. The pesticide 4,4'-DDE¹⁰ was detected at low concentrations (i.e., at or slightly above the method detection limit) in LSW-2, LSW3, and LSW 4 in January 2006 and January 2007, ranging between 0.11 µg/L and 0.55 µg/L (Pacific GeoScience, 2003, 2004a-d, 2005a-d, 2006a-d, 2007a-d, 2008).

A discussion of additional prior surface water and groundwater testing conducted by the County at the landfill property as part of its Solid Waste Water Quality Assessment Test (1991) is presented below under Groundwater Quality, below.

Groundwater Conditions

Regional Groundwater Conditions

Regionally, groundwater occurs in the Wilson Grove Formation, Tolay Volcanics, and Franciscan Complex Bedrock. The Wilson Grove Formation has high porosity (measure of the voids in a geologic material, which allows water movement) and moderate transmissivity (rate at which water flows through the entire thickness of the aquifer) and therefore, is one of the most productive water-bearing units in Sonoma County. In contrast, the Tolay Volcanics, which underlie the Wilson Grove Formation in many locations throughout Sonoma County, have a lower porosity and transmissivity because, unlike the Wilson Grove Formation, groundwater is held in and travels through a varying array of fractures (this type of flow is referred to as fracture flow). The Franciscan Complex has the lowest porosity of the three due to fewer fractures and

⁸ Sampling locations used in all Pacific GeoScience monitoring reports since October 2000 are demoted as SW-1 through SW-4. This EIR added the 'L' to the location name to distinguish surface water sample on the landfill and to avoid confusion with other surface water samples collected elsewhere and reported herein.

⁹ LSW-1 was dry in October 2003, April 2004, July 2004, October 2004, July 2005, and October 2005 and LSW-4 was dry in July 2005 and October 2005; therefore stormwater samples were not collected at these times from LSW-1 and LSW-4.

¹⁰ DDE is the standard acronym for dicloro-diphenyl-dichloroethylene, while DDT is the accepted acronym for dichloro-diphenyl-trichloroethane. *4,4 DDE* is a breakdown product of DDT, which was often used as an insecticide in the past. The use of DDT was banned in 1972.

high clay content in some of the rock within the complex. (Section IV.B, Geology, Soils, and Seismicity provides a detailed discussion of the geological setting.) Groundwater in the Wilson Grove Formation occurs as unconfined groundwater and forms the regional water table.¹¹ Recharge to the Wilson Grove Formation is primarily through surface infiltration of precipitation. Groundwater within the saturated sediments of the Wilson Grove Formation can infiltrate into the underlying bedrock fractures or be discharged at the surface in seeps, springs and streams.

Groundwater Conditions on the Project Site

The Sonoma County General Plan places the project site within groundwater availability classification Zone IV, described as an area with low or highly variable water yield. Information on groundwater conditions beneath the project site was developed for this EIR through:

- A review of existing groundwater well logs and California State Well Completion Reports;
- A field reconnaissance program (see Footnote 7) which studied the seeps and discharge points to establish an understanding of the surface water/groundwater interaction. The project site field reconnaissance included measurement of water levels in the onsite groundwater supply wells and water level fluctuation in the seeps, swale channels, piezometers and spring boxes; and
- The installation and monitoring of three onsite groundwater monitoring wells (MW-1, MW-2 and MW-3) located in the north-central portion of the project site; and monitoring of the two existing production wells DW-1 and DW-2.

Groundwater Wells on the Project Site

The project site contains a total of five groundwater wells; groundwater production wells DW-1 and DW-2, which were installed in 2004, and groundwater monitoring wells MW-1, MW-2 and MW-3, which were installed in January 2007. The location of these wells is shown in Figure IV.C.-4.

Production well DW-1 is located in the northeast portion of the project site, while well DW-2 is located in the east central portion of the property and within the footprint of the proposed quarry. Well DW-1 is 345 feet deep and draws water from a 124-foot thickness of Wilson Grove Formation sandstone and 116 vertical feet of fractured volcanic rock. Well DW-2 is 545 feet deep and draws water from about 60 vertical feet of volcanic rock, and 95 vertical feet of deep shale. Following the installation of these wells, aquifer tests were performed to determine the amount of water the wells could produce without causing additional groundwater drawdown. The results of the test showed that the wells are capable of producing about between 30 gpm and 50 gpm. Both groundwater supply wells have pumps installed and are currently used for agricultural purposes.

Monitoring wells MW-1, MW-2 and MW-3 were installed on the west-facing slope of the project site, and are oriented roughly inline between the landfill and the proposed quarry (see Figure IV.C-4 for well specifications). MW-1 is the lowest of the three at an elevation of 287 feet

¹¹ Unconfined groundwater occurs at atmospheric pressure and fluctuates in response to shallow recharge from precipitation and under flow.

amsl and located the closest to Roblar Road. At 60.5 feet deep, MW-1 is screened across the interface zone between the Wilson Grove Formation and the underlying Tolay Volcanics; the well screen intersects clay and weathered rock of the Wilson Grove, and the underlying Tolay Volcanic rock. Groundwater in MW-1 measured in the quarterly samples ranged between a low of approximately 23 feet below ground surface (bgs) in February 2007 and high of 16 feet bgs in March 2008.

Monitoring well MW-2 is situated approximately 500 feet upslope of MW-1 at an elevation of about 390 feet amsl. MW-2 is 180 feet deep and is screened across the weathered rock, clay, and bedrock interface zone between the Wilson Grove Formation and the underlying Tolay Volcanics. Groundwater measured in monitoring well MW-2 ranged between a low of approximately 60 feet bgs in February 2007, and a high of 45 feet bgs in March 2008. Monitoring well MW-3 is located over 600 feet upslope of MW-2 at an elevation of 431 feet amsl. MW-3 is 115 feet deep, and screened entirely within the Tolay Volcanic bedrock. Groundwater measured in monitoring well MW-3 ranged between a low of approximately 21 feet bgs in December 2007 and a high of 15 feet bgs in March 2008 (AGE, 2007b-c, 2008b-c).

Please see Groundwater Monitoring, below, for a discussion of the water quality monitoring program and results for the on-site wells.

Groundwater Occurrence

Groundwater occurs beneath the site in three defined zones: the Wilson Grove Formation, within fractures of the basaltic resource rock (Tolay Volcanics), and in shears and fractures of the underlying Franciscan Formation. The Wilson Grove Formation covers the project site in thicknesses ranging from about six feet to 43 feet and is composed of semi-consolidated sand (with silt and clay) and sandstone (Dailey, 2005; Miller Pacific, 2004). The high soil permeability of the surface soils and their inability to hold water plus the relatively high permeability of the Wilson Grove Formation, allows groundwater to infiltrate through the Wilson Grove Formation until it encounters the underlying Tolay volcanics. The hard, dense volcanic rocks impede vertical groundwater infiltration so the groundwater travels laterally to discharge at a seep, a spring, or into Ranch Tributary. The Roblar Tuff, a volcanic rock composed of cemented volcanic ash, occurs at the base of the Wilson Grove Formation. Due to the impermeable nature of the tuff, groundwater can become perched over it and in some cases, the tuff confines shallow groundwater.¹² Other than localized confining conditions caused by Roblar Tuff, the groundwater in the Wilson Grove Formation appears unconfined. Conversely, groundwater in the Tolay Volcanics and underlying Franciscan Complex rocks appears to be under confined conditions (pressures greater than atmospheric).¹³

¹² Perched groundwater zones are localized, isolated saturated zones separated above the water table by impermeable layers. Groundwater is sometimes confined within perched zones.

¹³ The groundwater appears to be under confining pressures (above that of atmospheric) evidenced by the observation that water levels in wells tapping confined zones rise to a depth relative to the confining pressure. As reported in the Well Completion Report for the onsite production wells (discussed below), the first encountered groundwater in DW-1 was at 100 feet below the surface and groundwater in DW-2 was first encountered at 140 feet below the surface. Water levels rose approximately 50 feet at DW- 1 and DW-2 after well completion.

Groundwater Flow Direction and Gradient

On the project site, the Ranch Tributary watershed divide (Figure IV.C-5) controls the shallow groundwater flow within the Wilson Grove Formation. As shown by the generalized groundwater contours and flow direction arrows in Figure IV.C-5, groundwater flow direction in the Wilson Grove Formation mimics the slope and gradient of the existing topography. As a result, shallow groundwater beneath the project site within the Ranch Tributary watershed currently flows southwest to the Ranch Tributary, and shallow groundwater beneath the project site north of the Ranch Tributary Watershed divide, flows west-northwest towards the Roblar Landfill property and Roblar Road.

Groundwater elevation measurements from monitoring wells MW-1, MW-2, and MW-3 confirm that groundwater in the Wilson Grove-Tolay Volcanic interface zone (including up to 30 or so feet of the Tolay Volcanics) follows the down-sloping surface topography and flows in a west-northwesterly direction towards Americano Creek at an average gradient of 0.14 feet per foot in the 2007/08 measurements.¹⁴

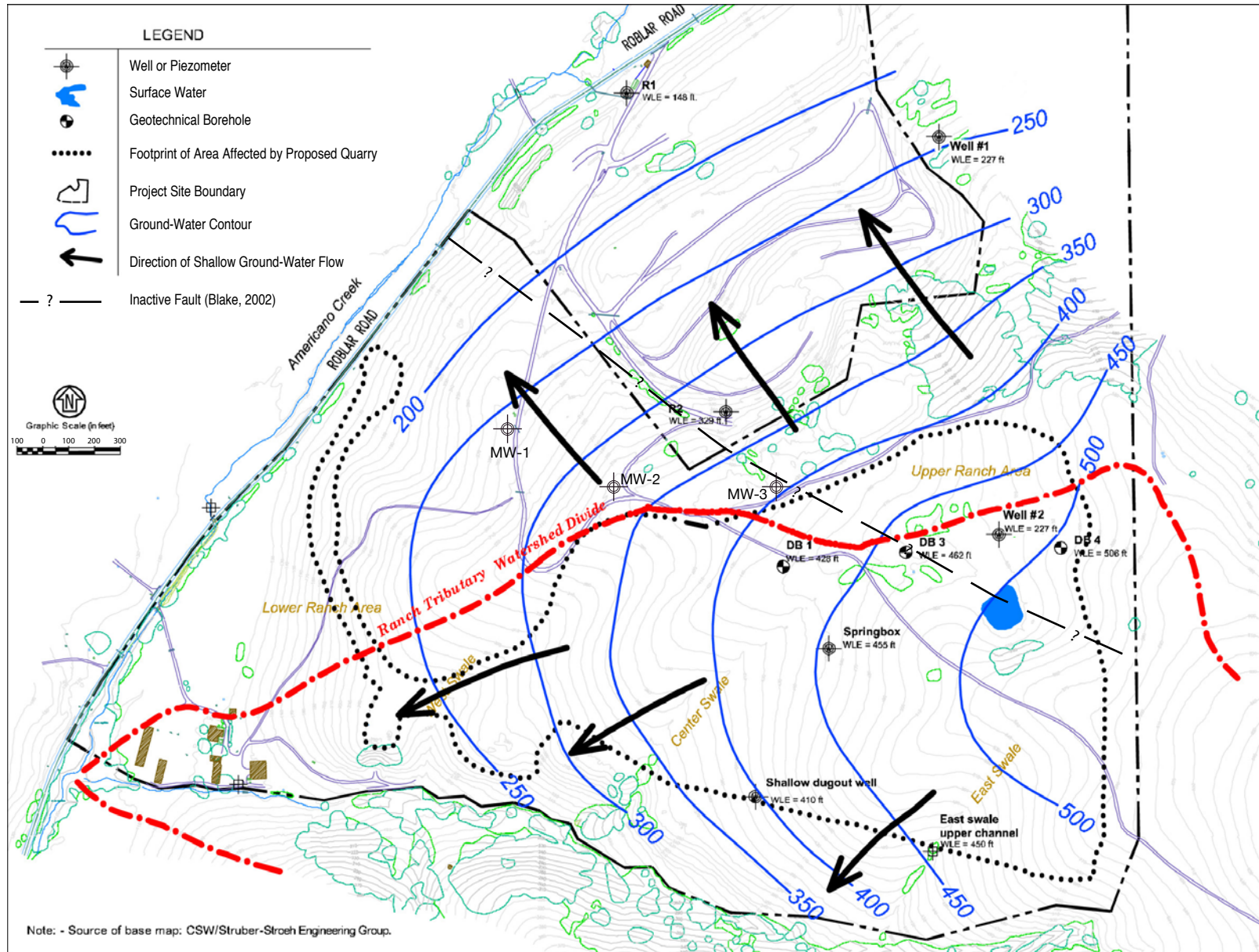
However, groundwater flow direction and gradient within the deeper Tolay Volcanics and underlying Franciscan Complex bedrock is less defined due to fracture flow conditions. Groundwater flow direction in fractured bedrock depends on the orientation, arrangement, width, deepness, and frequency of fractures in a particular bedrock zone. Some zones are more pervasively fractured and therefore, transmit more water. Wells completed in bedrock sometimes have low yield because the well draws water from localized, sometimes disconnected fractures.

Dunham Fault and Relationship to Groundwater

An inactive fault (Dunham Fault) has been mapped across the project site (see Figure IV.C-5). There is a potential that the Dunham fault is a shear zone exhibiting a higher permeability (hydraulic conductivity) than the surrounding rock. Measured water levels in monitoring well MW-3 (discussed above), which is located in proximity to the inferred trace of the Dunham fault, and the observation of “increased water production in borehole” in the exploratory boring of MW-3 (AGE, 2007b), may suggest groundwater flow characteristics indicative of an ancient shear zone. Observations of “softer bedrock” at a depth of 80 feet made during drilling monitoring well MW-3 (AGE, 2007b) may indicate the sheared rock, a characteristic of an ancient fault feature.

The Dunham Fault is mapped through the existing stock pond, located at an elevation of 500 feet in the eastern portion of the site (see Figure IV.B-1). In some geologic settings, surface water ponds suggest the location of a fault feature or inactive shear zone; ponds over active faults are referred to as sag ponds. However, the topography and geologic cross sections suggest that the stock pond is fed by a spring located at the contact of the Wilson Grove Formation and the underlying Tolay Volcanics, and is not a sag pond formed by faulting.

¹⁴ “Feet per foot” describes the ratio of vertical change to horizontal change. For example, subsurface flow that changes elevation by 10 feet in 100 feet would be said to have a gradient of 0.1 feet per foot.



SOURCE: Balance Hydrologics, Inc., CSW/Stuber-Stroeh Engineering Group

Roblar Road Quarry . 204334
Figure IV.C-5
 Existing Shallow Groundwater Contours

Refer to Section IV.B, Geology, Soils, and Seismicity for additional discussion of this mapped fault feature.

Groundwater Chemistry

Groundwater chemistry data in the project vicinity is based on results of the field reconnaissance and survey completed for this EIR by Balance Hydrologics, Inc. During the early summer survey (June 2005), the water quality samples were collected from (a) Americano Creek at Canfield Bridge, at the upstream corner of the property and upstream of the Roblar Landfill, (b) Americano Creek at Roblar Road upstream of the Ranch Tributary confluence and downstream of the landfill and the Dunham fault, (c) the Ranch Tributary above the confluence with Americano Creek, and (d) the spring box in the Center Swale. Water samples collected from these locations in June 2005 represent baseflow in the creeks and tributaries and therefore, are representative of the groundwater in the site vicinity.

The June 2005 water samples were analyzed for general minerals as a means of assessing (or “fingerprinting”) the likely sources of water (i.e., shallow or deep groundwater, surface water) (see Appendix C-1). Each sample was analyzed for several parameters including specific conductance (a measure of water’s capacity to conduct electricity), temperature, hardness (combined concentration of calcium and magnesium), general minerals (i.e., bicarbonate, iron, sodium, potassium) and metals, including, boron, copper, silica and zinc.

The sample results were then analyzed based on the ionic signatures (the concentrations of general minerals), which were plotted to determine the relative differences between the water sample at each location. In general, the results indicated that water in Americano Creek was similar to shallow groundwater found in the Wilson Grove Formation (as evidenced by the composition of water from the spring box in the Center Swale) and the water in the Ranch Tributary was similar in ionic composition to deep groundwater, indicating that baseflow in the Ranch Tributary probably originates from a deeper groundwater source.

Groundwater Conditions at Roblar Landfill Property

Additional information regarding near-vicinity groundwater conditions was available through groundwater data collected at the adjacent Roblar Landfill property. In 1991, as part of its Solid Waste Water Quality Assessment Test (SWAT) for Roblar Landfill, the County installed three groundwater monitoring wells (R-1, R-2 and R-3) on the landfill property.

Subsurface exploration completed at the Roblar Landfill as part of the SWAT determined that groundwater resides in three different geologic zones. Monitoring Well R-1, located near Roblar Road, northwest of the landfill’s lowest waste cell (north side of the landfill), is 28 feet deep and extends vertically through a shallow sandy deposit. This unit may be an ancient stream channel, which cut through the Wilson Grove Formation. R-2, located south of the landfill’s uppermost waste cell (southern portion of the landfill site) is 46 feet deep and extends through sandy silt (Wilson Grove Formation) to 26 feet and to 46 feet in bedrock (Tolay Volcanics). It appears that groundwater occurs in the fractured bedrock (Kleinfelder, Inc., 1992). Monitoring Well R-3, located north of the landfill’s lowest waste cell (northeast corner of landfill site), is 46 feet deep

and extends 36.5 feet through a siltstone unit, which, based on reported presence of marine fossils, appears to be the Wilson Grove Formation.

Interpretation of the geologic data gathered in 1991, when the monitoring wells were drilled and installed, indicates the subsurface water beneath the landfill resides primarily in the Wilson Grove Formation above the Tolay Volcanics and the Franciscan Complex bedrock. Recent groundwater monitoring on the Roblar Landfill property by AGE in 2007/08 also verifies that groundwater predominantly flows in a northwest direction across the landfill mimicking general hillslope topography at a gradient of 0.14 feet per foot (AGE, 2007c-d). This is generally consistent with previous groundwater flow and gradient measurements ranging between 0.08 and 0.14 feet per foot calculated by Pacific GeoScience during previous groundwater monitoring events at the landfill (Pacific GeoScience 2005e-g, 2006e, 2007e).¹⁵

The groundwater flow direction at the project site and the landfill property differ in that the flow direction at the project site is westerly while the direction at the landfill is more northerly. This variability of flow direction is due to the differences in the surface topography (the landfill slopes are oriented to the north while the project site is oriented to the west), because, as stated above, the flow direction of the groundwater mimics that of the overlying topography. The flow gradients at the landfill and project site are similar, and again, a function of the topography.

Please see Groundwater Monitoring, below, for a discussion of water quality monitoring program for, and results from, the landfill property wells.

Groundwater Monitoring

This section provides the available groundwater monitoring data for the project site as well as the adjacent Roblar Road landfill site. In January 2007, at the request of Sonoma County PRMD, the applicant installed three groundwater monitoring wells on the project site (MW-1, MW-2 and MW-3) and began a quarterly groundwater monitoring program of these wells, as well as the two existing on-site domestic wells (DW-1 and DW-2). This program was subsequently expanded to include, and be conducted in conjunction with, groundwater monitoring by the Sonoma County DPTW-IWD of the three monitoring wells on the landfill property (R-1, R-2 and R-3). The purpose of the groundwater monitoring program was to establish the existing baseline groundwater quality on the project site and vicinity, and to serve as an on-going program to evaluate potential changes in groundwater quality on the site and vicinity that could occur after project implementation.

The location of the three new groundwater monitoring wells on the project site (between the landfill property and the proposed quarry footprint; see Figure IV.C-4) was selected to provide representative project site boundary monitoring points, or “sentry wells” to monitor groundwater quality, and detect whether pollutants, if any, may be migrating from the adjacent Roblar Landfill property to the project site.

¹⁵ Groundwater flow gradients can vary with season and sometimes can vary due to the method of calculation.

The results of this monitoring program and other available monitoring data is described below.

Groundwater Monitoring at the Project Site

Groundwater monitoring data for the project site presented in this EIR were included in a well installation report and five quarterly monitoring reports completed by Advanced GeoEnvironmental, Inc. (AGE) (AGE, 2007b-c, 2008b-d). The monitoring reports document groundwater sampling and analysis for the three groundwater monitoring wells and two production wells from February, April, September and December, 2007; and March 2008¹⁶. The groundwater monitoring program includes sampling and analysis of groundwater for water chemistry (e.g. pH, alkalinity, hardness, and TDS), salts, organochlorine pesticides, PCBs, semi-volatile organic compounds (SVOCs), and trace metals. Water levels were also collected during each monitoring event to calculate the groundwater gradient (the results of which are presented under Groundwater Flow Direction and Gradient, above).

Laboratory analysis of samples collected at the project site in 2007/08 detected, in one or more quarterly monitoring events, low concentrations (i.e., at or slightly above the method detection limit) of volatile organic compounds (VOCs) as acetone (in MW-2, MW-3, and DW-2), chloromethane (in MW-1 and DW-1), chloroform (in DW-1), methyl ethyl ketone (MEK) (in MW-2 and MW-3), toluene (in MW-2 and DW-2) and 1,1,2 trichloroethane (TCA) (in MW-3).¹⁷ While the levels of each of these constituents were at or slightly over the laboratory method detection limits, in all cases they were below the applicable state and federal water quality objectives for drinking water.¹⁸ The source of the detected contaminants is not established, however, potential sources could include cross-contamination during well construction, contamination during sampling laboratory analysis, and/or existing water quality conditions.

Laboratory analysis of the groundwater samples did not detect organochlorine pesticides, PCBs, or SVOCs, and concentrations of metals were indicative of naturally-occurring levels in groundwater considering the local geology and groundwater system.

With the exception of well MW-2, other constituents and groundwater parameters, such as pH, TDS, alkalinity were consistent through the four sampling events and were indicative of background groundwater quality in this region. Laboratory analysis of groundwater in MW-2 reported pH, specific conductance, alkalinity, and TDS at anomalously elevated levels, inconsistent with water quality parameters detected in the other on-site wells. The cause of this

¹⁶ It should be noted that production wells DW-1 and DW-2 were not sampled in the 2007 fourth quarter, as wet conditions prevented access.

¹⁷ *Acetone* is a widely used, highly volatile solvent. *Chloromethane*, also called methyl chloride, is a chemical compound once widely used as a refrigerant. *Chloroform* was once commonly used as a general anesthetic and as a flavoring agent in toothpastes, mouthwashes and cough syrups. *MEK* is a flammable solvent that has many industrial uses, primarily in the plastic industry. *MEK* is also used in the synthetic rubber industry, in the production of paraffin wax, and in household products such as lacquer and varnishes, paint remover, and glues. *Toluene* and *TCA* are toxic volatile organic compounds often used as an industrial solvent (DTSC, 2007).

¹⁸ The water quality objective used for acetone is the Reference Dose as a Drinking Water Level from the U.S. Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS). The water quality objectives used for chloromethane and MEK are the Suggested No-Adverse-Response Levels (SNARL) from the U.S. EPA Drinking Water Advisory. The water quality objectives used for chloroform, toluene and TCA are Primary Maximum Contaminant Levels for drinking water from the California Department of Health Services.

inconsistency in MW-2 is not verified, however, may be attributable to materials used during construction of the well.

Groundwater Monitoring at the Roblar Landfill Site

Groundwater beneath the adjacent Roblar Landfill property has been monitored by the County on several occasions to determine whether waste material present in the landfill cells has affected groundwater. The first sampling effort was conducted as part of a Solid Waste Water Quality Assessment Test (SWAT report) completed for the landfill (Kleinfelder, 1992). In addition, since November 2004, the Sonoma County DTPW-IWD has voluntarily conducted groundwater monitoring at the landfill property, and submitted the results to the RWQCB (Pacific GeoScience 2005e-g, 2006e, 2007e). Also, as previously discussed, beginning in 2007, quarterly monitoring of the landfill property was included in the on-going groundwater monitoring effort for the proposed project and completed by the applicant (AGE, 2007b-c, 2008b-d).

The 1991 Roblar Landfill SWAT monitoring program for the Roblar Landfill focused on potential migration pathways for surface water and groundwater.¹⁹ Required work under the SWAT included installation of three monitoring wells (Wells R-1, R-2, and R-3) and four subsequent rounds of sampling and chemical analysis for halogenated and volatile organic compounds, pesticides, PCBs, metals, and general chemistry parameters (i.e. pH, specific conductance and total dissolved solids). Two landfill surface water samples (LSW-1 and LSW-2) were also collected as part of the SWAT study.

The results of groundwater monitoring under the 1991 SWAT program showed that the only VOC detected was that of toluene in monitoring well R-1 at a concentration just slightly above the laboratory method detection limit. Toluene was not detected again in the subsequent sampling events under the SWAT. Laboratory analysis also detected trace amounts of the insecticide Endosulfan I in the landfill surface water sample.²⁰ Based on the groundwater and surface water sample results obtained through the SWAT sampling program, it was concluded in the SWAT report that “there has been little or no impact to water quality and the environment from past landfill operations, and there is no indication of leachate leaving the site boundaries” (Kleinfelder, Inc., 1992).

Recent groundwater monitoring at the Roblar Landfill property (2004 to 2008) confirmed the presence of a low, dissolved concentrations of cis-1,2-Dichloroethene (1,2 DCE) in monitoring well R-1.²¹ The low concentrations of 1,2 DCE has been consistently detected in Well R-1 since November 2004. The only other organic compound detected in the groundwater on the landfill

¹⁹ The SWAT report is required under California Assembly Bill (AB) 3525 (Calderon Bill) of 1984. AB 3525 established the SWAT program to evaluate inactive and active landfills in California. Each landfill is ranked by the California State Water Resources Control Board (SWRCB) based on its potential threat to water quality. The local RWQCB (in the case of Roblar Landfill, the North Coast Region) approved a SWAT work plan prior to commencement of the water quality investigation in 1992. The resulting SWAT report provided analytical results of the investigations and provides recommendations and conclusions.

²⁰ *Endosulfan I* is an insecticide used on vegetable crops, fruits and nuts (DTSC, 2007)

²¹ *1,2 Dichloromethane* (1,2 DCE) is a common volatile organic compound found in a variety of chemical cleaning products such as paint thinner.

property was vinyl chloride in Well R-1 in a number of samples between 2005 and 2008.²² While the levels of each of these constituents were at or slightly over the laboratory method detection limits, in all cases they were below the applicable state and federal water quality objectives for drinking water²³.

Leachate Testing at Roblar Landfill Property

Since the closed Roblar Landfill is unlined, leachate is routinely removed from the landfill via an on-site leachate collection system, and transported to the Santa Rosa Treatment Plant.²⁴ The on-site leachate collection system consists of a network of gravity drains installed within the landfill that routes leachate to storage tanks. Leachate is collected from the lowest pad in three French drains within extent of approximately 1,100 linear feet. Leachate enters the drains via gravity and drains to two collection sumps, where it is then pumped into two storage tanks with a combined storage capacity of 40,000 gallons.

Prior to its removal from the site, the leachate is tested to ensure that it does not contain chemical constituents or metals at levels that could overwhelm the treatment plant or otherwise expose workers and the public to hazardous materials. A sample of the leachate is analyzed annually for VOCs and SVOCs, 19 metals, biological oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), total kjedahl nitrogen (TKN), and total settleable solids (TSS). Leachate testing reports for 2002 through 2007 were reviewed for this EIR (Pacific GeoScience, 2002, 2003b, 2004e, 2005h, 2006f, and 2007f).

SVOCs, VOCs, and arsenic have been detected at low concentrations (i.e., at or slightly above the laboratory method detection limit) in the leachate collected from the landfill. TSS are generally high, typical of a leachate and TDS ranges between 600 mg/L and 700 mg/L. Acetone was detected at low concentrations in 2002, 2003 and 2004 sampling events. The VOC chlorobenzene was detected at a low concentration in the 2005 sampling event, and the VOC 1,1 Dichloroethane was detected at a low concentration in the 2006 sampling event.²⁵ The pesticide 4,4 DDE was detected at a low concentration in the 2007 sampling event.

The leachate testing reports reviewed for this EIR indicate that the leachate does not contain chemical constituents at levels considered hazardous waste under Title 22 of the California Code of Regulations.

²² *Vinyl Chloride* is often associated with DCE because vinyl chloride is a breakdown product of 1,2 DCE.

²³ The water quality objective used for 1,2 DCE and vinyl chloride are Primary Maximum Contaminant Levels for drinking water from the California Department of Health Services.

²⁴ "Leachate" means any liquid formed by the drainage of liquids from waste or by the percolation or flow of liquid through waste. It includes any constituents extracted from the waste and dissolved or suspended in the fluid. The term ceases to apply to such liquid upon its being treated to the extent that it no longer contains any constituent of concern whose concentration exceeds the water quality objectives of ground water in the uppermost aquifer underlying the waste management unit (CCR Title 27, Section 20164).

²⁵ *Chlorobenzene* and *1,1 Dichloroethane* are volatile organic compounds that are often used as a solvent and in the production of other chemicals.

Regulatory Framework

Regulatory authorities exist on both the state and federal levels for the control of water quality in California. The major federal legislation governing the water quality aspects of the project is the Clean Water Act, as amended by the Water Quality Act of 1987. The objective of the act is “to restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” The State of California’s Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California. The SWRCB administers water rights, water pollution control, and water quality functions throughout the state, while the RWQCBs conduct planning, permitting, and enforcement activities.

Federal

Clean Water Act

Under the Clean Water Act (CWA) of 1977, the U.S. Environmental Protection Agency (EPA) seeks to restore and maintain the chemical, physical, and biological integrity of the nation’s waters. The statute employs a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. The CWA authorizes the EPA to implement water quality regulations. The National Pollutant Discharge Elimination System (NPDES) permit program under section 402(p) of the CWA controls water pollution by regulating stormwater discharges into the waters of the U.S. California has an approved state NPDES program. The EPA has delegated authority for water permitting to the SWRCB, which has nine regional boards. The North Coast RWQCB regulates water quality in the project area.

Total Maximum Daily Load

Section 303(d) of the CWA requires that each state identify water bodies or segments of water bodies that are “impaired” (i.e., not meeting one or more of the water quality standards established by the state). These waters are identified in the Section 303(d) list as waters that are polluted and need further attention to support their beneficial uses. Once the water body or segment is listed, the state is required to establish Total Maximum Daily Load (TMDL) for the pollutant causing the conditions of impairment. TMDL is the maximum amount of a pollutant that a water body can receive and still meet water quality standards. Typically, TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The intent of the 303(d) list is to identify water bodies that require future development of a TMDL to maintain water quality. In accordance with Section 303(d), the RWQCB has identified impaired water bodies within its jurisdiction, and the pollutant or stressor responsible for impairing the water quality. Estero Americano is listed as a medium priority for TMDL listing for nutrients and a low TMDL priority for sediment. Americano Creek is considered a low priority for TMDL listing for nutrients.

Waste Discharge Requirements

Section 401 of the CWA requires a permit for every applicant of a federal permit or license for an activity that may result in a discharge of pollutants to the waters of the U.S. (including permits under section 404 of the CWA, see Section IV.I, Biological Resources). The purpose of the

permit application is to obtain certification that the proposed activity will comply with the state water quality standards (RWQCB, 2003b).

State and Regional Water Quality Control Board

The primary responsibility for the protection and enhancement of water quality in California has been assigned by the California legislature to the SWRCB and the nine RWQCBs. The SWRCB provides state-level coordination of the water quality control program by establishing statewide policies and plans for the implementation of state and federal laws and regulations. The RWQCBs adopt and implement water quality control plans (basin plans) that recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act allows the SWRCB to adopt statewide water quality control plans or basin plans. The purpose of the plans is to establish water quality objectives for specific water bodies. The RWQCB has prepared the *North Coast Water Quality Control Plan* (Basin Plan) (1995) that establishes water quality objectives and implementation programs to meet the stated objectives and to protect the beneficial uses of the Bay waters (see regional regulatory discussion below). The act also authorizes the NPDES program under the CWA, which establishes effluent limitations and water quality requirements for discharges to waters of the state. Most of the implementation of SWRCB's responsibilities is delegated to the nine regional boards. Under the NPDES program, the RWQCB has established permit requirements for stormwater runoff for the project area (see Regional discussion below).

Regional

The North Coast RWQCB is responsible for the protection of beneficial uses and the water quality of water resources within the North Coast region of California. The North Coast RWQCB has set water quality objectives for all surface waters in the region. Of particular importance to the proposed project is the Basin Plan (discussed below) turbidity standard (since quarries are known sediment producers), which states "turbidity shall not be increased more than 20 percent above naturally occurring background levels" (RWQCB, 2001). Water quality objectives are also set for groundwater with respect to bacteria, organic and inorganic chemical constituents, radioactivity, and taste and odor. The RWQCB administers the NPDES stormwater permitting program and regulates stormwater discharges. The RWQCB also issues 401 certifications for projects that require Section 404 permit from the U.S. Army Corps of Engineers (USACE). The regulatory requirements under the RWQCB are discussed below.

Basin Plan

The RWQCB prepared the Basin Plan for the North Coast region that contains descriptions of the legal, technical, and programmatic bases of water quality regulation in the region. Water quality control plans (Basin Plans) provide the basis for protecting water quality in California. Basin Plans are mandated by both the Federal Clean Water Act (CWA) and the State Porter-Cologne Water Quality Act (Porter-Cologne). The goal of the Basin Plan is to provide a definitive program

of actions designed to preserve and enhance water quality and to protect beneficial uses of water in the North Coast Region. The Basin Plan is comprehensive in scope and includes the following:

- Descriptions of the resources and beneficial uses to be protected
- Water quality objectives that have been established for the protection of those uses
- Implementation plans and control strategies to achieve the water quality objectives
- Descriptions of statewide plans and policies that apply to the waters of the North Coast Region
- Descriptions of the North Coast Region's surveillance and monitoring activities.

The Basin Plan is used as a regulatory tool by the Regional Water Board's technical staff. RWQCB orders cite the Basin Plan's water quality standards and prohibitions applicable to a particular discharge. The Basin Plan is also used by other agencies in their permitting and resource management activities. It also serves as an educational and reference document for dischargers and members of the public.

Beneficial uses of surface waters are described in the Basin Plan and are designated for major surface waters and their tributaries. The beneficial uses listed for the Estero Americano Hydrologic area include: municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply, groundwater recharge, navigation, hydropower generation, recreation, commercial and sport fishing, cold freshwater habitat, wildlife habitat, rare species, marine habitat, fish migration, fish spawning, and estuarine habitat.

Industrial Activity Permitting

Mining activities at the project site are subject to the requirements of the NPDES General Permit for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities (referred to hereafter as the General Permit). The General Permit, which is administered by the RWQCB, regulates discharges from certain types of industrial facilities, including mining operations. The General Permit requires regulated facilities to (among other things):

- Prepare and maintain a Stormwater Pollution Prevention Plan;
- Implement storm water best management practices to minimize discharge of pollutants in runoff;
- Conduct regular inspections of the facility, during both wet and dry weather;
- Collect and analyze samples of runoff at least twice per year from each discharge location; and
- Prepare and submit annual reports on storm water management activities.

California Surface Mining and Reclamation Act of 1975

The Surface Mining and Reclamation Act of 1975 (SMARA), as amended, provides guidelines for mineral extraction designed to prevent or minimize the negative public health, property, and environmental impacts associated with surface mining. As related to hydrologic and water quality issues, the process of reclamation includes maintaining water quality, and minimizing flooding and erosion damage to wildlife and aquatic habitats caused by surface mining. The requirements of the Act apply to any surface mining operations that disturb more than one acre or remove more than 1,000 cubic yards of material. Therefore, the proposed Roblar Road Quarry is subject to the requirements of SMARA.

Sonoma County Ordinances, Local Plans, and Policies

Sonoma County Surface Mining and Reclamation Ordinance

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. The following sections from the ordinance are applicable to the proposed project:

Sec. 26A-09-010. General standards for Mining Permit and Operations

- (d) *Stormwater Runoff, Flood Control and Water Quality.* All operations shall manage earthwork and processing activities in such a manner as to minimize: ponding or accumulation of storm water not necessary for silt control, alterations to the natural drainage system, and siltation of adjacent or downstream watercourses.
- (1) All operations shall incorporate the “best management practices” into the storm water pollution prevention plan required by the RWQCB.
 - (2) Operations along stream channels shall obtain the appropriate permits and comply with the requirements of this code, including Ordinance 3836R, the Sonoma County Water Agency, the Regional Water Quality Control Board, the California Department of Fish and Game (CDFG), the State Lands Commission, and/or the Army Corps of Engineers as applicable. Any of the drainage alterations, ponding or filling activities listed below shall be expressly prohibited unless approved by the applicable agencies before commencing operations.
 - (i) Impair or impede or obstruct the natural flow of storm waters, or other water running in a defined channel, natural or man-made, or cause or permit the obstruction of any such channel or easement dedicated for drainage purposes.
 - (ii) Deposit any material in such channel.
 - (iii) Alter the surface of land so as to reduce the capacity of such channel.
 - (iv) Construct, alter, or repair any storm water drainage structure, facility or channel without first obtaining a permit therefore, as herein provided.

- (v) Place any material along the sides of any defined channel or so close to the side of said channel as to cause such material to be carried away by flood waters passing through such channel.
 - (vi) Construct any structure within one hundred feet (100') of the top of any embankment, natural or man-made which defines a channel, except where the flood hazard has been found to be remote in the view of the Sonoma County water agency.
 - (vii) Deposit any material, which contains paper, bottles, cans, lumber, garbage, organic matter, or other material which will not readily become an integral part of said channel side.
 - (viii) Deposit car bodies, concrete or asphalt construction rubble or any unsightly material on the top or sides of any embankment, natural or manmade which defines a channel.
- (e) *Water Quality.* In order to avoid and prevent contamination or degradation of surface or ground waters, all operations shall comply with the following standards:
- (1) Any waters discharged from the site to adjacent lands, streams, or bodies of water or to any groundwater body shall meet all applicable water quality standards of the Regional Water Quality Control Board and any other agency with authority over such discharges. Records of any water quality monitoring conducted in conjunction with the requirements of such agency or agencies shall be made available to the director on request. Discharges of sediment laden water to designated on-site settling ponds, desilting basins in or reclamation areas shall not be deemed to be in violation of this part solely on the basis of sediment content;
 - (2) Excavations which may penetrate near or into usable water bearing strata shall not subject such groundwater basin or subbasin to pollution or contamination.
- (g) *Erosion and Sedimentation.*
- (1) During the period mining operations are being conducted, and prior to final reclamation of mined lands, measures shall be taken to prevent erosion of adjacent lands from waters discharged from the site of mining operations or the offsite discharge of sediment. In addition, the mining operator shall be responsible for, and take whatever steps are necessary to prevent the erosion of lands adjacent to the district boundary into the excavated area. Such measures may include the construction of properly designed retarding basins, settling ponds and other water treatment facilities, ditches, diking and revegetation of slopes. Settling ponds and other water treatment facilities shall be located and managed so that accumulated sediment will not enter any stream or groundwater body unless such discharge is in accordance with the storm water pollution prevention plan (SWPPP) and best management practices (BMP's) approved by the RWQCB pursuant to subsection (d) of this section.
 - (2) Sediment basins, settling ponds, ditches, levees, dikes, culverts and other structures as well as erosion control and streambank protection measures shall be sized and designed by a civil engineer in accordance with standards set forth in the most current "flood control design criteria" manual published by the Sonoma County water agency and otherwise in accordance with acceptable engineering practices and any subsequent local, state, or federal regulations or revisions. An erosion and sediment control plan, including supporting calculations and diagrams, shall be prepared by a civil engineer or certified erosion and sediment control specialist and submitted for

review with new mining or reclamation applications. Erosion and sediment control plans shall be designed in accordance with the most current "Erosion and Sediment Field Manual" published by the Regional Water Quality Control Board.

- (3) Grades in areas being mined shall be maintained so as to avoid accumulations of water that could serve as breeding areas for mosquitoes or as sites of fish entrapment.

Sec. 26A-09-040. Quarry Mining Standards

- (f) *Water Supply.* All quarry sites must have adequate water supplies to support the operation. Sites located in Sonoma County Water Availability Zones III and IV will require analysis of the proposed water use, evaluation of the adequacy of the water supply, and mitigation of effects on water resources and nearby water users. Quarry operators may be required to monitor, survey, or report on depth and grades of excavation, groundwater levels, water use, revegetation and other subjects.
- (g) *Erosion and Sediment Control.* Drainage plans and facilities must minimize slope erosion and off-site sedimentation.

Sec. 26A-11-010. Reclamation Plan Requirements

- d) *Reclamation Plan Standards.* Properties used for surface mining shall be reclaimed after the operation or an approved phase of the operation has been completed in accordance with the following standards:
 - (6) *Drainage, Erosion and Sediment Control.*
 - (i) Grading plans shall be designed and carried out to minimize erosion, provide for drainage to natural outlets or interior basins designed for water storage, and to eliminate potholes and similar catchments that could serve as breeding areas for mosquitoes, sites of fish entrapment, or threats to public safety.
 - (ii) Silt basins which will store water during periods of surface runoff shall be equipped with sediment control and removal facilities and protected spillways designed to minimize erosion when such basins have outlet to lower ground.
 - (iii) Sediments accumulated in any detention basin, pond, or other facility shall be periodically removed. Such removal shall take place at least once within fourteen (14) days of and no later than November 1st of each year.
 - (iv) Final grading and drainage shall be designed in a manner to prevent discharge of sediment above natural levels existent prior to mining operations.
 - (v) Upon reclamation, no condition shall remain which will or could lead to the degradation of water quality below applicable standards of the regional water quality control board or any other agency with authority over water quality.
 - (vi) Measures undertaken for slope protection, erosion and sediment control, shall conform to the requirements of Sections, 26A-09-010 (d), (e) and (g).
 - (vii) Overburden, waste mud, silt, and other sediments generated by the mining operation shall be stored in such a manner that allows their recovery for use in reclamation.
 - (viii) Levees and other bank protection measures shall conform to the standards of the Sonoma County water agency consistent with the requirements of Section 26A-090-010(g). Plans for the maintenance of such measures or structures shall be included in the reclamation plan;

General Plan

The following policies from the Resource Conservation and Public Safety Elements of the Sonoma County General Plan are relevant to the project site and/or proposed project:

Prevention of Soil Erosion

RC-2b: Include erosion control measures for any discretionary project involving construction or grading near waterways or on lands with slopes over 10 percent.

RC-2d: Require a soil conservation program to reduce soil erosion impacts for discretionary projects which could increase waterway or hillside erosion. Design improvements such as roads and driveways to retain natural vegetation and topography to the extent feasible.

RC-2e: Retain natural vegetation and topography to the extent economically feasible for any discretionary project improvements near waterways or in areas with a high risk of erosion as noted in the Sonoma County Soil Survey.

RC-2g: Continue to enforce the Uniform Building Code to reduce erosion and slope instability problems.

Water Resources

RC-3a: Grading, filling and construction should not substantially reduce or divert any stream flow that would affect groundwater recharge.

RC-3b: Require groundwater monitoring programs for all large scale commercial and industrial uses using wells.

RC-3c: Continue to encourage research on and monitoring of local groundwater, watersheds, streams, and aquifer recharge areas in order to determine their water supply value.

RC-3e: Encourage wastewater disposal methods which minimize reliance on discharges into natural waterways. If discharge is proposed, review and comment on projects and environmental documents and request that projects maximize reclamation, conservation and reuse programs to minimize discharges and protect water quality and aquifer recharge areas.

RC-3h: Require proof of adequate groundwater in Class III and IV water areas. Require test wells or the establishment of community water systems in Class IV water areas. . . Deny discretionary applications unless a geologic report establishes that groundwater supplies are adequate and will not be adversely impacted by the cumulative amount of additional development.

Reduction of Potential Damage from Flooding

PS-2c: Base land use planning and development review on FEMA maps and data or parcel specific scaled interpretations of these maps and site specific elevation data.

Mineral Resources

RC-11b: Review projects for environmental impact and land use conflicts and consider the following minimum factors when approving mining permits: topsoil salvage,

vegetation, fisheries and wildlife impacts, noise, erosion control, roadway conditions and capacities, reclamation and bonding, air quality, energy consumption, engineering and geological surveys, aggregate supply and replenishment, drainage, and the need for economical aggregate materials.

Petaluma Dairy Belt Area Plan

The Petaluma Dairy Belt Area Plan was adopted in 1985, and revised in 1993. The Petaluma Dairy Belt area is located in south and southwestern Sonoma County, along the Marin County border. Area plan goals and policies as they relate to hydrology and water quality that are pertinent to the proposed project and project site include the following:

Water-Quality Protection

1. It shall be the goal of this Area Plan to safeguard and maintain a high quality of water.
 - a. Maintain or enhance water quality to allow continued environmental health of natural waterway habitats.

Groundwater

1. It shall be the goal of this Area Plan to maintain the quality of groundwater resources.

Water Resources

1. It shall be the goal of this Area Plan to conserve, use, protect, and maintain water resources that are essential to the continued availability of other resources.
 - a. Give high priority to the protection of watersheds, aquifer recharge areas, and natural drainage systems in any consideration of land use.
2. It shall be the goal of this Area Plan to safeguard and maintain water quality and waterways.

Draft Sonoma County General Plan 2020

Sonoma County is in the process of updating its existing General Plan. While the existing adopted Sonoma County General Plan (1989, as amended) is the current governing general plan, relevant policies from the draft *Sonoma County General Plan 2020* are presented below for informational purposes.

The following new land use and water resource element goals and policies identified in the Draft Sonoma County General Plan 2020 would also be relevant to the proposed project. Note: These are draft policies recommended by the Citizens Advisory Council (CAC) as amended by the Planning Commission. As of publication of this Draft EIR, the Sonoma County Board of Supervisors has not yet completed their deliberations or finalized these policies.

Goal LU-8: Ensure that Sonoma County's water resources are protected on a sustainable yield basis which avoids long-term declines in available surface and groundwater resources or water quality.

Policy LU-8a: Require that new development, to the maximum extent practicable, comply with applicable waste discharge requirements and avoid pollution of storm water, surface water and groundwater.

Goal WR-1: Protect, restore and enhance the quality of surface and groundwater resources to meet the needs of all beneficial uses.

Objective WR-1.3: Establish development standards to maximize retention of runoff and regulate development to avoid, to the maximum extent practicable, pollution of storm water, water bodies and groundwater.

Objective WR-1.4: Encourage new groundwater recharge opportunities and protect existing groundwater recharge areas

Policy WR-1g: Minimize deposition and discharge of sediment, debris, waste and other pollutants into surface runoff, drainage systems, surface water bodies, and groundwater.

Policy WR-1h: Continue to require grading plans to include measures to avoid soil erosion and consider upgrading requirements as needed to avoid sedimentation in storm water to the maximum extent practicable.

Policy WR-1p: Require new development projects to evaluate and consider naturally-occurring and human caused contaminants in groundwater.

Aggregate Resources Management Plan

The main objective of the Aggregate Resource Management Plan (1994) was “to increase quarry production to provide a full range of uses and replace terrace sources as the primary supply for future construction aggregate and to facilitate the expansion of existing quarry operations in a manner that can meet the needs for aggregate in an environmentally sound manner.” It was thought that, in general, fewer environmental impacts would be associated with aggregate production at upland quarries. The ARM Plan states the following with regard to upland quarries:

“Drainage plans and facilities must minimize slope erosion and off-site sedimentation” (page 7-10).

“The minimum allowed setback for quarry mining operations from streambanks and critical habitat areas designated in the General Plan is 100 feet” (page 7-10).

The ARM Plan did not focus on potential hydrologic impacts associated with upland quarries. The ARM Plan states that “quarries are not expected to result in significant hydrologic impacts, primarily because of their occurrence in upland areas, away from river courses and heavy water flows” (page 8.3-1).

A discussion of objectives contained in the ARM Plan that are relevant to the proposed project are presented in Section IV.A, Land Use, Planning and Agricultural Resources.

Impacts and Mitigation Measures

The following section focuses on potential project impacts related to surface water, groundwater and water quality. The evaluation considered current conditions at the project site, proposed project plans, and applicable regulations and guidelines.

Significance Criteria

The significance criteria for this hydrologic and water quality impact analysis are adapted from the CEQA *Guidelines*, Appendix G. Based on the guidelines, hydrologic impacts resulting from the proposed mining operations and/or future reclamation would be considered significant if the project would result in any of the following hydrologic conditions.

- Violate any water quality standards or waste discharge requirements;
- 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 land uses or planned uses for which permits have been granted);
- 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 that would result in substantial erosion or siltation on or off the site;
- 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 a manner that would result in flooding on or off the site;
- Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems;
- Otherwise substantially degrade water quality;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of failure of a levee or a dam; or
- Result in inundation by seiche, tsunami, or mudflow.

Due to the location and characteristics of the proposed quarry site, certain hydrologic conditions are not associated with the project and therefore, are not considered potential impacts. These hydrologic conditions are addressed briefly below but are not discussed further in this document.

100-Year Flood Zone. The proposed quarry site is located at approximately 250 feet above msl (150 feet above Roblar Road and Americano Creek) and therefore not located within a 100-year flood zone of Americano Creek. Proposed structures and ancillary equipment for the quarry operation would not be sited within the 100-year flood zone.

Seiche, Tsunami, or Mudflow. There are no large open bodies of water near the project site, and therefore, the site is not susceptible to damage from seiche activity. The project site is more than ten miles from the Pacific Ocean, and therefore is not susceptible to coastal hazards (tsunami, extreme high tides, or sea level rise). The project site is not in the mapped inundation hazard area. The potential for slope instability, including mudflows, is addressed in the IV.B, Geology, Soils and Seismicity section of this EIR.

Project Impacts

Impact C.1: The removal of Wilson Grove overburden material and exposure of bedrock would increase the amount of stormwater runoff leaving the site and increase peak flows in Ranch Tributary and Americano Creek. The additional flows caused by the project could lead to downstream flooding and excessive bank erosion. This would be a potentially significant impact.

Removal of topsoil and Wilson Grove Formation overburden material as part of the quarrying process would reduce the surface water infiltration and storage capacity and expose semi-impervious to impervious bedrock surfaces. The reduction of infiltration and proposed stormwater routing through engineered drainage facilities would result in higher stormwater flows leaving the site and larger peak runoff periods in Ranch Tributary and Americano Creek. Without stormwater management facilities with adequate capacity, there is the potential that storm water runoff from the quarry site would increase, causing downstream flooding and stream bank instability in Ranch Tributary and Americano Creek during large to very large storm events (those with recurrence intervals of 10-, 25-, 50-, or 100- year).²⁶ Increased storm flows capable of causing localized flooding and damaging streambank erosion do not typically occur during the normal rainstorms (2-year and 5-year storms).

The project's proposed storm drainage plan, designed for the proposed quarry by the applicant's engineer (CSW/Stuber-Stroeh Group, Inc.), is discussed and illustrated in Chapter III, Project Description. The drainage system was designed to accommodate peak storm flows generated during a 25-year return storm and includes storm flow capture and conveyance facilities to collect flows from outside the mining area and from within the active quarry. According to the applicant's engineer, the proposed overflow structures for the drainage system and sediment pond shall be designed to ensure stability and reduce flood damage during temporary overtopping during a larger 50- or 100-year event.

A perimeter drainage swale would intercept and collect all storm flows generated outside the mining limits on the project site, and route the flows to the Ranch Tributary. The exception to this would be storm flows collected within the proposed vehicle access road; flows generated on the access road would be collected through a drainage ditch installed along the road and routed directly to a discharge point in Americano Creek. Impact C-2, below addresses potential water quality issues associated with the access road drainage. The perimeter drainage swales would be

²⁶ A 10-year storm has a 10 percent chance of occurring in a single year, a 25-year storm has a 4 percent chance of recurrence, a 50-year storm has a 2 percent chance of occurring and a 100-year storm has a 1 percent chance.

lined with grass and/or rip rap and set back a minimum 5-foot horizontal distance from the outer edge of the mine. Rip rap would also be added to the banks of the natural drainage which would accept the storm water in order to spread and dissipate energy from this discharge and decrease the potential of stream bank instability at the point of discharge.

Storm water on the quarry slopes within the mining area would be collected by storm drain pipes installed on the quarry benches, which would route flows to the quarry floor, and hence west to a proposed sediment pond (see Impact C.2, below, for additional information on proposed sediment control features). Natural seepage from the walls of the quarry would also contribute to the amount of surface water flows during the winter months. Impact C.3, below, discusses potential additional water impacts that would need to be managed on site as a result of seepage. The majority of the floor of the quarry would be graded to allow drainage collected within the mining area to flow out of the quarry towards the proposed sediment pond. However, portions of the quarry floor would be reverse graded (towards the mining face) to provide additional areas within the quarry for storm water and sediment control and storage during peak storm events.

The proposed sediment pond was designed primarily as a water quality control structure intended to reduce sediment prior to discharge, and not designed to manage and contain flows from large storms (i.e., 50 and 100-year events). As a result, excessive runoff from the site during large storm events could exceed storage capacity within the proposed sediment pond and additional storage area within the quarry floor, resulting in overflow to the Ranch Tributary and potential downstream flooding in Americano Creek (along Roblar Road) and erosion problems within Americano Creek and Ranch Tributary. This would be considered a potentially significant impact. Mitigation Measure C.1a through c, below, would ensure that potential adverse effects related to flooding would be reduced to a less than significant impact.

Mitigation Measure C.1a: At project approval, the applicant shall implement a baseline flow and creek stage monitoring program for the Ranch Tributary and Americano Creek. This program shall continue the flow monitoring program currently underway through the project duration, and as determined by the County, through post-reclamation. The required monitoring program should include two locations of Ranch Tributary (representative of upstream and downstream conditions) and three representative locations on Americano Creek (i.e., upstream location at east property boundary, and locations upstream and downstream of Ranch Tributary). Flow and creek stage monitoring shall be conducted quarterly and following winter storm events. The applicant shall apply the data to design of stormwater discharge facilities to ensure that stormwater discharges from the site do not exceed pre-project flows in Ranch Tributary and Americano Creek. Flow and creek stage data shall also be used to determine discharge rates and shall be compiled for use in obtaining the necessary NPDES discharge permits. The Applicant shall submit baseline flow monitoring data to the Sonoma County Water Agency and Sonoma County PRMD.

Mitigation Measure C.1b: The applicant shall prepare, for review and approval by the Sonoma County PRMD, a drainage plan that addresses stormwater runoff from the proposed quarry during active mining and post reclamation. The stormwater drainage plan must ensure that the peak stormwater and seasonal non-stormwater flows are managed to the extent that stormwater flow entering Americano Creek and Ranch Tributary from the project site does not exceed pre-project baseline flows during the 2-, 10-, 25-, 50- and 100-

year storm events. The drainage plan shall include specific design criteria that ensure 1) the proposed sediment ponds operate as a stormwater runoff detention feature with the capacity to contain and manage at least a 25-year return storm and 2) alternative on-site stormwater detention strategies are implemented to ensure that stormwater flows are adequately detained so discharges to Americano Creek and Ranch Tributary do not exceed baseline discharge rates. Alternative detention strategies could include alternate detention basins, expanded use of the quarry floor for detention, or expanded use of infiltration areas for percolation and storage. The drainage plan and accompanying design calculations shall demonstrate that on-going and post-reclamation discharges to Americano Creek and Ranch Tributary would not exceed baseline discharge levels.

Mitigation Measure C.1c: All on-site drainage facilities shall be constructed according to Sonoma County Water Agency's Flood Control Design Criteria and the Sonoma County PRMD standards and requirements, and shall be operated and maintained in accordance with the prepared drainage plan during operation of the quarry and post-reclamation.

Significance after Mitigation: Implementation of Mitigation Measures C-1a through C-1c would ensure that stormwater is detained on the site and adequately discharged to avoid downstream flooding and excessive bank instability during storm events. After mitigation, the potential for flooding and/or excessive downstream bank erosion would be less than significant.

Impact C.2: During initial construction grading and operation of the proposed project, disturbed and unprotected soil could erode from contact with wind and water causing an increased amount of sediment and other pollutants to be carried downstream through the drainage system. This could contribute to the existing sediment loads in Ranch Tributary, Americano Creek, and Estero Americano. This would be a potentially significant impact.

The proposed project would involve grading, excavation, and earthmoving activities which could subject soil, either stockpiled or otherwise exposed, to erosion by wind and water. Once dislodged by surface flow, soil particles become entrained in stormwater runoff and if not properly controlled, the sediment-laden runoff can be discharged to the Ranch Tributary, Americano Creek, and ultimately to Estero Americano. Americano Creek and Estero Americano were listed in 1998 as impaired water bodies under Section 303(d) of the Clean Water Act due to, among other pollutants, nutrients and sediment. Additional sediment input to the Americano Creek system from the proposed project could increase the sediment load and contribute to degradation of downstream water quality. Particular construction and operational activities most likely to cause the sediment to enter the waterways include initial development of the various project features (e.g., access road, sedimentation pond, parking area), and on-going quarrying activities, including topsoil and overburden removal, transporting and storage of materials, and aggregate processing. In addition to sediment, other contaminants, such as grease, oil, or diesel fuel can enter the adjacent receiving waters if released during quarry operations. These compounds become attached to the sediment and are carried by stormwater runoff until the sediment settles out.

The project's proposed storm drainage plan is discussed and illustrated in Chapter III, Project Description. The proposed sediment control pond would be constructed to capture sediment-laden water collected within the mining area and allow the sediment to settle out prior to discharge to the Ranch Tributary and eventually Americano Creek. The sediment pond would be sized such that the ratio of the surface area of the pond to the active mine area would be 1:20 (i.e., one acre for each 20 acres of future active mining area). This pond would be sized to manage a ten-year storm event, using design calculations from the RWQCB Erosion and Sediment Control Field Manual. The applicant would expand the sediment pond with each new mining phase to accommodate the increased mining area. Prior to discharge of the water, the applicant would be required to demonstrate, to the satisfaction of the Regional Water Quality Control Board, that the discharge meets turbidity and other water quality standards for receiving waters. Prior to each wet season, the applicant would remove sediment from the pond and the pond would be prepared to receive runoff and sediment for the next winter season.

Portions of the quarry floor would also be graded to provide additional areas within the quarry for sediment control during peak storm events. Additionally, since the toe of Stockpile Area B would be located within a small swale to the Ranch Tributary, the project includes construction of a small sedimentation pond downstream of the toe to minimize erosion and delivery of the stockpiled soil material into this swale. The downstream berm of the Stockpile B sediment pond would extend across the natural swale to ensure that the pond captures sediment from the stockpile before it enters Ranch Tributary.

Regulatory controls include provisions of the Sonoma County Surface Mining and Reclamation Ordinance (SMARO) (discussed above in *Regulatory Framework*), which requires the applicant to control stormwater runoff, manage quality of waters discharged to receiving waters and sediment (Section 26A-090-010), slope erosion and offsite sedimentation (Section 26A-09-040), and reclamation erosion and sediment control (Sec 26A-11-010). The applicant must also comply with the State Water Resources Control Board NPDES regulations for construction and industrial activities, which require preparation of the Storm Water Pollution Prevention Plan (SWPPP).

Although the regulatory provisions under SMARO would be instrumental in reducing sediment inputs to Americano Creek, there remains a potential that uncontrolled sediment discharges could occur from a project of this magnitude. Therefore, considering the large area of disturbance associated with the proposed quarry, the proximity of that disturbance to the Ranch Tributary and Americano Creek, and the current impaired state of the Americano Creek system due to sediment, sediment discharge from the project would be a potentially significant impact if not mitigated. The mitigation measures discussed below requires the applicant to develop and implement a formal program to protect water quality. The measures outlined in this program would ensure that the impacts associated with erosion and the eventual sediment delivery to Ranch Tributary and Americano Creek remain less than significant during operational life of the project and during post-reclamation.

Mitigation Measure C.2a: *Develop Water Quality Protection Program.* The applicant shall develop and implement a Water Quality Protection Program (WQPP) to control sediment and pollutant runoff from the quarry during its operational life and beyond

through post reclamation. All structural elements and processes shall be designed and approved by a professional civil engineer experienced in stormwater management and sediment control. The design shall meet the standards of the Sonoma County SMARO. All hydrologic and engineering calculations, including sediment trap efficiency, shall be submitted to the County for review and approval prior to commencement of project grading.

The WQPP consists of several elements, as discussed below, to control the source of sediment and the discharge of that sediment into the adjacent receiving waters of Americano Creek and Ranch Tributary.

Storm Water Pollution Prevention Plan (SWPPP). As required by the SWRCB (see Regulatory Framework section above), the applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP) that adequately addresses control and reduction of stormwater laden with sediment or other pollutants. The applicant shall submit a copy of the SWPPP to the County PRMD. The applicant shall comply with requirements set forth by the RWQCB in the SWPPP Program for annual reporting and water quality sampling, which typically includes annual reports and reports of failed best management practices (BMPs). The SWPPP shall be regularly updated as BMPs are updated and new BMPs are constructed and/or the quarry operation changes. The SWPPP shall be implemented during the initial stage of quarry construction and stay in effect through the completion of reclamation.

Aggressive Source Control. The WQPP shall outline and describe source control measures designed to prevent erosion. Specific measures, as cited below, shall be adapted from the most current edition of the *Stormwater Best Management Practice Handbook for Construction*, published by the California Stormwater Quality Association (CASQA). Equivalent measures deemed more effective by the North Coast RWQCB may be substituted.

- Reclamation or stabilization of all quarry slopes and the quarry floor (excluding the working/processing/stockpile/loading/access areas) shall be completed by October 1 of each year. Stabilization measures include hydraulic application of surface stabilizing compounds, hydroseeding, mulching, or other measures to prevent erosion. To insure accurate compliance with this condition, the applicant shall submit to the Sonoma County PRMD, a site plan or aerial photograph clearly depicting the extent of mining and reclamation on the site every five years during mining and reclamation and at the completion of reclamation;
- In areas not being actively mined, bare soil shall be protected from erosion with the application of hydraulic mulch or hydroseeded;
- In areas requiring temporary protection until a permanent vegetative cover can be established, bare soil shall be protected by the application of straw mulch, wood mulch, or mats;
- To the extent practical, benches should be back-sloped or provided with rock or straw bale checks so that sediment is trapped on the benches rather than washed into the sediment ponds; and
- Benches shall drain into adequately sized pipes or rock-lined channels that convey the runoff to the quarry floor. Outlets of pipes shall have appropriate energy dissipaters to prevent erosion at the outfall.

Sediment Retention Measures. The WQPP shall include specific measures to trap eroded sediment on site to prevent a discharge to receiving waters. Specific measures cited below shall be adapted from the most current edition of the CASQA Stormwater BMP handbook for construction. The applicant shall install sediment retention measures prior to winter (on or about October 15) or in areas receiving surface water runoff in the dry season (e.g. the areas receiving seepage from the quarry walls). Sediment retention measures shall be regularly inspected by quarry personnel and corrective action shall be conducted in the event that the measures fail. Inspection and performance of the sediment retention measures shall be included in the SWPPP and included in the required annual report. Equivalent measures deemed more effective by the North Coast RWQCB may be substituted.

- Silt fences, fiber rolls, and straw bale barriers shall be used on bare slopes not being actively mined to intercept and trap sediment carried by sheet flow;
- The program shall include a description of the construction method for the sediment ponds, including the design storm and spillways;
- The applicant shall design the proposed sediment ponds to the maximum size practical for the available space. The sediment pond shall include a forebay to trap coarse soil particles before the runoff enters the main sediment ponds. Recognizing that the sediment ponds may not be large enough to trap very fine particles such as clay, the design shall include supplemental treatment that can be used as needed to meet the water quality discharge criteria for this project. Supplemental treatment may be chemical treatment that promotes fine particle settlement, mechanical filters to remove fine particles, or other measures approved and required by the North Coast RWQCB for this particular project; and
- All runoff from actively mined or reclaimed areas shall be directed through the sediment pond. Stormwater may be released from the ponds between storm events so long as the water to be released meets the discharge requirements established for this project by the RWQCB.

Implement Contaminant-Control BMPs. The applicant shall implement BMPs to reduce the potential for discharge of contaminants to storm water runoff. These BMPs shall be designed by a civil engineer and the design engineer shall oversee BMP installation. To minimize the introduction of contaminants which may degrade the quality of water discharged from the site, the following measures shall be taken:

- Fueling and maintenance of all rubber-tired loading, grading and support equipment shall be prohibited within 100 feet of drainage ways. Fueling and maintenance activities associated with other less mobile equipment shall be conducted with proper safeguards to prevent hazardous material releases. All refueling and maintenance of mobile vehicles and equipment shall take place in a designated area with an impervious surface and berms to contain any potential spills;
- The site shall be controlled by maintaining security fencing and locking gates and posted trespass signs at all vehicular access points to the site to prevent unauthorized entry;
- Runoff from the access roads shall be captured and treated either in the main sediment pond or in a separated sediment retention pond located at the base of the access road. The sediment pond shall be designed and constructed to accommodate

runoff from the road during a 25-year design storm and be capable of reducing sediment load to not exceed pre-project baseline at the discharge point; and

- All chemical dust suppressants and slope stabilization chemicals or polymers, and sediment pond enhancement chemicals or polymers shall be EPA-approved and shall be used strictly according to the manufacturer's directions. An accurate accounting of the kinds and quantities of these materials used on the site shall be maintained by the operator.

Mitigation Measure C.2b: *Develop and Implement Stormwater Monitoring Program.*

The applicant shall collect representative samples from all stormwater discharge outfalls (at the location where the discharge leaves the sediment pond or where the discharge leaves the site) while discharges are occurring in compliance with the requirements of General Permit (No. CAS000001) for Discharges of Storm Water Associated with Industrial Activities. Unless specific water quality goals or waste discharge limits are established for the quarry by the RWQCB, discharges shall not exceed water quality objectives outlined in the North Coast RWQCB Basin Plan. Water sampling shall be conducted by a third-party consultant and water samples shall be submitted to a California-certified analytical laboratory for analysis. The Stormwater Monitoring Program required during the project shall be consistent with the pre-project baseline sampling and analysis effort that commenced in 2007. The monitoring program shall include:

- Collection of samples at upstream and downstream of the quarry outfalls in Ranch Tributary during discharges from the site (at the same frequency as described above);
- All of the semi-annual samples shall be analyzed for pH, TSS, turbidity, specific conductance, and total organic carbon (as required by the General Permit) and total and dissolved iron, manganese and petroleum, and oil and grease by a State-certified analytical laboratory (note that this sampling program shall be designed to coincide and work in concert with the water quality sampling required as part of Mitigation Measure C.4; and
- The surface water quality data shall be analyzed by a qualified professional for indications of exceedance of water quality benchmarks and/or changing conditions in water quality that could indicate a potential impact to water quality conditions in Ranch Tributary.

The applicant shall submit a monitoring report to the RWQCB with a copy submitted to the Sonoma County PRMD. Frequency of reporting shall be determined by the RWQCB but shall not be less frequent than twice each rainy season. The qualified water quality professional conducting the monitoring shall provide an analysis of the data and an evaluation of the overall effectiveness of the sediment control system. If the water quality objectives have been exceeded, the report shall include analysis as to the specific causes of the exceedances and recommended measures to bring the discharges into compliance.

Mitigation Measure C.2c: *Implement corrective measures to meet water quality objectives, if necessary.* Once mining is underway, if annual surface water monitoring indicates that discharges from the quarry exceeded the water quality objectives, the applicant shall propose changes to the sediment control program that will improve its performance sufficiently to meet the performance criteria. Corrective action may include, but is not limited to, additional source control BMPs, expansion of the existing detention

ponds, use of chemical flocculation, installation of mechanical filtration of the discharge, construction of extended wet ponds and/or treatment wetlands. The proposed changes shall be submitted to the RWQCB for comment, revised as needed to address their comments, and then implemented by the applicant. If the performance criteria are not met for two consecutive years, the County will confer with the applicant and the RWQCB and Sonoma County PRMD to determine whether further changes in the sediment control plan are likely to result in compliance. If suitable changes are not identified, then the County shall require the quarry to reduce production as needed to meet the performance criteria.

Mitigation Measure C.2d: *Maintain and repair storm damage to conveyance and water quality control systems, as necessary.* The applicant shall maintain procedures to ensure prompt identification and repair of damage to the drainage and water quality control systems, especially after large storm events. The applicant shall conduct routine inspection and maintenance of the stormwater and sediment control facilities. Stormwater drainage conveyance and outfalls shall be inspected monthly during the dry season and after each rain storm between October and March. If inspections reveal that stormwater conveyance of water quality control facilities (e.g. sediment ponds, energy dissipation structures) are damaged, corrective actions shall be implemented immediately. The applicant shall immediately report, to the Sonoma County PRMD, any storm-related drainage or sediment control system failure that results in discharge of sediment to Ranch Tributary or Americano Creek. The applicant shall submit a written report within 72 hours and describe the occurrence, corrective action, and observed performance of the corrective action.

Significance after Mitigation: Mitigation measures requiring implementation of the WQPP and Stormwater Monitoring Program, in addition to the implementation of corrective measures to maintain water quality objectives and timely repair and reporting of system damage, would ensure that impacts to surface water quality of Americano Creek and Ranch Tributary remain less than significant. The identified mitigation measures would reduce project pollutant loading to Ranch Tributary and Americano Creek to within regulatory discharge limits.

Impact C.3: Excavation of the proposed quarry could initiate groundwater seepage from the surrounding Wilson Grove Formation and/or the underlying fractured Tolay Volcanics. This condition would contribute to surface water runoff in the quarry that could exceed capacity of drainage and storage features proposed as part of the project. This would be a potentially significant impact.

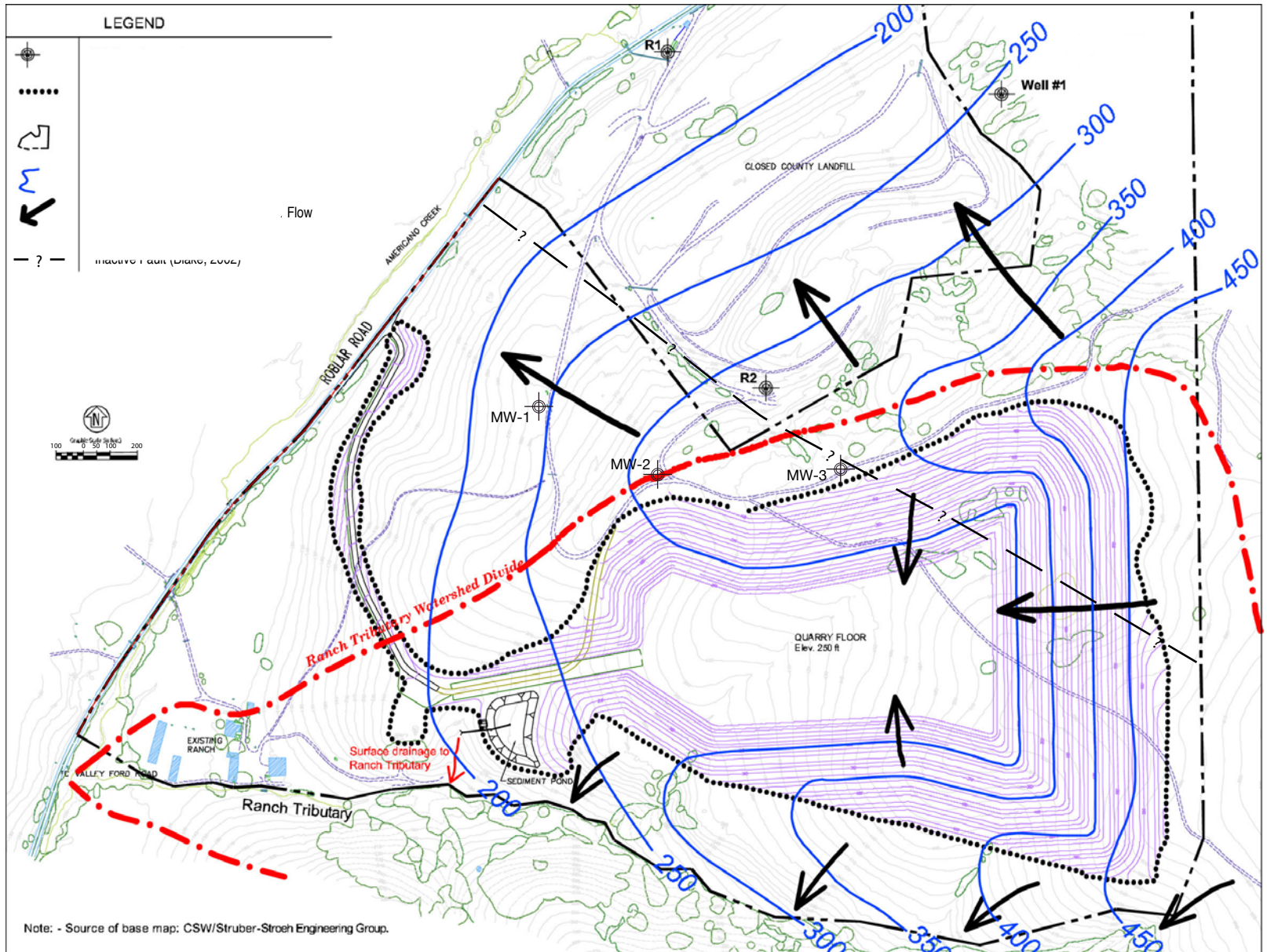
Groundwater seepage from the geologic materials composing the walls of the quarry could flow into the quarry and could produce additional surface water runoff that may not be accommodated by the collection trenches and sediment ponds. The proposed project would excavate into the Wilson Grove Formation and the underlying Tolay Volcanics basalt (resource rock) and expose the groundwater bearing zones within both of these formations. Groundwater in the Wilson Grove Formation would likely be encountered at its contact interface with the Tolay Volcanics, while groundwater-bearing seeps and fractures within the Tolay Volcanics would be encountered on the quarry walls, to the maximum depth of the quarry. Excavation could also encounter perched groundwater zones where the tuff is present at deeper depths within the Wilson Grove Formation.

As discussed in the Setting, the installation of onsite monitoring well MW-3 suggested a possible intersection with the ancient shear zone referred to as the Dunham fault. Monitoring well MW-3 is located in proximity to the inferred trace of the Dunham fault. Observations made during drilling and installation of MW-3 support a hypothesis that the fault feature influences groundwater flow. These observations include rapid groundwater level rise in the well boring during drilling and encountering soft bedrock material possibly consistent with sheared fault zone material. Quarry excavation during Phases 2 and 3 could expose a sheared zone associated with the Dunham fault trace resulting in additional groundwater flow from the quarry walls. In any case, because geologic materials are heterogeneous on the site, the seepage rates would vary considerably depending on season, rock type, bedrock orientation, degree of weathering and consolidation pressures.

The volume of groundwater that could seep from the walls of the quarry depends on the prevailing groundwater flow direction. As discussed in the Setting, groundwater in the Wilson Grove Formation generally mimics the topography and flows across the project site either in a northwest direction toward Americano Creek or a southwest direction toward the Ranch Tributary (Figure IV.C-4). However, the groundwater flow direction in the Tolay Volcanics is variable because the groundwater in the fractured volcanic rock is influenced by the direction and pervasiveness of fractures in the bedrock. Due to the apparent variability in groundwater flow, groundwater would seep out from the quarry walls from various locations and at different rates. Figure IV.C-6 shows the predicted groundwater flow direction within the Wilson Grove Formation once the quarry is in its third phase of operation. As shown in Figure IV.C-6, the north boundary of the Ranch Tributary watershed divide would shift further north of its existing estimated location as a result of the change in topographic contour of the project site. The northerly shift in the watershed divide would alter groundwater flow across the project site and result in seepage from all three quarry walls.

As part of the hydrologic analysis for the EIR, the seepage rates for Franciscan Complex, Los Osos Clay Loam and weathered Wilson Grove formation were calculated using known values of groundwater gradient, hydraulic conductivity, width of quarry seepage area, and seepage rate of particular geologic material. The resulting seepage rates for each geologic material established a range from very low seepage rate (1 gpm in Franciscan Formation Rock) to the highest seepage rate (39 gpm in weathered Wilson Grove Formation material). For the purposes of this EIR analysis, a seepage rate from quarry walls at quarry buildout is estimated at a maximum constant flow rate of 20 gpm. This rate is partly based on seepage area of 50,000 square feet (calculated from the cross sectional area of the east wall below the elevation of 400 feet above msl), but also accounts for groundwater that would likely seep into the quarry from the north and south quarry walls.

At an estimated maximum constant seepage rate of 20 gallons per minute, the quarry would need to manage an additional approximately 30,000 gallons of water per day. During the periods of winter storms, the surface water management facilities would need to manage both storm water flows and the additional quantity of groundwater seepage. Seepage water would need to be routed through the surface water drainage system, contained in areas on the quarry floor and the proposed on-site sediment pond. The seepage water contained in these storage areas would



SOURCE: Balance Hydrologics, Inc., CSW/Stuber-Stroeh Engineering Group

Roblar Road Quarry . 204334

Figure IV.C-6
Estimated Shallow Groundwater Contours at Quarry Buildout

provide additional dust control and processing water, however, the quantity not used would be discharged via the sediment pond to the Ranch Tributary, and hence to Americano Creek.

Based on the preliminary design, the proposed storm water management system for the quarry would have capacity to accommodate flows generated during a 25-year storm. The stormwater management system is estimated to have the necessary capacity to also accommodate seepage flows (CSW/Stuber-Stroeh Group, 2006). However, the seepage into the operating quarry would vary with season and geologic conditions and therefore, is unpredictable. Because of this unpredictability, the potential that seepage would present an operational constraint and/or contribute to an exceedance of the design capacity of the drainage system represents a potentially significant impact; this impact would be less than significant with Mitigation Measure C.3, below.

Mitigation Measure C.3: The drainage plan identified in Mitigation Measure C.1 shall account for additional flows created by groundwater seepage expected to occur through the quarry walls. The plan shall consider management of seepage during operation, as well as, in the long term following reclamation and be based on conservative estimates of seepage derived from measured hydraulic conductivities in the weathered and unweathered Wilson Grove Formation and the Tolay Volcanics. The drainage plan shall include measures to ensure that the quarry wall seepage can be managed by stormwater flow conveyance structures and that these structures would not be overwhelmed during the 2-, 10-, 25-, and 100-year storm events.

Significance after Mitigation: Mitigation prescribed above would ensure that the stormwater drainage system at the quarry could adequately accommodate seepage flows from the quarry walls, and therefore, this impact is less than significant.

Impact C.4: Excavation of the proposed quarry could cause groundwater which may contain contaminants to enter the quarry walls as seepage. In addition, groundwater from the on-site production wells proposed to be used for quarry operations may contain contaminants. Contaminated water could degrade water quality in Ranch Tributary and Americano Creek if not properly contained and treated prior to discharge. This would be a potentially significant impact.

As discussed in the Setting, groundwater sampling and analysis conducted in 2007 and 2008 for the three monitoring wells and two production wells installed on the quarry project site, detected low concentrations of certain VOC compounds (acetone, chloromethane, chloroform, MEK toluene and TCA). As discussed in the Setting, the source of the detected VOCs is not established, however, potential sources could include cross-contamination during well construction, contamination during sampling laboratory analysis, and/or existing water quality conditions. In addition, groundwater sampling and analysis conducted between 2004 and 2008 for monitoring wells on the Roblar Landfill property confirmed the presence of the VOC 1,2 DCE and vinyl chloride in low, dissolved concentrations in Well R-1, located near Roblar Road. The available data suggest that the VOCs could be present in the shallow groundwater of the Wilson Grove Formation and the deeper groundwater held in fractures within the Tolay Volcanics. While

the levels of the VOC constituents at the project site and landfill property were at or slightly over the laboratory method detection limits, in all cases, they were below the applicable state and federal water quality objectives for drinking water.

As discussed in Impact C.3, excavation of the quarry would initiate groundwater flow towards the quarry, as shown in Figure IV.C-6, causing seepage in the quarry walls. Because the quarry excavation would intersect Wilson Grove overburden and Tolay Volcanic resource rock, and given the previous detections of VOCs, there is a potential that groundwater containing concentrations of VOCs or other potential contaminants would enter the quarry as seepage. As described in Impact C.3, the seepage rate and volume of groundwater would vary depending on location and depth on the quarry walls and because of the variability of the geology.

The proposed drainage system would route the potentially contaminated seepage water to the sediment basin prior to discharge to Ranch Tributary. If not properly contained and treated, the discharge of this seepage water to Ranch Tributary could degrade downstream water quality; this impact would be considered significant. Similarly, the DW-1 and/or DW-2 wells proposed to be used for quarry operations could contain groundwater contaminants, and potentially draw groundwater from beneath the adjacent landfill property, as discussed in Impact C.8, below. If groundwater pumped from DW-1 or DW-2 were contaminated and not properly treated, its release to Ranch Tributary and Americano Creek would be a potentially significant impact.

The mitigation measures identified below would reduce the risks associated with potentially contaminated seepage and/or supply well water during the life of the project and post-reclamation.

Mitigation Measure C.4a: Due to the anomalous groundwater chemistry results in monitoring well MW-2, and the potential for cross-contamination that may have occurred during the original installation of one or more of the on-site monitoring wells, the applicant shall install a new monitoring well to replace MW-2, and shall redevelop monitoring wells MW-1, MW-3, and DW-2. In addition, a new monitoring well (hereafter named well MW-4) shall be installed on the quarry property at a location north of the proposed Phase 3 footprint, in line between wells DW-1 and DW-2, the precise location to be determined by the County. The selected driller shall be experienced in environmental drilling activities and subject to approval by the County. Site selection and installation/ redevelopment work scope shall be developed in consultation with, and approved by, the County. The County shall also provide oversight during installation/ redevelopment of the wells.

Mitigation Measure C.4b: Split samples shall be collected under County supervision from the four on-site monitoring wells (MW-1, new MW-2, MW-3 and new MW-4) and two existing onsite production wells (wells DW-1 and DW-2) each quarter to continue to provide water quality data and provide an early warning of potential groundwater contamination, including any potential contamination that could be entering the quarry property from the Roblar Landfill property. The split samples shall go to different State-certified laboratories. Water samples shall be tested for the same suite of analytes used at the adjacent Roblar Landfill during the 2004 through 2008 monitoring events, and at the project site during the 2007/08 monitoring events. The QA/QC protocol for the sampling and analysis program shall be developed in consultation with, and approved by, the County. Quarterly water sample results shall be sent to and reviewed by the Sonoma County PRMD.

Mitigation Measure C.4c: In conjunction with the groundwater sampling program, groundwater levels in the three onsite monitoring wells (MW-1, new MW-2, and MW-3), two existing onsite production wells (well DW-1 and DW-2), as well as the adjacent landfill property wells (R-1, R-2 and R-3) shall be measured to allow continued monitoring of groundwater levels and potential localized changes in gradient in the site vicinity.

To ensure consistency in measured groundwater level data, prior to mining and as required, all the existing and proposed wells on the quarry and landfill properties to be used for monitoring shall be surveyed by a licensed surveyor for location and elevation, referenced to mean sea level, utilizing the North American Datum of 1988-GEOID 99 (NAVD88).

Mitigation Measure C.4d: If sampling detects the introduction of contaminated groundwater in a production well at levels that would exceed the quarry's NPDES surface water discharge limits, the well shall be temporarily taken offline while a treatment system, capable of removing the contaminant from the water, is designed and installed. While the production well is not operating, supplemental water for quarry operations (treated, as appropriate – see Mitigation Measure C.4e) shall be supplied by the proposed sediment ponds, from storage ponds on the quarry floor. If this is not feasible, the applicant shall either temporarily provide water from an off-site source, or temporarily reduce production to limit water demand until well service is restored.

Mitigation Measure C.4e: Prior to discharge to Ranch Tributary, the applicant shall regularly sample and analyze all water collected within the quarry for the same suite of analytes used at the adjacent Roblar Landfill during the 2004 through 2008 monitoring events, and at the project site during the 2007/08 monitoring events. The QA/QC protocol for the sampling and analysis program shall be completed by an environmental professional knowledgeable of current surface water/groundwater regulations and sampling procedures. In the event that the discharge water does contain contaminants, surface water discharge to Ranch Tributary shall cease and all discharges shall be contained. Once contained, discharged water shall be treated on-site (e.g., use of activated carbon filters and/or aeration) until concentrations of the chemicals are not detected or the concentrations are within the storm water discharge criteria set forth through the NPDES industrial discharge permit.

Significance after Mitigation: The mitigation measures prescribed above, in addition to Mitigation Measures C.2a-c, would ensure that potential contaminants in the groundwater entering the quarry as seepage could be detected and managed prior to discharge, and therefore, this impact is less than significant with prescribed mitigation.

Impact C.5: Altering approximately 30 percent of the Ranch Tributary watershed by proposed mining could decrease baseflow in Ranch Tributary and affect flows in Americano Creek. This would be a potentially significant impact.

Storm runoff accounts for the majority of surface flow in the Ranch Tributary, but the baseflow (flow that is not directly attributed to a storm event) is supplied by the water-bearing sediments in the Wilson Grove Formation and the upper fractured portion of the underlying Tolay Volcanics. The proposed quarry would eliminate an area of approximately 65 acres of groundwater storage on the project site and, as shown on Figure IV.C-5, would reduce the area of groundwater storage

and underflow available to Ranch Tributary. Altering groundwater flow and decreasing storage could reduce base flow to the Ranch Tributary and flows in Americano Creek.

The hydrogeologic evaluation completed for this EIR (Balance Hydrologics, 2005) concluded that the largest effect on groundwater would occur at the completion of Phase 3 of mining, when the quarry encompasses its largest footprint and reaches its maximum depth. At that time, the quarry excavation would have encroached into and removed the Wilson Grove Formation and Tolay Volcanic material, causing groundwater flow pathways to change and reducing the area available for recharge (Figure IV.C-5). Groundwater storage in the quarry area would only occur seasonally within the overburden materials placed on the quarry floor as part of reclamation of each mining phase. In addition, the reclaimed quarry slopes would only have soil moisture available for sustaining the vegetation, but would have no groundwater storage capability except in the fractures of the underlying Tolay Volcanics of the quarry walls.

The degree to which the proposed project would directly affect the baseflow amounts in Ranch Tributary is not certain primarily because of the varying geology and groundwater conditions across the site and annual climatic conditions. However, because the proposed project would eliminate a portion of the available groundwater storage within the Ranch Tributary watershed, it is likely that the drainage and groundwater seepage within the watershed would decrease. Reduced baseflow in a small tributary watershed could have negative biological implications, such as the seasonal reduction of groundwater and surface water available to the riparian area (see Section IV.D, Biological Resources). Implementation of Mitigation Measure C.5a-b, below, would ensure that existing baseflows would be maintained in the Ranch Tributary to reduce the potential for adverse impacts to the existing characteristics of the riparian area during project operation and post-reclamation.

Mitigation Measure C.5a: The applicant shall incorporate into the final project drainage plan a hydrologic strategy that replaces potential baseflow lost due to the quarry operation. This mitigation measures requires a) continuation of the baseflow monitoring program that commenced in Spring 2007, and b) determining from that data whether substantial changes in baseflow is occurring during the operation of the quarry. If a reduction in baseflow due to project activities becomes evident through long term monitoring, the applicant shall design and install a system that passively diverts stored surface water to the Ranch Tributary to replicate pre-project base flows. If necessary, stored surface water shall be treated prior to discharge, consistent with Mitigation Measure C.4. Sonoma County PRMD shall review and approve the monitoring plan and passive surface water diversion system prior to implementation. The applicant shall continue to monitor the passive delivery system to ensure consistent replacement of baseflow. The applicant shall submit quarterly reports to the Sonoma County PRMD that details system monitoring and performance.

Mitigation Measure C.5b: If the passive water diversion system described in Mitigation Measure C.5a is required to replicate pre-project base flows in Ranch Tributary, the applicant shall incorporate surface water temperature monitoring in Ranch Tributary and Americano Creek into the base flow monitoring program. Water discharged for base flow maintenance shall comply with the *North Coast Water Quality Control Plan Water Quality Objective* for temperature, which states that water temperatures in water bodies designated for Cold Freshwater Habitat (COLD) beneficial use shall not be increased by more than 5°F

above the natural receiving water temperature. If necessary, the applicant shall install a system that discharges on-site well water (treated, if necessary) instead of, or in combination with, stored water to meet the temperature objective.

Significance after Mitigation: Mitigation Measure C.5 would require that the applicant develop and implement a strategy to passively route replacement water to compensate for baseflow lost as a result of the proposed quarry and therefore, this impact is considered less than significant with prescribed mitigation.

Impact C.6: The proposed quarry could eliminate a groundwater recharge area thereby reducing deep recharge to regional groundwater sources. This would be a less than significant impact.

Under existing site conditions, groundwater is stored in water-bearing sediments of the Wilson Grove Formation and flows down gradient under the force of gravity, mimicking the western sloping topography. Groundwater within the Wilson Grove aquifer is recharged by precipitation during the wet season and becomes perched over the less permeable Tolay Volcanics. During the winter and well into the dry season, the shallow groundwater is largely depleted by lateral drainage to seeps and springs, evapotranspiration (loss of moisture through uptake by plants), and percolation into the fractures of the Tolay Volcanics (Balance Hydrologics, 2006). Considering the number of springs and seeps observed at the surface of the project site (see Figure IV.C-2), it appears that most of the water in the Wilson Grove Formation migrates laterally to discharge at the surface in swales or in seeps along Ranch Tributary and Americano Creek. The percentage of the groundwater held in the Wilson Grove Formation that percolates into the fractures of underlying bedrock Tolay Volcanics is less due primarily to the less permeable, fractured bedrock structure of the Tolay Volcanics. The productivity of water wells in the regionally widespread Sonoma Volcanics (which include the Tolay Volcanics) is highly variable and unpredictable (Ford, 1975).

The nature and occurrence of the Tolay Volcanics in the project vicinity limits its ability to perform well as productive aquifer or a source of deep groundwater recharge beneath the site. The groundwater that percolates down into the Tolay Volcanics does so through many discontinuous fractures and crevices, which are pervasive throughout the rock. Compared to an alluvial (e.g. composed of sand and gravel) groundwater aquifer that can store large volumes of water in the pore spaces between the sand and gravel grains, a bedrock aquifer stores considerably less water because the water is held only in a matrix of discontinuous rock fractures. For planning purposes, the storage coefficient²⁷ for the Wilson Grove Formation was estimated at 0.1 and in contrast, the storage coefficient for the Tolay Volcanics is 0.01—a degree of magnitude lower (Balance Hydrologics, 2006). A resource exploration project at the proposed quarry site in 2004 identified fractured Tolay Volcanics to the maximum depth explored of 240 feet but the degree of fracturing tended to decrease with depth with many of the fractures filled with clay and other minerals (MPEG, 2004).

²⁷ The Storage Coefficient is the volume of water that an aquifer releases or takes into storage.

The reduced capacity of the fractured Tolay Volcanics to store and transmit groundwater beneath the site is further demonstrated by data obtained from pump tests performed immediately after the installation of onsite production wells (DW-1 and DW-2).²⁸ The performance of these wells under these observed pumping conditions demonstrate that, as is typical with groundwater flow in fractured bedrock, the Tolay Volcanics have a reduced ability to transmit water to wells (recharge) due to its matrix of discontinuous fractures. It is generally the case that well yields (or the amount of water able to be extracted from a well per foot of well) in fractured bedrock systems decrease with depth because fewer fractures are encountered and the size of the fracture, joint, or fault plane is smaller (Abbott, 2007). Therefore, bedrock of the Tolay Volcanics unit underlying the site, although able to yield groundwater, does not provide considerable recharge to a deeper, highly productive, regional aquifer. However, it should be noted that some recharge into the underlying fractured zone of the Tolay Volcanics would still occur with the project through the quarry floor and the sediment ponds.

Due to the dense, fractured matrix of the Tolay Volcanic unit underlying the site and its limited capability to transmit and store large amounts of groundwater, removal of the overlying Wilson Grove Formation and exposure of the Tolay Volcanics within the limits of the proposed quarry would not affect regional groundwater recharge and therefore, this impact is less than significant.

Refer to Impact IV.C-7 for a discussion on the potential impact of quarry excavation on nearby domestic groundwater wells, and Impact IV.C-8 on potential impacts to nearby domestic well from pumping groundwater at the project site.

Mitigation: None Required.

Impact C.7: Removal of Wilson Grove overburden and excavation into the Tolay Volcanics unit through mining could adversely affect groundwater flow and quality in nearby domestic groundwater wells. This would be a less than significant impact.

The Americano Creek watershed and surrounding uplands compose the recharge area for the local groundwater sources. The primary source of groundwater is within the water-bearing units of the Wilson Grove Formation, which are typically perched atop the more massive and less permeable Tolay Volcanics. Groundwater is contained in the fractures of the Tolay Volcanics but to a considerably lesser extent (see additional discussion of water bearing capacity and groundwater flow of the Tolay Volcanics in the analysis of Impact C.6). Local private, domestic wells, most of which are located up-gradient and north of the proposed quarry site, are completed in the relatively more reliable and productive groundwater aquifer of the Wilson Grove

²⁸ Well DW-1 is screened in the Wilson Grove and Tolay Volcanics to a depth of 340 feet. The well driller's report showed 330 feet of measured drawdown during a two hour pump test at 27 gpm. Well DW-2 is 545 feet deep and intersects three zones of the Tolay Volcanics unit. The well driller report indicates that the draw down was about 530 feet with a pump rate of 60 gallons per minute for two hours. It should be noted that the pump tests discussed here are performed following well installation do not provide the accuracy to determine pumping depth and pump size. These pump tests only provide an estimate of well yield and can not be used to determine long term yield. Longer term well pump tests are typically completed after well development, prior to pump placement.

Formation, which increases in thickness to north of the site (Balance Hydrologics, 2006). Furthermore, the majority of local wells considered proximate to the project site are up-gradient to regional groundwater flow and therefore would not be affected by changes in groundwater conditions at the proposed quarry.

As shown in Figure IV.C-6, pronounced alterations to project site groundwater flow would occur along the southern boundary of the site where the quarry would encroach into the Ranch Tributary watershed area. Changes to groundwater flow on the southern property boundary would be contained within the project area and would not extend south beyond Ranch Tributary. North of the Ranch Tributary divide (shown as the red line on Figure IV.C-6), groundwater flow would remain in a northwest direction toward Roblar Road, as it is under existing conditions. Shallow groundwater across the Roblar Road Landfill would not change and would still flow west/northwest. However, the quarry would reduce the recharge area above the landfill (indicated by the slight northerly migration of the Ranch Tributary Watershed Divide) possibly causing groundwater levels beneath the landfill to decrease slightly.

The removal of Wilson Grove Formation and the exposure and quarrying of the Tolay Volcanics over an area of 65 acres would not adversely affect nearby groundwater wells. Domestic wells within an approximate one-mile radius of the site are concentrated along Canfield Road and along Roblar Road east of Canfield Road (Kleinfelder, Inc., 1992). These wells are completed in the Wilson Grove Formation and are all on the opposite side of the groundwater divide formed by Americano Creek and to the north (upgradient) of the project site (see Figure IV.C-1). Additional wells are located east of the project site at private residences. These wells are either located upgradient, or in separate watersheds, and are not recharged by the surface water infiltration or groundwater underflow in the Ranch Tributary. One domestic groundwater supply well is located across Americano Creek from the proposed site. Although completion logs for these wells are not available, it is expected that they are completed within the Wilson Grove Formation. This well and other unidentified private wells across Roblar Road from the site would not be affected by quarry excavation because they are located across Americano Creek, which functions as a groundwater boundary.²⁹ Groundwater effects would be contained within the project boundaries, and therefore would not influence offsite water supply wells. For these reasons, the proposed project would have a less than significant impact on groundwater flow in nearby domestic groundwater supply wells. Furthermore, because the project would not impact groundwater flow conditions, it follows that groundwater quality in these wells would also remain unaffected.

Mitigation: None Required.

Impact C.8: The proposed project would pump groundwater from two onsite supply wells. The use of the two onsite wells could impact neighboring wells by causing periodic

²⁹ Based on the geology and topography of the project area, shallow groundwater contained within the Wilson Grove Formation flows to the lowest point and reaches the surface at a discharge point which, in this case, is Americano Creek. Americano Creek is considered a groundwater boundary because it is the lowest point capturing groundwater from uplands on either side of the creek.

drawdown or lowering of local groundwater levels. This would be a less than significant impact.

The use of the onsite groundwater production wells DW-1 and DW-2 to provide the necessary water supply could cause interference in neighboring, private supply wells, resulting in temporary or long-term drawdown. The applicant estimates the quarry would require approximately three million gallons of water per year, which would be obtained from these two wells, and supplemented by onsite surface water storage. These wells would be the primary source for processing operations, dust control, irrigation and landscaping, and for the office building (for drinking and septic use). Well water would be stored, as needed, in a proposed on-site water storage tank. When available, water collected in the proposed sediment pond would be used, as appropriate, to supplement water from the on-site wells for dust control and irrigation purposes.

The pumps in the wells DW-1 and DW-2 are sized and installed to provide the maximum yield from the well while maintaining a constant water level. Pumping tests completed after the installation of these two wells established the required well pump depths and allowable pumping rates. Pumping tests also help evaluate the maximum amount of water that can be pumped from a well, over an extended period of time, while maintaining a constant water level and avoiding drawdown below the depth of the pump. The depth a pump is set and the pumping rate is established based on the efficiency of the well and the pumping rate at which no additional drawdown occurs.

The proposed project would not require continued groundwater pumping. The proposed operation of the onsite groundwater supply wells involve cycled pumping and storage, a strategy that requires groundwater wells to pump groundwater periodically, when water level in the tanks decline. Because the groundwater pumps are not functioning continually, and only pump long enough to refill the storage tanks, the drawdown due to pumping is only temporary and groundwater would recharge in the well when pumping has ceased.

The area influenced by pumping wells DW-1 and DW-2 would not intersect the area of influence of neighboring domestic wells because the onsite wells are either 1) far enough away and on the opposite side of the groundwater divide from other wells drawing from the Wilson Grove Formation (as in the case of well DW-1 or DW-2) or 2) drawing supply from water held in deeper bedrock fractures exclusively (as in the case of well DW-2).

As discussed in Impact C-7, above, domestic wells within an approximate one-mile radius of the site are concentrated along Canfield Road and along Roblar Road east of Canfield Road and are all on the opposite side of the groundwater divide formed by Americano Creek and to the north (upgradient) of the project site. Well DW-2 draws water from the many discontinuous water-bearing fractures that the well intercepts. Pumping from a bedrock aquifer results in an area of influence surrounding the well that does not extend laterally as much as it extends vertically; the area affected by the well is long and narrow rather than wide and flat.

Given these factors, groundwater pumping from the two onsite wells would not affect pumping in neighboring domestic wells given the proposed pumping cycles, the well depth and placement, and the location and distance of neighboring domestic wells. This impact is less than significant.

However, proposed increased use of onsite well DW-1 and/or DW-2 would have the potential to periodically induce groundwater flow from beneath the adjacent Roblar Landfill property towards the supply wells when the wells are operated, when considering the proximity of the landfill property and the underlying water-bearing geologic units of the vicinity. This could cause well DW-1 and/or DW-2 to periodically lower the water levels in the monitoring wells at the landfill property. Lowering levels in those wells would not be considered significant because the wells at the landfill are used for monitoring only. However reduced groundwater levels may skew historic groundwater level data. (See also Impact C.4, above, regarding potential groundwater quality effects from use of water from supply wells that may contain contaminants and applicable mitigation measures.)

Mitigation: None Required.

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D. Biological Resources

Introduction

This section describes the existing botanical, wildlife, and wetland resources at the project site, identifies the potential impacts of the proposed project on these resources, and discusses mitigation measures to minimize or eliminate potentially significant impacts imposed by the project. Vegetation, wildlife and wetland documentation presented in this section are based on field reconnaissance surveys conducted on March 3, 2005, as well as focused biological surveys conducted on the property or vicinity from 2003 to 2007 (Golden Bear Biostudies, 2003; Fawcett, 2005; ESA 2007a; ESA 2007b) and regional area (Fawcett, 2007). This section also incorporates the results of a seep and spring survey conducted on the project site by Balance Hydrologics, Inc., in May, June and September, 2005. The habitat requirements for special-status plant and animal species with potential to occur in the project area were assessed and compared to the habitats present at the project site. Factors such as habitat quality and species distribution were also considered in evaluating the likelihood of special-status species occurring in the project area. Vegetation and general hydrologic conditions were examined to estimate the extent of wetlands potentially subject to the U.S. Army Corps of Engineers (Corps) and the California Department of Fish and Game (CDFG) jurisdiction.

Other information sources included applicable biological literature, the Sonoma County General Plan (County of Sonoma, 1998), the U.S. Fish and Wildlife Service (USFWS) on-line list of special-status species for the Two Rock U.S. Geological Survey (USGS) 7.5-minute quadrangle and Sonoma County (USFWS, 2007), the California Native Plant Society (CNPS) on-line Electronic Inventory (CNPS, 2007), and the California Department of Fish and Game's California Natural Diversity Data Base (CNDDB, 2008) for the Two Rock USGS 7.5-minute quadrangle and surrounding quads.

Additionally, review included previous EIRs completed on the project site, including the Draft Environmental Impact Report for the Roblar Road Hard Rock Quarry (Earth Metrics Inc., 1989) and Draft Environmental Impact Report for Roblar Road Quarry (Engineering-Science, 1987).

Setting

Regional Setting

The project site lies in southwestern Sonoma County within the Outer North Coast Ranges subregion of the California Floristic Province¹ (Hickman, 1993), approximately two miles west of

¹ Geographic subdivisions are used to describe and predict features of the natural landscape. The system of geographic units is four-tiered: provinces, regions, subregions, and districts. The State of California is covered by three floristic provinces: California Floristic Province, Great Basin and Desert. The California Floristic Province is the largest, includes most of the state and small portions of Oregon, Nevada and Baja California, Mexico and is made up of six regions.

the Santa Rosa Plain.² In general, this region is characterized by mosaics of upland oak and mixed evergreen forests, native and non-native grasslands, chaparral, upland scrubs, marsh and wetland communities, and riparian scrubs and forests. The Outer North Coast Ranges maintain a Mediterranean climate, with most of the precipitation occurring in the winter and early spring months. Compared to the coast of California, this region has colder winters and hotter summers.

Project Setting

The project site is located in the Americano Creek watershed, approximately five miles west of the City of Cotati. The northern and western boundaries of the project site parallel Roblar Road and Americano Creek. The southern boundary follows a drainage, referred to in this EIR as Ranch Tributary, which flows into Americano Creek at the southwestern corner of the project site. Open rangelands lie to the east of the project site. With the exception of the closed Sonoma County landfill adjacent to and north of the project site, the surrounding landscape is dominated by open rangeland and agricultural lands, with a limited number of scattered rural residences. Cattle currently graze the majority of the project site.

The project site is situated on north, west and south-facing slopes, with elevations ranging from approximately 110 feet above sea level (asl) at the site entrance at Roblar Road to about 600 feet asl in the southeastern corner of the site. Slopes range from approximately 10 to 30 percent.

The majority of the proposed quarry portion of the project site is within the Ranch Tributary subwatershed, which includes the adjoining areas to the south and east. Three southwest trending ephemeral swales, referred to in this EIR as West Swale, Center Swale, and East Swale, drain the portion of the project site within the Ranch Tributary watershed (Figure IV.D-1). Surface water captured within these swales either infiltrates into the shallow soil or runs overland to discharge into the Ranch Tributary. The site also contains a stock pond (referred to in this EIR as Center pond) at the head of the Center Swale at an elevation of approximately 500 feet msl. During the March 2005 site visit, the pond received groundwater input from several small seeps on the surrounding uphill slopes. A small percentage of site runoff from the lower portion of the project site drains to a low-lying floodplain or terrace located in the southwest corner of the site, adjacent to Americano Creek. The hydrologic characteristics of the project site are further described in Section IV.C, Hydrology and Water Quality.

Plant Communities and Wildlife Habitats

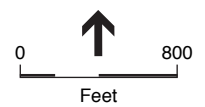
Plant communities are assemblages of plant species that occur together in the same area, and are defined by species composition and relative abundance. The vegetation/habitat classification system used is based on the California Department of Fish and Game's (CDFG) *List of California Terrestrial Natural Communities Recognized by the CNDDDB* (CDFG, 2003) and field observations. Plant communities generally correlate with wildlife habitat types. Wildlife habitats

² The Santa Rosa Plain, an area of approximately 55,000 acres extending from Windsor to Cotati, provides important habitat for a number of federally threatened and endangered plants and animals, mostly associated with vernal pools.



- Seasonal Drainage
- ▨ Seasonal Wetland

Note: Some seasonal wetlands are too small to depict on this figure.



SOURCE: ESA, GlobeExplorer

Roblar Road Quarry . 204334

Figure IV.D-1
Existing Vegetation and
Water-Associated Features

typically were classified and evaluated using CDFG's *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer, 1988). Plant communities on the project site have been disturbed from current and past cattle grazing. Figure IV.D-1 depicts vegetation communities and wildlife habitat on the site.

Non-native Grassland

Non-native grassland is the dominant plant community over most of the project site. Within this community, annual species dominate and include filaree (*Erodium moschatum*), hare barley (*Hordeum gussoneanum* spp. *leporinum*), and rip-gut brome (*Bromus diandrus*). Other species observed include common chickweed (*Stellaria media*), white clover (*Trifolium repens*), and subterranean clover (*T. subterraneum*).

Grasslands attract reptiles and amphibians such as western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Crotalis viridis*). Bird species commonly found in this community include California quail (*Callipepla californica*), mourning dove (*Zenaida macroura*), and western meadowlark (*Sturnella neglecta*). Annual grasslands are important foraging grounds for aerial and ground-foraging insect eaters such as *Myotis* bat species and pallid bats (*Antrozous pallidus*). Mammals such as coyote (*Canis latrans*), black-tailed deer (*Odocoileus hemionus columbianus*), California ground squirrel (*Spermophilus beecheyi*), black-tailed jackrabbit (*Lepus californicus*), and Botta's pocket gopher (*Thomomys bottae*) are expected to browse and forage on project-area grasslands. Grasslands in the project vicinity support a moderate population of American badger (*Taxidea taxus*), evidenced by foraging burrows and dens that occur on the project site and throughout the regional area (ESA, 2007a). Small rodents such as deer mouse (*Peromyscus maniculatus*) and California meadow vole (*Microtus californicus*) attract raptors (birds of prey) including red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*B. lineatus*), American kestrel (*Falco sparverius*), and white-tailed kite (*Elanus leucurus*).

Black Oak and Coast Live Oak Woodland

Black oak woodland is present in the northeastern portion of the site (Figure IV.D-1). California black oak (*Quercus kelloggii*) is the dominant species in this community. Coast live oak (*Q. agrifolia*) occurs as an associated species on the site. The plant community is characterized as coast live oak woodland where coast live oak is dominant. The understory consists of non-native annual grasses and herbaceous flowering plants.

Oak woodland habitats provide food and shelter for a variety of bird species, including insect eaters such as chestnut-backed chickadee (*Parus rufescens*), white-breasted nuthatch (*Sitta carolinensis*), and warbling vireo (*Vireo gilvus*). Other species attracted to these habitats include song sparrow (*Melospiza melodia*), California quail (*Callipepla californica*), and California towhee (*Pipilo crissalis*), which glean insects from the foliage on the ground. Western scrub jay (*Aphelocoma californica*), acorn woodpecker (*Melanerpes formicivorus*) and squirrels (*Sciurus* sp.) are dependent on the acorns during the winter.

Riparian Woodlands

Arroyo Willow Riparian Woodland. Arroyo willow riparian woodland occurs along Americano Creek in the northwestern portion of the project site as well as along Ranch Tributary on the southern boundary of the site. Willows (*Salix lasiolepis* and *Salix lucida* spp. *lasiandra*) are dominant along Americano Creek with an understory of poison hemlock (*Conium maculatum*) and Himalayan blackberry (*Rubus discolor*). Ranch Tributary also contains elements of coastal oak woodland in addition to arroyo willow riparian habitat.

California Bay Riparian Woodland. California bay riparian woodland occurs along the Center Swale, which flows toward Ranch Tributary (see Figure IV.D-1). California bay (*Umbellularia californica*) is the dominant species. Associated species included willows. An isolated stand of three to four California bay trees occurs west of the West Swale.

Passerines known to forage in riparian woodlands include wrentit (*Chamaea fasciata*), black phoebe (*Sayornis nigricans*), yellow-rumped warbler (*Dendroica coronata*), and orange-crowned warbler (*Vermivora celata*). Raptors such as Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), and white-tailed kite (*Elanus leucurus*) are known to nest in riparian woodlands. Cavities within oak trees may provide nesting sites for western screech owl (*Otus kennicottii*), western bluebird (*Sialia mexicana*), and ash-throated flycatcher (*Myiarchus cinerascens*), and roosting sites for bats. In addition, downed branches provide cover for various reptiles, amphibians, and small mammals.

Aquatic Habitats

Freshwater Seep. Freshwater seeps occur where there is a perennial or nearly perennial source of water with minimal flow and saturated to moist soils year-round. On the project site, the edges of the existing stock pond (Center Pond), the three swales, and several seeps on the hillsides surrounding Center Pond support this plant community, which includes soft rush (*Juncus effusus*) and spreading rush (*Juncus patens*). Seeps identified on the project site are described in Section IV.C, *Hydrology and Water Quality* and depicted in Figure IV.C-2. Several active seeps were observed adjacent to Center Pond in March 2005; however, they were inactive when observed later in the year (Balance Hydrologics, Inc., 2006).

Seasonal Wetland. Seasonal wetlands occur in the southwestern portion of the property adjacent to Americano Creek (Figure IV.D-1). The vegetation is typically composed of mostly low growth annual herbs. The dominant species occurring in the seasonal wetlands on the project site are manna grass (*Glyceria occidentalis*), semaphore grass (*Pleuropogon californicus*), annual bluegrass (*Poa annua*), Mediterranean barley (*Hordeum gussoneanum* var. *marinum*), and spiny-seed buttercup (*Ranunculus muricatus*). The lowest areas of the wetlands near Roblar Road may be remnants of the previous natural meanders of Americano Creek (Golden Bear Biostudies, 2003).

An additional seasonal wetland was identified on the property by Balance Hydrologics, Inc., and is referred to as North Pond in this EIR (Balance, 2006). This area stores ponded rainwater and was observed by Balance Hydrologics, Inc. to gradually dry up through the summer season.

Pond. The existing stock pond (Center Pond) on the project site was artificially-created and is fed by a series of seeps during the wet season. During the March 2005 ESA reconnaissance surveys, the pond had a hydrologic connection to Center Swale. At that time, the water surface of the pond was covered by mosquito fern (*Azolla* sp.), which likely grows back annually.

Drainages. Three seasonal drainages originate on the project site. These drainages are referred to as West Swale, Center Swale, and East Swale in this document (see Figure IV.D-1). All three drain the property in a southwesterly direction and flow into Ranch Tributary along the southern border of the site. Center Swale is the largest seasonal drainage (approximately 1,800 linear feet) and originates at Center Pond. During the wet season, outflow from the pond feeds into the swale. However, this surface water connection does not persist throughout the year. The channel of Center Swale is incised in some areas and the banks are impacted by cattle grazing. The West Swale and East Swale are small (approximately 900 and 600 linear feet, respectively) drainages that support primarily rushes (*Juncus* spp.). In March 2005, Center and West swales contained flowing water, but East swale did not. By June 2005, the West and East swales contained some limited wet areas, but no flowing water. In contrast, the lower portion of the Center Swale contained flowing water in May 2005, which had receded to several areas of standing water and wetted soil by June 2005. In September 2005, some standing water and wetted soil was observed in Center and East Swales.

Seasonal drainages, such as the three on-site swales, provide a seasonal water source for wildlife and foraging, breeding and migrating habitat for various amphibians and reptiles such as Pacific chorus frog (*Pseudacris regilla*) and western aquatic garter snake (*Thamnophis couchii*).

Ranch Tributary originates near the southeastern corner of the property and follows a fairly steep canyon adjacent to the southern property boundary until it flows into Americano Creek at the southwestern corner of the project site. The tributary receives on-site run-off from the three seasonal drainages and is fenced from the cattle grazing operation. As such, riparian vegetation along the tributary is well established and extensive. As it enters the small valley floor, it passes through a small patch of relatively dense riparian vegetation before flowing into Americano Creek.

Flow measurements recorded in the Ranch Tributary during Balance Hydrologics, Inc., 2005 field study³ (see Section IV.C *Hydrology and Water Quality*) show that the Ranch Tributary discharges water to Americano Creek throughout the year (Balance, 2006). During dry periods (i.e., summer and fall), flows in the tributary are predominantly baseflow supplied by shallow and deep groundwater. These are supplemented by surface runoff during the wet season.

In the vicinity of the project site, Americano Creek is a small meandering creek that flows adjacent to Roblar Road. Riparian vegetation is limited in some areas, presumably due to cattle grazing operations throughout this portion of the valley; however, downstream portions of the creek support extensive growth of arroyo willows. Approximately 400 feet upstream of the

³ Balance Hydrologics, Inc. measured flow in Americano Creek as part of the field study to support this EIR. Flow measurements were taken on three separate occasions at Canfield Road, north of the project site and at the point where Americano Creek crosses under Roblar Road, adjacent to the site.

existing access road to the project site, Americano Creek crosses under Roblar Road and flows through a narrow corridor between the road and the property. In this reach, the creek has been channelized and extensive riprap protects Roblar Road from scour. Riparian vegetation in this portion of the creek only occurs along the bank adjacent to the project site.

Seasonal flow measurements conducted in 2005 show that Americano Creek maintains flows during most of the year. Measurable streamflow occurred in Americano Creek at the Roblar Road crossing in May and June. However, no flow was present at this site in September although minimal streamflows were still observed upstream at Canfield Road.

Freshwater seeps, seasonal wetlands and drainages, and the stock pond may provide wildlife with a seasonal to year-round water source and support common amphibians such as Pacific chorus frog, bullfrog (*Rana catesbeiana*), California newt (*Taricha torosa*), and western toad (*Bufo boreas*). In addition, birds such as black phoebe (*Sayornis nigricans*), red-winged blackbird (*Agelaius phoeniceus*), green heron (*Butorides virescens*), and great egrets (*Ardea alba*) and bats such as *Myotis* species and pallid bats may use freshwater marshes and seeps on the property for foraging.

On-site Development

The project site is largely undeveloped; however, a ranch on the southwestern portion of the property has several barns, chicken coops and other small buildings, and an unoccupied residence. These buildings may be used by bat species such as pallid bats (*Antrozous pallidus*) and myotis bats (*Myotis* sp.) for day and night roosting. The barn and other buildings may also support birds such as barn owl (*Tyto alba*) and great horned owl (*Bubo virginianus*).

Wildlife Movement Corridors

Wildlife movement corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or by areas of human disturbance or urban development. Topography and other natural factors in combination with urbanization can fragment or separate large open-space areas. The fragmentation of natural habitat creates isolated “islands” of vegetation that may not provide sufficient area to accommodate sustainable populations and can adversely impact genetic and species diversity. Movement corridors mitigate the effects of this fragmentation by allowing animals to move between remaining habitats, which in turn allows depleted populations to be replenished and promotes genetic exchange with separate populations.

The property is currently fenced with three- to four-foot high wire and wood fencing around the property perimeter, which poses only minor restrictions to wildlife movement through the project area. Undeveloped portions of the parcel provide a general migratory route for wildlife species that are found throughout the project region, such as mule deer, gray fox, badger, and other mammals. Wildlife may move through the project site from expansive grassland and woodland habitats surrounding all sides of the property. Americano Creek and Ranch Tributary immediately adjacent to the project site, as well as oak woodland and riparian woodland habitats on and

adjacent to the property, provide vegetative cover for wildlife and facilitate wildlife movement around the project area.

Special-Status Species

Several species known to occur in the project vicinity are accorded “special status” because of their recognized rarity or vulnerability to various causes of habitat loss or population decline. Some of these receive specific protection defined in federal or state endangered species legislation (see Regulatory Framework below). Others have been designated as “sensitive” based on adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. The latter category is recognized by Section 15380(b) of the California Environmental Quality Act (CEQA) Guidelines. This CEQA Guidelines section provides a definition of rare, endangered or threatened species that is broader than that included in federal and state endangered species regulations⁴. These species are referred to collectively as “special-status species” in this document, following a convention that has developed in practice but has no official sanction. The various categories encompassed by the term, and the legal status of each, are discussed in the Regulatory Framework component of this section below. For purposes of this EIR, special-status species include:

- Plant and animal species designated as rare, threatened or endangered under the federal or state endangered species acts;
- Species that are candidates for listing under either federal or state law;
- Species designated by the USFWS as species of concern or species of local concern, or by CDFG as species of special concern;
- Species protected by the federal Migratory Bird Treaty Act (16 U.S.C. 703-711);
- Bald and golden eagles protected by the federal Bald Eagle Protection Act (16 U.S.C. 668); and
- Species such as candidate species and CNPS List 1 and 2 species that may be considered rare or endangered pursuant to Section 15380(b) of the CEQA Guidelines.

Table D-1 in Appendix D lists 19 special-status plant species and 34 special-status wildlife species known or reported to occur in the vicinity of the project site based on data in the CNDDDB (2007), CNPS Electronic Inventory (2007), special-status species information from the USFWS (2007), field surveys of the project site discussed above, and biological literature of the region. Special-status plants and wildlife are evaluated in this document based on a plausible likelihood of habitat loss or project-related disturbance occurring during the implementation of the proposed project.

⁴ For example, there is a general agreement among biologists, ecologists and other resource specialists, that vascular plants listed as List 1 or 2 by the CNPS meet the broader definition in CEQA Guidelines Section 15380(b).

Special-Status Plant Species

Of the 19 special-status plant species presented in Table D-1, none are expected to occur on the project site due to the lack of suitable habitat and the results of focused botanical surveys. Focused surveys conducted in 2002 and 2003 failed to identify any of the 19 special-status plants listed in Table D-1 (Golden Bear Biostudies, 2003). The surveys specifically targeted Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*), narrow-anthered California brodiaea (*Brodiaea californica* var. *leptandra*), Bolander's reed grass (*Calamagrostis bolanderi*), fragrant fritillary (*Fritillaria liliacea*), Hayfield tarplant (*Hemizonia congesta* ssp. *leucocephala*), Pitkin Marsh lily (*Lilium pardalinum* ssp. *pitkinense*), Sebastopol meadowfoam (*Limnanthes vincularis*), Hickman's cinquefoil (*Potentilla hickmanii*), California beaked-rush (*Rhynchospora californica*), round-headed beaked-rush (*Rhynchospora globularis* var. *globularis*), and Santa Cruz clover (*Trifolium buckwestiorum*). Additionally, suitable habitat was not observed for the remaining eight species, which are deemed absent from the site [i.e., Sonoma sunshine (*Blennosperma bakeri*), Burke's goldfields (*Lasthenia burkei*), North Coast semaphore grass (*Pleuropogon hooverianus*), marsh milkvetch (*Astragalus pycnostachyus* var. *pycnostachyus*), Jepson's linanthus (*Linanthus jepsonii*), marsh microseris (*Microseris paludosa*), showy Indian clover (*Trifolium amoenum*) and Gairdner's yampah (*Perideridia gairdneri* ssp. *gairdneri*)] (Golden Bear Biostudies, 2003).

Special-Status Wildlife Species

A total of nine surveys for special-status wildlife species were conducted on the property and in Americano Creek and Ranch Tributary between December 2002 and September 2007 (Golden Bear Studies, 2003; Fawcett, 2005; ESA, 2007a; ESA 2007b). Appendix D provides an account of special status species that occur in the project region, their listing status, and potential distribution on or near the project site. No California freshwater shrimp (*Syncaris pacifica*), California tiger salamander (*Ambystoma californiense*), foothill yellow-legged frog (*Rana boylei*), northwestern pond turtle (*Clemmys marmorata*), or central California coast steelhead (*Oncorhynchus mykiss*) were identified on the property or the surrounding drainages (Golden Bear Studies, 2003; Fawcett, 2005).

Surveys identified California red-legged frog (*Rana aurora draytonii*) in Center Pond (Fawcett, 2005; ESA, 2007b). Survey results also concluded that foothill-yellow-legged frogs and northwestern pond turtles could potentially occur on the property based on the presence of potentially suitable habitat and the known regional distribution of these species (Fawcett, 2005). Marginal habitat for both species may occur in association with project area creeks, while pond turtles may be found throughout the project site with optimal habitat at Center Pond.

In 2007, ESA conducted a focused examination of American badger activity on and near the project site (ESA, 2007a). For this review, ESA noted widespread badger excavations and possible denning activity in areas located on and west of the project site. Off-site habitat in the regional area appears to provide similar habitat conditions to those encountered on the project site.

Americano Creek is not known to support California freshwater shrimp (USFWS, 1998; CNDDDB, 2008). The ephemeral nature of this creek generally precludes the presence of California freshwater shrimp.

Of the 33 special-status plants and animals considered in this analysis, only the following 20 are considered to have potential to occur on or adjacent to the study area. These include California red-legged-frog, foothill yellow-legged frog, northwestern pond turtle, Cooper's hawk, sharp-shinned hawk, golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), oak titmouse (*Baeolophus inornatus*), Lawrence's goldfinch (*Carduelis lawrencei*), white-tailed kite, California horned lark (*Eremophila alpestris actia*), loggerhead shrike (*Lanius ludovicianus*), Allen's hummingbird (*Selasphorus sasin*), American badger, pallid bat, Pacific western big-eared bat (*Corynorhinus townsendi townsendi*), long-eared myotis bat (*Myotis evotis*), long-legged myotis bat (*Myotis volans*), Yuma myotis bat, and fringed myotis (*Myotis thysanodes*). These species are discussed below. In addition, two special-status fish species, tidewater goby (*Eucyclogobius newberryi*) and central California coast steelhead (*Oncorhynchus mykiss*) are known to occur approximately seven miles downstream of the project site within the Americano Creek/Estero Americano⁵ watershed.

California Tiger Salamander (*Ambystoma californiense*). The California tiger salamander (CTS) is a large terrestrial salamander with several white or pale yellow spots or bars on black skin (Stebbins, 1985). The undersides are highly variable and range from uniformly white or pale yellow to variegated white or pale yellow and black. Males generally average about 203 mm (8 in) in total length, and females average about 173 mm (6.8 in) in total length (USFWS, 2004b).

Breeding and aestivation habitat includes vernal pools, and seasonal and perennial ponds and surrounding upland areas in grassland and oak savannah plant communities from sea level to about 3,600 feet (Jennings and Hayes, 1994; Petranka, 1998; CNDDDB, 2007; USFWS, 2004b).

CTS breed and lay eggs following relatively warm rains in winter months. CTS participate in nocturnal breeding migrations that may cover distances of 1,000 meters or more (Jennings and Hayes, 1994; Petranka, 1998). Juveniles emigrate from drying breeding sites to small mammal burrows, and may take two years to mature (Jennings and Hayes, 1994; Petranka, 1998). During years of low rainfall, CTS may not reproduce at all and because they take refuge in burrows during the dry months, they are rarely observed outside of the breeding season (Barry and Shaffer, 1994).

CTS most commonly breed in vernal pools, but may utilize the quiet waters of ponds, reservoirs, lakes, vernal pools, and occasionally streams (Stebbins, 1985). Adult CTS spend most of the year in subterranean refugia, especially burrows of California ground squirrels (*Spermophilus beecheyi*) and occasionally man-made structures. The species appears to be restricted to grasslands and low foothill regions of Central and Northern California, which is where the longest-lasting rain pools tend to form (Jennings and Hayes, 1994; Petranka, 1998).

⁵ The tidally-influenced lower reaches of the Americano Creek watershed are widely referred to as Estero Americano.

The project site is located 1.75 miles west of and outside the 2003 USFWS Draft Potential Range of the Sonoma County CTS (USFWS, 2003; ESA, 2007b). Aquatic dipnet surveys conducted on the Roblar Road quarry project site by Michael Fawcett, Ph.D. in 2002, 2003 and 2004 did not identify CTS (Golden Bear Biostudies, 2003; Fawcett, 2005). However, on March 15, 2007, as part of biological review of another project, Dr. Fawcett identified a CTS breeding site approximately 1.1 mile northeast of the site boundary.

Five aquatic features on and near the quarry project site were dipnet sampled by ESA biologist B. Pittman, CWB in 2007 to ascertain CTS breeding activity (ESA, 2007b). The survey had negative results for CTS. Also, two of the features on the Roblar Road quarry site were dipnet sampled over successive years by Dr. Fawcett with negative survey findings for CTS (Golden Bear Biostudies, 2003; Fawcett, 2005).

ESA's 2007 survey findings suggest that CTS do not regularly breed in the aquatic features on the Roblar Road quarry site. The present survey supports Dr. Fawcett's earlier findings that CTS have not been identified in potential breeding habitat on Roblar Road quarry site. Given the current negative survey findings and the location of the site outside the 2003 USFWS Draft CTS mapped range and the Santa Rosa Plain Conservation Strategy boundary, CTS are not believed to be present on the project site.

California Red-legged Frog (*Rana aurora draytonii*). California red-legged frogs (CRLF) typically occur in perennial streams with deep pools and stands of overhanging willows and an intermixed fringe of cattails (*Typha latifolia*) (Jennings, 1988). However, CRLF also have been found in ephemeral creeks and drainages and in ponds that may or may not have riparian vegetation. The CRLF disperse upstream and downstream of their breeding habitat to forage and seek sheltering habitat. Sheltering habitat for CRLF potentially includes all aquatic, riparian, and upland areas within the range of the species and any landscape features that provide cover, such as existing animal burrows, boulders or rocks, organic debris (e.g., downed trees or logs), and industrial debris. Incised stream channels with portions narrower than 18 inches and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of CRLF within a watershed and can be a factor limiting frog population numbers and survival. During winter rain events, juvenile and adult CRLF are known to disperse up to 1 to 2 kilometers (0.6 to 1.2 miles) (Rathbun et al., 1991).

CRLF generally breed from January to May, attaching eggs to vegetation or other available sites in shallow water. Tadpoles grow to 3 inches before metamorphosing. CRLF are adapted to a highly variable climate that can alternate yearly between very wet and extreme drought conditions. In response to this variability, in wet years frog reproduction is high, and more sites become occupied by dispersing young frogs. In drought years populations may decline, and previously occupied sites are no longer inhabited. Therefore, it is important to preserve areas that may be unoccupied, as they may become so in other years.

The CRLF is a federal-listed threatened species (USFWS, 1996; 2006) and California Species of Special Concern. The northernmost extent of this species' range includes Sonoma and Mendocino Counties.

CRLF are present in Center Pond on the project site (Fawcett, 2005; ESA 2007). Americano Creek and Ranch Tributary both provide potential habitat for CRLF. Though CRLF were not found in Americano Creek and Ranch Tributary, Fawcett (2005) concluded that both drainages may provide critical dispersal paths from the pond to other occupied breeding sites in the Americano Creek watershed. Other known occurrences of the species within the watershed have been reported approximately 2.25 miles west and 3.0 miles southeast of the project site (CNDDDB, 2007).

Foothill Yellow-Legged Frog (*Rana boylei*). This species inhabits rocky streams and is rarely found far from permanent water. Foothill yellow-legged frog tadpoles require three to four months of water for successful development. Rocks within the streams or within several feet of the water provide cover during periods of inactivity.

Ranch Tributary contains potentially suitable, although marginal, habitat for foothill yellow-legged frogs (Fawcett, 2005). The species was not observed during 2002, 2003, 2004, and 2005 surveys (Fawcett, 2005).

Northwestern Pond Turtle (*Clemmys marmorata marmorata*). The northwestern pond turtle occurs in a variety of permanent and intermittent aquatic habitats such as ponds, marshes, rivers, streams, and ephemeral pools. Pond turtles require suitable basking habitat and haul-out sites, such as emergent rocks or floating logs, which they use to thermoregulate their temperature throughout the day (Stebbins, 1985). Pond turtles also require an upland egg laying sites near appropriate aquatic habitat, typically within 650 feet of aquatic habitat.

Suitable aquatic habitat occurs within the project boundaries in the stock pond and ephemeral drainages on the property. Though these aquatic habitats on the property provide suitable habitat for northwestern pond turtle, this species was not identified on the property during 2002, 2003, 2004, and 2005 surveys (Fawcett, 2005), or during focused CTS surveys (ESA, 2007). This species commonly occurs in ponds and creeks throughout the Americano Creek watershed (Fawcett, 2005), including mainstem Americano Creek near Valley Ford Highway (CNDDDB, 2007). Northwestern pond turtles have also been observed approximately 2.5 miles southeast of the project site (CNDDDB, 2007). Thus, the potential exists for this species to move through upland areas and within aquatic habitat on the project site.

American Badger (*Taxidea taxus*). The American badger, a California Species of Special Concern, is an uncommon, permanent resident found throughout most of the State of California except the humid coastal forests of northwestern California in Del Norte Co. and the northwestern portion of Humboldt Co. (Zeiner et al, 1988). This species is considered to occur in greatest abundance in dry, open stages of shrub, forest and herbaceous habitats, its principal requirement being friable soils.

Drastic declines in badger populations have been documented as far back as the 1930s and 40s, when Grinnell et al. (1937) noted that badger numbers were reduced over virtually the entire species' range in California. At that time they were still abundant in the Central Valley, but now they survive in low numbers on the peripheral portions of the valley and in coastal counties to the

west. Zeiner (1988) identifies that in the coastal areas from Mendocino County south they have been drastically reduced in numbers. Agricultural and urban development are recognized as primary causes of decline in California. There is no current data on the status of badger populations in California, but they have obviously declined or disappeared in large sections of the state.

Badger habitat in California includes a diversity of habitats. The principal requirements for this species seem to be sufficient food sources, friable soils, and relatively open, uncultivated ground. Grasslands, oak savannahs, and mountain meadows near timberline are identified as preferred habitats.

Badgers are carnivorous predatory specialists that target small rodents. Their preferred prey includes rats, mice, chipmunks and especially ground squirrels and pocket gophers. Their diet shifts seasonally and yearly in response to prey availability and may also include reptiles, insects, earthworms, eggs, birds and carrion.

In spring 2007, ESA conducted a badger habitat assessment on the western portion of the project site and areas further west (ESA, 2007). The study found extensive use of grassland habitats by badgers south and west of the quarry project site, with similar habitats available on the project site. Based on field surveys, it is apparent that badgers are present in the local project vicinity and may be encountered during construction and or operation of the project. This is especially true given what is known of badger home ranges, which may vary from 400 acres to over 2,000 acres. Prior information about the badger population in the Americano Creek watershed from the single 2003 CNDDDB report provided limited information beyond the presence of this species at a single location. ESA's 2007 survey report documented widespread badger excavations and possible denning activity in the examined areas.

A review of off-site habitat in the local and regional area, including areas that were studied near an alternative haul route alignment, provide similar habitat conditions to those studied. Areas that are north, south, and west of the site and haul route support grazed annual grasslands that outwardly exhibit habitat conditions that support badgers in the survey area.

Special-Status Birds. The project site provides potential nesting and foraging habitat for a variety of special-status raptors⁶. Cooper's hawk (*Accipiter cooperi*), sharp-shinned hawk (*A. striatus*), white-tailed kite (*Elanus leucurus*), golden eagle (*Aquila chrysaetos*) and other raptors such as red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), and great horned owl (*Bubo virginianus*), may nest in the oak woodland in the northeastern corner of the property and forage over project site grasslands. A red-tailed hawk was observed on the project site during ESA reconnaissance surveys.

Although burrowing owls have not been reported in the immediate vicinity of the project site, the species was observed approximately 7 miles northeast of the project site in 2002. Grasslands on the project site may provide foraging and wintering habitat for this species. Furthermore, the project site contains numerous ground squirrel burrows that provide potential nesting sites.

⁶ California Fish and Game Code Section 3503.5 prohibits the take or destruction of any raptor, adult, egg or nest.

Special-status passerine⁷ species that may utilize the project site include California horned lark, loggerhead shrike, Allen's hummingbird, oak titmouse and Lawrence's goldfinch. California horned lark and loggerhead shrike forage for insects in grassland habitats. Allen's hummingbird, oak titmouse, and Lawrence's goldfinch nest and forage in oak and riparian woodlands and may inhabit these areas on the property.

Special-Status Bats. Insects associated with the grassland areas of the project site provide a potential food source for bats, and abandoned or unused buildings and structures associated with the existing ranch may provide potential roosting habitat for pallid bat (*Antrozous pallidus*), Pacific western big-eared bat (*Corynorhinus townsendi townsendi*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), fringed myotis (*Myotis thysanodes*), and Yuma myotis (*Myotis yumanensis*).

Special-Status Fish. Tidewater goby and central California steelhead occur in Estero Americano approximately seven miles downstream of the project site (CNDDDB, 2007). Although Americano Creek in the vicinity of the project site does not provide suitable aquatic habitat for either species, potential effects to these species and/or downstream habitat require an examination of off-site fisheries resources.

Tidewater goby occurs primarily in brackish shallow lagoons and lower stream reaches where the water is fairly still but not stagnant. Tidewater goby have been documented in water with salinity levels from zero to 10 parts per thousand, temperature levels from 35° to 73° F, and water depths from 5 to 7.5 feet. The tidewater goby spends all life stages in lagoons and enters the marine environment only when forced out of the lagoon by strong storms. Reproduction occurs year-round although distinct peaks in spawning occur in April and May.

Steelhead typically migrate to marine waters in the spring after spending one or more years in freshwater. They typically reside in marine waters 2-3 years prior to returning to their natal stream in winter and spring to spawn as 4- or 5- year olds. Unlike salmon, steelhead are iteroparous, meaning they can spawn more than once before they die. Steelhead require cool (ideally less than 18°C), clean water in streams that contain adequately sized spawning gravels, instream cover, and riparian shading. The presence of migration barriers in the form of dams, grade control structures, culverts, or water diversion structures significantly limit steelhead access to historic habitat in the upper reaches of central California coast watersheds.

Critical Habitat for Listed Fish and Wildlife Species

The USFWS (2005) defines the term critical habitat in the federal Endangered Species Act. It is a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. An area is designated as "critical habitat" after the USFWS publishes the proposed

⁷ California Fish and Game Code Section 3503 prohibits the take or destruction of any passerine bird, nest or egg.

regulation in the *Federal Register* and considers public comments on the proposal. The final boundaries of the critical habitat area are published in the *Federal Register*.

USFWS-designated critical habitat for CRLF does not occur in Sonoma County (USFWS, 2006).

Critical habitat for central California coast steelhead was designated by the National Marine Fisheries Service (NMFS) in September 2005 and became effective on January 2, 2006 (NMFS, 2005). Approximately 0.75 mile of the mainstem of Estero Americano from the Pacific Ocean to the confluence of Ebabias Creek, as well as 0.5 miles of Ebabias Creek, have been designated as critical habitat for the species. Reaches of Americano Creek upstream of the Ebabias Creek confluence are not included in the designation. The project site is located adjacent to Americano Creek approximately 7 miles upstream of designated critical habitat areas for steelhead.

Critical habitat for the tidewater goby applies only to designated areas in San Diego and Orange counties (USFWS, 2000).

Heritage and Protected Trees

The project site supports numerous oak trees that are considered protected in accordance with the Sonoma County's tree ordinance (Tree Protection and Replacement Ordinance No. 4014), including the oak woodland community in the northern portion of the project site and the isolated stand of oak trees in the open grassland. The oak woodland community in the northern portion of the project site (see Figure IV.D-1) would also be subject to the Oak Woodlands Conservation Act. The isolated stand of oak trees south of Center Pond is composed of nine black oak trees. These trees have nine-inch or greater diameters at standard height and are located within the limits of the proposed grading areas. No heritage or valley oak trees occur on the project site.

Project Setting – Lakeville Road Easement Exchange Site

The approximate 244-acre proposed Lakeville Road easement exchange site is located in southern Sonoma County adjacent to the Petaluma River within the Central Coast subregion of the California Floristic Province (Hickman, 1993). In general, this region is characterized by coastal plant communities, including coastal sage scrub, salt marshes and coastal prairie. The Lakeville Road property is mostly agricultural land. A levee separates coastal salt marsh vegetation along the Petaluma River from the property. The western boundary of the site west of the levee supports coastal brackish marsh vegetation and grassland, and may support habitat for special-status species, including burrowing owl, saltmarsh common yellowthroat (*Geothlypis trichas*), California clapper rail (*Rallus longirostris obsoletus*), and salt marsh harvest mouse (*Reithrodontomys raviventris*) (CNDDDB, 2006). The property may also support a drainage swale east of the levee that is potentially subject to Sections 404 and 401 of the Clean Water Act.

Regulatory Framework

Regulation of Special-Status Species

Federal Endangered Species Act

Under the Federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce have joint authority to list a species as threatened or endangered (16 United States Code [USC] 1533[c]). Pursuant to the requirements of FESA, a federal agency reviewing a proposed project within its jurisdiction must determine whether any federally listed, threatened, or endangered species, or species proposed for federal listing may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species. In addition, the federal agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]). Substantial adverse project impacts on these species or their habitats would be considered potentially significant in this EIR.

Procedures for addressing federally listed species follow two principal pathways, both of which require consultation with the USFWS which administers FESA for all terrestrial species, or the National Marine Fisheries Service (NMFS), which administers FESA for marine fish species, including anadromous salmonids. The first pathway (FESA, Section 10(a) Incidental Take Permit) is set up for situations where a non-federal government entity (or where no federal nexus exists) must resolve potential adverse impacts to species protected under FESA. The second pathway (FESA, Section 7 Consultation) involves projects with a federal connection or requirement; typically these are projects where a federal lead agency is sponsoring or permitting the proposed project. For example, a permit from the Corps may be required if a project will result in wetland impacts. In these instances, the federal lead agency (e.g., the Corps) initiates and coordinates the following steps: informal consultation with USFWS and/or NMFS to establish a list of target species; preparation of biological assessment assessing potential for the project to adversely affect listed species; coordination between state and federal biological resource agencies to assess impacts/proposed mitigation; and development of appropriate mitigation for all significant impacts on federally listed species.

The FESA administering agency ultimately issues a final Biological Opinion on whether the project will affect a federally listed species. A Section 10(a) Endangered Species Incidental Take Permit would be necessary when the “taking” or harming of a species is incidental to the lawful operation of a project.

California Endangered Species Act

Sections 2080 and 2081 of the California Fish and Game Code regulate the take of plants and animals that are protected under the authority of the California Endangered Species Act of 1984 (CESA). Under CESA, CDFG maintains a list of threatened species and endangered species (California Fish and Game Code 2070). The CDFG also maintains a list of candidate species that are species CDFG has formally noticed as being under review for addition to either the list of

endangered species or the list of threatened species, as well as a list of “species of special concern” which serve as “watch lists.”

Pursuant to the requirements of CESA, an agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species.

CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code dealing with rare or endangered plants or animals. This section was included in the guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant effect on, for example, a candidate species that has not yet been listed by either the USFWS or CDFG. Thus, CEQA provides the ability to protect a species from potential project impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

CEQA Appendix G requires an analysis of potential adverse effects on riparian habitat or other sensitive natural communities identified in local or regional plans, policies, regulations or by CDFG. Sensitive natural communities are identified by the CDFG in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986) and by the CNDDDB. Appendix G requires an assessment of substantial adverse effects to riparian habitat or other sensitive natural communities. Local planning documents such as general plans often identify these resources as well.

Other Statutes, Codes, and Policies Affording Limited Species Protection

Birds

The federal Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Birds of prey are protected in California under the State Fish and Game Code, Section 3503.5 (1992). Section 3503.5 states that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “taking” by the CDFG.

Plants

The legal framework and authority for the state's program to conserve plants are woven from various legislative sources, including CESA and CEQA Guidelines. In addition, the California Native Plant Protection Act of 1977 (Fish and Game Code Section 1900 – 1913) gives the CDFG authority to designate state endangered, threatened, and rare plants and provides specific protection measures for identified populations.

The California Native Plant Society (CNPS) maintains a list of special status plant species based on collected scientific information. Designation of these species by CNPS has no legal status or protection under federal or state endangered species legislation. CNPS designations are defined as List 1A (plants presumed extinct); List 1B (plants rare, threatened, or endangered in California and elsewhere); List 2 (plants rare, threatened, or endangered in California, but more numerous elsewhere); List 3 (plants about which more information is needed – a review list); and List 4 (plants of limited distribution - a watch list). There is a general agreement among biologists, ecologists and other resource specialists, that vascular plants listed as rare or endangered or as List 1 or 2 by the CNPS meet the broader definition in CEQA Guidelines Section 15380(b). Thus, substantial adverse effects to these species would be considered significant. Additionally, plants constituting CNPS List 1A, 1B or 2 meet the definitions of CDFG Code Section 1901 (Native Plant Protection Act) or Sections 2062 and 2067 (CESA).

Wetlands

U.S. Army Corps of Engineers

Wetlands and other waters, e.g., rivers, streams and natural ponds, are a subset of “waters of the U.S.” and receive protection under Section 404 of the Clean Water Act. The Corps has primary federal responsibility for administering regulations that concern waters and wetlands on the project site under statutory authority of the Clean Water Act (Section 404). In addition, the regulations and policies of various federal agencies (e.g., U.S. Department of Agriculture, and Natural Resource Conservation Service [NRCS], U.S. EPA) mandate that the filling of wetlands be avoided to the extent possible.

The term “waters of the U.S.” as defined in Code of Federal Regulations (33 CFR 328.3[a]; 40 CFR 230.3[s]) includes: (1) All waters which are currently used, 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; (2) All interstate waters including interstate wetlands; (3) All other waters such as intrastate 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 which are or could be used by interstate or foreign travelers for recreational or other purposes; or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce; (4) All impoundments of waters otherwise defined as waters of the United States under the definition; (5) Tributaries of waters identified in paragraphs (1) through (4); (6) Territorial seas; and (7) Wetlands adjacent to waters (other than waters that are themselves

wetlands) identified in paragraphs (1) through (6). The Corps requires obtaining a permit if a project proposes placing structures within navigable waters and/or alteration of waters of the United States.

San Francisco Bay Regional Water Quality Control Board

Under Section 401 of the federal Clean Water Act (CWA), the San Francisco Bay Regional Water Quality Control Board (RWQCB) must certify that actions receiving authorization under section 404 of the CWA also meet state water quality standards. The RWQCB also regulates waters of the state under the Porter-Cologne Act Water Quality Control Act (Porter Cologne Act). The RWQCB requires projects to avoid impacts to wetlands if possible and requires that projects do not result in a net loss of wetland acreage or a net loss of wetland function and values. The RWQCB typically requires compensatory mitigation for impacts to wetlands and/or waters of the state. The RWQCB also has jurisdiction over waters deemed “isolated” or not subject to Section 404 jurisdiction under *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (SWANCC).⁸ Dredging, filling, or excavation of isolated waters constitutes a discharge of waste to waters of the state and prospective dischargers are required to obtain authorization through an Order of Waste Discharge or waiver thereof from the RWQCB and comply with other requirements of the Porter-Cologne Water Quality Control Act.

California Department of Fish and Game

Under Sections 1600 - 1616 of the California Fish and Game Code, the CDFG regulates activities that would “substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake.” The jurisdictional limits of CDFG are defined in Section 1602 of the California Fish and Game Code as, “bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake....” The CDFG requires a Streambed Alteration Agreement for activities within its jurisdictional area.

Oak Woodlands Conservation Act

The Oak Woodlands Conservation Act was passed by the California Legislature in 2001. On January 1, 2005 California State Senate Bill 1334 added Section 21083.4 to the Public Resources Code. This statute requires that a county must determine whether or not a project will result in a significant impact on oak woodlands and, if it is determined that a project may result in a significant impact on oak woodlands, then it shall require one or more of the following mitigation measures:

1. Conserve oak woodlands through the use of conservation easements;

⁸ Based on the Supreme Court ruling (SWANCC) concerning the Clean Water Act jurisdiction over isolated waters (January 9, 2001), non-navigable, isolated, intrastate waters based solely on the use of such waters by migratory birds are no longer defined as waters of the United States. Jurisdiction of non-navigable, isolated, intrastate waters may be possible if their use, degradation, or destruction could affect other waters of the United States, or interstate or foreign commerce. Jurisdiction over such other waters are analyzed on a case-by-case basis. Impoundments of waters, tributaries of waters, and wetlands adjacent to waters should be analyzed on a case-by-case basis.

2. Plant an appropriate number of trees, including maintenance of plantings and replacement of failed plantings;
3. Contribute funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements;
4. Other mitigation measures developed by the county.

This law protects oak woodlands that are not protected under the State Forest Practice Act, and is applicable to counties, but not to cities or other public agencies.

Local Ordinances, Plans and Policies

Sonoma County General Plan – Open Space and Resource Conservation Elements

The Open Space Element and the Resource Conservation Element of the Sonoma County General Plan (1998) contain goals, policies and objectives applicable to preservation of biological resources. The relevant policies of these sections are presented below.

Open Space Element

Critical Habitat Areas

- **OS-4e:** Require on building permits a minimum setback of 50 feet from the edge of any wetlands that are within a critical habitat area. Exempt existing farm buildings and allow them to be expanded or modified.

Resource Conservation Element

Vegetation and Wildlife Resources

- **RC-5b:** On discretionary projects, use native or compatible nonnative species to the extent possible for landscaping. Discourage use of exotics, such as pampas grass and scotch broom.
- **RC-5c:** Make the preservation of significant native oaks and other native trees a primary consideration in the review of development projects.

Protection of Rare and Endangered Species

- **RC-6b:** Protection for rare and endangered species, wetlands, and other biotic resources not indicated on Figure OS-3 of the Sonoma County General Plan shall be accomplished through compliance with applicable state and federal law.
- **RC-6c:** Notwithstanding the densities shown on the land use maps, provide for creation of separate parcels of land where necessary to establish sites for the preservation of rare and endangered species and other biotic resources.

Protection and Conservation of Freshwater Fishery Resources

- **RC-8c:** Design public and private projects to minimize damage to the stream environment and to maintain instream flows.

- **RC-8d:** Avoid substantial alteration of the stream channel and riparian vegetation in the design of flood control projects on streams with substantial natural areas.

Draft Sonoma County General Plan 2020

Sonoma County is in the process of updating its existing General Plan. While the existing adopted Sonoma County General Plan (1989, as amended) is the current governing general plan, relevant goals and policies from the draft *Sonoma County General Plan 2020* are presented below for informational purposes. Note: These are draft policies recommended by the Citizens Advisory Council (CAC) as amended by the Planning Commission. As of publication of this Draft EIR, the Sonoma County Board of Supervisors has not yet completed their deliberations or finalized these policies.

- **Goal OSRC-7:** Protect and enhance the County's natural habitats and diverse plant and animal communities.
- **Policy OSRC-7o:** Encourage the use of native plant species in landscaping. For discretionary projects, require the use of native or compatible non-native species for landscaping where consistent with fire safety. Prohibit the use of invasive exotic species.
- **Goal OSRC-8:** Protect and enhance Riparian Corridors and functions along streams, balancing the need for agricultural production, urban development, timber and mining operations, and other land uses with the preservation of riparian vegetation, protection of water resources, flood control, bank stabilization, and habitat other riparian functions and values.
- **Objective OSRC-8.3:** Recognize and protect riparian functions and values of undesignated streams during review of discretionary projects.
- **Policy OSRC-8b:** Establish streamside conservation areas along both sides of designated Riparian Corridors as follows, measured from the top of the higher bank on each side of the stream as determined by PRMD: Other Riparian Corridors - 50'.
- **Policy OSRC-8d:** Allow or consider allowing the following uses within any streamside conservation area:
 - 1) Timber harvest operations conducted in accordance with an approved timber harvest plan.
 - 2) Streamside maintenance, fire fuel management, and restoration.
 - 3) Road crossings, street crossings, utility line crossings.
 - 4) Mining operations conducted in accordance with the County Surface Mining and Reclamation Ordinance.
 - 5) Permitted summer dams.
 - 6) Grazing and similar agricultural production activities not involving structures or cultivation, except as defined by (7) below.
 - 7) Agricultural cultivation
 - a) located no closer than 100' from the top of the bank in the "Russian River Riparian Corridor".

- b) located no closer than 50' from the top of the bank in the “Flatland Riparian Corridors” or in upland areas of “Other Riparian Corridors”.
 - c) located no closer than 25' from the top of the bank in the “Other Riparian Corridors” not in upland areas.
- 8) Equipment turnaround and access roads associated with agricultural cultivation, provided that the affected area is the minimum necessary for these turnaround and access roads and that a minimum 25' vegetative filter strip is provided and maintained between the affected area and the top of the bank.
 - 9) Vegetation removal as part of an integrated pest management program administered by the Agricultural Commissioner.
 - 10) Creekside bikeways, trails, and parks within Urban Residential, Commercial, Industrial, or Public-Quasi Public land use categories.
 - 11) Development authorized by exception under Policy OSRC-8e.
- **Policy OSRC-8m:** Apply the SCWA Flood Control Design Criteria creek setback to development along streams where necessary to protect against streambank erosion.

Sonoma County Tree Ordinances

The Tree Protection and Replacement Ordinance (No. 4014) of the Sonoma County Code sets preservation and protection standards for protected trees with a 9-inch or greater diameter at breast (standard) height (dbh). Protected trees include big leaf maple (*Acer macrophyllum*), black oak (*Quercus kelloggii*), blue oak (*Quercus douglasii*), coast live oak (*Quercus agrifolia*), interior live oak (*Quercus wislizenii*), madrone (*Arbutus menziesii*), oracle oak (*Quercus morehus*), Oregon oak (*Quercus garryana*), redwood (*Sequoia sempervirens*), valley oak (*Quercus lobata*), California bay (*Umbellularia californica*) and their hybrids. Only mature valley oaks are considered a protected tree of special significance. The number and size of replacement plantings is calculated using one of the two arboreal value charts as instructed in the ordinance. Arboreal Value Chart #1 requires analysis to be completed in the construction area and requires 100 percent replacement or in lieu fees. Arboreal Value Chart #2 requires analysis of the entire site but allows for removal of up to 50 percent of the arboreal value. Compensation for the loss of trees greater than 50 percent requires determining the number of trees to replace using the arboreal value chart.

A portion of the property is zoned within a Valley Oak Habitat (VOH) Combining District. Sonoma County Ordinance No. 4991 protects valley oak trees and valley oak woodlands within the Valley Oak Habitat (VOH) district boundaries. This ordinance requires mitigation of any large valley oak (dbh greater than 20 inches) or small valley oak (dbh less than 20 inches) having a cumulative diameter at breast height greater than sixty (60) as a result of valley oak tree removal or cutting down within the VOH. Mitigation may be in the form of (1) tree replacement by planting valley oak seedlings on the subject property or on another site in the county having the geographic, soil, and other conditions necessary to sustain a viable population of valley oaks, (2) retaining other valley oak trees on the subject property, (3) a combination of measures (1) and (2), or (4) paying an in-lieu fee, which shall be used exclusively for valley oak planting programs in the County.

The Sonoma County Ordinance No. 3651 preserves heritage and landmark trees that have been nominated and accepted by the County as heritage or landmark trees. This ordinance requires that any person or entity proposing to remove or damage a heritage and landmark tree shall first obtain a tree permit. No heritage or landmark trees occur on the project site.

Petaluma Dairy Belt Area Plan – Natural Resources

Sonoma County's Petaluma Dairy Belt Area Plan (1993) contains land use and development goals and policies applicable to preservation of biological resources in the Petaluma Dairy Belt area. The Petaluma Dairy Belt area is located in south and southwestern Sonoma County, along the Marin County border. The relevant policies of these sections are presented below.

Rare and Endangered Species

- Surveys for rare and endangered species shall be required for all discretionary permits in the Dairy Belt Area Plan area. Waiver of this requirement may be permitted only if it can be demonstrated that there are no rare or endangered species on the affected site.

Riparian Corridors

- Agricultural uses, including cultivation of the land for agricultural use, shall maintain a 30 foot setback from the outer edge of the riparian vegetation.
- Riparian vegetation shall not be removed to accommodate any residential or commercial development allowed by this plan.
- Other means to preserve riparian vegetation should be encouraged, through setback requirements, contract agreements between landowners and non-profit conservancy groups, or other means focused on preserving both agricultural viability and riparian corridor protection.

Plant and Animal Life

- Preserve the permanent wildlife habitat areas that are representative of this Area Plan's floral and faunal communities. Human uses of these areas should be adequately regulated to protect these communities, and land uses should be restricted to those that are compatible with the perpetuation of these communities. These habitats shall include but not be limited to the following: (1) remaining natural stream and river courses; (2) natural fresh water and salt water marshes; and (3) habitats necessary for the preservation of rare or endangered species.
- Minimize future damage to fisheries, fish habitats, and spawning grounds, and, as far as possible, repair past damage.
- Encourage the use of native plants for screening and landscaping.

Impacts and Mitigation Measures

Significance Criteria

Appendix G of the CEQA *Guidelines* (as revised) indicates that a project would have a significant effect for biological resources if it would:

- 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 CDFG or USFWS;
- 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 CDFG or USFWS;
- 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;
- 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;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

For the purposes of this EIR, the determination of significance is based on the above-mentioned guidelines and policies set forth by the County's General Plan and other documents as referenced in the impact discussion. Environmental impacts associated with the proposed project are discussed below.

Impact D.1: Project construction and grading activities within the proposed aggregate mining area could disturb or remove wetland and riparian habitat located on-site and directly adjacent to the southern boundary of the site. This would be a significant impact.

Proposed grading, stockpiling, and mining operations would excavate and fill the existing seasonal stock pond and approximately 2,000 linear feet of the upper portions of the three swales on the property, as well as remove any associated riparian and wetland vegetation. Mining and grading activities would result in the permanent loss of approximately 600 linear feet of the West Swale and approximately 1,200 linear feet of the Center Swale. Additional disturbance would occur in the West Swale where the outfall pipe from the proposed sedimentation pond is extended to the swale and rip rap is added to the swale banks. Proposed placement of Stockpile B and its associated sedimentation basin would result in the permanent loss of approximately 200 linear feet of the East Swale.

The three swales, Center Pond, and some of the seeps are potentially subject to the jurisdiction of the Corps under Section 404 of the Clean Water Act, the jurisdiction of RWQCB under Section

401 of the Clean Water Act and/or the jurisdiction of CDFG under Sections 1600 – 1607 of Fish and Game Code since they have a hydrologic connection to other waters of the U.S. Excavation and filling of potentially jurisdictional wetlands would result in a significant impact.

Removal of a portion of the Ranch Tributary watershed may incrementally reduce baseflow in the Ranch Tributary and cause a reduction of flow in Americano Creek (see Impact C.5, *Hydrology and Water Quality*). The potential reduction in baseflows may reduce water availability to the riparian vegetation along Ranch Tributary and Americano Creek. Additional potential impacts to project site drainages include the potential for decreased water quality, and increased erosion and sedimentation, and increased peak flows. These impacts are discussed below under Impact D.6.

Measures D.1a through D.1c would reduce the project impacts to wetlands and riparian habitats to a less-than-significant level.

Mitigation Measure D.1a: To mitigate the filling or excavating of potentially jurisdictional wetlands within the proposed project area, the project proponent shall:

- Conduct a formal wetland delineation in accordance with 1987 *Corps of Engineers Wetlands Delineation Manual* and have it verified by the U.S. Army Corps of Engineers (Corps). If the Corps and/or CDFG determine that the potentially affected water-associated features are jurisdictional, then the project proponent shall obtain appropriate wetland permits and implement all conditions contained in the Section 404 Clean Water Act permit (possibly an Nationwide permit) from the Corps, Section 1603 Streambed Alteration Agreement from CDFG, and/or Section 401 water quality certification from the Regional Water Quality Control Board.
- Compensate for the loss of jurisdictional wetlands at a 2:1 ratio (or as agreed to by the permitting agencies) within the project site boundary, or at a 3:1 ratio (or as agreed to by the permitting agencies) off-site within the local watershed, by creating, restoring or enhancing waters of the U.S., or contributing in-lieu funds to an existing or new restoration project preserved in perpetuity. The restoration effort shall require implementation of a five-year monitoring program with applicable performance standards, including but not limited to establishing: 80 percent survival rate of restoration plantings native to local watershed; absence of invasive plant species; absence of erosion features; and a functioning, and self-sustainable wetland system.

Mitigation Measure D.1b: Avoid all potential jurisdictional wetlands and riparian habitat located along the southern boundary (i.e., Ranch Tributary) and the southwestern corner (i.e., seasonal wetlands on valley floor adjacent to Americano Creek) of the property. Prior to construction activities, the project applicant shall take appropriate measures to protect the wetland and riparian habitat located in these areas. The following protection measures are to be included in the grading and Reclamation Plan:

- Installation of exclusionary construction fencing along the southern property line as well as around the two seasonally wetlands identified on Figure IV.D-1 to protect these features from all project construction and operation activities;
- Implementation of measures to control dust in adjacent work areas (please see comprehensive dust control program identified in Mitigation Measure F.4 in Section IV.F, Air Quality);

- Maintenance of the hydrologic inputs (flow) to the seasonally wet area in the southwestern corner of the property (please see Mitigation Measure C.5 in Section IV.C, Hydrology and Water Quality); and
- The project applicant shall maintain the minimum allowed 100-foot setback for quarry mining operations from stream banks (Americano Creek and Ranch Tributary) and critical habitat areas designated in the Sonoma County General Plan (Chapter 26A, County Code).

Mitigation Measure D.1c: Implementation of Mitigation Measure C.5 presented in Section IV.C *Hydrology and Water Quality* would monitor baseflow conditions in the potentially affected reaches of Ranch Tributary and Americano Creek to determine if quarry operations affect baseflows. If a reduction of baseflows becomes evident, the applicant shall design and install a system that would divert stored surface water from the project site to Ranch Tributary to replicate pre-project baseflows.

Significance after Mitigation: Less than Significant.

Impact D.2: Project construction and grading activities within the proposed aggregate mining area would impact protected trees. This would be a significant impact.

The project site supports numerous oak trees and several California bay trees that would be considered protected in accordance with the Sonoma County’s tree ordinance, including trees in the oak woodland community in the northern portion of the project site, an isolated stand of oak trees in the open grassland, and California bay trees west of the West Swale. Table IV.D-1 lists protected trees proposed for removal within the limits of construction.

The isolated stand of oak trees south of Center Pond is composed of nine black oak trees (see Table IV.D-1). These trees have nine-inch or greater diameters at standard height, and meet the criteria of the Sonoma County’s tree ordinance as protected trees. Proposed mining within Phase 3 would result in removal of these nine protected oak trees.

**TABLE IV.D-1
PROTECTED TREES PROPOSED FOR REMOVAL**

Species	Location	Diameter at Standard Height
Black oak	South of Center Pond	2-stemmed: 9-inch + 24-inch
Black oak	South of Center Pond	2-stemmed: 12-inch + 12-inch
Black oak	South of Center Pond	9-inch
Black oak	South of Center Pond	12-inch
Black oak	South of Center Pond	12-inch
Black oak	South of Center Pond	12-inch
Black oak	South of Center Pond	12-inch
Black oak	South of Center Pond	2-stemmed: 12-inch + 30-inch
Black oak	South of Center Pond	18-inch

SOURCE: ESA

Mining activities would avoid directly removing the protected trees in the oak woodland community in the northern portion of the project site since it is located outside the mining and stockpiling footprint. A proposed minimum 25-foot setback from mining and stockpiling activities would serve to buffer this oak woodland. Furthermore, stockpiles A and B would be hydroseeded to minimize dust and erosion. Nevertheless, the oak trees located nearest proposed Stockpile A could be impacted from potential soil runoff from the stockpile, particularly during the rainy season, prior to the full establishment of the hydroseed cover.

In addition, the proposed staging pad (for equipment storage) proposed at the top of the access road would be located uphill of and adjacent to an isolated stand of three to four protected California bay trees. Proposed grading activities associated with the development of this pad could expose these bay trees to erosion and sedimentation runoff.

As a general rule, the closer a construction activity is to the trunk of a tree, the greater the potential for damage. Each root that is damaged or compacted reduces the tree's capacity to supply water and nutrients to the leaves. Extensive damage to the root zone could lead to mortality of the tree. Implementation of Mitigation Measures D-2a through D-2e would protect trees during grading and stockpiling activities.

Furthermore, potential changes in the direction and or quantity of shallow groundwater flow (see Figures IV.C-4 and IV.C-5) to the oak woodland located north of the proposed mining area may result in a reduction in natural water supply to these trees. A reduction in groundwater supply to the oak woodland may result in stress and/or mortality of individual trees or the entire woodland.

As part of Phase 3 of the project, a reclamation and erosion control plan would be implemented for the entire project site and would include planting coast live oak trees along with other vegetation to control erosion. However, based on the applicant's preliminary plant list, no black oak trees are identified for planting. Implementation of Mitigation Measures D-2a through D-2e would require replacing black oak in accordance with the Sonoma County tree ordinance as part of the reclamation and erosion control plan, and would reduce impacts to protected trees to a less-than-significant level.

Mitigation Measure D.2a: In accordance with Sonoma County Ordinance No. 4014, prior to the start of any clearing, stockpiling, excavation, grading, compaction, paving, change in ground elevation, or construction, the project proponent shall obtain a certified arborist to identify trees proposed for preservation (saved) and trees proposed for removal at the project site on a map. The map shall indicate the size and species of trees proposed for removal and preservation. The project proponent shall save trees identified for preservation on the project site and clearly delineate such trees by constructing short post and plank walls, or other protective fencing material, at the dripline of each tree to hold back fill. The delineation markers shall remain in place for the duration of the work. The placement of the fencing material at the dripline shall be coordinated with a certified arborist.

Mitigation Measure D.2b: Where proposed development or other site work must encroach upon the dripline of a tree identified to be saved (see Mitigation Measure D.2a, above), special construction techniques will be required to allow the roots of remaining trees within the project site to breathe and obtain water (examples include, but are not limited to, use of

hand equipment for tunnels and trenching, installation of protective fencing, allowance of only one pass through a tree's dripline). Tree wells or other techniques may be used where advisable. Permission from, and inspection by, the PRMD will be required prior to backfilling, if applicable. No burning or use of equipment with an open flame shall occur near or within the dripline (except for authorized controlled burns) of a tree identified for preservation. No parking; storage of vehicles, equipment, machinery, stockpiles of excavated soils, or construction materials; or dumping of oils or chemicals shall be allowed within the dripline of preserved trees.

Mitigation Measure D.2c: In coordination with a landscape architect, certified arborist or qualified biologist, the project proponent shall replace all removed protected trees in accordance with the Sonoma County Tree Protection and Replacement Ordinance No. 4014 and incorporate these trees into the reclamation and erosion control plan. Arboreal Value Chart #1 shall be used to determine the number of replaced trees or amount of in-lieu fees.

Mitigation Measure D.2d: If any protected tree (as defined in County of Sonoma Ordinance No. 4014) proposed for preservation is damaged or stressed and results in mortality due to mining operations (including changes to shallow groundwater flows), then the project proponent shall replace the protected tree in accordance with the Arboreal Value Chart. If on-site replacement is not feasible, the proponent shall pay in-lieu fees into the County of Sonoma tree replacement fund. Should pruning be required, this will be performed by a certified arborist. No more than 25 percent of a tree's canopy will be removed during the pruning of preserved trees.

Mitigation Measure D.2e: In coordination with a landscape architect, certified arborist or qualified biologist, the project proponent shall develop and implement a five-year tree monitoring program for all replaced trees. Appropriate performance standards may include, but are not limited to establishing: a 80 percent survival rate of tree plantings and the ability to be self-sustaining at the end of five years. Additional monitoring periods may be required until the trees successfully establish.

Significance after Mitigation: Less than Significant.

Impact D.3: Project construction and grading activities within the proposed aggregate mining area would remove known habitat for California red-legged frog and potential habitat for foothill yellow-legged frog and northwestern pond turtle. This would be a significant impact.

As discussed in the Setting, Center Pond is known to support a population of California red-legged frogs (CRLF) and offers potential habitat for northwestern pond turtles. Ranch Tributary provides potentially suitable, although marginal, habitat for foothill yellow-legged frog (FYLF). Furthermore, the seeps and seasonal drainages on the project site provide potential aquatic habitat and movement corridors for red-legged frogs and pond turtles. The pond, seeps, and swale reaches located within the proposed mining area would be eliminated by the project. Furthermore, the proposed project would result in the loss of approximately 70 acres of upland habitat over the 20-year mining period that may be intermittently used by CRLF.

California red-legged frogs are aquatic frogs that breed at aquatic sites with permanent or semipermanent water. However, given the choice, many CRLF prefer to remain near permanent water bodies during dry periods. Even when permanent water is available, this species opportunistically migrates into upland habitats, due to normal dispersal behavior, from breeding sites, feeding, or basking or also for cover and aestivation during sustained dry periods. An unknown number of CRLF would be impacted in upland habitat and in the removal of Center Pond.

Although the downstream portions of the three swales are outside the proposed quarry footprint, anticipated changes to surface water and groundwater hydrology of the site could potentially deprive the remaining swale reaches of some flow, thus reducing existing aquatic habitat values in the swales outside the mining footprint. However, the proposed artificial drainage swale to be constructed around the perimeter of mining area may provide future aquatic habitat to special-status amphibians and reptiles.

The project applicant proposes to remove Center Pond during Phase 1 and replace it with a new stock pond (to support continued cattle grazing on the portions of the property that would be unaffected by the mining operation) at an undetermined location on the property. The new stock pond and proposed sediment detention basin may provide habitat for CRLF, FYLF, and northwestern pond turtle.

In addition to the ultimate loss of aquatic habitat discussed above, the grading activities associated with the removal of this habitat could result in injury or mortality of special-status aquatic species through crushing or burying of individuals by construction equipment. Similarly, if the drainage swale becomes populated by special-status aquatic species, the reconfiguration of the swale between mining phases may result in injury or mortality to individuals.

The loss of known (Center Pond) or potential (swales and seeps) aquatic habitat for the CRLF, FYLF, and northwestern pond turtle, or the direct injury or mortality of individuals as a result of construction activities, would be a significant impact.

The implementation of Mitigation Measure D.3 would reduce this impact to less than significant.

Mitigation Measure D.3: The project proponent shall implement measures to minimize and avoid take of CRLF that would additionally benefit pond turtles and foothill yellow-legged frog, if present. The following measures are derived from the Programmatic Biological Opinion (PBO) for impacts to California red-legged frog (USFWS, 1999). Projects that impact CRLF, such as the Roblar Road Quarry project, require formal consultation with the USFWS and issuance of a Biological Opinion. The following actions will minimize impacts to these species.

Construction-Related Measures

- A USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and their habitat, and the general measures that are being implemented to protect the CRLF as they relate to the project.

- The mitigation pond shall be created and suitable for receiving relocated CRLF prior to the removal of Center Pond and surrounding upland habitat.
- Following construction of the mitigation pond and no more than 14 days prior to the initiation of grading activities near Center Pond, a USFWS-approved wildlife biologist shall capture all CRLF and other special-status aquatic species and relocate them to the mitigation pond.
- A USFWS-approved biologist shall be present during initial grading activities in and surrounding Center Pond until CRLF have been removed. Thereafter, an onsite person shall be designated to monitor onsite compliance with all minimization measures. The USFWS-approved biologist shall ensure that this individual receives training consistent with that outlined in the Biological Opinion.
- During all phases of project operations, all trash that may attract CRLF predators shall be properly contained and removed from the site.
- The fueling and maintenance of vehicles and other equipment shall occur at least 20 meters from any riparian habitat or water body.

Pond Design, Management, and Monitoring

- The project proponent shall coordinate with the USFWS to select a suitable site for a new mitigation stockpond of equal or greater size to Center Pond within the property boundaries. The location and design of the new pond shall conform to guidelines of the USFWS Recovery Plan for CRLF (USFWS, 2002) and shall also include a permanent upland habitat buffer of no less than 250 feet around the pond. The final pond design shall be approved by the USFWS as a requirement of the project Biological Opinion. The mitigation pond should be created and functioning prior to the initiation of ground disturbing activities within 250 feet of Center Pond.
- The mitigation pond shall be designed to provide CRLF breeding habitat and shall include areas with deep-water cover for adult, juvenile and metamorphic red-legged frogs and shallow areas to provide for tadpole and juvenile rearing. The pond shall be designed to pool to a depth of between 3 to 4 feet and to maintain at least 1.0 foot of standing water through September 15 during years with average rainfall. To ensure sufficient water is available to support CRLF breeding, a qualified hydrologist shall be consulted to assess the amount of water that will be available at the selected site during dry, average, and wet years. A design plan shall be prepared to include a grading plan and cross-section plan indicating pond depth and dimensions. The basin shall be contoured based on the above design, and lined with clay or a similar impervious substrate to ensure water holding capacity that meets minimum performance standards and specifications.
- The mitigation pond shall be vegetated in accordance with the guidelines set forth in the Red-legged Frog Recovery Plan. Relocated vegetation shall salvage and utilize *native* emergent and aquatic vegetation from Center Pond whenever possible. Upland habitat surrounding the pond should be seeded with native grassland cover species.
- An adaptive management plan shall be developed for the mitigation pond consistent with the USFWS Recovery Plan for CRLF (USFWS, 2002) and project Biological Opinion. The plan shall include a program to monitor pond performance over time and discourage the presence of non-native vegetation and bullfrogs. During the initial

five year monitoring period, annual hydrologic, vegetation and wildlife surveys shall be performed to document ponding conditions, the establishment of aquatic vegetation and to monitor California red-legged frog use of the pond.

- The adaptive management plan shall provide provisions to quantify site conditions relative to performance standards for a period of five years, to include:
 1. Ability to maintain standing water at a depth of at least 1.0 foot within at least 50 percent of the pond area through September 15 during a year with average rainfall.
 2. Presence of CRLF in any life history stage, to be determined by egg mass surveys and focused nighttime surveys for adults and juveniles.
 3. The presence of native emergent or aquatic vegetation covering at least 10 percent of the pond edge.
 4. Absence of persistent, self-sustaining populations of non-native CRLF predators, particularly bullfrogs.

The adaptive management plan shall include contingency measures to respond to inadequate hydrologic conditions (if later identified) and provide for control of non-native vegetation and CRLF predators, if identified in the mitigation pond. If bullfrogs are identified, the preferred management method shall be manual (hand) removal using a gig or other means. This method maintains the availability of aquatic habitat for red-legged frogs and sustains aquatic vegetation. If hand removal of bullfrogs proves ineffective, the pond shall be drained and dried between October 1 and November 15 (following metamorphosis of red-legged frog tadpoles) to break the bullfrog life cycle.

An invasive plant species management plan shall be incorporated into the adaptive management plan to provide for the management and removal of invasive aquatic vegetation, if present. The preferred management method shall be for manual (i.e., non-chemical) removal of invasive species, whenever possible.

Pond management shall continue for the duration of the proposed project, or as required by the Biological Opinion.

Significance after Mitigation: Less than Significant.

Impact D.4: Project construction and grading activities within the proposed aggregate mining area could disturb active nests of raptors and other special-status birds. This would be a potentially significant impact.

No special-status bird species were observed on the project site during reconnaissance surveys. Although these species were not observed within the proposed quarry site, potential habitat for the following special-status species birds occurs on the property: Cooper's hawk, sharp-shinned hawk, golden eagle, burrowing owl, oak titmouse, Lawrence's goldfinch, white-tailed kite, northern harrier, California horned lark, loggerhead shrike, and Allen's hummingbird.

Proposed grading, stockpiling, and other site disturbance would result in the removal of several trees in the vicinity of the existing stock pond (see Impact D.2, above for further detail) as well as other vegetation associated with the seasonal drainages. Furthermore, a total of approximately 70 acres of non-native grasslands would be lost over the 20-year mining period. If removal of the non-native grassland is conducted during the breeding season (February 1 through August 31), these project activities have the potential to result in direct mortality of raptors and passerines nesting within grasslands, oak woodlands, or riparian vegetation. Although burrowing owls are not known to occur on the site, grading and earthmoving activities within project site grasslands during the non-breeding season could result in mortality of this species, if present at the time these activities occur.

If ground-disturbing activities (i.e., ground clearing or grading, including removal of shrubs), are scheduled to occur during the non-breeding season (September 1 through January 31), no mitigation is required. However, if ground-clearing activities would occur from February 1 to August 31, implementation of Mitigation Measure D.4a would reduce potential impacts to nesting raptors and other special-status birds to a less-than-significant level. Mitigation Measure D.4b would reduce potential significant impacts to burrowing owl less-than-significant level.

Mitigation Measure D.4a: Avoid disturbing active nests of raptors and other special-status birds through preconstruction surveys and creation of no-disturbance buffers during ground-clearing and grading activities associated with initiation of each mining phase.

If site preparation activities (i.e., ground clearing and grading, including removal of trees or shrubs) are scheduled to occur during the non-breeding season (September 1 through January 31), no mitigation is required.

If site preparation activities are scheduled to occur during the breeding season (February 1 through August 31), the following measures shall be implemented to avoid potential adverse effects to nesting raptors and other special-status birds:

- A qualified wildlife biologist shall conduct preconstruction surveys of all potential nesting habitat within 500 feet of construction activities where access is available.
- If active nests are found during preconstruction surveys, a no-disturbance buffer acceptable in size to CDFG shall be created around active raptor nests and nests of other special-status birds during the breeding season or until it is determined that all young have fledged. Typical buffers include 500 feet for raptors and 250 feet for other nesting special-status birds. The size of these buffer zones and types of construction activities restricted in these areas may be further modified through coordination with CDFG and will be based on existing noise and human disturbance levels at each project site. Nests initiated during construction are presumed to be unaffected and no buffer is necessary. However, the “take” of any individuals will be prohibited.
- If preconstruction surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation is required. Trees and shrubs within the project footprint that have been determined to be unoccupied by special-status birds or that are located outside the no-disturbance buffer for active nests may be removed.

Mitigation Measure D.4b: Although burrowing owls have not been reported from the immediate vicinity of the project site, the project proponent shall avoid disturbing potential burrowing owl burrows through preconstruction surveys and creation of no-disturbance buffers during ground-clearing and grading activities associated with initiation of each mining phase.

- No more than 2 weeks before grading and ground-clearing activities begin prior to each of the three mining phases, a survey for burrowing owls shall be conducted by a qualified biologist within 500 feet of the earthmoving activities. The survey shall conform to the most current protocol described by the California Burrowing Owl Consortium (presently the 1993 protocol). If burrowing owl habitat is identified during the initial survey, a complete owl survey consisting of four site visits shall be performed as detailed in the Consortium guidelines.
- If occupied owl burrows are found during the surveys, a determination shall be made by a qualified burrowing owl biologist as to whether or not proposed project activities would affect the occupied burrows or disrupt reproductive behavior. If it is determined that the project would not adversely affect occupied burrows or disrupt breeding behavior, project implementation may proceed without any restriction or mitigation measures. If it is determined that the project could adversely affect occupied burrows during the August 31 through February 1 non-breeding season, the subject owls may be passively relocated from the occupied burrow(s) using one-way doors. There shall be at least two unoccupied burrows suitable for burrowing owls within 300 feet of the occupied burrow before one-way doors are installed. The unoccupied burrows shall be located 160 feet from construction activities and can be natural burrows or artificial burrows constructed according to current design specifications. Artificial burrows shall be in place at least one-week before one-way doors are installed on occupied burrows. One-way doors would be in place for a minimum of 48 hours before burrows are excavated.
- If it is determined that the project would physically affect occupied burrows or disrupt reproductive behavior during the nesting season (February 1 through August 31) then avoidance is the only mitigation available (California Burrowing Owl Consortium 1993; CDFG 1995). Implementation of ground-clearing and grading activities shall be delayed within 250 feet of occupied burrows until it is determined that the subject owls are not nesting or until a qualified biologist determines that juvenile owls are self-sufficient or are no longer using the natal burrow as their primary source of shelter.

Significance after Mitigation: Less than Significant.

Impact D.5: Project construction and grading activities could result in direct impacts to American badger and the loss of annual grasslands that support this species. This would be a potentially significant impact.

Project activities, including grading, stockpiling, and other site disturbances would disturb annual grasslands on the project site and eliminate numerous badger dens. The removal of inactive badger dens would not be considered a significant project impact, but there is a potential that active dens may be encountered. This species may be present on the site at any time of the year,

and the removal of active dens could result in the direct mortality of individual badgers that are denning in project area grasslands, if present when activities occur.

Mitigation Measure D.5 would be implemented prior to ground-clearing activities to reduce potential impacts to badgers to a less-than-significant level.

Mitigation Measure D.5: Avoid and minimize impacts to badgers through preconstruction surveys prior to ground clearing and grading in annual grasslands habitat or areas that are known or suspected to support badger.

Within 30-days prior to initiation of each mining phase, a qualified biologist shall survey for badgers within 100-feet of project activities. If no evidence of badger presence is detected, no further mitigation is required. If evidence of badgers is identified, the following measures are required to avoid potential impacts to this species:

- Use exclusion techniques to passively relocate any badgers that are present in project areas or within 50 feet of project activities. When outside the project area, but within 50 feet of activities, vacated dens shall be temporarily covered using plywood sheets or similar materials.
- To reduce the risk of badger mortality from vehicles, the use of private (non-county operated) haul roads shall be limited to daylight hours during the March to June badger pupping season with gated access.
- A 25 mile-per-hour speed limit shall be posted for roads on the site.

Significance after Mitigation: Less than Significant.

Impact D.6: Project construction and grading activities within the proposed aggregate mining area could disturb active roosts of special-status bat species. This would be a potentially significant impact.

Potential foraging and roosting habitat for special-status bat species is present on the Roblar Road Quarry project site. Ground-clearing activities, such as tree removals, could potentially disturb active bat roosts in the area and result in direct mortality of special-status bats. Furthermore, the existing ranch buildings offer potential roosting habitat for bats. The existing house on the project site is proposed to be remodeled and used by the quarry caretaker. In addition, the existing barn and workshop structures would remain and be utilized by the quarry operator. Remodeling and/or renewed use of these buildings could potentially disturb active bat roosts and result in direct mortality of special-status bats. The disturbance or destruction of active roosting habitat for special-status bat species, as well as the potential mortality of bats, would be a significant impact. Mitigation Measure D.6 would reduce this potential impact to less than significant.

Mitigation Measure D.6: Avoid disturbing active roosts of special-status bats through preconstruction surveys and creation of no-disturbance buffers during ground-clearing and grading activities associated with initiation of each mining phase, as well as during project activities related to remodeling and/or renewed use of the existing buildings.

Prior to construction activities (i.e., ground-clearing and grading, including removal of trees or shrubs, building remodeling, renewed building use) within 200 feet of trees or buildings potentially supporting special-status bats, a qualified bat biologist will survey for special-status bats. If no evidence of bats (i.e., direct observation, guano, staining, strong odors) is present, no further mitigation is required.

If evidence of bats in trees on the property is observed, the following measures are required to avoid potential adverse effects special-status bats:

- A no-disturbance buffer of 100-feet, or other suitable distance determined in coordination with CDFG, will be created around active bat roosts during the breeding season (April 15 through August 15). Bat roosts initiated during construction are presumed to be unaffected, and no buffer is necessary. However, the “take” of individuals will be prohibited.
- Removal of trees showing evidence of bat activity will occur during the period least likely to impact the bats as determined by a qualified bat biologist (generally between February 15 and October 15 if winter hibernacula are observed or between August 15 and April 15 if maternity roosts are present). If known bat roosting habitat is destroyed during tree removal activities, artificial bat roosts shall be constructed in an undisturbed area of the property, at least 200 feet from any project activities. The design and location of the artificial bat roost(s) shall be determined by a qualified bat biologist.

If evidence of bats in existing buildings on the property is observed, the following measures are required to avoid potential adverse effects special-status bats:

- Prior to any remodeling activities and/or renewed use of existing buildings with observed bat activity, a qualified bat biologist shall review design drawings and use plans for the building(s). The biologist shall then make a determination, in coordination with CDFG, whether the bats would need to be evicted in order to implement the remodeling/new use of the structures, or if the bats would not be affected and should remain in the structure. If eviction is deemed necessary, the bats shall be transferred to an artificial roosting site. The artificial roost shall be constructed in an undisturbed area of the property, at least 200 feet from any project activities. The design and location of the artificial bat roost(s) shall be determined by a qualified bat biologist.

Significance after Mitigation: Less than Significant.

Impact D.7: Quarry activities associated with the proposed project may result in adverse impacts to the surface hydrology and water quality of on-site and surrounding drainages, including Ranch Tributary and Americano Creek, that may impact special-status fish species known to occur downstream of the project site. This would be a potentially significant impact.

Impacts C.1 through C.5 presented in Section IV. *Hydrology and Water Quality* describe the potential effects of the proposed project on the surface water hydrology and water quality of on-site drainages and the adjacent Ranch Tributary and Americano Creek. These impacts, as well as their potential effects on special-status fish species (steelhead and tidewater goby) known to occur seven miles downstream from the project site in the lower Americano Creek watershed, are summarized below. Please refer to Section IV. *Hydrology and Water Quality* for a detailed discussion of these impacts.

- The proposed project may cause peak surface flows in Ranch Tributary and Americano Creek to increase due to an overall reduction in surface water infiltration and storage capacity (Impact C.1). Increased storm water runoff rates and volume could cause downstream flooding, stream bank instability, and sedimentation. This may lead to degradation of the existing aquatic habitat quality in lower Americano Creek.
- During construction grading and operation of the proposed project, disturbed and unprotected soil could erode, causing an increased amount of sediment to be carried downstream through the drainage system (Impact C.2). This sediment could enter the Ranch Tributary and Americano Creek and thus contribute to the existing sediment load within Americano Creek. Increased sedimentation may adversely affect water quality and channel substrate composition. Specific rates of sedimentation are dependant upon the duration, volume, and frequency at which sediments are contributed to the surface water flow. Substantial sedimentation rates may smother fish eggs and fish food (i.e., benthic invertebrates), degrade spawning habitat, and fill pools. Furthermore, suspended sediments increase the turbidity of the water. High rates of turbidity can result in direct mortality or deleterious sublethal effects (e.g., gill abrasion, decreased visibility during foraging) to fish.
- Excavation of the proposed quarry could cause groundwater which may contain contaminants to enter the quarry walls as seepage. This seepage could degrade water quality in Ranch Tributary and Americano Creek if not properly contained and treated prior to discharge (Impact C.4). Contamination of surface waters in Americano Creek may result in stress, physical harm, and/or mortality of aquatic organisms, including special-status fish species and their prey.
- Altering approximately 30 percent of the Ranch Tributary watershed by proposed mining could decrease baseflow to Ranch Tributary and affect flows in Americano Creek (Impact C.5). A reduction in Ranch Tributary flows to Americano Creek during the low flow period of summer and early fall may adversely affect important aquatic habitat parameters such as water depth, velocity, and temperature in downstream areas occupied by special-status fish species.

As discussed in Section IV.C *Hydrology and Water Quality*, the implementation of Mitigation Measures C.1 through C.5 would reduce potential hydrology and water quality impacts such as increased peak flows, erosion and sedimentation, water contamination, and baseflow reductions to less than significant. Therefore, the potential impacts to special-status fish species such as

increased bank erosion, increased turbidity, spawning habitat degradation, stress or mortality due to water contamination, and reduction of summer and fall habitat availability and quality are not anticipated. No further mitigation is required.

Significance after Mitigation: Less than Significant.

Impact D.8: Blasting activities associated with the proposed project could result in noise disturbance to special-status wildlife species. This would be a less-than-significant impact.

As discussed in Chapter III, Project Description, blasting may be required on average once or twice a month during the three phases of the proposed project. As described in Section IV.G, Noise and Vibration, the detonation of explosive charges results in temporary ground vibration, air-overpressure (noise), and audible blast noise (Revey Associates, 2006). Blasting activities may therefore disturb special-status wildlife species (e.g., nesting birds, bats) present on or adjacent to the project site.

Although no specific criteria or guidelines have been developed to reduce the potential impacts of blasting on wildlife, a review of available scientific literature and other published materials indicate that the effects of proposed blasting at the project site would be considered minor and therefore less-than-significant. One study evaluated the impacts of blasting on a variety of animal species at the Washington Park Zoo in Portland, Oregon. In this study, researchers evaluated the physiological and observed physical effects on a number of mammal and bird species from nearby (as close as 500 ft) blasting noise and vibration. Blasting and ground motion conducted during the study were at levels higher than expected for the blasting at the proposed quarry. Researchers concluded that the tested animals experienced no long-term negative effects from the levels of noise and vibration produced by the blasting (Hall *et al.*, 1998).

Another study, evaluated the likely effects of low-level jets and sonic booms on nesting peregrine falcons and other raptors were gathered at aeries in Arizona. Responses to extremely frequent and nearby jet aircraft were often minimal and never associated with reproductive failure. Nesting success and site re-occupancy rates were high for all aeries and no significant changes in heart rate response were noted. The birds observed were noticeably alarmed by the noise stimuli in the range of 82-114 dBA, but the negative responses were brief and never limited productivity (Gladwin *et al.*, 1988).

A third study conducted disturbance tests such as shotgun blasts and explosives detonations at seabird colonies. Startled birds flew from their nests but did not knock their eggs from the nests and returned within 30 seconds. Birds were more susceptible to disturbance while they were roosting or courting than during nest-building, incubation, or rearing young, when their tendency to remain at their nest site was strong. In laboratory studies on avian production of white leghorn hens, simulated sonic booms (156.3 dB peak flat) had no effect on oviposition, hatchability, viability, and hatching time, compared to controls. However, chicks subjected to sound stress weighed less than the control chicks at 19 days (Gladwin *et al.*, 1988).

Although no references regarding the potential effects of blasting on bats are available, the peak auditory sensitivity of bats is typically at a higher frequency than that of humans, while blast-induced noise occurs at frequencies below the threshold-of-hearing for humans. As such, blast-induced noise at the proposed quarry site is not expected to affect special-status bat species.

The available literature on the effects of noise disturbance on wildlife indicates that blasting at the project site would have brief startling effects on wildlife, but would not result in long-term impacts such as nest abandonment or decline in reproductive success. At most, blasting-induced noise levels would amount to a short-term (several seconds) nuisance, but the overall impact is considered less-than-significant.

Mitigation: None Required.

Impact D.9: Fencing of the proposed project site would result in interference with existing migratory wildlife corridor on the parcel and minor fragmentation of wildlife habitat. This would be a less-than-significant impact.

The project site is currently fenced along its perimeter with a three- to four-foot high fence constructed of several strands of barbed wire attached to wooden posts. This fence does not present a major impediment to wildlife movement. Under the proposed project, the site would be fenced for public safety. In addition, the unspecified area of the property that would continue to support a cattle operation would also be fenced. Although specific details for the design of new fences are not currently available, it is assumed that the new perimeter fence would be taller and more secure than the existing one, and would thus impede wildlife movement through the project site. However, the property is surrounded by two drainages, Americano Creek and Ranch Tributary, as well as large expanses of open space. Therefore, while wildlife movement would likely be impeded across the 199-acre project site, this impact would be considered less-than-significant due to the continued availability of migratory wildlife corridors in the immediate vicinity of the project site as well as in the general area of the property. This impact is considered less-than-significant.

Mitigation: None Required.

Impact D.10: The project would not result in a change in land use on the Lakeville Road easement exchange site. Therefore, the effects of the project on existing biological resources present on and adjacent to the Lakeville Road site would be less than significant.

As discussed in Chapter III, Project Description, the applicant proposes to participate in the Department of Conservation's Williamson Act Easement Exchange Program (WAEPP). The applicant proposes to place the Lakeville Road property (purchased by the applicant in November 2005) under a permanent agricultural easement as part of the WAEPP for rescission of 70 acres of grazing land currently under the existing Williamson Act contract on the Roblar Road

property. The property is currently used for dryland oat hay farming and is not currently under a Williamson Act contract.

This Lakeville Road easement exchange site includes one single-family home and is currently used for agricultural uses, which would continue under the conservation easement. Adjacent parcels to the northeast (Sleepy Hollow Dairy) east/south (Lower Ranch), and other nearby properties are within existing agricultural preserves. The project would not result in a change in land use on the Lakeville Road site, but rather would result in continued agricultural uses on the site that would be consistent with land uses in the area as well as the Land Extensive Agriculture (LEA) land use designation.

While the applicant would continue to retain fee title ownership of the easement exchange property, a permanent agricultural conservation easement would be transferred for future stewardship to an appropriate private land trust or government conservation agency, such as the Sonoma Land Trust or the Sonoma County Agricultural Preservation and Open Space District. Although the exact type of future agricultural use is not known at this time, it is assumed that the Sonoma Land Trust or the Sonoma County Agricultural Preservation and Open Space District will implement management practices that will protect sensitive biological resources. Therefore, the proposed project would not affect existing biological resources on or adjacent to the Lakeville Road site.

Mitigation: None Required.

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E. Transportation and Traffic

Introduction

This section describes the existing and future setting for traffic and circulation both with and without the proposed project. The analysis provides information on the local roadway network, operating levels of service (LOS), potential impact of traffic associated with the project, traffic and bicycle/pedestrian safety, road wear, and identification of mitigation measures necessary to mitigate potential significant impacts.

The transportation analysis is prepared for five scenarios, including:

- Existing (2005);
- Near-Term Cumulative Base (Year 2007);
- Near-Term Cumulative Base + Project;
- Long-Term Cumulative Base (Year 2027); and
- Long-Term Cumulative Base + Project

The traffic count data and level of service calculations for this analysis are on-file at the Sonoma County Permit and Resource Management Department.

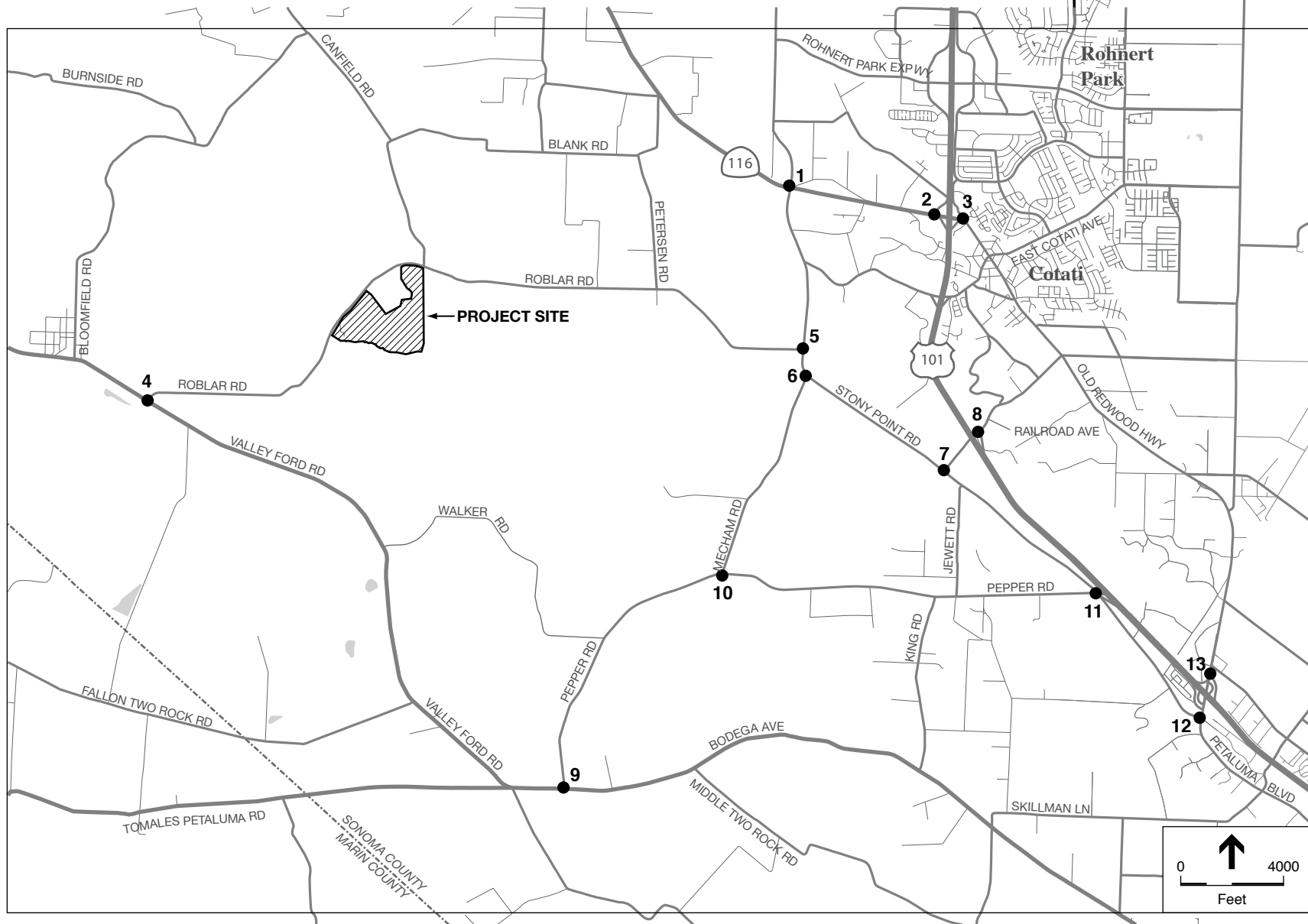
It should be noted that during preparation of this Draft EIR, in an effort to reduce potential environmental impacts, the applicant requested the inclusion of a project alternative for consideration in the EIR that includes an alternate truck haul route different from that proposed under the project. This alternate haul route is addressed in Alternative 2 in Chapter V, Alternatives, in this Draft EIR.

Setting

Sonoma County is considered a rural, low-density region. Major trip attractors are dispersed throughout the County and therefore, the dominant mode of transportation is the private automobile (SCTA, 2001). The roadway network that would be affected by the project is located in southwestern unincorporated Sonoma County, as well as within the Cities of Petaluma and Cotati. The transportation system in the project region is composed of an interconnected network of federal, state, and county roadways, and bicycle facilities. Major roadways in the project area are described below.

Roadway System and Site Access

The project site and surrounding roadway network are presented in Figure IV.E-1. The project area is served primarily by a network of rural two-lane roadways. These roadways are typically unimproved and lack curbs and sidewalks. The project site is located on Roblar Road, approximately two miles east of Valley Ford Road, and 3½ miles west of Stony Point Road. Regional access to the area is provided by U.S. Highway 101 (U.S. 101), State Route 116 (SR 116), Valley Ford Road and Stony Point Road, while local access is provided via Roblar Road, Pepper Road, and Mecham Road.



SOURCE: ESA

Roblar Road Quarry . 204334

Figure IV.E-1
Roadway Network and Study Intersections

U.S. Highway 101 is a principal north-south freeway in Sonoma County, extending northward to Mendocino County, and southward to Marin County, and points beyond. In the Cotati vicinity in Sonoma County, U.S. 101 is a four-lane freeway. U.S. 101 provides access to/from the project site via interchanges at SR 116, Railroad Avenue (northbound off-ramp), Pepper Road (southbound on-ramp) and Old Redwood Highway.

State Route 116 is a major east west route in Sonoma County, extending between SR 1 in the west and SR 121 in the east, and providing direct access to U.S. 101. In the project vicinity, SR 116 is designated as a two-lane rural principal arterial. SR 116 contains approximately 12-foot wide travel lanes and paved shoulders ranging between two and four feet in width. SR 116 is relatively level and straight east of Stony Point Road. The posted speed limit on SR 116 is 35 miles per hour (mph) in the developed area near Cotati and 55 mph out of the city limits.

Valley Ford Road is designated as a two-lane rural minor arterial, and trends in a roughly northwest-southeast direction. In the project vicinity, Valley Ford Road contains approximately 12-foot wide travel lanes plus turn lanes at intersections, and approximately six-foot wide paved shoulders. There is gradual vertical and horizontal curvature in the road. The roadway is posted with a 55 mph speed limit.

Stony Point Road is a two-lane rural principal arterial roadway, and extends in a north-south direction roughly parallel to U.S. 101. Stony Point Road contains approximate 12-foot wide travel lanes plus turn lanes at intersections. North of Pepper Road, Stony Point Road contains approximately four- to six-foot wide paved shoulders; and south of Pepper contains narrow or unpaved shoulders. There is gradual vertical and horizontal curvature in the road; as with U.S. 101, Stony Point Road rises in the vicinity of the Cotati grade. Stony Point Road contains a *prima facie* 55 mph speed limit¹ along the proposed project haul route.

Roblar Road is a two-lane major rural collector road that provides direct access to the project site. Roblar Road has approximate 12-foot lanes with two- to three-foot wide shoulders bordered by open drainage ditches between Stony Point Road and Canfield Road (the northeast border of project site). Roblar Road contains approximate 10-foot wide travel lanes between Canfield Road and Valley Ford Road (with some stretches as narrow as 8.5 to 9 feet in width) with no shoulders, bordered by open drainage ditches in locations.

Segments of Roblar Road both east and west of the project site are characterized by horizontal curvature and minor vertical curvature, while other segments are straight and level. The posted speed limit is 45 mph between Stony Point Road and Orchard Station Road (located approximately 1.5 miles east of the project site), where it increases to a *prima facie* 55 mph between Orchard Station Road and Valley Ford Road. There is one signed advisory 35 mph curve and four 45 mph curves east of the project site. West of the project site, there are two signed advisory 30 mph curves, one 40 mph curve, and one 45 mph curve. There is a 25 mph school speed zone (when school is in session) in the vicinity of the Dunham Elementary and Quest Montessori Schools (located approximately 2.25 miles east of the project site in the community of

¹ Unposted speed limits are known as “prima facie” speed limits.

Roblar). On Roblar Road west of Carniglia Road (approximately one-half mile east of Canfield Road), a “Slippery When Wet or Frosty” warning sign is posted on Roblar Road.

Pepper Road extends between Valley Ford Road and Stony Point Road. This roadway is classified as a rural major collector road west of Mecham Road, and a rural minor collector road east of Mecham Road. Pepper Road has approximate 12-foot travel lanes with approximate six-foot wide paved shoulders west of Mecham Road, with shoulders narrowing to two to three feet in width east Mecham Road. There is gradual horizontal and vertical curvature to the road. Pepper Road contains a *prima facie* 55 mph speed limit. East of Mecham Road, Pepper Road contains a signed advisory 50 mph curve west of King Road. There is a 25 mph school speed zone on Pepper Road in the vicinity of Jewett Road.

Mecham Road is a two-lane rural major collector roadway that runs roughly north-south between Stony Point Road and Pepper Road. Mecham Road contains 12-foot travel lanes plus approximate six-foot wide paved shoulders. There is gradual vertical and horizontal curvature to the road. Mecham Road has a posted speed limit of 45 mph east of Hammel Road, and a *prima facie* 55 mph speed limit west of Hammel Road. Mecham Road provides direct access to the Central Landfill, and therefore, contains notable heavy truck traffic.

Existing Traffic Operating Conditions

Existing Daily Traffic and Truck Volumes

Vehicle volume and classification data was collected at two locations on Roblar Road, and a minimum of one location on other roadways that would serve as haul routes for the proposed project, using 24-hour count machines. The count machines on Roblar Road were placed 0.2 miles west of Dunham School and 0.65 miles west of Canfield Road for a week-long period from March 11-17, 2005.

Based on these counts, Table IV.E-1 presents the existing average daily traffic volumes on the selected roadway segments. The data indicates that the Roblar Road carries an average daily traffic volume of approximately 1,250 vehicles per day (vpd) near Canfield Road and 2,240 vpd near Dunham School. The average weekday volumes are higher on Roblar Road near Dunham School with approximately 2,300 vpd, versus 2,100 vpd on weekend days. However, near Canfield Road, weekend volumes were slightly higher, with 1,270 vpd, versus 1,240 vpd on weekdays.

The minimum desired width for a road carrying over 2,000 vehicles per day is 32 feet, consisting of 24 foot traveled way and four foot shoulders on either side (AASHTO, 2001). Roblar Road ranges between 21 and 35 feet in width, with the wider section being east of the project site.

Table IV.E-1 also presents the average daily truck volume and truck classification (based on number of axles) on the selected roadway segments. The percentage of truck traffic along the study roadways ranges between eight and 18 percent, with Roblar Road carrying the smallest percentage of trucks (eight to nine percent) and Mecham Road carrying the highest (18 percent,

**TABLE IV.E-1
TRUCK AXLE CLASSIFICATION PERCENTAGES**

Segment	ADT	Total Trucks	Total Truck %	Truck Axles		
				2	3	4+
Mecham Road						
Between Pepper and Stony Point	4,667	872	18%	498	118	256
Pepper Road						
Between Mecham and Walker	3,584	380	11%	204	40	136
Roblar Road						
0.65 miles west of Canfield Road	1,249	94	8%	83	1	10
0.20 miles west of Dunham Elementary	2,236	199	9%	162	3	34
Stony Point Road						
Between Pepper and Roblar	10,454	1,053	10%	641	66	346
Between Roblar and SR 116	13,681	1,751	13%	1,150	158	443
Valley Ford Road						
Between Pepper and Roblar	3,170	413	13%	200	11	202

SOURCE: ESA 2005

influenced largely by truck traffic associated with the Central Landfill). The majority of trucks on the study roadways were two-axle trucks.

Study Intersections

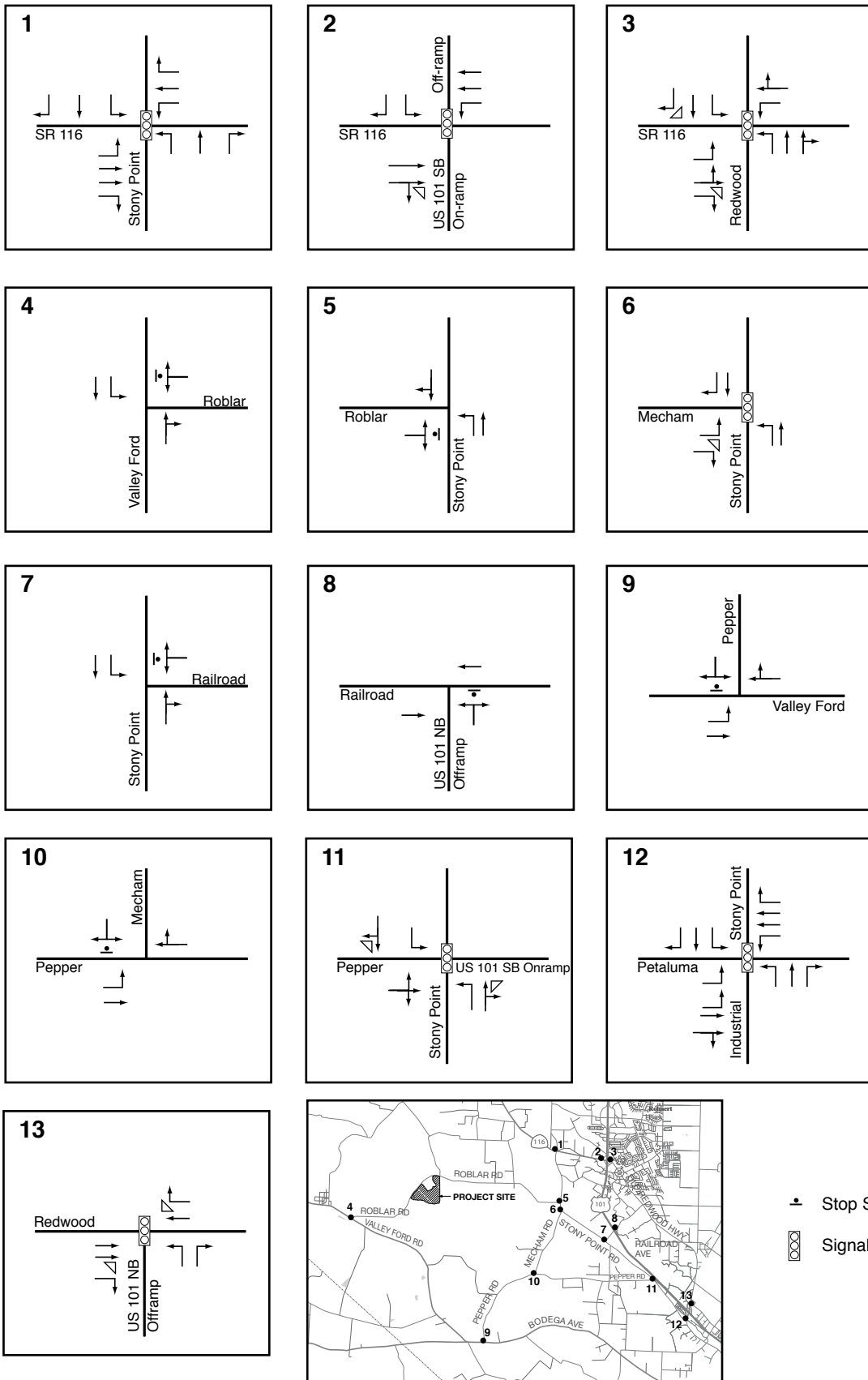
Intersection analysis was conducted because intersections are typically where traffic congestion and resultant delays are greatest on roadways. Thirteen intersections were selected for analysis because they have the potential to be affected by project-generated traffic (see Figure IV.E-1). The lane geometry and traffic controls at these intersections are shown in Figure IV.E-2. The 13 study intersections are:

1. Stony Point Road at State Route 116
2. State Route 116 at U.S. 101 SB Ramps
3. State Route 116 at Old Redwood Highway
4. Roblar Road at Valley Ford Road
5. Roblar Road at Stony Point Road
6. Stony Point Road at Mecham Road
7. Stony Point Road at Railroad Avenue
8. Railroad Avenue and U.S. 101 NB Off-Ramp
9. Pepper Road at Valley Ford Road
10. Pepper Road at Mecham Road
11. Pepper Road at Stony Point Road
12. Stony Point Road at Old Redwood Highway-Petaluma Boulevard
13. Old Redwood Highway at U.S. 101 NB Ramps

NOTE: NB = Northbound and SB = Southbound

Existing Peak Weekday and Saturday Traffic Volumes

Based on potential significant effects associated with the proposed project, it was determined that weekday a.m., weekday p.m., and Saturday conditions would be evaluated (Sonoma County Ordinance No. 3437 allows quarry operations Monday through Saturday). Vehicle turning movement counts were conducted in April 2005 at the study intersections. Counts were



SOURCE: ESA

Roblar Road Quarry . 204334

Figure IV.E-2
Lane Configuration and Intersection Control

conducted during the weekday a.m., p.m. peak periods (7:00 to 9:00 a.m., 4:00 to 6:00 p.m.), and Saturday midday peak periods (11:00 a.m. to 1:00 p.m.). The intersection turning movement volumes are presented in Figure IV.E-3.

Intersection Level of Service Analysis Methodologies

The operation of a local roadway network is commonly measured and described using a grading system called Level of Service (LOS). The LOS grading system qualitatively characterizes traffic conditions associated with varying levels of vehicle traffic, ranging from LOS A (indicating free-flow traffic conditions with little or no delay experienced by motorists) to LOS F (indicating congested conditions where traffic flows exceed design capacity and result in long delays). This LOS grading system applies to both roadway segments and intersections.

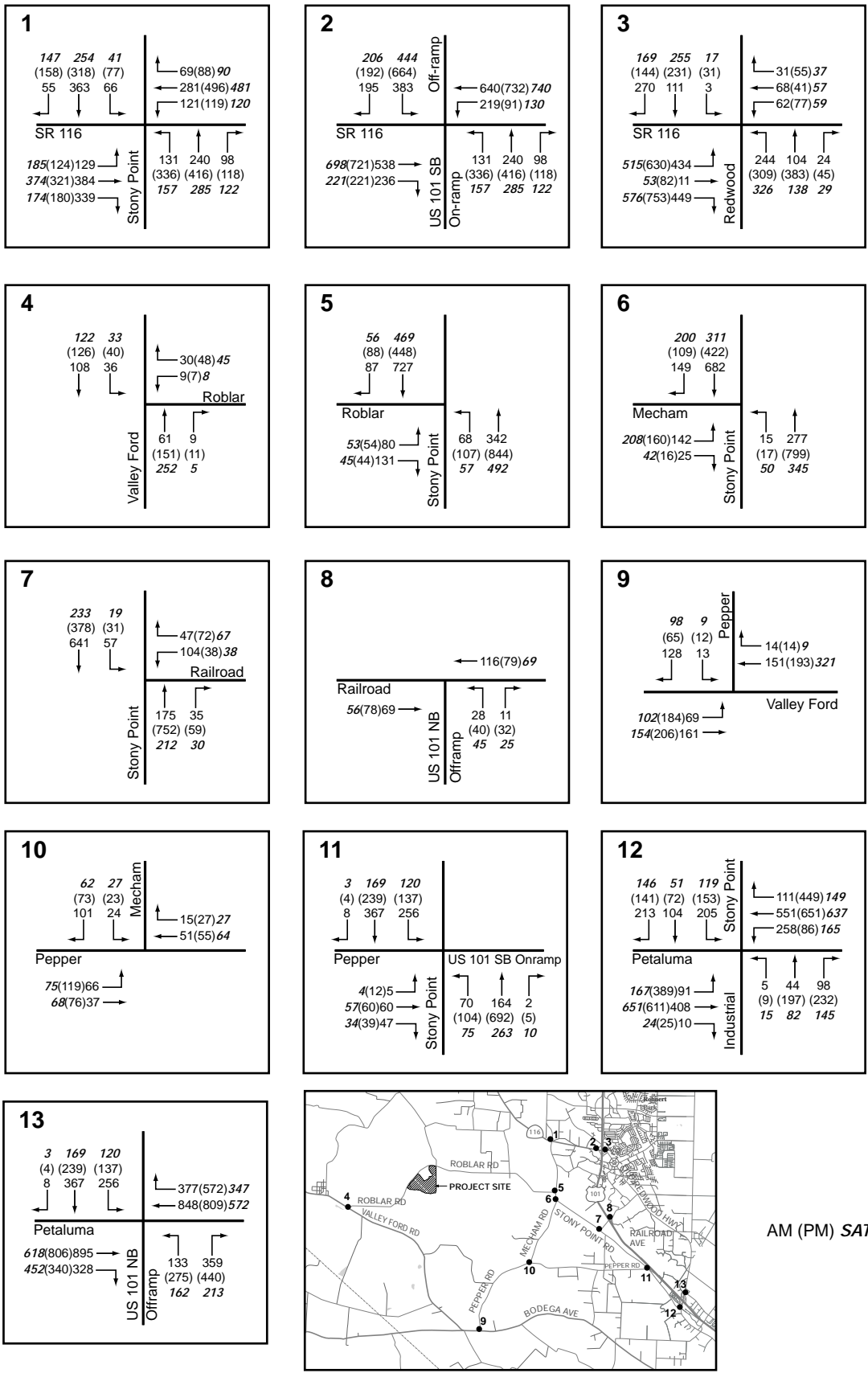
The level of service calculation methodology for intersections is dependent on the type of traffic control device, traffic signals or stop signs. The level of service methodology bases a signalized intersection's operation on the average control delay threshold calculated using methods described in Chapter 16 of the *2000 Highway Capacity Manual* (Transportation Research Board). The average delay for signalized intersections is calculated using TRAFFIX analysis software and is correlated to a LOS designation as shown in Table IV.E-2.

**TABLE IV.E-2
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS**

Level of Service	Average Control Delay Per Vehicle (Seconds)	Description
A	≤ 10.0	Operations with very low delay occurring with favorable progression and/or short cycle length.
B	10.1 to 20.0	Operations with low delay occurring with good progression and/or short cycle lengths.
C	20.1 to 35.0	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.
D	35.1 to 55.0	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.
E	55.1 to 80.0	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.
F	> 80.0	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.

SOURCE: Transportation Research Board, 2000 *Highway Capacity Manual*.

Intersection level of service calculations were conducted at the unsignalized intersections using the methodologies for two-way stop sign-controlled (TWSC) intersections contained in Chapter 17 of the *2000 Highway Capacity Manual* (HCM). The LOS rating is based on the control delay for the stop-controlled movement expressed in seconds per vehicle. Control delay



AM (PM) SAT

SOURCE: ESA

Roblar Road Quarry . 204334

Figure IV.E-3
Existing Peak Hour Turning Movement Volumes

includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The control delay was calculated using the TRAFFIX analysis software and is correlated to a LOS designation as shown in Table IV.E-3.

**TABLE IV.E-3
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS**

Level of Service	Average Control Delay Per Vehicle (Seconds)	Description
A	≤ 10.0	Little or no delay
B	10.1 to 15.0	Short Traffic delays
C	15.1 to 25.0	Average traffic delays
D	25.1 to 35.0	Long traffic delays
E	35.1 to 50.0	Very long traffic delays
F	> 50.0	Extreme traffic delays with intersection capacity exceeded

SOURCE: Transportation Research Board, 2000 *Highway Capacity Manual*.

Table IV.E-4 presents existing levels of service at the 13 study intersections during the weekday a.m. and p.m. peak-hours, and Saturday midday peak hour. All study intersections currently operate at acceptable levels of service (LOS D or better) during the peak hours, except the intersections of Stony Point and Roblar Roads, Stony Point Road and SR 116, and Stony Point Road and Railroad Avenue. The intersection of Stony Point and Roblar Roads is currently operating at LOS F during the weekday a.m. and p.m. peak hours. The intersections of Stony Point Road at SR 116, and Stony Point Road at Railroad Avenue are currently operating at LOS E during the weekday p.m. peak hour.

Planned Roadway Improvements

The following is a list of planned road improvements:

- New signal at Roblar Road and Stony Point Road, in Sonoma County: This intersection improvement project will include widening the Roblar Road approach to include separate left-turn and right-turn lanes. The improvements at this intersection are planned to be installed during the 2008/09 fiscal year.
- U.S. 101 HOV Lanes (Old Redwood Highway in Petaluma to Rohnert Park Expressway in Rohnert Park): This project will add HOV lanes in each direction, ramp improvements, auxiliary lanes between SR 116 and Rohnert Park Expressway, and may include a northbound climbing lane along Cotati Grade. Interchange improvements at Railroad Avenue are an option. Construction is anticipated to being in 2009. This project is funded through the environmental and design phase, and construction is partially funded. (Caltrans, 2005)

**TABLE IV.E-4
PEAK-HOUR INTERSECTION LEVELS OF SERVICE (LOS)
EXISTING CONDITIONS^a**

Intersection	Control ^b	Weekday					
		AM		PM		SAT Midday	
		LOS	Delay ^c	LOS	Delay ^c	LOS	Delay ^c
Stony Point Road at State Route 116	Signal	C	33.8	E	64.2	D	35.5
State Route 116 at U.S. 101 SB Ramps ^d	Signal	C	22.4	C	21.4	C	20.2
State Route 116 at Old Redwood Highway	Signal	C	29.2	C	33.9	C	33.7
Roblar Road at Valley Ford Road	TWSC	A	9.1	A	9.6	B	10.3
Roblar Road at Stony Point Road	TWSC	F	73.9	F	69.5	C	24.3
Mecham Road at Stony Point Road	Signal	B	13.0	B	13.8	B	18.3
Stony Point Road at Railroad Avenue	TWSC	D	25.7	D	28.5	B	11.6
Railroad Avenue at U.S. 101 NB Off-Ramp ^d	TWSC	A	9.5	A	9.5	A	9.3
Pepper Road at Valley Ford Road	TWSC	B	10.1	B	10.9	B	11.4
Pepper Road at Mecham Road	TWSC	A	9.3	A	9.7	A	9.6
Pepper Road at Stony Point Road	Signal	B	14.4	B	17.0	B	15.1
Stony Point Road at Old Redwood Highway- Petaluma Boulevard	Signal	C	31.3	C	31.1	C	28.8
Old Redwood Highway at U.S. 101 NB Ramps ^d	Signal	C	27.0	D	35.4	B	17.9

^a Worst movement LOS at two-way stop-controlled intersections; overall intersection LOS at signalized intersections.

^b Signal = Signal controlled, TWSC = Two-way stop (sign) controlled.

^c Average Stopped Delay expressed in terms of Seconds per Vehicle.

^d NB= Northbound, SB= Southbound

SOURCE: ESA (2006) using TRAFFIX and the 2000 Highway Capacity Manual operations analysis methodology.

- State Route 116 (Gravenstein Highway- Redwood Drive to Alder Avenue), in Cotati: A portion of SR 116 in Cotati will be widened from one lane to two lanes in each direction, with a center turn lane. Depending on the extent of development along the highway corridor, this widening may be extended west of Alder Avenue in the future. This improvement is planned and approved to be installed as part of the Cotati Commons Project. (Winzler & Kelly, 2005)
- Old Redwood Highway/Commerce Boulevard/U.S.101 Northbound On-ramp, in Cotati: A traffic signal will be installed and coordinated with the traffic signal at Old Redwood Highway/SR 116. This improvement is planned and approved to be installed as part of the Cotati Commons Project. (Winzler & Kelly, 2005)
- Alder Avenue and SR 116, in Cotati: A traffic signal will be installed and a left-turn lane added for eastbound left-turns to Alder Avenue from SR 116. This improvement is planned and approved to be installed as part of the Cotati Commons Project. (Winzler & Kelly, 2005)

- Redwood Drive and SR 116, in Cotati: The southbound lanes would be modified to provide a left-turn lane and a combined left-turn/through/right-turn lane. The phasing in the north-south direction would be split phase to accommodate the lane re-striping. This improvement is planned and approved to be installed as part of the Cotati Commons Project. (Winzler & Kelly, 2005).
- U.S. 101 Northbound Ramps and SR 116, in Cotati: The northbound approach would be widened to include a second left-turn lane. In addition, off-peak coordinate signal timing would be established. This improvement is planned and approved to be installed as part of the Cotati Commons Project. (Winzler & Kelly, 2005)
- Old Redwood Highway and SR 116, in Cotati: Modifications to the traffic signal phasing, re-striping and potential minor widening would include a left-turn lane and one combined through/left-turn lane and one though/right-turn lane on the northbound approach of Old Redwood Highway. And the signal phasing would be changed to split phasing for the north-south approaches. This improvement is planned and approved to be installed as part of the Cotati Commons Project. (Winzler & Kelly, 2005)

Existing Vehicle Speed on Roblar Road

In order to evaluate existing travels speeds on Roblar Road, speed data was collected at the same locations (0.2 miles west of Dunham School, and 0.65 miles west of Canfield Road) and during the same time period (March 11-17, 2005) as the 24-hour traffic count data. As discussed under Roadway System and Site Access, above, the posted speed limit on Roblar Road is 45 mph between Stony Point Road and Orchard Station (an exception is in the immediate vicinity of the Dunham School, where the speed limit is 25 mph when school is in session), and increases to a *prima facie* 55 mph between Orchard Station and Valley Ford Road.

The 85th percentile speed collected on Roblar Road was just under 60 mph.² Specifically, near Dunham School (and outside of hours when school is in session), the 85th percentile speed was slightly lower (57.4 mph) than speeds just west of Canfield Road (59.4 mph). The mean, or 50th percentile average speed, was approximately 50 mph, with a 10 mph pace speed between 45 and 55 mph.³ Overall, the speed survey indicates vehicles on Roblar Road are currently traveling at speeds higher than the posted speed limit.

Collision Records

Five years of collision records (2002-2006) were obtained from the California Highway Patrol for Roblar Road and other roadway segments that would serve as haul routes for the proposed project (see Table IV.E-5). Roughly five percent of the total collisions on the study roadway segments involved trucks (10 out of 188 total collisions). Of the study roads, the Stony Point Road study segment had the highest number of overall collisions in the five year period (93 collisions).

² The 85th percentile speed is the speed at or below which 85 percent of the motorists drive on a given road unaffected by slower traffic or poor weather. This speed indicates the speed that most motorists on the road consider safe and reasonable under ideal conditions.

³ Pace speed is the speed at which drivers are traveling at a speed within 10 miles per hour of each other.

**TABLE IV.E-5
ACCIDENT HISTORY ON MAJOR ROADWAYS IN PROJECT AREA**

Roadway Segment	Distance (miles)	2002	2003	2004	2005	2006	2002-2006 Average	Accident Rate (per MVMT) ^a
Mecham Road (Stony Point to Pepper.)	1.9							
- Total Accidents		1	0	2	3	1	1.4	0.49
- Accidents Involving Trucks		0	0	0	0	0	0	
Pepper Road (Valley Ford to Stony Point)	5.9							
- Total Accidents		5	7	6	2	13	6.6	0.86
- Accidents Involving Trucks		0	0	0	1	2	0.6	
Roblar Road (Valley Ford to Stony Point)	6.5							
- Total Accidents		5	7	5	8	7	6.4	1.21
- Accidents Involving Trucks		0	0	0	0	0	0	
Stony Point Road (Pepper to 116)	4.74							
- Total Accidents		22	23	12	17	19	18.6	0.89
- Accidents Involving Trucks		2	1	1	0	0	0.8	
Valley Ford Road (Roblar to Pepper)	5.0							
- Total Accidents		4	3	3	9	4	4.6	0.83
- Accidents Involving Trucks		1	0	1	1	0	0.6	

**Accident Rates – 2004
(accidents per million vehicle miles traveled)**

Sonoma County Average: 2-lane rural roads	1.37
Caltrans District 4: 2-lane rural roads	1.37
Statewide Average: 2-lane rural roads	1.25

^a Million Vehicle Miles Traveled

SOURCES: ESA 2008, using data from California Highway Patrol, 2007; Caltrans 2004 Accident Data on California State Highways, 2006a.

All the study roadways have overall accident rates below statewide and Sonoma County averages for two-lane roads in rural settings. As shown in Table IV.E-5, the latest accident rate for two-lane rural roads in Sonoma County was 1.37 accidents per million vehicle miles traveled (MVMT), while the statewide average for two-lane rural roads was 1.25 accidents/MVMT.

Roblar Road had the highest accident rate per MVMT (1.21) of the study roadway segments although, as stated above, it is below both the County's and State's averages for two-lane rural roads. Of the 32 collisions recorded over the past five years on Roblar Road, none involved trucks. A review of the records for Roblar Road indicates that approximately 55 percent of these accidents were single vehicle collisions with fixed objects or non-collisions where vehicles ran off the road and became disabled. The remaining 45 percent involved two vehicles. Collisions on Roblar Road were attributed to a variety of factors, including following too closely, violation of right-of-way, and improper turning. Over two-thirds of the total collisions on Roblar Road occurred during clear weather, while slightly less one-quarter of the collisions occurred on cloudy

or rainy days. Two accidents occurred on a foggy day. Over two-thirds of the total collisions on Roblar Road in the last five years occurred on the segment between Canfield Road and Valley Ford Road, involving single vehicles.

Stony Point Road had the highest report of accidents involving trucks in the past five years (just under one truck collision a year), but also carries the highest number of vehicles. Valley Ford Road and Pepper Road were the only other study roadways that reported accidents involving trucks, each averaging just over one-half truck related accidents a year.

Pedestrian and Bicycle Traffic

Pedestrian facilities are comprised of sidewalks, crosswalks, and pedestrian signals. The rural project area contains no pedestrian facilities, except for school route crosswalks that are marked on Roblar Road at Petersen Road (for Dunham Elementary School) in the community of Roblar. In addition, along the study haul road of Pepper Road, a pedestrian crosswalk and flashing red stop light exist at Jewett Road.

Bicycle facilities are typically categorized as bike paths (Class I), bike lanes (Class II), or bike routes (Class III). Class I bike paths are paved trails that are separated from the roadways. Class II bike lanes are lanes on roadways that are designated for use by bicycles by striping, pavement legends, and signs. Class III bike routes are roadways that are designated for bicycle use with signs, but have partial or no striping or pavement legends, or have bike lane width not meeting Class II criteria. There are currently over 33 miles of Class I bike paths, and 64 miles of Class II bike lanes in Sonoma County (SCTA, 2003). However, within the vicinity of the project site, there are currently no designated bike facilities.

The Countywide Bicycle and Pedestrian Advisory Committee (CBPAC), an advisory committee to Sonoma County Transit (SCT) and the Sonoma County Transportation Authority (SCTA) and local agencies, supports bicycle- and pedestrian-related development in Sonoma County. The CBPAC assisted the SCT and SCTA in preparation of the *Sonoma County Bikeways Plan* (last revised February 8, 2007), and the associated *Countywide Bicycle Plan 2003 Update*, respectively. These plans classify Roblar Road, Pepper Road, Mecham Road, Valley Ford Road, and SR 116 (west of the Madrone Avenue) as proposed Class III bike routes, and Stony Point Road and Old Redwood Highway as proposed Class II bike lanes (SCTA, 2003). The *Sonoma County Bikeways Plan* list of improvement projects recommends the installation of shoulders on the entire length of Roblar Road, and on the section of Stony Point Road between Pepper Road and the Petaluma City limits.

In order to evaluate existing bicycle activity on Roblar Road, bicycle volume data was collected on Roblar Road at the same locations (0.2 miles west of Dunham School, and 0.65 miles west of Canfield Road) and during the same time period (March 11-17, 2005) as the 24-hour traffic count data. The results of the data collection show that there is notably more bicycle traffic on the weekends and that the east portion of Roblar Road has comparatively more bicycle traffic than the west section. There was an average of 34 bicyclists on weekend days west of Dunham School, versus an average of 20 bicyclists on weekdays. West of Canfield Road, weekend day bicycle

volumes averaged 10, versus 8 on a weekday. Bicycle volumes on Roblar Road peaked on the surveyed Sunday with 46 trips near Dunham School.

Bicycle volumes per hour were highest in the afternoons, starting at noon and continuing through the evening commute period on Friday through Monday. Sunday had the highest number of bicyclists per hour, with 12 bicycles at 1:00 p.m., and maintained over five bicycles per hour for five one-hour periods. Friday hourly volumes maintained four to five bicycles for three one-hour periods. Saturday and Monday had one-hour each that had five bicycles in an hour.

Regulatory Framework

The development and regulation of the project area transportation network primarily involves state and local jurisdictions. All roads within the project area are under the jurisdiction of state and local agencies. State jurisdiction includes permitting and regulation of the use of state roads, while local jurisdiction includes implementation of state permitting, policies, and regulations, as well as management and regulation of local roads. Applicable state and local laws and regulations related to traffic and transportation issues are discussed below.

California Department of Transportation

The California Department of Transportation (Caltrans) manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulation of the use of state roadways. The project area includes two roadways that fall under Caltrans' jurisdiction (U.S. 101 and SR 116).

Caltrans requires that permits be obtained for transportation of oversized loads and transportation of certain materials, and for construction-related traffic disturbance. Caltrans regulations would apply to project construction that would include the transportation of construction crews and construction equipment throughout the project area.

Sonoma County

Several of the roads in the project corridor are under the jurisdiction of Sonoma County. County policies and regulations regarding the design, use, or obstruction of roadways are detailed in the Sonoma County General Plan *Circulation and Transit Element* (Sonoma County PRMD, 1989). The majority of these goals and policy guidelines in the Circulation and Transit Element pertain to the development and planning of roadways and transit systems.

The *2001 Countywide Transportation Plan* for Sonoma County provides further guidance for transportation planning and associated goals and policies (SCTA, 2001). This plan focuses on the design and implementation of improvements to the county circulation system, including roadways, bikeways, and rail service.

Sonoma County's General Plan Circulation Element Objective CT-6.1 (level of service) states that LOS C is to be maintained on major roadways, other than U.S. 101, to the extent practicable on an average daily and peak period basis; in some circumstances, LOS D or E may be acceptable

for a short duration of time during peak commute periods. The Sonoma County General Plan also indicates that LOS A, B and C are preferred for signalized and unsignalized intersections. However, poorer levels of service may be acceptable in some situations. No minimum standards are listed for private or commercial driveway intersection approaches, such as the proposed project driveway approach to Roblar Road.

The Sonoma County *Surface Mining and Reclamation Ordinance* (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The following sections from the ordinance are applicable to the proposed project:

Sec. 26A-09-010. General standards for Mining Permit and Operations

- (b) *Off-Street Parking.* Adequate off-street parking shall be provided to accommodate the expected use from employees, customers, and equipment.
- (c) *Roads and Traffic.* All mining operations shall be conducted in such a manner as to minimize the adverse impacts of aggregate truck traffic on roads, traffic circulation, traffic congestion, and traffic safety.
 - (1) *Access Roads.* All private roads or driveways providing access to a mining site shall be adequately managed to prevent aggregate or other materials being drawn onto the public roads and rights-of-way. Management techniques may include surfacing approach ways, installing tire grates, avoidance of over-filling and over-watering, covering loads, regular sweeping or washing of roadway and shoulders, and spill clean-up response.
 - (2) All surface mining operations permitted pursuant to this chapter shall be required to pay an annual traffic mitigation fee to the Sonoma County Department of Transportation and Public Works, pursuant to Chapter 26-98 of this code, to mitigate the traffic and circulation impacts of the operation's truck traffic will have on the County road network by paying a fair share of the costs for safety and circulation improvements.
 - (3) *Encroachment Permit* – The construction and/or upgrade of driveways or other alterations within the public right-of-way are required to obtain an encroachment permits from the County or Caltrans or have such requirement waived, prior to commencement of activities in the public right-of-way.
 - (4) *Traffic Signs and Traffic Management Facilities* – Traffic warning signs, bicycle lanes, acceleration-deceleration lanes, turning lanes or other traffic management facilities shall be placed by the operator at appropriate locations as determined by either the State Department of Transportation or the Sonoma County Department of Public Works.
 - (5) *Public Roads Maintenance* – Where public roads are used to access the mining site, provisions may be required in the mining permit and/or reclamation plan for the upgrading of roads to a standard capable of accommodating the additional weight of trucks and minimizing traffic hazards. Such provisions, if

required, shall meet the approval of either the State Department of Transportation or the Sonoma County Department of Public Works.

- (6) All surfacing mining operations permitted pursuant to this chapter shall be required to pay an annual road mitigation fee to the Sonoma County Department of Transportation and Public Works to mitigate the wear and tear the operation's truck traffic will have on the County roads used as haul routes by paying a fair share of the maintenance and improvement costs. The amount of the fee shall be determined by the Sonoma County Department of Transportation and Public Works on a case-by-case basis.
- (7) All operators shall be required to develop a truck driver education program which includes posting details on preferred haul routes and informing drivers of procedures established to reduce public conflicts. Operators will also be required to monitor driver compliance and respond to complaints about gravel trucks.
- (8) All roads to be used for site access should have sufficient width, shoulders, pavement strength, and other features necessary to adequately mitigate the traffic impacts of proposed operations. Public access roads shall meet the design requirements of the General Plan and related standards. Traffic levels on public access roads shall not exceed the acceptable levels identified in the General Plan.

Impacts and Mitigation Measures

Standards of Significance

According to Appendix G of the CEQA *Guidelines*, a project that would “cause an increase in traffic which is substantial in relation to existing traffic load and capacity of the street system” may be deemed to have a significant adverse impact on the environment.

Sonoma County Significance Criteria

The following applicable County significance criteria were used to judge the transportation impacts:

- At an unsignalized intersection, there would be a significant cumulative impact if operation is worse than LOS D in the existing base case, or if future cumulative peak-hour traffic volumes would cause the operation of the intersection to become worse than LOS D. If there is a significant cumulative impact, then the project-related traffic would cause a significant impact that is cumulatively considerable if the average vehicle control delay of the unacceptable movement or approach is increased by 5 seconds or more.
- At an unsignalized intersection, there would be a significant cumulative impact if the addition of project vehicle or pedestrian traffic causes an intersection to meet or exceed Caltrans signal warrant criteria.
- At a signalized intersection, there would be a significant cumulative impact if operation is worse than LOS D in the existing base case, or if future cumulative peak-hour traffic volumes would cause the operation of the intersection to become worse than LOS D. If there is a significant cumulative impact, then the project-related traffic would cause a

significant impact that is cumulatively considerable if the average vehicle control delay of the unacceptable movement or approach is increased by 7.5 seconds or more when conditions without the project are LOS E, and 5 seconds or more when conditions without the project are LOS F.

- Traffic safety in the project area would be substantially worsened if the project were to introduce a design feature or incompatible uses, inadequate emergency access, or would add substantial truck traffic to a primary haul road that does not meet current County roadway design standards and/or contain limited sight distance.
- The project would have a significant impact to bicyclists/ pedestrians if the project would add substantial truck traffic to a primary haul road that is a designated proposed bikeway and/or is regularly used by bicyclists or pedestrians, and the road does not meet current County roadway design standards (including paved shoulders of sufficient width for use by bicycles).
- The project would have a significant impact to roadwear if it would increase heavy truck traffic volumes that would increase the Traffic Index (TI) by more than 1.5 on roadways built to accommodate heavy truck traffic, and by more than 0.5 on other roadways, or would add vehicles whose weight exceeds weight limit restrictions on the affected roadway.

Two of the study intersections are located in Cotati (SR 116 at U.S. 101 SB ramps, and SR 116 at Old Redwood Highway). The City of Cotati's adopted Level of Service (LOS) Standard contained in their *1998 General Plan* allows for a minimum operation of LOS D for all intersections (City of Cotati, 1998). Two of the study intersections are located in the City of Petaluma (Stony Point Road at Old Redwood Highway-Petaluma Boulevard, and Old Redwood Highway at U.S. 101 NB Ramps). The City of Petaluma's adopted LOS Standard is contained in their General Plan indicates that on city streets where the level of service is currently at LOS C or better, the level of service shall not deteriorate below LOS C. When the level of service was at LOS D or E in 1985, the level of service shall not deteriorate to the next lower level (City of Petaluma, 1985). Neither the City of Cotati or Petaluma general plan standards identify specific thresholds that can be applied to a project's incremental effect at intersections that may already be operating at LOS E or worse under future base (without project) conditions. For purposes of this EIR, the County's threshold for signalized intersections identified above is used to assess project impacts at the study intersections in Cotati and Petaluma.

Intersection Operating Conditions

Hours of Operation

The County mining regulations (Ordinance No. 3437) allow the hours of operation for quarries as follows: Monday through Friday 6:00 a.m. to 10:00 p.m.; Saturday, 6:00 a.m. to 4:30 p.m.; and on Sunday, no mining or processing except as authorized. The anticipated typical hours of operation of the proposed quarry would be 7:00 a.m. to 5:00 p.m., with most plant operations, including loading/weighing of trucks, ceasing by 4:00 p.m., and general maintenance occurring until 5:00 p.m.

Project Trip Generation

The vehicle trip generation for the proposed project was estimated by determining the production and hauling rate at which the project would operate.⁴ As discussed in Chapter III, Project Description, the project would produce a total volume not to exceed 570,000 cubic yards (cy) of aggregate per year. On a daily basis, the average production rate would be about 2,260 cy of aggregate. Using a composite truck haul load of 15 cy, these conditions would generate approximately 151 truck loads per day, or 302 one-way truck trips.⁵ In addition to truck trips, up to 10 employees would work at the project site, and modest number of other miscellaneous vehicles would access the site (e.g., delivery, visitors, maintenance, etc.) which would generate additional daily vehicle trips.

However, for a more conservative approach, a maximum daily production rate of about 3,600 cy of aggregate was used to determine the project’s effect to the transportation environment. On a peak production day, the project would generate approximately 240 truck loads per day, or 480 one-way truck trips. Peak-hour trips generated on a peak production day are estimated to be roughly 43 one-way truck trips, and up to 10 employee and miscellaneous vehicles during the peak hour. Table IV.E-6 breaks down the total projected peak hour and daily trips associated with this project for average and peak production days.

**TABLE IV.E-6
PROJECT TRIP GENERATION**

	Weekday						Saturday Midday Peak Hour			Daily Trips
	AM Peak Hour			PM Peak Hour			In	Out	Total	
	In	Out	Total	In	Out	Total				
Average Production Day										
Haul Truck Traffic	19	8	27	3	24	27	16	11	27	302
Other Traffic ^a	1	0	1	0	10	10	5	5	10	30
Total	20	8	28	3	34	37	21	16	37	332
Peak Production Day										
Haul Truck Traffic	30	13	43	4	39	43	26	17	43	480
Other Traffic ^a	1	0	1	0	10	10	5	5	10	30
Total	31	13	44	4	49	53	31	22	43	510

^a Includes employees, delivery, visitors, and maintenance trips.

SOURCE: ESA (2006) with information provided by North Bay Construction.

As discussed in Chapter III, Project Description, the applicant indicates that it would also import concrete and asphalt from its construction sites to the site for recycling. Under such conditions, the applicant would schedule the inbound leg of its truck trips to import the recycled materials to

⁴ It was assumed that each load hauled from the facility will generate two trips (i.e., one inbound [empty] and one outbound [full]).

⁵ Based on information provided by the applicant, ninety (90) percent of the haul trucks would have an approximate 16 cy capacity and 10 percent would consist of a range of trucks with comparatively smaller capacities.

the quarry, and the outbound leg for its off-hauling of aggregate materials from the quarry. Consequently, no increase in truck haul trips beyond that associated with the proposed hauling of aggregate materials describe above is anticipated.

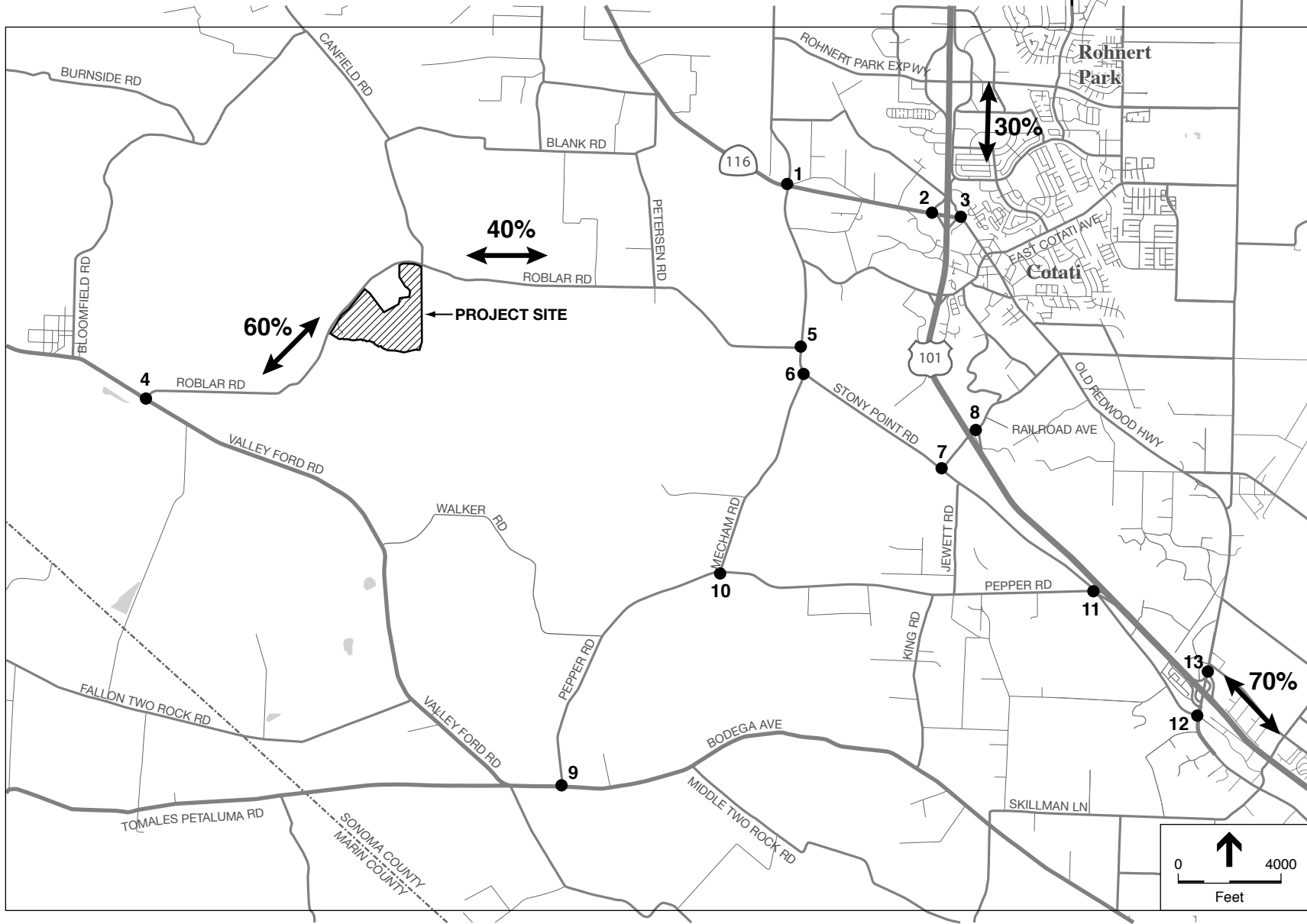
Quarry Truck Distribution Patterns

Project haul trucks would be distributed to/from the quarry based on the market for aggregate, the applicant's use of aggregate for its own construction projects, and the applicant's contracts with construction companies. The applicant estimates that at least 60 percent of total material produced at the quarry would either be used directly by the applicant or would be sold under contract. All hauling conducted directly by the applicant, and all contract sales, would be conditioned such that trucks hauling materials under those contracts would be required to enter and exit the quarry from the west on Roblar Road, thereby avoiding the community of Roblar (see Chapter III, Project Description, for description of specific haul routes).

The remaining aggregate materials (up to 40 percent) would be sold to private contractors, and were distributed to/from the east because it is the most direct route between the project site and U.S. 101. The applicant estimates that over 90 percent of the product produced at the proposed quarry would be used in Sonoma County (including the Cities of Cotati, Petaluma, Rohnert Park, Sebastopol, and south Santa Rosa), and the balance used in the Novato area of Marin County. The trip distribution pattern is illustrated in Figure IV.E-4. Because of delays on U.S. 101 during the peak hours, and because of the constraints of the Cotati Grade, it was assumed that project traffic would take advantage of U.S. 101 off-ramps at their initial opportunity. For example, trucks coming from the north would exit at SR 116, and trucks coming from the south would exit at Petaluma Boulevard or Railroad Avenue.

Traffic Volume Growth Rate

Year 2007 and 2027 area wide growth in traffic volumes were developed using a number of sources, including growth rates projected for the project vicinity by the Sonoma County PRMD (Sonoma County, 2006), the City of Cotati's *Citywide Traffic Improvement Plan* (2005), and approved and pending developments, and consultation with Sonoma County PRMD and the SCTA. The applied growth rates were developed based on the proposed haul routes which were grouped into two geographic areas to better capture traffic growth patterns. The first geographic area was the U.S. 101 corridor, which includes Railroad Avenue, Old Redwood Highway, SR 116, and Stony Point Road. A three percent annual growth rate was applied to these roads during the weekday a.m. and p.m. peak hours. The second geographic area consists of rural roadways, including Valley Ford Road, Roblar Road, Mecham Road, and Pepper Road. A 1.5 percent annual growth rate was applied to these roads during the weekday a.m. and p.m. peak hours. A 1.5 percent annual growth rate was applied to all roadways to represent traffic volume growth during the Saturday midday peak hour. These annual growth rates are considered conservatively high.



SOURCE: ESA

Roblar Road Quarry . 204334
Figure IV.E-4
Haul Routes and Trip Distribution

Near-Term Cumulative Base (Year 2007)

It is assumed none of the expected planned off-site road improvements in the study area (presented under *Planned Roadway Improvements*, above), would be in place for the Near-Term Cumulative conditions. The Near-Term Cumulative Base peak hour turning movement volumes are presented in Figure IV.E-5. The results of the LOS analysis for Near-Term Cumulative Base Conditions are summarized in Table IV.E-7.

**TABLE IV.E-7
PEAK-HOUR INTERSECTION LEVELS OF SERVICE (LOS)
NEAR-TERM CUMULATIVE BASE CONDITIONS^a**

Intersection	Control ^b	Weekday				SAT Midday	
		AM		PM		Delay ^c	LOS
		Delay ^c	LOS	Delay ^c	LOS		
Stony Point Road at State Route 116	Signal	42.0	D	85.1	F	44.6	D
State Route 116 at U.S. 101 SB Ramps ^d	Signal	22.9	C	22.0	C	20.7	C
State Route 116 at Old Redwood Highway	Signal	29.7	C	35.9	D	35.5	D
Roblar Road at Valley Ford Road	TWSC	9.1	A	9.6	A	10.4	B
Roblar Road at Stony Point Road	TWSC	>90	F	>90	F	29.2	D
Mecham Road at Stony Point Road	Signal	13.4	B	14.1	B	18.3	B
Stony Point Road at Railroad Avenue	TWSC	33.8	D	37.8	E	12.1	B
Railroad Avenue at U.S. 101 NB Off-Ramp ^d	TWSC	9.6	A	9.6	A	9.4	A
Pepper Road at Valley Ford Road	TWSC	10.2	B	11.1	B	11.6	B
Pepper Road at Mecham Road	TWSC	9.4	A	9.8	A	9.6	A
Pepper Road at Stony Point Road	Signal	14.7	B	19.2	B	15.3	B
Stony Point Road at Old Redwood Highway-Petaluma Boulevard	Signal	31.8	C	32.5	C	29.1	C
Old Redwood Highway at U.S. 101 NB Ramps ^d	Signal	33.9	C	45.8	D	18.7	B

^a Worst movement LOS at two-way stop-controlled intersections; overall intersection LOS at signalized intersections.

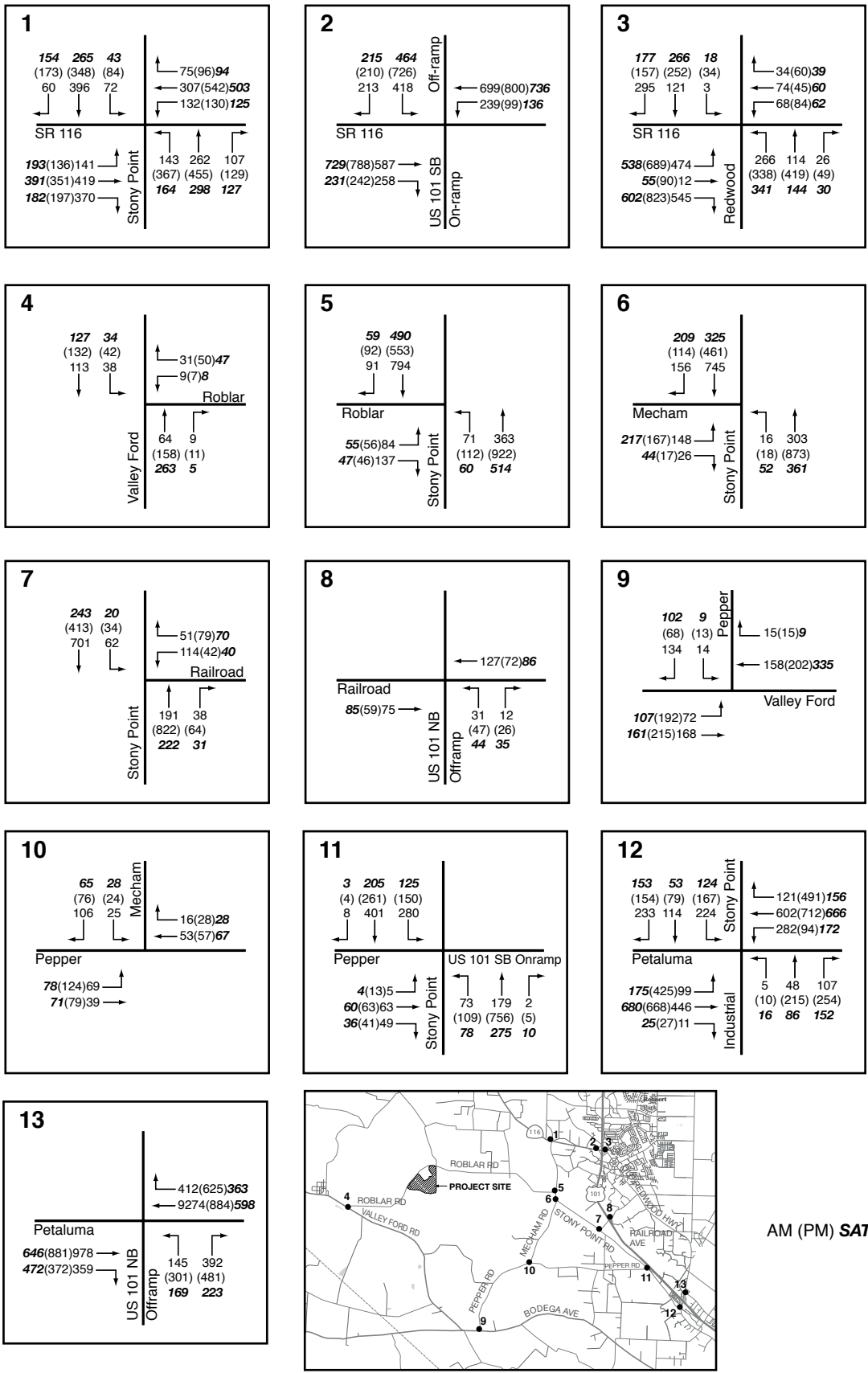
^b Signal = Signal controlled, TWSC = Two-way stop (sign) controlled.

^c Average Stopped Delay expressed in terms of Seconds per Vehicle.

^d NB= Northbound, SB= Southbound

SOURCE: ESA (2006) using TRAFFIX and the 2000 Highway Capacity Manual operations analysis methodology.

Near-term Cumulative Base traffic conditions at ten of the 13 study intersections are projected to operate at acceptable levels of service (LOS D or better) during all peak hours. However, three of the study intersections would operate at unacceptable levels of service during one or more peak hours. The intersections of Stony Point Road and SR 116, and Stony Point Road and Railroad Avenue, are projected to operate at unacceptable LOS F in the weekday p.m. peak hour. In addition, the intersection of Stony Point and Roblar Roads is projected to operate at unacceptable LOS F in the weekday a.m. and p.m. peak hours.



AM (PM) SAT

SOURCE: ESA

Roblar Road Quarry . 204334

Figure IV.E-5
Near-Term Cumulative Base
Peak-Hour Turning Movement Volumes

Near-Term Cumulative Base Plus Project

Impact E.1: The proposed project would contribute to Near-Term Cumulative traffic volume at study intersections during the weekday a.m. and p.m. peak-hours, and Saturday peak hour. This would be a significant impact at one study intersection.

Near-Term Cumulative Base plus Project conditions are defined as Near-Term Cumulative Base plus traffic added by the proposed project. Estimated vehicle trip generation for the proposed project is presented under *Project Trip Generation*, above. Project impacts are then identified by comparing the LOS results under Near-Term Cumulative plus Project conditions to those under Near-Term Cumulative Base conditions. Traffic volumes were adjusted to reflect a passenger car equivalent (PCE) of 3.0 for heavy truck traffic.⁶

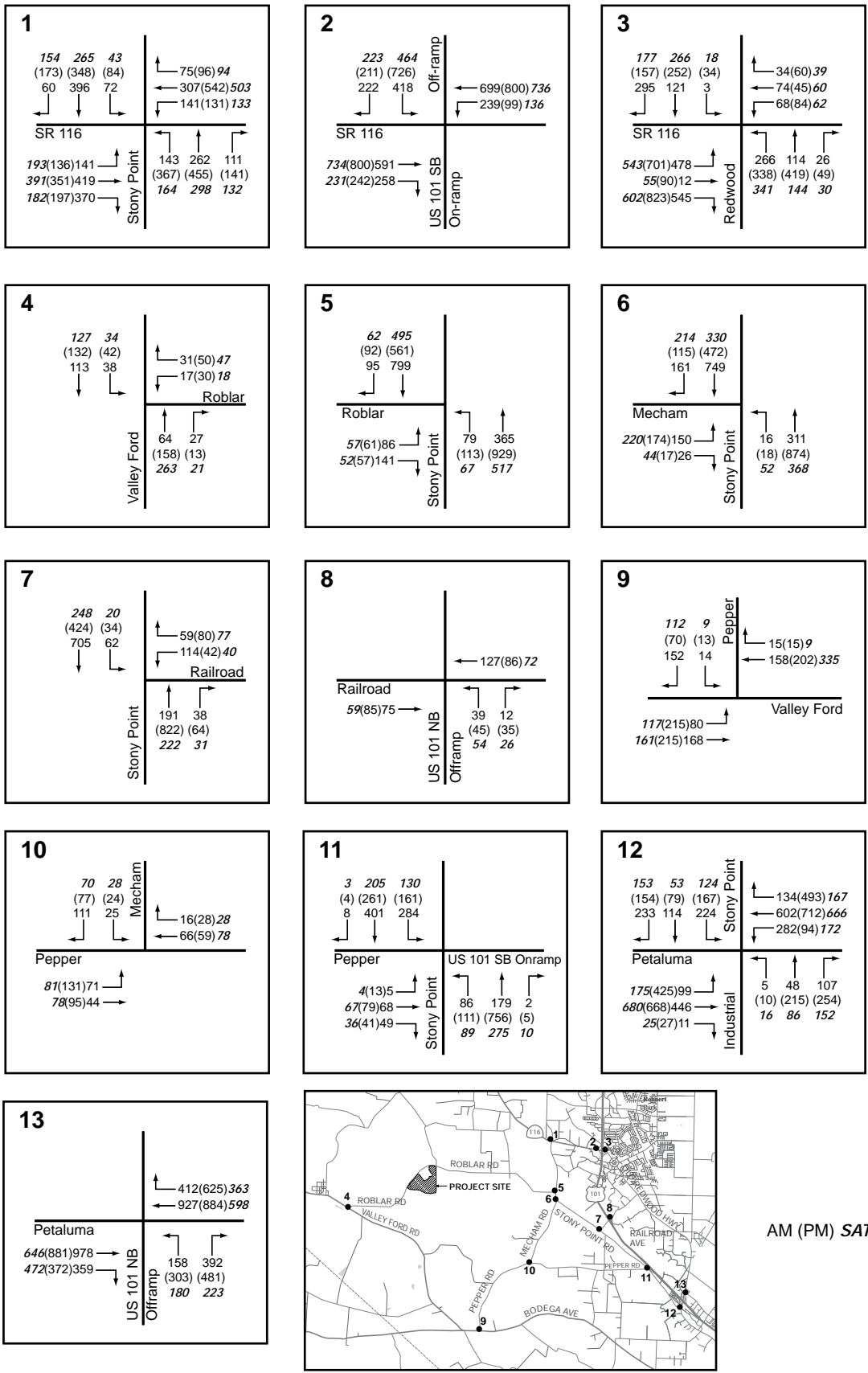
Figure IV.E-6 illustrates the traffic volumes at the study intersections under Near-Term Cumulative Base plus Project conditions. The results of the LOS analysis for Near-Term Cumulative Base plus Project conditions are summarized in Table IV.E-8. With the addition of project-generated traffic, ten of the 13 study intersections are projected to continue to operate at an acceptable LOS D or better during all peak hours. However, the three study intersections that were already estimated to operate at LOS F during one or more peak hours under Near-Term Cumulative Base conditions would continue to operate unacceptably under Near Term Cumulative Base plus Project conditions. With the proposed project, the intersection of Stony Point Road and SR 116, and Stony Point Road and Railroad Avenue, would continue to operate at unacceptable LOS F during the weekday p.m. peak hour, but the project would add less than five seconds of delay (i.e., a less-than-significant impact).

The intersection of Stony Point and Roblar Roads would continue to operate at unacceptable LOS F in the weekday a.m. and p.m. peak hours with the proposed project, and project traffic would add more than five seconds of delay, which would be a significant impact. In addition, this intersection would degrade to an unacceptable LOS E in the Saturday midday peak, which would also be a significant impact. As discussed in the Setting, the County is planning for installation of a signal and associated improvements at this intersection in fiscal year 2008/09.

Mitigation Measure E.1: Install traffic signals and associated improvements at the intersection of Roblar Road and Stony Point Road. These improvements would improve the level of service at the intersection to LOS B or better during peak hours.

This intersection is located within the County's jurisdiction; accordingly, the implementing agency for Mitigation Measure E.1 would be Sonoma County. The County has anticipated the need for the signalization and other improvements at this intersection. The County's preliminary design includes widening all approaches to the intersection, including shoulders; lengthening the northbound left-turn lane; and adding a southbound left-turn lane (for access to the driveway across Roblar Road).

⁶ For this analysis, a heavy truck would be equivalent to three passenger cars.



AM (PM) SAT

SOURCE: ESA

Roblar Road Quarry . 204334

Figure IV.E-6
Near-Term Cumulative Base plus
Project Peak-Hour Turning Movement Volumes

**TABLE IV.E-8
PEAK-HOUR INTERSECTION LEVELS OF SERVICE (LOS)
NEAR-TERM CUMULATIVE BASE PLUS PROJECT CONDITIONS^a**

Intersection	Control ^b	Weekday				SAT Midday	
		AM		PM		Delay ^c	LOS
		Delay ^c	LOS	Delay ^c	LOS		
Stony Point Road at State Route 116	Signal	41.8	D	84.0	F	44.3	D
State Route 116 at U.S. 101 SB Ramps ^d	Signal	23.7	C	22.0	C	21.4	C
State Route 116 at Old Redwood Highway	Signal	29.6	C	36.5	D	35.8	D
Roblar Road at Valley Ford Road	TWSC	10.1	B	11.8	B	12.0	B
Roblar Road at Stony Point Road	TWSC	>90	F	>90	F	43.7	E
Mecham Road at Stony Point Road	Signal	13.8	B	15.8	B	18.4	B
Stony Point Road at Railroad Avenue	TWSC	34.9	D	41.6	E	12.3	B
Railroad Avenue at U.S. 101 NB Off-Ramp ^d	TWSC	10.1	B	9.7	A	9.7	A
Pepper Road at Valley Ford Road	TWSC	10.8	B	12.0	B	12.5	B
Pepper Road at Mecham Road	TWSC	9.9	A	10.2	B	10.2	B
Pepper Road at Stony Point Road	Signal	16.0	B	21.8	C	16.4	B
Stony Point Road at Old Redwood Highway-Petaluma Boulevard	Signal	31.8	C	32.6	C	29.1	C
Old Redwood Highway at U.S. 101 NB Ramps ^d	Signal	33.9	C	45.8	D	19.2	B

^a Worst movement LOS at two-way stop-controlled intersections; overall intersection LOS at signalized intersections.

^b Signal = Signal controlled, TWSC = Two-way stop (sign) controlled.

^c Average Stopped Delay expressed in terms of Seconds per Vehicle.

^d NB= Northbound, SB= Southbound

Bold typeface signifies a significant impact.

SOURCE: ESA (2007) using TRAFFIX and the 2000 Highway Capacity Manual operations analysis methodology.

These improvements shall be implemented prior to initiation of mining at the proposed quarry. The project applicant shall pay a fair share of the cost of the required improvements. The Sonoma County Department of Transportation and Public Works shall be responsible for preparing a cost estimate of the required improvements.

Significance after Mitigation: Mitigation Measure E.1 would reduce the identified intersection impact to a less-than-significant level. These improvements are planned to be installed in fiscal year 2008/09.

The intersection improvements planned by the County at this intersection would result in a number of potential secondary environmental impacts. The County has already completed environmental review of these planned improvements (*Signalization of Stony Point Road at Roblar Road, Mitigated Negative Declaration/Initial Study and Mitigation Monitoring Program*, October 2005), and mitigated all potential significant short- and long-term secondary

environmental impacts to a less-than-significant level. That environmental document is incorporated in this EIR by reference.

Long-Term Cumulative Base (Year 2027)

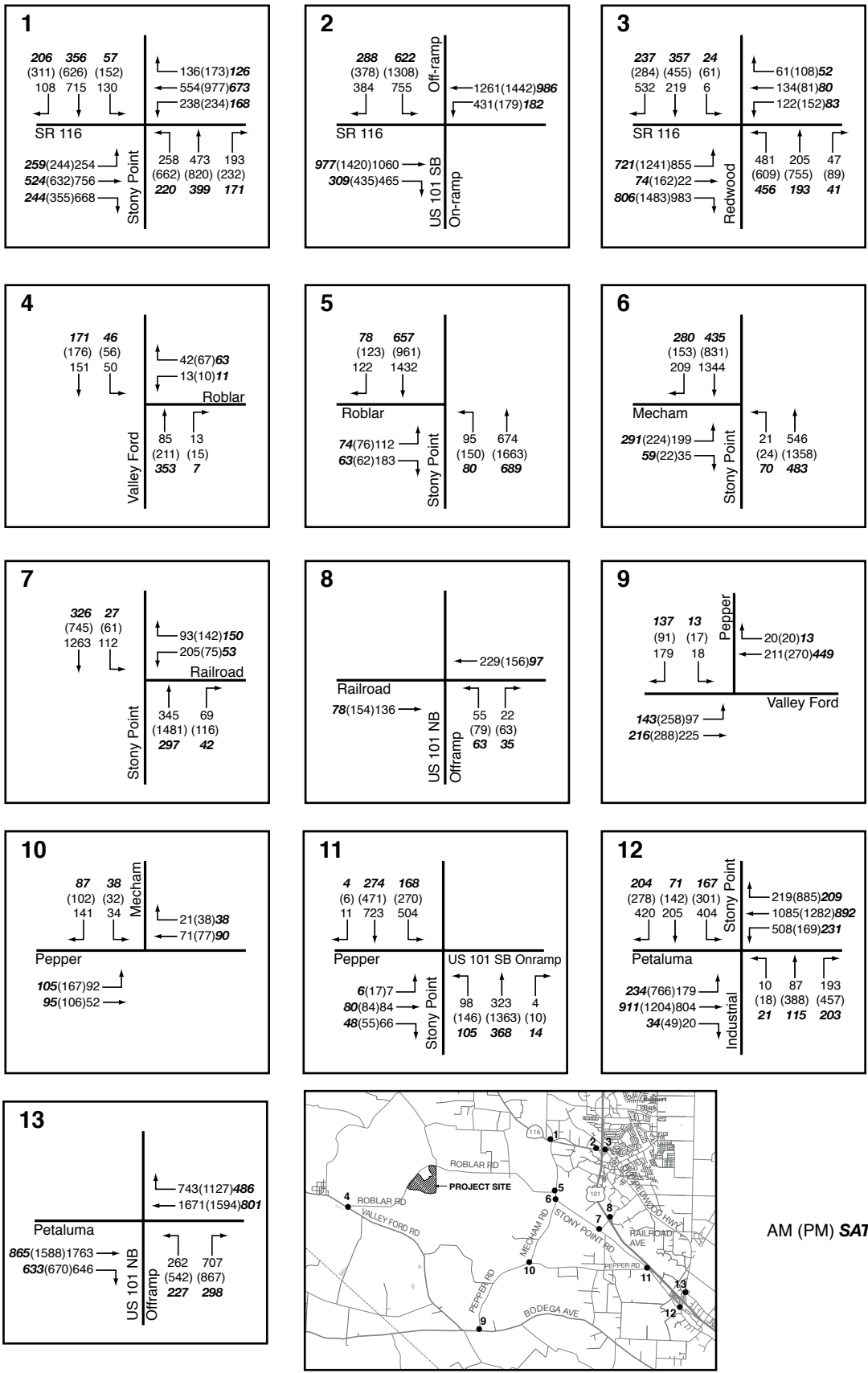
2027 was selected as the subject year for buildout of the proposed quarry, given the assumed first year of operation of the quarry (2007) and the 20-year duration of the proposed mining use permit. The Long-Term Cumulative Base scenario conservatively uses the higher 2030 traffic projections to represent Cumulative Base conditions in 2027. For Long-Term Cumulative Base conditions, it is assumed the planned off-site road improvements in the study area (presented under *Planned Roadway Improvements*, in the Setting) would be in place. Long-Term Cumulative Base peak-hour volumes are presented in Figure IV.E-7. The results of the LOS analysis for Long-Term Cumulative Base conditions are summarized in Table IV.E-9.

**TABLE IV.E-9
PEAK-HOUR INTERSECTION LEVELS OF SERVICE (LOS)
LONG-TERM CUMULATIVE BASE CONDITIONS^a**

Intersection	Control ^b	Weekday				SAT Midday	
		AM		PM		Delay ^c	LOS
		Delay ^c	LOS	Delay ^c	LOS		
Stony Point Road at State Route 116	Signal	116.3	F	>120	F	59.7	E
State Route 116 at U.S. 101 SB Ramps ^d	Signal	38.7	D	52.5	D	23.1	C
State Route 116 at Old Redwood Highway	Signal	35.5	D	>120	F	37.2	D
Roblar Road at Valley Ford Road	TWSC	9.4	A	10.2	B	11.4	B
Roblar Road at Stony Point Road	Signal	102.3	F	64.1	E	8.8	A
Mecham Road at Stony Point Road	Signal	57.3	E	35.1	D	18.5	B
Stony Point Road at Railroad Avenue	TWSC	>90	F	>90	F	15.0	B
Railroad Avenue at U.S. 101 NB Off-Ramp ^d	TWSC	11.1	B	11.0	B	9.8	A
Pepper Road at Valley Ford Road	TWSC	11.2	B	13.1	B	13.8	B
Pepper Road at Mecham Road	TWSC	9.8	A	10.5	B	10.2	B
Pepper Road at Stony Point Road	Signal	19.8	B	>120	F	16.0	B
Stony Point Road at Old Redwood Highway-Petaluma Boulevard	Signal	56.6	E	100.0	F	31.7	C
Old Redwood Highway at U.S. 101 NB Ramps ^d	Signal	>120	F	>120	F	17.8	B

^a Worst movement LOS at two-way stop-controlled intersections; overall intersection LOS at signalized intersections.
^b Signal = Signal controlled, TWSC = Two-way stop (sign) controlled.
^c Average Stopped Delay expressed in terms of Seconds per Vehicle.
^d NB= Northbound, SB= Southbound

SOURCE: ESA (2006) using TRAFFIX and the 2000 Highway Capacity Manual operations analysis methodology.



SOURCE: ESA

Roblar Road Quarry . 204334

Figure IV.E-7
 Long-Term Cumulative Base Peak-Hour
 Turning Movement Volumes

Under Long-Term Cumulative Base traffic conditions, five of the 13 study intersections would operate at acceptable levels of service (LOS D or better) during all peak hours. However, eight of the study intersections would operate at unacceptable levels of service under Long-Term Cumulative Base conditions during one or more peak hours. The intersections of Stony Point Road at Roblar Road, Railroad Avenue, Mecham, Pepper Road, and SR 116 would all operate at unacceptable LOS E or F during one or more of the weekday peak hours. Furthermore, the intersection of Stony Point Road and SR 116 would also operate at unacceptable LOS E during the Saturday midday peak hour.

In addition, the intersection of SR 116 and Old Redwood Highway in Cotati would operate at unacceptable LOS F in the weekday p.m. peak hour. Finally, the intersections of Stony Point Road and Old Redwood Highway-Petaluma Boulevard, and Old Redwood Highway and U.S. 101 Northbound ramps in Petaluma would operate at unacceptable LOS E or worse during the weekday a.m. and p.m. peak hours.

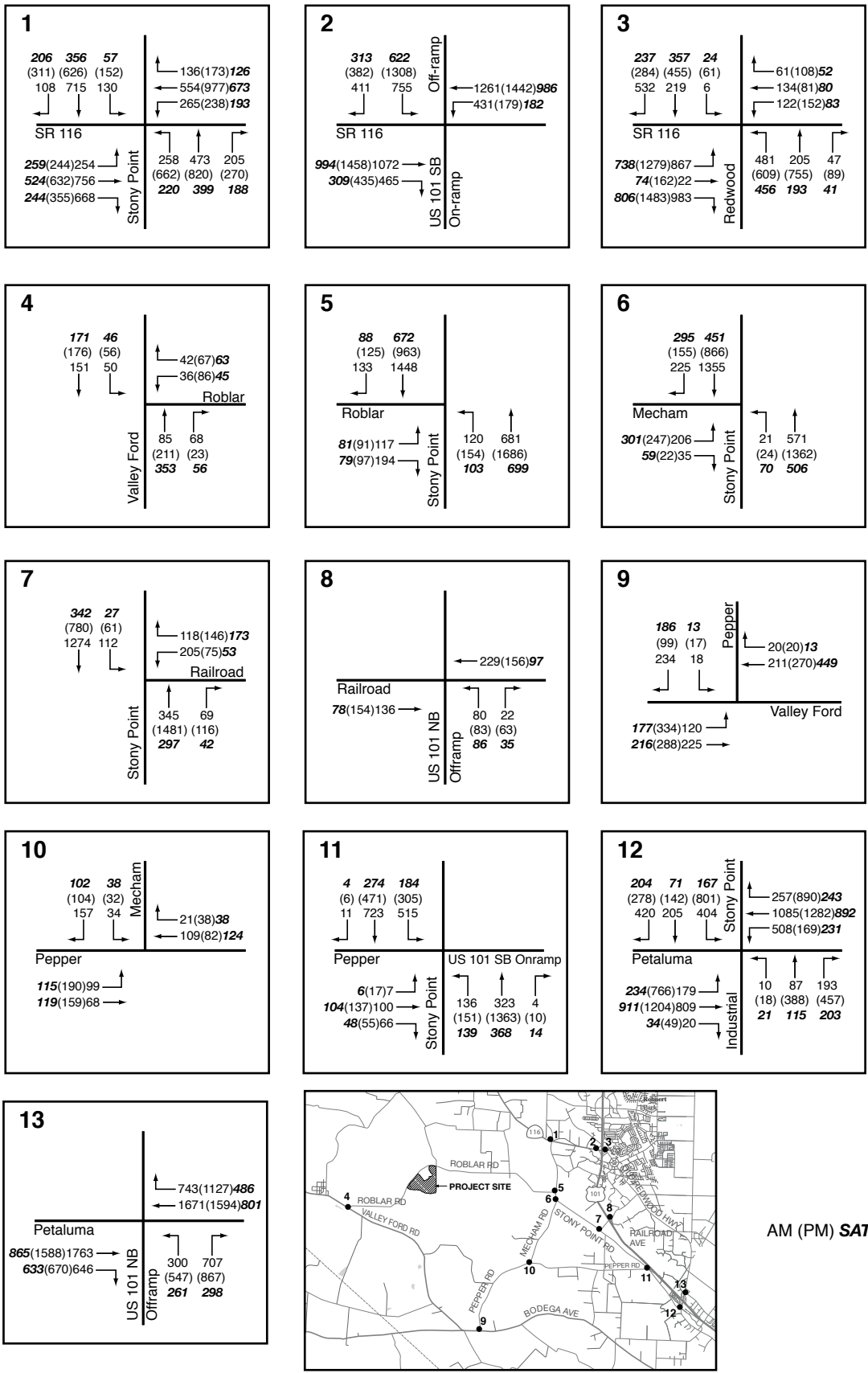
Long-Term Cumulative Base plus Project Conditions

Impact E.2: The proposed project would contribute to Long-Term Cumulative traffic volume at study intersections during the weekday a.m. and p.m. peak hours, and Saturday peak hour. This would be a significant impact at certain study intersections.

Long-Term Cumulative Base plus Project conditions are defined as Long-Term Cumulative Base conditions plus traffic added by the proposed project. Year 2027 vehicle trip generation for the proposed quarry is the same as that presented for Near-Term conditions, because production limits would remain constant over the life of the quarry. Project impacts are then identified by comparing the LOS results under Long-Term Cumulative Base plus Project conditions to those under Long-Term Cumulative Base conditions. As was the case for the Near-Term Cumulative plus Project analysis, traffic volumes were adjusted to reflect a PCE of 3.0 for heavy truck traffic.

Figure IV.E-8 illustrates the traffic volumes at the study intersections under Long-Term Cumulative Base plus Project conditions. The results of the LOS analysis for Long-Term Cumulative Base plus Project conditions are summarized in Table IV.E-10. With the addition of project-generated traffic, five of the 13 study intersections are projected to continue to operate at an acceptable LOS D or better during all peak hours.

However, the eight study intersections that were operating at unacceptable levels (LOS E or worse) during one or more peak hours without the project (i.e., under Long-Term Cumulative Base conditions) would further degrade incrementally under Long-Term Cumulative Base plus Project conditions. The intersections of Stony Point Road at Roblar Road, Railroad Avenue, Mecham Road, Pepper Road, and SR 116 would all continue to operate at unacceptable LOS E or worse during one or more of the weekday a.m. and p.m. peak hours. Furthermore, the intersection of Stony Point Road and SR 116 would also continue to operate at unacceptable LOS E during the Saturday midday peak hour.



AM (PM) SAT

SOURCE: ESA

Roblar Road Quarry . 204334

Figure IV.E-8
Long-Term Cumulative Base plus
Project Peak-Hour Turning Movement Volumes

**TABLE IV.E-10
PEAK-HOUR INTERSECTION LEVELS OF SERVICE (LOS)
LONG-TERM CUMULATIVE BASE PLUS PROJECT CONDITIONS^a**

Intersection	Control ^b	Weekday				SAT Midday	
		AM		PM		Delay ^c	LOS
		Delay ^c	LOS	Delay ^c	LOS		
Stony Point Road at State Route 116	Signal	>120	F	>120	F	59.8	E
State Route 116 at U.S. 101 SB Ramps ^d	Signal	42.5	D	55.9	D	23.8	C
State Route 116 at Old Redwood Highway	Signal	35.6	D	>120	F	37.5	D
Roblar Road at Valley Ford Road	TWSC	10.6	B	13.3	B	13.6	B
Roblar Road at Stony Point Road	Signal	114.3	F	70.4	E	10.1	B
Mecham Road at Stony Point Road	Signal	61.7	E	41.5	D	19.0	B
Stony Point Road at Railroad Avenue	TWSC	>90	F	>90	F	15.8	C
Railroad Avenue at U.S. 101 NB Off-Ramp ^d	TWSC	11.8	B	11.1	B	10.1	B
Pepper Road at Valley Ford Road	TWSC	12.1	B	14.8	B	15.5	C
Pepper Road at Mecham Road	TWSC	10.5	B	11.1	B	10.9	B
Pepper Road at Stony Point Road	Signal	20.7	C	>120	F	17.0	B
Stony Point Road at Old Redwood Highway-Petaluma Boulevard	Signal	56.2	E	100.7	F	31.6	C
Old Redwood Highway at U.S. 101 NB Ramps ^d	Signal	>120	F	>120	F	18.3	B

^a Worst movement LOS at two-way stop-controlled intersections; overall intersection LOS at signalized intersections.

^b Signal = Signal controlled, TWSC = Two-way stop (sign) controlled.

^c Average Stopped Delay expressed in terms of Seconds per Vehicle.

^d NB= Northbound, SB= Southbound

Bold typeface signifies a significant impact.

SOURCE: ESA (2006) using TRAFFIX and the 2000 Highway Capacity Manual operations analysis methodology.

In addition, the intersection of SR 116 at Redwood Highway in Cotati would continue to operate at LOS F during the weekday p.m. peak hour. Finally, the intersections of Stony Point Road and Old Redwood Highway-Petaluma Boulevard, and Old Redwood Highway and U.S. 101 Northbound ramps in Petaluma would continue to operate at LOS E or worse during the weekday a.m. and p.m. peak hours.

The project would add less than five seconds of delay to the intersections of Stony Point and Mecham Road, Stony Point Road and Pepper Road, and Stony Point Road at Old Redwood Highway-Petaluma Boulevard, and Old Redwood Highway at the U.S. 101 Northbound Ramps in Petaluma (less-than-significant impacts). However, the project would increase delays by more than five seconds at the intersections of Stony Point Road and Roblar Road, Stony Point Road and Railroad Avenue, Stony Point Road at SR 116, and SR 116 at Old Redwood Highway, which would be significant impacts at these four intersections.

Mitigation Measure E.2a: In addition to the signalization and associated improvements identified in Mitigation Measure E.1, provide a dedicated right-turn lane on the southbound approach at the intersection of Stony Point at Roblar Road. This would mitigate the project's impact to a less-than-significant level (i.e., would reduce the project-generated increase in delay to less than five seconds [the threshold of significance]), but not to LOS D or better.

This intersection is located within the County's jurisdiction; accordingly, the implementing agency for Mitigation Measure E.2a would be Sonoma County. As discussed in Mitigation Measure E.1, above, the County plans signalization and associated improvements at this intersection fiscal year 2008/09. The County's preliminary design for this intersection identifies a proposed flaring of the southbound approach that may provide room for a dedicated southbound right-turn lane. However, in the absence of final design specifications, it is unknown whether minor additional width may be needed on Stony Point Road beyond that identified in Mitigation Measure E.1 to accommodate this dedicated southbound right-turn lane.

The applicant shall be required to pay costs associated with the redesign, potential right-of-way acquisition, and installation of improvements prior to start of mining.

Mitigation Measure E.2b: When signal warrants are met, install traffic signals at the intersection of Stony Point Road and Railroad Avenue. The installation of a signal would improve the level of service at the intersection to LOS D or better during the peak hours.

This intersection is located within the County's jurisdiction; accordingly, the implementing agency for Mitigation Measure E.2b would be Sonoma County. Regular (annual) monitoring and signal warrant analysis of this intersection shall be conducted until such time warrants for signalization are met. The project applicant shall pay a fair share of the cost of the required improvements. The Sonoma County Department of Transportation and Public Works shall be responsible for preparing a cost estimate of the required improvements.

Mitigation Measure E.2c: The signal timing at the intersection of Stony Point Road at SR 116 shall be optimized to improve the capacity of the intersection. Optimization involves changing the timing of an individual traffic signal to better reflect traffic volumes, and can include changing the cycle length or reallocating green time between different phases of a traffic signal. Optimization of the signal timing would mitigate the project's impact to a less-than-significant level (i.e., would reduce the project-generated increase in delay to less than five seconds [the threshold of significance]), but not to LOS D or better.

The intersection of Stony Point Road at SR 116 is within the jurisdiction of both Sonoma County and Caltrans. Accordingly, the implementing agencies for Mitigation Measure E.2c would be Sonoma County and Caltrans. Regular (annual) monitoring of this intersection shall be conducted until such time as the need for identified improvements is met. The project applicant shall pay a fair share of the cost of the required improvements.

Mitigation Measure E.2d: The signal timing at the intersection of SR 116 at Old Redwood Highway shall be optimized to improve the capacity of the intersection. Optimization of the signal timing would mitigate the project's impact to a less-than-significant level (i.e., would reduce the project-generated increase in delay to less than five seconds [the threshold of significance]), but not to LOS D or better.

The intersection of SR 116 at Old Redwood Highway is within the jurisdiction of both Caltrans and the City of Cotati. Accordingly, the implementing agencies for Mitigation Measure E.2d would be Caltrans and the City of Cotati. Regular (annual) monitoring of this intersection shall be conducted until such time the need for identified improvements is met. The project applicant shall pay a fair share of the cost of the required improvements.

Significance after Mitigation:

Mitigation Measure E.2a: Implementation of Mitigation Measure E.2a would reduce the identified project contribution to the cumulative intersection impact to a less-than-significant level. However, the applicant may need to acquire land from private landowners along Stony Point Road to provide sufficient right-of-way width to implement the identified roadway widening improvements. In addition, the applicant would also need to fund and implement the roadway improvements, and then dedicate any right-of-way land with the road improvements to the County. Because of the need to acquire the right-of-way, the implementation of Mitigation Measure E.2a may not be feasible. If the identified improvements in Mitigation Measures E.2a were found to be infeasible, the intersection impact would be Significant and Unavoidable.

Mitigation Measure E.2b: Implementation of Mitigation Measure E.2b would reduce the identified project contribution to the cumulative intersection impact to a less-than-significant level. However, the intersection improvement is not currently funded or planned. If these improvements are not in place once signal warrant analysis conducted as part of annual monitoring demonstrates the need for signalization is met, the intersection impact would be Significant and Unavoidable.

Mitigation Measure E.2c: Implementation of Mitigation Measure E.2c would reduce the identified project contribution to the cumulative intersection impact to a less-than-significant level.

Mitigation Measure E.2d: Implementation of Mitigation Measure E.2d would reduce the identified project contribution to the cumulative intersection impact to a less-than-significant level.

The construction of the intersection improvements described in Mitigation Measure E.2a could result in potential secondary environmental impacts. These secondary impacts are described under the subsection “Secondary Impacts Resulting from Implementing Off-Site Transportation Mitigation Measures” at the end this section.

Bicycle/Pedestrian Safety

Impact E.3: The project would add substantial truck traffic to certain primary haul roads that are designated proposed bikeways and/or are regularly used by bicyclists or pedestrians, and which do not meet current County roadway design standards. This would be a significant impact.

The project would cause a substantial increase truck traffic on certain public roadways in Sonoma County (see Impact E.4 for additional detail), and could increase the risk of accidents due to

potential conflicts between project traffic and bicyclists and/or pedestrians. The potential for conflicts would be considered greatest in circumstances where the primary proposed truck haul road would be regularly used by bicyclists or pedestrians and/or is a designated proposed bikeway, and the road does not meet current County roadway design standards (including paved shoulders of sufficient width for use by bicycles). The impact discussion focuses on lower volume rural roadways and/or collector roadways (i.e., Roblar Road, Valley Ford Road, Pepper Road and Mecham Road), as the addition of project truck traffic would be most noticeable by bicyclists or pedestrians on these roadways. In addition, project haul trucks could lose gravel from their trailers which could end up on shoulders and in bike lanes, potentially creating a hazard for bicyclists.

As discussed in the Setting, the *Sonoma County Bikeways Plan* and the associated *Countywide Bicycle Plan 2003 Update* classify Roblar, Valley Ford, Pepper and Mecham Roads as proposed Class III bike routes. The weeklong bicycle count conducted in March 2005 indicated that the bicycle volumes on Roblar Road in the community of Roblar east of the project site ranged from an average of 20 trips on weekdays to 34 trips on weekend days, with lower overall bicycle volumes on Roblar Road in the project vicinity. Bicycle trips on any given day throughout the year could be higher or lower than this count, depending on season, weather conditions, size of bicycling groups, and other factors. While bike counts were not conducted for the other study roads, they are all currently used by bicyclists.

The community of Roblar and the residential community along east Pepper Road also generate pedestrians in their respective areas. As explained in the Setting, in the community of Roblar, Roblar Road contains a posted 25 mph speed limit (while school in session) and school route crosswalk at Petersen Road in the Dunham School vicinity. In the east Pepper Road community, Pepper Road contains a 25 mph school zone speed limit, and a crosswalk and flashing red stop light at Jewitt Road. These features are designed to promote pedestrian safety.

Nevertheless, Roblar Road and Pepper Road (east of Mecham Road) do not meet current County road design standards for travel lane and/or shoulder width. Specifically, Roblar Road west of Canfield Road contains approximate 10-foot wide travel lanes (with some sections containing lanes as narrow as 8.5 to 9 feet in width), less than current County roadway standard of 12 feet. Further, Roblar Road and portions of Pepper Road east of Mecham Road contain either no paved shoulders, or shoulder width less than the current County standard of six feet in width. It should be noted the *Sonoma County Bikeways Plan* recommends the installation of shoulders on the entire length of Roblar Road; however, no funding currently exists for this improvement.

Using the significance criteria, a significant impact is identified for the entire length of Roblar Road, and the section of Pepper Road east of Mecham Road.

Mitigation Measure E.3a: Improve Roblar Road and Pepper Road (between Mecham Road and Stony Point Road) to meet current County road design standards, including, but not limited to, two 12-foot wide vehicle travel lanes, two six-foot wide shoulders, and associated striping/signage to meet Class II bike facilities. These improvements shall be conducted prior to initiation of quarry mining.

Mitigation Measure E.3b: The project applicant shall ensure that all loaded trucks are covered or maintain a six-inch free board to prevent spillage of materials onto haul routes.

Mitigation Measure E.3c: The intersection of the proposed access road and Roblar Road shall be kept free of loose gravel and dirt that may accumulate from exiting trucks. In addition to the proposed use of tire wash and tire scraper to loosen dirt from the trucks and their tires, the applicant shall conduct regular sweeping of the intersection of the proposed access road with Roblar Road.

Significance after Mitigation: Mitigation Measures E.3a-c would reduce the identified traffic safety hazard impact to a less-than-significant level. However, the roadway improvements identified in Mitigation Measure E.3a are not currently funded or planned. Furthermore, the applicant would need to acquire land from private landowners along portions of Roblar Road and Pepper Road to provide sufficient right-of-way width to implement the identified roadway widening improvements. The existing County right-of-way width on Roblar Road is 50 feet between Valley Ford Road and Orchard Station Road (roughly 4.5 miles), and 60 feet between Orchard Station Road and Stony Point Road (roughly 2 miles) (Giovannetti, 2008). The existing County right-of-way on Pepper Road east of Mecham Road is 50 feet. Some individual parcels on these roads are wider due to previously implemented road improvement projects and other land development. The minimum estimated required right-of-way width to improve the roadways to current County standards would be 60 feet, although additional right-of-way width may be needed in locations constrained by existing topography, utilities, drainage or other factors. The applicant would also need to fund and implement the roadway widening improvements, and then dedicate the right-of-way land with the roadway improvements to the County. As a consequence, the implementation of Mitigation Measure E.3a may not be feasible. If the improvements identified in Mitigation Measure E.3a were found to be infeasible, the traffic safety impacts would be Significant and Unavoidable.

The construction of the roadway improvements described in Mitigation Measure E.3a would also result in potential secondary environmental impacts. These secondary impacts are described under the subsection “Secondary Impacts Resulting from Implementing Off-Site Transportation Mitigation Measures” at the end of this section.

Please also refer to Chapter V, Alternatives, which presents an alternative (Alternative 2 – Alternative Haul Route / Contracted Sales Only Alternative) which entails substantially less off-site transportation improvements and less associated secondary impacts.

Traffic Safety

Impact E.4: The project would add substantial truck traffic to certain primary haul roads that do meet current County roadway design standards and/or contain limited sight distance. This would be a significant impact.

The project would cause a substantial increase truck traffic on certain public roadways in Sonoma County, and most notably the primary truck haul roads, including Roblar Road, Valley Ford

Road, Pepper Road, Mecham Road, Stony Point Road and SR 116. Of the primary haul roads, the largest increase in daily truck traffic as a percentage of total traffic would occur on Roblar Road. The project would increase the percentage of average daily truck traffic on Roblar Road west of project site from an existing 8 percent to an estimated 19 percent (net increase of 11 percent). On Roblar Road east of the project site, in the community of Roblar, the project would increase the percentage of average daily truck traffic from an existing 9 percent to an estimated 14 percent (increase of five percent). Net increases in the average daily truck traffic on all other proposed primary haul roads would be five percent or less, with the smallest increases occurring on Stony Point Road, Mecham Road and SR 116.

As explained in the Setting, overall, about ten percent of the existing traffic on the study haul route roadways consists of truck traffic, however, approximately five percent of total collisions on study route segments in the last five years involved trucks. Furthermore, based on the recorded accident data, the accident rate on all study road segments was below both County and statewide average for two-lane rural roads.

All project traffic would use Roblar Road to access the project site. (See also Alternative 2 in Chapter V, which would limit project truck traffic to a mile-long segment of Roblar Road.) As discussed in Impact E.3, above, Roblar Road does not meet current County road design standards for travel lane and shoulder width. Roblar Road is also varied in physical characteristics along its alignment, containing several segments with horizontal and/or minor vertical curvature, as well as adjacent topographic features (hillside) which limit sight distance for drivers in locations. Signed advisory reduced speeds are present at nine curves on Roblar Road. The speed survey conducted on Roblar Road indicates the existing 85th percentile speed (the speed most motorists consider safe and reasonable under ideal conditions) at the recorded locations (0.2 miles west of Dunham School, and 0.65 miles west of Canfield Road) was just under 60 mph. This was higher than the posted speed limit of 45 mph (between Stony Point Road and Orchard Station Road and the *prima facie* of 55 mph (between Orchard Station Road and Valley Ford Road).

Given the proposed use of Roblar Road as a primary truck haul road, and considering that (1) the travel lane and shoulder widths on this roadway do not meet current County standards, (2) vehicles currently travel at speeds higher than posted speed limits, and (3) the winding nature of the roadway and topography contributes to limited sight distance in locations, the addition of project truck traffic to this roadway would be considered a significant impact. The potential impact could be increased during periods of poor visibility, such as fog; or reduced road traction, such rainy or frosty conditions; and/or during potential infrequent nighttime operations.

All other primary study haul roads (Valley Ford Road, Pepper Road, Mecham Road, Stony Point Road, and SR 116) contain wider vehicle travel lanes and shoulders, more gradual roadway curvature and/or overall greater sight distance than Roblar Road. As a result, no significant impact associated with traffic safety is identified to these other primary study haul roads.

Mitigation Measure E.4a: Implement roadway improvements for Roblar Road identified in Mitigation Measure E.3a.

Mitigation Measure E.4b: The County shall post warning signs on Roblar Road at key locations where sight distance may continue to be limited after implementation of Mitigation Measure E.3a.

Mitigation Measure E.4c: The County shall post warning signs on Roblar Road 250 feet ahead of the access driveway that cautions drivers about truck traffic entering and exiting the roadway.⁷ The warning signs shall follow guidelines set forth in the *California Manual on Uniform Traffic Control Devices* (Caltrans, 2006c).

Significance after Mitigation: Mitigation Measures E.4a-c would reduce the identified impacts associated with potential increases in traffic accidents to a less-than-significant level. However, as discussed above (page E-34), the roadway improvements identified in Mitigation Measure E.3a are not currently funded or planned. Furthermore, the applicant would need to acquire land from private landowners along portions of Roblar Road and Pepper Road to provide sufficient right-of-way width to implement the identified roadway widening improvements. In addition, the applicant would also need to fund and implement the roadway improvements, and then dedicate the right-of-way land with the road improvements to the County. As a consequence, the implementation of Mitigation Measure E.3a (and correspondingly, Mitigation Measure E.4a) may not be feasible. If the identified improvements in Mitigation Measures E.3a/E.4a were found to be infeasible, the traffic safety impacts would be Significant and Unavoidable.

The roadway improvements described in Mitigation Measure E.4a would result in potential secondary environmental impacts. These secondary impacts are described under the subsection “Secondary Impacts Resulting from Implementing Off-Site Transportation Mitigation Measures” at the end of this section.

Please also refer to Chapter V, Alternatives, which presents an alternative (Alternative 2 - Alternative Haul Route / Contracted Sales Only Alternative) which entails substantially less off-site transportation improvements and less associated secondary impacts.

Access Road Construction

Impact E.5: The proposed project would result in inadequate site access. This would be a significant impact.

The proposed access road connection to Roblar Road would occur approximately 1,200 feet east of the existing vehicular access point to the project site. The proposed access road would be paved for approximately 2,000 linear feet within the project site, containing two 10-foot travel lanes plus unpaved shoulders. See Figures III-14 and III-17 in the Project Description for additional detail.

⁷ A vehicle traveling at 60 mph needs approximately 230 feet in order to come to a complete stop (NHTSA, 1998).

Currently, there are no westbound left-turn or eastbound right-turn lanes on Roblar Road at the proposed project access point. The eastbound lane shoulders could be used by right-turning vehicles to decelerate to a safe turning speed, but the shoulders are not wide enough to fully accommodate a haul truck. It is also expected that large project trucks would need to make wide turns into the opposing lane to access the site, which could impede through traffic. These considerations would represent a safety hazard because there is only one travel lane in each direction on Roblar Road, and as discussed above, existing vehicles on Roblar Road travel at about 60 mph in the access road vicinity, exceeding the *prima facie* of 55 mph.

The proposed driveway should be designed to adequately accommodate two-way truck traffic with sufficient space to allow incoming vehicles to maneuver onsite without adversely affecting traffic operation in the public right-of-way.

Mitigation Measure E.5a: Improve Roblar Road at the proposed access point to the site to accommodate project haul trucks accessing the site. This improvement shall include a left-turn lane for project trucks on the westbound approach, and road widening on the eastbound approach to fully accommodate right-turning trucks.

Mitigation Measure E.5b: Design the roadway cross-section to meet the design standards set forth by the American Association of State Highway and Transportation Officials (AASHTO) in *A Policy on Geometric Design of Highways and Streets*.

Significance after Mitigation: Mitigation Measures E.5a-b would reduce the identified impacts associated with potential increases in traffic accidents to a less-than-significant level. The required right-of-way width for the identified improvement would be approximately 80 feet. The County may not currently own the required right-of-way width along this section of Roblar Road to implement the identified improvements. The applicant may need to acquire land from an adjacent private landowner on Roblar Road to provide sufficient right-of-way width to implement the identified roadway improvements. In addition, the applicant would also need to fund and implement the roadway improvements, and then dedicate the right-of-way land with the road improvements to the County. As a consequence, Mitigation Measure E.5a-b may not be feasible. If the improvements identified in Mitigation Measure E.5a-b were found to be infeasible, the traffic safety impacts would be Significant and Unavoidable.

The roadway improvements described in Mitigation Measure E.5a-b would result in potential secondary environmental impacts. These secondary impacts are described under the subsection “Secondary Impacts Resulting from Implementing Off-Site Transportation Mitigation Measures” which is found at the end of this section.

Please also refer to Chapter V, Alternatives, which presents an alternative (Alternative 2 - Alternative Haul Route / Contracted Sales Only Alternative) which entails substantially less off-site transportation improvements and less associated secondary impacts.

Roadway Wear

Impact E.6: The proposed project could contribute to the degradation of pavement on public roads. This would be a significant impact.

The truck trips generated by the project would cause incremental damage and wear to roadway pavement surfaces along the haul route. The degree to which this impact would occur depends on the roadway's design (pavement type and thickness) and its current condition. Freeways and state routes, such as U.S. 101 and SR 116, are designed to handle a mix of vehicle types, including heavy trucks, and thus, the project's impact on those facilities would be negligible. Local roadways, such as Roblar and Pepper Roads, however, are generally not designed to accommodate heavy vehicles, and truck travel on these roads would have the potential to adversely affect the pavement condition. Roadway damage can include conditions such as loose asphalt and potholes that have the potential to make driving conditions less safe. Roadways significantly impacted from project truck traffic would have to be upgraded to support vehicle weights up to 25 tons.

The capability of a roadway to handle a traffic load is measured by deflection testing, coring, and visual condition surveys of the road. These methods allow the roadway's traffic index (TI) to be assessed. The TI is a logarithm-based scale that indicates the ability of the pavement structure to support the repetitive wheel and axle loads of large trucks, given a sound structural roadway subbase. Typically, TI ratings of 7.0 to 9.0 are calculated for roadways that are not expected to carry appreciable amounts of truck traffic. Higher TI values of 9.0 to 10.0 are typical of major arterial roadways with heavy truck traffic, and values of 10.0 or more are common for freeways and freeway ramp systems. The effects on pavement life from passenger cars, pickups, and two-axle, four-wheel trucks are considered to be negligible.

To evaluate the potential project impact on roadway condition and maintenance, the estimated TI for current and project conditions was calculated for roadway segments on the proposed project haul routes. The TI was calculated in accordance with the procedures specified in the Caltrans *Highway Design Manual* on the basis of a 20-year roadway design period (the standard period used by Caltrans) and average daily truck traffic volumes (Caltrans, 2006b). A summary of the TI calculations for roadways on the project haul route are presented in Table IV.E-11.

Current truck traffic volumes on the proposed primary project haul routes reveal that existing TI values range between 7.5 and 11.2. The existing TI for Roblar Road ranges between 7.5 and 8.4. Of the study haul roads, the existing TIs are highest on Mecham and Stony Point Roads, because these roadways currently carry substantial amounts of traffic, including trucks (e.g., from Central Landfill).

As Table IV.E-11 shows, the project would increase the estimated TI for all the proposed haul routes. Based on the significance criteria, the project would have a significant impact on Roblar and Pepper Roads. This preliminary evaluation indicates a substantial asphalt overlay or reconstruction may be required for these roads. However, because TI values only estimate the impact from increased truck traffic on a roadway and do not account for actual roadway

**TABLE IV.E-11
CALCULATED TRAFFIC INDEX (TI) FOR PROJECT HAUL ROUTES ^a**

Roadway	Existing	Existing plus Project
Mecham Road	10.5	10.7
Pepper Road	9.6	10.6
west of Mecham Road	9.4	10.2
east of Mecham Road		
Roblar Road	7.5	10.3
west of Project Site	8.4	9.8
east of Project Site		
Stony Point Road	11.2	11.6
north of Roblar Road	10.8	11.2
south of Roblar Road		
Valley Ford Road	9.9	10.8

^a Traffic Indices in this table represent values calculated on the basis of existing and project truck traffic volumes, and Equivalent Single-Axles Load factors in the Caltrans Highway Design Manual.

Bold typeface signifies a significant impact.

SOURCE: ESA (2008) and the Caltrans *Highway Design Manual* Traffic Index methodology.

conditions, field analysis should be conducted to determine the existing condition of the base and subbase of these roadways.

Mitigation Measure E.6a: The project applicant shall conduct core sampling and associated testing of Roblar Road and Pepper Road, and review as-builts if available, in order to determine the roadway thickness, and the condition of the base and subbase of the roadways. If such testing indicates the existing roadways are not designed, for and/or in a condition that would not accommodate, long-term project truck traffic, the roadways shall be improved as needed (e.g., overlays or reconstruction) per Caltrans Design Manual standards. The project applicant shall pay the full cost of road improvements, including design and construction.

Mitigation Measure E.6b: Prior to mining, the project applicant shall enter into a *Roadway Maintenance Agreement* with Sonoma County providing their proportionate share of the responsibility to maintain the proposed haul roads.

Significance after Mitigation: Mitigation Measure E.6a-b would reduce the identified roadwear impacts to a less-than-significant level. However, the potential roadway improvements that may be required in Mitigation Measure E.6a are not currently funded or planned. If the improvements identified in Mitigation Measure E.6a were found to be infeasible, the road wear impact would be Significant and Unavoidable.

If the improvements in Mitigation Measure E.6a were implemented within the existing paved width of the subject roadways, no secondary environmental impacts would occur. Please see, however, potential secondary impacts that would be associated with a roadway widening of Roblar and Pepper Road identified in Mitigation Measure E.3a. These secondary impacts are

described under the subsection “Secondary Impacts Resulting from Implementing Off-Site Transportation Mitigation Measures,” which is found at the end of this section.

Please also refer to Chapter V, Alternatives, which presents an alternative (Alternative 2 – Alternative Haul Route / Contracted Sales Only Alternative) which entails substantially less off-site transportation improvements and less associated secondary impacts.

Construction

Impact E.7: Project construction would result in temporary increases in truck traffic and construction worker traffic. This would be a potentially significant impact.

Construction activities in Phase 1 of the project would generate offsite traffic would include the initial delivery of construction vehicles and equipment to the project site, the daily arrival and departure of construction workers, the delivery of materials throughout construction, and the removal of construction debris. Deliveries would include the portable quarry equipment and other building materials for onsite structures, utilities (e.g., irrigation and plumbing equipment, electrical supplies), and paving materials.

Construction-generated traffic would be temporary, and therefore, would not result in any long-term degradation in operating conditions on any roadways in the project locale. The impact of construction-related traffic would be a temporary, intermittent lessening of the capacities of study area roadways because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles. However, given the proximity of the plan area to regional roadways (i.e., U.S. 101 and Stony Point Road), construction trucks would have relatively direct routes. Most construction traffic would be dispersed throughout the day. Thus, the temporary increase would not significantly disrupt daily traffic flow on any of the project area roadways.

Although the impact from the number of vehicles would be less than significant, truck movements could have an adverse effect on traffic flow in the area caused by these trucks’ slower speeds and longer turning maneuvers. As such, the impact is considered potentially significant.

Mitigation Measure E.7: The project applicant and/or construction contractor(s) shall develop a construction management plan for review and approval by the Sonoma County Public Works Department. The plan shall include at least the following items and requirements to reduce, to the maximum extent feasible, traffic congestion during construction of this project and other nearby projects that could be simultaneously under construction:

- A set of comprehensive traffic control measures that include designating construction access routes and scheduling of major truck trips and deliveries to avoid peak traffic hours and designated construction access routes; and
- Notification of adjacent property owners and public safety personnel regarding scheduled major deliveries.

Significance after Mitigation: Less than Significant.

Secondary Impacts Resulting from Implementing Off-Site Transportation Mitigation Measures

Impact E.8: Implementation of Mitigation Measures E.3a/E.4a and E.5a could result in short-term and/or long-term environmental impacts on land use and agricultural resources, geology and soils, hydrology and water quality, hazardous materials, biological resources, transportation and circulation, air quality, noise, aesthetics and cultural resources. This would be a potentially significant impact.

Mitigation Measures E.3a/E.4a identify improving the entire approximate 6.5-mile length of Roblar Road, and approximately 3¼ miles of Pepper Road (between Mecham Road and Stony Point Road) to meet current County road design standards, including, but not limited to, two 12-foot wide vehicle travel lanes, two six-foot wide shoulders, and associated striping/signage to meet Class II bike facilities. Furthermore, Mitigation Measure E.5a identifies additional improvements to Roblar Road at the approaches to the proposed access road.

Over the long-term, the identified off-site improvements would serve to mitigate project impacts, and provide a beneficial effect on the movement of large vehicles, cars and bicyclists on haul routes, and decrease the potential for conflicts between these modes of transportation. However, construction and implementation of these off-site transportation improvements would also result in their own potentially significant temporary and long-term environmental impacts. A detailed analysis of the specific off-site impacts cannot be completed until and if design work was undertaken that would provide information on the specific alignment and structural improvements that may be required along Roblar and Pepper Roads to accommodate the proposed widening. If the proposed roadway improvements were pursued, subsequent detailed environmental analysis and County approval would be required. However, the following provides an assessment of the likely range of potential environmental impacts that would be anticipated with the identified roadway widening improvements, and preliminary mitigation measures to reduce environmental impacts.

Land Use and Agricultural Resources

The land uses along Roblar Road primarily carry a General Plan land use/zoning of Land Intensive Agriculture and Diverse Agriculture. Along Pepper Road east of Mecham Road, adjacent land uses contain Land Intensive Agriculture, Diverse Agriculture or Rural Residential General Plan land use/zoning designations. Several parcels along the Roblar Road and Pepper Road alignments are under a Williamson Act contract or other agricultural conservation easement protection. The California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) classifies parcels along the Roblar and Pepper Road alignments as either “prime farmland,” “farmland of local importance,” “grazing land,” or “other.”

As discussed under the “Significance after Mitigation” for Mitigation Measure E.3, above, the applicant would need to acquire land from private landowners along portions of Roblar Road and Pepper Road to provide sufficient right-of-way width to implement the identified roadway widening improvements. Depending on the final alignment and limits of construction, the roadway widening improvements would result in the temporary and permanent loss of some agricultural land/open space along the roadway alignments, including the potential for loss of some prime farmland. The roadway widening improvements could also conflict with Williamson Act contracts and conservation easements governing a number of adjacent properties along the alignments.

Geology and Soils

During construction, the identified widening improvements on Roblar and Pepper Roads would require vegetation removal, shallow excavation and grading along the alignment. Construction operations would expose the soil surface and create temporary soil stockpiles, which would be susceptible to erosion by wind or water.

Steep slopes are located adjacent to sections of Roblar Road. Of particular concern is the rocky outcrop on the north side of Roblar Road across from the southeast corner of the project site; the hillside along sections of the south side of Roblar Road east of the proposed access road; and the hillside sections on the south side of Roblar Road in vicinity of an “s-curve,” approximately one-half mile west of the project site. Accordingly, the proposed roadway widening could require substantial upslope cuts into the underlying bedrock or looser soil materials to achieve required slope stability, and equally substantial downslope fills to support the increased road width. Depending on the geologic material, some areas would require the cut slope angle to be reach 1:1 to 3:1; the need for greater slope angle would require considerably more grading and possible encroachment into private property. Additionally, excavation in certain bedrock types could require blasting to remove the rock for grading. In some areas (i.e. along Roblar Road adjacent to the proposed site) fills necessary to achieve the wider road width could encroach into Americano Creek, requiring specialized slope stability measures and revetment. Road cut slopes and fill slopes must achieve a required “factor of safety” (the point at which a slope is considered stable) for seismic conditions (earthquake) and non-seismic conditions (i.e. failures driven by gravity under saturated conditions). Although achieving required factors of safety for conditions in this area is possible using standard engineering design and construction practices, a detailed geotechnical feasibility and design study must be conducted to develop site-specific engineering design criteria and approaches. Mitigation Measure E.8b, below, reflects current engineering practice and the accepted standard of care to mitigate potential impacts from unique geological conditions along the roadway alignments.

Mitigation Measure E.8a: As part of the grading and construction specifications for the roadway widening, implement best management practices (BMPs) to reduce or eliminate soil erosion during construction. The contractor shall implement these BMPs and be responsible for the inspection and maintenance of the BMPs during construction. These measures shall be incorporated into the Storm Water Pollution Prevention Plan (SWPPP) for the proposed roadway widening (see Mitigation Measure E.8c, below).

Mitigation Measure E.8b: A design level geotechnical investigation shall be required to identify site specific geologic conditions and geotechnical constraints and develop adequate engineering design criteria and remedies to reduce the potential for slope instability from cutting and filling of adjacent slopes along the roadway alignments. Methods for reducing potential slope instability effects could include, but are not limited to, slope reconstruction, earth buttress construction, or retaining structures/walls. All recommendations identified by the licensed geotechnical engineer shall be included in the final design and be incorporated into the roadway widening project.

Hydrology and Water Quality / Hazardous Materials

During construction, the stripping of vegetation and disturbance of soils along the roadway alignments could result in increases in sedimentation that would affect surface water quality in local water courses. In addition, the accidental release of hazardous materials (e.g., fuels, lubricants) associated with construction could contaminate soil and/or stormwater along the roadway alignments.

A number of surface water courses are located along or across the roadway alignments, including Americano Creek, Gossage Creek and Washoe Creek along Roblar Road, and the Petaluma River and Liberty Creek along Pepper Road. Americano Creek crosses Roblar Road three times, and follows closely and roughly parallel to Roblar Road for several hundred feet in the project site vicinity. Gossage and Washoe Creeks each cross Roblar Road once. The Petaluma River drainage and Liberty Creek crosses Pepper Road once. In addition, open drainages exist along one or both sides of sections of Roblar and Pepper Roads along their alignment. Consequently, the proposed roadway widening of Roblar and Pepper Roads may directly impact portions of Americano Creek, necessitating the alteration of this creek through realignment and/or culverting, and/or could impact Gossage Creek, Washoe Creek and/or Petaluma River and Liberty Creek at the roadway crossings of these water courses.

The proposed widening of Roblar and Pepper Roads would incrementally increase the amount of impervious surface along the roadway alignments (net increase of approximately 11 acres along Roblar Road and 3 acres along Pepper Road), and therefore, increase the amount of stormwater runoff from the roadways, and increasing peak flows to local watercourses and hence, potential flooding and bank erosion. However, when considering this increase in impervious area would be distributed throughout a large area, and increases in runoff would be distributed to several water courses, this net increase would not in itself be significant. However, Mitigations Measures E.8c and E.8d are provided to ensure that potential impacts associated with temporary construction water quality and drainage would remain less than significant.

Mitigation Measure E.8c: Prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) before commencing with roadway widening construction. As part of this process, a Notice of Intent shall be filed with the State Water Resources Regional Control Board, in compliance with the statewide NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit). The SWPPP shall specify Best Management Practices (BMPs) to control contamination of surface flows through measures to prevent the potential discharge of pollutants from the construction area.

The BMPs shall be designed to minimize erosion of disturbed soil areas. BMPs could include, without limitation, silt fences, gravel or sand bags, stormdrain inlet protection, soil stockpile protection, preservation of existing vegetation where feasible, use of straw mulch, dust control, and other measures. The SWPPP will also include protection and spill prevention measures for any temporary onsite storage of hazardous materials used during construction. The project applicant shall adhere to the identified BMPs as well as the waste discharge and stormwater requirements outlined in the permit.

Mitigation Measure E.8d: The proposed storm drain system for the roadway widening improvements shall be designed in accordance with all applicable County and Sonoma County Water Agency (SCWA) drainage and flood control design standards. The drainage plan for the roadway widening improvements shall ensure the proposed drainage facilities are properly sized to accommodate projected stormflows and prevent any potential project flooding on-site and in downstream areas.

Biological Resources

The vegetative communities along the Roblar Road and Pepper Road alignments are dominated by bare ruderal areas and non-native grasslands, interspersed with stretches of black oak, Coast live oak and eucalyptus woodlands. Much of the western half of Roblar Road extends in close proximity to Americano Creek (crossing it three times). In addition, seasonal wetlands are present near Roblar Road along what may have been the remnants of the previous natural meander of Americano Creek (Golden Bear Biostudies, 2003). Roblar Road also crosses Gossage and Washoe Creeks. Arroyo willow riparian woodlands, dominated in varying degrees by several willow species and rushes, occur on the Roblar Road alignment in association with Americano Creek, and at the crossings of Gossage Creek and Washoe Creek. In contrast, the Petaluma River and Liberty Creek do not support riparian woodlands in the vicinity of Pepper Road.

Depending on the roadway design and extent of disturbance, the identified roadway widening improvements would have the potential to result in temporary and/or permanent impacts to jurisdictional waters of Americano Creek located in the vicinity of Roblar Road (including any associated potential jurisdictional wetlands), as well as at the Roblar Road crossing of Washoe Creek and Gossage Creek, and the Pepper Road crossing of Liberty Creek and the Petaluma River.

No reports of the California tiger salamander (CTS) breeding habitat have been previously identified along Roblar Road or the study segment of Pepper Road (i.e., east of Meham Road). However, an area including the eastmost 1.5 miles of Roblar Road is within the USFWS Draft Potential Range of the CTS. Furthermore, a documented CTS breeding site was recently identified further west and outside this range (approximately 1/3 mile north of Roblar Road / 1/2-mile west of Orchard Station Road) (Fawcett, 2007, CDFG, 2008). CTS may aestivate sporadically in upland areas within small mammal burrows or other suitable cover, and may seasonally migrate through the roadway improvement areas. Consequently, the roadway widening improvements on the east half of Roblar Road could affect aestivation and migration habitat for this species. There is a relatively lesser likelihood that CTS would be encountered in the west half of the Roblar Road, given that it is beyond both the USFWS CTS boundary and any documented

sightings of this species, and potential breeding habitat was not identified in close proximity to the project area.

There are no documented California red-legged frog (CRLF) breeding sites within 1,000 feet of either the Roblar Road or Pepper roadway alignments. However, Americano Creek provides potential aquatic habitat (including breeding habitat) for the CRLF. Other potential aquatic habitat (although no breeding habitat) may also be found in the other water courses along the Roblar and Pepper Road study segments. CRLF could also be encountered in upland areas of water courses along or across the Roblar Road and Pepper Road alignments during routine overland movements by adults and juveniles. The foothill yellow-legged frog (FYLF) is not identified or documented on the Roblar Road and Pepper Road alignments. However, Gossage and Washoe Creeks provide potential aquatic habitat that may support this species. In addition, the northwestern pond turtle could be encountered in or near Gossage Creek, Washoe Creek, and the Petaluma River. As a result, the proposed construction and grading activities could remove potential habitat for the CRLF, the FYLF and northwestern pond turtle.

Roadway widening improvements would also have the potential to result in direct or indirect impacts to several dozen mature trees along the Roblar Road and Pepper Road alignments, including, but not limited to black oak, Coast live oak, cypress, eucalyptus, redwood and pine. In addition, construction activities and the loss of these trees along the roadway alignments could result in the disturbance of active nests of raptors and other special-status birds, particularly during the breeding season (February 1 to August 31).

The American badger, a California Species of Special Concern, is spread throughout the local project area and use grassland habitat, including that located in the vicinity of Roblar Road and Pepper Road. The roadway widening of Roblar and Pepper Roads would result in a minor loss of grassland habitat for the badger, and construction could encounter badger dens that have been located in the project vicinity.

Many of the mitigation measures identified to mitigate potential impacts to biological resources from the proposed quarry project (including jurisdictional waters and wetlands, effects to special status wildlife species and habitat, tree loss) would also be relevant and applicable for mitigating impacts associated with the roadway widening improvements on Roblar and Pepper Roads. Accordingly, the following mitigation measures identified in Section IV.D in this EIR (as amended, below) are identified to mitigate impacts from the roadway widening improvements to biological resources.

Mitigation Measure E.8e: To mitigate the filling or excavating of potentially jurisdictional wetlands along the roadway widening alignments, the project proponent shall:

- Conduct a formal wetland delineation in accordance with 1987 *Corps of Engineers Wetlands Delineation Manual* and have it verified by the U.S. Army Corps of Engineers (Corps). If the Corps and/or CDFG determine that the potentially affected water-associated features are jurisdictional, then the project proponent shall obtain appropriate wetland permits and implement all conditions contained in the Section 404 Clean Water Act permit (possibly an Nationwide permit) from the Corps, Section

1603 Streambed Alteration Agreement from CDFG, and/or Section 401 water quality certification from the Regional Water Quality Control Board.

- Compensate for the loss of jurisdictional wetlands at a 2:1 ratio (or as agreed to by the permitting agencies) within the project site boundary, or at a 3:1 ratio (or as agreed to by the permitting agencies) off-site within the local watershed, by creating, restoring or enhancing waters of the U.S., or contributing in-lieu funds to an existing or new restoration project preserved in perpetuity. The restoration effort shall require implementation of a five-year monitoring program with applicable performance standards, including but not limited to establishing: 80 percent survival rate of restoration plantings native to local watershed; absence of invasive plant species; absence of erosion features; and a functioning, and self-sustainable wetland system.

Mitigation Measure E.8f: Avoid all potential jurisdictional wetlands and riparian habitat located along the roadway alignments, as feasible. Prior to construction activities, the project applicant shall take appropriate measures to protect the wetland and riparian habitat located in these areas. The following protection measures are to be included in the grading and Reclamation Plan:

- Installation of exclusionary construction fencing to protect these features from all project construction and operation activities; and
- Implementation of measures to control dust in adjacent work areas (please see comprehensive dust control program identified in Mitigation Measure F.4 in Section IV.F, Air Quality).

Mitigation Measure E.8g: The contractor shall comply with all laws and regulations (Caltrans Standard Specifications, section 7-1.01). The contractor shall be made aware that, if there is removal of any trees on private property in conjunction with the roadway widening improvements, it must be in accordance with the following: 1) the County Tree Protection and Replacement Ordinance; 2) the Sonoma County Valley Oak Stewardship Guidelines for valley oak trees removed within the Valley Oak Habitat combining district; and 3) the Heritage or Landmark Tree Ordinance. Enforcement of this measure will be through a combination of the DTPW and PRMD staff.

Mitigation Measure E.8h: The project proponent shall implement measures to minimize and avoid take of CRLF and CTS that would additionally benefit pond turtles and FYLF, if present. The following measures are derived from the Programmatic Biological Opinion (PBO) for impacts to California red-legged frog (USFWS, 1999). Projects that impact CRLF or CTS require formal consultation with the USFWS and issuance of a Biological Opinion. The following actions will minimize impacts to these species.

- A USFWS-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training will include a description of the CRLF and CTS and their habitat, and the general measures that are being implemented to protect the CRLF as they relate to the roadway widening improvements.
- A preconstruction survey for CTS shall be performed by a qualified biologist within 72 hours of new ground disturbances for work areas on Roblar Road between Carniglia Lane and Stony Point Road. Such surveys allow for the identification and relocation of CTS and other special status species that may be present.

- A USFWS-approved biologist shall be present during initial grading activities to monitor roadway construction activities within 100 feet of creek corridors and aquatic habitat that could support CRLF. Thereafter, an onsite person shall be designated to monitor onsite compliance with all minimization measures. The USFWS-approved biologist shall ensure that this individual receives training consistent with that outlined in the Biological Opinion.

Mitigation Measure E.8i: Implement Mitigation Measure D.4a and D.4b to reduce potential impacts to nesting raptors and other special-status birds.

Mitigation Measure E.8j: Implement Mitigation Measure D.5 to reduce potential impacts to badgers.

Transportation and Circulation

The widening improvements on Roblar and Pepper Roads would cause temporary congestion during construction. It is likely that temporary closures of either road may be needed. It is also likely that only one lane of traffic on either road would remain open during the majority of construction of the project. This may result in traffic taking alternate routes to avoid construction delays. Having only one lane of traffic open during peak commute hours could cause substantial backups. Construction of the roadway widening improvements would also result in short-term increases in vehicle trips by construction vehicular activities and construction workers. Most project-related traffic would be dispersed throughout the work day, thus lessening the effect on peak-hour traffic. These would be short-term construction related impacts and would cease upon construction completion. The following mitigation measures would reduce this potential impact to a less-than-significant level.

Mitigation Measure E.8k:

- To the extent possible, the contractor shall schedule truck trips outside of peak commute hours.
- Lane closures on Roblar and Pepper Road shall occur only during the hours of 8:30 a.m. and 4:30 p.m. Outside of these hours on Monday through Friday, or on weekends, two lanes of traffic on both roads must be open.
- If lengthy delays are anticipated, signs shall be posted to notify motorists that traffic will be subject to delay.
- Traffic safety guidelines compatible with Section 12 of the Caltrans Standard Specifications, "Construction Area Traffic Control Devices" shall be followed during construction. Project plans and specifications shall also require that adequate signing and other precautions for public safety be provided during project construction.
- For highly sensitive land uses, such as schools, fire and police, the County shall require the construction contractor to develop access plans in consultation with facility owner or administrator. The contractor shall notify the facility owner in advance of the timing, location, and duration of construction activities and the locations of detours and lane closures.
- The County shall require the contractor to provide for passage of emergency vehicles through the project site at all times.

- The County shall require the contractor to maintain access to all parcels adjacent to the construction zone during construction.

Air Quality / Noise

Earthmoving and construction activities associated with the roadway widening improvements would result in temporary construction-related impact on air quality and noise (including potential blasting noise if blasting is required to excavate certain bedrock types).

Mitigation Measure E.8l: The following dust control measures will be included in the project:

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

Mitigation Measure E.8m: Roadway widening construction activities for this project shall be restricted as follows:

- All internal combustion engines used during construction of this project shall be operated with mufflers that meet the requirements of the State Resources Code, and, where applicable, the Vehicle Code.
- 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. Only work that does not require motorized vehicles or power equipment shall be allowed on holidays. If work outside the times specified above becomes necessary, the resident engineer shall notify the PRMD Environmental Review Division as soon as practical.

Aesthetics

Implementing roadway widening improvements on Roblar Road and Pepper Road would result in the removal of a number of trees and other vegetation, recontouring of some adjacent slopes, and the potential installation of roadway support features (e.g., retaining walls or embankments) in some locations, resulting in a potential visual impact. The visual impact could be reduced by revegetating slopes. This would include erosion control measures, along with the addition of planting native shrubs and trees to soften the appearance of any cut slopes. The following mitigation measure would reduce the impact to less than significant.

Mitigation Measure E.8n:

- Following roadway widening and creation of any cut slopes, the County shall require the contractor to provide landscape improvements. Native shrubs and trees shall be planted to create a landscape that recalls the native landscape of the region. Plants shall be selected that require the least maintenance, and create a sustainable landscape.
- If retaining walls are required as part of the roadway widening, the use of natural finishes shall be considered, if feasible.
- A maintenance program, including weeding and summer watering shall be followed until plants have become established (minimum of three years).

Cultural Resources

It is possible that presently unknown archaeological or paleontological sites could be unearthed during construction.

Mitigation Measure E.8o: If archaeological materials are discovered during project construction, construction shall cease in the immediate vicinity of the find until a qualified archaeologist is consulted to determine the significance of the find, and has recommended appropriate measures to protect the resource. Further disturbance of the resource will not be allowed until those recommendations deemed appropriate by the County have been implemented.

Mitigation Measure E.8p: If paleontological resources or unique geologic features are discovered during project construction, construction shall cease in the immediate vicinity of the find until a qualified paleontologist or geologist is consulted to determine the significance of the find and has recommended appropriate measures to protect the resource.

Significance: Potentially Significant and Unavoidable. The above-identified mitigation measures would likely mitigate all potential significant impacts to a less than significant level. However, subsequent detailed environmental analysis and County approval would be required for the roadway widening improvements. That analysis may disclose additional impacts and/or identify additional mitigation measures to reduce impacts. However, unless and until that analysis is completed, the impacts are considered Significant and Unavoidable.

Please also refer to Chapter V, Alternatives, which presents an alternative (Alternative 2 - Alternative Haul Route / Contracted Sales Only Alternative) which entails substantially less off-site transportation improvements and less associated secondary impacts.

Impact E.9: Implementation of Mitigation Measure E.2a may require minor additional roadway width on Stony Point Road beyond that planned by the County that could result in additional secondary environmental impacts. This would be a potentially significant impact.

As discussed in Mitigation Measure E.1a, the County is planning on implementing a number of improvements at the intersection of Stony Point Road and Roblar Road in fiscal year 2008/2009.

The County has already completed environmental review of these improvements and mitigated all potential significant short- and long-term secondary environmental impacts to a less-than-significant level (Sonoma County PRMD, 2005). Mitigation Measure E.2a identifies that minor additional width on Stony Point Road at Roblar Road (beyond that planned by the County) may be required under cumulative conditions to accommodate a dedicated southbound right-turn lane. As with the original planned improvements, any potential minor additional widening would occur on the easterly side of Stony Point Road to avoid any effects to the historic Washoe House. There are no apparent environmental impacts associated with this potential minor additional widening that would be substantially different or greater than those previously identified and analyzed. Specifically, minor additional roadway widening would not result in substantially greater construction air emissions and noise; would not result in substantially greater effects on biological resources, including potential CTS habitat, migrating birds, and tree loss; would not substantially increase surplus soil, would not result in substantially different effects on archaeological and paleontological resources, and would not substantially increase erosion or pollutants to stormwater. Accordingly, with implementation of the previously approved mitigation measures for this intersection, incorporated here by reference, all potential significant short- and long-term secondary environmental impacts associated with the potential minor additional widening would remain less than significant.

Mitigation Measure E.9: Implement adopted mitigation measures contained in the *Signalization of Stony Point Road at Roblar Road, Mitigated Negative Declaration and Mitigation Monitoring Program*, Sonoma County PRMD, October 2005.

Significance after Mitigation: Less than Significant.

References – Transportation and Traffic

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F. Air Quality

Introduction

This section evaluates the potential impacts of the proposed project on regional and local air quality from both stationary and mobile sources of air emissions. Development of this section was based on a review of existing documentation of air quality conditions in the region, air quality regulations from the United States Environmental Protection Agency (EPA), the California Air Resources Board (CARB), the Bay Area Air Quality Management District (BAAQMD), and information related to the project description.

Setting

Topography, Climate and Meteorology

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features that influence pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

The project site is located in southern Sonoma County, within the boundaries of the San Francisco Bay Area Air Basin (Bay Area Air Basin). The Bay Area Air Basin encompasses all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo and Santa Clara Counties, and the southern portions of Solano and Sonoma Counties.

The project site is located within a series of low-lying hills. To the east of the project area, the Cotati and Petaluma valleys are bordered by the Sonoma Mountains, while to the west of the project area are the Estero Lowlands, which open to the Pacific Ocean. The region from the Estero Lowlands to the San Pablo Bay, including the project site vicinity, is known as the Petaluma Gap.

Wind patterns in the Petaluma and Cotati Valleys are strongly influenced by the Petaluma Gap, with winds flowing predominantly from the west. As marine air travels through the Petaluma Gap, it splits into northward and southward paths moving into the Cotati and Petaluma valleys. The southward path crosses San Pablo Bay and moves eastward through the Carquinez Strait. The northward path contributes to Santa Rosa's prevailing winds from the south and southeast. Petaluma's prevailing winds are from the northwest.

Air temperatures are very similar in the two valleys. Summer maximum temperatures are in the low-to-mid-80's, while winter maximum temperatures are in the high-50's to low-60's. Summer minimum temperatures are around 50 degrees, and winter minimum temperatures are in the high 30's (CARB, 1992).

Regulatory Context

Air quality issues are addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs.

Criteria Air Pollutants

Regulation of air pollution is achieved through both national and state ambient air quality standards and emission limits for individual sources of air pollutants. As required by the federal Clean Air Act, the EPA has identified criteria pollutants and established National Ambient Air Quality Standards (NAAQS or national standards) to protect public health and welfare. NAAQS have been established for ozone (O₂), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter equal to or less than 10 microns (PM₁₀), particulate matter less than 2.5 microns (PM_{2.5}), and lead (Pb).¹ These pollutants are called “criteria” air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

The NAAQS are defined as the maximum acceptable concentration that may be reached, but not exceeded more than once per year. California has adopted more stringent ambient air quality standards for most of the criteria air pollutants (CAAQS or state standards). Table IV.F-1 presents both sets of ambient air quality standards (i.e., national and state) and provides a brief discussion of the related health effects and principal sources for each pollutant. California has also established state standards for sulfates, hydrogen sulfide, and vinyl chloride.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for ozone. Substantial ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds, like ozone.

Carbon Monoxide

Carbon monoxide (CO) is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic, and in wintertime, with wood-burning stoves and fireplaces. High CO concentrations develop primarily during winter when periods of light winds

¹ A micron is one-millionth of a meter.

**TABLE IV.F-1
STATE AND NATIONAL CRITERIA AIR POLLUTANT STANDARDS, EFFECTS, AND SOURCES**

Pollutant	Averaging Time	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 Hour 8 Hour	0.09 ppm 0.07 ppm	– 0.08 ppm	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases and nitrogen oxides react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial / industrial mobile equipment.
Carbon Monoxide	1 Hour 8 Hour	20 ppm 9.0 ppm	35 ppm 9 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide	1 Hour Annual	0.18 ppm 0.030 ppm	– 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide	1 Hour 3 Hour 24 Hour Annual	0.25 ppm – 0.04 ppm –	– 0.5 ppm 0.14 ppm 0.03 ppm	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Respirable Particulate Matter (PM ₁₀)	24 Hour Annual	50 µg/m ³ 20 µg/m ³	150 µg/m ³ –	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g. wind-raised dust and ocean sprays).
Fine Particulate Matter (PM _{2.5})	24 Hour Annual	– 12 µg/m ³	35 µg/m ³ 15 µg/m ³	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including nitrogen oxides, sulfur oxides, and organics.
Lead	Month Quarter	1.5 µg/m ³ –	– 1.5 µg/m ³	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.

NOTE: ppm = parts per million; µg/m³ = micrograms per cubic meter.

SOURCE: BAAQMD, 2007a.

combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia.

Nitrogen Oxides

When combustion temperatures are extremely high, as in aircraft and automobile engines, atmospheric nitrogen combines with oxygen to form various oxides of nitrogen. Nitric oxide (NO) and nitrogen dioxide (NO₂) are the most significant air pollutants generally referred to as NO_x. Nitric oxide is a colorless and odorless gas that is relatively harmless to humans, quickly converts to NO₂ and can be measured. Nitrogen dioxide has been found to be a lung irritant capable of producing pulmonary edema. Inhaling NO₂ can lead to respiratory illnesses such as bronchitis and pneumonia.

Particulate Matter

Particulate matter (PM₁₀ and PM_{2.5}) consists of particles that are 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM₁₀ and PM_{2.5} represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, wood burning stoves and fireplaces, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities and mining, are more local in nature, while others, such as vehicular traffic and wood burning stoves and fireplaces, have a more regional effect.

In 2005, approximately 90 percent of all PM₁₀ emissions in the portion of Sonoma County within the Bay Area Air Basin were from area sources, including farming operations (30 percent), paved road dust (25 percent), residential fuel combustion (14 percent, primarily from woodstoves and fireplaces), and construction and demolition (12 percent) (CARB, 2006a).

Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Dust comprised of large particles (diameter greater than 10 microns) settles out rapidly and is easily filtered by human breathing passages. This dust is of concern more as a soiling nuisance rather than a health hazard. The remaining fraction, PM₁₀ and PM_{2.5}, are a health concern particularly at levels above the federal and state ambient air quality standards. PM_{2.5} (including diesel exhaust particles) is thought to have greater effects on health, because these particles are so small and thus, are able to penetrate to the deepest parts of the lungs. Scientific studies have suggested links between fine particulate matter and numerous health problems including asthma, bronchitis, acute and chronic respiratory symptoms such as shortness of breath and painful breathing. These studies indicate

that children are more susceptible to the health risks of PM_{2.5} because their immune and respiratory systems are still developing (CARB, 2000).

As with PM₁₀, the majority (86 percent) of all PM_{2.5} emissions in the portion of Sonoma County within the Bay Area Air Basin were from area sources in 2005, including farming operations (38 percent), residential fuel combustion (28 percent), paved road dust (nine percent), and construction and demolition (five percent) (CARB, 2006a).

The CARB revised the PM₁₀ standard in 2002, pursuant to the Children's Environmental Health Protection Act. The revised PM₁₀ standard is 20 µg/m³ for an annual average. In addition, the CARB adopted a PM_{2.5} standard set at 12 µg/m³ for an annual average.

Other Criteria Pollutants

Sulfur dioxide (SO₂) is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO₂ is also a precursor to the formation of atmospheric sulfate, particulate matter and contributes to potential atmospheric sulfuric acid formation that could precipitate downwind as acid rain. The maximum SO₂ concentrations recorded in the project area are well below federal and state standards; as a result the area is in attainment status with both federal and state SO₂ standards. As such, while SO₂ is a criteria pollutant, it is not considered a pollutant of concern within the BAAQMD, and this pollutant is therefore not further evaluated in this analysis.

Ambient lead concentrations meet both the federal and state standards in the project area. Lead has a range of adverse neurotoxin health effects, and was formerly released into the atmosphere primarily via leaded gasoline products. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. The proposed project would not introduce any new sources of lead emissions; consequently, lead emissions are not required to be quantified by the BAAQMD and are not further evaluated in this analysis.

Toxic Air Contaminants

Toxic air contaminants (TACs) are pollutants that are associated with acute, chronic, or carcinogenic effects but for which no ambient air quality standard has been established. TAC impacts are evaluated by determining if a particular chemical poses a significant risk to human health and, if so, under what circumstances. The ambient background of toxic air contaminants is the combined result of many diverse human activities, including gasoline stations, refineries, automobiles, industrial operations, and painting operations. In general, mobile sources contribute more substantially to health risks than stationary sources (BAAQMD, 2007b).

In 2000, CARB assessed the State-wide health risks from exposure to diesel exhaust and to other toxic air contaminants. It is difficult to distinguish the health risks of diesel emissions from the other air toxics, since diesel exhaust contains about 40 different TACs. The Study reported that in 2000, the State-wide cancer risk from exposure to diesel exhaust was about 540 per million (i.e., 540 cancers per million people) as compared to a total risk for exposure to all ambient air toxics of 760 per million. This estimate, which accounts for about 70 percent of the total risk from TACs, included both urban and rural areas in the state. It can be considered as an average worst-

case for the state, since it assumes constant exposure to outdoor concentrations of diesel exhaust and does not account for expected lower concentrations indoors, where people spend most of their time (CARB, 2000).

Odors and Nuisances

Though offensive odors from stationary sources rarely cause any physical harm, they still remain unpleasant and can lead to public distress generating citizen complaints to local governments. The occurrence and severity of odor impacts depend on the nature, frequency and intensity of the source; wind speed and direction; and the sensitivity of receptors. The *CEQA Guidelines* recommends that odor impacts be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between the receptor and the source will mitigate odor impacts. Aggregate mining and those sources associated with quarry mining are not known to generate objectionable odors and thus, are not discussed further.

Greenhouse Gases

Gases that trap heat in the atmosphere are called greenhouse gases. The major concern is that increases in greenhouse gases as a result of human activity are contributing to Global Climate Change. Global Climate Change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation and temperature. Although there is disagreement as to the speed of global warming and the extent of the impacts attributable to human activities, most agree that there is a direct link between increased emission of so-called greenhouse gases and long term global temperature. What greenhouse gases have in common is that they allow sunlight to enter the atmosphere, but trap a portion of the outward-bound infrared radiation and warm up the air. The process is similar to the effect greenhouses have in raising the internal temperature, hence the name greenhouse gases. Both natural processes and human activities emit greenhouse gases. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature; however, emissions from human activities such as electricity production and motor vehicles have elevated the concentration of greenhouse gases in the atmosphere.

This accumulation of greenhouse gases has contributed to an increase in the temperature of the earth's atmosphere and contributed to Global Climate Change, also known as global warming. The principal greenhouse gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and water vapor (H₂O). Carbon dioxide is the reference gas for climate change because it is considered the most important greenhouse gas. To account for the warming potential of greenhouse gases, emissions of all greenhouse gases are often quantified and reported as CO₂ equivalents. Large emission sources are reported in million metric tons of CO₂ equivalents.

State Standards

Greenhouse Gases. In 2005, Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide emission of greenhouse gases would be progressively reduced, as follows:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels; and
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32, or AB 32; Health and Safety Code Division 25.5, Sections 38500, et seq.), which identifies global warming as a serious environmental threat with the potential to exacerbate air quality problems, reduce the quantity and supply of water from the Sierra snowpack, cause a rise in sea levels, damage marine ecosystems, and increase human health-related problems. AB 32 requires the CARB to design and implement emission limits, regulations, and other feasible and cost-effective statewide measures, such that statewide greenhouse gas emissions (GHGs) are reduced to 1990 levels by 2020 (representing an approximate 25 percent reduction in emissions). Specifically, AB 32 requires CARB to:

- Determine the current level of GHG emissions in California by requiring statewide reporting and verification of GHG emissions;
- Reconstruct the 1990 levels of California's GHG emissions;
- Adopt a statewide GHG emissions limit equal to the approved 1990 emissions levels; and
- Set a reduction schedule and adopt regulatory programs by January 1, 2011, to achieve the target levels by 2020.

In setting the policy framework for CARB's implementation of the Act to address these impacts, AB 32 does not indicate what role local land use planning should play in the statewide strategy or how environmental review under CEQA is implicated.

Pursuant to AB 32, by June 30, 2007, CARB was required to publish a list of "discrete early action" measures that can be implemented before it adopts the emissions limit and regulations. The broad spectrum of strategies to be developed include a Low Carbon Fuel Standard, regulations for refrigerants with high global warming potentials, increased methane capture from landfills, and green ports (CARB, 2007a).

Since June 2007, CARB staff has evaluated all 48 recommendations submitted by stakeholders and several internally-generated staff ideas and published the *Expanded List of Early Action Measures To Reduce Greenhouse Gas Emissions In California Recommended For Board Consideration* in October 2007 (CARB, 2007a). Based on its additional analysis, CARB staff is recommending the expansion of the early action list to a total of 44 measures (see Table G-1 in Appendix E-1). The 44 measures are in the sectors of fuels, transportation, forestry, agriculture, education, energy efficiency, commercial, solid waste, cement, oil and gas, electricity, and fire suppression. None of the early action measures address how local agencies should address greenhouse gas emissions associated with land use approvals.²

² Although stakeholders suggested CARB address CEQA as a discrete early action measure (listed in Appendix B to the report), CARB did not discuss that suggestion in the report. CARB has instead indicated that that recommendation will be forwarded with the other suggestions listed in Appendix B to the appropriate state agencies (in this case, the California Resources Agency and CARB) for their future consideration.

The 2020 target reductions are currently estimated to be 174 million metric tons of CO₂ equivalents. In total, the 44 recommended early actions have the potential to reduce greenhouse gas emissions by at least 42 million metric tons of CO₂ equivalent emissions by 2020, representing about 25 percent of the estimated reductions needed by 2020. CARB staff is working on 1990 and 2020 greenhouse gas emission inventories in order to refine the projected reductions needed by 2020 and expects to present its recommendations to the CARB by the end of 2007.

In addition to identifying early actions to reduce greenhouse gases, the CARB has also developed mandatory greenhouse gas reporting regulations pursuant to requirements of AB32. The regulations will require reporting for facilities that make up the bulk of the stationary source emissions in California. The regulations identify major facilities as those that generate more than 25,000 metric tons of CO₂ per year. Cement plants, oil refineries, electric generating facilities/providers, co-generation facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons of CO₂ per year, make up 94 percent of the point source CO₂ emissions in California (CARB, 2007b).

In 2007, the California Legislature also enacted SB 97, which, among other things, added a new CEQA provision to require the Office of Planning and Research to prepare guidelines for analyzing and mitigating greenhouse gas emissions and transmit them to the Resources Agency by July 1, 2009, for adoption no later than January 1, 2010. As noted in the Governor's SB 97 signing letter to the State Senate, once adopted these guidelines will provide a coordinated policy for reducing greenhouse gas emissions by providing much-needed guidance to state and local agencies as to how they should analyze, and when necessary, mitigate greenhouse gas emissions in environmental documents (See Governor's signing letter at <http://gov.ca.gov/pdf/press/SB-97-signing-message.pdf>).

In January 2008, the California Air Pollution Control Officers Association (CAPCOA) issued a "white paper" on evaluating GHG emissions under CEQA, entitled "CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act" (available online at <http://www.capcoa.org/ceqa/CAPCOA%20White%20Paper%20-%20CEQA%20and%20Climate%20Change.pdf>) The CAPCOA white paper strategies are not guidelines and have not been adopted by any regulatory agency; rather, the paper is offered as a resource to assist lead agencies in considering climate change in environmental documents.

Regulatory Agencies

EPA is responsible for implementing the myriad of programs established under the federal Clean Air Act, such as establishing and reviewing the NAAQS and judging the adequacy of State Implementation Plans (SIPs). EPA has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

The CARB is responsible for establishing and reviewing the state standards, compiling the California SIP, securing approval of that plan from EPA, and identifying toxic air contaminants.

CARB also regulates mobile emission sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. The county or regional air quality management districts are primarily responsible for regulating stationary sources at industrial and commercial facilities within their jurisdictions and for preparing the air quality plans that are required under the federal Clean Air Act and California Clean Air Act. These regional air quality plans prepared by districts throughout the state are compiled by the CARB to form the SIP. The local air districts also have the responsibility and authority to adopt transportation control and emission reduction programs for indirect and area-wide emission sources.

Local councils of governments, county transportation agencies, cities and counties, and various non-governmental organizations also join in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs. BAAQMD is the regional agency with jurisdiction over the southern portion of Sonoma County. The BAAQMD is responsible for bringing and/or maintaining air quality within federal and state air quality standards. This includes the responsibility to monitor ambient air pollutant levels and to develop and implement attainment strategies to ensure that future emissions will be within federal and state standards.

Air Quality Plans, Policies and Regulations

Plans and Policies

As required by the federal Clean Air Act and the California Clean Air Act, air basins or portions thereof have been classified as either “attainment” or “nonattainment” for each criteria air pollutant, based on whether or not the standards have been achieved. Nonattainment areas are also required to prepare air quality plans that include strategies for achieving attainment.

The Bay Area Air Basin is in attainment for NO₂, SO₂, CO, and lead for both the NAAQS and the CAAQS. The Bay Area Air Basin is in nonattainment for ozone for both the NAAQS and CAAQS. The Bay Area Air Basin is also in nonattainment of the CAAQS for PM₁₀ and PM_{2.5}, but is in attainment of the NAAQS for PM₁₀ and PM_{2.5}. Table IV.F-2 displays the current attainment status.

Air quality plans developed to meet federal requirements are referred to as SIPs. The federal Clean Air Act and the California Clean Air Act require plans to be developed for areas designated as nonattainment (with the exception of areas designated as nonattainment for the state PM₁₀ standard). Plans are also required under federal law for areas designated as “maintenance” for national standards. Such plans include strategies for attaining the standards. Currently, there are three plans for the Bay Area:

- Bay Area 2005 Ozone Strategy (BAAQMD, 2006) develops control strategies to further reduce ozone precursors. This document supersedes the Bay Area 2000 Clean Air Plan (BAAQMD, 2000).

**TABLE IV.F-2
ATTAINMENT STATUS OF THE BAY AREA FOR
THE STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	Attainment Status	
		State Standards ^a	National Standards ^b
Ozone	8 Hour	Unclassified	Nonattainment
	1 Hour	Nonattainment	–
Carbon Monoxide	8 Hour	Attainment	Attainment
	1 Hour	Attainment	Attainment
Nitrogen Dioxide	Annual	–	Attainment
Sulfur Dioxide	1 Hour	Attainment	–
	Annual	–	Attainment
	24 Hour	Attainment	Attainment
	3 Hour	–	Attainment
Respirable Particulate Matter	1 Hour	Attainment	–
	Annual	Nonattainment	Attainment
Fine Particulate Matter	24 Hour	Nonattainment	Unclassified
	Annual	–	Unclassified
Lead	Quarter	–	Attainment
	Month	Attainment	–

^a California standards for ozone, CO (except Lake Tahoe), SO₂ (1-hour and 24-hour), NO_x, and PM₁₀ are values that are not to be exceeded.

^b National standards other than for ozone, particulates, and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year.

SOURCE: BAAQMD, 2007a.

- Ozone Attainment Plan for the 1-Hour National Ozone Standard (BAAQMD, 1999a and 2001) developed to meet federal ozone air quality planning requirements; and
- Carbon Monoxide Maintenance Plan (CARB, 2004) developed to ensure continued attainment of the national CO standard;

On January 4, 2006, BAAQMD, in cooperation with the Metropolitan Transportation Commission and ABAG, adopted the *Bay Area 2005 Ozone Strategy*. The Bay Area 2005 Ozone Strategy reviews the region's progress over the years in reducing ozone levels, describes current conditions, and charts a course for future actions to further reduce ozone levels in the Bay Area. The control strategy is a central element of the Bay Area 2005 Ozone Strategy. The control strategy outlines a set of control measures to further reduce ozone precursor emissions in order to reduce ozone levels in the Bay Area and to reduce transport of pollution to downwind regions. It also includes stationary source measures, mobile source measures, and transportation control measures.

BAAQMD Rules and Regulations

BAAQMD is the agency with permit authority over most types of stationary emission sources in the Bay Area. BAAQMD exercises permit authority through its *Rules and Regulations*. Both federal and state ozone plans rely heavily upon stationary source control measures set forth in BAAQMD's *Rules and Regulations*. In contrast to the ozone plans, the *CO Maintenance Plan* relies heavily on mobile source control measures.

California Air Resource Board

Diesel Exhaust Control Program. In August of 1998, the CARB identified particulate emissions from diesel-fueled engines [diesel particulate matter (DPM)] as TACs. CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* and the *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* (CARB, 2000). The Board approved these documents in 2000. The documents represent proposals to reduce diesel particulate emissions, with the goal being to reduce emissions and the associated health risk by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra low sulfur diesel fuel.

Also in 2000, the EPA promulgated regulations (EPA, 2001) requiring that the sulfur content in motor on-road vehicle diesel fuel be reduced to less than 15 ppm as of June 1, 2006. Control of DPM emissions focuses on two strategies, reducing the amount of sulfur in diesel fuel and developing filters for operating diesel engines to reduce the amount of particulate matter that is emitted. Secondly, the EPA finalized a comprehensive national emissions control program, the 2007 Heavy-duty Highway Diesel Program (also known as the HD 2007 Program), which regulates highway heavy-duty vehicles and diesel fuel as a single system. Under the HD 2007 program, the EPA established new emission standards that would significantly reduce PM and NO_x from highway heavy-duty vehicles.

The EPA also promulgated new emission standards for nonroad diesel engines and sulfur reductions in nonroad diesel fuel that would dramatically reduce emissions attributed to nonroad diesel engines. Similar standards have been established by CARB, although more stringent. This affects emissions from construction equipment, locomotives, and marine diesels. The EPA estimates that PM will be reduced 95 percent, NO_x will be reduced 90 percent, and SO_x will be virtually eliminated as an emission from this source. Sulfur in nonroad diesel fuel will be reduced 99 percent from existing levels. In June of 2007, the interim cap of sulfur content was 500 ppm. In June of 2010, sulfur will be limited to 15 ppm (ultra low sulfur fuel) as a result of federal standards. Of note, CARB requirements and trigger dates for sulfur content limits for nonroad equipment match those for onroad vehicles (i.e., as of June 1, 2006). Secondly, in California, retrofits are also required for some existing equipment types³ and emission control devices for new equipment. The general objective is to reduce DPM emissions to levels of below 0.01 grams per brake horsepower-hour (g/bhp-hr). As emphasized, these represent substantial decreases over

³ <http://www.dieselnet.com>

current DPM emissions rates, which approximate 0.2 g/bhp-hr depending on equipment type and model year.

Asbestos Toxic Air Control Measure. In 2002, the CARB adopted a new Asbestos Airborne Toxic Control Measure for construction, grading, quarrying and surface mining operations. New emission control measures, such as dust suppressants apply to activities such as road construction and road maintenance, construction, grading, and quarrying and surface mining operations in areas with naturally-occurring asbestos/serpentine rock. Geologic mapping does not indicate the existence of asbestos/serpentine rock within the project site, and the quarry operator has indicated serpentine-containing materials have never been encountered on site.

Silica Crystalline Dust. In 2005, the California Office of Environmental Health Hazard Assessment (OEHHA) added a chronic reference exposure level (REL) for crystalline silica. Silica is a hazardous substance when it is inhaled, and the airborne dust particles that are formed when the material containing the silica is broken, crushed, or sawn pose potential risks.

Sonoma County General Plan

The Resource Conservation Element of the General Plan (Sonoma County, 1994a) contains the following air quality goals, objectives, and policies that would apply to the proposed Project.

Goal RC-13: Preserve and maintain good air quality and provide for an air quality standard that will protect human health and preclude crop, plant, and property damage in accordance with the requirements of the federal and state Clean Air Acts.

Objective RC-13.1: Maintain the projected County air quality as set forth in the Final EIR and minimize air pollution.

Objective RC-13.2: Encourage reduced motor vehicle use as a means of reducing resultant air pollution.

The following policies, in addition to those of the Circulation and Transit Element, are used to carry out these objectives:

RC-13a: Require that commercial and industrial development projects be designed to minimize air emissions. Reduce direct emissions by decreasing the need for space heating.

RC-13b: Encourage public transit, ridesharing and van pooling, shortened and combined motor vehicle trips to work and services, use of bicycles, and walking. Minimize single passenger motor vehicle use.

RC-13c: Refer projects to the local air quality districts for their review.

RC-13d: Review proposed changes in land use designations for potential deterioration of air quality and deny them unless they are consistent with the air quality levels projected in the general plan EIR.

RC-13f: Encourage the adoption of standards, the development of new technology, and retrofitting to reduce air pollution resulting from geothermal development.

Draft Sonoma County General Plan 2020

Sonoma County is in the process of updating its existing General Plan. While the existing adopted Sonoma County General Plan (1994, as amended) is the current governing general plan, relevant policies from the draft *Sonoma County General Plan 2020* are presented below for informational purposes.

The following additional new open space and resource conservation element objective and policy identified in the Draft Sonoma County General Plan 2020 would also be relevant to the proposed project. Note: These are draft policies recommended by the Citizens Advisory Council (CAC) as amended by the Planning Commission. As of publication of this Draft EIR, the Sonoma County Board of Supervisors has not yet finalized these policies.

Objective OSRC-16.1: Minimize air pollution and greenhouse gas emissions.

Policy OSRC-16i: Ensure that any proposed new sources of toxic air contaminants or odors provide adequate buffers to protect sensitive receptors and comply with applicable health standards. Promote land use compatibility for new development by using buffering techniques such as landscaping, setbacks, and screening in areas where such land uses abut one another.

Sonoma County Surface Mining and Reclamation Ordinance

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. The following sections from the ordinance are applicable to the proposed project:

Sec. 26A-09-010. General Standards for Mining Permit and Operations

- o) *Air Quality*. All operations shall be conducted in accordance with applicable air pollution control standards as amended over time:
 - (1) Mining facilities having stationary sources of aggregate materials extraction, and/or processing shall comply with all applicable Federal, State, and local requirements governing the review, permitting, and emission of air quality contaminants. Where applicable such compliance shall included, but not limited to, Federal New Source Review (NSR), New Source Performance Standards (NSPS), State Air Toxics Control Measures (ACTMs) and any other such local reviews and permit requirements as determined necessary by either the Northern Sonoma County Air Pollution Control District or the BAAQMD.
 - (2) Dust Suppression – All haul roads, driveways, and activity areas, including equipment, shall be maintained as necessary to minimize the emissions of dust. Maintenance shall be conducted as necessary to prevent fugitive dust from

becoming a nuisance to adjacent properties. Maintenance procedures may include but are not limited to watering, oiling, paving, and/or application of other appropriate dust suppressants.

Existing Air Quality

The CARB operates regional monitoring networks that measure the ambient concentrations of the six criteria pollutants. Existing and probable future levels of air quality in the project area can generally be inferred from ambient air quality measurements conducted by CARB at its monitoring stations.

The major pollutants of concern in the region are ozone and particulate matter (both respirable and fine). The long-term ambient monitoring station located closest to the project site is in Santa Rosa at 5th Street, approximately twelve miles to the northeast of the project site. The data at the monitoring station is estimated to be representative of conditions in the project area. Table IV.F-3 shows the most recent available five-year (2002-2006) summary of monitoring data collected from the nearby station, compared with CAAQS and NAAQS standards. There was one exceedance of the PM₁₀ state 24-hour standard and one exceedance of the PM_{2.5} national 24-hour standard in both 2001 and 2006. Ozone concentrations have generally remained steady during the five-year period with a single exceedance of the 1-hour state standard during 2003.

**TABLE IV.F-3
AIR QUALITY DATA SUMMARY (2002–2006) FOR THE PROJECT AREA^a**

Pollutant	Standard ^b	Monitoring Data by Year				
		2002	2003	2004	2005	2006
Ozone						
Highest 1 Hour Average (ppm) ^c		0.077	0.096	0.076	0.072	0.077
Days over State Standard	0.09	0	1	0	0	0
Days over National Standard	0.12	0	0	0	0	0
Highest 8 Hour Average (ppm) ^c	--	0.060	0.079	0.060	0.051	0.058
Days over National Standard	0.08	0	0	0	0	0
Particulate Matter (PM₁₀)						
Highest 24 Hour Average (µg/m ³) ^c	50	63.6	36.3	48.1	38.9	89.5
Days over State Standard	--	2	0	0	0	2
Annual Average (µg/m ³) ^c	20	19.7	16.9	18.0	15.9	18.8
Particulate Matter (PM_{2.5})						
Highest 24 Hour Average (µg/m ³) ^c	35	50.7	38.8	26.6	33.6	59.0
Days over State Standard	--	0	0	0	0	1
Annual Average (µg/m ³) ^c	12	10.5	8.8	8.3	7.6	9.2

^a Ambient monitoring station is located at 5th Street in Santa Rosa.

^b Generally, state standards are not to be exceeded and national standards are not to be exceeded more than once per year.

^c ppm = parts per million; µg/m³ = micrograms per cubic meter.

NA Data not available at this time.

NOTE: Values in **bold** are in excess of applicable standard.

SOURCE: BAAQMD, 2002-2006.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. Schools, hospitals and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with associated greater exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system.

The closed Roblar Landfill is located adjacent to and north of the project site. Other adjacent land uses include livestock grazing, dairies and agricultural residential lots. The closest residence to the proposed mining area is located approximately 600 horizontal feet northeast of the northeast corner of the Phase 3 mining limit. A ranch house is also located across Roblar Road approximately 200 feet west of the project site boundary, and approximately 1,800 feet west of the west edge of the proposed Phase 1 mining area. Further east along Roblar Road in the community of Roblar are a series of smaller rural residential properties and two schools (Dunham Elementary School and Quest Montessori School).

Impacts and Mitigation Measures

Significance Criteria

According to Appendix G of the CEQA *Guidelines*, a project would have a significant effect on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any nonattainment pollutant (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

For project-level impact analysis, BAAQMD provides various thresholds and tests of significance that can be used to determine whether a project would conflict with or obstruct implementation of the air quality plan, violate any air quality standard or contribute substantially to an existing or projected air quality violation or expose sensitive receptors to substantial pollutant concentrations.

Criteria Pollutants

BAAQMD's CEQA Guidelines established quantitative thresholds of significance for criteria pollutant emissions, including:

- Total emissions of ROG, NO_x, and PM₁₀ emissions from project operations exceed 80 pounds per day and/or 15 tons per year.
- Excessive localized CO concentrations due to 1) motor vehicle emissions of CO that exceed 550 lbs/day; 2) project traffic that impacts intersections or roadway links at Level of Service (LOS) D, E, or F or that causes LOS to decline to D, E, or F; or 3) project traffic that increases traffic volumes on nearby roadways by 10 percent or more (unless the traffic volume is less than 100 vehicles per hour). An increase of 550 pounds per day would be considered significant if it leads to a possible local violation of the CO standards i.e., if it creates a "hot spot" (BAAQMD, 1999b).
- The BAAQMD Guidelines do not contain quantitative odor significance thresholds. However, the Guidelines include the "creation of objectionable odors" on a list of effects that are considered significant.

According to the BAAQMD CEQA Guidelines, a project's contribution to cumulative impacts for criteria pollutants should be considered significant if the project's impact individually would be significant (i.e. exceeds the BAAQMD's quantitative thresholds). For a project that does not individually have significant operational air quality impacts, the determination of significant cumulative impacts is based on an evaluation of the consistency of the project with the local general plan, and the general plan with the regional air quality plan (see Impact F.7 for more detail).

Toxic Air Contaminants

The operation of any project with the potential to expose sensitive receptors to substantial levels of TACs (such as DPM) would be deemed to have a potentially significant impact. More specifically, proposed projects that have the potential to expose the public to TACs in excess of the following BAAQMD CEQA thresholds would be considered to have a significant air quality impact:

- Probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in one million people for 70 year exposure.
- Ground-level concentrations of non-carcinogenic TACs would exceed a Hazard Index greater than 1 for the MEI.

These BAAQMD CEQA thresholds apply to stationary sources. However, TACs from the proposed project are exclusively DPM, and the project would include both stationary and mobile sources of DPM. As a result, for purposes of this EIR, the above BAAQMD significance standards are applied to the combined stationary and mobile source emissions of DPM. This is the most conservative criteria for judging potential DPM impacts of the proposed project.

These standards are typically applied to the results of a health risk assessment based on a detailed air dispersion modeling effort. These criteria apply only to the direct impacts of a project and not cumulative impacts.

Greenhouse Gas Emissions

As yet, there are no current CEQA thresholds of significance established for GHGs. Senate Bill 97 requires the state Office of Planning and Research to develop Guidelines “for the mitigation of GHG emissions or the effects of GHG emissions” by July 1, 2009. However, in recognition of this emerging issue, California Assembly Bill 32 (the *California Global Warming Solutions Act*) calls for CARB to adopt regulations requiring the reporting and verification of GHG emissions statewide and that a limit equivalent to 1990 levels be achieved by the year 2020. In anticipation of this advancing initiative, CEQA documents can include an inventory of GHGs.

For purposes of this EIR, 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 timetable established in AB 32, California Global Warming Solutions Act of 2006.

Project Operation

Impact F.1: The proposed project would generate emissions of criteria pollutants (PM₁₀, NO_x, ROG, and CO) on the project site and along haul routes. Project-generated emissions of ROG, and CO would be less than the applicable significance thresholds; consequently, the impact of the project on these criteria pollutants would be less than significant. Project emissions of PM₁₀ would be above the applicable significance threshold; this impact would be less than significant with mitigation. Project emissions of NO_x would be above the applicable significance threshold; this would be a significant and unavoidable impact.

Chapter III discusses in detail the various stages of quarry development, including initial grading and construction, on-going operation, and reclamation. Air quality impacts would be associated with all stages of the quarry life, but would be most prevalent during the processing and transportation operations. Project-related air quality impacts fall into two categories: fugitive dust impacts due to aggregate processing and other on-site operations (unpaved roads, handling and storage, blasting, wind erosion) and criteria pollutant impacts due to nonroad equipment (loaders, dozers, etc.), onsite generator, and haul trucks (on-site and off-site).

As discussed in the Project Description, the quarry proposes to mine and process approximately 570,000 cubic yards (cy) of quarry material annually. The maximum daily production rate at the quarry would be 3,600 cy per day. Rock and crushed stone at the quarry would be initially loosened by drilling and blasting, then worked and transported by heavy earth moving equipment to the proposed mobile processing plant. Processing operation dust would be generated mainly by the crushing and screening phases. As rock is broken by rapid compression, the dust particulates become airborne. When conveyors drop screened aggregate into various aggregate stockpiles, additional dust particulates can escape and become airborne. Fugitive dust would also be

generated by loading and hauling vehicles on the site, as well as the reentrainment of settled dust by wind or machine movement. In addition, topsoil and/or overburden stockpiles stored on the site would be potential sources of fugitive dust.

Vehicular and site equipment exhaust emissions would also be generated by a variety of gasoline and diesel-powered equipment to be used at the project site, including the proposed diesel-powered generator. Off-site transportation-generated air quality emissions would be primarily associated with hauling of aggregate materials. As explained in the Project Description, aggregate materials would be transported via trucks to variety of destinations, primarily in the southern portion of Sonoma County. The great majority of aggregate materials would be hauled in large capacity trucks. Between 60 and 80 percent of material produced at the quarry would be sold under contract, and trucks hauling materials under those contracts would be required to follow specified haul routes (see Project Description). Additional off-site transportation emissions (although a comparatively much smaller amount) would be generated by the daily arrival and departure of employee vehicles.

The quarry would employ numerous control measures to reduce dust and exhaust emissions. Dust control with spray misters is proposed to be used on all processing equipment, including the jaw crushers, feeding conveyers, primary and secondary cones and stacker belt ends. Additional dust control would be provided through use of baghouses on the processing equipment. The quarry proposes to use a water truck to routinely sprinkle down internal access roads for dust suppression from vehicle movement. In addition, the quarry proposes to install a tire wash area at the exit of the quarry site, and install tire scraper both at the quarry exit and the proposed truck scale to loosen dirt from the trucks and their tires. No chemical dust suppressants would be used on the processing equipment; however, magnesium chloride is proposed to be used for dust control on the entrance road of the quarry, as needed. The project applicant would use newer onsite mobile equipment (2003 or newer model year engines), which provide better operating efficiency and better emission controls than older equipment. In addition, the proposed diesel generator would be CARB certified or better.

Emission factors for the emission-generating operations associated with the proposed project were determined based on methodology found in publications and databases including EPA's *Compilation of Air Pollutant Emission Factors* (AP-42), vender specifications, CARB documentation for the aggregate processing, fugitive dust sources, and diesel generator, CARB's OFFROAD2007 (CARB, 2006b) emission model for offroad equipment, and CARB's EMFAC2007 (CARB, 2006c) emission model for motor vehicles. Detailed information concerning the emission factors and other pertinent assumptions are contained in Appendix E-2.

Conditions were assessed for the proposed quarry's assumed first year of operation (2007), and last year of operation (2027). Table IV.F-4, below, presents estimated maximum (worst-case) daily and average annual emissions of criteria pollutants, and comparison to the applicable regulatory threshold. Table IV.F-4 shows that the estimated maximum daily and annual project emissions of NO_x, would exceed the applicable significance thresholds throughout the 20-year lifetime of the facility. In addition, the maximum daily project emissions of PM₁₀ would exceed

**TABLE IV.F-4
ESTIMATED MAXIMUM DAILY AND AVERAGE ANNUAL PROJECT EMISSIONS**

Condition	NO _x	PM ₁₀	ROG	CO
Emissions (pounds per day)				
Maximum Daily				
2007	663	90.4	35.5	160
2027	303	65.9	21.2	63.8
<i>Daily Threshold</i>	<i>80</i>	<i>80</i>	<i>80</i>	<i>550</i>
Emissions (tons per year)				
Annual				
2007	53.3	7.2	2.7	12.6
2027	24.9	5.3	1.6	4.8
<i>Annual Threshold</i>	<i>15</i>	<i>15</i>	<i>15</i>	<i>--</i>

NOTE: Values in **bold** are in excess of applicable threshold.

SOURCE: Environmental Science Associates, 2007

the applicable significance threshold in the 2007 study year. Daily and annual emissions of ROG and CO would, however, be less than the respective significance thresholds in 2007 and 2027.

As shown in Table IV.F-5, the relative contribution by source of total project-generated NO_x and PM₁₀ would change over time. Most notably, the decrease in off-site haul truck contribution of project NO_x and PM₁₀ is due to the retiring from service of older, more polluting haul trucks that would occur over time, and the mandated reduction in emissions from highway haul trucks as set forth in current regulations, as discussed in this section.

**TABLE IV.F-5
PROJECT SOURCE CONTRIBUTION TO NO_x AND PM₁₀ IN 2007 AND 2027**

Project Source	NO _x		PM ₁₀	
	2007	2027	2007	2027
On-Site Processing Equipment and Fugitive Dust	--	--	62%	85%
On-Site Mobile Equipment	17%	37%	4%	5%
Diesel Generator	20%	42%	1%	1%
Off-site Haul Trucks	63%	21%	34%	9%
	100%	100%	100%	100%

SOURCE: Environmental Science Associates, 2007

The mitigation measures identified below address the diesel generator, onsite mobile equipment, and offsite haul trucks for reducing the significant NO_x and PM₁₀ emissions resulting from the project:

Mitigation Measure F.1a: The applicant shall utilize PG&E electricity to power the mobile processing plant instead of using the proposed diesel-powered generator. As shown Table IV.F-6, by switching to PG&E electricity, total project-generated annual NO_x emissions would be reduced by nearly 20 percent in 2007 and by approximately 42 percent in 2027. Furthermore, implementation of this mitigation measure by itself would avoid the significant impact of exceedance of the annual NO_x threshold in 2027 (but not, however, in 2007). The conversion from the diesel generator to PG&E electricity would also have the beneficial effect of reducing other project-generated criteria pollutants, as well eliminating the project’s on-site stationary source of diesel emissions (see Impact F.3 for discussion of diesel impacts).

**TABLE IV.F-6
TOTAL REDUCTION IN MAXIMUM DAILY AND ANNUAL NO_x EMISSIONS WITH
IMPLEMENTATION OF MITIGATION MEASURES F.1A THROUGH F.1C**

Condition	Total Project NO _x Emissions	Reduction in Project NO _x with Implementation of Mitigation Measures				Total Project NO _x Emissions with Implementation of Mitigation Measures F.1a, F.1b and F.1c	Significant after Mitigation?
		F.1a	F.1b	F.1c	Total (F1a+F1.b+F1.c)		
Emissions (pounds per day)							
<i>Maximum Daily</i>							
2007	663	-104	-63.2	-214	-381	282	Yes
2027	303	-104	-58.8	-5.4	-168	135	Yes
<i>Daily Threshold</i>	80					80	
Emissions (tons per year)							
<i>Annual</i>							
2007	53.3	-10.4	-4.4	-16.9	-31.7	21.6	Yes
2027	24.9	-10.4	-4.1	-0.4	-14.9	10.0	No
<i>Annual Threshold</i>	15					15	

NOTE: Values in **bold** are in excess of applicable threshold.

SOURCE: Environmental Science Associates, 2007

The specific electrical loading and requirements of the proposed project shall be determined by PG&E after the project applicant submits a formal application for electrical service. At that time, PG&E would review the proposed project and identify what additional on- and/or off-site electrical requirements would be needed to deliver electrical service to the site.

Mitigation Measure F.1b: The project applicant shall utilize 2007 model engines or newer on-site loaders, dozers, rock trucks, and water truck. As described in the EIR Project Description, the applicant proposes to utilize two dozers, two loaders, two rock trucks and one water truck on-site.

As shown in the Table IV.F-6, by utilizing the latest available model dozers, loaders, rock trucks, and water truck, total project-generated annual NO_x emissions would be reduced by approximately 8 percent in 2007. The use of the latest model mobile equipment would also have beneficial effect of reducing other project-generated criteria pollutants, as well as reducing project on-site mobile diesel emissions (see Impact F.3 for discussion of diesel impacts).

Mitigation Measure F.1c: The project applicant shall require that all quarry operator owned off-site-haul trucks, and to the extent feasible, all off-site haul trucks that would be under contract with the quarry operator, use 2003 model or newer trucks. As stated in the EIR Project Description, the applicant estimates that no less than 60 percent of total material produced at the quarry would either be directly used by the applicant or sold under contract. Of this amount, the applicant estimates that 90 percent (or approximately 54 percent of total haul trucks) could be required to use 2003 model or newer haul trucks (the remaining 10 percent would consist of smaller contractors and truck fleets, where it would be infeasible to require use of newer model trucks).

Table IV.F-6 shows that with implementation of Mitigation Measure F.1c, the total project-generated annual NO_x emissions would be reduced by approximately 32 percent in 2007. It should be noted any higher percentage use of newer haul trucks would result in further reduction in total estimated NO_x emissions.

The use of newer model haul trucks would also have beneficial effect of reducing other project-generated criteria pollutants, as well as reducing project haul truck diesel emissions. Notably, as shown in Table IV.F-7, implementation of this measure would reduce total project-generated maximum daily PM₁₀ emissions in 2007 to a less than significant level.

Mitigation Measure F.1d: Implement the formal comprehensive dust control program identified in Mitigation Measure F.4. The implementation of a formal comprehensive dust control program for implementation during project operation would ensure all localized PM₁₀ emissions would remain less than significant.

Significance after Mitigation: Significant and Unavoidable for maximum daily emissions of NO_x for 2007 and 2027 and annual NO_x for 2007, however, Less than Significant for annual emissions of NO_x for 2027; and Less than Significant for PM₁₀.

Table IV.F-6 presents the combined effect on project NO_x emissions when implementing Mitigation Measures F.1a through F.1c. As shown in the table, collectively these measures would reduce annual NO_x emissions by approximately 31.7 tons per year in 2007 and by 14.9 tons per year in 2027. As a result, implementation of these mitigation measures would collectively decrease annual NO_x emissions by roughly 50 percent.

Nevertheless, total maximum daily NO_x emissions would still exceed the daily threshold through the life of the project and the annual threshold between 2007 and 2027. For this reason, the impact would remain Significant and Unavoidable.

**TABLE IV.F-7
TOTAL REDUCTION IN MAXIMUM DAILY AND ANNUAL PM₁₀ EMISSIONS WITH
IMPLEMENTATION OF MITIGATION MEASURES F.1A THROUGH F.1C**

Condition	Total Project PM ₁₀ Emissions	Reduction in Project PM ₁₀ with Implementation of Mitigation Measures			Total (F1a+F1.b+F1.c)	Total Project PM ₁₀ Emissions with Implementation of Mitigation Measures F.1a, F.1b and F.1c	Significant after Mitigation?
		F.1a	F.1b	F.1c			
Emissions (pounds per day)							
<i>Maximum Daily</i>							
2007	90.4	-0.6	-1.0	-14.9	16.5	73.9	No
2027	60.9	-0.6	-0.1	-0.3	1.1	64.8	No
<i>Daily Threshold</i>	80					80	
Emissions (tons per year)							
<i>Annual</i>							
2007	7.2	-0.1	-0.1	-1.2	1.3	5.9	No
2027	5.3	-0.1	-0.0	-0.0	0.1	5.2	No
<i>Annual Threshold</i>	15					15	

NOTE: Values in **bold** are in excess of applicable threshold.

SOURCE: Environmental Science Associates, 2007

Impact F.2: The proposed project would generate localized CO emissions on roadways and at intersections in the project vicinity. The project concentrations of CO would be a less than significant impact.

Project-generated CO emissions were determined based on the amount of peak daily and average annual traffic that would be generated by the proposed project. A conservative average trip distance of 30 miles (each way) for employees and 24 miles (each way) for haul trucks were used. Project-generated CO emissions would be approximately 160 pounds per day and 12.6 tons per year in 2007, and lower in 2027 (see Table IV.F-4). These CO emissions would be less than the respective significance thresholds (550 pounds per day and 15 tons per year).

To evaluate “hot spot” potential, a microscale impact analysis was conducted at project study intersections identified in the traffic analysis to be most impacted by the project. For this analysis, local carbon monoxide concentrations were estimated using the protocol contained in the *BAAQMD CEQA Guidelines*, and the results of the traffic study prepared for this project.

The *BAAQMD CEQA Guidelines* carbon monoxide protocol involves a screening-level analysis, which serves to identify which intersections under which scenarios require further, more refined analysis. Resultant project peak-hour increases in CO concentrations at the study intersections analyzed were 0.1 ppm or less, with total CO concentrations (baseline plus project) well under the

state and national one- and eight-hour CO standards. The screening-level analysis was sufficient to demonstrate the no exceedances would occur in the vicinity of study intersections during either 2007 or 2027. Therefore, the effect of the project on local carbon monoxide standards would be less than significant, and accordingly, CO hotspot analysis at specific intersections is not warranted.

It should be noted carbon monoxide concentrations in 2027 are projected to be substantially lower than 2007 due to improvements in the automobile fleet, attrition of older, high-polluting vehicles, and improved fuel mixtures. Such reduction would offset any effects of increase in traffic due to cumulative development. Thus, project-related and cumulative traffic would have a less than significant impact on local carbon monoxide concentrations.

Mitigation: None required.

Impact F.3: The proposed project would generate DPM emissions from off-site project haul trucks, and from on-site mobile and stationary sources during the lifetime of the quarry. This would be a less than significant impact.

DPM emissions would be generated by project haul trucks along haul routes, as well as from on-site mobile sources (e.g., dozers, loaders, on-site trucks) and the sole on-site stationary source (diesel generator) during the 20-year lifetime of the quarry.

The potential health risks associated with exposure to DPM are risks that result from long-term exposure and are generally considered to be related to the cumulative lifetime exposure to DPM. The proposed project would result in changes in the annual DPM concentrations in the project vicinity over time. This assessment was intended to provide a worst-case estimate of those changes through the use of a screening analysis that employs a standard emission estimation program and accepted pollutant dispersion models. The screening analysis calculates the corresponding DPM concentrations, and associated cancer and non-cancer health risk. This assessment accounts for project operation variations and phasing, equipment location, meteorology, improving diesel engine technology, and the chemical properties of DPM. In addition, this assessment relies on a series of conservative assumptions concerning project DPM emission sources such as replacement factors, usage rates, and size.

The dispersion modeling of on-and off-site project sources of DPM was conducted using the Industrial Source Complex-3 (ISC-3) model, Version 02035. This model is an appropriate choice for this analysis because it covers a variety of terrain and can predict both short-term and long-term (annual) average concentrations while using nearby representative hourly meteorological data.

The dispersion modeling analysis modeled DPM emissions from all diesel sources associated with the proposed project, and was used to predict DPM concentrations at certain critical receptors surrounding the quarry and along the quarry haul routes over the project lifetime. Detailed information concerning the dispersion modeling and health risk assessment and other

pertinent assumptions are contained in Appendix E-2. The estimated DPM emissions reflect the annual production rate of the quarry of 570,000 cubic yards. The estimated DPM emissions also reflect already adopted State and federal mandated changes in diesel fuel and diesel engines that would apply to the project.

The locations of representative sensitive receptor study sites considered in this analysis are illustrated in Figure IV.F-1. Sensitive receptors, including Dunham Elementary School and specific residences, were selected based on their proximity to the proposed project site and/or from Roblar Road, and consequently, serve as representative study receptors for evaluation of diesel impacts from both on- and off-site project sources. While other sensitive receptors are also located within the vicinity of the proposed project and along the haul routes, the selected receptors capture the maximum and typical diesel effects that would be experienced from the proposed project.

As noted in the significance criteria, under CEQA, the cancer risk from DPM emissions would be considered significant if the project results in an increase in cancer risk of 10 in one million people for 70 year exposure.

Off-Site Haul Truck DPM Emissions

The total estimated DPM emissions from the project haul trucks would be 0.24 tons per year during 2007, decreasing to 0.04 tons per year by 2027.

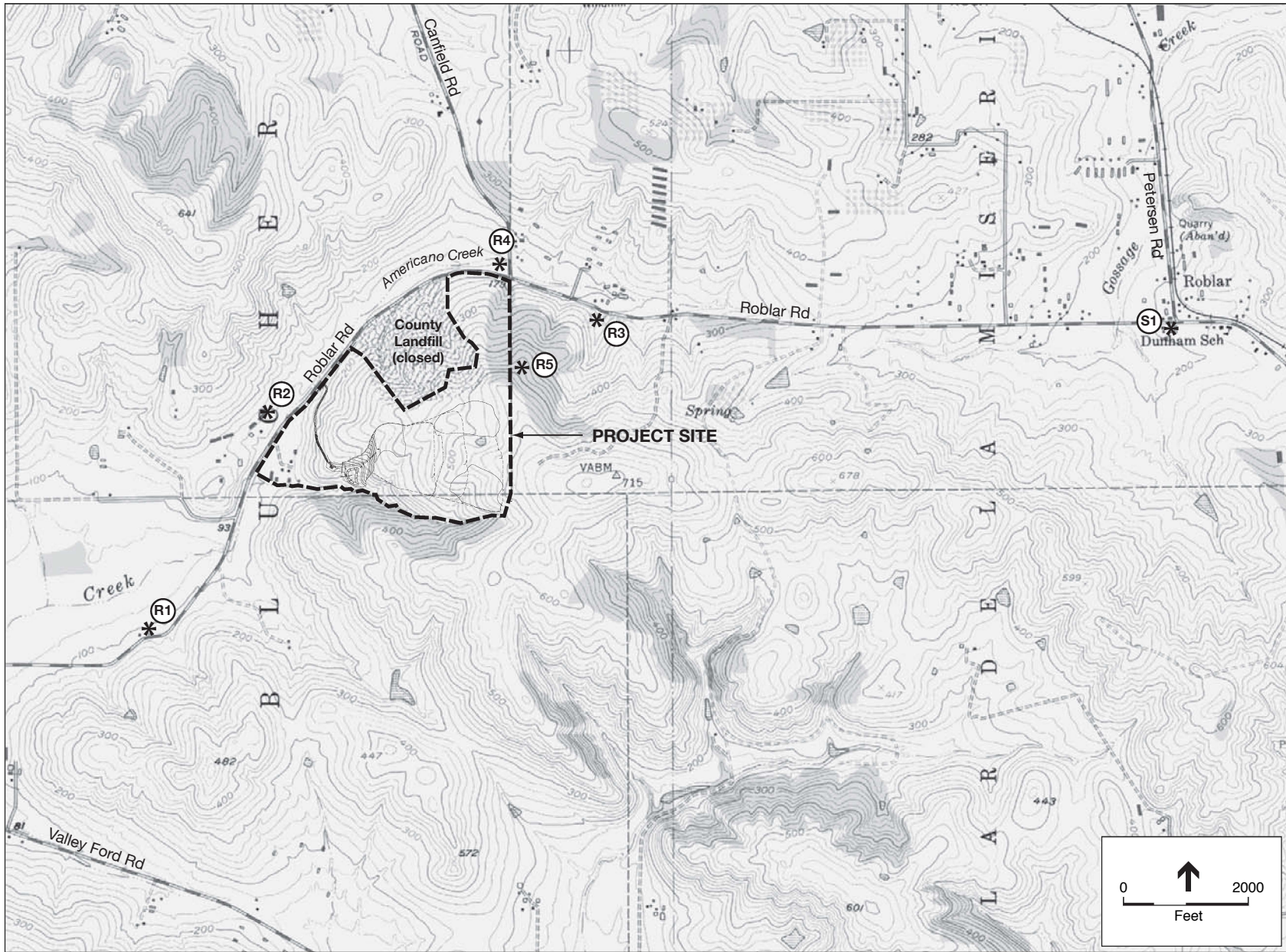
Table IV.F-8 presents the estimated annual average DPM concentrations that would be experienced at each of the six study receptors from project haul trucks based on dispersion modeling. As shown in Table IV.F-8, annual average DPM concentrations (over a 70-year lifetime) from project off-site haul trucks would range between approximately 0.001 and 0.002 $\mu\text{g}/\text{m}^3$ at study receptors, with concentrations decreasing with increased distance from the roadway.

On-Site DPM Emissions

On-site DPM emissions related to the project would be associated with on-site equipment (loaders, dozers, rock trucks, etc.), diesel generator, and haul trucks while on-site. The dispersion modeling utilized the annual emission rates of DPM while accounting for the phasing of mining operations within the 20 year lifetime. The analysis also accounts for movement of the processing facility during the lifetime, as well as elevation changes of the mining area. Lastly, the analysis accounts for typical equipment lifetimes, based on the CARB OFFROAD2007 model.

The total estimated DPM emissions from on-site sources would be 0.32 tons in 2007, incrementally increasing to 0.34 tons by 2027.

Table IV.F-8 presents the estimated annual average DPM concentrations that would be experienced at each of the six study receptors based on dispersion modeling. As shown in Table IV.F-8, annual average DPM concentrations (over a 70-year lifetime) from on-site sources would range between 0.001 $\mu\text{g}/\text{m}^3$ and 0.019 $\mu\text{g}/\text{m}^3$, with concentrations decreasing with increased distance from the proposed quarry.



SOURCE: USGS

Roblar Road Quarry . 204334

Figure IV.F-1
Study Receptor Locations for Potential DPM Impacts

**TABLE IV.F-8
ESTIMATED ANNUAL AVERAGE DPM CONCENTRATIONS FROM
THE PROJECT AT STUDY RECEPTORS**

Receptor Identification Number ^a	Location	Estimated Annual Average DPM Concentrations over 70-year lifetime ($\mu\text{g}/\text{m}^3$) ^{b,c}		
		Off-Site Haul Trucks	On-Site Sources	Total (Off-site + Onsite)
S1	Dunham Elementary School	0.001	0.001	0.002
R1	Residence approximately 2,700 feet southwest of project site along Roblar Road	0.001	0.002	0.004
R2	Residence directly across Roblar Road west of project site	0.002	0.006	0.008
R3	Residence approximately 800 feet east of northeast corner of project site along Roblar Road	0.001	0.005	0.007
R4	Residence at northwest corner of intersection of Roblar Road and Canfield Road	0.001	0.004	0.005
R5	Residence on adjacent property east of project site (approximately 160 feet east of project site, and 600 feet northeast of Phase 3 mining)	0.001	0.019	0.020

^a See Figure IV.F-1 for illustration of location of receptors.
^b Concentration values are rounded.
^c $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter.

SOURCE: Environmental Science Associates, 2007.

Health Risk of DPM

The total carcinogenic risk at the study receptors from the proposed project (i.e., from the off-site haul trucks and all on-site sources) over the 20-year life of the quarry is estimated to be less than one per million risk at Dunham Elementary School, between approximately 2 and 4 per million risk at four of the study residence receptors, and approximately 8.4 per million risk at the nearest residence receptor. These increments are less than the significance threshold of 10 cancers in a million persons. Therefore, the potential carcinogenic health risks from DPM associated with the proposed project would be less than significant.

In addition, the DPM chronic health index would be well below 1. Therefore, the potential chronic health impacts from DPM associated with the proposed project would also be less than significant.

Mitigation: None required. However, implementation of Mitigation Measure F.1a through F.1c would collectively further reduce total annual off- and on-site project DPM emissions [by approximately 0.26 tons in 2007 (a 45 percent reduction), and by 0.08 tons in 2027 (a 20 percent reduction)]. Accordingly, implementation of this mitigation would further decrease DPM exposure and associated health risk at nearby receptors and along haul routes over the project lifetime.

Impact F.4: During the initial construction phase, and episodically during operation, on-site sources of fugitive dust generated by the proposed project would have the potential to contribute to local increases in PM₁₀ at nearby receptors. This would be a potentially significant impact.

As discussed in Impact F.1, continuing normal operation of the project would generate emissions of PM₁₀ (fugitive dust) on the project site and along haul routes. The quarry would employ numerous control measures to reduce dust emissions during operation, including use of spray misters and, as needed, baghouses, on all processing equipment; use of a water truck to routinely water down internal access roads, use of tire wash area and tire scrapers to loosen dirt from the trucks and their tires.

The initial construction phase of the proposed project (e.g., initial site clearing, construction of access road, buildings, sedimentation pond, etc.) would result in a temporary source of dust emissions. In addition, within the normal range of operation of the proposed project, certain meteorological conditions (e.g. dry days with high winds) could result in episodes where dust from the project site creates a potential nuisance to nearby off-site properties, and/or drivers along Roblar Road near the project entrance, despite the proposed dust suppression techniques and design elements at the project site. This would be a potentially significant impact when those episodes occurred.

The implementation of a formal comprehensive dust control program for implementation during initial construction and on-going operation would ensure all potential dust emissions would remain less than significant.

Mitigation Measure F.4: A comprehensive dust control program shall be implemented by project applicant that would include the quarry's proposed dust control measures to maintain minimal fugitive dust impacts from the project.

Elements of the dust control program (especially during the dry season) for project components include, but are not necessarily limited to, the following:

- Water all active unpaved vehicle circulation areas daily, using reclaimed water whenever possible. Watering should be sufficient to prevent airborne dust from leaving the site. Increased watering frequency whenever wind speeds exceed 15 miles per hour during dry conditions.
- Suspend excavation activity when winds (instantaneous gusts) exceed 25 miles per hour during dry conditions.
- Cover all quarry-operated trucks hauling soil, sand, and other loose materials, or require all quarry-operated trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer) or CHP standards.
- Sweep paved roadways (with water sweepers using reclaimed water if possible) at the end of each day if visible soil material is carried onto adjacent paved roads.

- Hydroseed or apply soil stabilizers to inactive exposed soil areas (as presented in the quarry's reclamation and water quality control plan).
- Exposed soil stockpiles shall be enclosed, covered, watered daily or treated with a (non-toxic) soil stabilizer.
- Limit traffic speeds on unpaved roads and circulation areas to 15 miles per hour.
- Designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. The operator shall have at least one employee who is a certified visual emissions evaluator.
- Install wheel washers or other washing method (e.g., water sprayers or use of a water depression crossing) so that that tires or tracks of all exiting trucks leaving the site are cleaned of dirt and gravel to minimize tracking these materials onto public roads.
- Conduct blasting activities by using water injection when drilling to control drilling dust, using sequential delay timing schemes to generate effective rock fragmentation and vibration control to minimize blasting dust, remove loose overburden to prevent dilution of mined rock, which lessens the amount of fine material that can become airborne by blasting, and as needed, during dry summer periods, water onto blast areas to further mitigate dust⁴.
- Ensure covers over the quarry's crushers (e.g., baghouses or sheds) are in place to minimize fugitive dust during crushing operations. With certain equipment, the use of water or foam spray may be the most effective method to be used, as determined in consultation with the Air District.

Mitigation Measure F.4 would also serve to further mitigate erosion-generated dust effects discussed in Section IV.B, Geology, Soils and Seismicity; and IV.C, Hydrology and Water Quality. Although it would not completely eliminate fugitive dust and PM₁₀ emissions from the project, it would serve to mitigate the project's contribution to any potential cumulative localized dust episodes in the project vicinity from nearby agricultural uses.

Implementation of Mitigation Measures F.1a through F.1c, above, would also result in reduction of project PM₁₀ emissions.

Significance after Mitigation: Less than Significant.

⁴ Assessment of Rock Blasting Impacts and Recommended Practices for Proposed Roblar Quarry, Revey Associates, Inc, April 2006.

Impact F.5: Project operations would involve the crushing of aggregate on-site, which could result in the airborne release of crystalline silica. This would be a less than significant impact.

In February 2005, OEHHA added a chronic reference exposure level (REL) for crystalline silica⁵. Silica is a hazardous substance when it is inhaled, and the airborne dust particles that are formed when the material containing silica is broken, crushed, or sawn pose potential risks. The chronic reference exposure level for crystalline silica was established by the California OEHHA as $3 \mu\text{g}/\text{m}^3$.

The dispersion modeling of crystalline silica was conducted using the same model as was used for evaluating DPM impacts [i.e., Source Complex-3 (ISC-3) model, Version 02035]. There is no specific data available from the applicant on the content of silica in the materials present on the project site. However, the silica content in basalt rock (similar to Tolay Volcanics formation present on-site, which would be the resource rock for processing) can be up to five percent. In contrast, the silica content in sandstone (similar to Wilson Grove formation present on-site, and which would be overburden) can be greater than 90 percent. For purposes of this EIR, a conservatively high estimate of 100 percent silica in the materials on-site was assumed for estimating potential impacts at off-site receptors.

The annual average concentration of silica dust associated with the proposed project would be $0.15 \mu\text{g}/\text{m}^3$ at the nearest receptor, less than the non-carcinogenic chronic exposure level of $3 \mu\text{g}/\text{m}^3$. With increasing distance from the project site, the concentrations would decrease (for example, at Dunham School, the annual average concentration of silica dust from the project would be $0.02 \mu\text{g}/\text{m}^3$). These concentrations would be less than the acceptable exposure levels; therefore, the non-carcinogenic risk from silica dust associated with the project would be less than significant.

Mitigation: None Required. However, implementation of Mitigation Measure F.4, above, would ensure that dust generated on-site would be minimized to the extent feasible.

Cumulative

Impact F.6: The proposed project would make an incremental contribution to cumulative GHG emissions (CO₂, CH₄, and N₂O) as a result of onsite generator, onroad motor vehicles, and onsite offroad equipment. No accepted methodology or standards exist for determining the significance of these emissions.

As discussed in the Setting section of this Chapter, no regulatory guidance or standard methodology yet exists for evaluating GHG emissions in the context of land use permitting and CEQA analysis. CEQA requires analysis of a project's environmental effects based on the net increment of change that will occur as a result of the project. Such an analysis requires a

⁵ <http://www.oehha.ca.gov>

methodology to determine the increment of change, and appropriate standards for determining whether the change is significant. In the case of GHG emissions, the relevant state and federal agencies have not yet identified either a methodology or standards for determining a land development project's incremental impact on climate change. Neither CARB nor the BAAQMD has developed guidelines for evaluating GHG emissions in the context of land use development. As noted previously, under SB 97, the State Office of Planning and Research has until July 1, 2009 to develop CEQA guidelines for addressing GHG emissions in environmental documents and to transmit those proposed guidelines to the State Resources Agency; the Resources Agency then has until January 1, 2010 to certify and adopt the proposed guidelines.

As indicated in the Governor's letter to the Senate upon signing SB 97, the development of CEQA significance thresholds and methodologies should be guided by the appropriate responsible agencies to achieve a standardized approach consistent with AB 32. This is especially important given the complexity of climate change and the State's leadership role in establishing California's response to this important environmental issue.

Nevertheless, while significance thresholds are not currently established, this EIR does attempt to quantify the greenhouse gases that will be emitted by this project (see "Project Greenhouse Gas Inventory" below), and evaluate the project's consistency with the State's GHG emissions reduction goal, and propose appropriate, feasible measures to reduce the project's contribution to GHG emissions.

Project Greenhouse Gas Inventory

For this EIR, GHG emissions from onroad motor vehicles are estimated based on CO₂ and CH₄ speed-dependent emission factors provided in CARB's EMFAC2007 model. N₂O emissions for motor vehicles are based on the N₂O emission factors listed in Table 3.2.3 of Volume 2 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. GHG emissions from offroad equipment are based on CO₂, N₂O, and CH₄ emission factors provided in CARB's OFFROAD2007 model. GHG emissions from the onsite generator are based on EPA's AP-42.

The results was converted to CO₂ equivalent values using the Global Warming Potential values of 1 for CO₂, 23 for CH₄, and 296 for N₂O (based on a 100 year period) as presented in the IPCC's Third Assessment Report⁶. Table IV.F-9 provides the estimate of GHG emissions for 2007. Per convention, the total project-generated GHG emissions are estimated at 5,404 metric tons of CO₂ equivalent.

Consistency with the State Goal of Reducing GHG Emissions

As estimated above, project CO₂ equivalent emissions are approximately 5,400 metric tons of CO₂ equivalents per year from on- and off-site operations. The project would not be classified as a major source of greenhouse gas emissions. In fact, under the new greenhouse gas mandatory reporting regulation now being developed by CARB, the project would not be required to report

⁶ Climate Change 2001: The Scientific Basis, Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, New York City, NY, 2001.

**TABLE IV.F-9
PROJECT-RELATED ANNUAL GREENHOUSE GAS EMISSIONS**

Activity	CO ₂	N ₂ O	CH ₄	CO ₂ -Equivalent	CO ₂ -Equivalent
	short tons ^a			metric ton ^b	
Onsite Construction Equipment	1,125	0.00	0.07	1,127	1,022
Generator	1,167	0.00	0.71	1,183	1,073
Offsite Haul Trucks	3,643	0.01	0.09	3,648	3,309
Total	5,935	0.01	0.87	5,958	5,404

^a 1 short ton (U.S.) = 2,000 lb.

^b 1 metric ton = 2,204.6 lb

SOURCE: Environmental Science Associates, 2007

its emission, since its total emissions would only be about 22 percent of the lower reporting limit of 25,000 metric tons per year. Furthermore, when compared to the overall state reduction goal of approximately 174 million metric tons per year, the maximum greenhouse CO₂ equivalent emissions for the project would account for approximately 0.003 percent of the state emission reduction goal for 2020.

It should also be noted the project as mitigated would incorporate a number of measures to minimize project air emissions, which include the greenhouse gases CO₂, CH₄, and N₂O (please refer to Measures F.1a through F.1c). Implementation of these measures would reduce project GHG emissions by approximately 20 percent.

In addition, the proposed project would provide a local source of PCC-grade aggregate for construction projects within the County. As discussed in the Project Description, the project is specifically intended to provide a local source of high-quality aggregate in the south central portion of the County to minimize required transport distances. The applicant estimates over 90 percent of the product produced at the proposed quarry would be used in Sonoma County (including the Cities of Cotati, Petaluma, Rohnert Park, Sebastopol, and south Santa Rosa), and the balance used in the Novato area of Marin County. Accordingly, the proposed project would reduce the need for aggregate to serve this area to alternatively come from more distant sources, including out-of-county, and therefore, reduce longer haul truck travel distances and associated air emissions, including greenhouse gases. As a result, the proposed project would likely have fewer GHG emissions compared to the No Project Alternative. Please see Chapter V, Alternatives in this EIR for additional information on this issue.

CARB is currently developing strategies to reduce statewide GHG emissions, including heavy-duty vehicle emission reductions, as directed by AB 32. As a condition of approval, the County shall require the project to comply with any applicable strategies adopted by CARB through promulgated regulations.

Impact F.7: The proposed project, together with anticipated cumulative development in the area, would contribute to regional criteria pollutants and TACs. This would be a significant and unavoidable impact.

As discussed in Impact F.1, the proposed project would result in a significant project impact from NO_x that cannot be mitigated to a less than significant level. According to the BAAQMD CEQA Guidelines, if a project would individually have a significant air quality impact, the project would also be considered to have a significant cumulative air quality impact. As such, the project would also have a significant cumulative contribution to NO_x.

As discussed in Impact F.1 and F.3, the proposed project would result in less than significant project impact from PM₁₀, ROG, CO and DPM emissions. The BAAQMD CEQA Guidelines process for determining significant cumulative impact is based first on an evaluation of whether the project is located in a jurisdiction with its general plan (1989 *Sonoma County General Plan*, as amended) consistent with the most recent Clean Air Plan (CAP, in this case, the *Bay Area 2005 Ozone Strategy*). Because the County has not conducted a formal determination of whether its current County General Plan is consistent with the 2005 Ozone Strategy, for purposes of this EIR, it is conservatively assumed the General Plan is not consistent with 2005 Ozone Strategy. In circumstances where the general plan is not consistent with the CAP, the BAAQMD CEQA Guidelines indicate that the determination of significant cumulative impacts be based on whether the combined impacts of the proposed project along with other past, present and reasonably foreseeable future projects exceed any of the project significance thresholds for project operations. When considering the combined contribution of emissions of the project along with all other projects within the County and air basin, the project would exceed the significant thresholds for project operations for these pollutants, and therefore, also have a significant cumulative contribution to these air pollutants.

The BAAQMD CEQA Guidelines also require addressing whether the project causes County growth inconsistent with the CAP population and VMT assumptions. Aggregate generated by the project would support new development in Sonoma County, but not in itself act as a stimulus to it. Furthermore, as discussed in Impact F.6, above, the proposed project would reduce the need for aggregate to serve the local area to alternatively come from more distant sources, including out-of-county, and therefore, reduce longer haul truck travel distances and associated air emissions. As a result the proposed project is not anticipated in itself to cause growth in the County inconsistent with the CAP populations and VMT assumptions.

Mitigation: None Feasible.

Significance after Mitigation: Significant and Unavoidable.

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G. Noise and Vibration

Introduction

This section includes background information on noise and vibration and applicable noise guidelines and standards, including Sonoma County noise standards. This section also provides information on recent noise measurements at locations potentially affected by quarry operations, assesses the potential impacts the noise from construction and operations of the proposed quarry would have on sensitive noise receptors in the vicinity of the quarry and along haul routes to the quarry. This section also identifies mitigation measures to reduce or eliminate potential noise impacts of the project.

Noise Setting

Environmental Noise Fundamentals

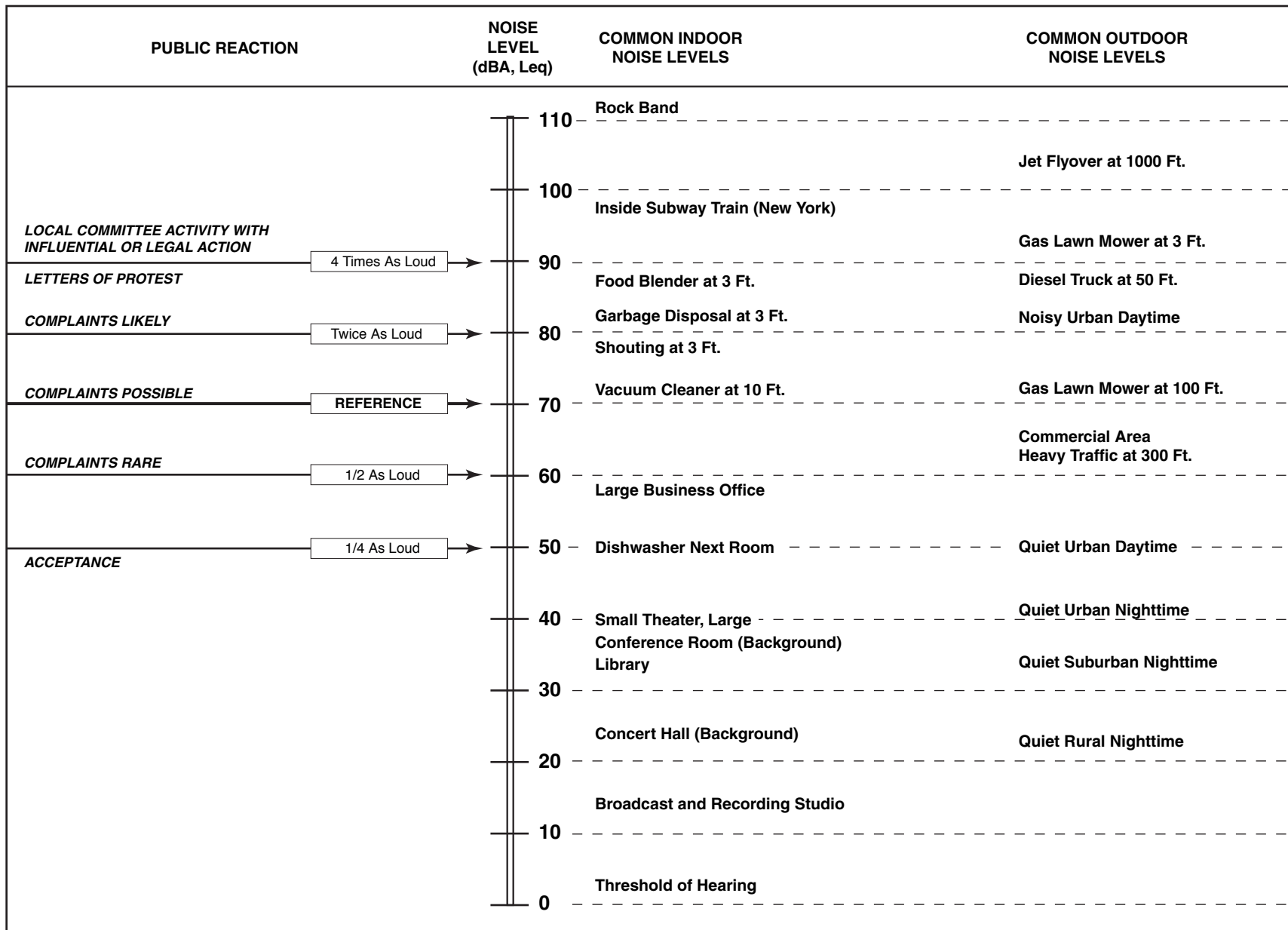
Noise is defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) which is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ears decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. Some representative noise sources and their corresponding A-weighted noise levels are shown in Figure IV.G-1.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Figure IV.G-1 are representative of measured noise at a given instant in time, however, they rarely persist consistently over a long period of time. Rather, community noise varies continuously over a



SOURCE: Caltrans Transportation Laboratory Noise Manual, 1982; and

Roblar Road Quarry . 204334

Figure IV.G-1
Noise Sources and Effects on People

period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment varies the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

- Leq: the equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The Leq is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
- Lmax: the instantaneous maximum noise level for a specified period of time.
- L50: the noise level that is equaled or exceeded 50 percent of the specified time period. The L50 represents the median sound level.
- L90: the noise level that is equaled or exceeded 90 percent of the specified time period. The L90 is sometimes used to represent the background sound level.
- Ln: the noise level that is equaled or exceeded N percent of the specified time period. L1 for example is the noise level equaled or exceeded 1 percent of the specified time period.
- Ldn: 24-hour day and night A-weighted noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night (“penalizing” nighttime noises). Noise between 10:00 PM and 7:00 AM is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.
- CNEL: similar to the Ldn the Community Noise Equivalent Level (CNEL) adds a 5-dBA “penalty” for the evening hours between 7:00 PM and 10:00 PM in addition to a 10-dBA penalty between the hours of 10:00 PM and 7:00 AM

As a general rule, in areas where the noise environment is dominated by traffic, the Leq during the peak-hour (Leq(h)pk) is generally equivalent to the Ldn at that location (within +/- 2 dBA) (Caltrans, 1998).

Effects of Noise on People

The effects of noise on people can be placed into three categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- a change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- a 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion, hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver such as parking lots or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a

rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement (Caltrans, 1998).

Blasting Noise and Vibration Terms and Principals

Appendix F-1 contains detailed information on blasting. The information below contains an overview of blasting terms and concepts that will help the reader to understand information presented in the Impacts section.

When explosive charges detonate in rock, they are designed so that most of the energy is used in breaking and displacing the rock mass. However, some of the energy can also be released in the form of transient stress waves, which in turn cause temporary ground vibration. Detonating charges also create rock movement and release of high-pressure gas, which in turn induce air-overpressure (blast noise), airborne dust and audible blast noise.

Vibration Perception and Damage Criteria

The average person is quite sensitive to ground motion, and levels as low as 0.50 millimeters per second (mm/s) (equivalent to 0.02 inches per second [in/s]) can be detected by the human body when background noise and vibration levels are low. Vibration intensity is expressed as Peak Particle Velocity (PPV), which is simply the maximum speed that the ground moves while it temporarily shakes. Since ground-shaking speeds are very small, it is measured in inches per second (in/s). Frequency of motion or cycles per second is a measure of how many times a particle of ground moves back and forth (or up and down) in one second of time. Frequency is expressed in units of Hertz (Hz).

Blast Noise (Air-Overpressure)

The term “blast noise” is a misleading because the largest component of blast-induced noise occurs at frequencies below the threshold-of-hearing for humans (16 to 20 Hz). Hence, the common industry term for blast-induced noise is “air-overpressure.” As its name implies, air-overpressure is a measure of the transient pressure changes. These low-intensity pulsating pressure changes, above and below ambient atmospheric pressure, are manifested in the form of acoustical waves traveling through the air.

When calculating maximum overpressure values, the absolute value of the greatest pressure change is used — regardless of whether it is a positive or negative change. The frequency of the overpressure (noise) is determined by measuring how many up-and-down pressure changes occur in one second of time. Blast noise occurs at a broad range of frequencies and the highest-energy blast noise usually occurs at frequencies below that of human hearing (<20 Hz).

When measurements include low frequency noise (2 Hz and higher) with a flat response, they are called “linear scale” measurements. Air-overpressure measurements are typically expressed in dB units and when the scale is linear, the unit designation is “dBL.” Regular acoustical noise measurements taken for the purpose of monitoring compliance with local noise ordinances almost always use weighted scales that discriminate against low frequency noise. Thus for a similar

noise source, A-weighted and C-weighted scales will usually record significantly lower levels of noise. Differences between decibel scale measurements for individual blasts will vary depending on their unique frequency-intensity spectrums. Since full-range recording of blast-induced noise can only be done with linear (2-Hz response) instruments, it is imperative that all compliance specifications for blast-induced noise be expressed in dBL.

The regulatory limit defined by USBM, in State of California regulations, for air-overpressure measured with 2-Hz response seismographs is 133-dBL (0.014 psi). Damage to old or poorly glazed windows does not occur until air-overpressure reaches about 150 dBL. More importantly, since the decibel scale is a logarithmic ratio, the actual overpressure at 150 dBL is 0.092 psi, versus 0.013 psi at 133 dBL. Therefore, the actual pressure at the 133 dBL limit, is over seven times (0.0917/0.0129) lower than the threshold damage level at 150 dBL.

Regulatory Setting

Sonoma County

Sonoma County General Plan

The project site is in an unincorporated area of Sonoma County. The Sonoma County General Plan Noise Element sets various goals and objectives that apply to projects in Sonoma County. General Plan noise level performance standards in Table NE-2, below, are performance standards for noise producing land uses that may affect noise sensitive land uses:

**TABLE NE-2
(NOISE LEVEL PERFORMANCE STANDARDS) –
NOISE ELEMENT OF THE SONOMA COUNTY GENERAL PLAN^a**

Maximum Exterior Noise Level Standards, dBA			
Category	Cumulative Duration of Noise Event in Any One-hour Period	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
1	30-60 Minutes	50	45
2	15-30 Minutes	55	50
3	5-15 Minutes	60	55
4	1-5 Minutes	65	60
5	0-1 Minutes	70	65

^a For sake of clarity when referencing in the EIR, the table number (Table NE-2) corresponds to the same table presented in the Sonoma County General Plan.

SOURCE: Sonoma County General Plan

The following goals, objectives, and policies are applicable to the proposed project:

Objective NE-1.2: Develop and implement measures to avoid exposure of people to excessive noise levels.

Objective NE-1.3: Protect the present noise environment and prevent intrusion of new noise sources which would substantially alter the noise environment.

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 Ldn, 60 dB CNEL, or the performance standards of Table NE-2.

Policy NE-1c: Control non transportation related noise from new projects. The total noise level resulting from new sources and ambient noise shall not exceed the standards in Table NE-2 as measured at the exterior property line of any affected residential 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.
- 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.
- 3) Reduce the applicable standards in Table NE-2 by 5 decibels if they exceed the ambient level by 10 or more decibels.

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 Ldn and/or the standards of Table NE-2 for existing and projected future (20 years hence) conditions, with a comparison made to the adopted policies of the Noise Element
- 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.
- 7) be reviewed by the Health Department.

Draft Sonoma County General Plan 2020

Sonoma County is in the process of updating its existing General Plan. Applicable goals and policies from the noise space element of the existing general plan listed above are proposed to be carried forth into the new general plan, with minor modifications. One proposed modification (new Policy Ne-1c(5)) would allow noise levels to be measured at the location of the adjacent noise sensitive land use, instead of the exterior property line of the adjacent noise-sensitive land use, for the noise exposure standards in Table NE-2 if 1) the adjacent property has already been developed pursuant to its existing zoning, or 2) if there is available open land zoned for agricultural or resource uses available for noise attenuation. Note: As of publication of this Draft EIR, the Sonoma County Board of Supervisors has not yet completed their deliberations or finalized these policies.

Sonoma County ARM Plan

The ARM Plan establishes standards applicable to mining operations within the County, including for operational noise. The ARM Plan states “(a)ll operations shall be conducted to reduce noise to acceptable levels as nearby sensors. The maximum acceptable noise levels for all aggregate operations are the standards contained in the Noise Element of the General Plan or any regulations adopted to support and enforce those standards. More stringent noise control may be required as a permit condition when local circumstances warrant additional protection of adjacent uses.” This ARM Plan operating standard has been added to, and codified in, the Sonoma County Surface Mining and Reclamation Ordinance (see discussion below).

Sonoma County Surface Mining and Reclamation Ordinance (SMARO), and Relationship to ARM Plan and General Plan

Noise from mining operations is addressed in the SMARO, No. 5165. Consistent with the ARM Plan operational noise standard, Article 26A-09, Section 26A-09-010(i) states that “the maximum acceptable noise levels for these operations are those set forth in the Noise Element of the *Sonoma County General Plan*, and that more stringent noise standards may be required as permit conditions when particular local circumstances warrant additional protection of potentially affected areas.” The General Plan Noise Element establishes thresholds for when noise impact occurs. These are defined as either when the Ldn or CNEL exceed 60 dB or when the standards defined in General Plan Table NE-2 are exceeded. These standards provide noise levels for the daytime and the nighttime based on the duration of the noise event in any one hour.

The General Plan Table NE-2 standards establish a baseline, continuous exterior noise level exposure limit of 50 dBA for the daytime and 45 dBA for the nighttime (see Category 1). Implementing these standards for the other time intervals requires relating them to common noise metrics. For this purpose the “Ln” metrics are applied using the daytime limits for illustration. From Table NE-2, for a sound that lasts up to 1 minute out of an hour (2% of an hour, or L2), the daytime standard is 70 dBA or lower. For a sound that lasts 5 minutes out of an hour or 8% of the time (L8), the daytime noise standard 65 dBA. For a sound that lasts 15 minutes out of an hour or 25% of the time (L25), the level cannot exceed 60 dBA. For a sound that lasts 30 minutes out of an hour (L50), the level cannot exceed 55 dBA. For continuous sounds, the level cannot exceed 50 dBA.

For new project-related noise sources, Policy NE-1c (see above) indicates total non-transportation noise level resulting from new sources and ambient noise shall not exceed the standards in Table NE-2 as measured at the exterior property line of any affected residential land use. In applying this General Plan noise policy, it should be noted that it is directed toward protecting residential land use. The land in the project site vicinity is zoned Land Extensive Agriculture and Diverse Agriculture. In the case of this and other non-residentially zoned areas, some additional consideration needs to be made. Properties adjacent to the project site contain non-residential uses intervening between the terrace mine and the actual residences. Since the properties adjacent to Phase VI are not zoned residential, and there are non-residential intervening uses, the residential property lines limits of Table NE-2 do not strictly apply, and rather, the Table NE-2 limits are applied in the vicinity of the actual residences.

In regard to noise from traffic on public roadways, Policy NE-1b states that noise sensitive land uses should be avoided when the exterior level in outdoor activity areas exceed 60 dB Ldn and when interior levels exceed 45 dB Ldn with the doors and windows closed. If it is not practical to achieve the exterior level standard, levels up to 65 dB Ldn are allowed as long as the interior standard is still met.

The ARM Plan PEIR indicates that “(s)ignificant impacts from any mining project may occur if related noise levels increase three decibels in areas adjacent to haul routes and are raised above the performance standards set forth in the Sonoma County General Plan for sensitive receptors or if net noise levels increase three decibels in adjacent areas which are currently designated as noise-impacted.”

Blasting

The use of explosives associated with quarry mining is addressed in the SMARO, No. 5165. Section 26A-09-040(h) states “No blasting shall be used except as authorized by the use permit. Blasting activities shall be conducted by a qualified licensed blasting professional in compliance with State blasting regulations. Blasting permits shall be obtained from the Sonoma County Sheriff’s Department. Blasting operations shall be designed to minimize adverse noise and vibration impacts on offsite residential areas. Permits may be conditioned to require notice to immediate neighbors prior to blasting.

U.S. Department of Labor, Mine Safety and Health Administration (MSHA)

The mission of the Mine Safety and Health Administration (MSHA) is to administer the provisions of the Federal Mine Safety and Health Act of 1977 (Mine Act) and to enforce compliance with mandatory safety and health standards as a means to eliminate fatal accidents; to reduce the frequency and severity of nonfatal accidents; to minimize health hazards; and to promote improved safety and health conditions in the Nation’s mines. MSHA carries out the mandates of the Mine Act at all mining and mineral processing operations in the United States, regardless of size, number of employees, commodity mined, or method of extraction.

MSHA’s new noise standards (1999) require mine operators to monitor workplace noise exposure and provide for miners and their representatives to observe the monitoring. The standards establish several levels requiring mine operators to take action:

- Miners exposed to an average sound level of 85 decibels (85 dBA) or more over an 8-hour period must be enrolled in a hearing protection program, which will include special training, hearing tests, and hearing protection.
- If workplace noise levels reach 90 dBA or more over an 8-hour period, mine operators must use feasible engineering and administrative controls to reduce noise levels. Hearing protectors are required to be provided and worn if the permissible exposure level cannot be achieved using feasible engineering and administrative controls.
- At workplace noise levels of 105 dBA or more over an 8-hour period, mine operators must ensure the use of both ear plug and earmuff type hearing protectors.

- At no time during the work shift may noise levels exceed 115 dBA.

Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others because of the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Residences, hotels, schools, rest homes, and hospitals are generally more sensitive to noise than commercial and industrial land uses.

Noise-sensitive land uses in the immediate vicinity of the project are limited to residential dwellings on agricultural-zoned land (Land Extensive Agriculture and Diverse Agriculture). The closest residence to the proposed mining area is located approximately 600 horizontal feet northeast of the northeast corner of the Phase 3 mining limit (and approximately 160 horizontal feet east of the project site boundary). This residence is located on the other side of a ridgeline that is situated between the project site and the residential property, and is not in view of the proposed mining area. There are additional residences to the northeast but these are all located further away than the aforementioned closest residence and, are also located on the other side of the ridgeline and not in view of the proposed mining area.

A ranch house is also located across Roblar Road approximately 200 feet west of the project site boundary, and approximately 1,800 feet west of the west edge of the proposed Phase 1 mining area. This ranch house has an unimpeded view of the portion of the project site where the proposed quarry would be located. Other residences with open or partial views of the proposed mining area are located further southwest, west and north of the project site, but located comparatively farther away than above-described ranch house.

Residences are also located along roads that would serve as truck haul routes to the project site. There are thirty to forty houses along Roblar Road to the east of the site (between the site and Stony Point Road); some of these residences are closer than fifty feet from the center of the road. The Dunham Primary School is approximately two miles east of the site on Roblar Road. The historic Washoe building is located at the corner of Roblar Road and Stony Point Road. There are also approximately forty houses along the haul route that starts to the west and ends up at Stony Point Road (Roblar Road to Valley Ford Road, to Pepper Road to Mecham Road to Stony Point Road). Of these, only one residence located west of the site on Roblar Road (between project site and Valley Ford Road).

Existing Noise Environment

The noise environment surrounding the project site is influenced primarily by agricultural-associated operations and truck and automobile traffic on local roadways. The noise environment along proposed truck haul routes is also influenced by traffic noise, including noise from U.S. 101 along the U.S. 101 corridor, and from various agricultural, commercial and industrial operations, including the Central Landfill on Mecham Road, and the Stony Point Quarry on Stony Point Road.

In order to characterize the existing noise environment on roadways that would be used by project haul trucks, 24-hour noise measurements were conducted on representative study roadways (Roblar Road, Valley Ford Road and Pepper Road) on January 11th and 12th, 2006. The locations of these long-term noise measurements are shown in Figure IV.G-2. Graphs of the 24-noise measurement data for various noise indicators are presented in Figures F-1 through F-6 in Appendix F-2. In order to characterize the existing noise environment on the project site and in the immediate project site vicinity, four short term measurements were taken on or adjacent to the project site on January 13, 2006. Noise measurement results for all study locations are summarized in Table IV.G-1.

**TABLE IV.G-1
SOUND-LEVEL MEASUREMENTS AT STUDY LOCATIONS^{a,b}**

Location	Time Period	Leq (decibels)	Noise Sources
LT-1: Roblar Road, Dunham School, 70 feet from center of road.	24-hour CNEL: Wednesday: 61 dB Thursday: 61 dB	Hourly Leq (h) ranged from 52 to 59 dB	Vehicle traffic
LT-2: 8425 Valley Ford Road, 115 feet from center of road.	24-hour CNEL: Wednesday: 63 dB Thursday: 63 dB	Hourly Leq (h) from 54 to 61 dB	Vehicle traffic
LT-3: 1798 Pepper Road, 85 feet from center of road.	24-hour CNEL: Wednesday: 65 dB Thursday: 64 dB	Hourly Leq (h) from 56 to 63 dB	Vehicle traffic
ST-1: Roblar Road – entrance to the proposed quarry, directly across from neighboring ranch. 25 feet from center of road.	9:10 a.m. (Jan 13, 2006)	Leq from 43.5 to 64.7 dB	Vehicle Traffic, creek, birds, and frogs
ST-2: Within Phase II area of project site	3:11 p.m.(Jan 13, 2006)	Leq from 51.1 to 50.6 dB	Distant trucks and wind ~10mph
ST-3: Middle of proposed Phase III area of project site (near existing stock pond)	3:25 p.m. (Jan 13, 2006)	Leq from 60.9 to 57.8 dB	cows, birds, wind ~15mph
ST-4: At east property line east of Phase III area	3:39 p.m. (Jan 13, 2006)	Leq from 54 to 56 dB	Wind ~ 15mph

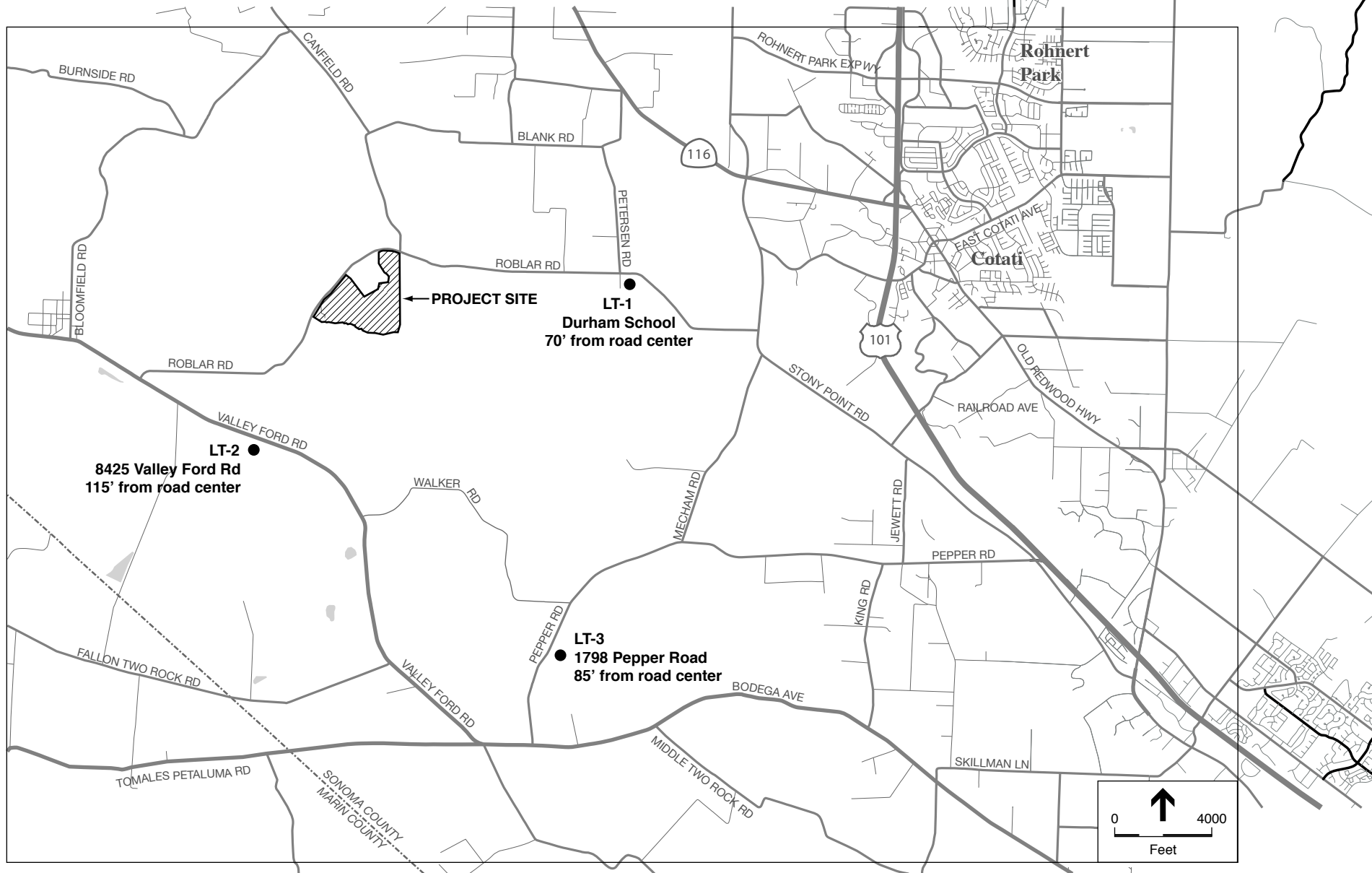
^a Locations correspond to those illustrated in Figure IV.G-2.

^b Noise measurement data presented here reflects hourly averages collected at this location in January of 2006, using a Type 2, Metrosonics dB-308 sound level meter, calibrated prior to use.

SOURCE: ESA, 2006

As shown in Table IV.G-1, the measured noise levels for the long-term sites had hourly averages that range from 52 to 63 dBA, which are noise levels expected on rural roads with light to moderate traffic. In the project area, noise levels are primarily a function of the distance from the road and the time of day, with the higher noise averages occurring during rush-hour traffic, and the lowest noise levels occurring during the nighttime hours. There are few major noise sources in the vicinity of the project site. As was noted during the short-term measurements on the project site, at locations further from the road and higher on the hillsides, winds can be the main source of noise, masking anthropomorphic sources.

IV.G-12



SOURCE: ESA

Roblar Road Quarry . 204334

Figure IV.G-2
Long-Term Noise Measurement Locations for Haul Routes

Impacts and Mitigation Measures

Significance Criteria

Consistent with the CEQA *Guidelines* Appendix G, the proposed project would result in a significant impact on the environment if it would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in any applicable plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing levels existing without the project.
- Exposure of people residing or working in the project area to excessive noise levels, 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.
- Expose people residing or working in the project area to excessive noise levels if the project is located in the vicinity of a private airstrip.

The proposed project is not located within an airport land use plan, is not located within two miles of a public airport or within the vicinity of a private airstrip. Consequently, no impacts associated with public or private air facilities would occur, and this issue is not discussed further in this section.

For the purposes of this EIR, and consistent with noise standards contained in the Sonoma County General Plan and the ARM Plan, the following would constitute a significant impact:

- Noise generated from the project's on-site sources that exceed the County's General Plan noise level performance standards, and
- Noise generated from a project's off-site generated traffic would increase noise levels by 3 dBA or more at noise-sensitive receptors.

Unlike noise, there are no standards set for ground vibration in the Sonoma County General Plan. The following standards shall be used to identify potentially significant vibration and blast overpressure impacts of the project.

- Blast overpressure, measured with 2-Hz response seismographs, greater than 133-dBL (0.014 psi) at offsite residences.
- Ground motion greater than to 0.5 in/s (in accordance with the low-frequency PPV limits suggested by the US Bureau of Mines RI8507) at off-site wood-frame structures.

The MSHA 1999 noise standards would apply to the proposed project and are assumed to provide hearing protection for the quarry workers. Occupational noise levels will not be further discussed in the impacts section of this chapter.

Impact Analysis

Impact G.1: Noise generated by mining equipment and excavation activities, and initial construction, would result in an increase in the ambient noise levels at the nearest residence(s). This would be a potentially significant impact.

Chapter III, Project Description, provides a detailed description of proposed initial grading and construction phase, and on-going mining and processing operations proposed in Phases 1 through 3. Noise generating activities would be generated during the initial grading and construction phase would be associated with the excavation and grading of the proposed initial processing area and sediment pond, construction of the access road, equipment storage area, office and parking lot, and installation of the truck scales and mobile quarry plant. Noise would also be generated by the arrival and departure of trucks delivering construction materials, and the internal hauling of excess soil and overburden to an on-site stockpile area.

Noise generating activities would include the clearing of vegetation and removal of topsoil and overburden and hauling of these materials to the on-site stockpile locations, the cutting of quarry benches into the hillslope, ripping of materials from the quarry face and transfer of materials to the mobile processing plant, the processing and sorting of materials at the plant, loading of materials onto haul trucks, the daily arrival and departure of quarry haul trucks, occasional off-loading of recycled materials imported to the plant, and on-going miscellaneous maintenance activities. The mobile quarry plant equipment would consist of a jaw crusher, cone crusher, plate feeders, screens and conveyor belts. The plant is proposed to be powered by a diesel engine-generator. Blasting may also be required for excavation one or two times a month. Another potential source would be fully loaded haul trucks descending the access route. Trucks exiting the quarry could be required to use their Jake brakes on the access road, which would have the potential to create noticeable noise.

Mining equipment is expected to generate noise levels similar to construction equipment. Table IV.G-2 shows summary information from a comprehensive U.S. EPA study that documented typical construction noise levels that have been measured at a distance of 50 feet from the noisiest source and 200 feet from the rest of the equipment associated with construction.

Noise from excavation operations and earth moving activities for mining operations would be similar to the noise levels for ground clearing and excavation shown in Table IV.G-2, which are 85 dBA and 91 dBA Leq, respectively.

In order to ascertain noise levels that would be generated by the mining and processing operations associated with the proposed quarry, noise measurement data taken at the Canyon Rock Quarry in support of an EIR for a proposed expansion were reviewed (Sonoma County, 2006). The Canyon Rock Quarry is an existing hard rock quarry in Sonoma County and conducts many of the same

**TABLE IV.G-2
TYPICAL CONSTRUCTION ACTIVITY NOISE LEVELS**

Construction Phase	Noise Level (dBA Leq) ^a
Ground Clearing	85
Excavation	91
Foundation Construction	76
Erection of Structures	85
Finishing	92

^a Average noise levels correspond to a distance of 50 feet from the noisiest piece of equipment associated with a given phase of construction and 200 feet from the rest of the equipment associated with that phase.

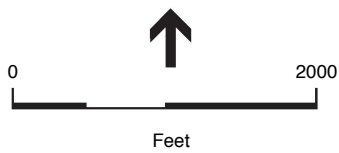
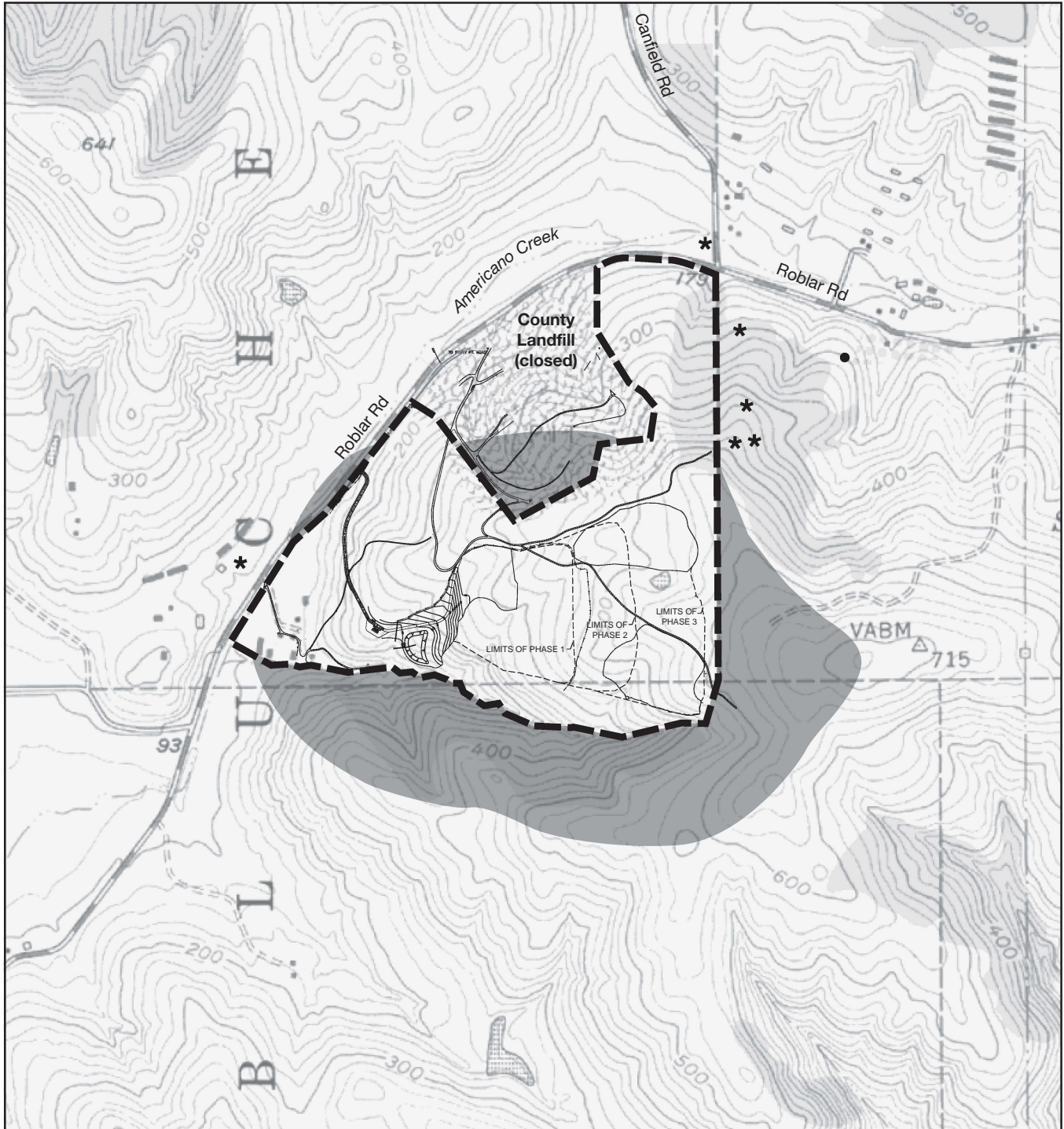
SOURCE: U.S. Environmental Protection Agency, Bolt, Beranek, and Newman, Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, December 1971.

type of quarrying and processing activities as those expected at the proposed Roblar Road quarry site. Consequently, noise data collected from the Canyon Rock Quarry is considered to be representative of the anticipated noise to be generated at the proposed quarry. The quarry operations at the Canyon Rock Quarry had the most notable effect on Categories 1 (Leq) and 2 (L50) in the Table NE-2 Sonoma County daytime noise level performance standards.¹ Critical distances from quarry operations were established to be:

- Locations within 1,600 feet of the center of the quarry operations, if the location has a direct line-of-site to the whole of the quarry operation with minimal vegetation intervening;
- Locations within 760 feet from the center of the quarry operations if the location is partially shielded based on the topography between the location and the quarry operations area; and
- Locations within 460 feet of the center of the quarry operations if the location is fully shielded from quarry operations.

Figure IV.G-3 shows a composite of the potentially affected off-site areas surrounding the quarry property based on the critical distances identified above and the surrounding topography. The location of the center of quarry operations was conservatively estimated in consideration of the phases of quarry operations. As shown in Figure IV.G-3, the nearest residences that could potentially be affected by the proposed on-site quarry operations would either have direct line-of-site to the proposed quarry (i.e., the ranch house to the west of the quarry across Roblar Road) or would be fully shielded from the quarry (i.e., the receptors over the ridgeline to the northeast of the quarry). Figure IV.G-3 shows that while the estimated quarry noise threshold zone extends off-site to adjacent surrounding properties, it would not reach any existing off-site residences. Therefore, the project would not be expected to exceed the daytime noise standards in Table NE-2 at these residences. Nevertheless, differences in actual equipment, site characteristics and meteorology could result in incrementally higher or lower noise levels at the proposed quarry than predicted based on those operations occurring at the Canyon Rock Quarry. Given these

¹ Only the daytime standard is considered as the quarry would not operate during nighttime hours.



- Off-Site Areas within Estimated Quarry Noise Threshold Zone
- Sensitive Receptors located nearest Project Site

SOURCE: USGS, ESA

Roblar Road Quarry . 204334
Figure IV.G-3
 Quarry Noise Threshold Zone

considerations, and the relative distance of the nearest receptors to the proposed quarry to the northeast and west, there remains the potential that noise levels could exceed the noise thresholds in Table NE-2 and result in a potentially significant noise impact of the project to those receptors.

In addition, the proposed permit would allow project operations to begin as early as 6:00 a.m. If noisy operations were to commence before 7:00 a.m., the project could exceed the nighttime limits for Table NE-2 and result in a significant noise impact of the project to the nearest sensitive receptors to the northeast and the west.

Mitigation Measure G.1a: At the initiation of each of the three project phases and at regular intervals within each phase, noise monitoring shall be conducted by a qualified acoustical consultant at fence line locations to the west and the northeast that are on the direct line between the path from the center of quarry operations and the nearest off-site sensitive receptor in that direction. Noise source levels of the specific equipment to be used shall be measured and specific sound levels at the residences predicted.

If no exceedances of the Table NE-2 daytime standards are predicted, operations may proceed. Should noise levels exceed the daytime limits in Table NE-2, the quarry operator shall take measures so that quarry operations are within the limits in Table NE-2. Measures could include any combination of the following: (1) additional soundproofing to equipment (2) soundberms or other noise barriers to attenuate equipment noise, (3) sound proofing to affected occupied residences, (4) restriction on duty cycles for noisy equipment, or other recommended measures. If the operator presents evidence to the County that demonstrates that the identified measures will prevent noise levels in excess of the Table NE-2 standards, then the measures shall be implemented and mining operations may proceed within the area included in the monitoring study. Once work begins, the noise level shall be monitored for a period long enough to validate the predicted levels. Upon request by the County, the applicant shall provide additional monitoring at later times to demonstrate compliance.

Mitigation Measure G.1b: To comply with the nighttime requirement in Table NE-2, loud operations capable of exceeding the nighttime requirement in Table NE-2 shall not occur in the 6:00 to 7:00 a.m. timeframe. This requirement shall also be reviewed during the start-up noise testing described in Mitigation Measure G.1a.

Significance after Mitigation: Less than Significant.

Impact G.2: Traffic associated with operation of the project would result in an increase in ambient noise levels on nearby roadways used to access the quarry. This would be a potentially significant impact.

The proposed project would generate new motor vehicle trips on the local road network. Truck trips would typically begin as early as 7:00 a.m. These trips would be distributed over the local road network and would affect roadside noise levels at sensitive receptor locations.

To assess the impact of project traffic on roadside noise levels, noise level projections were made using the Federal Highway Administration's (FHWA) Noise Prediction Model for those road segments that would be used by the haul trucks (as determined in the traffic section of this report)

and that pass by sensitive receptors. The results of the modeling effort are shown in Table IV.G-3. The traffic volumes used for the modeling effort are morning weekday peak-hour volumes during periods when the mine is at peak production. Estimated noise levels shown in Table IV.G-3 correspond to a distance of approximately 50 feet from the centerline of the roadway segments, which is the minimum setback for most of the sensitive receptors (a few homes appear to be closer than this distance). Some of the residences located along project roadways are set back up to several hundred feet from the roadway centerline. In such cases, the noise levels in Table IV.G-3 can be attenuated (lessened) by at least 3 dBA per doubling of distance from the roadway centerline.² The net increases in roadside noise levels shown in Table IV.G-3 would be the same regardless of distance from the roadway centerline (including residences closer than 50 feet from the roadway center).

As shown in Table IV.G-3, the project traffic would cause a significant noise impact in the Near-term and Long-term scenarios on Roblar Road between the project entrance and Valley Ford Road. Two residences located along Roblar Road would be affected on this roadway segment. The other roadway segments most affected would be Roblar Road between the project entrance and Stony Point Road and Valley Ford Road between Roblar Road and Pepper Road. However, neither of these roadway segments would experience increases greater than 3 dBA during the peak hour as a result of the project; consequently the project would result in a less than significant impact on these segments.

Mitigation Measure G.2: As feasible, and if approved by the property owners, the applicant shall fund residential noise insulation upgrades on the two residences on Roblar Road between the project entrance and Valley Ford Road, sufficient to maintain existing interior noise levels with the increased truck traffic.

Significance after Mitigation: Significant and Unavoidable. Mitigation Measure G.2 would require approval of the property owners to make the residential noise insulation upgrades. Without the approval of the property owners to implement this mitigation measures, this impact would remain significant.

Impact G.3: Blasting that would occur under the project would generate temporary airborne and groundborne noise and vibration. This would be a potentially significant impact.

Depending on the hardness of the rock, blasting may be required during all three phases of the mining, on average once or twice a month. All blasting would be conducted in compliance with applicable federal and State blasting regulations. Blasting would be conducted by a qualified blasting expert pursuant to a blasting plan. The blasting plan would contain a complete

² For example, where residences are located 100 feet from the roadway centerline noise levels in Table IV.G-3 can be reduced by 3 dBA, where residences are located 200 feet from the roadway centerline noise levels can be reduced by 6 dBA, where residences are setback 400 feet from the roadway centerline noise levels can be reduced by 9 dBA, and so on.

**TABLE IV.G-3
EXISTING, NEAR-TERM AND LONG-TERM AM PEAK-HOUR TRAFFIC NOISE LEVELS ALONG ROADWAYS IN THE PROJECT VICINITY**

Roadway Segment ¹	AM Peak-Hour Noise Level, dBA, Leq								
	Existing	Near Term Cumulative Base (No Project)	Near Term Cumulative Base Plus Project	Incremental Increase (Near Term vs. Near Term + Project)	Significant? (Yes or No) ²	Long-Term Cumulative Base (No Project)	Long Term Cumulative Base Plus Project	Incremental Increase (Long Term vs. Long Term + Project)	Significant? (Yes or No) ²
1. Roblar Rd. between project entrance and Stony Point Rd.	65.3	65.5	67.1	1.6	No	66.9	68.2	1.3	No
2. Roblar Rd. between project entrance and Valley Ford Rd.	58.2	58.4	65.2	6.8	Yes	59.9	65.5	5.6	Yes
3. Valley Ford Rd. between Roblar Rd. and Pepper Rd.	64.8	65.0	67.5	2.5	No	66.5	68.4	1.9	No
4. Pepper Rd. between Mecham Rd. and Walker Rd.	62.0	62.2	62.6	0.4	No	63.6	64.0	0.4	No
5. Mecham Rd. north of Pepper Rd.	61.6	61.8	62.0	0.2	No	63.3	63.4	0.1	No
6. Stony Point Rd. north of Roblar Road	72.1	72.5	72.7	0.2	No	75.3	75.5	0.2	No
7. Stony Point Rd. south of Roblar Rd.	71.9	72.2	72.7	0.5	No	75.0	75.4	0.4	No

¹ Road center to receptor distance is 15 meters (approximately 50 feet) for values shown in this table. Noise levels were determined using FHWA Traffic Noise Prediction Model (FHWA RD-77-108).

² Considered significant if the incremental increase in noise is greater than 3 dBA Leq in a noise environment greater than 60 dBA CNEL.

³ Vehicle mix on based on existing truck percentages from the Transportation Section with the addition of project vehicle trips. The speed limit for these segments was assumed to be 45 miles per hour.

SOURCE: ESA, 2006

description of clearing and guarding procedures; descriptions of how explosives will be safely transported and used at the site; evacuation, security and fire prevention procedures; blasting equipment list, and procedures for notification of nearby receptors. In the area of the closed landfill, drill holes are proposed to be monitored by as gas detection device for methane gas. No explosives would be stored on site.

Appendix F-1 in this EIR contains a detailed assessment conducted by Revey Associates, Inc., of rock blasting impacts and recommended practices for the project. The impact analysis below summarizes key information from that blasting assessment on potential impacts. Information provided by the applicant and a number of conservative assumptions were used in assessing potential worst-case impacts.

Preliminary details provided by the applicant are that each proposed blast at the quarry would consist of 20-25 holes, 10 feet apart and drilled to a maximum of 30 feet deep. Assuming four feet of extra drilling is done below the 30-foot bench floors (sub-drilling) the maximum explosive column in a 34-foot deep hole, stemmed with eight feet of crushed stone would be 26 feet. The use of Ammonium Nitrate Fuel Oil (ANFO) is described in the applicant's mining plan for use in dry holes. For wet holes, packaged or pumped emulsion explosives having appropriate water resistance can be used in place of bulk ANFO. Pumped emulsion explosives carry a higher density and weight of charge compared to use of bulk explosives. As a conservative approach, it is assumed that pumped emulsion explosives would be used. Under this assumption, the maximum potential weight of a single 26-foot charge would be around 275 pounds ($5^2 \times 1.24 \times 0.34 \times 26$).

Impacts to Neighboring Homes

Groundborne Vibration Effect at Nearby Homes

Using the maximum potential charge weight of 275 pounds assumed in this EIR (see above), a blast near the edge of the quarry closest to the nearest residence (located 600 feet northeast of the quarry) would result in peak ground motion of approximately 0.77 in/s. This would exceed the maximum ground motion threshold of 0.5 in/s identified in the significance criteria. As a result, groundborne vibration from blasting in the east end of proposed quarry would be a potentially significant impact to the nearest homes to the northeast, unless the charge weights were reduced in this area.

Air-overpressure and Flyrock Control

In the applicant's Mining and Reclamation Plan, air-overpressure is proposed to be limited to 130 dBL, which is less than the 133-dBL limit recommended by the US Bureau of Mines. In this case, intensities of air-overpressure (blast noise) for 5-inch charges, stemmed with at least 8 feet of crushed stone stemming, would not exceed 122.5 dBL at the nearest residences (see Appendix F-1, Section 3.4). Using eight-feet of crushed stone stemming to confine 5-inch charges would also assure that excessive rock movement (flyrock) would not occur and the improved charge confinement would limit gas-pressure losses, which would improve overall rock fragmentation.

The onset of potential air-overpressure damage (broken or loosened glass window panes) would not occur unless air-overpressure exceeded 145 dBL. In real pressure terms, the expected air-overpressure level of 122.5 dBL would generate a pressure of 0.00387 psi, which is 13.4 times lower than the 0.052-psi pressure at 145 dBL. Using stemming controls, and consistently measuring air-overpressure with intensities less than the proposed 130-dBL limit at nearby structures, no damage or annoyance would result from blast-induced air-overpressure.

Impact to Buried Pipes or Utilities at Nearby Homes

Presuming that pipes and other utility lines are located at or near the closest residence located 600 feet northeast of the proposed mining area, peak ground motion in ground near utilities for blasts where charges would be sized to meet a minimum scaled distance of 65, would likely not exceed 0.30 in/s [$240(65)^{-1.6}$]. Motion of this intensity would be far below the cautious 5.0-in/s-limit recommended by the US Bureau of Mines (RI 9523) to expressly protect buried pipes of any construction and condition. Therefore, blasting vibrations would have a less than significant impact on buried pipes or utilities.

Impacts to the Roblar Road Landfill

Concern may be expressed that blast-induced vibration could influence the ground beneath and adjacent to the landfill cells with the adjacent closed Roblar Landfill. The closest waste cell of the Roblar Landfill to the edge of the proposed quarry is approximately 400 feet.

Blast induced ground motion in ground above, below, and surrounding the waste cells, at a distance of 400 feet would be around 1.5 in/s. It is important to note that at closer distances, the frequency of ground vibration would be relatively high, which is important because elastic ground displacement is inversely proportional to frequency. In perspective, the landfill site was subject to the 1989 Loma Prieta quake that created motions and displacements many times greater than those that would be caused by blasting proposed by the project. For comparison, peak motions exceeding 13 in/s at frequency of 1 Hz were caused by the Loma Prieta Quake at nearby monitoring locations. Assuming motions at this site were only 5.0 in/s at 1 Hz, the peak ground displacement would have been around 0.8 inches [$5 / (2 \times 3.14 \times 1) = PPV / (2 \times \pi \times f)$]. Blast motions caused by point-source charges, at a distance of 400 feet would occur at a frequency of 30 Hz and probably much higher. At a peak particle velocity of 1.5 in/s, the peak elastic ground displacement would be around 0.008 inches, which is approximately 100 times less than the movement the fill-site survived during the Loma Prieta Quake. Hence, at an assumed charge weight-per-delay of 275 pounds, it is extremely unlikely that blast-induced ground motion would result in any impact on the existing buried waste cells or on the ground around them.

Leachate pipes and/or water quality monitoring wells on the landfill property are located as close as 350 to 400 feet of the edge of the quarry. If charge-per-delay is limited to ensure peak particle velocities do not exceed 5.0 in/s at these pipes and wells, it is unlikely that any damage would occur. At the closest distance of 350 feet, the maximum charge allowed to ensure ground motion of 5.0 in/s would not be exceeded would be over 900 pounds. However, this would not occur because much smaller charges would be needed to ensure with the much smaller PPV limits that

would apply to the residential homes. Hence, due to the residential vibration requirements, ground motions at the wells and leachate pipes would be far below levels of concern.

Concern may also be expressed that methane gas generated from decomposing waste might be transmitted through rock crevices and create a threat of potential gas-explosions. The applicant has indicated that drill holes would be monitored with a methane gas detection device in the area of the old landfill cells, although no distance or minimum methane limits were defined. It should be noted that controls were previously developed for blasting at a quarry conducted near the Central Landfill. For that blasting (which at times was conducted within 50 feet of waste fill locations), methane monitoring was required for all blastholes within 1,000 feet of waste filled areas.

Standard testing devices, like those commonly used in underground coal mines or gassy mines, can be used to perform this testing. If blastholes intersect methane gas pockets or formations that produce methane, these test instruments can accurately detect its presence. Since concentrations of methane in air that are combustible range from 4 to 15%, it would certainly be safe and reasonable to allow blasting when measured levels of methane do not exceed the 0.1 percent minimum trace level allowed to escape to the air by the Bay Area Air Quality Management District. Moreover, since natural concentrations of methane are not expected in the Franciscan sandstone formations, methane monitoring could be done at the collars of blastholes closest to the existing buried waste areas. For the project site, it is extremely unlikely that methane above the proposed 0.1 percent limit would be detected in any drilled holes. However, for caution it would be reasonable to test methane at hole-collars of six holes drilled closest to the Roblar landfill property for all blasts located within 1,500 feet of the existing waste storage cells.

Impact to Earthen or Rock Slopes Adjacent to Roblar Road

Concern may be expressed that blast-induced vibration may cause liquefaction of soils in slopes adjacent to Roblar Road. This occurrence would be extremely unlikely because at the closest distance of 1,200 feet between blast areas and the slopes, and the assumed maximum charge-per-delay of 275 pounds, the scaled distance would be $66.3\text{-ft-lb-}0.5$ ($1,100 / 275 ^ .5$), which would exceed the liquefaction threshold level of $10\text{-ft-lb-}0.5$ by more than a factor of more than six times. This would therefore be a less-than-significant impact.

Mitigation Measure G.3a: The blasting plan shall ensure that ground motions do not exceed 0.5 in/s at the nearest residence. The nearest residence would be located about 600 feet northeast of the proposed mining area where rock-blasting operations might occur. To ensure that the intensity of ground motion in this location would not exceed the 0.5 in/s limit, all blasting in the eastern edge of the proposed quarry shall be designed to assure that charges are sized to maintain a scaled distance (Ds) of 65 or greater (see Appendix F-1 in the EIR). With this limitation, maximum cumulative weight of any charges firing within any 8-milliseconds time period shall not exceed 85.2 pounds $[(600/65)^2]$. This limitation would be achieved if the applicant used delay-decked charges in 5 inch holes or reduced hole-size or the height of benches. For practical blasting purposes, the single charge in a 34-foot hole could be separated into two or three individually delayed charges, separated by stemming, to ensure the maximum charge weight-per-delay in 5-inch holes is appropriate for vibration control.

Mitigation Measure G.3b: The applicant shall conduct monitoring of ground vibration and air-overpressure at a minimum of two locations to ensure these effects remain under threshold levels. One location should be close to the nearest residential property. The second monitoring point should be the adjacent landfill property. All monitoring equipment and practices shall conform with the standards developed by the Vibration Section of the International Society of Explosive Engineers (see Attachment 1 in Appendix F of this EIR).

Mitigation Measure G.3c: Blasting shall be limited to daytime hours between 10:00 am. and 4:00 p.m.

Mitigation Measure G.3d: A blasting permit shall be obtained from the Sonoma County Sheriff's Department prior to any blasting.

Mitigation Measure G.3e: Discuss the blast monitoring program with the residents in the project area. Educate property owners as to what is being done and why. Obtain information on time periods that are sensitive to blast activity.

Mitigation Measure G.3f: Conduct a pre-blast survey to determine the condition of existing structures, and to alert homeowners that some rattling may be expected but damage is not expected. Contacts should be provided so that damage claims and complaints can be monitored and responded to quickly.

Mitigation Measure G.3g: Schedule blasts to occur at approximately the same time on each blast day. Include this information in public announcements.

Significance after Mitigation: Less than Significant.

Impact G.4: Traffic associated with operation of the project would result in an increase in cumulative noise levels on roadways used to access the quarry. This would be a potentially significant impact.

To determine cumulative noise increases, existing noise levels in Table IV.G-3 were compared to total cumulative noise levels that would occur under the Long-term Base Plus Project conditions (i.e., existing plus background traffic increases plus project). Under this comparison, roadway Segments 2, 3, 6 and 7 have a cumulative increase of greater than 3 dBA. The project contribution is cumulatively considerable for Roadway Segment 2 (Roblar Road between project entrance and Valley Ford Road) and Segment 3 (Valley Ford Road between Roblar Road and Pepper Road) because of the project further increases Long-term Base levels by more than 1 dBA. The project contribution is less than cumulatively considerable for Roadway Segments 6 and 7 because the project would raise Long-term Base levels by less than 1 dBA, and increases less than 1dBA cannot be perceived.

It should be noted that the Sonoma County Aggregate Resources Management Plan (ARM Plan) and EIR identified cumulative noise to be potentially significant where residences, schools, or other noise-sensitive uses are close by to busy haul routes in rural areas. When the ARM Plan was adopted, the Board of Supervisors made a Statement of Overriding Considerations for this significant and unavoidable impact.

Mitigation Measure G.4: Implement Mitigation Measure G.2 for the two residences on Roblar Road between project entrance and Valley Ford Road.

Significance after Mitigation: As discussed in Mitigation Measure G.2, this measure would require approval of the property owners to make the residential noise insulation upgrades.

It should also be noted that the because of the topography and setting traditional means of traffic noise abatement on project haul routes such as road side barriers is not viable. As a result the impact would remain Significant and Unavoidable as concluded in the adoption of the ARM Plan.

References – Noise

- Barry, T.M. and J.A. Regan. FHWA Highway Traffic Noise Prediction Model. Report No. FHWA-RD-77-108. Washington, DC: Federal Highway Administration, December 1978.
- Caltrans, Technical Noise Supplement, 1998.
- Cunniff, Patrick, *Environmental Noise Pollution*, 1977.
- Revey Associates, Inc., *Assessment of Rock Blasting Impacts and Recommended Practices for Proposed Roblar Road Quarry Sonoma County, California*, November 2006.
- Sonoma County, *General Plan*, 1989, as amended.
- Sonoma County, *Canyon Rock Quarry Expansion Project Environmental Impact Report*, certified June 2006.
- U.S. Environmental Protection Agency, Bolt, Beranek, and Newman, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, 1971

H. Hazardous Materials

Introduction

This section discusses existing conditions at the project site, and the potential public health and environmental issues related to storage, use or accidental release of potentially hazardous materials from the project and project site, and worker safety. All potential hazardous materials issues associated with the adjacent, closed Roblar Landfill, including monitoring and maintenance activities, and associated groundwater or surface water quality effects, are discussed in Section IV.C, Hydrology and Water Quality. Potential impacts associated with wildland fires and effects on fire protection services are discussed in Section IV.J, Public Services and Utilities. Furthermore, all potential effects on air quality associated with the project (including air toxics) are addressed in Section IV.F, Air Quality.

Setting

Hazardous Materials Background and Current Site Conditions

Project Site

Site Description

The project site is largely undeveloped, and is currently leased for livestock grazing. The site contains a ranch, including several outbuildings and an unoccupied residence near the southwest corner of the site. A small stock pond is located on the east side of the site. There are two water wells on-site, located in the northeast and central-east portions of the site. An on-site septic system previously served the ranch house; this septic system was upgraded in 2007 by the project applicant. Electrical lines extend to the project site from Roblar Road. The project site does not currently contain any known above ground or underground storage tanks.

Nearby Properties

The closed Roblar Landfill is located adjacent to and north of the project site. As part of the County's Stormwater Pollution Prevention Plan (SWPPP) for the landfill, the Sonoma County Department of Transportation and Public Works – Integrated Waste Division (DTPW-IWD) routinely tests surface water quality at the landfill, and submits quarterly reports to the Regional Water Quality Control Board (RWQCB). Since the Roblar Landfill is unlined, leachate is routinely removed from the landfill via an on-site leachate collection system, and transported to the Santa Rosa Treatment Plant. This leachate is routinely tested for potential hazardous constituents. In 2004 and 2005, the Sonoma County DTPW-IWD voluntarily conducted groundwater monitoring at the three existing groundwater wells located on the landfill site. Additional details on monitoring conducted at the landfill are presented in Section IV.C, Hydrology and Water Quality.

Other nearby land uses to the project site include livestock grazing, dairies and agricultural residential lots.

Hazardous Materials Sites Databases

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. Government Code section 65962.5 requires the California Environmental Protection Agency (Cal-EPA) to develop at least annually an updated Cortese List. A number of State and local government agencies are required to provide additional hazardous material release information for the Cortese List.

Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. These include State Response and/or Federal Superfund sites, and Backlog sites listed under Health and Safety Code section 25356, as well as Certified with Operation and Maintenance sites. Other applicable databases include, but are not limited to, the State Water Resources Control Board (SWRCB) Leaking Underground Storage Tanks list (LUST) and Spills, Leaks, Investigations, and Cleanups Report (SLIC).

The project site is not listed on any applicable databases which compose the Cortese List. The adjacent landfill property is, however, on the SLIC report; please see Section IV.C, Hydrology and Water Quality for additional information.

Regulatory Setting

Definitions

Hazardous Materials

Hazardous materials are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into the following four categories, based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases).¹ Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications, as well as in residential areas to a limited extent.

Hazardous Waste

A hazardous waste is any hazardous material that is discarded, abandoned, or is to be recycled. Hazardous materials and wastes can result in public health hazards if released to the soil, groundwater, or air.

Cal-EPA DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. In unincorporated Sonoma County, investigation or remediation of releases from underground or aboveground petroleum storage tanks are performed under the direction of the local oversight agency (LOP). The Sonoma County Department Health Services, Environmental Health Division is the LOP for the area of the project site. Other types of

¹ Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Article 3.

hazardous substance release sites may be overseen by the LOP with proper notification and authorization from the RWQCB, North Coast Region, and the DTSC.

Regulatory Framework

Hazardous Materials Management

Numerous local, State, and Federal laws and regulations regulate the use, storage, and disposal of hazardous materials, including management of contaminated soils and groundwater. The United States Environmental Protection Agency (U.S. EPA) is the Federal agency that administers hazardous materials and waste regulations. State agencies include the Cal/-EPA, which includes DTSC, the North Coast RWQCB, the California Air Resources Board (CARB), and other offices. The Bay Area Air Quality Management District (BAAQMD) has jurisdiction over the air basin that includes the project site. Local regulatory agencies include the Sonoma County Departments of Health Services and Emergency Services. A description of agency jurisdiction and involvement in management of hazardous materials is provided below.

U.S. EPA. The U.S. EPA is the Federal agency responsible for enforcement and implementation of Federal laws and regulations pertaining to hazardous materials. The legislation includes the Resource Conservation and Recovery Act of 1986 (RCRA), the Superfund Amendments and Reauthorization Acts of 1986 (SARA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). The Federal regulations are primarily codified in Title 40 of the Code of Federal Regulations (40 CFR). The U.S. EPA provides oversight and supervision for site investigations and remediation projects, and has developed land disposal restrictions and treatment standards for the disposal of certain hazardous wastes.

California DTSC. The California DTSC works in conjunction with the U.S. EPA to enforce and implement specific laws and regulations pertaining to hazardous wastes. The California legislation, for which DTSC has primary enforcement authority, includes the Hazardous Waste Control Act and the Hazardous Substance Account Act. Most State hazardous waste regulations are contained in Title 22 of the California Code of Regulations (CCR). The California DTSC generally acts as the lead agency for soil and groundwater clean up projects, and establishes clean up and action levels for subsurface contamination that are equal to, or more restrictive than, Federal levels.

North Coast RWQCB. The project site is located in the jurisdiction of the North Coast RWQCB. The RWQCB is authorized by the California Porter-Cologne Water Quality Act of 1969 to implement water quality protection laws. The RWQCB provides oversight for sites where the quality of groundwater or surface waters is threatened, and has the authority to require investigations and remedial actions.

CARB and the BAAQMD. The project site is in the Bay Area Air Basin. The CARB and BAAQMD have joint responsibility for developing and enforcing regulations to achieve and maintain State and Federal ambient air quality standards in the district. CARB is responsible for enforcing the Clean Air Act and California's State Ambient Air Quality Standards. BAAQMD is responsible for regulating air emissions from stationary sources, monitoring air quality, and

reviewing air quality issues in environmental documents. The Air Quality section of this EIR (Section IV.F) further describes the responsibilities of CARB and BAAQMD, air quality conditions in the Bay Area Air Basin, and potential air quality impacts associated with the proposed project.

Local Hazardous Materials Management. The primary agencies responsible for local enforcement of State and Federal laws controlling hazardous materials management include the Hazardous Materials Division (HMD) of the Sonoma County Department of Emergency Services (SCDES) and the Environmental Health Division (EHD) of the Sonoma County Department of Health Services (SCDHS). SCDES is a Certified Unified Program Agency (CUPA), the local agency responsible for coordination of hazardous waste generator programs, underground fuel tank management, tiered permitting process for waste treatment, and administering the Hazardous Materials Business Plan program. SCDHS is responsible for management of leaking underground storage tank site investigation and cleanup.

Businesses that store, handle, or dispose of hazardous materials must submit a Hazardous Materials Business Plan (business plan) in accordance with the California Health and Safety Code Section 25504. The business plans must be updated every two years or within 30 days after a substantial change in site operations. The business plan must:

- List all the hazardous materials stored at a site
- Identify emergency response procedures for spills and personnel
- Identify evacuation plans and procedures
- Identify training records for personnel to substantiate annual refresher training

If hazardous materials are used or stored at a site, all employees are also required to receive hazard communication training. The purpose of the training is to ensure that employees understand the nature of the hazardous materials that they handle and can safely use, store, and dispose of the materials in accordance with Title 8, CCR. The hazard communication standard requires that employers must:

- Prepare an inventory of hazardous materials
- Make Material Safety Data Sheets available to employees
- Conduct employee training on chemical hazards and safe handling of materials
- Ensure that hazardous material containers are properly stored and labeled

Inspections of businesses that store hazardous materials are performed by SCDES. The hazard communication requirements are enforced by the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA).

Worker Health and Safety. Worker health and safety is regulated at the Federal level by the Federal Department of Industrial Relations. Worker health and safety in California is regulated by Cal/OSHA. California standards for workers dealing with hazardous materials are contained in Title 8, CCR, and include practices for all industries (General Industry Safety Orders), and specific practices for construction, and hazardous waste operations and emergency response. Cal/OSHA conducts on-site evaluations and issues notices of violation to enforce necessary improvements to health and safety practices.

Sonoma County Surface Mining and Reclamation Ordinance

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. The following sections from the ordinance are applicable to the proposed project:

Sec. 26A-09-010. General Standards for Mining Permit and Operations

- f) *Hazardous Materials.* All operations shall manage hazardous materials and hazardous wastes in compliance with the requirements of the Uniform Fire Code, the Uniform Building Code, the County Public Health Department, local fire protection agencies, the Regional Water Quality Control Board, the California EPA, and either the Northern Sonoma County Air Pollution Control District or the Bay Area Air Quality Management District as applicable. Hazardous materials and wastes are to be removed from all mining areas within the 100-year flood plain by November 1 of each year. Each mining site where hazardous materials are used or hazardous wastes are stored is required to have a Spill Prevention and Countermeasure Plan.

Sec. 26A-09-040. Quarry Mining Standards

- (h) *Use of Explosives.* No blasting shall be used except as authorized by the use permit. Blasting activities shall be conducted by a qualified licensed blasting professional in compliance with State blasting regulations. Blasting permits shall be obtained from the Sonoma County Sheriff's Department. Blasting operations shall be designed to minimize adverse noise and vibration impacts on offsite residential areas. Permits may be conditioned to require notice to immediate neighbors prior to blasting.

Impacts and Mitigation Measures

Significance Criteria

The CEQA *Guidelines* provide standards for determining whether the effects of a potential impact should be considered significant. Appendix G of the CEQA *Guidelines* provides that a project may be deemed to have a significant impact if it would:

- Create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;

- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
- Result in a safety hazard for people residing or working in the project area (for a project located within the vicinity of a private airstrip or 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);
- Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan; or

As discussed in the Setting, the project is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Furthermore, the project site is not located within the vicinity of a private airstrip or public airport, nor within one-quarter mile of an existing or proposed school. Consequently, the project would have no impact to these issues, and these issues are therefore not discussed further in this EIR.

This impact analysis focused on potential effects of hazardous materials associated with mining and reclamation activities. All potential hazardous materials issues associated with the adjacent, closed Roblar Landfill, including monitoring and maintenance activities, and associated groundwater or surface water quality effects, are discussed in Section IV.C, Hydrology and Water Quality. Potential impacts associated with wildland fires and effects on fire protection services are discussed in Section IV.J, Public Services and Utilities. Furthermore, all potential effects on air quality associated with the project (including air toxics) are addressed in Section IV.F, Air Quality.

Impact H.1: Hazardous materials transported or used onsite during proposed mining and reclamation activities (i.e., petroleum products, blasting materials) could be spilled or otherwise released through improper handling or storage. This would be a potentially significant impact.

Proposed mining and reclamation activities may involve the use of certain hazardous substances and/or petroleum products. Inadvertent release of these materials could result in adverse impacts to soil, surface water, and/or groundwater. However, the onsite storage and/or use of large quantities of materials capable of impacting soil and groundwater are not typically required for a project of the proposed size and type. The implementation of appropriate best management practices is required pursuant to existing permits (e.g., National Pollutant Discharge Elimination System and Hazardous Materials Business Plan permits for mining and reclamation activities).

The potential impact of releases of hazardous materials at mining sites was evaluated in the Program EIR for the Sonoma County Aggregate Resources Management Plan (Impact 8.16-1). The impact analysis determined that adherence to existing federal, state, and local laws and regulations would reduce the potential impact of releases of hazardous materials to a less-than-significant level. The mitigation measure (Mitigation Measure 8.16-1) specifically referenced adherence to the requirement that a Spill Prevention, Control and Counter Measure Plan (SPCCMP) be prepared for mining operations.

No explosives would be stored on site. However, blasting materials would occasionally be transported and used at the quarry, and this could be considered potentially hazardous. However, the transport of blasting materials to the site is restricted by the California Highway Patrol to pre-approved routes, and all explosive transport vehicles must satisfy all the stringent vehicle standards as required by the Federal Department of Transportation. Once explosives enter the site, their transportation and use is regulated by the Federal Occupational Safety Administration and by Cal OSHA. All blasting would be conducted in compliance with applicable federal and State blasting regulations. Blasting would be conducted by a qualified blasting expert pursuant to a blasting plan. The blasting plan would contain a complete description of clearing and guarding procedures; descriptions of how explosives will be safely transported and used at the site; evacuation, security and fire prevention procedures; blasting equipment list, and procedures for notification of nearby receptors. In the area of the closed landfill, drill holes would be monitored by as gas detection device for methane gas. With compliance with existing regulations, the potential project hazards related to the transport, storage, and use of blasting materials on site, as well as any potential project contribution to cumulative hazards, is considered mitigated to a less-than-significant level.

Mitigation Measure H.1a: Prior to initiation of the project, the applicant shall prepare a Spill Prevention, Control and Counter Measure Plan (SPCCMP) in conformance with the requirements of the Code of Federal Regulations 40CFR112. A copy of the SPCCMP shall be submitted to the Sonoma County Department of Emergency Services to demonstrate completion of the mitigation.

Mitigation Measure H.1b: If hazardous waste is generated or stored, then the operator shall comply with hazardous waste generator laws and AB2185 requirements and obtain a permit or approval from the C.U.P.A. or the participating agency. The applicant shall submit a copy of a current permit to the Permit and Resource Management Department Health Specialist to verify compliance.

Mitigation Measure H.1c: All hazardous waste materials shall be stored, handled and managed in accordance with the approved site plan and hazardous materials plan so as to reduce the potential for any spillage.

Mitigation Measure H.1d: No soil or other material containing hazardous or toxic waste shall be imported to the quarry.

Significance after Mitigation: Less than Significant.

References – Hazardous Materials

California Code of Regulations, Title 22 and Title 23, as amended.

California Department of Toxic Substances Control website, <http://www.dtsc.ca.gov>.

Sonoma County, *Aggregate Resources Management Plan and Environmental Impact Report*, 1994.

Sonoma County, *General Plan*, 1989, amended through 1998.

Sonoma County, *Chapter 26- Zoning Ordinance*, revised through December 1993.

State Water Resources Control Board website, <http://www.swrcb.ca.gov/>.

I. Aesthetics

Introduction

This section discusses the existing visual character of the project site and views of and from the site, and analyzes the potential for the proposed project to affect existing site character and views. Information for the discussion and subsequent analysis is drawn from a site visit and project plans. This section also describes the visual context of the project site and identifies policies from the Sonoma County General Plan relevant to protection of aesthetic landscape resources and to visual impact assessment pursuant to CEQA.

Setting

Project Site Characteristics

Site Location

A topographic map of the project site and vicinity, indicating a number of viewpoint locations, is presented in Figure IV.I-1. The project site is located on an approximate 200-acre parcel at 7601 Roblar Road in southern Sonoma County, approximately five miles west of the City of Cotati. The project site is bounded on the north by Roblar Road and the County-owned, closed Roblar Landfill, on the west by Roblar Road, on the south by a tributary of Americano Creek (named Ranch Tributary in this EIR), and on the east by privately-owned land.

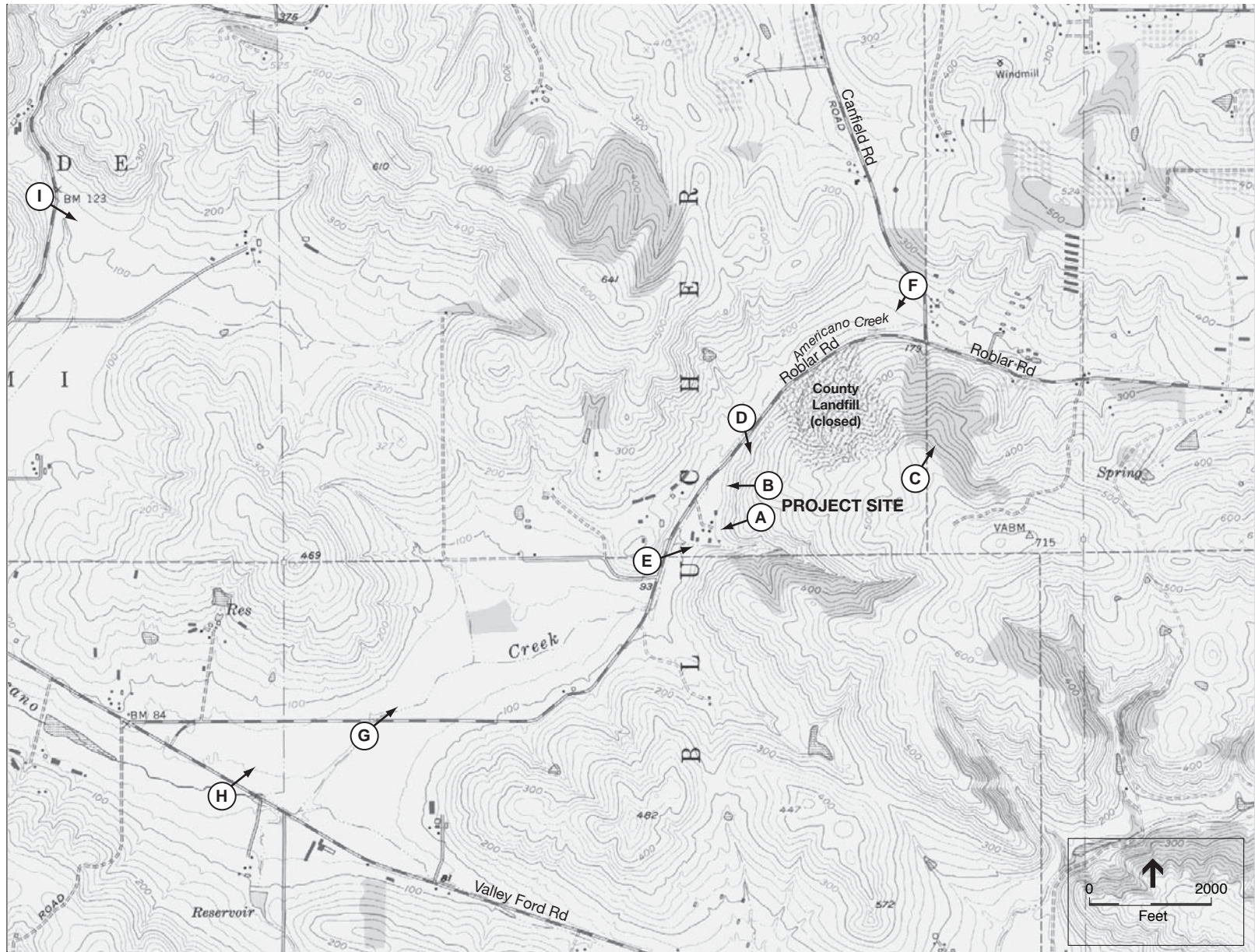
Landform

Geographically, the project site is located within a long east-west trending valley that extends roughly between Cotati to the east and Bodega Bay to the west. The meandering Americano Creek forms the low point within this valley, with rolling hills rising on either side. In the project vicinity, the valley and Americano Creek trend in a northeasterly-southwesterly direction, with the project site located on the valley's southeast slopes. Landforms on and in the vicinity of the project site are generally curvilinear and irregular in outline and gently rounded as forms.

The project site elevation varies and, depending on the location, slopes on the site are north, west or southward facing. Elevations on the site range from approximately 110 feet asl along the property boundary adjacent to Roblar Road to approximately 600 feet asl at the site's highest point (the southeast corner). Slopes throughout the site range from approximately 10 to 30 percent. The project site is generally unaltered and within its natural state, with the exception of the developed farmhouse area.

Vegetation

The project site is largely undeveloped and characterized by vegetated sloping hillsides supporting cattle grazing. On-site vegetation consists primarily of annual grasslands, with remnants of oak woodland in the northeast portion of the site, a seasonal wetland area on the valley bottom adjacent to Americano Creek in the southwest corner of the site, and riparian



SOURCE: USGS

Roblar Road Quarry . 204334
Figure IV.1-1
Viewpoint Location Map

vegetation located along the drainages on and adjacent to the site. Three small seasonal drainages located on the site flow southwesterly to the Ranch Tributary along the property's south border, and ultimately to Americano Creek.

In visual terms, the existing vegetation constitutes a pattern of broad expanses of grass interspersed with stands of shrubs and trees. The grassy expanses are usually fine-textured and exhibit marked seasonal color changes from verdant greens in spring to golden browns in late summer and fall. The stands of evergreen oak contrast in form and color with the grasslands, particularly as the grasses dry and turn brown in the summer. Water courses are marked in places by deciduous and evergreen trees.

On-Site Land Uses

Existing development on the project site is concentrated within the southwest portion of the site, with the remainder of the site undeveloped as noted above. The site contains a ranch that consists of a barn and several small buildings and an unoccupied residence near the southwest corner of the site (see Viewpoint A in Figure IV.I-2). These buildings are single-story structures with simple rectangular forms and wood siding and metal or shingled roofs. This developed portion of the site is also at the lowest elevation, with the site sloping upward to the east. Vehicular access to the ranch is provided from Roblar Road near the southwest corner of the site. A small stock pond is located on the east side of the project site. Unpaved roadways on the site provide internal access between the access point at Roblar Road, the ranch, the adjacent closed landfill, the stock pond, and the upper (eastern) reaches of the project site. Two water wells are currently located on-site, one in the northeast and the other in the central-east portions of the site.

Project Vicinity

The project site vicinity is largely undeveloped, characterized by agricultural uses and low-density, dispersed residential uses. Nearby properties to the north, west and south are generally comparable in size to the project site, and typically consist of grazing lands and single-family residences. To the west of the project site, across Roblar Road, there is a single-family residence and various structures associated with agricultural uses (see Viewpoint B in Figure IV.I-3). Immediately northeast of the project site is a cluster of single-family residences down slope from the site. Additional agricultural structures and single-family residences are located on nearby hillsides (see Viewpoint C in Figure IV.I-4).

The northern boundary of the project site abuts the closed Roblar Landfill. The adjacent, closed Roblar Landfill is primarily undeveloped. In the community of Roblar, east of the site along Roblar Road, there are a series of rural residential properties, generally on smaller lots than in the immediate project vicinity. Also located in Roblar is Dunham Elementary School and limited commercial uses.

Viewpoints of Project Site

The project site is visible from public vantage points, primarily roadways, and from private property. Depending on vantage point and distance from project site, the views from public



Figure IV.I-2 - Viewpoint A: Looking southwest from project site towards Roblar Road (site's ranch buildings in foreground)



Figure IV.I-3 - Viewpoint B: Looking west from project site towards Roblar Road and existing off-site development



Figure IV.I-4 - Viewpoint C: Looking northeast from east border of project site towards existing off-site development

roadways and private property may range from a glimpse of the upper portions of the site to a more complete view of the site's sloping hillsides.

Roadways providing varying degrees of visibility of the site include Roblar Road, Valley Ford Road, Canfield Road, Bloomfield Road and Burnside Road. Three of the roadways in the project site vicinity - Valley Ford Road to the southwest of the site, and portions of Burnside Road and Bloomfield Road to the northwest of the site - are identified in the General Plan as scenic corridors, and are discussed further under the Regulatory Setting.

For the purposes of this analysis, views of the site can be categorized as short-range (views from points adjacent to the site) and long-range (views from points over one-quarter mile from the site). The following describes views of the project site in both categories, with "existing" photographs of the site taken in January and February of 2006 included to assist in the understanding of existing conditions (see Viewpoints D through I in Figures IV.I-5 through IV.I-10). Figures IV.I-6, IV.I-8 and IV.I-9 also serve as the selected viewpoints for visual simulations, developed to facilitate visualization of various stages of the proposed quarry operations (see Impacts section).

Short-Range Views

The project site is visible from certain short-range vantage points on private property and from public roads adjacent to the site, including Roblar Road adjacent to the site, and Canfield Road to the north and perpendicular to Roblar Road. The project site is adjacent to Roblar Road from which views of the lower portions of the site are available, but where the upward slope of the hillside limits other views of the site (see Viewpoint D in Figure IV.I-5). These short-range views are dominated by on-site vegetation, primarily annual grasslands interspersed with some trees and shrubs. Traveling along Roblar Road, the ranch and associated structures are visible interspersed with trees located on the relatively flat portion of the site, along with the sloping hillside to the east of the ranch (see Viewpoint E in Figure IV.I-6). Views of the project site from Canfield Road are largely dominated by the closed Roblar Landfill in the foreground, with views of some of the ridge and upper slopes of the project site beyond, and the western portion of the site (see Viewpoint F in Figure IV.I-7). As shown in the Figure IV.I-7, past disturbances on the Roblar Landfill site are evident, as the site is terraced and maintains minimal vegetation. Similar to views from Roblar Road, the major element in views from Canfield Road is the grasslands interspersed with shrubs and trees that are typical of the site's vegetation.

Long-Range Views

Long-range views in which the project site is visible as a distinct feature are predominantly from the southwest along Valley Ford Road and Roblar Road, although views of the site are also available to the northwest, along Bloomfield Road and Burnside Road. The site's visual patterns are similar to those in the surrounding area, and are characterized by rolling hills with annual grasslands, interspersed with clusters of trees and shrubs, and riparian vegetation along drainages. From long-range views on Roblar Road and Valley Ford Road, much of the site's west- and south-facing undeveloped hillsides are visible. Remnants of oak woodland located in the northeast portion of the site, and the riparian vegetation along the site's drainages along the south



Figure IV.I-5 - Viewpoint D: Looking south from Roblar Road towards proposed location of access road on project site



Figure IV.I-6 - Viewpoint E: Looking northeast from Roblar Road towards project site



Figure IV.I-7 - Viewpoint F: Looking southwest from Canfield Road towards closed County landfill and project site



Figure IV.I-8 - Viewpoint G: Looking northeast from Roblar Road towards project site (>1 mile away)



Figure IV.I-9 - Viewpoint H: Looking northeast from Valley Ford Road towards project site (>1 1/2 mile away)



Figure IV.I-10 - Viewpoint I: Looking southwest from Bloomfield Road towards project site (2 1/4 miles away)

boundary of the project site are also visible from these roadways (see Viewpoints G and H in Figures IV.I-8 and IV.I-9). From Bloomfield Road, views of the oak woodland and grasslands along the site’s upper elevations are available (see Viewpoint I in Figure IV.I-10).

Existing Visual Sensitivity Determination

For purposes of this study, the visual sensitivity of the project site is given a rating of low, moderate, high or maximum using the following definitions provided as part of the County’s Permit and Resource Management Department Visual Assessment Guidelines:

Sensitivity	Characteristics
Low	The site is within an urban land use designation and has no land use or zoning designations protecting scenic resources. The project vicinity is characterized by urban development or the site is surrounded by urban zoning designations and has no historic character and is not a gateway to a community. The project site terrain has slopes less than 20 percent and is not on a prominent ridgeline and has no significant natural vegetation of aesthetic value to the surrounding community.
Moderate	The site or portion thereof is within a rural land use designation or an urban designation that does not meet the criteria above for low sensitivity, but the site has no land use or zoning designations protecting scenic resources. The project vicinity is characterized by rural or urban development but may include historic resources or be considered a gateway to a community. This category includes building or construction sites with visible slopes less than 30 percent or where there is significant natural features of aesthetic value that is visible from public roads or public use areas (i.e. parks, trails etc.).
High	The site or any portion thereof is within a land use or zoning designation protecting scenic or natural resources, such as General Plan designated scenic landscape units, community separators, or scenic corridors. The site vicinity is generally characterized by the natural setting and forms a scenic backdrop for the community or scenic corridor. This category includes building and construction areas within the SR designation located on prominent hilltops, visible slopes less than 40 percent or where there are significant natural features of aesthetic value that are visible from public roads or public use areas (i.e. parks, trails etc.). This category also includes building or construction sites on prominent ridgelines that may not be designated as scenic resources but are visible from a designated scenic corridor.
Maximum	The site or any portion thereof is within a land use or zoning designation protecting scenic resources, such as General Plan designated scenic landscape units, community separators, or scenic corridors. The site vicinity is generally characterized by the natural setting and forms a scenic backdrop for a designated scenic corridor. This category includes building or construction sites within the scenic resource designation on or near prominent ridgelines, visible slopes greater than 40 percent or where there are significant natural features of aesthetic value that are visible from a designated scenic corridor.

The project site would be considered to be of moderate visual quality overall. The project vicinity is rural and characterized by rolling hills covered predominantly by grasslands. Single-family residences as well as structures associated with agricultural use are dispersed among the hills. The project site is primarily undeveloped, consistent with nearby properties in terms of visual characteristics. The project site is visible from public roadways, including three County-designated scenic corridors. However the project site is not located within a scenic corridor setback (defined as 30 percent of the depth of the lot to a maximum of 200 feet from the centerline of the roadway), and the site’s zoning and land use designation does not identify it as a protected scenic resource. The site itself does not constitute a significant scenic or natural resource nor does it contain individual landscape or architectural features with significant aesthetics value.

Regulatory Environment

Sonoma County General Plan

The *Sonoma County General Plan* contains objectives and policies that guide development in the County. Scenic resources within the County are discussed in the General Plan Open Space Element, which divides scenic resources into three resource categories, including scenic corridors, community separators, and scenic landscape units. These resources are designated on Figure OS-2 of the Open Space Element. The project site is not located within or in proximity to any community separator areas or scenic landscape units. The project site is visible from three scenic corridors identified in the County General Plan, including Valley Ford Road, located to the southwest of the site, and segments of Bloomfield Road and Burnside Road, located to the northwest of the site (see Figure IV.I-11). However, the project site is not located within a scenic corridor setback. Scenic corridors are defined by the General Plan as “a strip of land of high visual quality along a certain roadway (p. 408).”

Petaluma Dairy Belt Area Plan

The Petaluma Dairy Belt Area Plan was adopted in 1985, and revised in 1993. The Petaluma Dairy Belt area is located in south and southwestern Sonoma County, along the Marin County border. Area plan goals as they relate to visual resources that are pertinent to the proposed project and project site include Scenic Resources Goal No. 1, which states it shall be the goal to protect and maintain the area’s diverse scenic resources; and Policy (e), which states new development should be reviewed to minimize their impact on scenic quality.

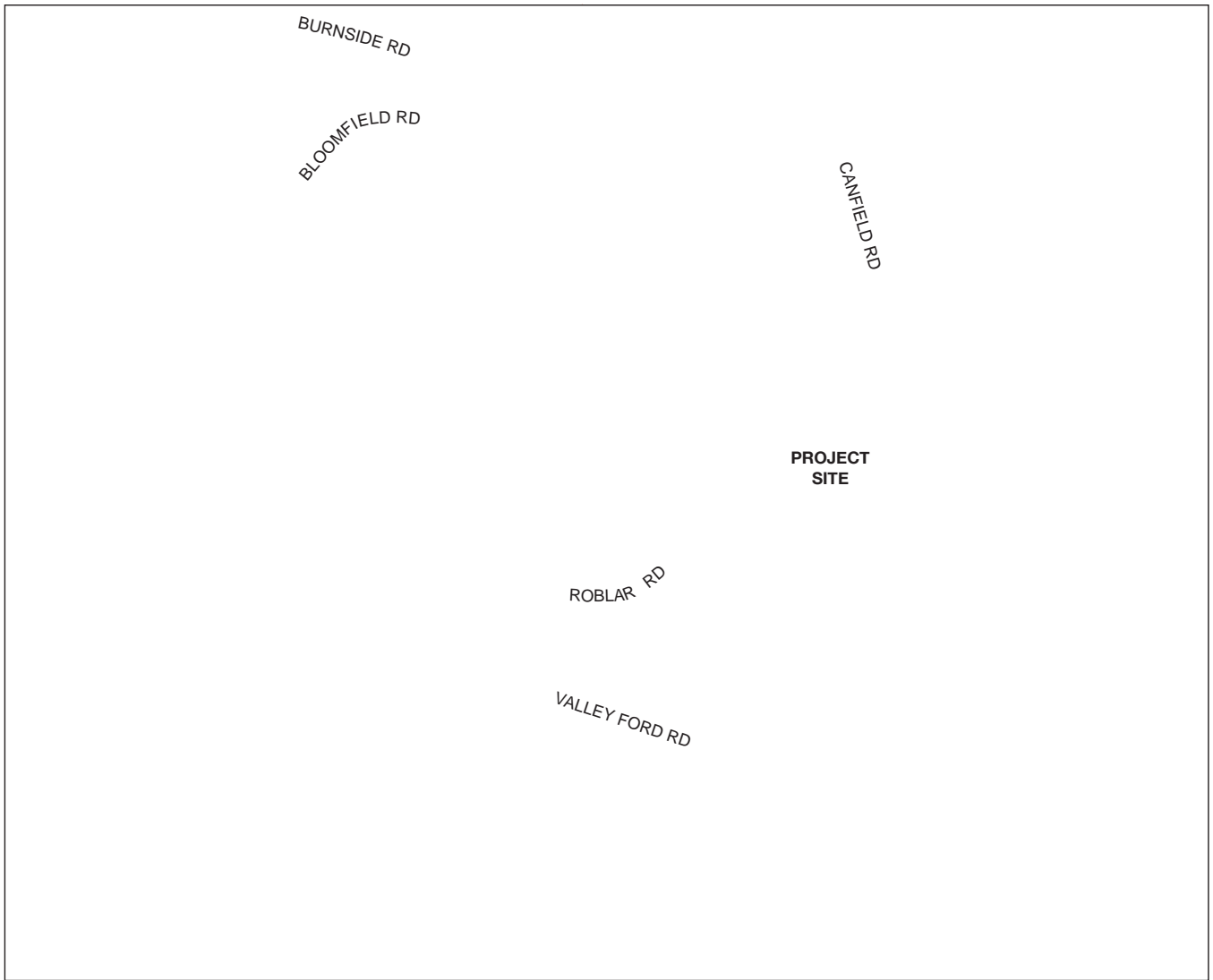
Sonoma County Surface Mining and Reclamation Ordinance

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the SMARA and the Public Resources Code by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan. The following sections from the ordinance are applicable to visual effects of the proposed project:

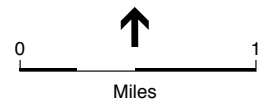
Sec. 26A-09-010. General Standards for Mining Permit and Operations

- l) *Sight Regulations.* Provisions shall be made where practical for buffering, berming, and visual screening between the operation and an adjacent public street right-of-way, public uses such as schools, parks, golf courses, and other such public uses determined to be visually sensitive by the County. Special provisions for screening may be required for operations in designated scenic areas or within three hundred (300) feet of a designated scenic corridor. The height and type of such screening shall be set by the permit.

- q) Night lighting shall be located and designed to minimize off-site glare.



— Scenic Corridor in Sonoma County General Plan



SOURCE: ESA and USGS

Roblar Road Quarry . 204334

Figure IV.I-11
Scenic Corridors in Project Vicinity

Sec. 26A-09-040. Quarry Mining Standards

- b) *Visibility.* To the extent feasible, quarry sites shall be screened visually from public roads and uses with topographic features, berms, shrubs and trees native to the area.

Sec. 26A-11-040. Reclamation of Quarries

- c) *Revegetation.* Quarry sites shall be reclaimed and revegetated with planting grass mixtures approved by the Soil Conservation Service and with shrubs and trees native to the area. Mining activities shall be planned so that reclamation is an ongoing activity, thus shortening the duration of habitat loss. Slopes and benches shall be regraded and have soil added as necessary to the surface to restore pre-existing conditions as much as possible.

Draft Sonoma County General Plan 2020

Sonoma County is in the process of updating its existing General Plan. Applicable goals and policies from the open space element of the existing general plan listed above are proposed to be carried forth into the new general plan. Note: As of publication of this Draft EIR, the Sonoma County Board of Supervisors has not yet completed their deliberations or finalized these policies.

California Scenic Highway Program and Scenic Corridor Protection Program

In 1963, the California Legislature established the State's Scenic Highway Program, intended to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq. There are no officially designated or eligible state scenic highways in the project vicinity, or which have views of the project site.

Impacts and Mitigation Measures

The existing visual character of the site and its surroundings is determined by the attributes of specific features and patterns that occur as a result of natural and/or cultural processes. Evaluation of potential project impacts on the existing visual character of the site and its surroundings requires analysis of the visual elements of the project and how those elements (separately or collectively) would affect the existing visual character of the site and views of it from off-site locations.

Significance Criteria

For the purposes of this EIR, and taking guidance from Appendix G of the CEQA *Guidelines*, impacts to the visual quality or character of a site may occur if the project would result in:

- a substantial adverse effect on a scenic vista;
- substantial degradation of the existing visual character or quality of the site and its surroundings;

- the production of substantial light or glare; or
- substantial damage to scenic resources including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway.

Sonoma County has developed the following methodology for evaluating visual impacts:

1) establish the level of visual sensitivity of the site (as described in the Setting); 2) characterize the visual dominance of the project; and 3) determine significance of the visual impact by comparing site sensitivity and the visual dominance of the project.

The visual dominance of the project is determined by comparing the contrast of the following elements or characteristics of the project with its surroundings and on that basis rating the project inevident, subordinate, co-dominant, or dominant, as described below:

Dominance	Characteristics
Dominant	Project elements are strong – they stand out against the setting and attract attention away from the surrounding landscape. Form, line, color, texture, and night lighting contrast with existing elements in the surrounding landscape.
Co-Dominant	Project elements are moderate – they can be prominent within the setting, but attract attention equally with other landscape features. Form, line, color, texture, and night lighting are compatible with their surroundings.
Subordinate	Project is minimally visible from public view. Element contrasts are weak – they can be seen but do not attract attention. Project generally repeats the form, line, color, texture, and night lighting of its surroundings.
Inevident	Project is generally not visible from public view because of intervening natural land forms or vegetation.

The significance of the visual impact is determined by comparing site sensitivity (as determined in the Setting) with the visual dominance rating of the project as follows:

Sensitivity	Visual Dominance			
	Dominant	Co-Dominant	Subordinate	Inevident
Maximum	Significant	Significant	Significant	Less than Significant
High	Significant	Significant	Less than Significant	Less than Significant
Moderate	Significant	Less than Significant	Less than Significant	Less than Significant
Low	Less than Significant	Less than Significant	Less than Significant	Less than Significant

Project Impacts

Impact I.1: The proposed quarry would substantially alter the visual character of the project site and adversely affect views of the site from both public and private vantage points. This would be a significant impact.

Viewshed Analysis

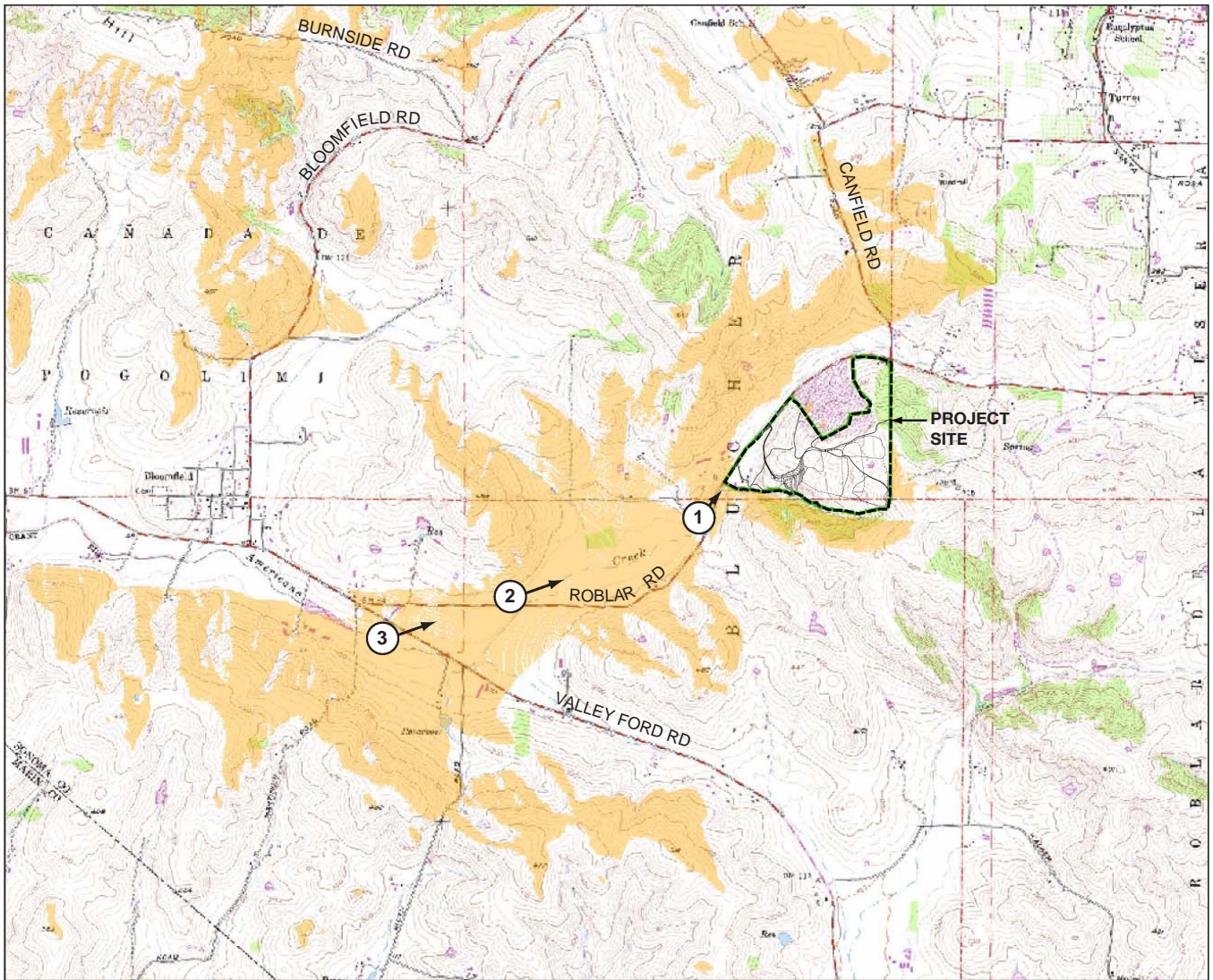
Figure IV.I-12 presents the results of a viewshed analysis that was conducted to identify areas surrounding the project site that would have potential views of any element of the proposed project features.¹ The viewshed analysis is based on topography only, and does not take into account existing (or future) established intervening vegetation, which in many cases, would further limit views of the project site and proposed project. As a consequence, the illustrated viewshed analysis provides a worst-case assessment of potential project visibility and is conservative in nature.

In summary, off-site areas that would have the most open and unobstructed views of and into the proposed quarry would be the private properties on the hills across the valley immediately west of the project site. In addition, some private properties along the valley floor that Roblar Road follows westward to Valley Ford Road, as well as certain private and public views on and adjacent to Valley Ford Road (a County scenic corridor), and some private and public properties on some hills southwest of the quarry would have views of the north and/or east quarry faces. Certain private and public properties along Burnside Road (County scenic corridor) and Bloomfield Road would also have views of the portions of the quarry, although from greater distance.² Views from the north on Canfield Road would be largely obstructed by the intervening topography of the landfill property and vegetation, and therefore, only glimpses of upper portions of the quarry may be visible from this location. The great majority of public and private areas south and east of the site would not have views of proposed quarry features, and would be completely obstructed from view from intervening topography and/or vegetation.

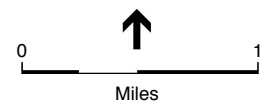
It should be noted while views of the proposed quarry would be available from Roblar Road from points west of the project site (see discussion of visual simulations, below), when traveling on Roblar Road adjacent to the project site views of the quarry features would be completely obstructed by existing site topography and the proposed setback of the quarry mine. Please refer to Figures III-6 through III-8 in Chapter III, Project Description, which show existing and proposed sight lines of the quarry from locations on Roblar Road adjacent to the project site.

¹ The viewshed analysis utilized an existing digital elevation of the project area, modified to reflect changes in the project site that would be associated with alteration of topography from the quarry, stockpiles, access road, etc. ARC-GIS software was then used to identify off-site areas that would have potential views of any elements of the proposed project features.

² While a segment of Bloomfield Road is also designated as a County scenic corridor, the project would not be visible from the portion of Bloomfield Road that is designated as such.



Areas with Potential Views of Proposed Project Features



SOURCE: ESA and USGS

Roblar Road Quarry . 204334

Figure IV.I-12

Viewshed Analysis and Photosimulation Locations

Project Visual Features

Chapter III, Project Description, provide detailed plan, profile and cross sections of the project site and proposed quarry to illustrate the alterations in the site topography that would occur under the project, and location of all new construction and equipment. The project would result in both temporary and permanent visual changes at the site through the alteration of landscape and introduction of active industrial operations. The project would strip existing vegetation and remove overburden in the footprint of the quarry to be mined each year, and leave large areas of exposed rock on the quarry face and floor while quarry mining is underway. In addition, the project would create two large stockpiles of topsoil and overburden materials; these would be largest in size during Phase 1, and decrease in size during subsequent phases. The project would also alter the existing landform by grading associated with the proposed access road, sedimentation pond, and equipment staging area. The project would also result in the installation of a mobile processing plant on the quarry floor, and various support structures (e.g., office building) and stationary and mobile equipment on the property (e.g., water storage tank, construction vehicles, new fencing).

In Phase 1, Coast redwoods are proposed to be planted in the vicinity of the proposed office, equipment storage area and parking lot and along the proposed access road to help screen views of these facilities from off-site. Coast redwoods are also proposed to be planted along the south side of Roblar Road within the project property. Ongoing reclamation would include the new planting for visual screening and erosion control, the incremental planting and maintenance of mined slopes, and the maintenance of the sediment pond. The active mining area at any one time would be limited to 30 acres. As quarrying in an area is completed, reclamation would be conducted using select fill, overburden and topsoil. Revegetation would primarily consist of hydroseed, trees and other vegetation. In addition, building (e.g., administration building) and other structures not associated with reclamation would be dismantled or demolished and removed from the site.

Visual Simulations

The adverse changes in the existing visual character of the site would affect existing short- and long-range views from off-site public vantage points as well as private vantage points. Computer-generated visual simulations illustrating “before” and “after” visual conditions at the project site as seen from representative public viewpoints are presented as part of this analysis. Digitized photographs and computer modeling techniques were used to prepare the simulation images, based on the project plans provided by the project sponsor. The intent of the simulations is to reflect the worst-case visual impacts on views; therefore the simulations illustrate those stages of the project in which the impacts to that particular view would be the greatest. The simulations also illustrate conditions prior to reclamation activities.

Comparison of Existing and Proposed Views

Short-Range View from Roblar Road: Figure IV.I-13 show existing and simulated project conditions in a short-range view of the project site (Viewpoint No. 1) several hundred feet southwest of the site on Roblar Road. In the existing view, the ranch and associated structures are



Viewpoint 1 : Existing View looking northeast from Roblar Road



Visual Simulation of Proposed Project - Phase 3

visible in the foreground, and beyond these structures, to the east and southeast, the grass-covered slopes of the project site slope upward. Trees are interspersed with the on-site ranch structures; some riparian vegetation is also visible within a portion of the Ranch Tributary riparian corridor along the south border of the site.

The visual simulation for Viewpoint No. 1 illustrates grading at the end of Phase 3 (i.e., end of 20-year life of the project), and prior to final reclamation. From this viewpoint, the portion of the skyline formed by the project site changes, as the project site's hillside has been lowered due to mining. Some of the upper area of the westward-facing slopes of the quarry pit would also be visible from this viewpoint, and would be steeper and more uniform than the existing hillslope. The trees proposed to be planted along on-site access road and equipment staging area are also visible in the visual simulation. Overall, from this viewpoint, the project would result in noticeable changes to the existing view; however, scenic resources would not be substantially affected.

Long-Range View from Roblar Road: Figure IV.I-14 show existing and simulated project conditions in a long-range view of the site (Viewpoint No. 2) approximately one mile to the southwest on Roblar Road. From this vantage point, under existing conditions, the rolling hills of the project site are similar to, and blend with, the adjacent rolling hillside. Visible features on the project site include the annual grasslands, interspersed with clusters of trees and shrubs, and riparian vegetation along drainages. Existing on-site structures are not visible from this vantage point.

The visual simulation for Viewpoint No. 2 illustrates grading at the end of Phase 1 (Year 5) of project activities. This phase was selected for a visual simulation to illustrate interim quarry operations, including some project components that would not be present by the end of Phase 3 (e.g., the two proposed stockpiles east of the quarry pit). From this viewpoint, the skyline of the project site is slightly altered by the two gently sloped stockpiles in the upper area of the project site. The quarry pit itself would not interrupt the skyline, but would represent a distinct contrast in topography and color compared to the surrounding undeveloped areas. The south- and west-facing quarry faces in the Phase 1 pit are visible in the simulation. The proposed trees to be planted along on-site access road and equipment staging area are also visible.

Long-Range View from Valley Ford Road: Figure IV.I-15 illustrates existing and simulated project conditions in a long-range view of the site (Viewpoint No. 3) approximately 1½ miles to the southwest on Valley Ford Road (a County-designated scenic corridor). Similar to views from Viewpoint No. 2, under existing conditions, the rolling hills of the project site are similar to, and blend with, the adjacent rolling hillside. Visible features on the project site include the annual grasslands, clusters of trees and shrubs, and riparian vegetation along drainages. As with Viewpoint No. 2, existing on-site structures are not visible from this vantage point.

The visual simulation for Viewpoint No. 3 illustrates grading at the end of Phase 3 (i.e., end of 20-year mining permit), and prior to final reclamation. From this viewpoint, the quarry pit would not interrupt the skyline, but would represent a distinct contrast in topography and color compared to the surrounding undeveloped areas. The south- and west-facing quarry faces in the



Viewpoint 2 : Existing View looking northeast from Roblar Road



Visual Simulation of Proposed Project - Phase 1 including stockpiles



Viewpoint 3 : Existing View looking northeast from Valley Ford Road



Visual Simulation of Proposed Project - Phase 3

SOURCE: Environmental Vision

Roblar Road Quarry . 204334

Figure IV.I-15

Viewpoint 3 without and with Project Simulation

Phase 1 pit are visible in the simulation. The proposed trees to be planted along on-site access road and equipment staging area are also visible. Since Stockpiles A and B would be removed by the end of Phase 3, they are therefore not present in the visual simulation.

Visual Impact

As discussed in the Setting, pursuant to the County PRMD *Visual Assessment Guidelines*, the project site is identified as possessing moderate visual quality. As determined in the viewshed analysis, a number of off-site public and private areas would have views of some project features, including views on and adjacent to Valley Ford Road and Burnside Road (County scenic corridors), Roblar Road, Canfield Road and Bloomfield Road, as well as from a number of vantagepoints on surrounding hillsides to the north, west and southwest. However the project site is not located within a scenic corridor setback, and the site's zoning and land use designation does not identify it as a protected scenic resource.

As illustrated in the visual simulations, the most prominent permanent alteration to the site would be the change in topography within the proposed 65-acre quarry pit. The quarry pit and mining equipment would constitute a distinctive new visual feature, creating marked contrasts in form, color and texture with existing landscape features and patterns. Specifically, the volume of the quarry pit, its shape, and the regular slope, texture and color of its cut slopes would strongly distinguish it from any existing natural or cultural features on the site or in the site vicinity. Seen against the generally rolling terrain and few, scattered farm and residential structures that provide its visual context, the quarry pit and equipment would appear dominant and intrusive in comparison. Because the site's visual sensitivity would be classified as moderate, and the project would be classified as dominant, pursuant to the County's evaluation criteria, the project's visual impact would be significant.

Adherence to standards set forth in the ARM Plan and SMARO, i.e., setbacks, revegetation/screening wherever possible, limiting the total amount of disturbed area onsite prior to final reclamation of the area, etc., would minimize visual impacts while the site is being actively mined. Furthermore, final reclamation in compliance with the ARM Plan and SMARO would return the project site to a natural state to the extent feasible.

Mitigation: Significant and Unavoidable. Even with measures proposed by the project sponsor, and implementation of conditions contained in the ARM Plan and SMARO, visual impacts would not be reduced to a level of insignificance. It should be noted the ARM Plan also identified potential visibility of mining and processing operations for mining facilities within the County as significant and unavoidable.

Impact I.2: The project could result in the production of new sources of light and/or glare. This would be a less-than-significant impact.

Typical hours of operation for the quarry would be between 7:00 a.m. and 5:00 p.m., Monday through Saturday, with most plant operations, including loading/weighing of trucks, ceasing by

4:00 p.m., and general maintenance occurring until 5:00 p.m. The proposed hours of operation would be within the allowed hours of operations per the County's mining regulations (Ordinance No. 3437), which allow quarries to operate Monday through Friday 6:00 a.m. to 10:00 p.m.; Saturday, 6:00 a.m. to 4:30 p.m.; and on Sunday, no mining or processing except as authorized.

The quarry could operate infrequently during the permitted evening hours, such as when a quarry client requires materials for a nighttime construction project. Under such circumstances, mining or crushing would not occur in the evening hours, and nighttime operations would be limited to the loading and weighing of material. During these evening operations, the quarry would use portable lights that would point downward into the processing area. The only other on-site source of light would be at the scale house to provide adequate visibility within the parking lot and scales. An arm-mounted cobra head luminaire would be installed atop a wooden pole with an automatic photo-electric control which would turn the fixture on and off. During the off-hours, the lighting would only be maintained at the scale house for security purposes.

Within the project area, existing nighttime lighting is associated with farm structures, residences, and automobiles traveling along nearby roadways and is low-intensity and dispersed. Although the project would introduce new lighting sources on the project site, illumination would be focused and shielded to prevent spillage and increases in ambient light levels.

Given the infrequent use of the evening lighting, and the setback and screening of the project site from view by topography, and distance to nearest receptors, no significant glare or spillover lighting effects are anticipated. However, consistent with County standard conditions of approval, all night lighting associated with the project would be screened to prohibit direct light or glare onto adjacent properties.

Mitigation: None Required.

Cumulative Impacts

Impact I.3: The proposed quarry, in conjunction with other cumulative development in the project vicinity, would alter the visual character of the project vicinity. This would be less-than-significant cumulative impact.

The principal other existing land use that contributes to altered landform in the project vicinity is the closed Roblar landfill. Active landfilling operations were terminated on that property in the early 1970s, and the property has since received groundcover and revegetation work.

Aside from the proposed project, there are no other reasonably foreseeable projects in the project site vicinity that would contribute to adverse visual effect. Final reclamation of the quarry site in compliance with the ARM Plan and SMARO would return the site to a natural state to the extent feasible, and accordingly serve to minimize project contribution to cumulative visual effects.

Mitigation: None Required.

References – Aesthetics

(The references cited below are available at the Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, California, unless otherwise specified.)

Sonoma County, *General Plan*, 1989, amended through 1998.

Sonoma County, *Surface Mining and Reclamation Ordinance*, December 7, 1999.

J. Public Services and Utilities

This section discusses public service and utility issues, including the proposed project's relationship to existing police, fire, park, solid waste and other applicable public service/utilities provided in unincorporated areas of Sonoma County.

Setting

Fire Protection

The project site is located within the boundary of the Gold Ridge Fire Protection District (GRFPD). The GRFPD was formed in 1993 when the Fire Districts of Hessel and Twin Hills merged, serving the communities of Hessel, Twin Hills, and Freestone. The department is made up of three full-time employees, several part-time employees, and approximately 82 volunteers. The GRFPD maintains three stations; the station nearest the project site is the Hessel Station, (Station 1), located at 4500 Hessel Road. This station responds to approximately 350 emergency calls for service a year. This station is also staffed with two part-time employees and a number of volunteer personnel. The station maintains an engine and water tender primarily used for responding to structural fires, and one Type 3 vehicle use primarily for responding to vegetation fires (Delucci, 2006). The GRFPD station of second response would be the Twin Hills Station (Station 2), located at 1690 Watertrough Road. The Twin Hills Station responds to just under 400 calls per year. Most of the time, the Twin Hills Station is staffed 24 hours a day; volunteers support the paid staff on incidents requiring additional equipment or personnel (GRFPD, Delucci, 2006).

The project site is also located within a designated State Responsibility Area (SRA)¹, for which the California Department of Forestry and Fire Protection (CDF) is primarily responsible for addressing wildfires. The CDF station nearest the project site is located at 655 Lorchman Lane in Petaluma. This CDF station maintains a minimum of 3 firefighters during the fire season (typically the end of May through the end of October), two firefighters during the non-fire season, and a Type 3 vehicle throughout the year. The CDF station of second response is located at 4150 Graton Road in Occidental. The CDF is also capable of providing other resources for firefighting wildfires, including additional fire response personnel and additional engines, as well as air tankers, helicopters, dozers and other equipment, when needed (Mickelson, 2006).

The GRFPD and CDF also maintain mutual aid agreements with the Rancho Adobe Fire Protection District, and the Sonoma County Department of Emergency Services (SCDES) Fire Division. One of the volunteer fire agencies overseen by the SCDES is the Bloomfield Volunteer Fire Department Company, whose fire district covers the Bloomfield area located west of the GRFPD boundary (Sonoma County, 2006).

¹ Section 4102 of the Public Resources Code (PRC) defines "State Responsibility Areas" as those areas of the state for which the State has the financial responsibility of preventing and suppressing fires. Under PRC Sections 4125 and 4126, these areas roughly correspond to vegetated lands that have watershed value. Lands in incorporated cities or owned by the federal government are excluded.

Police Protection

The Sonoma County Sheriff's Department provides law enforcement services to unincorporated areas of the county, including the project site. Currently the Department is comprised of over 660 employees and over 100 volunteers. The Department's law enforcement services are provided by the over 135 Deputy Sheriffs in the Patrol Bureau, 48 Deputies in its Investigations Bureau, and the 35 Deputies assigned to the Court Security and Transportation Bureaus. The Sonoma County Sheriff's Department Headquarters are located at 2796 Ventura Avenue, in Santa Rosa (Sonoma County, 2006).

The project site is located in an emergency service zone of the Department covering an unincorporated area of Sonoma County roughly bounded by the Cities of Rohnert Park/Cotati and Roblar Road to the north, the City of Petaluma and portions of Valley Ford/Pepper Roads to the west/south, and the Solano County line to the east. In 2005, there were approximately 2,200 calls for service from the Sheriff's Department to this emergency service zone. Response time for Sheriff's deputies within this emergency service zone was approximately 13 minutes (Harris, 2006).

The California Highway Patrol (CHP) provides law enforcement along all state routes within California, including Highway 116 and U.S. 101 within the project vicinity, and assist local governments during emergencies when requested. The CHP maintains local offices in Rohnert Park.

Public Parks and Recreational Facilities

Parks and publicly accessible recreation areas in unincorporated Sonoma County are under the jurisdiction of the Sonoma County Regional Parks Department. The Regional Parks Department classifies parks in Sonoma County as regional recreation areas, regional open space areas, community and neighborhood parks, trails and other lands. Regional parks and open spaces are the county's largest publicly accessible recreational areas, and are typically 200 acres or more. Community and neighborhood parks are generally 25 acres or less and are located within a 30-minute drive to the populations they are intended to serve. Other park lands include State and Federal Parks and Preserves which are areas with significant natural or cultural features and/or resources that merit preservation for public enjoyment and education. State and Federal Lands are generally preserved for residents and visitors to protect areas with scenic beauty or special habitat areas.

The project site is located within the Petaluma Environs Planning Area of the Sonoma County General Plan. The Petaluma Environs Planning Area has a total of 315 acres of parklands owned and operated by state, County and local agencies, consisting of Petaluma Adobe State Park (42 acres), Helen Putnam Regional Park (171 acres), and Bloomfield Park (3 acres) (Sonoma County, 1986).

Solid Waste Generation and Disposal

The Aggregate Resources Management (ARM) Plan calls for the Sonoma County Permit and Resource Management Department, in consultation with the Sonoma County Department of Transportation and Public Works (DTPW) to explore the ways in which recycled materials could be used to substitute for newly mined aggregate and how the County could encourage this activity. The recycled materials that would most likely be used to substitute for newly mined aggregate include recycled concrete, asphalt, and road base.

The Central Landfill, owned by the Sonoma County DTPW and operated by the Sonoma County Waste Management Authority, accepts mixed municipal solid waste, agricultural waste, construction and demolition debris, industrial waste, tires, and woodwaste. The Central Landfill currently accepts approximately 1,300 tons per day (tpd) (Monday through Friday), 600 tpd on Saturday and 300 tpd on Sundays; on an annual basis this accounts for approximately 385,000 tons per year (Wells, 2005).

In 2003, in response to groundwater releases at the Central Landfill, the North Coast Regional Water Quality Control Board (RWQCB) ordered expansion of the Central Landfill to be stopped, pending additional groundwater monitoring and identification of corrective action needs at the site. (The County had permitted landfill capacity through 2018, with additional expansion plans proposed to allow the facility to operate through 2050). The Sonoma County Waste Management Authority is evaluating short-term and long-term waste disposal alternatives for handling the County's solid waste stream. The Sonoma County Waste Management Authority is currently trucking 100 percent of materials collected at the landfill to other disposal locations for the near-term, until and if the disposal at the Central Landfill can be reinstated and the County decides whether to continue to operate the Central Landfill. The Sonoma County Waste Management Authority has negotiated agreements with a number of other waste management agencies to ensure transport and disposal of wastes from the Central Landfill through approximately 2010.

Electricity

Electrical service in the project area is provided by Pacific Gas and Electric Company (PG&E). PG&E provides natural gas and electricity to approximately 13 million people throughout a 70,000 square mile service area in Northern and Central California. Under deregulation, other companies may also provide electricity, but PG&E delivers the service.

The California Energy Commission (CEC) indicates total consumption in California in 2004 was approximately 270,930 gigawatt-hours (GWH) with a peak of approximately 66,400 megawatts (MW); in 2016, total consumption is projected to be 313,400 GWH with a peak of approximately 67,400 MW. Within the PG&E Planning area, total consumption in 2004 was approximately 101,100 GWH with a peak of approximately 20,800 MW; in 2016, total consumption is estimated to be 118,400 GWH with a peak of approximately 24,600 MW (CEC, 2005).²

² The CEC defines the PG&E Planning Area includes PG&E bundled retail customers, customers served by energy service providers using the PG&E distribution system to deliver electricity to end users, and customers of publicly owned utilities and irrigation districts in PG&E transmission system (with the exception of the Sacramento Municipal Utility District).

The California Independent System Operator (California ISO) is charged with managing the flow of electricity along the State's open market wholesale power grid. The California ISO Five-Year Assessment (2004-2008) anticipates that adequate supply will most likely be available to meet peak demands through 2008, but that there will be a continuing need for additional transmission capacity expansions to increase import levels, support new generation, and alleviate congestion.

Impacts and Mitigation Measures

Significance Criteria

According to Appendix G of the CEQA *Guidelines*, a project may be deemed to have a significant impact on the environment if it would:

- 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 to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: fire, police, or parks;
- expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.
- exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- 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;
- 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;
- be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- not comply with federal, state, and local statutes and regulations related to solid waste.

Since the project site is not currently served by public water distribution or wastewater collection infrastructure, and the project would not create a demand for public water or wastewater services, there would be no impact from the project on public water and wastewater facilities. All potential impacts to private water wells in the project area are addressed in Section IV.C, Hydrology and Water Quality. Potential effects on local stormwater collection facilities are also addressed in Section IV.C, Hydrology and Water Quality. Since there are no public parks or recreation areas located in the vicinity of the project site; the project would have no effect on public park and recreation facilities.

Fire Protection

Impact J.1: The proposed project would increase demand for fire protection and emergency medical services. This would be a potentially significant impact.

Operation of the proposed project could require response by the Gold Ridge Fire Protection District (GRFPD) and/or California Department of Forestry (CDF) for fire protection and medical emergencies. Response by the GRFPD to the project site would be primarily associated with potential structural fires, on-or off-site vehicular accidents, and medical emergencies, whereas response by the CDF would be primarily associated with potential wildland fires. However, both the GRFPD and CDF are multidisciplinary, and depending on the type, size and location of the emergency, and staffing and equipment availability of the emergency services at the time, could respond to all potential fire protection and medical responses. Based on the project location and proposed operational characteristics, the proposed project would not be anticipated to create a significant demand for fire protection services or additional personnel for either the GRFPD or the CDF (Delucci, Mickelson, 2006).

The CDF indicates the potential for wildland fires in the project area would be greatest during the fire season (particularly during the months of July through October, when vegetation is typically at its driest). The CDF additionally indicates the incorporation of a fire break around quarry operations, and the use of appropriate mufflers and spark arrestors on project equipment would be important to ensure the project would not create a significant potential for inadvertently starting wildland fires. Since there is no fireflow infrastructure (e.g., water distribution lines, hydrants) in the project vicinity, the CDF stated that the on-site water truck and 10,000 gallon water tank proposed by the applicant for the quarry could serve to supplement the mobile water tenders that would be brought to the site by the CDF and/or GRFPD in the event of a fire (Mickelson, 2006).

The GRFPD also expressed concern that the proposed operation of large equipment and machinery at the quarry could create the potential for a response by their district requiring heavy-rescue equipment and/or training. GRFPD currently maintains standard light-rescue equipment, such as “Jaws of Life[®]” for extraction of victims from vehicular accidents, and their firefighters do not have heavy-rescue training. Presently, should heavy rescue response assistance be required by the GRFPD, such services would be provided by the Santa Rosa Fire Department. Another fire protection district within Sonoma County (Forestville Fire Protection District), whose service area contains active hard rock quarries (including the Canyon Rock and Blue Rock quarries), was contacted to gain insight as to the nature of historic response by their district to those quarries. There have been no responses requiring a heavy rescue response to existing quarries within their district (the most recent accident involving large equipment was at a former quarry over 30 years ago) (Duignan, 2007). On the basis of all this information, while the potential would exist that an accident at the proposed quarry could occur requiring a heavy-rescue response, such potential appears to be small, and furthermore, heavy-rescue response assistance is available from another mutual aid fire district.

With the implementation of mitigation identified below, the proposed project would not substantially hinder the GRFPD’s ability to provide adequate fire and emergency medical services to the project site or to other locations under their jurisdiction. Similarly, any potential

effects to the CDF fire protection services are not expected to be adverse. Thus, projects effects to the fire protection services, including potential contribution to cumulative demand for fire protection and emergency services, would be less than significant.

Mitigation Measure J.1: As part of the County’s Environmental and Design Review process, prior to project approval, the GRFPD shall review the project site plans to ensure proper emergency access and fire prevention features are incorporated into the project.

Significance after Mitigation: Less than Significant.

Police Protection

Impact J.2: The proposed project would require police protection and traffic enforcement services of the Sonoma County Sheriff’s Department. This would be a less than significant impact.

Operation of the proposed project could require response by the Sonoma County Sheriff’s Department for typical police protection services (e.g., for traffic enforcement, traffic control in the event of vehicular accident, trespassing/vandalism, etc.). The proposed project would not prevent the Department from providing adequate law enforcement services to the general area, or require any new or physically altered facilities because of the proposed development. Similarly, potential effects to the California Highway Patrol along Highway 116 are not expected to be adverse. Thus, projects effects to police protection services, including potential contribution to cumulative demand for police protection services, would be less than significant.

Implementation of Mitigation Measure E.4c in Section IV.E, Traffic and Transportation would require the project applicant to pay to for speed enforcement (i.e., speed trailer or county sheriff) on Roblar Road one time a month, as need is demonstrated by the Sheriff Department (e.g., collision reports or speeding tickets) during the duration of the project.

Mitigation: None required beyond that identified elsewhere in this EIR.

Solid Waste

Impact J.3. The proposed project would generate amounts of solid waste, and may involve use of recycled materials at the quarry. This would be a less than significant impact.

Under the project, employees and general administrative functions associated with the quarry would generate a minor amount of trash which would require disposal. This waste would be regularly collected and transported to the Central Landfill. Given the amount of solid waste generated onsite from these sources would be relatively small, it would not be considered a

significant project contribution, nor a considerable cumulative contribution to solid waste generated within the county.

As part of quarry operations, the quarry would import concrete and asphalt to the site for recycling from its construction sites. This operation would be consistent with the goals of the ARM Plan and aid in achieving the County's goals of reducing the amount of solid waste that is disposed of in landfills, and therefore would be beneficial.

Mitigation: None Required.

Electricity

Impact J.4: The proposed project, and implementation of certain mitigation, would increase demand for PG&E electricity. This would be a less than significant project and cumulative impact.

PG&E electrical lines extend to the project site from Roblar Road. As proposed, the project would generate a relatively small demand for PG&E electricity for operation of the proposed office, and nighttime security lighting. Furthermore, implementation of Mitigation Measure F.1a in Section IV.F, Air Quality, would require the applicant to utilize PG&E electricity to power the mobile processing plant instead of using the proposed diesel-powered generator. The specific electrical loading and requirements of the proposed project shall be determined by PG&E after the project applicant submits a formal application for electrical service. At that time, PG&E would review the proposed project and identify what additional on- and/or off-site electrical requirements would be needed to deliver electrical service to the site.

Mitigation: None Required.

References – Public Services and Utilities

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K. Cultural and Paleontological Resources

Introduction

This section is based on a cultural resources study of the project site and vicinity prepared by Tom Origer & Associates (*A Cultural Resources Survey for the Roblar Road Quarry EIR, Sonoma County, California*, 2005). This study included archival research at the Northwest Information Center (NWIC), Sonoma State University (NWIC File No. 05-444), examination of the library and files of Tom Origer & Associates, consultation with the Native American Heritage Commission and local Native American representatives, and field inspection of the project site. The study also based on a paleontological resource study conducted for Tom Origer & Associates (*Assessment of the Paleontological Sensitivity of the Proposed Roblar Road Quarry, Sonoma County, California*, Allen, 2006).

Setting

Study Area Location and Description

The study area consists of about 70 acres of the 199-acre project site. There is a ranch complex located in the southwest corner of the project site that is located outside the proposed area of disturbance. There have been some modifications to the project site in the form of water control and storage (i.e., storage tanks, ponds, and trenches), and dirt access roads. Adjacent to and north of the project site is the closed Roblar Landfill. The nearest year-round water source is Americano Creek, which flows along Roblar Road to the north and west of the project area. Three seepage springs were observed on the property. One feeds the man-made pond at the eastern border of the study area. The terrain of the study area is moderately sloping. A few low rock outcrops were noted near the southern boundary of the study area. Soils within the study area are of the Steinbeck series, and are moderately well drained soils usually found on marine terraces (Miller 1972:Sheet 104, 79-81). When uncultivated, Steinbeck soils support the growth of grasses, forbs, brush, and scattered oaks. Historically, parcels with Steinbeck soils were used for grazing and pasture land, although some have also been used to cultivate grain and hay (Miller 1972:81).

Cultural Setting

Archaeological evidence indicates that human occupation of California began at least 12,000 years ago (Fredrickson 1984:506). Early occupants appear to have had an economy based largely on hunting, with limited exchange, and social structures based on extended family units. Later, milling technology and an inferred acorn economy were introduced.

This diversification of economy appears to be coeval with the development of sedentism, and population growth and expansion. Sociopolitical complexity and status distinctions based on wealth are also observable in the archaeological record, as evidenced by an increased range and distribution of trade goods (e.g., shell beads, obsidian tool stone), which are possible indicators of both status and increasingly complex exchange systems.

At the time of European settlement, the study area was situated in an area controlled by the Coast Miwok (Barrett 1908; McLendon and Oswalt 1978). The Coast Miwok were hunter-gatherers who lived in rich environments that allowed for dense populations with complex social structures (Barrett 1908; Kroeber 1925). They settled in large, permanent villages about which were distributed seasonal camps and task-specific sites. Primary village sites were occupied continually throughout the year and other sites were visited in order to procure particular resources that were especially abundant or available only during certain seasons. Sites often were situated near freshwater sources and in ecotones where plant life and animal life were diverse and abundant.

Historically, the study area is situated within the Blucher Rancho, which straddles the present-day Sonoma/Marin county line. This land was granted to Stephen Smith and confirmed to his heirs in 1857 (General Land Office [GLO] 1857). County maps and atlases from the late 1800s show that the study area was part of the Henry Hall holdings (Bowers 1867; Thompson 1877). Hall came from Connecticut in 1850 and farmed about 2200 acres (Thompson 1877:101). Near the end of the century, the property belonged to W.P. Hinshaw (Reynolds and Proctor 1898).

Cultural Resource Study Procedures

Archival Study Procedures

Archival research completed for this project included a search of the library and files of Tom Origer & Associates and a review of the archaeological site base maps and records, survey reports, and other materials on file at the Northwest Information Center, Sonoma State University, Rohnert Park (NWIC File No. 05-444). Sources of information included but were not limited to the current listings of properties on the National Register of Historic Places, California Historical Landmarks, California Register of Historical Resources, and California Points of Historical Interest as listed in the Office of Historic Preservation's Historic Property Directory (OHP 2005). Ethnographic literature that describes appropriate Native American groups, county histories, and other primary and secondary sources were also reviewed. Sources reviewed are listed in the "Materials Consulted" section of this report.

The Office of Historic Preservation has determined that structures in excess of 45 years of age should be considered potentially important historical resources, and former building and structure locations could be potentially important historic archaeological sites. Archival research included an examination of historical maps to gain insight into the nature and extent of historical development in the general vicinity, and especially within the study area. Maps ranged from hand-drawn maps of the 1800s (e.g., General Land Office) to topographic maps issued by the United States Geological Survey (USGS).

Native American Consultation

The Native American Heritage Commission, Sacramento, was contacted for information regarding the presence of sacred sites or other cultural use sites within or near the study area. A letter from the Native American Heritage Commission, dated November 11, 2005, indicated that they have no information regarding the presence of sacred sites within or near the study area.

Information about the project was also sent to Gene Buvelot of the Federated Indians of Graton Rancheria and to the Ya-Ka-Ama Indian Educational Center. Ken Tipon responded for the Federated Indians of Graton Rancheria by telephone on November 18, 2005. Mr. Tipon indicated that they knew of nothing in that area.

Field Procedures

A mixed-strategy survey was completed by Nelson Thompson on November 21, 2005. Areas intensively surveyed included the proposed access road, the knolls overlooking the canyon, the banks and beds of seasonal washes, and the areas surrounding the springs and pond. The open pasture was inspected by walking corridors 15 to 20 meters wide in a zig-zagging fashion. Survey conditions were generally good. The grass had been grazed low, which aided in ground surface visibility. A hoe was used to clear small areas so that the surface could be inspected. Frequent animal burrow backdirt piles provided an opportunity to view subsurface soils.

Cultural Resource Study Findings

Archival Study Findings

Archival research indicated that there are no recorded cultural resources within the study area; however, it had not been subjected to prior cultural resources investigation. Previous studies in the vicinity found no archaeological sites or historic-period resources that extend into the current study area (Jordan 1990a, 1990b).

Review of the ethnographic literature for this area found no ethnographic sites within or near the study area (Barrett 1908; McLendon and Oswalt 1978). In general, prehistoric archaeological sites in this area tend to be situated on gentle terrain near freshwater sources, and on elevated land above stream flood plains.

There are no local, state, or federally recognized historic properties within or near the study area (OHP 2005; Sonoma County Planning Department 1984; State of California Department of Parks and Recreation 1976).

Review of historical maps found no buildings depicted within the proposed area of disturbance (Bell and Heymans 1888; Bowers 1867; GLO 1857; McIntire and Lewis 1908; Reynolds and Proctor 1898; Thompson 1877; USACE 1922; USGS 1933, 1942). The 1954 USGS map shows the ranch complex in the westernmost portion of the study area, near Roblar Road.

Field Survey Findings

Field survey found no prehistoric cultural materials within the study area. Trenches and other excavations related to water conveyance and storage were noted within the study area. These appeared to be relatively recent and were not considered to be historically important. No other historic-period resources were noted. The ranch complex on the property is not within the proposed area of disturbance.

Paleontological Setting

Site Geology

A complete description of site geology is presented in Section IV.B, Geology, Soils and Seismicity. The rock unit exposed at the surface of the project site is the Wilson Grove formation, a two to seven million year old sedimentary unit consisting primarily of fine-grained marine sandstone, conglomerate, limestone concretions and tuff. Previous geologic investigations indicate that the thickness of the Wilson Grove Formation beneath the project area ranges from 20 to 60 feet.

Underlying the Wilson Grove is hard, basalt (volcanic) rock sometimes referred to as the Tolay Volcanics. This unit of old basalt flows extends from the bottom of the Wilson Grove formation to beyond the expected depth of the proposed quarry (approximately 250 feet above mean sea level). The volcanics underlying the Wilson Grove Formation at the project site have been recently dated at approximately 8.3 Ma by Ar/Ar method (Dave Wagner, pers. comm., 2005; Steve Bezore, pers. comm., 2005).

The Franciscan Complex forms the basement rock beneath the site and underlies the volcanics. Outcrops of Franciscan rocks are also located in the northwest portion of the site, along Roblar Road, and along the drainage along the southern property boundary.

Site Paleontology and Findings

The Wilson Grove was laid down millions of years ago in a marine environment after much of the regional volcanic activity had ceased. According to Powell and Allen (2001) and Powell et al. (2004), the Wilson Grove Formation was deposited in continental shelf and near shore marine environments, similar to Monterey Bay today. The formation is exceedingly fossiliferous and contains many fossil-rich beds of marine clams, snails, crabs, birds, dolphins and whales.

One of its rarest fossils, the primitive whale skull from an extinct species of blue whale, was collected immediately west of the project site at the Steinbeck Ranch localities (Allen et al., 1998). The fossils encountered at and/or near the project site are listed in Appendix G. The fossils encountered on the project site come from a locality near an old excavation pit, located outside of the footprint of proposed construction of the quarry. It should be noted that the Wilson Grove outside of the old "pit" excavations on the project site is covered by vegetation and has not been studied. However, based on the fossil content of the existing pit exposures, the formation at the site of the footprint of the proposed quarry is also estimated to be highly fossiliferous. Several previously documented fossil localities exist at the site (Powell et al., 2004). Zullo and Naidu (1982) have collected some unique fossils from the formation.

Conversely, the Franciscan Complex outcrops that are exposed at the site are estimated to be devoid of fossils.

Impacts and Mitigation Measures

Significance Criteria

In accordance with Appendix G of the *CEQA Guidelines*, a significant effect will normally occur if a project would:

- Cause a substantial adverse change in the significance of a historical resource, or a unique archaeological resource, as defined in §15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Cultural Resources

Impact K.1: Land alteration proposed under the project could affect previously undiscovered cultural resources. This would be a potentially significant impact.

The project site does not contain any recorded cultural resources. No buildings, structures, sites, or objects eligible for inclusion on the California Register of Historic Resources were discovered within the study area; therefore, no resource-specific recommendations are warranted. However, there is the remote possibility that buried archaeological deposits could be present and encountered during land alteration activities proposed under the project. If present, these resources would be most likely encountered in soils disturbed or removed during the initial grading associated with road and facility construction, and with on-going clearing operations when the topsoil is removed from the quarry site.

Prehistoric archaeological site indicators include: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

Mitigation Measure K.1a: All employees on site shall undergo a cultural resources orientation and awareness training prior to commencing work activities on site. Such training shall include familiarization with the stop work restrictions if buried archaeological remains or artifacts are uncovered. The operator shall provide Permit and Resource Management Department with a verification list of the employees completing the orientation. The training and list shall be updated by the operator as new employees are added.

Mitigation Measure K.1b: During quarry operations, particularly initial grading and on-going clearing operations, should any undiscovered evidence of archaeological materials be encountered, work at the place of discovery shall be halted, and a qualified archaeologist

shall be consulted to assess the significance of the finds. Prompt evaluations could then be made regarding the finds, and management plan consistent with CEQA and Sonoma County cultural resources management requirements could be adopted.

Mitigation Measure K.1c: If prehistoric Native American burials are encountered, a qualified archaeologist, the Sonoma County Coroner, the California Native American Heritage Commission and local Native American Heritage Commission shall be consulted in accordance with established requirements.

Significance after Mitigation: Less than Significant.

Paleontological Resources

Impact K.2: Land alteration proposed under the project would affect paleontological resources. This would be a potentially significant impact.

The geologic units underlying the project site consist of the Wilson Grove formation, underlain by Tolay Volcanics, which in turn is underlain by Franciscan complex. As part of the project, the Wilson Grove formation, estimated to be 20 to 60 feet thick within the quarry footprint, would be considered “overburden,” and would be stripped off to gain access to the resource rock. The underlying Tolay Volcanics unit on the site would provide the resource rock for the proposed quarry.

As discussed in the Setting, the environment of deposition for the Wilson Grove Formation was near shore marine (bays, beach, shallow sea) and continental shelf, and is abundantly fossiliferous, containing fossil-rich beds of marine clams, snails, crabs, birds, dolphins and whales. Several important fossil localities have been previously identified within and very near the project site, some of which reveal important age data or are extinct, very rare species. Based on the fossil content of the previously identified fossils on and near the project site, the Wilson Grove formation within the footprint of the proposed quarry is also estimated to be highly fossiliferous. Consequently, proposed quarrying operations, particularly the removal of overburden on the project, site could result in the disturbance, destruction and/or loss of paleontological resources on the site.

The mitigation measures identified below are consistent with the Society of Vertebrate Paleontology (SVP) standard guidelines for mitigating adverse construction-related impacts on paleontologic resources (SVP 1995, 1996).

Mitigation Measure K.2a: Prior to the start of construction, construction personnel involved with earth-moving activities will be informed on the appearance of fossils and the proper notification procedures. This worker training will be prepared and presented by a qualified paleontologist.

Mitigation Measure K.2b: Prior to the initiation of quarry activities, a qualified paleontologist shall be retained to conduct a preliminary survey and surface salvage in an

effort to recover, as is feasible, surface deposits (if present) in their original context. The preliminary survey shall identify and map areas of high-potential rock units, as well as low and undetermined-potential rock-units within the quarry site area—if such distinctions can be established on a micro-topographic scale versus existing geologic surveys of the area. The paleontologist shall focus the field survey in exposures of sensitive stratigraphic units within the quarry site that would be disturbed.

Mitigation Measure K.2c: Prior to the initiation of quarry activities, the consulting paleontologist shall both prepare a monitoring and mitigation program and implement the program during the excavation phase at the quarry site and for all other project-related ground disturbance. The paleontologic resource monitoring and mitigation program shall include, but not limited to, as outlined by the Society of Vertebrate Paleontology (1995):

- preconstruction coordination;
- guidelines for excavation monitoring;
- emergency discovery procedures;
- procedures to permit the stabilization of large remains to allow for identification and permanent preservation. This includes stabilization of large remains and screen washing of fossiliferous sediments to recover significant microfossil remains;
- discusses how recovered fossils would be analyzed, including (but not limited to): identification to genus/species, element, etc.; interpretation of species abundance and diversity; determination of sex ratios and the relative abundance of ontogenetic age groups; dating of remains as appropriate; evaluation of potential taphonomic factors; and comparison with other vertebrate faunas from the Sonoma County region.
- Discusses how recovered significant fossils would be preserved and curated, including all associated contextual data, at a Federally recognized, accredited repository with long-term retrievable storage.
- Defines a framework for regularly scheduled reporting on the project.

Mitigation Measure K.2d: Earth-moving quarry activities shall be monitored where this activity will disturb previously undisturbed sediment. Monitoring will not be conducted in areas where exposed sediment will be buried, but not otherwise disturbed. If high-potential and undetermined-potential areas within the quarry can be distinguished, full-time monitoring shall take place in rock units that have high paleontologic sensitivity, e.g. Wilson Grove Formation, while units of undetermined sensitivity shall be spot-checked monitored. In lieu of any rock-unit distinction on the site, the frequency and duration of the monitoring conducted shall be under the discretion of the project paleontologist.

Mitigation Measure K.2e: Significant fossils discovered shall be salvaged. Salvage would include recovery of exposed significant paleontologic resources, removal and/or molding of exposed trackways and sampling where necessary to recover microfossil remains.

Mitigation Measure K.2f: Upon completion of a 50% threshold of quarry excavation, as determined by Roblar Quarry managers, the project paleontologist shall prepare a progress report including a summary of the field and laboratory methods, site geology and stratigraphy, faunal list, and a brief statement of significance and relationship of the site to

similar fossil localities. A similar final report shall be prepared at the 100% threshold of quarry excavation. These reports shall be distributed to the appropriate lead and cooperating agencies and any relevant scholarly publications.

Significance after Mitigation: Less than Significant.

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CHAPTER V

Alternatives

A. Introduction

CEQA requires an evaluation of the comparative effects of a range of reasonable alternatives to the project that would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project (*CEQA Guidelines* Section 15126.6(a)). The range of alternatives is governed by the “rule of reason” that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice (Section 15126.6(f)). The significant effects of the alternatives shall be discussed, but in less detail than the significant effects of the proposed project (Section 15126.6(d)).

The EIR must assess the identified alternatives and determine which among the alternatives (including the project as proposed) is the environmentally superior alternative. One of the alternatives to be assessed is the “No Project” alternative (see discussion below under that heading). If the No Project alternative is identified as the environmentally superior alternative, then another of the remaining alternatives must be identified as the environmentally superior alternative.

This chapter discusses the following alternatives to the proposed project:

- 1) No Project Alternative consisting of 1A) a No Project - No Subsequent Development Alternative, and 1B) a No Project – Reasonably Foreseeable Development Alternative,
- 2) Alternative Haul Route / Contracted Sales Only Alternative
- 3) Reduced Production [(285,000 cubic yards (CY)) / Reduced Size (Phases 1 and 2 Footprint) Alternative

It should be noted that variations of identified alternatives could also be considered by the decisionmakers, including, but not limited to, a hybrid of Alternatives 2 and 3, or some variation in the quarry production and/or footprint of Alternative 3.

The components of these alternatives are described below, including a discussion of their impacts and how they would differ from those under the proposed project. A discussion of the environmentally superior alternative is also included in this chapter.

The *CEQA Guidelines* require that an EIR briefly describe the rationale for selecting the alternatives to be discussed (Section 15126.6(a)), and suggest that an EIR also identify any

alternatives that were considered by the lead agency but were rejected as infeasible (Section 15126.6(c)). This chapter of the EIR also addresses these issues.

B. Factors in Selection of Alternatives

The alternatives addressed in this EIR were selected in consideration of one or more of the following factors:

- the extent to which the alternative would accomplish most of the basic objectives of the project (see “Project Sponsor’s Objectives” in Chapter III);
- the extent to which the alternative would avoid or lessen any of the identified significant adverse environmental effects of the project;
- the feasibility of the alternative, taking into account site suitability, economic viability, availability of infrastructure, consistency with regulatory limitations, and whether the project sponsor can reasonably acquire, control, or otherwise have access to the site;
- the appropriateness of the alternative in contributing to a “reasonable range” of alternatives necessary to permit a reasoned choice; and
- the requirement of *CEQA Guidelines* to consider a “no project” alternative as well as an “environmentally superior” alternative (*CEQA Guidelines*, Section 15126.6).

In consideration of the above factors, three alternatives (including two variations of the No Project Alternative, plus two other alternatives) were selected to be addressed in this EIR. Each of these alternatives is described below.

C. Descriptions of Alternatives, and Bases for Their Selection

Alternative 1A: No Project – No Subsequent Development Alternative

Description

Under the No Project - No Subsequent Development Alternative, implementation of the proposed project would not occur. All aggregate reserves on site, including the estimated 11.4 million cubic yards (CY) of materials proposed to be mined as a result of the project would instead remain in-place, and all site characteristics would remain in their existing condition. As a result, none of the approvals that would be required by the County under the project would occur under this alternative, including the proposed Zone Change to add the Mineral Resource (MR) combining zone, the Surface Mining Conditional Use Permit / Reclamation Plan to allow mining operation, and the rescission of the Williamson Act contract on the 70-acre quarry portion of the project site and placement of the 244-acre Lakeville Road easement exchange site under an agricultural conservation easement.

The project site would be left in its current condition (i.e., primarily undeveloped with the exception of the ranch complex and related facilities, unimproved roads, etc.). The project site would continue to be owned by the project applicant, and leased for livestock grazing. Although this alternative would not preclude the potential for future sale or lease of the project site, or the potential for future private or public development, these potential activities would be subject to separate approvals and environmental review, as applicable. See description of Alternative 1B: No Project - Reasonably Foreseeable Development, below.

It is assumed that the aggregate demand in Sonoma County would be accommodated by one or more existing in-county aggregate sources, new in-county aggregate sources, and/or out-of-county aggregate sources.

Basis for Selection

The No Project – No Subsequent Development Alternative is included in this EIR because *CEQA Guidelines*, Section 15126.6(e)(1), requires that an EIR evaluate a “no project” alternative along with its impact in order to provide a comparison of the impacts of approving the proposed project with the impacts of not approving the proposed project. Pursuant to *CEQA Guidelines*, Section 15126.6(e)(3)(B), the No Project Alternative – No Subsequent Development Alternative discusses the “property remaining in its existing state.”

Alternative 1B: No Project – Reasonably Foreseeable Development Alternative

Description

Under the No Project – Reasonably Foreseeable Development Alternative, as under Alternative 1A, implementation of the proposed project would not occur, and all aggregate reserves on-site would remain in-place. As a result, none of the approvals that would be required by the County under the project would occur under this alternative, including the proposed Zone Change to add the Mineral Resource (MR) combining zone, the Surface Mining Conditional Use Permit / Reclamation Plan to allow mining operation, and the rescission of the Williamson Act contract on the 70-acre quarry portion of the project site and placement of the 244-acre Lakeville Road easement exchange site under an agricultural conservation easement.

Unlike Alternative 1A, under this alternative, it is assumed the project site would be developed with one or more of the land uses permitted under the existing zoning for these areas. Given the potential uses permitted under the LEA zoning, and the existing terrain and resources within the project site, potential permitted uses (without a use permit) could include raising, feeding, maintaining and breeding of farm animals; or low-density residential use (one residence would be permitted on each of the two parcels). It is assumed the construction and operation of these new uses would be subject to all applicable County and/or State requirements. It is also assumed all on-site and/or off-site infrastructure would be constructed at a sufficient degree to serve this alternative.

As under Alternative 1A, it is assumed that the aggregate demand in Sonoma County would be accommodated by one or more existing in-county aggregate sources, new in-county aggregate sources, and/or out-of-county aggregate sources.

Basis for Selection

The No Project – Reasonably Foreseeable Development Alternative is included in this EIR because *CEQA Guidelines* Section 15126.6(e)(2) states that the no project alternative shall discuss “what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.”

Alternative 2: Alternative Haul Route / Contracted Sales Only

Description

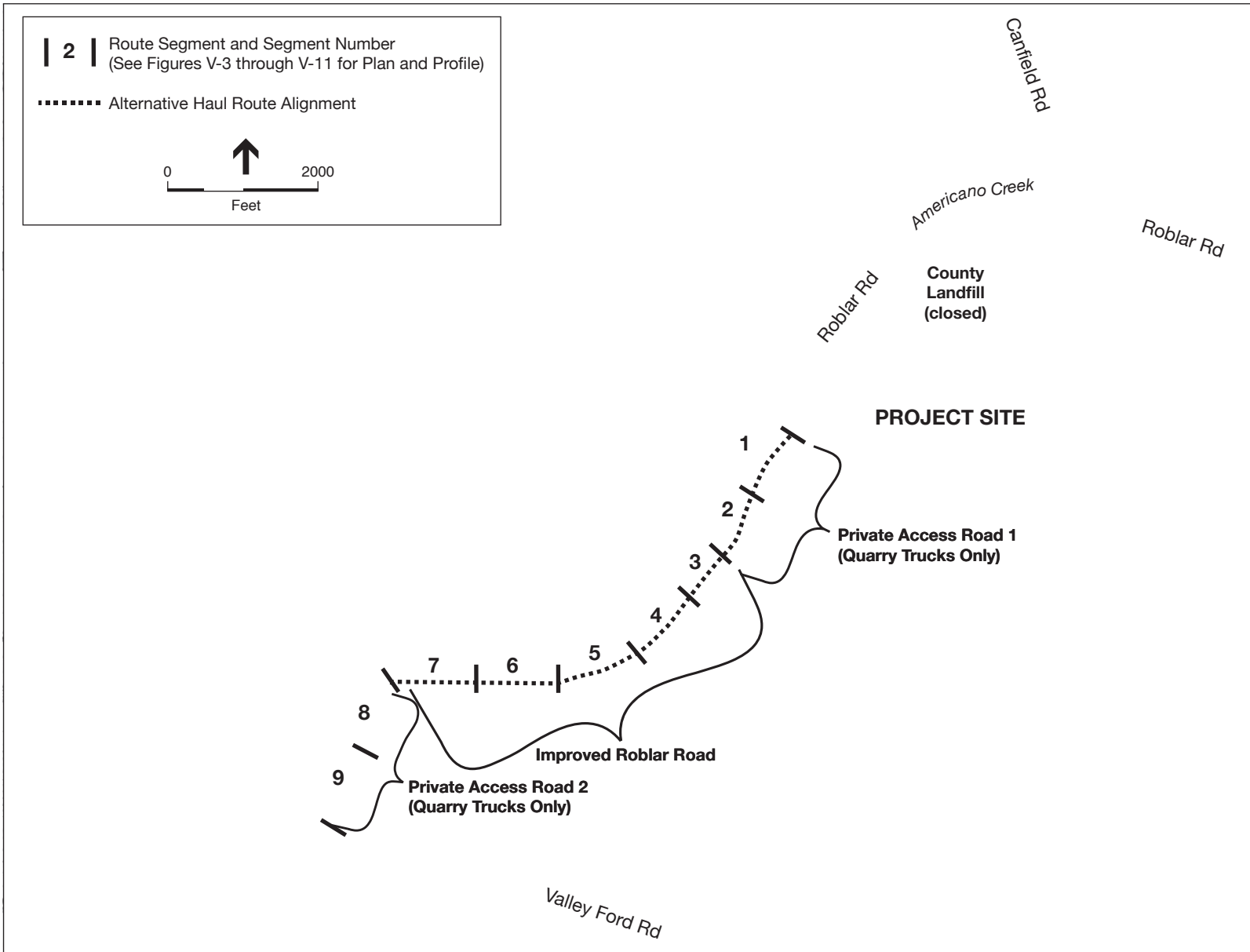
During preparation of the Draft EIR, the applicant requested the inclusion of a project alternative for consideration and analysis in the EIR. Hereafter, this alternative is referred to as the Alternative Haul Route / Contracted Sales Only alternative. In support of this alternative, the applicant submitted a number of preliminary engineering drawings of an alternative haul route which are presented in this EIR.

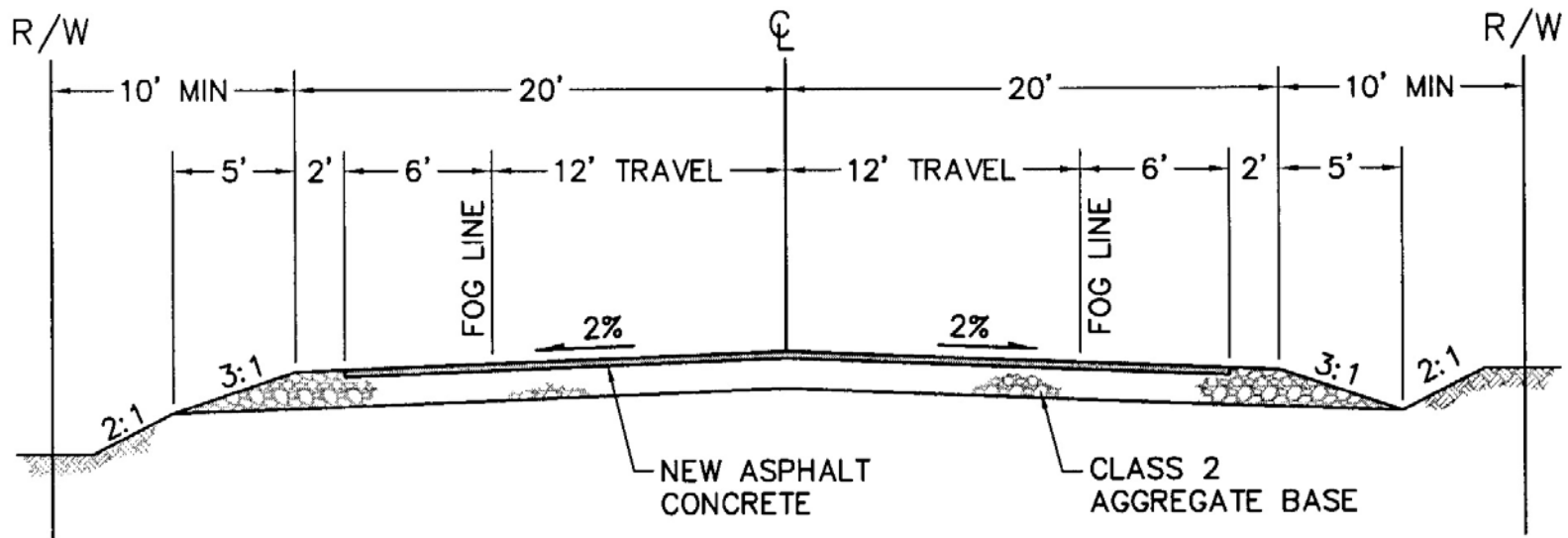
Under this alternative, all project truck traffic generated by the quarry would use the applicant’s identified alternative haul route. This alternative haul route would consist of two new temporary private off-road segments (named “Access Road 1” and “Access Road 2”), an improved section of Roblar Road, and use of various other existing public roads. In addition, no project haul trucks would use Roblar Road east of the alternative access road, or Pepper Road east of Mecham Road.

Under this alternative, 100 percent of materials produced at the quarry would be either directly used by the applicant or sold under contract. As such, all quarry haul trucks generated at the quarry would be those associated with the applicant’s own truck fleet, or private haulers under contract with the applicant, and where the specified haul route would be imposed in the contract. The use of the specified alternative haul route would be enforced by the applicant, subject to penalties and/or contract termination, depending on the nature and/or frequency of a deviation of the specified haul route by a driver.

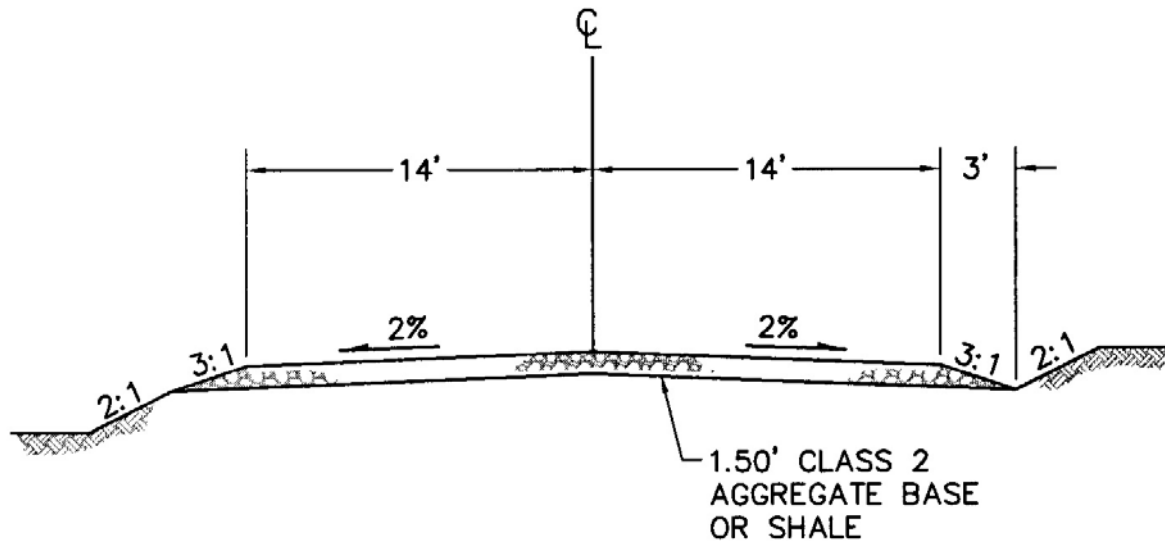
Figure V-1 is key map showing the location of the new private off-road segments and improved section of Roblar Road (broken into Segments 1 through 9, for illustrative purposes). Figure V-2 presents typical proposed cross-sections for the private new off-road segments and the improved section of Roblar Road. Figures V-3 through V-11 provide preliminary plan and profile detail on the new private off-road segments and the improved section of Roblar Road.

As shown in V-3 and V-4, the alternative haul route would initiate within the southwest portion of the project site, and extend south and off-road from the existing internal access road for approximately 2,100 feet to and through adjacent private property (Wilson property), connecting



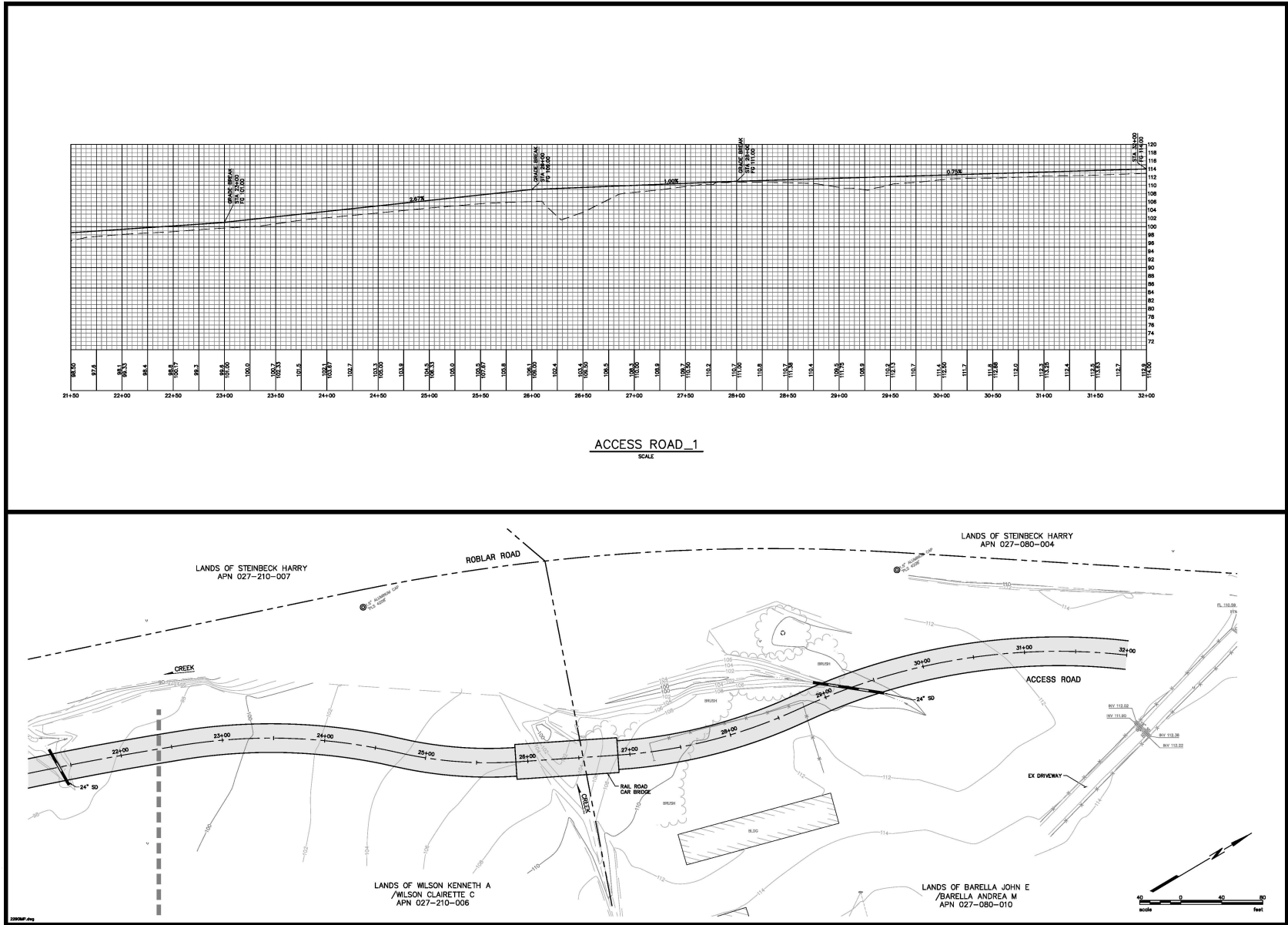


IMPROVED ROBLAR ROAD TYPICAL CROSS-SECTION



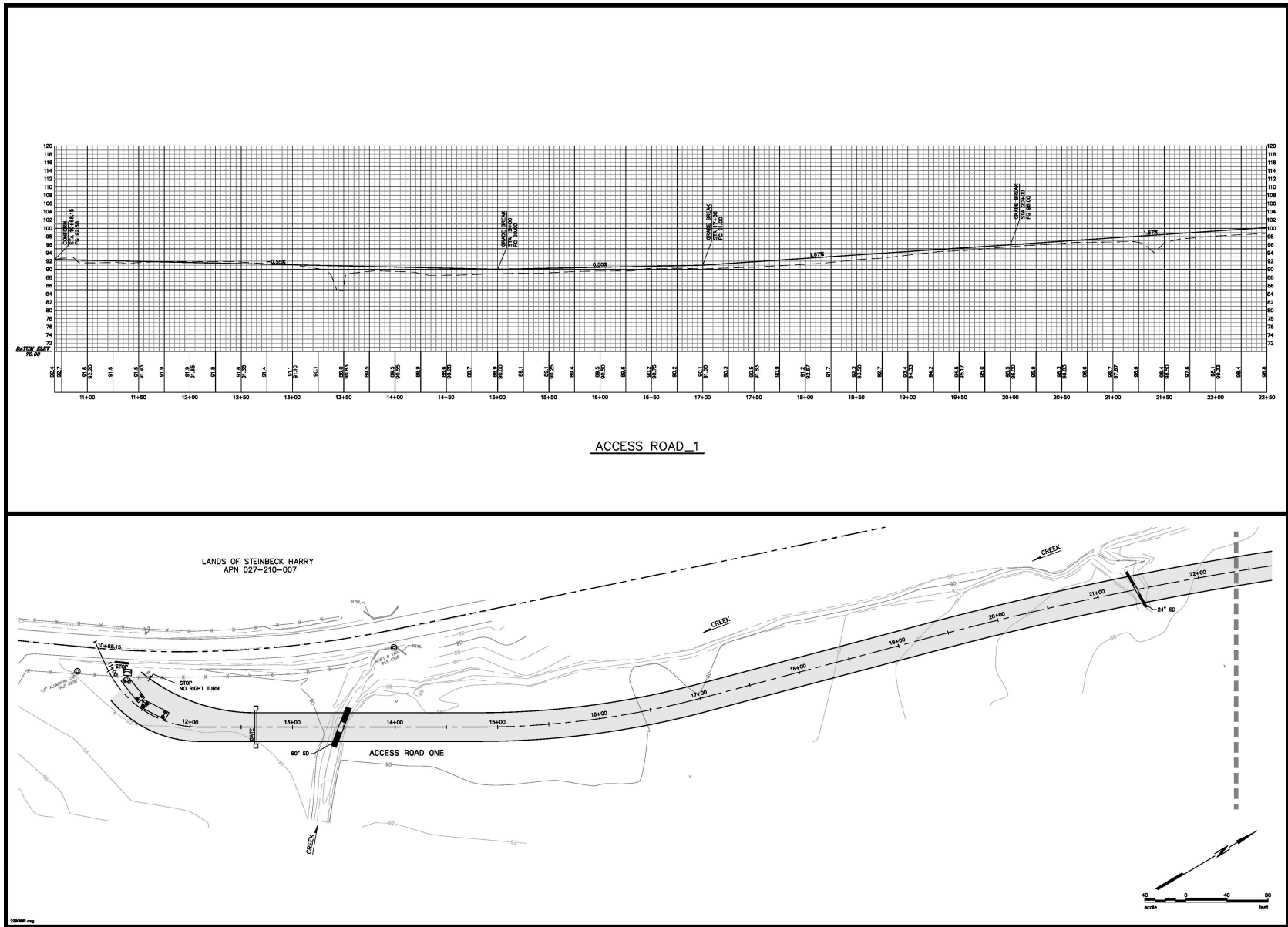
PRIVATE ACCESS ROAD TYPICAL CROSS-SECTION

V-6



SOURCE: Carlenzoli and Associates

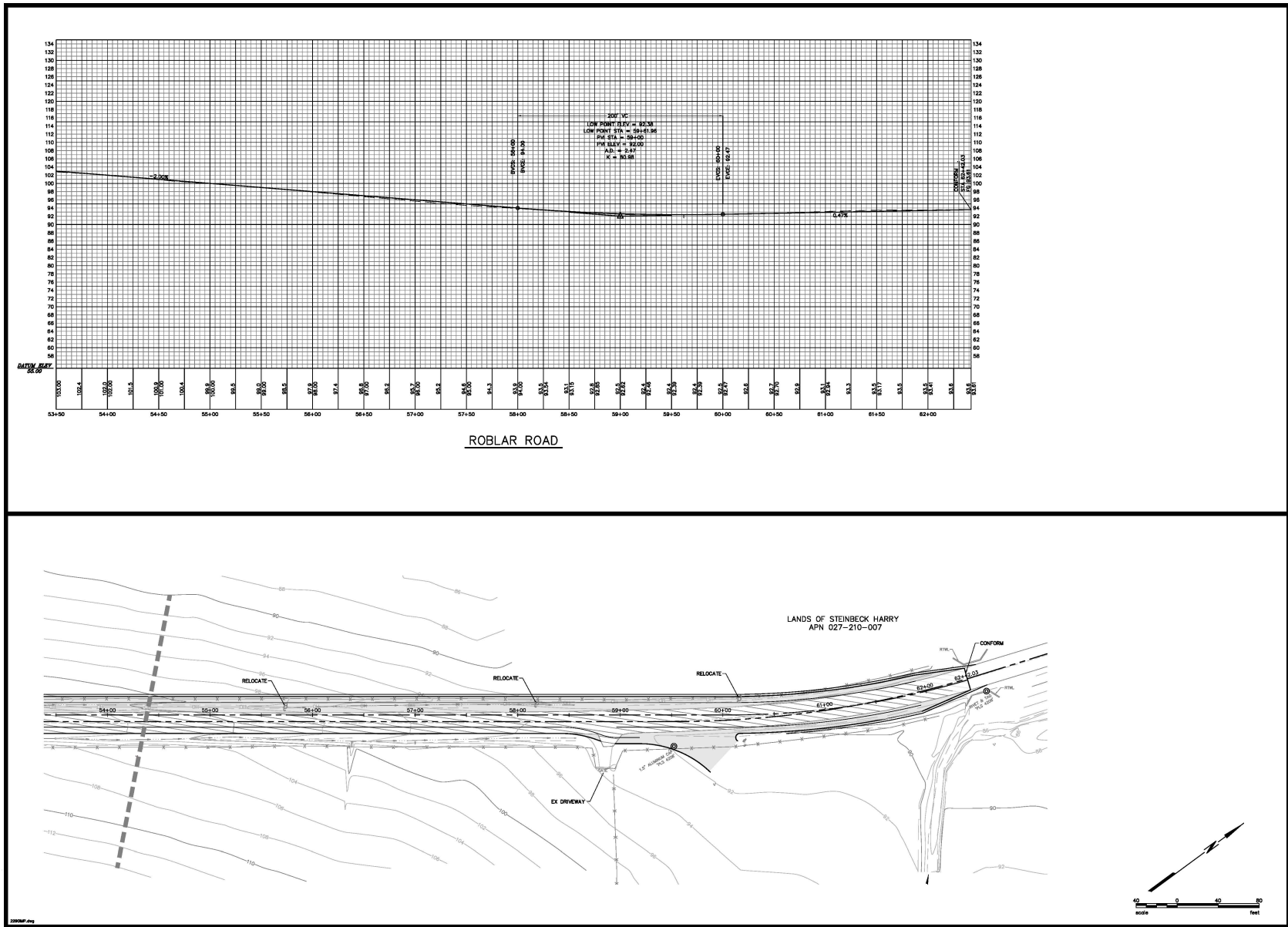
Roblar Road Quarry . 204334
Figure V-3
Alternative Haul Route-Access Road 1
Plan and Profile Segment 1



SOURCE: Carlenzoli and Associates

Roblar Road Quarry . 204334

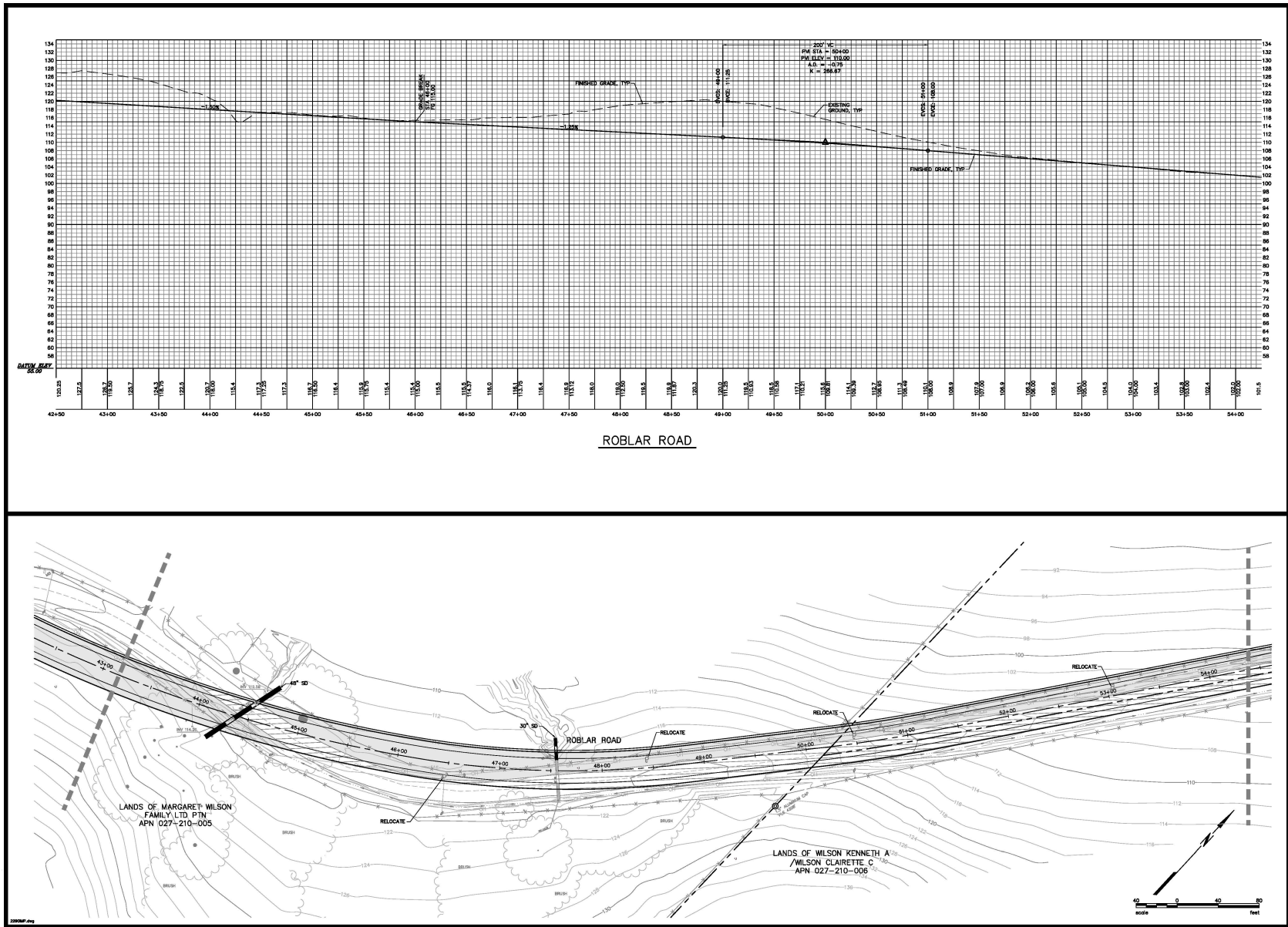
Figure V-4
Alternative Haul Route-Access Road 1
Plan and Profile Segment 2



SOURCE: Carlenzoli and Associates

Roblar Road Quarry . 204334

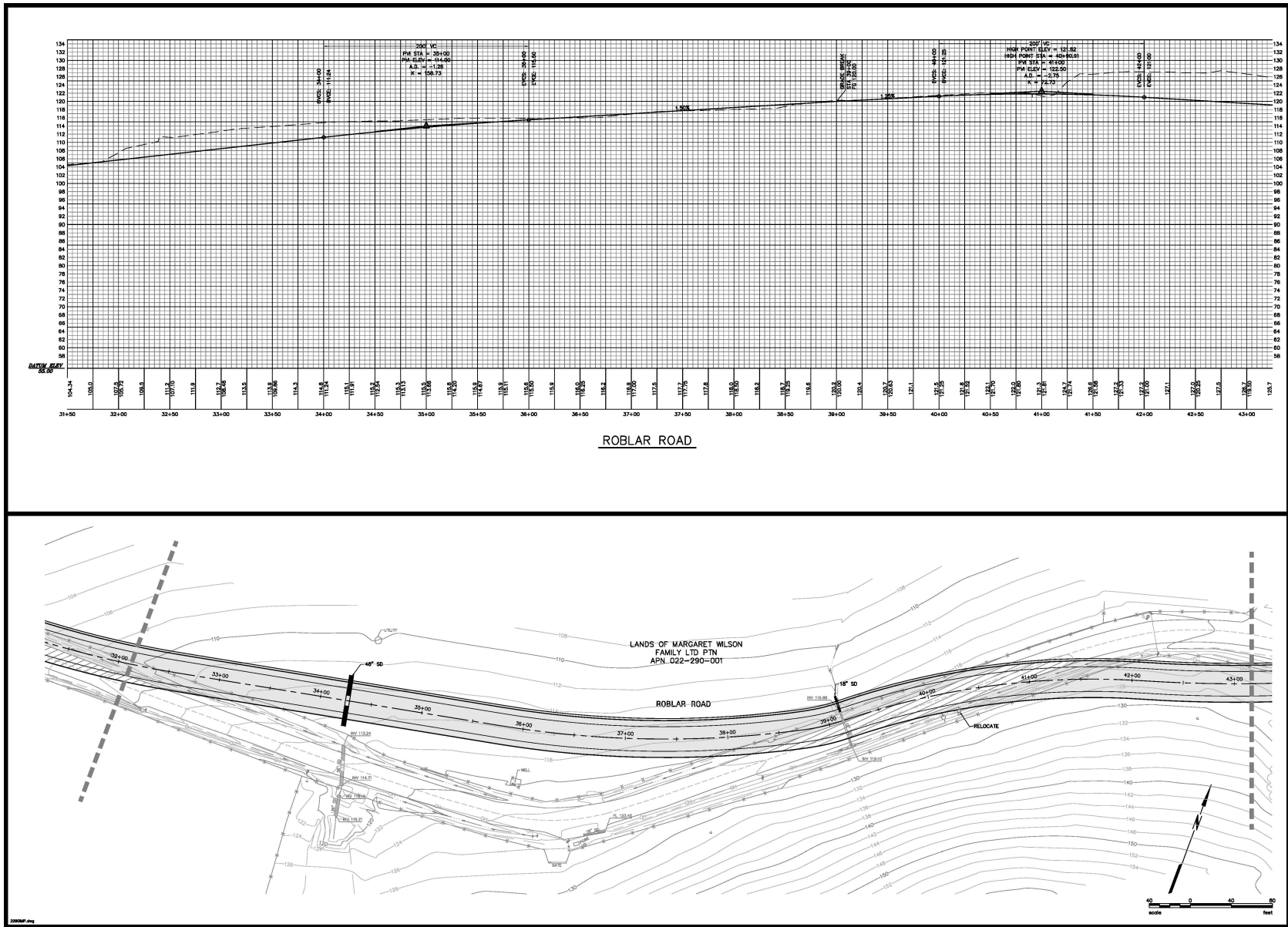
Figure V-5
Alternative Haul Route-Improved Roblar Road
Plan and Profile Segment 3



SOURCE: Carlenzoli and Associates

Roblar Road Quarry . 204334

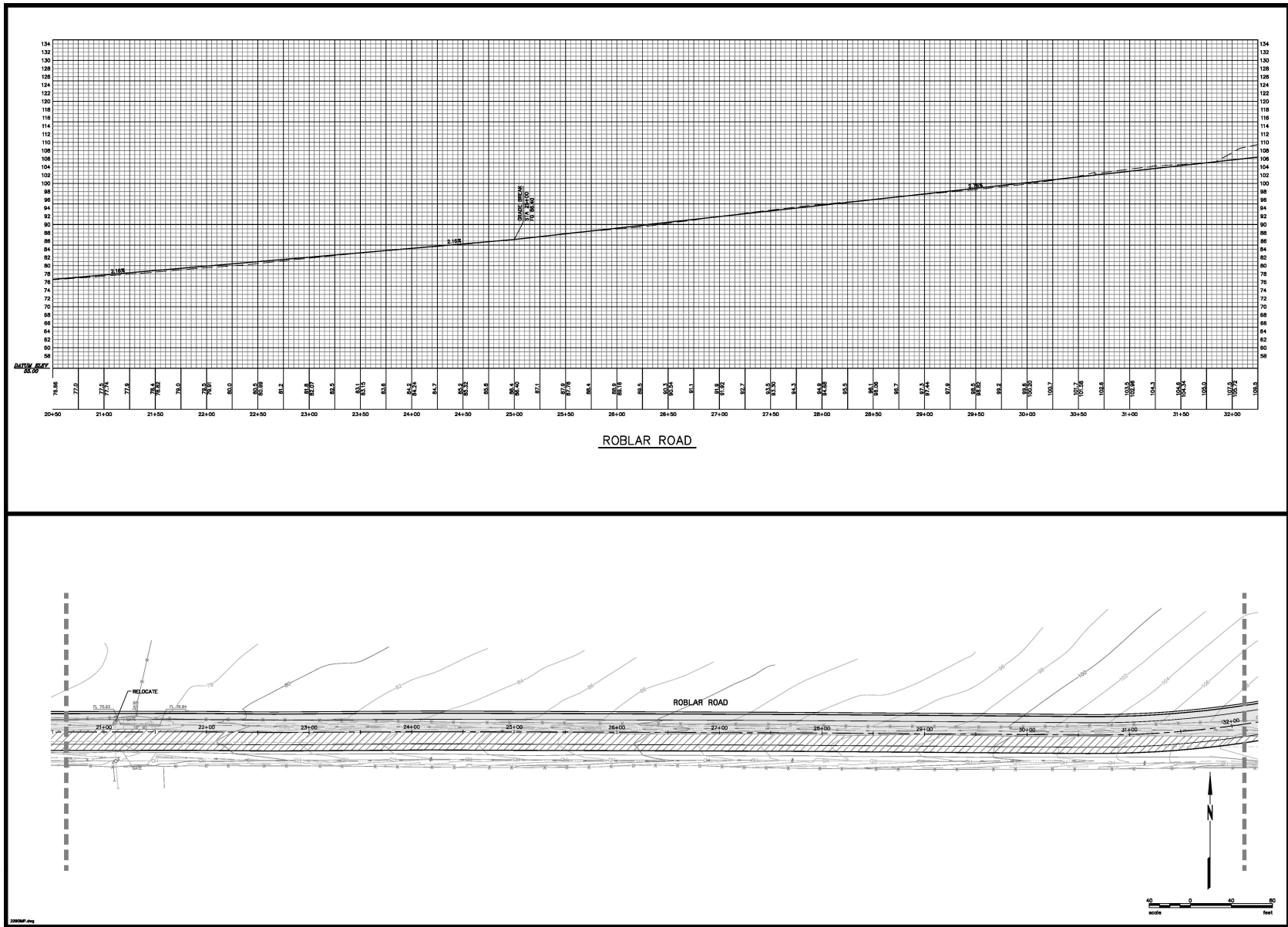
Figure V-6
Alternative Haul Route-Improved Roblar Road
Plan and Profile Segment 4



SOURCE: Carlenzoli and Associates

Roblar Road Quarry . 204334

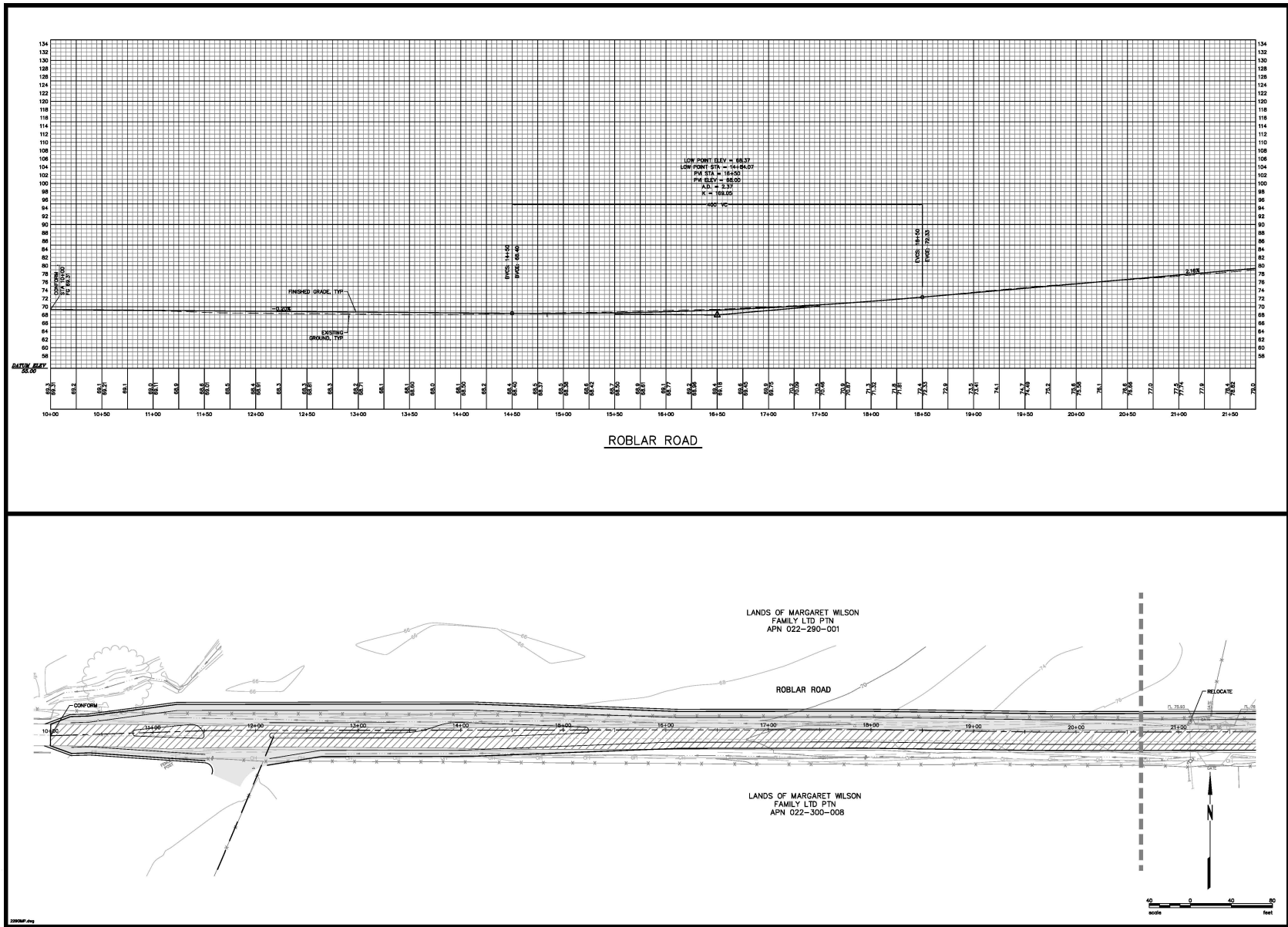
Figure V-7
Alternative Haul Route-Improved Roblar Road
Plan and Profile Segment 5



SOURCE: Carlenzoli and Associates

Roblar Road Quarry . 204334

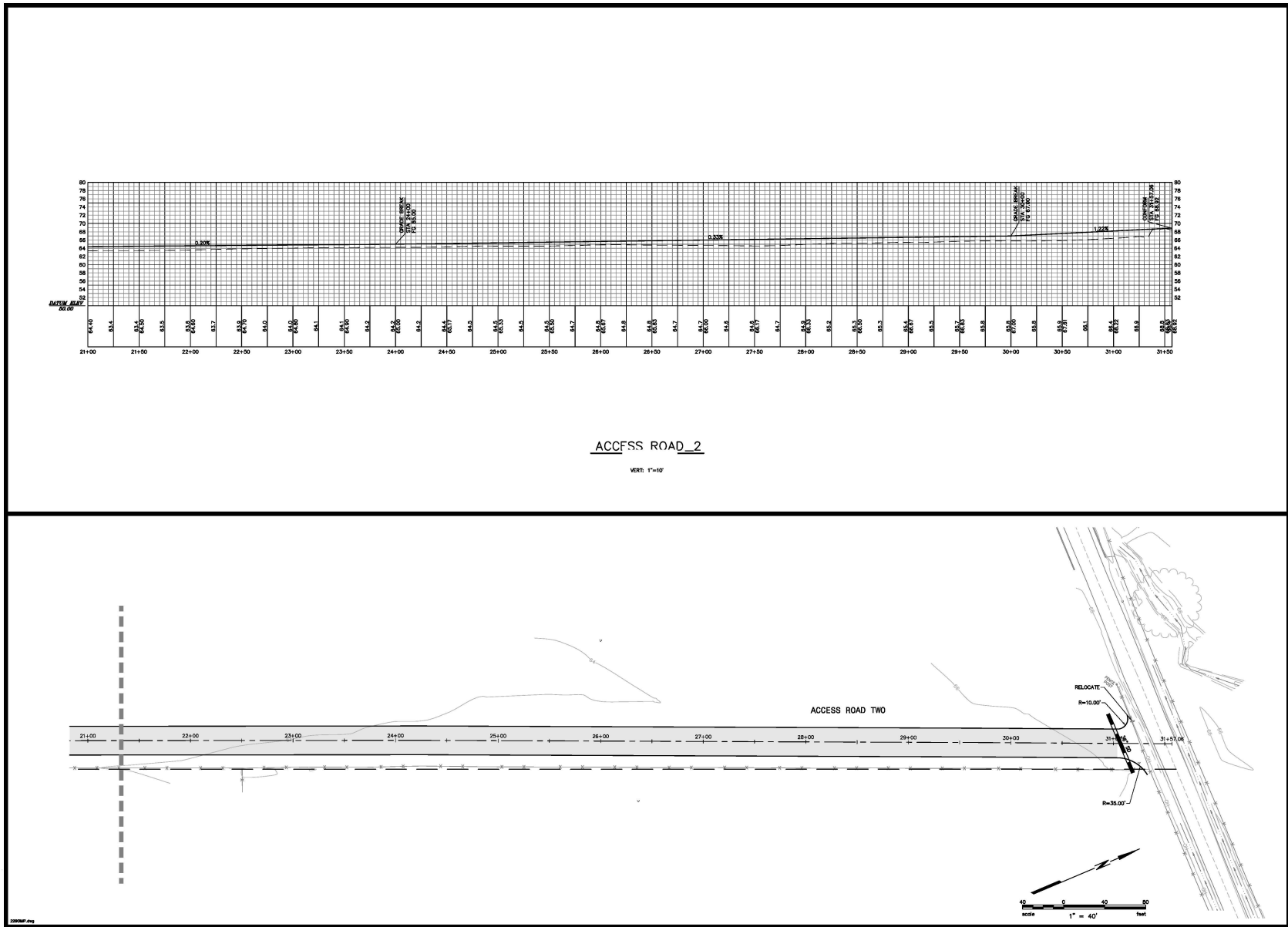
Figure V-8
Alternative Haul Route-Improved Roblar Road
Plan and Profile Segment 6



SOURCE: Carlenzoli and Associates

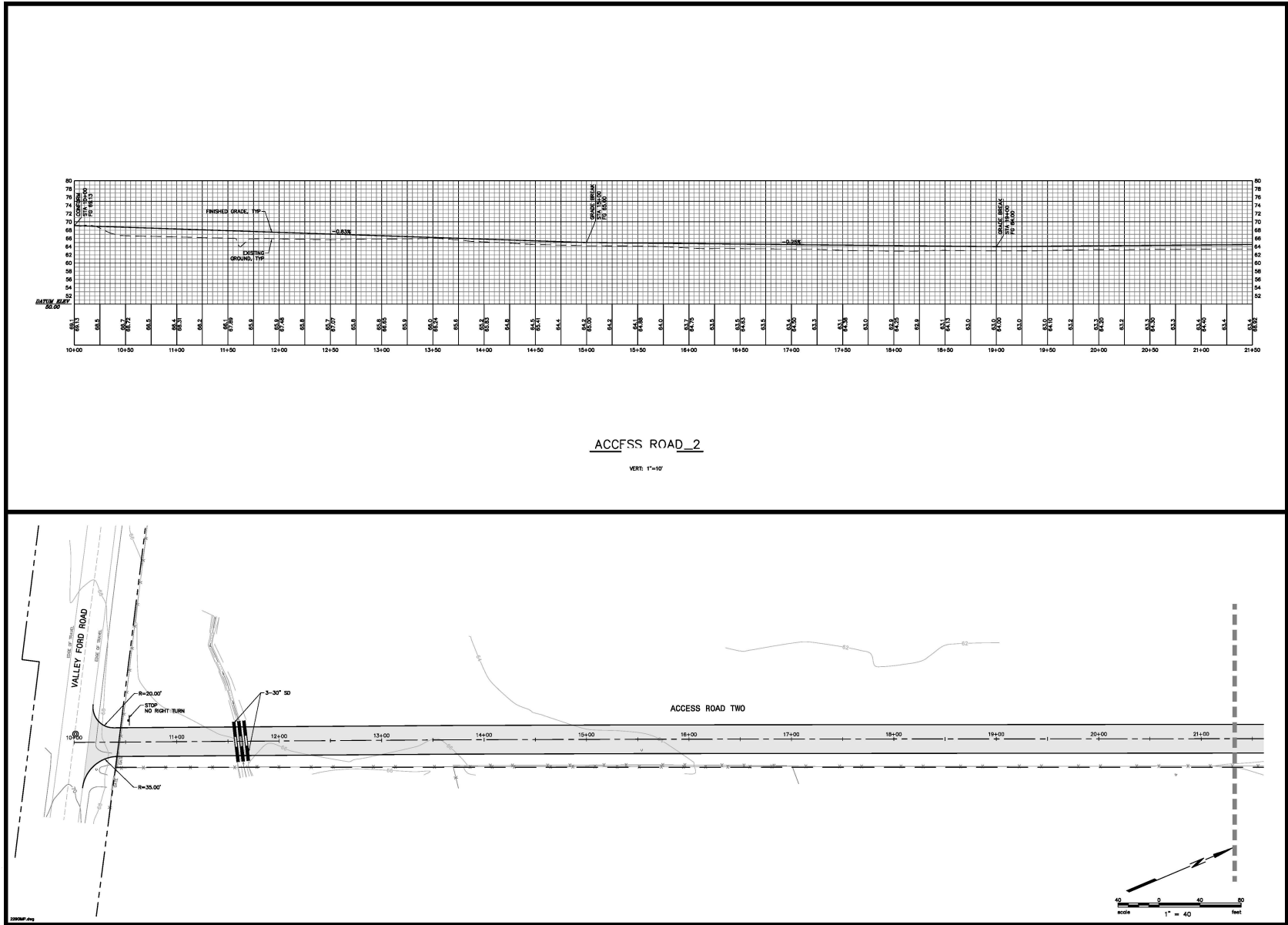
Roblar Road Quarry . 204334

Figure V-9
Alternative Haul Route-Improved Roblar Road
Plan and Profile Segment 7



SOURCE: Carlenzoli and Associates

Roblar Road Quarry . 204334
Figure V-10
Alternative Haul Route-Access Road 2
Plan and Profile Segment 8



SOURCE: Carlenzoli and Associates

Roblar Road Quarry . 204334
Figure V-11
Alternative Haul Route-Access Road 2
Plan and Profile Segment 9

to Roblar Road. The applicant proposes installation of a railroad car bridge for road access over Ranch Tributary at the project site south border, and installation of storm drains for other road crossing of drainages on the project site and Wilson property. The entrance to this access road would be gated at Roblar Road. As shown in Figure V-2, this off-road segment would consist of two paved 14-foot wide travel lanes plus drainage improvements on each side.

As shown in Figures V-5 through V-9, the alternative haul route would then extend westward along an improved and widened Roblar Road for a length of approximately one mile. As shown in Figure V-2, this section of Roblar Road would be improved to meet current County road design standards, including, but not limited to, two 12-foot wide vehicle travel lanes, two six-foot wide shoulders (as well as associated striping/signage to meet Class II bike facilities). Moreover, the roadway would be improved as needed to meet pavement structural requirements per Caltrans Design Manual standards. As shown in Figures V-6 and V-7, the roadway would be realigned at an existing “S-curve” on Roblar Road to reduce the horizontal curvature at this location. Existing overhead electrical utilities would also be relocated along this section of Roblar Road. Modifications and/or new stormdrain facilities would also be required within or adjacent to this section of Roblar Road.

As shown in Figure V-1, V-10 and V-11, the alternative haul route would then depart from Roblar Road. As Access Road 2, the alternative haul route would extend southwest and off-road through private property (Neve property) for approximately 2,100 feet between Roblar Road and Valley Ford Road. The applicant proposes installation of stormdrains for the road crossing of two drainages on the Neve property. As with Access Road 1, Access Road 2 would also consist of two paved 14-foot wide travel lanes plus drainage improvements on each side. From this point, project trucks would travel to and/from the east on Valley Ford Road, Pepper Road (west of Mecham Road), Mecham Road, and a combination of Stony Point Road, SR 116, Railroad Avenue and/or Old Redwood Highway to/from U.S. 101.

Under this alternative, the maximum annual permitted production rate would be identical to that proposed under the project (570,000 CY per year). Correspondingly, the total volume of aggregate that could be mined at the quarry would be 11.4 million CY over a 20-year use permit, as under the proposed project. It is also assumed that the mining approach and techniques, and location and design of all quarry related facilities (e.g., sedimentation pond and drainage features, stockpiles), processing and mobile equipment, and staffing would be identical to those proposed under the project. It is further assumed that both incremental and final reclamation would be identical to that proposed for the project.

Similarly, many of the approvals that would be required by the County for this alternative would be the same as the proposed project, including the proposed Zone Change to add the Mineral Resource (MR) combining zone, and the Surface Mining Conditional Use Permit / Reclamation Plan to allow mining operations, and the rescission of the Williamson Act contract on the 70-acre quarry portion of the project site and placement of the 244-acre Lakeville Road easement exchange site under an agricultural conservation easement.

However, additional approvals would be required for the improvements and use of the alternative haul route. The existing County right-of-way width on Roblar Road along the proposed mile-long widening is 50 feet. The minimum estimated required right-of-way width to improve the roadways to current County standards would be 60 feet, although additional right-of-way would be needed where the roadway would be realigned and/or constrained by existing topography, utilities, drainage or other factors. The applicant would purchase the land needed for the additional right-of-way from the private landowners who currently own this land, fund and implement the identified roadway widening improvements, and then dedicate the right-of-way land with the roadway improvements to the County.

The land use comprising the alignment of the proposed new off-road segments (Access Roads 1 and 2), and land adjacent to and/or along the alignment of the proposed improved section of Roblar Road, carry a General Plan land use/zoning of Land Intensive Agriculture. The land comprising Access Road 1, and a portion of the land adjacent to and/or along the alignment of the proposed improved section of Roblar Road, are currently under an agricultural conservation easement with the District (part of the 700-acre Roblar Ranch). In addition, the land comprising Access Road 1 (Wilson property), Access Road 2 (Neve property), and all the land adjacent to and/or along the alignment of the proposed improved section of Roblar Road, are currently under a Williamson Act contract. Under this alternative, the applicant would enter into an agreement whereby the District would temporarily release its conservation easement on approximately four acres (encompassing the extent of Access Road 1 and adjacent area to the north on the property that would be cut off and isolated by Access Road 1), in exchange for a permanent conservation easement over the entirety of the quarry project site (approximately 199 acres).

As part of the reclamation of the quarry site, the applicant would also reclaim the two private off-road haul road segments and restore those areas to their natural condition. Upon restoration of those areas, the applicant would release its easement over the four acres on the Wilson property and the property owner would reconvey without compensation a conservation easement over the four acres to the District. The contents of the conservation easement would be identical to the existing District easement on that four acres.

Basis for Selection

The Alternative Haul Route / Contracted Sales Only alternative was included to provide an alternative that would reduce environmental impacts compared to the proposed project.

Alternative 3: Reduced Production (285,000 CY) / Reduced Size (Phases 1 and 2 Footprint) Alternative

Description

Under the Reduced Production (285,000 CY) / Reduced Size (Phases 1 and 2 Footprint) Alternative, aggregate production at the quarry would be restricted to a maximum of 285,000 CY per year (half the permitted maximum annual production proposed under the project). Correspondingly, the total volume of aggregate that could be mined at the quarry would be

5,700,000 CY over the 20-year use permit. For purposes of this alternative, it is assumed that only the Phases 1 and 2 footprints would be mined over the 20-year use permit (i.e., no mining within the Phase 3 footprint would occur). However, as under the proposed project, temporary stockpiling of topsoil and overburden would occur within the Phase 3 footprint. It is also assumed that the mining approach and techniques, and location and design of all quarry related facilities (e.g., access road, sedimentation pond and drainage features, stockpiles), processing and mobile equipment, and staffing would be identical to those proposed under the project for Phases 1 and 2. It is further assumed that both incremental and final reclamation would be identical to that proposed for Phases 1 and 2 under the project.

As with the proposed project, approvals that would be required by the County for this alternative would include the proposed Zone Change to add the MR) combining zone, the Surface Mining Conditional Use Permit / Reclamation Plan to allow mining operation, and the rescission of the Agricultural Preserve Contract on a portion of the project site [although a comparatively smaller area (approximately 50 acres) than under the proposed project (70 acres)], and placement of the 244-acre Lakeville Road easement exchange site under an agricultural conservation easement.

Since the maximum amount of materials mined under this alternative would only be half of that proposed under the project, the possibility exists that the applicant could apply for a subsequent permit prior to final reclamation of this alternative to mine aggregate reserves within other portions of the project site (e.g., in the Phase 3 footprint, which contains an estimated 5,700,000 CY of reserves). However, any request to mine beyond the limits of this alternative would require a new use permit, new reclamation plan, and would entail new environmental review under CEQA of potential environmental effects. Furthermore, implementation of any potential additional use permit would not be permitted to commence until after the 20-year life of the use permit of this alternative expires.

It is assumed that the potential unmet demand for aggregate resources in Sonoma County (if the actual annual aggregate demand was greater than that permitted) would be accommodated by one or more other existing in-county aggregate sources, new in-county aggregate sources, and/or out-of-county aggregate sources.

Basis for Selection

The Reduced Production (285,000 CY) / Reduced Size (Phases 1 and 2 Footprint) Alternative was included to provide an alternative that would reduce environmental impacts compared to the proposed project.

D. Alternatives Considered But Rejected as Infeasible

Other alternatives were considered for inclusion in this EIR, but were rejected because they would not meet most of the project sponsor's basic objectives, would not avoid or substantially lessen the potential impacts of the proposed project, were considered legally infeasible, economically unviable, or for other reasons, as described below.

Alternative Location

A specific “alternative location” analysis was not warranted because 1) the proposed project is generally consistent with the General Plan, 2) the project is consistent with the ARM Plan in that the project site is an identified potential quarry site, 3) the rezoning required for the project is to place the project site in the Mineral Resource Zone, which is an overlay zoning classification that allows mineral extraction on sites that have valuable minerals, which have been determined to be present on the site, and 4) the applicant does not currently own another site suitable for aggregate production. Nevertheless, two potential off-site locations in the project vicinity are described and qualitatively evaluated, below:

Roblar Road East Site

The Roblar Road East site is a 186-acre area located along a ridge that is located adjacent to and east of the project site. This Roblar Road East site is contained within all of APNs 24-090-032 and -033, and portions of APNs 027-200-003, and 24-090-004 and -016. The Roblar Road East site parcels are zoned as LEA B6-60, except APN 027-200-003, which is zoned LEA B6-160.

The Roblar Road East site, along with the project site, comprise the area identified in the ARM Plan as the “Roblar Road Potential Quarry Site.” The Department of Conservation California Geologic Survey (DOC CGS) has newly classified the Roblar Road East site as Mineral Resource Zone 2b (MRZ-2b) for Class II-Base-grade aggregate (MRZ-2b is defined by DOC CGS as areas underlain by mineral deposits where geologic information indicates that significant inferred resources are present) (DOC CGS, 2005). The underlying volcanic rock on these parcels have not been tested for aggregate quality, however, the volcanic rock is likely hard and durable enough to make Class II Base aggregate. [In comparison, based on actual testing, the DOC CGS classifies the Roblar Road project site as MRZ-2b for Portland cement concrete grade (PCC-grade), asphalt concrete-grade (AC- grade) and Class II-Base-grade aggregate] (DOC CGS, 2005).

The parcels that comprise the Roblar Road East site are under ownership by three different parties; none are owned by the applicant. APNs 027-200-003 and 024-090-004 are currently under a Williamson Act contract. Furthermore, APN 027-200-003 is under an agricultural conservation easement by the Sonoma County Agricultural Preservation and Open Space District (District) as part of the Roblar Ranch. As a consequence, development of a potential quarry on the Roblar Road East site would not fully avoid the type of Williamson Act contract issues that are associated with the proposed project, and would conflict with the District conservation easement that covers one of the parcels of the site.

In addition, the Roblar Road East site is located closer to Dunham Elementary School (within a mile) than the project site (located over 2 miles away). Development of a quarry on the Roblar Road East site would also have the potential to shift a number of localized environmental effects (e.g., noise, air emissions, visual, biological) identified in the EIR to different receptors on or in the vicinity of the Roblar Road East site.

Walker Road Site

The Walker Road site is approximately 375-acre area located about ¾-mile southeast of the project site, and just north of Walker Road. The site is located within portions of APNs 022-010-004, 022-020-001, and 027-200-003. An unnamed seasonal drainage bisects the site. A generally east-west trending ridge with steep heavily vegetated northerly facing slopes occupies the area south of the drainage. Spur ridges of an off-site east-west trending ridge occupy the area to the north of the drainage. The Walker Road site is zoned as LEA B6-160.

This area is identified in the ARM Plan as the “Walker Road Potential Quarry Site.” The DOC CGS have classified the Walker Road Site as Mineral Resource Zone 3b (MRZ-3b) for Class II-Base-grade aggregate (MRZ-3b is defined by DOC CGS as areas containing inferred mineral occurrences of undetermined mineral resource significance) (DOC CGS, 2005). The ARM Plan indicates that the site would require exploration in order to determine if significant quantities of material suitable for construction aggregate are present.

The parcels that comprise the Walker Road site are under ownership by two different parties; none are owned by the applicant. All Walker Road site parcels are currently under a Williamson Act contract. Adjacent parcels to the north, south and west are also under a Williamson Act contract. In addition, an adjacent parcel to the south (Brayton property) is also protected under an agricultural conservation easement by the Sonoma County Agricultural Preserve and Open Space District. As a consequence, development of a potential quarry on the Walker Road site would not avoid the type of Williamson Act contract issues that are associated with the proposed project.

Development of a quarry on the Walker Road site would remove a number of direct environmental impacts identified in the EIR for the Roblar Road site and vicinity (trucks, air emissions, visual, noise, biological); however, it would have the potential to shift these environmental effects to different receptors on or in the vicinity of the Walker Road site. The Walker Road site is comparatively more heavily vegetated than the project site, and therefore, alteration of that Walker Road site would have the potential to create comparatively greater impacts to biological resources on that site.

Summary

A specific “alternative location” analysis was not warranted. Furthermore, development of a quarry in any off-site undeveloped and natural areas, including those sites in the project vicinity described above, would have the potential to result in new environmental impacts depending on the physical characteristics of the site, and/or result in a shift in environmental impacts of a similar nature and magnitude to those that would otherwise occur at the project site. Please see also No Project Alternative, which discusses the feasibility of expanding or developing other quarries in the County and of importing aggregate from out-of-county sources.

Quarry Truck Time Restrictions

This potential alternative would place limits on the time of day that trucks accessing the quarry would be allowed to travel on Roblar Road and Pepper Road east of Mecham Road, in order to reduce potential safety impacts when children are in the vicinity of these roadways before and after school, and/or avoid peak commute traffic hours. The County does not have the authority to restrict the use of public roadways in this manner. However, the quarry could be restricted to the sale of rock at the quarry to the period between 9:00 a.m. and 2:00 p.m. This restriction would effectively remove the traffic impact during typical school arrival and departure times, as well as the a.m. and p.m. peak commute hours. However, by restricting truck traffic to midday hours, there would be the potential for substantial congestion during that time. In addition, this potential alternative would not be practical from an operational standpoint. While the quarry would have many types of customers, both large and small, the principal part of the business involves providing rock to construction projects. The delivery of rock to these customers must be timed to meet the needs of construction schedules, which typically require deliveries that begin early and are more evenly spaced over the day. For the above reasons, this alternative was not considered to be feasible. (Please see Alternative 2, below, which would avoid all project quarry truck traffic on Roblar Road east of the project site, and Pepper Road east of Mecham Road).

E. Distinctive Environmental Characteristics

Alternative 1A: No Project – No Subsequent Development Alternative

Direct Environmental Impacts

Land Use and Agricultural Resources

Under this alternative, no quarry would be developed on the project site. As a result, this alternative would avoid all potential direct land use and agricultural impacts associated with the proposed project. Specifically, this alternative would avoid the potentially significant land use compatibility impacts with residential land uses in the project vicinity that would be associated with the operation of a quarry. This alternative would also avoid the significant but mitigable impacts of the temporary and permanent conversion of farmland on the project site to a non-agricultural use, the temporary and permanent loss of Grazing Land and Farmland of Local Importance, and conflict with the Williamson Act Contract governing the site. The placement of the 244-acre Lakeville Road property under a permanent agricultural easement would not occur under this alternative (however, this alternative would not preclude the potential for future placement of that property under an agricultural easement protection as part of another proposal). This alternative would also avoid any potential impacts to secondary land use and agricultural resources associated with implementation of off-site transportation improvements identified as mitigation for the proposed project.

Geology, Soils and Seismicity

Since no quarry would be developed on the project site, this alternative would not result in any topographic alteration of the project site, nor introduce any quarry workers or associated population to the site. Consequently, this alternative would avoid all potential direct geologic, soil and seismic impacts associated with the proposed project. Specifically, this alternative would avoid potentially significant but mitigable impacts to workers from geologic hazards from mining (e.g., slope failures); and impacts to erosion from ground disturbance. This alternative would also avoid any potential secondary geologic, soil and seismic impacts associated with implementation of off-site transportation improvements identified as mitigation for the proposed project.

Hydrology and Water Quality

As no quarry would be developed on the project site, this alternative would avoid all potential direct impacts to hydrology and water quality associated with the proposed project. Specifically, this alternative would not result in an increase in impermeable surfaces on the site, and therefore, would not increase the amount of peak stormflows off-site in Ranch Tributary and Americano Creek. Accordingly, this alternative would avoid the potentially significant but mitigable impact associated with potential increases in flooding and bank erosion to these water courses. Similarly, this alternative would avoid a potentially significant but mitigable impact associated with an increase in the amount of sediment and other pollutants downstream. This alternative would also avoid the significant but mitigable impacts associated with quarry wall groundwater seepage on flows, potential seepage/supply well water contaminants. In addition, this alternative would avoid the significant but mitigable impact to summer baseflows in Ranch Tributary. Furthermore, this alternative would avoid any potential effects (albeit less than significant) to deep recharge to regional groundwater, groundwater flow and quality in nearby domestic groundwater wells, and temporary or permanent drawdown or lowering of local groundwater levels. This alternative would also avoid any secondary hydrology and water quality impacts associated with implementation of off-site transportation improvements identified as mitigation for the proposed project.

Biological Resources

Since no quarry would be developed on the project site, this alternative would avoid all potential direct impacts to biological resources associated with the proposed project. Specifically, this alternative would avoid the potentially significant but mitigable impacts to: disturbance of jurisdictional waters, including wetlands, and riparian habitat; tree loss; habitat for special status aquatic species; disturbance of active nests of raptors and other special-status birds, and active roosts of special-status bat species; the American badger and its habitat; and special-status fish species downstream of the site. Any incidental (and less than significant) impacts to noise disturbance to special-status wildlife species from blasting, and interference with existing migratory wildlife corridor would also be avoided. This alternative would also avoid any secondary impacts to biological resources associated with implementation of off-site transportation improvements identified as mitigation for the proposed project.

Transportation and Circulation

No quarry traffic would be generated at the project site under this alternative. Accordingly, this alternative would avoid all potential direct impacts to transportation and circulation associated with the proposed project. Specifically, this alternative would avoid the potentially significant impacts to: contribution to cumulative degradation in levels of service at study intersections, potential increases in traffic safety hazards for bicyclists and pedestrians and traffic accidents on certain roadways; increases in roadway wear; and adequacy of site access. This alternative would also avoid any potentially significant but mitigable short-term increases in construction traffic on local roads during initial grading and construction phase. This alternative would also avoid any short-term secondary impacts to transportation and circulation associated with implementation of off-site transportation improvements identified as mitigation for the proposed project.

Air Quality

As no quarry would be developed on the project site, there would be no mining, processing or quarry truck traffic that would generate emissions of pollutants on the project site and along haul routes. Accordingly, this alternative would avoid all potential direct air quality impacts associated with the proposed project. Specifically, this alternative would avoid project generated emissions of criteria pollutants, including significant emissions of NO_x . This alternative would also avoid increases (albeit less than significant) in DPM emissions, as well as avoid potentially significant contribution to regional criteria pollutants and TACs. In addition, this alternative would avoid significant but mitigable episodic local increases in PM_{10} . Furthermore, this alternative would avoid (albeit less than significant) effects on localized CO emissions and airborne release of crystalline silica. Finally, this alternative would avoid direct generation of any GHG emissions associated with operation of the quarry. This alternative would also avoid any short-term secondary impacts to air quality associated with implementation of off-site transportation improvements identified as mitigation for the proposed project.

Noise and Vibration

Under this alternative, no quarry noise generating activities would occur, and no vehicular traffic would be generated. Accordingly, this alternative would avoid all potential direct noise impacts associated with the proposed project. Specifically, this alternative would avoid potentially significant but mitigable increases in ambient noise levels at nearby residences, and airborne and groundborne noise from blasting. This alternative would also avoid the significant increase in ambient noise levels on haul routes from quarry traffic, and contribution to cumulative increases in noise levels on roadways. This alternative would also avoid any short-term secondary noise impacts associated with implementation of off-site transportation improvements identified as mitigation for the proposed project.

Hazardous Materials

This alternative would avoid all potential direct hazardous materials impacts associated with the proposed project, including avoiding the significant but mitigable impact of transport, storage or use of hazardous materials. This alternative would also avoid any potential short-term secondary

impacts that may be associated with hazardous materials with implementation of off-site transportation improvements identified as mitigation for the proposed project.

Aesthetics

This alternative would avoid all potential direct aesthetic impacts associated with the proposed project, including the significant impact to alteration of visual character from development and operation of a quarry. This alternative would also avoid the impacts (albeit less than significant) of increases in light and glare, and any contribution to cumulative changes in visual character in the project vicinity. This alternative would also avoid any short- and long-term secondary aesthetic impacts associated with implementation of off-site transportation improvements identified as mitigation for the proposed project.

Public Services

This alternative would avoid all potential direct impacts to public services and utilities associated with the proposed project, including potentially significant but mitigable impact to fire protection services, and less than significant effects on police protection services, solid waste services, and electrical public utilities.

Cultural Resources

This alternative would avoid all potential direct aesthetic impacts to cultural resources associated with proposed project. Specifically, this alternative would avoid the potentially significant but mitigable impacts to disturbing previously undiscovered archeological and paleontological resources on the project site. This alternative would also avoid any secondary impacts to potential previously undiscovered cultural resources that may be present along the alignment of the off-site transportation improvements identified as mitigation for the proposed project.

Potential Indirect Environmental Impacts

Sonoma County PRMD reports that in 2006, a total of 3.38 million tons of aggregate were sold in the County. With respect to PCC-grade aggregate, in 2006, approximately 82 percent was produced by terrace operations, about 12 percent was produced by instream sources, and six percent was produced by hard rock quarries. With respect to AC-grade aggregate, hard rock quarries met 80 percent of this demand, and terrace mines produced the remaining 20 percent. With respect to Class II Base-grade aggregate, hard rock quarries met 98 percent of this demand, and instream mines produced two percent (Sonoma County, 2008).

The existing permitted mining operations in Sonoma County producing PCC-, AC-, and/or Class II Base-grade aggregate are limited to hard rock quarries and instream mining. Since the ARM Plan imposed deadline for terrace mining on April 15, 2006, no terrace mining within Sonoma County has occurred (there is, however, a proposal for a time extension for mining the remaining aggregate materials in Syar's Phase VI terrace pit).

The Sonoma County PRMD estimates that in 2006, the permitted PCC reserves in Sonoma County were between 385,000 tons and 1,985,000 tons, the permitted AC reserves were 1,300,000 tons, and permitted Class II Base grade reserves were 4,430,000 tons. In the absence of implementing potential feasible options for meeting future demand for aggregate, Sonoma County PRMD estimates the remaining permitted local reserves for PCC –grade aggregate would be expected to fall short of the local demand between 2007 and 2008, remaining local AC-grade reserves are expected to fall short between 2008 and 2010, and remaining local road base reserves are expected to fall short in about between 2009 and 2010 (Sonoma County, 2006).

To satisfy Sonoma County’s future aggregate demand, the following options would be required:

- *Expansion of Existing Quarries:* Two existing major quarries in Sonoma County are currently capable of producing high quality aggregate: the Mark West Quarry and Bohan & Canelis Quarry. PCC-, AC-, and Class II Base-grade aggregate resources and reserves are located at the Bohan & Canelis Quarry, and AC- and Class II-Base-grade aggregate resources and reserves in and adjacent to the Mark West Quarry. The Canyon Rock, Blue Rock, and Stony Point Quarries provide Class II Base-grade aggregate, but do not produce enough hard enough rock for substantial asphalt and concrete production.
- *Development of New Quarry Sources:* The ARM Plan identified seven potential new quarry locations in Sonoma County (Roblar Road, Beebe Ranch, Kawana Springs, Porter Creek, Rodgers Creek, Walker Road and Wildcat Mountain sites) with construction-grade resources. The DOC CGS recently classified the Roblar Road quarry site as having a significant inferred source of PCC-, AC- and Class II-Base-grade aggregate.
- *Allow Additional Terrace Mining:* The ARM Plan called for a termination of terrace mining in the County on April 15, 2006. No additional terrace mining is proposed, other than a proposed time extension for mining the remaining aggregate materials in Syar’s Phase VI terrace pit.
- *Allow Additional Instream Mining:* Given environmental restrictions on instream mining, substantial expansion of ARM Plan-designated instream mining is unlikely.
- *Prohibit Sales of Aggregate to Out of County Users.* 11 percent of Sonoma County’s total aggregate production in 2006 was exported out of the County (95 percent of this amount went to Napa and Marin Counties). This amount is offset by the approximate 19 percent of aggregate imported into the County in 2006 (Sonoma County, 2008). However, a County-imposed restriction on sales to out-of-county users is not likely feasible. Even if the County could limit the export of aggregate produced in Sonoma County, the quantity of retained supplies would not meet Sonoma County’s aggregate needs.
- *Import Aggregate from Out of County Sources.* Increased importation of aggregate into the County would be necessary to meet future construction needs unless there was considerable expansion of existing mining areas and/or development of new mining areas within Sonoma County. It is considered likely that some increase of imported aggregate sales within Sonoma will occur.

The proposed Roblar Road quarry project would produce up to 570,000 CY (or about 855,000 tons) of aggregate (including PCC-, AC- and Class II-Base-grade) annually, which could accommodate over 20 percent of the total existing annual demand for aggregate in Sonoma

County. Over the 20-year life of the quarry, the Roblar Road quarry would produce up to 11.4 million CY (17.1 million tons) of aggregate.

Under the No Project – No Subsequent Development alternative, the aggregate materials at the Roblar Road quarry would not be mined. Correspondingly, as discussed above, this alternative would avoid a number of direct and secondary impacts at the Roblar Road quarry site and vicinity. However, if the aggregate is not mined at the Roblar Road quarry site, the materials would need to come from one or more of the above-identified options to replace the deficit. With respect to in-county quarry expansion projects, there are three current proposals (Mark West Quarry, Stony Point Quarry and Lakeville Quarry). Of these, only the proposed Mark West Quarry expansion would provide PCC- and AC-grade materials; the Stony Point quarry expansions would provide additional Class II Base grade materials. With respect to new in-county quarries, there are no other current proposals besides the Roblar Road quarry project.

Any potential quarry expansion or new quarry in Sonoma County to replace the deficit that would be created from not mining the Roblar Road quarry site would have the potential to result in their own new site-specific environmental effects (e.g., biological resources, hydrology and water quality, geology, land use conflicts and cultural resources), depending on the physical characteristics of each site, as well as shift many of this project's environmental effects (e.g., truck traffic effects, air emissions, noise) to the new mining location(s).

Even with potential expansion of existing quarries and development of new quarries within Sonoma County, it is likely that out-of-county import of aggregate will be required on an ongoing basis. Some aggregate producers and users have already begun to import sand and gravel to meet their needs. There are a wide range of out-of-county (including out-of-country) mining sources and locations. As with in-county mining sources, the use of out-of-county mining sources to replace the deficit that would be created from not mining the Roblar Road quarry site would have the potential to result in its own site-specific environmental effects at those out-of-county locations.

If trucking were to be the predominant form of transport of out-of-county sources into the County, effects on transportation and air emissions associated with haul trucks under this scenario would be greater than that estimated for the proposed project. The import of aggregate into the County by rail could generate comparatively less air emissions than trucks (although dependent in part on how much aggregate is being hauled per train haul, among other factors). However, it is speculative as to the amount of new rail construction and upgrades that would need to be implemented throughout the region under this scenario, as are the associated potential environmental effects from such an undertaking. While the resumption of rail freight service within the County has been proposed, there are environmental, legal, and operational issues that must be resolved before such service can be implemented and connected to the national rail network. In many instances, rail import would also need truck transport to move aggregate from the mine source to the rail loading points, and from the unloading points to the consumer, resulting in potentially greater truck trip lengths compared to the proposed project.

Sonoma County has experienced an increase in materials imported from out-of-county (e.g., Canada) via ship and/or barge, and several companies are currently operating barge facilities in Petaluma. When considering that both the proposed Roblar Road quarry and barging operations in Petaluma would primarily serve destinations in south to central Sonoma County, the average truck haul trip length within Sonoma County between these scenarios would be comparable. However, trucks or other alternative transport methods may still be needed to move aggregate from the out-of county mining source to the ship/barge loading point, resulting in potentially greater truck trip lengths compared to the proposed project. In addition, since there are no deep-water docks with dedicated port facilities and space to support importing aggregate via ship in Sonoma County, materials imported by ship into counties with deep water docks (e.g., San Francisco) need to be transported via an alternative transport method (e.g., truck, barge) into Sonoma County. Import by ship would also be expected to generate a greater contribution to regional air quality emissions than trucks, particularly with NO_x emissions.

Alternative 1B: No Project – Reasonably Foreseeable Development Alternative

Direct Environmental Impacts

As with Alternative 1A, under Alternative 1B - No Project - Reasonably Foreseeable Development Alternative, implementation of the proposed project would not occur. Accordingly, all the direct project environmental impacts that would be avoided with Alternative 1A (as discussed above) would also be avoided with Alternative 1B. Similarly, all the potential secondary environmental impacts associated with the construction of off-site transportation improvements would also be avoided under Alternative 1B.

The project site is currently used as dryland grazing for livestock production. Given the potential uses permitted under the LEA zoning, and the existing terrain and resources within the project site, potential permitted uses (without a use permit) for the project site under Alternative 1B could include raising, feeding, maintaining and breeding of farm animals; or low-density residential use (one residence would be permitted on each of the two parcels). As such, potential direct environmental impacts associated with either of these uses would be similar to existing circumstances on the project site, and less than the proposed project.

Potential Indirect Environmental Impacts

Potential indirect environmental impacts under the No Project - Reasonably Foreseeable Development Alternative, including those associated with other in-county and/or out-of-county aggregate sources would be identical to those identified for the No Project – No Subsequent Development Alternative. Please refer to that discussion.

Alternative 2: Alternative Haul Route / Contracted Sales Only

Direct Environmental Impacts

Land Use and Agricultural Resources

Since the quarry mining and reclamation plan (except for the vehicular access) and on-site mining/processing operations associated with this alternative would be identical to the proposed project, direct impacts to land use and agricultural resources associated with development and operation of a quarry under this alternative would be similar to the proposed project. This would include the significant impacts associated with the quarry's land use compatibility with surrounding residential land uses; and significant but mitigable impacts associated with the temporary and permanent conversion of farmland on the quarry site to a non-agricultural use, the temporary and permanent loss of Grazing Land and Farmland of Local Importance on the quarry site, and conflicts with the Williamson Act Contract governing the quarry site. The beneficial effects of placement of the 244-acre Lakeville Road property under a permanent agricultural easement that was proposed under the project would also occur under this alternative.

This alternative would, however, have different off-site land use and agricultural resource effects compared to the proposed project, due to the alternative haul route. As described in the Alternative 2 description, the land comprising Access Road 1, and a portion of the land adjacent to and/or along the alignment of the proposed improved section of Roblar Road, are currently under an agricultural conservation easement with the District (part of the 700-acre Roblar Ranch). Under this alternative, the applicant would enter into an agreement whereby the District would temporarily release its conservation easement on approximately four acres (encompassing the extent of Access Road 1 and adjacent area to the north on the Wilson property that would be cut off and isolated by Access Road 1), in exchange for a permanent conservation easement over the entirety of the quarry project site (approximately 199 acres). As part of the reclamation of the quarry site, the applicant would reclaim the two private off-road haul road segments and restore those areas to their natural condition. Upon restoration of those areas, the applicant would release its easement over the four acres on the Wilson property and the property owner would reconvey without compensation a conservation easement over the four acres to the District. Consequently, while there would be a temporary net loss of approximately four acres of land within an agricultural conservation easement along the alternative haul route, there would ultimately be a comparatively large net increase in land permanently protected in an agricultural easement following the reclamation of the quarry property and off-road haul route segments.

As discussed in the Alternative 2 description, the land comprising Access Roads 1 and 2 are currently under Williamson Act contract within Type II and Type I agricultural preserves, respectively. In addition, the lands adjacent to and/or along the alignment of the proposed improved section of Roblar Road are also under a Williamson Act contract. To be allowed, non-agricultural uses on land under a Williamson Act contract must be listed as "compatible uses" in the County's "Rules and Regulations for Administration of Agricultural Preserves" ("Rules") for the type of preserve involved, and must be consistent with the Williamson Act's "principles of compatibility" listed in Government Code §51238.1, subdivision (a), or otherwise satisfy the

requirements of subdivisions (b) and (c) of that section, unless an exception to compliance with §51238.1 applies under §51238.2 for mineral extraction. The principles of compatibility are:

- (1) The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels or on other contracted lands in agricultural preserves;
- (2) The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. . .and
- (3) The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use. (Govt. Code §51238.1, subd. (a).)

Access Roads

The County's Rules for both Type I and Type II preserves, list quarrying operations, not including crushing or other refining of raw materials, as an allowable compatible use on contracted land. The access roads, as a part of the quarrying operations, not including crushing or other refining of raw materials, would serve the quarrying operations only and would be restored to their natural condition at the end of mining. Accordingly, these private roads could be considered a listed compatible use under the Rules.

In addition, the access roads would likely be consistent with the Williamson Act's principles of compatibility, listed above, that is, they would not significantly compromise the long-term productive agricultural capability of the contracted parcel or other contracted lands; they would not significantly displace or impair current or reasonably foreseeable agricultural operations on the contracted parcel or other contracted lands; and they will not result in the significant removal of adjacent contracted land from agricultural or open-space use. The Neve property (through which Access Road 2 would extend) currently contains a plant nursery. However, the development and operation of Access Road 2 would not disrupt or hinder continued agricultural operation of those facilities.

If the access roads were determined not to satisfy the principles of compatibility under Govt. Code §51238.1(a), then Access Road 1, which is located on Type II contracted land, may still be allowable under Govt. Code §51238.1(c), if certain findings are made and certain mitigation measures are imposed to ensure the use is as compatible as possible. Govt. Code §51238.1(c) states:

- (c) In applying the criteria pursuant to subdivision (a), the board or council may approve a use on nonprime land which, because of onsite or offsite impacts, would not be in compliance with paragraphs (1) and (2) of subdivision (a), provided the use is approved pursuant to a conditional use permit that shall set forth findings, based on substantial evidence in the record, demonstrating the following:
 - (1) Conditions have been required for, or incorporated into, the use that mitigate or avoid those onsite and offsite impacts so as to make the use consistent with the principles set forth in paragraphs (1) and (2) of subdivision (a) to the greatest extent possible while maintaining the purpose of the use.

- (2) The productive capability of the subject land has been considered as well as the extent to which the use may displace or impair agricultural operations.
- (3) The use is consistent with the purposes of this chapter to preserve agricultural and open-space land or supports the continuation of agricultural uses, as defined in §51205, or the use or conservation of natural resources, on the subject parcel or on other parcels in the agricultural preserve. The use of mineral resources shall comply with §51238.2.
- (4) The use does not include a residential subdivision. (Govt. Code §51238.1, subd. (c).)

As required by these provisions, approval of Access Road 1 would be pursuant to a conditional use permit, and conditions to mitigate incompatibility to the greatest extent possible would be imposed.

Alternatively, if the access roads are unable to satisfy the compatibility requirements under Govt. Code §51238.1, then they may still be approved, on both Type I and Type II lands, if they fall into the exception for mineral extraction uses under Govt. Code §51238.2, which states:

Mineral extraction that is unable to meet the principles of §51238.1 may nevertheless be approved as compatible use if the board or council is able to document that (a) the underlying contractual commitment to preserve prime agricultural land, as defined in subdivision (c) of §51201, or (b) the underlying contractual commitment to preserve land that is not prime agricultural land for open-space use, as defined in subdivision (o) of §51201, will not be significantly impaired.

Conditions imposed on mineral extraction as a compatible use of contracted land shall include compliance with the reclamation standards adopted by the Mining and Geology Board pursuant to §2773 of the Public Resources Code, including the applicable performance standards for prime agricultural land and other agricultural land, and no exception to these standards may be permitted.

For purposes of this section, “contracted land” means all land under a single contract for which an applicant seeks a compatible use permit. (Govt. Code §51238.2.)

Since both Access Road 1 and Access Road 2 would be part of the quarrying operation, not including crushing or other refining of raw materials, they may be approved if the requirements of Govt. Code §51238.2 are met, including planned reclamation of the roads as part of the mineral extraction use. The underlying Type I and Type II contractual commitments are not likely to be significantly impaired by the access roads, as the roads require minimal acreage. Additionally, the access roads will be required to comply with the reclamation standards adopted by the Mining and Geology Board pursuant to §2773 of the Public Resources Code, including the applicable performance standards for prime agricultural land and other agricultural land. Consequently, the development and operation of temporary Access Roads 1 and 2 would not likely result in any conflict with the Williamson Act contract governing the property.

In the event that the access roads are determined to conflict with the existing Williamson Act contractual commitments and do not fall within an exception, this would be a potentially significant impact. In that case, the contracts would have to terminate before the access roads

could be constructed, likely by way of an “easement exchange” pursuant to Govt. Code §51256. (See discussion below.)

Widening of Roblar Road

Lands adjacent to and/or along the alignment of the section Roblar Road proposed for improvement are also currently under a Williamson Act contract within a Type II agricultural preserve. While no grading plan is available at this time, it is conservatively estimated that under four acres of existing Williamson Act contract land along the improved section of Roblar Road may be permanently lost from agricultural use. The road realignment would be an allowable use under the County’s “Rules for Administration of Agricultural Preserves” if it were listed as an allowable “public use,” would be owned by a political subdivision of the state (i.e., the County), and is necessary to serve the agricultural preserve (Rule 14.A.10). The road realignment would realign a road used by the public, would be ultimately owned by the County, and would be considered necessary for the safety of persons travelling to and from the preserve. The road realignment must also meet the principles of compatibility listed in Government Code §51238.1, subdivision (a) described above, or otherwise satisfy the requirements of subdivisions (b) and (c) for uses on Type II nonprime land.

While the improved section of Roblar Road would result in the permanent loss of under four acres of agricultural land, it does not appear this loss would significantly compromise the overall long-term productive capabilities, or significantly displace or impair agricultural operations of the parcels in which the improvements are located, or adjacent parcels. The Williamson Act contract land that may be permanently lost would consist of a narrow strip of land extended over a mile along the improved section of Roblar Road. In addition, approximately 1¼ acres of land within the existing County right-of-way for Roblar Road (in the vicinity of the S-curve) could be potentially reclaimed and added as Williamson Act land, and actively used for grazing after the roadway has been realigned. As such, land adjacent to the improved Roblar Road alignment could continue to be actively used for grazing.

However, if the County finds the proposed widening of the Roblar Road is not an allowable use under the County’s Rules or does not meet the principles of compatibility listed in Government Code §51238.1, the applicant would likely need to pursue an easement exchange as allowed under the provisions of the Williamson Act Easement Exchange Program (WAEPP), in order to terminate the Williamson Act contractual restrictions. Under this program, the Williamson Act contract land affected by the improvements along Roblar Road would be rescinded, and other land would be simultaneously placed under an agricultural conservation easement, pursuant to Government Code §§51256. As addressed in this EIR, the applicant is currently pursuing an easement exchange on the quarry project site, whereby 70 acres of Williamson Act contract governing that site would be rescinded, and the 244-acre Lakeville Road property would be placed under an agricultural conservation easement. Consequently, the applicant could pursue including the land that would be lost by the Roblar Road widening improvements in that easement exchange process. It should be noted, however, that this would entail the participation and cooperation of all landowners currently holding the Williamson Act contracts on the properties involved in the realignment.

The DOC FMMP classifies the land containing the proposed off-road segments and the proposed improved section of Roblar Road as “Farmland of Local Importance.” Consequently, the proposed road improvements for the alternative haul road would not result in any temporary or permanent conversion of any areas of “Prime Farmland,” “Unique Farmland” or “Farmland of Statewide Importance.”

As described above, the alternative haul road improvements under Alternative 2 (i.e., along Access Roads 1 and 2, and the improved section of Roblar Road) would result in a number of new temporary and permanent off-site land use and agricultural impacts. However, when compared to the more extensive off-site roadway improvements identified as mitigation measures for the proposed project (including widening of the entire length of Roblar Road and Pepper Road east of Mecham Road) and the associated secondary impacts associated with the implementation of those mitigation measures (including loss of prime agricultural land, conflicts with additional Williamson Act contracts and/or agricultural conservation easements, and other identified environmental effects) - see Secondary Impacts described in Impact E.8, the off-site land use and agricultural impacts of Alternative 2 would be substantially less than the proposed project.

Geology, Soils and Seismicity

Since the quarry mining and reclamation plan for this alternative (except for the vehicular access) would be identical to the proposed project, direct on-site geologic, soil and seismic impacts associated with construction and operation of a quarry for Alternative 2 would be similar to the proposed project, including potentially significant but mitigable impacts to workers from geologic hazards from mining; and impacts to erosion from ground disturbance.

This alternative would, however, have different off-site geologic and soil effects compared to the proposed project, due to the alternative haul route. Construction of the off-road haul route segments, and the widening improvements on the mile-long section of Roblar Road, would require vegetative removal and grading, creating bare surfaces and exposing soil, increasing the potential temporary increases in erosion during the construction phase. In addition, steep slopes are present adjacent to portions of the proposed improved section of Roblar Road in the vicinity of an “S-curve,” approximately one-half mile west of the project site. While no grading plan is provided, the applicant’s proposed improvements on Roblar Road would require cutting adjacent upslope areas to achieve stable slopes and/or filling downslope areas to accommodate the widened roadway. Road cuts to adequate to achieve necessary slope stability would require considerably more grading and possible encroachment into private property while fills necessary to achieve the wider road width could encroach into Americano Creek, requiring specialized slope stability measures and revetment. Excavation in certain bedrock types could require blasting to remove the rock for grading. Although achieving required factors of safety for conditions in this area is possible using standard engineering design and construction practices, a detailed geotechnical feasibility and design study must be conducted to develop site-specific engineering design criteria and approaches. Implementation of best management practices (BMPs) during construction (similar to those identified in Mitigation Measure E.8a) and requirement of a design level geotechnical investigation to reduce the potential for slope instability from cutting and filling of adjacent slopes along the roadway alignments (similar to

that identified in Mitigation Measure E.8b) would reduce these potentially significant impacts to a less than significant level.

As described above, the alternative haul road improvements would result in a number of new temporary and permanent off-site geologic, soil and/or seismic impacts. However, when compared to the more extensive off-site roadway improvements identified as mitigation measures for the proposed project, and the associated secondary impacts associated with the implementation of those mitigation measures - see Secondary Impacts described in Impact E.8, the off-site geologic, soil and/or seismic impacts of Alternative 2 would be substantially less than the proposed project. In particular, this alternative would avoid a number of additional steep sloped areas on Roblar Road that would otherwise be encountered by improving all of Roblar Road, including a rocky outcrop on the north side of Roblar Road across from the southeast corner of the project site and a hillside along sections of the south side of Roblar Road east of the proposed access road.

Hydrology and Water Quality

Since the quarry mining and reclamation plan (except for the vehicular access) and associated drainage and sediment controls for this alternative would be identical to the proposed project, direct hydrology and water quality impacts associated the development and operation of a quarry under this alternative would be similar to the proposed project. This would include potentially significant but mitigable effects on flooding and bank erosion in Ranch Tributary and Americano Creek from the increase in on-site impervious surfaces, potential increases the amount of sediment and other pollutants downstream from the quarry property, quarry wall groundwater seepage on flows, potential seepage/supply well water contaminants, and summer baseflows in Ranch Tributary. Furthermore, this alternative would have the same potential effects (albeit less than significant) to deep recharge to regional groundwater, groundwater flow and quality in nearby domestic groundwater wells, and temporary or permanent drawdown or lowering of local groundwater levels.

This alternative would, however, have different off-site hydrology and water quality effects compared to the proposed project, due to the proposed alternative haul route. Construction of this alternative would result in temporary increases in sedimentation that would temporarily affect surface water quality in local water courses. In addition, the off-road haul route segments and improved section of Roblar Road would cross a number of creeks and drainages, and require installation of new stormdrains and/or culverts, as well as located in the vicinity of Americano Creek, which could affect existing local drainage patterns. The proposed temporary paving of Access Roads 1 and 2 and permanent widening of the section of Roblar Road would incrementally increase the amount of impermeable surfaces along these alignments (permanent net increase of approximately 2 acres along Roblar Road, and a temporary increase of 3 acres associated with Access Roads 1 and 2). When considering that this increase in impermeable area would be distributed throughout a large area, and increases in runoff would be distributed to several water courses, the potential effect on flooding would not be expected to be significant. Implementation of Storm Water Pollution Prevention Plan (SWPPP) and its BMPs during construction (similar to Mitigation Measure E.8c) and requirement that the proposed storm drain

system for the roadway widening improvements be designed in accordance with all applicable County and Sonoma County Water Agency (SCWA) drainage and flood control design standards (similar to Mitigation Measure E.8d) would ensure potential temporary and long-term effects of hydrology and water quality from these roadway improvements would be less than significant.

As described above, the alternative haul road improvements would result in a number of new temporary and long-term off-site hydrology and water quality impacts. However, when compared to the more extensive off-site roadway improvements identified as mitigation measures for the proposed project and their associated secondary impacts associated with the implementation of those mitigation measures - see Secondary Impacts described in Impact E.8, the off-site hydrology and water quality impacts of Alternative 2 would be substantially less than the proposed project. In particular, this alternative would have overall less potential direct impacts to surface waters during construction, and would completely avoid the crossing of Americano Creek, Gossage Creek and Washoe Creek along Roblar Road, and the Petaluma River and Liberty Creek along Pepper Road, that could otherwise occur with improving all of Roblar Road and the section of Pepper Road. This alternative would also result in a permanent loss of approximately two acres of pervious surfaces from off-site roadway improvements, compared to a loss of 14 acres of pervious surfaces under the project as mitigated.

Biological Resources

Since the quarry mining and reclamation plan for this alternative (except for the vehicular access) would be identical to the proposed project, direct impacts to biological resources associated with the development and operation of a quarry under this alternative would be similar to the proposed project, including potentially significant but mitigable impacts to: disturbance of on-site jurisdictional waters, including wetlands, and riparian habitat; on-site tree loss; on-site habitat for special status aquatic species; disturbance of active on-site nests of raptors and other special-status birds, and active roosts of special-status bat species; the American badger and its habitat; and special-status fish species downstream of the site.

This alternative would, however, have different off-site effects to biological resources compared to the proposed project, due to the proposed alternative haul route. Vegetation, wildlife and wetland documentation for the areas of the alternative haul route that would be affected by new construction (Access Roads 1 and 2, and the widened section of Roblar Road) is based on focused biological surveys conducted by ESA. Biological resources in these areas were evaluated during site visits by ESA wildlife biologist Brian Pittman, CWB, on January 25, April 6, April 20, May 25 and June 8, 2007, as part of an American badger site assessment (ESA, 2007a) and California tiger salamander (CTS) protocol-level survey (ESA, 2007b).

The plant communities and wildlife habitats in the areas of the alternative haul route that would be affected by new construction are generally similar to communities and resources that occur on the quarry project site. Like the quarry site, the areas of the alternative haul route are dominated by grazed annual grasslands. Other habitat features include a substantial Himalayan blackberry patch, three intermittent drainages (the Ranch Tributary and two unnamed drainages), and wet meadow areas that support annual grasslands. Cattle graze the majority of this alternative haul

route alignment, excepting the area of Access Road 2. The following describes the plant communities and wildlife habitat, and special-status species that would be affected by new construction associated with the alternative haul route.

Grasslands. Non-native grassland is the dominant plant community in the project area. Within this community, annual species dominate and include filaree (*Erodium moschatum*), hare barley (*Hordeum gussoneanum* spp. *leporinum*), and rip-gut brome (*Bromus diandrus*). Other species observed include common chickweed (*Stellaria media*), white clover (*Trifolium repens*), and subterranean clover (*T. subterraneum*).

Arroyo Willow Riparian Woodland. Arroyo willow riparian woodland is present in Americano Creek and on Ranch Tributary on the southern boundary of the site. Access Road 1 would cross Ranch Tributary near its confluence with Americano Creek. Within this vicinity, Ranch Tributary supports both arroyo willow and pacific willow. In the vicinity of the Access Road 1 crossing of Ranch Tributary, the drainage corridor measures roughly three feet wide with a riparian corridor varying from 10 to 25 feet in width. No other willow riparian woodlands in the areas of the alternative haul route would be affected by new construction.

Seasonal Wetland. Seasonal wetlands and wet meadow habitat occurs along the alternative haul route (see in Segments 2, 8 and 9 in Figure V-1). These areas are characterized by seasonally saturated soils that support a predominance of wetland associated vegetation species including northwestern manna grass (*Glyceria occidentalis*), rushes (*Juncus* spp.), semaphore grass (*Pleuropogon californicus*), annual bluegrass (*Poa annua*), and Mediterranean barley (*Hordeum gussoneanum* var. *marinum*). The approximate area and location of seasonal wetlands (though not necessarily the areas that would be impacted by the Alternative Haul Route) is 1,800 sq. ft. (Segment 2), 1,500 sq. ft. (Segment 8), and 300 sq. ft. (Segment 9). The construction of Access Roads 1 and 2 could impact portions these features.

Drainages. In addition to Ranch Tributary, three other principal seasonal drainages occur within the area of the alternative haul route that would be affected by new construction. An unvegetated four-foot wide drainage traverses Access Road 1 in Segment 2, an approximately 25-foot wide drainage swale vegetated with Himalayan blackberries traverses Segment 5, and a roughly 8-foot wide drainage traverses the alignment in Segment 9 near Valley Ford Road. The drainages in Segment 2 and Segment 9 are steeply incised and support only minimal vegetation.

Special-Status Species. The areas of the alternative haul route that would be affected by new construction support much the same assemblage of special status species as the project site. This area of the haul route provides aquatic habitat that could support foothill yellow-legged frog (FYLF), California red-legged frog (CRLF) and northwestern pond turtle in Ranch Tributary and Americano Creek. Badger dens and excavation activity were noted in upland portions of the alternative haul route alignment between the quarry project site and Valley Ford Road. Additionally, wooded portions of the alignment near Americano Creek provide potential breeding habitat for Cooper's hawk and sharp-shinned hawk, and open grasslands provide potential breeding habitat for burrowing owl.

Construction and grading activities on the alternative haul route would disturb or remove jurisdictional wetland and riparian habitat. New construction associated with the alternative haul route would result in temporary and permanent disturbance or displacement of up to 0.003 acre (150 sq. ft.) of Corps jurisdictional wetlands and between 0.01 and 0.03 acre of CDFG-regulated riparian habitat in Ranch Tributary, approximately 0.08 acre of seasonal wetlands that occur within the alignment, and about 0.04 acre in three drainages that traverse the alignment. Conducting a formal wetland delineation and compensating for the loss of jurisdictional wetlands, avoidance as feasible, and other measures to protect the wetland and riparian habitat (similar to Mitigation Measures E.8e and E.8f) would reduce impacts to wetlands and riparian habitats along the alternative haul route to a less-than-significant level.

Construction and grading activities on the alternative haul route could encounter special status wildlife species such as CRLF, FYLF and northwestern pond turtle. Aquatic habitat that may support one or more of these species occurs in association with Americano Creek. CRLF and pond turtles may also occur infrequently in association with seasonal wetlands and grasslands habitat on the alternative haul route. The implementation of measures to minimize and avoid take of CRLF and additionally benefit pond turtles and FYLF, including the training for construction personnel for these species, and monitoring by a USFWS-approved biologist within 100 feet of creek corridors and aquatic habitat that could support CRLF (similar to that contained in Mitigation Measure E.8h) would reduce potential impacts to the species along the alternative haul route to a less than significant level.

Construction and grading activities on the alternative haul route would also have the potential to impact breeding or otherwise special-status birds. The alignment primarily supports annual grasslands habitat, thus species that could be affected by project construction are mainly ground-nesting species. Wooded portions of the alignment, including portions of Americano Creek, Ranch Tributary, and a substantial grove of eucalyptus trees that occur on and near the alignment may also support protected nesting birds. If construction were conducted during the breeding season (February 1 through August 31), project activities have the potential to result in direct mortality of raptors and passerines nesting within grasslands, oak woodlands, or riparian vegetation. Although burrowing owls are not known to occur along the alternative haul route alignment, grading and earthmoving activities within project site grasslands during the non-breeding season could result in mortality of this species, if present at the time these activities occur. If ground-clearing activities would occur during the breeding season, implementation of measures for avoiding disturbance of active nests of raptors and other special-status birds through preconstruction surveys and creation of no-disturbance buffers (similar to that contained in Mitigation Measure D.4a) would reduce potential impacts to nesting raptors and other special-status birds along the alternative haul route to a less-than-significant level. Furthermore, implementation of Mitigation Measure D.4b would reduce potential significant impacts to the burrowing owl less-than-significant level.

Construction and grading would disturb annual grasslands along the alignment and eliminate numerous badger dens. The removal of inactive badger dens would not be considered a significant impact, but there is a potential that active dens may be encountered. This species may be present on the site at any time of the year, and the removal of active dens could result in the

direct mortality of individual badgers that are denning in project area grasslands, if present when activities occur. The implementation of Mitigation Measure D.5 prior to ground-clearing activities would reduce potential impacts to badgers along the alternative haul route to a less-than-significant level.

Potential roosting habitat for special-status bat species is present in the existing ranch buildings on the quarry site, and potentially in the eucalyptus grove in the vicinity of the section of Roblar Road to be widened. As a consequence, construction and grading of the alternative haul route could result in the disturbance or destruction of active roosting habitat for special-status bat species, as well as the potential mortality of bats. The implementation of Mitigation Measure D.6 would reduce this potential impact to potential special status bat species along the alternative haul route to less than significant.

As described above, the alternative haul road improvements would result in a number of new temporary and permanent off-site impacts to biological resources. However, when compared to the more extensive off-site roadway improvements identified as mitigation measures for the proposed project, and the associated secondary impacts associated with the implementation of those mitigation measures - see Secondary Impacts described in Impact E.8, the off-site impacts to biological resources under Alternative 2 would be substantially less than the proposed project. In particular, this alternative would have overall less potential direct impacts to surface waters and their wildlife habitat during construction, and would completely avoid the crossing of Americano Creek, Gossage Creek and Washoe Creek along Roblar Road, and the Petaluma River and Liberty Creek along Pepper Road, that could otherwise occur with improving all of Roblar Road and the section of Pepper Road. Alternative 2 would also completely avoid any potential aestivation and migration habitat for the CTS that may occur on the east portion of Roblar Road, and result in considerably less tree loss than that which would be encountered by improving all of Roblar Road and the section of Pepper Road.

Transportation and Circulation

Under this alternative, the mining and processing equipment and operations, including permitted hours of operation, would be identical to that proposed under the project. As a consequence, the average and maximum daily production rates, and associated average and maximum daily vehicles trips generated at the quarry, would be identical to the proposed project.

However, as discussed in the Alternative 2 description, under this alternative 100 percent of materials produced at the quarry would be either directly used by the applicant or sold under contract. Furthermore, all project truck traffic would use the applicant's identified alternative haul route, consisting of new Access Road 1, a mile-long section of improved Roblar Road, new Access Road 2, Valley Ford Road, Pepper Road (west of Mecham Road), Mecham Road, and a combination of Stony Point Road, SR 116, Railroad Avenue, and/or Old Redwood Highway to/from U.S. 101. No project haul trucks would use Roblar Road east of the alternative access road, or Pepper Road east of Mecham Road. Otherwise, overall regional distribution of quarry truck and materials destinations is assumed to be similar to the project.

The results of the level of service (LOS) analysis for Near-Term Cumulative Base plus Alternative 2 (with a comparison to Near-Term Cumulative Base plus proposed project) are presented in Table V-1. Under this alternative, noticeable changes in cumulative level of service and/or delay compared to the proposed project would occur at two study intersections. At the intersection of Stony Point and Railroad Avenue, Alternative 2 would result in a significant impact during the weekday a.m. and p.m. peak hours (degradation to unacceptable LOS E and F, respectively), whereas the proposed project would not. In contrast, at the intersection of Roblar Road and Stony Point Road, while Alternative 2 (as with the proposed project) would contribute to a significant increase in delay (i.e., greater than five seconds) during the weekday a.m. and p.m. peak hours, Alternative 2 (unlike the proposed project) would avoid a significant impact during the Saturday midday peak hour. Signalization of these intersections (see Mitigation Measures E.1a and E.2b) would mitigate the alternative's contribution to cumulative LOS at these study intersections impact to a less-than-significant level. As discussed in the Transportation section, the County is planning for installation of a signal and associated improvements at the intersection of Roblar Road and Stony Point Road in fiscal year 2008/09. However, as with the proposed project, the impact at Stony Point Road and Railroad Avenue under Alternative 2 would remain potentially Significant and Unavoidable until full funding for, and implementation of, this improvement is assured.

The results of the LOS analysis for Long-Term Cumulative Base plus Alternative 2 (with a comparison to Long-Term Cumulative Base plus proposed project) are presented in Table V-2. This alternative would have a similar cumulative effect on study intersections as the proposed project. As with the proposed project, Alternative 2 would result in a significant impact at four study intersections: Stony Point Road and SR 116 (LOS F and greater than five second delay in a.m. peak hour), SR 116 and Old Redwood Highway (LOS F and greater than five second delay in p.m. peak hour), Roblar Road and Stony Point Road (LOS F/E and greater than five second delay in a.m. and p.m. peak hours, respectively), and Stony Point Road and Railroad Avenue (LOS F and greater than five second delay in a.m. and p.m. peak hours). Implementation of the mitigation measures identified for the proposed project under Long-Term Cumulative conditions would similarly mitigate this alternative's impact. Specifically, provision for a dedicated right-turn lane on the southbound approach at the intersection of Stony Point at Roblar Road (Mitigation Measure E.2a), signalization of the intersection of Stony Point Road and Railroad Avenue (Mitigation Measure E.2b), and optimization of the signal timing at the intersections of Stony Point Road at SR 116, and SR 116 at Old Redwood Highway (Mitigation Measure E.2c and E.2d, respectively) would mitigate the alternative's contribution to cumulative LOS at these study intersections impact to a less-than-significant level. However, as with the proposed project, impacts at Roblar Road and Stony Point Road and Stony Point Road and Railroad Avenue and would remain potentially Significant and Unavoidable until full funding for, and implementation of, these improvements is assured and/or feasibility is confirmed.

Alternative 2 would avoid quarry truck traffic on the majority of the length of Roblar Road, and from Pepper Road east of Mecham Road, both of which contain stretches of narrow travel lane and/or shoulder width. Furthermore, Alternative 2 would improve the approximate one-mile long stretch of Roblar Road that would be used by quarry traffic to meet current County road design

**TABLE V-1
PEAK-HOUR INTERSECTION LEVELS OF SERVICE (LOS): PROPOSED PROJECT AND ALTERNATIVE 2
NEAR-TERM CUMULATIVE BASE PLUS PROJECT CONDITIONS^a**

Intersection	Control ^b	Proposed Project						Alternative 2					
		Weekday				SAT Midday		Weekday				SAT Midday	
		AM		PM		LOS	Delay ^c	AM		PM		LOS	Delay ^c
		Delay ^c	LOS	Delay ^c	LOS			LOS	Delay ^c	LOS	Delay ^c		
Stony Point Road at State Route 116	Signal	41.8	D	84.0	F	44.3	D	41.8	D	84.0	F	44.3	D
State Route 116 at U.S. 101 SB Ramps ^d	Signal	23.7	C	22.0	C	21.4	C	23.7	C	22.0	C	21.4	C
State Route 116 at Old Redwood Highway	Signal	29.6	C	36.5	D	35.8	D	29.6	C	36.5	D	35.8	D
Roblar Road at Valley Ford Road	TWSC	10.1	B	11.8	B	12.0	B	9.1	A	9.6	A	10.4	B
Roblar Road at Stony Point Road	TWSC	>90	F	>90	F	43.7	E	>90	F	>90	F	32.9	D
Mecham Road at Stony Point Road	Signal	13.8	B	15.8	B	18.4	B	17.5	B	18.6	B	21.8	C
Stony Point Road at Railroad Avenue	TWSC	34.9	D	41.6	E	12.3	B	39.3	E	73.1	F	12.9	B
Railroad Avenue at U.S. 101 NB Off-Ramp ^d	TWSC	10.1	B	9.7	A	9.7	A	10.6	B	9.7	A	10.2	B
Pepper Road at Valley Ford Road	TWSC	10.8	B	12.0	B	12.5	B	11.3	B	12.7	B	13.3	B
Pepper Road at Mecham Road	TWSC	9.9	A	10.2	B	10.2	B	10.1	B	11.1	B	10.2	B
Pepper Road at Stony Point Road	Signal	16.0	B	21.8	C	16.4	B	14.8	B	26.3	C	15.9	B
Stony Point Road at Old Redwood Hwy- Petaluma Boulevard	Signal	31.8	C	32.6	C	29.1	C	31.8	C	32.5	C	29.1	C
Old Redwood Hwy at U.S. 101 NB Ramps ^d	Signal	33.9	C	45.8	D	19.2	B	33.7	C	45.8	D	18.7	B

^a Worst movement LOS at two-way stop-controlled intersections; overall intersection LOS at signalized intersections.

^b Signal = Signal controlled, TWSC = Two-way stop (sign) controlled.

^c Average Stopped Delay expressed in terms of Seconds per Vehicle.

^d NB= Northbound, SB= Southbound

Bold typeface signifies a significant impact.

SOURCE: ESA (2007) using TRAFFIX and the 2000 Highway Capacity Manual operations analysis methodology.

**TABLE V-2
PEAK-HOUR INTERSECTION LEVELS OF SERVICE (LOS): PROPOSED PROJECT AND ALTERNATIVE 2
LONG-TERM CUMULATIVE BASE PLUS PROJECT CONDITIONS^a**

Intersection	Control ^b	Proposed Project						Alternative 2					
		Weekday				SAT Midday		Weekday				SAT Midday	
		AM		PM				AM		PM			
		Delay ^c	LOS	Delay ^c	LOS	LOS	Delay ^c	LOS	Delay ^c	LOS	Delay ^c	LOS	Delay ^c
Stony Point Road at State Route 116	Signal	>120	F	>120	F	59.8	E	>120	F	>120	F	59.8	E
State Route 116 at U.S. 101 SB Ramps ^d	Signal	42.5	D	55.9	D	23.8	C	42.5	D	55.9	D	23.8	C
State Route 116 at Old Redwood Highway	Signal	35.6	D	>120	F	37.5	D	35.6	D	>120	F	37.5	D
Roblar Road at Valley Ford Road	TWSC	10.6	B	13.3	B	13.6	B	9.4	A	10.2	B	11.4	B
Roblar Road at Stony Point Road	Signal	114.3	F	70.4	E	10.1	B	110.9	F	74.2	E	9.0	A
Mecham Road at Stony Point Road	Signal	61.7	E	41.5	D	19.0	B	59.6	E	44.6	D	20.6	C
Stony Point Road at Railroad Avenue	TWSC	>90	F	>90	F	15.8	C	>90	F	>90	F	17.4	C
Railroad Avenue at U.S. 101 NB Off-Ramp ^d	TWSC	11.8	B	11.1	B	10.1	B	12.9	B	11.3	B	10.7	B
Pepper Road at Valley Ford Road	TWSC	12.1	B	14.8	B	15.5	C	12.9	B	16.6	C	17.0	C
Pepper Road at Mecham Road	TWSC	10.5	B	11.1	B	10.9	B	10.7	B	12.5	B	10.9	B
Pepper Road at Stony Point Road	Signal	20.7	C	>120	F	17.0	B	20.4	C	>120	F	16.6	B
Stony Point Road at Old Redwood Hwy- Petaluma Boulevard	Signal	56.2	E	100.7	F	31.6	C	56.6	E	100.0	F	31.7	C
Old Redwood Hwy at U.S. 101 NB Ramps ^d	Signal	>120	F	>120	F	18.3	B	>120	F	>120	F	18.8	B

^a Worst movement LOS at two-way stop-controlled intersections; overall intersection LOS at signalized intersections.

^b Signal = Signal controlled, TWSC = Two-way stop (sign) controlled.

^c Average Stopped Delay expressed in terms of Seconds per Vehicle.

^d NB= Northbound, SB= Southbound

Bold typeface signifies a significant impact.

SOURCE: ESA (2007) using TRAFFIX and the 2000 Highway Capacity Manual operations analysis methodology.

standards. Consequently, this alternative would avoid the potentially significant and unavoidable traffic safety hazard for bicyclists and pedestrians on Roblar Road and Pepper Road east of Mecham Road that was identified for the proposed project. In addition, this alternative would avoid the potentially significant and unavoidable impact associated with an increase in the potential for traffic accidents on these roadway segments.

This alternative would not construct the access road connection to Roblar Road proposed under the project (1,200 feet east of the existing access to the site), but rather, would construct the Access Road 1 connection to Roblar Road, and the Access Road 2 connections to Roblar Road and Valley Ford Road. Consequently, this alternative would create three new access road connections to public roadways where quarry truck turning movements would be required (as opposed to one new connection under the proposed project), thereby creating a greater potential for conflicts between turning quarry trucks and other traffic on Roblar and Valley Ford Roads. As shown in Figures V-6 and V-7, the applicant's preliminary drawings indicate improvements at each end of the improved section of Roblar Road to accommodate quarry trucks turning in and out of the off-road segments, including but not limited to, space for deceleration on the eastbound approach to Access Road 1, and a westbound left-turn pocket on the approach to Access Road 2. Field observations and measurements indicate that there is sufficient sight distance at the proposed new roadway intersections to allow approaching vehicles to perceive, react, and safely stop, as well as allow quarry trucks to make their turning movements. In addition, the provision for new access points to Roblar Road and Valley Ford Road under this alternative to meet all applicable roadway design standards (similar to that contained in Mitigation Measures E.5a and E.5b) would ensure all potential significant safety effects associated with truck turning movements at new public road connections would be mitigated to a less than significant level.

Table V-3 presents the calculated traffic index (TI) for study roadways for Alternative 2 compared to the proposed project and existing conditions. With the improvement of the segment of Roblar Road that would be used by quarry trucks, and the avoidance of quarry truck traffic on Pepper Road east of Mecham Road, Alternative 2 would avoid the significant and unavoidable project impact associated with contribution to the degradation of pavement on Roblar Road, and Pepper Road east of Mecham Road.

The change in quarry truck distribution on roadway network under Alternative 2 would also result in different rates of roadway wear on study roadways. As shown in Table V-3, Alternative 2 would result in a greater estimated TI on Roblar Road west of the project site, Valley Ford Road, Pepper Road west of Mecham Road, and Mecham Road compared to the project. However, Alternative 2 would not result in any additional road segments that would be significantly impacted compared to the proposed project.

Off-site road improvements associated with Alternative 2 would result in temporary congestion during construction. The implementation of traffic control measures during construction (similar to those contained in Mitigation Measure E.8k) would reduce these temporary construction related effects on transportation to a less than significant level. It should be noted that when compared to the more extensive off-site roadway improvements identified as mitigation measures

**TABLE V-3
CALCULATED TRAFFIC INDEX (TI) FOR PROJECT HAUL ROUTES FOR
THE PROPOSED PROJECT AND ALTERNATIVE 2^a**

Roadway	Existing	Existing plus Proposed Project	Existing plus Alternative 2
Mecham Road	10.5	10.7	11.1
Pepper Road			
west of Mecham Road	9.6	10.6	11.1
east of Mecham Road	9.4	10.2	9.4
Roblar Road			
west of Project Site	7.5	10.3	10.6**
east of Project Site	8.4	9.8	8.4
Stony Point Road			
north of Roblar Road	11.2	11.6	11.6
south of Roblar Road	10.8	11.2	11.2
Valley Ford Road	9.9	10.8	11.2

^a Traffic Indices in this table represent values calculated on the basis of existing and project truck traffic volumes, and Equivalent Single-Axles Load factors in the Caltrans Highway Design Manual.

** Under Alternative 2, the approximate one-mile of this segment that would be used by quarry trucks would be improved as needed per Caltrans Design Manual standards; consequently, no significant impact identified.

Bold typeface signifies a significant impact.

SOURCE: ESA (2008) and the Caltrans *Highway Design Manual* Traffic Index methodology.

for the proposed project, off-site transportation impacts of Alternative 2 would be substantially less than the proposed project as mitigated.

Air Quality

Under this alternative, the quarry mining and reclamation plan (except for the vehicular access), and mining and processing equipment and operations would be identical to that proposed under the project. Accordingly, the annual production rate, and average and maximum daily production rates of the quarry under this alternative would be identical to the proposed project. As a consequence, total on-site emissions generated by on-site stationary and mobile equipment would be similar to the proposed project. Similarly, the total number of average and maximum daily vehicles trips generated at the quarry would be identical to the proposed project. However, the distribution of haul truck traffic on the local study road network for this alternative would be different than the proposed project.

Use of the alternative haul route would result in an incrementally longer average truck haul trip length compared to the proposed project, which would also result in incrementally greater air emissions. Table V-4, below presents estimated total maximum daily and average annual emissions from all quarry sources (including on-site equipment and vehicles, and off-site haul trucks) for Alternative 2 compared to the proposed project, focusing on the criteria pollutants that were identified to approach or exceed the significance thresholds under the project (i.e., NO_x, and

PM₁₀). As shown in Table V-4, Alternative 2 would incrementally increase the significant emissions of NO_x, and PM₁₀ over the proposed project, but would not trigger any new significant impacts for these or other criteria pollutants for the conditions assessed.

**TABLE V-4
ESTIMATED MAXIMUM DAILY AND AVERAGE ANNUAL EMISSIONS:
PROPOSED PROJECT AND ALTERNATIVE 2**

Condition	Proposed Project		Alternative 2	
	NO _x	PM ₁₀	NO _x	PM ₁₀
Emissions (pounds per day)				
Maximum Daily				
2007	663	90.4	707	93.6
2027	303	65.9	310	66.5
Daily Threshold	80	80	80	80
Emissions (tons per year)				
Annual				
2007	53.3	7.2	56.8	7.5
2027	24.9	5.3	25.4	5.3
Annual Threshold	15	15	15	15

NOTE: Values in **bold** are in excess of applicable threshold.

SOURCE: Environmental Science Associates, 2007

As with the proposed project, implementation of Mitigation Measures F.1a-c (utilize PG&E electricity to power the mobile processing plant; use 2007 model engines or newer on-site mobile equipment; and use 2003 model or newer haul trucks.) would reduce the significant daily PM₁₀ emissions in 2007, and annual emissions of NO_x for 2027 to a less than significant level. However, as with the proposed project, maximum daily emissions of NO_x for 2007 and 2027 and annual NO_x for 2007 would remain Significant and Unavoidable.

Dispersion modeling was conducted of on-and off-site project sources of DPM for Alternative 2 to evaluate the potential health risks associated with exposure to DPM, using the same model as that used for the proposed project (ISC-3). Table V-5 presents the estimated annual average DPM concentrations that would be experienced at each of the six study receptors for Alternative 2 and the proposed project based on dispersion modeling. As shown in Table V-5, as would be expected, the estimated annual average DPM emissions associated with the haul trucks would be greater than the proposed project west of the quarry site along Roblar Road (due to the alternative haul route), and correspondingly, less than the proposed project at points east of the quarry.

The total carcinogenic risk at the study receptors from Alternative 2 over the 20-year life of the quarry is estimated to be less than one per million risk at Dunham Elementary School, between approximately 2 and 3 per million risk at four of the study residence receptors, and approximately 8.3 per million risk at the nearest residence receptor. These increments are less than the

**TABLE V-5
ESTIMATED ANNUAL AVERAGE DPM CONCENTRATIONS FROM
PROPOSED PROJECT AND ALTERNATIVE 2 AT STUDY RECEPTORS**

Receptor Identification Number ^a	Location	Proposed Project			Alternative 2		
		Estimated Annual Average DPM Concentrations over 70-year lifetime ($\mu\text{g}/\text{m}^3$) ^{b,c}			Estimated Annual Average DPM Concentrations over 70-year lifetime ($\mu\text{g}/\text{m}^3$) ^{b,c}		
		Off-Site Haul Trucks	On-Site Sources	Total (Off-site + Onsite)	Off-Site Haul Trucks	On- Site Sources	Total (Off-site + Onsite)
S1	Dunham Elementary School	0.001	0.001	0.002	0.000	0.001	0.001
R1	Residence approximately 2,700 feet southwest of project site along Roblar Rd	0.001	0.002	0.004	0.002	0.002	0.004
R2	Residence directly across Roblar Rd west of project site	0.002	0.006	0.008	0.001	0.006	0.007
R3	Residence approximately 800 feet east of northeast corner of project site along Roblar Rd	0.001	0.005	0.007	0.000	0.005	0.006
R4	Residence at northwest corner of intersection of Roblar Rd and Canfield Rd	0.001	0.004	0.005	0.000	0.004	0.004
R5	Residence on adjacent property east of project site (approximately 160 feet east of project site, and 600 feet northeast of Phase 3 mining)	0.001	0.019	0.020	0.001	0.019	0.020

^a See Figure IV.F-1 in Section IV.F for illustration of location of receptors.

^b Concentration values are rounded.

^c $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter.

SOURCE: Environmental Science Associates, 2007.

significance threshold of 10 cancers in a million persons. Therefore, as with the proposed project, the potential carcinogenic health risks from DPM associated with the alternative would be less than significant. In addition, the DPM chronic health index would be well below 1, and therefore, also less than significant. As with the proposed project, implementation of Mitigation Measure F.1a through F.1c would collectively further reduce total annual off- and on-site DPM emissions for this alternative, and accordingly, would further decrease DPM exposure and associated health risk at nearby receptors and along haul routes over the project lifetime.

Like the proposed project, less than significant effects associated with peak-hour increases in CO concentrations at the study intersections would be similarly less than significant for Alternative 2.

Since on-site operations would be similar to the proposed project, and the new off-site roadway segments constructed for the alternative haul route would be paved, any episodes of fugitive dust generated by the proposed project in the site vicinity would be similar to the proposed project. As

a result, the implementation of a formal comprehensive dust control program (see Mitigation Measure F.4) would ensure all potential dust emissions would remain less than significant. As with the proposed project, effects associated with potential airborne release of crystalline silica for Alternative 2 would be similarly less than significant.

While estimated greenhouse gases (GHGs) for Alternative 2 would also be incrementally higher than the proposed project due to an incrementally greater average trip length, Alternative 2, like the proposed project, would not be classified as a major source of greenhouse gas emissions, and moreover, would reduce the need for aggregate to serve this area to come from more distant aggregate sources. In addition, implementation of Mitigation Measures F.1a-c for Alternative 2 would further reduce the GHG emissions of this alternative.

As with the proposed project, when considering Alternative 2 together with anticipated cumulative development in the area, this alternative would have a significant and unavoidable cumulative impact associated with contribution to regional criteria pollutants and TACs.

Off-site road construction associated with Alternative 2 would result in temporary construction-related impact on air quality, particularly dust. The implementation of dust control measures during construction (similar to those contained in Mitigation Measure E.81) would reduce these temporary air quality effects to a less than significant level. When compared to the more extensive off-site roadway improvements identified as mitigation measures for the proposed project, construction related air quality impacts of Alternative 2 would be substantially less than the proposed project as mitigated.

Noise

Under this alternative, the quarry mining and reclamation plan (except for the vehicular access), and mining and processing equipment and operations would be identical to that proposed under the project. Accordingly, on-site noise impacts associated with Alternative 2 would be identical to the proposed project. As a consequence, significant but mitigable increases in the ambient noise levels at the nearest residences from mining and processing activities, including any temporary airborne and groundborne noise and vibration effects from blasting, would be similar to the proposed project.

The change in quarry truck distribution on the roadway network for Alternative 2 would result in a corresponding change in ambient noise levels compared to the proposed project on certain study area roadways. Table V-6 presents the estimated near-term and long-term peak-hour traffic noise levels on study area roadways for Alternative 2 and the proposed project. As shown in Table V-6, Alternative 2 would result in greater ambient noise levels on Roblar Road west of the project site, Valley Ford Road, Pepper Road west of Mecham Road, and Mecham Road compared to the proposed project. However, Alternative 2 would not result in any additional road segments that would be significantly impacted compared to the proposed project [i.e., significant impact (greater than 3 decibel increase from baseline conditions) limited to the segment of Roblar Road west of project site]. The installation of residential noise insulation upgrades on the two residences on Roblar Road between the project entrance and Valley Ford Road (see Mitigation

**TABLE V-6
NEAR-TERM AND LONG-TERM AM PEAK-HOUR TRAFFIC NOISE LEVELS ALONG ROADWAYS IN THE PROJECT VICINITY:
PROPOSED PROJECT AND ALTERNATIVE 2**

Roadway Segment ¹	AM Peak-Hour Noise Level, dBA, Leq							
	Proposed Project				Alternative 2			
	Near Term Cumulative Base (No Project)	Near Term Cumulative Base Plus Project	Incremental Increase (Near Term vs. Near Term + Project)	Significant? (Yes or No) ²	Near Term Cumulative Base (No Project)	Near Term Cumulative Base Plus Alternative 2	Incremental Increase (Near Term vs. Near Term + Alternative 2)	Significant? (Yes or No) ²
1. Roblar Rd. between project entrance and Stony Point Rd.	65.5	67.1	1.6	No	65.5	65.5	0	No
2. Roblar Rd. between project entrance and Valley Ford Rd.	58.4	65.2	6.8	Yes	58.4	65.8	7.4	Yes
3. Valley Ford Rd. between Roblar Rd. and Pepper Rd.	65.0	67.5	2.5	No	65.0	67.8	2.8	No
4. Pepper Rd. between Mecham Rd. and Walker Rd.	62.2	62.6	0.4	No	62.2	62.9	0.7	No
5. Mecham Rd. north of Pepper Rd.	61.8	62.0	0.2	No	61.8	62.6	0.8	No
6. Stony Point Rd. north of Roblar Road	72.5	72.7	0.2	No	72.5	72.7	0.2	No
7. Stony Point Rd. south of Roblar Rd.	72.2	72.7	0.5	No	72.2	72.2	0.5	No
	Long-Term Cumulative Base (No Project)	Long Term Cumulative Base Plus Project	Incremental Increase (Long Term vs. Long Term + Project)	Significant? (Yes or No) ²	Long-Term Cumulative Base (No Project)	Long Term Cumulative Base Plus Alternative 2	Incremental Increase (Long Term vs. Long Term + Alternative 2)	Significant? (Yes or No) ²
1. Roblar Rd. between project entrance and Stony Point Rd.	66.9	68.2	1.3	No	66.9	66.9	0	No
2. Roblar Rd. between project entrance and Valley Ford Rd.	59.9	65.5	5.6	Yes	59.9	66.0	6.1	Yes
3. Valley Ford Rd. between Roblar Rd. and Pepper Rd.	66.5	68.4	1.9	No	66.5	68.7	2.2	No
4. Pepper Rd. between Mecham Rd. and Walker Rd.	63.6	64.0	0.4	No	63.6	64.2	0.6	No
5. Mecham Rd. north of Pepper Rd.	63.3	63.4	0.1	No	63.3	63.9	0.6	No
6. Stony Point Rd. north of Roblar Road	75.3	75.5	0.2	No	75.3	75.5	0.2	No
7. Stony Point Rd. south of Roblar Rd.	75.0	75.4	0.4	No	75.0	75.4	0.4	No

¹ Road center to receptor distance is 15 meters (approximately 50 feet) for values shown in this table. Noise levels were determined using FHWA Traffic Noise Prediction Model (FHWA RD-77-108).

² Considered significant if the incremental increase in noise is greater than 3 dBA Leq in a noise environment greater than 60 dBA CNEL.

³ Vehicle mix on based on existing truck percentages from the Transportation Section with the addition of project vehicle trips. The speed limit for these segments was assumed to be 45 miles per hour.

SOURCE: ESA, 2008

Measure G.2) would mitigate project effects; however, as under the proposed project, since this measure depends on the approval of the property owners to implement this mitigation, until and if the property owners agreed to this mitigation measure, this impact would also remain significant for Alternative 2.

Alternative 2 would also have a larger contribution to cumulative noise levels on Roblar Road west of the project site, Valley Ford Road, Pepper Road west of Mecham Road, and Mecham Road compared to the proposed project. However, Alternative 2 would not result in any additional road segments that would have a significant cumulative noise impact compared to the proposed project [i.e., significant cumulative impact (greater than 1 decibel increase from existing conditions) for Segments 2, 3, 6 and 7]. Implementation of Mitigation G.2 would also mitigate Alternative 2's contribution to significant cumulative noise levels. However, as under the proposed project, since this measure depends on the approval of the property owners to implement this mitigation, until and if the property owners agreed to this mitigation measure, this impact would also remain significant for Alternative 2. It should be noted that since Alternative 2 would not add quarry truck traffic to Roblar Road east of the project site, this alternative would not change ambient noise levels on that road segment.

Off-site road construction associated with Alternative 2 would result in temporary construction-related noise impacts (including potential blasting noise if blasting is required to excavate certain bedrock types). The implementation of noise mitigation measures during construction, including adherence to the County's permitted hours for construction activities (similar to those contained in Mitigation Measure E.8m) would reduce these temporary noise effects to a less than significant level. When compared to the more extensive off-site roadway improvements identified as mitigation measures for the proposed project, construction related noise impacts of Alternative 2 would be substantially less than the proposed project as mitigated.

Hazardous Materials

Under this alternative, the quarry mining and reclamation plan, including use, storage and transport of hazardous materials would be similar to that proposed under the project. Accordingly, potential significant but mitigable impacts associated with hazardous materials for Alternative 2 would be identical to the proposed project.

Off-site road construction associated with Alternative 2 would result in temporary construction-related effects associated with hazardous materials, including the potential for accidental release of hazardous materials (e.g., fuels, lubricants) to soil and/or stormwater along the roadway alignment. The implementation of a SWPPP during construction (similar to Mitigation Measure E.8c) would ensure potential temporary hazardous materials impacts from these roadway improvements would be less than significant.

Aesthetics

Under this alternative, the quarry mining and reclamation plan (except for the vehicular access) would be identical to that proposed under the project. Correspondingly, significant impacts associated with alteration in the visual character of the project site for the proposed project would

also be significant for Alternative 2. Similarly, less than significant project effects associated with the production of new sources of light and/or glare, and contribution to cumulative changes in visual character would also be less than significant for Alternative 2.

Off-site road construction associated with Alternative 2 would result in a temporary visual change associated with the development of Access Roads 1 and 2; these roads would be reclaimed to their natural conditions following 20-year life of the quarry. Alternative 2 would also result in a permanent visual change along the alignment of the widened section of Roblar Road, including removal of vegetation, recontouring of some adjacent slopes, and the potential installation of roadway support features (e.g., retaining walls or embankments). As with the proposed project, the visual impact for Alternative 2 would be reduced through implementation of slope revegetation and other aesthetic measures identified in Mitigation Measure E.8n.

While off-site road construction associated with Alternative 2 would result in both temporary and permanent aesthetic effects, when compared to the more extensive off-site roadway improvements identified as mitigation measures for the proposed project, off-site transportation impacts of Alternative 2 would be substantially less than the proposed project as mitigated.

Public Services and Utilities

Under this alternative, the quarry mining and reclamation plan (except for the vehicular access) would be identical to that proposed under the project. Correspondingly, significant but mitigable impacts to fire protection services, and less than significant impacts to police protection services, solid waste services, and electrical utility service for the quarry for Alternative 2 would be similar to the proposed project.

Off-site road construction associated with Alternative 2 would require the relocation of utilities along the section of Roblar Road to be widened. However, when compared to the more extensive off-site roadway improvements and associated utilities relocation that would be required for the proposed project, potential temporary effects on public utilities for Alternative 2 would be substantially less than the proposed project. See also Transportation, above, for measures identified for maintaining emergency vehicular access for fire/police protection services during construction.

Cultural Resources

Under this alternative, the quarry mining and reclamation plan (except for the vehicular access) and extent of on-site disturbance would be similar to that proposed under the project. Correspondingly, significant but mitigable impacts from quarry development to archaeological and paleontological resources for this alternative would be similar to the proposed project.

A cultural resources study of the portions of the Alternative 2 haul route alignment that would be affected by new construction (i.e., Access Roads 1 and 2, and the section of Roblar Road that would be improved) was conducted by Tom Origer & Associates (*A Cultural Resources Survey Addendum for the Roblar Road Quarry EIR, Sonoma County, California, 2007*). This study included archival research at the Northwest Information Center (NWIC), Sonoma State

University (NWIC File No. 06-1131), examination of the library and files of Tom Origer & Associates, consultation with the Native American Heritage Commission and local Native American representatives, and field inspection of the project site. The cultural resource analysis also considers the paleontological resource study conducted for Tom Origer & Associates (*Assessment of the Paleontological Sensitivity of the Proposed Roblar Road Quarry, Sonoma County, California*, Allen, 2006) for the proposed project.

The terrain of the study area is moderately sloping. Slopes along the alignment consist of the Steinbeck series, and are moderately well-drained soils usually found on marine terraces. Other soils consist of Blucher, Clear Lake (poorly draining clays and loams), and Los Osos series (well drained clay loams). Historically, parcels with these soils were used for grazing and pasture land, although some have been used to cultivate grain, hay, and some row crops. On the quarry project site, Access Road 1 would extend in the vicinity of the ranch complex.

The Native American Heritage Commission and the Federated Indians of Graton Rancheria indicate they have no information regarding the presence of sacred sites within or near the study area. Archival research indicates that there are no recorded cultural resources within the study area; however the entire project area has not been subjected to prior cultural resource investigations. One survey found three cultural resources within ¼-mile of the study area, however, these sites do not extend into the study area. No other previous studies in the vicinity found archaeological sites or historic-period resources that extend into the study area. Review of the ethnographic literature for this area found no ethnographic sites within or near the study area. There are no local, state or federally recognized historic properties within or near the study area.

The portions of the Alternative 2 haul route alignment that would be affected by new construction were surveyed by Tom Origer and Associates on January 25, 2007, by walking in transects 20 meters wide. The field survey found no prehistoric cultural materials.

As with the proposed project, there is the possibility that buried archaeological or paleontological deposits could be present and encountered during land alteration activities for Alternative 2 during construction. As with the proposed project, the implementation of Mitigation Measures E.8o and E.8p during construction of the Alternative 2 haul route would mitigate these potential impacts to a less than significant level. In addition, because there is a higher potential that historic resources (such as trash pits and privies) could be found in the vicinity of the ranch complex, it is recommended that an archaeological monitor be present for the length of the Access Road 1 construction between the existing on-site access road and Ranch Tributary.

Alternative 3: Reduced Production (285,000 CY) / Reduced Size (Phases 1 and 2 Footprint) Alternative

Direct Environmental Impacts

Land Use and Agricultural Resources

This alternative would be restricted to half the permitted maximum annual production proposed under the project and limited to mining within the Phase 1 and 2 footprints (i.e., no mining within the Phase 3 footprint). Consequently, overall direct impacts to land use and agricultural resources associated with development and operation of a quarry under this alternative would be less than the proposed project. The impacts associated with the quarry's land use compatibility with surrounding residential land uses would be less than the proposed project, but still significant. This alternative's significant but mitigable impacts associated with the temporary and permanent conversion of farmland on the quarry site to a non-agricultural use, the temporary and permanent loss of Grazing Land and Farmland of Local Importance on the quarry site, and conflicts with the Williamson Act Contract governing the quarry site would be incrementally less than the proposed project. The beneficial effects of placement of the 244-acre Lakeville Road property under a permanent agricultural easement that was proposed under the project would be similar under this alternative.

This alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project (including widening of the entire length of Roblar Road and Pepper Road east of Mecham Road). Consequently, this alternative would have identical secondary impacts associated implementation of those mitigation measures (including loss of prime agricultural land, conflicts with additional Williamson Act contracts and/or agricultural conservation easements, and other identified environmental effects) - see Secondary Impacts described in Impact E.8, the off-site land use and agricultural impacts of Alternative 3 would be equal to the proposed project.

Geology, Soils and Seismicity

The active mining area at any one time for this alternative would be limited to 30 acres, identical to the proposed project. However, since the mining plan for this alternative would be limited to the Phase 1 and 2 footprint, the total area affected by mining (approximately 48 acres) would be less than the proposed project (approximately 70 acres). As with the proposed project, quarry slopes would be graded at 1½:1 (horizontal:vertical), with 10-foot wide benches at 30-foot vertical intervals. However, final quarry wall height under this alternative would be less than the proposed project. At the highest point, the east quarry wall for Alternative 3 would be as much as 50 feet lower than the proposed project. Overall direct on-site geologic, soil and seismic impacts associated with construction and operation of a quarry for Alternative 3 would be less than the proposed project, including potentially significant but mitigable impacts to workers from geologic hazards from mining; and impacts to erosion from ground disturbance.

Since this alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project, it would have identical secondary impacts

associated with implementation of those mitigation measures, including effects of short and/or long-term increases in erosion, and localized geologic and seismic hazards, and the potential for long-term increases in erosion. Similarly, implementation of Mitigation Measure E.8a and E.8b would reduce these effects for Alternative 3.

Hydrology and Water Quality

As discussed above, the active mining area at any one time for this alternative would be limited to 30 acres, identical to the proposed project. Since the mining plan for this alternative would be limited to the Phase 1 and 2 footprint, the associated drainage and sediment controls for this alternative would be similar to that proposed through Phase 2 of the project. Since the total area affected by quarry development for this alternative would be less than the proposed project, overall direct hydrology and water quality impacts associated the development and operation of a quarry under this alternative would be less than the proposed project. This would include potentially significant but mitigable effects on flooding and bank erosion in Ranch Tributary and Americano Creek from the increase in on-site impervious surfaces, potential increases in the amount of sediment and other pollutants downstream from the quarry property, quarry wall groundwater seepage, potential seepage/supply well water contaminants, and summer baseflows in Ranch Tributary. Furthermore, this alternative would have incrementally lesser effects (and still less than significant) to deep recharge to regional groundwater, groundwater flow and quality in nearby domestic groundwater wells, and temporary or permanent drawdown or lowering of local groundwater levels.

Since this alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project, it would have identical secondary impacts associated with implementation of those mitigation measures, including temporary increases in sedimentation, potential alteration in local drainage patterns, and increases in runoff from increases in impermeable surfaces. Similarly, implementation of Mitigation Measure E.8d would reduce these effects for Alternative 3.

Biological Resources

Since this alternative would be limited to mining within the Phase 1 and 2 footprints, mining would disturb an incrementally smaller amount of on-site biological resources from mining, including avoiding Center Pond and its aquatic habitat (e.g., for CRLF, and potentially FYLF and northwestern pond turtles) and the adjacent stand of nine black oak trees. However, as under the proposed project, much of the area of the Phase 3 footprint under Alternative 3 (excluding Center Pond and the stand of trees) would still be temporarily disturbed by the placement of stockpiles in this area during mining. Consequently, direct impacts to biological resources associated with the development and operation of a quarry under this alternative would be incrementally less than the proposed project, including potentially significant but mitigable impacts to: disturbance of on-site jurisdictional waters, including wetlands, on-site tree loss; on-site habitat for special status aquatic species; disturbance of active on-site nests of raptors and other special-status birds, the American badger and its habitat; and special-status fish species downstream of the site.

Since this alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project, it would have identical secondary impacts along associated implementation of those mitigation measures, including potential impacts during construction to surface waters (including several creek crossing), wildlife habitat including potential effects on potential aestivation and migration habitat for the CTS, and tree loss along the roadway widening alignment. Similarly, implementation of Mitigation Measures E.8e-j would reduce these effects for Alternative 3.

Transportation and Circulation

Under Alternative 3, aggregate production at the quarry would be restricted to a maximum of 285,000 CY per year (half the permitted maximum annual production proposed under the project). Consequently, the total annual number of vehicle trips generated by this alternative would be approximately half that of the proposed project. However, since the type of mining and processing equipment, and permitted hours of operation, would be identical to the proposed project, on a given workday the average and maximum daily production rates of this alternative could be similar to the proposed project. Correspondingly, on those days, the average and maximum daily vehicles trips generated at the quarry under this alternative would be equal to the proposed project. Under those circumstances, this alternative would have the same effect on LOS at study intersections under Near-Term and Long-Term Cumulative conditions as the proposed project. While this alternative would have the potential to result in a similar effect on LOS as the proposed project on maximum production days, the frequency that maximum production days (and the corresponding greatest project effect on LOS) would occur for this alternative would likely be less than the proposed project.

Although less than the proposed project, this alternative would still create a potential significant traffic safety hazard for bicyclists and pedestrians, and potential for traffic accidents, on the same roadway segments as those identified for the proposed project.

The reduction in quarry trucks generated on the roadway network under Alternative 3 would result in a change in effect on roadwear on study roadways. Table V-7 presents the calculated traffic index (TI) for study roadways for Alternative 3 compared to the proposed project and existing conditions. As shown in Table V-7, Alternative 3 would result in a lesser increase in TI study roadway compared to the project. In particular, Alternative 3 would avoid a significant impact increase in TI on Pepper Road east of Mecham Road that would be experienced under the proposed project.

Since this alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project, it would have identical secondary impacts associated implementation of those mitigation measures, including temporary construction related effects on transportation (potential lane closures, etc.). Similarly, implementation of Mitigation Measures E.8k would reduce these effects for Alternative 3.

**TABLE V-7
CALCULATED TRAFFIC INDEX (TI) FOR PROJECT HAUL ROUTES FOR
THE PROPOSED PROJECT AND ALTERNATIVE 3^a**

Roadway	Existing	Existing plus Proposed Project	Existing plus Alternative 3
Mecham Road	10.5	10.7	10.6
Pepper Road			
west of Mecham Road	9.6	10.6	10.2
east of Mecham Road	9.4	10.2	9.9
Roblar Road			
west of Project Site	7.5	10.3	9.4
east of Project Site	8.4	9.8	9.3
Stony Point Road			
north of Roblar Road	11.2	11.6	11.4
south of Roblar Road	10.8	11.2	11.0
Valley Ford Road	9.9	10.8	10.4

^a Traffic Indices in this table represent values calculated on the basis of existing and project truck traffic volumes, and Equivalent Single-Axles Load factors in the Caltrans Highway Design Manual.

Bold typeface signifies a significant impact.

SOURCE: ESA (2008) and the Caltrans *Highway Design Manual* Traffic Index methodology.

Air Quality

Under this alternative, annual aggregate production at the quarry would be restricted to half that of the proposed project. Consequently, total annual operation of mining and processing equipment, total number of vehicle trips generated annually by this alternative, and associated annual air emissions would be approximately half that of the proposed project. However, since the type of mining and processing equipment, and permitted hours of operation, would be identical to the proposed project, on a given workday the average and maximum daily production rates of this alternative could be similar to the proposed project. Correspondingly, on those days, the maximum daily air emission would be similar to the proposed project.

Table V-8, below, presents maximum daily and average annual emissions of criteria pollutants of the Alternative 3, and comparison to the applicable regulatory threshold and to the proposed project. As shown in Table V-8, Alternative 3 would avoid a significant project impact to annual NO_x emissions in 2027. It should be also noted that implementation of Mitigation F.1a-c for this alternative would mitigate the significant impact annual NO_x emissions in 2007 to a less than significant level, whereas under the proposed project it would remain significant. As with the proposed project, implementation of Mitigation Measures F.1a-c would reduce the significant daily PM₁₀ emissions in 2007 to a less than significant level. However, as with the proposed project, maximum daily emissions of NO_x for 2007 and 2027 would remain Significant and Unavoidable. While this alternative would have the potential to result in similar emissions as the proposed project on maximum production days, the frequency that maximum production days

**TABLE V-8
ESTIMATED MAXIMUM DAILY AND ANNUAL AVERAGE EMISSIONS:
PROPOSED PROJECT AND ALTERNATIVE 3**

Condition	Proposed Project				Alternative 3			
	NO _x	PM ₁₀	ROG	CO	NO _x	PM ₁₀	ROG	CO
	Emissions (pounds per day)				Emissions (pounds per day)			
Maximum Daily								
2007	663	90.4	35.5	160	663	90.4	35.5	160
2027	303	65.9	21.2	63.8	303	65.9	21.2	63.8
Daily Threshold	80	80	80	550	80	80	80	550
	Emissions (tons per year)				Emissions (tons per year)			
Annual								
2007	53.3	7.2	2.7	12.6	26.7	3.6	1.4	6.3
2027	24.9	5.3	1.6	4.8	12.5	2.7	0.8	2.4
Annual Threshold	15	15	15	--	15	15	15	--

NOTE: Values in **bold** are in excess of applicable threshold.

SOURCE: Environmental Science Associates, 2008

(and the corresponding maximum daily emissions) would occur for this alternative would likely be less than the proposed project.

The estimated annual average DPM emissions generated by this alternative, and corresponding annual average DPM concentrations at the study receptors, would be approximately half that of the proposed project. Consequently, the total carcinogenic risk at the study receptors from Alternative 3 over the 20-year life of the quarry is estimated to be approximately half that of the proposed project, and similarly less than significant. As with the proposed project, implementation of Mitigation Measure F.1a through F.1c would collectively further reduce total annual off- and on-site DPM emissions for this alternative, and accordingly, would further decrease DPM exposure and associated health risk at nearby receptors and along haul routes over the project lifetime.

Peak-hour increases in CO concentrations at the study intersections under Alternative 3 would be approximately half that of the proposed project and similarly well under the regulatory threshold for significance. Potential episodes of fugitive dust generated by this alternative in the site vicinity would be similar to or less than the proposed project, and mitigable with implementation of formal comprehensive dust control program. As with the proposed project, effects associated with potential airborne release of crystalline silica for Alternative 2 would be less than the project, and similarly less than significant.

Estimated annual GHG emissions for Alternative 2 would be approximately half that of the proposed project, and as with the project, would not be classified as a major source of greenhouse gas emissions. In addition, as with the proposed project, implementation of Mitigation Measures F.1a-c for Alternative 3 would further reduce the GHG emissions of this alternative.

As with the proposed project, when considering Alternative 2 together with anticipated cumulative development in the area, this alternative would have a significant and unavoidable cumulative impact associated with contribution to regional criteria pollutants and TACs.

Since this alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project, it would have identical secondary impacts associated implementation of those mitigation measures, including temporary construction-related impact on air quality, particularly dust. Similarly, implementation of Mitigation Measure E.8l would reduce these effects for Alternative 3.

Noise

Under this alternative, annual aggregate production at the quarry would be restricted to half that of the proposed project. Consequently, total annual operation of mining and processing equipment, and associated effect by these activities on annual ambient noise levels by this alternative would be less than the proposed project. Moreover, by limiting the mining plan to the Phase 1 and Phase 2 footprint, this alternative would avoid direct noise impacts from mining (including blasting) within Phase 3, although it would not avoid noise generated by temporary stockpiling activities that would occur within the Phase 3 area. However, since the type of mining and processing equipment, and permitted hours of operation, would be identical to the proposed project, on a given workday the average and maximum daily production rates of this alternative could be similar to the proposed project. Correspondingly, on those days, the significant but mitigable impacts on daily ambient noise levels associated with this alternative would be similar to the proposed project.

Similarly, on an annual basis, the total number of vehicle trips generated annually by this alternative would be half that of the proposed project. Consequently, increases in annual ambient noise levels by quarry traffic on haul routes by this alternative would be less than the proposed project. However, on maximum production days, quarry truck generated noise, including contribution to cumulative noise, and the associated effects on daily roadside noise levels at sensitive receptor on the haul routes would be significant, as under the proposed project.

Since this alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project, it would have identical secondary impacts associated implementation of those mitigation measures, including temporary construction-related impact noise impacts. Similarly, implementation of Mitigation Measure E.8m would reduce these effects for Alternative 3.

Hazardous Materials

Alternative 3 would be expected to use, store and transport incrementally less hazardous materials than the proposed project. Accordingly, potential significant impacts associated with hazardous materials for Alternative 2 would be incrementally less than proposed project, and similarly mitigable.

This alternative would have identical secondary impacts associated implementation of those mitigation measures, including the potential for accidental release of hazardous materials to soil and/or stormwater along the roadway alignment during construction. Similarly, implementation of a SWPPP as identified in Mitigation Measure E.8m would reduce these effects for Alternative 3.

Aesthetics

The mining for Alternative 3 would be limited to the Phase 1 and 2 areas, and consequently overall visual impacts would be incrementally less than the proposed project. For example, at its highest point, the east quarry wall height for Alternative 3 at full buildout would be as much as 50 feet lower (or approximately 15 percent lower) than the east quarry wall height for the proposed project at buildout. Since the location for, and approximate amount of, stockpiled materials would be similar for the Alternative 3 as for the proposed project, temporary visual impacts from the presence of stockpiles proposed in the Phase 2 and 3 areas would be similar. As under the proposed project, adherence to standards set forth in the ARM Plan and SMARO i.e., setbacks, revegetation/ screening wherever possible, limiting the total amount of disturbed area onsite prior to final reclamation of the area, etc., would minimize visual impacts of Alternative 3 while the site is being actively mined. Furthermore, final reclamation in compliance with the ARM Plan and SMARO would return the project site to a natural state to the extent feasible. Nonetheless, the impact of a substantial alteration in the visual character of the project site and adversely affecting views for Alternative 3, as with the proposed project, would be significant and unavoidable.

Similar to the proposed project, this alternative would have a less than significant effect associated with the production of new sources of light and/or glare, and contribution to cumulative changes in visual character.

Since this alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project, it would have identical secondary impacts associated with implementation of those mitigation measures, including temporary and permanent visual change along the roadway removal of vegetation, and in certain areas, recontouring of slopes and potential installation retaining walls or embankments. Similarly, implementation of Mitigation Measure E.8n would reduce these visual effects for Alternative 3.

Public Services and Utilities

Significant but mitigable impacts to fire protection services, and less than significant impacts to police protection services, solid waste services, and electrical utility service for the quarry for Alternative 3 would be similar or less than the proposed project.

Since this alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project, it would have identical secondary impacts associated implementation of those mitigation measures, including the potential for utilities relocation, and need for maintaining emergency vehicular access for fire/police protection

services during construction. Similarly, implementation of Mitigation Measure E.8k would reduce effects on public services and utilities for Alternative 3.

Cultural Resources

Since Alternative 3 would alter an incrementally smaller area of the quarry site than the proposed project, overall effects on cultural resources for Alternative 3 would be incrementally less than the proposed project, including, potentially significant but mitigable impacts to disturbing previously undiscovered archeological and paleontological resources on the project site.

Since this alternative would require the same off-site roadway improvements identified as mitigation measures for the proposed project, it would have identical secondary impacts associated implementation of those mitigation measures, including the potential for encountering presently unknown cultural resources. Similarly, implementation of Mitigation Measure E.8o would reduce effects on off-site cultural resources for Alternative 3.

Potential Indirect Environmental Impacts

Since the maximum annual aggregate production, and the total volume of aggregate that could be mined at the quarry over the 20-year use permit would be half that of the proposed project, the ability for the quarry under this alternative to assist in meeting the future demand for local aggregate would be reduced by half. It is assumed that additional aggregate to replace the deficit that would be created by this alternative would need to come from one or more of the previously-identified options (i.e., in-county quarry expansion or other new quarry; and/or out-of-county import). Consequently, the potential indirect impacts associated with this alternative would be similar in nature to, but overall less than, that which would be experienced with the No Project Alternative. These relative indirect environmental impacts are discussed under the No Project – No Subsequent Development Alternative.

F. Environmentally Superior Alternative

Of the alternatives assessed in this EIR, the alternative with the least direct environmental impact is the No Project – No Subsequent Development Alternative. This alternative would avoid all significant direct environmental impacts that would occur under the proposed project. This alternative would also avoid all significant secondary environmental effects associated with the implementation of off-site roadway improvements identified as mitigation measures for the proposed project (i.e., widening of Roblar Road and Pepper Road east of Mecham Road).

Nonetheless, the No Project – No Subsequent Development Alternative also has the potential to result in a number of potentially significant indirect impacts. If aggregate is not mined at the Roblar Road quarry site, the materials would need to come from one or more options to replace the deficit, including expansion of existing quarries or development of other new quarries in Sonoma County, and/or import of aggregate from out-of-county sources. All these options have the potential to create their own site-specific and/or off-site environmental impacts.

The No Project – No Subsequent Development Alternative would not meet any of the project sponsor’s objectives. Section 15126.6(e)(2) of the CEQA Guidelines states that if the environmentally superior alternative is the no project alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

Among the other alternatives, Alternative 2 - Alternative Haul Route / Contracted Sales Only is determined to be the environmentally superior alternative. This alternative would require substantially less off-site roadway improvements identified as mitigation measures for the proposed project and Alternative 3. Correspondingly, Alternative 2 would have comparatively less significant short- and long-term secondary impacts associated with implementation of those mitigation measures. Furthermore, given the potential infeasibility of some of the off-site transportation mitigation measures for the proposed project, Alternative 2 would avoid certain significant and unavoidable project impacts, including the traffic safety hazard for bicyclists and pedestrians, increase in the potential for traffic accidents, and degradation of pavement, on Roblar Road and Pepper Road east of Meham Road.

Alternative 3 would result in incrementally less direct on- and off-site impacts due to the reduced production and smaller quarry footprint as compared to the proposed project and Alternative 2, although it would not avoid any direct significant and unavoidable impacts of the proposed project. In addition, since this alternative would require the same off-site transportation mitigation as the proposed project, it would have the same secondary impacts associated with the implementation of off-site transportation improvements as the proposed project. Also, since this alternative would produce half the aggregate materials of the proposed project and Alternative 2, Alternative 3 would create indirect impacts associated with the deficit in materials coming from the other identified in-county and/or out-of county options.

It should be noted that variations of identified alternatives could also be considered by the decisionmakers, including, but not limited to, a hybrid of Alternatives 2 and 3, or some variation in the quarry production and/or footprint of Alternative 3.

References – Alternatives

(The references cited below are available at the Sonoma County Permit and Resource Management Department, 2550 Ventura Avenue, Santa Rosa, California, unless otherwise specified.)

Allen, James, *Assessment of the Paleontological Sensitivity of the Proposed Roblar Road Quarry, Sonoma County, California*, prepared for Tom Origer and Associates, 2006.

Department of Conservation, *Mineral Land Classification of Aggregate Materials in Sonoma County, Special Report 175*, California Department of Conservation, California Geological Survey, 2005.

Environmental Science Associates (ESA), *Roblar Road Quarry Project, American Badger Site Assessment*, Prepared for the County of Sonoma, August 2007(a).

ESA, Roblar Road Quarry Project, California Tiger Salamander Protocol-level Survey, Prepared for the County of Sonoma, August, 2007(b).

Sonoma County, *Aggregate Resources Management Plan and Environmental Impact Report*, 1994.

Sonoma County, *General Plan*, 1989, amended through 1998.

Tom Origer and Associates, *A Cultural Resources Survey Addendum for the Roblar Road Quarry EIR, Sonoma County, California*, 2007.

CHAPTER VI

Impact Overview

A. Significant and Unavoidable Environmental Impacts

The proposed project, if implemented, could result in significant adverse environmental impacts. Mitigation measures proposed as part of the project, as well as measures identified by this EIR, would avoid or reduce most of the impacts to a less-than-significant level. The following significant adverse impacts would be unavoidable, even with the implementation of the mitigation measures proposed as part of the project and identified in this report:

- Impact A.1 – Effect of change in land use (introduction of active mining operations) on compatibility with residential land uses in the project vicinity.
- Impact E.8 – Potential secondary impacts from implementation of certain off-site transportation mitigation improvements.
- Impact F.1 – Project emissions of NO_x.
- Impact F.7 – Project contribution to cumulative regional criteria pollutants and TACs.
- Impact I.1 – Substantial alteration in the visual character of the project site and adverse effect on views of the site from both public and private vantage points.

The following significant adverse impacts would be unavoidable if mitigation measures identified in the EIR were found to be infeasible:

- Impact E.2 – Project contribution to Long-Term Cumulative traffic volume at certain study intersections during the weekday a.m. and p.m. peak hours, and Saturday peak hour.
- Impact E.3 – Addition of substantial truck traffic to certain primary haul roads that are designated proposed bikeways and/or are regularly used by bicyclists or pedestrians, and which do not meet current County roadway design standards.
- Impact E.4 – Addition of substantial truck traffic to certain primary haul roads that do meet current County roadway design standards and/or contain limited sight distance.
- Impact E.5 - Inadequate site access.
- Impact E.6 - Project contribution to the degradation of pavement on certain public roads.
- Impact G.2 – Project increase in ambient noise levels at certain sensitive receptors on roadways used to access the quarry.

- Impact G.4 – Project contribution to increase in cumulative noise levels at certain sensitive receptors on roadways used to access the quarry.

It should be noted that Alternative 2 (discussed in Chapter V, Alternatives) would avoid or reduce the significant impacts identified in Impacts E.3, E.4, E.5, E.6 and E.8 to less than significant.

If the County approves the project despite the identified significant and unavoidable impacts, the County must find that specific economic, legal, social, technological, or other considerations make infeasible the mitigation measures or project alternatives identified in the EIR. In addition, the County must state the reasons for its action in writing. This “Statement of Overriding Considerations” must be included in the record of project approval.”

B. Cumulative Impacts

CEQA defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative analysis is intended to describe the “incremental impact of the project when added to other, closely related past, present, or reasonably foreseeable probable future projects” and can result from “individually minor but collectively significant projects taking place over a period of time (*Guidelines* Sec. 15355).

The cumulative impact analyses in this document are based on a cumulative growth scenario that incorporates both reasonably foreseeable future development within Sonoma County under the ARM Plan and General Plan. Cumulative area wide traffic growth was based on a number of sources, including growth rates projected for the project vicinity by the Sonoma County PRMD, the City of Cotati, approved and pending developments, and consultation with Sonoma County PRMD and the SCTA. It should be noted there are no other substantial reasonably foreseeable cumulative projects proposed in the quarry site vicinity.

Each topical analysis presented in Chapter IV, Environmental Setting, Impacts, and Mitigation Measures, of this report considers possible cumulative impacts related to the discussion, as applicable, and identifies circumstances in which the project would contribute to significant cumulative impacts. See also Section A, Significant and Unavoidable Impacts, above.

C. Growth Inducing Impacts

The proposed project is anticipated to help accommodate increases in demand for aggregate in Sonoma County. Consequently, aggregate generated by the project would support new development in Sonoma County, but not in itself act as a stimulus to it. Future mining allowed by the ARM Plan, including mining on the Roblar Road site, was also assessed in the ARM Plan Program EIR and found to not induce substantial growth in the County. The proposed project would not result in a substantial increase in employment, and correspondingly, would not result in an increase in population and an associated demand for housing in the area. A number of transportation improvements are identified in the Section IV.E in the EIR to improve intersection level of service and decrease potential conflicts between project trucks and bicyclists/pedestrians

and other vehicles. The purpose of these transportation improvements is to respond to the project's contribution to existing and/or near-term cumulative deficiencies at these locations, and not to provide excess capacity for the purpose of accommodating future growth anticipated in the region. For these reasons, the project is not anticipated to result in substantial growth inducement.

D. Effects Found not to Be Significant

The environmental effects of the proposed project are identified and discussed in detail in Chapter IV, Environmental Setting, Impacts, and Mitigation Measures, and are summarized in the Chapter II, Summary in this EIR. Except for the significant unavoidable effect identified above, all other identified significant environmental effects of the project would be less than significant with mitigation.

CHAPTER VII

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A. EIR Preparers

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Bonos, D., Sonoma Agricultural Preservation and Open Space District, personal communication, November 2005.

Brosnan, J., Sonoma Land Trust, personal communication. November 2005.

Crawford, A., Marin Agricultural Land Trust, personal communication, November 2005.

Delucci, Rick, Battalion Chief, Gold Ridge Fire Protection District, personal communication, September 7, 2006.

Duignan, Gary, Fire Chief, Forestville Fire Protection District, personal communication, November 27, 2007.

Doran, M., University of California Cooperative Extension - Livestock Specialist, personal communication, January 2006.

Gatz, Patricia, Department of Conservation, personal communication, January 2006.

Giovannetti, Ken, Sonoma County Department of Transportation and Public Works, personal communication with Sonoma County Permit and Resource Management Department, April 9 and 10, 2008.

Harper, John, Mendocino County Agricultural Extension Agent, personal communication, December 2005.

Harris, Matthew, Crime Analyst, Sonoma County Sheriff's Department, personal communication, September 12, 2006.

Kullberg, J., (former Lakeville Road Easement Exchange property owner/farmer), personal communication, January 2006.

Linley, Terry, American Ag Credit, personal communication, December 2005.

Macovy, L., Sonoma County Farm Bureau, personal communication, December 2005.

Mickelson, Mike, Battalion Chief, California Department of Forestry and Fire Protection, personal communication, September 12, 2006.

Velasquez, L., Sonoma-Marín County Farm Service Agency, personal communication, December 2005.

APPENDIX A

Notice of Preparation



COUNTY OF SONOMA
PERMIT AND RESOURCE MANAGEMENT DEPARTMENT

2550 Ventura Avenue, Santa Rosa, CA 95403-2829
(707) 565-1900 FAX (707) 565-1103

**NOTICE OF PREPARATION
OF DRAFT ENVIRONMENTAL IMPACT REPORT
and
NOTICE OF PUBLIC SCOPING MEETING**

Project Title: Roblar Road Quarry Project - PLP03-0094

Project Applicant: John Barella/James Hummer

Environmental Impact Report: The Sonoma County Permit and Resource Management Department has received an application from John Barella for the Roblar Road Quarry Project. Sonoma County will be the lead agency and will prepare an Environmental Impact Report (EIR) for the above project, as the project could have significant impacts on the environment. We are asking for your views regarding the scope of environmental issues that should be addressed in the EIR.

The project description, figures, and the probable environmental effects of the project are contained in the attached materials. If you wish to comment on the environmental issues that should be addressed in the EIR, please send written comments to Mike Sotak at the address on the letterhead.

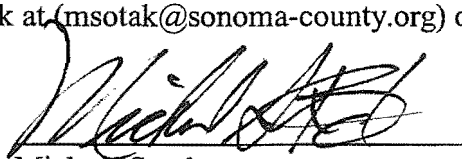
If you are a responsible agency, we need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may want to consider the EIR prepared by the County when considering your permit or other approval for the project.

Due to the time limits mandated by State Law, your response must be sent at the earliest possible date, but not later than 30 days after receipt of this notice.

Public Scoping Meeting: The Permit and Resource Management Department will hold a public scoping meeting from **6:30 pm to 9:00 pm on September 1, 2004**. This meeting will allow an opportunity for the public to express views regarding the scope of the environmental issues to be addressed in the EIR. These comments will be considered by the County during preparation of the EIR. The meeting will be held at the Dunham Elementary School, Community Room, 4111 Roblar Road, Petaluma.

For additional information, please email Mike Sotak at (msotak@sonoma-county.org) or call him at (707) 565-1931.

Date: August 4, 2004


Michael Sotak
Planner

Attachment: Project Description and Probable Environmental Effects

PROJECT DESCRIPTION AND PROBABLE ENVIRONMENTAL EFFECTS

OF THE

ROBLAR ROAD QUARRY PROJECT

INTRODUCTION

Northbay Construction proposes a project to construct a quarry on Roblar Road, northwest of Petaluma, to provide high quality rock materials to the building industry, as shown in Figure 1. The applicant has requested the preparation of a full EIR for the project, with concurrence from the County. The EIR will address a full range of impact areas, as described in Probable Environmental Impacts discussion below.

This document was prepared by Chris Seppeler, Senior Environmental Specialist with the Sonoma County Permit and Resource Management Department, Environmental Review Division. Information on the project was provided by the applicant as part of his application submittal. This application is available for review at the Permit and Resource Management Department. Please contact the Project Planner Mike Sotak, at (707) 565-1931, for more information.

PROJECT BACKGROUND

An application was filed in 1986 by Stony Point Rock Quarry Inc., to construct a quarry adjacent to Roblar Road and the closed Roblar Road landfill site. A Draft EIR was circulated with a public hearing on the Draft EIR in April, 1987. Comments received on the Draft EIR were addressed in the Final EIR that was circulated in August 1987. The proposal was not certified and the project application was withdrawn following receipt of comments and continued objections from the public.

In 1988, a revision to the previously filed application, was filed by Stony Point Rock Quarry Inc. The revision reduced the annual production of quarried rock. A DEIR for this project was circulated with a public hearing on the Draft EIR in November 1989. The Final EIR was circulated in January 1990 and supplemented in October 1990. The Supplement to the Final EIR addressed additional comments. The Planning Commission recommended certification of the EIR and approval of the project, however, the Final EIR and project were denied without prejudice by the Board of Supervisors in December, 1990. At the time of denial, the project EIR was found to be inadequate in the areas of traffic and potential for contamination from the closed Roblar Road landfill site. Efforts to revive this application continued for some time until September 10, 1993 when the application was terminated and the file closed.

On December 4, 2003 an application was filed by North Bay Construction Inc. (owned by John Barella), to construct the Roblar Road Quarry at the same location discussed for both of the above referenced applications, as shown in Figure 2.

SETTING

The Roblar Road Quarry site is located in the rolling hills of southern Sonoma County, approximately five miles west of Cotati (Figures 1, 2). The site is located on the east side of Roblar Road, on an 198.7-acre parcel that is currently used for grazing. The site is zoned Land Extensive Agriculture (LEA), and is an agricultural preserve under a Williamson Act contract. Currently on the site is a ranch, consisting of several buildings and an unoccupied residence, with access from Roblar Road. In addition, on the east side of the site a small stock pond is found.

Adjacent land uses include the county-owned closed Roblar Road Landfill on the north side of the site. Although this landfill is closed, the Sonoma County Department of Transportation and Public Works continues to maintain and monitors the facility. Other surrounding land uses include agriculture and livestock grazing.

PROJECT DESCRIPTION

The applicant is proposing to develop a hard rock quarry in the southeastern portion of the site that will disturb approximately 70 acres over a 20-year mining period. The material the quarry will provide include aggregate road base, subbase, drain rock, quarry fines, fill material, riprap (rocks six inches and larger), and possibly concrete aggregates. As these materials are processed, they will be stockpiled for eventual loading and delivery.

In order to proceed with the project, the applicant is requesting a Surface Mining Conditional Use Permit, and also a rezone of the parcel from LEA to an LEA-Mineral Resource Combining District. The Use Permit and the rezone will require the County to conduct environmental review for compliance with the California Environmental Quality Act (CEQA).

Site Access: Quarry site access will be from Roblar Road at the northwestern portion of the parcel, and a new road would be constructed on-site to the quarry area (Figure 3). This access road would connect to Roblar Road at the northwestern portion of the parcel. The new, on-site road will paved, 20-foot wide, and proceed south and east from Roblar Road to the quarry site.

The site office, scales, equipment storage, refueling area, and parking will be located as shown on Figure 3, which the applicant proposes to screen from Roblar Road with trees.

Grading and Operations: Site grading will begin with construction of the access road, and construction and installation of the truck scales, office, equipment storage area, and parking lot (Figure 3). Any excess materials from grading these areas and the access road, will be placed in Stockpile A or B as shown on Figure 3.

Following or concurrent with construction of the access road and site buildings, the initial phase of site development (Phase 1, years one to five) will begin. This will consist of removal of material to create the initial rock processing area, which would have a pad elevation of approximately 370 feet. The topsoil and overburden material removed from this initial processing area will be placed in Stockpile A

and B, located at the northwestern edge of the parcel. The overburden material will be sold, and some topsoil will remain on site as needed for reclamation at the end of each phase of the mining operation. Following preparation of the initial processing area, the quarry crushing equipment (the plant) will be installed at the initial processing area. Processing of the materials from within the limits of Phase 1 will be initiated. As material is harvested in the Phase 1 area, the processing equipment will be moved about on the quarry floor. Once the Phase 1 harvesting is complete, the plant will be permanently located in the center of the Phase 1 floor (approx. elevation of 250') for the remainder of the quarry life. During this initial phase, a sediment pond will be constructed in the southeast portion of the quarry, allowing sediment from the captured runoff from the quarry area to settle out prior to discharge. The slopes within the quarry will have a maximum slope of 1.5:1, with benches on the slope every 30 vertical feet, and the runoff directed to the sediment pond.

Depending upon the hardness of the rock, blasting may be required. A specific blasting plan has been submitted by the applicant which contains detailed safety procedures and a list of the codes and requirements that must be complied with to ensure safety standards are being met. Below are a few of the key components of the blasting plan.

- The plan includes blasting proposed by the applicant would be limited to once or twice a month, with each blast consisting of 20-25 holes ten feet apart, and 40 feet deep. Charges would be detonated sequentially in order to minimize shock waves and sound. The proposed blasting plan is as follows:
- All drilling and blasting will be supervised by a licensed blaster who will lay out drilling and blasting patterns with the use of delay detonators in order that peak particle velocity of blast-induced ground motion shall not exceed 2.0 inch second near any private off-site structure, and in no case shall blasting noise (air-blast) measured near buildings exceed 130 dBL. All blasts will be seismically monitored.
- In the area of the old landfill cell, drill holes will be monitored by a gas detection device for methane gas. With the use of delay detonation in this area, there would be no fragmentation of the rock material between the quarry site and the closed landfill.

Similar to Phase 1 of the project, Phase 2 of the project will be years 5 to 10 of operation. During this period, the quarry will expand in an easterly direction as harvesting continues (Figure 3). During Phase 3, the final phase of harvesting (years 10 - 20 of operation), mining will continue to the eastern most boundary of the quarry. The rock crushing equipment will remain at the location on the quarry floor that was created during the Phase 1 grading. As with Phase 1, slopes will be reclaimed during Phases 2 and 3 as they are completed.

Setbacks of the quarry will be 25 feet from the northern property boundary, and a minimum of 100 feet from all other boundaries.

Hours of operation proposed by the applicant are those found in the Aggregate Resources Management Plan, and the Sonoma County Surface Mining and Reclamation Ordinance. These hours are 6 am to 10 pm, Monday through Friday, and 6 am to 4:30 pm on Saturday. No mining or processing is proposed for

Sundays.

The quarry would employ approximately 8 - 10 people full time during the construction season, and 4 - 6 during the winter season.

Drainage and Sediment Controls: The area of the quarry has a watershed of approximately 80 acres, with slopes from 10 - 30%. The entire parcel drains into Americano Creek located on the northwest side of Roblar Road. Erosion and sediment control will consist of best management practices (BMP's), including construction of a sediment basin to capture runoff from within the quarry (Figure 3). The basin will be sized to be a minimum of one-acre in size for every 20 acres of active mining area to allow sufficient time for sediment to settle out prior to discharge. Water that enters the quarry as rainfall and possibly groundwater will be directed via swales along the perimeter of the quarry floor to the sediment pond. The pond will then discharge into a tributary on site, which then flows into Americano Creek. This sediment basin will include a spillway in the event of large storm events. Prior to the rainy season each year, the basin will be cleaned out and the removed material stockpiled for use during reclamation activities.

At the up-slope perimeter of the quarry, and outside of each phase of the active mining area, a perimeter interceptor ditch will be constructed. These ditches would discharge to the small tributary channel on site. The ditches may be rock and/or grass lined, depending upon the flow velocities.

In order to reduce the tracking of soil material onto the public roads, the applicant has proposed to pave approximately 2,000 feet of the entrance road into the quarry and install a tire scraper. This tire scraper would be located near the truck scales, and would appear similar to a cattle crossing, but larger. As the trucks roll across the scraper, it would jolt the tires, causing the aggregate and soil to drop off the tires into a pit located below the tire scraper. This pit would then be periodically cleaned, and the gravel and soil removed for reuse.

Production Rates: The annual production rate for all phases will be 570,000 cubic yards/year, or approximately 2,260 cubic yards per work day. This annual rate would remain the same the entire 20 years the quarry is open.

Access and Circulation: Based on the proposed production rates, 252 working days per year, and an average of 15 cubic yards per truckload, it is estimated that approximately 149 truck trips per day would enter and leave the quarry. There will be variety of different truck types being loaded at the quarry with sizes ranging from 3 tons up to 24 tons. In order to reduce the traffic impacts associated with the truck trips, the applicant has proposed to divert traffic west from the quarry on Roblar Road. Quarry products going north would use Valley Ford Road to Pepper Road, Mecham Road to Stony Point Road to Highway 116, then to Highway 101. Products going south from the site would use Valley Ford Road to Pepper Road to Highway 101. It is estimated that 70% of the products produced by the quarry would be used in the Petaluma area and in Marin County, with the remainder being used from Cotati north.

Other Site Improvements: An on-site septic system will be installed in the vicinity of the proposed site office. The system would be designed in accordance with the requirements of the County and any other applicable permitting agencies.

Water for office use and for dust control will be provided from two wells that currently are found on-site. These wells deliver 30 and 60 gpm. The water in the sediment pond may also be used for dust control and irrigation.

Reclamation Plan: A Reclamation Plan was submitted by the applicant. This Plan is available for review at PRMD. The reclamation activities will occur in phases throughout the 20-year mining period. Below is a brief summary of the key items that the plan proposes.

Phase 1 Reclamation Activities: The easterly side of Roblar Road will be landscaped to help minimize the visual impact of the quarry from Roblar Road.

Phase 2 Reclamation Activities: As mining progresses, finish grading will occur on the side-slopes. These slopes will be no steeper than 1.5:1, with benches at vertical intervals not more than 30 feet. The benches will have four to six inches of topsoil placed on them, as will any sculptured cut slopes that will hold the topsoil. These areas will then be hydroseeded, and trees and shrubs will be planted on the benches. Tree planting will also occur as each phase is completed, with irrigation provided for three to five years. These plantings will have an overall survival rate of 80% at the end of the 3 -5 year irrigation period. The quarry floor will be graded to drain to the sediment pond.

Phase 3 Reclamation Activities: Final reclamation will occur when all quarrying is complete. This final reclamation will include the final grading of the quarry floor (approximately 16 acres) leaving a slightly sloping bottom for positive drainage towards the sediment pond. The remaining topsoil will then be spread over the quarry floor, and this area hydroseeded.

***ANALYSIS OF PROBABLE ENVIRONMENTAL EFFECTS FOR THE
ROBLAR ROAD QUARRY PROJECT***

The County has determined that a full EIR is required for this project. This EIR will address a complete range of impact areas, as described below.

Aesthetics

The project will include the excavation of approximately 70 acres to create a quarry. This excavation may be visible to the public from various viewpoints. Although the applicant has proposed vegetation planting along the access road to reduce the visual impact of the roadway, including planting trees on the quarry benches, and the seeding of the quarry slopes, the project may still result in a significant visual impact.

The EIR will use the County Visual Assessment Guidelines to determine the visual impacts of the project. These guidelines include a procedure requiring a photographic analysis to evaluate potential impacts.

Agricultural Resources

The project site is currently used for grazing, and is under a Williamson Act contract. The applicant does not propose to change the use of the property following quarry activities. The Williamson Act will remain, and the site will be restored in a manner that will allow for further agricultural use. A response to the referral letter was received from the Sonoma County Agricultural Commissioners Office that recommended (1) notice to adjacent property owners of the days and times of blasting to minimize the frightening of livestock, and (2) a 100-foot agricultural setback on the south and east side of the proposed project area. The application includes the recommended setbacks.

The EIR will determine if the blasting will result in a potential noise impact that could disturb livestock or other farm animals in the vicinity. The EIR will also address the feasibility of the site to be used for agriculture following reclamation, and whether mining of a parcel in Williamson Act contract conflicts with the contract.

Air Quality

The project will include both stationary and mobile equipment that can degrade air quality. This includes emissions of criteria pollutants, including dust and diesel emissions. The EIR will consider impacts on air quality for the area surrounding the quarry site from operations and truck traffic.

Biological Resources

The applicant has submitted a Biotic Assessment of the site (*Biotic Assessment, Special Status Species and Habitat Survey of the Sonoma Rock Roblar Quarry Site in Sonoma County, Golden Bear Biostudies, June, 2003*). This study found the project to have no impact to special status plants or animals, however, it described an impact to a pond and connected drainage channel, because the project would remove this pond and drainage feature, the study recommended mitigation.

The project will include sediment basins to treat runoff from the site prior to discharge into the creek channel on site, and, ultimately, Americano Creek. If the drainage system is not designed correctly, it could result in sediment laden water being discharged off site and into Americano Creek.

The EIR will review this study for adequacy, and determine appropriate mitigations for the removal of these features. The EIR will also determine if any trees will be removed, and the impacts of this removal. In addition, the EIR will review that applicant's designs for the drainage system, and recommend appropriate mitigation measures to reduce sediment input into receiving waterways both during quarry activities, and following reclamation at the end of the 20-year mining period (see Hydrology and Water Quality below).

Cultural Resources

The project site is in a relatively undisturbed area. A response to the referral letter was received from the Northwest Information Center at Sonoma State University. The Center stated that the project area has the possibility of containing unrecorded archaeological sites, and recommended a study.

The EIR will include a cultural resources survey of the property, and, if resources are found, recommend appropriate mitigation measures.

Geology

The applicant submitted a geologic evaluation of the site (*Preliminary Geologic Evaluation Proposed Roblar Road Quarry, John Dailey, October, 2002*). This study focused on the presence of suitable rock for mining, but did not address slope stability, other geologic hazards (ie, earthquakes, landslides) and the possibility of blasting having an impact on the slopes. The applicant has proposed 1.5:1 side slopes within the quarry, with benches every 30 feet.

The EIR will include an analysis of the geology of the site as it relates to slope stability, earthquake hazards, and landslides, and any other potential geologic hazards, and recommend appropriate mitigation measures. For soil erosion, see the Hydrology and Water Quality discussion below.

Hazards and Hazardous Materials

The project site is adjacent to the closed Roblar Road Landfill site, which is monitored and maintained by Sonoma County Department of Transportation and Public Works (DTPW), Integrated Waste Division. This landfill has no liner (a protective layer underneath the refuse to prevent leachate migration into groundwater), as the refuse was placed in the landfill many years ago. It is likely that the excavation of the quarry will be below the lowest depths of refuse placed in the landfill. Because of this, it is possible that the quarry could intercept groundwater, and, if leachate has migrated below the landfill, cause contaminated groundwater to flow into the quarry. In addition, blasting could fracture the rock beneath the old landfill, causing leachate to move offsite of the landfill.

The EIR will determine the potential of the quarry project to impact the Roblar Road Landfill site as it relates to changes in groundwater flows and direction, including movement of leachate from the landfill site and possible contamination of groundwater supplies. The EIR will review information on the landfill, including all monitoring data collected by the DTPW regarding the landfill.

Hydrology and Water Quality

All drainage from the project site flows into Americano Creek adjacent to Roblar Road. The project applicant has proposed drainage improvements to route runoff around the quarry, and also the use of a sediment basin to capture site runoff from disturbed areas, to reduce sediment laden water from leaving the project site. The application includes hydrological calculations for drainage improvements and sediment basin sizing. In addition, the applicant proposes to test the water leaving the sediment basin periodically. Areas in which the mining is complete will be revegetated, and Best Management Practices will be used for additional erosion and sediment control measures. If the erosion control measures are not adequate to prevent eroded soil from leaving the site, eroded soil could enter Americano Creek.

The EIR will determine the adequacy of the proposed sediment basin for reducing sediment from on site runoff prior to releasing water off site, in addition to the proposed site drainage improvements. In addition, the EIR will recommend appropriate specific erosion control measures related to sediment basin sizing, erosion control measures, and recommend additional measures as needed.

Land Use and Planning

The project site is currently in a Williamson Act contract. The applicant has proposed no change to this contract, and proposes to return the quarry to this use following mining activity (see Agricultural Resources for further discussion).

The EIR will address the consistency of the project with the County General Plan, the Aggregate Resources Management Plan (ARM Plan), and any other applicable county plans. In addition, the EIR will determine whether the site can be reclaimed to agricultural use and not conflict with the existing Williamson Act contract.

Noise

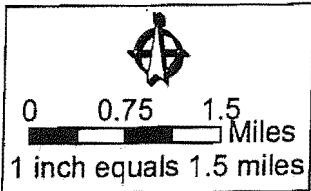
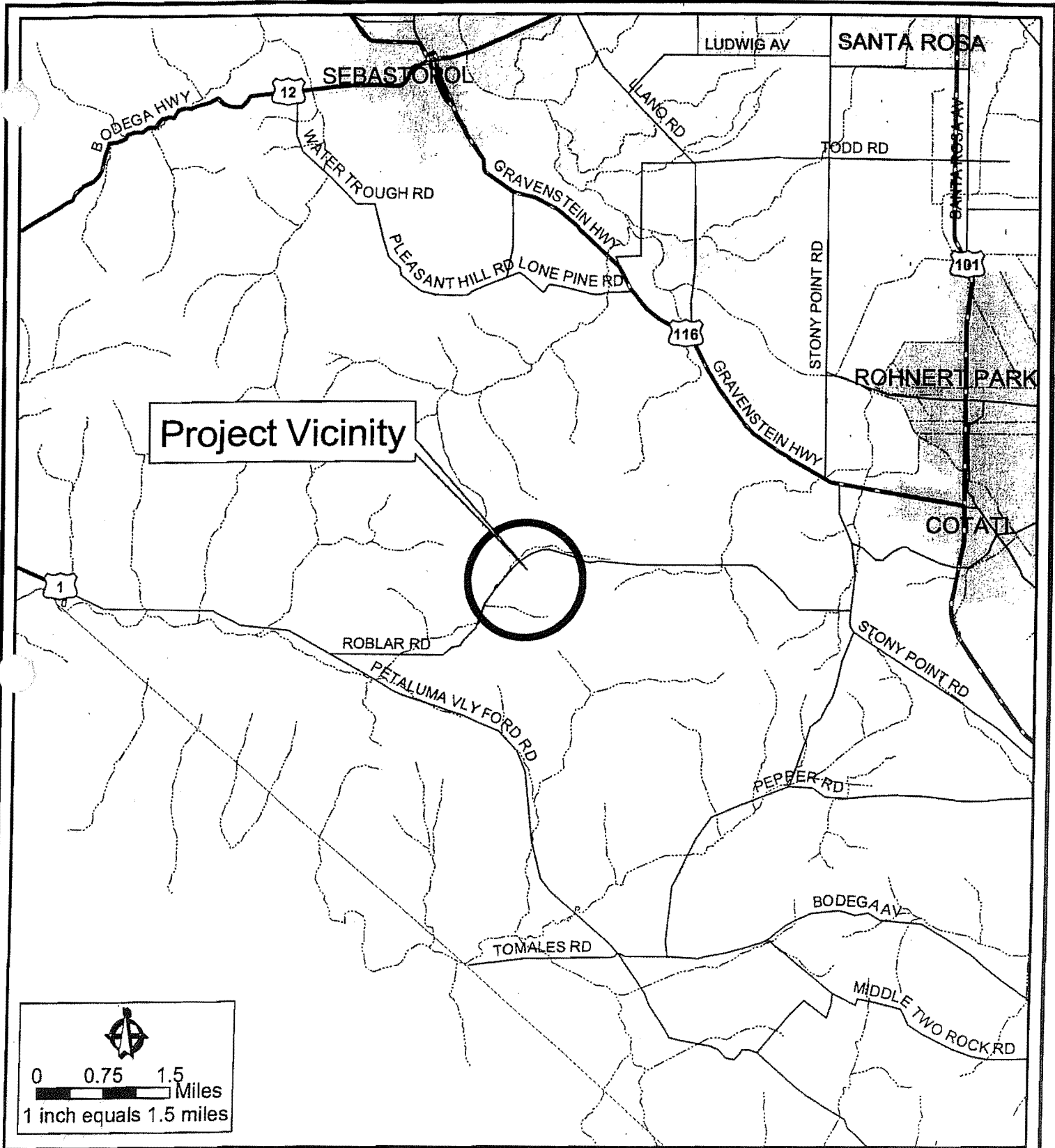
The project will generate noise from the use of heavy construction equipment, a rock crusher, blasting, and general grading activities. In addition, blasting can generate vibrations that could impact neighboring areas to the quarry. Increased truck traffic may result in noise impacts along local roads.

The EIR will analyze the noise impacts of all quarry activities, including truck traffic, as they relate to the Sonoma County General Plan Noise Element. Appropriate mitigation measures will be recommended.

Transportation/Traffic

The project will generate approximately 149 truck trips per day. Although the applicant is proposing to direct these truck trips west on Roblar Road as described in the project description, these truck trips may have significant impacts on local roads. In addition, the proposed truck traffic on Roblar Road could damage the existing road surface.

The EIR will address traffic impacts on the local roads, and intersections in the project vicinity. In addition, the EIR will include an analysis of traffic safety as a result of the increased truck trips on these roads, and recommend appropriate mitigation measures.



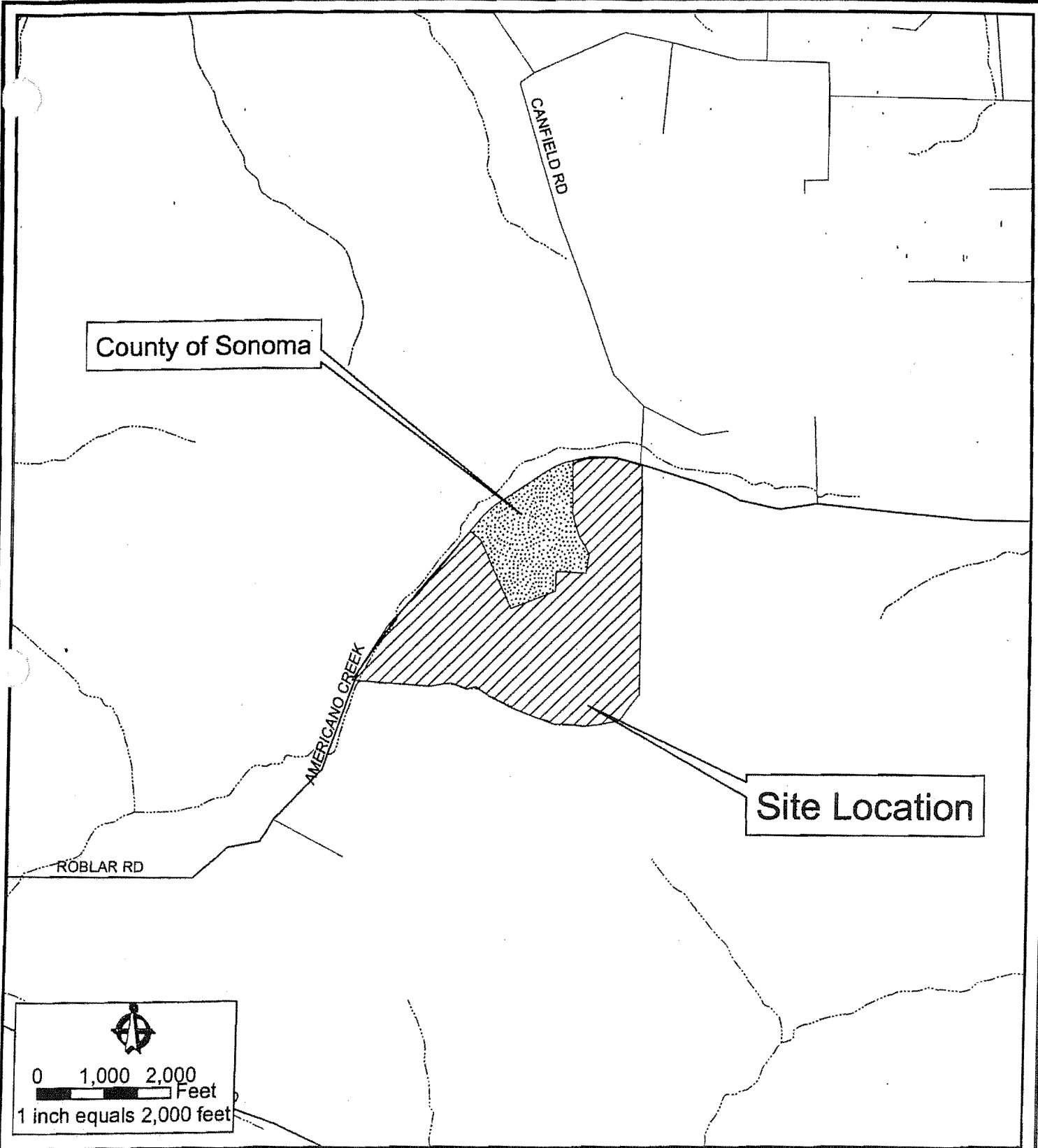
Robler Road Quarry Vicinity Map

Permit and Resource Management Department
 ENVIRONMENTAL SERVICES UNIT
 COUNTY OF SONOMA


Author: PRM/D
 Cartography: D. Henry
 File No.: Environmental review
 robler road quarry
 vicinity map.mxd
 Date: 05/11/2004

Figure 1





Robler Road Quarry Location Map

Figure 2 

Permit and Resource Management Department
 DEPARTMENT OF ENVIRONMENTAL SERVICES
 COUNTY OF SONOMA
 Author: PRMD
 Cartography: D. Henry
 File No.: Environmental review/
 robler road quarry
 location map.mxd
 Date: 05/11/2004

ADJUSTED
 BOUNDARY INFORMATION: SEE SHEET 1
 SHEET NO. 10 OF 10 (SEE SHEET 11 FOR BOUNDARY INFORMATION)

REMARKS
 THIS IS A COPY OF THE ORIGINAL RECORD DRAWING. THE ORIGINAL RECORD DRAWING IS FILED IN THE OFFICE OF THE COUNTY ENGINEER, SONOMA COUNTY, CALIFORNIA.

UTILITY NOTES
 THE LOCATION OF UNDERGROUND UTILITIES SHOWN HEREON HAS BEEN DETERMINED FROM SURFACE EVIDENCE OR FROM EXISTING RECORDS. THE SURVEYOR ACCEPTS NO LIABILITY FOR THE EXISTENCE OR NON-EXISTENCE OF UTILITIES. THE LOCATION OF UNDERGROUND UTILITIES SHOWN HEREON IS FOR INFORMATION ONLY AND IS NOT TO BE USED AS A BASIS FOR CONSTRUCTION.

TOPOGRAPHIC MAP
 THIS IS A COPY OF THE ORIGINAL RECORD DRAWING. THE ORIGINAL RECORD DRAWING IS FILED IN THE OFFICE OF THE COUNTY ENGINEER, SONOMA COUNTY, CALIFORNIA.



Graphic Scale (in Feet)
 0 100 200 300 400 500

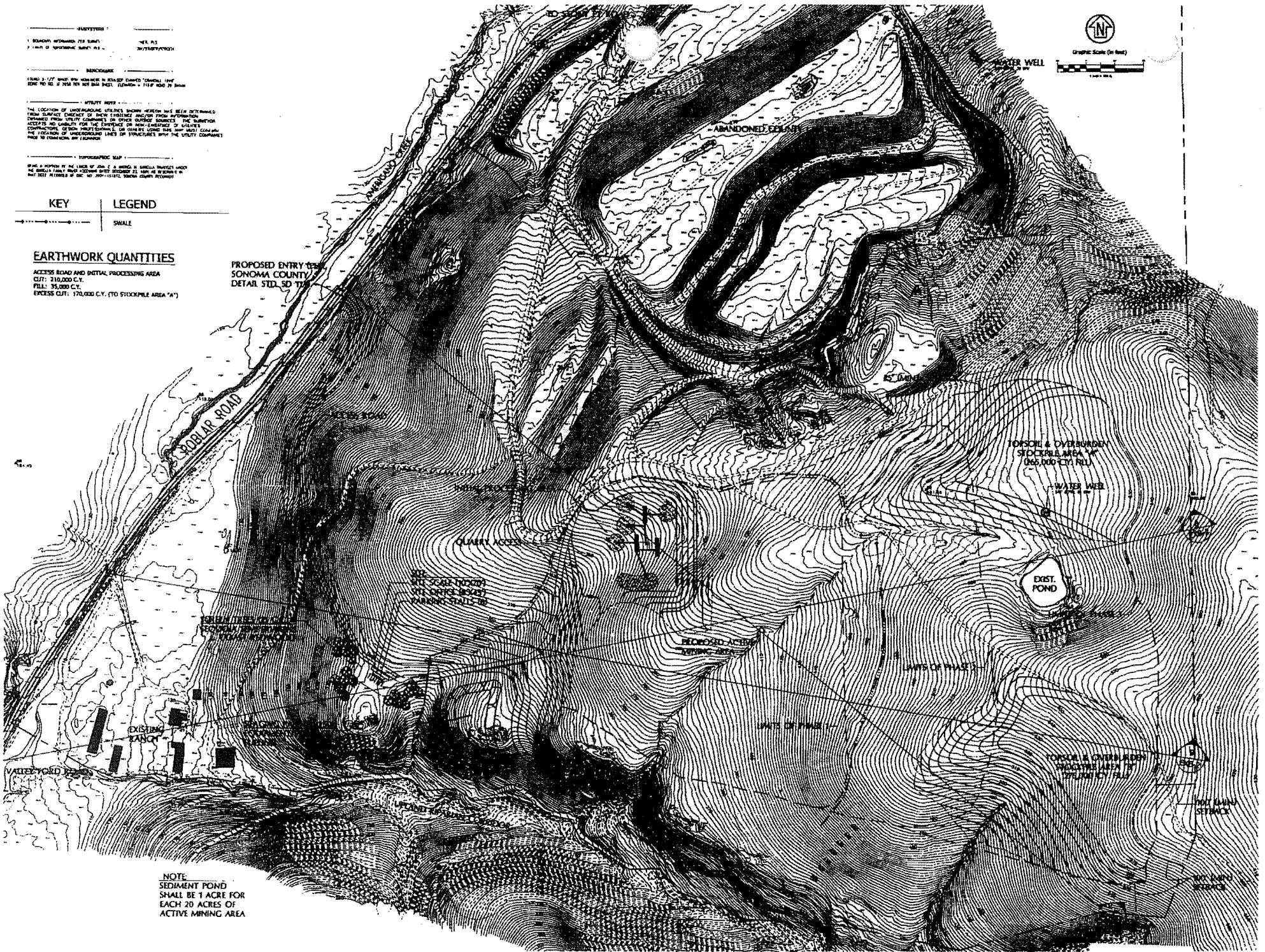
KEY | **LEGEND**

--- SHALE

EARTHWORK QUANTITIES

ACCESS ROAD AND INITIAL PROCESSING AREA
 CUT: 210,000 C.Y.
 FILL: 35,000 C.Y.
 EXCESS CUT: 175,000 C.Y. (TO STOCKPILE AREA "A")

PROPOSED ENTRY ROAD
 SONOMA COUNTY
 DETAIL STD. SD 110



NOTE
 SEDIMENT POND
 SHALL BE 1 ACRE FOR
 EACH 20 ACRES OF
 ACTIVE MINING AREA

Figure 3

Draft

ROBLAR ROAD QUARRY

Environmental Impact Report
Technical Appendices
SCH # 2004092099

Prepared for
County of Sonoma Permit and
Resource Management Department

May 2008



Draft

ROBLAR ROAD QUARRY

Environmental Impact Report
Technical Appendices
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Resource Management Department

May 2008



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204334



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Draft EIR and Appendix A (<i>Bound Separately</i>)	

APPENDIX B

Farmland Conversion Study

ROBLAR ROAD QUARRY FARMLAND CONVERSION STUDY

Prepared for:
Sonoma County Permit and Resource
Management Department

ROBLAR ROAD QUARRY FARMLAND CONVERSION STUDY

Prepared for:
Sonoma County Permit and Resource
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CHAPTER I

Introduction

The purpose of the Roblar Road Quarry Farmland Conversion Study is to address the agricultural-related planning issues identified by the California Department of Conservation (DOC) that would be associated with a proposed easement exchange under the Williamson Act Easement Exchange Program (WAEPP).

The project applicant, North Bay Construction, Inc., proposes to develop a quarry (Roblar Road Quarry) at 7601 Roblar Road, located approximately five miles west of Cotati in southern Sonoma County. The project applicant has requested the necessary entitlements from the County of Sonoma to enable development of the quarry. Approval of this request would grant a use permit for mining for a 20-year period, under the terms of the County's Aggregate Resource Management (ARM) Plan, mining regulations, and any approval conditions that are imposed. The proposed quarry project would disturb approximately 70 acres (including a 65-acre quarry pit) of the approximate 199-acre parcel over a 20-year mining period, after which site reclamation would occur. The project site is currently zoned Land Extensive Agriculture and is an agriculture preserve under the Williamson Act.

The County of Sonoma, serving as Lead Agency responsible for administering the environmental review for the proposed Roblar Road Quarry project under the California Environmental Quality Act (CEQA), has determined that preparation of an environmental impact report (EIR) was needed for the proposed project because it has the potential to cause significant effects on the environment. On August 4, 2004, the County sent a Notice of Preparation (NOP) to governmental agencies and organizations and organizations and persons interested in the project. The NOP requested those agencies with regulatory authority over any aspect of the project to identify the relevant environmental issues that should be addressed in the EIR.

In October 2004, in response to the NOP, the DOC Division of Land Resource Protection indicated to Sonoma County Permit and Resource Management Department (PRMD) that the proposed mining and reclamation project appeared to be incompatible with the Williamson Act pursuant to the California Government Code (see DOC response to NOP in Appendix A in this study). The DOC requested an evaluation of the project's compliance with the compatible use provisions of the Williamson Act, as well as an evaluation of the project's impacts on agricultural land. Furthermore, the DOC identified several mitigation requirements and encouraged the use of the WAEPP and establishment of an adequate permanent agricultural easement in exchange for the project's impact on loss of agricultural land.

In July 2005, the project applicant indicated to Sonoma County PRMD that as part of the proposed project, it proposed to seek rescinding the Williamson Act contract on a portion (70 acres) of the Roblar Road project site in exchange for creation of a permanent agricultural conservation easement on another property off-site. The approximate 244-acre exchange property, recently purchased by the project applicant, is located near Lakeville Road in southern Sonoma County. The proposed exchange would be performed under the WAEEP and therefore subject to its applicable California Government and Public Resource Code regulations. Among other requirements, the County must make specific findings and approve rescission of the agricultural preserve contract on the 70-acre portion of the Roblar Road project site, and the agreement must be approved by the State Secretary of Resources. See additional information provided by DOC in Appendices A-2 and A-3.

This Farmland Conversion study's analyses and findings provide a preliminary evaluation of the proposed easement exchange to determine its adequacy in meeting the DOC requirements. This study serves as a technical support document from which relevant and applicable information will be used for inclusion in the EIR for the proposed quarry/easement exchange, and to assist in future compliance with the WAEEP process.

CHAPTER II

Existing Site Descriptions

A. Roblar Road Property (Project Site)

Site Description

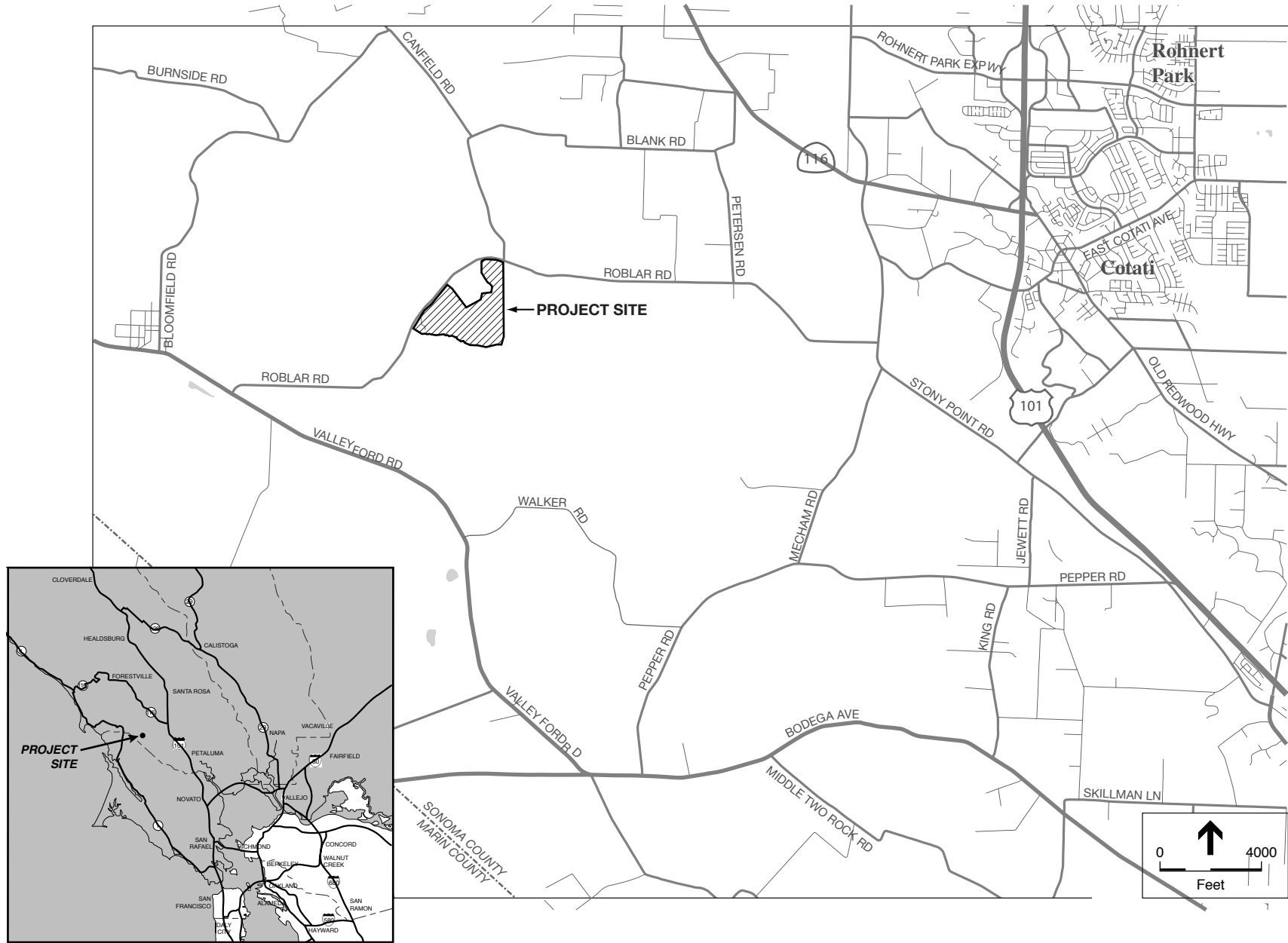
The Roblar Road quarry property (also referred to in this study as the project site) is located on two parcels totaling 198.76 acres at 7601 Roblar Road in southern Sonoma County, approximately five miles west of the City of Cotati (see Figure 1: Regional Location Map – Roblar Road Project Site). The project site is located within Township 5 North, Range 9 West, Sections 1 and 2; and Township 6 North, 9 West, Section 36 of the Two Rock Quadrangle (see Figure 2: Site Location Map). The Assessor’s Parcel Numbers (APNs) are 027-080-009 and -010. The project site is bounded on the north by Roblar Road and the County-owned, closed Roblar Landfill, on the west by Roblar Road, on the south by a tributary to Americano Creek (herein referred to as Ranch Tributary), and on the east by privately-owned land.

Geographically, the project site is located within a long east-west trending valley that extends roughly between Cotati to the east and Bodega Bay to the west. The meandering Americano Creek forms the low point within this valley, with rolling hills rising on either side. In the project vicinity, the valley and Americano Creek trend in a northeasterly-southwesterly direction, with the project site located on the valley’s southeast slopes. Depending on location, slopes within the project site face north, west or southward. Elevations on the site range from approximately 110 feet above sea level (asl) along the property adjacent to Roblar Road to approximately 600 feet asl at the site’s highest point (southeast corner). Slopes throughout the site range from approximately 10 to 30 percent.

Vegetation on the project site consists primarily of annual grasslands, with remnants of oak woodland in the northeast portion of the site, a seasonal wetland area on the valley bottom adjacent to Americano Creek in the site’s southwest corner, and riparian vegetation located along the drainages on and adjacent to the site. Three small seasonal drainages located on the project site flow southwesterly to Ranch Tributary along the property south border, and ultimately to Americano Creek.

Zone of Influence

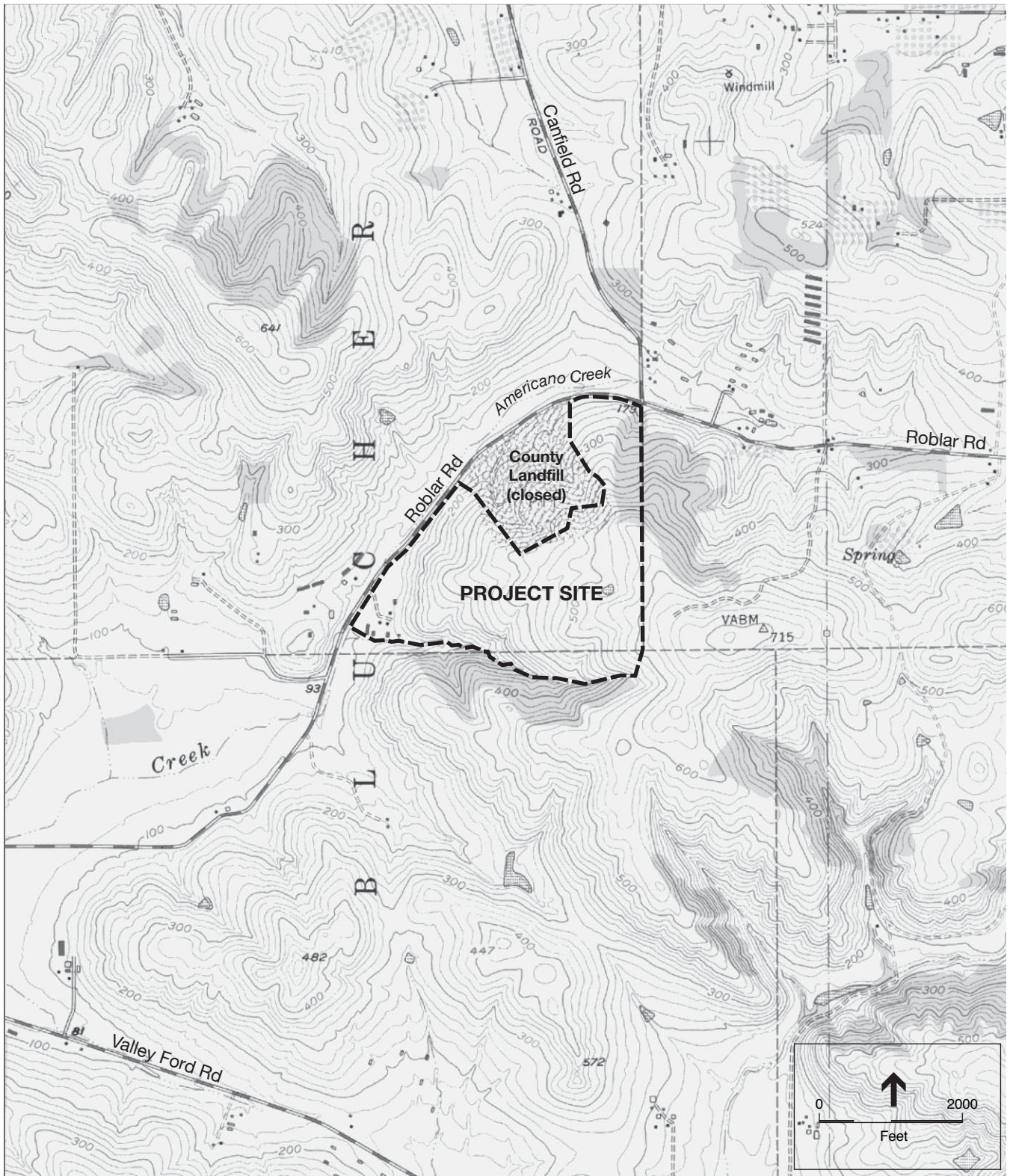
Consistent with the requirements of the California Department of Conversation (DOC) California Agricultural Land Evaluation and Site Assessment Model (LESA) methodology, a “zone of influence” was defined for the Roblar Road project site. As shown in Figure 3, the zone of



SOURCE: ESA

Roblar Road Quarry Farmland Conversion Study . 204334

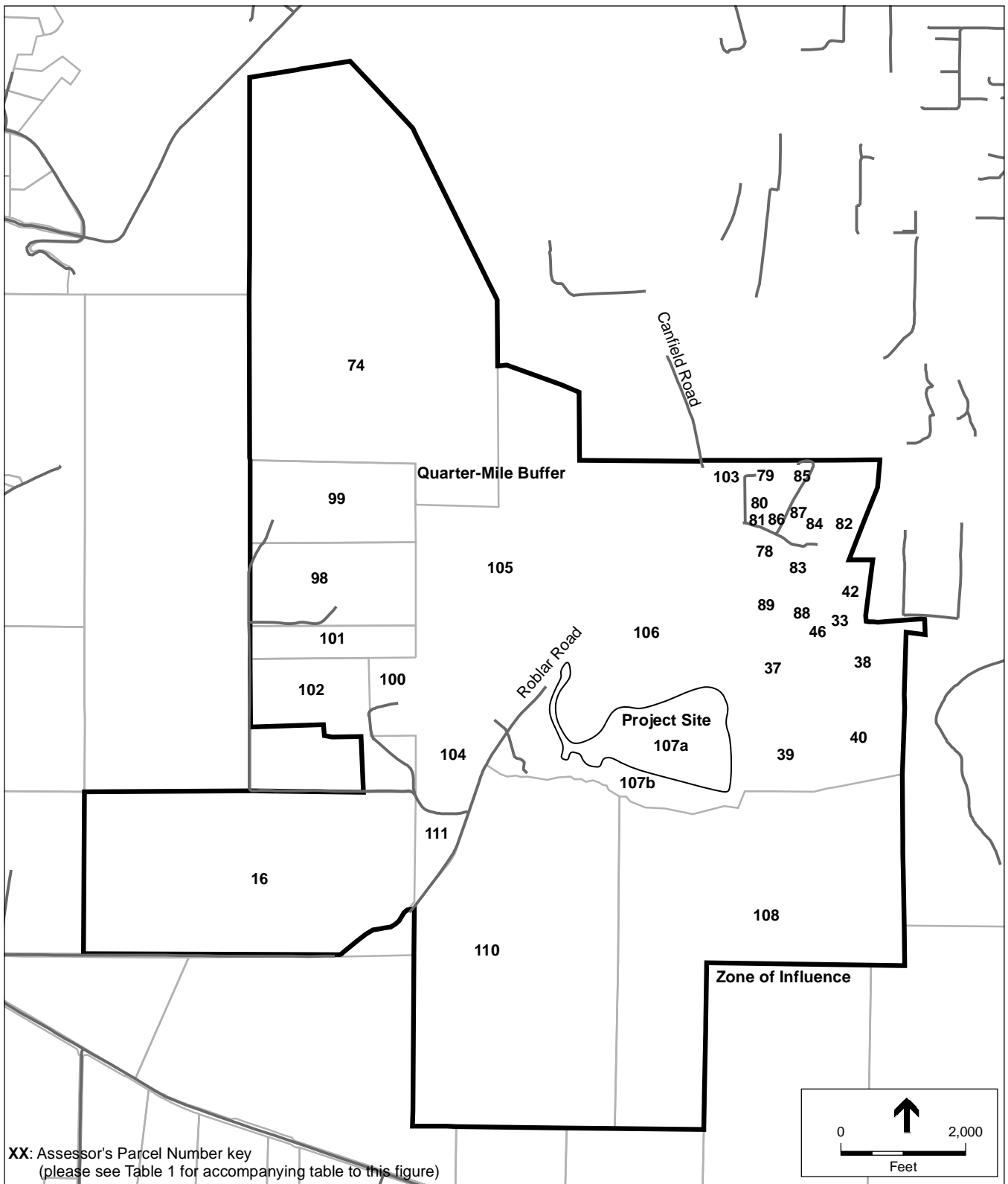
Figure 1
Regional Map - Roblar Road
Project Site



SOURCE: USGS

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 2
Site Location Map - Roblar Road Project Site



- - - Property Boundary

SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 3

Zone of Influence and Assessor's Parcel Key Map for Roblar Road Project Site

influence includes all parcels that are located within one-quarter mile of the project site. The zone of influence for the project site comprises a total of 2,792 acres. The LESA Model was used for the agricultural conversion impact analysis of the proposed project (see Chapter VI for additional details on LESA methodology and impact analysis).

Description of Nearby Properties

A closed landfill (Roblar Landfill) is located adjacent to and north of the project site. The Roblar Landfill was closed in 1973. Agricultural properties and other land uses are currently present elsewhere adjoining the project site. Other adjacent land uses include livestock grazing, dairies and agricultural residential lots. Further east along Roblar Road (in the community of Roblar, outside the zone of influence) are a series of smaller rural residential properties and two schools (Dunham Elementary School and Quest Montessori School).

Site and Vicinity Ownership

The quarry project applicant, North Bay Construction, Inc., is the current owner of the Roblar Road property. The applicant acquired the property from John and Anna Scott on October 31, 2001 as part of the larger 958-acre Roblar Ranch property. The Scotts originally placed the property under a Williamson Act contract # 2-387-72 with the County of Sonoma in March 1972. In May, 2004, the applicant sold the permanent agricultural easement rights for two southern parcels of Roblar Ranch to the Sonoma County Agricultural Preservation and Open Space District. The applicant subsequently sold the encumbered properties separately to local farmers Kenneth Wilson (APN# 027-210-006) and Joseph Tresch (APN# 027-210-003).

Figure 3 and Table 1 present Assessors Parcel location and numbers for the project site and zone of influence.

Existing Land Use Controls

The project site is currently within an agricultural preserve under a Williamson Act contract. The *Sonoma County General Plan* designation for the project site is LEA (Land Extensive Agriculture). The project site is currently zoned LEA B6 160 Z (Land Extensive Agriculture District; B Combining District – 160-Acre/Unit; 2nd Unit Exclusion Combining District). A portion of the property is also within a Valley Oak Habitat (VOH) Combining District. The project site is identified in the *Sonoma County Aggregate Resources Management (ARM) Plan* as a potential quarry site. The property is also located within the boundary of Sonoma County's *Petaluma Dairy Belt Area Plan*. See additional discussion of these governing controls in Chapter IV, Relevant Plans, Programs and Regulations.

On-Site Improvements

The project site is largely undeveloped and used as dryland grazing for livestock production. The site contains a ranch, including several outbuildings and a currently unoccupied residence near the southwest corner of the site. Vehicular access to the site currently is from Roblar Road near the southwest corner of the site. Existing unpaved roadways provide internal access between the

**TABLE 1
EXISTING PARCELS IN THE PROJECT VICINITY**

Assessor's Parcel Figure Key Number ^a	Assessor's Parcel Number	Assessor's Parcel Figure Key Number ^a	Assessor's Parcel Number
1	022-010-001	86	025-120-020
16	022-290-001	87	025-120-021
21	022-300-008	88	025-120-022
32	024-090-020	89	025-120-023
33	024-090-023	95	025-130-009
37	024-090-030	96	027-070-003
38	024-090-031	98	027-070-005
39	024-090-032	99	027-070-006
40	024-090-033	100	027-070-009
41	024-090-034	101	027-070-011
42	024-090-035	102	027-070-012
43	024-090-036	103	027-080-001
46	024-090-039	104	027-080-004
74	025-100-007	105	027-080-005
75	025-110-001	106	027-080-006
76	025-110-002	107a	027-080-009
77	025-110-004	107b	027-080-010
78	025-120-003	108	027-200-003
79	025-120-007	109	027-210-005
81	025-120-009	110	027-210-006
82	025-120-011	111	027-210-007
83	025-120-013	118	062-130-026
84	025-120-014	121	062-130-036
85	025-120-015	122	062-130-038

^a See accompanying Figure 3, for location of parcels.

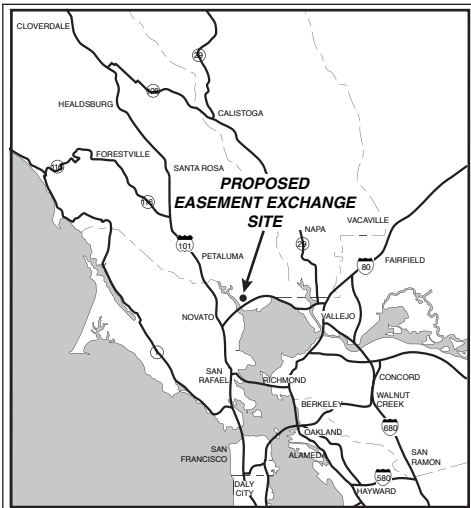
SOURCE: Sonoma County PRMD

Roblar Road entry, the ranch, the adjacent closed landfill, the stock pond, and the upper (eastern) reaches of the project site. A small stock pond is located on the east side of the site. Two water wells are currently on-site, located in the northeast and central-east portions of the site. An on-site septic system previously served the ranch house; the applicant is currently seeking a permit from the County to install a new septic system to serve the house. The project site perimeter is currently fenced with some additional interior fencing primarily for cattle holding and feed areas. Electrical lines extend to the project site from Roblar Road.

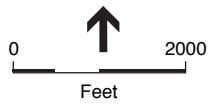
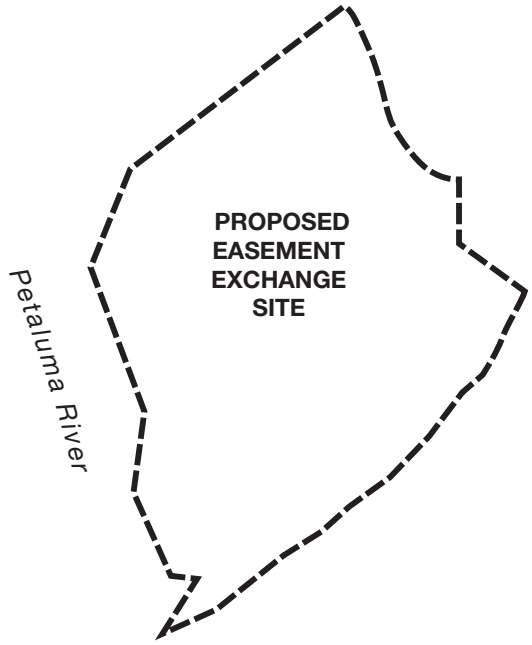
B. Lakeville Road Property (Easement Exchange Site)

Site Description

The Lakeville Road property (also referred to in this study as the proposed easement exchange site) is located near Lakeville Road in southern Sonoma County and adjacent to the Petaluma River (see Figure 4: Site Location Map – Lakeville Road Easement Exchange Site). The property is located approximately seven miles southeast of the Petaluma city limit (and approximately three miles southeast of the City of Petaluma Planning Area), and across the Petaluma River from the Novato city limit and County of Marin. This 243.64-acre site consists of APNs 068-130-001



LAKEVILLE RD



----- Approximate Property Boundary

SOURCE: USGS, 1968, 1980

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 4
Site Location Map - Lakeville Road
Easement Exchange Site

(230 acres) and 068-130-008 (13.64 acres). The property is bounded by marshland adjacent to the Petaluma River to the west, and sloughs along the northwest, northeast and southeast boundaries. The easement exchange site is located approximately at sea level.

Site and Vicinity Ownership

The quarry project applicant, North Bay Construction, Inc., is the current owner of the proposed easement exchange site. The applicant purchased the property from Jens Kullberg on November 18, 2005.

Figure 5 and Table 2 present Assessors Parcel location and numbers for the easement exchange site and vicinity.

**TABLE 2
EXISTING PARCELS FOR
THE LAKEVILLE ROAD EASEMENT EXCHANGE SITE AND VICINITY**

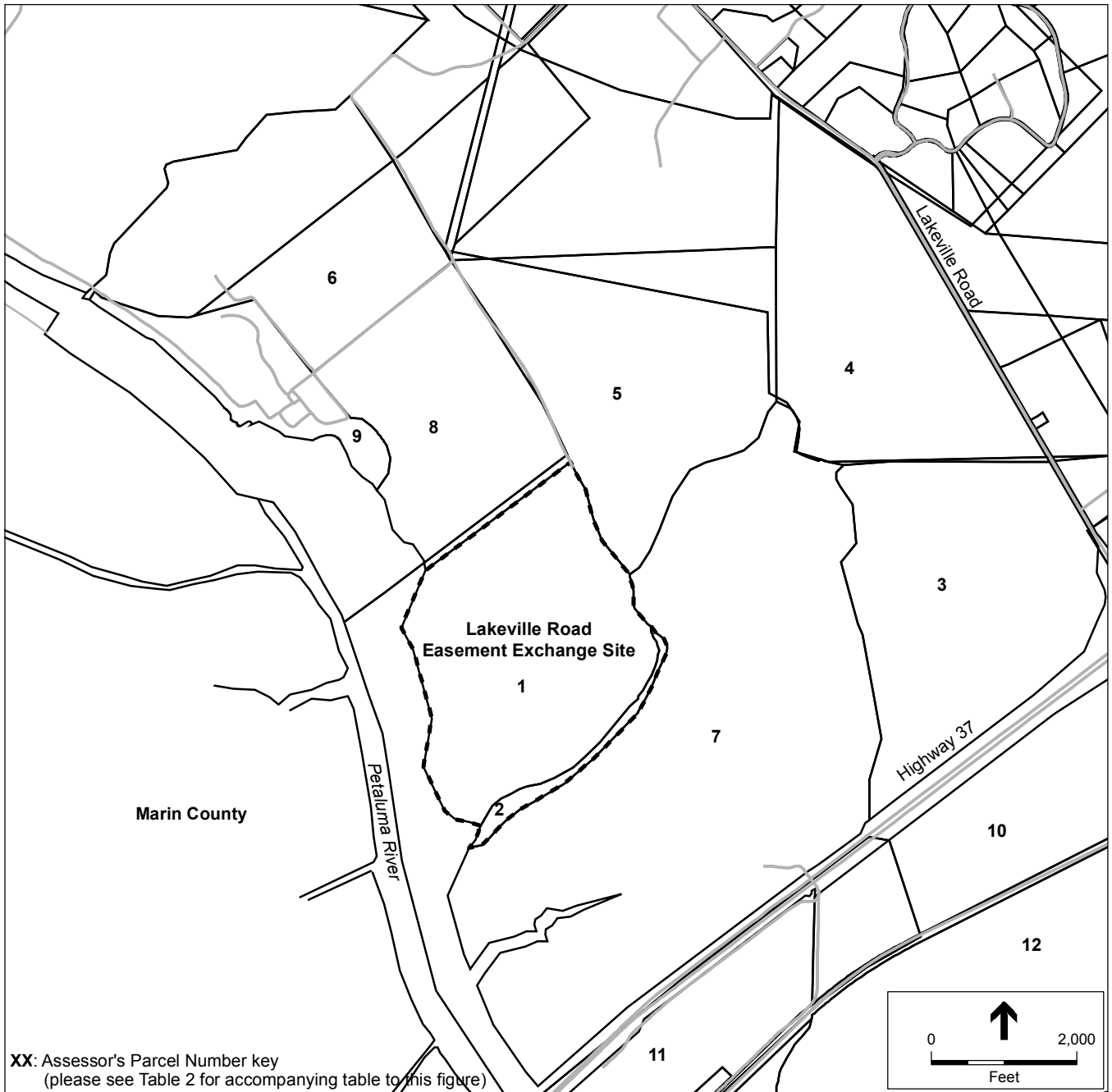
Assessor's Parcel Figure Key Number ^a	Assessor's Parcel Number
1	068-130-001
2	068-130-008
3	068-130-009
4	068-150-011
5	068-130-010
6	068-120-013
7	068-130-013
8	068-120-014
9	068-120-015
10	068-140-015
11	068-120-026
12	068-140-030

^a See accompanying Figure 5, for location of parcels.

SOURCE: Sonoma County PRMD

Existing Land Use Controls

The project site is not currently under a Williamson Act contract. The *Sonoma County General Plan* designation for the project site is LEA (Land Extensive Agriculture). The project site is currently zoned LEA F2 (Land Extensive Agriculture District; Floodplain Combining District), with a BR zoning designation (Biotic Resource Combining District) over the western portion of the site adjacent to the Petaluma River. The property is also located within the boundary of Sonoma County's *Petaluma Dairy Belt Area Plan*. See additional discussion of these governing controls in Chapter IV, Relevant Plans and Regulations.



SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 5

Assessor's Parcel Key Map for Lakeville Road Easement Exchange Site and Vicinity

On-Site Improvements

The Lakeville Road easement exchange property is farmed for dryland hay production. The site contains a farmhouse residence (currently occupied), large hay barn (5,800 square feet) and small equipment shed. An on-site water well and septic system serve the farmhouse; the site is also served by electricity.

CHAPTER III

Past and Current Agricultural Use at Sites

A. Agricultural Trends in Sonoma County

Sonoma County is well suited for agricultural cultivation as a result of its favorable climate, good soils, availability of water, dependable market demand and established farming community and infrastructure. In 2004, farming within Sonoma County reported earning approximately \$526 million in revenues which was 2.9% higher than its \$511 million generated by the industry in 2003. Wine grape cultivation is Sonoma County's primary crop - accounting for more than 60% of the County's entire agricultural production value in 2004.

Livestock and poultry (including livestock and poultry products) generated over \$165 million in agricultural production value – which represented approximately 31.5% of the county's total agricultural production in 2004. Sonoma's cool temperatures and long grass growing season makes it ideal for high quality cattle and milk production.

Dairy production is the county's third most important agricultural commodity. In addition to traditional cow dairies, numerous specialty goat and sheep farmers also operate within the county. There are approximately 80 cow dairies operating within in Sonoma County which generally produce top quality fresh milk (with high fat, solids and protein content) which typically sell at prices 8% higher than state averages (Sonoma County Agricultural Commissioner, 2004). In 2004, Sonoma County produced over 75 million gallons of milk valued at approximately \$98.8 million. By volume, Sonoma County produced 1.8% of the state's total milk production.

B. Past and Current Agricultural Uses at the Roblar Road Project Site

The Roblar Road project site has been used continuously for dryland cattle grazing for several decades. In the late 1980s and early 1990s, applications were filed to develop a quarry on the project site. [Those proposals were associated with different applicants (Stony Point Rock Quarry, Inc. and former site owner), and not the current quarry proposal or applicant.] Under those prior quarry applications, Stony Point Rock Quarry Inc. proposed to lease the project site from the former land owners to develop and operate a quarry. While a quarry development plan and draft environmental compliance analyses for those quarry proposals were completed, the quarry was never approved by the County for development.

After the project site was purchased by North Bay Construction, Inc., the property has been grazed under a lease agreement to a local cattle farmer since June 2003. Under the lease terms, a maximum of 60 cows and their calves are permitted on the property. Grazing use is also limited to a maximum of 360 Animal Unit Months (AUMs) per year. The current lease rate for the entire property is \$5,000 per year, which is equivalent to approximately \$25 per acre or \$13.88 per AUM. Generally, cattle operators run their herds on the property two or three times a year depending on the rainfall and grassland growing conditions.

The property's current leasing rates are comparable with typical rates for grazing in the region which local Agricultural Extension agent John Harper estimates are typically \$8 to \$15 per AUM (Harper, 2005). Lex Macovy of the Sonoma Farm Bureau more conservatively estimates that local dryland grazing lease rates are typically \$10 to \$12 per AUM (Macovy, 2005).

No past site-specific carrying capacity analyses are available for the project site or comparable nearby properties. During the winter months, livestock farmers frequently corral their herds and use supplemental feed. As a result, livestock farmers can keep larger herds on the site by not relying solely on the site's forage capacity. Alternatively, farmers may herd their livestock to alternative nearby pastures or truck them further away to other grazing lands. According to the project applicant, before its purchase, the entire 958-acre Roblar Ranch property (which includes the approximate 199-acre project site) supported a 300 head herd of cattle with supplemental feed used during the winter (Barella, 2005). It should be noted the project site consists of lower quality grazing land (and consequently, a lower carrying capacity) compared to other areas of the Roblar Ranch property which have higher quality grazing lands.

The 2002 Non-insured Assistance Program Forage Data for Sonoma County generally characterizes rangeland in the area as "below average" native forage that may be expected to have a carrying capacity of 10 to 20 acres per Animal Unit (Velasquez, 2005). Local agricultural experts familiar with the area generally agree that local dryland grazing properties would typically be expected to have carrying capacity such that 6 to 7 acres of dryland pasture would be adequate to support a cow per year (i.e. roughly equivalent to an Animal Unit) (Macovy, 2005). In which case, the approximate 199-acre project site would be expected to support 28 to 33 animal units per year (which is comparable to the project site's current lease arrangement).

C. Past and Current Agricultural Uses at the Lakeville Road Easement Exchange Site

The easement exchange property has been farmed for dryland hay production for over fifty years by the Kullberg family (previous land owner) before its recent sale to North Bay Construction, Inc. Mr. Kullberg continues to farm the property for dryland hay production under a lease agreement with the applicant. Currently, one farmer is employed at the property.

Oat hay is the property's sole crop and it is farmed without irrigation. Typically, approximately 100 acres of oat hay are planted in the mid- to late Fall and another 140 acres are planted with higher grade oat seed in the Spring (generally late February or early March depending on the

weather).¹ The Spring planting generally yields less due to its shorter growth season. No chemical fertilizers or herbicides are used on the property. However, each year, bio-soils from a local sewage treatment facility are applied to approximately half of the farm as natural crop fertilizer. Pumping of excess water is performed during the wet season to prevent ponding on the property (Kullberg, 2006).

Annually, the property typically yields at least 580 tons of oat hay which is sold to local livestock farmers and horse owners as supplemental feed. Mr. Kullberg reports typical minimum yields of three tons per acre for his Fall planting and two tons per acre for the Spring planting. During very good years, total yields of up to 1,000 tons have been achieved (Kullberg, 2006). The reported typical yields are comparable to Sonoma County averages for oat hay production which have an average yield of 2.62 ton per acre (Sonoma County, 2004).

Oat hay's typical forage capacity is 2.5 AUM per ton (Doran, 2006). Therefore, the Lakeville Road easement exchange property's annual hay production can be expected to provide the equivalent of 1,450 AUMs of supplemental hay feed for local livestock producers. This would represent approximately enough for 120 animal units. Mr. Kullberg reported good and reliable demand for his oat hay production. Oat hay is particularly favored by horse owners. Although livestock owners often prefer alfalfa feed, oat hay remains an important supplemental feed source for their herds. This is particularly the case in areas (such as Sonoma County) that have historically relied on oat hay production and which have limited potential for the economically feasible irrigated hay production necessary to grow alfalfa (Doran, 2006). As an increasing proportion of former cropland areas around Petaluma and other cities in Central Sonoma County have been lost to urbanization or grape production, dryland farming elsewhere within Sonoma become increasingly important as sources for growing hay feed to support local livestock (Doran, 2006).

¹ Mr. Kullberg reported also farming approximately 20 acres of adjoining land within the Sonoma River flood plain (but not under title).

CHAPTER IV

Relevant Plans, Programs, and Regulations

A. Sonoma County Regulatory Framework

Sonoma County General Plan

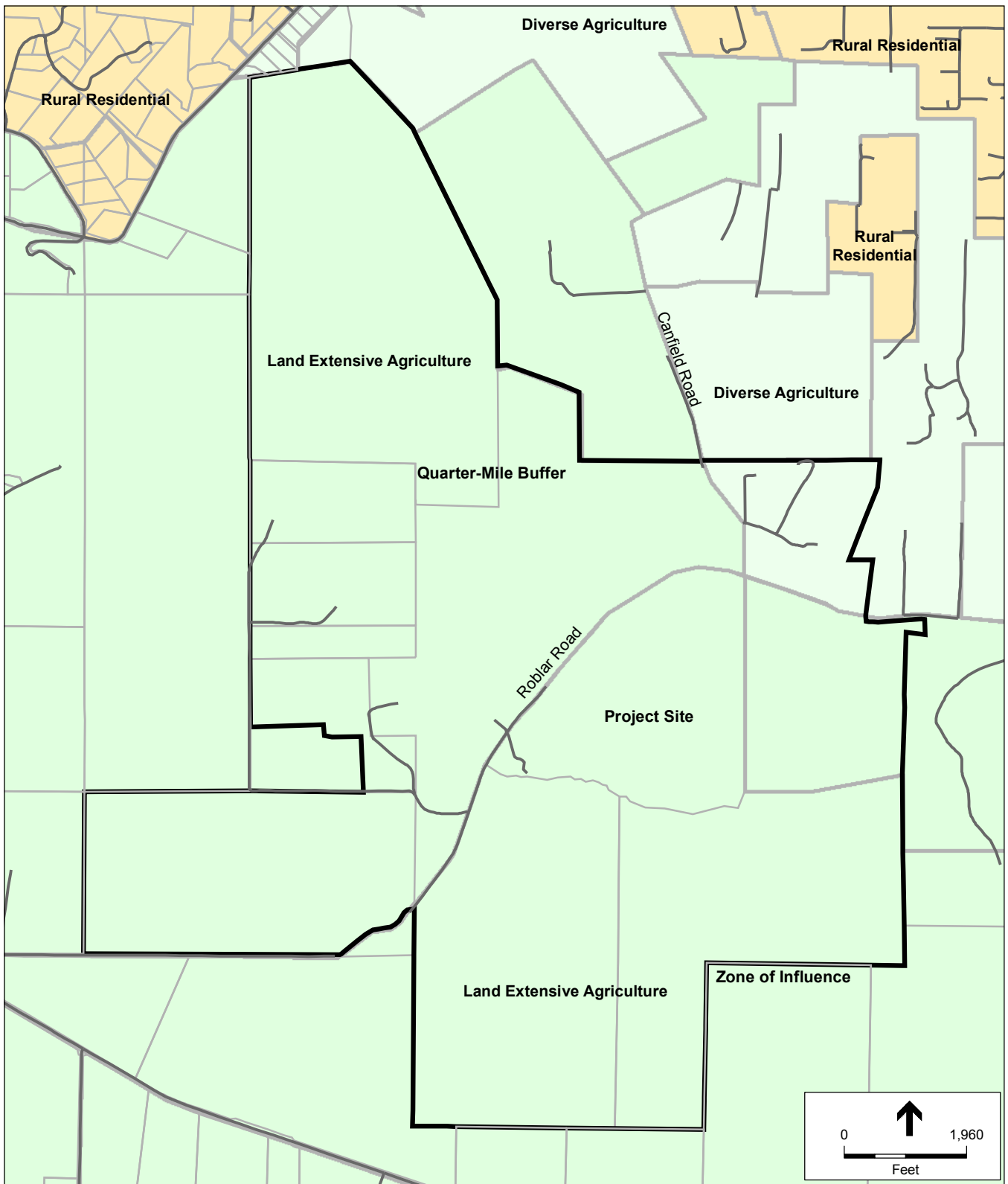
The *Sonoma County General Plan*, initially adopted in 1989, amended through 1998, is the County's current General Plan. (It should be noted an update to Sonoma County General Plan is currently undergoing environmental review). The County's General Plan is comprised of a number of plan elements, functionally grouped as follows: Land Use, Housing, Open Space, Agricultural Resources, Resource Conservation, Public Safety, Circulation and Transit, Air Transportation, Public Facilities and Services, and Noise. The *Sonoma County General Plan* contains nine sub-county planning regions. Both the project site (Roblar Road property) and proposed land exchange site (Lakeville Road property) are located within the Petaluma and Environs Planning Area of the *Sonoma County General Plan*.

General Plan Land Use Designations

Roblar Road Project Site

Figure 6 presents Sonoma County General Plan land use designations for the project site and vicinity. The General Plan land use category for the project site is LEA (Land Extensive Agriculture). 2,686 of the 2,792 acres (approximately 96 percent) that comprise the zone of influence are also designated LEA. The purpose of the LEA category is "to enhance and protect lands capable of and generally best used for the production of food, fiber and plant materials." Permitted uses in the LEA category include agricultural production, processing and other agricultural services. The LEA category also permits surface mining operations consistent with the Aggregate Resources Management Plan, subject to the standards of the County Surface Mining and Reclamation Ordinance (see below).

Parcels in the northeast corner of the zone of influence (accounting for approximately 106 acres) are designated DA (Diverse Agriculture District). This category is intended "to enhance and protect those land areas where soil, climate and water conditions support farming but where small acreage intensive farming and part-time farming activities are predominant, but where farming may not be the principal occupation of the farmer."



SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 6

General Plan Land Use Designations for Roblar Road Project Site and Vicinity

Legend

- Land Extensive Agriculture
- Diverse Agriculture
- Rural Residential

Lakeville Road Easement Exchange Site

As shown in Figure 7, the easement exchange site and adjoining parcels carry a General Plan land use category of LEA (same as the Roblar Road project site). There is also a DA District (northeast of the site) and a RVSC District (Recreational Visitor Serving Commercial) across Highway 37 to the south (currently occupied by Port Sonoma Marina). The RVSC District is intended to “provide for both outdoor and recreation uses and the commercial service needs of visitors and travelers.”

General Plan Goals, Objectives and Policies

Sonoma County General Plan elements with goals and policies most pertinent to the proposed project include the Land Use, Agricultural Resources and the Resource Conservation elements, discussed below.

Land Use Element

The General Plan Land Use Element guides growth and development and use of land in the County. Following are relevant agricultural-related goals and objectives from that element:

Goal LU-8: Protect lands currently in agricultural production and lands with soils and other characteristics which make them potentially suitable for agricultural use. Retain large parcel sizes and avoid incompatible non-agricultural uses.

Objective LU-8.1: Avoid conversion of lands currently used for agricultural production to non-agricultural use.

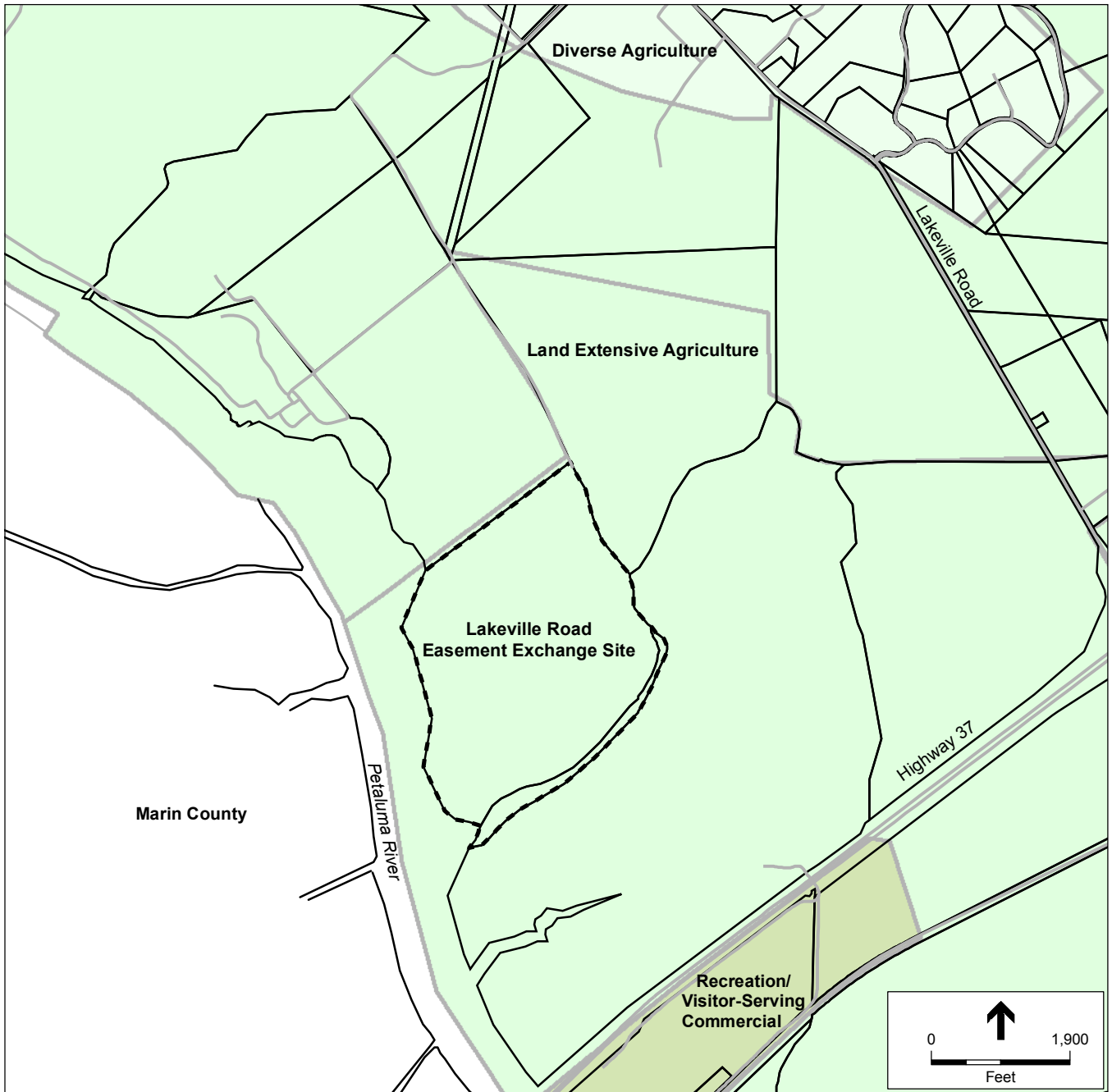
Objective LU-8.4: Discourage uses in agricultural areas that are not compatible with long-term agricultural production.

Agricultural Resources Element

The General Plan Agricultural Resources Element establishes policies, programs and measures that are intended to promote and protect the current and future needs of the agricultural industry within the County. Following are relevant agricultural-related goals and objectives from that element:

Objective AR-2.1: Limit intrusion of urban development into agricultural areas.

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. . .



Legend

- Land Extensive Agriculture
- Diverse Agriculture
- Recreation / Visitor-Serving Commercial

SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 7

General Plan Land Use Designations for Lakeville Road Easement Exchange Site and Vicinity

Resource Conservation Element

The Resource Conservation Element of the General Plan provides for the conservation of natural resources including water, forests, soils, rivers, harbors, fisheries, wildlife, minerals, and other natural resources. These include:

Goal RC-11: Provide for production of aggregates to meet local needs and contribute the County's share of demand in the North Bay production-consumption region. Manage aggregate resources to avoid needless resource depletion and ensure that extraction results in the fewest environmental impacts.

Objective RC-11.1: Use the Aggregate Resources Management Plan to establish priority areas for aggregate production and to establish detailed policies, procedures, and standards for mineral extraction.

Objective RC-11.2: Minimize and mitigate the adverse environmental effects of mineral extraction and reclaim mined lands.

Policy RC-11a: Consider lands designated in the Aggregate Resources Management Plan (ARM Plan) as priority sites for aggregate production and mineral extraction and review requests for additional designations for conformity with the general plan and the ARM plan.

Policy RC-11b: Review projects for environmental impact and land use conflicts and consider the following minimum factors when approving mining permits: topsoil salvage, vegetation, fisheries and wildlife impacts, noise, erosion control, roadway conditions and capacities, reclamation and bonding, air quality, energy consumption, engineering and geological surveys, aggregate supply and replenishment, drainage, and the need for economical aggregate materials.

Policy RC-11c: Review projects which are on or near sites designated "Mineral Resources" in the ARM Plan for compatibility with future mineral extraction.

Sonoma County Zoning Ordinance

Roblar Road Project Site

The project site is zoned as LEA B6 160 Z (Land Extensive Agriculture District; B Combining District - 160-Acre/Unit; 2nd Unit Exclusion Combining District). The purpose of the LEA zoning designation is to enhance and protect lands best suited for permanent agricultural use and capable of relatively low production per acre of land, and to implement the provisions of the general plan and the policies of the agricultural resources element.

A *Mineral Resource* (MR) combining district overlay would be required for the Roblar Road quarry project site under the project. The purpose of the MR combining district overlay is to conserve and protect land that is necessary for future mineral resource production. The MR district is intended to be applied only where consistent with the aggregate resources management plan and combined with base zoning within specific general plan land use categories, including the LEA category. The MR district allows mining with the issuance of a surface mining use

permit and the approval of a reclamation plan, but restricts residential and other incompatible uses. Its uses supersede those allowed in the applicable base district (Zoning Ordinance, Section 26-72-005).

Lakeville Road Easement Exchange Site

The project site is currently zoned LEA F2 (Land Extensive Agriculture District; Floodplain Combining District), with a BR zoning designation (Biotic Resource Combining District) over the western portion of the site adjacent to the Petaluma River. The purpose of the F-2 Floodplain district is to provide for the protection from hazards and damage which may result from flood waters (Zoning Ordinance, Section 26-58-005). The purpose of the BR district is to protect biotic resource communities including critical habitat areas and riparian corridors for their habitat and environmental value and to implement the provisions of the Open Space Element of the General Plan (Zoning Ordinance, Section 26-72-005).

Sonoma County Surface Mining and Reclamation Ordinance (SMARO)

The Sonoma County Surface Mining and Reclamation Ordinance (Ordinance No. 5165) was adopted in order to comply with and implement the provisions of the State Surface Mining and Reclamation Act of 1975 (SMARA) (Public Resources Code Sections 2710 *et seq*) as amended, and the Public Resources Code (PRC) sections by adopting procedures for reviewing, approving, and/or permitting surface mining operations, reclamation plans, and financial assurances in the unincorporated areas of Sonoma County. The ordinance sets forth the general procedural, operational, and reclamation requirements that must currently be complied with, where applicable, by aggregate mining and production operations in the County. These requirements are in addition to any site-specific requirements that may be adopted in the 1994 ARM Plan.

Aggregate Resources Management (ARM) Plan

The Sonoma County Aggregate Resources Management Plan (ARM Plan) was last adopted in 1994. The goal of the ARM Plan is to meet the County's need for aggregate while minimizing environmental impacts and land use conflicts in a manner consistent with the requirements of CEQA, SMARA and State Mineral Resources Management policies.

The following objectives contained in the ARM Plan are relevant to the proposed project:

Objective 2: Facilitate new or expanded quarry operations at designated sites or at other locations with resources which can meet the needs for aggregate in an environmentally sound manner.

Objective 9: Encourage the retention of locally produced aggregate for use within the Sonoma County.

The ARM Plan also establishes operating and reclamation standards for hardrock mining activities. These include standards for erosion control, slope and bench standards, hazardous

materials control, noise standards, days and hours of operation, revegetation standards, successful reclamation standards, and other criteria. These standards have been added to the County's SMARO.

Petaluma Dairy Belt Area Plan

The Petaluma Dairy Belt Area Plan was adopted in 1985, and revised in 1993. The Petaluma Dairy Belt area is located in south and southwestern Sonoma County, along the Marin County border. The primary intent of the plan is to "delineate areas where development should occur and areas where agriculture should remain the primary use" (Sonoma County, 1993, p. 21). Area plan goals and policies pertinent to the proposed project include the following:

Agriculture Goals and Policies

1. It shall be the goal of this Area Plan to protect and maintain agricultural land for the value of its products, its economic impact on the county, its contribution to community life, and its environmental value.
 - b. Support the policies and programs providing tax and economic incentives that will ensure the long term retention of agricultural lands.
 - f. Encourage parcel sizes sufficient to provide productive, economic agricultural use.

Mineral Goals and Policies

1. It shall be the goal of this Area Plan to provide for the comprehensive planning and restoration of mineral extraction areas, such as sand and gravel deposits or quarries.
 - a. Consider inventories of mineral resources when planning or approving development.
 - b. Discourage residential, commercial, or industrial development that would be incompatible with proper mining resources.
 - c. Require that mineral extraction operations be performed in a way that is compatible with surrounding land uses and minimizes adverse effects on the environment.

Hessel Study

The Hessel Study, adopted in 1979, is a specific plan applicable to an approximately 6,000-acre area opposite Roblar Road, to the north of the project site. The specific plan area is generally located adjacent to Highway 116, about 1.5 miles west of Cotati and 4 miles southeast of Sebastopol. The Hessel Study is generally intended to retain the rural qualities of the Hessel area and to "foster dispersion of growth from the Hessel central area to outlying neighborhoods units while still retaining agriculture in the outlying areas." Although not directly applicable to the project site, the Hessel Study recommended land use plan guidelines for adjacent development.

B. Other Agricultural Related Acts and Programs

California Land Conservation Act (Williamson Act)

Applicable Legislation and Regulation

Since its enactment in 1965, the California Land Conservation Act (more generally known as the Williamson Act) has been the state's premier land conservation program. The Williamson Act enables counties and cities to designate Agricultural Preserves that provide preferential taxation to private land owners who execute contracts restricting the use of their land within an Agricultural Preserve to agricultural or open-space uses and certain compatible uses. Agricultural landowners with properties under Williamson Act contracts are assessed taxes on the income-producing value of these property instead of their assessed market value. To qualify for the program, the landowner is required to sign a contract with the county or city agreeing to restrict the use of the land for a minimum 10-year period. The contract is renewed automatically annually unless one of the parties files for non-renewal or the contract is cancelled. The specific terms of the contract can vary between cities and counties depending on local land use policies.

The California Department of Conservation has oversight responsibility for program administration and compliance. The land uses permitted under Williamson Act contracts are governed by Government Code Section 51238.1 which states:

Uses approved on contracted lands shall be consistent with all of the following principles of compatibility:

- (1) The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels or on other contracted lands in agricultural preserves.
- (2) The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contacted parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping.
- (3) The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use.

In addition, each city and county has the discretion to determine land uses that are permissible or prohibited under the Williamson Act contracts (provided these uses are not precluded under the Act). Government Code Section 51238.2 specifically addresses surface mining of Williamson Act-contracted lands. Section 51238.2 states:

Mineral extraction that is unable to meet the principles of Section 51238.1 may nevertheless be approved as compatible use if the board or council is able to document that:

- (a) the underlying contractual commitment to preserve prime land as defined in subdivision

(c) of Section 51201 [which defines “prime” land], or (b) the underlying contractual commitment to preserve nonprime land for open-space use as defined in subdivision (c) of Section 51201 [which defines nonprime land], will not be significantly impaired.

Conditions imposed on mineral extraction as a compatible use of contracted land shall include compliance with the reclamation standards adopted by the Mining and Geology Board pursuant to Section 2773 of the Public Resources Code, including the applicable performance standards for prime agricultural and other agricultural land, and no exception to these standards may be permitted.

The SMARA standards to which Section 51238.2 refers are those for the reclamation of land to agricultural purposes.

See Chapter VI for a discussion of the Williamson Act Easement Exchange Program and its requirements.

Williamson Act Contracts in California and Sonoma County

As of January 2005, 16.6 million acres of Californian farmland have been enrolled under the Williamson Act which represents more than half of the state’s total 30 million acres of farmland and nearly a third of the its privately owned land. In 2005, Sonoma County had 272,272 acres of farmland under agricultural easement protection most of which was under the Williamson Act protection as nonprime farmland (230,342 acres) or as prime farmland (41,931 acres) (DOC, 2006).

Figure 8 shows the distribution of Williamson Act contract lands throughout Sonoma County.

Williamson Act Contracts in Roblar Road Project Site and Lakeville Road Easement Exchange Site Vicinity

Roblar Road Project Site

Figure 9 illustrates the properties in the Roblar Road project site vicinity that are currently under Williamson Act contracts. The previous Roblar Road property owners originally entered into an approved Williamson Act contract #2-387-72 with Sonoma County dated February 28, 1972, and recorded March 2, 1972. A Notice of Non-Renewal of the Williamson Act contract was approved by the County on November 29, 2005 and recorded on December 7, 2005. All of the other properties subject to a Williamson Act contract may be expected to remain in agricultural production for a minimum of ten years.

Lakeville Road Easement Exchange Site

Figure 10 illustrates the properties in the Lakeville Road easement exchange property vicinity that are currently under Williamson Act contracts. The easement exchange property is not currently under Williamson Act protection. The property was never placed under a Williamson Act contract primarily because its annual property tax payments were already low (based on the property’s original purchase price in the early 1950s), and because it wished to maintain its sale options by keeping the property unencumbered (Kullberg, 2006).

Agricultural Conservation Easements

Open Space Districts and Organizations

Sonoma County Agricultural Preservation and Open Space District

The Sonoma County Agricultural Preservation and Open Space District (District) was established as part of the Open Space Element of the Sonoma County General Plan to acquire and administer open space lands. The District is a public agency funded by ¼ percent sales tax in Sonoma County. However, the District is not a regulatory agency and does not have the power of eminent domain. The District acquires conservation easements through voluntary transactions with landowners, and also purchases land outright from willing sellers. The District identifies four acquisition categories: Agriculture, Greenbelts, Natural Resources and Recreation. The Agriculture Acquisition Category includes small farms, dairies, livestock ranches, vineyards and other agricultural lands that contribute to the County's agricultural economy and provide valuable open space. The District has protected over 32,000 acres of active agricultural lands in Sonoma County.

Sonoma Land Trust

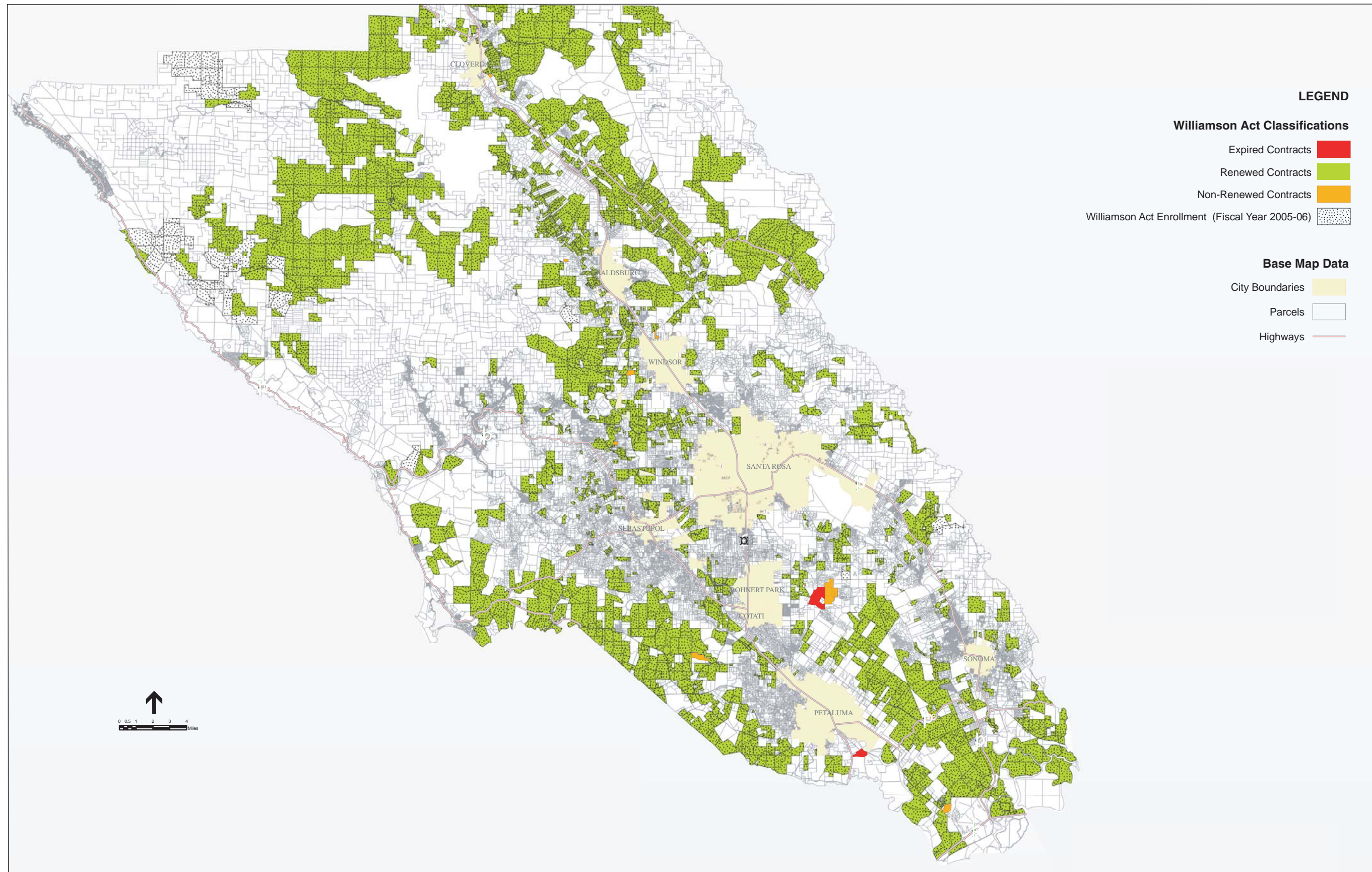
The Sonoma Land Trust, founded in 1976, is a private, non-profit membership organization that has protected more than 17,000 acres in and around Sonoma County by working directly with willing landowners. The Land Trust offers stewardship, education and advice for the preservation and enhancement of agricultural, natural and open space lands.

Agricultural Conservation Easements in Vicinity of Roblar Road Project Site

Figure 11 illustrates locations of agricultural conservation easements by the Sonoma County Agricultural Preservation and Open Space District in the vicinity of the Roblar Road project site. The project applicant sold the permanent agricultural easement rights for Roblar Ranch property (south of and adjacent to the Roblar Road project site) to the District in May 2004.

Agricultural Conservation Easements and other Protected Lands in Vicinity of Lakeville Easement Exchange Site

Figure 12 illustrates agricultural conservation easements and other protected lands in the vicinity of the Lakeville Road Easement Exchange site. The Sonoma Land Trust maintains an agricultural conservation easement on the adjacent property to the south (Lower Ranch). The Sonoma Land Trust also owns the North Parcel and Leonard Ranch properties, and is currently working to restore and enhance the seasonal wetlands on those properties. Under a partnership between the State Lands Commission, California Department of Fish and Game and the Sonoma Land Trust, 48 acres of formerly diked lands (Petaluma River Marsh) adjacent to, and south of, the easement exchange site were opened to tidal action and restored. The Sonoma County Agricultural Preservation and Open Space District maintains an agricultural conservation easement on the adjacent Sleepy Hollow Dairy property northeast of the exchange property.

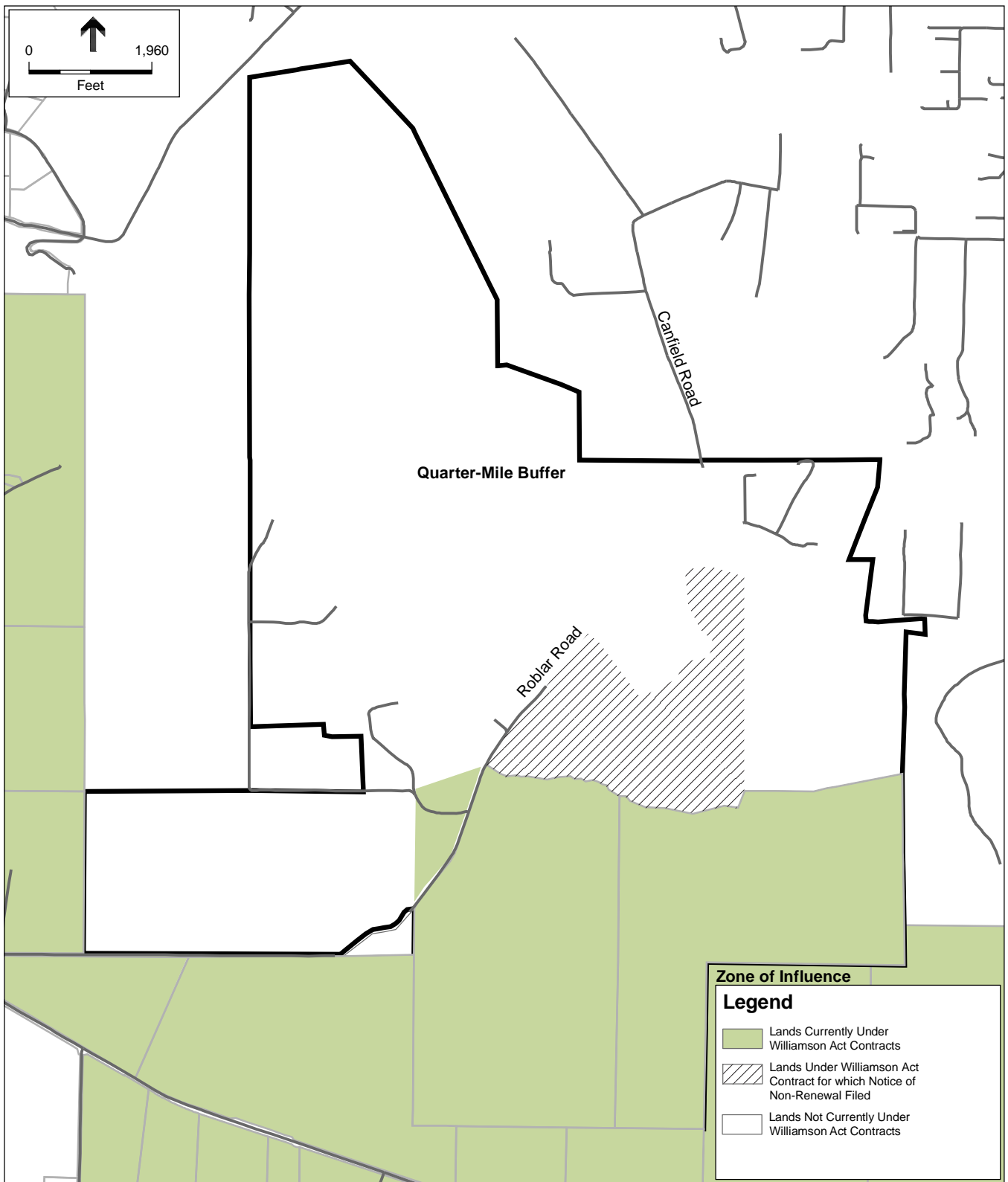


SOURCE: Sonoma County PRMD

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 8
Williamson Act Lands in Sonoma County

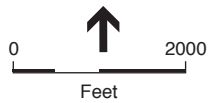
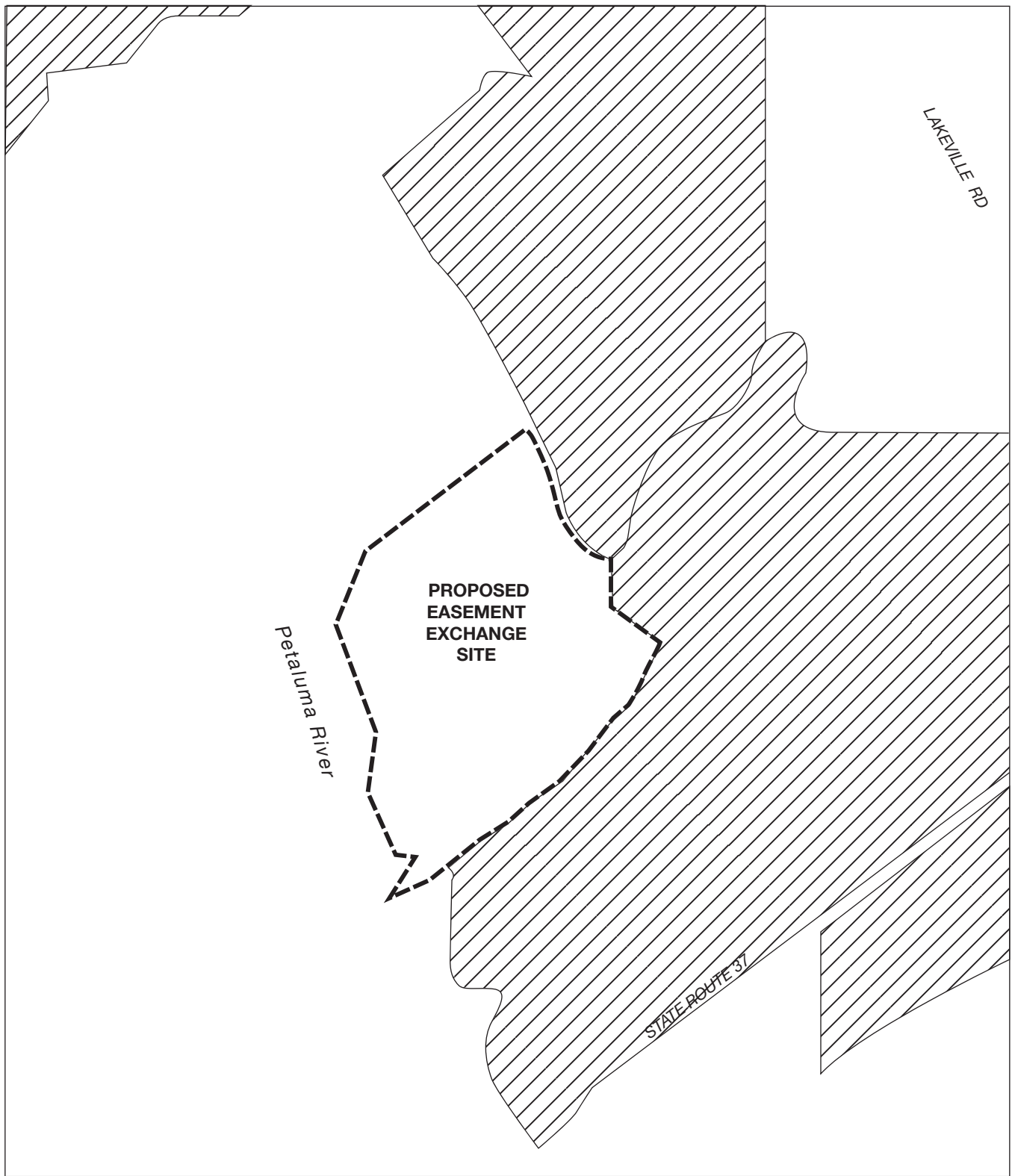
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SOURCE: County of Sonoma, 2005; ESA, 2005

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 9
Williamson Act Lands In
Roblar Road Project Site Vicinity



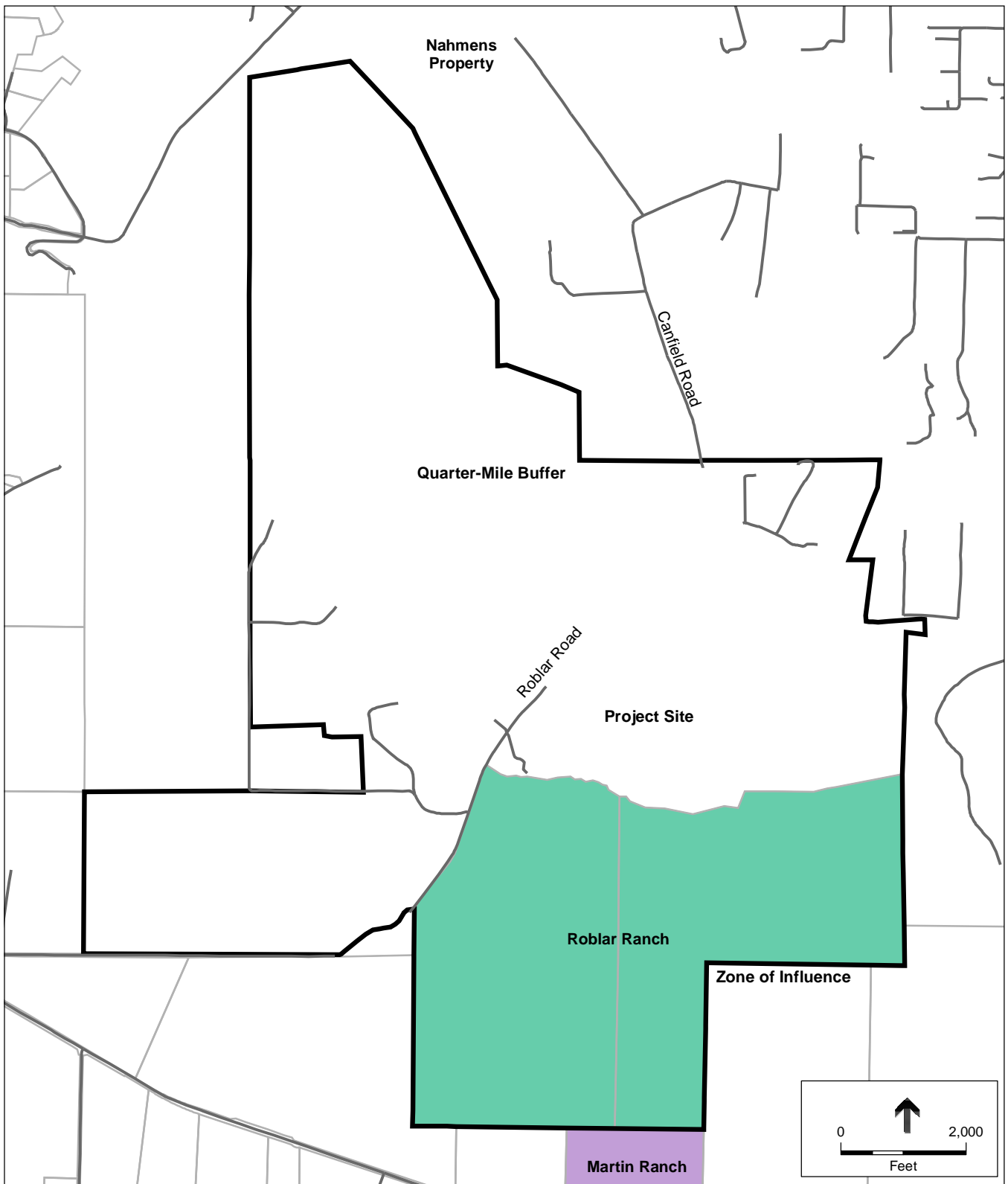
--- Approximate Property Boundary

□ Lands Currently Under Williamson Act Contracts

SOURCE: USGS

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 10
Williamson Act Lands in Lakeville Road
Easement Exchange Site Vicinity



SOURCE: County of Sonoma, 2005; ESA, 2005

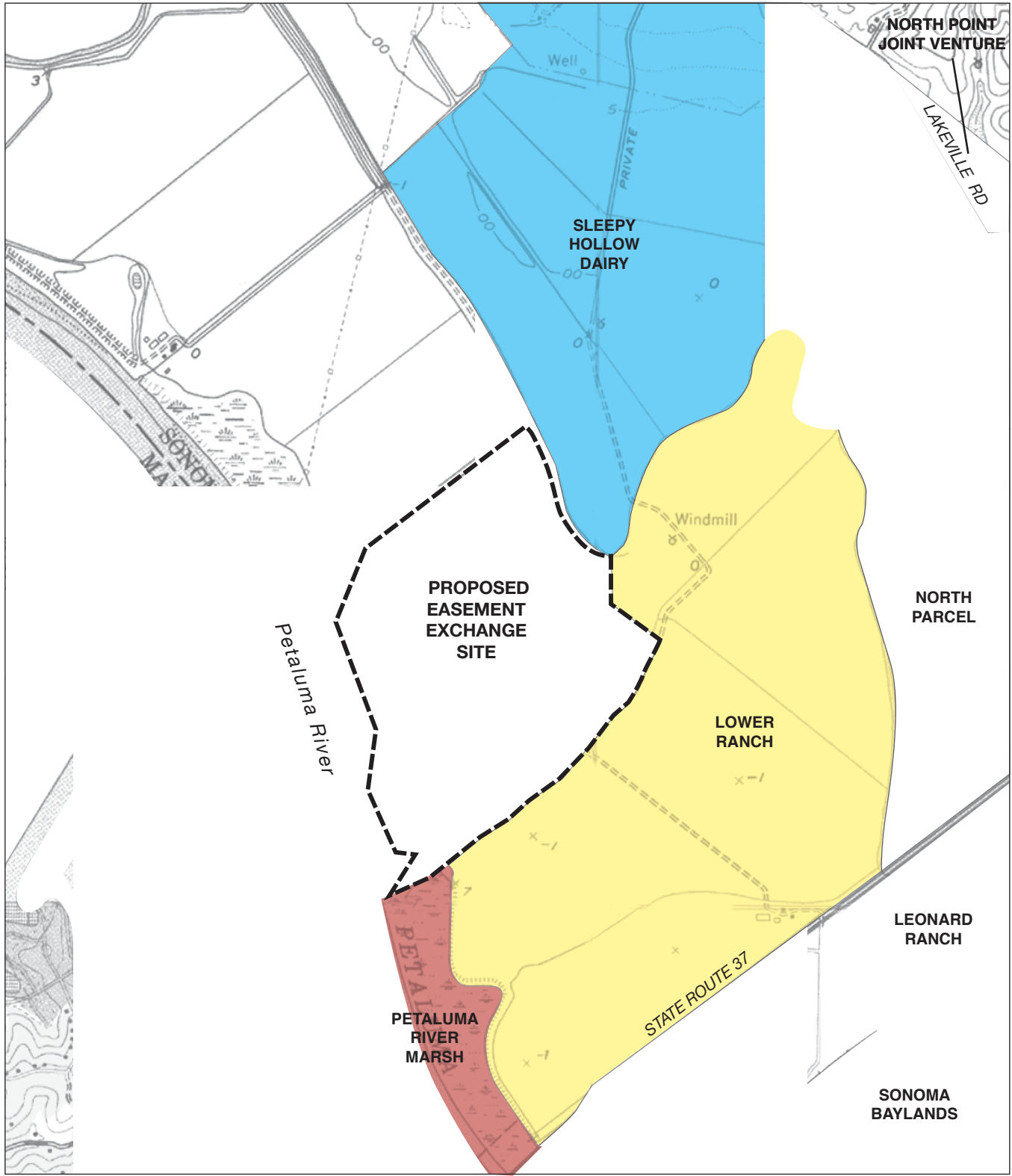
Roblar Road Quarry Farmland Conversion Study . 204334

Figure 11

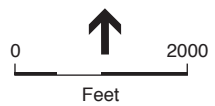
Agricultural Conservation Easements in Project Site Vicinity

Legend

- Roblar Ranch
 - Martin Ranch
 - Nahmens Property
- Under agricultural conservation easement by the Sonoma County Agricultural Preservation and Open Space District



- Approximate Property Boundary
- Under Agricultural Conservation Easement by the Sonoma County Agricultural Preservation and Open Space District
- Under Agricultural Conservation Easement by the Sonoma Land Trust
- Owned and Protected by Sonoma Land Trust
- Future Donation to Sonoma Land Trust
- State Coastal Conservancy Property
- California Department of Fish and Game Property
- Marin Audobon Society Property
- State Lands Commission Property



SOURCE: USGS, Sonoma Land Trust

Roblar Road Quarry . 204334

Figure 12
Agricultural Easements and Other Protected Lands in
IV-16 Lakeville Road Easement Exchange Site Vicinity

Further south along the San Pablo Bay, the 431-acre Sonoma Baylands property was restored to tidal action in 1996 through a partnership between the California State Coastal Conservancy, the U. S. Army Corps of Engineers and the Sonoma Land Trust. As part of the restoration project, dredge material from the Port of Oakland was used to raise the subsided properties' elevation closer to its final desired marsh elevation.

Further east, the Sonoma Land Trust acquired the 2,327-acre North Point Joint Venture and Dickson Ranch properties (now collectively known as the Sears Point Restoration Project) in early 2005. The Sonoma Land Trust is currently evaluating a number of restoration approaches for that property. Together with the other neighboring and nearby conservation and restoration properties including the San Pablo Bay National Wildlife Refuge, the area represents one of the most significant restoration projects occurring throughout the San Francisco Bay.

Farmland Quality

Evaluation Factors

A property's farmland quality depends on numerous land characteristics that thereby determine its capability for supporting crop or livestock production. These include soil quality (i.e. the site's soil chemistry and other physical characteristics), topography, climate, moisture supply as well as the availability and quality of irrigation water.

Two common land classification systems are used nationally for evaluating a property's agricultural production suitability: (1) the U.S. Department of Agriculture's (USDA) Natural Resource Conservation Service² Land-Capability Classification System; and (2) the Storie Index Rating System (developed by the University of California). These classification systems are factors used in the LESA Model for evaluating agricultural conversion impacts of the proposed project.

USDA Natural Resource Conservation Service (NRCS) Land-Capability Classification System

The USDA NRCS Land Capability Classification System rates soil types by County in relation to its associated limitations for crop management. Capability grouping depicts, in general, the suitability of soils most kinds of field crops. The groups are made according to the soil's limitations when used for field crops. The capability system is grouped according to three levels including Capability Class, Subclass and Unit.

Capability Classes are designated by Roman numerals and are designed to indicate a progressively greater limitation and/or narrower practical use according to a corresponding increase from I to VIII. A soil rated as Class I would have few limitations, whereas a soil rated as Class VIII could have severe limitations that, in most circumstances, would preclude it from commercial crop production. Generally, Capability Classes I through III are considered Prime

² Before 1994 the National Resource Conservation Service (NRCS) was known as the Soil Conservation Service.

Farmland according to the DOC. *Capability Subclasses* are designated by adding a small letter to the class numeral, to give an indication of the main limitation associated with the soil type (e.g., e = erosion, w = wetness). *Capability Units* are given Arabic numbers (0 through 9), and represent soil groups within subclasses and suggest the chief kind of limitation. Table 1 in Appendix B in this study presents additional details of NRCS land capability grouping of soils.

Storie Index Rating System

Storie index ratings are based on soil characteristics only, and are obtained by evaluating such factors as soil depth, surface layer texture, subsoil characteristics, drainage, salts and alkali, and relief. Other factors, such as availability of water for irrigation, climate, and market are not considered in determining Storie index rating values. The Storie index rating descriptions are presented in Table 3.

**TABLE 3
STORIE INDEX RATING DESCRIPTIONS**

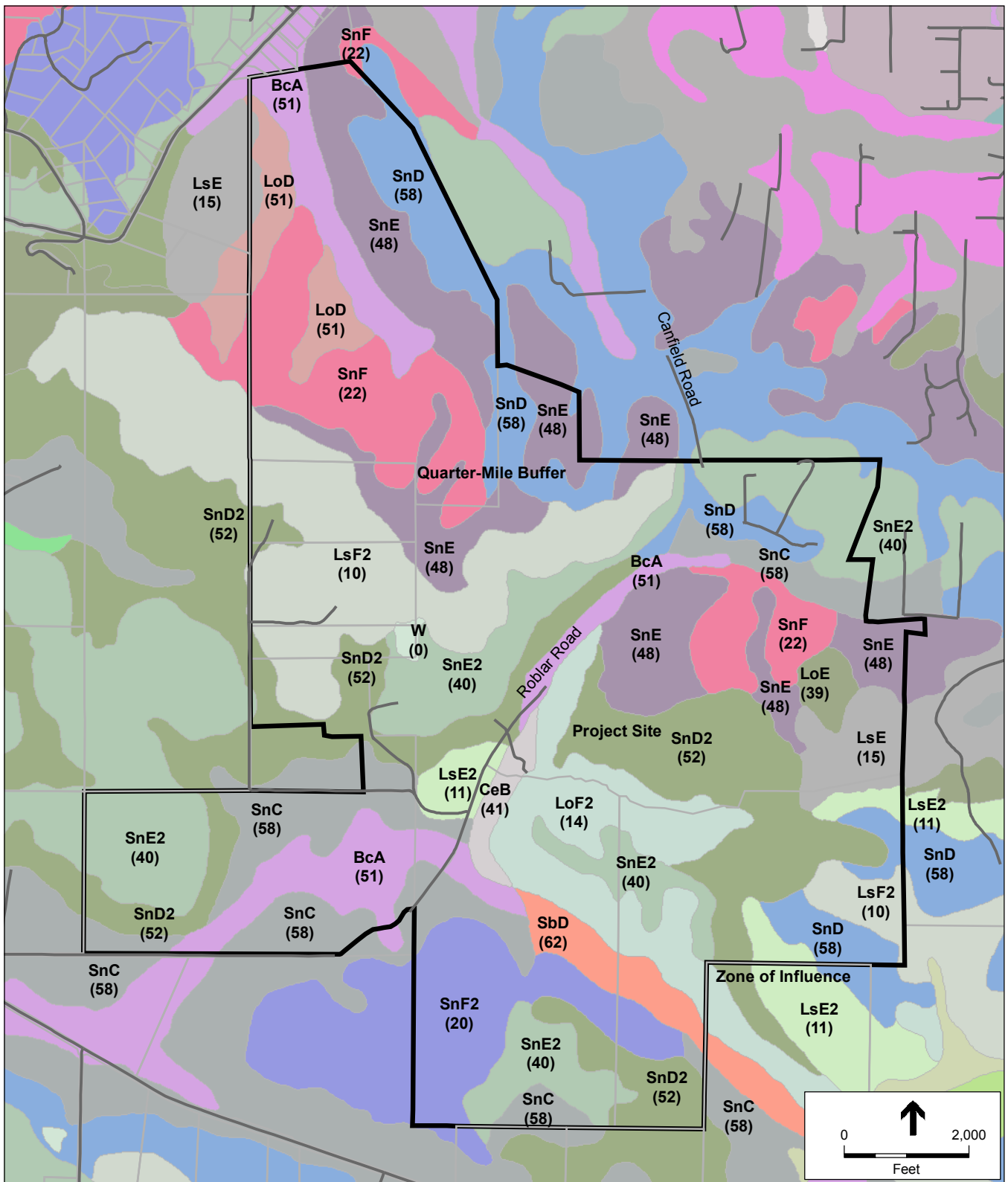
Grade	Storie Index Rating	Description
1	80-100	Few limitations that restrict their use for crops
2	60-80	Suitable for most crops, but have minor limitations that narrow the choice of crops and have a few special management needs
3	40-60	Suited to few crops or to special crops and require special management
4	20-40	If used for crops are severely limited and require special management
5	10-20	Not suitable for cultivated crops, but can be used for pasture and range
6	< 10	Soil and land types generally not suited to farming

SOURCE: United States Department of Agriculture, Natural Resource Conservation Service

NRCS Land-Capability and Storie Index Ratings at Roblar Road Project Site

Figure 13 illustrates the NCRS soil types, and corresponding Storie Index ratings, for the Roblar Road project site and neighboring land parcels. Table 4 provides additional detail on applicable soil descriptions and capability class. As shown in Figure 13, the soil, slope and erosion conditions at the project site and within the project site’s zone of influence vary.

The great majority of soils on the Roblar Road project site (approximately 95%) consist of Steinbeck loam and Los Osos clay loam, with a Land Capability Classification of IV/VI. Approximately 10.5 acres of the project site (approximately 5%) of the project site (in the low-lying areas near Roblar Road) are Blucher fine sandy loam and Clear Lake clay. These soils carry a Land Capability Classification of II (and therefore meet the criteria for prime farmland as outlined in the USDA land inventory and monitoring project for Sonoma County) (see Appendix B in this study). In comparison, approximately 486 acres of the entire 2,792-acre zone of influence (approximately 17%) are rated as Land Capability Classifications of I though III, meeting the criteria for prime farmland.



SOURCE: County of Sonoma, 2005; ESA, 2005; USDA, 2005

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 13

Soil Types and Storlie Indices for the Roblar Road Project Site Vicinity

Legend

 Portion of Project Site Affected by Proposed Quarry

TABLE 4
NCRS SOIL TYPE DESCRIPTIONS AND CAPABILITIES, AND
STORIE INDEX RATINGS IN ROBLAR ROAD PROJECT SITE VICINITY

Soil Type Symbol^a	Description	Capability Class, Subclass and Unit^b	Storie Index Rating^{c,d}
BcA	Blucher fine sandy loam, 0 to 2% slopes	IIw-2	51
CeB	Clear Lake clay, 2 to 5% slopes	IIe-5	41
HbC	Haire gravelly loam, 0 to 9% slopes	IIIe-3	35
LoD	Los Osos clay loam, 2 to 15% slopes	IIIe-3	51
LoE	Los Osos clay loam, 15 to 30% slopes	IVe-3	39
LoF2	Los Osos clay loam, 30 to 50% slopes, eroded	Vle-3	14
LsE	Los Osos clay loam, thin solum, 15 to 30% slopes	Vle-3	15
LsE2	Los Osos clay loam, thin solum, 15 to 30% slopes, eroded	Vle-3	11
LsF2	Los Osos clay loam, thin solum, 30 to 50% slopes, eroded	VIIe-3	10
SbD	Sebastopol sandy loam, 9 to 15% slopes	IVe-1	62
SnC	Steinbeck Loam, 2 to 9% slopes	IIIe-1	58
SnD	Steinbeck Loam, 9 to 15% slopes	IVe-1	58
SnD2	Steinbeck Loam, 9 to 15% slopes, eroded	IVe-1	52
SnE	Steinbeck Loam, 15 to 30% slopes	Vle-1	48
SnE2	Steinbeck Loam, 15 to 30% slopes, eroded	Vle-1	40
SnF	Steinbeck Loam, 30 to 50% slopes	Vle-1	22
SnF2	Steinbeck Loam, 30 to 50% slopes, eroded	Vle-1	20

^a See Figure 13 for illustration of soil types in Roblar Road project site vicinity.

^b See Table 1 in Appendix B for NCRS Capability class definitions.

^c See Table 3 for Storie Index rating descriptions.

^d See Figure 13 for illustration of Storie Index ratings in Roblar Road project site vicinity.

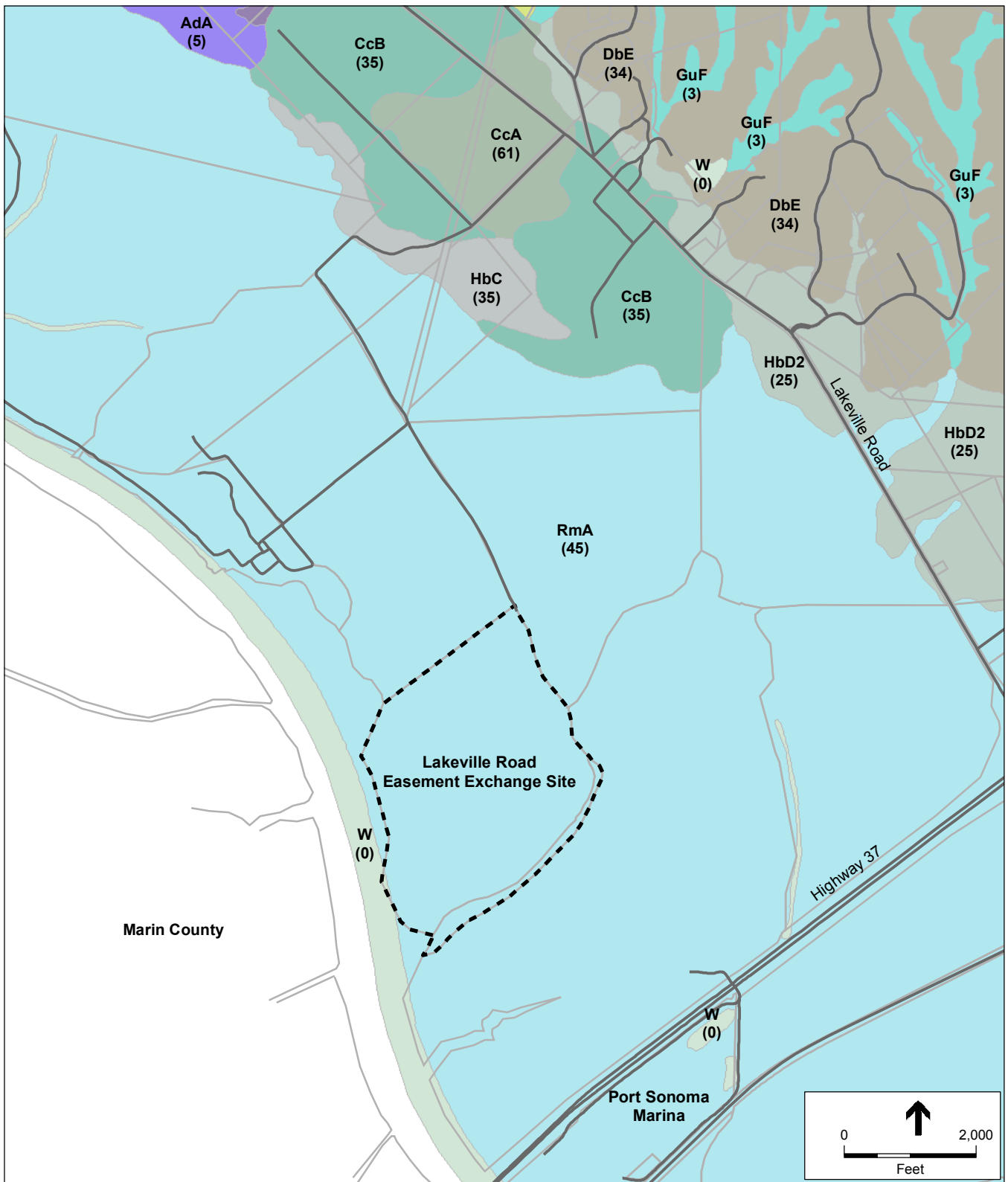
Shaded areas represent soils encountered within the Roblar Road project site.

SOURCE: United States Department of Agriculture, Natural Resource Conservation Service

As shown in Figure 13, Storie index ratings for the Roblar Road project site range from 14 to 52, depending on soil type.

NRCS Land-Capability and Storie Index Ratings at Lakeville Road Easement Exchange Site

Figure 14 illustrates the NCRS soil types, and corresponding Storie Index ratings, for the Lakeville Road easement exchange site and general vicinity. Table 5 provides additional detail on applicable soil descriptions and capability class. The Lakeville Road easement exchange site and adjacent parcels consist of Reyes silty clay, with a Land Capability Classification of IV. As shown in Figure 14, the Storie index rating for the Lakeville Road easement exchange site is 45.



SOURCE: County of Sonoma, 2005; ESA, 2005; USDA, 2005

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 14

Soil Types and Storied Indices for the Lakeville Road Easement Exchange Site Vicinity

**TABLE 5
NCRS SOIL TYPE DESCRIPTIONS AND CAPABILITIES, AND
STORIE INDEX RATINGS IN LAKEVILLE ROAD EASEMENT EXCHANGE SITE VICINITY**

Soil Type Symbol^a	Description	Capability Class, Subclass and Unit^b	Storie Index Rating^{c,d}
AdA	Alluvial land, sandy, overwash	VIIw-4	<10
CcA	Clear Lake clay loam, 0 to 2% slopes	IIs-5	24
CcB	Clear Lake clay loam, 2 to 5% slopes	IIe-5	59
DbE	Diablo clay, 15 to 30% slopes	IVe-5	34
GuF	Gullied land	VIIIe-1	<5
HbC	Haire gravelly loam, 0 to 9% slopes	IIIe-3	35
HbD2	Haire gravelly loam, 9 to 15% slopes, eroded	IVe-3	25
RmA	Reyes silty clay, 0 to 2% slopes	IVw-9	45

^a See Figure 14 for illustration of soil types in Lakeville Road easement exchange site vicinity.

^b See Table 1 in Appendix B for NCRS Capability class definitions.

^c See Table 3 for Storie Index rating descriptions.

^d See Figure 14 for illustration of Storie Index ratings in Lakeville Road easement exchange site vicinity.

Shaded areas represent soils encountered within the Lakeville Road easement exchange site.

SOURCE: United States Department of Agriculture, Natural Resource Conservation Service

California Department of Conservation Farmland Mapping and Monitoring Program (FMMP)

The California Department of Conservation (DOC) administers the Important Farmland Mapping and Monitoring Program (FMMP) which evaluates the quality of farmlands throughout the State of California. The suitability of the local soil resources plays a crucial part in the FMMP’s farmland classifications. The FMMP uses USDA NRCS soil survey information, land inventory and monitoring criteria to classify most of the state’s agricultural regions into five agricultural and three nonagricultural land types. Every two years, the FMMP publishes this information in its Important Farmland map series. The five agricultural land classifications are:

Prime Farmland: This consists of the land best able to sustain long-term crop production. These lands must have a developed and adequate irrigation water supply. These lands must have been used for irrigated crop farming for some period during the previous 4 years.

Farmland of Statewide Importance: These are lands with similar land use, irrigation system and physical characteristics as prime farmland but with minor shortcomings (e.g. steeper soils).

Unique Farmland. Lands with lesser quality soils used to produce California’s leading agricultural cash crops. These are generally irrigated lands but can include nonirrigated orchards or vineyards.

Farmland of Local Importance. Agricultural properties determined by the county’s local government to be important for the local agricultural economy.

Grazing Land. Lands most suited for livestock grazing.

Nonagricultural lands are classified as: Urban and Built-Up lands; Water (perennial water bodies greater than 40 acres); or Other Land (i.e. not included in any other mapping category).

The FMMP is an informational service only and does not constitute state regulation of local land use decisions. Prime Farmland, Farmland of Statewide Importance, and Unique Farmland are considered valuable and any conversion of land within these categories is typically considered to be an adverse impact. The FMMP classifications for lands within Sonoma County are presented in Table 6.

**TABLE 6
SONOMA COUNTY FMMP LAND CLASSIFICATION SUMMARY**

FMMP Land Classification Category	Total Acreage
Important Farmland	
Prime Farmland	36,377
Farmland of Statewide Importance	19,747
Unique Farmland	31,173
Farmland of Local Importance	74,851
Total Important Farmland	162,148
Grazing Land	421,126
Agricultural Land Total	583,274
Urban and Built-Up Land	72,848
Other Land	352,582
Water	17,354
Total Area Inventoried	1,026,058

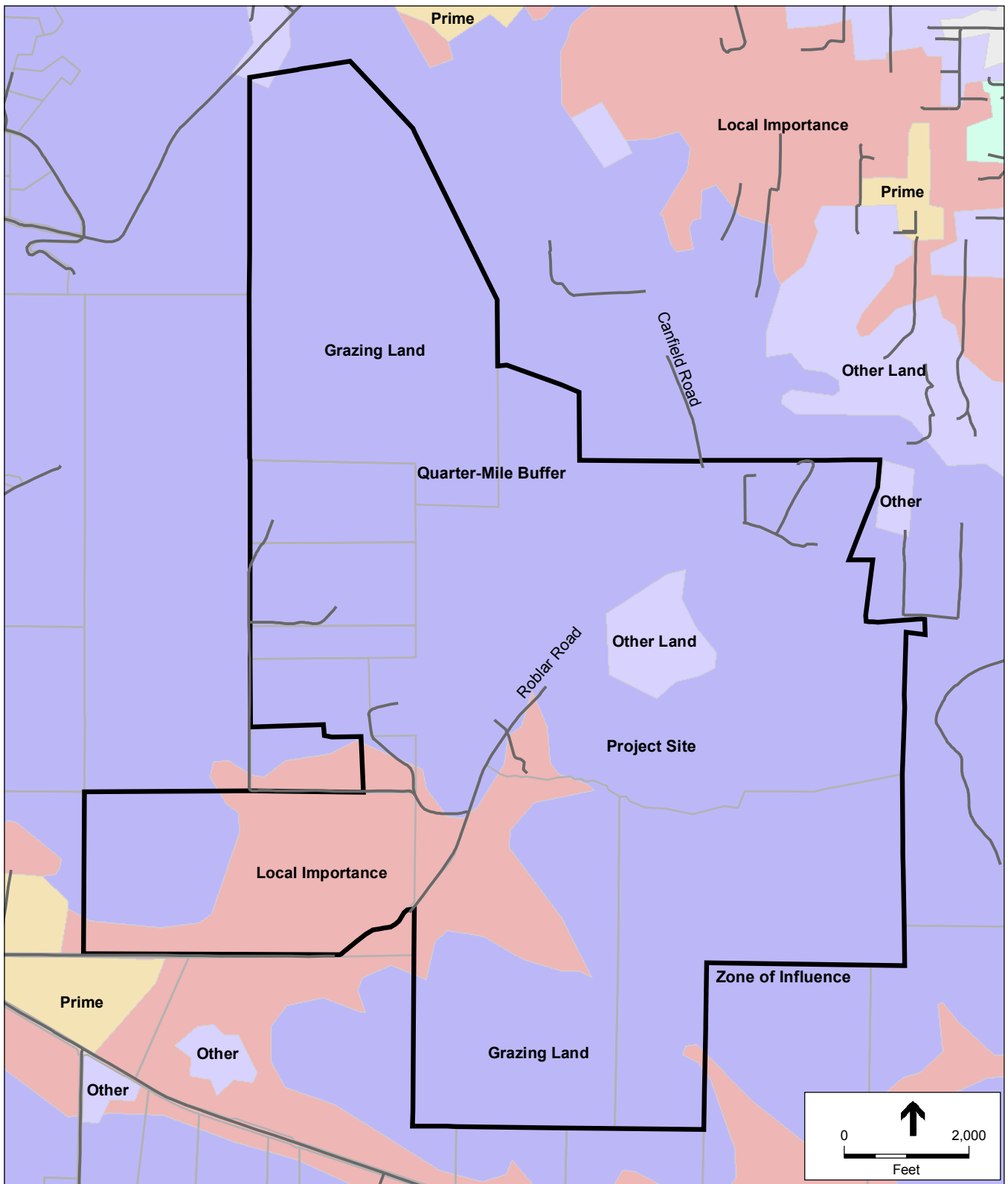
SOURCE: Department of Conservation, Farmland Mapping and Monitoring Program

FMMP Classification at Roblar Road Project Site

Figure 15 shows the DOC FMMP land classification for the project site and its zone of influence. Most of the Roblar Road project site is designated “grazing land.” A small area in the southwest portion of the site (approximately 10.5 acres, or about 5% of the project site) is classified as “farmland of local importance.” There is no “prime farmland,” “farmland of statewide importance,” or “unique farmland” within the project site.

FMMP Classification at Lakeville Road Easement Exchange Site

Figure 16 shows the FMMP land classification for the Lakeville Road easement exchange site and vicinity. The entire easement exchange site and all adjacent parcels are classified as “farmland of local importance” by the FMMP.



SOURCE: County of Sonoma, 2005; ESA, 2005;
 Calif. Dept. of Conservation, 2005

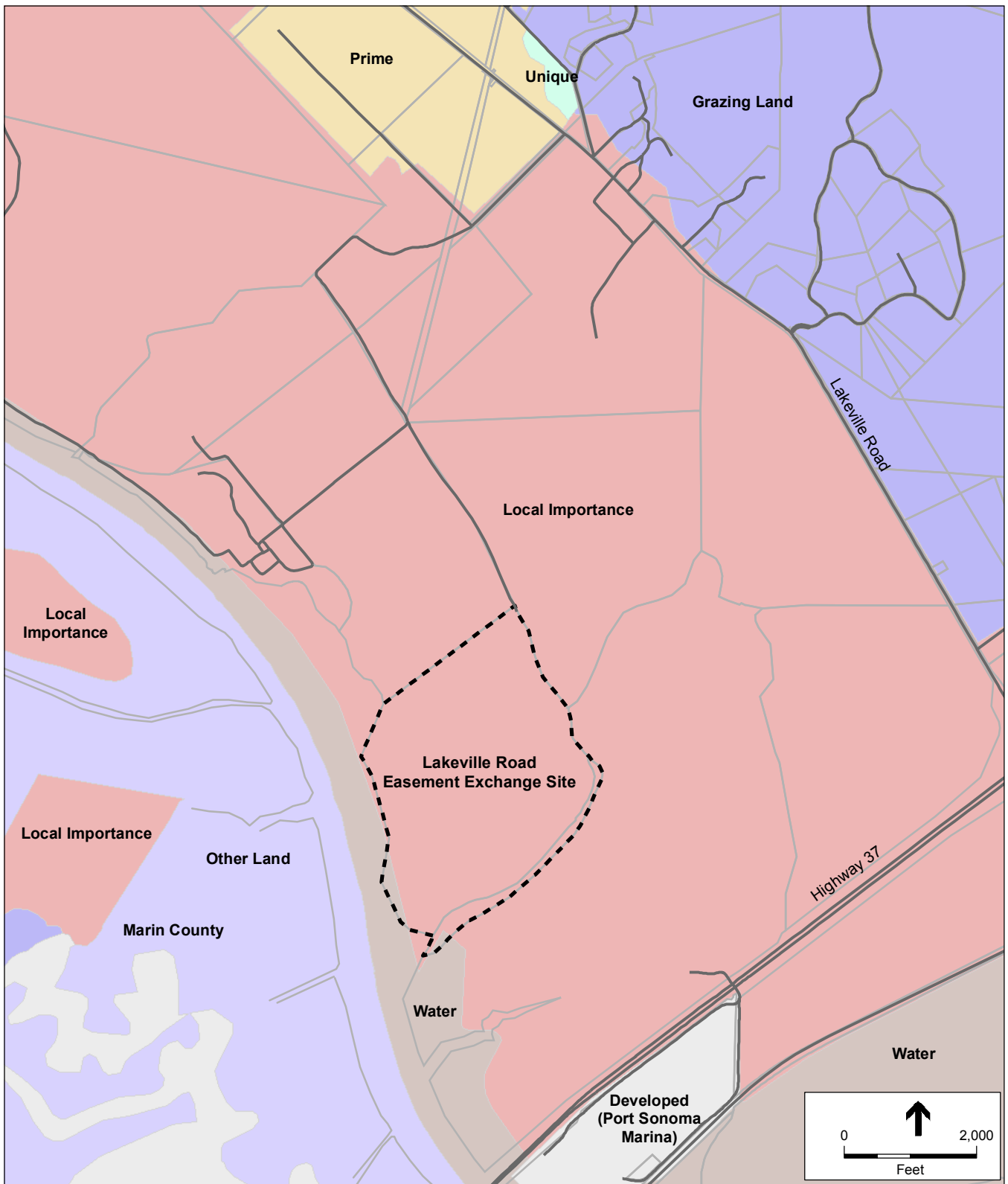
Legend

 Portion of Project Site Affected by Proposed Quarry

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 15

Important Farmland Classifications for the
 Roblar Road Project Site Vicinity



SOURCE: County of Sonoma, 2005; ESA, 2005;
Calif. Dept. of Conservation, 2005

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 16

Important Farmland Classifications for the
Lakeville Road Easement Exchange Site Vicinity

Other Factors

Besides soil quality evaluation factors, climate is also an important factor in determining a site's farmland quality. This is frequently the case particularly for grazing lands as it is often the most limiting factor in determining the site's rangeland carrying capacity. Sonoma County's climate generally consists of moderate temperatures and precipitation. While temperatures within the inland areas of Sonoma County can reach the 90's (and occasionally even exceed 100), even during the warm period of the year night temperatures tend to be cool (usually in the lower 50s). Average precipitation rates within central Sonoma County generally are between 30 and 40 inches although nearly all this precipitation occurs during the winter season. As a result, the summer period is long enough that range land dries up typically by late summer. The mean growing season for Sonoma County's central region is 230 to 260 days. Sonoma County's coastal areas generally experience more moderate temperatures due to the cooling influence of coastal winds and cloudiness. However, the southeastern parts of Sonoma County are generally drier with average annual rainfall levels of 20 or few inches (Elford, 1964).

Water availability can also have a major influence on a site's farm use potential. Irrigable properties with a reliable and affordable water supply will greatly increase the range of agricultural production that can occur. To assess the water availability for farmland site, the Department of Conservation recommends identifying the potential water sources (i.e. surface or groundwater supplies) and their likely supply constraints/conditions with particular attention in evaluating both drought and non-drought years (Department of Conservation, 1997). The Department of Conservation also recommends assessing the feasibility of irrigated production (i.e. considering the market demand and economic returns for irrigated crops produced in the region). For the water availability assessment for its Land Evaluation and Site Assessment (LESA) Model, the presence of an existing irrigation system is a precondition for a determination of irrigation feasibility. In addition, the physical and economic restrictions on use of the irrigation system are considered to determine whether production can occur (both during drought and non-drought years). If a viable economic return can not be achieved then the agricultural production will not be feasible.

CHAPTER V

Project Description

A. Proposed Quarry

The project applicant has requested the necessary entitlements from the County of Sonoma to enable development of the proposed Roblar Road Quarry. Approval of this request would grant a use permit for mining for a 20-year period, under the terms of the County's Aggregate Resource Management (ARM) Plan, mining regulations, and any approval conditions that are imposed. The proposed project would disturb approximately 70 acres (including a 65-acre quarry pit) of the approximate 199-acre parcel over a 20-year mining period.

The Roblar Road Quarry proposes to mine approximately 570,000 cubic yards of quarry material annually (approximately 2,260 cubic yards per day). Quarry materials would include aggregate road base, subbase, drain rock, quarry fines, fill material, riprap (rocks six inches and larger) and concrete aggregates. As these materials are processed they would be stockpiled on site for eventual loading and delivery. The Phase 1 quarry slopes would be graded at 1½:1 (horizontal:vertical) with 10-foot wide benches at 30-foot vertical intervals. The applicant intends to continue cattle grazing during all proposed phases of mining on the portion of the project site that would not contain mining operations.

Reclamation would be associated with visual enhancements, on-going reclamation and final reclamation. Ongoing reclamation would include the new planting for visual screening and erosion control, the incremental planting and maintenance of mined slopes, and the maintenance of the proposed sediment pond. The active mining area at any one time would be limited to 30 acres. As quarrying in an area is completed, reclamation would be conducted using select fill, overburden and topsoil. Revegetation would primarily consist of hydromulch, trees and planting. All finished slopes would be reseeded. When harvesting of aggregate is completed, final reclamation would be conducted. Figure 17 illustrates the proposed quarry reclamation plan at the Roblar Road project site.

B. Proposed Easement Exchange

The applicant proposes to participate in the Department of Conservation's Williamson Act Easement Exchange Program (WAEPP). The applicant proposes to place the Lakeville Road property (purchased by the applicant in November 2005) under a permanent agricultural easement as part of the WAEPP for rescission of 70 acres of grazing land currently under the existing Williamson Act contract on the Roblar Road property. As discussed under in Chapter IV, the two parcels are currently used for dryland oat hay farming and are not currently under a Williamson

Act contract. Chapters II, III, and IV provide a detailed description of the Lakeville Road easement exchange site characteristics and existing use.

While the applicant would continue to retain fee title ownership of the easement exchange property, a permanent agricultural conservation easement would be transferred for future stewardship to an appropriate private land trust or government conservation agency, such as the Sonoma Land Trust or the Sonoma County Agricultural Preservation and Open Space District.

C. Project Objectives

The primary purpose of the proposed project is the development of the new quarry at the Roblar Road site. Specific project objectives include:

- To profitably develop and operate a hard rock quarry on land owned by the applicant, in reasonable proximity to Highway 101, at a site designated for aggregate production in the Sonoma County ARM Plan.
- To provide an affordable and reliable source of aggregate suitable for Portland cement concrete (“PCC”), asphalt concrete (“AC”) and asphalt concrete base (“ACB”) to customers in the south central portion of Sonoma County, thus minimizing transport distances and associated costs and impacts and facilitating the State and County policy of meeting local demand for high quality aggregate with local resources.
- To develop a quarry that assists the County of Sonoma in meeting its stated goals and policies of shifting aggregate production away from terrace mining to hard rock quarries, thereby avoiding the conversion of prime agricultural land on the terraces of the Russian River.
- To assist in ameliorating the PCC, AC and ACB aggregate shortage identified in a recent report of the Department of Conservation titled *CGS Special Report 175: Mineral Land Classification of Aggregate Materials in Sonoma County, California*, dated 2005.

The County’s goals and objectives for aggregate resources were established in the Sonoma County ARM Plan. Relevant objectives from the ARM Plan are presented below:

- Facilitate new or expanded quarry operations at designated sites or at other locations with resources which can meet the needs for aggregate in an environmentally sound manner.
- Encourage the retention of locally produced aggregate for use within Sonoma County.



NOTES

1. RECLAMATION SHALL TAKE PLACE CONCURRENTLY WITH MINING. AS QUARRYING OF AN AREA IS COMPLETED, RECLAMATION WILL BE DONE USING SELECT FILL, OVERBURDEN AND TOPSOIL.
2. ACTIVE QUARRY AREA WILL BE LIMITED TO 30 ACRES.
3. ALL FINISH SLOPES WILL BE RE-SEEDED. FLOOR AREA WILL BE RE-VEGETATED UPON COMPLETION OF PROCESSING OPERATIONS.
4. ALL DISTURBED AREAS SHALL BE ENCOURAGED TO FLOW INTO SITE AND TOWARD SILTATION PONDS. SIDE CASTING SHALL BE AVOIDED.
5. THE TOPSOIL AND OVERBURDEN MOUNDS SHALL BE PROTECTED FROM EROSION BY STRAW COVERING AND HYDROMULCHING PRIOR TO OCTOBER 1.
6. DISTURBED AREAS SHALL BE PROTECTED FROM EROSION BY USE OF SILT FENCES, HAY BALES, HYDROMULCHING AND OTHER APPROPRIATE METHODS AS OUTLINED IN "BEST MANAGEMENT PRACTICES" FOR EROSION CONTROL.

KEY

LEGEND



HYDROSEEDED AREA



PROJECT SITE BOUNDARY

SOURCE: CSW/Stuber-Stroeh Engineering Group, Inc.

Roblar Road Quarry Farmland Conversion Study . 204334

Figure 17
Quarry Reclamation Plan

CHAPTER VI

Farmland Conversion Impacts

A. Land Evaluation and Site Assessment Model (LESA) Analysis and Findings

In 1993, Senate Bill 850 (Chapter 812/1993) directed the California Resources Agency “to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process (PRC Section 21095).” As a result, the DOC developed the California Land Evaluation and Site Assessment Model (LESA) as a point-based approach for rating the relative value of agricultural lands.

The LESA model has been used to assist in evaluating the impact of a project’s future impacts on agriculture. The LESA model measures two basic sets of factors: (1) Land Evaluation factors that measure the inherent soil-based qualities of land as they relate to agricultural sustainability; and (2) Site Assessment factors which consider social, economic and geographic attributes which contribute to the societal value of agricultural land. The site assessment also considers the land use of nearby properties within the project site’s zone of influence. Appendix C presents the analysis worksheet tables and LESA analysis findings for conversion of the Roblar Road property to quarry use. The approach used for the analysis of the proposed project conforms to the methodological guidance provided in the California Agricultural Land Evaluation and Site Assessment Model Instruction Manual (Department of Conservation, 1997). DOC staff were also consulted as needed for additional direction on use of the model. Factor scores were calculated (each with a possible maximum score of 100) and then weighted and combined to derive the Final LESA score determining the potential significance of the proposed agricultural conversion.

At the request of DOC, the LESA model was run solely for the Roblar Road project site (and not the proposed Lakeville Road easement exchange site), since the LESA model is not intended for quantitatively comparing the merits of farmland being lost as a result of a project to those of farmland being preserved as a result of an easement exchange.

However, at the request of the DOC, LESA models for two different-sized study areas for the Roblar Road project site were developed, and results presented herein: Scenario 1 - the entire 199-acre Roblar Road project site (herein referred to as the full project site), and Scenario 2 - the portion of the Roblar Road project site (70 acres) that would be used for the proposed quarry, and the corresponding area proposed to be removed from Williamson Act protection (herein referred to as the affected area of site).

LESA Model Scenario 1: Full Project Site

Table C-1 in Appendix C shows the calculations for the Land evaluation worksheet and Site evaluation worksheet 1 for the full project site. The project site's Land Capability Classification factor score was estimated to be 37.8 and its Storie Index factor score was 39.1. Together the project's Land Evaluation weighted factor subscore for the full project site was 19.2.

In the Site Assessment analysis, the full project site attained a Project Size factor score of 60 and a Water Resource Availability factor score of 25 (see Appendix Table C-2). The high proportion of nearby protected agricultural lands resulted in a maximum Surrounding Agricultural Land factor score of 100 and Surrounding Protected Resource Land factor score of 95 (see Appendix Table C-3). Together the project's Site Assessment weighted factor subscore was 32.5.

Appendix Table C-4 summarizes the LESA analysis's findings and estimates the project's Final LESA score as 51.7. However, since the Land Evaluation subscore is below the 20 point scoring threshold, the LESA model indicates project's agricultural conversion when considering the entire site is not considered significant.

LESA Model Scenario 2: Affected Area of Project Site

Appendix Table C-5 shows the calculations for the Land Evaluation worksheet and Site Evaluation worksheet 1 when considering only the portion of the project site that would be affected by the proposed quarry operations. The project's Land Capability Classification factor score was estimated to be 46.6 and its Storie Index factor score was 48.3. Together the project's Land Evaluation weighted factor subscore was 23.7. The higher score for the impacted area (when compared with the entire project site) reflects the higher proportion of shallower sloped (9%-15%), Steinbeck Loam soils (SnD2) within the impacted area. These soils are Class IV land under the NRCS Land Classification System (qualifying as Grazing land), and carry a higher class than some other soils (e.g., Los Osos clay) and/or steeper sloped areas of the project site.

In the Site Assessment analysis, the project scored low in its Project Size with a factor score of 20 (reflecting the reduced project area being considered). The affected area's Water Resource Availability factor score (see Appendix Table C-6), Surrounding Agricultural Land factor and Surrounding Protected Resource Land factor scores (see Appendix Table C-7) are unchanged from those for the project site as a whole. Together the project's Site Assessment weighted factor subscore was 26.5.

Appendix Table C-8 summarizes the LESA analysis's findings and estimates the project's Final LESA score as 50.2. Since both the Land Evaluation and Site Assessment weighted factor

subscores were greater than the 20 scoring thresholds, the LESA model indicates the project's agricultural conversion is considered potentially significant under the affected area scenario.

LESA Model Conclusions

The LESA analyses estimate the level of the agricultural conversion impact for the full project site, and the smaller affected area of project site, by total LESA scores of 51.7 and 50.2 respectively. In both cases, the overall total LESA scores are relatively low – each are about half of the maximum potential point score of 100 and closer to the minimum potential significance threshold of 40 (which only applies if both the Land Evaluation and Site Assessment weighted factor subscores are greater than 20 points). Although the affected area of site's overall LESA score is less than that for the full project site, the affected area contained a proportion of higher class soil characteristics than the project site as a whole, which raised the score above the 20 point minimum significance threshold.

While the LESA model is rarely used as a comparative methodology for quantifying agricultural conversion impacts, the magnitude of the LESA score does provide insight as to the type of easement exchange that might be most applicable for reducing the proposed project's impact.

B. Lost Farmland Acreage

During the 20 year mining period, the proposed quarry operations at the Roblar Road project site would directly disturb 70 acres of the approximate 199-acre property, and temporarily remove that land from dryland grazing use. As discussed in the Project Description, above, the quarry site and related infrastructure is proposed to be adequately fenced to allow dryland grazing to continue on the site's other remaining approximate 129 acres, which would remain under Williamson Act protection.

As proposed quarrying would proceed, areas directly disturbed by quarrying operations would be incrementally reclaimed. Following the 20-year mining period, the quarry site would go through final reclamation. Nevertheless, the applicant estimates that following final reclamation, up to 40 percent of the 70-acre affected area (or approximately 28 acres) could potentially be permanently lost from future productive rangeland use.

The great majority (approximately 27 acres) of the potential permanently lost 28 acres is designated by the DOC FMMP farmland classification system as "grazing land." Only a small proportion (approximately one acre) of the potential permanently lost acreage would include farmland qualifying as "farmland of local importance" under DOC's FMMP. Implementation of the proposed project would not result in the loss of any areas of Prime farmland, Unique farmland or Farmland of Statewide Importance, as none exists on-site. Consequently, the potential permanent loss of agricultural land on the project site would not meet the CEQA significance thresholds as established in CEQA *Guidelines*, Appendix G.

As a proportion of Sonoma County's 421,126 acres of grazing land, the interim loss of 70 acres of dryland grazing associated with the project would represent less than a 0.017% decrease in the

County's rangeland. The potential permanent loss of up to 28 acres of rangeland would represent an even smaller 0.006 % decrease to Sonoma County rangeland resources.

As part of the project's easement exchange process, the applicant would establish a permanent agricultural conservation for the 244 acre easement exchange property. The easement exchange site, currently used for dryland oat hay farming, is classified by DOC's FMMP as "farmland of local importance," recognizing it's comparatively higher importance for agricultural production than to that at Roblar Road project site. As identified in Table 4, within Sonoma County, grazing land accounts for approximately 72% of the County's total agricultural lands, and is far more prevalent than "farmland of local importance," which at 74,851 acres accounts for an approximately 13% of total agricultural lands in the County. The proposed establishment of an agricultural conservation easement for the Lakeville Road easement exchange site would ensure that 244 acres would permanently remain in farming use. This would thereby protect approximately 0.33 % of Sonoma County's current "farmland of local importance" from potential future non-agricultural development.

The total Williamson Act land base in Sonoma County is 272,272 acres (DCS, 2006). The proposed project would remove 70 acres of non-prime farmland from Sonoma County's current protected farmland base, which would represent a 0.03% decrease in the County's total protected farmland base. Given that the exchange property would result in a permanent agricultural easement for 244 acres of previously unprotected hay croplands, the project would result in a net increase of at least 174 acres for the interim period of the quarry operation – nearly a 0.06% increase in protected farmland. If the useable reclaimed areas of the project site (estimated at approximately 42 acres) were to be placed under agricultural protection following reclamation, the net increase in protected lands could be as much as 216 acres, which would represent an approximate 0.08% increase in the total protected farmland in Sonoma County.

As discussed in more detail later in the proposed exchange property's suitability analysis, approximately 3.5 acres of permanent conservation protection would be gained for each acre of the interim lost Williamson Act production at Roblar Road (ratio of 3.5:1). Furthermore, following site reclamation of the quarry after its 20 year period of operation, the potential maximum net permanent grazing land loss would represent a ratio of approximately 8.7:1 of protected farmland for each acre of grazing land lost.

Furthermore, the greater proportional benefit of the proposed protection of Sonoma's scarcer farmland of local importance (compared to the lesser proportion of land lost from the County's far greater grazing land resources) also suggests that the exchange would likely represent a net benefit for its agricultural land resources and its agricultural sector.

C. Project Effect on Livestock Production on Roblar Road Site

Lost Livestock Production at Roblar Road Project Site

As discussed in the Chapter III, the Roblar Road project site currently provides grazing for up to an equivalent of 360 animal unit months (AUM), and local livestock operators frequently use supplemental feed during several months of the winter. As a result, the actual size of herd that might be raised on the Roblar Road project site could vary. If supplemental feeding/grazing land were to be used for four months of the year, then the site might be expected to be adequate for approximately 45 head of cattle.

Except for the reduced acreage, future livestock grazing and production would be expected to continue largely unaffected by the proposed quarry operations. The quarry would be fenced adequately to separate the livestock from the quarry operations and adequate water supplies would be maintained for the cattle.

Given the mostly comparable grazing land quality within the project site, then as a conservative estimate of the likely impact of the interim lost grazing land use would be the displacement of up to 16 head of cattle from the approximately 127 AUM of forage capacity at the site. The maximum permanent lost cattle production associated with a potential permanent loss of 28 acres of grazing land would be approximately 6.3 cattle and nearly 51 AUM.

Estimated Value of Lost Livestock Production at Roblar Road Project Site

During the five year period between 2000 and 2004, based on analysis of past Sonoma County crop production statistics on past yields and agricultural sales, it is estimated that an average of approximately 34,600 head of livestock were raised annually within Sonoma County. The average weight per head of these livestock was 5.27 cwt (hundredweight) with an estimated average price of \$75.39 per cwt (in 2006 dollars). The average value per head for cattle raised in Sonoma County was \$397.31 (in 2006 dollars).

The estimated annual value of the projected “interim” lost livestock production of 16 head of cattle during the future quarry operations is approximately \$6,360 (in 2006 dollars). Following the 20-year mining period and site reclamation, the projected value of the annual livestock production that would be permanently lost from future livestock production at the Roblar Road project site is estimated to be approximately \$2,500 (in 2006 dollars).

According to local livestock experts, the reduced herd size that could be kept on the Roblar Road property’s remaining grazing acreage would still likely be viable for a livestock operator (Linley, 2005). Furthermore, the estimated interim or permanent annual losses would not be sufficient to result an employment impact of a full lost job.

D. Project Effects on Agricultural Production of Lands Adjoining Roblar Road Site

The proposed project, particularly as mitigated, would not be expected to have any significant direct effects on the adjoining properties agricultural land or local farmers' livestock raising activities.

The relatively small size of the agricultural production loss on the project site (interim loss of 70 acres of grazing lands and the potential permanent loss of 28 acres) are not be expected to have any discernable adverse impact on the viability of other local agricultural producers. Other local livestock producers' grazing lands and livestock herds are not expected to be physically impacted by the quarry operations to an extent that would reduce their farming productivity.³ As a result, the proposed mining activities would not result in any significant off-site impacts to adjacent agricultural lands or their operations. As a result, the Williamson Act recission would not be likely to result in the removal of adjacent lands or other farmland in the area from agricultural use.

DOC has expressed concern of the WAEEP regarding Williamson Act cancellations resulting "in discontinuous patterns of development for cancellation parcel(s) that: (1) are contiguous to existing urban development; or (2) have intervening parcels between the parcels to be cancelled and existing development or that are otherwise discontinuous" (see Appendix A-3 in this study). While the project site would result in non-agricultural equipment and structures (e.g., mobile processing plant, office) at the project site during the 20-year period that mining would occur, those facilities would be removed following final reclamation. Since the project would not add any long-term urban development at the site nor affect the future agricultural use of the neighboring farms, the proposed Williamson Act cancellation would therefore not result in discontinuous patterns of development around the project site.

Relatedly, DOC is also concerned under the WAEEP that "development of the contracted land would provide more contiguous pattern of urban development than development of proximate noncontracted lands" (see Appendix A-3 in this study). Since the project's proposed post use is for non-urban development, the project would be expected to have no impact on the pattern of nearby urban development. Furthermore, due to the highly localized nature of the potential mineral resources as specified in the ARM Plan, development of proximate noncontracted lands to achieve the project's objectives is not feasible and therefore does not offer an alternative site for comparison of the project's impacts on local urban development.

³ This is an initial assessment limited to effects on the agricultural sector. Fuller assessment of the project's potential environmental impact will be evaluated in the project's EIR.

E. Estimated Value of Hay Production at the Lakeville Road Easement Exchange Site

As discussed in the Chapter III, the Lakeville Road easement exchange site typically yields at least 580 tons of oat hay annually although during very good years, and yields of up to 1,000 tons from the property have been achieved (Kullberg, 2006). The reported typical yields are comparable to Sonoma County averages for oat hay production which had an estimated average yield of 2.62 ton per acre (Sonoma County, 2004). Mr. Kullberg reported that hay prices vary from approximately \$85 per ton for the lower quality livestock forage to as much as \$110 per ton for his best quality hay (which is typically sold to local horse owners). Although the reported hay prices for better quality hay are high, these prices are comparable to the average oat hay price in Sonoma County reported for 2000 to 2004 was \$92.30 per ton (in 2006 dollar terms). Conservatively using Sonoma County average hay prices, the easement exchange property is estimated to generate on average approximately \$53,500 a year in hay sales.

The easement exchange site's annual hay sales therefore represents more than 8.4 times the estimate value of the interim lost livestock sales at the Roblar Road project site, and more than 21 times than that of the maximum potential permanently lost grazing lands at the Roblar Road project site.⁴

In addition to the direct economic benefit to Sonoma County's economy from its farming income, the easement exchange property's hay production has additional indirect economic benefits to the County's agricultural sector. Most local livestock operators need hay for supplemental feed for their cattle especially during winter months and therefore rely on affordable local hay supplies to maintain their herd. Supplemental feed is also needed to "bulk up" their livestock before they are sold. As discussed in the existing conditions analysis, the exchange property's total hay production would be expected to provide 1,450 AUMs of supplemental hay feed per year for local livestock producers. This represents enough feed for approximately 120 animal units. In terms of the value of their final sales, at \$397.31 per head, the easement exchange site's hay production would have indirectly assisted in generating over an estimated \$47,600 in livestock sales (note other costs and factors would be associated in generating these sales, and therefore, not all of this income benefit may be solely attributable to the hay production).

This indirect contribution to local livestock producers of the easement exchange site's hay production provides appreciable benefit and support to Sonoma County's agricultural sector's viability. Based on the greater value of the of the easement exchange property's hay production compared to the Roblar Road project site's lost grazing acreage's potential livestock earnings, the easement exchange property provides comparatively greater benefits to the local agricultural sector.⁵

⁴ While the establishment of an agricultural conservation easement on the site may not necessarily offset an immediate threatened loss of the property's agricultural use, the comparison demonstrates the easement exchange site's significant direct economic contribution to Sonoma County agricultural economy.

⁵ However, quantifying the proportion of the net value associated with establishing the permanent agricultural easement on the property is beyond the scope of this report.

F. Estimated Value of the Proposed Roblar Road Quarry

The income and employment benefits to Sonoma County from the proposed quarry project should also be recognized to identify the proposed project's full direct economic impact on Sonoma County's economy. The proposed Roblar quarry operations would mine approximately 570,000 cubic yards of quarry material, including aggregate road base, subbase, drain rock, quarry fines, fill material, riprap and possibly concrete aggregate. Such operations would generate considerable revenue in annual quarry material sales.

The quarry would also be expected to employ approximately eight to ten people full time during the heavy construction season. During the winter season, employment at the quarry would be expected to drop to four to six people. In addition, approximately two administrative staff would also be expected to be employed by the quarry operations although they would likely work off-site elsewhere in the Sonoma County. Therefore, the proposed project would contribute at least 6 to 8 jobs year round. Since the lost grazing area is not expected to be sufficiently great to result in a lost livestock operator job, these additional jobs could represent a net project related benefit to Sonoma County (depending on the no project alternative and related impacts). If Sonoma County's future aggregate needs would otherwise be met by aggregate imported from outside Sonoma County, then any associated quarry sales and employment benefits would instead be expected to be gained by another County economy.

Overall, based on the above analysis, it may be concluded that the public benefit to Sonoma County residents from both the proposed project's direct and indirect benefits in providing: (1) needed additional aggregate supplies, and (2) additional permanent conservation of the easement exchange future agricultural production, would outweigh the agricultural use loss of grazing lands on the Roblar Road project site.

G. Requirements for Williamson Act Easement Exchanges

Since January 1998, Williamson Act easement exchange legislation has established a voluntary rescission process by which Williamson Act contracts can under limited and special circumstances be cancelled while simultaneously dedicating a permanent agricultural conservation easement on another property. Detailed information on the Williamson Act Easement Exchange Program's process and requirements are attached in Appendix A in this study. However, the WAEEP's key components and issues are briefly discussed below.

Approval of the Williamson Act Easement Exchange requires establishment of a conservation easement in perpetuity to ensure the land will remain permanently in agricultural use. By transferring the property's future development rights to a suitable land trust or conservation agency, the current landowners (and any future landowners) must use the property for sustained and commercially viable agricultural production.

The eligibility criteria required for the proposed easement exchange are defined in PRC Section 10251, which states:

Applicants for an agricultural conservation easement or fee acquisition grant shall meet all of the following eligibility criteria:

- (a) The parcel proposed for conservation is expected to continue to be used for, and is large enough to sustain, commercial agricultural production. The land is also in an area that possesses the necessary market, infrastructure, and agricultural support services, and the surrounding parcel sizes and land uses will support long-term commercial agricultural production.
- (b) The applicable city or county has a general plan that demonstrates a long-term commitment to agricultural land conservation. This commitment shall be reflected in the goals, objectives, policies, and implementation measures of the plan, as they relate to the area of the county or city where the easement acquisition is proposed.
- (c) Without conservation, the land proposed for protection is likely to be converted to nonagricultural use in the foreseeable future.

According to DOC, documentation will also be required to verify that the proposed easement is evaluated pursuant to the selection criteria set forth in Public Resources Code section 10252, particularly subdivision (a), (c), (e), (f) and (h). These regulations further specify selection criteria and evaluation considerations (including site evaluation factors and local government land conservation policies and programs) and adequate land stewardship provisions required for the proposed easement exchange site.

DOC requires that the easement value of the mitigating easement parcel must be equal or greater than the Williamsons Act's cancellation fee. In addition, the easement exchange parcel must be of equal size or larger than the cancelled Williamson Act contract property.

As part of the WAEEP process, a qualified organization must agree to hold, monitor and enforce the conservation easement. To qualify to hold the conservation easement, the governmental or non-profit entities must have the "experience, financial and personnel capability to draft, hold, monitor and enforce conservation easements" as well as show the commitment to administer, monitor, enforce the easement to ensure effective future compliance by the landowner. Furthermore, to be easement holder under WAEEP, a non-profit corporation primary purpose must be land preservation. Appropriate organizations for the proposed Lakeville Road easement exchange property primarily include the Sonoma County Agricultural Preservation and Open Space District and the Sonoma Land Trust.

To cancel the existing Williamson Act contract, the local governing body (e.g. Board of Supervisors) must make specified findings and formally approve the proposed easement exchange. However, these findings and the resolution of approval must be reviewed and approved by the Director of the Department of Conservation. Once approved, landowner and local governing body can enter into an agreement to rescind the existing Williamson Act contract and thereby establish the easement exchange.

Since its establishment, very few easement exchanges have been completed under the WAEEP. As of 2005, only three Williamson Act easement exchanges have been completed which rescinded 494 acres of farmland in exchange for placement of agricultural easement exchanges on 579 acres (DOC, 2004). According to DOC staff, due to the complexities of the easement exchange process, as well as the unique characteristics and circumstances of each specific project, little information, precedent or other guidance from previous easement exchanges are applicable to proposed easement exchange (Gatz, 2006). In addition, the time and compliance requirements required for fulfillment and completion of the WAEEP have discouraged many applicants; in many cases, applicants have chosen instead to cancel their Williamson Act contract and pay the cancellation fees (and associated penalties if applicable).

Despite the lack of precedent projects, and the complexity of program compliance, the applicant is seeking a WAEEP to reduce project-related agricultural impacts of the Roblar Road project. As part of the WAEEP process, appropriate CEQA compliance will be completed as well as the necessary consultations and partnerships with other public agencies (including the California Department of Conservation) and stakeholders (such as the Sonoma County Agricultural Preservation and Open Space District).

Inadequacy of Williamson Act Non-Renewal Process for Fulfilling the Project Objectives

DOC guidelines for the WAEEP process state that non-renewal is the preferred procedure for a landowner under a Williamson Act contract to change the use of the land under contract to uses other than agricultural production and compatible uses. Furthermore, a key WAEEP restriction is that:

“Cancellation and rescission are not permissible when the objectives to be served by cancellation can be accomplished by nonrenewal or if the objectives to be served should have been predicted and served by non-renewal in the past.”

Chapter V in this report presents a description of the proposed project, including project objectives; Appendix D in the EIR provides detailed discussion of aggregate demand, production and supply in Sonoma County. As explained in Chapter V, the Department of Conservation California Geologic Survey (DOC CGS) estimates aggregate demand in Sonoma County will continue to increase over the next 50 years. More importantly, DOC CGS estimates that permitted reserves of high quality aggregate in Sonoma County are running out, particularly in consideration of the planned termination of terrace mining in Sonoma County 2006. Specifically, PCC-grade aggregate reserves in Sonoma County are anticipated to be exhausted by 2008, Class II Base-grade aggregate reserves by 2009, and AC-grade aggregate reserves by 2012. Chapter V also identifies the alternative aggregate supply options including expansion of existing quarries in the County; development of new quarry sources in the County; continuing terrace mining and/or increasing instream mining in the County; restricting sales of aggregate to out-of-county users; and importing aggregate from out-of-county sources. The County estimates that a combination of some of these options will be required to fully accommodate future County demand for construction-grade aggregate.

The Roblar Road site is one of only a limited number of potential new quarry sites in the County ARM Plan that may be expected to be probable to develop and which may add high quality aggregate production. DOC CGS has recently classified the area of the Roblar Road quarry site as containing substantial inferred resources for PCC-, AC- and Class II-Base-grade aggregate are available. Furthermore, the Roblar Road site is currently owned by the quarry applicant and is the only site for new quarry development in the County where a current application for new quarry development has been filed.

Aggregate extraction is defined as a compatible use in the County's Type 2 Williamson Act Regulations. However, recently, the DOC has questioned whether aggregate extraction should be considered an acceptable and compatible use for Type 2 Williamson Act land.

The Williamson Act nonrenewal process would require a ten year wait until the site could come out of contract before quarry development could begin. In which case, if the non-renewal application for the Roblar Road site were filed in 2006, potential quarry production would not be expected until 2017 at the earliest. If nonrenewal had been initiated in 2003 (when the quarry application was filed), potential production from a quarry at the site would not have been possible before 2014 at the earliest. If nonrenewal had been initiated in 2001 (when the applicant purchased the Roblar Road site), potential production from the quarry would not have been possible before 2012 at the earliest.

As a result, the project's objectives (identified above) would not be adequately accomplished by nonrenewal of the site's Williamson Act contract. Accordingly, this supports the application under the WAEEP to partially rescind the existing Williamson Act contract on the Roblar Road site in exchange for the proposed permanent easement exchange at the Lakeville Road site.

The issue of whether non-renewal of the project site's Williamson Act contract could and should have been pursued previously to achieve the project objectives depends on a landowners' specific circumstances. It would have been highly speculative for the former owners of the Roblar Road property to initiate the nonrenewal process for the quarry when they owned the property since: (1) they lacked the necessary expertise and resources to pursue quarry development, and (2) previous efforts to develop the site's mining reserves had been unsuccessful. Additionally, until recently, it appeared the aggregate extraction could have been considered a compatible use under the County's Type 2 Williamson Act regulations.

Since its acquisition of the entire Roblar Ranch property in October 2001, the applicant has pursued the project's objectives for quarry development in a reasonably timely manner. The applicant arranged subdivision of the original site, and subsequently established agricultural easements of the southern Roblar Ranch parcels and sold them to local livestock operators and landowners. Since filing its original application for a Mining Permit and Reclamation Plan with Sonoma County in late 2003 and following subsequent consultation with the County and DOC, the applicant has sought to comply with the WAEEP process. As discussed previously, nonrenewal would have also postponed development of the quarry facilities until after Sonoma County's need for high quality aggregate would already be realized (particularly PCC- and Class-II Base-grade materials).

Easement Exchange Property Suitability Analysis

As discussed previously in the discussion of the Requirements for the Williamson Act Easement Exchange above, the proposed easement exchange property must meet several criteria, conditions and standards for adequacy. As shown in the Williamson Act Easement Exchange Application requirements and procedure information presented in Appendix A-3 in this study, application for the project's William Act Easement Exchange would require extensive additional documentation and procedural compliance.

This Farmland Conversion study's analyses and findings are intended to provide a preliminary evaluation of the proposed easement to determine its adequacy in meeting the DOC requirements. Fulfillment of the WAEEP's agricultural capability requirements (i.e., subsection (a) in the Requirements section) are evidenced by the easement exchange property's longstanding agricultural production history discussed earlier. The project's consistency with local planning requirements (i.e., subsection (b) in the Requirements section) was discussed earlier in the previous section on relevant Sonoma County Land Use Goals and Policies. Other site suitability issues including the development pressure on the easement exchange site are discussed and analyzed below.

Conservation Value

Local stakeholders and land trust organization representatives were interviewed about the proposed project to gather key informant opinions on the suitability and key issues associated with the Lakeville Road property as a suitable easement exchange property in the proposed Williams Act Easement Exchange. Most of the stakeholders and land trust representatives identified the Lakeville Road easement exchange site's proximity as beneficial to the on-going agricultural and environmental conservation efforts in the Baylands area. The easement exchange site's proximity to the Sonoma Land Trust's nearly 1,500 acres of easement properties and Sonoma's Baylands makes its highly desirable as an agricultural easement property. The value of the site's environmental connectivity benefits and the enhancement of the area's other ongoing restoration and environmental protection efforts establish its environmental benefits as an easement. The stakeholders interviewed generally agreed that protection of the Lakeville Road site from future development in and of itself offered valuable conservation benefits for both the region's agriculture sector and environmental resources. Furthermore, the property's current benefits and potential contribution is enhanced as part of the area's extensive (and likely to expand) agricultural and environmental conservation efforts (Brosnan, 2005; Crawford, 2005).

Representatives interviewed from both Sonoma Land Trust and Sonoma County Agricultural Preservation and Open Space District expressed possible and qualified interest in holding a future agricultural conservation easement for the Lakeville Road site. While their opinions are preliminary and would necessarily require considerable future due diligence, planning and contractual negotiations, as well as Board approval, both agreed that the site appeared to have considerable easement value (Brosnan, 2005; Bonos, D). However, these representatives also expressed that funding and organizational sustainability are critical issues facing land trusts throughout California and so would be important issues for any future land stewardship

arrangements for the property. The Sonoma Land Trust also suggested that land ownership would best remain with the project applicant for tax reasons which might therefore allow the land trust to use from the farming lease to offset future land stewardship costs (Brosnan, 2005).

As discussed in the analysis of the easement exchange site's past and current agricultural use, the easement exchange site generally has comparable quality land as the Roblar Road project site. Furthermore, as an easement exchange for the proposed lost Williamson Act acreage, the applicant is providing 244 acres of agricultural land for the estimated 70 acres of temporarily lost Williamson Act livestock production – a ratio of approximately 3.5 acres of permanent conservation protection for each acre of the interim lost Williamson Act production at Roblar Road. Furthermore, following site reclamation of the quarry after its 20 year period of operation, the net permanent lost of Williamson Act agricultural land would be at most 28 acres which would represent an approximately 8.7:1 ratio for the project.

The easement exchange site is well suited for dryland hay production. Hay is an important source of supplemental feed for cattle especially during the winter season when most livestock operators corral their herds. As a result, the hay production at the easement exchange site supports livestock operations at other farms in the region.

As part of the proposed William Act Exchange, a permanent agricultural easement would be established on the easement exchange property. This would ensure the long term preservation of agricultural use at the Lakeville easement exchange property unlike the current Williamson Act preservation for the Roblar Road site which is non-permanent. Land owners can choose non-renewal of their Williamson contract which may enable future site development after their remaining 10 year contract term expires. The greater permanency of the agricultural easement represents an additional resource conservation benefit associated with the proposed Williamson Act Easement Exchange.

Site Development Pressure

The development threat to the Lakeville Road easement exchange property has decreased following Sonoma Land Trust's conservation easement creation of the adjacent 528-acre Lower Ranch, purchase of the nearby 472-acre North Parcel/Leonard Ranch properties, and recent purchase of the 2,327-acre North Point Joint Venture and Dickson Ranch properties and subsequent establishment of Sears Point Restoration Project. (The Federated Indians of Graton Rancheria and developer Station Casinos, Inc., had previously proposed development of a large casino facility on portions of the North Point Joint Venture property, but following extensive protest from the County, local environmental groups and the general public, the tribe donated its purchase options to the Sonoma Land Trust.)

Although mostly surrounded by protected lands, the Lakeville Road easement exchange property would be expected to continue to have road access. While the site's low elevation would require additional infrastructure improvements for any future site development, the recently renewed interest in the proposed development of ferry service at the nearby Port Sonoma could attract future development to easement exchange property. The Port Sonoma property is located south of

the easement exchange property between Highway 37 and the Northwestern Pacific Railroad. The owners of Port Sonoma have recently formed a ferry service venture (North Bay Ferry Service) to operate a ferry service from Port Sonoma to other Bay Area locations. The company is actively pursuing efforts to establish ferry service and as part of the 2005 Federal Transportation and Highway Bill has obtained \$20 million in earmarked federal funding for planning and equipment. While ferry service operating at Port Sonoma could potentially be linked by rail service to Novato it would have to operate as a branch route to primary service line between Cloverdale and Larkspur. The Sonoma-Marín Area Rail Transit District currently has no plans to include service to Port Sonoma in its future rail service development planning.

Although development of ferry service at Port Sonoma would require major environmental review and approval (including permits from, but not limited to, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service and Bay Conservation and Development Commission), North Bay Ferry Service has begun planning and the San Francisco Bay Area Water Transit Authority is performing wake wash studies in the area (Argus Courier, 2004). If successful, future development of the Port Sonoma could add substantial development interest and options to the easement exchange site.

Future development pressure on the site may also exist from future residential ranchette development. Throughout many parts of California (and especially those areas close to major urban areas), farmlands increasingly face development pressure from ranchette developments where landowners purchase farm properties as sites to rebuild new large residential homes. Depending on the local zoning and planning ordinances, ranchette developments can lead to subdivision of larger agricultural properties into minimum required parcels. Not only are these smaller farm parcels generally less economical to operate, the associated land price increase can contribute to the economic pressure on local farming in general. While the new owners could conform to existing zoning requirements for minimum parcel sizes, the subsequent farming of the property is rarely performed by the new owners. Instead, any farming will be done by land leasees and becomes a secondary land use for the property. In some cases, farming of the property decreases by wealthy landowners wishing to minimize the intrusion of the farm operations or are unwilling to add the additional investment necessary to maintain or develop their land's farm use potential. Another frequent result of ranchette development is increased opposition to local farming practices by new residents wishing to minimize and regulate local farming operations for example, limiting hours of operation during harvesting periods and fertilizer applications due to noise or air quality objections.

The easement exchange property could be subject to potential future ranchette interest due to its unique coastal/riverside location, proximity to the Novato and the rest of the Bay Area, as well as the land development limitations on the surrounding parcels which may make the site even more attractive to land owners.

Land Value Comparison of the Project and Easement Exchange Sites

As part of the Williamson Act Easement Exchange process, an independent Appraisal Report will need to be completed for the two properties in conformance with the Uniform Standards of Professional Appraisal Practice (USPAP) to verify that the exchange property is of equal or

greater value than the cancellation fee required to cancel the Williamson Act contract (as per Government Code section 51256(d)).

While that Appraisal Report will determine the current fair market values for the two properties, since both properties have been recently sold, the properties' current assessed values can also provide information for comparing their relative land values. The assessed value of the entire Roblar Road project site when it was transferred in 2004 was \$731,880 which adjusted into 2006 dollar terms would be approximately \$776,300 (and not including any land value appreciation adjustments). In which case, proportionally, the land value for the 70-acre impacted area would be approximately \$273,000 (not including any adjustments for the buildings or other land improvements).

The Williamson Act contract cancellation fee is computed at 12.5 percent of the property's cancellation value. The property's cancellation valuation is the current fair market value of the property as though it were free of contractual restrictions (such the Williamson Act restrictions). Therefore, the cancellation fee for the project site would be approximately \$41,000.

In comparison, the Lakeville Road easement exchange property sold for approximately \$1.5 million in November 2005 which would be equivalent to approximately \$1.545 million in 2006 dollar terms – an assessed value more than 5.6 times that of the project site and 37 times the estimated Williamson Act cancellation fee. Even adjusting for the difference in the property sizes, the easement exchange assessed value per acre is approximately 61% higher than the project site.

CHAPTER VII

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APPENDIX A

Correspondence and Supplemental Information from Department of Conservation

**Appendix A-1: Department of Conservation Response to Notice
of Preparation (October 21, 2004)**

**Appendix A-2: Supplemental Information Provided by
Department of Conservation (September 21,
2005)**

**Appendix A-3: Supplemental Information Provided by
Department of Conservation (January 18, 2006)**

Appendix A-1: Department of Conservation Response to Notice of Preparation (October 21, 2004)



DEPARTMENT OF CONSERVATION
STATE OF CALIFORNIA

October 21, 2004

DIVISION OF
LAND RESOURCE
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VIA FACSIMILE (707) 565-8343

Mr. Mike Sotak
Sonoma County
Permit and Resources Management Department
2550 Ventura Avenue
Santa Rosa, CA 95403

Subject: Roblar Road Quarry Project Notice of Preparation (NOP) for a
Draft Environmental Impact Report (DEIR) - SCH# 2004092099,
Sonoma County

Dear Mr. Sotak:

The Department of Conservation's (Department) Division of Land Resource Protection (Division) has reviewed the NOP for the referenced project. 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 project's impacts on agricultural land and resources.

Project Description

The project is an application for a hard rock quarry by Northbay Construction that will disturb approximately 70 acres of a 148.74-acre parcel of nonprime grazing land enforceably restricted by Williamson Act contract (APN 027-080-007). The mining period is 20 years. The project site is located adjacent to Roblar Road near its intersection with Valley Ford Road, northwest of Petaluma and five miles west of Cotati, in southern Sonoma County (County).

The mining will be conducted in three phases of five, five and ten years. A crushing plant will be moved about in the Phase 1 area and then permanently located in the center of the area at the end of Phase 1. Slopes will be reclaimed during each phase and will be no steeper than 1.5:1 with benches at vertical intervals not more than 30 feet. The benches will be hydro-seeded and planted with trees and shrubs. Grading of the quarry floor (16 acres), which will be hydro-seeded, will drain toward a settlement pond.

Agricultural Setting of the Project

The DEIR should describe the project setting in terms of the current and historical agricultural use of the land. The Division's Important Farmland Map for Sonoma County should be utilized to identify agricultural land within the project site and in the surrounding area that may be impacted. Acreages for each land use designation should be identified for both areas. Likewise, the County's Williamson Act Map should be utilized to identify potentially impacted Williamson Act land and whether it is prime or nonprime agricultural land according to definition in Government Code §51201(c).

Williamson Act Lands

Mining on contracted land is generally considered an incompatible use and not allowed pursuant to Government Code §51238.1. However, a Board of Supervisors may approve mineral extraction as a compatible use under Government Code §51238.2 if it can document that the underlying commitment to preserve agricultural land will not be significantly impaired. Conditions imposed must include compliance with reclamation standards to return the land to prime agricultural land or other agricultural land pursuant to California Code of Regulations section 3707 or 3708. No exception to these standards may be permitted.

The conversion of 70 acres of nonprime contracted land for 20 years does not appear to meet the test of compatibility under sections 51238.1 or 51238.2. The crushing plant is not mineral extraction and is not provided as a conditional exception under Government Code §51238.2. Although the NOP states that the applicant does not propose to change the use of the property, reclamation does not appear to comply with Government Code §51238.2. Grazing on a slope of 1.5:1 and on benches planted in trees and shrubs does not appear feasible. In addition, the width of the benches and access to them may limit the feasibility of grazing. And finally, a sediment pond does not appear to comply with reclamation standards under Government Code §51238.2.

Without changes in reclamation, it appears that the appropriate action for the County is to not permit mining operations on the property until the contract for the land involved is terminated through nonrenewal, cancellation or easement exchange. If reclamation concurrent with the described phases were to comply with Government Code §51238.2, it may be necessary to cancel or nonrenew the contract for only that portion of land involved with the crushing plant (i.e., Phase 1 area). The Department requests that the County respond in the DEIR as to how the project will comply with the compatible use provisions of the Williamson Act.

Project Impacts on Agricultural Land

The Department recommends that the DEIR evaluate the project's impacts on agricultural land, including the temporary or permanent conversion of farmland and conflicts with or termination of a Williamson Act contract. The conversion of Prime Farmland, Unique Farmland or Farmland of Statewide Importance and the termination of a Williamson Act contract are considered potentially significant adverse impacts.

Impacts on agricultural resources may also be quantified and qualified by use of established thresholds of significance (CEQA Guidelines §15064.7). The Division has developed a California version of the USDA Land Evaluation and Site Assessment (LESA) Model, a semi-quantitative rating system for establishing the environmental significance of project-specific impacts on farmland. The model may also be used to rate the relative value of alternative project sites. The LESA Model is recommended by CEQA and is available from the Division at the contact listed below.

Mitigation Measures

The Department encourages the use of agricultural conservation easements on land of at least equal quality and size as partial compensation for the direct loss of agricultural land. If a Williamson Act contract is terminated, or if growth inducing or cumulative agricultural impacts are involved, we recommend that this ratio be increased. We highlight this measure because of its acceptance and use by lead agencies as mitigation under CEQA. It follows a rationale similar to that of wildlife habitat mitigation. The loss of agricultural land represents a permanent reduction in the State's agricultural land resources. Agricultural conservation easements will protect a portion of those remaining resources and lessen project impacts in accordance with CEQA Guideline §15370.

Mitigation using agricultural conservation easements can be implemented by at least two alternative approaches: the outright purchase of easements or the donation of mitigation fees to a local, regional or statewide organization or agency whose purpose includes the acquisition and stewardship of agricultural conservation easements. The conversion of agricultural land should be deemed an impact of at least regional significance, and the search for replacement lands conducted regionally or statewide, and not limited strictly to lands within the project's surrounding area.

Other forms of mitigation may be appropriate for this project, including the following:

- Protecting farmland in the project area or elsewhere in the County through the use of less than permanent long-term restrictions on use such as 20-year Farmland Security Zone contracts (Government Code §51296 et seq.) or 10-year Williamson Act contracts (Government Code §51200 et seq.).

Mr. Mike Sotak
October 21, 2004
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- Directing a mitigation fee to invest in supporting the commercial viability of the remaining agricultural land in the project area, County or region through a mitigation bank that invests in agricultural infrastructure, water supplies, marketing, etc.

Thank you for the opportunity to comment on this NOP. The Department looks forward to receiving your response and a copy of the DEIR. If you have questions on our comments or require technical assistance or information on agricultural land conservation, please contact Bob Blanford at 801 K Street, MS 18-01, Sacramento, California 95814; or, phone (916) 327-2145.

Sincerely,



Dennis J. O'Bryant
Acting Assistant Director

cc: Scott Morgan, Project Analyst
State Clearinghouse

Southern Sonoma County Resource Conservation District
1300 Redwood Way, Suite 170
Petaluma, CA 94954

Appendix A-2: Supplemental Information Provided by Department of Conservation (September 21, 2005)

Agricultural Setting of the Project

The Draft Environmental Impact Report (DEIR) should describe the project setting in terms of the actual and potential agricultural productivity of the land. The Division's Important Farmland Map for Madera County should be utilized to identify project land and surrounding land that may be impacted. Acreages for each land use designation should be identified. In addition, we recommend including the following items of information to characterize the agricultural land resource setting of the project.

- Current and past agricultural use of the project area. Include data on the types of crops grown, crop yields and farm gate sales values.

Project Impacts on Agricultural Land

The Department recommends that the following be included in the DEIR.

- Type, amount, and location of farmland lost to project implementation. The conversion of Prime Farmland, Unique Farmland or Farmland of Statewide Importance is considered a potentially significant adverse impact. In addition the termination of Williamson Act contracts is considered a significant impact.
- Impacts resulting indirectly from project implementation, including growth-inducing impacts to adjacent agricultural and Williamson Act contracted lands.
- Impacts on current and future agricultural operations; e.g., water availability, traffic and population increases, land-use conflicts, increases in land values and taxes, vandalism, etc.
- Incremental project impacts leading to cumulatively considerable impacts on agricultural land. These impacts would include impacts from the proposed project as well as impacts from past, current and probable future projects. The Division's farmland conversion tables may provide useful historical data.
- Impacts on agricultural resources may also be quantified and qualified by use of established thresholds of significance (CEQA Guidelines §15064.7). The Division has developed a California version of the USDA Land Evaluation and Site Assessment (LESA) Model, a semi-quantitative rating system for establishing the environmental significance of project-specific impacts on farmland. The model may also be used to rate the relative value of alternative project sites.

Williamson Act Lands

The Department recommends that the DEIR include a map detailing the location of agricultural preserves and contracted land within the project site and surrounding area. The DEIR should also tabulate the number of Williamson Act acres according to its designation as prime or non-prime agricultural land according to Government Code §51201(c)).

We also recommend that the DEIR include a discussion of Williamson Act contracts that may be terminated in order to accommodate the project

Williamson Act Easement Exchange Program (WAEPP)

Government Code §§51256 and 51256.1 provide that a landowner and a city or county may enter into an agreement to rescind a contract in accordance with the contract cancellation provisions of §51282 in order to simultaneously place other land within the city or county under an agricultural conservation easement. Among other requirements, the board or council must make specific findings, and the agreement must be approved by the Secretary of Resources.

- If the project may involve such an agreement, the DEIR should discuss how the requirements would be met. In addition, the suitability of the proposed project for a Williamson Act Easement Exchange pursuant to PRC §10251 and §10252 and GC §51256 and §51256.1 should be discussed in the DEIR as well as an explanation of the WAEPP rescission program, procedures and criteria.
- As a general rule, land should be withdrawn from Williamson Act contract through the nine-year nonrenewal process. Immediate termination via cancellation is reserved for "extraordinary", unforeseen situations (See Sierra Club v. City of Hayward (1981) 28 Cal.3d 840, 852-855). Furthermore, it has been held that "cancellation is inconsistent with the purposes of the (Williamson) Act if the objectives to be served by cancellation should have been predicted and served by nonrenewal at an earlier time, or if such objectives can be served by nonrenewal now" (Sierra Club v. City of Hayward).
- Discuss the suitability of the proposed WAEPP project pursuant to WA cancellation provisions of Government Code §51282 and the findings required in Government Code §§ 51256 and 51256.1
- Discuss why cancellation/rescission should be pursued instead of completion of the non-renewal process. The DEIR should address the following questions relative to nonrenewal: What are the reasons the applicant gives for choosing the contracted property for the alternate use? When did the applicant decide to propose the alternate use for the property? Why does the applicant state that cancellation is necessary? Will completing the nonrenewal process underway accomplish the goal of locating the alternate use on the site? If not, why would completing the nonrenewal process fail to serve the purpose? Would earlier initiation of the nonrenewal process have provided for the alternate use? Did either one or both parties to the contract know that the land would soon be ripe for development? Is the cancellation being proposed because the land is now ripe for development?. Would completing the undergoing nonrenewal process interfere with the orderly urban development of the county or any other purpose to be served by cancellation? Is this an extraordinary circumstance where cancellation could be approved and if so, why?

- The DEIR should discuss the impacts that termination of contracts would have on nearby properties also under contract; i.e., growth-inducing impacts from the perspective that the removal of contract protection not only lifts a barrier to development but results in higher property taxes and an incentive to shift to a more intensive land use such as urban development. The termination of a Williamson Act contract is considered a significant adverse impact.

The Department recommends that the following information be included in the DEIR:

- If cancellation is proposed, notification must be submitted to the Department prior to a board or council's consideration of a proposal for tentative cancellation (Government Code §51284.1). The board or council must consider the Department's comments prior to making a decision on the proposal. Required findings must be made by the board or council in order to approve tentative cancellation. Cancellation provisions involving Farmland Security Zone (FSZ) contracts include additional requirements. We recommend that the DEIR include discussion of how the required findings can be made and the documentation to support making the findings. This notification must be submitted separately from the CEQA process and CEQA documentation. (The notice should be mailed to Darryl Young, Director, Department of Conservation, c/o Division of Land Resource Protection, 801 K Street MS 13-71, Sacramento, CA 95814-3528.)

Mitigation Measures

The Department encourages the purchase of agricultural conservation easements on land of at least equal quality and size as partial compensation for the direct loss of agricultural land. If high quality land is converted or a Williamson Act contract is terminated, or if growth inducing or cumulative agricultural impacts are involved, we recommend that this ratio be increased. We highlight this measure because of its use as mitigation under CEQA. However, the placement of an agricultural conservation easement on land as required for a Williamson Act Easement Exchange does not constitute mitigation for the loss of the Williamson Act contracted land to development. Other adequate mitigation measures must be implemented to offset the loss.

Mitigation using agricultural conservation easements can be implemented by at least two alternative approaches: the outright purchase of easements or the donation of mitigation fees to a local, regional or statewide organization or agency whose purpose includes the acquisition and stewardship of agricultural conservation easements. The conversion of agricultural land should be deemed an impact of at least regional significance, and the search for replacement lands conducted regionally or statewide, and not limited strictly to lands within the project's surrounding area.

While the direct conversion of agricultural land and other agricultural impacts are often deemed to be unavoidable by an agency's CEQA analysis, mitigation measures must

nevertheless be considered. The adoption of a Statement of Overriding Consideration does not absolve the agency of the requirement to implement feasible mitigation that lessens a project's impacts.

A principal purpose of an EIR is to present a discussion of mitigation measures in order to fully inform decision-makers and the public about ways to lessen a project's impacts. Reduction to a level below significance should not be a criterion that eliminates feasible measures. Pursuant to CEQA Guideline 15370, mitigation includes measures that "avoid, minimize, rectify, reduce or eliminate, or compensate" for the impact. For example, mitigation includes *"Minimizing impacts by limiting the degree or magnitude of the action and its implementation (§15370(b))"* or *"Compensating for the impact by replacing or providing substitute resources or environments (§15370(e))."*

All measures ostensibly feasible should be included in the DEIR. Each measure should be discussed, as well as the reasoning for selection or rejection. The Division has compiled an annotated listing of approximately 30 "conservation tools" that have been used to conserve or mitigate project impacts on agricultural land. This compilation report may be requested from the Division at the address or phone number below.

When presenting mitigation measures in the DEIR, it is important to note that mitigation should be specific, measurable actions that allow monitoring to ensure their implementation and evaluation of success. A mitigation consisting only of a statement of intention or an unspecified future action may not be adequate pursuant to CEQA.

Information about agricultural conservation easements, the Williamson Act and provisions noted above is available on the Department's website or by contacting the Division at the address and phone number listed below. The Department's website address is:

<http://www.conservation.ca.gov/dlrp/index.htm>

Appendix A-3: Supplemental Information Provided by Department of Conservation (January 18, 2006)

WILLIAMSON ACT EASEMENT EXCHANGE PROGRAM PROCESS

The Williamson Act Easement Exchange Program (WAEEP) combines the Williamson Act's (WA) cancellation procedure and elements of the California Farmland Conservancy Program (CFCP) easement program. The WAEEP provides a contract rescission process that includes added incentives and requirements. The WAEEP project must be sponsored jointly by the landowner and the local government and is subject to the approval of the Director of the California Department of Conservation (Department).

Pre-application consultation

Prior to submitting a WAEEP cancellation/rescission application to the local government and prior to submitting a rescission application to the state, consultation with the Department is recommended at the earliest possible time regarding:

- The cancellation/rescission criteria applicable to the land proposed to be removed from the Williamson Act
- Scoping the content of the EIR for the proposed alternate use (development) on the Williamson Act land proposed for rescission/cancellation
- The necessity to complete action at the local government level prior to action by the Department
- Identification of a land trust or other qualified organization to hold the permanent agricultural conservation easement(s)
- Location and suitability of proposed and alternative easement land(s).

CEQA

Cancellations and rescissions. CEQA determinations are required to be made by the local government for all Williamson Act contract cancellations. Categorical exemptions are not applicable. Contract cancellations of 100 acres or more are deemed to be projects of statewide, regional or areawide significance, and these CEQA documents must be circulated through the State Clearinghouse. An initial study must review all agricultural lands issues. The CEQA document must review whether nonrenewal of the contract can serve the cancellation purpose and each of the cancellation findings in GC section 51282. Requirements in the specific contract that are more restrictive than those in the statute must also be analyzed in the CEQA documents.

Rescissions. The Department is a CEQA Responsible Agency for WAEEP purposes. CEQA documents need to address each of the WAEEP findings that must be reviewed by the Director. This includes the CFCP easement eligibility and selection criteria, the proposed easement location and alternative easement location, and the requirement that the rescission project will make a beneficial contribution to the protection of agricultural lands in the area.

Nonrenewal of the Williamson Act contract

If the landowner desires to change the use of the land under contract to uses other than agricultural production and compatible uses, the preferred procedure is to file a notice of nonrenewal. Cancellation and rescission are not permissible when the objectives to be served by cancellation can be accomplished by nonrenewal or if the objectives to be served should have been predicted and served by nonrenewal in the past. So that development is planned for well in advance, landowners and local governments should undertake nonrenewal to terminate contracts.

The contract cancellation and the contract rescission processes

Cancellation and rescission. A landowner using the contract *cancellation* process pays a cancellation penalty. The local government conducts the cancellation proceeding subject to comment from the Department. In contrast, *rescission* is initiated by the local government and requires Department approval. In rescission *two* exchanges take place. The contract is exchanged for the permanent easement, and an easement that is has a value equal to or more than the amount of the cancellation penalty is received in lieu of actual payment of the cancellation penalty.

Conversion of cancellation to rescission. At some point before a project's cancellation process is complete, a landowner may seek to convert a cancellation proceeding into a rescission proposal by entering into a Rescission Agreement and submitting a Rescission Application to the Department. However, if rescission is desired, it should be planned for beginning with a pre-application consultation with the Department.

Contract cancellation process. The owner of the Williamson Act contracted land completes a cancellation petition and submits it to local government and the Department for review. If cancellation findings and requirements can be met, the landowner proceeds with the process.

1. The Lead Agency completes the CEQA process for the alternative use proposed for the contracted land. The CEQA documents must contain analysis of the environmental impacts of development of the alternative use, as well as the reason that nonrenewal is determined to be inadequate to accomplish the objectives of the project. Notice of Preparation, Draft Environmental Impact Reports and other CEQA documents must be submitted to the Department for review and comment prior to final Department comment on the cancellation notice.
2. The landowner submits a petition for WA contract cancellation to the local government having jurisdiction over the contracted land.
3. When the board of supervisors or city council accepts the petition application as complete it sends a notice to DOC with specific information.
4. DOC reviews the cancellation notice, proposed findings, CEQA and other applicable documents. DOC notifies the local government and landowner of review results. If DOC does not agree that the findings are appropriate and

- supportable, the landowner can resubmit, attempt to move forward on contract cancellation, or drop the cancellation petition. If DOC determines that the findings are appropriate, and supported by substantial evidence, it notifies the local government.
5. Local government must determine the cancellation valuation of the land and the cancellation fees.
 6. After notice to the public, DOC, and WA contract holders within one mile of the proposed cancellation, a public hearing must be held.
 7. When the board or council approves the tentative cancellation it passes a resolution that includes documenting the justification for findings. Local government submits the resolution and findings to DOC for review.

Contract rescission process. The Department determines if the cancellation findings may be met in the first part of the rescission process.

Rescission Part I

1. The Department participates as a Responsible Agency in the Lead Agency's CEQA process on the alternate use proposed for the Williamson Act contracted land.
2. The landowner and the local government enter into a Rescission Agreement that includes authority for submission of a Rescission Application to the Department and for the other necessary actions to complete the easement exchange. A CEQA determination is necessary for the agreement. A revised agreement may be required before the application is approved.
3. A Rescission Part I Application is submitted to the Department. If the applicant desires, a full application consisting of Parts I and II may be submitted, but the applicant may not prefer to take actions such as easement drafting prior to Department Part I review.
4. The Department determines if it has sufficient information for its Part I review.
5. If the Department determines that the rescission findings cannot be met, the applicant is advised that proceeding with a full Part I & II application is inadvisable.
6. If Department staff finds that making the rescission findings may be feasible, it recommends that the applicant complete remaining pre-application procedures and consider preparation of a Full Part I and II rescission application.

Rescission Part II

7. A full Rescission Application, consisting of Parts I and II is submitted to the Department. A Part I & II application must contain seven key components, including Rescission Agreement, Final EIR, easement holder identification, easements lands identification, easement appraisal, and escrow instructions.

Rescission Agreement (First key component – see paragraph 2 above)

Certified Final EIR with full analysis of the rescission (Second key component)

Identified qualified easement holder (Third key component)

8. A qualified easement holder is identified.
- a) The qualified easement holder (grantee) may be a nonprofit land trust, conservancy or foundation, a resource conservation district, a regional park or open space district, a regional park or open space authority, a city, or a county.
 - b) The preferred qualified easement holder or a co-holder is a nonprofit land trust, conservancy or foundation with experience holding and monitoring agricultural conservation easements and that has a governing body that is committed to conservation of agricultural land.
 - c) The organization should demonstrate in its mission and actions, such as in its community outreach program, a commitment to the preservation of working agricultural lands, a commitment to agriculture as a preferred land use, and a commitment to supporting commercial agricultural operations.
 - d) It must demonstrate easement management and agricultural land conservation expertise, including the fiscal and technical capacity to draft, hold, monitor and enforce the easement, including defending the easement through litigation if necessary (Public Resources Code section 10252 (f) and Civil Code 815.7).
 - e) Private organizations must be tax exempt and qualified nonprofit organization under Internal Revenue Code (IRC) sections 501(c)(3) and further qualify under IRC sections 170(b)(1)(A)(vi) or 170(h)(3).
 - f) It must meet the organizational purpose requirements of Public Resources Code sections 10211 and 10221, and Civil Code 815.3(a).

Identified qualified easement lands (Fourth key component)

9. Qualified lands and optional lands are proposed for easements. The landowner of Williamson Act contracted land initiates a cooperative effort with qualified easement holders, the Department or others to find qualified easement areas that:
- a) Are the same size or larger than the Williamson Act contracted area proposed for cancellation (Government Code section 51256(c).
 - b) Have the same dollar value or greater than the cancellation fee required to cancel Williamson Act contract (Government Code section 51256(d).
 - c) Meet the easement elements required in Public Resources Code sections 10251 and 10252.
 - d) As demonstrated by review of a preliminary report from a title company, appear to be without title impediments.
 - e) Have been the subject of an initial environmental site review questionnaire.

- f) Are demonstrated in a preliminary manner to not have boundary or other disputes.
10. The applicant submits pre-application easement land review material to the Department for the proposed easement(s) and/or an alternate easement or easements:
- A preliminary report from a title company
 - Identification of all interests in the land, including owners, leases, etc.
 - A completed Department's site review questionnaire
 - Any available surveys, maps, reports, water rights, and other documents for the easement properties.
11. The Department schedules an initial site visit of the proposed easement areas with the landowner, easement holder and local government representative to assess the characteristics of the proposed easement parcel.
12. If the Department determines that the proposed easement warrants consideration, an agricultural conservation easement should be drafted. If the pre-application review indicates that the proposed easement parcel may not be satisfactory, the landowner can propose a different easement area, or enlarge or enhance the proposed easement area.

Draft Agricultural Conservation Easement (Fifth key component)

13. The easement holder drafts an agricultural conservation easement satisfactory to the easement landowner. When easement language is complete, and identifies all elements, it is signed off on by the easement holder and the landowner.
14. The easement is submitted to the Department for review at the earliest feasible time. The easement must have the fundamental characteristics found in agricultural conservation easements.
15. The Department reviews and evaluates the easement and works with the landowner and trust to complete an easement draft adequate for purposes of appraising the value of the property affected by the easement. The easement language remains open for changes throughout consideration of the project and is not finalized until escrow.

Easement area appraisal (Sixth key component)

16. After consultation with the Department, the landowner hires a qualified agricultural easement appraiser to determine easement value.
17. Appraiser follows appraisal specifications required by Department of General Services (DGS) to complete appraisal.
18. The easement appraisal is submitted to DOC for review and evaluation.
19. DOC reviews and evaluates easement appraisal and submits to DGS. If DGS indicates that the appraisal was not adequate, landowner can contact DOC for recommendations, and modify easement language, seek another easement appraisal, or drop easement exchange proposal.
20. The appraiser's easement valuation will in most cases need to be reviewed again near escrow because of changes in easement language, passage of time, the requirement that the appraisal be made within 30 days of the Rescission Agreement, and in the event that market conditions change.

Draft escrow instructions (Seventh key component)

21. A draft of comprehensive escrow instructions necessary to carry out all elements of the transaction must be submitted to the Department. For good cause shown, the draft instructions may be submitted to the Department for its review separate from the application binder.

Part I & II Binder Application submittal and review

22. The project is finalized at the local government level.
23. The applicant develops documents and materials for the application and incorporates them into a three-ring binder for submittal.
24. The application is submitted to the local government for review and preparation of rescission findings and resolution of project support or rejection.
25. If local government can make the findings and approve the project, the local government prepares an approval and transmittal form and submits the binder to DOC for review. An original and two copies are required.

Department review

26. The Department determines if the application is complete. If not the Department identifies needed information and tasks.
27. The Department reviews the project, including binder contents.
28. The Department may determine that an agreement between the applicant and/or landowner and the Department is necessary.
29. The Department completes tasks necessary to assure that the rescission can be successfully carried out.

Public Review

30. If not provided previously, notice is provided to the public and neighboring landowners of the opportunity to comment to the Department.
31. The Department reviews comments received and applicant response.

Department decision

32. If all findings required cannot be made the project is denied by DOC. DOC then informs the local government and the landowner of the decision with an invitation to contact DOC if the landowner wishes to modify project.
33. If DOC can make findings, project is approved. The Director sends an approval letter to the applicant, local government, and easement holder.

**WAEEP Rescission Part I Application
Information Needed on Cancellation Parcel(s)**

Location and description of parcel(s)

Owner name and ownership interest
Any options or other interests in the land
Directions to the site and contact person for obtaining access
Site and vicinity maps
Aerial photographs
Legal description
Any maps, reports or other documents regarding the property
Any notices regarding the property

CEQA

All CEQA-related documents (notices, Initial Study, NOP, DEIR, etc.)

Williamson Act

Contract (Assessor's parcel number, contract number, agricultural preserve number)
Resolution establishing the contract
Documents for the Agricultural Preserve, including the resolution establishing the preserve
Any cancellation petition filed at any time for all or part of the area
County or city Williamson Act rules
Applicable notice of nonrenewal
County or city cancellation and/or rescission policy
A list of pending cancellation petitions and of any approved in the last five years
If public acquisition of contracted land is planned, the status of those plans

LAFCO policies

Applicable Sphere of Influence maps and policies
If contracted land is proposed to be annexed, a copy of the LAFCO agricultural land policies including on lands subject to a Williamson Act contract
If contracted land is proposed to be annexed, the status of such plans

General plans and zoning

Copies of applicable portions of all local government, including for districts, zoning maps and ordinances, general plans, plan elements, growth boundaries and ordinances, capitol improvement plans, financing plans and proposals.

Alternative uses

For each alternative use proposed for the contracted land provide "with a level of specificity" that permits making the findings required:

- Its description
- Explanation of how each use is consistent with the general plans.

- A "list of those governmental agencies known by the landowner to have permit authority related to the proposed alternative use."

Agricultural use information

Soil category description including acreage figures for the different soil classes

Agricultural commodity and production records for the past 10 years

The total number of acres of Williamson Act contracted land to be cancelled

Vicinity lands

Map showing each current and past contracted parcel in the vicinity including on the map or chart:

- Acreage
- Date of notice of nonrenewal, if any
- Date nonrenewal was or will become effective

Map showing each non-contract parcel in the vicinity

List of noncontracted parcels containing:

- Size
- Soil quality
- Use

Descriptive findings

For non-contract parcels in the vicinity describe and explain the:

- Suitability for the alternative use
- Availability for the alternative use

An explanation about how the "cancellation is not likely to result in the removal of adjacent lands from agricultural use" for:

- Each adjacent parcel and
- The area as a whole.

An explanation of how the "cancellation will not result in discontinuous patterns of development" for cancellation parcel(s) that:

- Are contiguous to existing urban development
- Have intervening parcels between the parcels to be cancelled and existing urban development or that or otherwise discontinuous

An explanation of how "development of the contracted land would provide more contiguous pattern of urban development than development of proximate noncontracted land."

An explanation of how cancellation of the "contract shall be in the public interest" including a description of other public concerns that substantially outweigh the objective of the Williamson Act.

An explanation "If there is no other reasonable or comparable agricultural use to which the land may be put."

WILLIAMSON ACT EASEMENT EXCHANGE APPLICATION BINDER for Part II

- A. Table of Contents
- B. Letter to the Department of Conservation from the applicant formally submitting the Williamson Act Easement Exchange proposal.
- C. Agreement between landowner and city council or board of supervisors.
- D. Findings by board or council as required in Government Code section 51256 (a), (b), (c) and (d).
- E. Title Holder description and information.
- F. Summary Description of the proposed Easement Exchange project.

SECTION I: SITE SPECIFIC INFORMATION

Williamson Act Contracted Land

- 1) Site and Vicinity Map and aerial photograph for Williamson Act Contracted Land
- 2) Soil Category description for Williamson Act Contracted Land including acreage figures for the different soil classes.
- 3) General Plan and Zoning Designations for Williamson Act Contracted Land
- 4) Agricultural Commodity and Production Records for the Williamson Act Contracted Land for the past ten (10) years
- 5) Copy of the Williamson Act contract

Agricultural Conservation Easement Land

- 1) Site and Vicinity Map and aerial photograph for the Agricultural Conservation Easement Land
- 2) General Plan and Zoning Designations for Agricultural Conservation Easement Land
- 3) Soil Category description for Agricultural Conservation Easement Land based on land capability, farmland mapping and monitoring program definitions, productivity indices, and other soil, climate and vegetative factors.
- 4) Agricultural Commodity and Production Records for the Agricultural Conservation Easement Land for the past ten (10) years
- 5) If applicable, a provision that agricultural uses on the Conservation Easement land will be in accordance with an NRCS conservation plan for the easement land.
- 6) Include documentation to verify that the following eligibility criteria set forth in Public Resources Code section 10251 are met:

- a) The easement land is large enough to sustain commercial agricultural use.
 - b) The easement land is an area that has necessary market, infrastructure, and agricultural support services. (Identify that an adequate current and future water supply source is available (water rights contracts, wells, surface water, etc))
 - c) The surrounding parcel sizes and land uses will support long-term commercial agricultural production.
 - d) The city or county's general plan demonstrates a long-term commitment to agricultural land conservation as reflected in the goals, objectives, polices and implementation measures of the general plan relating to the conservation easement area. (Local policies may include Right to Farm Ordinances, Agricultural Elements, zoning designations for the easement area and any other local agricultural conservation policies.)
 - e) The conservation easement proposal is consistent with the city or county general plan.
 - f) Without conservation the proposed easement area would likely be converted to nonagricultural use in the foreseeable future. (Include a clear and substantial description of the development pressures affecting the proposed easement area.)
- 7) Include documentation to verify that the proposed easement is evaluated pursuant to the selection criteria set forth in Public Resources Code section 10252, particularly subdivisions (a), (c), (e), (f) and (h).

SECTION II: RESOLUTIONS

- 1) A resolution by the local government approving the rescission.
- 2) A resolution by the local government approving the Agricultural Conservation Easement proposal.
- 3) If the proposed easement area is within a city's Sphere of Influence, both the city and county must pass resolutions approving the easement proposal.

SECTION III: WILLIAMSON ACT CANCELLATION FINDINGS AND RESOLUTIONS

- 1) Resolution by the local government tentatively approving Williamson Act contract cancellation.
- 2) Williamson Act cancellation findings with documentation of substantial evidence supporting findings for cancellation.
- 3) Resolution by the local government executing a certificate of rescission.

SECTION IV: CONSERVATION EASEMENT DEED

- 1) Verify that any existing liens, mortgages or other encumbrances on the conservation easement are subordinated to the easement.
- 2) "No conflict of interest" and related statements by Grantor and Grantee.
- 3) Specific, limited statements of permissible and limited uses on the conservation easement and a clear statement of the Grantor's rights and responsibilities, in both the body of the easement and easement exhibits.

- 4) An agreement extinguishing development rights on the conservation easement.
- 5) Clarification of the enforcement rights and remedies of the Grantee and the State
- 6) Clarification that the easement does not create any rights of the Grantee and the State that would trigger liability under toxic/hazardous waste laws.
- 7) A "no merger" provision that will maintain the separate legal status of the easement in the event that the easement holder ever comes into ownership of the underlying fee title to the conservation easement.

SECTION V: CONSERVATION EASEMENT HOLDER

- 1) Documentation that the proposed conservation easement holder is a governmental entity or a nonprofit land trust, conservancy or foundation that:
 - a) Is a tax exempt and qualified nonprofit organization under Internal Revenue Code sections 501(c)(3) and 170(h)(3).
 - b) Meets the organizational purpose requirements of Public Resources Code (PRC) sections 10211, 10212 and Civil Code section 815.3.
 - c) Has the fiscal and technical capacity to draft, hold, monitor and enforce the easement, including litigation if necessary.

SECTION VI: INDEPENDENT APPRAISAL REPORT

An independent Appraisal Report prepared in conformance with the Uniform Standards of Professional Appraisal Practice (USPAP) currently adopted by the Appraisal Standards Board of the Appraisal Foundation. In addition to any other USPAP reporting requirement, the appraisal report must contain the following:

1. Title page with sufficient identification of appraisal project.
2. Letter of transmittal summarizing important assumptions and conclusions, value estimate, date of value and date of report, etc.
3. Table of contents.
4. Assumptions and Limiting Conditions.
5. Description of the scope of work, including the extent of data collection and limitations, if any, in obtaining relevant data.
6. Definition of Fair Market Value, as defined by California Code of Civil Procedures, Section 1263.320.
7. Photographs, plat map, and legal description of subject property.
8. Ownership and sales history of subject property.
9. Discussion of any current Agreement of Sales, option, or listing of Subject.
10. Regional, area, and neighborhood analyses.
11. Market conditions and trends including identification of the relevant market, a discussion of supply and demand within the relevant market factors impacting demand for site acquisition and leasing within the relevant market area.
12. Subject land/site characteristics (size, topography, zoning and land use, utilities, offsite improvements, access, easements and restrictions, flood and earthquake information, toxic hazards, taxes and assessments, etc.).
13. Description of subject improvements, including physical age.
14. Subject leasing and operating cost history.

15. Opinion of highest and best use of subject property, and reasoning in support of the opinion in the depth and detail required by its significance to appraisal. If alternative feasible uses exist, explain and support market, development, cash flow, and risk factors leading to an ultimate highest and best use.
16. All approaches to market value applicable in the subject market. Explain and support the exclusion of any usual approaches to value.
17. Map(s) showing all comparable properties in relation to subject property.
18. Photographs and plat maps of comparable properties.
19. Discussion of comparable properties, and direct comparisons to subject property.
20. Comparable data sheets. For sales, include significant information such as grantor/grantee, sale/recordation dates, financing, conditions of sale, sufficient location information (street address, post mile, and/or distance from local landmarks such as bridges, road intersections, structures, etc.), land/site characteristics, improvements, and confirming source. For leases, include significant information such as lessor/lessee, lease date and term, type of lease, rent and escalation, expenses size of space leased, and tenant improvement allowance, concessions, use restrictions, options, and confirming source.
21. If applicable, discussion of construction cost methodology, costs included and excluded, entrepreneurial profit, accrued depreciation from all causes and remaining economic life.
22. If applicable, construction cost data including cost data source, date of estimate or date of publication of cost manual, section and page reference of cost manual, replacement or reproduction of cost method used, depreciation method used, copies of cost manual pages or cost estimate if provided from another source and supporting calculations including worksheets or spreadsheets.
23. Discussion of severance damage (or lack of it).
24. Effect of title exceptions on fair market value.
25. Implied dedication statement.
26. Reconciliation and final value estimate. Explain and support conclusions reached.
27. Discussion of any departures taken in the development of the appraisal.
28. Signed Certification.

SECTION VII: CONSERVATION EASEMENT--FARMSTEAD BUILDING ENVELOPE

- 1) Written and mapped description of the use, size and location of all structures on the property
- 2) Any proposed new residential structures and structure location
- 3) Presently proposed or potential agricultural structures, including farm labor housing, that will maintain as much flexibility as possible for continuing agricultural productivity
- 4) Identification of and map of any existing building envelope and the same or any other building envelope that could contain proposed or potential structures.

SECTION VIII: APPENDICES

July 2003

APPENDIX B

NCRS Land Capability Soil Grouping Definitions

**APPENDIX B - TABLE 1
NRCS LAND CAPABILITY SOIL GROUPING DEFINITIONS**

Capability Classifications	Description
Capability Classes	
I	Class I soils have few limitations that restrict their use.
II	Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
III	Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.
IV	Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
V	Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife. (None in Sonoma County)
VI	Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.
VII	Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.
VIII	Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes.
Capability Subclasses	
e	Main limitation is risk of erosion unless close-growing plant cover is maintained.
w	Water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage).
s	Soil is limited mainly because it is shallow, droughty, saline, or stony.
c	Chief limitation is climate that is too cold or too dry.
Capability Units	
0	A problem or limitation caused by sand and gravel in the substratum.
1	An actual or potential erosion hazard
2	A problem or limitation of wetness caused by poor drainage or flooding.
3	A problem or limitation caused by slow or very slow permeability of the subsoil or substratum.
4	A problem or limitation caused by coarse soil texture or excessive gravel.
5	A problem or limitation caused by fine or very fine textured surface soil.
6	A problem or limitation caused by silt or alkali.
7	A problem or limitation caused by cobblestone, other stones, or rock outcrops.
8	A problem or limitation caused by shallowness to bedrock or hardpan.
9	A problem or limitation caused by low fertility or by toxicity.

SOURCE: Source: United States Department of Agriculture, Natural Resource Conservation Service

APPENDIX C

LESA Model Worksheets

APPENDIX C

TABLE C-1

LESA LAND EVALUATION WORKSHEET & SITE EVALUATION WORKSHEET 1

Land Evaluation Worksheet
Roblar Road Project Site

Land Capability Classification (LCC)
and Storie Index Scores

A	B	C	D	E	F	G	H
Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
BcA	1.7	0.01	IIw-2	80	0.7	51	0.4
CeB	8.8	0.04	Ile-5	90	4.0	41	1.8
LoF2	40.2	0.20	Vle-3	20	4.0	14	2.8
LsE2	1.6	0.01	Vle-3	20	0.2	11	0.1
SnD2	94.1	0.47	IVe-1	50	23.7	52	24.6
SnE	26.8	0.13	Vle-1	20	2.7	48	6.5
SnF	25.6	0.13	Vle-1	20	2.6	22	2.8
Totals	198.8	(Must Sum to 1.0)		LCC Total	37.8	Storie Index Total	39.1

Site Evaluation Worksheet 1
Roblar Road Project Site

Project Size Score

	I	J	K
	LCC Class I-II	LCC Class III	LCC Class IV-VII
	1.7		
	8.8		
			40.2
			1.6
			94.1
			26.8
			25.6
Total Acres	10.5		188.3
Project Size Scores	30		60

Highest Size Project Score **60**

APPENDIX C

TABLE C-2

**LESA SITE EVALUATION WORKSHEET 2
WATER RESOURCES AVAILABILITY**

Roblar Road Project Site

A	B	C	D	E
Project Portion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score (C x D)
1	not irrigated	1.0	25	25
2				
3				
4				
5				
6				
		(Must Sum to 1.0)	Total Water Resources Score	25

Notes: Totals may not add exactly due to rounding.

Source: ESA; California Department of Conservation "California Agricultural Land Evaluation and Site Assessment (LESA) Model."

APPENDIX C

TABLE C-3

**LESA SITE EVALUATION WORKSHEET 3
SURROUNDING AGRICULTURAL LAND & SURROUNDING PROTECTED RESOURCE LAND**

Roblar Road Project Site

A	B	C	D	E	F	G
Zone of Influence					Surrounding Agricultural Land Score (From Table)	Surrounding Protected Resource Land Score (From Table)
Total Acres	Acres in Agriculture	Acres of Protected Resource Land	Percent in Agriculture (B/A)	Percent Protected Resource Land (C/A)		
2,792	>2,686	2,403	> 96%	86%	100	95

Notes: Totals may not add exactly due to rounding.

Source: ESA; California Department of Conservation "California Agricultural Land Evaluation and Site Assessment (LESA) Model."

APPENDIX C

TABLE C-4

FINAL LESA SCORE SHEET

Roblar Road Project Site

	Factor Scores	Factor Weight	Weighted Factor Score
<u>LE Factors</u>			
Land Capability Classification	37.8	0.25	9.5
Storie Index	39.1	0.25	9.8
<i>LE Subtotal</i>		0.5	19.2
<u>SA Factors</u>			
Project Size	60	0.15	9.0
Water Resource Availability	25	0.15	3.8
Surrounding Agricultural Land	100	0.15	15.0
Protected Resource Land	95	0.05	4.8
<i>SA Subtotal</i>		0.5	32.5
Final LESA Score			51.7

Notes: Totals may not add exactly due to rounding.

Source: ESA; California Department of Conservation "California Agricultural Land Evaluation and Site Assessment (LESA) Model."

APPENDIX C

TABLE C-6

**LESA SITE EVALUATION WORKSHEET 2
WATER RESOURCES AVAILABILITY**

Roblar Road Project Site - Lost Agricultural Land Only

A	B	C	D	E
Project Portion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score (C x D)
1	not irrigated	1.0	25	25
2				
3				
4				
5				
6				
		(Must Sum to 1.0)	Total Water Resources Score	25

Notes: Totals may not add exactly due to rounding.

Source: ESA; California Department of Conservation "California Agricultural Land Evaluation and Site Assessment (LESA) Model."

APPENDIX C

TABLEC-7

**LESA SITE EVALUATION WORKSHEET 3
SURROUNDING AGRICULTURAL LAND & SURROUNDING PROTECTED RESOURCE LAND**

Roblar Road Project Site - Lost Agricultural Land Only

A	B	C	D	E	F	G
Zone of Influence					Surrounding Agricultural Land Score (From Table)	Surrounding Protected Resource Land Score (From Table)
Total Acres	Acres in Agriculture	Acres of Protected Resource Land	Percent in Agriculture (B/A)	Percent Protected Resource Land (C/A)		
2,792	>2,686	2,403	> 96%	86%	100	95

Notes: Totals may not add exactly due to rounding.

Source: ESA; California Department of Conservation "California Agricultural Land Evaluation and Site Assessment (LESA) Model."

APPENDIX C

TABLE C-5

LESA LAND EVALUATION WORKSHEET & SITE EVALUATION WORKSHEET 1

Land Evaluation Worksheet
Roblar Road Project Site - Lost Agricultural Land Only

Land Capability Classification (LCC)
and Storie Index Scores

A	B	C	D	E	F	G	H
Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
BcA	0.4	0.01	IIw-2	80	0.5	51	0.3
CeB	0.2	0.00	IIe-5	90	0.3	41	0.1
LoF2	6.5	0.09	VIe-3	20	1.9	14	1.3
SnD2	60.5	0.87	IVe-1	50	43.4	52	45.2
SnE	2.0	0.03	VIe-1	20	0.6	48	1.4
SnF	0.0	0.00	VIe-1	20	0.0	22	0.0
Totals	69.6	(Must Sum to 1.0)		LCC Total	46.6	Storie Index Total	48.3

Site Evaluation Worksheet 1
Roblar Road Project Site

Project Size Score

	I	J	K
	LCC Class I-II	LCC Class III	LCC Class IV-VII
	0.4		
	0.2		6.5
			60.5
			2.0
			0.0
Total Acres	0.6		69.0
Project Size Scores	0		20
Highest Size Project Score		20	

Notes: Totals may add exactly due to rounding.

Source: ESA; California Department of Conservation "California Agricultural Land Evaluation and Site Assessment (LESA) Model."

APPENDIX C

TABLE C-8

FINAL LESA SCORE SHEET

Roblar Road Project Site - Lost Agricultural Land Only

	Factor Scores	Factor Weight	Weighted Factor Score
<u>LE Factors</u>			
Land Capability Classification	46.6	0.25	11.7
Storie Index	48.3	0.25	12.1
<i>LE Subtotal</i>		0.5	23.7
<u>SA Factors</u>			
Project Size	20	0.15	3.0
Water Resource Availability	25	0.15	3.8
Surrounding Agricultural Land	100	0.15	15.0
Protected Resource Land	95	0.05	4.8
<i>SA Subtotal</i>		0.5	26.5
Final LESA Score			50.2

Notes: Totals may not add exactly due to rounding.

Source: ESA; California Department of Conservation "California Agricultural Land Evaluation and Site Assessment (LESA) Model."

APPENDIX C

Hydrology Appendix

**Table 1. Recharge and water-holding properties of surficial soils
Roblar Road Quarry, Sonoma County, California**

Map Symbol	Soil Series ¹	Parent Material	Taxonomy (order, subgroup, family)	Hydrologic Soil Group	Project Area Coverage (% estimated)	Depth Zone (inches)	USCS ²		Attenberg Limits		Permeability (inches/hour)	Available Water Capacity ³		Reaction (pH)	Remarks
							Liquid	Plastic				Per Inch (in./in. of soil)	Profile (total, in)		
SnD2	Steinbeck loam, 9% to 15% slopes, eroded	weakly to moderately consolidated Wilson Grove sandstone	Alfisols	B (moderate infiltration and runoff potential)	40%	0 to 24	CL	25-35	10-20	0.63 to 2.0	0.16 to 0.18	3.8	5.1 to 5.5	Most of the proposed quarry area is covered with this soil.	
			Mollic Haploxeraalfs			24 to 45	CL	30-40	20-30		0.18 to 0.21	3.8	5.6 to 6.0		
			Fine-loamy, mixed, mesic			<i>Total</i>		7.6							
SnE, SnE2	Steinbeck loam, 15% to 30% slopes	weakly to moderately consolidated Wilson Grove sandstone	Alfisols	B (moderate infiltration and runoff potential)	15%	0 to 21	CL	25-35	10-20	0.63 to 2.0	0.16 to 0.18	3.4	5.1 to 5.5	Areas north of the proposed quarry, including the existing landfill area.	
			Mollic Haploxeraalfs			21 to 40	CL	30-40	20-30		0.18 to 0.21	3.4	5.6 to 6.0		
			Fine-loamy, mixed, mesic			<i>Total</i>		6.8							
SnF	Steinbeck loam, 30% to 50% slopes	weakly to moderately consolidated Wilson Grove sandstone	Alfisols	B (moderate infiltration and runoff potential)	15%	0 to 18	CL	25-35	10-20	0.63 to 2.0	0.16 to 0.18	2.9	5.1 to 5.5	Areas north of the proposed quarry, and east the existing landfill area.	
			Mollic Haploxeraalfs			18 to 36	CL	30-40	20-30		0.18 to 0.21	3.1	5.6 to 6.0		
			Fine-loamy, mixed, mesic			<i>Total</i>		5.9							
LoF2	Los Osos clay loam, 30% to 50% slopes, eroded	Weathered, fractured sandstone and shale	Mollisols	C (slow infiltration, high runoff potential)	20%	0 to 12	CL or ML	35-45	10-20	0.2 to 0.63	0.19 to 0.21	2.3	5.6 to 6.0	Areas on the south and west portions of the site.	
			Typic Argixerolls			12 to 28	CL or ML	35-50	10-25		0.06 to 0.2	2.2	6.6 to 7.3		
			Fine, montmorillonitic, thermic			<i>Total</i>		4.5							
CeB	Clear Lake clay, 2% to 5% slopes	Alluvium; soils formed under poor drainage conditions	Mollisols	D (very slow infiltration, very high runoff)	> 5%	0 to 60	CH	50-60	20-35	0.06 to 0.2	0.14 to 0.16	8.4	5.1 to 8.4	Found in the southwest portion of the site near Americano Creek and Ranch Tributary.	
			Typic Haplaquolls			60 to 72	SC	15-25	5-10		0.14 to 0.16	1.7	7.4 to 8.4		
			Coarse-loamy, noncalcareous, mesic			<i>Total</i>		10.1							
BcA	Blucher fine sandy loam, overwash, 0% to 2% slopes	Alluvium; soils of stream bottoms and alluvial fans, somewhat poorly drained loam	Vertisols	C (slow infiltration, high runoff potential)	< 5%	0 to 34	SM or CL	20-40	0-35	0.63 to 0.2	0.14 to 0.18	4.8	5.6 to 8.4	Found in the southwest portion of the site near Americano Creek.	
			Typic Pelloxererts			34 to 72	ML or CL	40-50	10-30		0.19 to 0.21	7.2	7.4 to 8.4		
			Fine, montmorillonitic, thermic			<i>Total</i>		12.0							

Notes

- Information taken from the most-recent USDA soil survey for the area (1972), and/or Soil Survey Laboratory Data for Some Soils of California (Soil Survey Investigations Report No. 24), 1973. This soil survey generally does not distinguish areas smaller
- USCS = Unified Soils Classification System, commonly used in geotechnical or soil-foundation investigations, and in routine engineering geologic logging.
- Available Water Capacity = Held water available for use by most plants, usually defined as the difference between the amount of soil water at field capacity (one day of drainage after a rain or recharge event) and the amount at the wilting point.

Table 2. Summary of field measurements and water quality analyses, Roblar Road Quarry, Sonoma County, California

PARAMETER	UNITS	REPORTING LIMIT	MCL	Sampled Waters			
DESCRIPTORS				F061023001	F061023002	F061023003	F061023004
Lab I.D.				Americano Creek at Canfield Rd	Americano Creek at Roblar Rd	Ranch Tributary Outlet	Center Swale Spring Box
Site				N38.32396	N38.31723	N38.31429	N38.31579
Latitude, NAD27	degrees			W122.79627	W122.80852	W122.80812	W122.80017
Longitude, NAD27	degrees			260	115	118	455
Elevation, NGVD29	feet			Caltest	Caltest	Caltest	Caltest
Lab used				gp, mw	gp, mw	gp, mw	gp, mw
Sample collected by				yes	yes	yes	yes
Sample filtering							
FIELD MEASUREMENTS							
Date	MM/DD/YY			6/28/2005	6/28/2005	6/28/2005	6/28/2005
Time	HH:MM			10:30	11:30	11:50	15:00
Specific conductance (@ 25 C°)	umhos/cm			475	511	574	216
Conductance (@ field temp)	umhos/cm			386	431	504	179
Temperature	deg C			15.2	16.8	18.3	16.0
WATER QUALITY INDICATORS							
Alkalinity (total)	mg/L CaCO3	10		130	140	130	46
Hardness (total)	mg/L CaCO3	5		170	180	260	56
Hydroxide (OH)	mg/L	1.7		0	0	0	0
pH	pH Units	0.1	10.6	7.3	7.5	7.7	6.8
Specific conductance (@ 25 C°)	umhos/cm	10	1600	460	500	600	210
Total dissolved solids (TDS)	mg/L	10	1000	351	375	449	156
GENERAL MINERALS							
Bicarbonate (as CaCO3)	mg/L	12		160	170	150	56
Calcium (Ca)	mg/L	0.5		37	37	57	12
Carbodate (as CaCO3)	mg/L	6	120	0	0	0	0
Chloride (Cl)	mg/L	1	250	32	41	33	15
Iron (Fe)	mg/L	0.05	0.3	0.5	0.15	0.21	0
Magnesium (Mg)	mg/L	0.5		18	20	28	6.3
Manganese (Mn)	mg/L	0.005	0.05	0.048	0	0.012	0
Potassium (K)	mg/L	1		3.7	5	2.2	1.8
Sodium (Na)	mg/L	1		31	37	26	18
Sulfate (SO4)	mg/L	5	250	23	20	110	21
TITLE 22 PRIMARY STANDARDS, INORGANIC							
Aluminum (Al)	mg/L	0.05	1				
Antimony (Sb)	mg/L	0.006	0.006				
Arsenic (As)	mg/L	0.002	0.010				
Barium (Ba)	mg/L	0.1	1				
Beryllium (Be)	mg/L	0.001	0.004				
Cadmium (Cd)	mg/L	0.001	0.005				
Chromium (Cr)	mg/L	0.001	0.05				
Fluoride (F)	mg/L	0.1	1	0.24	0	0.27	0.29
Mercury (Hg)	mg/L	0.0002	0.002				
Nickel (Ni)	mg/L	0.01	0.1				
Nitrate as (NO3)	mg/L	1	45	10.6	7.5	9.3	13.7
Selenium (Se)	mg/L	0.005	0.05				
Thallium (Tl)	mg/L	0.001	0.002				
OTHER CONSTITUENTS							
Boron (B)	mg/L	0.1		0	0.38	0	0
Copper (Cu)	mg/L	0.01	1	0	0	0	0
Silica (as SiO2)	mg/L	1		53	42	41	55
Zinc (Zn)	mg/L	0.02	5	0	0	0	0
LAB CHECK							
Major Cations (Ca+Mg+K+Na+Fe+Mn)	meq/L	--	--	4.79	5.23	6.34	1.95
Major Anions (HCO3+CO3+Cl+SO4+F+NO3)	meq/L	--	--	4.76	5.09	6.38	2.22
Ion Balance (Cations/Anions)	--	--	--	1.01	1.03	0.99	0.88

NOTES

Observer key: mw = Mark Woyshner; gp = Gustavo Porras
 Lab results: 0 = not detected; blank value = not tested
 MCL = Title 22 Maximum Contaminant Level as of June 12, 2003; the MCL of Lead is the Regulatory Action Level

Table 3. Water levels measured on site, Roller Road Quarry, Sonoma County.

Description of monitoring station	Ground Water											Surface Water (for comparative purposes)				
	County Landfill Well R-1 (downgradient) ¹	County Landfill Well R-2 (upgradient) ¹	County Landfill Well R-3 (udowngradient) ¹	Dailey Borehole #3 ²	Dailey Borehole #4 ²	Dailey Borehole #5 ²	On Site Well #1	On Site Well #2	Center Swale Spring Box at Top of Wetland	Center Swale Shallow Piezometer at Bottom of Wetland	Center Swale Shallow Dugout Well	Center Swale Spring and Stock Pond	East Swale Upper Channel	Ranch Tributary Upper Riparian Corridor	Ranch Tributary Outlet	Americano Cr. at Canfield Rd.
GPS waypoint number	-- (feet)	-- (feet)	-- (feet)	-- (feet)	-- (feet)	-- (feet)	429 (feet)	417 (feet)	003 (feet)	412 (feet)	007 (feet)	418 (feet)	420 (feet)	-- (feet)	431 (feet)	407 (feet)
Well descriptors:																
Surface elevation	160	350	180	479	523	448	310	510	455	410	412	500	450	490	118	160
Stickup	0	0	0	0	0	0	0.77	0.78	0.5	0.44	1.25	--	--	--	--	--
Total depth	28	46	45	37	51	24	340	540	3	3	5.5	--	--	--	--	--
Depth to water:																
11/19/04	12.19	21.02	24.78	--	--	--	--	--	--	--	--	--	--	--	--	--
1/6/05	10.45	20.25	22.84	--	--	--	--	--	--	--	--	--	--	--	--	--
5/24/05	--	--	--	--	--	--	83.14	53.00	--	1.88	--	--	--	--	--	--
6/28/05	--	--	--	--	--	--	83.19	53.21	0.50	2.53	3.30	--	--	--	--	--
8/18/05	--	--	--	17	17	20.5	--	--	--	--	--	--	--	--	--	--
10/10/05	--	--	--	--	--	--	83.70	55.10	0.50	dry	3.10	--	--	--	--	--
Water-level elevation:																
11/19/04	147.81	328.98	155.22	--	--	--	--	--	--	--	--	500	450	490	118	160
1/6/05	149.55	329.75	157.16	--	--	--	--	--	--	--	--	500	450	490	118	160
5/24/05	--	--	--	--	--	--	227.63	457.78	--	408.56	--	500	450	490	118	160
6/28/05	--	--	--	--	--	--	227.58	457.57	455.00	407.91	409.95	500	450	490	118	160
8/18/05	--	--	--	462.00	506.00	427.50	--	--	--	--	--	500	450	490	118	160
10/10/05	--	--	--	--	--	--	227.07	455.68	455.00	--	410.15	500	450	490	118	160

Notes:

1. Reported in Pacific Geosciences, March 2005, Ground-water monitoring report for the Roller Landfill, Sonoma County, California
2. Reported in Dailey, 2005, Geotechnical/geological evaluation for EAR, proposed Roller Road quarry, Sonoma County, California.

Table 4. Estimated static seepage rate, Roblar Road Quarry, Sonoma County, California.

	Franciscan Greywacke/melange (KJfs) ²		Los Osos clay loam (weathered Franciscan Greywacke/melange)		Steinbeck loam (weathered Wilson Grove Formation)
	Mean	Maximum	Low at depth	High at depth	
Water level elevation in well #1 on site (feet) ¹	227	227	227	227	227
Water level elevation in well #2 on site (feet) ¹	456	456	456	456	456
Horizontal distance between wells #1 and #2 (feet)	1500	1500	1500	1500	1500
Ground-water gradient	0.12	0.12	0.12	0.12	0.12
Soil permeability (inches/hour) (Table 1) ³	--	--	0.06	0.2	0.63
Hydraulic conductivity (feet/second)	3.15E-07	8.38E-06	1.39E-06	4.63E-06	1.46E-05
Width of quarry seepage (feet) ⁴	1000	1000	1000	1000	1000
Depth of seepage (feet) ⁴	50	50	50	50	50
Seepage area (square feet) ⁴	50000	50000	50000	50000	50000
Seepage rate (cfs) ⁵	0.0019	0.05	0.01	0.03	0.09
Seepage rate (gpm) ⁵	1	23	4	12	39

Notes:

1. Measured by Balance Hydrologics staff on September 30, 2005.
2. Reported hydraulic conductivity in Landfill 1 delineation assessment report central disposal site, Sonoma County, California (Pacific GeoScience, 2005).
3. Miller, V.C., 1972, Soil Survey, Sonoma County: USDA and UC publication.
4. Estimated cross-sectional area below 400-foot elevation.
5. Rate estimated with Darcy's Law.

APPENDIX D

Biological Resources Appendix

**TABLE D-1
SPECIAL STATUS SPECIES CONSIDERED IN THE EVALUATION AT THE PROJECT SITE**

Common Name <i>Scientific Name</i>	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area
SPECIES LISTED OR PROPOSED FOR LISTING			
Animals			
Invertebrates			
California freshwater shrimp <i>Syncaris pacifica</i>	FE/CE	In low elevation, low gradient streams with moderate to heavy riparian cover; in shallow pools away from main streamflow.	Absent. Seasonal drainages in project area do not provide habitat. Marginal habitat may be present in Americano Creek, but this portion of the creek is typically dry in years during the summer and fall. Nearest known occurrence is in Blucher Creek 2 miles north of the project area (CNDDDB, 2007).
Fish			
Tidewater goby <i>Eucyclogobius newberryi</i>	FE/CSC CH ¹	Lagoons and estuaries along the coast of California.	Absent. Drainages in or adjacent to the project area do not provide suitable habitat. No records of species in project area streams. Nearest known occurrence in Estero Americano, approx. 7 miles downstream of project area.
Coho salmon - Central California coast ESU <i>Oncorhynchus kisutch</i>	FE/SE ² CH	Central California coastal drainages, including drainages of San Francisco Bay; streams with cover, cool water and sufficient dissolved oxygen. Require beds of loose, silt-free gravel for spawning.	Absent. Drainages in or adjacent to the project area do not provide spawning or rearing habitat. No records of species in project area streams.
Steelhead - Central California coast DPS <i>Oncorhynchus mykiss</i>	FT/-- CH	Central California coastal drainages, including drainages of San Francisco and San Pablo Bays; streams with cover, cool water and sufficient dissolved oxygen. Require beds of loose, silt-free gravel for spawning.	Low. Drainages in or adjacent to the project area do not provide spawning or rearing habitat. Infrequent records of steelhead occurring in Estero Americano, approx. 7 miles downstream of project area. No records of species in project area streams. Designated critical habitat for the species does not occur in the vicinity of the project area.
Chinook salmon- California coastal ESU <i>Oncorhynchus tshawytscha</i>	FT/-- CH	Central California coastal drainages; mainstem streams and rivers with cover, cool water and sufficient dissolved oxygen. Require beds of loose, silt-free gravel for spawning. Russian River and tributaries mark southern extent of this ESU.	Absent. Drainages in or adjacent to the project area do not provide spawning or rearing habitat and is outside the geographic range of the ESU. No records of species in project area streams. Designated critical habitat for the species does not occur in the vicinity of the project area.

¹ Critical habitat is designated only in San Diego and Orange counties.

² Only populations south of San Francisco Bay are currently listed as State Endangered, but populations north of San Francisco Bay have also been proposed for endangered status.

TABLE D-1 (continued)
SPECIAL STATUS SPECIES CONSIDERED IN THE EVALUATION AT THE PROJECT SITE

Common Name <i>Scientific Name</i>	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area
SPECIES LISTED OR PROPOSED FOR LISTING (cont.)			
Amphibians			
California tiger salamander <i>Ambystoma californiense</i>	FT/CSC PCH	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds and vernal pools.	Low. Aquatic and upland habitat present within the project area, but species was not found surveys between 2002 and 2007. Numerous known occurrences within 5 miles of project area; 2007 observation 1.1 m NE of quarry property boundary (CNDDDB, 2007).
California red-legged frog <i>Rana aurora draytonii</i>	FT/CSC ³ CH	Breeds in stock ponds, pools, and slow-moving streams.	Present. Center Pond within the project area supports species and provides potential breeding habitat. Frogs were observed in this pond in 2005 and 2007 (Fawcett, 2005; ESA, 2007).
Birds			
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	FC/CE	Nests in thick riparian forest growth of willow, often mixed with cottonwood and understory of blackberry, nettles or wild grape; usually in flood bottoms of larger river systems.	Unlikely. Last reported in Cotati area in 1975. Marginal habitat present along Americano Creek, but integrity of riparian vegetation has been extensively impacted by grazing practices and Roblar Road.
Plants			
Sonoma alopecurus <i>Alopecurus aequalis</i> var. <i>sonomensis</i>	FE/-/1B	Freshwater marshes and swamps; on banks with other wetland species in riparian scrub.	Unlikely. Steeply cut creek banks provide minimal wetland habitat.
Sonoma sunshine <i>Blennosperma bakeri</i>	FE/CE/1B	Vernal pools and swales in grassland.	Low. Seasonal wetlands on site are of artificial origin and are degraded; disturbance levels probably too high for this species to occur; not observed during past surveys.
Burke's goldfields <i>Lasthenia burkei</i>	FE/CE/1B	Vernal pools; seeps and meadows.	Low. Seasonal wetlands on site are of artificial origin and are degraded; disturbance levels probably too high for this species to occur; not observed during past surveys.
Pitkin marsh lily <i>Lilium pardalinum</i> ssp. <i>pitkinense</i>	FE/CE/1B	Mesic and freshwater marsh	Low. Seasonal wetlands on site are of artificial origin and are degraded, other grassland areas regularly disked; disturbance levels probably too high for this species to occur; not observed during past surveys.
Sebastopol meadowfoam <i>Limnanthes vincularis</i>	FE/CE/1B	Vernal pools, swales, mesic meadows, or marshy areas in grassland or valley oak savannah.	Low. Seasonal wetlands on site are of artificial origin and are degraded, other grassland areas regularly disked; disturbance levels probably too high for this species to occur; not observed during past surveys.

³ The April 2006 California red-legged frog final critical habitat ruling (USFWS, 2006) amended the geographic range for which this species is listed to reflect the entire range of the subspecies.

TABLE D-1 (continued)
SPECIAL STATUS SPECIES CONSIDERED IN THE EVALUATION AT THE PROJECT SITE

Common Name <i>Scientific Name</i>	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area
SPECIES LISTED OR PROPOSED FOR LISTING (cont.)			
North Coast semaphore grass <i>Pleuropogon hooverianus</i>	FSC/CT/1B	Wet grassy meadows and seeps, sometimes freshwater marsh; in usually shaded areas of broadleaved upland forest and north coast coniferous forest.	Unlikely. Combination of wetland/shaded forest habitat lacking on project site. Disturbance levels probably too high for this species to occur; not observed during past surveys.
Hickman's cinquefoil <i>Potentilla hickmanii</i>	FE/CE/1B	Mesic and freshwater marsh	Low. Seasonal wetlands on site are of artificial origin and are degraded, other grassland areas regularly disked; disturbance levels probably too high for this species to occur; not observed during past surveys.
Showy Indian clover <i>Trifolium amoenum</i>	FE/--/1B	Open sites and swales in grassland and coastal bluff scrub; sometimes on serpentine soils.	Unlikely. Optimal habitat lacking, disturbance levels probably too high; not observed during past surveys.
OTHER SPECIAL-STATUS SPECIES			
Animals			
Fish			
Russian River tule perch <i>Hysteroecarpus traskii pomo</i>	FSC/--	Require deep pools (> 3ft.) in streams with clear flowing water with abundant cover.	Absent. Streams in project area do not provide spawning or rearing habitat. No records of species in project area streams.
River lamprey <i>Lampetra ayresi</i>	FSC/--	Clean gravelly riffle necessary for spawning; ammocoetes require sandy stream edges or backwaters.	Absent. Streams in project area do not provide spawning or rearing habitat. No records of species in project area streams.
Hardhead <i>Mylopharodon conocephalus</i>	--/CSC	Streams with slow velocity; in clear deep pools with sand-gravel-boulder bottoms.	Absent. Streams in project area do not provide spawning or rearing habitat. No records of species in project area streams.
Amphibians			
Northern red-legged frog <i>Rana aurora aurora</i>	--/CSC	Generally near permanent water, but during non-breeding season can be found far from water in damp woods and meadows.	Absent. Range of the species extends from approximately the Russian River north. Not known from the Cotati area.
Foothill yellow-legged frog <i>Rana boylei</i>	FSC/CSC	Found in or near rocky streams in a variety of habitats, including valley-foothill hardwood, valley-foothill hardwood-conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types.	Low-Moderate. No suitable habitat present on the project site. Marginal habitat present in Ranch Tributary at southern border of project site. Not observed on site or vicinity (Fawcett, 2005). Recorded in Copeland and Crane creeks east of Rohnert Park (CNDDDB, 2007).
Reptiles			
Northwestern pond turtle <i>Emys (=Clemmys) marmorata marmorata</i>	FSC/CSC	Needs permanent or almost permanent water with basking sites.	Moderate. Stock pond on site provides suitable habitat. Not observed on site (Fawcett, 2005). Nearest known occurrence approx. 2.5 miles SE of project area (CNDDDB, 2007).

TABLE D-1 (continued)
SPECIAL STATUS SPECIES CONSIDERED IN THE EVALUATION AT THE PROJECT SITE

Common Name <i>Scientific Name</i>	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area
OTHER SPECIAL-STATUS SPECIES (cont.)			
Birds			
Cooper's hawk <i>Accipiter cooperi</i>	--/CSC	Nests in conifers or deciduous stands near riparian areas	Low-Moderate. Foraging habitat present. Potential nesting habitat in trees on site and in riparian area of Ranch Tributary, but species not very tolerant of human disturbance near nest sites.
Sharp-shinned hawk <i>Accipiter striatus</i>	--/CSC	Nests in forest canopy	Low-Moderate. Foraging habitat present. Potential nesting habitat in trees on site and in riparian area of Ranch Tributary, but species not very tolerant of human disturbance near nest sites.
Golden eagle <i>Aquila chrysaetos</i>	--/CSC	Nests in canyons and large trees in open habitats.	Low-Moderate. Foraging habitat present. Potential nesting habitat in trees on site.
Northern harrier <i>Circus cyaneus</i>	--/CSC	Mostly nests in emergent vegetation, wet meadows or near rivers and lakes, but may nest in grasslands away from water	Low. Foraging habitat present, but no nesting habitat on site (grassland nesting unlikely due to cattle grazing).
White-tailed kite <i>Elanus leucurus</i>	FSC/CSC	Nests in trees adjacent to grasslands, forages over grasslands and agricultural lands	Low-Moderate. Foraging habitat present. Potential nesting habitat in trees located in NE corner of project area.
Tricolored blackbird <i>Agelaius tricolor</i>	FSC/CSC	Colonial species; needs open water and insect foraging area within a few kilometers of colony.	Low. Habitat elements lacking at site. Record in Americano Creek approx. 5 miles west of project area.
Burrowing owl <i>Athene cunicularia</i>	FSC/CSC	Nests and forages in low-growing grasslands that support burrowing mammals.	Low-Moderate. Habitat present within the project area, including numerous ground squirrel burrows. Previously not recorded from area, but seen in 2002, approx. 7 miles NE of project area and in 2005 3 m SW of Petaluma (CNDDDB, 2007).
Oak titmouse <i>Baeolophus inornatus</i>	FSLC/--	Inhabits montane hardwood-conifer, montane hardwood, blue, valley, and coastal oak wood-lands, and montane and valley foothill riparian habitats.	Low-Moderate. Potential habitat is present on the property.
Lawrence's goldfinch <i>Carduelis lawrencei</i>	FSC/--	Preferred nesting habitat includes dense oak woodlands and riparian habitats.	Low-Moderate. The project site provides suitable nesting and foraging habitat.
California horned lark <i>Eremophila alpestris actia</i>	--/CSC	Nests and forages in short-grass prairie, mountain meadow, coastal plain, fallow fields, and alkali flats	Moderate. The project site provides suitable nesting and foraging habitat.
Loggerhead shrike <i>Lanius ludovicianus</i>	FSC/CSC	Scrub, open woodlands, and grasslands.	Moderate. The property provides suitable foraging and nesting habitat.
Allen's hummingbird <i>Selasphorus sasin</i>	FSC/--	Coastal scrub, valley foothill hardwood, and riparian habitats.	Moderate. May forage and nest on the property.

**TABLE D-1 (continued)
SPECIAL STATUS SPECIES CONSIDERED IN THE EVALUATION AT THE PROJECT SITE**

Common Name <i>Scientific Name</i>	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area
OTHER SPECIAL-STATUS SPECIES (cont.)			
Mammals			
Pallid bat <i>Antrozous pallidus</i>	--/CSC	Inhabits a variety of habitats ranging from desert scrub to grasslands to coniferous and mixed hardwood forests. In northern and central CA, associated primarily with oak woodlands. Feeds mostly on ground-dwelling arthropods.	Low to Moderate. Project area buildings and woodlands provide potential roosting habitat.
Pacific western big-eared bat <i>Corynorhinus townsendii townsendii</i>	FSC/CSC	Highly associated with mines and caves, found in a variety of habitats ranging from oak woodlands to mixed coniferous forests, to low desert scrub.	Low to Moderate. Project area buildings and structures provide potential habitat.
Greater western mastiff-bat <i>Eumops perotis californicus</i>	FSC/CSC	Primarily distributed along the western Sierra Nevada in all habitats with significant rock outcrops and formations.	Low. Project area buildings and structures provide marginal habitat.
Long-eared myotis bat <i>Myotis evotis</i>	FSC/--	Inhabits woodlands and forests up to approximately 8,200 feet in elevation, roosts in crevices and snags.	Low to Moderate. Habitat in project area is marginal; buildings and structures provide potential habitat.
Long-legged myotis <i>Myotis volans</i>	FSC/--	Inhabits a wide variety of habitats ranging from coastal forests to Joshua tree woodlands, day roosts in hollow trees and snags. Forages over open areas on moths, beetles and other flying insects	Low to Moderate. could use various habitats on project site
Fringed myotis bat <i>Myotis thysanodes</i>	FSC/--	Inhabits a variety of woodland habitats, roosts in crevices or caves, and forages over vegetation and along forest edges.	Low to Moderate. Project area buildings and structures provide potential habitat.
Yuma myotis <i>Myotis yumanensis</i>	FSC/--	Found throughout California, particularly associated with most low elevation reservoirs; forages on emergent aquatic insects over relatively still water.	Low to Moderate. Project area buildings and structures provide potential habitat. Could forage over stockpond.
American badger <i>Taxidea taxus</i>	--/CSC	Non-native grassland and rolling hills of grassland/ oak woodland.	Present. Rolling grasslands within the project areas support badger dens with signs of habitation. Observed in project area in 2003 (ESA, 2007a; CNDDDB 2007).
Plants			
Marsh milk vetch <i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i>	FSLC/--/4	Coastal dunes and coastal salt marshes	Unlikely. Preferred habitat not present on site; disturbance levels probably too high for this species to occur; not observed during past surveys.
Narrow-anthered California brodiaea <i>Brodiaea californica</i> var. <i>leptandra</i>	--/--/1B	Broadleafed upland forest, chaparral, lower montane coniferous forest	Unlikely. Suitable habitat not present on site; disturbance levels probably too high for this species to occur; not observed during past surveys.
Bolander's reed grass <i>Calamagrostis bolanderi</i>	FSLC/--/4	Mesic meadows and seeps, freshwater marsh	Low. Disturbance levels probably too high for this species to occur; not observed during past surveys.

TABLE D-1 (continued)
SPECIAL STATUS SPECIES CONSIDERED IN THE EVALUATION AT THE PROJECT SITE

Common Name <i>Scientific Name</i>	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area
OTHER SPECIAL-STATUS SPECIES (cont.)			
Fragrant fritillary <i>Fritillaria liliacea</i>	FSC/--/1B	Coastal scrub and prairie, grasslands, often on serpentine soils; 10 to 1350 feet	Unlikely. Preferred habitat not present on site; disturbance levels probably too high for this species to occur; not observed during past surveys.
Hayfield tarplant <i>Hemizonia congesta</i> ssp. <i>leucocephala</i>	--/--/3	Coastal scrub, valley and foothill grassland	Low. Preferred habitat not present on site; disturbance levels probably too high for this species to occur; not observed during past surveys.
Jepson's linanthus <i>Linanthus jepsonii</i>	FSC/--/1B	Open to partially shaded grassy slopes in chaparral and cismontane woodland; on volcanic soil or periphery of serpentine substrate	Unlikely. Habitat lacking on site; not observed during past surveys.
Marsh microseris <i>Microseris paludosa</i>	FSC/--/1B	Moist grassland or somewhat open areas of closed-cone coniferous forest, cismontane woodland and coastal scrub.	Unlikely. Habitat lacking on site; not observed during surveys.
Gairdner's yampah <i>Perideridia gairdneri</i> ssp. <i>gairdneri</i>	FSC/--/4	Wet meadows and vernal pools under <i>Pinus radiata</i> along the coast; mesic areas	Low. Preferred habitat not present on site; disturbance levels probably too high for this species to occur; not observed during past surveys.
California beaked-rush <i>Rhynchospora californica</i>	--/--/1B	Freshwater marshes, seeps and swamps	Low. Preferred habitat not present on site; disturbance levels probably too high for this species to occur; not observed during past surveys.
Round-headed beaked-rush <i>Rhynchospora globularis</i> var. <i>globularis</i>	--/--/2	Freshwater marshes and swamps	Unlikely. Habitat lacking on site; not observed during past surveys.
Santa Cruz clover <i>Trifolium buckwestiorum</i>	FSC/--/1B	Margins of coastal prairie, broadleaf upland forest, cismontane woodland	Low. Preferred habitat not present on site; disturbance levels probably too high for this species to occur; not observed during past surveys.

STATUS CODES:

FEDERAL: (U.S. Fish and Wildlife Service)

FE = Listed as Endangered (in danger of extinction) by the Federal Government.
 FT = Listed as Threatened (likely to become Endangered within the foreseeable future) by the Federal Government.
 FPT = Proposed for Listing as Threatened.
 FC = Candidate to become a *proposed* species.
 FSC = Federal Species of Concern. May be Endangered or Threatened, but not enough biological information has been gathered to support listing at this time.
 CH = Critical Habitat.
 PCH = Proposed Critical Habitat.

California Native Plant Society

List 1A= Plants presumed extinct in California
 List 1B= Plants rare, Threatened, or Endangered in California and elsewhere
 List 2= Plants rare, Threatened, or Endangered in California but more common elsewhere
 List 3= Plants about which more information is needed
 List 4= Plants of limited distribution

STATE: (California Department of Fish and Game)

CE = Listed as Endangered by the State of California
 CT = Listed as Threatened by the State of California
 CR = Listed as Rare by the State of California (plants only)
 CSC = California Species of Special Concern
 * = Special Animals
 3503.5=Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)

SOURCES: CNDDB (2007); CNPS (2005); ESA (2007); Golden Bear Biostudies (2003); Hickman (1993); Peterson (1990); Stebbins (1985); USFWS (2005); Zeiner et al. (1990).

APPENDIX E

Air Quality Appendix

Appendix E-1

**TABLE E-1
RECOMMENDED AB32 GREENHOUSE GAS MEASURES
TO BE INITIATED BY CARB BETWEEN 2007 AND 2012**

ID #	Sector	Strategy Name
1	Fuels	Above Ground Storage Tanks
2	Transportation	Diesel – Offroad equipment (non-agricultural)
3	Forestry	Forestry protocol endorsement
4	Transportation	Diesel – Port trucks
5	Transportation	Diesel – Vessel main engine fuel specifications
6	Transportation	Diesel – Commercial harbor craft
7	Transportation	Green ports
8	Agriculture	Manure management (methane digester protocol)
9	Education	Local gov. Greenhouse Gas (GHG) reduction guidance / protocols
10	Education	Business GHG reduction guidance / protocols
11	Energy Efficiency	Cool communities program
12	Commercial	Reduce high Global Warming Potential (GWP) GHGs in products
13	Commercial	Reduction of PFCs from semiconductor industry
14	Transportation	SmartWay truck efficiency
15	Transportation	Low Carbon Fuel Standard (LCFS)
16	Transportation	Reduction of HFC-134a from DIY Motor Vehicle AC servicing
17	Waste	Improved landfill gas capture
18	Fuels	Gasoline disperser hose replacement
19	Fuels	Portable outboard marine tanks
20	Transportation	Standards for off-cycle driving conditions
21	Transportation	Diesel – Privately owned on-road trucks
22	Transportation	Anti-idling enforcement
23	Commercial	SF ₆ reductions from the non-electric sector
24	Transportation	Tire inflation program
25	Transportation	Cool automobile paints
26	Cement	Cement (A): Blended cements
27	Cement	Cement (B): Energy efficiency of California cement facilities
28	Transportation	Ban on HFC release from Motor Vehicle AC service / dismantling
29	Transportation	Diesel – offroad equipment (agricultural)
30	Transportation	Add AC leak tightness test and repair to Smog Check
31	Agriculture	Research on GHG reductions from nitrogen land applications
32	Commercial	Specifications for commercial refrigeration
33	Oil and Gas	Reduction in venting / leaks from oil and gas systems
34	Transportation	Requirement of low-GWP GHGs for new Motor Vehicle ACs
35	Transportation	Hybridization of medium and heavy-duty diesel vehicles
36	Electricity	Reduction of SF ₆ in electricity generation
37	Commercial	High GWP refrigerant tracking, reporting and recovery program
38	Commercial	Foam recovery / destruction program
39	Fire Suppression	Alternative suppressants in fire protection systems
40	Transportation	Strengthen light-duty vehicle standards
41	Transportation	Truck stop electrification with incentives for truckers
42	Transportation	Diesel – Vessel speed reductions
43	Transportation	Transportation refrigeration – electric standby
44	Agriculture	Electrification of stationary agricultural engines

SOURCE: California Air Resources Board, September 2007a. Draft List of Early Action Measures To Reduce Greenhouse Gas Emissions In California Recommended For Board Consideration.

Appendix E-2

Crushed Stone Processing

Rock and crushed stone products are loosened by drilling and blasting, loaded by front-end loader into large haul trucks that transport the material to the processing operations. Processing operations include crushing, screening, size classification, material handling and storage operations. All of these processes can be large sources of PM10 emissions, if uncontrolled.

Quarried stone is dumped into hopper feeders, usually a vibrating grizzly type, or onto screens. The feeder or screens separate large stones from finer rocks that do not require primary crushing, thus, reducing the load to the primary crusher. Jaw or impactor crushers are usually used for initial reduction. The crusher product, larger diameter stones, and the grizzly undersize material are discharged onto a belt conveyor and usually are conveyed to a surge pile for temporary storage, or are sold as coarse aggregates.

The stone from the surge pile is conveyed to a vibrating inclined screen. This unit separates oversized rock from the smaller stone. The undersize material from the vibrating screen is considered to be a product stream and is transported to a storage pile and sold as base material. The stone that is too large to pass through the top deck of the screen is processed in the secondary crusher. Cone crushers are commonly used for secondary crushing (although impact crushers are sometimes used), which typically reduces material to about 1 to 4 inches. The material from the second level of the screen bypasses the secondary crusher because it is sufficiently small for the last crushing step. The output from the secondary crusher and the material from the secondary screen are transported by conveyor to the tertiary circuit, which includes a sizing screen and a tertiary crusher.

Tertiary crushing is usually performed using cone crushers or other impact crushers. Oversize material from the top deck of the sizing screen is fed to the tertiary crusher. The tertiary crusher output, which is typically about one inch, is returned to the sizing screen. Various product streams with different size gradations are separated in the screening operation. The products are conveyed or trucked directly to finished product bins, open area stockpiles, or to other processing systems such as washing, air separators, and screens and classifiers (for the production of manufactured sand).

Sand is also manufactured. This is a small-sized rock product with a maximum size of 3/16th inch. Crushed stone from the tertiary sizing screen is sized in a vibrating inclined screen (fines screen) with relatively small mesh sizes. Oversize material is processed in a cone crusher adjusted to produce small diameter material. The output is then returned to the fines screen for resizing. Facilities that use wet suppression systems (spray nozzles) to maintain relatively high material moisture contents can effectively control PM emissions throughout the process.

Air emissions were determined for the operation of the crushed stone processing units. The air emission calculations accounted for the proposed production level, the number, types, and size of equipment, and the type of material processed and emission controls, if any. The emission factors were determined using the methodology found in Section 11.19 of EPA's Compilation of Air

Pollutant Emission Factors (AP-42) (EPA, 2006a). **Table AQ-1** presents the emission factors for the stone processing operations. A substantial portion of the air emissions from gravel processing consists of heavy particles that may settle out within the plant area. The stacker belts (a total of four) have air emissions controls applied to them as does the plate feeder, the three crushers (one jaw and two cone), and the triple screen. Emissions are based on a production level of 300 cy per hour, 3,600 cy per day, and 570,000 cy per year.

**TABLE AQ-1
EMISSION FACTORS FOR AGGREGATE PROCESSING**

Emission Point	Number of Points	Uncontrolled Emission Factor (lbs/ton of material)	Controlled Emission Factor (lbs/ton of material)
Stacker Belt	4	0.0014	0.000048
Crushers	3	0.0024	0.00059
Screens (Three Deck)	3	0.015	0.00084
Plate Feeder	1	---	0.00010
Truck Unloading/Loading	3	0.000116	---

SOURCE: EPA, 2006a.

Fugitive sources include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic, and wind erosion from aggregate storage piles. The amount of fugitive emissions generated during the transfer of aggregate depends primarily on the surface moisture content of these materials.

Blasting Operations

Occasionally, rock is encountered that is too hard to push put of the hill with large equipment. In this case, the rock must be blasted with dynamite in order to fracture it and push it out of the hill. Twenty to 25 holes, approximately 40 feet deep are drilled into the rock and set charges to blast the rock. The charges are detonated sequentially over a time span of approximately 100 milliseconds to fracture the rock in place and allow the machinery to push it out. Usually only one or two blasts occur per month. Blasting is limited to daytime hours. The emission factors were calculated using the methodology found in the *Sonoma County Aggregate Resources Management Plan and Environmental Impact Report* (Sonoma County, 1994). The emission factor for the quantity of emissions (in pounds) per blast event is estimated using the following equation:

$$EF = 0.2 * 961 (A)^{0.8} / [(D)^{1.8} (M)^{1.9}]$$

where:

- EF = emission factor (lb emissions/blast)
- A = blast area (100 square feet)
- D = depth of blast (40 feet)
- M = moisture content (1.0 %)

Based on available data, the emission factor for blasting operations is 10 pounds of PM10 per blast.

MSHA rules require the use water injection when drilling to control drilling dust. Standard blasting practices using sequential delay timing schemes to generate effective rock fragmentation and vibration control will also minimize blasting dust. Quarry operators usually remove loose overburden to prevent dilution of mined rock, which also lessens the amount of fine material that can become airborne by blasting. If needed, during dry summer periods, water can also be sprayed onto blast areas to further mitigate dust. If these standard practices are committed to by the applicant and rigorously applied, it is unlikely that airborne dust from blasting will be a cause of concern¹.

Handling and Storage

Fugitive particulate matter emissions are expected from the handling and storage of raw materials from quarry processing. The methodology for the calculation of particulate emissions from the handling and storage of raw materials is described in AP-42 Section 13.2.4 (EPA, 2006b) for aggregate handling and storage piles. The quantity of dust emissions from aggregate handling and storage operations varies with the volume of aggregate passing through the storage cycle. The emission factor for the quantity of emissions per quantity of material is estimated using the following equation:

$$EF = k(0.0032) \frac{\left[\frac{U}{5} \right]^{1.3}}{\left[\frac{M}{2} \right]^{1.4}}$$

where:

EF	=	emission factor (lb emissions/ton material)
k	=	particulate size multiplier (PM10 = 0.35)
U	=	mean wind speed (5.5 mph)
M	=	material moisture content (0.7 %)

Based on available data, the emission factor for handling and storage activities is 0.0055 pounds of PM10 per ton of material processed (uncontrolled) and 0.00138 pounds of PM10 per ton of material processed (controlled). Weather data (wind speed) from <http://www.wrcc.dri.edu/summary> for Santa Rosa, California. To account for emission controls, a control efficiency of 75 percent was applied.

Wind Erosion

In addition to emissions from the handling of storage piles, EPA provides a methodology for calculating emissions from wind erosion of storage piles as documented in AP-42 Section 13.2.5 (EPA, 2006c). The emission factor for wind-generated particulate emissions is dependent on the frequency of disturbance of the storage pile and is expressed in units of grams per square meter (g/m²) per year. The following equations were used to calculate the emission factor.

¹ *Assessment of Rock Blasting Impacts and Recommended Practices for Proposed Roblar Quarry*, Revey Associates, Inc, November 2006.

$$EF = k \sum_{i=1}^N P_i$$

$$P_i = 58(u^* - u_t^*)^2 + 25(u^* - u_t^*); P_i = 0 \text{ for } u^* \leq u_t^*$$

$$u^* = 0.4 u_{10} / \ln(z / z_0)$$

where:

EF	=	emission factor (g/m ² /yr)
k	=	aerodynamic particle size multiplier (0.5) dimensionless
P	=	erosion potential (g/m ²)
N	=	number of disturbances (20 disturbances per year)
u^*	=	friction velocity (m/s)
u_t^*	=	threshold friction velocity (1.02 m/s) (AP42, 1995)
u_{10}	=	fastest mile wind speed (33 mph) for Santa Rosa, California
z	=	10 m
z ₀	=	0.1 m)

The basis of this methodology is that wind-blown dust from exposed areas will occur only when two conditions are met: the surface of the exposed area is disturbed and winds occur in excess of a threshold wind speed. Once the two conditions have been met, the emission factor is used to determine how much dust is generated. No more wind erosion occurs until the surface is again disturbed and the wind again exceeds the threshold speed. The calculation assumes the storage piles will be disturbed daily, when the 2-minute wind speed exceeds the threshold velocity of 23 mph. Based on meteorological data from Santa Rosa during June 2002 through May 2003², this occurred 20 days during the period.

Based on available data, the emission factor for handling and storage activities is 5.25 grams of PM10 per square meter of stockpile (uncontrolled) and 1.28 grams per square meter of stockpile (controlled). To account for emission controls, a control efficiency of 75 percent was applied.

Unpaved Roads

When a vehicle travels over an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed. The

² http://www.wrh.noaa.gov/total_forecast/index.php?wfo=mtr&zone=caz506&fire=caz205&county=cac097

emission factors were calculated using the methodology found in Section 13.2, Unpaved Roads of the EPA's AP-42 (EPA, 2006d). The equation for developing the emission factor is:

$$EF = k (S/12)^a (W/3)^b [(365-p)/365] (1-CE)$$

where:

k (PM ₁₀)	=	1.5 (empirical constant)
S	=	Silt content of 10% (use whole number value)
W	=	34 tons Mean vehicle weight of 34 tons, the average of empty and full
p	=	Number of days with measurable precipitation (74 days)
a	=	0.9 (empirical constant)
b	=	0.45 (empirical constant)
CE	=	Control efficiency rate of 75% (empirical constant)

Based on available data, the emission factor for unpaved roads is 3.80 pounds of PM₁₀ per vehicle mile traveled (uncontrolled) and 0.757 pounds of PM₁₀ per vehicle mile traveled (controlled). To account for emission controls, a control efficiency of 75 percent was applied. The number of days with measurable precipitation in Santa Rosa, California, were acquired from the Western Regional Climate Center's website, <http://www.wrcc.dri.edu/>. The project condition provides for 478 daily and 50,148 annual vehicle trips; each vehicle is presumed to be traveling a distance of one-sixteenth of a mile on an unpaved circulation area.

Diesel Generator

Since extending an electrical supply line to the site would be cost-prohibitive, a generator would supply the power for the processing plant. The generator would be diesel-powered and rated at 1006 horsepower.

All reciprocating internal combustion engines operate by the same basic process. A combustible mixture is first compressed in a small volume between the head of a piston and its surrounding cylinder. The mixture is then ignited, and the resulting high-pressure products of combustion push the piston through the cylinder. This movement is converted from linear to rotary motion by a crankshaft. The piston returns, pushing out exhaust gases, and the cycle is repeated. The emission factors were based on information contained within the manufacturer's specification sheet and EPA's AP-42 Section 3.4 (EPA, 1996).

Nonroad Equipment and Mobile Vehicles

The types of non-road equipment and motor vehicles at the project site would include loaders, dozers, and off-highway trucks (such as water trucks, rock trucks), haul trucks, pickup trucks, and employee vehicles. Emission factors for all equipment except haul trucks and employee vehicles were obtained from the California Air Resources Board's (CARB) OFFROAD model (CARB, 2006a) and its documentation and the databases prepared in its support. Emission factors for each equipment type were applied to the anticipated equipment work output (horsepower-hours of expected equipment use). Equipment horsepower, model year, expected lifetime, and hours of

operations were provided. The conservative assumption was made that all equipment would be operated simultaneously. Equipment was assumed to operate at the excavation pit and/or the processing plant as provided.

Emission factors for haul trucks and employee vehicles were obtained from the CARB EMFAC2007 (CARB, 2006b) model. The haul trucks were assumed to travel 24 miles each way between the facility and the aggregate markets. **Table AQ-2** presents the non-road equipment usage data. **Table AQ-3** presents the emission factors used for non-road equipment and motor vehicles. Of note, the emission factor account for equipment deterioration rates as equipment gets older. That is, a model year 2010 will have a higher emission rate in 2012 than in 2011.

**TABLE AQ-2
SUMMARY DATA FOR NON-ROAD EQUIPMENT**

Equipment Type	Model Year	Quantity	Load Factor	Daily Hours	Annual Hours	Average Size (horsepower)
Dozer	2003	1	0.59	10	2000	500
Dozer	2003	1	0.59	10	2000	470
Dozer (Winter Work)	2003	1	0.59	8	64	470
Loader	2003	1	0.55	10	2000	430
Loader	2003	2	0.55	10	2000	430
Loader (Winter Work)	2003	1	0.55	8	320	430
Water Truck	2003	1	0.57	10	2000	300
Rock Truck	2003	2	0.57	10	400	355

^a Per piece of equipment

SOURCE: Roblar Road Quarry, 2006; CARB 2006a

**TABLE AQ-3
EMISSION FACTORS FOR NON-ROAD EQUIPMENT AND MOTOR VEHICLES
IN 2007, 2016, AND 2027**

Equipment Type	Units	Reactive Organic Gases	Carbon Monoxide	Nitrogen Dioxide	PM10
2007					
Dozer	g/hp-hr	0.27	0.66	2.75	0.08
Loader	g/hp-hr	0.19	0.58	2.45	0.07
Off-Highway Truck	g/hp-hr	0.28	0.65	2.70	0.08
Diesel Haul Trucks	g/mile	0.875	4.79	16.8	0.656
Employee Vehicles	g/mile	0.180	4.28	0.417	0.0310
2016					
Dozer	g/hp-hr	0.29	0.67	2.79	0.08
Loader	g/hp-hr	0.27	0.62	2.59	0.08
Off-Highway Truck	g/hp-hr	0.28	0.65	2.70	0.08
Diesel Haul Trucks	g/mile	0.440	2.11	6.44	0.269
Employee Vehicles	g/mile	0.035	1.51	0.136	0.030
2027					
Dozer	g/hp-hr	0.29	0.67	2.79	0.08
Loader	g/hp-hr	0.26	0.61	2.52	0.08
Off-Highway Truck	g/hp-hr	0.28	0.65	2.70	0.08
Diesel Haul Trucks	g/mile	0.251	1.13	2.60	0.148
Employee Vehicles	g/mile	0.0100	0.683	0.054	0.0300

PM₁₀ = Particulate matter and particulate matter less than 10 micrometers in aerodynamic diameter

SOURCE: California Air Resource Board. 2006a. EMFAC2007 Version 2.3 and 2006b. OFFROAD2007, November 2006.

2. Dispersion Modeling Analysis

Dispersion is the process by which atmospheric pollutants disseminate due to wind and vertical stability. The results of a dispersion analysis are used to assess pollutant concentrations at or near an emission source. The results of an analysis allow predicted concentrations of pollutants to be compared directly to air quality standards and other criteria such as health risks based on modeled concentrations. Dispersion modeling allows one to assess future impacts when new state and federal regulations for diesel trucks are implemented.

A rising pollutant plume reacts with the environment in several ways before it levels off. First, the plume's own turbulence interacts with atmospheric turbulence to entrain ambient air. This mixing process reduces and eventually eliminates the density and momentum differences that cause the plume to rise. Second, the wind transports the plume during its rise and entrainment process. Higher winds mix the plume more rapidly, resulting in a lower final rise. Third, the plume interacts with the vertical temperature stratification of the atmosphere, rising as a result of buoyancy in the unstable-to-neutrally stratified mixed layer. However, after the plume encounters the mixing lid and the stably stratified air above, its vertical motion is dampened.

Molecules of gas or small particles injected into the atmosphere will separate from each other as they are acted on by turbulent eddies. The Gaussian mathematical model simulates the dispersion of the gas or particles within the atmosphere. The formulation of the Gaussian model is based on the following assumptions:

- The predictions are not time-dependent (all conditions remain unchanged with time)
- The wind speed and direction are uniform, both horizontally and vertically, throughout the region of concern
- The rate of diffusion is not a function of position
- Diffusion in the direction of the transporting wind is negligible when compared to the transport flow

The Gaussian dispersion model algorithm provides a simple analytical method of estimating downwind concentrations, where concentration is a function of several basic elements:

- Initial plume height (sum of the physical stack height and the plume rise)
- The source emission rate
- The horizontal and vertical plume distribution (based on atmospheric stability)
- The wind speed at source height
- The height of the receptor
- The off-centerline of the receptor
- The downwind distance from the source to the receptor

2.1 Dispersion Modeling Approach

Equipment and vehicles producing DPM emissions include mining equipment such as loaders, dozers, generator, and haul trucks. This section presents the methodology used for the refined dispersion modeling analysis of onsite equipment. This section addresses all of the fundamental components of an air dispersion modeling analysis including:

- Model selection and options
- Receptor spacing and location
- Meteorological data
- Source release characteristics

The dispersion modeling analysis estimated the ambient DPM concentrations resulting from project emissions and then determined the incremental cancer risk.

2.1.1 Model Selection and Options

The Industrial Source Complex-3 model (Version 02035) was used for the modeling analysis. This model is an appropriate choice for this analysis because it covers simple, intermediate, and complex terrain and can predict both short-term and long-term (annual) average concentrations. The model was run using the regulatory default options (stack-tip downwash, buoyancy-induced dispersion, final plume rise), default wind speed profile categories, default potential temperature gradients, no deposition or depletion of particulate matter, and no pollutant decay. Based on observations of the area and accepted methodologies (Auer, 1978) surrounding the project site, rural dispersion coefficients were applied.

2.1.2 Receptor Locations

Sensitive receptors such as residences, schools, and outdoor recreational areas near the proposed project were chosen as the receptors to be analyzed. A total of seven receptors were analyzed. Receptors were placed at a height of 1.8 meters (typical breathing height). Terrain elevations for receptor locations were used (i.e., complex terrain) based on available USGS information for the area.

2.1.3 Meteorological Data

The rate at which emissions are dispersed in the atmosphere depends upon the intensity of the ambient turbulence, the wind velocity, the position relative to obstacles in the flow field, and any dilutions attributable to the source itself. The most important factor leading to plume spread in the atmosphere is the amount of ambient turbulence. In a stable atmosphere, the horizontal and vertical turbulence is very limited. The plume remains near its emission height and undergoes minimal mixing. This situation is common during the nighttime and early morning hours. If the layer below the plume height becomes neutral to unstable, the plume mixes rapidly to the surface. This is known as a fumigation condition and can cause high concentrations. This occurs for short duration during the early morning. As heating of the surface persists, a fully unstable mixing layer develops, and the plume loops up and down in response to large-scale convective eddies. A neutral-stability atmosphere yields moderate amounts of turbulence and results in a cone-shaped

plume. Finally, if an inversion is present below the emission height, a lofting condition exists and the plume is cut off from ground-level impacts.

Stability class frequencies were calculated from the deviation of the horizontal wind direction. This method was used to categorize the stability class as a function of wind speed and time of day. Stability classes range from extremely unstable (A) to moderately stable (F). These classes are used in dispersion models to estimate how much a plume will spread over time and space. In general, the more stable the atmosphere, the less potential for plume spread, creating higher plume concentrations.

Surface meteorological data and upper air meteorological (mixing height) data from Valley Ford and Oakland, California³, respectively, were used for the modeling analysis. Meteorological data were obtained from BAAQMD and used for modeling impacts of the proposed project. Data from 2000 through 2003 were used and the meteorological year with the worst-case results was reported.

2.1.4 Source Release Characteristics

Onsite equipment was treated as area sources located within the property boundary of operations within the mining phases. Annual DPM emission rates were based on exhaust PM10 emissions from diesel onsite equipment and operational information. Emission rates were based on the CARB's OFFROAD2007 and EMFAC2007 emission models and reflect promulgated regulations concerning on-road and off-road vehicles and equipment. Operational information (types of equipment, equipment size, and hours of operation) was provided. The DPM emissions are approximately 96 percent of the emissions of exhaust PM2.5 from diesel-powered equipment (per EPA guidance); while PM2.5 is approximately 97 percent of the PM10 emissions. These sources were treated as area sources with a release height of 3.1 meters.

Source exhaust parameters for the diesel generator were assumed to be 6.1 meters in height, 718 degrees Kelvin for exhaust temperature, 120 meters per second for exhaust velocity, and a stack diameter of 0.20 meters (based on manufacturer specifications). The generator was assumed to be within the center of the processing plant.

To predict ambient concentrations of pollutants generated by vehicular traffic, emissions from vehicle exhaust systems were estimated with the CARB's emission factor model, EMFAC2007. It was assumed that the haul trucks traveling to and from the project site would primarily be diesel-powered heavy-heavy-duty trucks; although a portion of the fleet is medium-heavy duty. Emission factors for haul trucks were obtained from the EMFAC2007 model. Ambient conditions assumed a temperature of 85 degrees Fahrenheit (°F) and a humidity of 50 percent). Of note, DPM emission factors are not affected by meteorological conditions. The DPM dispersion modeling analysis used emission factors representing free flowing and idling vehicles. Emissions in future years were calculated by EMFAC2002, assuming the phasing in of new regulations and using default scrappage factors. Emission factors were based on a vehicle speed of 35 miles per hour. Emission factors for all other conditions were based on a vehicle speed equal to the speed limit.

³ http://ws1.baaqmd.gov/metdata/valley_ford.htm

Terrain elevations for emission source locations were used (i.e., complex terrain) based on available USGS information for the area.

3. Health Risk Assessment Calculations

The principal issues related to health risks from the project pertain to emissions of toxic substances from the exhaust of diesel trucks and equipment. The incremental risks were determined for these sources of toxic air contaminants as described above and summed to obtain an estimated total incremental carcinogenic health risk. The health risk assessment was conducted according to methodologies present in BAAQMD's Health Risk Screening Analysis Guidelines (BAAQMD, 2005).

In accordance with California Office of Environmental Health Hazard Assessment (OEHHA) guidelines (CalEPA, 2003), this was accomplished by applying the highest estimated concentrations of DPM at the receptors analyzed to the established cancer risk estimates and acceptable reference concentrations (RfC) for non-cancer health effects. The HHRA for this project utilized CARB Hotspot Analysis and Reporting Program (HARP)⁴ to determine the cancer risks and non-cancer health effects. HARP is a computer software package that combines the tools of emission inventory database, facility prioritization, air dispersion modeling, and risk assessment analysis.

The cancer risk is the probability of an individual developing cancer as a result of exposure to HAPs. The cancer risk based on a one-year exposure can be estimated by utilizing the cancer potency factor (mg/kg-day), the annual average concentration ($\mu\text{g}/\text{m}^3$), and the lifetime exposure adjustment.

The cancer risks are assumed to occur exclusively through the inhalation pathway; therefore, the cancer risks can be estimated from the following equation:

$$\text{Dose} = \sum C \cdot \text{DBR} \cdot \text{EF} \cdot \text{ED} \cdot (10^{-6}) / (\text{AT})$$

Where:

Dose	Dose through Inhalation (mg/kg-day)
C	Annual average concentration ($\mu\text{g}/\text{m}^3$) (from previous equation) during the 70 year exposure period
DBR	Daily Breathing Rate (L/kg-day)
EF	Exposure Frequency (days/year)
ED	Exposure Duration (years)
AT	Averaging Period over which exposure is averaged (25,550 days or 70 years)

$$\text{Cancer Risk} = \text{Dose (mg/kg-day)} \cdot \text{Cancer Potency (kg-day/mg)} \cdot (10^6)$$

⁴ On December 9, 2006 after a one year grandfathering period, the AERMOD model replaced ISC3 as EPA's preferred regulatory model (EPA, 2005). The current version of HARP (Version 1.3) (CARB, 2003) uses the ISC3 dispersion tool. CARB has recognized this disconnection with EPA's preferred regulatory model and has developed a Converter (to converts air dispersion files (e.g., AERMOD and ISC3) into text files that can be imported into the HARP) and it was released to the public as a beta version on April 30, 2007.

The Hazard Index is an expression used for the potential for non-cancer health effects. The relationship for the non-cancer health effects is given by the annual concentration ($\mu\text{g}/\text{m}^3$) and the Reference Exposure Level ($\mu\text{g}/\text{m}^3$). The chronic reference exposure level for DPM was established by the California OEHHA as $5 \mu\text{g}/\text{m}^3$.

The relationship for the non-cancer health effects is given by the following equation:

$$\text{HI} = \text{C}/\text{REL}$$

where,

HI_{DPM}	Hazard index; an expression of the potential for non-cancer health effects.
C_{DPM}	Annual average DPM concentration ($\mu\text{g}/\text{m}^3$) during the 70 year exposure period
REL_{DPM}	Reference exposure level (REL); the concentration at which no adverse health effects are anticipated.

The cancer risk and health index are determined by pollutant and then totaled for comparison with the significance thresholds.

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APPENDIX F

Noise Appendix

APPENDIX F-1

Assessment of Rock Blasting Impacts –
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**ASSESSMENT OF ROCK BLASTING IMPACTS AND
RECOMMENDED PRACTICES FOR PROPOSED
ROBLAR ROAD QUARRY
SONOMA COUNTY, CALIFORNIA**

November 2006

Prepared for:
ENVIRONMENTAL SCIENCE ASSOCIATES

Prepared by:
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Highlands Ranch, CO

REVEY Associates, Inc.

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ATTACHMENT 1 – ISEE INDUSTRY BLAST MONITORING STANDARDS

1.0 INTRODUCTION AND SCOPE

North Bay Construction, Inc. (Applicant) is proposing to develop and operate a rock quarry on a 198.76-acre parcel of land at 7601 Roblar Road in Southern Sonoma County, located approximately five miles west of the City of Cotati (see Figure 1: Site Location Map). A preliminary investigation of rock at this site (J.H. Dailey, 2002) indicates it contains a substantial source of moderate to hard Franciscan Sandstone and other hard volcanic basalt and andesite rock. High-quality aggregates produced from these formations could service area construction markets for many years. For identification purposes, the proposed operation would be called the Roblar Road Quarry.

On October 9, 2005, Gordon F. Revey (author) inspected the proposed site of the Roblar Road quarry. A representative from Environmental Science Associates (ESA) accompanied the author and pointed out where planned excavations would be located at the site. Locations of adjacent agricultural structures, residences, roadways, the closed Sonoma County Landfill site, utilities and other facilities in the area, along with the topography of the site, were also studied during this site visit. Other materials that were reviewed in the course of this evaluation include: plans submitted by the Applicant, various County documents related to the application, Geological studies of the site, and Comments regarding Submitted Plans. Project related references and other general technical references referred to in the text of this report are listed in the References Section (6.0) of this report.

In order to acquaint the reader with the physical science of blast effects, including ground vibration and air-overpressure (noise), short technical summaries about physical blast effects are included in the body of this report. A review of proposed blasting operations and specific evaluations of their potential impacts is also included and in some instances additional mitigation controls are proposed.

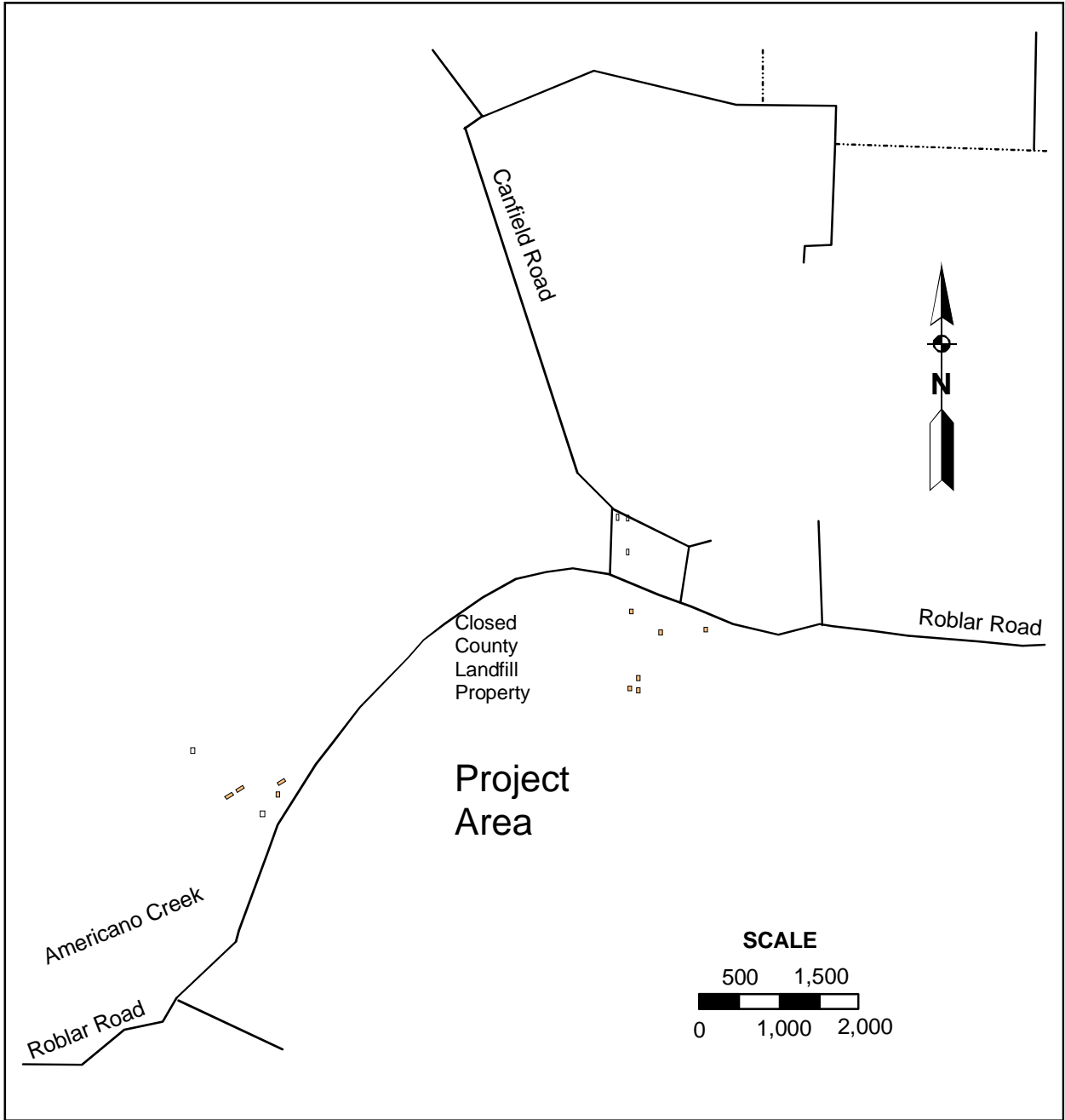


Figure 1.0 – Roblar Road Quarry Site Location Map

2.0 BLASTING CONCERNS AND IMPACTS

Following is a listing of identified blasting concerns and issues. They are not listed in any particular order based on importance or other criteria.

1. Impacts on water resources including surface water, ground water and neighboring wells and aquifers.
2. Security of explosive materials.
3. Damage to neighboring structures including but not limited to residential property, agricultural structures, and buried utilities.
4. Impacts on domestic and wild animals.
5. Disturbances caused by blast-induced vibration and noise.
6. Control of blast dust and fumes.
7. Nitrate and ammonia contamination of soil and water resources by blasting chemicals.
8. Stability of adjacent rock and soil slopes.
9. Concern about blast-induced flying rock and debris.
10. Impacts of blasting of adjacent landfill cells.

All identified concerns are evaluated in Section 4.0 of this report.

3.0 BLAST EFFECTS, DAMAGE CRITERIA AND HUMAN RESPONSE

Before analyzing potential impacts of the specific blasting operations proposed at the Roblar Road site, the following pages and subsections 3.1 through 3.6 provide a general technical review of the physical effects of blasting, prediction methods, damage criteria, and human response.

When explosive charges detonate in rock, they are designed so that most of the energy is used in breaking and displacing the rock mass. However, some of the energy can also be released in the form of transient stress waves, which in turn cause temporary ground vibration. Detonating charges also create rock movement and release of high-pressure gas, which in turn induce air-overpressure (noise), airborne dust and audible blast noise.

In the very-near zone, crushing usually occurs in the rock around the charge. The extent of this compressive and shear failure zone is usually limited to one or two charge radii (half the diameter of the charge). Beyond the plastic crushing zone, the rock or ground is temporarily deformed by elastic strain waves. For some distance, tangential strain intensity exceeds the rock's strength and new fractures are created. The magnitude of dynamic strain and particle motion decreases as distance from the charge increases. Radial cracks are created in rock around detonating charges as a result of induced strain that exceeds the rock's tensile strength. These cracks generally do not extend farther than 26 charge radii. For instance, if the diameter of the charge is 5 inches, radial cracks might extend 65 ($5/2 \times 26$) inches into adjacent rock.

3.1 Vibration Ground Waves

Within and beyond the cracking zone, stress waves spread through the rock mass and along the ground surface. Some waves pass through the "body" of the rock mass. Primary compression waves and shear waves are examples of body waves. Other surface vibration waves travel along the ground surface similar to the way waves travel along the surface of water. In an ideal isotropic and homogenous rock mass, wave energy would travel evenly in all directions. However, most rock masses are far from ideal, so wave energy is reflected, refracted and attenuated by various geological and topographical conditions. The elastic properties of rock greatly influence vibration magnitude and attenuation rate. When seismic waves pass through the ground, ground particles oscillate within three-dimensional space. Soon after blasting has stopped, vibration energy dissipates and the ground particles become still.

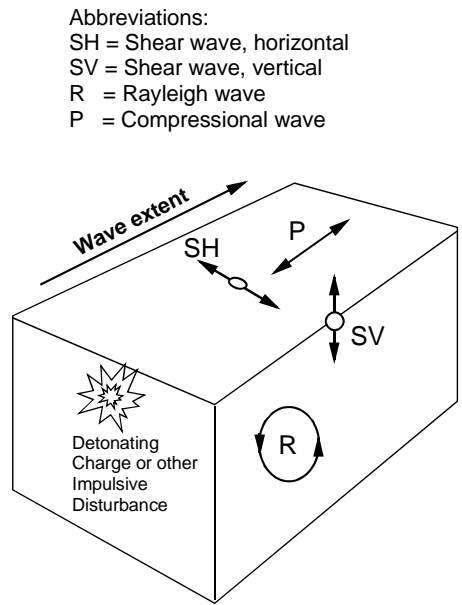


Figure 3.1 – Typical Vibration Waves

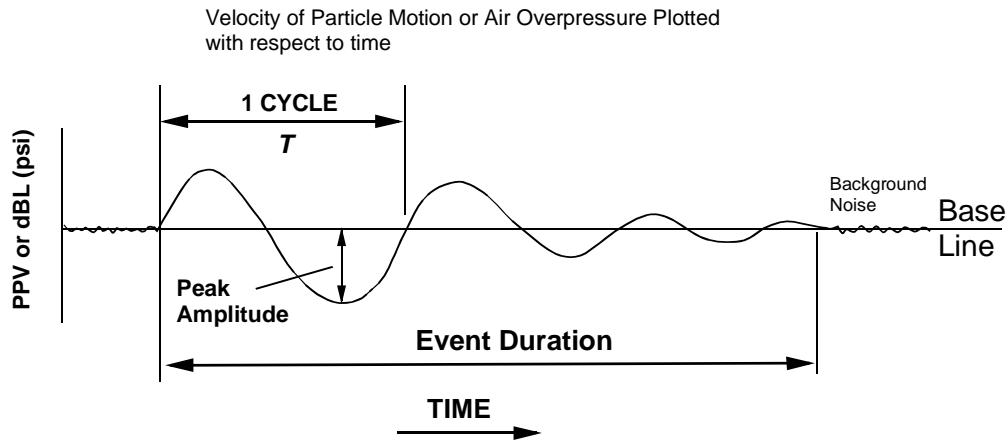


Figure 3.2 – Idealized Vibration or Air Overpressure Time—Intensity History Plot

The intensity of ground motion can be measured in several ways. These measures include:

- Particle displacement
- Particle velocity
- Particle acceleration
- Vibration frequency

Displacement is a measure of ground particle travel distance or location with respect to time. Particle velocity measures the speed of movement and acceleration is the rate of velocity changes. Vibration frequency is a measure of how many oscillations a ground particle makes per second of time. Frequency is reported in units of Hertz (Hz), which is equivalent to cycles per second.

3.2 Vibration Perception and Damage Criteria

The average person is quite sensitive to ground motion, and levels as low as 0.50 mm/s (0.02 in/s) can be detected by the human body when background noise and vibration levels are low. A curve plotting intensities of ground motion and motion frequencies that would not cause cosmetic cracking in drywall and plaster-lath walls is shown in Figure 3.3. Vibration intensity is expressed as Peak Particle Velocity (PPV), which is simply the maximum speed that the ground moves while it temporarily shakes. Since ground-shaking speeds are very small, it is measured in inches per second (in/s). Frequency of motion or cycles per second is a measure of how many times a particle of ground moves back and forth (or up and down) in one second of time. Frequency is expressed in units of Hertz (Hz).

The “Safe PPV Limits” for various frequencies of ground recommended by the US Bureau of Mines (Siskind et al, 1980), are shown by the curves in Figure 3.3. These limits, usually applied in most California jurisdictions, are specifically intended to protect typical wood frame homes. Significantly higher PPV limits, ranging from 5.0 to 20 in/s, are used to protect buried pipes and other heavy civil structures.

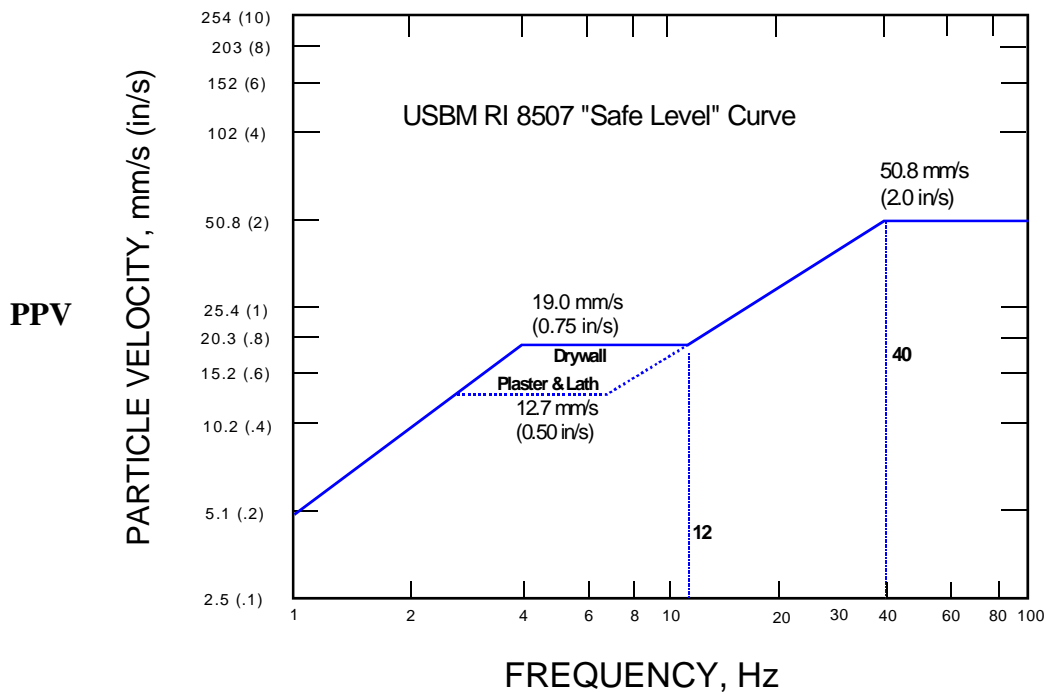


Figure 3.3 -- USBM “Safe Level” vibration curve from RI 8507

3.3 Blast Noise (Air-Overpressure)

The term “Blast noise” is a misleading because the largest component of blast-induced noise occurs at frequencies below the threshold-of-hearing for humans (16 to 20 Hz). Hence, the common industry term for blast-induced noise is “air-overpressure”. As its name implies, air-overpressure is a measure of the transient pressure changes. These low-intensity pulsating pressure changes, above and below ambient atmospheric pressure, are manifested in the form of acoustical waves traveling through the air. The speed of sound varies in different materials, depending on the density of the medium. For instance, pressure waves travel at the speed of 4,920 ft/s (1,500 m/s) in water, whereas, in air they travel at only 1,100 ft/s (335 m/s) because air has a lower density.

When calculating maximum overpressure values, the absolute value of the greatest pressure change is used — regardless of whether it is a positive or negative change. The frequency of the overpressure (noise) is determined by measuring how many up-and-down pressure changes occur in one second of time. Blast noise occurs at a broad range of frequencies and the highest-energy blast noise usually occurs at frequencies below that of human hearing (<20 Hz).

3.4 Air-Overpressure Measurement Scales

When measurements include low frequency noise (2 Hz and higher) with a flat response, they are called "linear scale" measurements. Air-overpressure measurements are typically expressed in decibels (dB) units and when the scale is linear, the unit designation is “dBL.” Regular acoustical noise measurements taken for the purpose of monitoring compliance with local noise ordinances almost always use weighted scales that discriminate against low frequency noise. Thus for a similar noise source, A-weighted and C-weighted scales will usually record significantly lower levels of noise. Differences between decibel scale measurements for individual blasts will vary depending on their unique frequency-intensity spectrums. Since full-range recording of blast-induced noise can only be done with linear (2-Hz response) instruments, it is imperative that all compliance specifications for blast-induced noise be expressed in “Linear” scale decibels (dBL).

In a study by USBM, researchers measured blast-induced noise a common location using A-weighted, C-weighted and Linear Microphones. The comparable measurements taken about 800 feet from a blast, shown in Figure 3.4, show that a linear peak noise of 120 dBL equates to only 112 dBC and 85 dBA. For blasts at the Roblar Road site, where closest neighboring structures are 600 feet away, the peak linear-scale noise would be around 122.5 dBL. $[120-20 \text{ Log } (600/800)]$ ($OP_x = OP_1 - 20 \text{ log}_{10} (R_x / R_1)$).

Note that differences for individual blasts will vary depending on their unique frequency-intensity spectrums. Since full-range recording of blast-induced noise can only be done with linear scale instruments, it is imperative that all compliance specifications be expressed in linear scale (dBL).

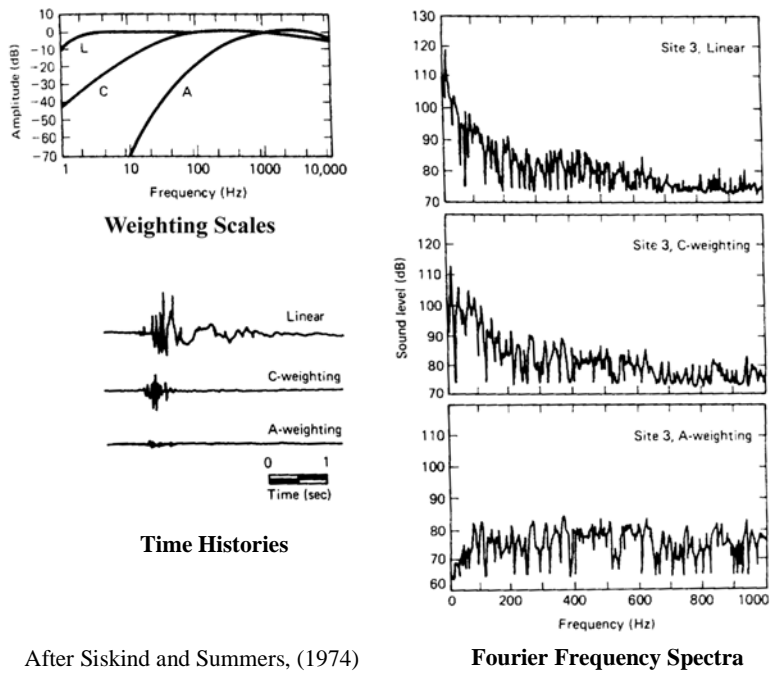


Figure 3.4 -- Effects of Weighted Filtering on Air-overpressure Records

The regulatory limit defined by USBM, in State of California regulations, for air-overpressure measured with 2-Hz response seismographs is 133-dBL (0.014 psi). Damage to old or poorly glazed windows does not occur until air-overpressure reaches about 150 dBL. More importantly, since the decibel scale is a logarithmic ratio, the actual overpressure at 150 dBL is 0.092 psi, versus 0.013 psi at 133 dBL. Therefore, the actual pressure at the 133 dBL limit, is over seven times (0.0917/0.0129) lower than the threshold damage level at 150 dBL. The relationships between actual overpressure expressed in psi and decibel scale measurements are shown in the following Equations. NOTE: Due to the logarithmic ratios used to decibel values, seemingly small changes in decibel readings can equate to large changes in absolute overpressure (psi).

$$dB = 20 \text{Log}_{10} \left(\frac{P}{P_o} \right) \quad \text{or} \quad P = P_o 10^{\left(\frac{dB}{20} \right)} \quad \text{Equation 3.1}$$

Where: dB = decibels, P = overpressure (psi), P_o = Threshold of Human Hearing Pressure (20 microPascals or 2.9 x 10⁻⁹ psi).

3.5 Blast Vibration Intensity Predictions

It is standard practice to use scaling relationships to predict vibration intensities at various distances. These relationships, based on similitude theory, are used to develop empirical relationships between ground vibration particle velocity, charge weight, and distance. Distance is scaled by dividing it by the square root of the maximum charge weight firing at any time within a blast. This single scaled distance variable can then be used to predict vibration intensity (PPV). The scaling relationship between peak-particle-velocity (PPV) and scaled distance (D_s) is shown below in Equation 3.2.

$$PPV = K \left(\frac{D}{\sqrt{W}} \right)^m \quad \text{or} \quad PPV = K (D_s)^m \quad \text{Equation 3.2}$$

- Where:
- PPV = Peak Particle Velocity (in/s)
 - D = Distance (ft)
 - W = Maximum Charge-weight-per-delay (lb)
 - K = Rock Energy Transfer Constant (K-Factor)
 - m = Decay Constant
 - D_s = Scaled Distance (m-kg^{-0.5})

Site-specific constants, **K** and **m**, can be determined by performing a regression analysis of multiple peak particle velocity (PPV) and D_s data pairs. In simple terms, for any given site, **K** is a measure of how much vibration energy is transferred to the ground near the explosive charge and **m** defines how fast the energy attenuates with distance.

A sample regression curve that was recently prepared by the author to support blasting controls for an upcoming subway project in New York City is shown in Figure 3.4. When plotted in log-log scale, the exponential relationship between scaled distance and PPV generally follows a straight line with a negative slope (**m**) -- usually around -1.6, and Y-intercept (**K**) values varying between 960 and 26, as defined by Oriard (1972). The **K** value (amount of energy at the source) is higher when charges are more confined and/or rock has a high stiffness ratio (Young's modulus of elasticity).

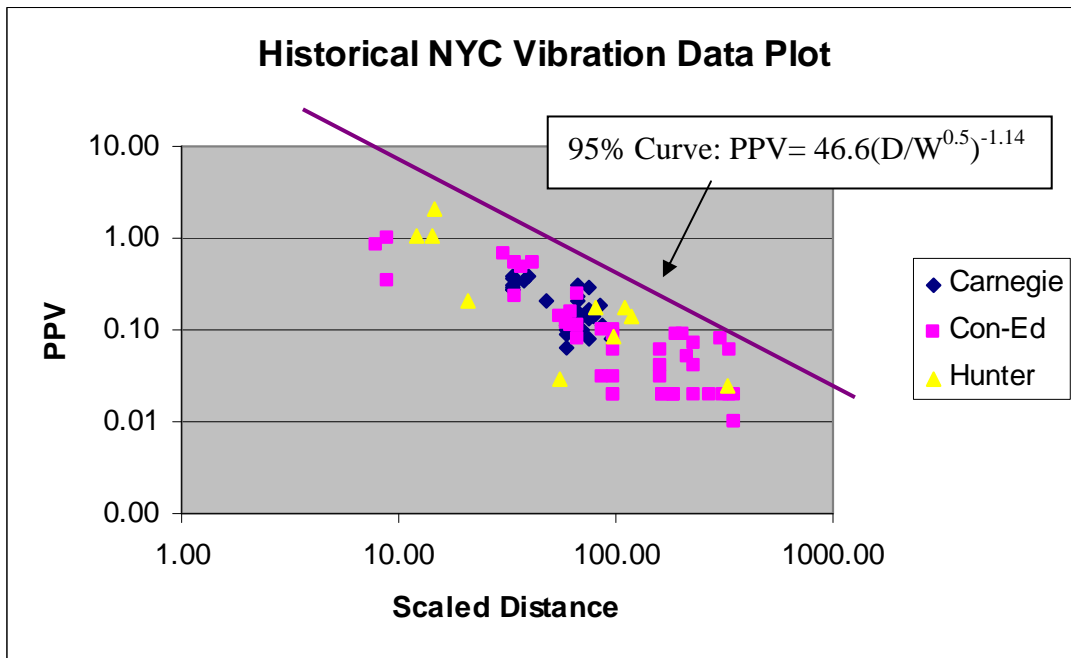


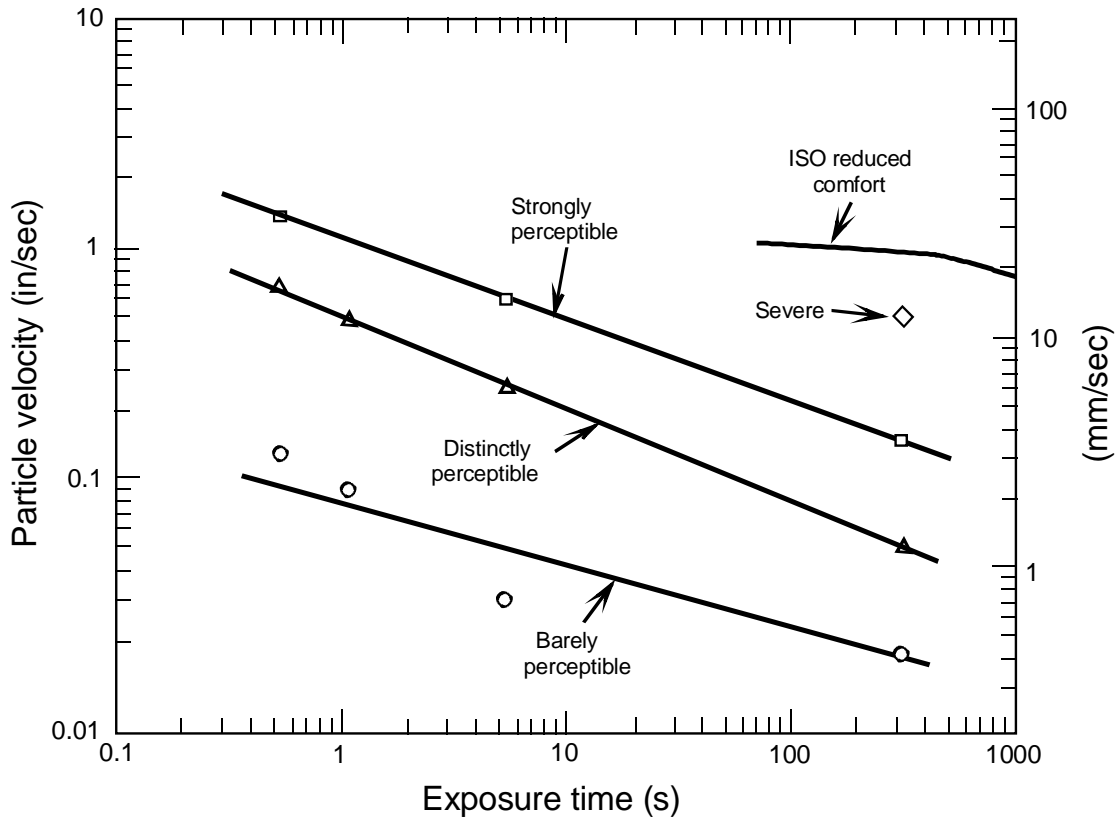
Figure 3.4 – Historical NYC Scaled Distance—PPV Data from Blasting at Carnegie Hall, the Con-Edison Shaft at 36th Street and 1st Avenue and foundation blasting at Hunter College at between 38th and 39th Streets (NOTE: the 95% curve means that 95 percent of the time, predicted values will be lower than the value calculated).

When site-specific historical data is not available, the *K* factor value can be estimated based on physical rock properties and degree of blast confinement. From the author’s past experience, for blasts in the hard Franciscan Sandstone and other igneous rock formations at the Roblar Road site, a prediction equation with a *K* factor of 240 can be used to predict vibration intensities (PPV) at various locations of concern. With this cautiously high *K*-factor, predicted levels of vibration will likely be higher than actual values measured at similar scaled distances. The resulting prediction equation, which is used in the site-specific evaluations in Section 4 of this report, is shown Equation 3.3 below.

$$PPV = 240 \left(D / \sqrt{W} \right)^{-1.6} \quad \text{Equation 3.3}$$

3.6 Human Response to Transient Vibrations

In addition to concerns about vibration damage, under certain conditions, humans and animals can be startled or annoyed by blast-induced ground vibration. Research has also shown that the human response to transient vibration--like those caused by blasting--varies depending on exposure time and the intensity of the motion. Response curves defining how humans respond to transient vibrations based on these variables are shown in Figure 3.5.



Human response to transient pulses of varying duration after Wiss and Parmalee (1974)

Figure 3.5 – Human Response to Transient Vibration

4.0 IMPACTS OF BLASTING AT THE PROPOSED ROBLAR ROAD QUARRY SITE

In the following sections, potential effects of blasting are analyzed and where appropriate, practical and proven mitigation measures are recommended.

The preliminary blast plan details described by the Applicant's representative (Hummer, 2004) indicates explosive charges would be stemmed by at least 8 feet of clean crushed stone stemming. Blasting information in the Applicant's Surface Mining and Reclamation Plan indicates that one or two blasts, typically having 20 to 25 holes, would occur monthly. Holes would be spaced on 10-foot centers and drilled to a maximum depth of 30 feet. Since it is generally recommended to confine charges with stemming of height equal to or greater than 20 charge-diameters, an appropriate maximum diameter of blastholes for this proposed quarry would be around 5 inches (8 x 12 / 20).

Assuming four feet of extra drilling is done below the 30-foot bench floors (sub-drilling) the maximum explosive column in a 34-foot-deep hole, stemmed with 8 feet of crushed stone would be 26 feet. The use of an Ammonium Nitrate and Fuel Oil blend (ANFO) is described in the mining plan for use in dry holes. For wet holes, packaged or pumped emulsion explosives having appropriate water resistance can be used in place of bulk ANFO. Pumped emulsion explosives carry a higher weight of charge compared to use of bulk explosives. As a worst-case scenario, it is assumed for this study that pumped emulsion explosives are used. Using this assumption, the maximum weight of a single 26-foot charge would be around 275 pounds ($5^2 \times 1.24 \times 0.34 \times 26$). It should be noted that charge weights at the eastern edge of the mining area would likely need to be reduced to 100 or so pounds to ensure peak ground motions do not exceed 0.5 in/s. For practical blasting purposes, the single charge in a 34-foot hole could be separated into two or three individually delayed charges, separated by stemming, to ensure the maximum charge weight-per-delay in 5-inch holes is appropriate for vibration control.

For the purposes of the evaluations done in this report, it is also assumed that the applicant would not drill blastholes with diameter greater than 5-inches and the maximum-charge-per-delay would not exceed amounts necessary to ensure vibration levels (PPV) do not exceed safe levels shown in Figure 3.3. Note that for vibration and air-overpressure prediction purposes, the impact of various delay-timed charges is not considered cumulative unless the delay time between sequentially fired charges is less than 8 milliseconds.

4.1 Impacts on Water Resources

From the author's experience at many other blasting operations throughout the United States, concerns about blasting impacts on water resources have involved physical damage to existing water wells, reservoirs, springs and aquifers or chemical contamination of ground water. A discussion of these potential physical and chemical impacts at the Roblar Road site follows.

Physical Damage to Water Resources

In a study (RI 7901, 1983) conducted by the US Bureau of Mines (USBM), researchers set up tests designed to determine the maximum zone of physical rock damage zone that can occur

around blastholes. In this study, core logs, borehole periscopes, permeability tests and various other measures were used to determine the extent of blast damage to adjacent rock not fragmented and removed by blasting.

Data from the study indicated that the extent of localized blasthole damage in the form of radial cracking is generally a function of radial charge diameter, explosive type, and rock characteristics. In one test, the fracturing produced around 6½ -inch-diameter blastholes, loaded with bulk ammonium nitrate /fuel oil (ANFO) was measured and it was found that the maximum cracking extended 26 charge radii.

At the Roblar Road site, the maximum fracture radius for the assumed 5-inch blastholes, at 26 charge radii, would likely not exceed 65 inches or 7.3 feet. Since all off site water wells and other utility lines are located much farther than the limits of ground rupturing, it is not physically possible that they could be damaged by blast-induced ground fracturing.

Using a conservative assumption that a potential private well would be located at the nearest residence (600 feet northeast of the edge of the mining area), the resultant intensity of ground motion for blasting with charge-per-delay not exceeding 100 pounds would be around 0.34 in/s ($240 (600/100^{0.5})^{-1.6}$). Vibratory motion of this intensity in the ground near wells would have no impact on the condition of the aquifers that feed them or on the quality or quantity of the water produced by the well. For perspective, a ten-foot increase in the height of water in the well would create a greater more pressure than the transient pressure caused by vibration waves of this intensity.

Chemical Contamination of Ground Water and Surface Water

Most commercial explosives contain 70 to 94% ammonium nitrate, by weight. If substantial amounts of explosives were spilled or incompletely detonated, rainwater would cause some amount of ammonia and nitrate to leach out and go onto into the ground. Over time, leached ammonia and nitrates would penetrate into ground water and can possibly be washed by rainwater over the ground surface and into surface and ground water resources. The U.S. EPA ambient water quality criterion is 0.02-mg/L free-ammonia and the drinking water criterion for nitrate as nitrogen ($\text{NO}_3^- \text{N}$) is 10-mg/L.

At the Roblar Road site, if best industry standards of care concerning clean-up procedures are used to recover any spilled explosives materials like ANFO or emulsion slurry explosives, and charges are adequately primed with cast-booster primers, losses of ammonia and nitrates to ground water or flowing surface water would not even be measurable. The author has visited many existing quarries with operating conditions similar to that of the proposed Roblar Road quarry, and knows of no substantial water contamination incidents at these operations, many of which have operated for over 20 years.

4.2 Security of Explosive Materials

In this day and age, it is quite normal and expected for residents to express concerns about the security of explosive materials. To ensure that explosive materials are indeed properly secured during transport and use, industry groups and government agencies have cooperatively developed laws and standard practices used in all operations throughout the United States. In March, 2003 the Safe Explosives Act was enacted, which hereby requires background checks for all persons that handle, use, or have access to explosive materials. The act also requires all explosive users to obtain a federal blasting license issued by the Bureau of Alcohol Tobacco and Firearms (ATF).

The Applicant has indicated that no explosives would be stored on the site, so on-site storage permits would not be required and issues regarding overnight explosives storage would not apply.

Since most quarry blasting in the State of California is now done by sub-contractors, it is presumed that in this case a blasting contractor would deliver adequate quantities of explosives to the site on days when blasting is planned. All unused explosives and detonators would be returned to the blasting contractor's secure offsite magazines at the end of each day that blast occurs.

As required by Department of Transportation (DOT) rules, explosive materials would be delivered in specially built vehicles marked with United Nations (UN) hazardous materials placards. Explosives and detonators are delivered in separate vehicles or they are separated in compartments meeting DOT rules within the same vehicle. Vehicles contain at least two 10-pound Class-A fire extinguishers and all sides of the vehicles display placards displaying the UN Standard hazard code for the onboard explosive materials. Drivers must have commercial drivers licenses (CDL) with Hazmat endorsements, and drivers must carry bill-of-lading papers detailing the exact quantities and code dates of transported explosives or detonators. Once explosives are delivered to the blasting site, the licensed blaster-in-charge is responsible for directly overseeing their security. The blaster-in-charge must have adequate experience and successfully pass a licensing test verifying their knowledge of blasting methods, rules and safety procedures.

In the State of California, CalOSHA administers the testing and licensing of blasters and the California Highway Patrol establishes safe explosive transport routes and oversees all DOT rules enforcement.

If all these rules and procedures are rigorously followed, similar to the thousands of similar deliveries made daily to other quarry sites throughout the US, explosive materials could be safely transported to and from this site without incident.

4.3 Impacts to Neighboring Homes, Pipes, other Structures and Earthen Slopes

In response to a question from the County Permits and Resource Management Department (PRMD) concerning vibration limits, the Applicant's representative (Hummer, 2004) responded that blast-induced ground motion shall not exceed 2.0 in/s near any private off site structure. While this limit might be appropriate to protect well-constructed buildings with brick or concrete walls, it is not an appropriate limit for older off-site wood-frame dwellings. Most city and state regulations, in accordance with the low-frequency PPV limits suggested by the US Bureau of Mines (RI8507), limit ground motion to 0.5 in/s at wood-frame structures. Moreover, from the author's experience, occupants of homes could vigorously object to ground motion exceeding 0.5 in/s at any frequency.

As shown in Figure 4.1, at the nearest residence would be located about 600 feet northeast of the proposed mining area where rock-blasting operations might occur. At this distance, to ensure that that the intensity of ground motion does not exceed the reasonable 0.5 in/s limit, the author recommends all blasting should be designed to assure that charges are sized to maintain a scaled distance (D_s) of 65 or greater. With this limitation, maximum cumulative weight of any charges firing within any 8-milliseconds time period should not exceed 85.2 pounds $[(600/65)^2]$. This limitation could be achieved if the applicant used delay-decked charges in 5 inch holes or reduced hole-size or the height of benches.

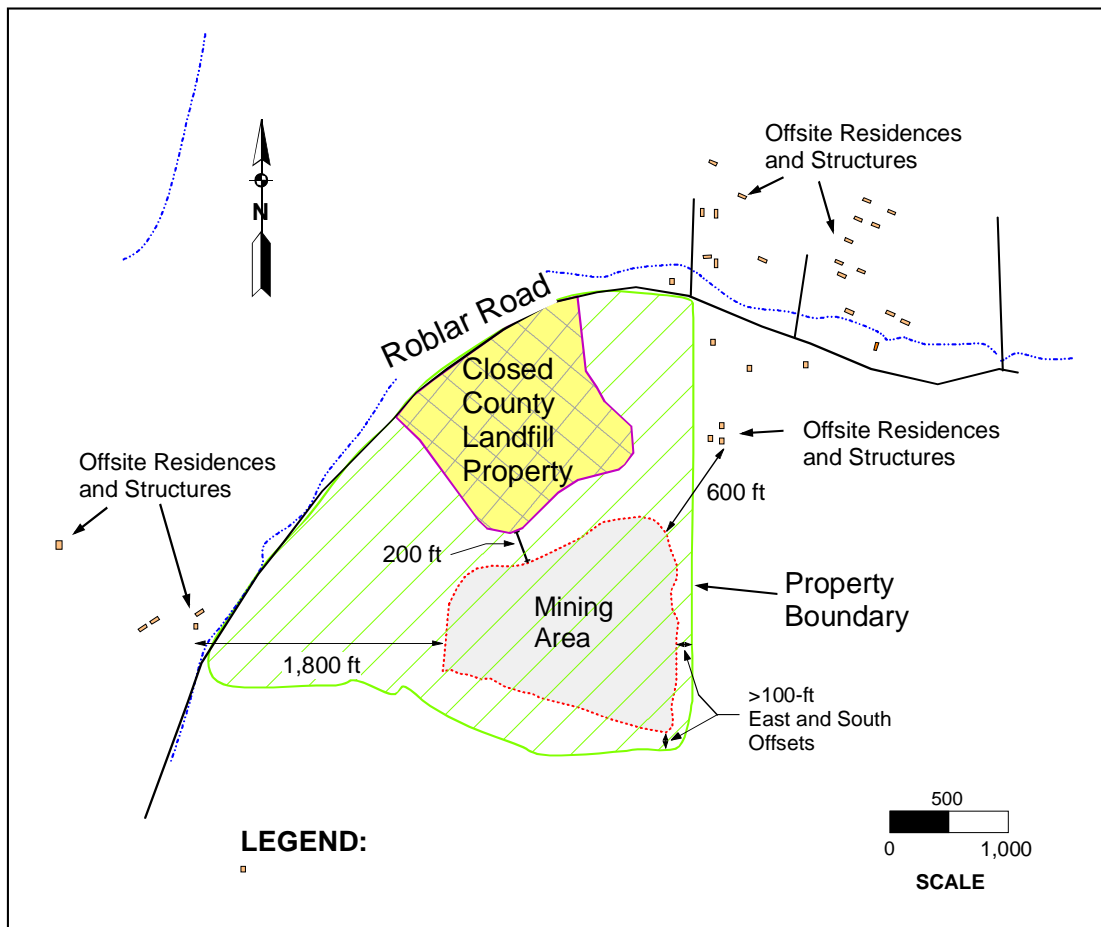


Figure 4.1 – Roblar Road Mining Area and Nearby Structures of Concern

Impact to Earthen or Rock Slopes adjacent to Roblar Road

Concern may be expressed that blast-induced vibration may cause liquefaction of soils in slopes adjacent to Roblar Road. This occurrence would be extremely unlikely because at the closest distance of 1,100 feet between blast areas and Roblar Road soil slopes, and an assumed maximum charge-per-delay of 275 pounds, the scaled distance would be $66.3\text{-ft}\cdot\text{lb}^{-0.5}$ ($1,100 / 275^{0.5}$), which would exceed the liquefaction threshold level of $10\text{-ft}\cdot\text{lb}^{-0.5}$ by more than a factor of six times.

With no need for further analysis, it can be concluded that blasting, conforming to the described limits, would not damage any structures, utilities, and earthen or rock slopes near the proposed Roblar Road mining area.

Impact to Buried Pipes or Utilities at Nearby Residences

Presuming that pipes and other utility lines are located at or near the closest residence located 600 feet northeast of the proposed mining area, peak ground motion in ground near utilities for blasts where charges would be sized to meet a minimum scaled distance of 65, would likely not exceed 0.30 in/s [$240(65)^{-1.6}$]. Motion of this intensity is far below the cautious 5.0-in/s -limit recommended by the US Bureau of Mines (RI 9523) to expressly protect buried pipes of any construction and condition. Therefore, blasting vibrations would likely have no impact on buried pipes or utilities at nearby residences.

Air-overpressure and Flyrock Control

In the submitted Mining Plan the Applicant has proposed limiting Air-overpressure to 130 dBL, which is less than the 133-dBL limit recommended by the US Bureau of Mines. In this case, intensities of air-overpressure (blast noise) for 5-inch charges, stemmed with at least 8 feet of crushed stone stemming, would likely not exceed 122.5 dBL at distances of 600 feet and greater (See calculation in Section 3.4, p. 7). Using 8-feet of crushed stone stemming to confine 5-inch charges would also assure that excessive rock movement (flyrock) does not occur and the improved charge confinement would limit gas-pressure losses, which would certainly improve overall rock fragmentation.

The onset of potential air-overpressure damage (broken or loosened glass window panes) does not occur until air-overpressure exceeds 145 dBL. In real pressure terms, expected air-overpressure level of 122.5 dBL generates a pressure of 0.00387 psi, which is 13.4 times lower than the 0.052-psi pressure at 145 dBL. If The Applicant applies the recommended stemming controls, and consistently measures air-overpressure with intensities less than the proposed 130-dBL limit at nearby structures, it is extremely unlikely that any damage or annoyance would result from blast-induced air-overpressure.

4.4 Human and Animal Impacts

As established in the prior section, respective vibration and air-overpressure intensities at the nearest off-site properties are not expected to exceed 0.30 in/s and 122.5 dBL.

Human Response to Blasting

Since the duration of quarry blasts rarely exceed two seconds, the Wiss-Curves (see Figure 3.5) indicate that ground vibration, at the nearest offsite dwelling, with levels around 0.09 in/s would be in the barely perceptible range. Since Cal-OSHA Rules limit blasting to daytime hours when ambient levels of background noise and vibration are high, neighbors to the blasting would most often not even know it has occurred.

Impacts on Animals

While visiting the site, the author observed pastureland, where domestic animals may feed or range, on adjacent properties. Accordingly, some neighbors might express concerns about potential blasting impacts on domestic and wild animals. Several years ago the author participated in a controlled study regarding the impacts of blasting on a variety of animal species conducted by animal biologists at the Washington Park Zoo in Portland, Oregon. In this study, researchers evaluated the effects of nearby (as close as 500 ft) blasting noise and vibration on black rhinos, naked mole rats, elephants, spotted owls, snow leopards, red pandas and several other species (Hall et al, 1998). Elephants were specifically chosen for this study because they are known to communicate at infrasonic noise frequencies below human hearing range. The black rhinos were studied because zookeepers were concerned that blasting might aggravate the problems with a pair that was unsuccessful at breeding during the year prior to the construction work. The physiological effects of blasting were evaluated by measuring the level of the stress hormone (cortisol) found in animal scat, before and after blasting. In addition, for the first six blasts, the physical reactions of the tested animals were observed when blasting occurred. The intensity of blast-induced ground motion in this study was as high as 0.68 in/s, which is more than six times higher than the 0.11-in/s level expected at nearest off-site range areas.

Maximum air overpressure for this blasting was about 130 dBL (Linear scale) and ground motion reached about 0.25 in/sec, which are both much higher than levels expected for the blasting at the Roblar Road Quarry. The researchers noted that the tested animals noticed the first blast or two; however, they quickly acclimated to the noise and vibration. Additionally, the black rhinos mated successfully for the first time while construction was occurring on the tunnels. In their final conclusions, the researchers found that the tested animals experienced no long-term negative effects from the levels of noise and vibration produced by the construction blasting.

From the authors' personal experience, white-tailed deer were observed, on many occasions, within several hundred feet of an open-air explosive testing range at the Reynolds Plant of the former Atlas Powder Company in Tamaqua, Pennsylvania. The peak air overpressures, during unconfined explosive tests, at that distance often exceeded 145 dBL. When blasts were detonated

the deer might casually lift their heads and look toward the test site. However, they never ran away or appeared otherwise bothered by the loud noise. It was obvious that, like the animals at the Metro Washington Park Zoo in Portland, the deer had become acclimatized to the blasting noise.

For the past five or so years, the author was involved in several expansion projects at the County of Sonoma California Central Disposal Site in Petaluma, CA, where blasting regularly occurred within 1,000 feet of dairy cows. Measurements in the cow pastures indicated that respective blast noise and vibration levels were as high as 0.08 in/s and 128 dBL, which are similar in scale to levels anticipated for the proposed Roblar Road Quarry. Despite initial concerns by the dairy operators, all involved parties have now concurred that blasting did not disturb the cows.

Based on the referenced studies and observations of the author at many other projects, blasting at the Roblar Road Project would have little or no impact on domestic or wild animals near the site or on neighboring properties.

4.5 Control of Dust

MSHA rules require the use water injection when drilling to control drilling dust. Standard blasting practices using sequential delay timing schemes to generate effective rock fragmentation and vibration control would also minimize blasting dust. Quarry operators usually remove loose overburden to prevent dilution of mined rock, which also lessens the amount of fine material that can become airborne by blasting. If needed, during dry summer periods, water can also be sprayed onto blast areas to further mitigate dust. If these standard practices are committed to by the applicant and rigorously applied, it is unlikely that airborne dust from blasting would be a cause of concern.

4.6 Impacts on Soil Resources

Some small amounts of blasting agents, which in quarries is typically ammonium nitrate pellets mixed with fuel oil (ANFO), is lost to the ground by spillage or wind blowing it during loading. The amount of nitrates released to the ground by these losses is typically not toxic to any flora or fauna in an agricultural environment like that near the Roblar Road site. Wind-blown ANFO dust that lands on the ground surface effectively becomes fertilizer for plants that convert it to other natural matter through photosynthesis. If The Applicant applies good practices for minimizing spillage, concentrations of nitrates or ammonia in soils would not be harmful or even noticeable.

4.7 Impacts on the Closed Sonoma County Landfill

The County and others have expressed concern that blast-induced vibrations could influence the ground beneath and adjacent to the closed landfill cells (the landfill cell closest to the proposed quarry is located approximately 400 feet north of the edge of the quarry).. Concern has also been

expressed that methane gas generated from decomposing waste might be transmitted through rock crevices and create a threat of potential gas-explosions.

In the responses to PRMD question regarding blasting impacts on the landfill site, the Applicant's representative (Hummer, 2004) has indicated that drill holes would be monitored with a methane gas detection device in the area of the old landfill cells. No distance or minimum methane limits are defined. Several years ago the author developed controls for quarrying and construction blasting conducted very close to landfill cells at the current Sonoma County Waste Management Facility in Petaluma, CA. For that blasting, at times done within 50 feet of waste fill locations, methane monitoring was required for all blastholes within 1,000 feet of waste filled areas.

Standard testing devices, like those commonly used in underground coal mines or gassy mines, can be used to perform this testing. If blastholes intersect methane gas pockets or formations that produce methane, these test instruments can accurately detect its presence. Since concentrations of methane in air that are combustible range from 4 to 15%, it would certainly be safe and reasonable to allow blasting when measured levels of methane do not exceed the 0.1 percent minimum trace level allowed to escape to the air by the Bay Area Air Quality Management District. Moreover, since natural concentrations of methane are not expected in the Franciscan sandstone formations, methane monitoring could be done at the collars of blastholes closest to the existing buried waste areas. For this site, it is extremely unlikely that methane above the proposed 0.1 percent limit would be detected in any drilled holes. However, for caution it would be reasonable to test methane at hole-collars of six holes drilled closest to the landfill site for all blasts located within 1,500 feet of the existing waste storage cells.

Blast induced ground motion in ground above, below, and surrounding the waste cells, at a distance of 400 feet would be around 1.5 in/s. It is important to note that at closer distances, the frequency of ground vibration would be relatively high, which is important because elastic ground displacement is inversely proportional to frequency. In perspective, this site has been earthquake proofed by the 1989 Loma Prieta quake that created motions and displacements many times greater than those that would be caused by blasting. For comparison, peak motions exceeding 13 in/s at frequency of 1 Hz were caused by the Loma Prieta Quake at nearby monitoring locations. Assuming motions at this site were only 5.0 in/s at 1 Hz, the peak ground displacement would have been around 0.8 inches [$5 / (2 \times 3.14 \times 1) = PPV / (2 \times \pi \times f)$]. Blast motions caused by point-source charges, at a distance of 400 feet would occur at a frequency of 30 Hz and probably much higher. At a peak particle velocity of 1.5 in/s, the peak elastic ground displacement would be around 0.012 inches, which is over 60 times less than the movement the fill-site has already survived during the Loma Prieta Quake. Hence, if charge weight-per-delay does not exceed 275 pounds, it is extremely unlikely that blast-induced ground motion would have any impact whatsoever on the four existing buried waste cells or on the ground around them.

Leachate pipes and/or water quality monitoring wells are on the closed landfill property are located within 350 to 400 feet of the proposed mining area. If charge-per-delay is limited to ensure peak particle velocities do not exceed 5.0 in/s at these pipes and wells, it is unlikely that any damage would occur. At the closest distance of 350 feet, the maximum charge allowed to ensure ground motion of 5.0 in/s would not be exceeded would be over 900 pounds. However, this would not occur because much smaller charges would be needed to ensure with the much smaller PPV limits that would apply to the residential homes. Hence, due to the residential vibration requirements, ground motions at the wells and leachate pipes would be far below levels of concern.

5.0 CONCLUSIONS

If the Applicant adopts the practices and limitations already planned and accepts the additional limitations proposed in this report, the author finds no issues that could prevent the execution of safe and environmentally compliant blasting operations at the Roblar Road Quarry.

If mining does occur, to ensure compliance with regulated and proposed blasting limitations the Applicant should monitor ground vibration and air-overpressure at a minimum of two locations for each blast. One location should be at or close to the nearest residential property. Second monitoring points should include the landfill area and other structures of concern. All monitoring equipment and practices should conform to standards developed by the Vibration Section of the International Society of Explosive Engineers (ISEE), as shown in Attachment I.

6.0 REFERENCES

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ATTACHMENT 1

ISEE BLAST MONITORING STANDARDS

INDUSTRY BLAST MONITORING STANDARDS

The following standards should be applied when measuring blast-induced vibration and air-overpressure (noise). These standards are based on the best practices recommended by The Vibration Section of the International Society of Explosives Engineers – 1999.

Part 1. General Guidelines

1. Operators: Only personnel who have successfully completed a proper training course should operate monitoring equipment.
2. Calibration: The instrument manufacturer should annually calibrate recording units and sensors. Documenting certificates should be kept on file and copies should be provided to appropriate persons upon request.
3. Event Record Keeping: Hard copy reports and electronic file-copies of all event-monitoring records should be maintained for all blasts. Operating notes should be programmed into the instruments, which should be printed monitoring records. These notes at a minimum should include the operator's name, date, time, place and other pertinent data specific to the monitoring location.
4. Trigger Levels: When employing instruments to operate in auto-trigger-mode, trigger levels should be set low enough to record blast effects. If expected levels of blast noise or vibration do not exceed minimum trigger levels, the instrument should be attended by an operator and turned on manually.
5. Documenting Monitor Location: In addition to event reports, an accurate method should be used to determine the monitoring location for later reference. Acceptable methods are 1) plotting numbered locations on scaled maps; 2) defining location with GPS northing, easting and elevation values; and 3) noting the name of the structure and the measured distance (+/- 1 ft) where the seismograph was placed relative to at least two identifiable reference points. Any person should be able to locate and identify the exact monitoring location at a future date.
6. Distance to Blast: The horizontal distance from the seismograph to the blast should be known to at least two significant digits. For example, a blast within 1000 feet would be nearest tens of feet and a blast within 10,000 feet would be measured to the nearest hundreds of feet. Where the vertical-to-horizontal ground slope ratio exceeds 2.5 to1, slant distances or true distance should be used and recorded in the monitoring records.
7. Processing Time: When instruments are used in auto-trigger and continuous-recording mode to record the effects of multiple blasts, the time between successive blasts shall be at least one (1) minute and seismographs shall be set to NOT automatically print out event records. These procedures should ensure that instruments have adequate time to save event data for each blast and reset to monitoring mode before subsequent blasts occur.

8. Memory Management: The instrument operator should know the memory or record capacity of the seismograph and ensure that adequate memory is available to store the event data from the blast(s) planned during that operating day.
9. Waveform Data: Instruments shall be set to save full waveform data for all monitored blast and digitally saved event files shall contain this data for use in further analyses if needed.
10. Instrument Setup Time: Equipment operators should allow ample time for proper setup of the seismograph, transducers and microphones. At least 15 minutes of time should be allotted for each setup location.
11. Securing cables: In order to prevent false triggering caused by wind-blown cables, the operator should secure suspended or freely moving cables from the wind or other extraneous sources.

Part II. Ground Vibration Monitoring

A. Sensor Placement

The sensor should be placed on or in the ground on the side of the structure towards the blast. A structure can be a house, pipeline, telephone pole, etc. Measurements on driveways, walkways, and slabs are to be avoided where possible.

1. Location relative to the structure: The sensor should be placed within 10 feet of the structure or less than 10% of the distance from the blast, whichever is less.
2. Soil density evaluation: The operator should avoid placing velocity transducers in loose or low-density soils. The density of the ground should be greater than or equal to the sensor density.
3. Sensor Level: Transducers should be placed so they are level or nearly level.
4. Sensor Orientation: Sensor blocks should be oriented so the arrow indicating the longitudinal direction is aimed at the blast location.
5. Monitoring when Access to Nearest Structure is not Accessible: Where access to a structure is not available, the transducers should be placed at the accessible location closest to the structure of concern and in line with the blast.

B. Sensor coupling

1. Sensor Coupling Methods: Based on expected acceleration determined from Chart 1, to avoid decoupling errors, the operator shall use the following methods to couple vibration transducers to the ground or structure.
 - a. Less than 0.2 g: No burial or attachment is necessary.

- b. Between 0.2 and 1.0 g: Transducer should be attached to the ground with a spike or covered with a sand bag.
- c. Greater than 1.0 g: Transducer should be buried, bonded to the ground or structure with stiff clay or putty, or some other method that should achieve firm attachment.

TABLE 1 – Acceleration intensity (g's) based on estimated particle velocities and frequencies

	Maximum Frequency (Hz or cycles-per-second)										
	4	10	15	20	25	30	40	50	100	150	200
PPV (in/s) at Acc. (g) ≥ 0.2	3.08	1.23	0.82	0.62	0.49	0.41	0.31	0.25	0.12	0.08	0.06
PPV (in/s) at Acc. (g) ≥ 1.0	15.38	6.15	4.10	3.08	2.46	2.05	1.54	1.23	0.62	0.41	0.31

- 2. Sensor Burial: When velocity transducers are buried the operator should employ the following methods.
 - a. Excavate a hole that is no less than three times the height of the sensor (ANSI S2.47-1990, R1997).
 - b. If possible, spike the sensor to the bottom of the hole.
 - c. Firmly compact soil around and over the sensor.
- 3. Attaching Sensors to bedrock or hard Structural Surfaces:
 - a. Bolt, clamp or use epoxy or putty to firmly couple the sensor to the hard surface.
 - b. The sensor may be attached to the foundation of the structure if it is located within +/- 1-foot of ground level (USBM RI 8969). This should only be used if burial, spiking or and bagging is not practical.
- 4. Other sensor placement methods: Use other methods as described below if disturbance of the ground is not possible.
 - a. Cover transducers with sand bags loosely filled with about 10 pounds of sand. When placed over the sensor the sandbag profile should be as low and wide as possible with a maximum amount of firm contact with the ground.
 - b. A combination of both spiking and sandbagging gives even greater assurance that good coupling is obtained.

C. Programming considerations

Site conditions dictate certain actions when programming the seismograph.

- 1. Ground motion trigger level: The PPV-trigger-level should be programmed low enough to trigger the unit from blast vibrations and high enough to minimize the occurrence of false events. The level should be slightly above the expected background vibrations for the area. A good starting level is 0.05 in/s.

2. Dynamic range and resolution: If PPV is expected to exceed 10 in/s or frequency is expected to exceed 250 Hz, special sensors approved by the Vibration Specialist should be used to measure blast effects. In these cases, the Vibration Specialist should also determine a digital sampling rate that should provide accurate recordings.
3. Recording duration: Set the record time for 2 seconds longer than the blast duration plus 1 second for each 1100 feet from the blast.

Part III Air-overpressure Monitoring

The following procedures should be used as possible when setting up instruments to measure blast-induced noise.

A. Microphone placement

The microphone should be placed along the side of the structure nearest the blast.

1. The microphone should be covered with a windscreen and mounted near the velocity transducers.
2. The preferred microphone height is 3 feet above the ground or within 1.2 inches of the ground. Other heights may be acceptable for practical reasons. (ANSI S12.18-1994, ANSI S12.9-1992/Part2) (USBM RI 8508)
3. If practical, the microphone should not be shielded from the blast by nearby buildings, vehicles or other large barriers. If such shielding cannot be avoided, the horizontal distance between the microphone and shielding object should be greater than the height of the shielding object above the microphone.
4. If placed too close to a structure, the airblast may reflect from the house surface and record higher amplitudes. Structure response noise may also be recorded. Placing the microphone near a corner of the structure can minimize reflection of over-pressure energy. (RI 8508)

B. Programming considerations

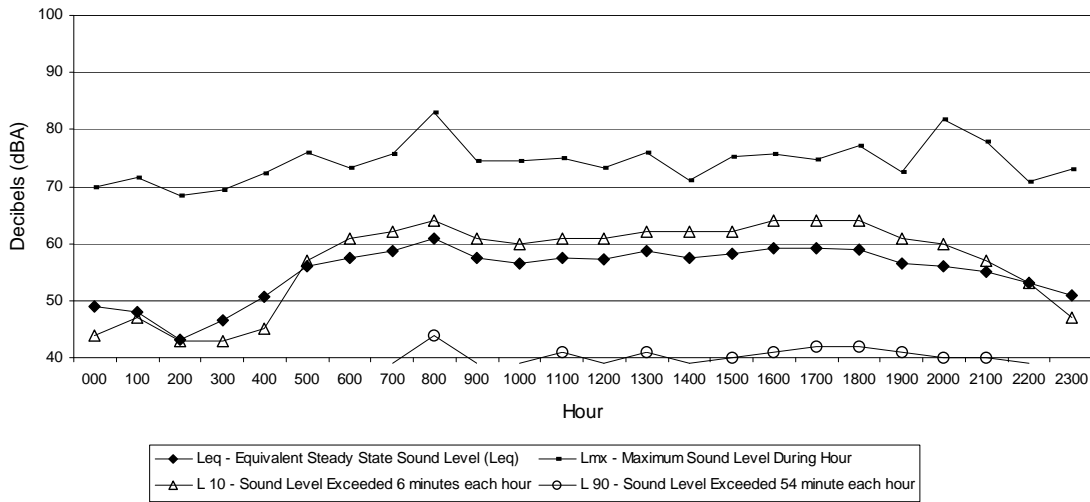
Site conditions dictate certain actions when programming the seismograph to record air-overpressure.

1. Trigger level: When only an airblast measurement is desired, the trigger level should be low enough to trigger the unit from the airblast and high enough to minimize the occurrence of false events. The level should be slightly above the expected background noise for the area. A good starting level is 120 dB.
2. Recording duration: When only recording airblast, set the recording time for at least 2 seconds more than the blast duration. When ground vibrations and air-overpressure measurements are desired on the same record, follow the guidelines for ground vibration programming (Part II C.3).

APPENDIX F-2

24-Hour Noise Measurement Data

**FIGURE F-1
24-HOUR NOISE MEASUREMENT:
ROBLAR ROAD – DUNHAM SCHOOL (70 FEET FROM ROAD CENTER)
WEDNESDAY, JANUARY 11, 2006**



**FIGURE F-2
24-HOUR NOISE MEASUREMENT:
ROBLAR ROAD – DUNHAM SCHOOL (70 FEET FROM ROAD CENTER)
THURSDAY, JANUARY 12, 2006**

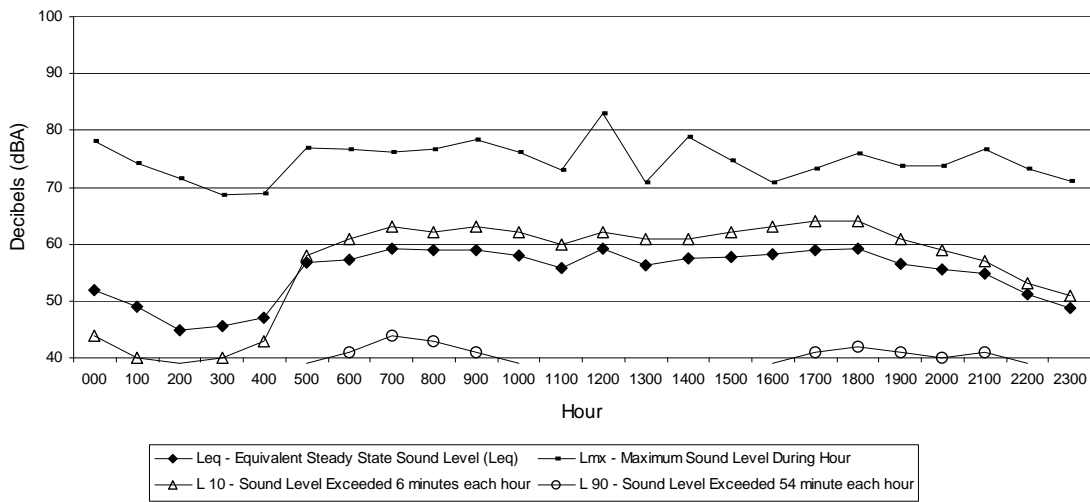


FIGURE F-3
24-HOUR NOISE MEASUREMENT:
8425 VALLEY FORD ROAD (115 FEET FROM ROAD CENTER)
WEDNESDAY, JANUARY 11, 2006

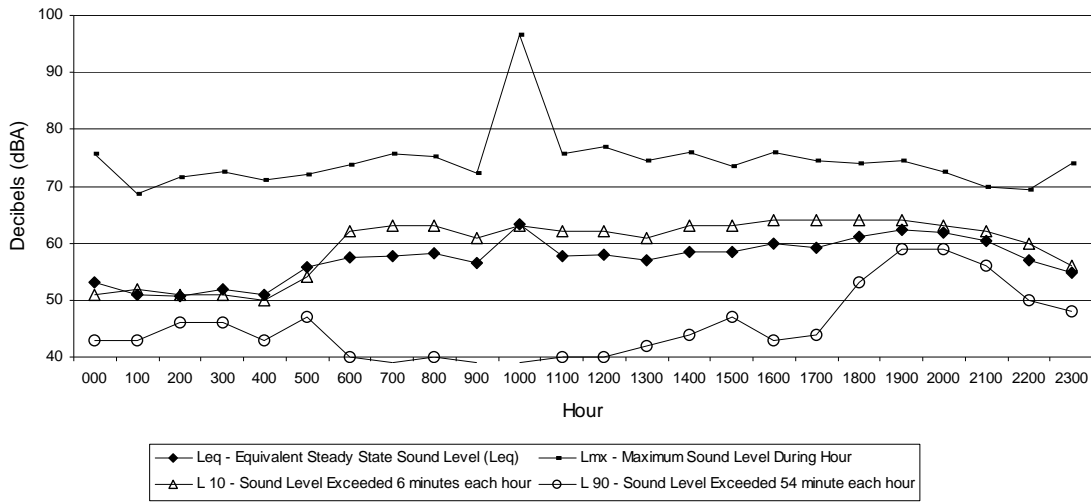
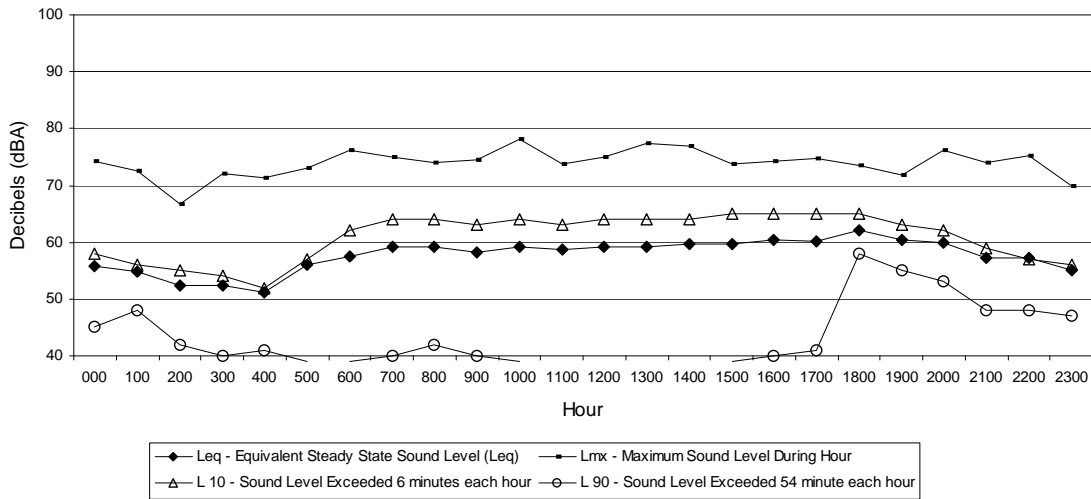
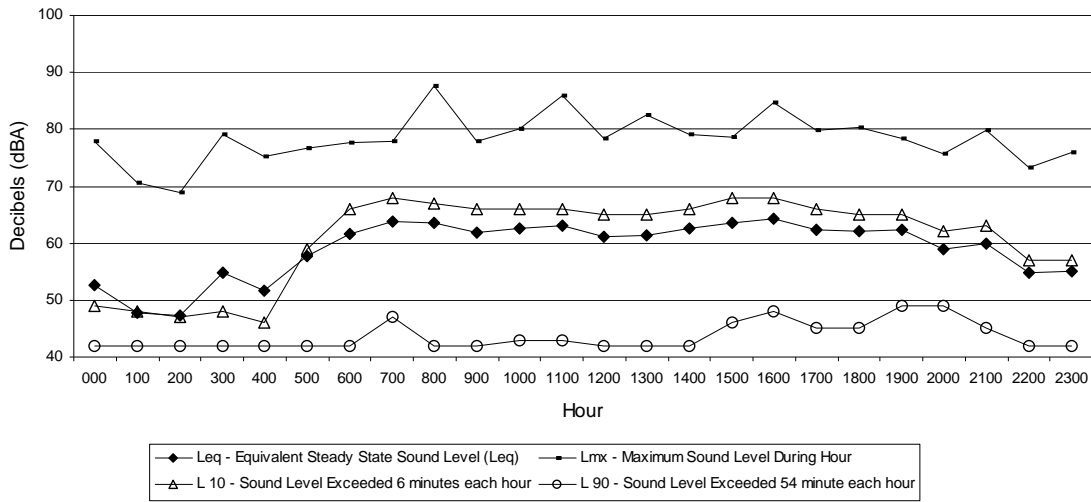


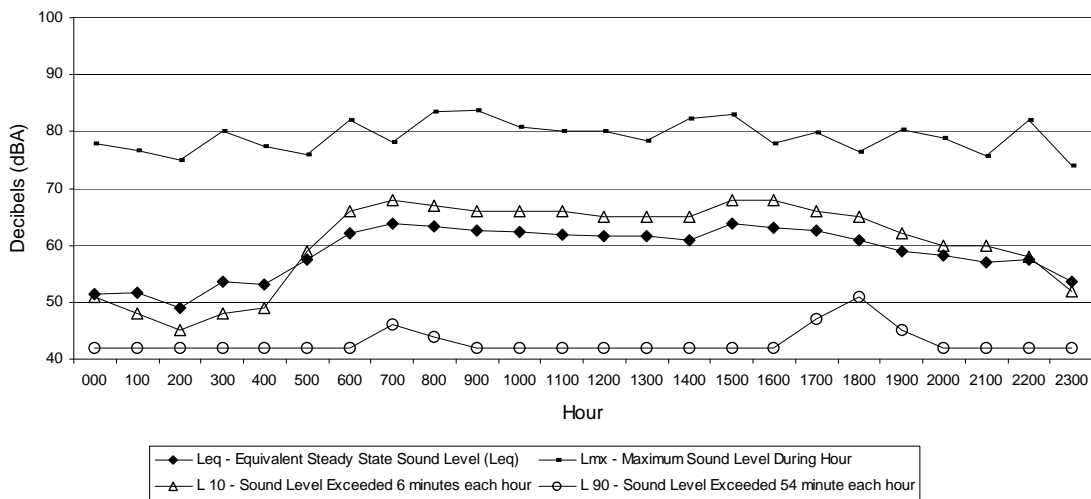
FIGURE F-4
24-HOUR NOISE MEASUREMENT:
8425 VALLEY FORD ROAD (115 FEET FROM ROAD CENTER)
THURSDAY, JANUARY 12, 2006



**FIGURE F-5
24-HOUR NOISE MEASUREMENT:
1798 PEPPER ROAD (85 FEET FROM ROAD CENTER)
WEDNESDAY, JANUARY 11, 2006**



**FIGURE F-6
24-HOUR NOISE MEASUREMENT:
1798 PEPPER ROAD (85 FEET FROM ROAD CENTER)
THURSDAY, JANUARY 12, 2006**



APPENDIX G

Cultural Resources Appendix

**ANNOTATED FAUNAL LIST OF TAXA REPORTED BY BEDROSIAN (1974)¹ FROM
OUTCROPS AT OR NEAR THE PROJECT SITE**

Taxa/Locality UCD 271a UCD 271b UCD 271c

Bryozoa

Indeterminate bryozoan remains

Mollusca

Bivalvia

Anadara trilineata (Conrad) [as *Arca trilineata* Conrad]]

Cardiidae, indeterminate [as *Pseudocardium* sp.]

Clinocardium meekianum (Gabb) [as *Laevicardium meekianum* (Gabb)]

Cryptomya californica (Conrad)

Luciniscia annulatum (Reeve) [as *Lucina acutilineata* (Conrad)]

Macoma sp. [as *M. nasuta* (Conrad)]

Maclridae, indeterminate [as *Spisula hemphilli* (Dall) and *Spisula* sp.]

Patinopecten? sp. [as *P. caurinus* (Gabb) and

Patinopecten purismansis (Arnold)]

Pectinidae, indeterminate [as *Pecten* sp.]

Protothaca sp. [as *P. staminea* (Conrad)]

Siliqua sp. [as *S. lucida* (Conrad), *S. media* (Sowerby), and *S. patula* (Dixon)]

Solen sp. [as *S. sicarius* Gould]

Tagelus? sp. [as *Tagelus californianus* (Conrad)]

Tresus pajaroanus (Conrad) [as *T. nuttallii* (Conrad)]

Veneridae? and Tellinidae?, indeterminate [as

Dosinia sp.]

Yoldia sp. [in part as *Yoldia cooperi* (Gabb)]

Gastropoda

Calyptreaea sp. [as *C. mammillaris* Broderip]

Crepidula onyx (Sowerby)

Crepidula sp.]

Diodora sp., cf. *D. aspera* (Rathke)

Megasurcula carpenteriana (Gabb)

Mitrella? sp.]

Nassarius sp. [as *Nassarius californicus* (Conrad)

and *N. grammatus* (Dall)]

Naticidae, indeterminate [as *Polinices lewisii* (Gould)]

Polinices reclusianus (Deshayes)

Polinices sp.]

Trophosycon sp.]

Arthropoda

Crustacea

Balanus? sp.]

Indeterminate crab parts

¹ Bedrossian, T.L., 1974, Fossils of the Merced Formation, Sebastopol region: California Geology, v. 27, no. 8, p. 175-182.

**ANNOTATED FAUNAL LIST OF TAXA FROM POWELL, ET AL. (2004)² FROM
OUTCROPS AT OR NEAR THE PROJECT SITE**

Taxa/Locality CAS 54138, CAS 55970, CAS 55973, CAS 60472, CAS 60484 – CAS 60487,
CAS 60489, UCD A271a, UCD A271b, USGS M4287, USGS M5845

Mollusca

Bivalvia

Anadara sp.]

Cardiidae, indeterminate

Cryptomya californica (Conrad)

Lucinidae, indeterminate

Macoma sp.]

Maclridae, indeterminate

Pectinidae, indeterminate

Pseudocardium? sp.]

Siliqua sp.]

Solen sp.]

Tagelus? sp.]

Yoldia sp.]

Gastropoda

Calyptreaea sp.]

Columbellidae, indeterminate

Crepidula sp.]

Diodora sp., cf. *D. aspera* (Rathke)

Lirabuccinum? sp.]

Nassarius sp.]

Naticidae, indeterminate

Nucella? sp.]

Trophosycon sp.]

² Powell, C.L., II, and Allen, J., 2001, Invertebrate fossils from the Wilson Grove Formation (late Miocene - late Pliocene), Sonoma County, northern California [abs.]: Programs and Abstracts, North American Paleontological Convention 2001, PaleoBios, v. 21, supplement to no. 2, p. 105.