CANYON ROCK QUARRY EXPANSION PROJECT

Draft Environmental Impact Report

SCH # 2000072063

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Prepared for:

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TABLE OF CONTENTS

CANYON ROCK QUARRY EXPANSION PROJECT DRAFT ENVIRONMENTAL IMPACT REPORT

LIST OF TABLES

Page

LIST OF TABLES (Continued)

Page

LIST OF FIGURES

CHAPTER I
INTRODUCTION

A. ENVIRONMENTAL REVIEW

The project sponsor, Canyon Rock Company, Inc. proposes an expansion of the existing Canyon Rock Quarry, located in unincorporated Sonoma County west of the Town of Forestville. The project sponsor has requested the necessary entitlements from the County of Sonoma to enable the expansion of the existing quarry to either the west or the north of its existing vested rights and permitted area. Approval of this request would grant a use permit for additional mining for a new 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 County of Sonoma, serving as Lead Agency responsible for administering the environmental review for the proposed project, 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.

The Canyon Rock Quarry Expansion application proposing the western expansion plan was filed on July 7, 1997. This application requested a use permit and rezoning to add the Mineral Resource combining district to four parcels to the west of the area permitted under the existing use permit, and approve a mining reclamation project on these four parcels, plus the 11.21 acres remaining on APN 083-210-019 (4.60 acres of this parcel was previously approved for mining under the existing use permit.

In June of 2000, the County prepared an Initial Study for the subject project to determine: 1) whether the proposed project fell within the scope of the ARM Plan; 2) whether the ARM Plan Program EIR adequately analyzed the impacts of the proposed project; 3) whether the proposed project would result in site-specific impacts not analyzed in the ARM Plan Program EIR; and 4) appropriate mitigation measures for any such additional environmental impacts.

The Environmental Review Committee (ERC) subsequently reviewed the Initial Study and recommended that a Mitigated Negative Declaration be prepared, tiering off of the prior Program EIR prepared for the ARM Plan. On September 7, 2000 the Planning Commission rejected the Mitigated Negative Declaration based on potential air quality impacts, and required that an EIR be prepared. The applicant disagreed with the Planning Commission and staff's proposed baseline for environmental review and appealed the baseline decision to the Board of Supervisors.

In February of 2001, the Sonoma County Board of Supervisors (BOS) concluded that the Western Expansion project did fall within the scope of the ARM Plan and that additional environmental review would be necessary for the project in four specific areas. The Sonoma County BOS determined that a project-specific focused EIR (tiered from the ARM Program EIR) would be required in order to examine the potential for environmental impact in the following issues:

- traffic
- air quality (potential diesel emissions)
- noise (impacts from on-site sources)
- water quality (potential sedimentation into Green Valley Creek)

The 53 mitigation measures/conditions of approval (see Appendix C) that were identified in the Initial Study for Mitigated Negative Declaration for the Western Expansion option (or Northern Expansion option, as applicable) will be carried forward or re-examined as necessary in this EIR.

Additionally, the Sonoma County BOS determined that the existing conditions baseline, against which the potential environmental impacts of the expansion option will be measured, shall include the five-year average (1997-2001) annual sales level of 350,000 cubic yards (Resolution No. 01-0157, February 6, 2001). This baseline represents the amount of material sold, and includes mined material as well as other material that was imported to the quarry (e.g., concrete to be recycled and rock to be re-sold for riprap). The Sonoma County BOS also defined the No Project alternative as a continuation of production at current levels until the aggregate resources on the existing site are exhausted.

On February 7, 2002 the applicant submitted a preliminary request to the County to modify their 1997 application to include a northern expansion plan as an equal-weight alternative to their application for the western expansion. The area for the northern expansion is primarily on property that has recently been acquired by the applicant. The County determined that a single EIR would be prepared to address the four environmental issues of the western expansion and a full range of environmental issues for the northern expansion.

In 2003, the County updated the environmental baseline to reflect the most recent five-year period at time the Notice of Preparation for this EIR was released (i.e., 1998-2002), with a corresponding five-year average annual sales level of 375,000 cubic yards.

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 informational document for use by governmental agencies and the public. It is intended to identify and evaluate potential environmental consequences of the proposed project, to identify mitigation measures that would lessen or avoid significant adverse impacts, and to examine feasible alternatives to the project. The information contained in the EIR is reviewed and considered by the lead agency prior to its action to approve, disapprove, or modify the proposed project.

CEQA states 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 impacts. 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 December 6, 2002, the County sent a Notice of Preparation (NOP) to governmental agencies and organizations and organizations and persons interested in the project. The NOP is included in Appendix A. 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 addition, the County held a public scoping meeting on December 17, 2002 at Odd Fellows Hall in Forestville to allow additional opportunity to the public to comment on the scope of environmental issues to be addressed in the EIR. A summary of written responses to the NOP is included in Appendix B.

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 provides the environmental information and evaluation necessary for the planning, site preparation, development, construction, operation, and maintenance of the Canyon Rock Quarry Expansion (the "project").

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. Further, this EIR is intended to serve as a Project EIR,[1] and it is anticipated that no further environmental review under CEQA would be necessary to implement any aspect of, or subsequent entitlement required for, the 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

1 As defined by *CEQA Guidelines* (Section 15161), a "Project EIR" is an EIR that analyzes the impacts of an individual activity or specific project. (The *CEQA Guidelines*, a component of the State of California Code of Regulations that is revised regularly, is a document whose purpose it is to aid in the interpretation and implementation of CEQA.)

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

The California Environmental Quality Act 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; 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 of Sonoma 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, as required by CEQA.

The Alternatives section of this EIR will present a comparative analysis and impact matrix to address the following alternatives to the proposed project:

- Alternative 1: *A "No-Project" Alternative*, as required by CEQA, in which the proposed quarry expansion options would not occur, and the project applicant would continue to mine under its current use permit, within the existing approved mining area, and at the current allowed vested rights and production rate. This EIR considers two "No-Project" Alternatives, including the following:
  - Alternative 1A: No Project – No Subsequent Development Alternative, in which the Western and Northern Expansion option areas would be left in their current condition following mining and associated reclamation within the existing vested rights and use permitted area; and
  - Alternative 1B: No Project – Reasonably Foreseeable Development Alternative, in which following mining and associated reclamation within the existing vested rights and use permitted area, the Western and Northern Expansion option areas would be developed with one or more of the land uses permitted under the existing zoning for these areas.

- Alternative 2: *Reduced Project Production Alternative*, which would reduce the maximum annual permitted production sales from 500,000 cubic yards per year to 375,000 cubic yards.
- Alternative 3: *Revised Project Configuration Alternative*, which would revise the configuration of the mining area for both expansion options to avoid specific environmentally sensitive areas onsite.

D. USE OF THIS 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 City'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 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 hearing(s).

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, summarizes the proposed project, any controversial issues associated with the project, the environmental effects of the project, and alternatives to the project (including the No Project Alternative). The Summary includes Table II-1, Summary of Environmental Impacts and Mitigation Measures, which lists each identified environmental impact, corresponding mitigation measure(s), and the residual level of significance following implementation of mitigation.

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 Measures: Western and Northern Expansion Options, describes the existing environmental setting, discusses the environmental impacts of the project, and identifies mitigation measures for environmental impact areas that are common to both the Western and Northern expansion options. The issue areas addressed in this section of the EIR are traffic, air quality, noise, and hydrology and water quality.

Chapter V, Environmental Setting, Impacts, and Mitigation Measures: Northern Expansion Option Only, describes the existing setting, discusses the environmental impacts of the project, and identifies mitigation measures for the environmental impacts primarily for the Northern Expansion option only. (However, where appropriate, this section also discusses impacts/mitigation for the Western Expansion option. In these instances, if an impact is addressing both expansion options, it is explicitly stated in the impact statement.) The issue areas addressed in this section of the EIR are biological resources, cultural resources, aesthetics, geology and soils, hazards and hazardous materials, land use and planning, public services, and public utilities.

Chapter VI, Environmental Effects of Potential Subsequent Mining Beyond the Proposed 20-Year Limit of Grading, which discusses potential environmental effects that could occur from subsequent mining outside the proposed 20-year limit of grading and within the proposed rezoned Mineral Resource District.

Chapter VII, Alternatives, presents an analysis of a reasonable range of alternatives to the proposed project, prevents the environmental impacts associated with each alternative, compares the relative impacts of each alternative to those of the project, and discusses the relationship of each alternative to the project objectives.

Chapter VIII, Impact Overview, presents discussions of growth inducement and summarizes discussions of cumulative impacts and unavoidable significant impacts.

Chapter IX, Report Preparation, lists report preparers and identifies persons and organizations consulted during report preparation.

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 sponsor, Canyon Rock Company, Inc. proposes an expansion of the existing Canyon Rock Quarry, located in unincorporated Sonoma County west of the Town of Forestville. The project sponsor has requested the necessary entitlements from the County of Sonoma to enable the expansion of the existing quarry to either the west or the north of its existing vested rights and permitted area (referred to as the Western Expansion option and Northern Expansion option). Approval of this request would grant a use permit for additional mining for a new 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 County of Sonoma, serving as Lead Agency responsible for administering the environmental review for the proposed project, 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.

B. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Potential environmental impacts of the project are summarized in Table II-1 at the end of this chapter. A detailed discussion of the impacts and mitigation measures appear in Chapter IV, Environmental Setting, Impacts, and Mitigation Measures for Western and Northern Expansion options, and Chapter V, Environmental Setting, Impacts, and Mitigation Measures for Northern Expansion option only. For each significant impact, the table includes a summary of mitigation measure(s) and an indication of whether the impact would be mitigated to a less-than-significant level. Please refer to Chapters IV and V in this EIR for a complete discussion of each impact and associated mitigation. As discussed in Chapter I, Introduction, 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 a significant adverse environmental impacts. Mitigation measures proposed as part of the project, would avoid or reduce most of the impacts to a less-than-significant level. As listed below, certain air quality and noise impacts would remain significant after mitigation.

- Project contribution to cumulative increases in traffic volumes at intersections in the project area (Western or Northern Expansion options) (*Impact IV.A.1*)
- Project contribution to cumulative increases in traffic volumes on roadways in the project area (Western or Northern Expansion options) (*Impact IV.A.2*)

- Project contribution to cumulative effects on pedestrian and bicycle flow conditions in the project area (Western or Northern Expansion options) (*Impact IV.A.3*)
- Loss of on-street parking spaces on Highway 116 west of Covey Road from implementation of Mitigation Measure IV.A.1.a and IV.A.3b (Western or Northern Expansion options) (*Impact IV.A.10*)
- Potential long-term effects to transportation and traffic, air quality, noise, hydrology and water quality, land use, biological resources, aesthetics and cultural resources from implementation of Mitigation Measure IV.A.3e (Western or Northern Expansion options) (*Impact IV.A.11*)
- Project contribution to cumulative increase in ambient noise levels on roadways serving the project. (Western or Northern Expansion options) (*Impact IV.C.7*)
- Direct loss and/or disturbance to natural communities from proposed project construction and grading activities. (Western or Northern Expansion option) (*Impact V.D.2*)
- Alteration in the visual character of the project site from proposed quarry expansion. (Western or Northern Expansion options) (*Impact V.E.1*)
- Project contribution to cumulative alteration in the visual character of the project vicinity. (Western or Northern Expansion options) (*Impact V.E.3*)

Chapter III, Project Description provides a detailed description of each expansion option (Western Expansion option and Northern Expansion option). Chapter IV, Environmental Setting, Impacts, and Mitigation Measures: Western and Northern Expansion Options, describes the existing environmental setting, discusses the environmental impacts of the project, and identifies mitigation measures for environmental impact areas that are common to both the Western and Northern expansion options. The issue areas addressed in this section of the EIR are traffic, air quality, noise, and hydrology and water quality. Chapter V, Environmental Setting, Impacts, and Mitigation Measures: Northern Expansion Option Only, describes the existing setting, discusses the environmental impacts of the project, and identifies mitigation measures for the environmental impacts primarily for the Northern Expansion option only. (However, where appropriate, this section also discusses impacts/mitigation for the Western Expansion option. In these instances, if an impact is addressing both expansion options, it is explicitly stated in the impact statement.

The following discussion briefly summarizes relative differences in level of environmental impact between the proposed Western and Northern Expansion options (a detailed discussion of differences in expansion options Chapters IV and V of this EIR):

Traffic and Transportation:	No difference between the expansion options in the increase in number of vehicle trips generated; potential contribution to effects on external traffic and transportation facilities between the expansion options would be the same.

Air Quality:	No difference between the expansion options in the project increase in criteria air pollutants, and DPM exposure along external haul routes. Due to distance, more off-site sensitive receptors potentially exposed to on-site diesel emissions from mobile equipment under Western Expansion option than Northern Expansion option.
Noise:	No difference between the expansion options in increase in noise from on-site stationary equipment, or off-site generated traffic along external haul routes. Due to distance, more off-site sensitive receptors potentially exposed to on-site mobile equipment noise under Western Expansion option than Northern Expansion option.
Hydrology and Water Quality:	No substantial difference between expansion options in potential impacts to hydrology and water quality of Green Valley Creek.
Land Use and Planning:	No substantial difference in potential land use impacts between expansion options.
Geology, Seismicity and Mineral Resources:	No substantial difference in potential geologic and soil impacts between expansion options.
Hazards and Hazardous Materials:	No substantial difference in potential impacts to hazards and hazardous materials between expansion options.
Biological Resources:	Avoidance of on-site wetlands possible in mitigation for Northern Expansion option, but not for Western Expansion option. Western Expansion option significantly affects potential red tree vole habitat; Northern expansion option does not. No substantial difference between the expansion options in the potential impacts to north coast conifer forest habitat, nesting/breeding birds, aquatic species in Green Valley Creek; and special status species.
Aesthetics:	The Northern Expansion option would result in less overall alteration in the vicinity of, and therefore less overall visual impacts from, Highway 116 (although still significant), as mining would ultimately move in a direction away from the highway. This would contrast with the mining plan of the Western Expansion option which substantially alter the topography along the entire length of the property frontage along Highway 116.
Public Services and Utilities:	No substantial difference in potential impacts to public services and utilities between expansion options.
Cultural Resources:	No substantial difference in potential impacts to cultural resources between expansion options.

C. ALTERNATIVES

This chapter discusses the following alternatives to the proposed project: 1A) a No Project – No Subsequent Development Alternative, 1B) a No Project – Reasonably Foreseeable Development Alternative, 2) Reduced Production Alternative; and 3) Revised Project Configuration Alternative. Of the alternatives assessed in this EIR, the alternative with the least environmental impact from a site-specific perspective 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. Among the other alternatives, the Reduced Production Alternative is determined to be the environmentally superior alternative.

D. AREAS OF CONTROVERSY

Public controversy has focused on the physical impacts resulting from quarry operations. These relate primarily to truck traffic and the associated concerns over air, noise and safety impacts. Concerns have also been expressed regarding impacts to Green Valley Creek, visual impacts and the noise impacts from quarry operations.

E. ISSUES TO RESOLVE

The County must determine whether to approve the Western Expansion or the Northern Expansion option. It must also determine whether to pursue a Forestville bypass project (Mitigation Measure IV.A.3.e) and how to implement the other traffic mitigations (signalization of various intersections and shoulder widening of Mirabel Road) given current budget constraints.

TABLE II-1
SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact	Mitigation Measures	Significance After Mitigation
Traffic and Transportation		
IV.A.1: The proposed project would contribute to cumulative increases in traffic volumes at intersections in the project area. This would be a significant impact under the Western or Northern Expansion options.	*Mitigation – Near-Term Cumulative* Highway 116 / Covey-Forestville Road Intersection **IV.A.1a:** Install traffic signals (with pedestrian signals) at the intersection of Highway 116 / Covey-Forestville Roads, and add left turn lanes on both Highway 116 approaches and a right turn lane on the westbound Highway 116 approach to the intersection. This would be a joint project implemented by the County and Caltrans. The project sponsor shall pay a fair share of the cost of the improvements. The calculation of the fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three times that of automobiles or small trucks. If the County determines that a bypass road will be constructed and that a signal at this intersection will not be needed, this mitigation measure will not be required to mitigate an impact of this project. Traffic volumes at the Highway 116 / Covey-Forestville intersection currently satisfy the Peak-Hour Volume Signal Warrant during weekday peak hours. Given the existing 40-foot curb-to-curb roadway width, on-street parking would be prohibited along both sides of Highway 116 for at least 350 feet west of the intersection to provide room to stripe the eastbound left turn pocket. Left-turn storage lengths of 50 feet (westbound) and 100 to 150 feet (eastbound) would be required. Implementation of this measure would improve the intersection service level to LOS C. Highway 116 / Mirabel Road Intersection **IV.A.1b:** Install traffic signals at the intersection of Highway 116 / Mirabel Road. This is expected to be a joint project implemented by the County and Caltrans. If traffic signals are not installed at the intersection by the time the quarry begins mining in either the western or northern expansion areas, the project sponsor shall pay a fair share of the cost of the improvements. The calculation of fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three times that of automobiles or small trucks. If deemed	*Near-Term Cumulative* Mitigation Measures IV.A.1a-c would reduce the intersection impacts to less than significant. However, none of the intersection improvements are funded or planned to be in place by 2007. If these improvements are not in place by the time the quarry begins mining in either the Western or Northern Expansion areas, the intersection impacts would be Significant and Unavoidable.

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Traffic and Transportation</u> (cont.)		
IV.A.1 (cont.)	acceptable by the County, the project sponsor may contribute an equal value of material or labor toward the construction of the intersection improvements in lieu of cash. Traffic volumes at the Highway 116 / Mirabel Road intersection currently satisfy the Peak-Hour Volume Signal Warrant during weekday and Saturday peak hours. The intersection improvements would include the correction of an existing sight distance problem on Highway 116 west of the intersection, construction of a left turn lane on Highway 116 for traffic turning northbound onto Mirabel Road, installation of traffic signals, and other associated improvements to the intersection. <u>River Road / Mirabel Road Intersection</u> **IV.A.1c:** Install traffic signals at the intersection of River Road / Mirabel Road. This is expected to be a project implemented by the County. If traffic signals are not installed at the intersections of River Road / Mirabel Road by the time the quarry begins mining in either the western or northern expansion areas, the project sponsor shall pay a fair share of the cost of the improvements. The calculation of fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three times that of automobiles or small trucks. If deemed acceptable by the County, the project sponsor may contribute an equal value of material or labor toward the construction of the intersection improvements in lieu of cash. Traffic volumes at the River Road / Mirabel Road intersection currently satisfy the Peak-Hour Volume Signal Warrant during weekday and Saturday peak hours. For Mitigation Measures IV.A.1a-c, the Sonoma County Department of Transportation and Public Works shall be responsible for preparing a cost estimate for the roadway improvements. The quarry operator shall enter into an agreement	

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

Impact	Mitigation Measures	Significance After Mitigation
Traffic and Transportation (cont.)		
IV.A.1 (cont.)	(subject to review and approval by PRMD) with the County for payment of the quarry's fair share of the estimated total cost of the improvements. The intersection improvements described in Mitigation Measures IV.A.1a-c would result in secondary environmental impacts. These impacts are described under the subsection "Secondary Impacts," which is found at the end of Section IV.A. *Mitigation –Cumulative 2021* No additional mitigation required with implementation of Mitigation Measures IV.A.1a-c, which would also mitigate the project's contribution to cumulative impacts in 2021 to a less than significant level.	*Cumulative 2021* If Mitigation Measures IV.A.1a-c were not implemented for the reasons discussed above, impacts in 2021 would remain Significant and Unavoidable.
IV.A.2: The proposed project would contribute to cumulative increases in traffic volumes on roadways in the project area. This would be a significant impact under the Western or Northern Expansion options.	*Mitigation – Near-Term Cumulative* **IV.A.2:** Widen Mirabel Road to provide paved shoulders. If the shoulders are not widened on both sides of Mirabel Road by the time the quarry begins mining the Western or Northern expansion areas, the project sponsor shall pay a fair share of the cost of the improvements. The calculation of the fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three time that of automobiles or small trucks. If deemed acceptable by the County, the project sponsor may contribute an equal value of material or labor toward the construction of the shoulders in lieu of cash. The level of service calculations take into account several physical characteristics of the roadway, including the width of the travel lanes and whether or not the road has paved shoulders. Other things being equal, a road with paved shoulders will have a better level of service for a given traffic volume than will a road without shoulders. Installing paved shoulders on Mirabel Road would improve the level of service enough to offset the effect of the project traffic.	*Near-Term Cumulative* Potentially Significant and Unavoidable if the improvements are not in place when the quarry begins mining in either the Western or Northern Expansion areas.

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

Impact	Mitigation Measures	Significance After Mitigation
Traffic and Transportation (cont.)		
IV.A.2 (cont.)	The shoulder widening described in Mitigation Measure IV.A.2 would result in secondary environmental impacts. These impacts are further described under the subsection "Secondary Impacts," which is found at the end of Section IV A.	
	Mitigation –Cumulative 2021	*Cumulative 2021*
	No additional mitigation required with implementation of Mitigation Measure IV.A.2, which would also mitigate the project's contribution to cumulative impacts in 2021 to a less than significant level.	If Mitigation Measure IV.A.2 were not implemented for the reasons discussed above, impacts in 2021 would remain significant and unavoidable
IV.A.3: The proposed project would contribute to cumulative effects on pedestrian and bicycle flow conditions in the project area. This would be a significant impact under the Western or Northern Expansion options.	*Mitigation – Near-Term Cumulative* Two alternate sets of mitigation measures are identified in this EIR: Mitigation Measure IV.A.3a (construct bypass road south of downtown Forestville area), or Mitigation Measure IV.A.3b-e (construct pedestrian and bicycle circulation and safety improvements within downtown Forestville), as described below:	*Near-Term Cumulative*
	Alternate 1: Construct Pedestrian and Bicycle Circulation and Safety Improvements Within Downtown Forestville: **IV.A.3a:** Implement Mitigation Measure A.1a (install traffic signals [with pedestrian signals] at the intersection of Highway 116 / Covey-Forestville Roads). The project sponsor shall pay a fair share of the cost of the improvements as specified in Mitigation Measure IV.A.3a. Installation of pedestrian signals with the traffic signals at this intersection would provide positive control of conflicting movements among automobiles, bicycles and pedestrians, ensuring a less-than-significant effect on pedestrian and bicycle safety.	Alternate 1 Significance after Implementation of Mitigation Measures IV.A.3a-c: Implementation of Mitigation Measures IV.A.3 a-c would reduce pedestrian and bicycle impacts on Highway 116 in downtown Forestville. However, all the pedestrian impacts would not be reduced. Pedestrian counts done

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

Impact	Mitigation Measures	Significance After Mitigation
Traffic and Transportation (cont.)		
IV.A.3 (cont.)	**IV.A.3b:** Provide sidewalks/pathways, where needed, along both sides of Highway 116 between Covey Road and Mirabel Road, and allow school children to ride on the sidewalks/ pathways. Alternatively, provide five-foot-wide bike lanes along each side of Highway 116 between Covey Road and Mirabel Road. The project sponsor shall pay its fair share contribution to the cost of this improvement. If bike lanes were provided along Highway 116 in this area, Highway 116 would need to be widened by six to eight feet on the north side of the highway for about 175 feet west of Covey Road. Some on-street parking spaces would have to be eliminated near 1st and 2nd Streets. **IV.A.3c:** Enhance the visibility of existing crosswalks at Covey and 1st Street. The project sponsor shall pay its fair share contribution to the cost of these improvements. This could include additional striping (e.g., yellow and/or crosshatching), signage and/or lighting. Several other measures identified in this EIR (including removal of on-street parking in the vicinity in order to provide left-turn lane on the approach to Covey Road, reducing parking spaces in the vicinity of crosswalks, and road widening in order to provide bike lanes) would provide overall greater sight lines for drivers and pedestrians in the vicinity.	in June 2002 indicated a substantial number of pedestrians crossing Highway 116 at midblock locations (i.e., not at intersections). Since it is likely that this type of pedestrian use will not be affected by the proposed mitigation measures, it is concluded that the potential for pedestrian conflicts with highway traffic on Highway 116 would remain Significant and Unavoidable.
	IV.A.3d: If the shoulders are not widened on both sides of Mirabel Road by the time the quarry begins mining the western or northern expansion areas, the project sponsor shall pay a fair share of the cost of the improvements.	Significance after Implementation of Mitigation Measures IV.A.3d: Implementation of Mitigation Measure IV.A.3d would reduce the potential impacts to bicyclists on

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

Impact	Mitigation Measures	Significance After Mitigation
Traffic and Transportation (cont.)		
IV.A.3 (cont.)	The roadway improvements described in Mitigation Measure IV.A.3a-d would result in secondary environmental impacts. These impacts are described under the subsection "Secondary Impacts," which is found at the end of Section IV.A.	Mirabel Road to less than significant. On Mirabel Road the impact is a potential conflict between bicycle traffic and other vehicle traffic. With the construction of paved shoulders, bicycle traffic could be separated from other vehicles, which would reduce this potential conflict on Mirabel Road to a less than significant level.
	Alternate 2: Construct Bypass Road South of Downtown Forestville Area:	Alternate 2
	IV.A.3e: Construct a bypass road to the south of the downtown area along an alignment similar to that shown in the Forestville Specific Plan. This is expected to be either a County project or a joint County-Caltrans project. The project sponsor shall pay its fair share contribution to the cost of this measure. The calculation of the fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three time that of automobiles or small trucks. If deemed acceptable by the County, the project sponsor may contribute an equal value of material or labor toward the construction of the shoulders in lieu of cash. The roadway improvements described in Mitigation Measure IV.A.3e would result in secondary environmental impacts. These impacts are described under the subsection "Secondary Impacts," which is found at the end of Section IV.A.	Significance After Implementation of Mitigation Measure IV.A.3e: Less than significant. However, if the bypass were not in place by 2007, the project impact would be Significant and Unavoidable. As discussed under Planned Improvements (see Setting section), funding is not presently available for the bypass, and there is no planned construction date.

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

Impact	Mitigation Measures	Significance After Mitigation
Traffic and Transportation (cont.)		
IV.A.3 (cont.)	*Mitigation –Cumulative 2021* Alternate 1 As discussed above, implementation of Mitigation Measures IV.A.3a-c would reduce bicycle and pedestrian impacts in downtown Forestville, but not to a less than significant level; implementation of Mitigation Measure IV.A.3d would reduce the bicycle impact on Mirabel Road only to a less than significant level. Alternate 2 No additional mitigation would be required with implementation of Mitigation Measures IV.A.3e, which would also mitigate the project's contribution to cumulative impacts in 2021 to a less than significant level.	*Cumulative 2021* Alternate 1 If Mitigation Measures IV.A.3a-d were not implemented for the reasons discussed above, impacts in 2021 would remain Significant and Unavoidable. Alternate 2 If Mitigation Measure IV.A.3.e was not implemented for the reasons discussed above, impacts in 2021 would remain Significant and Unavoidable.
IV.A.4: Traffic generated by the proposed project would increase potential conflicts among vehicles in the project area. This would be a less than significant impact under the Western or Northern Expansion options.	None required.	
IV.A.5: Traffic generated by the project could increase the need for road maintenance. This would be a potentially significant impact.	**IV.A.5:** The applicant shall participate in the Aggregate Road Mitigation Fund.	Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Traffic and Transportation</u> (cont.)		
IV.A.6: Implementing off-site transportation improvements identified in Mitigation Measures IV.A.1-3 in this EIR would result in temporary construction-related impacts on air quality, water quality, and noise. This would be a potentially significant short-term impact under the Western or Northern Expansion options.	**IV.A.6a:** The construction contract shall include a dust abatement program. Elements of the program shall include the following dust control measures to be implemented during construction: • Water or dust palliative shall be sprayed on unpaved construction and staging areas during construction. • Trucks hauling soil, sand and other loose materials over public roads shall cover the loads, or shall 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. **IV.A.6b:** The construction contract shall require that storage of any potential flammable liquids be in compliance with the Sonoma County Fire Code and section 7-1.01G of the Caltrans Standard Specification (or the functional equivalent) for the protection of surface waters. In the event of a spill of hazardous materials the Contractor shall immediately call the emergency number 9-1-1 to report the spill, and shall take appropriate actions to contain the spill to prevent further migration of the hazardous materials to storm water drains or surface waters. **IV.A.6c:** 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 Vehicle Code, where applicable. • 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 am and 7:00 pm on weekdays and 9:00 am and 7:00 pm on weekends and holidays.	Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Traffic and Transportation (cont.)		
IV.A.7: Implementing off-site transportation improvements identified in Mitigation Measures IV.A.1-3 in this EIR could result in temporary or long-term erosion effects from road cuts or other graded areas. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.A.7a:** By October 1, all disturbed areas and cut slopes shall be hydroseeded with an appropriate mix of seed, wood mulch, and tackifier. **IV.A.7b:** Following hydroseeding of the cut slope along the south side of Highway 116 between Mirabel Road and Hidden Lake Road, a wood fiber erosion control shall be applied to the slope to further protect the soil from erosion. This blanket shall either have no plastic incorporated, or, if the blanket does incorporate plastic, the plastic shall be a photo-degradable type which breaks down in 1 to 2 years.	Less than Significant.
IV.A.8: Implementing off-site transportation improvements identified in Mitigation Measure IV.A.1 in this EIR would result in the removal of trees and other vegetation along a portion of Highway 116, resulting in a potential visual impact. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.A.8:** Following stabilization of the cut slope along the south side of Highway 116 between Mirabel Road and Hidden Lake Road as described in Mitigation IV.A.6a-b, native shrubs and trees shall be planted on the cut slope. At least 50 liner-size native shrubs and trees shall be planted. A maintenance program including weeding and summer watering shall be followed until the plants have become established (minimum of three years).	Less than Significant.
IV.A.9: Implementing off-site transportation improvements identified in this EIR could result in disturbance of undiscovered archaeological resources. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.A.9***:* 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 shall not be allowed until those recommendations deemed appropriate by the County have been implemented.	Less than Significant.
IV.A.10: Implementation of Mitigation Measures IV.A.1a and IV.A.3b would result in the loss of on-street parking spaces on Highway 116 west of Covey Road. This would be a significant impact under the Western or Northern Expansion options.	None available.	Significant and Unavoidable

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

Impact	Mitigation Measures	Significance After Mitigation
Traffic and Transportation (cont.)		
IV.A.11: Implementation of Mitigation Measure IV.A.3e (construction of bypass road south of the downtown Forestville area) could result in significant long term environmental impacts on transportation and traffic, air quality, noise, hydrology and water quality, land use, biological resources, aesthetics and cultural resources. This would be a potentially significant impact under the Western or Northern Expansion options.	None available at this time.	Potentially Significant and Unavoidable. If the County decides to proceed with the bypass road, further analysis and a subsequent environmental document would be required. That analysis may identify mitigation measures that will reduce some or all of the above impacts to less than significant. However, unless and until that analysis is completed, the impacts are considered Significant and Unavoidable.
Air Quality		
IV.B.1: The proposed project would generate emissions of criteria pollutants (PM10, SO_2, NO_x, ROG, and CO) on the project site and along haul routes. Project-generated emissions in 2007 and 2021 would be below the applicable significance threshold for each criteria pollutant. This would be a less than significant impact under the Western or Northern Expansion options.	None required. The project's emissions of criteria pollutants are determined to be less than significant. However, see Impact IV.B.5 for potential impacts and mitigation associated with local cumulative increases in PM10 at nearby receptors. See also erosion control measures identified in Section IV.D, Hydrology and Water Quality, which will serve to further reduce potential air quality effects of the project.	

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

Impact	Mitigation Measures	Significance After Mitigation
Air Quality (cont.)		
IV.B.2: The proposed project would generate localized CO emissions at intersections in the project vicinity in 2007 and 2021 that would be below baseline conditions. This would be a less than significant impact under the Western or Northern Expansion options.	None required.	
IV.B.3: The proposed project would generate DPM emissions along haul routes in 2007 and 2021 that would be below baseline conditions. This would be a less than significant impact under the Western or Northern Expansion options.	None required.	
IV.B.4: The proposed project would generate DPM emissions from on-site mobile sources in 2007 and 2021 that would be below baseline conditions. However, on-site sources of mobile diesel equipment would move closer to individual off-site receptors under the expansion options which would have the potential to increase exposure to project DPM emissions at these receptors. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.B.4a:** Canyon Rock Quarry shall implement emission reductions of DPM on quarry on-site mobile equipment or through the acquisition of improved performance equipment that contain DPM reduction controls. Controls, such as retrofitting non-road equipment engines with CARB-certified DPM filters and catalysts while using ultra low sulfur fuel (ULSD), when available, would reduce DPM emissions from equipment by 85%. The traps catch the particulate matter and allow the catalysts to "burn" the DPM when using ULSD. With the use of CARB-certified catalysts only in conjunction with ULSD, the control efficiency is about 50%. The loaders/backhoes represent the largest annual emission rates of the total nonroad equipment (over 50%). There are currently eight loaders and one backhoe on-site. Thus, the mitigation measures will concentrate on the quarry's loaders/backhoes. One option would be to use only CARB-certified catalysts in conjunction with ULSD on all operating loaders/backhoes. Alternatively, CARB-certified filters and catalysts could be used on five of the nine operating loaders/backhoes in conjunction with ULSD, if all the loaders would operated at a similar annual rate. With the implementation of either of these options, approximately 50% control efficiency on	Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Air Quality (cont.)		
IV.B.4 (cont.)	the loaders/backhoes would be achieved, and the incremental health risk would be less than 10 per million at all off-site receptors, and correspondingly, less than significant. **IV.B.4b:** Canyon Rock Quarry shall properly tune its nonroad equipment.	
IV.B.5: On-site sources of fugitive dust generated by the proposed project would have the potential to contribute to episodes of local cumulative increases in PM10 at nearby receptors. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.B.5:** A comprehensive dust control program shall be implemented by project applicant that will expand on the quarry's existing and proposed dust control measures to further reduce impacts from the project. Currently, Canyon Rock Quarry has several air quality permits and dust control measures to control fugitive dust emissions. Canyon Rock Quarry shall continue to comply with these permits and measures. The following dust control program presented below enhances and expands on the quarry's existing dust control program. Elements of the dust control program (especially during the dry season) for project components includes, but 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 would be necessary 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). • 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.	Less than Significant

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

Impact	Mitigation Measures	Significance After Mitigation
Air Quality (cont.)		
IV.B.5: (cont.)	• Hydroseed or apply soil stabilizers to inactive 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 (non-toxic) soil stabilizers. • Limit traffic speeds on unpaved roads and circulation areas to 15 miles per hour. • Limit the amount of the disturbed area at any one time (see Hydrology and Water Quality section). • Designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite. • Install wheel washers or other washing method (e.g., water sprayers or use of a water depression crossing) so that tires or tracks of all exiting trucks leaving the site are cleaned of dirt and gravel to minimize tracking of these materials onto public roads. • In the absence of areas containing natural or manmade wind breaks, install wind breaks or plant trees/vegetative wind breaks at the predominant windward side of activity areas. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways, as needed. • Install covers over the quarry's crushers (e.g., baghouses or sheds) to minimize fugitive dust during crushing operations. With certain operations, the use of water or foam spray may be the most effective method used, as determined in consultation with the Air District.	

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Air Quality</u> (cont.)		
IV.B.5: (cont.)	• The operator shall have at least one employee who is a certified visual emissions evaluator. Mitigation Measure IV.B.5 would also serve to further mitigate erosion-generated dust effects discussed in Section IV.D, Hydrology and Water Quality; and V.B, Geology, Seismicity and Mineral Resources. 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 cumulative localized dust episodes in the project vicinity.	
IV.B.6: The proposed project, together with anticipated cumulative development in the area, would contribute to regional criteria pollutants. Since the project's contribution would be less than the project significance criterion, and because the contribution would not be expected to cause an exceedance of the ambient air quality standards, this would therefore be a less than significant impact under the Western or Northern Expansion options.	None required. The project's contribution to cumulative criteria pollutants are determined to be less than significant. However, see Impact IV.B.5 for potential impacts and mitigation associated with cumulative increases in PM10 at nearby receptors. See also erosion control measures identified in Section IV.D, Hydrology and Water Quality, which will serve to further reduce cumulative air quality effects of the project.	
IV.B.7: On-site sources of mobile diesel equipment that would move closer to individual off-site receptors under the expansion options would have the potential to contribute to cumulative increases in DPM exposure at individual receptors. This would be a potentially cumulatively significant impact under the Western or Northern Expansion options.	**IV.B.7:** Implement Mitigation Measures IV.B.4a-b.	With implementation of these measures, the project's contribution to potential cumulative increases in DPM exposure at nearby off-site receptors would be mitigated to a less than significant level.

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

Impact	Mitigation Measures	Significance After Mitigation
Noise		
IV.C.1: Operation of on-site stationary equipment under the proposed project would not generate noise substantially above existing ambient levels in the project vicinity. This would therefore be a less than significant impact under the Western or Northern Expansion options.	None required.	
IV.C.2: Certain proposed mobile equipment operations (clearing and initial vegetation material removal operations within 1,200 feet of receptors where no intervening terrain would exist) under the proposed project would generate noise levels at sensitive receptors that would potentially exceed Sonoma County General Plan Table NE-2 noise standards. This would be temporary, significant impact while those operations occur under the Western or Northern Expansion options.	**IV.C.2:** For any on-site mobile operations, in conjunction with clearing and initial material removal, that occur within 1,200 feet of occupied residences surrounding the quarry where no shielding by intervening terrain exists, the applicant shall: a. Use the quietest available equipment used for such operations. This shall include, as determined feasible by PRMD, the use of high performance mufflers and special engine noise control packages. b. Plan clearing operations so that any on-site terrain features that may provide shielding to the residents is removed last, as determined feasible by PRMD. c. Clearing and initial material removal mobile operations shall be conducted on Mondays through Fridays, between the hours of 8:00 a.m. and 5:00 p.m. only. d. Provide a 30-day advanced notification to PRMD for PRMD to notify the occupants of residences within 1200 feet of the clearing and initial material removal.	As discussed above, the clearing and initial vegetation material removal operation would cause a potentially significant impact within 1,200 feet of existing occupied residences where no intervening terrain would exist which would exceed the County's Table NE-2 Category 2 daytime standard of 55 dBA at some point during the operation. This exceedence is considered temporary in nature due to the anticipated annual duration during clearing and initial vegetation material removal which will not exceed five to ten days annually. The noise caused by this activity would be similar to one that might be experienced when road work or site grading is done near a residence. Therefore, with implementation of Mitigation Measure IV.C.2, the impact would be less than significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Noise (cont.)		
IV.C.3: Mobile operations associated with on-going extraction on the quarry faces and movement of materials on the quarry floor under the proposed project could generate noise levels at sensitive receptors that would exceed Sonoma County General Plan Table NE-2 noise standards. This would therefore be a potentially significant impact under the Western or Northern Expansion Options.	*Western Expansion Option* **IV.C.3a:** Prior to beginning any mobile operations associated with on-going extraction on the quarry faces within 1,200 feet of an occupied off-site residence, a noise monitoring study shall be performed by a qualified acoustical consultant and submitted by the quarry operator to the County. The noise monitoring study shall establish the region in which the operations are to take place. Shielding potential of the intervening topography and/or vegetation shall be assessed. 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 Table NE-2 standards are predicted, operations may proceed. 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. Operations may not be done outside the specific area included in the noise monitoring study except at distances greater than 1,200 feet from any occupied off-site residence. If the monitoring study predicts exceedances of Table NE-2 standards, the noise consultant shall recommend measures to prevent the exceedances. These measures could include: using special mufflers or engine control packages; planning operations to use topographic features to shield residences from noise; constructing earth berms or other noise barriers; sound proofing affected occupied residences; 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.	*Western Expansion Option* Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Noise</u> **(cont.)**		
IV.C.3: (cont.)	If there are no measures identified that will prevent the exceedances, then operations that cause the exceedances may proceed only if they will be of short duration. Short duration means that noise from the quarry operations, including noise from clearing and initial material removal, will not cause exceedance of Table NE-2 standards at any occupied residence for more then 10 days in a year. Exceedance of the standard more than ten days per year is not permitted. Mining operations that cannot meet this condition may not proceed. In this event, the applicant and the County will review and revise the grading plan as necessary to ensure that the Table NE-2 County noise standards will be met at occupied residences. Such changes may result in mining being prohibited in some areas.	
	<u>*Northern Expansion Option*</u>	<u>*Northern Expansion Option*</u>
	IV.C.3b: Implement Mitigation Measure IV.C.3a for the Northern Expansion option for Residence Nos. 11 and 12. For all other residences, no mitigation is required.	Less than Significant.
IV.C.4: Occasional blasting that would occur under the project would generate temporary airborne and groundborne noise and vibration. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.C.4a:** Blasting shall be limited to daytime hours from 10:00 am to 4:00 pm only. **IV.C.4b:** A blasting permit shall be obtained from the Sonoma County Sheriff's Department prior to any blasting. **IV.C.4c:** Blasting shall only be conducted by licensed certified personnel consistent with Federal, State, and local regulations. Blasts shall be designed such that the charge weight per delay does not exceed that the charge weight/distance curve shown in Figure IV.C.4c (See Section IV.C) The applicant shall be responsible for hiring a qualified expert to verify the above-described noise and vibration performance standards are being met if requested by the Sonoma County Permit and Resource Management Department. All blasts shall be designed so that charge weight per delay does not exceed the curve given in Figure IV.C.4c for the distance to the nearest residence. The charges shall be	Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Noise</u> (cont.)		
IV.C.4: (cont.)	detonated sequentially over a time span such that the delay between the detonation of individual charges is 8 milliseconds or greater. Overpressure intensity shall be reduced when the blast charges are well-confined; therefore, the qualified blasting expert shall ensure that the blast holes have adequate stemming and adequate burden.	
IV.C.5: Project-generated vehicles under the proposed project would result in an increase in ambient noise levels on roadways serving the project. This would be a less than significant impact under the Western or Northern Expansion options.	None required.	
IV.C.6: On-site quarry operations under the proposed project, when considered along with other potential noise-generating cumulative projects in the site vicinity, would not increase noise levels at off-site receptors beyond that identified for project impacts. Consequently, this would be a less than significant cumulative noise impact under the Western or Northern Expansion options.	None required. However, implementation of Mitigation Measures IV.C.2 and IV.C.3 would serve to mitigate the Canyon Rock Quarry expansion project's impact to noise levels at off-site receptors.	
IV.C.7: Project-generated vehicles under either the proposed project, when combined with increases in cumulative traffic, would result in an increase in ambient noise levels on roadways serving the project. This would be a significant cumulative impact under the Western or Northern Expansion options.	Because of the topography, setting, and low vehicle speeds involved, traditional means of traffic noise abatement such as road side barriers or quiet pavement are not viable.	As a result, the impact would remain significant and unavoidable as concluded in the adoption of the ARM Plan.

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

Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality		
IV.D.1: Implementation of the proposed project could result in discharges of pollutants (including sediment, metals, and petroleum hydrocarbons) in stormwater to Green Valley Creek, potentially violating water quality standards and/or impacting habitat. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.D.1:** The following mitigation measures, in conjunction with those measures proposed by the applicant, shall represent the water quality protection program. The program shall be implemented prior to initiation of mining under the proposed expansion (with the exception of Mitigation Measure IV.D.1c). The applicant shall demonstrate to the satisfaction of the RWQCB and the County that discharges from the site consistently meet the specified water quality benchmarks for stormwater discharges prior to proceeding with mining under the proposed expansion. All of the following mitigation measures shall be implemented for either expansion option: **IV.D.1a:** *Expand creekside buffer.* All aggregate equipment storage facilities and processing facilities shall be moved out of the floodplain of Green Valley Creek prior to initiation of mining under the proposed expansion. The floodplain boundary at the quarry shall be demarcated to minimize the potential of future encroachment of site activities into the floodplain area. The buffer zone shall be reconfigured so that flood water flowing across Highway 116 can enter the floodplain buffer zone at the site and flow unobstructed back into Green Valley Creek. The southeast portion of the site, that is subject to flooding and is currently used as an unimproved parking area, will be paved. Other areas will be vegetated to reduce erosion. No new stockpiles or permanent equipment will be placed in the 100-year floodplain as shown in Figure IV.D-2. **IV.D.1b:** *Implement aggressive sediment source control program.* Source control measures focus on keeping sediment on the slopes before it is entrained in runoff. Each of the following measures shall be implemented to reduce the amount of sediment that enters runoff within the quarry. Mining operations shall not commence in the expanded mining area until the following activities are completed:	Less than Significant. The identified mitigation measures would reduce pollutant loading to Green Valley Creek to below water quality benchmark levels prior to initiation of mining under the proposed expansion. The mitigation measures described above require that the runoff from the site meet or exceed the water quality benchmarks for the life of the project. Adverse impacts associated with discharge of pollutants are therefore considered less than significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality (cont.)		
IV.D.1: (cont.)	• Reclamation work has expanded the riparian corridor along Green Valley Creek (in the existing quarry area) to 100 feet from top bank, meeting all ARM Plan standards. The reclamation work shall have included but not be limited to removing all mining equipment, stockpiles, spoils, bins, barrels, tires, inoperative vehicles and any other debris from the berm along the creek, regrading of the berm so that the west toe of the berm is no less than 50 feet from top of bank of the creek and the berm slope does not exceed 2:1 (horizontal to vertical) or as otherwise approved by PRMD, completion of planting of the area with natural riparian or other appropriate type vegetation, and installation of a physical barrier to protect the area from encroachment of mining equipment. No new stockpiles or permanent equipment will be placed in the 100-year floodplain as shown in Figure IV.D-2; • A final grading and revegetation plan is prepared in conformance with recommendation of the California Department of Fish and Game which shall be included in the reclamation plan, and the sediment ponds/drainage system shall be installed/cleaned out as required by the erosion and sediment control plan; • A Spill Prevention Plan approved by the County Environmental Health Department's Hazardous Materials Division is made part of the reclamation plan; and • Reclamation or stabilization of all quarry slopes and the quarry floor (excluding the 40-acre working/processing/stockpile/loading/access areas and the acreage of the sedimentation ponds) must be completed by October 15 of each year. Stabilization measures include hydraulic application of surface stabilizing compounds, hydroseeding, mulching, or other measures to prevent erosion. The operator must be up to date with all required reporting forms and fees, and have no outstanding water quality-related violations anywhere in the quarry. To insure accurate compliance with this condition the applicant shall submit 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.	

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Hydrology and Water Quality</u> (cont.)		
IV.D.1: (cont.)	During mining and reclamation activities, the following measures shall be implemented to reduce the potential for erosion and sediment discharge: • Mining activities and the operation of heavy equipment on site shall be done in such a manner as to avoid repeated crossing of drainage ways or puddles that are actively flowing into the sediment pond/traps and offsite; • Topsoil suitable for use in revegetation shall be stockpiled for use in reclamation and replanting of cut slopes. Prior to October 15 of each year, all topsoil stockpiled for future use in revegetation shall be seeded and mulched in order to prevent soil loss through erosion; • Surfaces disturbed by mining shall be stabilized, to the extent practicable, by October 15 of each year. Stabilization measures include, but are not limited to, hydraulic application of surface stabilizing compounds, hydroseeding, mulching, or other measures to prevent erosion; and • All active processing area roads and work areas shall be stabilized surfaces or engineered with aggregate base fill thicknesses adequate to withstand heavy equipment and truck traffic. These roads shall be constructed with culverts and energy dissipation structures to convey runoff under the roads, as necessary. Areas on the quarry floor other than roads and active work areas shall be stabilized by the stabilization techniques described above. Mitigation IV.B.5 in Section IV.B, Air Quality; and Mitigation V.B.3 in Section V.B, Geology, Seismicity and Mineral Resources, also contain a number of measures that would serve to further mitigate potential erosion effects.	

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

Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality (cont.)		
IV.D.1: (cont.)	**IV.D.1c:** *Modify the mining plan.* The mining plan shall be modified so that the quarry floor slopes toward the active mining slope (the high wall). This reshaping of the quarry floor shall occur as mining progresses. A detention basin shall be constructed at or near base of the high wall to act as a primary sediment settling facility and sized to manage runoff from exposed slopes. The design of the basin shall be submitted to the Regional Water Quality Control Board for approval with copies to PRMD. The basin shall be setback from the high wall so as not to interfere with aggregate excavation. The basin may be relocated from time to time to best manage aggregate excavation. Discharge from this primary settling facility shall be directed to the detention ponds proposed by the project for further treatment prior to discharge to Green Valley Creek. **IV.D.1d:** *Modify the proposed detention basin design at the concrete batch plant.* At the new batch plant location, a new runoff and washwater holding facility shall be designed and constructed to contain all runoff from the batch plant area, including the location where trucks unload Portland cement and where mixer trucks are washed (both inside and outside of the mixer truck). The batch plant area shall be designed so that no run-on into the area of the batch plant occurs. In accordance with the Industrial General Permit, water shall not be discharged from this holding facility (truck washdown water is considered a non stormwater discharge). Water in this facility shall either be allowed to evaporate or if the pH level is appropriate, the water may be used on-site for dust control. **IV.D.1e:** *Implement best management practices.* Implement best management practices to reduce the potential for discharge of contaminants to storm water runoff. 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	

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

Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality (cont.)		
IV.D.1: (cont.)	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; • Prior to commencing mining activities a spill prevention and emergency/countermeasure response plan shall be prepared and submitted to the County Hazardous Materials Division for review and approval. The operator shall provide a copy of the approved plan to the Permit and Resource Management Department; • At vehicular access points, the site shall be controlled by maintaining security fencing and locking gates and posted trespass signs at all vehicular access points to the site; and • Runoff from the access roads shall be collected and passed through the sediment pond/trap system on site. **IV.D.1f(1):** *Implement a monitoring program.* The current stormwater monitoring program being implemented by the applicant shall be expanded for a single season to collect a series of baseline samples during a representative storm events. Timing of this monitoring shall depend on the volume of runoff, therefore, the water quality consulting firm performing the testing shall establish timing criteria with the RWQCB, to ensure data that is collected will provide the proper baseline sampling. The monitoring program shall include the following: • The baseline monitoring program shall be implemented by a qualified third-party water quality consulting firm that is approved by the County and compensated by the applicant;	

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

Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality (cont.)		
IV.D.1: (cont.)	• Prior to commencement of mining in the approved expansion area: a) A collection of a minimum of eight baseline samples of runoff from undisturbed locations to determine background constituent levels. Two locations shall be selected in areas away from mining activities and other human disturbance and sampled at least four times at each location during the single rainy season. b) All storms that generate discharge from the active mining portion of the project site to Green Valley Creek shall be monitored. However, as a practical measure, it shall not be required that monitoring events occur more frequently than once every two weeks or pursuant to the criteria developed by the RWQCB. The discharge end of each outfall shall be made easily accessible for inspection and sampling. c) This single-year collection of stormwater background data will be used as the basis to evaluate future water quality sampling data. **IV.D.1f(2):** *Collection of semi-annual RWQCB samples.* The applicant shall collect semi-annual representative samples from all stormwater discharge outfalls (at the location where the discharge leaves the detention 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: • Collection of samples at upstream and downstream of the quarry outfalls in Green Valley Creek during discharges from the site (at the same frequency as described above);	

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

Impact	Mitigation Measures	Significance After Mitigation

Hydrology and Water Quality (cont.)

IV.D.1: (cont.)

- 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 and TPH as diesel (with silica gel clean-up) by a State-certified analytical laboratory;
- The surface water quality data shall be analyzed by a qualified professional for indications of exceedence of water quality benchmarks and/or changing conditions in water quality that could indicate a potential impact to water quality conditions in Green Valley Creek. The following benchmark water quality values shall be used to determine whether an adverse impact may be associated with the discharge:

pH	Total Suspended Sediment	Turbidity	Specific Conductance	Iron	Total Petroleum Hydrocarbons as Diesel
6.5 to 8.5 [a]	0 to 100 mg/L [a]	Not greater than 20% increase in receiving water [b]	0 to 200 uS/cm [a]	0 to 300 ug/L [a]	<15 mg/L

[a] Based on State Stormwater Pollutant Benchmark levels.
[b] Based on the Basin Plan (RWQCB, 2001). This criteria cannot be applied to discharge samples from outfalls, but shall be applied to samples collected in Green Valley Creek upstream and downstream of the project site.

The applicant shall submit a monitoring report to the Regional Water Quality Control Board with a copy submitted to the Sonoma County Permit and Resource Management Department. Frequency of reporting will be determined by the RWQCB but shall not be less frequent than twice each rainy season.

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

Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality (cont.)		
IV.D.1: (cont.)	IV.D.1g: *Implement corrective action, as necessary.* If values measured from project site discharges fall outside the specified ranges, action must be taken to mitigate the exceedence. If the data indicate that contaminants of concern are increasing in concentration relative to baseline conditions, the qualified professional shall recommend corrective action. The applicant shall work with the RWQCB to implement appropriate corrective action, as necessary. Corrective action may include, but is not limited to, additional source control BMPs, expansion of the existing detention ponds, mechanical filtration of the discharge, construction of extended wet ponds and/or treatment wetlands. Mining in the proposed Western or Northern expansion areas shall not commence unless the applicant can demonstrate that the existing mining operation can meet the specified water quality objectives. IV.D.1h: *Repair storm damage, as necessary.* Following storm events which significantly damage (i.e., erosion or rainfall-induced landsliding) the reclamation areas, the operator shall have a qualified professional conduct a damage survey of the reclamation improvements, and recommend remedial actions as necessary to help assure that the performance standards will be met. A report shall be submitted to the Sonoma County Permit and Resource Management Department regarding the effects of such damage, including recommendations for replanting, if necessary.	
IV.D.2: The location of equipment, facilities, and aggregate stockpiles in the floodplain could exacerbate flooding impacts downstream. In addition, property damage and impacts to water quality during a flood event may occur. This would be a potentially significant impact under the Western or Northern Expansion options.	IV.D.2: Implement Mitigation Measure IV.D.1.	Less than Significant. The identified mitigation measures would eliminate operation and/or storage of equipment, facilities and aggregate materials stockpiles from the floodplain. Adverse impacts associated with flooding are therefore considered less than significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Hydrology and Water Quality (cont.)		
IV.D.3: Implementation of the proposed project could adversely affect local groundwater resources by reducing recharge to groundwater wells or causing permanent, unrecoverable groundwater level decline in nearby wells. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.D.3a:** Water used for processing activities and dust suppression shall be recycled from the sediment pond/traps to the extent practicable. **IV.D.3b:** The applicant shall conduct regular groundwater monitoring of onsite wells to identify both temporary groundwater drawdown and long term, unrecoverable groundwater drawdown resulting from increased onsite groundwater pumping. The self-monitoring program shall begin at project approval and prior to mining under the new permit in order to obtain a sufficient set of existing, baseline groundwater level data. The monitoring program shall use the existing extraction well and all other accessible, existing wells located within the project boundary. If necessary, the applicant shall install new monitoring wells as determined by the program developer. Regular and consistent water level monitoring would identify and distinguish between temporary or long-term decline of the groundwater levels. Water level data shall be collected prior to pumping, at regular intervals during pumping and at regular interval after pumping is stopped (static conditions). If during proposed project operations, data indicates that groundwater levels do not recover to at least 80 percent of the baseline levels over the pre-determined recovery period (based on existing recovery rates), the applicant shall reduce supplemental groundwater pumping to pre-project rates and obtain necessary supplemental water supply from onsite surface water sources or municipal supply. Further, if the groundwater monitoring program identifies a consistent groundwater level decline over the course of each water year (October to September) that is not in response to a known or reported regional drought condition, the applicant shall reduce pumping to pre-project levels and obtain a supplemental water supply from onsite water recycling or municipal source. Although the applicant would perform the actual groundwater monitoring and data collection, the program shall be developed by a California State certified hydrogeologist with experience in groundwater conditions local to Canyon Rock Quarry. Quarterly reports and data shall be submitted to Sonoma County. However, the County shall be immediately notified if groundwater conditions change substantially.	Less than Significant. The identified mitigation measures would reduce potential impacts associated with depletion of groundwater resources. The groundwater monitoring program would adequately identify temporary and long-term adverse effects of the additional supplemental pumping proposed by the project and provides a means to alter quarry practices to avoid the impacts associated with a long term decline of water levels. The prescribed mitigation ensures that impacts related to groundwater level decline in onsite and nearby wells would remain less than significant.

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Hydrology and Water Quality</u> (cont.)		
IV.D.3: (cont.)	The mitigation measure requires that the applicant initiate a self-monitoring program for groundwater at the quarry. The purpose of this program is to provide a mechanism for early identification of potential and significant groundwater level decline. The data obtained would identify and distinguish between temporary groundwater drawdown due to daily operations and long-term drawdown due to over-pumping of the groundwater bearing zones beneath the site. Long-term drawdown identified within the site boundaries could translate to lower, unacceptable, groundwater levels in neighboring, offsite wells at a later time. Monitoring under this program would be conducted on a regular schedule and from all accessible and useable groundwater wells on the quarry property. Data would be collected at regular interval (i.e. twice daily) while pumping is underway, after pumping is stopped, and while the well is in static (no pumping) conditions.	
IV.D.4: Implementation of the proposed project could significantly alter the hydrology of Green Valley Creek. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.D.4a.** The applicant shall design and operate the sediment retention ponds to act as runoff detention features so that peak flows in Green Valley Creek are not increased. The project proposes to construct and operate a series of detention basin (as described above) to facilitate the removal of suspended sediment from storm water runoff generated at the project site prior to discharge to Green Valley Creek. The basins are not designed or intended to retain all runoff from the site during the rainy season. Periodically, the basins would be drained to ensure that there is sufficient capacity to detain runoff generated in subsequent storm events. Water removed from the basins would be discharged into Green Valley Creek. If the discharges are not timed properly, they could potentially incrementally increase flooding hazards on the creek. Two factors should be considered to minimize the potential for the project to exacerbate existing flooding problems along Green Valley Creek: 1) the increase in volume of runoff from the project site, and 2) the timing of the release of runoff from the project site relative to peak flood flows in Green Valley Creek during a storm event. For example, a project that would generate a large increase in runoff that coincided with the flood peak in the creek would cause a greater impact	Less than Significant. The identified mitigation measures would reduce potential impacts associated with increased runoff so that peak discharges are not increased. Adverse impacts associated with increased runoff are therefore considered less than significant.

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Hydrology and Water Quality</u> (cont.)		
IV.D.4: (cont.)	on flooding than a project that generated a relatively small increase in runoff volume that did not coincide with the flood peak in the creek. The final drainage plan for the project shall be prepared by a licensed professional engineer and reviewed for adequacy by the County. **IV.D.4b:** The Sediment pond/traps and drainage systems shall be cleaned out pursuant to the standards stated in the approved erosion and sediment control plan. The sediments shall be stockpiled for use as topsoil in the reclamation process. The slope of the pond/trap banks (below water) shall be equal to or greater than a 3:1 (horizontal/vertical) slope to discourage shallow water areas which promote plant growth and mosquito breeding. All of the sediment pond/traps and drainage systems on site shall be cleaned out pursuant to the standards stated in the approved erosion and sediment control plan, as required by October 15. If upon inspection the sediment ponds/traps and drainage system have not been cleaned out, the owner will be put on notice to complete the cleaning within 30 days or all crushing, screening, grading, and sales of material on site shall immediately cease until the ponds/traps and drainage system have been cleaned out.	
IV.D.5: Continued operation of septic systems at the site could result in water quality impacts to Green Valley Creek. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.D.5:** An analysis shall be made by a Registered Civil Engineer or Registered Environmental Health Specialist regarding the existing septic system's ability to accommodate the proposed sewage loading. Any necessary system expansion or modifications shall be done under permit from the Well and Septic Section of the Permit and Resource Management Department and may require both soils analysis and percolation testing.	Less than Significant. The identified mitigation measure would reduce potential impacts associated with poorly treated septage. Adverse impacts associated with septic system operation are therefore considered less than significant.

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Hydrology and Water Quality</u> (cont.)		
IV.D.6: Cumulative impacts to the hydrology of Green Valley Creek could result from implementation of the proposed project and the proposed mining expansion at the Blue Rock Quarry. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.D.6:** Implement Mitigation Measure IV.D.4.	Less than Significant. Mitigation Measure IV.D.4 would require that on-site detention ponds are designed and operated so that no increase in peak discharges results from project implementation. Therefore, with implementation of Mitigation Measure IV.D.4, the project would not contribute to cumulative flooding impacts.
IV.D.7: The proposed project, in conjunction with other activities in the region, may result in cumulative adverse impacts to regional groundwater resources. This would be a less than significant impact under the Western or Northern Expansion options.	None required.	
IV.D.8: The proposed project, in conjunction with existing operations on the site, the operations of the adjacent Blue Rock Quarry, and vineyard plantings in the area, would result in cumulative adverse impacts to water quality in Green Valley Creek due to soil erosion. This would be a potentially significant impact under the Western or Northern Expansion options.	**IV.D.8:** Implementation of Mitigation Measure IV.D.1 would reduce the pollutant discharge from the Canyon Rock Quarry to a level below the existing baseline, because the measures would add new best management practices (BMPs) to both existing and new operations.	Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Land Use and Planning		
V.A.1: The proposed project would result in a change in land use on a portion of the project site. The effect of this change on surrounding existing or future nearby land uses would be less than significant.	None required for the proposed change in land use on the project site. However, this EIR identifies a number of mitigation measures that would be required to mitigate specific environmental impacts to land uses; please see those contained in Section IV.A., Traffic and Transportation; Section IV.B., Air Quality; Section IV.C, Noise; Section IV.D, Hydrology and Water Quality; Section V.B, Geology and Soils, Section V.C, Hazards and Hazardous Materials; Section V.D, Biological Resources; and Section V.E, Aesthetics.	
V.A.2: The proposed project would not increase employment, require extension of new public utilities, or displace a significant amount of housing. Consequently, the proposed project's effect to population and housing would be less than significant.	None required.	
Geology, Seismicity, and Mineral Resources		
V.B.1: In the event of a major earthquake in the region, seismic ground shaking could potentially injure people and cause collapse or structural damage to existing structures and extensions of existing structures. This would be a potentially significant impact.	**V.B.1:** All structures for the proposed project shall be designed in accordance with the 1997 UBC, which requires structural design that incorporates ground accelerations expected from known active faults. Expected ground motions determined by a registered geotechnical engineer shall be incorporated into the final structural design as part of the project. The final seismic considerations for the site shall be submitted to and approved by the Sonoma County Permit and Resource Management Department. Predicting seismic events is not possible, nor is providing mitigation that can entirely reduce the potential for injury and damage that can occur during a seismic event. However, using accepted geotechnical evaluation techniques and appropriate engineering practices, potential injury and damage can be diminished, thereby exposing fewer people and less property to the effects of a major damaging earthquake.	Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Geology, Seismicity, and Mineral Resources</u> (cont.)		
V.B.2: Development at the project site could subject people and property to slope instability hazards, including landslides, debris flows, and rockfalls caused by seismic and nonseismic mechanisms. This would be a potentially significant impact.	**V.B.2:** Prior to the commencement of mining, a licensed Geotechnical Engineer and Certified Engineering Geologist shall perform a site-specific geotechnical evaluation of the Northern Expansion option area. The evaluation shall include a determination of the factor of safety for proposed mining and reclamation slopes within both overburden materials and the underlying bedrock and a qualified opinion that the factor of safety is consistent with the requirements of Section 3704(d) of the State Mining and Geology Board Reclamation Regulations. The evaluation of seismically-induced landslides shall be consistent with the provisions of the *California Division of Mines and Geology Guidelines for Evaluating and Mitigating Seismic Hazards* (CDMG Special Publication 117, 1997). The evaluation shall be reviewed and approved by PRMD. The recommendations presented in the evaluation shall provide for annual inspection of mining and reclaimed slopes by CALOSHA and the Mine Safety and Health Administration (MSHA). Provisions for corrective action for slope stability or erosion problems identified during annual inspections shall be included in the evaluation.	Less than Significant.
V.B.3: Soil erosion of exposed cut or fill slopes, native slopes with removed vegetation, and soil stockpiles could result in damage to structures and temporary disruption to rough and final grading operations during and after reclamation activities as well as exacerbate the potential for landslide or debris flow. This would be a potentially significant impact.	**V.B.3:** The project applicant shall incorporate into the grading and construction specifications provisions requiring that all phases of construction implement best management practices (BMPs) to reduce and eliminate soil erosion. The contractor shall implement these BMPs, and the contractor shall be responsible for the inspection and maintenance of the BMPs through all phases of mining and reclamation. Mitigation IV.B.5 in Section IV.B, Air Quality; and Mitigation IV.D.1b in Section IV.D, Hydrology and Water Quality, also contain a number of measures that would serve to further mitigate potential erosion effects.	Less than Significant.
V.B.4: The proposed project would make aggregate resources available for consumption. This would be a less than significant impact.	None required.	

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Hazards and Hazardous Materials</u>		
V.C.1: Hazardous materials 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.	**V.C.1a:** Prior to excavation activities in the Northern Expansion areas, 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. **V.C.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. **V.C.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. **V.C.1d:** No soil or other material containing hazardous or toxic waste shall be imported to the quarry (Note, this condition is not intended to restrict the recycling of concrete or asphalt on site).	Less than Significant.
V.C.2: The project site includes the two sites of former leaking underground fuel storage tanks included on the State Water Resources Control Board Hazardous Substance Storage Container Database. Disturbance of soils or groundwater affected by releases of petroleum hydrocarbons could potentially expose workers to increased human health risks. This would be a less than significant impact.	None required.	

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

Impact	Mitigation Measures	Significance After Mitigation
<u>Hazards and Hazardous Materials</u> (cont.)		
V.C.3: Continued mining and reclamation activities at the project site could expose structures, on-site workers, and nearby residents to hazards associated with wildland fires. This would be a less than significant impact.	None required.	
<u>Biological Resources</u>		
V.D.1: Project construction and grading activities within the proposed 20-year limit of grading of the proposed project could disturb or destroy wetland and riparian habitat directly adjacent to the western boundary of the existing permitted area of the quarry. This would be a significant impact under the Western or Northern Expansion options.	*<u>Western Expansion Option</u>* **V.D.1a:** If it is infeasible to avoid filling or excavating potentially jurisdictional wetlands under the Western Expansion Option, then 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 a 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:	*<u>Western Expansion Option</u>* Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
V.D.1: (cont.)	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.	
	Northern Expansion Option	*Northern Expansion Option*
	V.D.1b: Avoid all potentially jurisdictional wetlands and riparian habitat located along the western boundary of the existing permitted area of the quarry. Prior to construction activities, the project applicant shall take appropriate measures to protect the wetland and riparian habitat located on the western boundary of the existing permitted area of the quarry. Protection measures to be included in the grading and Reclamation Plan: • Installation of exclusionary construction fencing around the seasonally wet area; • Implementation of all measures to control dust in adjacent work areas; • Maintenance of the hydrologic inputs (flow) to the seasonally wet area; and • The project applicant shall maintain the minimum allowed setback for quarry mining operations from stream banks and critical habitat areas designated in the Sonoma County General Plan, which is 100 feet (Chapter 26A, County Code).	Less than Significant.
V.D.2: Project construction and grading activities proposed under the proposed project would result in direct loss and/or disturbance to natural communities. This would be a potentially significant impact under the Western or Northern Expansion options.	**V.D.2:** Though loss of existing natural communities on the site would have an adverse effect on the project area, impacts would be offset by the project applicant's strict adherence to implementation of the reclamation standards for revegetation (Chapter 26A, County Code). The revegetation standards contained in the 1992 Revegetation Technical Report available at the Permit and Resource Management Department will be applicable.	Development of replacement vegetation will, over time, result in corresponding development of habitat characteristics comparable to those present on the project site. However, there will be a net loss of forest community that will extend past the operating life of the quarry. Consequently, the impact of loss of North Coast Conifer forest would remain significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
V.D.2: (cont.)	These standards require reclamation to begin as soon as possible during the mining process and completed within the schedule stated within the reclamation plan. Mined lands will be revegetated with grass seed mixtures approved by the CDFG and shrubs and trees native to the project area and appropriate to the topographic, soil, and climatic conditions of the site. Natural regrowth of riparian vegetation shall be encouraged on disturbed areas adjacent to streams. Revegetation operations will be inspected and monitored at least once a year by the PRMD and need for additional planting will be determined at that time. Unless site specific vegetation performance standards are established in the Reclamation Plan approval, revegetation standards shall be considered met once the established plantings have been in place at least five (5) years, are capable of self-regeneration, and have met the quantified measurements for a period of two (2) years without human intervention such as watering, weeding, fertilizing, replanting, etc. The proposed planting plan for Phase I and Phase II include certain plant species that are not native to the project area and therefore would not be consistent with the standards set forth in Chapter 26A of the County Code regarding use of native trees and shrubs. Locally occurring native species shall be used.	
V.D.3: Disturbance from construction activities and removal of vegetation under the proposed project could increase the occurrence of invasive plant species such as French broom and Scotch broom. This would be a significant impact under the Western or Northern Expansion options.	**V.D.3:** Reclamation boundaries and adjacent habitats shall be inspected regularly for presence of invasive plants, such as French and Scotch Broom and other relevant species. Occurrences shall be removed immediately by pulling, digging, or other approved invasive plant control methods in an approved manner.	Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
V.D.4: Quarry activities associated with the proposed project may result in erosion and sedimentation of surrounding creeks and drainages which could negatively impact aquatic species. This would be a potentially significant impact under the Western or Northern Expansion options.	**V.D.4:** Implement measures contained in Mitigation Measure IV.D.1 contained in Section IV.D, Hydrology and Water Quality, in this EIR.	Less than Significant.
V.D.5: Proposed quarry expansion may result in nest destruction or abandonment of nesting birds (protected raptors and other birds), if present. This would be a potentially significant impact under the Western or Northern Expansion options.	**V.D.5:** If clearing of vegetation occurs outside of the August 15 to March 1 nesting avoidance period, the owner must, prior to commencement of clearing of vegetation activities, retain a qualified biologist to survey the site for nesting raptors within 500 feet of the clearing area and for birds protected by CDFG Sections 3503 within 250 feet of the clearing area. The survey distance for raptors and other birds may be modified by a qualified biologist depending upon the site circumstances. If species are found to be nesting on-site or within close proximity, a buffer area shall be designated by the biologist and all clearing activities shall remain outside of this area until nesting is complete.	Less than Significant.
V.D.6: Proposed quarry expansion may result in the disturbance, displacement, or mortality to special-status wildlife species, including the northern spotted owl, and special-status bat species, if present. Impacts to nesting owls and adjacent foraging and screening habitat would be potentially Significant. The loss of bat foraging and roosting habitat is considered potentially significant impact under the Western or Northern Expansion options.	**V.D.6a:** For northern spotted owl, approved protocol surveys, consistent with §§919.9-919.10 of *California Forest Practice Rules* will be necessary. This effort requires: identification of functional owl nesting, roosting and foraging habitat on, and within 0.7 miles of any project boundary; review of known owl surveys that have been conducted within 1.3 miles of the project site; surveys, by a qualified biologist on the project site and within 0.7 miles of any boundary, in accordance with *Guidelines for Surveying Proposed Management Activities Which May Impact Northern Spotted Owls* (USFWS 1991). Surveys of the proposed project area may be required and would include a 1-year (6 visit) survey valid only until the beginning of the following breeding season or 2-year (3 visits/year) survey valid for 2 additional years, if owls are detected. The 2-year survey is preferable and is more likely to accurately determine presence or absence. Surveys shall be conducted between 15 March and 31 August, 1 to 2 years prior to commencing activities, depending on the survey type.	Less than Significant

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

Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
V.D.6: (cont.)	In general, any activity that is determined by CDF to constitute "take" would not be approved. Modifications to the THP would be required to avoid harassment or direct impacts to nesting owls. In addition, CDF will require that the THP meet specific requirements, including: no timber operations within 500 feet of an active nest site or pair activity center; maintenance of functional habitat (limited timber operations) between 500 and 1,000 feet of an active nest site or pair activity site; identification and retention of 500 or more acres of owl habitat within a 0.7-mile radius of an active nest site or pair activity center ; 1,336 or more acres of owl habitat within a 1.3-mile radius of an active nest site or pair activity center (including lands retained within a 0.7-mile radius); areas retained to be adjusted by CDF and CDFG to conform to natural landscape attributes such as draws and streamcourses. **V.D.6b:** Prior to commencement of tree harvesting, the applicant will need to commission a survey of the site by a CDFG-approved biologist specializing in local bat species. If occupied roosting habitat is identified, mitigation would consist of establishment of artificial roosts (wood structures) at suitable locations specified by a CDFG biologist, as near as possible to the site of the existing roosts. Removal of roost trees would not be allowed until the roost was unoccupied.	
V.D.7: Proposed quarry expansion may result in the disturbance, displacement, or mortality to the red tree vole (a special-status wildlife species). The direct loss of red tree voles and nests is considered a potentially significant impact for the Western Expansion option and a less than significant impact for the Northern Expansion option.	*Western Expansion Option* **V.D.7:** Within the Western Expansion option area, a portion of the area provides habitat features associated with the red tree vole. Areas supporting large Douglas fir trees should be retained. Retention actual or potential nest trees and a 100-meter (328 foot) radius buffer area around each nest site are identified as necessary in the *Northwest Forest Plan* (Biswell *et al* 2002). The majority of suitable red tree vole habitat in the Western Expansion option area is within 500 feet of Highway 116, and thus, much of the habitat would be within the buffer area between the road and the quarry. The setback area would need to be expanded to provide the necessary distance suitable habitat and quarry operations. This area shall be permanently preserved to eliminate potential impacts to red tree vole. This measure shall apply only if the Western Expansion option is approved.	*Western Expansion Option* Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
Biological Resources (cont.)		
V.D.7: (cont.)	*Northern Expansion Option* None required.	
Aesthetics		
V.E.1: The proposed quarry expansion would substantially alter the visual character of the project site. This would be a significant impact.	**V.E.1:** All mining stockpiles, spoils, and recycled material shall be stored at least 200 feet away from Highway 116 unless it is fully screened by a berm and/or vegetation. All new structures shall be located at least 200 feet away from Highway 116. No junk, debris, non-operative vehicles, or equipment unrelated to the quarry shall be stored anywhere on the quarry property, unless visually screened from off-site views.	Significant and Unavoidable for both the Western and Northern Expansion options. Even with measures proposed by the project sponsor and in this EIR, 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.
V.E.2: The proposed project would extend the potential for production of light and glare at the project site. This would be a less than significant impact.	None required.	

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

Impact	Mitigation Measures	Significance After Mitigation
V.E.3: The proposed quarry expansion, in conjunction with other cumulative development in the project vicinity, would substantially alter the visual character of the project vicinity. This would be a significant cumulative impact.	**V.E.3:** Implement Mitigation V.E.1.	Significant and Unavoidable for both the Western and Northern Expansion options. Even with measures proposed by the project sponsor and in this EIR, and implementation of conditions contained in the ARM Plan and SMARO, cumulative visual impacts would not be reduced to a level of insignificance.
<u>Public Services and Utilities</u>		
V.F.1: The proposed project would require the fire suppression and/or emergency medical services of the Forestville Fire Protection District. This would be a less than significant impact.	None required.	
V.F.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.	None required.	
V.F.3: The proposed project could create a demand for use of park and recreation facilities in the area. This would be a less than significant impact.	None required.	
V.F.4: The proposed project would require water from the Forestville County Water District. This would be a less than significant impact.	None required.	

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

Impact	Mitigation Measures	Significance After Mitigation
V.F.5: The proposed project would generate amounts of solid waste, and would involve the continuation of recycling operations at the quarry. This would be a less than significant impact.	None required.	
<u>Cultural Resources</u>		
V.G.1: Land alternation proposed under the proposed project could affect previously undiscovered cultural resources. This would be a potentially significant impact.	**V.G.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. **V.G.1b:** During quarry 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. **V.G.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.	Less than Significant.

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

Impact	Mitigation Measures	Significance After Mitigation
V.G.2: Land alternation proposed under the proposed project could affect previously undiscovered paleontological resources. This would be a potentially significant impact.	**V.G.2a:** The cultural resources orientation and awareness training program identified in Mitigation V.G.1a shall also include familiarization with paleontological resources. **V.G.2b:** During quarry operations, should any undiscovered evidence of paleontological resources be encountered, work at the place of discovery shall be halted, and a qualified paleontologist 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.	Less than Significant.

CHAPTER III
PROJECT DESCRIPTION

A. PROJECT OVERVIEW

The project sponsor, Canyon Rock Company, Inc. proposes an expansion of the existing Canyon Rock Quarry, located in unincorporated Sonoma County west of the Town of Forestville. The project sponsor has requested the necessary entitlements from the County of Sonoma to enable the expansion of the existing quarry to either the west or the north of its existing vested rights and permitted area (herein referred to as the Western Expansion option and Northern Expansion option). Approval of this request would grant a use permit for additional mining for a new 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 County of Sonoma, serving as Lead Agency responsible for administering the environmental review for the proposed project, 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.

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 continue ownership and profitable operation of the existing Canyon Rock Quarry by providing affordable aggregate to customers in Sonoma County;
- To extend the life of the existing quarry in a location where potential environmental effects can be avoided or minimized without rendering the project economically infeasible;
- To extend the life of the existing quarry in such a manner as to increase production of high quality aggregate in conformance with the goals and objectives of Sonoma County's 1994 ARM Plan;
- To extend the life of the existing quarry at an ARM Plan designated site to facilitate State and County policy of meeting local demand with local resources;
- To extend the life of the existing quarry to profitably and environmentally meet the long term aggregate needs of Sonoma County;
- To extend the life of the existing quarry and in doing so assist the County of Sonoma in meeting its obligations to shift aggregate production away from terrace mining to hard rock quarries; and,
- To extend the life of the existing quarry and in doing so assist the County of Sonoma in its goal to facilitate the local production of high quality aggregate and reduce the loss of high quality productive agricultural land.

C. PROJECT SITE LOCATION AND SITE DESCRIPTION

SITE LOCATION

The project site is located at 7525 Highway 116, in unincorporated Sonoma County, and within Township 7 North, Range 10 West, in the USGS 7.5 Camp Meeker Quadrangle (see Figure III-1). The project site is bounded on the south by Highway 116, and on the east by Martinelli Road.

Figure III-2 presents an aerial photograph of the project site and vicinity, and identifies the existing vested rights and use permitted area of Canyon Rock Quarry, and those areas that would be rezoned as Mineral Resource District under either the Western and Northern Expansion options. Geographically, the project site is located at the east end of Pocket Canyon and within the eastern fringe of the Coastal Range. Green Valley Creek with its associated habitat zone extends northward within the project site along the east site border. The project site is relatively level in the southeast portion of the site where the existing quarry main facilities are located, with surrounding slopes generally increasing steeply towards the west and northwest. Project elevations within the site range from a low of approximately 75 feet above sea level (asl) along Green Valley Creek, an average of about 100 feet asl on the quarry floor, to a high of approximately 475 feet asl along a ridge in the northwest portion of the site (as measured by USGS topographic maps and provided by the project applicant). Much of the project site not disturbed by existing quarry operations is heavily wooded with second growth timber, primarily Douglas fir, and tanoak.

NEARBY LAND USES

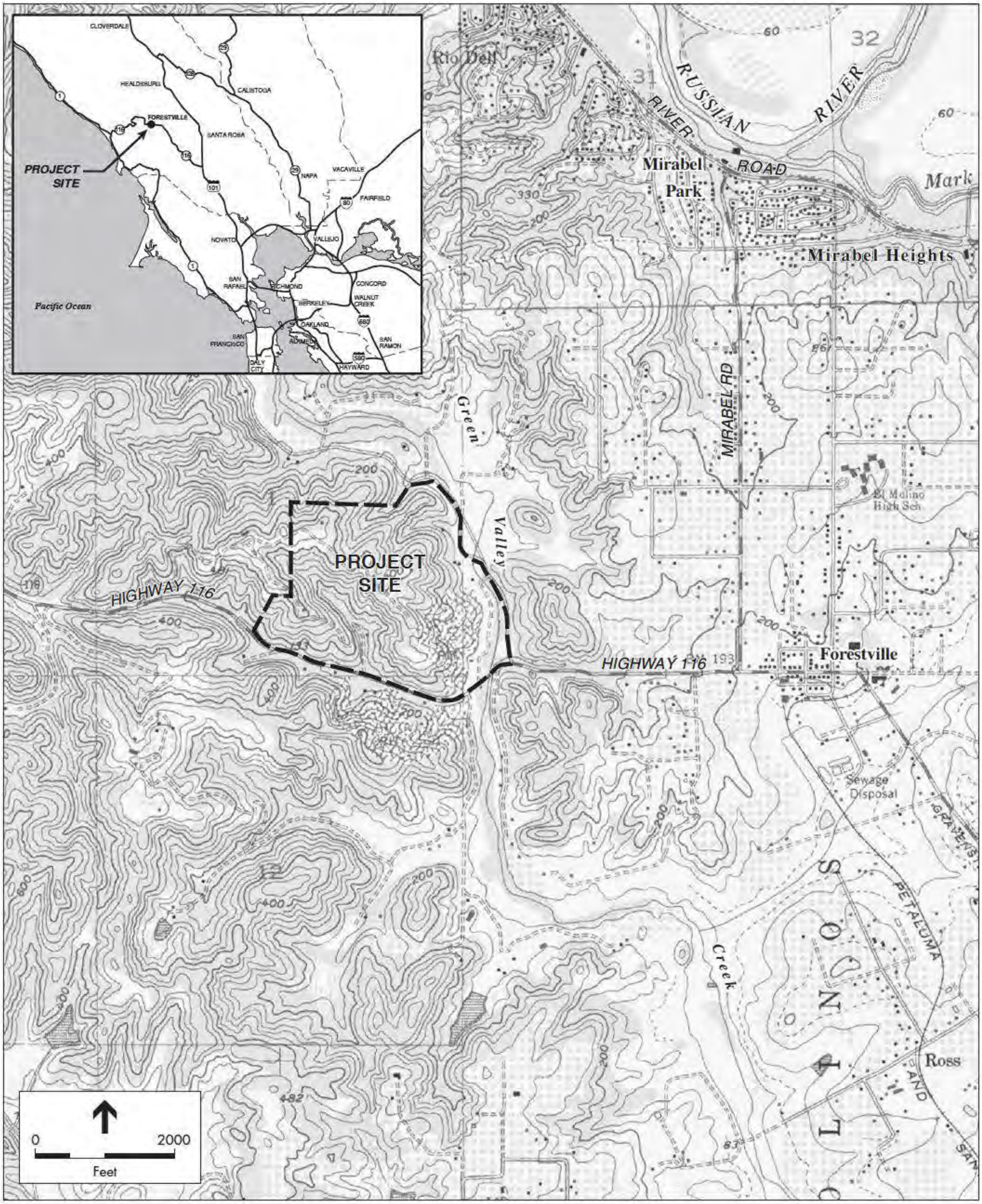
The project site is located approximately one-half mile west of the Town of Forestville, and approximately one mile southwest of the unincorporated communities of Mirabel Park and Mirabel Heights. Off-site land uses located in proximity to the site include the Blue Rock Quarry (located south of the site across Highway 116), and large lot residences and undeveloped land interspersed to the north, east and west.

SITE AND VICINITY OWNERSHIP

Table III-1, below, presents details on existing parcel ownership and size of the project site, including the portion of the currently subject to vested rights and permitted for mining, as well as the Western and Northern Expansion areas. Figure III-3, illustrates existing parcel ownership of the project site and surrounding vicinity. As described in Table III-1 and shown in Figure III-3, all parcels within the project site are currently owned by Canyon Rock Company, Inc.

EXISTING LAND USE AND ZONING DESIGNATION

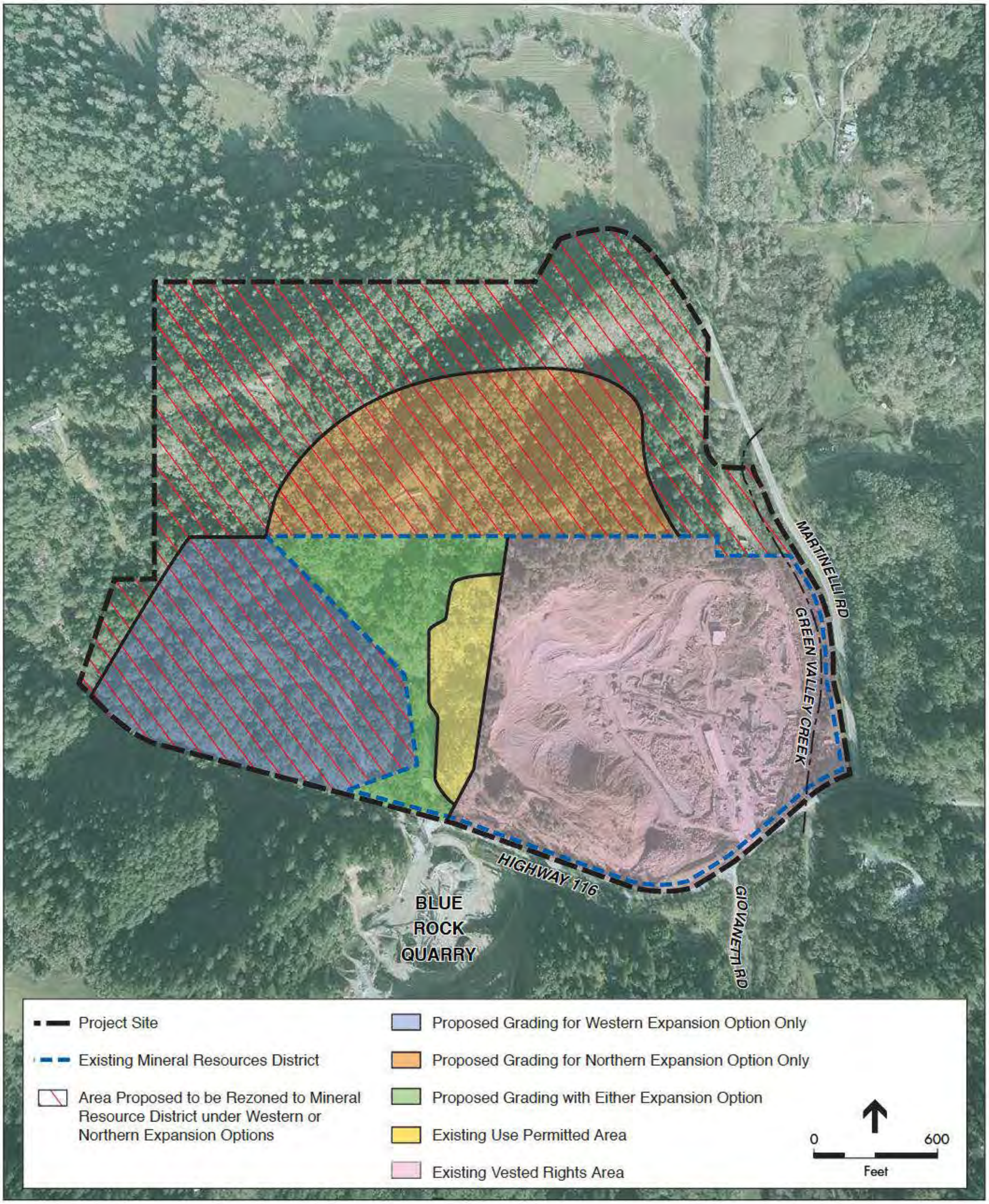
The Sonoma County General Plan designation for the project site (including existing permitted quarry area and parcels which make up the Western and Northern Expansion options) is Resources and Rural Development 160 acre density.



SOURCE: Environmental Science Associates

Canyon Rock Quarry / 202697 ■

Figure III-1
Site Location Map



SOURCE: Carlile Macy; Environmental Science Associates

Canyon Rock Quarry / 202697

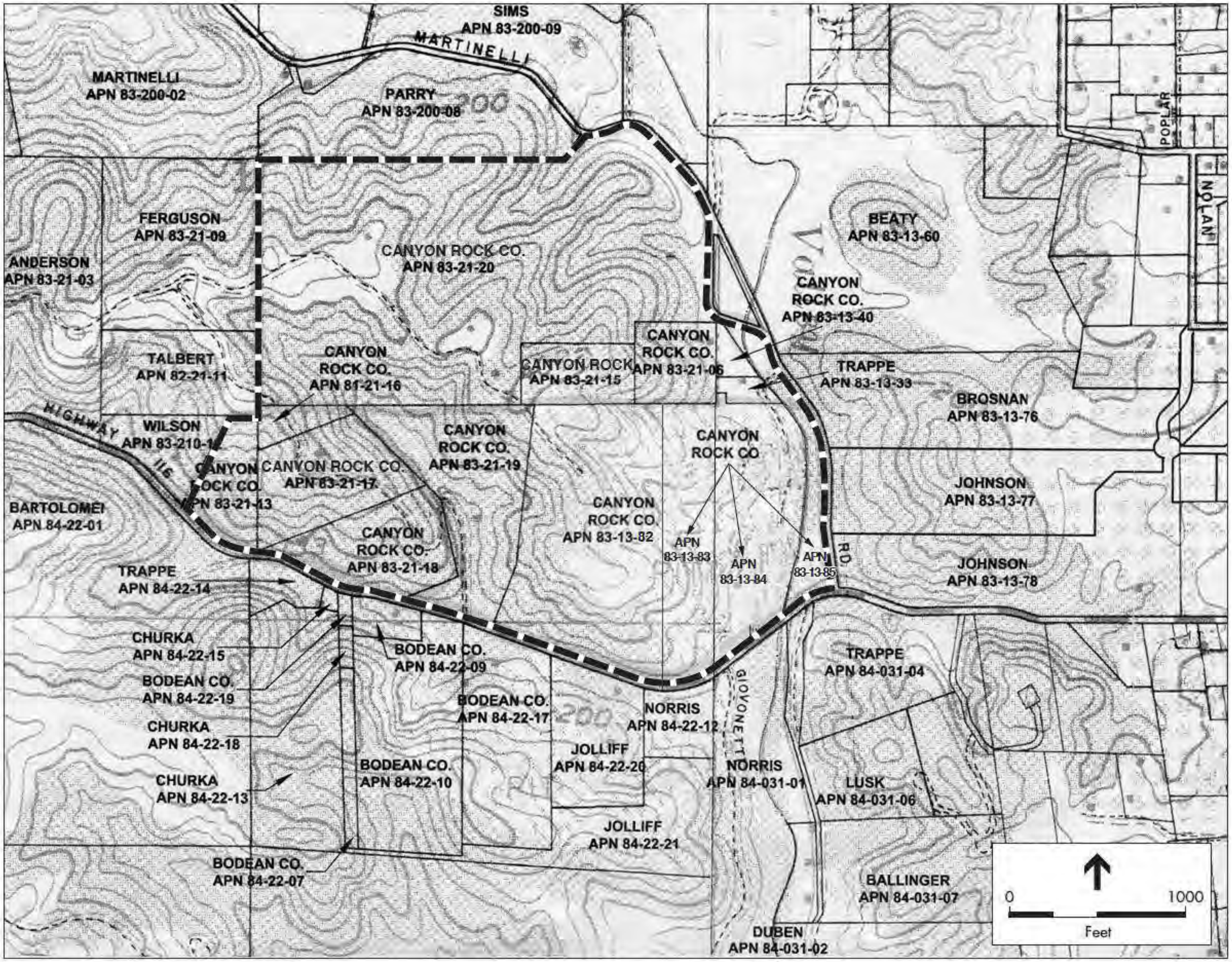
Figure III-2
Project Site and Vicinity

TABLE III-1
EXISTING PARCEL OWNERSHIP AND SIZE OF PROJECT SITE

Assessors Parcel Number (APN) [a]	Existing Parcel Ownership [b]		Parcel Size [a]
Existing Canyon Rock Quarry (Parcels Currently Zoned Mineral Resource District and Approved for Mining)			
APN 83-130-82	Canyon Rock Co.		30.04
APN 83-130-83	Canyon Rock Co.		11.47
APN 83-130-84	Canyon Rock Co.		14.09
APN 83-130-85	Canyon Rock Co.		2.71
APN 83-210-19 [c]	Canyon Rock Co.		4.60
		Total	**62.91 acres**
Western Expansion Option (Parcels Proposed to be Mined) [d]			
APN 83-210-13	Canyon Rock Co.		5.86
APN 83-210-16	Canyon Rock Co.		2.90
APN 83-210-17	Canyon Rock Co.		11.27
APN 83-210-18	Canyon Rock Co.		10.32
APN 83-210-19 [c]	Canyon Rock Co.		11.21
		Total	**41.56 acres**
Northern Expansion Option (Parcels Proposed to be Mined) [e]			
APN 83-210-19 [c]	Canyon Rock Co.		11.21
APN 83-210-06	Canyon Rock Co.		5.00
APN 83-210-15	Canyon Rock Co.		5.22
APN 83-210-20	Canyon Rock Co.		70.90
APN 83-130-33	Canyon Rock Co.		1.08
APN 83-130-40	Canyon Rock Co.		1.22
		Total	**94.63 acres**
Western Expansion Option or Northern Expansion Option (Parcels Proposed to be Rezoned Mineral Resource District) [e]			
APN 83-210-13	Canyon Rock Co.		5.86
APN 83-210-16	Canyon Rock Co.		2.90
APN 83-210-17	Canyon Rock Co.		11.27
APN 83-210-18	Canyon Rock Co.		10.32
APN 83-210-06	Canyon Rock Co.		5.00
APN 83-210-15	Canyon Rock Co.		5.22
APN 83-210-20	Canyon Rock Co.		70.90
APN 83-130-33	Canyon Rock Co.		1.08
APN 83-130-40	Canyon Rock Co.		1.22
		Total	**113.77 acres**

[a] From Sonoma County Assessor's Parcel Map, Block 83 pages 13 and 21, and revised by the County Board of Supervisors under Resolution 2412 on January 8, 2003; APN map update April 1, 2004.
[b] From *Canyon Rock Company, Inc., Draft Reclamation Plan*, September 2002.
[c] Only 4.6 acres of the 15.81 acres of APN 83-210-19 are approved for mining under Use Permit No. 90-362, although the entire parcel is currently zoned Mineral Resource District.
[d] Acres to be mined under proposed Western Expansion option would be less than total parcel size; see Figure III-6.
[e] Acres to be mined under proposed Northern Expansion option would be less than total parcel size; see Figure III-11.

SOURCE: Environmental Science Associates, 2003



SOURCE: Carlile Macy; County of Sonoma PRMD

Canyon Rock Quarry / 202697

Figure III-3
Ownership of Site and Vicinity

The base zoning for the entire project site is Resources and Rural Development (RRD) B6, 160-acre density, Scenic Resources. The existing vested rights and permitted quarry area additionally contains a Mineral Resource (MR) Combining District overlay. In addition, the area immediately adjacent to Green Valley Creek (primarily within the existing quarry area) has an F-2 (Secondary Flood Zone) and BR (Biotic Resource) Zoning overlay district.

EXISTING ON-SITE LAND USES

Figure III-4 illustrates existing land uses within the project site. Existing quarry facilities include aggregate processing facilities, concrete batch plants, and shop operations. These facilities are located on the quarry floor. The principal existing buildings include an equipment storage and garage building, office building, and a welding and repair shop. Other built features include an internal vehicle road system (paved in the vicinity of the quarry entrance), and sedimentation ponds and containment ponds. (A detailed description of existing quarry operations and on-site equipment is presented under "D. Existing Operations and Production," below). The existing concrete batch plant is presently being relocated a few hundred feet to the northwest of its existing location. This will remove it from the flood zone and place it further away from Highway 116 and Green Valley Creek.

There are also a variety of residences and other structures located within the project site. All structures within the project site are currently owned by Canyon Rock Company. One occupied residence is located within the existing vested rights and permitted area just west of Martinelli Road and north of Highway 116. There are two occupied houses on the parcels west of the existing permitted area on the site; one house is a rental unit, and the other house is currently occupied by a Canyon Rock Company employee. There are several occupied houses and a vacant, former monastery (originally built in the 1960's) located on the parcels north of the existing vested rights and permitted area. One house and barn on the northern parcels was recently demolished (February 2003) due to its dilapidated condition. Paved and unpaved roads provide access within the project site to these facilities.

The project site is served by the Pacific Gas and Electric Company (PG&E) for electricity and natural gas, and by Pacific Bell for telephone service. The site is served by the Forestville County Water District for potable water and for water used in the concrete batch plant on APN 83-130-84. There are a total of five water wells on the project site. One water well is used by the quarry to provide some water for aggregate washing, dust suppression misters at the main plant, equipment washing and irrigation for landscape planting along the berms. The four other water wells serve the existing on-site residences along Martinelli Road. Water for dust suppression at the site also comes from the quarry's sedimentation ponds and the Forestville County Water District (see description of sedimentation ponds under D. Existing Operations and Production, below). Sewage facilities consist of an on-site septic system and leach fields.

SOURCE: Carlile-Macy

Canyon Rock Quarry / 202697

Figure III-4
Existing Uses and Proposed Mining Areas on Project Site

D. EXISTING OPERATIONS AND PRODUCTION

EXISTING OPERATIONS

The applicant operates two companies on the existing quarry site: the Canyon Rock Quarry (mining operations) and the River Ready Mix Company (concrete batch plant). Regular hours of operation are Monday through Friday from 6:30 am to 5:00 pm, and Saturday 7:00 am to 4:00 pm. The County's mining regulations currently allow work at the quarry to extend into the evening (until 10:00 p.m.) on weekdays; however activities at the quarry do not typically occur outside its regular hours of operation. Exceptions would include when a quarry client requires the materials after regular quarry hours for a nighttime construction project. However, crushing (production) at the quarry does not occur at night; nighttime operations are limited to the loading and weighing of material (sales). The quarry manages these special orders to the extent possible by generating materials during the day and stockpiling until night.

The quarry currently employs 20 to 22 people. Currently, all employee and quarry-related traffic enter and exit the project site via a single access road off Highway 116, approximately 500 feet west of Martinelli Road. The Canyon Rock Quarry uses Highway 116 and Mirabel Road as the primary haul routes.

A list of all equipment utilized at quarry is presented in Table III-2. The quarry occasionally purchases new replacement equipment when wear and tear dictates.

EXISTING MINING APPROACH AND PHASING

Existing mining operations (Canyon Rock Quarry) at the quarry consist of the excavation and processing of the overburden and blue rock materials found on site. As described in Section B. Site Location and Description, above, the majority of the terrain is generally hilly.[1] To facilitate mining on the hillsides, the operator must first cut a series of benches into the hill, which serve as roads to move machinery safely up the hill face. Excavation of the overburden is accomplished with bulldozers and other earth moving equipment. All timber is removed in the process of excavation of overburden. The quarry owner typically harvests the timber in small increments.[2]

When necessary, the blue rock is first fractured and loosened by blasting, then removed by bulldozers. Blasting at the quarry averages one to two times per year. Charges are detonated during daytime hours between 10:00 am and 5:00 pm. Each blast consists of approximately 6 to 8 holes 8.75 inches in diameter, 100 feet deep, with a charge weight of explosives of 500 pounds per hole.

Processing of the raw rock material is accomplished by crushing with a jaw and cone-type crusher, followed by screening with dry and wet screens. These operations produce a number of products which are stockpiled on site for eventual loading and delivery (see Table III-3, below).

1 Some of the slopes are mildly steep at gradient ratios of 3:1. However, most of the terrain is very steep at gradient ratios of 2:1 or 1 ½:1 with a few areas at greater than 1:1 or nearly vertical.

2 The timber is used as firewood by the operator and his employees.

TABLE III-2
EXISTING EQUIPMENT AT CANYON ROCK QUARRY

Equipment [a,b]	Quantity	Equipment [a,b]	Quantity
Jaw Crushers	3	Forklift	2
Cone Crushers	4	Generators	3
Horizontal Impact Crushers	4	Air Compressors	2
Vertical Impact Crushers	4	Sweeper	1
Rock Screens	14	Log Skidder	1
Feeders	8	Off-Road Dump Trucks	2
Conveyer Belts	54	Water Trucks	2
Portable Screening Plant	1	Service Trucks	2
Concrete Plants	2	Portable Water Pumps	2
Loaders	8	Rock Trucks	6
Excavators	3	Concrete Trucks	5
Crawler Cats	3	Pickup Trucks	6
Rock Drills	2	Trailers	16
Bob Cat	2	Farm Tractors	2
Backhoe	1		

[a] This table identifies only those vehicles owned by Canyon Rock Company, Inc., and does not include any independently owned vehicles that may haul materials to and/or from the quarry, or that may be stored on-site for personal use by owner/operator.

[b] Total equipment presented. Actual operational equipment is less (i.e., one jaw crusher, one vertical crusher, one horizontal impact crusher, two cone crushers, four feeders, seven screens, and six conveyers included in this list are either spare or not in use).

SOURCE: Canyon Rock Company, Inc., 2003

The numerous products created from the rock at the quarry depend on the hardness and size of the rock. The geology of the site is generally uniform, however, the rock can vary greatly in hardness depending on area. The demand for softer and harder rock is typically seasonal. In the winter, the operator processes a softer rock for residential use. In the summer, during peak construction season, the operator processes harder rock.

Currently, the mining at the quarry is moving in a westerly direction. The access to the westerly hill is on a bench that crosses the face of the northern hill and wraps around to the western face (the operator created the current bench on the northern face because it has a less steep gradient and consequently is safer for movement of equipment). Under the existing 1991 Conditional Use Permit, the operator is permitted to mine up to 4.6 acres in a westerly direction. When completed, the operator will have exhausted the area of his existing use permit.

TABLE III-3
MATERIALS CURRENTLY PRODUCED AT CANYON ROCK QUARRY [a]

Class II Base	Quarry Fines
1 ½" Crushed Blue Rock	1 ½" Drain Rock
¾" Blue Rock	¾" Drain Rock
½" Blue Rock	3/8" Blue Rock
1 ½" Crushed Red Rock	Oversize Drain Rock 1" - 6"
¾" Crushed Red Rock	Rip Rap 2' +
¼" Minus/Fill Sand	Rip Rap 2' -
Class I Permeable	Red Fill
Class II Permeable	Rocky Fill
Blue Bank Run	River Sand
Structural Backfill	

[a] See also discussion in text regarding materials produced by River Ready Mix Company at the project site; materials recycled at the quarry, and other imported materials that may be used or resold.

SOURCE: Canyon Rock Company, Inc., 2002

CONCRETE BATCH PLANT

The concrete batch plant (River Ready Mix Company) uses aggregate (rock and sand) processed by the Canyon Rock Quarry or purchases river aggregates elsewhere. Portland cement and gravel is purchased from outside sources and delivered to the plant by truck. The plant also produces pre-cast concrete.

MATERIAL RECYCLING

Another operation at the quarry is the recycling of old concrete, asphalt and building materials. Broken pieces of concrete from the demolition of buildings, bridges, sidewalks, etc. are brought to the site and run through a rock crusher. The resulting material is mixed with crushed rock and sold as road base material. No contaminated material is allowed to be delivered to the quarry.

IMPORTED MATERIALS

Canyon Rock Quarry accepts clean earth fill material, rocks and boulders to be resold at the quarry. These materials typically come from construction projects which generate more excavated earth or other materials than can be used on their site. The quarry also imports sawdust, grape pulp, and other organic materials for mixing with overburden to produce topsoil.

EXISTING PRODUCTION

Several factors influence production at the quarry, including weather, economic conditions and availability. The quarry serves both private and public clients requiring a range of quarry materials products for public utilities, street construction, and residential and commercial construction. During the wet winter weather season, quarry production typically slows as clients construction work levels decrease. Conversely, when construction is not constrained by weather, the demand for quarry products increases, resulting in increased quarry production.

The five-year average annual sales of materials (1998 through 2002) at the quarry is reported to be 375,000 cubic yards. This includes materials that were mined as well as other materials that were imported to the quarry (see above discussion).

Under the quarry's existing vested rights and permit, aggregate production sales at the quarry is restricted to a maximum of 500,000 cubic yards (750,000 tons) per year. Of this amount, under the ARM Plan, existing quarries may import a maximum of 25 percent 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.

REMAINING CAPACITY OF CURRENTLY APPROVED MINING AREA

The material presently remaining in the currently approved mining area (the vested right area plus the area approved for mining in the 1991 permit) contains between 2 and 3 million cubic yards. That material is expected to last from four to six years, assuming the existing production rate continues unchanged.

EXISTING DRAINAGE AND WATER QUALITY CONTROLS

Virtually all water runoff from the quarry passes through sedimentation ponds prior to reaching Green Valley Creek. The sedimentation ponds are intended to remove medium size silt and large sediment from site runoff from the mining area. In addition, all water used for aggregate processing and equipment washing is diverted through the sedimentation ponds for settling. Water collected in the sedimentation ponds is reused in the gravel processing operations and for dust suppression.

The quarry currently utilizes two sedimentation ponds. Pond No. 1 is approximately 400 feet long and 30 to 50 feet wide, and drains an approximate nine-acre area. When runoff water in this pond rises to the top, it is directed to a culvert which first empties into a small pond and then is discharged to Green Valley Creek. Pond No. 2 is more than one-half acre in size and collects runoff from approximately 30 acres in the northerly portion of the existing quarry.

There are two separate facilities on the site used for cleaning the concrete trucks. The first area is used for washing the exterior of the trucks and the spilled aggregates around the batch plant. This area consists of two concrete pools located in a low area at the northeast corner of the River Ready Mix batch plant. These pools are located so as to catch drainage from around the batch plant. They are configured such that most drainage from the batch plant enters into the first (westerly) pool. The sand and gravel settles out into this pool and the water passes through an overflow pipe into the second (easterly) pool. Silt and clay sediments have a chance to drop out of suspension in the second pool before the water empties through a culvert and into Green Valley Creek. No cement goes into this system.

The second area is for washing the remaining concrete out of the inside of the mixing drums. This is a separate area located to the northeast of Sedimentation Pond No. 2. In this area, the washed out concrete from the mixing drums settles out into a containment area. The wash water eventually leaches out into the soil or evaporates. The remaining cement and aggregate materials is periodically removed and added to crushed rock which is sold as aggregate base.

EXISTING RECLAMATION

Reclamation is implemented incrementally at the quarry as mining progresses. The reclamation of Green Valley Creek within the quarry is complete. The primary objective for the reclamation of this creek was to establish a permanent form for the west bank to reduce sediment from the quarry that could enter the creek, and to enhance the visual character of the quarry site. Reclamation tasks at the creek included removing mining detritus from the creek channel and establishing a berm between the creek and quarry as a permanent feature with plantings. Other ongoing reclamation occurring at the quarry includes the continued maintenance of the sedimentation ponds, additional planting for visual screening and erosion control and the continuation of planting and maintenance on mined slopes. Reclamation within the existing vested rights and permitted mining area will continue as outlined in the existing reclamation plan.

EXISTING SETBACKS

A minimum 25-foot setback from parcels not owned by the quarry are currently maintained along all boundaries of the quarry, pursuant to the requirements of the ARM Plan. Berms constructed of overburden have been built up between Martinelli Road and Green Valley Creek, and along Highway 116. These have been planted with redwood and fir, to provide visual screening of the operation from Martinelli Road. The berm along Highway 116 between the quarry entrance and Martinelli Road was recently reformed to improve sight distance. Currently, the mining operation is required, by a permit, to maintain a 250-foot setback from the northern boundary of the existing permitted area because of slope stability concerns.

EXISTING CHEMICAL USE

During the operation of the quarry facilities, a chemical dust suppressant (CDS 8040) is used to control airborne particulate matter. In addition, minor amounts of hazardous materials (diesel, gasoline, oil, cleaning solvents, etc.) are used to maintain heavy equipment on the site. See Section V.C, Hazards and Hazardous Materials, in this EIR for more information on existing chemical use and storage at the quarry.

E. BACKGROUND

COUNTY PERMIT HISTORY

The Canyon Rock Quarry has been in operation since the early 1940s. Prior to 1991, the Canyon Rock Quarry consisted of 58.43 acres comprised of Assessor Parcel Numbers (APNs) 83-130-06, -42 and -43 (these parcels have since been redesignated APN 83-130-82, -83, -84 and -85; see Figure III-3). A use permit (UP-2291) was granted for quarry operations in 1957. A second use permit (same file number) was approved for a concrete batch plant on the site in 1961. A third use permit (same file number) was approved for an on-site caretaker's mobile home in 1975. Based on the early mining and permit activities, a vested right to conduct mining on these parcels was recognized by Sonoma County in 1981. A Reclamation Plan was approved for the quarry in 1984 (Wilson Engineering).

In 1991, the County approved a Use Permit (County File 90-362) for expansion of the quarry onto a 4.6-acre portion of APN 83-210-19 (15.81 acres total), located directly west and contiguous to the original 58-acre quarry. In conjunction with that approval and pursuant to Surface Mining and Reclamation Ordinance (SMARO) No. 3437, and superceded by SMARO No. 5165, a new Reclamation Plan was approved (Mitchell & Heryford) in 1991. All of APN 83-210-19 contains Mineral Resource District zoning, but only 4.6 acres of this parcel is currently approved for mining.

Applications for asphalt batch plants were submitted in 1993 and 1996. The 1993 application was withdrawn during the public hearing process. The 1996 application was denied by the Board of Zoning Adjustments and withdrawn after an appeal was filed.

The Countywide Aggregate Resources Management (ARM) Plan and accompanying EIR were adopted November 1, 1994 (replacing the prior 1980 ARM Plan).

HISTORY OF WESTERN EXPANSION OPTION

The Canyon Rock Quarry Expansion application proposing the western expansion plan was filed on July 7, 1997. This application requested a use permit and rezoning to add the Mineral Resource combining district to four parcels to the west of the 1991 expansion area, and approve a mining reclamation project on these four parcels, plus the 11.21 acres remaining on APN 083-210-019 (4.60 acres of this parcel was previously approved for mining under Use Permit 90-362. (See F., Project Characteristics, below for a detailed description of the proposed Western Expansion option.)

In June of 2000, the County prepared an Initial Study for the subject project to determine: 1) whether the proposed project fell within the scope of the ARM Plan; 2) whether the ARM Plan EIR adequately analyzed the impacts of the proposed project; 3) whether the proposed project would result in site-specific impacts not analyzed in the ARM Plan EIR; and 4) appropriate mitigation measures for any such additional environmental impacts.

The Environmental Review Committee (ERC) subsequently reviewed the Initial Study and recommended that a Mitigated Negative Declaration be prepared, tiering off of the prior Program EIR prepared for the ARM Plan. On September 7, 2000 the Planning Commission rejected the Mitigated Negative Declaration based on potential air quality impacts, and required that an EIR be prepared. The applicant disagreed with the Planning Commission and staff's proposed baseline for environmental review and appealed the baseline decision to the Board of Supervisors.

In February of 2001, the Sonoma County Board of Supervisors (BOS) concluded that the Western Expansion project did fall within the scope of the ARM Plan and that additional environmental review would be necessary for the project in four specific areas. The Sonoma County BOS determined that a project-specific focused EIR (tiered from the ARM EIR) would be required in order to examine the potential for environmental impact in the following issues:

- traffic
- air quality (potential diesel emissions)
- noise (impacts from on-site sources)
- water quality (potential sedimentation into Green Valley Creek)

The 53 mitigation measures/conditions of approval that were identified (see Appendix C) will be carried forward for the Western Expansion option (or Northern Expansion option, as applicable) or re-examined as necessary in this EIR.

Additionally, the Sonoma County BOS determined that the existing conditions baseline, against which the potential environmental impacts of the expansion option will be measured, shall include the five-year average annual sales level (Resolution No. 01-0157, February 6, 2001). At the time the resolution was passed, the five-year average annual sales level for the quarry was (1997-2001) was 350,000 cubic yards. This baseline represents the amount of material sold, and includes mined material as well as other material that was imported to the quarry (e.g., concrete to be recycled and rock to be re-sold for riprap). The Sonoma County BOS also defined the No Project alternative as a continuation of production at current levels until the aggregate resources on the existing site are exhausted.

In 2003, the County updated the environmental baseline to reflect the most recent five-year period at time the Notice of Preparation for this EIR was released (i.e., 1998-2002), with a corresponding five-year average annual sales level of 375,000 cubic yards.

HISTORY OF NORTHERN EXPANSION OPTION

On February 7, 2002 the applicant submitted a preliminary request to the County to modify their 1997 application to include the northern expansion plan as an equal-weight alternative to their application for the western expansion. The bulk of this property, known also as the Holy Order of Mans property (in reference to the prior ownership), was recently purchased by the applicant. (See F., Project Characteristics, below for a detailed description of the proposed Northern Expansion option.)

F. PROJECT CHARACTERISTICS

The project sponsor, Canyon Rock Company, Inc., has requested the necessary entitlements from the County of Sonoma to enable an expansion of the existing Canyon Rock Quarry to either the west or the north of its existing permitted area. Approval of this request would extend the life of the quarry for a new 20-year period. The applicant requests that the County approve one of two quarry expansion site options: the Western Expansion option or the Northern Expansion option. As described under C., Project Site Location and Site Description, above, both expansion areas are currently owned by Canyon Rock Company, Inc.

This EIR will address the environmental impacts of each expansion option. Pursuant to County BOS Resolution 01-0157 (see E., Background, above) this EIR will serve as a project-specific focused EIR (tiered from the ARM EIR) for the proposed Western Expansion option, focusing on the issues of traffic, air quality (potential diesel emissions), noise (impacts from on-site sources), and water quality (potential sedimentation into Green Valley Creek). In addition, this EIR will serve as project-specific full EIR for the proposed Northern Expansion option (i.e., all pertinent environmental topics will be analyzed).

EIR ASSUMPTIONS COMMON TO BOTH EXPANSION OPTIONS

Pursuant to County BOS Resolution 01-0157, the existing conditions baseline, against which potential environmental impacts of the Western Expansion option will be measured, will include the five-year average annual sales level. The environmental baseline for this EIR reflects the most recent five-year period at time the Notice of Preparation for this EIR was released (i.e., 1998-2002), with a corresponding five-year average annual sales level of 375,000 cubic yards. For purposes of this EIR, the annual 375,000 cubic yards sales will also serve as the existing conditions baseline for the Northern Expansion option.

As described in D., Existing Operations and Production, above, the remaining material presently available in the currently approved mining area (the vested area plus the area approved for mining in the 1991 Conditional Use Permit) is estimated at between 2 and 3 million cubic yards, expected to last from four to six years, assuming the current production rate continues unchanged. Once the mining operations reach the edge of the currently approved mining area, proposed mining within the new parcels under the Western or Northern Expansion option (depending on which option was approved) would be initiated. Production under either the Western or Northern Expansion option would not exceed 500,000 cubic yards, which is the current permitted/vested maximum annual production rate. At the maximum rate, the quarry could produce 10 million cubic yards of mined materials over the 20-year life of the proposed permit.

As a conservative "worst-case" approach, it is assumed for this EIR that project impacts for either the Western or Northern Expansion option would be that which would occur when the quarry operates at its maximum production rate (500,000 cubic yards). The project sponsor states that under a maximum annual production scenario of 500,000 cubic yards, 1) the quarry hours of operation would not change from existing conditions, 2) no new or additional quarry equipment over existing conditions would be required (beyond that which normally occurs as a result of wear and tear), and 3) no increase in existing employee staffing would occur. Rather, the existing staff and quarry equipment would either process more material while operating, and/or quarry equipment would be operated longer within the existing workday (Carlile Macy, 2003).

The project sponsor has prepared a draft Reclamation Plan for each expansion option showing the area to be mined during the 20-year life of the permit and how the mined area would be reclaimed. With either expansion option, the County would grant a use permit to allow mining for a period of 20 years. The existing use permit, issued in 1991, would remain valid until the new use permit is granted. At that time, the new use permit would supersede the existing quarry use permit. Either expansion option would be mined in compliance with the requirements and restrictions of the State Surface Mining and Reclamation Act and the Sonoma Surface Mining and Reclamation Ordinance No. 5165 (as set forth in County Code Section 26A).

WESTERN EXPANSION OPTION

The Western Expansion option would place Mineral Resource District zoning on Assessor Parcels Nos. (APNs) 83-210-13, -16, -17, and -18, located immediately to the west of the existing quarry, and totaling approximately 30.35 acres; as well as APNs 83-210-06, -15, and 20, and 83-130-33 and -40, located immediately north of the existing quarry, totaling approximately 83.42 acres (total of 113.77 acres). With this option, quarrying operations would be expanded onto APNs 83-210-13, -16, -17, and -18, and through APN 083-210-019 (15.81 acres, which is already zoned Mineral Resource District). Figure III-5 presents the proposed site map for the Western Expansion option.

MINING PLAN

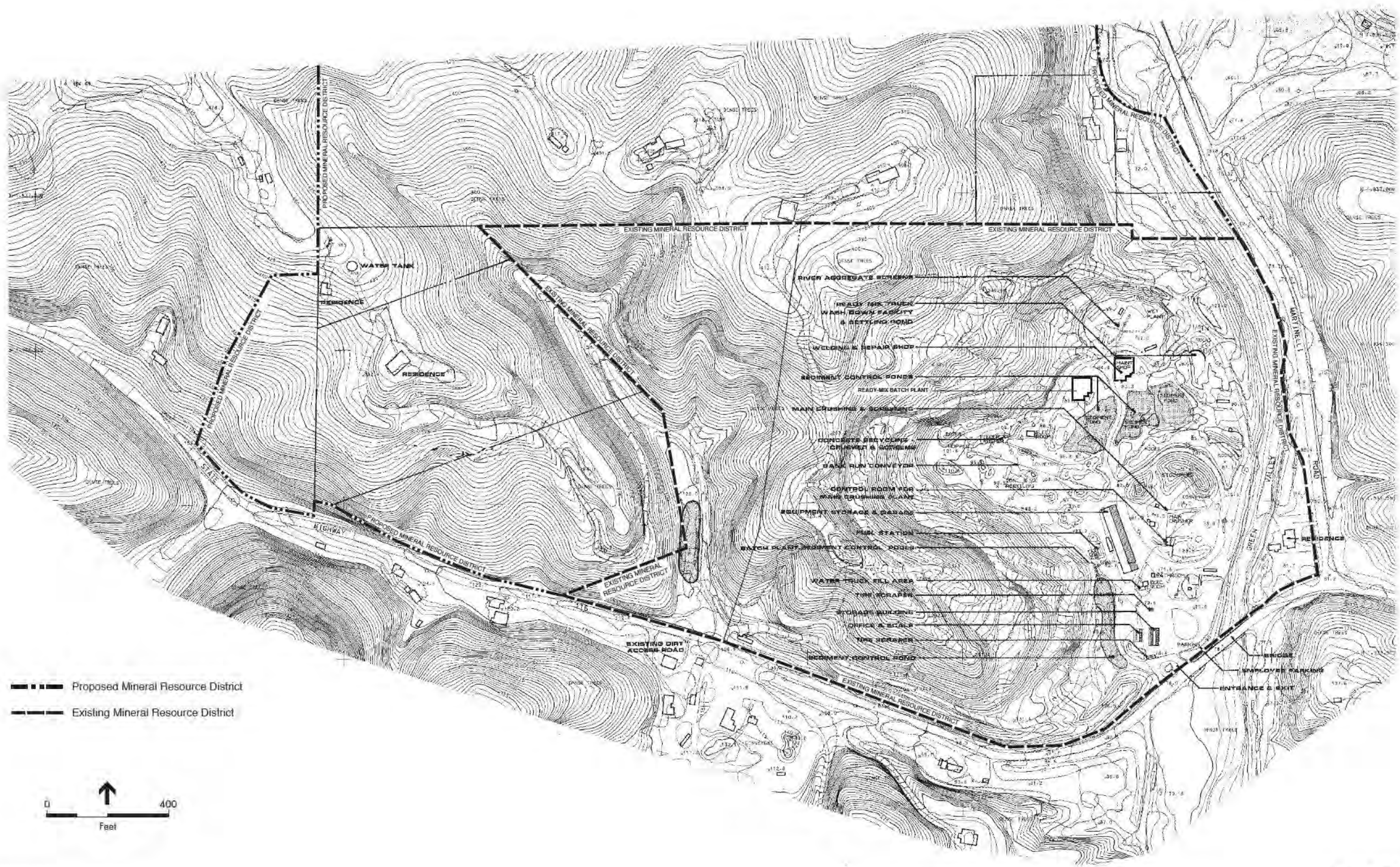
Figure III-6 presents the proposed final (20-year) grading for the Western Expansion option, and Figure III-7 presents proposed cross sections for the Western Expansion option. Final grading is proposed to be at a maximum of 1½ horizontal to 1 vertical, with bench intervals not exceeding 30 feet in vertical distance. A minimum 25-foot setback would be maintained along all boundaries of the proposed 41.56-acre addition to the quarry.

Under the Western Expansion option, mined material would initially be transported by a combination of the existing conveyer belt system and haul trucks to the gravel plant at the existing operation for processing. The operator could eventually extend the conveyer belt system into the Western Expansion parcels for transport. In addition, the ready-mix batch plant is presently being relocated from its existing location near the project entrance to an area west of Sedimentation Pond No. 2.

Both houses within the parcels west of the existing permitted area would be demolished, when necessary, upon commencement of the Western Expansion option.

BLASTING

As under existing conditions, occasional blasting operations under the Western Expansion option would occur as a required part of the mining process, and would continue to be practiced in accordance with the Sonoma Surface Mining and Reclamation Ordinance No. 5165 (as set forth in County Code Section 26A). No increase in blasting beyond that which normally occurs under existing conditions would occur under the Western Expansion option.



SOURCE: Carlile-Macy

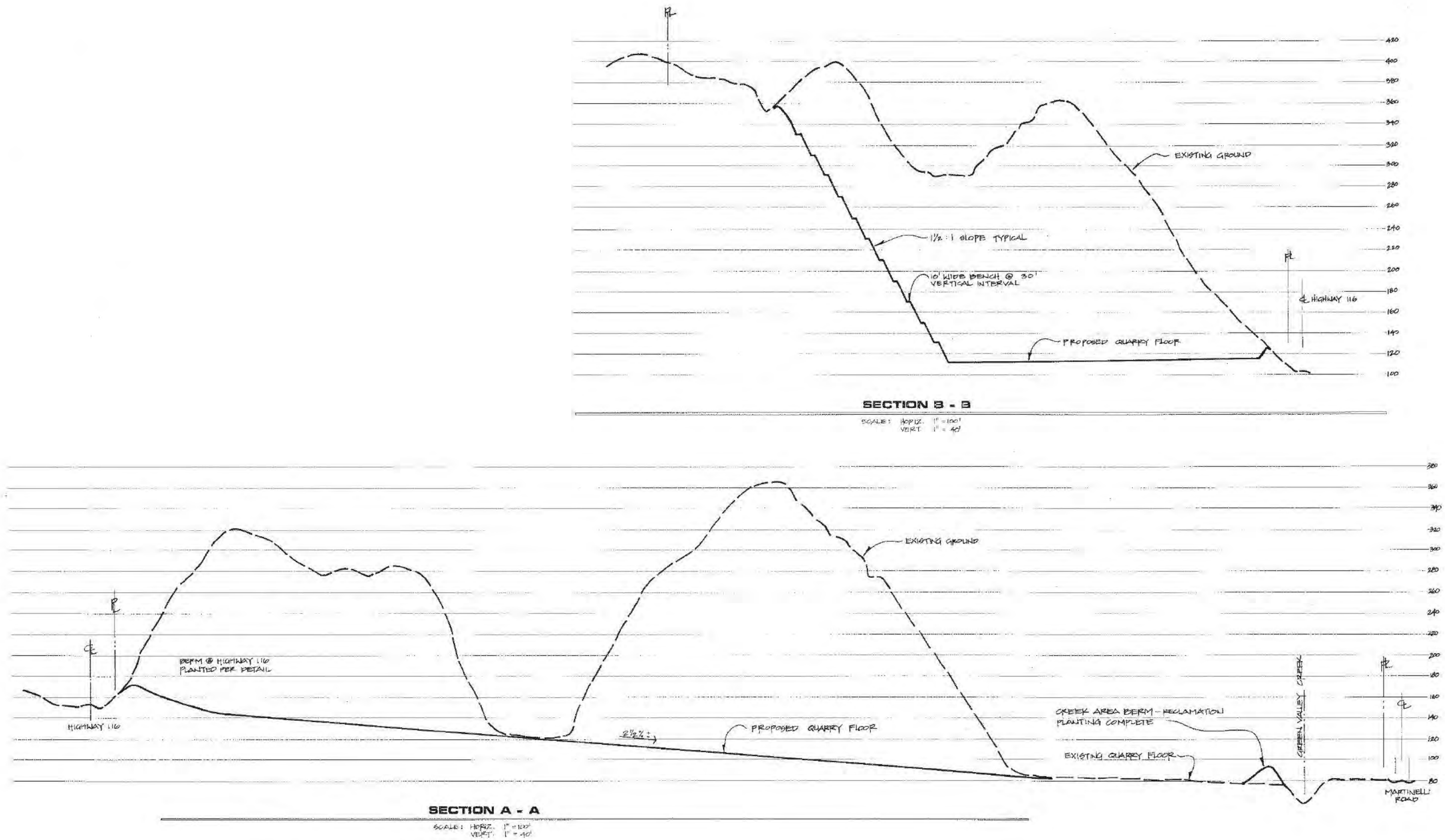
Canyon Rock Quarry / 202697 ■

Figure III-5

Western Expansion Option-Site Map

SOURCE: Carlile-Macy

Figure III-6
Western Expansion Option-Final Grading



SOURCE: Carlile-Macy

Canyon Rock Quarry / 202697 ■

Figure III-7

Western Expansion Option-Cross Sections

PROPOSED NEW EXIT ROAD

Under the Western Expansion option, a new second vehicular exit for the quarry onto Highway 116 is proposed to be established on parcel APN 83-130-82 (although not illustrated on the Western Expansion option figures). This new exit would be approximately 1,630 feet west of the existing main quarry driveway, on a straighter section of the highway where better sight distance (over 900 feet in both directions) can be achieved. A paved road would be constructed within the project site from the existing quarry to connect to this proposed new exit. This new exit would operate in addition to the existing driveway.

The ultimate use of this new exit road would depend on a number of factors. During wet weather, it is anticipated all vehicles leaving the quarry (i.e., trucks, employee vehicles, etc.) would exit at this location. However, during dry weather and/or slow periods, vehicles may continue to exit at the main quarry driveway, or some combination of both driveways may be used.

SITE DRAINAGE AND SEDIMENT CONTROL

Figure III-8 presents proposed site drainage and sediment control for the Western Expansion option. As under existing conditions, the primary method proposed to be used to control stormwater runoff for the Western Expansion option is to direct it through sedimentation ponds. Under the Western Expansion option, another sedimentation pond would be utilized. Western facing slopes in the quarry would be channeled to this pond. No new outfalls to Green Valley Creek are proposed under this option.

As under existing conditions, the accumulation of sediments within the existing and proposed ponds would be monitored biannually. When sediments occupy 1/3 to 1/2 the pond capacity, the sediment material would be removed, allowed to dry, and then stockpiled as topsoil or mixed with other products. Stockpiles of topsoil would then be mulched with weed free straw to prevent erosion.

As under existing conditions, swales and berms developed for erosion control and directing runoff would be maintained to ensure runoff from the quarry does not directly enter Green Valley Creek.

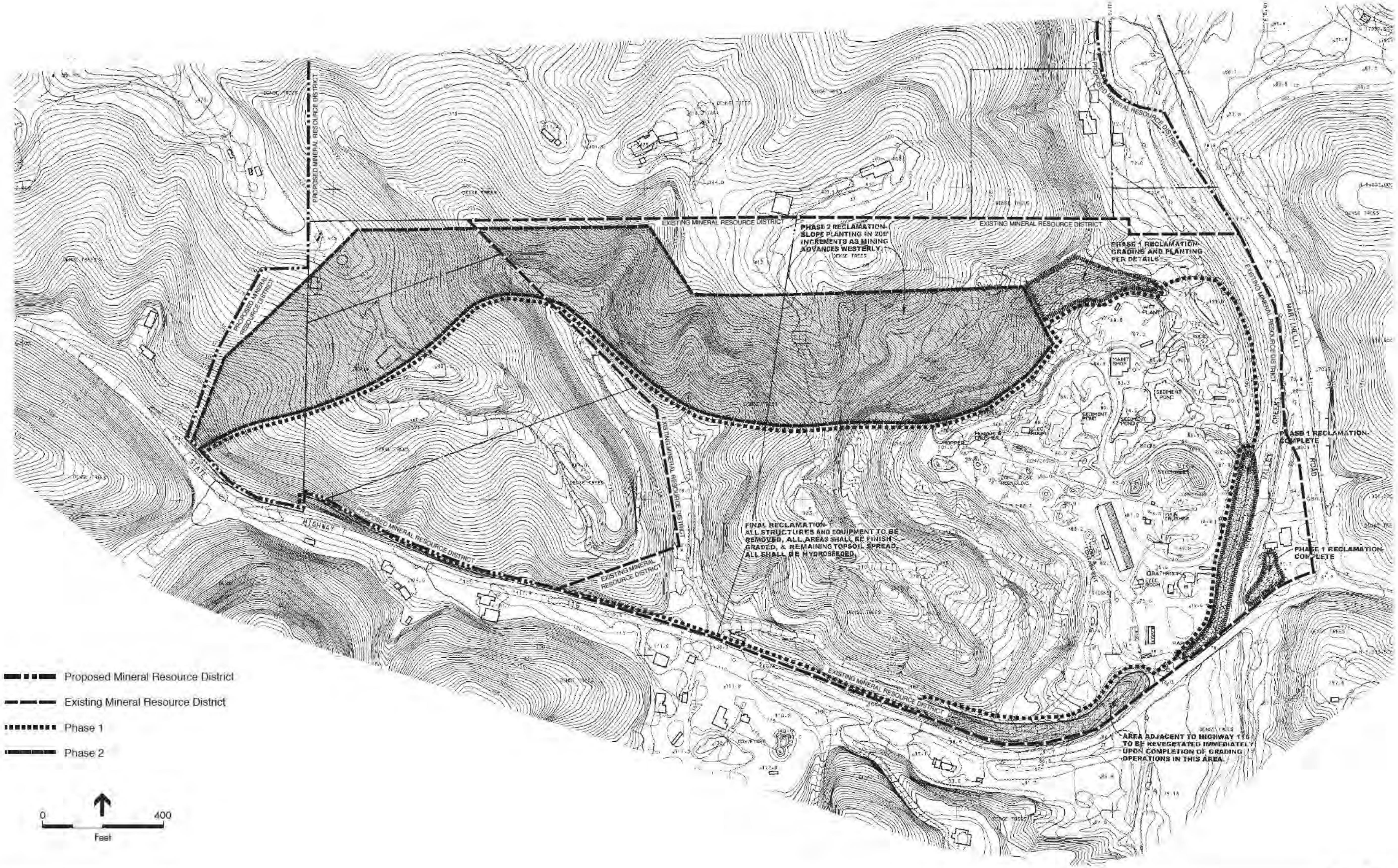
RECLAMATION

Figure III-9 presents proposed reclamation planting for the Western Expansion option. As under existing conditions, ongoing reclamation at the quarry would includes the continued maintenance of the sedimentation ponds, additional planting for visual screening and erosion control, and the continuation of planting and maintenance on mined slopes.

As mining advances to the west, the finished grading of the south-facing slopes would also generally advance so that the total area of exposed soil would not exceed existing permitted conditions. As large increments of the mined areas are finish graded, the slopes would be terraced, have bench drains established, and surfaces covered with topsoil and planted per details outlined in the proposed Reclamation Plan. Table III-4, below, presents the proposed plant list for slope planting for the Western Expansion option.

SOURCE: Carlile-Macy

Figure III-8
Western Expansion Option-
Site Drainage and Sediment Control



SOURCE: Carlile-Macy

Canyon Rock Quarry / 202697

Figure III-9
Western Expansion Option-Reclamation Planting

TABLE III-4
WESTERN EXPANSION OPTION – RECLAMATION PLANT LIST

CREEK AREA PLANTS	BERM AREA PLANTS
Big Leaf Maple	Madrone
Buckeye	Manzanita
White Alder	Incense Cedar
Blue Blossom	Blue Blossom
Oregon Ash	Toyon
Banks Rose	Cabrian Pine
California Bay Laurel	Coast Redwood
	California Bay Laurel
	Douglas Fir
SLOPE PLANTING	
North Coast Conifer Community	
Douglas Fir	Flannel Bush
Tanoak	Wild Rose
Coast Live Oak	Thimbleberry
California Black Oak	Blackberry
California Bay	Snowberry
California Hazelnut	
Chapparal	Seasonal Wetland
Chamise	Sedge
Manzanita	Smartweed
Wild Lilac	Blackberry
	Pennyroyal
Erosion Control Seed Mix	
California Fescue	Needle Grass
California Brome	California Melic
Woodland Brome	Blue Wildrye
Pygmy-leafed Lupine	Coyote Bush
Monkey Flower	Six Weeks Fescue

SOURCE: Canyon Rock Company, Inc., 2003

The project sponsor maintains equipment for hydroseeding and would perform this portion of the reclamation planting. Liner stock planting would be installed by contractors specializing in restoration planting.

Berms, which have been hydroseeded and planted with woody material (such as the berm near the intersection of Highway 116 and Martinelli Road, or the berm along Highway 116 west of the entrance) would be planted with liner stock plant materials.

NORTHERN EXPANSION OPTION

The Northern Expansion option would place Mineral Resource zoning on APNs 83-210-13, -16, -17, and -18, located immediately to the west of the existing quarry and totaling approximately 30.35 acres; as well as APNs 83-210-06, -15, -20, and 83-130-33 and 40, located immediately to the north of the existing quarry and totaling approximately 83.42 acres (total of 113.77 acres). With this option, quarrying operations would be expanded primarily through those parcels north of the existing quarry; and onto APN 083-210-019, which is already zoned Mineral Resource District. Figure III-10 presents the proposed site map for the Northern Expansion option.

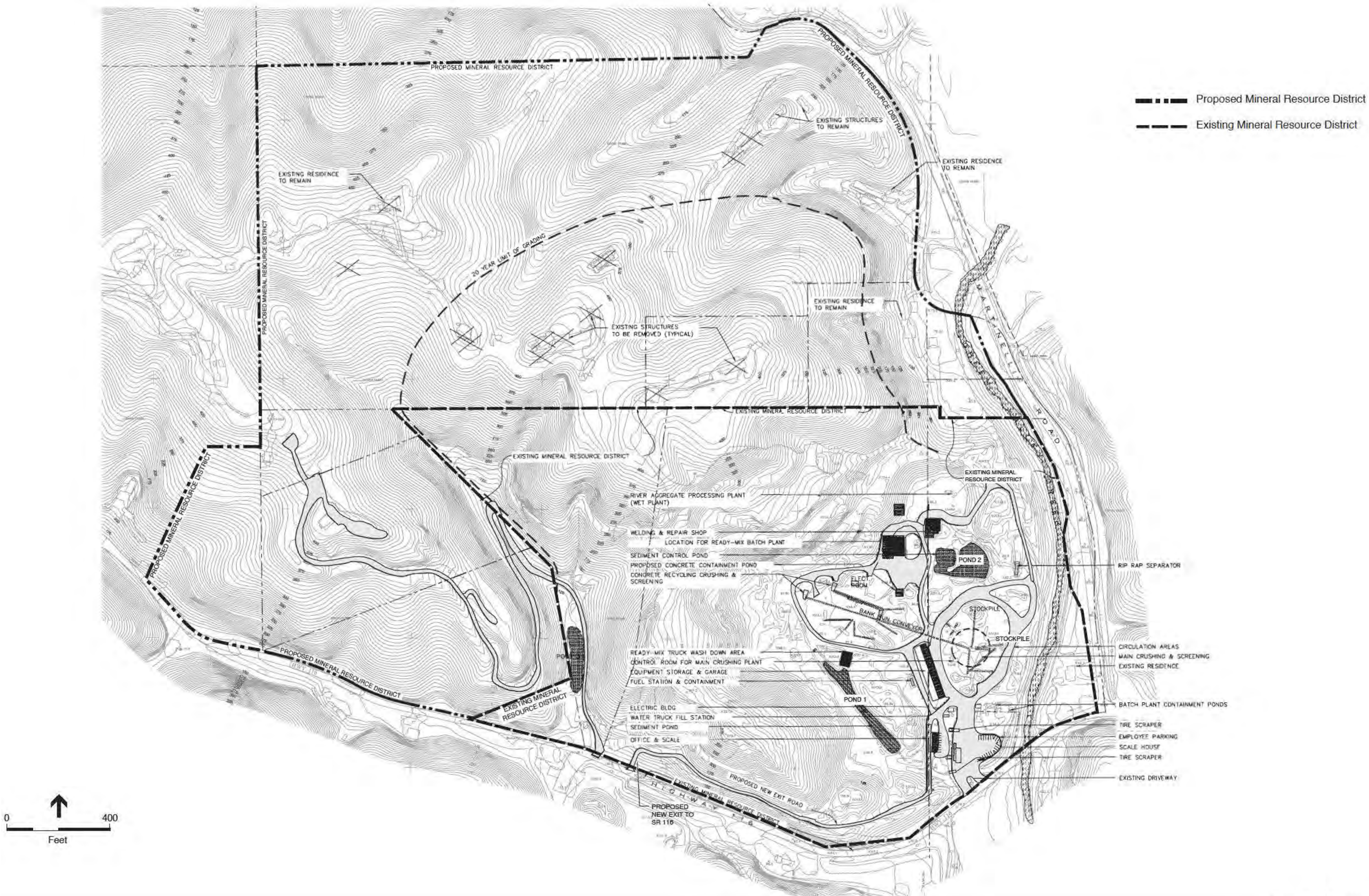
MINING PLAN – 20 YEAR GRADING LIMIT

Figure III-11 depicts the proposed 20-year grading plan for the Northern Expansion option, and Figure III-12 presents proposed cross sections for the Northern Expansion option. Final grading is proposed to be at a maximum of 1½ horizontal to 1 vertical, with bench intervals not exceeding 30 feet in vertical distance. As under the existing Conditional Use Permit, a 25-foot setback would be maintained along the quarry boundary along Highway 116. Elsewhere within the quarry, the setback of the 20-year grading limit to adjacent non-MR zoned parcels would be at least 200 horizontal feet.

Under the Northern Expansion option, the project sponsor proposes to move the crusher to the westerly limit of APN 83-130-82 to improve efficiency. The conveyor would remain in its existing location, but would be extended as needed to move crushed rock from the proposed location to a stockpile area where the crusher is presently located. In addition, the ready-mix batch plant is being relocated from its existing location near the project entrance to an area west of Sedimentation Pond No. 2.

Figure III-13 presents proposed mine staging for the Northern Expansion option. Upon completion of the westerly direction of mining operation, proposed mining under the Northern Expansion option would move north. Sections of the mining bench left from the westerly mining operation (currently located across the northerly hill in a northwest/southeast direction) would be reformed as mining cuts into the hill, resulting in a direct east/west line. The proposed straightening of the bench to an east-west direction is proposed by the project sponsor in part to decrease views of these operations from Highway 116. The amount of time it is anticipated to take to cut and reshape the existing bench and new working quarry face is approximately six years.

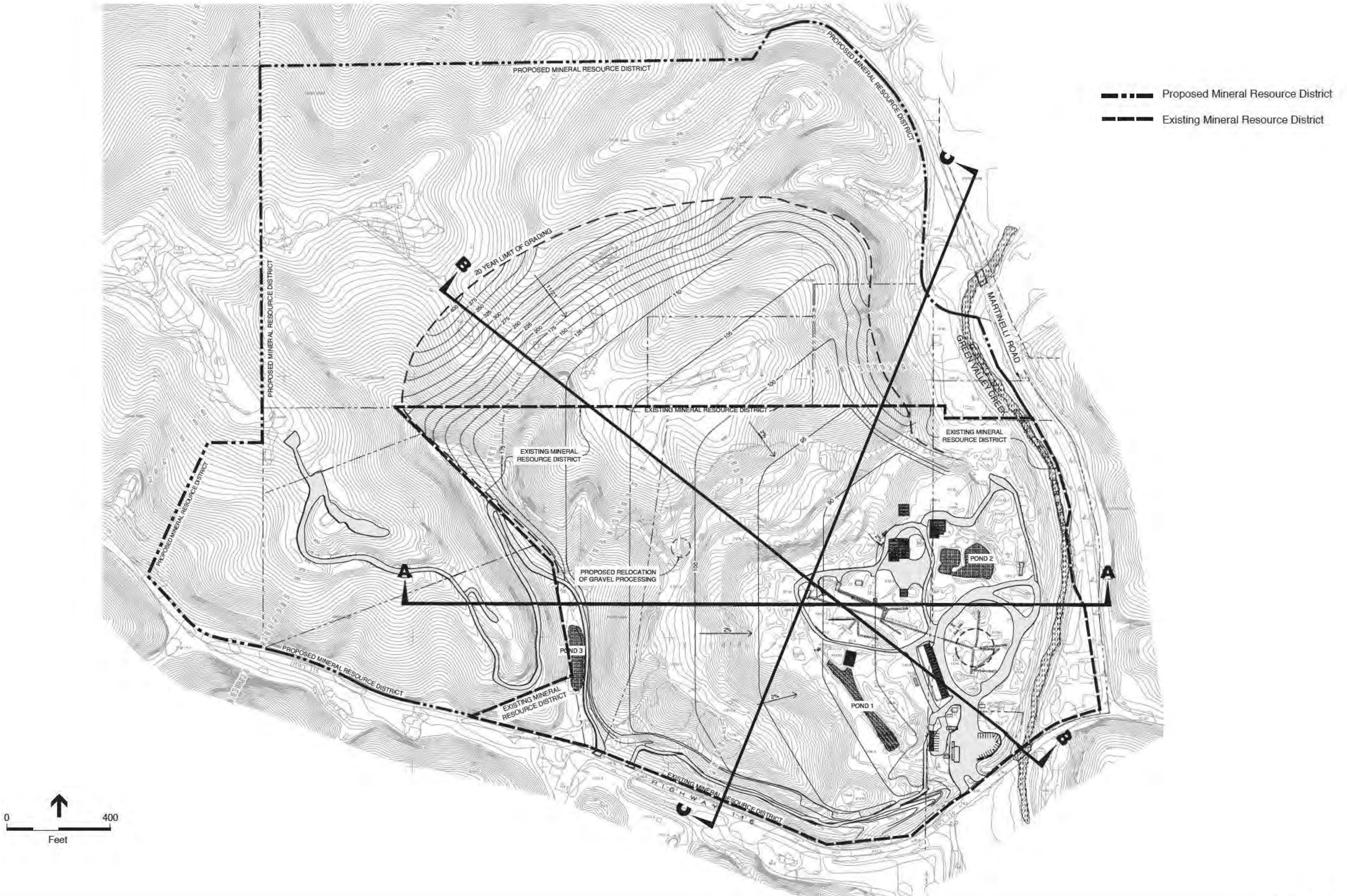
The final phases of mining within the 20-year grading limit under the Northern Expansion option would move back and forth across the northerly hill, mining from the top of the hill down. Other benches would be created higher on the hill as necessary to facilitate safe mining. As mining is completed in an area, the operator would perform temporary reclamation every fall by hydroseeding the open slopes to reduce erosion and improve the appearance of the mine by minimizing the open area of the working face. Due to the topography, as the mine moves north there would be resulting slopes facing both west and east that could be cut, shaped and reformed so that the final reclamation could take place.



SOURCE: Carlile-Macy

Canyon Rock Quarry / 202697

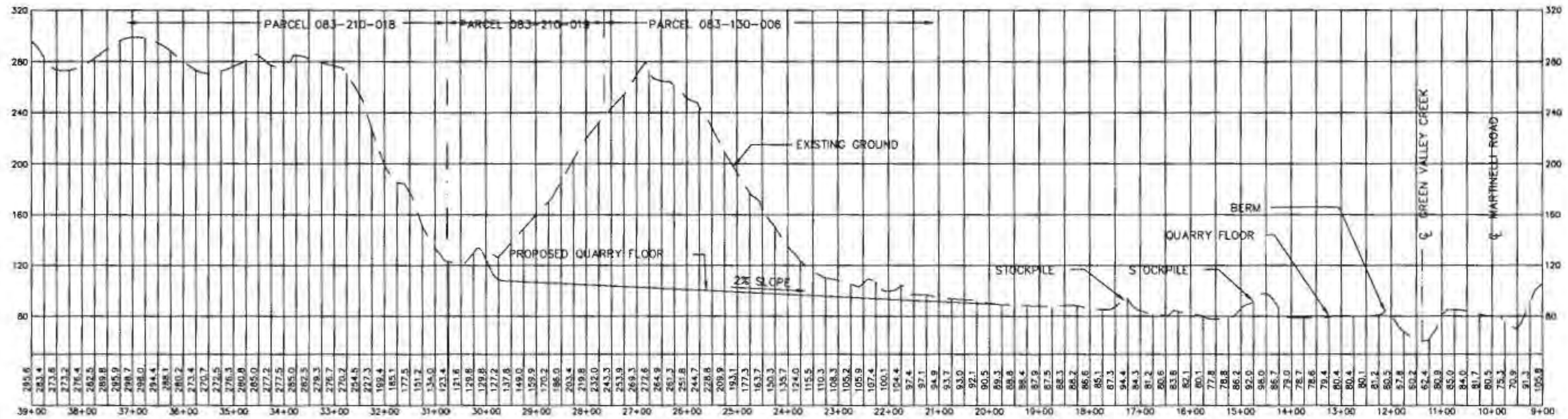
Figure III-10
Northern Expansion Option-
Site Map



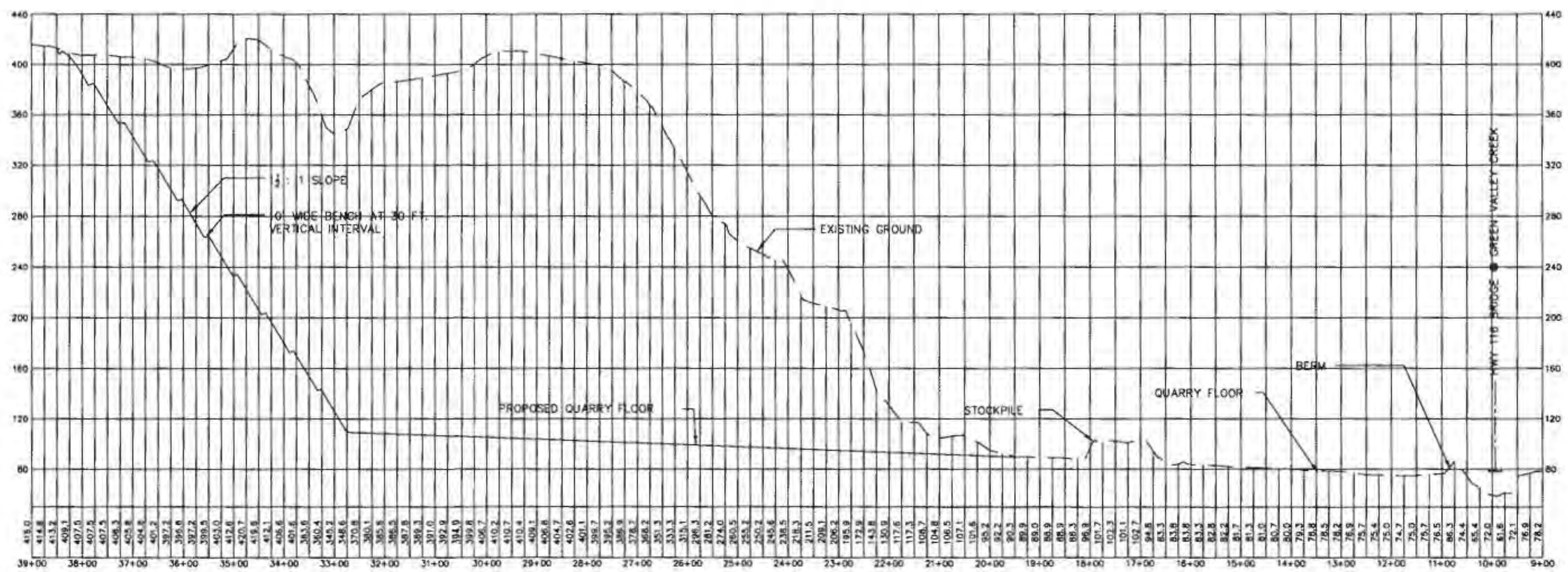
SOURCE: Carlile-Macy

Canyon Rock Quarry / 202697

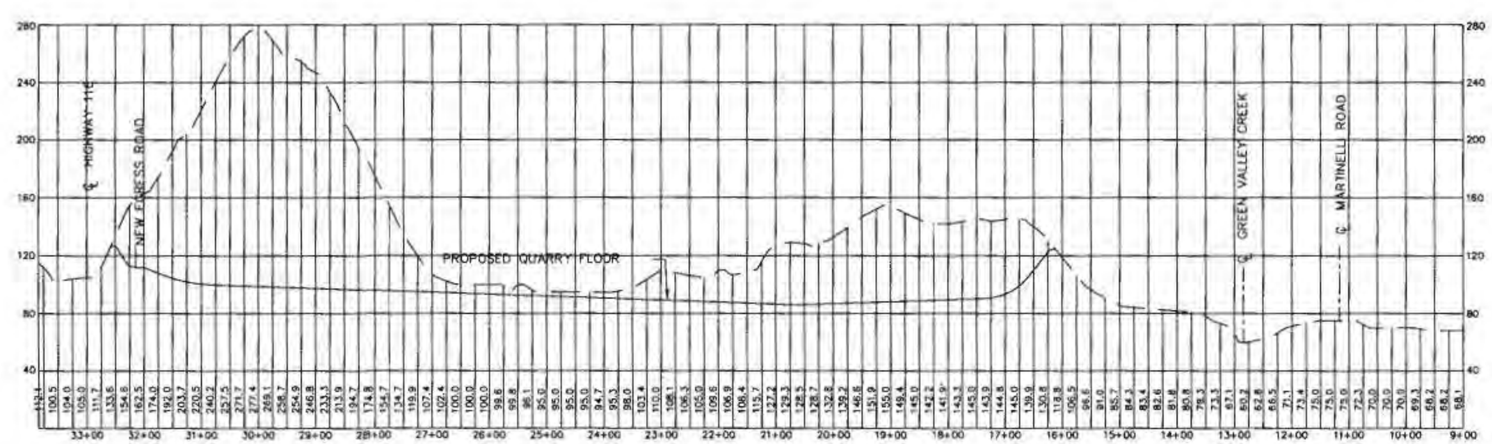
Figure III-11
Northern Expansion Option-
20-Year Grading Plan



SECTION A - A



SECTION B - B



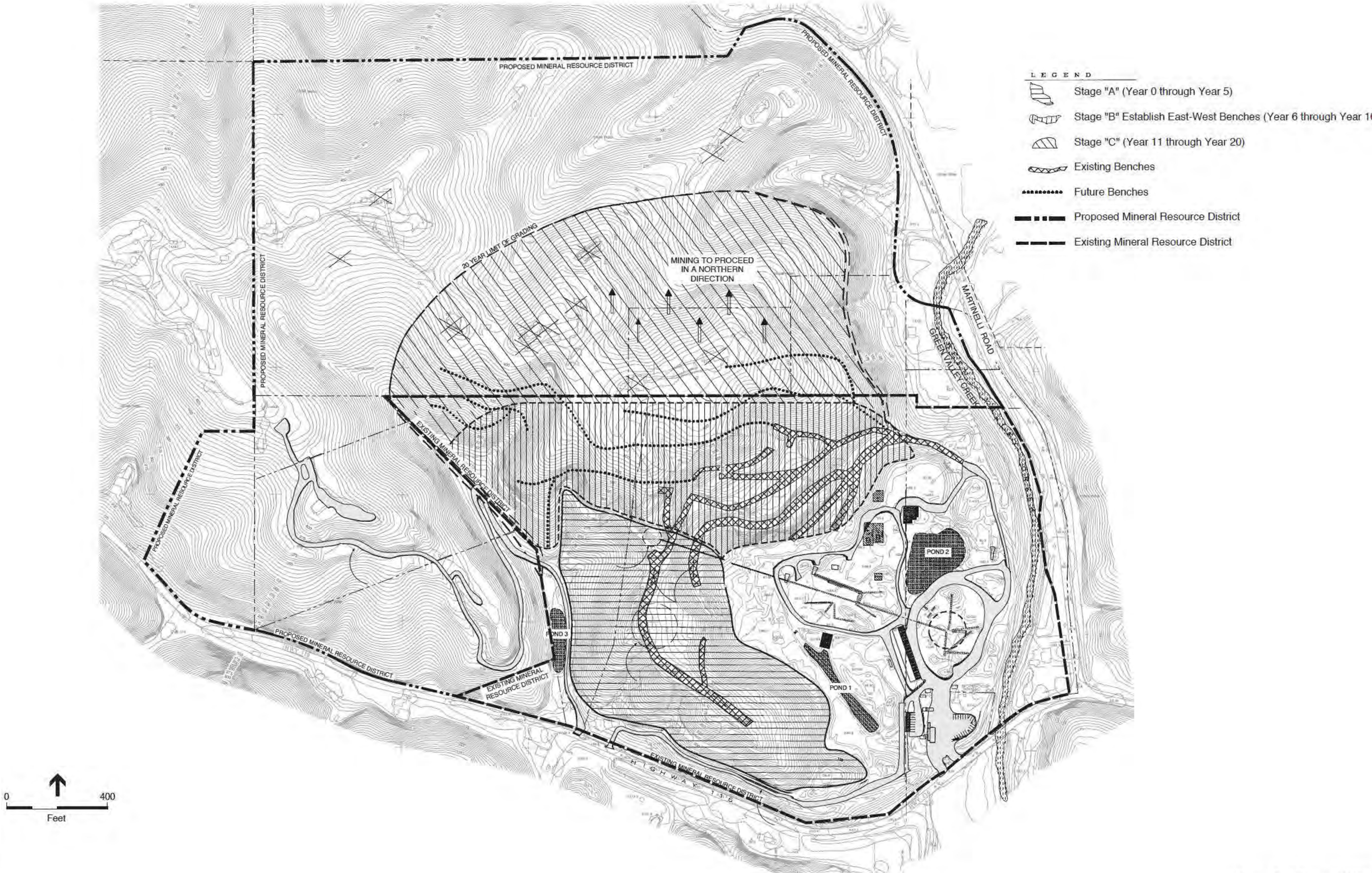
SECTION C - C

SOURCE: Carlile-Macy

Canyon Rock Quarry / 202697 ■

Figure III-12

Northern Expansion Option-Cross Sections



SOURCE: Carlile-Macy

Canyon Rock Quarry / 202697 ■

Figure III-13
Northern Expansion Option-
Mine Staging

BLASTING

As under existing conditions, occasional blasting operations under the Northern Expansion option would occur as a required part of the mining process, and would continue to be practiced in accordance with the Sonoma Surface Mining and Reclamation Ordinance No. 5165 (as set forth in County Code Section 26A). No increase in blasting beyond that which normally occurs under existing conditions would occur under the Northern Expansion option.

PROPOSED NEW EXIT ROAD

Under the Northern Expansion option (as under the Western Expansion option), a new second vehicular exit for the quarry onto Highway 116 is proposed to be established on parcel APN 83-130-82. This new exit would be approximately 1,630 feet west of the existing main quarry driveway, on a straighter section of the highway where better site-distance (over 900 feet in both directions) can be achieved. A paved road would be constructed within the project site from the existing quarry to connect to this proposed new exit. This new exit would operate in addition to the existing driveway.

The ultimate use of this new exit road would depend on a number of factors. During wet weather, it is anticipated all vehicles leaving the quarry (i.e., trucks, employee vehicles, etc.) would exit at this proposed location. However, during dry weather and/or slow periods, vehicles may continue to exit at the main quarry driveway, or some combination of both driveways may be used.

SITE DRAINAGE AND SEDIMENT CONTROL

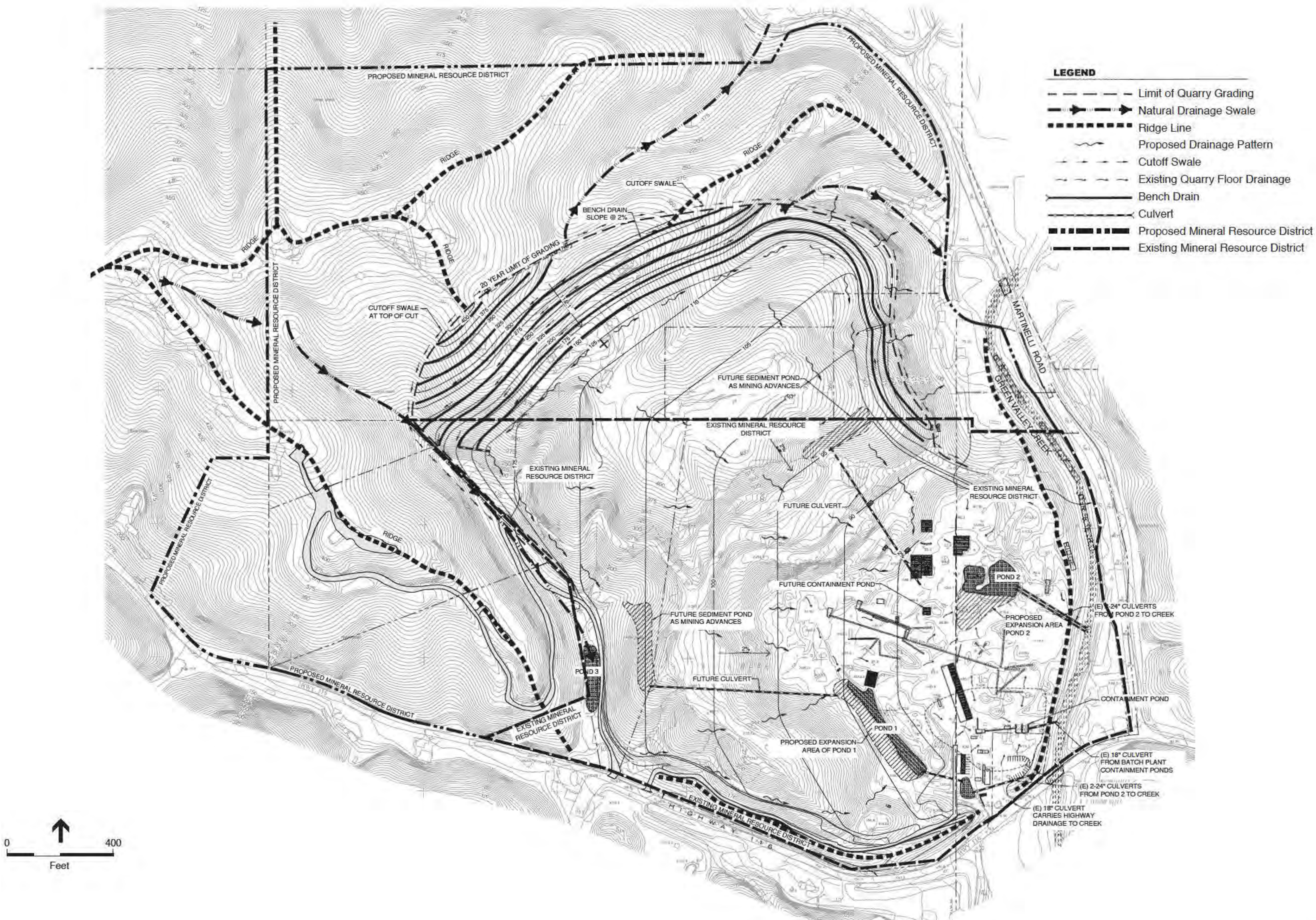
Figure III-14 presents proposed site drainage and sediment control for the Northern Expansion option. As under existing conditions, the primary method proposed to be used to control stormwater runoff for the Northern Expansion option are to direct it through sedimentation ponds. Under the Northern Expansion option, the existing sedimentation ponds would be increased in size, and additional ponds would be developed as the mining progresses.

As under existing conditions, the accumulation of sediments within the existing and proposed ponds under the Northern Expansion option would be monitored regularly. When sediments occupy 1/3 to ½ the pond capacity, they would be removed, allowed to dry, and then stockpiled as topsoil or mixed with other products. Stockpiles of topsoil would be mulched with weed free straw to prevent erosion.

As under existing conditions, swales and berms are proposed to be maintained to ensure runoff from the quarry does not directly enter Green Valley Creek.

RECLAMATION

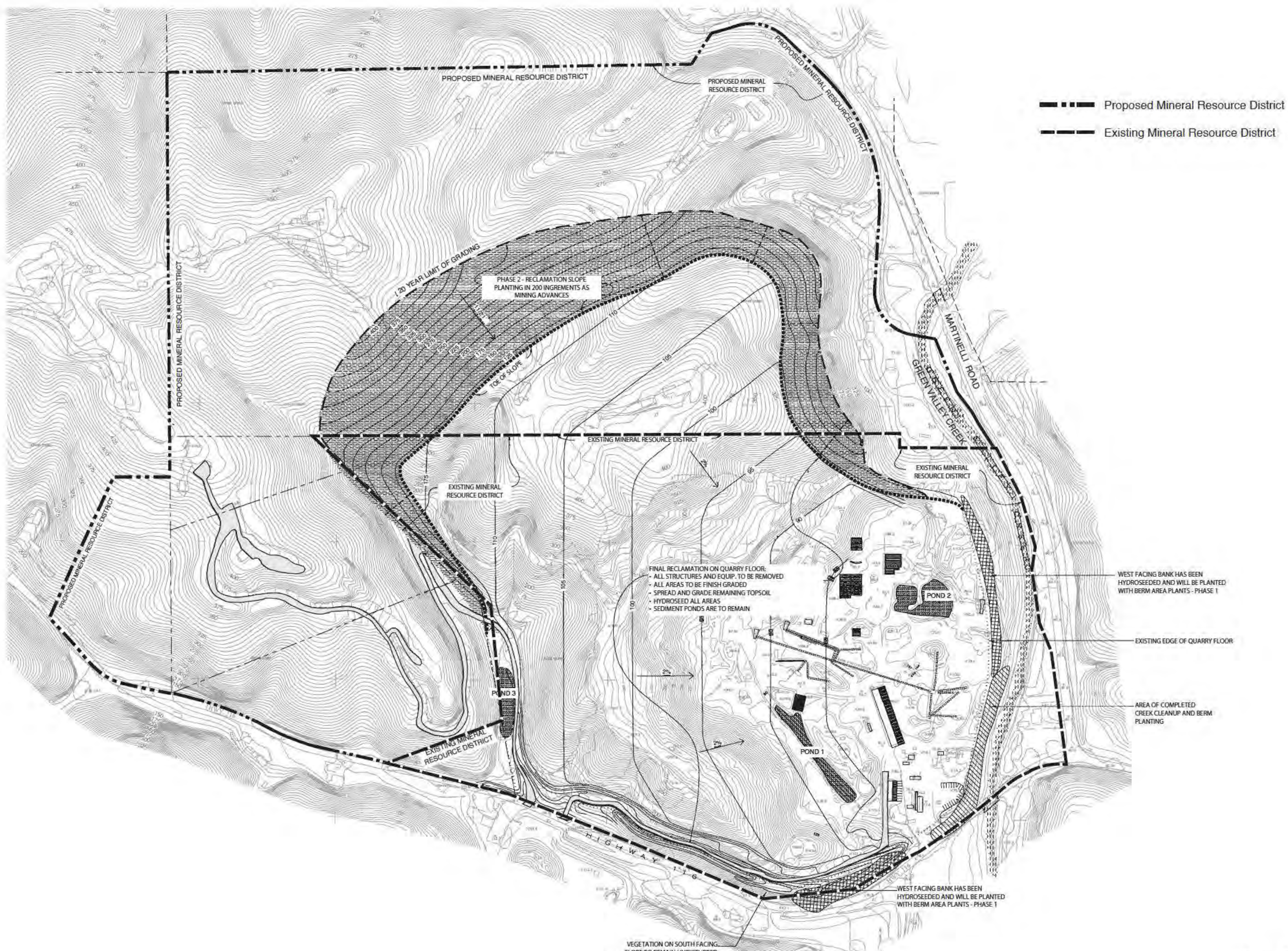
Figure III-15 presents proposed reclamation planting for the Northern Expansion option. As under existing conditions, ongoing reclamation at the quarry would include the continued maintenance of the sedimentation ponds, additional planting for visual screening and erosion control and the continuation of planting and maintenance on mined slopes.



SOURCE: Carlile-Macy

Canyon Rock Quarry / 202697

Figure III-14
Northern Expansion Option-
Site Drainage and Sediment Control



SOURCE: Carlile-Macy

Figure III-15
Northern Expansion Option-
Reclamation Planting

As mining advances, the finished grading of slopes would also generally advance so that the total area of exposed soil would not exceed existing permitted conditions. As large increments of the mined areas are finish graded, the slopes would be terraced, have bench drains established, and surfaces covered with topsoil and planted per details outlined in the proposed Reclamation Plan. Table III-5, below, presents the proposed plant list for slope planting.

TABLE III-5
NORTHERN EXPANSION OPTION - RECLAMATION PLANT LIST

SLOPE PLANTING	
North Coast Conifer Community	
Douglas Fir	Flannel Bush
Tanoak	Wild Rose
Coast Live Oak	Thimbleberry
California Black Oak	Blackberry
California Bay	Snowberry
Chaparral	Seasonal Wetland
Chamise	Sedge
Manzanita	Smartweed
Wild Lilac	Blackberry
EROSION CONTROL SEED MIX	
California Fescue	Needle Grass
California Brome	California Melic
Woodland Brome	Pygmy-Leafed Lupine
Blue Wildrye	Coyote Brush
Six Weeks Fescue	Monkey Flower

SOURCE: Canyon Rock Company, Inc., 2002

The project sponsor maintains equipment for hydroseeding and would perform this portion of the reclamation planting. Liner stock planting would be installed by contractors specializing in restoration planting.

Berms, which have been hydroseeded and planted with woody material (such as the berm near the intersection of Highway 116 and Martinelli Road, or the berm along Highway 116 west of the entrance) would be planted with liner stock plant materials.

G. POTENTIAL SUBSEQUENT MINING BEYOND PROPOSED 20-YEAR LIMIT OF GRADING

If either the Western or Northern Expansion option were approved, the proposed use permit would be limited to a 20 year mining duration, the maximum allowed under the ARM Plan. The project also would require a reclamation plan for this 20-year supply of aggregate. Accordingly, this EIR addresses all potential environmental impacts that would occur from mining within the 20-year limits of grading under proposed use permit and reclamation plan for either expansion option.

However, under either the Western or Northern Expansion option, the Mineral Resource District zone would be placed over a larger area than would be mined under the proposed 20-year use permit for either expansion option. Consequently, if the proposed project is approved, the possibility exists that the owner could apply for a new permit to allow additional mining outside the approved 20-year limit of grading and within the approved Mineral Resource District. It is estimated that under either expansion option, the surplus area in the northern and western parcels (outside the proposed 20-year grading limit of the options) could provide an additional 50 years of mining (assuming continuation of baseline production levels). However, any new request to mine beyond the proposed 20-year grading limits in the use permit and reclamation plans would require a new application, new use permit, new Reclamation Plan, and would entail new environmental review under CEQA of potential environmental effects. Furthermore, implementation of any additional use permit or reclamation plan to permit potential further mining would not commence until after the 20-year life of the proposed use permit expires.

Chapter VI presents a discussion of potential environmental effects that could be expected if a subsequent use permit and reclamation plan were sought at some point in the future to permit mining within the remainder of the Mineral Resources District. Given the speculative nature as to the specific production levels and timing of any potential future mining activities, potential effects are described qualitatively.

H. 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 Resources and Rural Development (RRD) 160-acre density (B6) Scenic Resources (SR) to APNs 83-210-13, -16, -17, and -18; 83-210-06, -15, and 20; and 83-130-33 and -40 (total of 113.77 acres); and

2) a Use Permit/Reclamation Plan (County Permit 97-0046) to allow an expansion of the mining operation onto four proposed parcels (41.56 acres) to the west or five proposed parcels (94.63 acres) to the north.

Other required local approvals may include the Sonoma County Water Agency, the County Public Health Department, and the Northern Sonoma County Air Pollution Control District.

Additional approvals may be required from the State Department of Conservation (Office of Mine Reclamation), State Department of Fish and Game, State Department of Forestry, California Department of Transportation (Caltrans), 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.)

Carlile Macy, personal communications.

Carlile Macy, *Surface Mining Application and Reclamation Plan* (Western Expansion option), November 1997.

Carlile Macy, *Canyon Rock Company, Inc. Reclamation Plan* (Northern Expansion option), September, 2002.

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

Sonoma County Assessor's Parcel Map, Block 83 pages 13 and 21

Sonoma County, *General Plan*, 1989, amended through 1998.

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

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

CHAPTER IV

ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES FOR WESTERN AND NORTHERN EXPANSION OPTIONS

IV.A TRANSPORTATION AND TRAFFIC

Except where noted, this section was prepared using the Master Traffic Impact Report for the Continuation or Expansion of Activities at Blue Rock and Canyon Rock Quarries in Forestville, December 28, 2001, prepared by the Crane Transportation Group (CTG). That document served as a source of data for preparation of the EIRs for both the proposed Canyon Rock and Blue Rock Quarry expansion projects. The master traffic impact report assessed potential transportation impacts associated with intersection and roadway levels of service, potential impacts to bicycle and pedestrian circulation, and potential safety conflicts along haul routes in Forestville. The master traffic report used significance criteria that have since been revised by the County. The CTG report was peer reviewed and updated (as appropriate), and the analysis of impacts in this EIR was assessed using current County significance criteria.

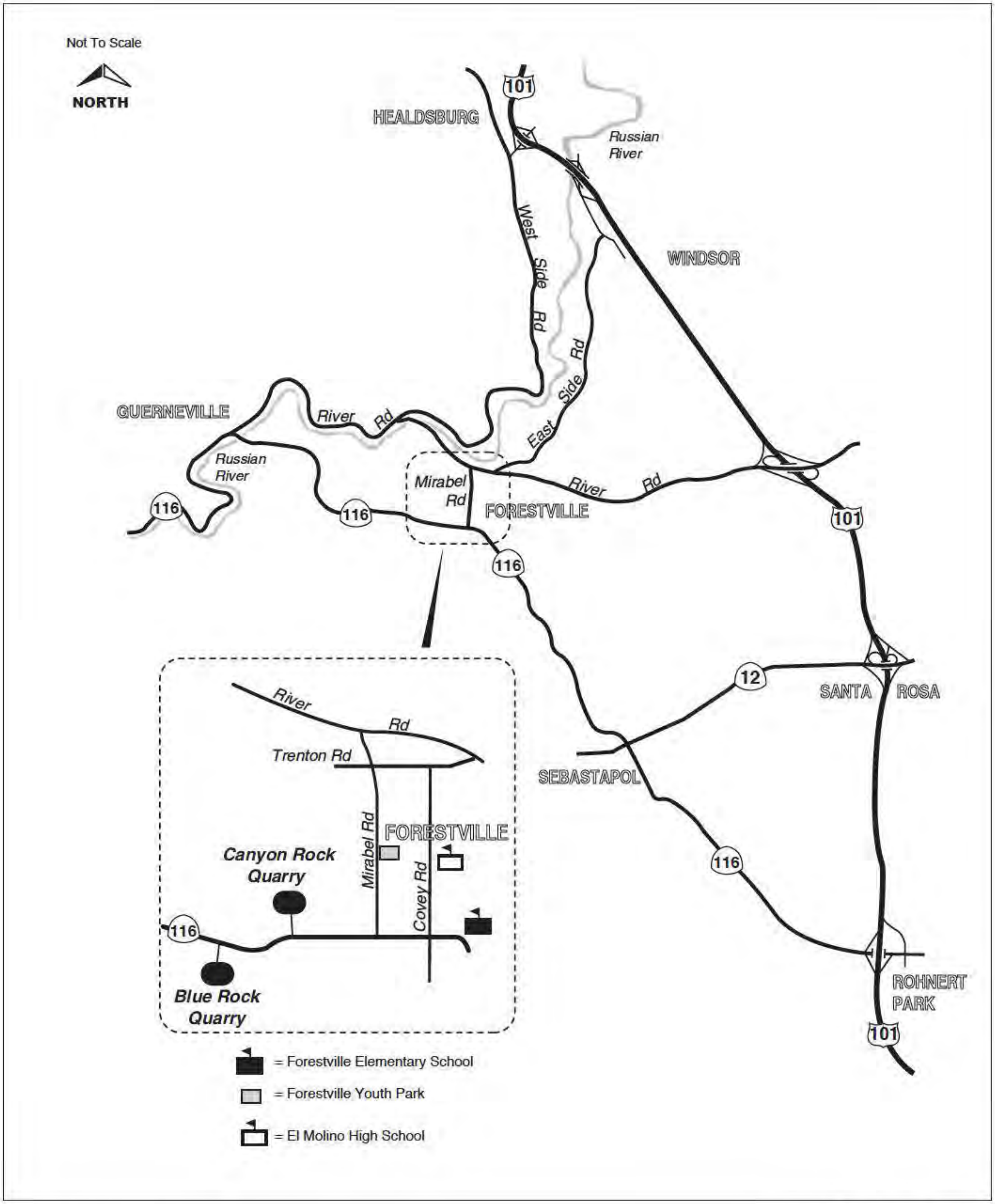
SETTING

ROADWAY SYSTEM AND SITE ACCESS

Canyon Rock Quarry is directly served by Highway 116 west of Forestville. Virtually all quarry trucks are destined to/from construction sites east of Forestville and use one of two routes through the community. Some trucks use Highway 116 through central Forestville and continue southerly on Highway 116 (Sebastopol and Rohnert Park), or on one of several east-west arterial roadways (the Santa Rosa area). Alternatively, trucks use Highway 116 and Mirabel Road in central Forestville, and then use River Road to/from the U.S.101 freeway just north of Santa Rosa (see Figure IV.A-1). Each local roadway is briefly described below, while a schematic presentation of the lane geometrics and control at each intersection evaluated for this study is presented in Figure IV.A-2. (Figure IV.A.2 does not depict the Forestville Bypass project, however, a written description of this project is included under Planned Roadway Improvements, below.)

Highway 116 (State Route 116)

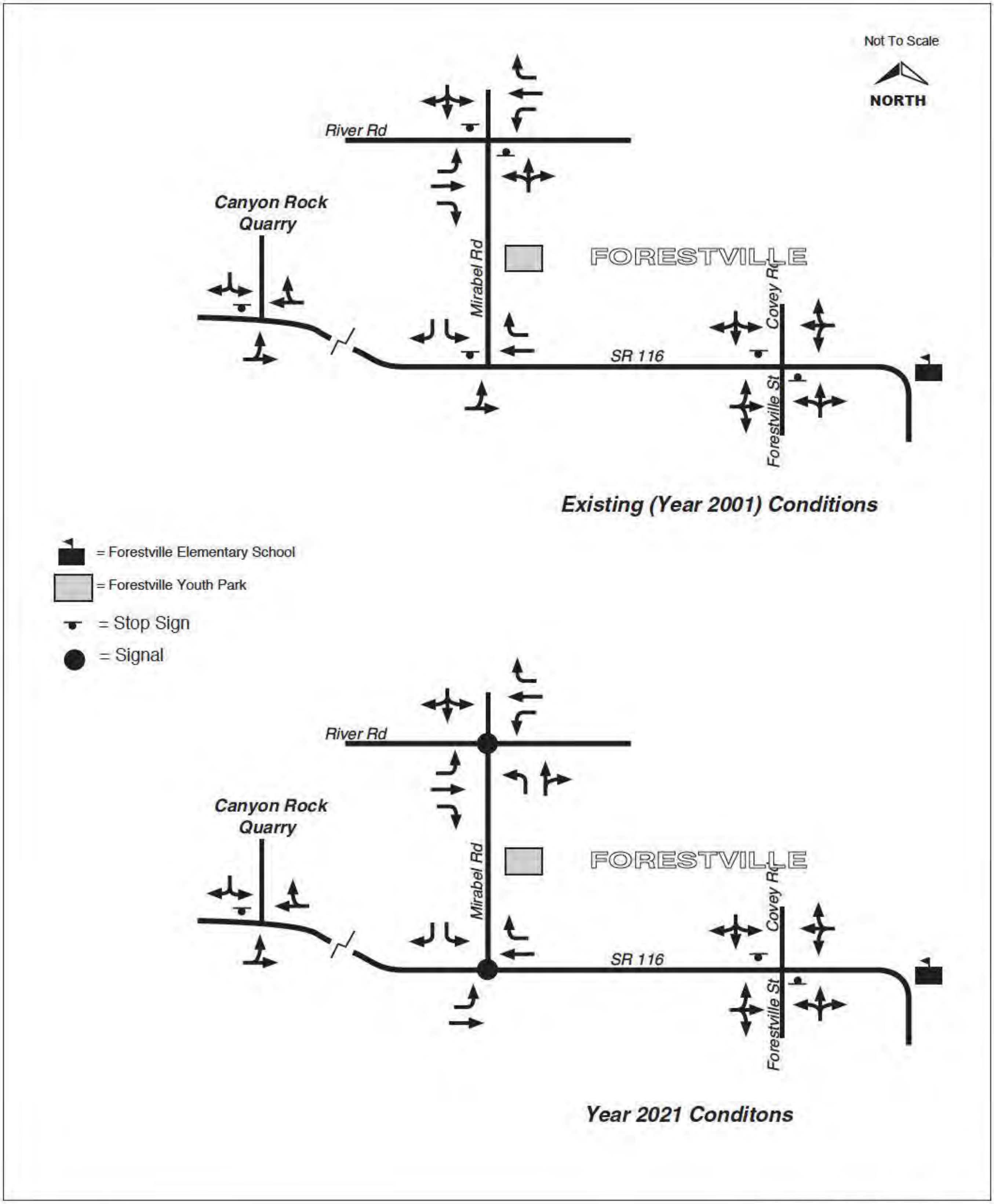
Highway 116 has two travel lanes in the Forestville area and in the vicinity of the quarry entrances. It continues northwesterly of the project area to Guerneville and Jenner at the Pacific Ocean and southeasterly to Sebastopol, Cotati and the U.S.101 freeway. It is not signalized or stop sign controlled



SOURCE: Crane Transportation Group

Canyon Rock Quarry / 202697 ■

Figure IV.A-1
Area Map



SOURCE: Crane Transportation Group

Canyon Rock Quarry / 202697 ■

Figure IV.A-2
Lane Geometrics and Intersection Control
Existing (Year 2001) and Year 2021

at any local intersection. The posted speed limit is 25 miles per hour (mph) in central Forestville, 45 mph west of town in the vicinity of the Canyon Rock and Blue Rock quarries, and 45 mph to the southeast of Forestville. The average daily traffic volume on Highway 116 is about 11,700 vehicles east of Mirabel Road, and about 6,300 vehicles west of Mirabel Road (Caltrans, 2002). Left turn lanes are not provided on the approaches to either quarry entrance or at any location within Forestville except at the two entrances to Forestville Elementary School. An exclusive right turn lane is provided on the westbound approach to Mirabel Road. Highway 116 lacks paved or gravel shoulders in most locations from Mirabel Road west to both quarry entrances. East of Mirabel Road (in central Forestville) paved area is provided for on-street parking in most locations near community serving commercial uses. Shoulders are provided in most locations southeast of the Covey Road intersection, but vary in width from one to six feet. Highway 116 traverses several horizontal and vertical curves in the study area. The two primary curve locations are a 90-degree horizontal curve at the east end of Forestville adjacent to the Forestville Elementary School, and a major vertical curve which crests just to the west of the Mirabel Road intersection. This vertical curve leads into an extended downhill grade (east to west) from just west of Mirabel Road to just east of Martinelli Road and the entrance to Canyon Rock quarry. Highway 116 has crosswalks at the Covey Road-Forestville Street, 1st Street and 2nd Street intersections.

Mirabel Road

Mirabel Road is a two-lane County arterial roadway extending about 1.5 miles in a north-south direction between Highway 116 and River Road. It is stop sign controlled on the approaches to both roadways. Four-foot-wide paved shoulders are in place only in proximity to Highway 116 and along an extended downhill grade (south to north) just south of Trenton Road. The posted speed limit varies from 35 to 45 miles per hour. A left turn lane is provided on the approach to Highway 116, but not on the approaches to other intersections. A sidewalk is provided along the east side of Mirabel Road between Highway 116 and the Forestville Youth Park.

River Road

At its intersection with Mirabel Road, River Road is a two-lane County arterial roadway extending west to the community of Guerneville and east about eight miles to the U.S.101 freeway. On River Road, left and right turn deceleration lanes are provided on the approaches to the Mirabel Road intersection.

Covey Road

Covey Road is a two-lane County collector street within Forestville on the north side of Highway 116. It is stop sign controlled at its intersection with Highway 116. The fourth, southerly leg of the Highway 116 / Covey Road intersection is named Forestville Road.

EXISTING TRAFFIC OPERATING CONDITIONS

Study Intersections

Four intersections were selected for analysis because they would most likely be significantly affected by project-generated traffic. The location and traffic controls at these intersections are shown in Figure IV.A-2. The four study area intersections are:

1. Highway 116 / Mirabel Road
2. Highway 116 / Covey Road-Forestville Road
3. River Road / Mirabel Road
4. Highway 116 / Canyon Rock Quarry Entrance

Existing Traffic Volumes

Based on potential significant effects associated with the proposed project, it was determined that both weekday and Saturday conditions should be evaluated. Review of production data from both the Canyon Rock and Blue Rock quarries indicated that Wednesdays are most frequently the peak activity weekday, and that at current production levels for the Canyon Rock Quarry, the peak production month is October.[1] Therefore, vehicle turning movement counts were conducted on Wednesday and Saturday in October 2001 at the four study intersections.[2]

Counts were conducted from 7:00 to 11:00 a.m., and from 1:00 to 6:00 p.m. on Wednesday, and from 9:00 a.m. to 5:00 p.m. on Saturday.[3] A separate tabulation of quarry trucks was kept for each count. About 65 percent of all quarry trucks used the Mirabel Road and River Road access route through Forestville, with the remaining 35 percent continuing on Highway 116 through central Forestville. This distribution pattern remained relatively constant for weekday and Saturday conditions for the counting events.

In addition, pre- and post-school pedestrian and bicycle counts were conducted in the vicinity of the Forestville Elementary School during an October weekday, and pedestrian and bicycle counts were conducted along Mirabel Road adjacent to the Forestville Youth Park on two Saturdays when at least two play fields were in use. See page IV.A-12 for a fuller description of pedestrian and bicycle traffic volumes in the area.

The selection of specific peak weekday and Saturday traffic hours to analyze was based upon an evaluation of non-quarry traffic activity (by hour), school start and end times on weekdays, and the likely

1 Canyon Rock Quarry has its maximum production month in October, with 14.4 percent of its yearly sales. Blue Rock Quarry currently has limited production capacity, which results in peak production during August and much lower activity in October. However, under the proposed Blue Rock Quarry expansion project, its peak production activity would shift from August to October.

2 Traffic counts were also conducted on a Wednesday and Saturday in October 2002 as a check to determine whether the October 2001 counts used for the December 2001 traffic impact report are still valid for use in this EIR. As described in a memo to County staff, differences in peak-hour traffic volumes between 2001 and 2002 are generally consistent with projected growth in traffic volumes on the local roadway system and are mostly within the range of normal daily variations in traffic (Crane Transportation Group, 2002).

3 Canyon Rock Quarry currently operates Monday through Saturday. Blue Rock Quarry currently operates Monday through Friday; however, under the proposed Blue Rock Quarry expansion project, it would also operate on Saturdays.

hours of peak inbound and outbound quarry truck activity. The October Wednesday a.m. peak hour selected for analysis purposes was 7:15-8:15 a.m., which encompasses peak non-quarry traffic volumes, peak school-related traffic activity in October, and a high level of quarry truck activity. The October Wednesday p.m. peak hour selected for the analysis was 2:30-3:30 p.m., which encompasses peak or near-peak non-quarry traffic on Highway 116, peak school-related traffic activity in October, and a high to moderately-high level of quarry truck activity. Quarry truck activity typically declines substantially by the end of the afternoon and, as a result, there is usually minimal quarry truck activity during the evening commute period between 4:00 and 6:00 p.m. on weekday. The Saturday peak hour selected for analysis purposes was 11:00 a.m. to 12:00 noon, which reflects the highest overall combination of non-quarry and quarry truck traffic along Highway 116 in central Forestville. While other hours later in the afternoon had higher background volumes, particularly along River Road, quarry truck volumes were minimal.

Baseline Traffic Volumes

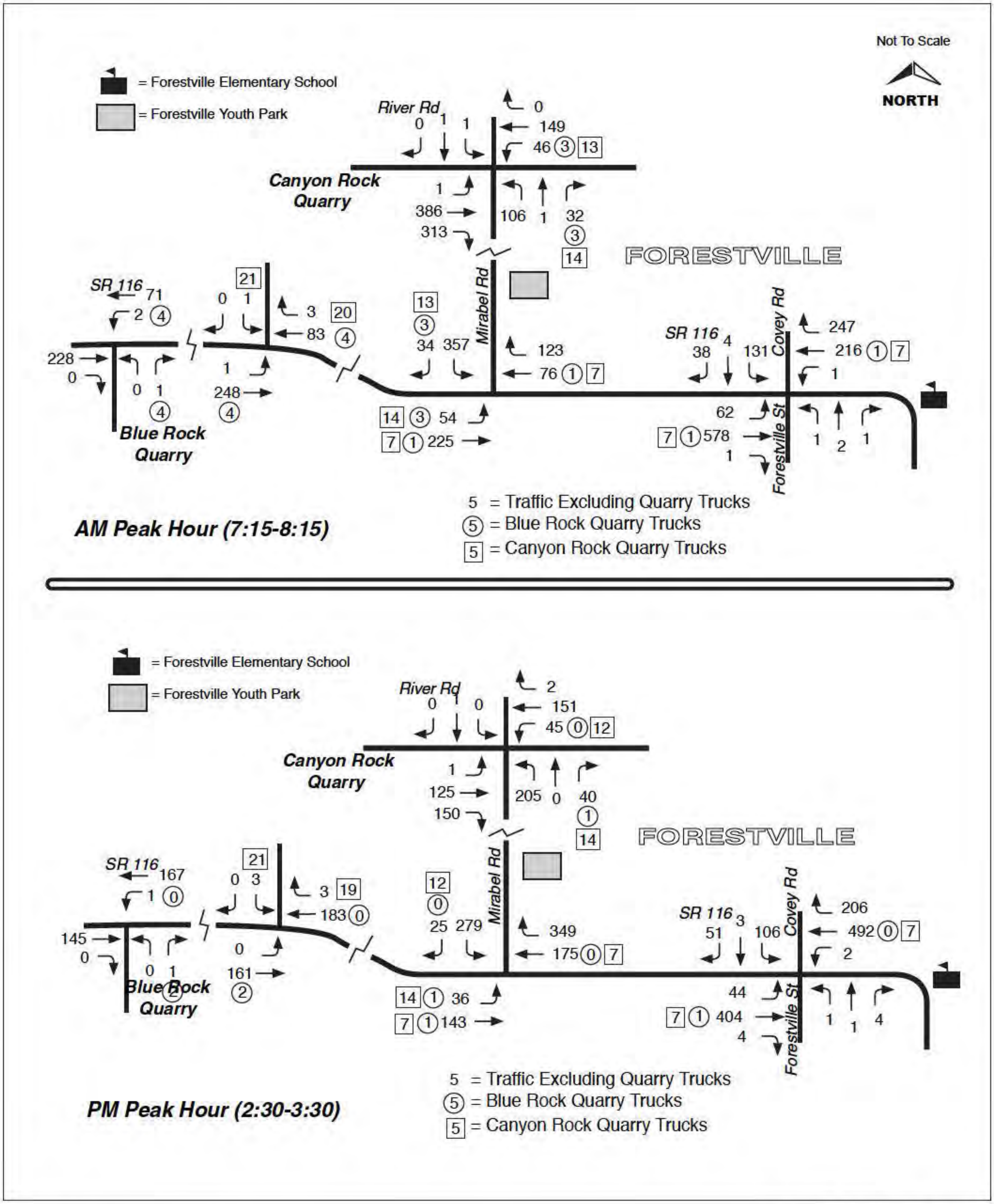
Existing traffic volumes were adjusted as appropriate to reflect the 5-year annual average baseline volumes for both quarries, as described in the Project Description. Baseline October weekday a.m. and p.m. peak-hour volumes are presented in Figure IV.A-3, while Baseline October Saturday peak hour volumes are presented in Figure IV.A-4.

Intersection and Roadway 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.

Unsignalized Intersections. LOS ratings for unsignalized intersections are determined using methodologies outlined in the *Highway Capacity Manual* (Transportation Research Board, 2000). All-way stop-controlled intersections receive one LOS designation (based on average control delay) reflecting operation of the entire intersection. Unsignalized intersection with stop sign control only on side streets (two-way stop control) are also evaluated using the LOS and average control delay scales, but for these unsignalized intersections, LOS and delay values are computed only for movements on the stop sign controlled approaches, and for left turns from the major street. Descriptions of the six levels of service, with delay ranges assigned to each, are shown in Table IV.A-1.

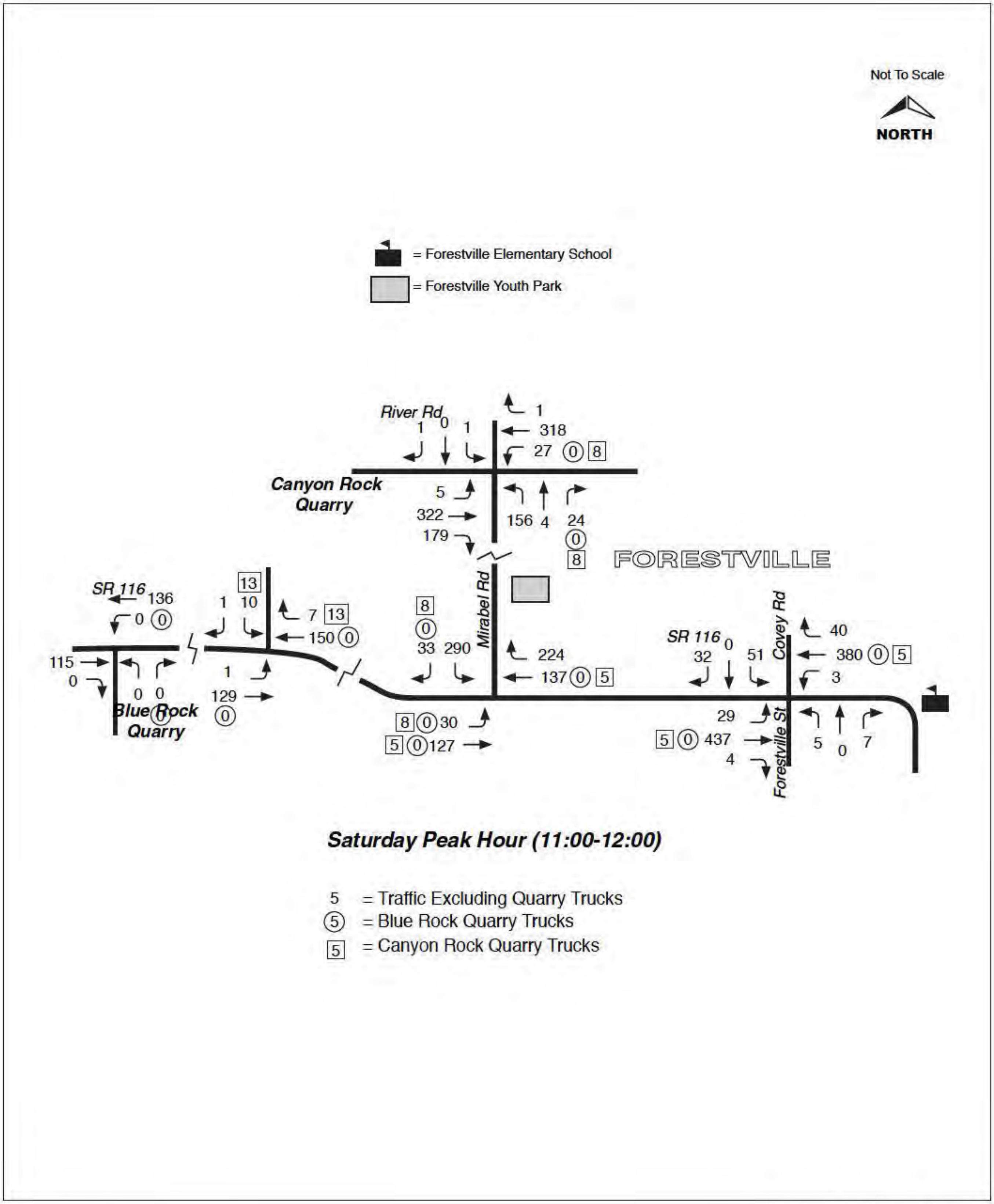
Traffic Signal Warrants. Traffic signals are used to provide an orderly flow of traffic through an intersection. Many times they are needed to offer side street traffic an opportunity to access a major road where high volumes and/or high vehicle speeds impede crossing or turn movements. They do not, however, increase the capacity of an intersection (i.e., do not increase the overall intersection's ability to accommodate additional vehicles) and, in fact, reduce somewhat the number of total vehicles that can pass through an intersection in a given period of time. Signals can also cause an increase in certain types of traffic accidents (e.g., rear-end accidents) if installed at inappropriate locations. There are 11 possible



SOURCE: Crane Transportation Group

Canyon Rock Quarry / 202697

Figure IV.A-3
Base Case October Weekday
AM and PM Peak Hour Volumes



SOURCE: Crane Transportation Group

Canyon Rock Quarry / 202697

Figure IV.A-4
Base Case October Saturday Peak Hour Volumes

TABLE IV.A-1
DEFINITIONS FOR INTERSECTION LEVEL OF SERVICE

Unsignalized Intersections			Signalized Intersections	
Description	**Average Total Vehicle Delay (Seconds)**	**Level of Service**	**Average Control Vehicle Delay (Seconds)**	**Description**
No delay for stop-controlled approaches.	≤10.0	A	≤10.0	Free Flow or Insignificant Delays: Operations with very low delay, when signal progression is extremely favorable and most vehicles arrive during the green light phase. Most vehicles do not stop at all.
Operations with minor delay.	>10.0 and ≤15.0	B	>10.0 and ≤20.0	Stable Operation or Minimal Delays: Generally occurs with good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average delay. An occasional approach phase is fully utilized.
Operations with moderate delays.	>15.0 and ≤25.0	C	>20.0 and ≤35.0	Stable Operation or Acceptable Delays: Higher delays resulting from fair signal progression and/or longer cycle lengths. Drivers begin having to wait through more than one red light. Number of vehicles stopping is significant. Most drivers feel somewhat restricted.
Operations with increasingly unacceptable delays.	>25.0 and ≤35.0	D	>35.0 and ≤55.0	Approaching Unstable or Tolerable Delays: Influence of congestion becomes more noticeable. Longer delays result from unfavorable signal progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop. Drivers may have to wait through more than one red light. Queues may develop, but dissipate rapidly, without excessive delays.
Operations with high delays, and long queues.	>35.0 and ≤50.0	E	>55.0 and ≤80.0	Unstable Operation or Significant Delays: Considered to be the limit of acceptable delay. High delays indicate poor signal progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.	>50.0	F	>80.0	Forced Flow or Excessive Delays: Occurs with oversaturation when flows exceed the intersection capacity. Represents jammed conditions. Many cycle failures. Queues may block upstream intersections.

SOURCE: Transportation Research Board, Special Report 209, *Highway Capacity Manual*, updated 2000.

tests for determining whether a traffic signal should be considered for installation (Caltrans, 2002). These tests, called "warrants," consider criteria such as traffic volume, pedestrian volume, presence of school children, and accident history. Usually, two or more warrants must be satisfied before a signal is installed. In this report, the Peak Hour Volumes Warrant (Rural Areas) has been applied, which when satisfied provides a strong indication that a detailed signal warrant analysis covering all possible warrants is appropriate. The "Rural Areas" criteria are applied to intersections in communities with fewer than 10,000 residents, or intersections where travel speeds on the uncontrolled intersection approaches are 40 miles per hour or higher.

Roadways. Operating conditions of two-lane rural roadways are evaluated using a methodology contained in the *Highway Capacity Manual*. The methodology considers physical and traffic characteristics, as well as driver expectations regarding travel speeds. Levels of service for Class I roadways (which have relatively high speeds expected, serve as commuter routes and as connecting links between facilities that serve long distance trips) are judged on the basis of average travel speed; the roadways in the study area are Class I roadways. Table IV.A-2 presents the level of service criteria for this type of roadway.

TABLE IV.A-2
LEVEL OF SERVICE (LOS) CRITERIA FOR
TWO-LANE RURAL ROADWAYS (CLASS I)

LOS	Average Travel Speed (MPH)
A	>55
B	>50 and ≤55
C	>45 and ≤50
D	>40 and ≤45
E	≤40
F	applies whenever the flow rate exceeds the segment capacity

SOURCE: Transportation Research Board, Special Report 209, *Highway Capacity Manual*, 2000.

As shown in Table IV.A-3, stop-sign-controlled movements at the unsignalized Highway 116 / Covey Road-Forestville Road intersection currently operate at an unacceptable LOS F during the weekday analysis periods, and at an acceptable LOS D during the Saturday analysis period. The stop-sign-controlled movements at the unsignalized Highway 116 / Mirabel Road intersection currently operate at an unacceptable LOS F during the weekday a.m. peak-hour analysis periods, and at an acceptable LOS D or better during the other analysis periods. All movements at the unsignalized River Road / Mirabel Road and Highway 116 / Quarry Access intersections currently operate at an acceptable LOS B or better during all analysis periods. Existing traffic volumes at all study intersections, except the Quarry Access intersection, satisfy the Peak-Hour Volume Signal Warrant. As shown in Table IV.A-4, Highway 116

TABLE IV.A-3
EXISTING LEVELS OF SERVICE (LOS) AT STUDY INTERSECTIONS [a]

Study Intersection / Movement	Weekday AM Peak Hour Delay	Weekday AM Peak Hour LOS	Weekday PM Peak Hour Delay	Weekday PM Peak Hour LOS	Saturday Peak Hour Delay	Saturday Peak Hour LOS	Signal Warrant Satisfied?
1. Highway 116 / Mirabel Road							Yes
- Mirabel Left Turns	>120	F	25.9	D	22.1	C	*(Weekday*
- Highway 116 Left Turns	7.8	A	8.8	A	8.3	A	*Saturday)*
2. Highway 116 / Covey-Forestville Roads							Yes
- Southbound Covey Approach	>120	F	>120	F	29.3	D	*(Weekday*
- Highway 116 Left Turns	10.1	B	9.4	A	8.5	A	*Only)*
3. River Road / Mirabel Road							Yes
- Northbound Mirabel Approach	12.1	B	11.0	B	12.6	B	*(Weekday*
- River Road Left Turns	10.7	B	8.3	A	8.8	A	*Saturday)*
4. Highway 116 / Quarry Access							
- Quarry Access Left Turns	14.2	B	13.9	B	12.0	B	No
- Highway 116 Left Turns	7.5	A	n.a.[b]	n.a.[b]	7.6	A	

[a] Levels of service reported here for each study intersection represent the worst-operating movements on the minor street (first line) and major street (second line). Traffic counts conducted in October 2002 determined that the October 2001 counts used for this LOS analysis still represent existing conditions; differences in peak-hour traffic volumes between 2001 and 2002 are generally consistent with projected growth in traffic volumes on the local roadway system and are mostly within the range of normal daily variations in traffic.

[b] No vehicles turned left from Highway 116 into the Quarry during the weekday p.m. peak hour when the count was conducted.

SOURCE: Crane Transportation Group, 2001

TABLE IV.A-4
EXISTING LEVELS OF SERVICE (LOS) ON STUDY ROADWAYS

Study Roadway	Weekday AM Peak Hour Avg. Speed (MPH)	Weekday AM Peak Hour LOS	Weekday PM Peak Hour Avg. Speed (MPH)	Weekday PM Peak Hour LOS	Saturday Peak Hour Avg. Speed (MPH)	Saturday Peak Hour LOS
1. Highway 116 West of Mirabel Road	43.8	D	44.0	D	44.6	D
2. Highway 116 East of Covey Road	37.4	E	37.1	E	38.7	E
3. Mirabel Road	36.6	E	35.9	E	37.0	E

SOURCE: Crane Transportation Group, 2001 currently operates at an unacceptable level of service in the project area during all analysis periods (i.e., worse than Caltrans' target LOS[4] on state highways), and Mirabel Road operates at an unacceptable LOS E during all analysis periods.

SAFETY AND ACCIDENTS

Five years of accident records (1996-2000) were obtained from the California Highway Patrol (CHP) for both Highway 116 and Mirabel Road in the Forestville area (see Table IV.A-5). Accidents along an approximate four-mile stretch of Highway 116 were evaluated (from Guerneville Road westerly to just west of the Blue Rock Quarry entrance) and were aggregated by three segments (i.e., Guerneville Road to Covey Road; Covey Road to Mirabel Road, and Mirabel Road to just west of the Blue Rock Quarry entrance). As shown in the table, very few (about two percent) of the accidents involved trucks. Because CHP records are not specific in regards to the cargo carried by trucks involved in accidents, it is not possible to tell how many of the small number of reported truck accidents involved quarry trucks.

Although the number of truck-related accidents has been low on the major roadways within and near Forestville, all local roadways have had overall accident rates from above to well-above statewide and Sonoma County averages for two-lane roads in rural or suburban settings. For example, as shown in Table IV.A-5, the Sonoma County accident rate for two-lane rural roads in 1999 was 1.24 accidents per million vehicle miles (MVM) traveled, while the statewide average for a two-lane major road was 1.16 accidents/MVM in rural conditions and 1.80 accidents/MVM in suburban conditions. During the same year, Highway 116 west and south of central Forestville had accident rates of about 2.60 accidents/MVM, while Mirabel Road had an accident rate of 2.17 accidents/MVM. However, Highway 116 within central Forestville (between and including the Mirabel Road and Covey Road intersections) had an accident rate of 8.41 accidents/MVM, or almost seven times the County average. If accidents at the Highway 116 / Mirabel Road and Highway 116 / Covey Road intersections are <u>not</u> included in the determination of the accident rate for Highway 116 between Mirabel Road and Covey Road, the year 1999 accident rate for this segment would be 2.80 accidents/MVM, i.e., still above County and statewide averages.

PEDESTRIAN AND BICYCLE TRAFFIC

As stated above, pedestrian and bicycle counts were conducted in the vicinity of the Forestville Elementary School during pre- and post-school periods on an October weekday, and also along Mirabel Road adjacent to the Forestville Youth Park on two Saturdays when at least two play fields were in use; see Figure IV.A-5. As shown, there is a substantial level of pedestrian activity at the Highway 116 / Covey Road intersection with both the Forestville Elementary School and the El Molino High School (farther north along Covey Road) in session. A crossing guard is on duty at the Highway 116 / Covey Road intersection before and after the elementary school day. Up to 55 to 60 pedestrians per hour (all students), and 6 student bike riders per hour, were counted crossing Highway 116 at Covey Road both before and after school. No elementary school children were observed crossing Highway 116 at any

4 Caltrans endeavors to maintain a target level of service at the transition between LOS C and LOS D on state highways. That is, LOS D is considered unacceptable.

TABLE IV.A-5
ACCIDENT HISTORY ON MAJOR ROADWAYS IN PROJECT AREA

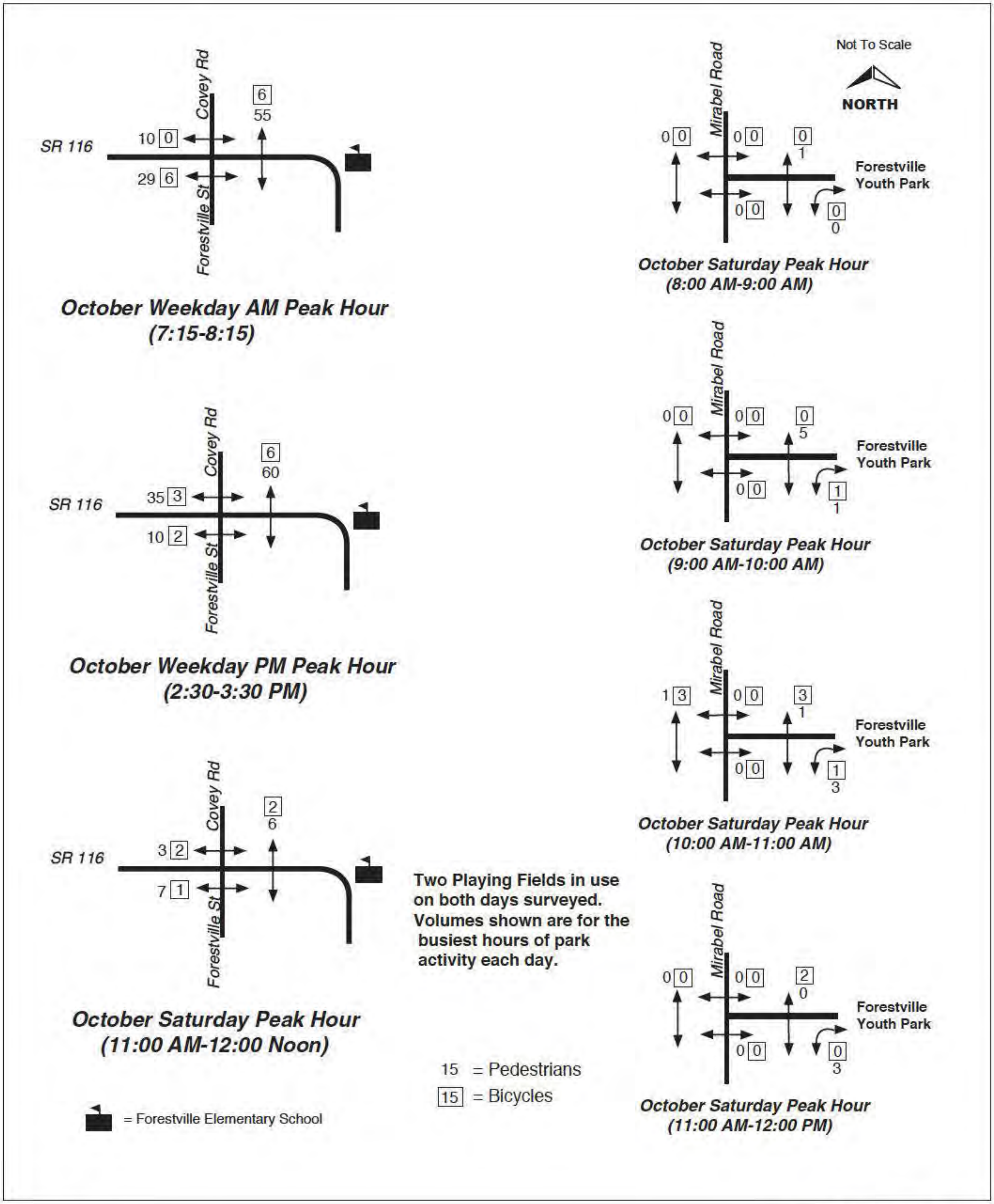
Roadway Segment	Distance (miles)	1996	1997	1998	1999	2000	1996-2000 Average
Highway 116 (*Guerneville Rd.– Covey Rd.*)	2.15						
- Total Accidents		22	22	22	24	12	20.4
- Accidents Involving Trucks		2	0	0	0	1	0.6
Highway 116 (*Covey Road – Mirabel Road*)	0.25						
- Total Accidents		9	8	7	9	3	7.2
- Accidents Involving Trucks		0	0	0	0	0	0
Highway 116 (*Mirabel Road – Blue Rock Quarry*)	1.60						
- Total Accidents		4	8	7	4	8	6.2
- Accidents Involving Trucks		0	0	0	0	0	0
Highway 116 (*Total Length*)	4.00						
- Total Accidents		35	38	36	37	23	33.8
- Accidents Involving Trucks		0	0	0	0	0	0.6
Mirabel Road (*Highway 116 – River Road*)	1.40						
- Total Accidents		9	8	8	10	12	9.4
- Accidents Involving Trucks		0	0	1	0	0	0.2

Accident Rates – 1999
(*accidents per million vehicle miles*)

Sonoma County Average: 2-lane rural roads	1.24
Statewide Average: 2-lane rural roads	1.16
Statewide Average: 2-lane suburban roads	1.80
Highway 116 (*Guerneville Rd.– Covey Rd.*)	2.57
Highway 116 (*Covey Road – Mirabel Road*) [a]	8.41 [a]
Highway 116 (*Mirabel Road – Blue Rock Quarry*)	2.58
Mirabel Road (*Highway 116 – River Road*)	2.17

[a] All accidents at the Highway 116 / Covey Road and Highway 116 / Mirabel Road intersections are included in this roadway segment.

SOURCES: Crane Transportation Group, using data from California Highway Patrol, 2001; Caltrans *1999 Accident Data on California State Highways*.



SOURCE: Crane Transportation Group

Figure IV.A-5
Existing (2001) Pedestrian and Bicycle Volumes

other location near the school. A total of 6 and 5 student-age bike riders were observed traveling along Highway 116 west of Covey Road before and after school, respectively. All school-age pedestrians and bike riders traveling along the south side of Highway 116 (just west of Covey Road) cross to the north side at Covey Road. A sidewalk is provided along the north side of Highway 116 between Covey Road and the Forestville Elementary School. No student bikers or pedestrians were observed traveling along Highway 116 south of Forestville.

The Forestville Youth Park is located on the east side of Mirabel Road about a half-mile north of Highway 116. There is a sidewalk along the east side of Mirabel Road between the Youth Park and Highway 116, but no sidewalks, pathways or shoulders on either side of Mirabel Road north of the Youth Park or on the west side of Mirabel Road just south of the Youth Park. Overall, based on more than nine hours of surveys on two Saturdays with heavy activity at the Youth Park, there were no pedestrians crossing Mirabel Road at the Youth Park during any of the survey hours. However, there were usually a few bike riders accessing the Youth Park via Mirabel Road or just traveling along Mirabel Road (but no more than 7 riders during any given survey hour).[5]

Pedestrian and bicycle rider counts were also conducted on Wednesday, June 12, 2002 along Highway 116 between Covey Road and Mirabel Road; Forestville Elementary School was in session during these surveys. Count results, presented in Figures A-1 to A-4 in Appendix H-1, showed that pre- and post-school student crossings of Highway 116 at Covey Road were about half or less such crossings counted in October 2001. The location along Highway 116 west of Covey Road with the highest number of pedestrians crossing the road was determined to be between 1st Street and Covey Road, in the vicinity of a local market, café and deli, where up to 31 pedestrians an hour crossed Highway 116 during the morning commute, and up to 21 pedestrians (including eight students) crossed during the after school peak hour. The second busiest crossing location of Highway 116 was at the 1st Street intersection. It is noted that there is a marked crosswalk on Highway 116 at 1st Street, but no other crosswalks between 1st Street and Covey Road.

PLANNED ROADWAY IMPROVEMENTS

Sonoma County Department of Transportation and Public Works staff expects the following road improvements to be in place by 2021 (see also Figure IV.A-2):

- <u>Highway 116 / Mirabel Road Intersection</u>: This improvement project would include adding a left turn lane on Highway 116 and installing traffic signals at the intersection. If the Forestville bypass is constructed (see below) a right turn lane for eastbound turns from Highway 116 to the bypass would be installed. Substantial grading would be required on SR 116 west of the intersection to improve sight distance and to create space for the road widening needed for the left turn lane. The project may also require installation of a left turn pocket on SR 116 at Hidden Lake Road, which is about 600 feet west of the Highway 116 / Mirabel Road intersection. The project is identified as a future project in the County's current Capital Project Plan (CPP). The County has not determined the source of funding for the project. Since the project is on a State highway, this would be a cooperative project with Caltrans. However, Caltrans has not proposed a project at this intersection.

[5] It should be noted that many of the scheduled activities at the Forestville Youth Park involve teams from outside the Forestville area. Thus, all players and fans associated with these games drive to and from the park.

- River Road / Mirabel Road Intersection: This improvement project would include installation of traffic signals. The project is not listed in the County's current CPP. The County has not determined the source of funding for the project.
- Mirabel Road Shoulder Widening: This improvement project would add six-foot wide paved shoulders to both sides of Mirabel Road from near the intersection with Highway 116 northerly to north of Davis Road. The project is listed in the County's current CPP. The County has not determined the source of funding for the project.
- Forestville Bypass: Sonoma County General Plan Policy CT-8b requires consideration of a bypass for central Forestville. The alignment of the bypass road shown in the 1975 Forestville Specific Plan would route traffic to the south of the downtown area. It would intersect Highway 116 at Mirabel Road, extend south and then east, again intersecting Highway 116 in the vicinity of Packinghouse Road. This project is identified as a future capital project in the County's current CPP. The bypass could be constructed as a County highway, or it could be constructed as a cooperative project with Caltrans. In the latter case the new road would become Highway 116 and the portion of existing Highway 116 that goes through downtown Forestville would become a County road. A portion of the right of way for the western end of the road has been dedicated to the County, however, neither the County nor the State has identified funds for the construction of this road.

Because of current budget problems at both the County and State levels, the construction dates for these projects is uncertain.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

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 Canyon Rock quarry driveway approach to Highway 116.

The following applicable County significance criteria were used to judge the transportation impacts[6]:

- 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.

[6] Please see Appendix H for a complete list of the County's Traffic Impact Thresholds of Significance Criteria.

- 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.
- For County mid-road segments, there would be a significant cumulative impact if operation is worse than LOS C in the existing base case, or if projected future peak-hour cumulative traffic volumes would cause the operation of the mid-road segment to become worse than LOS C. This criterion does not apply if operation worse than LOS C has been found acceptable for that road under Objective CT-2.1 of the Sonoma County General Plan. If there is a significant cumulative impact, then the project-related traffic would cause a significant impact that is cumulatively considerable if it would cause peak-hour mid-road travel speeds to decrease by 2 mph or more when conditions without the project are LOS D, 1 mph or more when conditions without the project are LOS E, and 0.5 mph or more when conditions without the project are LOS F.
- For mid-road segments on State highways, Caltrans endeavors to maintain a target level of service at the transition between LOS C and LOS D. If the existing operation is worse than LOS C, then the existing average travel speed should be maintained. There would be a significant cumulative impact if operation is worse than LOS C in the existing base case, or if projected future peak-hour cumulative traffic volumes would cause the operation to become worse than LOS C.
- Intersections with more than 10 adult pedestrian crossings an hour (or more than one child crossing an hour on a regular basis) have peak-hour volumes increased by at least 4 trucks per hour.
- Roadway segments without four-foot-wide paved shoulders, and with more than five bike riders per hour, have peak-hour volumes increased by at least 4 trucks per hour.
- Traffic safety in the project area would be substantially worsened due to the introduction of a design feature or incompatible uses, inadequate emergency access, or construction of an unsignalized intersection or addition of traffic to an existing unsignalized intersection approach that does not have adequate sight lines (based upon Caltrans criteria for state highway intersections and County criteria for County roadway intersections).

PROJECT TRIP GENERATION

Predicting the number of inbound and outbound trucks likely to be produced by the Canyon Rock Quarry during any given hour of a peak weekday and Saturday in the peak month of quarry activity was a four-stage process, as detailed below, and as shown in Table IV.A-6.

TABLE IV.A-6
PROJECT TRUCK TRIP GENERATION

	Base Case	Project Case	Net Change
Annual Production (cubic yards) [a]	**375,000**	**500,000**	**125,000**
- Extracted aggregate	300,000	375,000	75,000
- Recycled aggregate	75,000	125,000	50,000
Annual Aggregate Truck Loads (14.2 CY/truck)	**31,690**	**44,014**	**12,324**
- Outbound loads (total aggregate)	26,408	35,211	8,803
- Inbound loads (recycled aggregate)	5,282	8,803	3,521
Peak-Month Aggregate Truck Loads (October)	**4,563**	**6,338**	**1,775**
Weekly Aggregate Truck Loads (October)	**1,037**	**1,441**	**403**
Peak Daily Aggregate Truck Loads (Wednesday)	**224**	**312**	**88**
Peak Daily One-Way Truck Trips (Wednesday)	**452**	**628**	**176**
- Aggregate Trucks	448	624	176
- Non-Aggregate Trucks (Supply/Fuel Delivery)	4	4	0
Daily Aggregate Truck Loads (Saturday)	**73**	**101**	**28**
Daily One-Way Truck Trips (Saturday)	**148**	**204**	**56**
- Aggregate Trucks	146	202	56
- Non-Aggregate Trucks (Supply/Fuel Delivery)	2	2	0

[a] Base case annual production was derived on the basis of average production over the past five-year period (1998-2002).

SOURCES: Crane Transportation Group and Environmental Science Associates, using data from Canyon Rock Quarry activity reports, and hourly patterns of quarry truck activity observed during traffic volume data collection efforts by Crane Transportation Group in October 2001.

1. Determination of Annual Truck Traffic

Production levels were determined by County staff for the following analysis conditions:[7]

Past 5-Year Average:	375,000 cubic yards with 20% of sales from recycled material
Proposed Project:	500,000 cubic yards with 25% of sales from recycled material

[7] As discussed in Chapter III, Project Description, the County Board of Supervisors determined that the existing conditions baseline, against which the potential environmental impacts of the expansion option will be measured, shall include the five-year average annual sales level (Resolution No. 01-0157, February 6, 2001). At the time the Master Traffic Impact Report (CTG, 2001) was prepared, the five-year average annual sales level (1997-2001) for the Canyon Rock Quarry was 350,000 cubic yards. In 2003, the County updated the environmental baseline to reflect the most recent five-year period at the time the Notice of Preparation for this EIR was released (i.e., 1998-2002), with a corresponding five-year average annual sales level of 375,000 cubic yards. Consequently, all project vehicle trip generation estimates presented in this EIR are based on the increment between the base case five-year average annual sales level of 375,000 CY and the maximum annual sales level of 500,000 CY that would be permitted under the project (i.e., 125,000 CY incremental increase).

As indicated, it has been projected that the current 20 percent level of yearly sales from recycled material would increase to 25 percent of yearly sales under future conditions. It was also assumed for analysis purposes that any truck bringing recycled material to the quarry would leave empty, and that any truck going to the quarry for a load of aggregate would not be transporting recycled material. Based on an average truck capacity of 14.2 cubic yards, the project would increase the number of annual truck loads by about 12,324 trucks.

2. Determination of Peak Monthly, Weekly and Daily Truck Traffic

Currently, Canyon Rock Quarry has its peak production month in October with about 14.4 percent of its yearly sales (versus 8.3 percent in an average month), and that peak level of monthly production (i.e., percent of yearly sales) is expected to continue under project conditions. Based on that percentage, the project would increase the number of peak monthly truck loads by about 1,775 trucks.

Each week of the month is projected to have an similar level of quarry activity, but detailed daily activity information at the quarry indicates that Wednesdays are typically the busiest weekday, with about 21.6 percent of weekly sales (versus 16.7 percent on an average workday Monday through Saturday); about 7 percent of weekly sales occur on Saturdays. As a result, the project would increase the number of peak-month daily truck loads (on Wednesdays) above the five-year average by about 88 trucks, which translates to an increase of about 176 one-way truck trips per day (i.e., 88 outbound from the quarry, and 88 inbound to the quarry). Saturday daily one-way truck trips would increase by about 56 trips (i.e., 28 outbound and 28 inbound) due to the proposed project. The project is not expected to increase the number of non-aggregate trucks (e.g., supply and fuel delivery trucks) or employees traveling to and from the quarry.

3. Determination of Peak-Hour Truck Traffic

The October 2001 traffic counts were used to determine an hourly distribution pattern of truck activity at the Canyon Rock quarry on Wednesdays and Saturdays. Table IV.A-7 presents the resultant percent hourly distribution patterns of Canyon Rock Quarry truck traffic.

4. Quarry Truck Trip Distribution Patterns

All 2001 and future Canyon Rock quarry trucks were projected to distribute to/from east of the quarries for analysis purposes, consistent with the distribution pattern observed during the traffic counts conducted for this study; 65 percent of all quarry trucks were assigned to Mirabel Road and River Road, and 35 percent were assigned to Highway 116 through Forestville.

CUMULATIVE CONDITIONS

In addition to the proposed project at the Canyon Rock Quarry, traffic volumes on area roadways are predicted to increase from the proposed expansion of operations at the nearby Blue Rock Quarry and from non-project-specific areawide growth. Cumulative effects on transportation conditions from the total predicted traffic growth in the area, are presented herein.

TABLE IV.A-7
TRUCK TRAFFIC VOLUMES (PEAK DAY IN PEAK MONTH) – HOURLY DISTRIBUTION PATTERNS

Hour of the Day	Percent Inbound	Percent Outbound	Base Case [a] Inbound	Base Case [a] Outbound	Project Case [b] Inbound	Project Case [b] Outbound	Net Change [c] Inbound	Net Change [c] Outbound
Wednesdays								
6:00 – 7:00 AM	1%	0%	2	0	4	0	2	0
7:00 – 8:00 AM	9%	10%	20	23	27	31	7	8
8:00 – 9:00 AM	11%	11%	25	25	35	35	10	10
9:00 – 10:00 AM	12%	11%	27	25	38	35	11	10
10:00 – 11:00 AM	12%	13%	27	28	38	41	11	13
11:00 – 12 Noon	12%	10%	27	23	37	31	10	8
12 Noon – 1:00 PM	10%	10%	23	23	31	31	8	8
1:00 – 2:00 PM	11%	12%	25	27	34	38	9	11
2:00 – 3:00 PM	10%	11%	23	25	32	34	9	9
3:00 – 4:00 PM	8%	8%	18	18	25	25	7	7
4:00 – 5:00 PM	4%	4%	9	9	13	13	4	4
5:00 – 6:00 PM	0%	0%	0	0	0	0	0	0
TOTAL	100%	100%	226	226	314	314	88	88
Saturdays								
7:00 – 8:00 AM	12%	12%	9	9	12	12	3	3
8:00 – 9:00 AM	14%	14%	10	10	14	14	4	4
9:00 – 10:00 AM	16%	16%	12	12	16	16	4	4
10:00 – 11:00 AM	13%	13%	10	10	13	13	3	3
11:00 – 12 Noon	18%	18%	13	13	20	20	7	7
12 Noon – 1:00 PM	10%	9%	7	6	10	9	3	3
1:00 – 2:00 PM	5%	5%	4	4	5	5	1	1
2:00 – 3:00 PM	12%	13%	9	10	12	13	3	3
3:00 – 4:00 PM	0%	0%	0	0	0	0	0	0
4:00 – 5:00 PM	0%	0%	0	0	0	0	0	0
TOTAL	100%	100%	74	74	102	102	28	28

[a] Base Case annual production (375,000 CY) was derived on the basis of average production over the past five-year period (1998-2002).
[b] Project Case production is maximum annual sales level of that would be permitted under the project (i.e., 500,000 CY).
[c] Net Change represents the increment between the Base Case and Project Case sales levels (i.e., 125,000 CY).

SOURCE: Crane Transportation Group and Environmental Science Associates

This EIR presents potential transportation impacts of the project under both near-term cumulative and cumulative 2021 conditions, as follows:

Near-Term Cumulative

As discussed in Chapter III, Project Description, the applicant is currently approved to mine within the currently approved mining area until those aggregate resources are exhausted. That material is expected to last from four to six years, assuming the existing production rate remains unchanged. Therefore, the quarry would not begin mining the western or northern expansion areas until between 2007 and 2009. For the purpose of traffic analysis, it is assumed that near-term project traffic impacts would not occur until mining within one of the expansion areas begins, because there would be no departure from the already permitted baseline conditions until that time. It is assumed for this analysis that 2007 would be the earliest that mining would begin in one of the expansion areas, and production would be at the fully permitted amount.

Estimated near-term project trip generation for the Canyon Rock Quarry expansion project is presented under Project Trip Generation, above. The estimated near-term production level for the proposed Blue Rock Quarry project would be about 400,000 cubic yards per year, with 25% of sales from recycled material.[8] Using the same four-stage process described in Project Trip Generation, on page IV.A-17, the net increase in Blue Rock Quarry daily truck trips (i.e., above the five-year average base condition) is estimated to be about 424 trips on Wednesdays and about 164 trips on Saturdays. Determination of other near-term cumulative traffic in the study area was determined by Crane Transportation Group.

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, given the uncertainty in timing of those improvements due to budgetary constraints. This includes the signalization of the intersections of Highway 116 / Mirabel Road and River Road / Mirabel Road; Mirabel Road shoulder widening; and Forestville Bypass.

Determination of potential near-term impacts was made on the basis of the results of a near-term cumulative analysis conducted by Crane Transportation Group.[9]

Cumulative 2021

Year 2021 trip generation for the proposed Canyon Rock Quarry expansion project and the Blue Rock Quarry expansion is the same as that presented for near-term cumulative conditions, because their production limits would remain constant. Year 2021 areawide growth in traffic volumes were developed using growth rates projected for Forestville by the Sonoma County PRMD and for the Russian River corridor in a recently completed redevelopment plan for an area extending from Rio Nido to Monte Rio (Sonoma County, 2000). Because traffic on Highway 116, Mirabel Road and River Road in Forestville consists of both local and through vehicles, separate growth rates were determined for each component of

8 It is noted that Blue Rock Quarry's past five-year average annual production was about 115,000 cubic yards, and that it currently has only a negligible amount of its yearly production from recycled material.

9 Near-term cumulative analysis conducted by Crane Transportation Group in support of his analysis for the Blue Rock Expansion project EIR.

traffic. Overall, local area traffic was projected to grow 40 percent by 2021 (i.e., at a straight [non-compounding] rate of two percent per year), while maximum growth along the Russian River is expected to increase through traffic by 40 to 65 percent, depending upon the day and peak-hour under consideration. Resultant year 2021 cumulative October peak-hour volumes are presented in Figures IV.A-6 and IV.A-7.

For cumulative 2021 conditions, it is assumed the following planned off-site road improvements in the study area (presented under Planned Roadway Improvements, above) would be in place: signalization of the intersections of Highway 116 / Mirabel Road and River Road / Mirabel Road; and Mirabel Road shoulder widening. Potential changes in transportation effects with the implementation of the Forestville Bypass are discussed, however, the bypass is not assumed to be in place in this analysis.

Peak Production Days

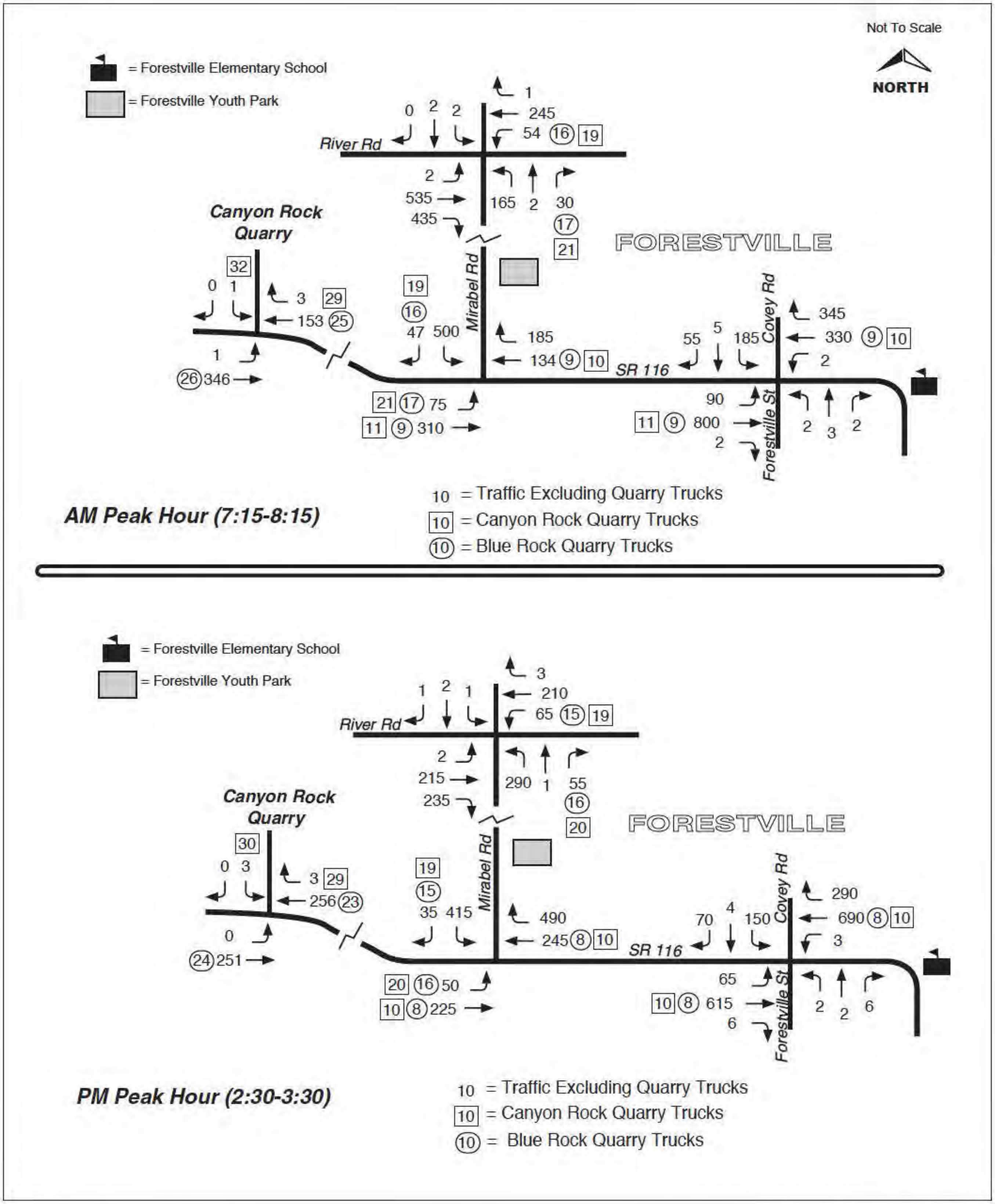
The above-described traffic volumes reflect "average" production days, though on the peak day within the peak month. Based upon past operation at the quarries, it is possible that the quarry will experience higher-than-"average" levels of truck activity during several days of the year. In order to evaluate operating conditions on these "peak of the peak" days, it was determined that "peak-production day" trucking activity would be 50 percent higher than "average production day" activity. Resultant year 2021 cumulative (peak-production day) October peak-hour volumes are presented in Figures IV.A-8 and IV.A-9. The effects of those "peak" production days on cumulative impacts are discussed below, as appropriate.

INTERSECTION OPERATING CONDITIONS

Impact IV.A.1: The proposed project would contribute to cumulative increases in traffic volumes at intersections in the project area. This would be a significant impact under the Western or Northern Expansion options.

Near-Term Cumulative

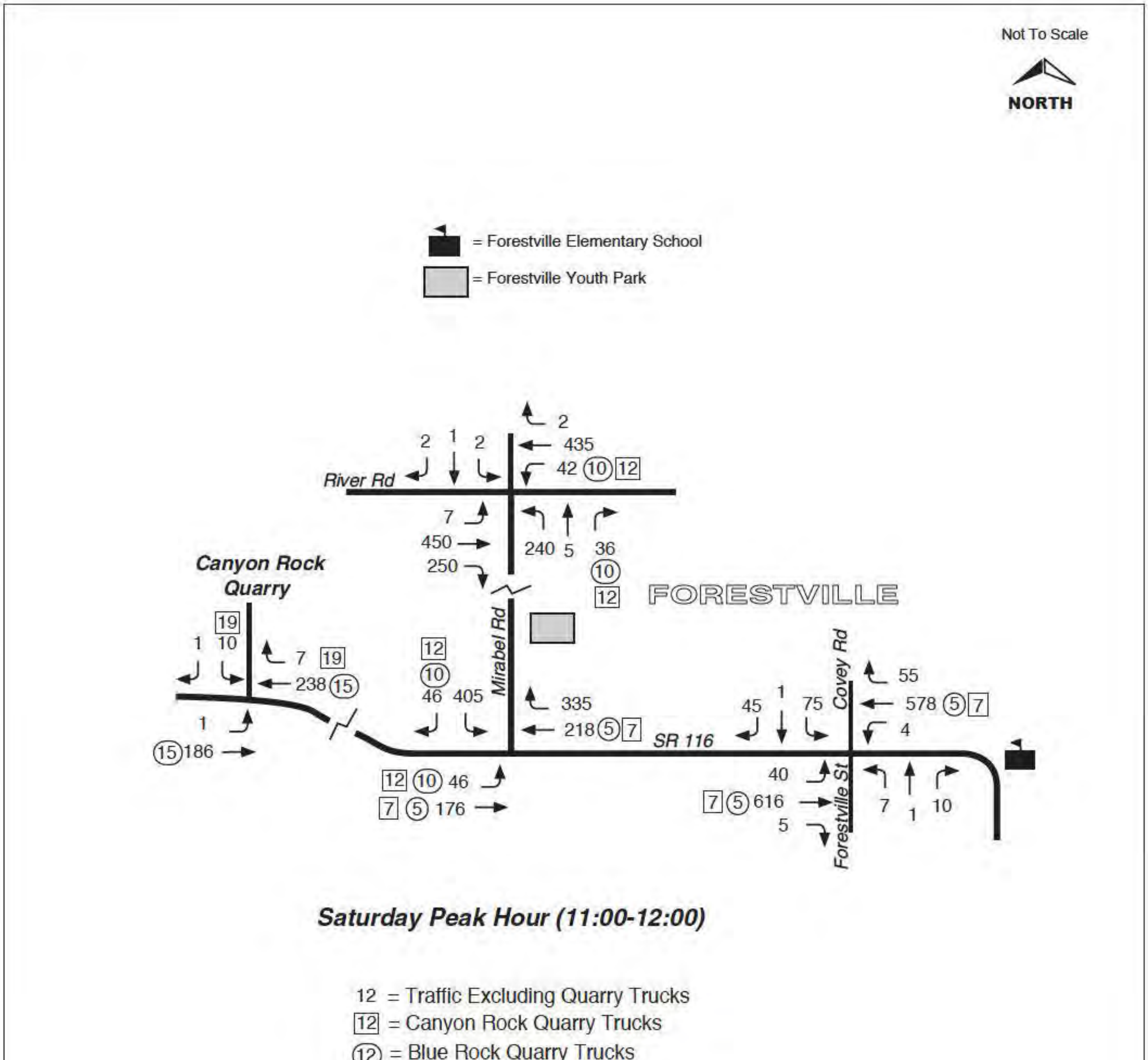
The near-term analysis (2007) presented in this EIR is based on the results of the near-term analysis (2001) conducted by Crane Transportation Group (CTG) in its Master Traffic Impact Report (December 2001), and supplemental analysis (2004) conducted by CTG in support of the proposed Blue Rock Quarry Expansion project (see Appendix H-2). Although CTG's analyses did not explicitly assess conditions in year 2007 (the earliest year that mining would begin for the proposed Canyon Rock Quarry expansion project), the 2001 and 2004 results are relevant when determining project impacts in year 2007. In the CTG analyses, the contribution of traffic from each of the proposed quarry projects was assumed to be constant over the 20-year study period (i.e., at the maximum permitted production levels), although ambient non-quarry traffic was assumed to gradually increase. Consequently, overall study intersection delays would increase over time, and cumulative traffic conditions would gradually degrade each year until and unless road improvements are made. The traffic analyses are summarized under the impact discussions below:



SOURCE: Crane Transportation Group

Canyon Rock Quarry / 202697

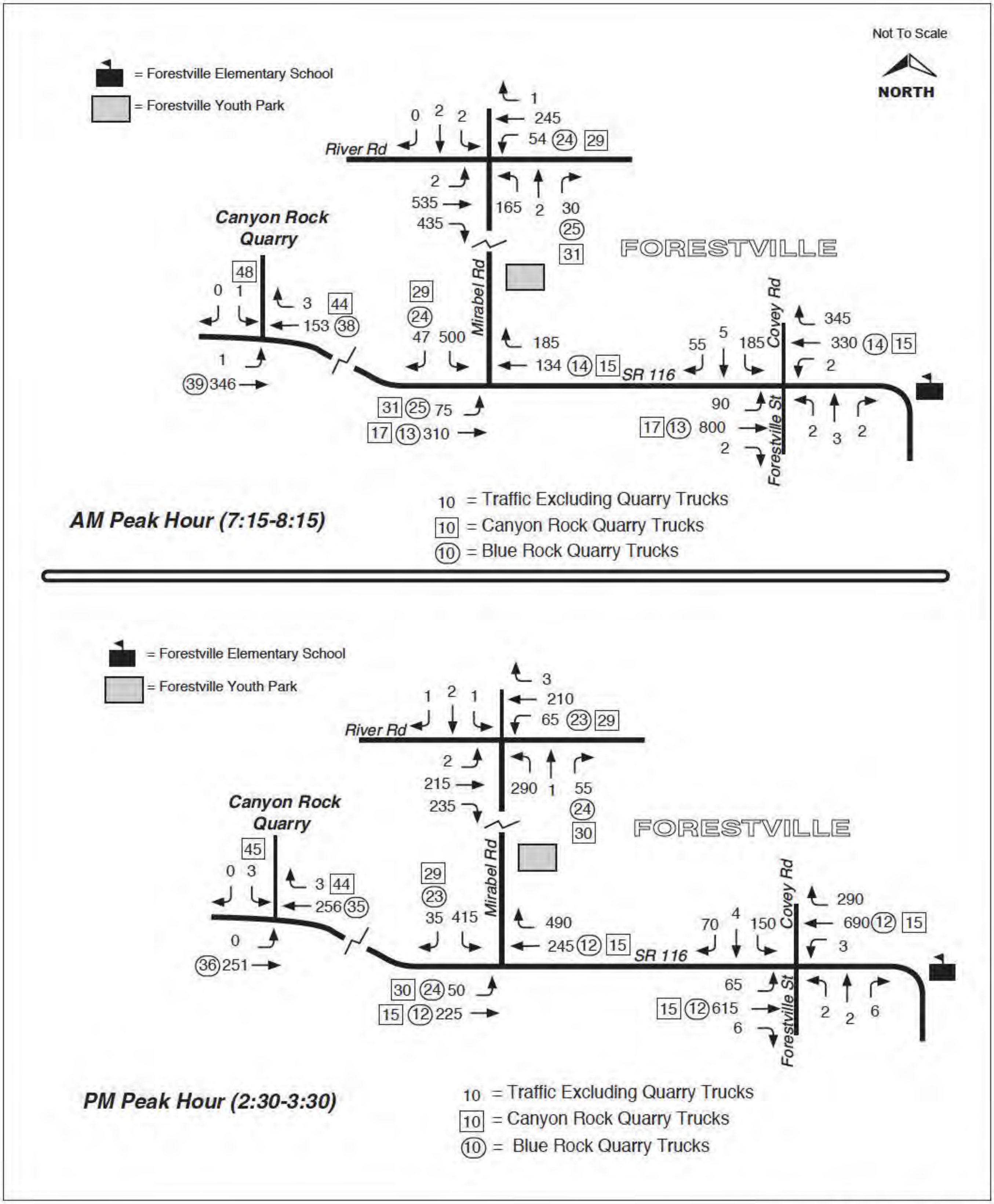
Figure IV.A-6
Year 2021 Cumulative October Weekday (Average Production Day)
AM and PM Peak Hour Volumes



SOURCE: Crane Transportation Group

Canyon Rock Quarry / 202697

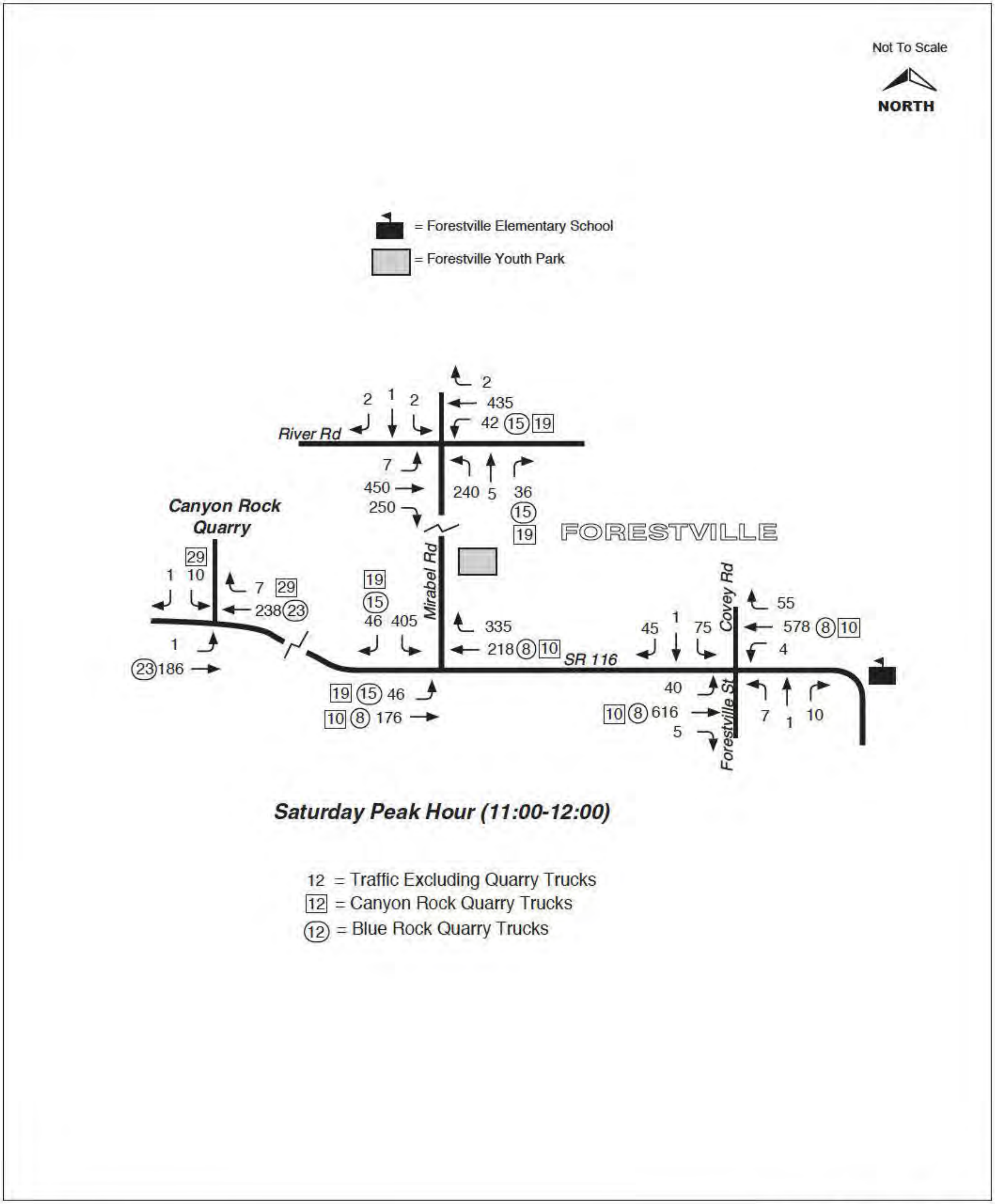
Figure IV.A-7
Year 2021 Cumulative October Saturday (Average Production Day)
Peak Hour Volumes



SOURCE: Crane Transportation Group

Canyon Rock Quarry / 202697

Figure IV.A-8
Year 2021 Cumulative October Weekday AM and PM Peak Hour Volumes (Peak Production Day)



SOURCE: Crane Transportation Group

Canyon Rock Quarry / 202697

Figure IV.A-9
Year 2021 Cumulative October Saturday
Peak Hour Volumes
(Peak Production Day)

Highway 116/Mirabel Road

The CTG Master Traffic Impact Report found that the side-street movements at this intersection operate at an unacceptable LOS F during the October 2001 weekday AM weekday peak hour, and at LOS D and C during the October 2001 weekday PM weekday and Saturday peak hours (see Table IV.A-8). The calculations assumed baseline quarry traffic and existing ambient non-quarry traffic. Under the County's criteria, LOS F is unacceptable, indicating that with the conditions assumed for 2001 there is an existing significant cumulative impact at the intersection during the weekday AM weekday peak hour. With truck trips from the two proposed quarry expansions added, the level of service would be unacceptable during the weekday PM peak hour as well as during the weekday AM peak hour. When traffic from a peak production day at both quarries is considered (as analyzed in the CTG Master Traffic Impact Report), the level of service during the Saturday peak hour would also be unacceptable (LOS E). The traffic due to either quarry expansion alone would add more than five seconds of delay, which would be significant under the County's criteria. The supplemental CTG traffic study (2004) reached generally similar conclusions regarding the level of service with cumulative traffic, although it calculated LOS F for the Saturday peak hour instead of the LOS E calculated in the Master Traffic Impact Report. From these results, it is estimated the project would also contribute more than five seconds of delay for the above-described scenarios in 2007, and the project's near-term impact would be significant.

Highway 116/Covey Road

The CTG Master Traffic Impact Report found that the side-street movements at this intersection operate at an unacceptable LOS F during the October 2001 weekday AM and PM peak hours, and at an acceptable LOS D during the Saturday peak hour (see Table IV.A-8). This indicates an existing significant cumulative impact at the intersection during the AM and PM weekday peak hours. The level of service during the Saturday peak hour would remain at an acceptable LOS D with cumulative traffic added. The traffic added by either quarry expansion would increase the delay by more than five seconds during the weekday AM and PM peak hours, which would be significant under the County's criteria. From these results, it is estimated the project would also contribute more than five seconds of delay for the above-described scenarios in 2007, and the project's near-term impact would be significant.

The supplemental CTG traffic study reached similar conclusions regarding the level of service during the weekday AM and PM peak hours, but found that the level of service during the Saturday peak hour to be LOS E, indicating an existing significant impact from cumulative traffic during this time period as well as the weekday peak hours. The supplemental CTG traffic study calculated the additional delay from the Blue Rock expansion would be less than five seconds, and therefore not cumulatively considerable. The incremental traffic increase from the Canyon Rock expansion would be smaller than that from Blue Rock; therefore it is concluded that Canyon Rock's contribution would not be cumulatively considerable during the Saturday peak. From these results, it is estimated the project would also contribute less than five seconds of delay for the Saturday peak hour in 2007, and the project's near-term impact on Saturdays would be less than significant.

Mirabel Road/River Road

The CTG Master Traffic Impact Report found that the northbound Mirabel Road approach at this intersection to be operates at LOS B in the October 2001 baseline condition on both weekday and Saturday peak hour, which is an acceptable condition (see Table IV.A-8). The CTG Master Traffic Impact Report does not indicate a significant cumulative impact even when the traffic from peak production days at the expanded quarries is added. However, the supplemental CTG traffic study completed in support of the proposed Blue Rock Quarry for the year 2004 reached a different conclusion. While the supplemental CTG study found that the intersection would operate acceptably during the weekday AM and PM peak hours, it determined that during the Saturday peak hour, the operation of the northbound Mirabel Road approach would degrade from LOS D to an unacceptable LOS E with cumulative traffic added, indicating a significant impact. The traffic added by either quarry expansion would increase the delay by more than five seconds during the Saturday peak hour, which would be significant under the County's criteria. From these results, it is estimated the project would also contribute more than five seconds of delay for the above-described scenarios in 2007, and the project's near-term impact would be significant.

Cumulative 2021

On the basis of estimated vehicle trip generation for the proposed project, as well as the Blue Rock Quarry expansion project and areawide growth, and the expected traffic signal installations (see discussion of Planned Roadway Improvements in the Setting, above), cumulative 2021 level of service conditions were computed (see Table IV.A-8). As shown in the table, in 2021, the southbound Covey Road approach at the unsignalized intersection of Highway 116 / Covey-Forestville Roads would operate at LOS F, as it currently does (which would be a significant cumulative impact). The project-related traffic would cause a significant impact that is cumulatively considerable because the project-caused increase in the average vehicle control delay on the southbound Covey Road approach would exceed the County's threshold of significance (i.e., an increase in control delay of five seconds or more). The other study intersections would operate at an acceptable LOS C or better under cumulative 2021 conditions (assuming expected traffic signal installations). The same cumulative impact determinations would apply to conditions on "peak" production days (defined above).

If the signals planned at the Highway 116 / Mirabel Road or at the Mirabel Road / River Road intersections (see Planned Roadway Improvements in Setting section) were not installed by 2021, then the long-term cumulative impacts at these intersections would be significant.

If the Forestville bypass were constructed by 2021, then much of the through traffic on Highway 116 would be expected to bypass downtown Forestville, and as a result, there would be fewer vehicles traveling on the "old" Highway 116 segment through the Covey intersection than assumed herein, and installation of traffic signals at that intersection might not be warranted.

As part of the proposed project, a new access driveway (for outbound vehicles only) would be constructed on Highway 116 west of the current two-way site driveway (just east of the entrance

TABLE IV.A-8
CUMULATIVE (2021) LEVELS OF SERVICE (LOS) AT STUDY INTERSECTIONS [a]

Study Intersection / Movement	Existing Conditions						Cumulative (2021) Conditions [b]					
	AM Peak		PM Peak		Saturday Peak		AM Peak		PM Peak		Saturday Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Highway 116 / Mirabel Road												
- Mirabel Left Turns	>120	F	25.9	D	22.1	C						
- Highway 116 Left Turns	7.8	A	8.8	A	8.3	A						
- Overall Intersection (*signalized by 2021*)							25.5	C	28.1	C	18.8	B
2. Highway 116 / Covey-Forestville Roads												
- Southbound Covey Approach	>120	F	>120	F	29.3	D	>120	**F**	>120	**F**	>120	**F**
- Highway 116 Left Turns	10.1	B	9.4	A	8.5	A	11.8	B	10.9	B	9.1	A
- Increase in Delay							**>5 sec** [c]		**>5 sec** [c]		**>5 sec** [c]	
3. River Road / Mirabel Road												
- Northbound Mirabel Approach	12.1	B	11.0	B	12.6	B						
- River Road Left Turns	10.7	B	8.3	A	8.8	A						
- Overall Intersection (*signalized by 2021*)							15.4	B	17.3	B	16.7	B
4. Highway 116 / Quarry Access												
- Quarry Access Left Turns	14.2	B	13.9	B	12.0	B	20.7	C	19.7	C	15.4	C
- Highway 116 Left Turns	7.5	A	n.a.	n.a.	7.6	A	7.9	A	n.a.	n.a.	8.0	A

[a] Levels of service and delay values reported here are for the overall signalized intersection, and for the worst-operating movements on the minor street (first line) and major street (second line) at the unsignalized intersections.

[b] Cumulative conditions represent the combined traffic volumes generated by the proposed Canyon Rock Quarry project and the proposed Blue Rock Quarry project, plus areawide non-project-specific traffic growth, added to existing traffic volumes.

[c] The characterization of the Increase in Delay on the southbound approach as ">5 sec" is meant to inform the reader that while the calculated delay for both existing and cumulative conditions is very high and is best described as ">120" seconds, the difference in calculated delay between existing and cumulative conditions exceeds the five-second threshold of impact significance established by the County.

SOURCE: Crane Transportation Group, 2001 driveway for the Blue Rock Quarry).[10] Use of the new driveway would be largely dependent on weather conditions; that is, during wet weather, all vehicles would exit the quarry site via the new egress, but during dry and/or low production days of the year, some or all vehicles would exit via the existing driveway. All vehicles entering the site would use the existing driveway at all times. The worst-case scenario for level of service at the Highway 116 / Quarry Access intersection would be when all vehicles (inbound and outbound) use the existing driveway. Therefore, the level of service results reported herein (i.e., LOS C) are the most conservative.[11]

Mitigation – Near-Term Cumulative

Highway 116 / Covey-Forestville Road Intersection

Mitigation Measure IV.A.1a: Install traffic signals (with pedestrian signals) at the intersection of Highway 116 / Covey-Forestville Roads, and add left turn lanes on both Highway 116 approaches and a right turn lane on the westbound Highway 116 approach to the intersection. This would be a joint project implemented by the County and Caltrans. The project sponsor shall pay a fair share of the cost of the improvements. The calculation of the fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three times that of automobiles or small trucks. If the County determines that a bypass road will be constructed and that a signal at this intersection will not be needed, this mitigation measure will not be required to mitigate an impact of this project.

As indicated in Table IV.A-3, page IV.A-11, traffic volumes at the Highway 116 / Covey-Forestville intersection currently satisfy the Peak-Hour Volume Signal Warrant during weekday peak hours. Given the existing 40-foot curb-to-curb roadway width, on-street parking would be prohibited along both sides of Highway 116 for at least 350 feet west of the intersection to provide room to stripe the eastbound left turn pocket. Left-turn storage lengths of 50 feet (westbound) and 100 to 150 feet (eastbound) would be required. Implementation of this measure would improve the intersection service level to LOS C.

Highway 116 / Mirabel Road Intersection

Mitigation Measure IV.A.1b: Install traffic signals at the intersection of Highway 116 / Mirabel Road. This is expected to be a joint project implemented by the County and Caltrans. If traffic signals are not installed at the intersection by the time the quarry begins mining in either the western or northern expansion areas, the project sponsor shall pay a fair share of the cost of the improvements. The calculation of fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three times that of automobiles or small trucks. If deemed acceptable by the County, the project sponsor may contribute an equal value of material or labor toward the construction of the intersection improvements in lieu of cash.

As indicated in Table IV.A-3, traffic volumes at the Highway 116 / Mirabel Road intersection currently satisfy the Peak-Hour Volume Signal Warrant during weekday and Saturday peak hours.

10 Prior to proceeding with construction of the proposed new driveway, the quarry operator will be required to obtain a State Encroachment Permit from Caltrans, and make improvements to Highway 116 as required by the Encroachment Permit.

11 Available sight distance on Highway 116 at the proposed new driveway is more than adequate to allow safe turns.

The intersection improvements would include the correction of an existing sight distance problem on Highway 116 west of the intersection, construction of a left turn lane on Highway 116 for traffic turning northbound onto Mirabel Road, installation of traffic signals, and other associated improvements to the intersection.

River Road / Mirabel Road Intersection

Mitigation Measure IV.A.1c: Install traffic signals at the intersection of River Road / Mirabel Road. This is expected to be a project implemented by the County. If traffic signals are not installed at the intersections of River Road / Mirabel Road by the time the quarry begins mining in either the western or northern expansion areas, the project sponsor shall pay a fair share of the cost of the improvements. The calculation of fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three times that of automobiles or small trucks. If deemed acceptable by the County, the project sponsor may contribute an equal value of material or labor toward the construction of the intersection improvements in lieu of cash.

As indicated in Table IV.A-3, traffic volumes at the River Road / Mirabel Road intersection currently satisfy the Peak-Hour Volume Signal Warrant during weekday and Saturday peak hours.

For Mitigation Measures IV.A.1a-c, the Sonoma County Department of Transportation and Public Works shall be responsible for preparing a cost estimate for the roadway improvements. The quarry operator shall enter into an agreement (subject to review and approval by PRMD) with the County for payment of the quarry's fair share of the estimated total cost of the improvements.

The intersection improvements described in Mitigation Measures IV.A.1a-c would result in secondary environmental impacts. These impacts are described under the subsection "Secondary Impacts," which is found at the end of Section IV.A.

Significance after Mitigation: Mitigation Measures IV.A.1a-c would reduce the intersection impacts to less than significant. However, none of the intersection improvements are funded or planned to be in place by 2007. If these improvements are not in place by the time the quarry begins mining in either the Western or Northern Expansion areas, the intersection impacts would be Significant and Unavoidable.

Mitigation –Cumulative 2021

Mitigation: No additional mitigation required with implementation of Mitigation Measures IV.A.1a-c, which would also mitigate the project's contribution to cumulative impacts in 2021 to a less than significant level. However, if Mitigation Measures IV.A.1a-c were not implemented for the reasons discussed above, impacts in 2021 would remain Significant and Unavoidable.

ROADWAY OPERATING CONDITIONS

Impact IV.A.2: The proposed project would contribute to cumulative increases in traffic volumes on roadways in the project area. This would be a significant impact under the Western or Northern Expansion options.

Near-Term Cumulative

On Mirabel Road, the project-created increases in traffic volumes would result in decreases in average speed that would exceed the threshold of significance established for this analysis (i.e., 1 mph or more for LOS E) as early as 2007, which would be a significant impact. The same impact determination would apply to conditions on "peak" production days (defined above). On all other study segments, changes in average speed would not exceed the threshold of significance.[12]

Cumulative 2021

On the basis of estimated vehicle trip generation for the proposed project, as well as the Blue Rock expansion project and areawide growth, and expected widening of shoulders on Mirabel Road (see Planned Roadway Improvements), cumulative 2021 level of service conditions were computed (see Table IV.A-9).

As shown in the table, the three study roadway segments would operate at LOS D or worse during all of the study periods, as they currently do (which would be a significant cumulative impact). However, because the reduction in average travel speeds on the study roadway segments related to project-created increases in traffic volumes [<1.2 mph on 116 at Mirabel; <0.5 mph on 116 at Covey; <1.4 mph on Mirabel] would not exceed the thresholds of significance established for this analysis (i.e., 2 mph or more for LOS D, and 1 mph or more for LOS E), project-related traffic would not cause a significant impact that is cumulatively considerable. Level of service conditions would be incrementally worse on "peak" production days (defined above), but the same significant cumulative impact determination would apply (i.e., project contribution to cumulative traffic increases would not exceed thresholds, and would therefore be less than significant).

Mitigation – Near-Term Cumulative

Mitigation Measure IV.A.2: Widen Mirabel Road to provide paved shoulders. If the shoulders are not widened on both sides of Mirabel Road by the time the quarry begins mining the Western or Northern expansion areas, the project sponsor shall pay a fair share of the cost of the improvements. The calculation of the fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three time that of automobiles or small trucks. If deemed acceptable by the County, the project sponsor may contribute an equal value of material or labor toward the construction of the shoulders in lieu of cash.

12 Level of service results from near-term analysis conducted by Crane Transportation Group, in support of the Blue Rock Quarry Expansion Project EIR.

TABLE IV.A-9
CUMULATIVE (2021) LEVELS OF SERVICE (LOS) ON STUDY ROADWAYS

Study Roadway	AM Peak Hour Avg. Speed (MPH)	AM Peak Hour LOS	PM Peak Hour Avg. Speed (MPH)	PM Peak Hour LOS	Saturday Peak Avg. Speed (MPH)	Saturday Peak LOS
Existing Conditions						
1. Highway 116 West of Mirabel Road	43.8	D	44.0	D	44.6	D
2. Highway 116 East of Covey Road	37.4	E	37.1	E	38.7	E
3. Mirabel Road	36.6	E	35.9	E	37.0	E
Cumulative (2021) Conditions						
1. Highway 116 West of Mirabel Road	**41.1**	**D**	**41.4**	**D**	**42.7**	**D**
- Decrease in Avg. Travel Speed	< 2 mph		< 2 mph		< 2 mph	
2. Highway 116 East of Covey Road	**33.0**	**E**	**32.3**	**E**	**35.9**	**E**
- Decrease in Avg. Travel Speed	< 1 mph		< 1 mph		< 1 mph	
3. Mirabel Road	**36.8**	**E**	**35.3**	**E**	**37.4**	**E**
- Decrease in Avg. Travel Speed	< 1 mph		< 1 mph		< 1 mph	

[a] Cumulative conditions represent the combined traffic volumes generated by the proposed Canyon Rock Quarry project and the proposed Blue Rock Quarry project (average production level), added to Base Case traffic volumes.

SOURCE: Crane Transportation Group

The level of service calculations take into account several physical characteristics of the roadway, including the width of the travel lanes and whether or not the road has paved shoulders. Other things being equal, a road with paved shoulders will have a better level of service for a given traffic volume than will a road without shoulders. Installing paved shoulders on Mirabel Road would improve the level of service enough to offset the effect of the project traffic.

The shoulder widening described in Mitigation Measure IV.A.2 would result in secondary environmental impacts. These impacts are further described under the subsection "Secondary Impacts," which is found at the end of Section IV A.

Significance after Mitigation: Potentially Significant and Unavoidable if the improvements are not in place when the quarry begins mining in either the Western or Northern Expansion areas.

Mitigation –Cumulative 2021

Mitigation: No additional mitigation required with implementation of Mitigation Measure IV.A.2, which would also mitigate the project's contribution to cumulative impacts in 2021 to a less than significant level. However, if Mitigation Measure IV.A.2 were not implemented for the reasons discussed above, impacts in 2021 would remain Significant and Unavoidable.

PEDESTRIAN AND BICYCLE CONDITIONS

Impact IV.A.3: The proposed project would contribute to cumulative effects on pedestrian and bicycle flow conditions in the project area. This would be a significant impact under the Western or Northern Expansion options.

At the Highway 116 / Covey Road intersection, on the basis of data collected in October 2001, Highway 116 carries about 1,190 vehicles per hour during the a.m. peak hour when about 55 student pedestrians and 5 student bike riders are crossing the state highway, and about 1,230 vehicles per hour during the mid-afternoon peak hour when about 60 student pedestrians and 6 bike riders are crossing the state highway.

Pedestrian and bicycle rider counts conducted in June 2002 along Highway 116 between Covey Road and Mirabel Road (see page IV.A-15) showed that the highest number of pedestrians crossing the road is between 1st Street and Covey Road, in the vicinity of a local market, café and deli, where up to 31 pedestrians an hour crossed Highway 116 during the morning commute, and up to 21 pedestrians (including eight students) crossed during the after school peak hour. The second busiest crossing location of Highway 116 was at the 1st Street intersection.

Traffic volumes would increase under near-term cumulative and cumulative 2021 conditions. The number of pedestrians and bicyclists would also increase as housing units are constructed near the downtown area. The recently approved Burbank Self-Help Housing project to the south and recently proposed Crinella and Thiessen projects to the west would likely add pedestrians and bicyclists, including students walking or riding bicycles to the schools and people walking or riding bicycles to the youth park on Mirabel Road.

The threshold of significance developed for this EIR is an increase in peak-hour traffic volume of 4 trucks or more at an intersection where there are more than 10 adult pedestrian crossings per hour (or more than one child crossing per hour).

Near-Term Cumulative

Project-created increases in traffic volumes would exceed the threshold of significance on Highway 116 at Covey Road, on Highway 116 between Covey Road and Mirabel Road, and on Mirabel Road (i.e., greater than 4 trucks) as early as 2007, which would be a cumulatively significant impact. The same impact determination would apply to conditions on "peak" production days (defined above).[13]

Cumulative 2021

Under cumulative 2021 conditions, the traffic volume increase generated by the combined quarry projects would exceed the above-described threshold of significance on Highway 116 at Covey Road, and on Highway 116 between Covey Road and Mirabel Road, which is considered a cumulatively significant impact. The same cumulative impact determination would apply to conditions on "peak" production days (defined above).

There are about 500 vehicles per hour traveling on Mirabel Road at the Forestville Youth Park on an October Saturday from 11:00 a.m. to 12:00 Noon (a period of high activity at the park). Traffic volumes on Mirabel Road would increase by 2021. While it is unlikely that pedestrians would cross Mirabel Road in the vicinity of the youth park unless development (unforeseeable at this time) were to occur on the west side of the road, there likely will be increased bicycle traffic along Mirabel Road. However, by 2021, six-foot-wide paved shoulders are expected to be provided along the entire length of Mirabel Road for bike rider use (see Planned Roadway Improvements, in the Setting). Therefore, the cumulative impact would be considered less-than-significant if these improvements were installed by 2021, but significant if those improvements were not in place by 2021. The same cumulative impact determination would apply to conditions on "peak" production days (defined above).

Mitigation – Near-Term Cumulative

Two alternate sets of mitigation measures are identified in this EIR: Mitigation Measures IV.A.3a-d (construct pedestrian and bicycle circulation and safety improvements within downtown Forestville), and Mitigation Measure IV.A.3e (construct bypass road south of downtown Forestville area), or as described below:

<u>Alternate 1: Construct Pedestrian and Bicycle Circulation and Safety Improvements Within Downtown Forestville:</u>

Mitigation Measure IV.A.3a: Implement Mitigation Measure A.1a (install traffic signals [with pedestrian signals] at the intersection of Highway 116 / Covey-Forestville Roads). The project sponsor shall pay a fair share of the cost of the improvements as specified in Mitigation Measure IV.A.3a.

Installation of pedestrian signals with the traffic signals at this intersection would provide positive control of conflicting movements among automobiles, bicycles and pedestrians, ensuring a less-than-significant effect on pedestrian and bicycle safety.

13 Pedestrian analysis results from near-term analysis conducted by Crane Transportation Group, in support of the Blue Rock Quarry Expansion Project EIR.

Mitigation Measure IV.A.3b: Provide sidewalks/pathways, where needed, along both sides of Highway 116 between Covey Road and Mirabel Road, and allow school children to ride on the sidewalks/ pathways. Alternatively, provide five-foot-wide bike lanes along each side of Highway 116 between Covey Road and Mirabel Road. The project sponsor shall pay its fair share contribution to the cost of this improvement.

If bike lanes were provided along Highway 116 in this area, Highway 116 would need to be widened by six to eight feet on the north side of the highway for about 175 feet west of Covey Road. Some on-street parking spaces would have to be eliminated near 1st and 2nd Streets.

Mitigation Measure IV.A.3c: Enhance the visibility of existing crosswalks at Covey and 1st Street. The project sponsor shall pay its fair share contribution to the cost of these improvements.

This could include additional striping (e.g., yellow and/or crosshatching), signage and/or lighting. Several other measures identified in this EIR (including removal of on-street parking in the vicinity in order to provide left-turn lane on the approach to Covey Road, reducing parking spaces in the vicinity of crosswalks, and road widening in order to provide bike lanes) would provide overall greater sight lines for drivers and pedestrians in the vicinity.

Mitigation Measure IV.A.3d: If the shoulders are not widened on both sides of Mirabel Road by the time the quarry begins mining the western or northern expansion areas, the project sponsor shall pay a fair share of the cost of the improvements.

The roadway improvements described in Mitigation Measure IV.A.3a-d would result in secondary environmental impacts. These impacts are described under the subsection "Secondary Impacts," which is found at the end of Section IV.A.

Significance after Implementation of Mitigation Measures IV.A.3a-c: Implementation of Mitigation Measures IV.A.3a-c would reduce pedestrian and bicycle impacts on Highway 116 in downtown Forestville. However, all the pedestrian impacts would not be reduced. Pedestrian counts done in June 2002 indicated a substantial number of pedestrians crossing Highway 116 at midblock locations (i.e., not at intersections). Since it is likely that this type of pedestrian use will not be affected by the proposed mitigation measures, it is concluded that the potential for pedestrian conflicts with highway traffic on Highway 116 would remain Significant and Unavoidable.

Significance after Implementation of Mitigation Measures IV.A.3d: Implementation of Mitigation Measure IV.A.3d would reduce the potential impacts to bicyclists on Mirabel Road to less than significant. On Mirabel Road the impact is a potential conflict between bicycle traffic and other vehicle traffic. With the construction of paved shoulders, bicycle traffic could be separated from other vehicles, which would reduce this potential conflict on Mirabel Road to a less than significant level.

<u>Alternate 2: Construct Bypass Road South of Downtown Forestville Area:</u>

Mitigation Measure IV.A.3e: Construct a bypass road to the south of the downtown area along an alignment similar to that shown in the Forestville Specific Plan. This is expected to be either a

County project or a joint County-Caltrans project. The project sponsor shall pay its fair share contribution to the cost of this measure. The calculation of the fair share shall consider that the large trucks used to haul rock have an effect on level of service that is approximately three time that of automobiles or small trucks. If deemed acceptable by the County, the project sponsor may contribute an equal value of material or labor toward the construction of the bypass road in lieu of cash.

The roadway improvements described in Mitigation Measure IV.A.3e would result in secondary environmental impacts. These impacts are described under the subsection "Secondary Impacts," which is found at the end of Section IV.A.

Significance after Implementation of Mitigation Measure IV.A.3e: Less than significant. However, if the bypass were not in place by 2007, the project impact would be Significant and Unavoidable. As discussed under Planned Improvements (see Setting section), funding is not presently available for the bypass, and there is no planned construction date.

Mitigation –Cumulative 2021

As discussed above, implementation of Mitigation Measures IV.A.3a-c would reduce bicycle and pedestrian impacts in downtown Forestville, but not to a less than significant level; implementation of Mitigation Measure IV.A.3d would reduce the bicycle impact on Mirabel Road only to a less than significant level. If these mitigation measures were not implemented for the reasons discussed above, impacts in 2021 would remain Significant and Unavoidable.

No additional mitigation would be required with implementation of Mitigation Measures IV.A.3e, which would also mitigate the project's contribution to cumulative impacts in 2021 to a less than significant level. However, if Mitigation Measure IV.A.3.e was not implemented for the reasons discussed above, impacts in 2021 would remain Significant and Unavoidable.

TRAFFIC SAFETY

Impact IV.A.4: Traffic generated by the proposed project would increase potential conflicts among vehicles in the project area. This would be a less than significant impact under the Western or Northern Expansion options.

As described on page IV.A-12, a review of five years of accident records (1996-2000) for both Highway 116 and Mirabel Road in the Forestville area indicates that very few (about two percent) of the accidents involved trucks, and because CHP records are not specific in regards to the cargo carried by trucks involved in accidents, it is not possible to tell how many of the small number of reported truck accidents involved quarry trucks. Although all local roadways have had overall accident rates from above to well-above statewide and Sonoma County averages for two-lane roads in rural or suburban settings, the number of truck-related accidents has been low.

The proposed project would neither change the physical characteristics of the street network surrounding the site, nor generate traffic that is incompatible with existing traffic patterns. The proposed project would construct a new access driveway (for outbound vehicles only) on Highway 116 west of the current two-way site driveway (just east of the entrance driveway for the Blue Rock Quarry). Use of the new driveway for quarry operations would vary, but site access for emergency vehicles would be enhanced, and sight lines would be adequate for vehicles turning left onto Highway 116 from this new driveway.

The County intends to add a condition of approval that would require the quarry's drivers to participate in a truck driver education/safety orientation that indicates preferred routes, and establishes procedures to reduce public conflicts and ensure traffic safety.

Based on above-described determinations, it would be unlikely that the rate of motor vehicle accidents (i.e., accidents per number of vehicles) would increase as a result of the project. Therefore, the project would have a less-than-significant impact on motor vehicle traffic safety.

Mitigation: None required.

ROADWAY WEAR

Impact IV.A.5: Traffic generated by the project could increase the need for road maintenance. This would be a potentially significant impact.

Heavy truck traffic from quarries and other sources of aggregate also has an impact on road maintenance. On average, one truck has approximately the same wear and tear impact as the passing of approximately 10,000 automobiles. This issue was analyzed in the ARM Plan Program EIR and found to be significant. To mitigate this potential impact, a road maintenance impact fee system was to be established pursuant to the ARM Plan. Presently, the road maintenance fee system is under development by the County Department of Transportation and Public Works, and a standard fee condition has been applied to all new aggregate permits requiring payment of the fee when it is finalized. It is expected that the final fee figure will take into account such items as the number of trucks generated and the length of haul route over County Roadways.

Mitigation IV.A.5: The applicant shall participate in the Aggregate Road Mitigation Fund.

Significance after Mitigation: Less than Significant.

SECONDARY IMPACTS RESULTING FROM IMPLEMENTING TRANSPORTATION MITIGATION MEASURES

Implementation of the off-site transportation improvements identified in Mitigation Measures IV.A.1-3 in this EIR would result in potential temporary and long-term secondary environmental impacts. While a detailed analysis of the specific impacts cannot be completed at this time, as none of the road improvements have been designed, the following discussion presents the potential impacts and identifies mitigation measures to the extent possible at this time.

Impact IV.A.6: Implementing off-site transportation improvements identified in Mitigation Measures IV.A.1-3 in this EIR would result in temporary construction-related impacts on air quality, water quality, and noise. This would be a potentially significant short-term impact under the Western or Northern Expansion options.

Earthmoving and other construction activities would result in the temporary generation of dust. Dust impacts could be mitigated by incorporating Best Management Practices for dust control. The following measure would reduce the impact to less than significant.

Mitigation IV.A.6a: The construction contract shall include a dust abatement program. Elements of the program shall include the following dust control measures to be implemented during construction:

- **Water or dust palliative shall be sprayed on unpaved construction and staging areas during construction.**
- **Trucks hauling soil, sand and other loose materials over public roads shall cover the loads, or shall 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.**

Construction could result in temporary water quality impacts due to spillage of fuels or other hazardous materials. Spillage of materials can be controlled by implementing Best Management Practices for construction sites. The following measure would reduce the impact to less than significant.

Mitigation IV.A.6b: The construction contract shall require that storage of any potential flammable liquids be in compliance with the Sonoma County Fire Code and section 7-1.01G of the Caltrans Standard Specification (or the functional equivalent) for the protection of surface waters. In the event of a spill of hazardous materials the Contractor shall immediately call the emergency number 9-1-1 to report the spill, and shall take appropriate actions to contain the spill to prevent further migration of the hazardous materials to storm water drains or surface waters.

Construction could result in high noise levels at receptors close to the construction sites. The following measure will reduce the impact to less than significant.

Mitigation IV.A.6c: 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 Vehicle Code, where applicable.**
- **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 am and 7:00 pm on weekdays and 9:00 am and 7:00 pm on weekends and holidays.**

Significance after Mitigation: Less than Significant.

Impact IV.A.7: Implementing off-site transportation improvements identified in Mitigation Measures IV.A.1-3 in this EIR could result in temporary or long-term erosion effects from road cuts or other graded areas. This would be a potentially significant impact under the Western or Northern Expansion options.

Constructing the intersection improvements at the Highway 116 / Mirabel Road intersection would involve a cut to lower the grade of Highway 116 and widen the road to install a left turn lane at Mirabel Road, and may require a left turn lane on Highway 116 at Hidden Lake Road. This cut woud be along the south side of Highway 116 for a distance of about 600 feet west of the intersection to Hidden Lake Road. The widening on Mirabel Road to install shoulders would also involve earthmoving (this would extend from Highway 116 to approximately 150 feet north of Davis Road). The intersection improvements at Highway 116 / Covey and Mirabel Road / River Road would also involve grading, although to a lesser extent. Construction of the bypass road would require substantial grading and fill slopes. The graded slopes could erode after construction, resulting in release of sediment to surface waters during rainstorms. The impact would be reduced to less than significant by implementing Best Management Practices during construction and by implementing an erosion control plan to stabilize the slopes permanently.

Mitigation IV.A.7a: By October 1, all disturbed areas and cut slopes shall be hydroseeded with an appropriate mix of seed, wood mulch, and tackifier.

Mitigation IV.A.7b: Following hydroseeding of the cut slope along the south side of Highway 116 between Mirabel Road and Hidden Lake Road, a wood fiber erosion control shall be applied to the slope to further protect the soil from erosion. This blanket shall either have no plastic incorporated, or, if the blanket does incorporate plastic, the plastic shall be a photo-degradable type which breaks down in 1 to 2 years.

Significance after Mitigation: Less than Significant.

Impact IV.A.8: Implementing off-site transportation improvements identified in Mitigation Measure IV.A.1 in this EIR would result in the removal of trees and other vegetation along a portion of Highway 116, resulting in a potential visual impact. This would be a potentially significant impact under the Western or Northern Expansion options.

The grading described above for the Highway 116 / Mirabel intersection woudl remove all vegetation along the southern side of Highway 116 for at least 600 feet from the intersection westerly. This would include removal of a large oak, as well as some shrubs and grass. The visual impact could be reduced to less than significant by revegetating the slope. This would include the erosion control measures in Mitigation IV.A.6a-b, with the addition of planting native shrubs and trees to soften the appearance of the cut slope. The following mitigation measure would reduce the impact to less than significant.

Mitigation IV.A.8: Following stabilization of the cut slope along the south side of Highway 116 between Mirabel Road and Hidden Lake Road as described in Mitigation IV.A.6a-b, native shrubs and trees shall be planted on the cut slope. At least 50 liner-size native shrubs and trees shall be planted. A maintenance program including weeding and summer watering shall be followed until the plants have become established (minimum of three years).

Significance after Mitigation: Less than Significant.

Impact IV.A.9: Implementing off-site transportation improvements identified in this EIR could result in disturbance of undiscovered archaeological resources. This would be a potentially significant impact under the Western or Northern Expansion options.

Although no archaeological resources are known to exist in the immediate vicinity of any of the proposed improvements, it is possible that grading and other construction activities could disturb presently undiscovered archaeological resources. The following mitigation measure would reduce the impact to less than significant.

Mitigation IV.A.9: 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 shall not be allowed until those recommendations deemed appropriate by the County have been implemented.

Significance after Mitigation: Less than Significant.

Impact IV.A.10: Implementation of Mitigation Measures IV.A.1a and IV.A.3b would result in the loss of on-street parking spaces on Highway 116 west of Covey Road. This would be a significant impact under the Western or Northern Expansion options.

Implementation of Mitigation Measure IV.A.1a to provide separate turn lanes on Highway 116 within the existing 40-foot curb-to-curb width would prohibit provision of five-foot-wide shoulders on each side of the road for bicycle lanes; only two- to three-foot-wide shoulder areas (adjacent to the curbs) would be available. To provide five-foot-wide shoulders (identified in Mitigation IV.A.1a), or sidewalks/pathways or bikelanes (identified in Mitigation Measure IV.A.3b), Highway 116 west of Covey Road would need to be widened six to eight feet on the north side of the street. The widening would affect existing landscaping and would require reconstruction of retaining walls. The loss of on-street parking spaces on Highway 116 west of Covey Road would constitute a significant secondary impact due to the current intermittent heavy use of on-street parking for local businesses in this area, as well as the heavy use of off-street parking in this area, because customers would need to walk farther to their destination from other on-street parking spaces to the west. See Appendix H-1, Figures A-5 to A-14, for the results of on- and off-street parking surveys conducted along Highway 116 between Covey Road and Mirabel Road by Crane Transportation Group.

Mitigation: None available. The impact would remain Significant and Unavoidable.

Impact IV.A.11: Implementation of Mitigation Measure IV.A.3e (construction of bypass road south of the downtown Forestville area) could result in significant long term environmental impacts on transportation and traffic, air quality, noise, hydrology and water quality, land use, biological resources, aesthetics and cultural resources. This would be a potentially significant impact under the Western or Northern Expansion options.

Although a bypass project would have beneficial effects on traffic in downtown Forestville, it would also have significant adverse impacts along its alignment. The following discussion of potential impacts has been developed from preliminary alignment studies by the County. However, a detailed analysis of the specific impacts and mitigation measures cannot be completed until the County undertakes additional design work for the bypass project. It is not expected that such design work would be conducted until the County has determined whether it is feasible to fund the project. If the County decides to pursue the bypass project, detailed environmental analysis and a subsequent environmental document would be required.

The bypass road would have two travel lanes, paved shoulders, and turn lanes where needed. The road would extend southerly from the vicinity of the Highway 116 / Mirabel Road intersection along a right of way previously dedicated to the County. The alignment would turn to the east and cross the Joe Rodota trail, and then continue easterly to intersect Highway 116 just to the south of Packinghouse Road. The project would require some large fills in the vicinity of the Joe Rodota trail. Property would be acquired for the right of way to the east of the Joe Rodota trail. It is expected that the trail would cross the bypass via a large culvert or tunnel beneath the road. Reconstruction of the Highway 116 / Mirabel Road intersection would be needed, and a new intersection of the bypass with Hightway 116 would be constructed south of Packinghouse Road.

Transportation and Traffic: The bypass road would result in a substantial change in Forestville traffic, as it would likely remove a large portion of Highway 116 traffic away from downtown Forestville. This would be a beneficial impact, as it would facilitate movement of the through traffic and ameliorate the problem caused by an incompatible mix of highway traffic with other uses in the downtown area, such as bicycles, pedestrians, and parking. It would also result in a change to Forestville Street at Packinghouse Road. Presently, Forestville Street extends from Highway 116 southerly to its end at the wastewater treatment plant. The bypass would segment Forestville Street. Parcels south of the bypass would have access to the bypass road, but parcels to the north would probably not. The northern segment of Forestville Street would end at the intersection with Packinghouse Road.

Air Quality: The bypass road would not increase traffic volumes, and would therefore would not have any significant effect on the total amount of vehicle emissions. The project would shift traffic away from the downtown area, decreasing emissions there. It would increase emissions along the bypass route, potentially affecting receptors (residences) along the new route. The bypass road would expose residents of existing and future homes to increased vehicle emissions. Presently there are homes just to the north of Packinghouse Road that would be close to the bypass road, and 30 new homes have recently been approved on a parcel that would be immediately adjacent to the bypass (Burbank Housing project, also called the Forestville Self-Help Development). Other housing has been proposed near the Highway 116 / Mirabel Road intersection (Crinella and Thiessen projects), although specific development plans have not been approved.

Noise: The bypass road would shift traffic away from the downtown area, which would decrease noise levels there. However, noise levels along the bypass route would increase substantially over existing ambient levels, because the bypass would introduce traffic into an area that presently has none. The potential receptors include existing houses to the north of Packinghouse Road and 30 new homes recently approved on a parcel immediately adjacent to the bypass (Burbank Housing project, also called the Forestville Self-Help Development). The Burbank project considered the potential noise from a future bypass road and included noise insulation in the homes to ensure interior noise levels would meet the noise standards in the County General Plan. It is expected that noise mitigation such as sound walls would need to be constructed as part of the bypass project to prevent excessive exterior noise levels in these homes, and possibly along Packinghouse Road to protect homes to the north. Other housing has been proposed near the Highway 116 / Mirabel Road intersection in an area that could be noise impacted by the bypass, although specific development plans have not been approved.

Hydrology and Water Quality: The bypass road would require an embankment, which would cross a small stream near the Joe Rodota Trail. The embankment could impact local drainage patterns, which could cause localized flooding or concentration of runoff that would cause erosion.

Land Use: Construction of the bypass road would require acquisition of land for right of way and a permanent conversion of this land to road use. It is likely that construction of the bypass would require the removal or relocation of a house to the south of the existing Highway 116 / Packinghouse Road intersection.

Biological Resources: The bypass road would cross a small stream and marsh near the Joe Rodota Trail, as well as seasonal wetlands to the east of the trail. Construction would result in a loss of wetland habitat. Sensitive plant or animal species are not known to be present in these wetlands, but the potential for impacts to sensitive species cannot be ruled out without detailed site surveys. Although most of the alignment would be through annual grassland, there are also some areas in which trees would be removed. The trees are primarily willows associated with the wetlands and roadside trees along Highway 116 at the eastern end of the bypass. The project would remove some wildlife habitat associated with the trees. Some of the roadside trees that could be removed by the project are oaks, which are protected by the County's Tree Protection Ordinance. Construction of the bypass intersection with Highway 116 at the eastern end could require realignment and widening of a portion of Highway 116 at a point where it crosses a tributary to Green Valley Creek. Widening or replacing the box culvert at this location could result in a loss of some riparian habitat. Downstream, Green Valley Creek is known to contain sensitive species (California freshwater shrimp and salmonids). The tributary may have habitat for both shrimp and salmonids near the Highway 116 crossing, and it is therefore assumed that the bypass construction could impact habitat for sensitive species there.

Aesthetics: The alignment of the bypass is largely undeveloped. The construction of the road would cause a significant change in the view from the surrounding area. The change would be especially noticeable to the public near the intersections of Highway 116 with Packinghouse Road and Mirabel Road. There would also be a significant change in the view from Packinghouse Road and Forestville Street. The new road could also be visible from more distant public vantage points, such as Hidden Lake Road.

Cultural Resources: Portions of the bypass alignment have been inspected to determine whether cultural resources are present (Crinella project and Burbank housing project), and no resources were found in the vicinity of the road alignment. Other portions of the route have not been inspected, and it is unknown whether cultural resources are present. It is therefore concluded that construction of the bypass road could affect presently unknown historic or prehistoric resources.

Significance: Potentially Significant and Unavoidable. If the County decides to proceed with the bypass road, further analysis and a subsequent environmental document would be required. That analysis may identify mitigation measures that will reduce some or all of the above impacts to less than significant. However, unless and until that analysis is completed, the impacts are considered Significant and Unavoidable.

REFERENCES – Transportation and Traffic

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

Caltrans (California Department of Transportation), *Traffic Manual, Chapter 9* (available at http://www.dot.ca.gov/hq/traffops/signtech/signdel/chp9/chap9.htm#Section_1), 2002.

Caltrans (California Department of Transportation), *2001 Traffic Volumes on California State Highways* (available at http://www.dot.ca.gov/hq/traffops), 2002.

Crane Transportation Group, *Master Traffic Impact Report, Continuation or Expansion of Activities at Blue Rock and Canyon Rock Quarries in Forestville*, December 28, 2001.

Crane Transportation Group, Memorandum to Tim Mayer, Sonoma County Planning Department, May 29, 2002.

Sonoma County Permit & Resource Management Department, *Russian River Redevelopment Plan EIR* (prepared by Wagstaff and Associates), March 2000.

Transportation Research Board, *Highway Capacity Manual*, Special Report 209, 2000.

IV.B AIR QUALITY

This section evaluates the potential impacts of the proposed Western and Northern Expansion options 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 Environmental Protection Agency (EPA), the California Air Resources Board (CARB), and the Northern Sonoma County Air Pollution Control District (NSCAPCD), along with the Bay Area Air Quality Management District (BAAQMD).

INTRODUCTION

To better manage the air resources of the State and common air quality problems on a regional basis, California is divided into 15 air basins. An air basin generally has similar meteorological and geographic conditions throughout. Areas within each air basin are considered to share the same air masses and are therefore expected to have similar ambient air quality. Air Pollution Control Districts (APCD) and Air Quality Management Districts (AQMD), generally known as air districts, are county or regional governing agencies that manage the air resources within each air basin. The jurisdictional boundaries of these air districts do not always correspond with the boundaries of the air basins. Therefore, an air basin may have more than one air district managing air quality. Conversely, an air district's authority may also extend beyond air basin boundaries.

The Canyon Rock Quarry is located at 7525 Highway 116 in an unincorporated area of Sonoma County near the town of Forestville, within the North Coast Air Basin. The North Coast Air Basin includes Del Norte, Humboldt and Trinity Counties (which are managed by the North Coast Unified APCD), and Mendocino and northern Sonoma Counties, which each comprise separate air districts within the North Coast Air Basin. Planning for the attainment and maintenance of both federal and State air quality standards in northern Sonoma County is the responsibility of the Northern Sonoma County APCD.

SETTING

This setting description provides an overview of region-specific information related to climate and topography, regulatory context followed by a discussion of plans, policies, and regulations, and existing air quality conditions pertaining to the project area. From a regulatory standpoint, the air pollutants of concern in the project area are ozone, nitrogen oxides (NO_x), carbon monoxide (CO), and particulate matter (PM), given that these are the primary pollutant emissions from the proposed project and nonattainment status in the region.

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.

TOPOGRAPHY, CLIMATE AND METEOROLOGY

The project site is located in the northern portion of Sonoma County and is within the boundaries of the North Coast Air Basin. Elevations in Sonoma County range from sea level along the western edge and in the southeast to 3,000 to 4,000 feet along much of the eastern boundary. The Russian River flows south and west into the sea. The northwest corner of the County, between the coast and the river is mountainous, with elevations ranging upward to approximately 2,000 feet. East of the river elevations increase again; Mt. St. Helena, on the eastern border reaches a crest of 4,344 feet. Sonoma Creek drains into San Pablo Bay through the Sonoma Valley in the southeastern corner of the County. Much of the southeastern part of the County is relatively flat farmland near sea level.

The climate of Sonoma County is characterized by moderate temperature and precipitation. Along the coast, temperatures remain cool throughout the summer and seldom drop below freezing during the winter. Inland areas have a wider temperature range, with high readings occasionally exceeding 100ºF and lows sometimes falling several degrees below freezing. Even during the warm period of the year, however, the night temperatures usually drop into the lower 50s. Precipitation is concentrated during the six months of winter with only light amounts reported during the rest of the year. Along the coast, low clouds and drizzle at night during the summer provide enough moisture to keep pastures green. Inland, however, the summer dry period is long enough that stored moisture in the soil is depleted and range dries up. The average seasonal precipitation ranges from less than 20 inches in the extreme southeast corner of the County, with 30 and 40 inches over much of the central part of the County. In the mountains, annual precipitation increases to more than 80 inches.

Dominant winds also exhibit a seasonal pattern, particularly in coastal areas. During the summer north to northwesterly winds, frequently strong, are common, while in the winter, storms from the South Pacific increase the percentage of days with winds from the south. In the river canyons that empty into the Pacific a diurnal pattern is often present in wind direction. In the morning hours cool air from higher elevations flows down the valleys while later in the day as the lower elevation air heats up this pattern is reversed and the air flow heads up the canyon. These air flows can frequently be very strong. Offshore and onshore flows are also common along the coast and are associated with pressure systems in the area. Onshore flows frequently bring foggy cool weather to the coast, while offshore flows often bring sunny, warm days.

The air pollution potential of northern Sonoma County could be high if there were significant sources of pollution. Prevailing winds can transport locally and non-locally generated pollutants northward into narrow valleys, which often trap and concentrate the pollutants under stable conditions. The local upslope and downslope flows set up by the surrounding mountains can also recirculate pollutants. However, local sources of air pollution are minor. With the exception of some processing of agricultural goods, such as cheese and wine manufacturing, there is little industry in the valleys. Increase in motor vehicle emissions and wood smoke emissions from stoves and fireplaces may increase pollution as the area grows in population and as a tourist attraction.

REGULATORY CONTEXT

Air quality within the Air Basin is 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. The air pollutants of concern and agencies primarily responsible for improving the air quality within the Air Basin and the pertinent regulations are further discussed below.

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, CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter equal to or less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), and lead (Pb). 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.B-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.

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 (NO_2) are the most significant air pollutants generally referred to as NOx. Nitric oxide is a colorless and odorless gas that is relatively harmless to humans, quickly converts to NO_2 and can be measured. Nitrogen dioxide has been found to be a lung irritant capable of producing pulmonary edema. Inhaling NO_2 can lead to respiratory illnesses such as bronchitis and pneumonia.

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. Significant 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

TABLE IV.B-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 –	0.12 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	0.25 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 (PM10)	24 Hour Annual	50 μg/m^3 20 μg/m^3	150 μg/m^3 50 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 (PM2.5)	24 Hour Annual	– 12 μg/m^3	65 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/m^3 = micrograms per cubic meter.

SOURCE: California Air Resource Board, January 9, 2003, http://www.arb.ca.gov/aqs/aaqs2.pdf 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 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.

Particulate Matter

Particulate Matter (PM10 and PM2.5) consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM10 and PM2.5 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.

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 PM2.5, are a health concern particularly at levels above the federal and state ambient air quality standards. PM2.5 (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. Children are more susceptible to the health risks of PM2.5 because their immune and respiratory systems are still developing.

In 1983, the CARB replaced the standard for "suspended particulate matter" with a standard for suspended PM10 or "respirable particulate matter." This standard was set at 50 $\mu g/m^3$ for a 24-hour average and 30 $\mu g/m^3$ for an annual average. The CARB revised the PM10 standard in 2002, pursuant to the Children's Environmental Health Protection Act. The revised PM10 standard is 20 $\mu g/m^3$ for an annual average. In addition, the CARB adopted a PM2.5 standard set at 12 $\mu g/m^3$ for an annual average.

Other Criteria Pollutants

Sulfur dioxide (SO_2) is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO_2 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 SO_2 concentrations recorded in the project area are well below federal and state standards. Accordingly, the North Coast Area is in attainment status with both federal and state SO_2 standards.

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 Northern Sonoma APCD 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 or, in the case of carcinogens, as appropriate. 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 (such as diesel) contribute more significantly to health risks than stationary sources (BAAQMD, 2000).

In 2001, California Air Resources Board assessed the State-wide health risks from exposure to diesel exhaust and to other toxic air contaminants (CARB, 2001). 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 CARB study detected diesel exhaust by using ambient air carbon soot measurements as a surrogate for diesel emissions. 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% 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.

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 the Canyon Rock Quarry are not known to generate objectionable odors.

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), but 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. Northern Sonoma County APCD is the regional agency with jurisdiction over northern Sonoma County within the North Coast Air Basin. However, often in matters of air quality, the Northern Sonoma APCD confers with the BAAQMD for guidance. The APCD 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. Table IV.B-2 displays the current attainment status of Northern Sonoma County with respect to the NAAQS and CAAQS. Northern Sonoma County APCD is in attainment of both the NAAQS and the CAAQS for NO_2, SO_2, CO, and lead. The District is attainment of the NAAQS for PM10 and ozone, but is in nonattainment of the CAAQS for PM10 and ozone. It is recognized that the nonattainment status of the District with respect to the state ozone standard is primarily a result of pollutant transport from the Bay Area and not locally generated. Therefore, an air quality plan for ozone is not required and no PM10 plan is required under state law.

TABLE IV.B-2
ATTAINMENT STATUS OF NORTHERN SONOMA COUNTY FOR THE STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Attainment Status	
		State Standards[a]	National Standards[b]
Ozone[c]	8 Hour	–	Attainment
	1 Hour	Nonattainment-Transitional	Unclassified
Carbon Monoxide	8 Hour	Unclassified	Unclassified/Attainment
	1 Hour	Unclassified	Unclassified/Attainment
Nitrogen Dioxide	Annual	–	Attainment
	1 Hour	Attainment	–
Sulfur Dioxide	Annual	–	Attainment
	24 Hour	Attainment	Attainment
	3 Hour	–	Attainment
	1 Hour	Attainment	–
Respirable Particulate Matter	Annual Arithmetic Mean	–	Attainment
	Annual Geometric Mean	Nonattainment	–
	24 Hour	Nonattainment	Unclassified
Fine Particulate Matter[c]	Annual Arithmetic Mean	–	Unclassified
	24 Hour	–	Unclassified

[a] California standards for ozone, CO (except Lake Tahoe), SO2 (1-hour and 24-hour), NOx, and PM10 are values that are not to be exceeded.
[b] National standards other than for ozone and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year.
[c] In 1997, EPA established an 8-hour standard for ozone and annual and 24-hour standards for PM2.5.

SOURCE: California Air Resources Board. State and National Area Designation Maps of California, 2000, http://www.arb.ca.gov/desig/desig.htm.

Sonoma County General Plan

To meet the requirements of state law, all cities and counties in California are required to prepare and adopt a General Plan. The Sonoma County General Plan, initially adopted in 1989, last amended in 1998, is the County's current General Plan. Elements within the General Plan include a number of guiding goals and policies, implementing programs to carry out goals and policies, and background data to provide the basis for the goals and policies. The Resource Conservation Element 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.

Northern Sonoma County APCD Nuisance Rule

The Northern Sonoma County APCD has established a nuisance rule that addresses odor issues in the area. Rule 400 states that air contaminants will not be discharged in quantities sufficient to constitute a public nuisance to any considerable number of persons or public or that would endanger the comfort or repose of any person or the public. For an odor to be considered a nuisance a complaint must be received from a "significant" number of people (i.e., more than one or two people) and the odor issue must be verifiable upon inspection by the APCD. Aggregate mining and those sources associated with the Canyon Rock Quarry are not known to generate objectionable odors.

Other Applicable Northern Sonoma County APCD Regulations

A summary of regulations potentially applicable to the proposed project is presented in Table E-7 in Appendix E; details of the regulations are contained in the *Northern Sonoma County APCD Rules and Regulations*.

California Air Resource Board

Diesel Exhaust Control Program

Current regulations apply emission standards to model years 1987 through 2003 for heavy-duty diesel truck and bus engines. Applicable to the 1994 and following year standards, sulfur content in the certification fuel has been reduced to 500 ppm. In October 1997, EPA adopted new emission standards for model year 2004 and later heavy-duty diesel truck and bus engines. These standards reflect the provisions of the Statement of Principles signed in 1995 by the EPA, CARB, and the manufacturers of heavy-duty diesel engines. The goal was to reduce NO_x emissions from highway heavy-duty engines to levels approximately 2.0 g/bhp·hr beginning in 2004.[1] These current emission standards were accounted for within this analysis.

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*. The Board approved these documents on September 28, 2000. The documents represent proposals to reduce diesel particulate emissions, with the goal being to reduce emissions and the associated health risk by 75% in 2010 and by 85% in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra low sulfur diesel fuel.

In December 2000, the EPA promulgated regulations requiring that the sulfur content in motor on-road vehicle diesel fuel be reduced to less than 15 ppm by 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 Highway Diesel program (HD 2007), 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. These standards were accounted for within this analysis.

In May of 2003, the EPA proposed new emission standards for nonroad diesel engines and sulfur reductions in nonroad diesel fuel that would dramatically reduce emissions attributed to nonroad diesel engines. This would affect emissions from construction equipment, locomotives, and marine diesels. As these emission standards are proposed, their benefits were not accounted for within this analysis.

As proposed, the new engine standards would take effect in 2008. The EPA estimates that PM would be reduced 95%, NO_x would be reduced 90%, and SO_x would be virtually eliminated as an emission from this source. Sulfur in nonroad diesel fuel would be reduced 99% from existing levels. In June of 2007, the interim cap of sulfur content would be 500 ppm. In June of 2010, sulfur would be limited to 15 ppm (ultra low sulfur fuel). The Tier 1 emission standards for nonroad diesel engines were set in 1994 and affect engines greater than 50 horsepower (hp). The Tier 2 and Tier 3 standards were set in 1998 and affected engines less than and greater than 50 hp. The new standards would affect engines ranging from 3 to 3,000 hp. Again, the EPA is proposing a "tiered" method of implementing the standard based on the engine capacity of the equipment.

Asbestos Toxic Air Control Measure

On July 22 of 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, will apply to activities such as road construction and road maintenance, construction, grading, and quarrying and surface mining operations in areas with naturally-occurring

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1 Further information on current regulations which apply to heavy-duty trucks, can be found at www.dieselnet.com/standards/us/hd.html.

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, including through testing for such materials.

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 and for this Project are ozone and particulate matter (both respirable and fine). The long-term ambient monitoring station located closest to the project site for ozone data is the Healdsburg Municipal Airport, approximately ten miles to the northeast of the project site. The long-term ambient monitoring station located closest to the project site for PM10 data is in Guerneville at Church and First Streets, approximately seven miles to the northwest of the project site. Both stations are located in Sonoma County and within the North Coast Air Basin. Since the climate and wind characteristics of the area surrounding the Canyon Rock Quarry are similar to those near the monitoring stations, data is expected to be representative of the air quality conditions at the project site. Table IV.B-3 shows a six-year summary of monitoring data collected from the nearby stations, compared with CAAQS and NAAQS. Generally, the air quality trends are improving with the number of exceedances and concentrations decreasing throughout the period. Northern Sonoma County was redesignated an attainment area for ozone in November 2003 (NSCAPCD, 2004). It should be noted that of the PM10 violations that have occurred in the last few years, the exceedences occurred primarily in the months of December and January. District officials have indicated these exceedences appear to be associated primarily with wood combustion in residential fireplaces.

An ambient monitoring station for PM2.5 and PM10 data is also located in Forestville (at the fire station); however only limited data is available from that station.[2] Table IV.B-4 summarizes the PM2.5 monitoring data from Forestville during the period of July 13, 2001 through September 24, 2002 and PM10 monitoring during 2001 and 2002. Appendix E, page E-15, provides an NSCAPCD summary of PM10 averages in 2001 and 2002 in Forestville and other Northern Sonoma County cities. The data collected suggests that air quality in Forestville meets all health-based standards established by the federal Clean Air Act and California Clean Air Act for particulate matter, however, both Acts require a minimum of three years of data before a finding of attainment can be made (NSCAPCD, 2003).

It should be noted that an independent ambient monitoring study and health risk assessment (for potential diesel particulate matter effects in Forestville) was conducted by J. Phyllis Fox, Ph.D., Environmental Management (PFEM), dated August 16, 2000. PFEM's study was reviewed for relevancy in preparation of this EIR. However, data from the PFEM study is not presented herein, used for comparative purposes, or relied on for any conclusions reached in this EIR for the following reasons: 1) PFEM's ambient monitoring was conducted in Forestville over a small sample period (six days), which does not provide a

2 The PM2.5 monitor in Forestville was discontinued in November 2002; PM10 monitoring in Forestville is continuing.

TABLE IV.B-3
AIR QUALITY DATA SUMMARY (1997–2002) FOR THE PROJECT AREA

Pollutant [a]	Standard [b]	Monitoring Data by Year					
		1997	1998	1999	2000	2001	2002
Ozone							
Highest 1 Hour Average (ppm)[c]		**0.10**	**0.13**	**0.10**	0.09	0.09	0.08
Days over State Standard	0.09	2	7	4	0	0	0
Days over National Standard	0.12	0	1	0	0	0	0
Highest 8 Hour Average (ppm)[c]		0.091	0.106	0.087	0.077	0.073	0.068
Days over National Standard	0.08	1	5	2	0	0	0
Particulate Matter (PM10)[d]:							
Highest 24 Hour Average ($\mu g/m^3$)[c]	50	**54**	32	**69**	41	**57**	27
Days over State Standard		2	0	3	0	6	0
Annual Average ($\mu g/m^3$)[c]	20	10.3	13.3	19.1	14.6	15.0	15.0
Particulate Matter (PM10)[e]:							
Highest 24 Hour Average ($\mu g/m^3$)[c]	50	**53**	31	**61**	33	**59**	27
Days over State Standard		1	0	3	0	1	0
Annual Average ($\mu g/m^3$)[c]	20	15.5	15.8	17.7	14.4	11.4	12.3

[a] No PM2.5 data was collected at these monitoring stations; see Table IV.B-4 for applicable PM2.5 data.
[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.
[d] Ambient monitoring site located in Healdsburg (113 Matheson Street).
[e] Ambient monitoring site located in Guerneville (Church and First Streets).

NOTE: Values in **bold** are in excess of applicable standard.

SOURCE: California Air Resources Board, *Summaries of Air Quality Data*, 1997, 1998, 1999, 2000, 2001, 2002 and Northern Sonoma County APCD Summaries, 1998, 1999, 2000, 2001, 2002.

representative basis from which to estimate annual average concentrations (when accounting for variations in annual operations of the nearby quarries, as well as meteorological conditions and other factors affecting dispersion and dilution of pollutants considered in this EIR); 2) The PFEM study did not estimate the potential health risks that could be specifically attributable to Canyon Rock Quarry under the scenario assessed in its study; 3) The PFEM Study did not include any analysis associated with the five-year annual average baseline or project scenarios established for and considered in this EIR; and, 4) The PFEM study did not account for the substantially improving emission efficiency of highway haul trucks and other emission sources in future years, as set forth in current regulations, and discussed and considered in this EIR.

TABLE IV.B-4
AIR QUALITY DATA SUMMARY (2001 – 2002) FROM FORESTVILLE[a]

Pollutant[e]	Standard[b]	Monitoring Data by Year 2001	2002
Particulate Matter (PM2.5):			
Highest 24 Hour Average ($\mu g/m^3$)[c,d]	65	32.6	37.3
Days over State Standard[d]		0	0
Period Average ($\mu g/m^3$)[c,d]	12	7.86	9.77
Particulate Matter (PM10):			
Highest 24 Hour Average ($\mu g/m^3$)[c]	50	60	34
Days over State Standard		1	0
Annual Average ($\mu g/m^3$)[c]	20	16.8	15.4

a Ambient monitoring station is located at the Fire Station.
b Generally, state standards are not to be exceeded and national standards are not to be exceeded more than once per year.
c $\mu g/m^3$ = micrograms per cubic meter.
d Detailed PM 2.5 data was only available from the District for July 13, 2001 through September 25, 2002 (see also Appendix E, page 15 for additional PM2.5 data).
e No ozone data was available at this monitoring station; see Table IV.B-3 for applicable ozone data.

SOURCE: Northern Sonoma County APCD, Ambient Monitoring Data, 2001-2002.

EXISTING AND BASELINE INVENTORY

The estimated emissions associated with the existing conditions (2002) and the five-year (1998-2002) annual average baseline production levels of 375,000 CY is presented in Table IV.B-5. These scenarios account for all quarry operations (including stone processing, concrete processing, nonroad equipment and haul trucks). A majority of the baseline emissions of ROG, CO, NO_x, SO_2 and DPM are a result of off-site haul trucks (i.e., 89%, 95%, 85%, 55%, and 58%, respectively). In contrast, a majority (approximately 89%) of the PM10 baseline emissions are due to on-site operations.

EXISTING CONTROLS USED AT QUARRY

Canyon Rock Quarry currently employs numerous control measures to reduce dust and exhaust emissions. Several years ago, vehicular circulation within the quarry was reorganized in an effort to keep excess water and mud out of the area through which gravel trucks move, and thus, reduce entrainment of road dust. Tire scrapers, constructed out of railroad track sections (similar to cattle crossings) have been installed both before and after the scale. As the trucks pass over these tire scrappers, the jolting action causes aggregates on the truck tires to be knocked off. Areas around the office and the driveway between the scale and Highway 116 have been paved with asphalt, thus, eliminating unpaved road dust in these locations. There is also a current practice of using a watering truck to keep paved areas clean and to dampen the unpaved vehicular circulation areas to effectively reduce airborne dust levels from on-site roads.

TABLE IV.B-5
ESTIMATED EXISTING AND BASELINE EMISSIONS FOR CANYON ROCK QUARRY

	Emissions (tons per year)					
	SO_2	NO_x	PM10	ROG	CO	DPM
Existing Conditions (2002)	7.60	82.6	31.2	11.8	117	4.26
Five-Year Annual Average Baseline (1998-2002)	6.45	73.8	26.5	11.4	122	3.71

SOURCE: Environmental Science Associates, 2003

To reduce gravel processing dust, many of the deck screens and conveyers at the quarry are fitted with water lines which produce a fog-like mist over the materials processed in this equipment while operating. The applicant also sprays a highly diluted chemical dust suppressant by machine into the quarry's crusher to effectively suppress dust from this equipment while it is operating. Of the 54 conveyors at the quarry, nine have air emission controls applied to them. None of the feeders/hoppers have air emission controls. Of the 14 screens, five have air emission controls applied to them. Of the 14 crushers, four have air emission controls applied to them. The concrete operations have air emission controls. In the last four years, Canyon Rock Quarry has purchased three new mixer trucks (for concrete) and four new highway trucks (gravel). These new trucks are built with electronically controlled engines subject to current, more stringent emissions standards for improved exhaust emissions and efficiency.

In addition, as under existing reclamation and water quality plans, annual hydroseeding is applied each fall to slopes from which material will not be mined in the near-term. This interim planting provides both erosion control and dust control. In addition, following mining within the existing vested rights and permitted mining areas, final erosion control measures would be implemented.

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 unincorporated communities of Mirabel Park and Mirabel Heights are approximately two miles north of the project site. Approximately 300 to 400 feet to the north, east, and west are large lot rural residential uses, with Green Valley Creek and Martinelli Road passing along the eastern boundary of the property. To the south, across Highway 116, is the Blue Rock Quarry and additional rural residential uses to the southeast (approximately 200 feet). The land uses nearest the project site that would be considered sensitive receptors are individual rural residences located near the site. Along typical off-site haul truck routes including within the city of Forestville, sensitive receptors would include residences, as well as the Forestville Elementary School, Forestville Youth Park, and El Molino High School.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

For project-level impact analysis, various thresholds and tests of significance can be used to determine whether a project would have a significant effect on air quality. According to the *CEQA Guidelines*, a project would have a significant effect on air quality if it:

- Conflicts with or obstruct implementation of the applicable air quality plan;
- Violates any air quality standard or contribute substantially to an existing or projected air quality violation;
- Results in a cumulatively considerable net increase of any nonattainment pollutant (including releasing emissions that exceed quantitative thresholds for ozone precursors);
- Exposes sensitive receptors to substantial pollutant concentrations; or
- Creates objectionable odors affecting a substantial number of people.

Based on Northern Sonoma APCD Regulation 1, the following quantitative thresholds of significance for emissions apply to the proposed project:

- Total emissions of PM10 from project operations in excess of 15 tons per year. Total emissions of NO_x, ROG, or SO_2 from project operations in excess of 40 tons per year. Total emissions of CO from project operations in excess of 100 tons per year.

For TACs, the CARB reported that health risks from exposure to diesel exhaust is already very high throughout the state. For purposes of this EIR, if a project results in an increase in exposure to diesel emission such that it resulted in an incremental increase of 10 cancers in a million people for 70-year exposure, this would be a significant impact.

Any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact.

METHODOLOGY

Project-related air quality impacts fall into two categories: fugitive dust impacts due to stone processing and concrete batching operations and criteria pollutant impacts due to the increase in nonroad equipment and haul truck (on-site and off-site) traffic as a part of the project operation. Fugitive dust emission sources also included unpaved roads, blasting, handling and storage, and wind erosion. Project-related air quality impacts were evaluated within the area consisting of the North Coast Air Basin portion of Sonoma County. Emission changes were estimated for all sources affected by the project, including stationary and mobile sources. The detailed emission calculation assumptions and background data for emission sources are contained in Appendix E.

Under the proposed Western Expansion option, mined material would initially be transported by a combination of conveyor belt system and on-site haul trucks to the aggregate plant at the existing operation for processing. A conveyor belt system for transport may eventually be installed. Under the proposed Northern Expansion option, the applicant proposes to move the crusher to the west. The conveyor would remain in its current location, but would be extended, as needed, to move crushed rock from the new crusher location to a stockpile area where the crusher is presently located.

The existing use permit for the concrete batch plant allows the plant to be located anywhere on the parcel. As part of the existing operation the owner recently moved the plant out of the flood zone and further from Highway 116. As mining proceeds into either expansion area, the operator does not anticipate the need for additional equipment, although over time old equipment would be replaced with new and more modern equipment. Longer conveyors may be constructed to move excavated rock to the existing crushers and screening equipment.

In order to determine an air quality impact, the emissions resulting from the project were compared to a baseline. For purposes of this EIR, the baseline emissions for stationary sources were developed for the most recent five-year period from 1998 to 2002 using an average annual sales level of 375,000 CY per year, and project impacts were compared to this baseline.

For purposes of this analysis, two years were analyzed: 2007 and 2021. It is expected that the project could be initiated as soon as 2007 when the capacity of the existing approved mining area is estimated to be exhausted (assuming existing production rates continue). Impacts in 2021 were assessed consistent with the future horizon year assessed for traffic in this EIR. Cumulative impacts were evaluated both on a local and regional basis.

Emission factors were determined based on methodology found in publications and databases including EPA's *Compilation of Air Pollutant Emission Factors* (AP-42) and CARB documentation for the stone processing, concrete batching, and other fugitive sources, EPA's NONROAD emission model for offroad equipment, and EMFAC2002 for motor vehicles. Detailed information concerning the emission factors and other pertinent assumptions are contained in Appendix E.

PROJECT OPERATION

Impact IV.B.1: The proposed project would generate emissions of criteria pollutants (PM10, SO_2, NO_x, ROG, and CO) on the project site and along haul routes. Project-generated emissions in 2007 and 2021 would be below the applicable significance threshold for each criteria pollutant. This would be a less than significant impact under the Western or Northern Expansion options.

Air quality impacts would be associated with all phases of quarry operation but are most prevalent during the processing and transportation operations. Rock and crushed stone products are generally first loosened by drilling and blasting, then worked and transported by heavy earth moving equipment. Processing operation dust is generated mainly by the crushing and screening phases. As rock particulates are broken by rapid compression, the dust particulates become airborne. When conveyors drop screened aggregate onto stockpiles, additional dust particulates can escape and become airborne. Fugitive dust is also generated by loading and hauling vehicles in use on the site or along access roads. Fugitive dust also includes the reentrainment of settled dust by wind or machine movement. Vehicular and site equipment exhaust emissions can be generated by a variety of gasoline and diesel-powered equipment.

Particulate emissions from concrete batch plants consist primarily of cement dust, although some sand and aggregate dust emissions also occur during batching operations. There is also the potential for dust emissions during the unloading and conveying of concrete and aggregates and during the loading of dry-batched concrete mix.

Air emissions were determined for the project accounting for the proposed production level increases (from the five-year annual average baseline of 375,000 CY to the worst-case maximum permitted annual production sales of 500,000 CY), the number, types, and size of equipment, the type of material processed, and any emission controls. Fugitive emissions were accounted for the quarry's main aggregate plant, the Class II plant, and the recycling plant, as well as the portable power screen, the rip rap operation, the wet plant, and the concrete plants. In addition, emissions associated with all mobile on-site equipment and off-site haul trucks were accounted for.

Table IV.B-6 displays total emissions from the quarry for 2002 (existing conditions), the five-year (1998-2002) annual average baseline, as well as baseline plus project conditions in 2007 and 2021, and the estimated net change in annual air emissions in 2007 and 2021 (i.e., net addition or reduction in emissions compared to the five-year average annual baseline condition). Table IV.B-7 presents the estimated net change in annual air emissions due to the project in 2007 and 2021 (as compared to baseline conditions), by emissions source, and a comparison of the total net change in each criteria pollutant compared to their respective regulatory significance thresholds for 2007 and 2021. Table IV.B-7 shows total net project annual emissions of PM10, NO_x, ROG, SO_2, and CO would be less than the respective significance thresholds in 2007 and 2021.

As shown in Table IV.B-7, project emissions of PM10 and SO_2 would experience a net increase in 2007 and 2021 compared to baseline conditions; however, emissions of ROG, NO_x, and CO would experience a net decrease.[3] The majority of the project net increases in SO_2 in 2007 and 2021 would be associated with increases in usage of on-site nonroad equipment and on-site truck usage under the worst-case production scenario (increase of 125,000 CY per year); although the component of SO_2 emissions

3 As shown in Table IV.B.6, existing (2002) emissions are greater than baseline (1998-2002) annual average emissions. Consequently, when alternatively comparing the project to existing conditions, net increases in emissions of PM10 and SO_2 in 2007 and 2021 would be less than that identified for baseline conditions, and net decreases in emissions of ROG, NO_x, and CO would be greater than that identified for baseline conditions.

TABLE IV.B-6
ESTIMATED EXISTING, BASELINE AND PROJECT EMISSIONS FOR CANYON ROCK QUARRY

	Emissions (tons per year)					
	SO_2	NO_x	PM10	ROG	CO	DPM
Existing Conditions (2002)	7.60	82.6	31.2	11.8	117	4.26
Five-Year Annual Average Baseline (1998-2002)	6.45	73.8	26.5	11.4	122	3.71
Baseline plus Project in 2007	8.11	71.5	33.7	10.3	97	3.11
2007 Project Net Change[a]	*+1.66*	*-2.3*	*+7.2*	*-1.1*	*-25*	*-0.61*
Baseline plus Project in 2021	8.15	22.2	32.3	3.3	28	1.69
2021 Project Net Change[a]	*+1.70*	*-51.6*	*+5.8*	*-8.1*	*-94*	*-2.02*

[a] Net addition or reduction in emissions compared to the five-year average annual baseline condition (1998-2002).

SOURCE: Environmental Science Associates, 2003

contributed by the project's off-site haul truck component would decrease compared to baseline conditions. The majority of net increases in PM10 in 2007 and 2021would be the result of the increase in production levels of on-site processing equipment assumed for the worst-case project scenario, causing greater fugitive dust; although the component of PM10 emissions contributed by the project's off-site haul truck component would decrease compared to baseline conditions.

Projected net decreases in ROG, NO_x, and CO (and decreases in the project's off-site haul truck component of SO_2 and PM10 emissions) in 2007 and 2021 are the result of future decreases in emission factors for project equipment and mobile sources, due to typical replacement cycles of older equipment, and implementation of the EPA's HD 2007 program and DPM reduction programs.

Recently proposed emission standards for nonroad diesel engines would have even greater benefits towards decreasing PM10 and SO_2 emissions (although not accounted for in this analysis). Under this proposed rule, SO_2 emission factors for heavy-duty highway trucks in 2007 and 2021 would be at 12% of the value for 2002. In 2021, CO, ROG, PM10, and NO_x emission factors would be approximately 20% of the values for 2002.

Other than differences between the location/proximity to sensitive receptors, there are no substantial differences between potential air quality impacts under the Western and Northern Expansion options. This is in large part because the majority of the gravel processing operations would remain at its existing location with either option. Proposed equipment relocation as part of the expansion plans would place equipment approximately 1,200 feet further into the quarry and behind existing landforms. Secondly, most sensitive receptors tend to be at higher elevations than quarry operations which would serve to limit

TABLE IV.B-7
TOTAL ESTIMATED NET CHANGE IN PROJECT EMISSIONS IN 2007 AND 2021[a]

Operation	Net Change in Emissions (tons per year)[a]									
	SO_2		NO_x		PM10		ROG		CO	
	2007	2021	2007	2021	2007	2021	2007	2021	2007	2021
Stone Processing	NA	NA	NA	NA	5.41	5.41	NA	NA	NA	NA
Concrete Batching	NA	NA	NA	NA	0.77	0.77	NA	NA	NA	NA
Wind Erosion	NA	NA	NA	NA	0.02	0.02	NA	NA	NA	NA
Blasting	NA	NA	NA	NA	0.01	0.01	NA	NA	NA	NA
Unpaved Roads	NA	NA	NA	NA	1.40	1.40	NA	NA	NA	NA
Handling/Storage	NA	NA	NA	NA	0.13	0.13	NA	NA	NA	NA
Nonroad Equipment	0.94	0.98	-0.56	-4.51	-0.18	-0.30	-0.08	-0.53	-0.06	-0.10
On-site Trucks	1.13	1.13	-2.22	-5.07	-0.15	-0.19	-0.07	-0.35	-0.10	-1.32
Off-site Haul Trucks	-0.41	-0.41	0.49	-42.01	-0.23	-1.48	-0.91	-7.22	-24.4	-92.5
Total Net Change in Project Emissions	1.66	1.70	-2.29	-51.6	7.18	5.77	-1.06	-8.10	-25	-94
Significance Threshold [b]	40	40	40	40	15	15	40	40	100	100

a Net addition or reduction in emissions compared to the five-year average annual baseline condition (1998-2002).
b DPM particles are typically small enough to be considered part of PM2.5 emissions. PM2.5 is considered a criteria pollutant. However, there are currently no regulatory significance thresholds for DPM or PM2.5 quantities. Potential DPM impacts are discussed in Impacts IV.B.3, IV.B.4 and IV.B.7.

NA = Not applicable.

SOURCE: Environmental Science Associates and Northern Sonoma County APCD, *Rules and Regulations*.

air quality impacts. Thirdly, gravitational settling (especially of larger particulates) tends to deposit particulate closer to the facility. Ambient concentrations of PM10 would be benefited by these factors.

As described in the Setting of this section, Canyon Rock Quarry currently employs numerous control measures to reduce dust and exhaust emissions, including the paving of the main quarry entrance and in the vicinity of the office; the use of tire scrapers near the quarry exit; use of water trucks to dampen unpaved circulation areas; use of water misters for many of the quarry's deck screens and conveyers, and use of a diluted chemical dust suppressant in the quarry's crusher while it is operating. The quarry has recently purchased seven new haul trucks (for on-site) built with electronically controlled engines subject to more stringent emissions standards for improved exhaust emissions and efficiency compared to the replaced equipment. In addition, under the quarry's existing reclamation plan, annual hydroseeding would continue to be applied to slopes within the existing vested rights and permitted mining area for erosion control and dust control.

Under either the Western or Northern Expansion option, all existing air and dust control measures currently implemented should be maintained, and expanded as necessary. As normal practice, the quarry would continue to replace older equipment with newer and thus, more fuel efficient (less polluting) ones. As proposed emission standards for nonroad equipment are established, upgrades would be incorporated into the equipment used at the quarry.

Under either the Western or Northern Expansion option, a new second vehicular exit from the quarry is also proposed. The proposed exit would provide an approximate 0.3-mile paved road within the quarry over which trucks would travel before exiting onto Highway 116. Over this distance, much of any potential remaining aggregates and mud on the exiting truck tires would be removed.

Under the proposed reclamation plan for the Western or Northern Expansion options, annual hydroseeding would be applied each fall to slopes in the expansion area from which material would not be needed during the winter/spring months. When mining within a particular area is exhausted, then final erosion control measures would be implemented. In addition to erosion control, these measures would provide dust control.

Mitigation: None required. The project's emissions of criteria pollutants are determined to be less than significant. However, see Impact IV.B.5 for potential impacts and mitigation associated with local cumulative increases in PM10 at nearby receptors. See also erosion control measures identified in Section IV.D, Hydrology and Water Quality, which will serve to further reduce potential air quality effects of the project.

Impact IV.B.2: The proposed project would generate localized CO emissions at intersections in the project vicinity in 2007 and 2021 that would be below baseline conditions. This would be a less than significant impact under the Western or Northern Expansion options.

There is expected to be additional hauling trucks associated with the project. The proposed project would result in approximately 176 net new daily aggregate truck trips (one-way) under average conditions (peak day in peak month), and approximately 24,648 net new annual aggregate one-way truck trips (see Section IV.A, Transportation and Traffic for further explanation). Approximately 40 percent of the material produced in the quarry goes towards Santa Rosa and northern county markets, 50 percent heads toward southerly markets, and about 10 percent is used by westerly markets. Accordingly, a conservative trip distance of 50 miles (each way) was used; this represents a distance within the North Coast Air Basin only. The emissions of CO related to the expected vehicle trips in both 2007 and 2021 would be reduced as compared to the five-year average annual baseline condition (1998-2002). CO emissions would reduce by 24.5 tons per year in 2007, and by 93.9 tons per year in 2021 compared to baseline conditions.[4] Thus, project CO emissions would be less than the 100 tons per year significance levels (due to decreasing

[4] Existing (2002) CO emissions are greater than baseline (1998-2002) annual average CO emissions. Consequently, when alternatively comparing the project to existing conditions, net decreases in emissions CO would be greater than that identified for baseline conditions.

emission factors for future years). Therefore, this would constitute a less than significant increase, and CO hotspot analysis at specific intersections was not warranted.

The Canyon Rock Quarry employs approximately 22 people. No additional employment (and no additional commuter traffic and associated CO emissions) is anticipated with the proposed expansion.

Mitigation: None required.

Impact IV.B.3: The proposed project would generate DPM emissions along haul routes in 2007 and 2021 that would be below baseline conditions. This would be a less than significant impact under the Western or Northern Expansion options.

DPM emissions were calculated for the off-site haul trucks for baseline conditions and for project conditions in 2007 and 2021. The detailed emission calculations are presented in the Air Quality Technical Appendix (Appendix E). The estimated baseline DPM emissions are 2.14 tons per year. For 2007 and 2021, the estimated DPM emissions account for the increased production from the project under the worst-case production scenario, as well as the phasing-in of cleaner on-road diesel engines that would be used on the project. DPM emissions related to the project in 2007 and 2021 from off-site haul trucks would decrease from the five-year (1998-2002) average annual baseline conditions.[5] Consequently, off-site haul trucks generated by the project in 2007 and 2021 would not increase exposure to DPM emissions above baseline conditions. Projected net decreases in the project haul truck DPMs in 2007 and 2021 (-0.28, and -1.53 tons per year, respectively) are the result of future decreases in emission factors for project off-site mobile sources as specified by CARB, due to typical replacement cycles of older equipment, and implementation of the EPA's HD 2007 program and DPM reduction programs.

Mitigation: None required.

Impact IV.B.4: The proposed project would generate DPM emissions from on-site mobile sources in 2007 and 2021 that would be below baseline conditions. However, on-site sources of mobile diesel equipment would move closer to individual off-site receptors under the expansion options which would have the potential to increase exposure to project DPM emissions at these receptors. This would be a potentially significant impact under the Western or Northern Expansion options.

DPM emissions were calculated for the on-site diesel equipment and for on-site haul trucks for baseline conditions, and for project conditions in 2007 and 2021. The detailed emission calculations are presented in the Air Quality Technical Appendix (Appendix E). For 2007 and 2021, the estimated DPM emissions reflect the increased production from the project (i.e., from the five-year annual average baseline of

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5 Existing (2002) DPM emissions are greater than baseline (1998-2002) annual average DPM emissions. Consequently, when alternatively comparing the project to existing conditions, net decreases in emissions DPM emissions would be greater than that identified for baseline conditions.

375,000 CY to the worst-case maximum permitted annual production sales of 500,000 CY), as well as the phasing-in of cleaner off-road diesel engines that would be used on the project. DPM emissions related to the project in 2007 and 2021 from on-site equipment and on-site haul trucks would decrease from baseline conditions.

However, over the life of proposed use permit for the quarry, certain on-site quarry mobile operations (e.g., backhoes, loaders), would gradually move westward under the Western Expansion, and north under the Northern Expansion option. Consequently, under the Western Expansion option, those on-site quarry mobile operations would gradually move closer to individual off-site sensitive receptors to the southwest and west of project site, and further away from off-site receptors located northeast, east, and southeast of the existing quarry area. Under the Northern Expansion option, those on-site quarry mobile operations would gradually move closer to individual off-site sensitive receptors to the west, northwest and north of project site, and further away from off-site receptors located south, southeast and east of the project site. The gradual relocation of on-site mobile sources of equipment associated with the project closer to some off-site receptors would have the potential to increase exposure to DPM emissions at those receptors.

The significance criteria used for this EIR considers an incremental increase of 10 cancers per million over a 70-year exposure of DPMs, which would correspond to a concentration of DPMs of 0.033 $\mu g/m^3$. In order to evaluate the associated exposure to those receptors from relocated mobile operations, a screening model analysis was conducted using the EPA's SCREEN3 model (Version 96043). This screening model was used to predict ranges at which project contributions of DPM could exceed the 0.033 $\mu g/m^3$ criteria.

The SCREEN3 model was executed using the regulatory default options (stack-tip downwash, buoyancy induced dispersion, final plume rise), default wind speed profile categories, default potential temperature gradients, no pollutant decay, using rural dispersion coefficients. These are the most conservative assumptions for this model. See additional information on SCREEN3 air quality model in Appendix E.

This EIR assumes that the project mobile equipment would be in the respective expansion areas over a 70-year exposure period, even though the project would be limited to 20-year duration under the proposed use permit. In addition, emission sources were based on typical annual equipment usage of those type of equipment with the worst case daily emission rates. When considering these conservative project assumptions, along with the conservative assumptions used for the model (e.g., worst-case conditions for meteorology, terrain, etc.), the resulting exposure results identified in this EIR are considered highly overstated.

The ranges at which project contributions of DPM could exceed the 0.033 $\mu g/m^3$ criteria were predicted for three receptors that would be located closest to the expansion areas, including No. 15, located east of the Northern Expansion option; No. 8, located west of the Northern Expansion option and northwest of the Western Expansion option; and No 16, located south of the Western Expansion option (see Figure IV.C-1 for location of receptors). Using the conservative assumptions outlined above, the distances at which the project contribution of DPM would be less than the 0.033 $\mu g/m^3$ criteria ranges from 1,600 to 2,100 feet to the center of operations of the applicable expansion option. Because the receptors would be located closer than these distances, it is possible that these receptors would be exposed to DPM concentrations in excess of 0.033 $\mu g/m^3$. It is therefore that a potential for a significant impact would exist. Implementation of the Mitigation Measure IV.B.4a-b, below, however, would mitigate potential DPM exposure effects to a less than significant level.

Mitigation Measure IV.B.4a: Canyon Rock Quarry shall implement emission reductions of DPM on quarry on-site mobile equipment or through the acquisition of improved performance equipment that contain DPM reduction controls.

Controls, such as retrofitting non-road equipment engines with CARB-certified DPM filters and catalysts while using ultra low sulfur fuel (ULSD), when available, would reduce DPM emissions from equipment by 85%. The traps catch the particulate matter and allow the catalysts to "burn" the DPM when using ULSD. With the use of CARB-certified catalysts only in conjunction with ULSD, the control efficiency is about 50%.

The loaders/backhoes represent the largest annual emission rates of the total nonroad equipment (over 50%). There are currently eight loaders and one backhoe on-site. Thus, the mitigation measures will concentrate on the quarry's loaders/backhoes. One option would be to use only CARB-certified catalysts in conjunction with ULSD on all operating loaders/backhoes. Alternatively, CARB-certified filters and catalysts could be used on five of the nine operating loaders/backhoes in conjunction with ULSD, if all the loaders would operated at a similar annual rate. With the implementation of either of these options, approximately 50% control efficiency on the loaders/backhoes would be achieved, and the incremental health risk would be less than 10 per million at all off-site receptors, and correspondingly, less than significant.

Mitigation Measure IV.B.4b: Canyon Rock Quarry shall properly tune its nonroad equipment.

Significance after Mitigation: Less than Significant.

CUMULATIVE

Impact IV.B.5: On-site sources of fugitive dust generated by the proposed project would have the potential to contribute to episodes of local cumulative increases in PM10 at nearby receptors. This would be a potentially significant impact under the Western or Northern Expansion options.

As discussed in Impact IV.B.1, above, continuing normal operation of the project would generate emissions of PM10 on the project site and along haul routes that would be below the applicable significance threshold for this pollutant. However, within the normal range of operation, 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 Highway 116 near the project entrance, despite the existing and proposed dust suppression techniques and design elements at the project site (discussed in Impact IV.B.1). This would be a potentially significant impact when those episodes occurred. Due to the local nature of such events, the dust nuisance episodes created by the proposed project could potentially combine with similar dust nuisance episodes created at the Blue Rock Quarry to aggravate this nuisance.

Mitigation Measure IV.B.5: A comprehensive dust control program shall be implemented by project applicant that will expand on the quarry's existing and proposed dust control measures to further reduce impacts from the project.

Currently, Canyon Rock Quarry has several air quality permits and dust control measures to control fugitive dust emissions. Canyon Rock Quarry shall continue to comply with these permits and measures. The following dust control program presented below enhances and expands on the quarry's existing dust control program. 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 would be necessary 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 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.
- Limit the amount of the disturbed area at any one time (see Hydrology and Water Quality section).
- Designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust offsite.
- 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.
- In the absence of areas containing existing natural or manmade wind breaks, install wind breaks or plant trees/vegetative wind breaks at the predominant windward side of activity areas.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways, as needed.
- 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.
- The operator shall have at least one employee who is a certified visual emissions evaluator.

Mitigation Measure IV.B.5 would also serve to further mitigate erosion-generated dust effects discussed in Section IV.D, Hydrology and Water Quality; and V.B, Geology, Seismicity and Mineral Resources. 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 cumulative localized dust episodes in the project vicinity.

Significance After Mitigation: Less than Significant.

Impact IV.B.6: The proposed project, together with anticipated cumulative development in the area, would contribute to regional criteria pollutants. This would be a less than significant impact under the Western or Northern Expansion options.

Northern Sonoma County is in nonattainment of the state standards for PM10. As discussed in the Setting, Air District officials have indicated that of the PM10 violations that have occurred in the last few years, exceedances appear to be associated primarily with wood combustion in residential fireplaces. Project PM10 emissions, when considered individually, would be below regulatory thresholds for this criteria pollutant (see Impact IV.B-1). Although the proposed project would have the potential to contribute to episodes of local cumulative increases in PM10 at nearby receptors (Impact IV.B-5), mitigation is identified to ensure project's contribution to any cumulative localized dust episodes in the project vicinity would be less than significant. As a result of these factors, the project's contribution to regional PM 10 issues would similarly be less than significant.

With respect to other criteria pollutants (SO2. NOx, ROG, and CO), when considered individually, the project-generated pollutants would all be below the respective regulatory thresholds (see Impact IV.B-1). In fact, project-associated NOx, ROG, and CO are estimated to decrease in 2007 and 2021 when compared to baseline conditions. Northern Sonoma County was recently redesignated an attainment area for ozone. As a consequence of all these factors, the project's contribution to these criteria pollutants on a regional basis would also be less than significant.

For these reasons, the project's effect on regional air quality, therefore, would not be cumulatively considerable.

Mitigation: None required. The project's contribution to cumulative criteria pollutants are determined to be less than significant. However, see Impact IV.B.5 for potential impacts and mitigation associated with cumulative increases in PM10 at nearby receptors. See also erosion control measures identified in Section IV.D, Hydrology and Water Quality, which will serve to further reduce cumulative air quality effects of the project.

Impact IV.B.7: On-site sources of mobile diesel equipment that would move closer to individual off-site receptors under the expansion options would have the potential to contribute to cumulative increases in DPM exposure at individual receptors. This would be a potentially cumulatively significant impact under the Western or Northern Expansion options.

As discussed in Impact IV.D.4, project-generated DPM emissions at the project site in 2007 and 2021 from on-site equipment and on-site haul trucks would decrease compared to baseline conditions. However, the gradual movement of certain on-site mobile equipment closer to certain sensitive receptors would have the potential to increase exposure to DPM emissions to those receptors. When considered in combination with potential increases in diesel emissions that would be associated with other sources of DPM emissions in the vicinity (including the proposed Blue Rock Quarry expansion project), the project would have the potential to contribute to cumulative exposure to DPM emissions at these receptors.

On a regional basis, since the on-site and off-site sources of DPM emissions in 2007 and 2021 would be lower than baseline conditions, the project's contribution to increases in cumulative diesel emissions would be negative. Consequently, the project would not contribute to regional increases in DPM emissions.

Mitigation Measure IV.B.7: Implement Mitigation Measures IV.B.4a-b.

Significance after Mitigation: With implementation of these measures, the project's contribution to potential cumulative increases in DPM exposure at nearby off-site receptors would be mitigated to a less than significant level.

REFERENCES – Air Quality

Association of Bay Area Governments, Bay Area Air Quality Management District, Metropolitan Transportation Commission, *San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard*, June 1999.

Association of Bay Area Governments, Bay Area Air Quality Management District, Metropolitan Transportation Commission, *Adopted Revised Bay Area 2001 Ozone Attainment Plan*, October 2001.

Bay Area Air Quality Management District, *BAAQMD CEQA Guidelines – Assessing the Air Quality Impacts of Projects and Plans*, December 1999.

Bay Area Air Quality Management District, *Bay Area 2000 Clean Air Plan*, December 2000a.

Bay Area Air Quality Management District. 2000. *Toxic Air Contaminant Control Program, 1999 Annual Report*, December 2000.

Bay Area Air Quality Management District, 2003, Ambient Air Quality Standards and Attainment Status, http://www.baaqmd.gov/planning/resmod/baas.htm

California Air Resources Board. 2000. State and National Area Designations Maps of California, 2001. http://www.arb.ca.gov/desig/desig.htm

California Air Resources Board, *Forecast Emissions by Summary Category Reports*, February 2003 and the 2002 *California Almanac of Emissions and Air Quality*. http://www.arb.ca.gov/emisinv/emsmain/reportform.htm.

California Air Resources Board. 1997. *Unpaved Road Dust (Non-farm Roads)*, August 1997.

California Air Resources Board. 1992. *California Surface Wind Climatology,* June 1984, Amended January 1992.

California Air Resources Board. 1998. *California Starts up "Smog Check" for Diesel Trucks and Buses*, June 3, 1998.

California Air Resources Board. 2002. California Ambient Air Quality Data, 1980-2001, December 2002.

California Air Resource Board. 2002. EMFAC2002 Version 2.2, September 23, 2002.

Canyon Rock Company. List of Plant Equipment.

Carlile May, 1997. Surface Mining Application and Reclamation Plan for Canyon Rock Company – Western Expansion Alterative. November 1997.

Carlile May, 2002. Surface Mining Application and Reclamation Plan for Canyon Rock Company – Northern Expansion Alterative. September 2002.

Environmental Protection Agency. 1991. Nonroad Engine and Vehicle Emission Study. November 1991.

Environmental Protection Agency. 1995. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 13.2.4 Aggregate Handling and Storage Piles, January 1995.

Environmental Protection Agency. 1995. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 11.19.2 Crushed Stone Processing, January, 1995.

Environmental Protection Agency. 1995. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 13.2.5 Industrial Wind Erosion, January 1995.

Environmental Protection Agency. 2000. NONROAD Emissions Inventory Model, Version 2.2, June 2, 2000.

Environmental Protection Agency. 2001. Federal Register, Control of Air Pollution from New Motor Vehicles Heavy-Duty Engine and Vehicle Standards and highway Diesel Fuel Sulfur Control Requirements: Final Rule, January 18, 2001.

Environmental Protection Agency. 2001. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 13.2.2 Unpaved Roads, October, 2001.

Environmental Protection Agency. 2001. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 11.12 Concrete Batching, October, 2001.

Environmental Protection Agency. 2002. Health Assessment Document for Diesel Engine Exhaust (EPA/600/8-90/057F), May 2002.

J. Phyllis Fox, Ph.D. Environmental Management, Exhibit to Shute, Mihaly & Weinberger, LLP. comment letter on the Canyon Rock Quarry Initial Study and Mitigated Negative Declaration, August 16, 2000.

Northern Sonoma County Air Pollution Control District (NSCAPCD), personal communication with Alex Saschin, March 4, 2004.

Northern Sonoma County Air Pollution Control District (NSCAPCD), *Forestville Air Quality Summary*, presented by Sonoma County Supervisor Mike Riley at October 4, 2003meeting in Forestville, 2003.

North Coast Unified Air Quality Management District, *Air Quality Control Rules,* September 25, 1998.

North Coast Unified Air Quality Management District, *Particulate Matter Attainment Plan,* May 11, 1995.

Sonoma County. 1994. Sonoma County General Plan, March 23, 1989, April 9, 1991 (revised), March 1, 1994 (revised).

Sonoma County Aggregate Resource Management Plan and Environmental Impact Report. November 1994.

Wieringa, J. 1998. *How far can Agrometeorological Station Observations be Considered Representative?* Preprint to 23rd American Meteorological Society Conference on Agricultural and Forest Meteorology.

IV.C NOISE

INTRODUCTION

This section provides an assessment of the potential noise impacts that may arise from the implementation of either one of the expansion options proposed for Canyon Rock Quarry. This section includes basic information on noise measurement and assessment, applicable noise regulations and guidelines, an evaluation of the existing noise environment, an assessment of expected noise levels, and potential noise mitigation strategies. As much of the preliminary information related to either the Western or Northern Expansion option is common to both, they are treated together up to the actual assessment of potential noise impact specific to areas of either expansion. This section is based upon a noise study prepared by Illingworth and Rodkin, Inc. in support of this EIR (Illingworth and Rodkin, Inc., 2003).

ENVIRONMENTAL NOISE FUNDAMENTALS

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

There are several methods of characterizing sound. A decibel (dB) is a unit of sound energy intensity. Sound waves, traveling outward from a source, exert a sound pressure level (commonly called "sound level") measured in dB. Environmental noise is usually measured in A-weighted decibels (dBA). An A-weighted decibel (dBA) is a decibel corrected for the variation in frequency response to the typical human ear at commonly encountered noise levels. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive for typical environmentally occurring sounds. Representative noise levels in units of dBA are shown in Table IV.C-1. Additional definitions of acoustical technical terms are defined in Table A in Noise Appendix F.

Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Typical noise descriptors include the energy-equivalent noise level (L_{eq}) the day-night average noise level (L_{dn}), and the Community Noise Equivalent Level (CNEL)[1].

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[1] L_{eq}, the energy-equivalent noise level (or "average" noise level), is the equivalent steady-state continuous noise level which, in a stated period of time, contains the same acoustic energy as the time-varying sound level that actually occurs during the same period. DNL, the day-night average noise level, is a weighted 24-hour noise level. With the DNL descriptor, noise levels between 10:00 p.m. and 7:00 a.m. are adjusted upward by 10 dBA to take into account the greater annoyance of nighttime noise as compared to daytime noise. CNEL, the community noise equivalent level, is similar to DNL, but an additional 5-dBA "penalty" is added to evening noise (7:00 p.m. to 10:00 p.m.). DNL and CNEL are considered equivalent for most planning purposes. All L_{eq}, DNL, and CNEL values reported herein reflect A-weighted decibels unless otherwise stated.

TABLE IV.C-1
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

At a Given Distance From Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
	130		
Civil Defense Siren (100')			
	120		
Jet Takeoff (200')			Pain Threshold
	110		
		Rock Music Concert	
	100		
Diesel Pile Driver (100')			Very Loud
	90		
		Boiler Room	
Freight Cars (50')	80	Printing Press Plant	
Pneumatic Drill (50')			
Freeway (100')	70	In Kitchen With Garbage	
Vacuum Cleaner (10')		Disposal Running	Moderately Loud
	60		
		Data Processing Center	
	50		
		Department Store	
Light Traffic (100')			
Large Transformer (200')	40		
		Private Business Office	Quiet
Soft Whisper (5')	30		
		Quiet Bedroom	
	20		
		Recording Studio	
	10		
	0		Threshold of Hearing

SOURCE: Illingworth and Rodkin, 2003.

For sound propagation outdoors, some additional concepts are important. For an ideal "point" source, sound level decreases with distance due to the spreading out of sound waves originating from the source. This geometrical or spherical spreading results in a reduction of sound pressure level of 6 dB per doubling of distance from the source. The strength of the source is often characterized by its *sound power level*. Sound power level is independent of the distance a receiver is from the source and is a property of source alone. Knowing the sound power level of an idealized source and its distance from a receiver, sound pressure level at the receiver point can be calculated based on geometrical spreading.

The sound level due to spherical spreading can be modified further by a number of additional factors. The first is the presence of a reflecting plane such as the ground. For hard ground, a reflecting plane typically increases A-weighted sound pressure levels by 3 dB. If some of the reflected sound is absorbed by the surface, this increase will be less than 3 dB. Other factors affecting the predicted sound pressure level are often lumped together into a term called *excess attenuation*. Excess attenuation is the amount of additional attenuation that occurs beyond simple spherical spreading. For sound propagation outdoors, there is almost always excess attenuation producing lower levels than what would be predicted by spherical spreading. Some examples of these include attenuation by sound absorption in air, attenuation by barriers, attenuation by rain, sleet, snow, or fog, attenuation by grass, shrubbery, and trees, and attenuation from shadow zones created by wind and temperature gradients. For sound propagating over soft ground at near grazing angles of incidence, excess attenuations of 20 to 30 dB can be measured due to interference effect of the direct and reflected sound. Under certain meteorological conditions, some of these excess attenuations mechanisms are reduced or eliminated leaving spherical spreading as the primary determinate of sound level at a receiver location.

When more than one point source contributes to the sound pressure level at a receiver point, the overall sound level is determined by combining contribution of the sources. This is done by adding the individual sound pressures together. For two sources that are independent and equal, the combined level results in a 3 dB increase over the level of each alone. This is due to the logarithmic nature of sound level. In assessing environmental noise, a 3 dB increase in level is typically considered as just perceivable while an increase of 1 dB is difficult to detect.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental -noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

REGULATORY BACKGROUND

Noise from quarry operations is addressed in the Sonoma County Surface Mining and Reclamation Ordinance (SMARO), No. 5165. Article 26A-09, Section 26A-09-010, paragraph (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*. This paragraph further states "more stringent noise standards may be required as permit conditions when particular local circumstances warrant additional protection of potentially affected areas." However, no guidance is given as to when such circumstances may occur. The Noise Element, Section 2.7 entitled "Noise Associated with Mineral Extraction" states that the standards of the Noise Element are complementary to and consistent with the Ordinance. Thus, as a first level of regulatory consideration, the standards of Section 3.0 of the Noise Element can be used. In Section 3.1 regarding land use compatibility, the Noise Element sets forth Objectives and Polices to protect people from exposure to excessive noise. Through its policies, the Noise Element establishes thresholds for when noise impact occurs. These are defined as either when the L_{dn} or CNEL exceed 60 dB or when the standards defined in the Table NE-2 from the General Plan 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.

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 County 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 "L_n" metrics (see Table A in Appendix F) 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 L_2), the daytime standard is 70 dBA or lower. For a sound that lasts 5 minutes out of an hour or 8% of the time (L_8), the daytime noise standard 65 dBA. For a sound that lasts 15 minutes out of an hour or 25% of the time (L_{25}), the level cannot exceed 60 dBA. For a sound that lasts 30 minutes out of an hour (L_{50}), the level cannot exceed 55 dBA. For continuous sounds, the level cannot exceed 50 dBA.

For new project related noise sources, Policy NE-1c describes how the standards are to be interpreted for non transportation noise:

> "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 5 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 dBA if they exceed the ambient level by 10 or more decibels."

This policy is directed toward protecting residential land use. In the case of mixed-use areas such as that surrounding the quarry, some additional consideration needs to be made. In these situations, adjacent property lines may include agricultural uses intervening between the quarry and the residential use. Policy NE-1f also provides some additional guidance in these situations:

> "Require development projects which do not include or affect residential uses or other noise sensitive uses to include noise mitigation measures where necessary to maintain noise levels compatible with activities planned for the project site and vicinity."

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 L_{dn} and when interior levels exceed 45 dB L_{dn} with the doors and windows closed. If it is not practical to achieve the exterior level standard, levels up 65 dB L_{dn} are allowed as long as the interior standard is still met.

The Sonoma County Aggregate Resources Management Plan ARM Plan and EIR specifies that "(s)ignificant impacts from any mining project may occur if related noise levels increase three decibels in areas adjacent to haul roads and are raised above the performance standards set forth in the *Sonoma County General Plan* Noise Element for sensitive receptors or if net noise levels increase three decibels in adjacent areas which are currently designated as noise-impacted."

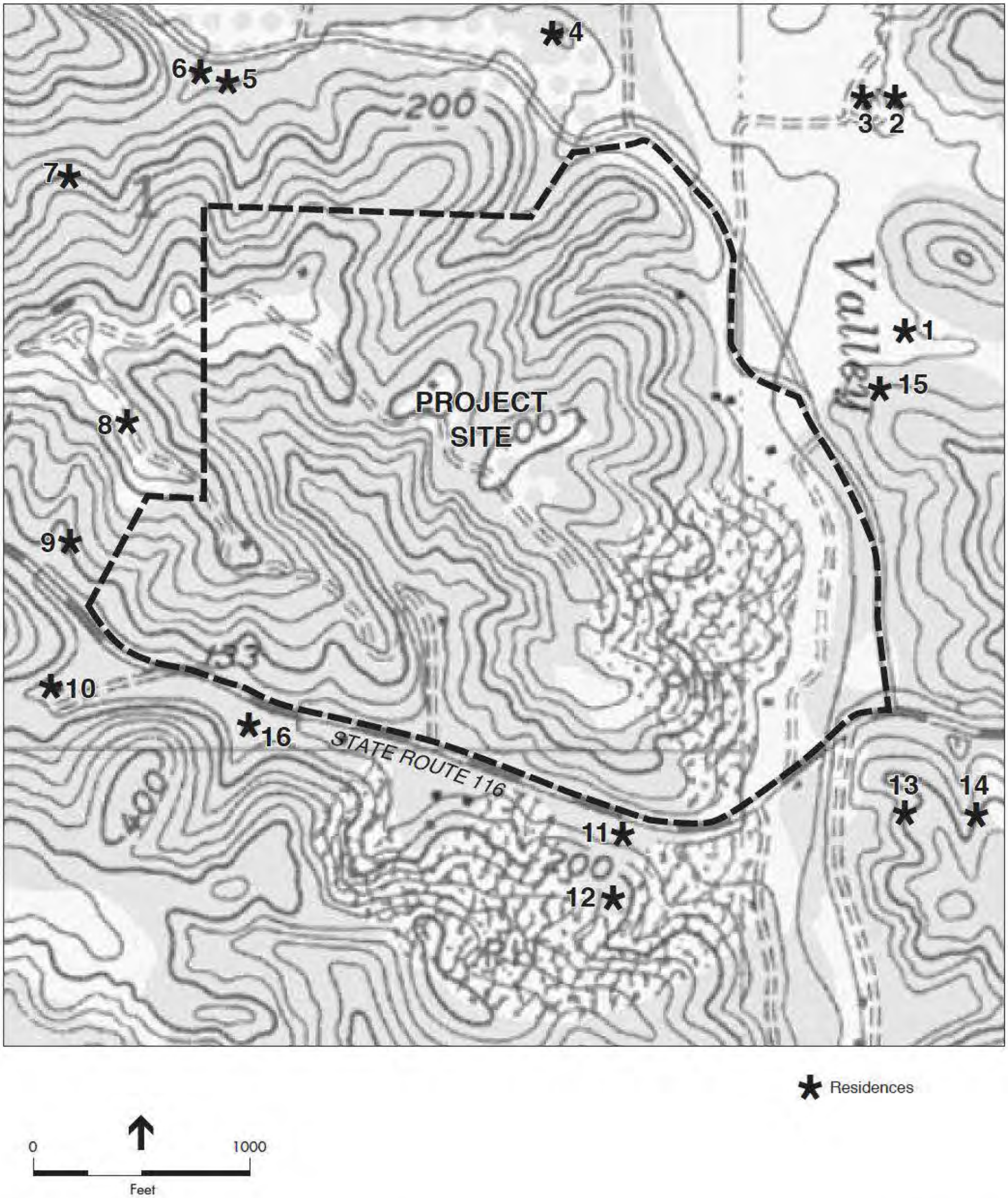
OFF-SITE SENSITIVE LAND USES

Some land uses are considered more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. Land uses such as residences, schools, libraries, churches, hospitals, and parks and other outdoor recreation areas generally are more sensitive to noise than are commercial and industrial land uses. The existing on-site residences (i.e., within the project boundary) are owned by Canyon Rock Quarry, and therefore, are not considered sensitive receptors for purposes of this EIR.

In general terms, the area surrounding the Canyon Rock Quarry site is rural in nature. The surrounding land uses tend to be agricultural with residences in the area, with the exception of the Blue Rock Quarry (across Highway 116). Figure IV.C-1 illustrates the location of existing off-site residences in the vicinity of Canyon Rock Quarry.

EXISTING NOISE ENVIRONMENT

The relevant noise sources include traffic on Highway 116 and Martinelli Road, and the two quarries (Canyon Rock and Blue Rock). Noise levels away from these noise sources can be quite low depending on the amount of nearby human activity. Because of the hilly topography of the area, significant amounts of excess sound attenuation can be experienced due to shielding effects. In some areas, dense forest that exists also affords some further excess sound attenuation.



SOURCE: Environmental Science Associates; Illingworth and Rodkin

Canyon Rock Quarry / 202697 ■

Figure IV.C-1
Existing Off-Site Residences in Vicinity of Project Site

To quantify the existing noise environment, noise levels were monitored on a 24-hour basis for periods of several days at eight locations.[2] Five of these were in the area in the direct vicinity of the quarry and three on roads in Forestville used by trucks hauling aggregate away from the two quarries. In addition to the long-term measurements, 16 short-term measurements were made. Eleven of these monitoring locations were on the quarry floor, two at locations distant from the quarry floor, but with line-of-sight, and three along roadways upon which aggregate hauling trucks operate. The length of these measurements ranged from a few minutes to an hour.

The location of the long-term measurement points (LT1 through LT5) and remote short-term measurement points (ST10 and ST11) surrounding the active Canyon Rock Quarry area are shown in Figure IV.C-2 and are further described in Table IV.C-2, below.[3,4]

NOISE LEVELS SURROUNDING ACTIVE CANYON ROCK QUARRY AREA

Long-Term Measurements

Figures 2 through 11 in Appendix F provides plots for long-term monitoring locations LT1 through LT5 that display the 1) hourly L_{eq} and L_n's over the complete period, and 2) the L_{50} level for each hour with the quarry workday as a parameter; and a detailed text description of these noise results. The following provides a summary of the noise results:

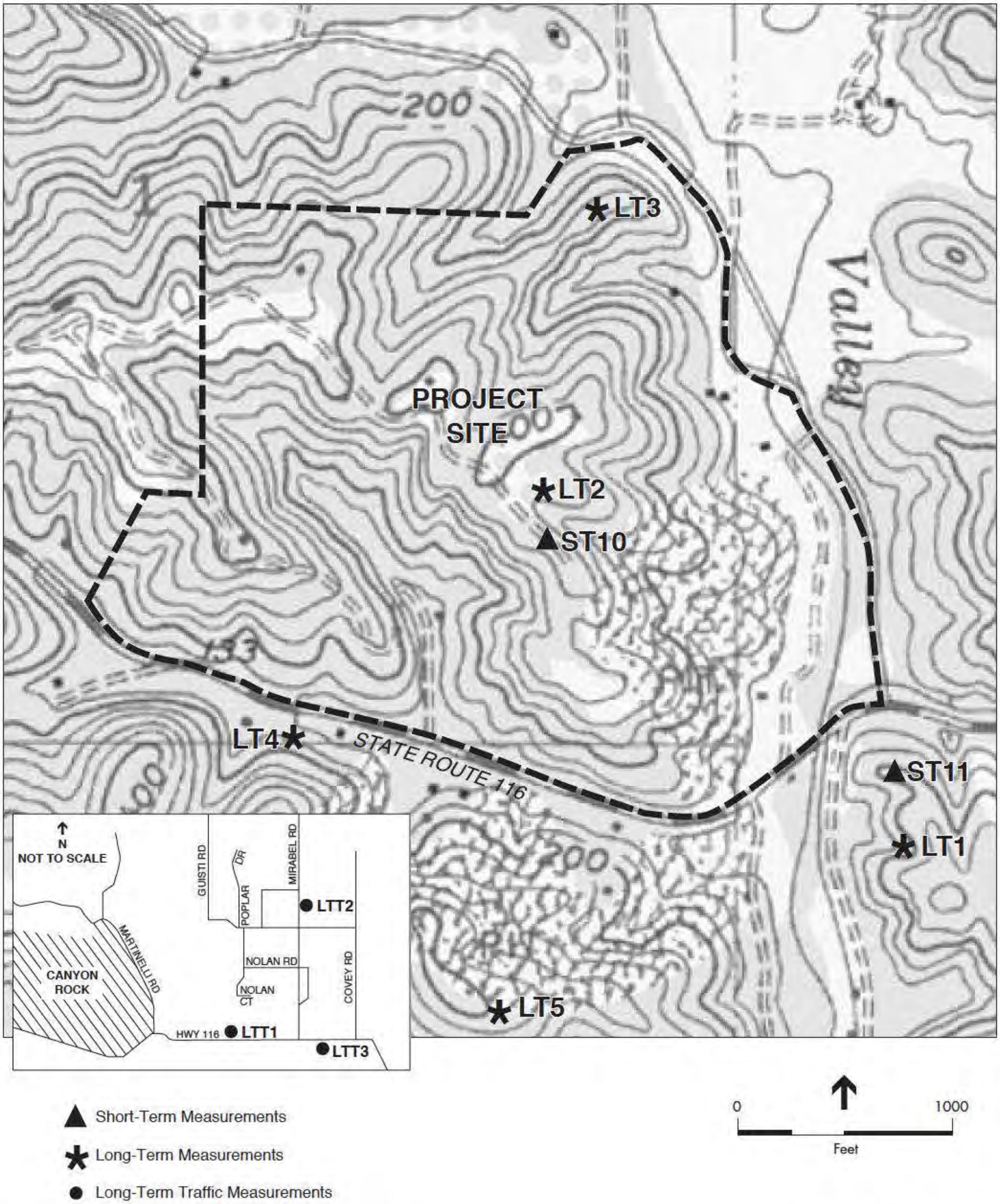
For LT1 and LT2, the noise data clearly shows the elevated noise levels and the cycle of existing quarry operation during the hours on workdays in which the quarry was operating (7:00 a.m. and 5:00 p.m.). The noise data also indicated the typical quarry noon-time hour break, during which quarry processing plants do not typically operate (although some operation of trucks and gravel moving equipment still occurs). In periods of lower noise throughout the day, existing noise levels in the vicinity are controlled by occasionally occurring individual events, such as vehicles on Highway 116 and/or Martinelli Road, as opposed to the very steady sounds produced by quarry operation.

2 The 24-hour noise levels were measured with a Larson-Davis (LD) precision Type 1 sound level meter fitted with a ½-inch pre-polarized condenser microphone and windscreen. The meter was calibrated before and after installation with a 114 dB, 1000 hertz Larson Davis acoustical calibrator. The monitoring stations were placed in trees typically about 10 ft above the ground away from suspected areas of human activity.

3 For sites LT1, LT2, and LT3, the levels were monitored from November 26 to December 4, 2002. Of the nine days included, four were holidays and weekend days during which Canyon Rock Quarry did not operate. Of the remaining operating days, three full days were captured along with two partial days. During the workdays, the quarry was operating all plants. Only data from the workdays were used for analysis. For LT4, the noise levels were monitored from the afternoon of December 4 to the morning of December 6, 2002. At the time of installation, no sound was audible from either the Canyon Rock or Blue Rock Quarry, although both were in operation. For LT5, the data was acquired from the afternoon of October 12 to the afternoon of October 18, 2001. On the weekdays at this site, the Blue Rock Quarry was operating along with Canyon Rock Quarry. On Saturday, only Canyon Rock Quarry was operating, while on Sunday, neither was operating. At this location, unusually high levels were monitored in the evening and nighttime hours on Friday, Saturday, and Sunday. The cause of these noises is not known, however, they were not associated with any quarry operations. In order to calculate 24-hour metrics at this location, data from the evening/nighttime hours of Monday, Tuesday, and Wednesday were used.

4 Short-term measurement at ST10 was made between 12:15 and 12:40 p.m. on December 3, 2002. Simultaneously, data was acquired at LT2 on a one-minute internal basis for comparison to ST10. Comparing the data from these two locations for the same time period indicated that the levels at LT2 were 12 dB lower than ST10. As the difference in distance between the locations was small, this reduction in noise level was due primarily to the shielding provided by the crest of the rim.

Short-term measurement ST11 was made between 1:35 and 1:42 p.m. on December 3, 2002at 1:35 p.m.



SOURCE: Environmental Science Associates; Illingworth and Rodkin

Canyon Rock Quarry / 202697

Figure IV.C-2
Location of Long-Term (LT), Remote Short-Term (ST), and Long-Term Traffic (LTT) Noise Measurements

TABLE IV.C-2
LONG TERM AND SHORT-TERM NOISE MEASUREMENT SITES SURROUNDING ACTIVE CANYON ROCK QUARRY

No.	Location Relative to Center of Operations	Description
LT1	~ 1000 ft SE	Line-of-sight to quarry partially obscured by trees, on hillside ~200 ft above Highway 116
LT2	~ 1150 ft NW	Forested area sloping to current edge of excavation, no line-of-sight to quarry; shielded by topography & trees
LT3	~ 2500 ft NWW	Forested area near hill top with intervening hills and valleys, at edge of proposed mineral resource district, no line-of-sight to quarry
LT4	~ 2500 ft W	92 ft south of Highway 116, no line-of-sight to Canyon Rock Quarry; ~ 1700 ft from Blue Rock Quarry, but shielded by topography
LT5	~ 1900 ft SSW	1050 ft south of Highway 116 at SE, no line-of-sight; ~ 1100 ft from Blue Rock Quarry operations, but shielded by topography
ST10	~ 1050 ft NW	Located at the top of the rim overlooking the quarry floor, approximately 100 feet closer than LT2. Line-of-sight to majority of all operations on the quarry floor.
ST11	~ 900 ft SE	Forested area sloping to current edge of excavation, overlooking majority of the quarry operations.

SOURCE: Illingworth and Rodkin, 2003

Due to its distance from the quarry and intervening topography, overall existing noise levels at LT3 are lower compared to those measured LT1 and LT2, and the cycle of operation of the quarry is not apparent. Rather, existing noise levels at this location were controlled by a continuous sound associated with one or more non quarry uses in the vicinity. Noise levels at LT4, located just off Highway 116 and several hundred feet west of the active Canyon Rock Quarry, was most influenced by existing traffic noise from Highway 116 (as exhibited by large difference between the L_1 and L_{90} measurements throughout the entire measurement period), even during the period in which both the Canyon Rock and Blue Rock quarries were operating.

As expected, at LT5 (located within the Blue Rock Quarry site), the existing noise from both quarries is the dominant contributor, with the majority of noise at this location attributable to the Canyon Rock Quarry. When just Canyon Rock Quarry was operating, the measured L_{50} and L_{eq} levels at this location were about 3 to 6 dB below the noise level experienced when both quarries are operating.

Averages for all of the hourly noise descriptors measured at each long-term location are presented in Table IV.C-3 for those hours in which the Canyon Rock Quarry was operating. For each hour of operation, the levels for the hours between 7 a.m. and noon and 1 p.m. and 5 p.m. were used for these

TABLE IV.C-3
AVERAGE NOISE OF LEVELS (DBA) AT
LONG TERM NOISE MEASUREMENT SITES SURROUNDING ACTIVE CANYON ROCK QUARRY DURING HOURS OF QUARRY OPERATION

Site	L_{eq}	L_1	L_2	L_8	L_{10}	L_{25}	L_{50}	L_{90}
LT1	59	63	62	61		60	59	55
LT2	47		51	50		48	47	
LT3	41		45			40	39	38
LT4	61	71	69	66		61	52	39
LT5	48	54			50		47	43
LT5[a]	53	58			55		53	50

[a] Canyon Rock and Blue Rock Quarries both operating

SOURCE: Illingworth and Rodkin, 2003

averages. (Tables A1 through A5 in Appendix F repeats this data along with the corresponding levels for the maximum and minimum hours and levels for nighttime and days when the quarry was not operating.) In considering this data, it should be recalled that at site LT3, no existing quarry related noise was measured and at site LT4, the noise was dominated by local traffic on Highway 116. Consequently, noise measurements at locations LT1, LT2, and LT5 give the best representation of Canyon Rock Quarry noise at varying distances and propagation circumstances away from the quarry.

The estimated CNEL and L_{dn} for the long-term sites are given in Table IV.C-4. For these data, the CNEL and L_{dn} were calculated for those days when the quarry was operating and those days when it was not. Where data were available, the metrics were averaged over days of the same condition (i.e., operating or not operating).

Short-Term Measurements

The measurement taken at ST10 measured noise produced by large front-end loaders loading a gravel truck with no quarry processing operations occurring at approximately 59 dBA at 1,030 feet. The measurement at ST11 measured the quarry in full operation, with activities including operations by a large front-end loader and truck loading concrete on the quarry floor at 67 to 68 dBA at a distance of about 550 feet; and steady level from the plants of about 64 dBA. Other non quarry measurements included passage of a public utilities heavy duty truck on Highway 116 at 69 dBA at about 210 feet.

TABLE IV.C-4
CNEL AND L_{DN} VALUES FOR LONG-TERM NOISE MONITORING SITES SURROUNDING ACTIVE CANYON ROCK QUARRY

Site	Description	CNEL, dBA	L_{dn}, dBA
LT1	Canyon Rock Operating	56	56
	Not Operating	50	49
LT2	Canyon Rock Operating	46	45
	Not Operating	42	42
LT3	Canyon Rock Operating	44	44
	Not Operating	44	44
LT4	Traffic Noise Dominated	62	61
LT5	Canyon Rock Operating	46	46
	Not Operating	44	43
	Canyon Rock & Blue Rock Operating	51	51

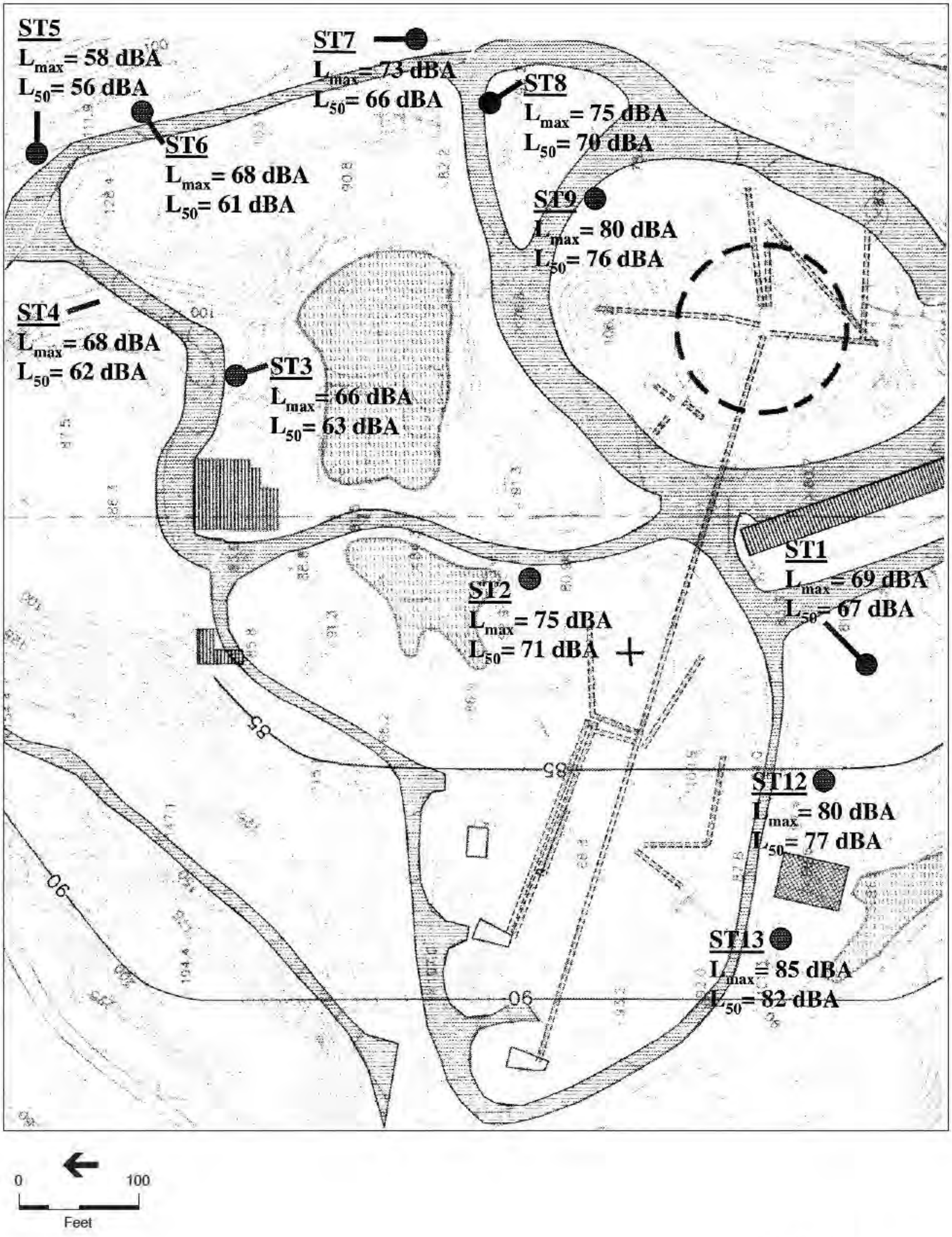
SOURCE: Illingworth and Rodkin, 2003

NOISE LEVELS ON THE QUARRY FLOOR

Short-term noise measurements were also made on the quarry floor in an effort to quantify the noise produced by specific on-site equipment and operations, and document the distribution of noise levels in the operations areas. The existing noise levels on the quarry floor tend to be comprised of both steady sounds from equipment such as the quarry's crushers and screens, and intermittent sounds from mobile equipment and transient events, such as feeding the various crushers and gravel haulers. On the quarry floor, within the operating area itself, levels can fluctuate considerably depending on what operations are occurring, how close they are to the measurement point, and the amount of shielding provided by piles of aggregate.

Altogether, measurements were made at 12 locations on the quarry floor.[5] During the times measurements were taken, the major pieces of equipment at the quarry were in operation. The locations of the measurements are shown in Figure IV.C-3, along with the measured maximum and median (L_{50}) A-weighted sound levels. In general, higher levels were measured near the main crusher, and the concrete recycling plant, with noise falling off for positions increasingly further north of these sources. (More complete data and photographs of the sites where available are presented in Figures B1 through B10 in Appendix F.)

[5] Ten of these short-term measurements were made on November 26, 2002 and two on December 3, 2002.



SOURCE: Illingworth and Rodkin

Canyon Rock Quarry / 202697 ■

Figure IV.C-3
Location of Short-Term Measurements on Quarry Floor near Various Operations

TRAFFIC NOISE MEASUREMENTS

Canyon Rock Quarry and the adjacent Blue Rock Quarry currently generate gravel haulers along major roadways, principally along Highway 116 and Mirabel Road in the project area. To quantify the existing noise generated on these roadways, including that generated by haul trucks, long-term and short-term traffic noise measurements were made at two locations along Highway 116, and one location along Mirabel Road in Forestville. The long-term traffic measurements were coordinated with the traffic study prepared for the quarries so that traffic volumes and the hourly noise levels (L_{eq}) could be compared and used to develop traffic models for each site. The first long-term traffic site (LTT1), at 7164 Highway 116, is located approximately halfway between Mirabel and Martinelli Roads. At this location, Highway 116 has a relatively steep positive grade heading east toward Forestville. The second site (LTT2) was located on a nearly level portion of Mirabel Road at the Forestville Youth Park, north of Highway 116. The third location (LTT3) was at 6625 Highway 116, near a small office complex in the commercial section of Forestville.[6,7] The location of the long-term traffic measurement locations are shown in Figure IV.C-2.

The CNEL and L_{dn} values for these measurement sites are provided in Table IV.C-5 for average of the weekday levels, Saturday and Sunday levels.

TABLE IV.C-5
CNEL AND L_{DN} VALUES FOR TRAFFIC NOISE IN FORESTVILLE

Site	Distance, ft	CNEL, dBA			L_{dn}		
		Weekday	Sat.	Sun.	Weekday	Sat.	Sun.
LTT1	31	71	70	68	71	69	68
LTT2	56	69	68	67	69	68	66
LTT3	48	70	69	68	69	68	67

SOURCE: Illingworth and Rodkin, 2003

Canyon Rock Quarry and the adjacent Blue Rock Quarry generate trucks hauling aggregate on weekdays and Saturdays, but do not operate on Sunday. A regular daily cycle in the levels at each noise measurement site is apparent in the hourly data plot, and only slightly different for each day of the week (see Figures C1 through C3 in Appendix F). From the traffic counts conducted during the time of the noise measurements, in the peak weekday a.m. and p.m. peak hours, the mix of quarry trucks to other traffic ranged from 5 to 12% for measurement location LTT1 (lower vehicle density section of Highway 116 west of Mirabel Road), and from 1 to 4% for measurement locations LTT2 and LTT3.

6 Long-term, 24-hour measurements were made at each from the period beginning the early afternoon of August 21 to approximately noon on August 28, 2001

7 The measurements for LTT1, LTT2, and LTT3 were made a distance of to the center of the roadway at 31 feet, 56 feet and 48 feet, respectively.

Short-term measurement of individual vehicle Single Event Levels (SEL) were also made at the noise measurement sites.[8] During the time spent at each site, the traffic was counted and categorized by vehicle classification. Averages of the measured SEL for different vehicle types at each location are presented in Table IV.C-6.

TABLE IV.C-6
MEASURED VEHICLE SINGLE EVENT LEVEL (SEL) AVERAGES AT LTT SITES

Site	Distance, (feet)	Light Vehicles	Medium Trucks	Heavy Trucks	Quarry Trucks
LTT1e	31	76		89	89
LTT1w			82	85	84
LTT2	56	72	81	82	82
LTT3	48	72	85	82	86

SOURCE: Illingworth and Rodkin, 2003

These data were normalized to 50 ft and further averaged to estimate hourly L_{eq} levels at each of the measurement sites based on the results of the traffic study at each site. Because of the grade of LTT1, the eastbound truck data for this site was analyzed separately. For comparison to the measured data, the levels were "re-propagated" back to the proper measurement distance. In this manner, L_{eq}'s measured during the short-term measurements were compared to the L_{eq}'s calculated based on the SEL's and actual traffic counted during the measurement interval.

Also, the typical weekday, daytime hourly L_{eq} from the long-term measurements was compared to the corresponding calculated Leq based on the SEL's and the data from the traffic study. Finally, using the traffic study data, the L_{eq} was calculated directly from the L_{eq}V2 noise model (a version of the Federal Highway Administration's noise prediction model) using the appropriate site-specific parameters. The results of these measurements and calculations are given in Table IV.C-7.

As shown in Table IV.C-8, the measured and calculated values for the short-term measurements and calculations are within 1 dB of each other. Similarly, the measured and calculated hourly long-term levels are within 1 dB. Finally, the measured hourly data and the results of the L_{eq}V2 model are within 1 dB. With this validation, the L_{eq}V2 model can be accurately used to evaluate projected truck traffic noise level changes under the project.

8 Short-term measurement of individual vehicle SEL levels were taken on August 22 between 11:30 a.m. and 1:35 p.m.

TABLE IV.C-7
COMPARISON OF MEASURED AND MODEL TRAFFIC NOISE

Site	Measured Short-Term L_{eq}	Calculated Short - Term L_{eq}	Measured Hourly L_{eq}	Calculated Hourly L_{eq}	L_{eq}V2 Model
LTT1	68	67	71	70	71
LTT2	65	65	67	66	68
LTT3	68	67	68	68	67

SOURCE: Illingworth and Rodkin, 2003

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 will result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Exposure of persons to or generation of excessive groundborne vibration or groundborne 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 levels existing without the project;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

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 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.

ASSESSMENT OF BASELINE NOISE

The results from the long-term monitoring were used to assess the areas surrounding Canyon Rock Quarry of areas where ambient noise levels are either currently within or exceed the County's noise standards. The County's standards used are (1) a CNEL or L_{dn} standard of 60 dB, and (2) the performance standards contained in Table NE-2 of the General Plan Noise Element.

There are no off-site locations surrounding the quarry where existing Canyon Rock Quarry operations cause an exceedance of the County's CNEL or L_{dn} standard. For monitoring location LT1 (considered worst-case with respect to the Canyon Rock Quarry due to its relative direct line-of-sight to the quarry), the CNEL and L_{dn} were 56 dB for the days when the quarry was operating at full production. Applying the County's CNEL/L_{dn} standard, a noise sensitive receiver would have to be less than 630 feet from the center of operations of the quarry, and have complete line-of-sight, for these standards to be exceeded. The area defined by this 630-foot limit is fully contained within the quarry property. The only long-term site which currently exceeds the County's CNEL/L_{dn} standard was LT4, where existing noise levels are dominated by non-Canyon Rock Quarry traffic noise (and not Canyon Rock Quarry-generated operations or traffic).

Site LT1 would be considered as currently in exceedance of the Table NE-2 noise performance standards in certain cumulative duration categories. Daytime L_{50} levels at this location are typically as high as 59 dBA with the existing quarry operating (as compared to approximately 39 dBA when the quarry is not operating), which exceeds the Table NE-2 Category 2 daytime standard of 55 dBA. Existing daytime steady noise levels when the quarry is operating also exceed the County's Table NE-2 Category 1 daytime standard of 50 dBA.[9] The County's daytime standards for shorter cumulative duration categories (Categories 3 through 5) are not exceeded when the quarry is operating.

At Site LT4, the existing daytime L_{25} level is currently as high as 61 dBA, which is in excess of the County's Table NE-2 Category 3 daytime standard of 60 dBA. The County's daytime standards for other cumulative duration categories are not exceeded at this location. As discussed above, the existing noise in this location is dominated by non-Canyon Rock Quarry traffic noise, and not Canyon Rock Quarry-generated operations or traffic.

Using the measured L_{50} noise levels at LT1, LT2, and LT5, more general conclusions can be made regarding noise exposure in the surrounding area due to existing quarry operations and shielding of receptors. LT1, located approximately 1,000 feet southeast of the center of Canyon Rock Quarry operations, has a direct line-of-sight to the whole of the quarry operation with minimal vegetation intervening. Relying solely on spherical spreading of sound for attenuation, any similar locations up to a

9 This determination was based on the existing average L_{90} and L_{min} levels at this location.

distance of 1,600 feet from the center of Canyon Rock Quarry operations would also be expected to exceed the Table NE-2 Category 2 daytime standard. Using the results of LT5, which could be considered partially shielded based on the topography between it and the quarry operations area, noise sensitive receptors would have to be less than about 760 feet from the center of Canyon Rock Quarry operations to exceed the Table NE-2 Category 2 standard. Using the results of the LT2, which is a more fully shielded location, sensitive receptors would have to be less than about 460 feet away from the center of Canyon Rock Quarry operations to exceed the Table NE-2 Category 2 standard.

There are four off-site residences within the 1,600-foot range (see Figure IV.C-1). Two of these residences (Nos. 13 and 14) are located on a hill directly southeast of the Canyon Rock Quarry across Highway 116, and two (Nos. 11 and 12) are located directly south of the quarry across Highway 116. Of these four residences, only Residence No. 13 (with clear line of site to quarry) is clearly in a location exceeding the Table NE-2 Category 2 daytime standard as a result of Canyon Rock Quarry operations (typical L_{50} levels estimated to be about 57 dBA with the Canyon Rock Quarry operating).[10] Pursuant to County General Plan policy, the Table NE-2 Category 2 daytime standard was adjusted upward to 57 dBA at this location to reflect the existing ambient condition.

For Residences Nos. 12 and 14, it is assumed that the noise levels approach that of the clear line-of-sight case. Under this assumption and applying the proper attenuation with distance (6 dB/doubling of distance), Residence No. 12 (at 1,250 feet to the south of the center of operations of the Canyon Rock Quarry) is estimated to have an L_{50} value of 57 dBA. Residence No. 14 (at 1,500 feet southeast) would have an L_{50} of 56 dBA. The Table NE-2 Category 2 daytime standard was adjusted upward to 56 dBA at these locations to reflect the existing ambient condition. Residence No. 11 currently benefits from existing intervening terrain such that the levels do not exceed the Table NE-2 standards.

PROJECT IMPACTS

As discussed in Chapter III, Project Description, the project sponsor states that under the maximum annual production scenario of 500,000 cubic yards for either the Western or Northern Expansion option, 1) the quarry hours of operation would not change from existing conditions, 2) no new or additional quarry equipment over existing conditions would be required (beyond that which normally occurs as a result of wear and tear), and 3) no increase in existing employee staffing would occur. Rather, the existing staff and quarry equipment would either process more material while operating, and/or quarry equipment would be operated longer within the existing workday.

When considering a full production day at the quarry when all quarry equipment operates, the production of noise generated from on-site equipment under the Western or Northern Expansion option would remain the same as baseline conditions on an hourly and a daily basis. However, the noise generated by the project and received at sensitive receptors could change from baseline conditions in three principal ways:

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10 Residence No. 14 does not appear to have full line of sight to Canyon Rock Quarry. Residence No. 11 is shielded by topography and in close proximity to Highway 116, and No. 12 appears to be partially shielded at least from some of the operations.

1. *Location of Mobile and Stationary Equipment Under the Project.* As the quarry expands under either expansion option, mobile noise sources (such as D10 and D6 crawlers and tractors), used to move material off of the quarry face down to the quarry floor would operate more in the direction of proposed expansion. Also, loading of trucks or conveyor belts to move material to the crushers would move out in the direction of the expansion. Depending on the plan implemented, stationary equipment (e.g., crushers) could be relocated in the direction of the expansion.

2. *Changes in Site Topography Under the Project.* Depending on location, removal of the existing terrain could potentially exposes sensitive receptors to more direct line-of-sight to the quarry operations, and thus potentially change resultant noise levels from the quarry at those receptors. Shielding by topography can reduce noise levels by 12 dB or more compared to situations where there is line-of-sight.

3. *Increase in Annual Production Under the Project Would Increase Accumulated Noise Exposure Throughout the Year.* Under the worst-case scenario, the proposed project would experience an increase in annual production from the existing baseline of 375,000 CY to a maximum annual production of 500,000 CY. Although, as noted above, this increase would not affect the production of noise for any given day of full production, the total number of days per year that partial or full quarry operation would occur would increase.

With respect to noise associated with project-generated off-site vehicular traffic, for purposes of this analysis, an increase in daily and annual project haul truck trips is also assumed, consistent with the traffic study prepared for the project. This potential noise impact of haul truck trip increases is assessed in Impacts IV.C.5 and IV.C.7.

Except where noted, the focus of potential project noise impacts to County General Plan Table NE-2 standards will be the Category 2 standard (L_{50}), as project noise would potentially first exceed this category before it would exceed other duration categories. Furthermore, only the daytime standard is considered as the quarry would not operate during nighttime hours.

On-Site Stationary Sources

Impact IV.C.1: Operation of on-site stationary equipment under the proposed project would not generate noise substantially above existing ambient levels in the project vicinity. This would therefore be a less than significant impact under the Western or Northern Expansion options.

Western Expansion Option

In order to evaluate the potential for on-site sources under the proposed Western Expansion option to sensitive receptors in the vicinity of the site, the location of project stationary noise sources (such as crushers, feeders, and screens) and mobile noise sources (such as front-end loaders, crawlers, and trucks) was considered, along with associated potential changes in on-site terrain and changes in annual production. (The potential for cumulative noise impacts associated with the nearby Blue Rock Quarry was also considered in Impact IV.C.5).

Under the proposed Western Expansion option, the existing stationary plant equipment would remain where currently located. Material would be moved from the point of extraction to plant feeders by existing equipment and by extending the conveyor belt system in the direction of the expansion. For assessing changes in noise levels resulting from the project's stationary equipment, the primary issues are potential loss of shielding from the existing terrain as the expansion progresses, and the distance of the sensitive receptors to the noise source. Under the proposed Western Expansion option, the floor of the quarry would advance in a westward direction, excavating material as it proceeds. Any potential off-site residences located north of the quarry would continue to be shielded by the intervening high-elevation terrain. As a result, no increase in noise levels from the project's stationary sources to the north would occur. In addition, no alteration in terrain would occur within the Western Expansion area east or southeast of the existing quarry floor. Consequently, for off-site residences to the east and southeast of the quarry, daily noise levels from stationary sources in these directions would also not change. To the west of the project site, residences would be well outside the 1,600-foot criteria discussed under the Baseline Noise Assessment, and, therefore, would not be affected by the project's stationary sources.

To the south of the existing quarry floor, however, the existing terrain which currently provides shielding in these directions would be altered. To the south of the quarry, two residences (Nos. 11 and 12) were identified which were closer than the 1,600-foot criteria. For No. 12, it was determined the current noise levels are consistent with a line-of sight assumption, and the existing L_{50} with the Canyon Rock Quarry operating was estimated at 57 dBA. However, under the Western Expansion option, changes to the terrain around the quarry would not increase the noise levels at this residence, as the noise level from existing stationary sources would remain the same. As a result, the levels at this location would not exceed the adjusted Table NE-2 Category 2 standard of 57dBA.

Residence No.11 currently benefits from existing intervening terrain such that the levels do not exceed the Table NE-2 standards. The elevation of the terrain at the structure is about 98 feet above sea level (asl). The floor of the quarry operation is at approximately 85 feet asl. Currently, there is a hill at an elevation of about 140 feet asl between the quarry floor and residence No. 11. With the proposed Western Expansion grading plan, this hill would be reduced to about 120 feet asl in elevation. However, the hill would obscure line-of-sight by about 15 feet for noise sources up to 30 feet above the ground and receivers at a height of 5 feet. This barrier would be effective in supplying the 4 dB or more of attenuation required for Table NE-2 standards to be met.

For the residents to the north, east and southeast of the quarry, the daily and hourly noise levels are expected to remain unchanged under the project. However, an increase in yearly average CNEL or L_{dn} is expected to occur as the number of operating days that Canyon Rock Quarry's plants run in order to accommodate the net increase in annual aggregate sales (additional 125,000 CY, or a 33 percent increase over baseline conditions). To examine this effect, the CNEL at the long-term site with the highest levels and biggest differential between operating days and non-operating day is analyzed in terms of yearly operation. Based on Table IV.C-4, the values measured at LT1 are used, where the CNEL with Canyon Rock Quarry's plants running is 56 dBA (versus 50 dBA without Canyon Rock Quarry operating). Establishing the baseline number of days of operation is problematic due to varying levels of productivity of the Canyon Rock Quarry equipment, and the number of the quarry equipment operating on any given day. Consequently, to understand the magnitude of the potential increase in yearly CNEL as a result of increase in production, the relationship between varying number of days per year to achieve the baseline production and the increase in CNEL with a 33% increase in production was calculated. This relationship is presented in Figure 17 in Appendix F. As shown in this table, under all potential operating scenarios, the increase in yearly averaged CNEL would be less than 1 dB; this increase would be considered less than significant.

Northern Expansion Option

An analysis similar to that applied to the Western Expansion proposal was also applied to the Northern Expansion option.

Under the Northern Expansion option, the crusher at the existing stockpiles would be moved west-northwest approximately 1,200 feet of its existing location. This proposed relocation would provide lower noises from this source at off-site residences to the east, southeast and south of the quarry. Also, under the Northern Expansion option, hilly terrain which provides shielding to the south, northwest, and north would be retained. Under the proposed grading plan, as excavation proceeds in a northwesterly direction, the terrain would continue to provide shielding to the residences along Martinelli Road to the north of the quarry site. As a result, there would be no significant noise effects using the standards in the Noise Element of Sonoma County General Plan as the hourly levels during quarry operation would not substantially increase and the CNEL and L_{dn} for the days of quarry operation would not substantially change.

On an annual basis, the potential noise effects of increased production would be the same as that assessed for the Western Expansion option, and would result in raising the yearly CNEL by less than 1 dB. This would be a less than significant impact.

Mitigation: None required.

On-Site Mobile Noise Sources

Clearing and Initial Vegetation Material Removal Operations

Impact IV.C.2: Certain proposed mobile equipment operations (clearing and initial vegetation material removal operations within 1,200 feet of receptors where no intervening terrain would exist) under the proposed project would generate noise levels at sensitive receptors that would potentially exceed Sonoma County General Plan Table NE-2 noise standards. This would be temporary, significant impact while those operations occur under the Western or Northern Expansion options.

Western Expansion Option

Initially, as the expansion progresses, several pieces of equipment would be used to clear trees and overburden prior to the actual extraction of material to be processed into usable aggregate. This operation would involve the use of chainsaws, as well as several bulldozers and tractors. These operations would be temporary and would occur relatively infrequently (i.e., maximum of five to ten workday duration each year).

To analyze the potential of these mobile sources to produce noise, typical noise source levels are required. Using results from the short-term measurements at Canyon Rock Quarry, and other similar operations in Sonoma County, source levels were established for dozers and front-end loaders. Although there is some range in these data, average levels normalized to a distance of 100 ft used in this analysis are presented in Table IV.C-8.

TABLE IV.C-8
NOISE SOURCE LEVELS FOR BULLDOZERS AND FRONT-END LOADERS AT A DISTANCE OF 100 FT IN OVERALL A-WEIGHTED SOUND PRESSURE LEVEL, DBA

L_{eq}	L2	L25	L50	L90	Lmax
77	81	78	77	74	82

SOURCE: Illingworth and Rodkin, 2003

Using these levels and the Table NE-2 standards, distances at which the standards would be exceeded were determined. This was done for two cases, the unadjusted values of Table NE-2, and the values adjusted for low ambient noise which occur in some areas surrounding the expanded quarry operation that are far from any identifiable noise sources (e.g., LT3). These distances are based on spherical divergence of sound and actual distances are expected to be somewhat less due to likely excess sound attenuation by terrain and heavy forested areas. The distances obtained using these assumptions are presented in Table IV.C-9 for L_2, L_{25}, and L_{50}. Based on these calculations, the most severe case is the L_{50}, assuming the mobile operations last more than 30 minutes out of an hour.

Comparison of the Table NE-2 Standards and the long-term data indicate that only in cases where receptors are very remotely located away from any existing noise sources (such as LT3) are the L_{50} levels low enough to apply the ambient correction. Relative to the L_{25}, LT2 and LT3 would both be considered for the correction. Taking these cases together, 1,200 feet becomes a reasonable, though conservative, distance at which to consider the potential of exceeding the Table NE-2 Standards for either the L_{50} or L_{25} for receptors. In terms of the proposed mobile operations, land clearing and initial vegetation material removal are the applicable concern in terms of potential noise at nearby receptors. Noise levels exceeding the Table NE-2 standards would potentially occur when clearing and initial vegetation material removal operations using bulldozers and tractors are within approximately 1,200 feet of the residences surrounding the quarry and there is no shielding by intervening terrain (such as along ridges).

As the quarry expands, there is the potential for changes in off-site noise levels at residences to the south and west of the quarry from the clearing and initial vegetation material removal operations of mobile equipment. For the two residences directly across Highway 116 opposite the southeast corner of the quarry (Nos. 11 and 12), noise levels would potentially exceed the Table NE-2 Standards during periods that these mobile operations occur along the southern boundary of the expansion area. In these cases, the

TABLE IV.C-9
THRESHOLD DISTANCES FOR POTENTIAL NOISE IMPACT BASED ON SONOMA COUNTY GENERAL PLAN TABLE NE-2 STANDARDS FOR MOBILE EQUIPMENT

Description	Sound Level Metric		
	L_2	L_{25}	L_{50}
Table NE-2 Standards (unadjusted), dBA [a]	70	60	55
Required Attenuation, dB	11.0	18.4	21.5
Equivalent Distance, feet	353	828	1,190
Table NE-2 Standards (adjusted), dBA	65	55	50
Required Attenuation, dB	16.0	21.5	26.5
Equivalent Distance, feet	628	1,190	2,115

[a] *Sonoma County General Plan*, Noise Element, Table NE-2.

SOURCE: Illingworth and Rodkin, 2003

equipment would be operating at distances of less than 500 ft in the absence of any shielding from the terrain. As the expansion moves further west, in the last one-third phase of the proposed expansion, some residences to the west and southwest (Nos. 8, 9, 10 and 16) would also potentially experience levels that exceed the Table NE-2 Standards from the intermittent clearing and initial vegetation material removal operations along the perimeter of the project site. This impact is likely to occur for short duration on an annual basis (five to ten days). The noise impact would be similar to short-term construction impacts.

Due to the variables involved, including the exact location of the operations, duration of operations, equipment used at the time, etc., the specific occurrence of amplitude and duration of levels potentially exceeding the Table NE-2 cannot be predicted at this time. It should also be noted that these activities would occur during daytime hours, considered the least sensitive hours for noise effects on sensitive receptors. Nevertheless, noise from these clearing and initial vegetation material removal mobile operations at the affected residences would be considered as a potential significant, short-term impact to identified receptors from mobile clearing and initial vegetation material removal operations.

Northern Expansion Option

As under the Western Expansion option, noise levels exceeding the Table NE-2 standards would potentially occur with the Northern Expansion option when clearing and initial vegetation material removal operations using bulldozers and tractors are within approximately 1,200 feet of the residences surrounding the quarry and there is no shielding by intervening terrain (such as along ridges). Two residences east of Martinelli Road (Nos. 1 and 15) could be exposed to noise levels that exceed the Table NE-2 standards during clearing and initial vegetation material removal. These residences would not be shielded by terrain when the operations occur on the downward slopes toward the road. As a result, there is a potential to exceed the Table NE-2 Standards. This impact would occur in the last third of the mining period. It is likely that this impact would occur during one or two years, because clearing and initial vegetation material would occur at distances greater than 1,200 feet in other years. Since the impact is likely to occur during one or two years within 1,200 feet of residences, and since it is expected to be of short duration (five to ten working days), it would be comparable to a short-term construction impact.

The specific level of impact would, however, depend on exact geometry of how the operations are conducted, intervening vegetation, equipment used, and other variables not known at the present time. As the expansion progresses even further to the northeast, similar potential exists for exceeding the limits at residences to the north and west of the expanded quarry. As with the Western Expansion option, these activities proposed under the Northern Expansion option would occur during daytime hours, considered the least sensitive hours for noise effects on sensitive receptors. Nevertheless, noise from these mobile clearing and initial vegetation material removal operations at the affected residences would be considered as a potential significant, short-term impact.

For both the Western and Northern Expansion options, there would be temporary, short term construction impacts that are generally considered to be mitigated to less than significant by limiting construction to the daytime hours (between 8am and 5pm) and requiring that all motorized equipment be operated with appropriate mufflers.

Mitigation Measure IV.C.2: For any on-site mobile operations, in conjunction with clearing and initial vegetation material removal, that occur within 1,200 feet of existing occupied residences surrounding the quarry where no shielding by intervening terrain exists, the applicant shall:

a. Use the quietest available equipment used for such operations. This shall include, as determined feasible by PRMD, the use of high performance mufflers and special engine noise control packages.

b. Plan clearing operations so that any on-site terrain features that may provide shielding to the residents is removed last, as determined feasible by PRMD.

c. Clearing and initial material removal mobile operations shall be conducted on Mondays through Fridays, between the hours of 8:00 a.m. and 5:00 p.m. only.

d. Provide a 30-day advanced notification to PRMD for PRMD to notify the occupants of residences within 1,200 feet of the clearing and initial vegetation material removal.

Significance after Mitigation: As discussed above, the clearing and initial vegetation material removal operation would cause a potentially significant impact within 1,200 feet of existing occupied residences where no intervening terrain would exist which would exceed the County's Table NE-2 Category 2 daytime standard of 55 dBA at some point during the operation. This exceedence is considered temporary in nature due to the anticipated annual duration during clearing and initial vegetation material removal which will not exceed five to ten days annually. The noise caused by this activity would be similar to one that might be experienced when road work or site grading is done near a residence. Therefore, with implementation of Mitigation Measure IV.C.2, the impact would be less than significant.

On-going Extraction Operations on the Quarry Faces, and Movement of Materials on the Quarry Floor

Impact IV.C.3: Mobile operations associated with on-going extraction on the quarry faces and movement of materials on the quarry floor under the proposed project could generate noise levels at sensitive receptors that would exceed Sonoma County General Plan Table NE-2 noise standards. This would therefore be a potentially significant impact under the Western or Northern Expansion Options.

Western Expansion Option

Once the land is cleared from clearing and initial vegetation material removal operations (see Impact IV.C.2), the face of the exposed hillside would be dislodged and pushed down to the quarry floor. This activity would be an on-going part of the quarry operation. This typically involves one or two bulldozers or front-end loaders operating throughout the day. Another mobile operation is the transport of material from the base of the exposed hillside to the feeders for the crushers or conveyor belt. Under the Western Expansion option, the crushers would remain in their current location, however, as the face of the quarry moves westward an extended conveyor belt system would move material to the crushers.

For off-site residents to the east and north of the quarry, the noise levels would remain as they are currently, or potentially be reduced, as the mobile sources operate at increasingly further distances to the west. Consequently for these residences, mobile operations on the quarry face or floor, noise impact would not be considered significant under the Western Expansion.

For residences to the south and west of the proposed expansion, the potential for noise impact depends the type of mobile operation and intervening terrain. For residences directly to the south (Residence Nos. 11, 12 and 16), the mobile operations would move closer as the expansion proceeds west. For all three residences, operations of dislodging and pushing material down the exposed quarry faces would not necessarily be shielded by terrain. The operations would be more of a continuous nature as the movement of rock off the quarry face is part of the ongoing operation of the quarry. As a result, noise from mobile sources operating on the quarry face and floor would be a potentially significant noise impact. For residences to the west and southwest (Residence Nos. 8, 9 and 10), these would generally be shielded from mobile operation occurring on the quarry floor. For operations on the quarry face, operations would be occurring at distances as close as 300 feet to Residence No. 9 at the final phase of the expansion. At these close distances, it is likely that any shielding provided by the face of quarry would be insufficient to maintain the noise level below the Table NE-2 standards for these ongoing operations. For Residence No. 8, the distance and shielding should be sufficient such that the standards are not exceeded. Residence No. 10 would be less than 1,200 feet away from operations on the quarry face and have little or no shielding. As a result, these is a potential that noise from mobile sources performing ongoing operations would be a significant impact for the five residences (Nos. 9, 10, 11, 12 and 16) located to the south and west of the proposed Western Expansion option.

Mitigation Measure IV.C.3a: Prior to beginning any mobile operations associated with on-going extraction on the quarry faces within 1,200 feet of an occupied off-site residence, a noise monitoring study shall be performed by a qualified acoustical consultant and submitted by the quarry operator to the County. The noise monitoring study shall establish the region in which the operations are to take place. Shielding potential of the intervening topography and/or vegetation shall be assessed. 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 Table NE-2 standards are predicted, operations may proceed. 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. Operations may not be done outside the specific area included in the noise monitoring study except at distances greater than 1,200 feet from any occupied off-site residence.

If the monitoring study predicts exceedances of Table NE-2 standards, the noise consultant shall recommend measures to prevent the exceedances. These measures could include: using special mufflers or engine control packages; planning operations to use topographic features to shield residences from noise; constructing earth berms or other noise barriers; sound proofing affected occupied residences; 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.

If there are no measures identified that will prevent the exceedances, then operations that cause the exceedances may proceed only if they will be of short duration. Short duration means that noise from the quarry operations, including noise from clearing and initial material removal, will not cause exceedance of Table NE-2 standards at any occupied residence for more then 10 days in a year. Exceedance of the standard more than ten days per year is not permitted. Mining operations that cannot meet this condition may not proceed. In this event, the applicant and the County will review and revise the grading plan as necessary to ensure that the Table NE-2 County noise standards will be met at occupied residences. Such changes may result in mining being prohibited in some areas.

Significance after Mitigation: Less than Significant.

Northern Expansion Option

As with the Western Expansion option, the Northern Expansion option would also involve extraction on the developing faces of the quarry; and movement of material on the quarry floor. As the excavation progresses, it would increasingly surround the quarry floor with inward facing walls. This would continue to provide shielding of the noise from mobile operations on the quarry floor to residences in all directions. To the north and east, residences are typically at or below the elevation of the quarry floor with higher terrain in between. To the west, residences are sufficiently shielded and far away that the levels are expected to remain below the NE-2 standards. As a result, no significant noise effects are expected to residences to the north, east, west and southwest of the quarry from these two types of on-going operations as the Northern Expansion proceeds.

For residences directly south of the existing quarry, Residence Nos. 11 and 12, the mobile operations would initially move closer as the expansion proceeds. For these two residences, operations of dislodging and pushing material down the exposed quarry faces would not necessarily be shielded by terrain. The operations would be more of a continuous nature as the movement of rock off the quarry face is part of the ongoing operation of the quarry. As a result, noise from mobile sources operating on the quarry face and floor is a potentially significant noise impact for these residences.

Mitigation Measures IV.C.3b: Implement Mitigation Measure IV.C.3a for the Northern Expansion option for Residence Nos. 11 and 12. For all other residences, no mitigation is required.

Significance after Mitigation: Less than Significant.

On-Site Blasting

Impact IV.C.4: Occasional blasting that would occur under the project would generate temporary airborne and groundborne noise and vibration. This would be a potentially significant impact under the Western or Northern Expansion options.

As under baseline conditions, occasional blasting would be used to fracture and loosen blue rock at the quarry. As under baseline conditions, this would occur one to two times per year. Blasting charges are proposed to be detonated during daytime hours between 10:00 am and 5:00 pm. Each blast would consist of approximately 6 to 8 holes 8.75 inches in diameter, 100 feet deep, with a charge weight of explosives of 500 pounds per hole. The fractured and loosened blue rock would then removed by bulldozers.

One of the primary issues concerning blasting is the potential to cause damage nearby structures. This can occur from either ground-borne vibration or acoustic overpressures. For the ground vibration such as that associated with quarry blasting, building damage is typically a concern, as is the human perception of the vibration. As with noise, ground vibration also decreases with increased distance from the blast. The strength of the blast is a function of the charge weight per hole or delay. As a result, being further from the blast or reducing the charge weight can reduce the received vibration. To relate these two variables, ground vibration peak particle velocity in inches/second (*ppv*) is commonly expressed as a function of scaled distance (SD) which is defined as the distance away from the blast divided by the square root of the charge weight per delay. The general form of this relationship is given by: $ppv = K(SD)^m$, where K and m are site attenuation factors. Assuming that these constants are known, the *ppv* can be determined for a given distance and charge weight. Conversely, if the acceptable *ppv* is given, the relationship between distance and charge weight necessary to meet that limit can be plotted.

Unlike noise, there are no standards set for ground vibration in the *Sonoma County General Plan,* although there are several other guidelines available which may be used for assessment. In regard to human perception, studies have shown that the threshold of perception for average people is in the range of 0.008 to 0.012 in/sec, PPV.[11] For structural damage, criteria and guidelines have been developed by the (former) U.S. Bureau of Mines and the Office of Surface Mining Reclamation. These criteria, from USBM RI 8507 "Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting," can be applied to the project. Under this standard, the threshold of cosmetic damage is at 0.75 in/sec or greater for frequencies above 4 hertz for drywall construction, and 0.50 in/sec for plaster construction. Based on these considerations, a limit of 0.50 in/sec was adopted in the *Sonoma County Central Disposal Site Improvement Program EIR* to protect nearby residences from damage due to blast-induced ground vibration. Using the current blasting techniques, there has been no reported damage to residences surrounding Canyon Rock Quarry. The closest residences are approximately 1,000 to 1,200 feet away from the general area in which blasting occurs. Using the constants K and m from the *Sonoma County Central Disposal Site EIR*, the calculated *ppv* at these distances would be at or above 0.50 in/sec, but below 0.75 in/sec. Using values of K and m based on data from nearby Blue Rock Quarry blasting, the predicted *ppv* is clearly below 0.50 in/sec. Based on this information, maintaining limits of 0.75 in/sec using the *Sonoma County Central Disposal Site* constants or using a limit of 0.50 in/sec using the Blue Rock Quarry constants would continue to provide damage protection for the nearby residences.

For acoustic overpressures, the USBM has determined that if the levels are below 134 dB, there is no chance of any damage to a residence. It should be noted that these levels are not A-weighted and are dominated by very low frequency content (6 to 20 Hz). Although these low frequencies could potentially be audible, the overall A-weighted L_{max} level would be well below the *Sonoma County General Plan* Table NE-2 standards at moderate distances (500 ft) beyond the blast area.

Under either of the two expansion options, as the quarry moves outward, the potential for producing ground vibration that might cause cosmetic damage may exist at neighboring residences if blasting was conducted at distance closer to 1,000 to 1,200 feet. Not knowing in advance where exactly blasting will be needed and used, it is not possible to specifically assess this impact at this time. However, for the Western Expansion option, residences may be as close as 500 feet from blasting, and for the Northern Expansion option, 700 feet. Consequently, this impact is deemed potentially significant.

Mitigation Measure IV.C.4a: Blasting shall be limited to daytime hours from 10:00 am to 4:00 pm only.

Mitigation Measure IV.C.4b: A blasting permit shall be obtained from the Sonoma County Sheriff's Department prior to any blasting.

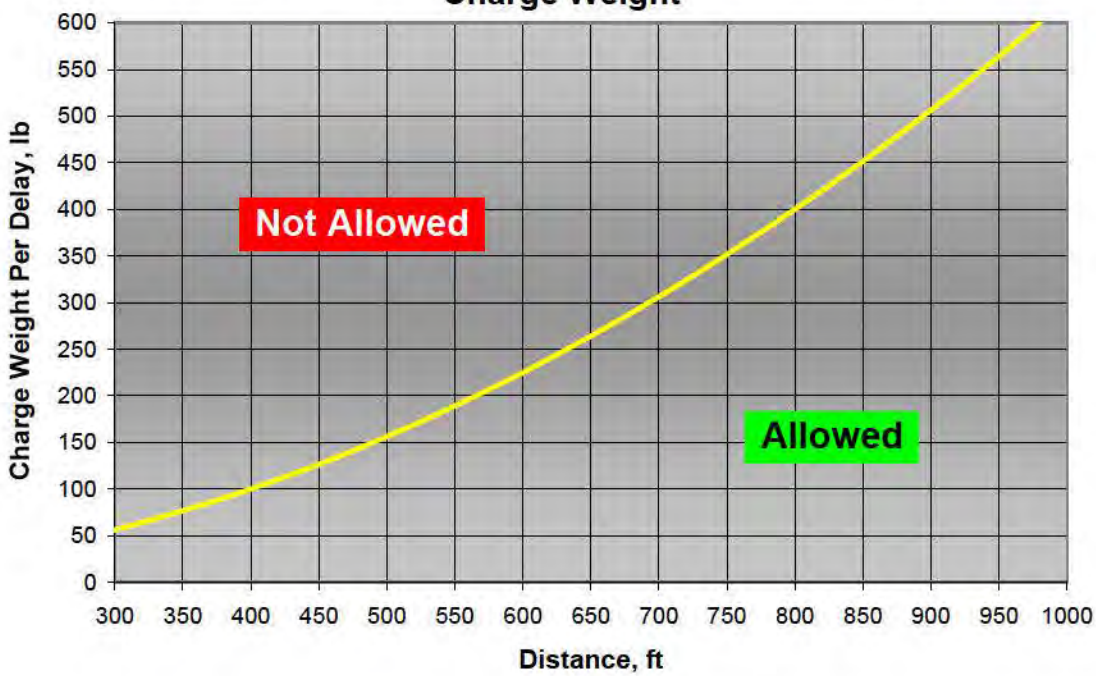
Mitigation Measure IV.C.4c: Blasting shall only be conducted by licensed certified personnel consistent with Federal, State, and local regulations. Blasts shall be designed such that the charge weight per delay does not exceed that the charge weight/distance curve shown in Figure IV.C.4c.

The applicant shall be responsible for hiring a qualified expert to verify the above-described noise and vibration performance standards are being met if requested by the Sonoma County Permit and Resource

11 NCHRP Synthesis 218, Cliff J. Schexnayder and James Ernzen, Transportation Research Board, 1996

Management Department. All blasts shall be designed so that charge weight per delay does not exceed the curve given in Figure IV.C.4c for the distance to the nearest residence. The charges shall be detonated sequentially over a time span such that the delay between the detonation of individual charges is 8 milliseconds or greater. Overpressure intensity shall be reduced when the blast charges are well-confined; therefore, the qualified blasting expert shall ensure that the blast holes have adequate stemming and adequate burden.

Figure IV.C.4c: Distance to Nearest Residence vs. Charge Weight



Significance after Mitigation: Less than Significant.

Off-Site Traffic Noise

The ARM Plan identified increases in future quarry truck traffic could cause a potentially significant increase in ambient noise levels along haul routes, and directed any subsequent review of specific quarry projects to quantify the impact to determine the specific level of significance.

Impact IV.C.5: Project-generated vehicles under the proposed project would result in an increase in ambient noise levels on roadways serving the project. This would be a less than significant impact under the Western or Northern Expansion options.

Western or Northern Expansion Option

The proposed project would affect the ambient noise environment in the project vicinity by generating off-site motor vehicle trips on the local road network. Project-generated traffic on noise levels was assessed both in terms of estimated increases in peak-hour noise levels, and increases in the CNEL or L_{dn}. The off-site traffic noise generated under either the Western or Northern Expansion options would be the same.

Traffic noise increases were evaluated for peak-hour conditions using the results of the traffic study and modeling capability discussed in the Setting section. Analysis of the traffic for noise purposes concentrated on the peak weekday in the peak month of quarry activity (October). Increases in quarry truck traffic were taken from those presented in the traffic study. The L_{eq}V2 noise model was used to calculate the increases in peak-hour noise at each the three noise measurement sites along Highway 116 measured for traffic noise (LTT1, LTT2 and LTT3). The increased production at Canyon Rock Quarry would cause the noise levels increase by 1 dB at each site. This would not be considered a substantial increase in noise level.

The project's effect on daily and yearly CNEL or L_{dn} would be even less. This is because of the night penalty applied to these CNEL and L_{dn} metrics and the truck traffic increase being limited to daytime hours. Applying the 1 dB for the three sites to the measured average hourly L_{eq}'s for the daytime hours of operations raises the CNEL and L_{dn} values at each by less than 1 dB for the proposed Canyon Rock expanded production. This would also not be considered a substantial increase in noise level.

Mitigation: None required.

CUMULATIVE IMPACTS

On-Site Sources

Impact IV.C.6: On-site quarry operations under the proposed project, when considered along with other potential noise-generating cumulative projects in the site vicinity, would not increase noise levels at off-site receptors beyond that identified for project impacts. Consequently, this would be a less than significant cumulative noise impact under the Western or Northern Expansion options.

Western Expansion Option

The other principal project in the site vicinity that would have the potential to increase off-site noise levels from its on-site sources is the proposed Blue Rock Quarry expansion project.[12] Based on the results of a noise study completed for the Blue Rock Quarry expansion project, residences to the south and southeast of the Canyon Rock site (Nos. 11, 12, 13 and 14) would not experience an increase in noise as the topography to the east of the Blue Rock Quarry would not change as part of its proposed expansion,

[12] The Blue Rock Quarry proposal would increase the production levels from baseline conditions from approximately 115,000 CY to a proposed 400,000 CY. Under the Blue Rock Quarry expansion project, the extraction activities would proceed west from its currently approved reclamation area. As with the Canyon Rock project, noise from Blue Rock Quarry's stationary sources (crushers, screens, conveyors, etc.) would remain the same as it is today.

and the existing shielding provided by the terrain would remain. Consequently, potential cumulative impacts at those receptors would not be greater than those identified for the proposed project. Residences to the west of Blue Rock and Canyon Rock Quarries (Nos. 9 and 10) are too far away from the stationary sources of the Canyon Rock Quarry for it to add to any potential cumulative impact that could occur due to the proposed Blue Rock Expansion project. Consequently, on-site stationary equipment operations under the proposed Western Expansion option, when considered along with the Blue Rock Quarry expansion project, would not increase noise levels at off-site receptors beyond that identified for project impacts.

For on-site mobile noise sources, only Residence No. 10 would be within the 1,200-foot criteria of the grading plan of both quarries. Given the topography to the limits of the proposed Blue Rock Expansion project, No. 10 would be well shielded from mobile source operations from the Blue Rock Expansion project, and resultant noise levels by that project at No. 10 would be below the Table NE-2 standards. Consequently, mobile equipment operations under the proposed Western Expansion option, when considered along with the Blue Rock Quarry expansion project, would not increase noise levels at off-site receptors beyond that identified for project impacts.

Northern Expansion Option

The proposed Northern Expansion quarry operations would operate at a further distance away from the Blue Rock Quarry operations (and residences between the quarries, including Nos. 11 and 12) than the Western Expansion quarry operations. Consequently, on-site stationary and mobile equipment operations under the proposed Northern Expansion option, when considered along with the Blue Rock Quarry expansion project, would also not increase noise levels at off-site receptors beyond that identified for project impacts.

Mitigation: None required. However, implementation of Mitigation Measures IV.C.2 and IV.C.3 would serve to mitigate the Canyon Rock Quarry expansion project's impact to noise levels at off-site receptors.

Cumulative Off-Site Traffic Noise

Impact IV.C.7: Project-generated vehicles under either the proposed project, when combined with increases in cumulative traffic, would result in an increase in ambient noise levels on roadways serving the project. This would be a significant cumulative impact under the Western or Northern Expansion options.

Western or Northern Expansion Option

Increases in cumulative traffic were considered for two cases. The first considered the addition of the Canyon Rock Quarry Expansion off-site project traffic increases, along with anticipated increases in off-site traffic from the proposed Blue Rock Quarry expansion project. The second case considered the addition of Canyon Rock Quarry Expansion project-generated increases, Blue Rock Quarry expansion project traffic increases, and non-quarry regional traffic increases anticipated in 2021, consistent with the traffic study.

Canyon Rock Quarry Plus Blue Rock Quarry. Under these conditions, the cumulative noise levels at the noise measurement sites would increase by 2 dB or less. On a yearly basis, when Sundays and other days that the quarries are not operating are factored in, the change in CNEL and L_{dn} would become even smaller with the most affected site (LTT1) experiencing less than a 1 dB increase. Although the increase in these metrics would not typically be considered substantial, it is important to examine the increase in hourly L_{eq} as the higher daytime levels are somewhat obscured by the penalized nighttime levels during which the quarry trucks will not operate. During the daytime hours, the hourly L_{eq} at LTT 2 and 3 would increase 2 dB while at LTT1, the hourly increase would be 3 dB. Although a 3 dB increase is often considered as the threshold to being a substantial increase, in this case it is considered to be substantial. This is because the Single Event Levels for the quarry trucks is typically 10 to 13 dB higher than for light vehicles. As a result, the quarry truck passby events will be clearly distinguishable from other traffic. By almost doubling the number of the distinguishable, quarry truck events with combined increases for the two quarries, this increase would be noticeable and because the change in average level is 3 dB, this increase is considered substantial. Based on these considerations, the noise impact is considered significant for residences in the vicinity of LTT1 (Highway 116 between Mirabel Road and the quarries).

Canyon Rock Quarry Plus Blue Rock Quarry and Non-Quarry Regional Traffic Increases. Under these conditions, the cumulative noise levels at the noise measurement sites would increase by 2 dB or less at each site. On a yearly basis, when Sundays and other days that the quarries are not operating are factored in, the change in CNEL and L_{dn} would become even smaller with the most affected site (LTT1) experiencing less than a 1 dB increase. However, the hourly L_{eq} levels at residences represented by LTT2 would increase 2 dB in the daytime hours, while the levels at residences represented by LTT1 and LTT3 would increase by 3 dB. As in the above case when increases in non-quarry regional traffic were excluded, these 3 dB increases are considered substantial due to the nearly doubling of distinguishable, quarry truck passby events. As a result, the noise impact is considered significant for residences in the vicinity of LTT1 and LTT3 (along Highway 116 from the quarries through Forestville).

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 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 unavoidable impact.

Mitigation: Because of the topography, setting, and low vehicle speeds involved, traditional means of traffic noise abatement such as road side barriers or quiet pavement are not viable. As a result, the impact would remain Significant and Unavoidable as concluded in the adoption of the ARM Plan.

It should be noted that implementation of Mitigation Measure IV.A.3e (construct a bypass road south of the downtown area) in Section IV.A, Traffic and Transportation, would mitigate cumulative traffic noise levels in downtown Forestville to a less than significant level. However, given funding uncertainties for this transportation improvement, there is no assurance this improvement can be implemented. If the bypass cannot be implemented, the cumulative noise impact in Forestville would remain Significant and Unavoidable. The roadway improvements described in Mitigation Measure IV.A.3e could also result in secondary noise environmental impacts (these impacts are described under the subsection "Secondary Impacts," which is found at the end of Section IV.A).

REFERENCES – Noise

Sonoma County, *General Plan*, 1989, amended through 1998.

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

Sonoma County, Department of Transportation and Public Works, *Sonoma County Central Disposal Site Improvement Program EIR*, July 1998.

Illingworth and Rodkin, Inc., Canyon *Rock Quarry Expansion Proposal Noise Technical Report*, July 2003.

IV.D HYDROLOGY AND WATER QUALITY

This section describes both existing hydrology and water quality at the project site, and conditions during implementation of the proposed project. The hydrologic data and information regarding Canyon Rock Quarry and the vicinity were obtained from a variety of sources, including published and unpublished reports, maps, and internet resources, as noted below.

SETTING

The Canyon Rock Quarry is located in the Green Valley Creek watershed, in relatively rugged terrain. Historic (and on-going) quarry operations have removed overburden and rock from an upland area adjacent to Green Valley Creek. This activity has resulted in steep active mining surfaces of the partially removed upland juxtaposed with flat surfaces where quarry equipment and site operations are congregated.

CLIMATE

The San Francisco Bay Area has a Mediterranean climate with cool, wet winters and dry, hot summers. The majority of precipitation (95 percent) falls as rain from October through April. The nearest climate data recording station is located in Graton 2.5 miles southeast of the project site. Average rainfall at the project site for the period between 1948 and 2001 is 42 inches per year; minimum and maximum recorded annual precipitation is 13.5 inches (1976) and 84.7 inches (1983), respectively (Western Regional Climate Center, 2003). During severe winter storms, the project site can receive relatively large volumes of precipitation in a short period of time.

SURFACE WATER

Russian River

The project site is located adjacent to Green Valley Creek, which is a tributary to the Russian River. The Russian River drains an area of 1,485 square miles in the California Coast Range north of San Francisco (Higgins, 1952). From its headwaters north of Ukiah, the Russian River flows southeastward through a series of canyons and valleys for about 60 miles. South of Healdsburg, the river generally flows to the southwest until it joins the Pacific Ocean near the town of Jenner. The Russian River system is the primary drinking water source for more than 570,000 people in Sonoma and Marin counties (Sonoma County Water Agency, 2003).

The Sonoma County Water Agency, the agency responsible for water supply in the region, has constructed five collector wells adjacent to the Russian River – two collectors near the Wohler Bridge and three collectors at Mirabel Park. Water is extracted by each collector from the deep gravel underflow of the Russian River. All of these collector facilities are located upstream of the confluence of Green Valley Creek with the Russian River.

Green Valley Creek

Green Valley Creek enters the Russian River near the community of Hollydale, at river mile 20. The project site is located adjacent to the creek approximately 2.5 miles upstream from its confluence with the Russian River (Figure IV.D-1). Green Valley Creek is a third order stream[1] with major tributaries that include Purrington, Harrison, and Atascadero creeks (CDFG, 2000). Green Valley Creek and its tributaries drain a basin of approximately 17 square miles. Elevations range from about 30 feet at the mouth of the creek to 700 feet in the headwaters.

Historically, the lower portion of the creek (from Green Valley School to the mouth), which includes the reach adjacent to the project site, has year-round flow with springs at the lower end. The creek is intermittent above this location (CDFG, 2000). However, recent observations indicate that the creek dries up completely at its mouth (where it empties into the Russian River) in the summer (Ryan, 2003).

The watershed was heavily logged in the 1920s and 1950s, and then heavily grazed. According to the California Department of Fish and Game Stream Inventory Report (2000), the creek "has responded to these land use changes, but has not necessarily recovered to (sic) them in many cases." Although the Green Valley Creek watershed has been affected by historical logging and overgrazing, and the creek channel itself has received discharges from apple processing facilities and quarries (including the project site), the creek continues to have recognized salmonid habitat value (refer to the Biology section of this DEIR for more information on habitat).

PROJECT SITE DRAINAGE

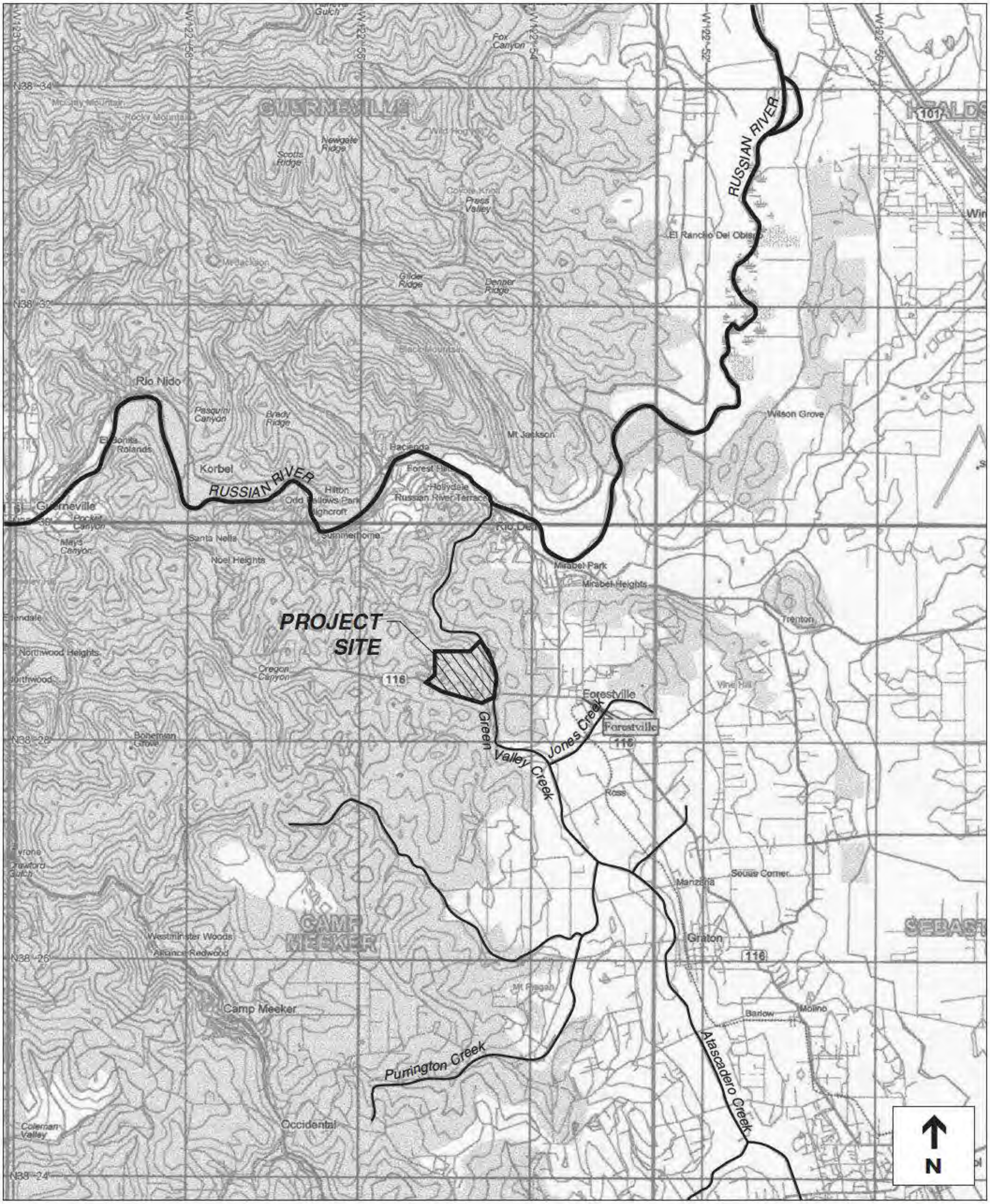
The site drainage patterns have been dramatically altered from their original configuration as a result of long-term mining activities at the site. All drainage from the site eventually enters Green Valley Creek. The existing project site can be divided into two areas with distinctly different drainage conditions: 1) the areas disturbed by mining, and 2) the relatively undisturbed areas.

Drainage in the Active Mining Area

The disturbed area is characterized by steep active mining surfaces, relatively flat staging/processing areas, and an almost complete lack of vegetation. There are essentially no native undisturbed soils in the mining area and no natural creek channels. Exposed bedrock and piles of overburden and crushed rock are the typical surficial materials.

Drainage of the disturbed area occurs as overland flow directed toward on-site detention basins (Figure IV.D-2). There are currently three basins: Sedimentation Ponds No. 1 and 2, and the concrete batch plant containment pond.

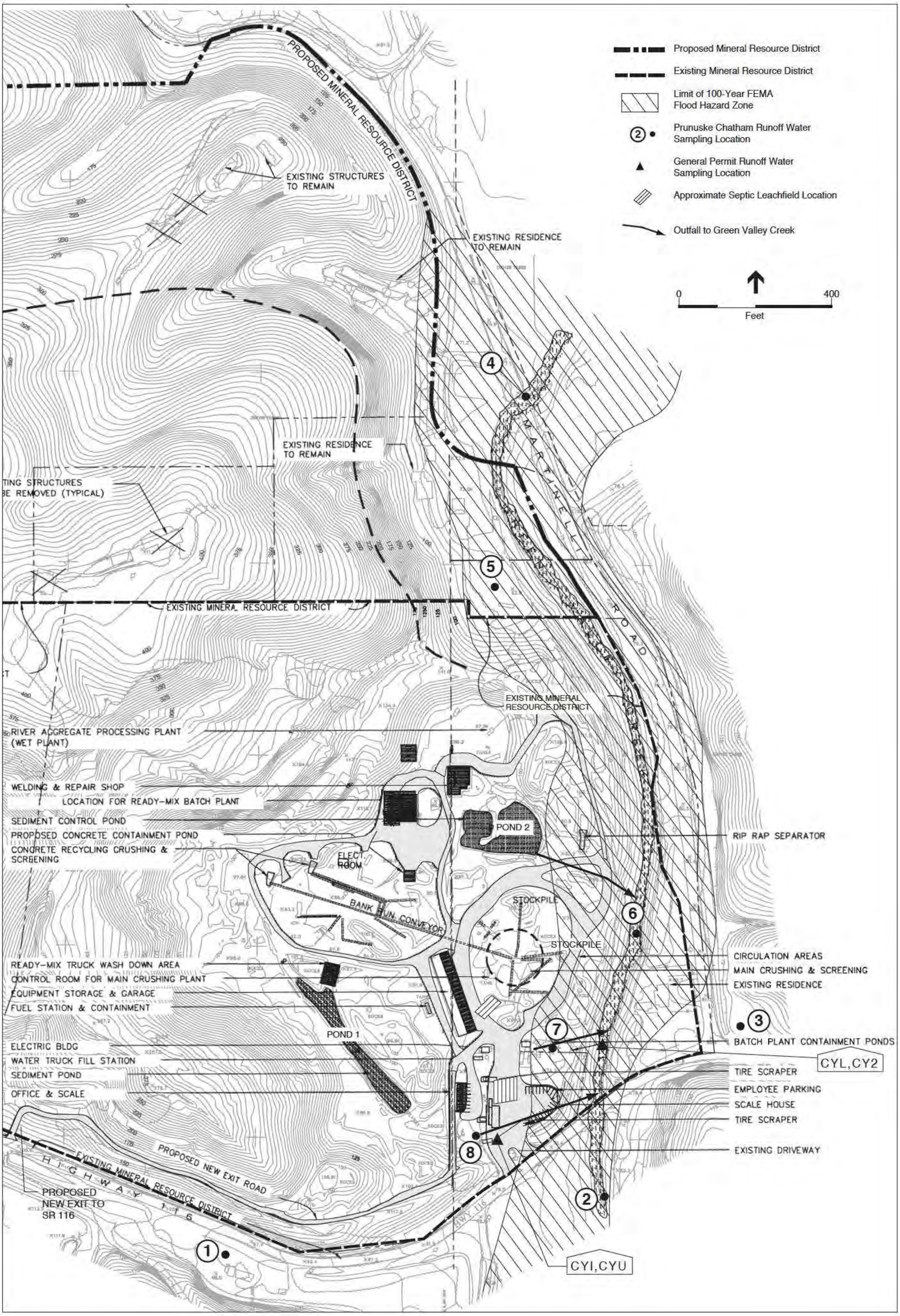
[1] The stream order signifies the relative position of a stream segment in a basin drainage network: the smallest, unbranched, intermittent tributaries are designated order 1; the junction of two first-order streams produces a stream segment of order 2; the junction of two second-order streams produces a stream segment of order 3, etc. Ephemeral draw channels that exist upstream from the intermittent first order streams in the drainage basin will be designated 0.



SOURCE: Delorme Yarmounth

Canyon Rock Quarry / 202697

Figure IV.D-1
Regional Hydrology



SOURCE: Carlile-Macy; Baseline Environmental Consulting

Canyon Rock Quarry / 202697

Figure IV.D-2
Hydrology on Site in Vicinity of Green Valley Creek

The purpose of the detention basins is to allow for settlement of sediment from the runoff before it is discharged to Green Valley Creek. Pond No. 1 is long and narrow (currently about 400 feet long and about 30 to 50 feet wide) and collects runoff from a drainage area of approximately nine acres (Carlile Macy, 2002). When the water level in the pond rises to near the top, water is directed into a culvert, which first empties into a small pond and then continues through a culvert where it is discharged to Green Valley Creek. Pond No. 2 is more than one-half acre and collects runoff from about 30 acres in the northerly portion of the site. When the water level in this pond rises to near the top, water is directed into an overflow pipe and discharged to Green Valley Creek through a grassy swale.

The concrete batch plant containment pond is approximately 225 square feet and constructed of concrete. This containment pond collects runoff and sediment in the vicinity of the batch plant. The pond is relatively small and receives drainage from a one- to two-acre area around the batch plant. Runoff is detained in the containment pond for a relatively short time before it is discharged directly to Green Valley Creek.

A second containment area is also located to the northeast of Sedimentation Pond No. 2, used for containing the washed out concrete from the mixing drums. The wash water eventually leaches out into the soil or evaporates. The remaining cement and aggregate materials is periodically removed and added to crushed rock which is sold as aggregate base.

Drainage outside the Active Mining Area

The areas outside the active mining area are characterized by well-vegetated slopes and upland areas to the north and west of the active mining area. Most of these upland areas are covered by conifer forests. The soils are mapped as Hugo very gravelly loam, characterized by very rapid runoff and high erosion potential (USDA, 1972). The permeability of the subsoil is considered moderate. Drainage of this area occurs as overland flow directed toward one of several small seasonal drainage channels. All southerly facing slopes in the western expansion area drain to a roadside swale along Highway 116. A detention basin has been constructed in the valley west of the active mining area to ameliorate an identified erosion problem in that area (see Pond 3 in Figure IV.D-2). The undisturbed uplands that comprise the proposed Northern Expansion area currently drain toward Martinelli Road (38 acres) and Highway 116 (16 acres) before being discharged to Green Valley Creek.

PROJECT SITE FLOODING

The eastmost portion of the project site is located within the 100-year flood hazard zone (see Figure IV.D-2), as mapped by FEMA.[2] Areas mapped within the 100-year flood hazard zone may be inundated during the 100-year storm event (a storm expected to occur, on average, once every 100 years). Areas within the 100-year flood hazard zone may also be inundated during less severe events. However, during less severe events, the inundation depths and extent of the area affected would be expected to be less. The remaining portion of the project site is mapped as "Zone X –Other Areas," areas determined to be outside the 500-year flood plain.

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2 Federal Emergency Management Agency, 1991, Flood Insurance Rate Map (FIRM), Sonoma County, California, Community Panel Number 060375 0660 B, April 2.

Based on anecdotal reports, the southeast portion of the project site has flooded as recently as 1998. During this flood, water backed up in Green Valley Creek about one-quarter mile upstream of Highway 116. Flood waters flowed down Giovanetti Road, over Highway 116, and into the Canyon Rock Quarry yard, in the current location of the concrete batch plant. These flows re-entered the creek to the north of the plant. This type of flooding has occurred on approximately five occasions since 1973, including during the winters of 1983 and 1986 (Trappe, 2003).

Quarry facilities currently located within the boundaries of the 100-year flood hazard zone, as mapped by FEMA, include the batch plant sediment collection ponds, employee parking area, product stockpiles and bins, and a riprap separator. The concrete batch plant was previously located within the 100-year flood zone, but is presently being relocated out of the zone, a few hundred feet to the northwest of its existing location.

GROUNDWATER

Depth to groundwater across the project site is expected to vary with location and season. No springs were noted in the expansion area, although several springs are located within the existing quarry (Bauer Associates, 1997). It is expected that the occurrence of groundwater is highly variable and that perched groundwater zones in the overlying soils and overburden would flow intermittently and enter bedrock fractures. Given the geology at the project site and the presence of bedrock flanking Green Valley Creek, groundwater in the hilly areas occurs dominantly as bedrock fracture flow rather than horizontal groundwater bearing alluvial strata. Fractures in rock masses can convey groundwater from the shallow overburden and soils deep into the bedrock formation. Often times, shear zones caused by tectonic activity (ancient ground movements) form large fracture zones that extent through the rock mass. Groundwater readily flows through these zones and, in some areas, can represent comparatively high yield groundwater sources. Groundwater bearing alluvial strata is located in the Green Valley Creek drainage and fluctuates with changes in season and flow within the creek. Alluvium within the Green Valley Creek drainage consists of clay, sand, and gravels that overlie the bedrock. According to a review of confidential Well Drillers Reports, provided by the California Department of Water Resources (DWR), these alluvial materials extend to at least 40 feet near Canyon Rock Quarry and consist of sandy clay and brown gravel. The well yields vary greatly according to the Well Drillers Reports that indicate up to 28 feet of drawdown after 1 hour of pumping at a rate of 16 gallons per minute.[3]

According to the applicant, the primary source of water used for aggregate processing, dust suppression, and potable water supply is provided to the site by the Forestville County Water District (Trappe, 2003). However, existing water wells at the project site supplement that public water supply. There are a total of five water wells on the project site, of which one serves as a water supply well for the quarry operations, and four serve residences on the site. The well used for quarry operations is located approximately 200 feet north of the existing concrete batch plant. The large diameter well (approximately two feet) is about 100 feet deep. Reportedly, the well can produce about 100 gallons of water per minute. This water

3 These drawdown amounts are based on well tests conducted by the well driller during installation and construction of the well. Although these reported drawdown amounts are useful for comparison purposes and loosely characterize the groundwater bearing zones, they cannot necessarily be used to calculate well yield, aquifer transmissivity, or other aquifer characteristics. Yields after the well is operational may vary from those determined during a driller's well test.

well is used by the quarry to provide some water for aggregate washing, dust suppression misters at the main plant, equipment washing and irrigation for landscape planting along the berms. Water for dust suppression at the site also comes from the quarry's sedimentation ponds and the Forestville County Water District. Well water and sedimentation water use at the project site has not been monitored; consequently, the amount of use of these water sources cannot be quantified.

Any party who installs a well in the State of California is obligated to prepare and submit a Well Driller's Report to the DWR. In April 2003, a search was conducted of the Well Driller's Reports files for wells located within one-half mile of the project site. The well survey indicated that 21 registered wells are located within a one-half mile radius of the site. Fourteen wells are within 1,000 feet and six of the wells are located within 300 feet of the project site. The general locations of the wells are shown on Figure IV.D-3.

WATER QUALITY

Storm Water Runoff

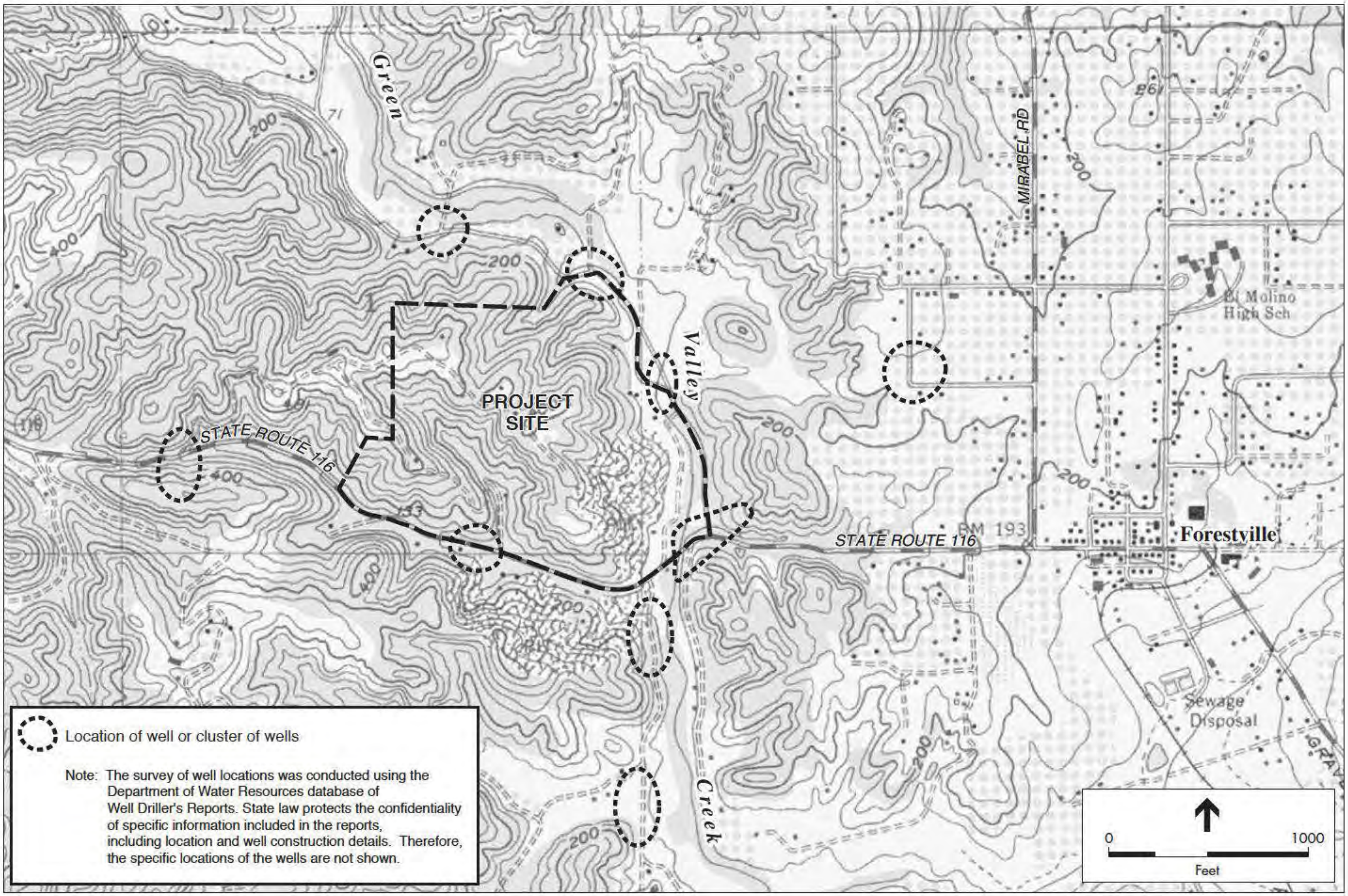
Water pollution is a critical issue associated with quarry runoff. At the project site, the disturbed quarry slopes, material stockpiles, and lack of vegetation have historically resulted in turbid (cloudy), sediment-laden storm water being discharged from the site during storms. To reduce the volume of sediment in storm water flows from the project site, detention basins have been constructed (as described above).

The Sonoma County Permit and Resource Management Department, the Sonoma County Water Agency, the RWQCB, California Department of Fish and Game, and the Atascadero-Green Valley Creek Watershed Council were contacted regarding the availability of water quality data for Green Valley Creek in the vicinity of the project site. The following data were available:

> *Sonoma County Water Agency (SCWA).* The SCWA monitors water quality conditions upstream and downstream of their Forestville Treatment Plant discharge location in compliance with their Waste Discharge Requirements (RWQCB Order No. 95-54). The treatment plant currently discharges to Jones Creek, a tributary to Green Valley Creek. Jones Creek enters Green Valley Creek approximately one mile upstream of where Green Valley Creek passes by the project site. Samples are collected monthly and analyzed for biological oxygen demand (BOD), pH, turbidity, temperature, dissolved oxygen (DO), nitrate, and hardness. A summary of the data is included in Appendix D-1. Turbidity values were typically below 20 NTUs[4] both upstream and downstream of the discharge location. However, turbidity values did exceed 50 NTUs on two occasions between 2000 and 2003. These values may be relevant when considering background turbidity levels in the creek system.

> *Atascadero-Green Valley Creek Watershed Council.* In October 2002, volunteer monitors participating in National Water Monitoring Day collected water quality data in Green Valley Creek approximately 0.3 mile north of Highway 116 (downstream of the quarry). (It was not raining at the time of sample collection.) The following data were collected (Ryan, 2003):

4 NTU = nephelometric turbidity units.



SOURCE: Environmental Science Associates; Baseline Environmental Consulting

Canyon Rock Quarry / 202697

Figure IV.D-3

Vicinity Well Locations

Water Temperature	Dissolved Oxygen	pH	Percent Saturation	Turbidity
14 degrees Centigrade	4 parts per million	7 pH units	39 percent	>40 JTUs[5]

Prunuske Chatham. In 2001, Prunuske Chatham, Inc. was retained by the project sponsor to conduct a surface water quality sampling event in the vicinity of the project site. The sampling event included collection of eight surface water samples from various locations, including from the channel of Green Valley Creek (upstream and downstream of the project site), outlet pipes from detention ponds, and from other minor drainages and culverts. The samples were analyzed for pH, total suspended solids, turbidity, specific conductance, metals, and TPH as diesel. The data are summarized in Table IV.D-1, below, and the sampling locations are shown on Figure IV.D-2.

General Permit Storm Water Sampling. In compliance with the storm water General Permit,[6] water quality monitoring of storm water runoff samples has been conducted by the applicant at the site since 1996. The General Permit requires that all outfalls be sampled twice each rainy season. The applicant has collected samples from two outfalls each rainy season (there are currently three outfalls at the site). In general, the samples have been collected from flowing water after it is detained in the detention basins and before it enters Green Valley Creek. However, because the storm water runoff treatment system at the site has been frequently modified, the sampling locations and sample identification nomenclature have varied considerably over the years. The data are summarized in Table IV.D-1.

Based on review for the analytical data, the Canyon Rock Quarry, there are recorded instances of discharged runoff from the existing quarry site in excess of state and federal storm water pollutant benchmark levels for pH, total suspended solids (TSS), specific conductance, and iron. In addition, runoff from the existing quarry routinely contains diesel at concentrations in excess of adopted RWQCB objectives. On one occasion (January 21, 2002), the runoff contained volatile aromatic hydrocarbons (BTEX and MTBE), which may be indicative of an on-site gasoline release.

The Prunuske Chatham data included analysis of a variety of metals, including mercury, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc. Iron was quantified for these samples by a laboratory in April 2003. With the exception of iron, none of the metals were identified at concentrations in excess of State or Federal water quality benchmark (Appendix D-2).

Groundwater

No information on groundwater quality at, or in the immediate vicinity of, the project site was available. The quality of the water from the well has not been tested, but based on its tendency to stain appliances, the well water is expected to have a high iron content (Trappe, 2003).

5 NTUs and JTUs should not be used interchangeably. JTUs are based on viewing an object through a tube of water. NTUs measure scattered light electronically.

6 Described under the "State and Regional Water Quality Control Board" section, below.

TABLE IV.D-1: CANYON ROCK QUARRY STORM WATER SAMPLING RESULTS

Discharge Location	Sampling Date	pH (pH units)	TSS mg/L	Turbidity NTU	SC µS/cm	O&G mg/L	TOC mg/L	Iron µg/L	MTBE µg/L	BTEX µg/L	TPH-d mg/L
General Industrial Permit Data											
NA (1)	1993-1994										
NA (1)	1994-1995										
NA (1)	1995-1996										
CRE-1	11/26/1996	7.4	180		300	ND	5.0	NA	NA	ND	0.84
CRS-1	11/26/1996	7.5	66		1,200	ND	5.1	NA	NA	ND	0.67
NA	1997										
S-1	1/14/1998	8.2	340		280	NA	2.5	4.6	NA	NA	0.29
E-1	1/14/1998	8.2	53		49	NA	4.0	2.5	NA	NA	0.55
S-1	2/18/1999	8.06	120		1,190	1.07	2.08	5,390	NA	ND<0.5	ND<0.05
E-1	2/18/1999	8.31	642		199	0.77	1.61	28,800	NA	ND<0.5	ND<0.05
SW-1	4/8/1999	7.05	187		1,100	2.17	2.33	6,810	NA	ND<0.5	0.142
E-1	4/8/1999	7.93	108		448	1.87	2.37	5,400	NA	ND<0.5	0.170
N-1	1/11/2000	9.34	630		NA	1.47	8.10	26,010	ND<5	ND<0.5	0.383
N-S-1	1/11/2000	7.75	8.09		NA	ND<0.69	17.2	26,400	ND<5	ND<0.5	0.126
C12-E-1	2/16/2000	8.28	1120		228	0.507	10.1	19,600	ND<5	ND<0.5	0.180
C12-W-1	2/16/2000	7.11	138		1,520	ND<0.44	21.4	6,140	ND<5	ND<0.5	NA
CY-1 (pond no. 1)	10/25/2000	7.56	613		1,520	0.75	8.0	7,800	ND<5	ND<0.5	0.397
CY-2 (concrete containment)	10/25/2000	7.58	85.4		2,070	2.67	13.0	6,550	ND<5	ND<0.5	1.320
CY-1 / UC-1 (pond no. 1)	4/20/2001	7.40	83.4		1,530	ND<0.625	ND<1	5,020	ND<5	ND<0.5	ND<0.05
CY-2 / LP-1 (concrete containment)	4/20/2001	8.95	309		349	1.22	ND<1	17,200	ND<5	ND<0.5	0.445
CYL NE Runoff (concrete containment)	1/21/2002	9.35	8.36	NA	201	ND<0.63	2.0	357	ND<5	ND<0.5	0.277
CYU SW Runoff (pond no. 1)	1/21/2002	7.08	7.00	NA	1,576	ND<0.63	5.0	1,320	30.1	(a)	0.798
CYI NE Runoff (pond no. 1)	3/22/2002	7.36	53.7	NA	431	1.37	3.9	3,350	ND<5	ND<0.5	NA
CY2 NE Runoff (concrete containment)	3/22/2002	8.40	501	NA	212	1.40	3.4	22,000	ND<5	ND<0.5	NA
CY-U (pond no. 1)	12/13/2002	8.19	830	NA	180	ND<1	3.2	32,000	ND<2.5	ND<0.5	ND<50
CYL (concrete containment)	12/13/2002	9.08	660	NA	98	ND<1	2.0	24,000	ND<2.5	ND<0.5	ND<50
Prunuske Chatham Data[1]:											
C1	3/4/2001	6.70	170	77	NA	NA	NA	6,100	NA	NA	0.0877
C2	3/4/2001	7.60	180	88.3	NA	NA	NA	8,300	NA	NA	0.058
C3	3/4/2001	7.80	40	27.2	NA	NA	NA	800	NA	NA	0.0697
C4	3/4/2001	7.80	150	88.8	NA	NA	NA	7,800	NA	NA	0.103
Y5	3/4/2001	7.70	46	99	NA	NA	NA	5,100	NA	NA	0.228
Y6	3/4/2001	7.30	120	81.5	NA	NA	NA	6,500	NA	NA	0.193
Y7	3/4/2001	7.30	274	168	NA	NA	NA	14,000	NA	NA	0.214
Y8	3/4/2001	6.80	154	23.7	NA	NA	NA	7,000	NA	NA	0.829
State Benchmark (2)		6.5-8.5	0-100	NE	0-200	0-10	0-110	300	NE	NE	NE
Federal Benchmark (3)		6.0-9.0	100	NE	NE	15	NE	1,000	NE	NE	NE

Notes:

TSS = Total Suspended Solids
SC = Specific Conductivity
O&G = Oil and Grease
TOC = Total Organic Carbon
MTBE = Methyl-tert-butyl-ethylene
BTEX = Benzene, toluene, ethylbenzene, and total xylene isomers
TPH-d = Total Petroleum Hydrocarbons as Diesel
mg/L = milligrams per liter
µS/cm = micro-Siemens per centimeter
µg/L = micrograms per liter
NA = Not Applicable/Not Analyzed/Not Available

ND<(Value) = Analyte not detected at a concentration greater than or equal to the value indicated
NE = Value not established
(a) Benzene=1.28 µg/L, Toluene=28.5 µg/L, Ethylbenzene=5.56 µg/L, total xylene isomers= 27.28 µg/L.
(1) Annual Report states there was no discharge during the time period indicated.
(2) California State Storm Water Pollutant Bechmeark Levels
(3) U.S. EPA Multi-Sector Permit, Parameter Benchmark Values
The General Permit samples that start with a "CY" were collected at the locations shown on Figure IV.D-2 Other General Permit sampling locations are unknown.
Refer to Appendix D-1 for the complete list of Federal and State water quality benchmarks.

[1]Sampling locations shown on Figure IV.D-2 These samples were also analyzed for TPH as gasoline. None of the samples contained gasoline above laboratory reporting limits. These samples were also analyzed for total metals. None of the metals analyzed were identified in concentrations above State or Federal benchmarks.

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 State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions throughout the state, while the Regional Water Quality Control Boards (RWQCBs) conduct planning, permitting, and enforcement activities.

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.

The project area lies within the jurisdiction of the North Coast RWQCB. 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 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.

Beneficial uses of surface waters are described in the Basin Plan and are designated for major surface waters and their tributaries. Green Valley Creek does not have specific designated beneficial uses in the Basin Plan, but as a tributary to the Russian River, the beneficial uses designated for the Russian River would apply. The beneficial uses designated for the Russian River include: municipal and domestic supply, agricultural supply, industrial service supply, industrial process supply, groundwater recharge, navigation, hydropower generation, recreation, commercial and sport fishing, warm freshwater habitat, cold freshwater habitat, wildlife habitat, fish migration, fish spawning, estuarine habitat, and aquaculture.

Industrial Activity Permitting

Mining activities at the project site are subject to the requirements of the National Pollutant Discharge Elimination System (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

RWQCB Regulation of the Canyon Rock Quarry

The Canyon Rock Quarry operators filed a Notice of Intent to comply with the provisions of the General Permit in 1992, and have regularly submitted annual reports to the RWQCB in compliance with the General Permit.

The file for the Canyon Rock Quarry maintained by the RWQCB contains one notice of violation (No. 177) dated November 10, 1999. A RWQCB inspector observed turbid water being discharged from the site that resulted in a violation of the Basin Plan turbidity standard. The sediment-laden discharge from the site was visually determined by the inspector at this inspection to increase the turbidity of the flowing water in Green Valley Creek by more than 20 percent relative to upstream conditions. In addition, the file contained three complaint letters from private citizens or groups regarding water quality concerns.

The RWQCB has indicated that the "existing operations have had a negative impact on Green Valley Creek due to sediment discharges in stormwater runoff" and "during several moderate rainfall events in late 1999 and early 2000, discharge from Canyon Rock violated permit and basin plan standards. Regional Water Board staff have (sic) worked diligently with Canyon Rock personnel, by providing suggested erosion and sediment control (ESC) best management practices in an attempt to lessen the sediment loads discharging to Green Valley Creek from this quarry. Although these changes helped to significantly reduce turbid discharges, this site remains highly vulnerable to discharging sediments in violation of both permit and basin plan standards. During a previous Regional Water Board staff inspection, Canyon Rock personnel were warned that repeated discharges that may occur during the forthcoming rainy season would result in enforcement action on the part of the Regional Water Board"(RWQCB, 2000).

Based on interviews with the RWQCB inspector, no enforcement action has been initiated. RWQCB staff continues to attempt to work cooperatively with Canyon Rock personnel. During a more recent inspection on 10 April 2003, RWCQB staff inspected recently implemented best management practices at the existing quarry site, including a cement weir at the truck scales, an additional sediment trap at the overburden storage area, and proposed relocation of the existing concrete batch plant to a location out of the 100-year floodplain (RWCCB, 2003). At the time of the inspection, the RWQCB staff recommended that the floor of the quarry be graded so that the floor slopes toward the highwall (active mining face) of the quarry rather than toward Green Valley Creek.

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, 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 Canyon Rock Quarry is subject to the requirements of SMARA.

SONOMA COUNTY

General Plan

The Sonoma County General Plan contains the following objectives and policies that pertain to hydrology and water quality issues and the proposed project.

Prevention of Soil Erosion

Objective RC-2.1: Ensure that permitted uses are compatible with reducing potential damage due to soil erosion.

Objective RC-2.2: Establish ways to prevent soil erosion and restore areas damaged by 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-2f: Prepare and submit to the Board of Supervisors an erosion and sediment control report.

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

Water Resources

Objective RC-3.3: Preserve and enhance the quality of surface and groundwater 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.

Reduction of Potential Damage from Flooding

Objective PS-2.2: Regulate new development to reduce the risks of damage and injury from known flooding hazards to acceptable levels.

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.

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).

SIGNIFICANCE CRITERIA

The CEQA Guidelines establish that a significant impact on hydrology and water quality would be expected to occur if the project would:

- 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 of the project site, certain impacts are not anticipated to be associated with the proposed project. 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). Association of Bay Area Governments mapping indicates that a catastrophic dam failure event could cause water to back up into Green Valley Creek (ABAG, 1980). However, 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 and Soils section of this EIR.

IMPACTS AND MITIGATION MEASURES

Impact IV.D.1: Implementation of the proposed project could result in discharges of pollutants (including sediment, metals, and petroleum hydrocarbons) in stormwater to Green Valley Creek, potentially violating water quality standards and/or impacting habitat. This would be a potentially significant impact under the Western or Northern Expansion options.

The existing mining operation at the project site has a history of discharging stormwater that exceeds water quality benchmarks for pH, TSS, specific conductance, iron, and diesel to Green Valley Creek. The operation has been cited for a water quality violation (turbidity) by the RWQCB and has been the subject of numerous citizen complaints regarding water quality discharges. Furthermore, as indicated by the RWQCB, if the applicant does not implement additional measures to treat runoff, future violations of the Basin Plan standards may occur. The proposed project would expand the existing quarry and create additional disturbed areas that may yield more sediment to runoff relative to existing conditions.

The existing operation uses the southeast portion of the quarry parcel for materials stockpiles and an unpaved parking area. This area is prone to flooding, and the existing use contributes to the release of sediment to the creek during flooding.

pH. Discharges from the detention basin that drains the area around the concrete batch plant have been demonstrated to exceed the water quality benchmark for pH. Of the last four General Permit stormwater samples collected from discharges from the concrete containment pond at the batch plant, three have exceeded the pH benchmark value of 8.5 (Table IV.D-1). It is possible that the cement used in the plant is entering the basin in drainage and elevating the pH levels.

Sediment (Total Suspended Solids and Turbidity). Either the Western or Northern Expansion option would be expected to increase the potential for soil erosion because additional areas would be disturbed relative to the existing conditions. The Universal Soil Loss Equation (USLE) was used to provide a semi-quantitative estimate of annual soil "loss" in tons per acre for the existing conditions, when the quarry is at it maximum size (near the end of the term of the proposed mining plan, and the completed reclamation conditions (Appendix D-3). The equation calculates the movement of soil onsite, not loss of soil to waterways (i.e., sediment delivery). Based on the USLE calculations, it is estimated that soil movement on the site would increase from the baseline condition by approximately 19 percent under the Western Expansion option and by eight percent under the Northern Expansion option. The relatively smaller increase in soil movement for the Northern Expansion area reflects the fact that existing topography in that area is steeper and the soil movement under existing conditions is higher relative to the Western Expansion area. It should be noted that the USLE calculations predict substantial decrease in soil movement at the site, relative to existing conditions, after the completion of reclamation (Appendix D-3).

Specific Conductance. Specific conductance is a measure of the ability of water to convey an electrical current, which is related to the mineral content of the water. Surface water runoff at the project site appears to contain elevated mineral content (as measured by specific conductance). Of the 20 stormwater samples collected at the project site (General Permit stormwater data), 16 of the samples were found to have a specific conductance in excess of the State water quality benchmark value for stormwater discharges (Table IV.D-1).

Iron. Surface water runoff at, and in the vicinity of, the project site appears to contain elevated concentrations of iron. Of the 20 General Permit stormwater samples collected at the project since 1998, only two of the samples did not exceed the State and Federal benchmark values for stormwater discharges. Samples containing greater than 20 times the Federal benchmark concentration were collected on six occasions since 1998 (Table IV.D-1).[7] It is possible that the iron is leaching from the disturbed and crushed rock at the project site. However, the Prunuske Chatham (2003) data indicate that the elevated iron concentrations in runoff may be a regional issue. A sample collected in Green Valley Creek upstream of the project site (sample C2 in Table IV.D-1) also contained elevated concentrations of iron. In addition, no other metals were identified at concentrations in excess of water quality benchmarks.

Diesel. Surface water runoff at, and in the vicinity of, the project site appears to contain elevated concentrations of TPH as diesel. Of the 28 stormwater samples collected at, and in the vicinity of, the project site (both the General Permit and Prunuske Chatham data), 19 of the samples contained diesel in excess of the U.S. EPA Suggested-No-Adverse-Response Level (SNARL) for toxicity other than cancer risk water quality criteria. The SNARL for diesel is 0.100 mg/L.

7 It should be noted that the benchmark values are for dissolved iron. The samples collected at the site were analyzed for total iron.

Keeping pollutants on-site and out of Green Valley Creek would require a comprehensive water quality protection program for the proposed project. The three main components of a comprehensive water quality protection program for this type of facility should include: 1) implementation of multiple types of source and treatment control best management practices, 2) monitoring of the effectiveness of the BMPs, and 3) implementation of corrective action should monitoring indicate that water quality benchmarks and objectives are not being met.

Current washing of truck exteriors and wheel wells is conducted in the vicinity of the existing concrete batch plant. The wash water and associated sediment are currently directed into a small concrete containment pond. According to the application "silt and clay sediments have a chance to drop out of suspension before the water empties through a culvert to Green Valley Creek" (Carlile Macy, 1997). Under the General Permit, truck wash water is considered a non-storm water discharge, and therefore discharge of this water to Green Valley Creek would not be in compliance with the General Permit conditions.

The applicant has also proposed the following measures (in addition to the existing measures currently being implemented) to mitigate potential erosion-related impacts to Green Valley Creek that would result from either expansion option:

- *Expansion of the existing detention basins.* The applicant used the methodology described in the Erosion and Sediment Control Field Manual (SFRWQCB, 1996) to determine the size of the basins required to adequately settle out suspended sediment for the Western Expansion option. However, the applicant used the settling velocity for medium silt to size the basins. These basins would not be expected to provide adequate settling time to treat fine silt and clay. For example, based on the methodology used by the applicant, to treat fine silt and clay, the proposed basins would need to be increased in surface area from the proposed 0.20 acres to 1.02 acres (Pond 1), from 0.92 acres to 4.36 acres (Ponds 2 and 3), and from 0.44 acres to 5.8 acres (Pond 4). The application for the Northern expansion option does not include a description of the methodology used to determine detention pond sizes. However, the proposed detention ponds appear to be of similar total surface area as for those proposed under the Western Expansion option, and therefore similar issues associated with not capturing fine silt and clay would be expected.

- *Hydroseeding of slopes.* The applicant proposes to hydroseed all slopes where no further mining is permitted.

- *Stabilization of the quarry floor.* The applicant proposes to minimize erosion on those areas of the quarry floor that are susceptible to erosion by covering the ground with straw and containing these areas with hay bales or straw wattles.

Neither expansion option, as proposed, provides adequate BMPs to fully mitigate the potential for continued discharge of pollutants to Green Valley Creek. Considering that protection of water quality is of particular concern in this watershed,[8] the measures proposed by the applicant are considered inadequate. The project also proposes no monitoring or corrective action if monitoring indicates adverse impacts.

8 The heightened concern is based on the use of the Green Valley Creek as a salmonid fishery. Refer to the Section V.D, Biological Resources section of this DEIR for additional discussion of the habitat value of Green Valley Creek.

Mitigation Measure IV.D.1: The following mitigation measures, in conjunction with those measures proposed by the applicant, shall represent the water quality protection program. The program shall be implemented prior to initiation of mining under the proposed expansion (with the exception of Mitigation Measure IV.D.1c). The applicant shall demonstrate to the satisfaction of the RWQCB and the County that discharges from the site consistently meet the specified water quality benchmarks for stormwater discharges prior to proceeding with mining under the proposed expansion.

All of the following mitigation measures shall be implemented for either expansion option:

Mitigation Measure IV.D.1a: ***Expand creekside buffer.*** All aggregate equipment storage facilities and processing facilities shall be moved out of the floodplain of Green Valley Creek prior to initiation of mining under the proposed expansion. The floodplain boundary at the quarry shall be demarcated to minimize the potential of future encroachment of site activities into the floodplain area. The buffer zone shall be reconfigured so that flood water flowing across Highway 116 can enter the floodplain buffer zone at the site and flow unobstructed back into Green Valley Creek.

The southeast portion of the site, that is subject to flooding and is currently used as an unimproved parking area, will be paved. Other areas will be vegetated to reduce erosion. No new stockpiles or permanent equipment will be placed in the 100-year floodplain as shown in Figure IV.D-2.

Mitigation Measure IV.D.1b: ***Implement aggressive sediment source control program.*** Source control measures focus on keeping sediment on the slopes before it is entrained in runoff. Each of the following measures shall be implemented to reduce the amount of sediment that enters runoff within the quarry. Mining operations shall not commence in the expanded mining area until the following activities are completed:

- Reclamation work has expanded the riparian corridor along Green Valley Creek (in the existing quarry area) to 100 feet from top bank, meeting all ARM Plan standards. The reclamation work shall have included but not be limited to removing all mining equipment, stockpiles, spoils, bins, barrels, tires, inoperative vehicles and any other debris from the berm along the creek, regrading of the berm so that the west toe of the berm is no less than 50 feet from top of bank of the creek and the berm slope does not exceed 2:1 (horizontal to vertical) or as otherwise approved by PRMD, completion of planting of the area with natural riparian or other appropriate type vegetation, and installation of a physical barrier to protect the area from encroachment of mining equipment. No new stockpiles or permanent equipment will be placed in the 100-year floodplain as shown in Figure IV.D-2;

- A final grading and revegetation plan is prepared in conformance with recommendation of the California Department of Fish and Game which shall be included in the reclamation plan, and the sediment ponds/drainage system shall be installed/cleaned out as required by the erosion and sediment control plan;

- A Spill Prevention Plan approved by the County Environmental Health Department's Hazardous Materials Division is made part of the reclamation plan; and

- Reclamation or stabilization of all quarry slopes and the quarry floor (excluding the 40-acre working/processing/stockpile/loading/access areas and the acreage of the sedimentation ponds) must be completed by October 15 of each year. Stabilization measures include hydraulic application of surface stabilizing compounds, hydroseeding, mulching, or other measures to prevent erosion. The operator must be up to date with all required reporting forms and fees, and have no outstanding water quality-related violations anywhere in the quarry. To insure accurate compliance with this condition the applicant shall submit 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.

During mining and reclamation activities, the following measures shall be implemented to reduce the potential for erosion and sediment discharge:

- Mining activities and the operation of heavy equipment on site shall be done in such a manner as to avoid repeated crossing of drainage ways or puddles that are actively flowing into the sediment pond/traps and offsite;
- Topsoil suitable for use in revegetation shall be stockpiled for use in reclamation and replanting of cut slopes. Prior to October 15 of each year, all topsoil stockpiled for future use in revegetation shall be seeded and mulched in order to prevent soil loss through erosion;
- Surfaces disturbed by mining shall be stabilized, to the extent practicable, by October 15 of each year. Stabilization measures include, but are not limited to, hydraulic application of surface stabilizing compounds, hydroseeding, mulching, or other measures to prevent erosion; and
- All active processing area roads and work areas shall be stabilized surfaces or engineered with aggregate base fill thicknesses adequate to withstand heavy equipment and truck traffic. These roads shall be constructed with culverts and energy dissipation structures to convey runoff under the roads, as necessary. Areas on the quarry floor other than roads and active work areas shall be stabilized by the stabilization techniques described above.

Mitigation IV.B.6 in Section IV.B, Air Quality; and Mitigation V.B.3 in Section V.B, Geology, Seismicity and Mineral Resources, also contain a number of measures that would serve to further mitigate potential erosion effects.

Mitigation Measure IV.D.1c: ***Modify the mining plan.*** The mining plan shall be modified so that the quarry floor slopes toward the active mining slope (the high wall). This reshaping of the quarry floor shall occur as mining progresses. A detention basin shall be constructed at or near base of the high wall to act as a primary sediment settling facility and sized to manage runoff from exposed slopes. The design of the basin shall be submitted to the Regional Water Quality Control Board for approval with copies to PRMD. The basin shall be setback from the high wall so as not to interfere with aggregate excavation. The basin may be relocated from time to time to best manage aggregate excavation. Discharge from this primary settling facility shall be directed to the detention ponds proposed by the project for further treatment prior to discharge to Green Valley Creek.

Mitigation Measure IV.D.1d: ***Modify the proposed detention basin design at the concrete batch plant.*** At the new batch plant location, a new runoff and washwater holding facility shall be designed and constructed to contain all runoff from the batch plant area, including the location where trucks unload Portland cement and where mixer trucks are washed (both inside and outside of the mixer truck). The batch plant area shall be designed so that no run-on into the area of the batch plant occurs. In accordance with the Industrial General Permit, water shall not be discharged from this holding facility (truck washdown water is considered a non stormwater discharge). Water in this facility shall either be allowed to evaporate or if the pH level is appropriate, the water may be used on-site for dust control.

Mitigation Measure IV.D.1e: ***Implement best management practices***. Implement best management practices to reduce the potential for discharge of contaminants to storm water runoff. 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;
- Prior to commencing mining activities a spill prevention and emergency/countermeasure response plan shall be prepared and submitted to the County Hazardous Materials Division for review and approval. The operator shall provide a copy of the approved plan to the Permit and Resource Management Department;
- At vehicular access points, the site shall be controlled by maintaining security fencing and locking gates and posted trespass signs at all vehicular access points to the site; and
- Runoff from the access roads shall be collected and passed through the sediment pond/trap system on site.

Mitigation Measure IV.D.1f(1): ***Implement a monitoring program.*** The current stormwater monitoring program being implemented by the applicant shall be expanded for a single season to collect a series of baseline samples during a representative storm events. Timing of this monitoring shall depend on the volume of runoff, therefore, the water quality consulting firm performing the testing shall establish timing criteria with the RWQCB, to ensure data that is collected will provide the proper baseline sampling. The monitoring program shall include the following:

- The baseline monitoring program shall be implemented by a qualified third-party water quality consulting firm that is approved by the County and compensated by the applicant;
- Prior to commencement of mining in the approved expansion area:

  a) A collection of a minimum of eight baseline samples of runoff from undisturbed locations to determine background constituent levels. Two locations shall be selected in areas away from mining activities and other human disturbance and sampled at least four times at each location during the single rainy season.

  b) All storms that generate discharge from the active mining portion of the project site to Green Valley Creek shall be monitored. However, as a practical measure, it shall not be required that monitoring events occur more frequently than once every two weeks or pursuant to the criteria developed by the RWQCB. The discharge end of each outfall shall be made easily accessible for inspection and sampling.

c) This single-year collection of stormwater background data will be used as the basis to evaluate future water quality sampling data.

Mitigation Measure IV.D.1f(2): ***Collection of semi-annual RWQCB samples.*** The applicant shall collect semi-annual representative samples from all stormwater discharge outfalls (at the location where the discharge leaves the detention 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:

- Collection of samples at upstream and downstream of the quarry outfalls in Green Valley Creek 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 and TPH as diesel (with silica gel clean-up) by a State-certified analytical laboratory;
- The surface water quality data shall be analyzed by a qualified professional for indications of exceedence of water quality benchmarks and/or changing conditions in water quality that could indicate a potential impact to water quality conditions in Green Valley Creek. The following benchmark water quality values shall be used to determine whether an adverse impact may be associated with the discharge:

pH	Total Suspended Sediment	Turbidity	Specific Conductance	Iron	Total Petroleum Hydrocarbons as Diesel
6.5 to 8.5 [a]	0 to 100 mg/L [a]	Not greater than 20% increase in receiving water [b]	0 to 200 uS/cm [a]	0 to 300 ug/L [a]	<15 mg/L

[a] Based on State Stormwater Pollutant Benchmark levels.
[b] Based on the Basin Plan (RWQCB, 2001). This criteria cannot be applied to discharge samples from outfalls, but shall be applied to samples collected in Green Valley Creek upstream and downstream of the project site.

The applicant shall submit a monitoring report to the Regional Water Quality Control Board with a copy submitted to the Sonoma County Permit and Resource Management Department. Frequency of reporting will be determined by the RWQCB but shall not be less frequent than twice each rainy season.

Mitigation Measure IV.D.1g: ***Implement corrective action, as necessary.*** If values measured from project site discharges fall outside the specified ranges, action must be taken to mitigate the exceedence. If the data indicate that contaminants of concern are increasing in concentration relative to baseline conditions, the qualified professional shall recommend corrective action. The applicant shall work with the RWQCB to implement appropriate corrective action, as necessary. Corrective action may include, but is not limited to, additional source control BMPs, expansion of the existing detention ponds, mechanical filtration of the discharge, construction of extended wet ponds and/or treatment wetlands. Mining in the proposed Western or Northern expansion areas shall not commence unless the applicant can demonstrate that the existing mining operation can meet the specified water quality objectives.

Mitigation Measure IV.D.1h: ***Repair storm damage, as necessary.*** Following storm events which significantly damage (i.e., erosion or rainfall-induced landsliding) the reclamation areas, the operator shall have a qualified professional conduct a damage survey of the reclamation improvements, and recommend remedial actions as necessary to help assure that the performance standards will be met. A report shall be submitted to the Sonoma County Permit and Resource Management Department regarding the effects of such damage, including recommendations for replanting, if necessary.

Significance after Mitigation: Less than Significant. The identified mitigation measures would reduce pollutant loading to Green Valley Creek to below water quality benchmark levels prior to initiation of mining under the proposed expansion. The mitigation measures described above require that the runoff from the site meet or exceed the water quality benchmarks for the life of the project. Adverse impacts associated with discharge of pollutants are therefore considered less than significant.

Impact IV.D.2: The location of equipment, facilities, and aggregate stockpiles in the floodplain could exacerbate flooding impacts downstream. In addition, property damage and impacts to water quality during a flood event may occur. This would be a potentially significant impact under the Western or Northern Expansion options.

Storage of aggregate stockpiles and equipment in the floodplain could reduce flood water storage capacity in the floodplain and/or slow conveyance of flood waters during extreme events, exacerbating backwater flooding impacts. No mention is made under either expansion option whether other materials or equipment would remain in the floodplain.

In addition, if equipment and property remained in the floodplain during extreme storm events, substantial property damage and potential injury to site workers could occur. Releases of sediment and chemical to flood water could also degrade water quality.

Mitigation Measure IV.D.2: Implement Mitigation Measure IV.D.1.

Significance after Mitigation: Less than Significant. The identified mitigation measures would eliminate operation and/or storage of equipment, facilities and aggregate materials stockpiles from the floodplain. Adverse impacts associated with flooding are therefore considered less than significant.

Impact IV.D.3: Implementation of the proposed project could adversely affect local groundwater resources by reducing recharge to groundwater wells or causing permanent, unrecoverable groundwater level decline in nearby wells. This would be a potentially significant impact under the Western or Northern Expansion options.

Groundwater Recharge

The local groundwater system could be adversely affected by changes in the volume and rate of infiltration and groundwater recharge. The proposed mining areas under either the Western Expansion or

Northern Expansion options are steep hilly uplands covered by a conifer forest. Under existing conditions, a relatively large portion of the precipitation that falls on these hilly uplands soaks into the overlying soils and when the soil is saturated, the watereither migrates laterally downslope through the soil matrix or vertically into the weathered overburden and underlying bedrock. The water that does not infiltrate into the soil flows overland and is eventually discharged to Green Valley Creek.

The surface water that can infiltrate deep into the overburden and bedrock can contribute to recharge of the underlying groundwater bearing zones. The rate that surface water infiltrates into the surface depends on the infiltration capacity, which is related to the soil type, moisture content, slope, presence of fracture zones in bedrock, and temperature. The porosity and permeability of rock is typically much lower than for soil which limits infiltration except in areas where fracture or shear zones are present in the bedrock. On an exposed bedrock surface, surface infiltration in rock is controlled by the frequency and size of fractures. Surface water infiltrates slowly downward until it encounters less weathered bedrock where it then either continues downward into discrete bedrock fractures or flows along the interface between weathered and less weathered rock toward other fracture zones or topographic lows, such as creek valleys. Surface infiltration is a primary source of recharge for upland springs and plays an important role in providing base flow for Green Valley Creek during the summer and fall. Surface water that infiltrates into the upland areas, in addition to the water table associated with Green Valley Creek, also provides recharge for water supply wells in the vicinity.

The rate of infiltration into soil versus bedrock at the site is very difficult to quantify as accurate data on the properties that control infiltration are not available. Hydrologist and engineers can roughly estimate the amount of infiltration based on rates of runoff. The relative amount of runoff that is expected from a given land use has been characterized by engineers as Rational Method *C* values. *C* values can vary from near zero to 1.0. A low *C* value indicates that most of the precipitation is retained on site for some time (held in the soil matrix, remains on the surface in puddles, or infiltrates into the ground). A high *C* value indicates that most of the precipitation runs off as surface flow at rates depending on the slope. Typically, woodlands and forests have a *C* value ranging from 0.05 to 0.25, indicating that most of the precipitation that falls on the forested uplands of the site infiltrates (Goldman, et. al., 1986).

Implementation of either of the expansion options would convert the surface and near surface in some areas of the project site from a well developed woodland to barren slopes with shallow or exposed bedrock. A lack of vegetative cover leads to low infiltration rates (Chorely, 1969). However, this is dependent on the condition of the bedrock (i.e., fracture and shear zones), the slopes, and present condition of woodland. The Rational Method *C* value for barren slopes ranges from 0.50 to 0.90, indicating that most of the precipitation that falls on these areas would run off rapidly (Goldman, et. al., 1986). It is possible that with implementation of a rigorous reclamation plan that the slopes could be resoiled and revegetated, but the development of soil structure, forest litter, and a forest canopy could take decades or more.

The estimated increase in runoff associated with the proposed expansion project under the Western or Northern option and cumulative increases (includes proposed Blue Rock project) are summarized in Table IV.D-2, below. As is demonstrated in the table, under the worst-case cumulative scenario, runoff rates would increase as much as 50 percent.

TABLE IV.D-2
PROJECT AND CUMULATIVE INCREASE IN RUNOFF (CFS) ESTIMATES IN THE SUBWATERSHED

		Project (Canyon Rock Quarry Only)		Cumulative (Canyon Rock and Blue Rock Quarries)	
		Estimated Discharge, cfs [a]		Estimated Discharge, cfs [a]	
Storm Frequency	Existing Discharge, cfs	Northern Expansion Option	Western Expansion Option	Northern Expansion Option	Western Expansion Option
10-Year	170	230	210	255	235
20-Year	190	255	235	285	265
100-Year	240	320	300	355	330
Average Percent Increase in Runoff Relative to Existing		35±%	25±%	50±%	40±%

[a] The estimated discharge is at 100% expansion and reclamation, and assumes a worst-case scenario, in which the settling ponds are at capacity and peak discharge is not detained on the site.

SOURCE: Questa Engineering (enclosed in Appendix D-3)

The change in the hillslope hydrogeology caused by the proposed project could reduce recharge to the local groundwater system and result in increased peak flows in Green Valley Creek. The creek could become more "flashy," meaning that peak flows would be higher during storms and baseflows would be lower (or nonexistent) during the dry months. (Changes to hydrology of Green Valley Creek are further discussed in Impact IV.D.4).

As discussed in the project description and in further detail in Impact IV.D.4 below, the applicant currently uses and proposes to install additional retention basins to provide water quality enhancement by sediment removal prior to stormwater discharge to Green Valley Creek. These basins will detain runoff temporarily and allow the applicant to manage discharges to Green Valley Creek thereby avoiding flash flow conditions. These basins will also serve the dual purpose of providing surface infiltration resulting in the eventual recharge to the shallow groundwater system. The sediment retention basins, however, would not necessarily mimic the pre-project infiltration rates on the altered hillslopes, but they would enhance surface infiltration and provide recharge to the shallow and deep groundwater systems.

Although the project could reduce groundwater recharge in some areas disturbed by the proposed project, constructed sediment retention basins would detain increased runoff generated by the proposed project. These ponds would locally enhance groundwater infiltration thereby ensuring that impacts related to reduction of groundwater recharge remain less than significant. Mitigation Measure IV.D.4 addresses in detail, management of sediment retention ponds to reduce significant alteration of flow in Green Valley Creek.

Groundwater Level Decline

Under existing conditions, the water supply for the quarry operations is provided primarily from the Forestville County Water District and is supplemented by water removed from detention basins and pumped from one of the four on-site wells. The total water use for aggregate processing, dust suppression, and potable water from each of these sources is not monitored at the site. Therefore, current volume and rate of groundwater extraction cannot be accurately estimated. Under the proposed project, the annual aggregate production sales rate would potentially increase from 375,000 tons per year (under baseline conditions) to maximum of 500,000 tons per year. The increase in aggregate production would result in increased water use. According to the applicant, groundwater is the least used source of water, partly due to the high iron content (Trappe, 2003). It is possible with higher production rates, groundwater use would increase proportionately to the increase in aggregate production (i.e., approximately 33 percent) however, the limiting factor to the whether the applicant uses the onsite well depends on whether the onsite well would provide the required increase in demand. Increased groundwater pumping to supplement supplies needed under the project could potentially cause additional groundwater drawdown that, depending on the local groundwater system, could be recognized in neighboring wells. Lower groundwater levels in nearby wells could result in groundwater levels below the minimum depth required for pumping and the need to have the well deepened or abandoned.

A DWR well survey indicated that 21 registered wells are located within a one-half mile radius of the site and fourteen wells within 1,000 feet of the project site. Four of the wells are on property are owned by the project applicant. Many of the wells identified by the survey are abandoned or have run dry. Some of the active offsite wells are placed at shallow depth (24 to 40 feet) within the alluvium of Green Valley Creek. Based on report well tests (DWR Well Driller's Report) and the subsurface materials, those wells have low yields and because they are shallow, presumably have lower water quality than water extracted from deeper wells.

The groundwater extraction well used by the applicant at the project site is up to 60 feet deeper than the neighboring wells located offsite and along Green Valley Creek. It is not determined whether the onsite extraction wells and the neighboring well are in hydrogeologic connection. If they are, over-pumping resulting from the proposed quarry expansion could cause a response (lowering of groundwater level) in nearby, offsite wells and could, over the long term, lower the groundwater levels in nearby wells to depths below the current pumping depth. Decline of water level below levels accessible by the well pump typically requires the well owner to abandon or deepen the extraction well and increases the cost of pumping water due to a greater vertical pumping distance. This is a potentially significant impact.

Mitigation Measure IV.D.3a: Water used for processing activities and dust suppression shall be recycled from the sediment pond/traps to the extent practicable.

Mitigation Measure IV.D.3b: The applicant shall conduct regular groundwater monitoring of onsite wells to identify both temporary groundwater drawdown and long term, unrecoverable groundwater drawdown resulting from increased onsite groundwater pumping.

The self-monitoring program shall begin at project approval and prior to mining under the new permit in order to obtain a sufficient set of existing, baseline groundwater level data. The monitoring program shall use the existing extraction well and all other accessible, existing wells located within the project boundary. If necessary, the applicant shall install new monitoring wells as determined by the program developer. Regular and consistent water level monitoring would identify and distinguish between temporary or long-term decline of the groundwater levels. Water level data shall be collected prior to pumping, at regular intervals during pumping and at regular interval after pumping is stopped (static conditions). If during proposed project operations, data indicates that groundwater levels do not recover to at least 80 percent of the baseline levels over the pre-determined recovery period (based on existing recovery rates), the applicant shall reduce supplemental groundwater pumping to pre-project rates and obtain necessary supplemental water supply from onsite surface water sources or municipal supply. Further, if the groundwater monitoring program identifies a consistent groundwater level decline over the course of each water year (October to September) that is not in response to a known or reported regional drought condition, the applicant shall reduce pumping to pre-project levels and obtain a supplemental water supply from onsite water recycling or municipal source. Although the applicant would perform the actual groundwater monitoring and data collection, the program shall be developed by a California State certified hydrogeologist with experience in groundwater conditions local to Canyon Rock Quarry. Quarterly reports and data shall be submitted to Sonoma County. However, the County shall be immediately notified if groundwater conditions change substantially.

The mitigation measure requires that the applicant initiate a self-monitoring program for groundwater at the quarry. The purpose of this program is to provide a mechanism for early identification of potential and significant groundwater level decline. The data obtained would identify and distinguish between temporary groundwater drawdown due to daily operations and long-term drawdown due to over-pumping of the groundwater bearing zones beneath the site. Long-term drawdown identified within the site boundaries could translate to lower, unacceptable, groundwater levels in neighboring, offsite wells at a later time. Monitoring under this program would be conducted on a regular schedule and from all accessible and useable groundwater wells on the quarry property. Data would be collected at regular interval (i.e. twice daily) while pumping is underway, after pumping is stopped, and while the well is in static (no pumping) conditions.

Significance after Mitigation: Less than Significant. The identified mitigation measures would reduce potential impacts associated with depletion of groundwater resources. The groundwater monitoring program would adequately identify temporary and long-term adverse effects of the additional supplemental pumping proposed by the project and provides a means to alter quarry practices to avoid the impacts associated with a long term decline of water levels. The prescribed mitigation ensures that impacts related to groundwater level decline in onsite and nearby wells would remain less than significant.

Impact IV.D.4: Implementation of the proposed project could significantly alter the hydrology of Green Valley Creek. This would be a potentially significant impact under the Western or Northern Expansion options.

As described in the discussion under Impact IV.D.3, above, implementation of either expansion option would result in changes to the surface water hydrology of the project site, and to some degree, the flows in Green Valley Creek. Table IV.D-3, below, summarizes the estimated increases in peak discharge for the 10-, 20-, and 100-year design storms associated with the proposed expansion options. The calculations were based on the Rational Method for estimating basin discharges. Either expansion option would be expected to result in less than a one percent increase in peak discharge in Green Valley Creek. However, since there are existing flooding problems along Green Valley Creek and in the Russian River downstream, any increase in peak discharge would be considered a significant impact.

TABLE IV.D-3
PROJECT INCREASES TO PEAK DISCHARGE (CFS) IN THE GREEN VALLEY WATERSHED AT POINT IMMEDIATELY DOWNSTREAM OF CANYON ROCK QUARRY

		Project Canyon Rock Quarry Only	
		Estimated Discharge, cfs [c]	
Storm Frequency	Existing Discharge, cfs [a]	Northern Expansion Option	Western Expansion Option
10-Year	8,537	8,597	8,577
20-Year	9,953 [b]	10,018	9,998
100-Year	12,550	12,630	12,610
Average Percent Increase in Runoff Relative to Existing		0.7±%	0.5±%

[a] Sonoma County Water Agency
[b] The 25-year discharge is used as an approximation of the 20-year discharge, as it is the only available estimate for Green Valley Creek (along with the 10- and 100-year discharge). The 25-year discharge is similar to, though slightly higher than the expected 20-year discharge.
[c] The estimated discharge is at 100% expansion and reclamation, and assumes a worst-case scenario, in which the settling ponds are at capacity and peak discharge is not detained on the site.

SOURCE: Questa Engineering (enclosed in Appendix D-3)

Mitigation Measure IV.D.4a. The applicant shall design and operate the sediment retention ponds to act as runoff detention features so that peak flows in Green Valley Creek are not increased.

The project proposes to construct and operate a series of detention basin (as described above) to facilitate the removal of suspended sediment from storm water runoff generated at the project site prior to discharge to Green Valley Creek. The basins are not designed or intended to retain all runoff from the site during the rainy season. Periodically, the basins would be drained to ensure that there is sufficient capacity to detain runoff generated in subsequent storm events. Water removed from the basins would be discharged into Green Valley Creek. If the discharges are not timed properly, they could potentially incrementally increase flooding hazards on the creek. Two factors should be considered to minimize the potential for the project to exacerbate existing flooding problems along Green Valley Creek: 1) the increase in volume of runoff from the project site, and 2) the timing of the release of runoff from the project site relative to peak flood flows in Green Valley Creek during a storm event. For example, a project that would generate a large increase in runoff that coincided with the flood peak in the creek would cause a greater impact on flooding than a project that generated a relatively small increase in runoff volume that did not coincide with the flood peak in the creek. The final drainage plan for the project shall be prepared by a licensed professional engineer and reviewed for adequacy by the County.

Mitigation Measure IV.D.4b: The Sediment pond/traps and drainage systems shall be cleaned out pursuant to the standards stated in the approved erosion and sediment control plan.

The sediments shall be stockpiled for use as topsoil in the reclamation process. The slope of the pond/trap banks (below water) shall be equal to or greater than a 3:1 (horizontal/vertical) slope to discourage shallow water areas which promote plant growth and mosquito breeding. All of the sediment pond/traps and drainage systems on site shall be cleaned out pursuant to the standards stated in the approved erosion and sediment control plan, as required by October 15. If upon inspection the sediment ponds/traps and drainage system have not been cleaned out, the owner will be put on notice to complete the cleaning within 30 days or all crushing, screening, grading, and sales of material on site shall immediately cease until the ponds/traps and drainage system have been cleaned out.

Significance after Mitigation: Less than Significant. The identified mitigation measures would reduce potential impacts associated with increased runoff so that peak discharges are not increased. Adverse impacts associated with increased runoff are therefore considered less than significant.

Impact IV.D.5: Continued operation of septic systems at the site could result in water quality impacts to Green Valley Creek. This would be a potentially significant impact under the Western or Northern Expansion options.

Two septic systems and associated leachfields are operated at the site. One of the septic systems services the office buildings near the entrance and one is located adjacent to the shop. Based on site plan included in the file at the Sonoma County Permit and Resource Management office, the leachfields appear to be approximately 200 feet (office system) and 300 feet (shop system) from the centerline of Green Valley Creek. The Basin Plan requires that leachfields be setback 100 feet from the line which defines the 10-year floodplain. The 10-year floodplain has not been defined at the site. However, the leachfield for the septic system located north of the retail office appear to be located approximately 70 feet from the 100-year flood hazard zone. Often in sloping terrain, there is little horizontal distance between the 10-year and the 100-year floodplain. Therefore, the existing leachfield may be in conflict with the Basin Plan setback policy.

A septic system permit dated from the early 1970s was included in the PRMD files. However, no information was available on construction and/or maintenance of these systems in the files. The typical design life of a septic system in this type of setting is 30 years (Tracy, 2003). It is possible that these systems may not provide adequate treatment of septage from the proposed project and thus could allow pollutants to be discharged to Green Valley Creek.

Mitigation Measure IV.D.5: An analysis shall be made by a Registered Civil Engineer or Registered Environmental Health Specialist regarding the existing septic system's ability to accommodate the proposed sewage loading. Any necessary system expansion or modifications shall be done under permit from the Well and Septic Section of the Permit and Resource Management Department and may require both soils analysis and percolation testing.

Significance after Mitigation: Less than Significant. The identified mitigation measure would reduce potential impacts associated with poorly treated septage. Adverse impacts associated with septic system operation are therefore considered less than significant.

Impact IV.D.6: Cumulative impacts to the hydrology of Green Valley Creek could result from implementation of the proposed project and the proposed mining expansion at the Blue Rock Quarry. This would be a potentially significant impact under the Western or Northern Expansion options.

Implementation of either the western or northern expansion option at the project site and implementation of the proposed mining plan at the Blue Rock quarry (located adjacent to the proposed project across Highway 116), would result in changes to the surface water hydrology of the watershed, and to some degree, the flows in Green Valley Creek. Table IV.D-4, below, summarizes the estimated increases in peak discharge for the 10-, 20-, and 100-year design storms associated with the proposed project and the cumulative increases (includes the proposed mining plan at the Blue Rock quarry). Increases in peak discharge could exacerbate downstream flooding problems. This is considered a potentially significant cumulative impact.

Mitigation Measure IV.D.6: Implement Mitigation Measure IV.D.4.

Significance after Mitigation: Less than Significant. Mitigation Measure IV.D.4 would require that on-site detention ponds are designed and operated so that no increase in peak discharges results from project implementation. Therefore, with implementation of Mitigation Measure IV.D.4, the project would not contribute to cumulative flooding impacts.

Impact IV.D.7: The proposed project, in conjunction with other activities in the region, may result in cumulative adverse impacts to regional groundwater resources. This would be a less than significant impact under the Western or Northern Expansion options.

The proposed project could deplete local groundwater resources by removing the soil overburden and exposing rock, which could influence and potentially reduce infiltration rates and groundwater recharge within the mining area; and by potentially extracting more groundwater relative to existing conditions. The potential impacts and required mitigation measures associated with depletion of groundwater resources associated with the proposed project alone were described under Impact IV.D.3 of this section. In addition to project specific effects, it is possible that the proposed project, in conjunction with other projects in the vicinity, could result in a cumulative impact to regional groundwater supplies.

TABLE IV.D-4
PROJECT AND CUMULATIVE INCREASES TO PEAK DISCHARGE (CFS) IN THE GREEN VALLEY WATERSHED AT POINT IMMEDIATELY DOWNSTREAM OF CANYON ROCK QUARRY

		Project Canyon Rock Quarry Only		Cumulative Canyon Rock and Blue Rock Quarries	
		Estimated Discharge, cfs [c]		Estimated Discharge, cfs [c]	
Storm Frequency	Existing Discharge, cfs [a]	Northern Expansion Option	Western Expansion Option	Northern Expansion Option	Western Expansion Option
10-Year	8,537	8,597	8,577	8,622	8,602
20-Year	9,953 [b]	10,018	9,998	10,048	10,028
100-Year	12,550	12,630	12,610	12,665	12,640
Average Percent Increase in Runoff Relative to Existing		0.7±%	0.5±%	1±%	0.7±%

a Sonoma County Water Agency
b The 25-year discharge is used as an approximation of the 20-year discharge, as it is the only available estimate for Green Valley Creek (along with the 10- and 100-year discharge). The 25-year discharge is similar to, though slightly higher than the expected 20-year discharge.
c The estimated discharge is at 100% expansion and reclamation, and assumes a worst-case scenario, in which the settling ponds are at capacity and peak discharge is not detained on the site.

SOURCE: Questa Engineering (enclosed in Appendix D-3)

The project site does not overlie a regional groundwater aquifer (DWR, 1975). The Franciscan Formation, which underlies most of the project site, is not considered a reliable or laterally extensive groundwater producing formation.[9] The relatively minor amount of groundwater that occurs in the vicinity of the site is in shallow alluvial sands and gravels along drainages. These shallow water-bearing zones (both the alluvial aquifers and the isolated Franciscan water-bearing zones) are largely isolated from the deeper, regional water supply aquifers. Groundwater flow and depth in these shallow zones are typically influenced by surface topography and seasonal precipitation. Shallow groundwater would be expected to flow toward Green Valley Creek, then flow north along Green Valley Creek, joining the underflow of the Russian River, and eventually discharging to the ocean. Depleting these alluvial aquifers near the project site could result in a incremental loss of groundwater supplies for downstream users of the alluvial aquifers along Green Valley Creek and the Russian River (potential impacts to local groundwater users were addressed under Impact IV.D.3).

9 It is possible for water wells to produce adequate water from the Franciscan, but these producing wells occur sporadically and rely on a complex network of water-saturated bedrock fractures.

Other identified projects considered under the cumulative analysis that could contribute to depletion of groundwater resources regionally include: the Blue Rock Quarry, the Graton Winery, and the Crinella Property (winery). Of these three sites, only the Blue Rock Quarry could substantially affect the local alluvial/colluvial and bedrock water-bearing zones based on proximity and expected volume of water use. The Blue Rock Quarry, similar to the proposed project, would remove overburden and therefore reduce the capacity of surface materials to infiltrate rainfall directly. However, the Blue Rock project would eventually create a mining pit that would fill with water (all precipitation and runoff in the mining area would be captured) and increase recharge of the aquifer. It is likely that the mining pit would be partially full of water year round and provide a steady replenishment of the recharge through continuous infiltration through bedrock fractures.

The magnitude of impact that the identified cumulative projects would have on local groundwater resources depends on the depth of the individual wells and the quantities of groundwater the wells extract. Typically, water supply wells would be drilled to depths sufficient to intersect reliable groundwater sources such as a regional aquifer or water-bearing bedrock fracture zone. Given the geology and groundwater occurrence in the area surrounding the proposed project site, well depths adequate to intersect and provide the required groundwater supplies would vary with location. This would result in groundwater wells that are either hydraulically connected within the same water–bearing zone or that extract groundwater from discrete, unconnected groundwater sources. Because of this potential variability, the individual contribution to groundwater resource depletion at each cumulative project site is unknown and difficult to quantify without extensive regional groundwater study. For this analysis, however, the inherent uncertainty in determining cumulative contribution would be resolved at project-specific level. Mitigation identified in this EIR includes a mechanism to adequately identify temporary and long-term adverse effects of the additional supplemental pumping proposed by the project and provides a means to alter quarry practices to avoid the impacts associated with a long term decline of water levels. If the proposed supplemental groundwater extraction is shown to contribute to a long term groundwater level decline, the project shall limit groundwater use to pre-project levels. The identified project mitigation identifies and addresses the impacts related to long term groundwater level decline and provides mitigation to reduce the impact, and therefore ensures that the cumulative contribution of the proposed project remains less than significant.

Mitigation: None required.

Impact IV.D.8: The proposed project, in conjunction with existing operations on the site, the operations of the adjacent Blue Rock Quarry, and vineyard plantings in the area, would result in cumulative adverse impacts to water quality in Green Valley Creek due to soil erosion. This would be a potentially significant impact under the Western or Northern Expansion options.

Mitigation Measure IV.D.8: Implementation of Mitigation Measure IV.D.1 would reduce the pollutant discharge from the Canyon Rock Quarry to a level below the existing baseline, because the measures would add new best management practices (BMPs) to both existing and new operations.

Significance after Mitigation: Less than Significant.

REFERENCES – Hydrology and Water Quality

Association of Bay Area Governments (ABAG), 1980, *Dam Failure Inundation Areas, San Francisco Bay Region*, scale 1:250,000, March.

Association of Bay Area Governments (ABAG), 1980, *Dam Failure Inundation Areas, San Francisco Bay Region*, scale 1:250,000, March.

Bauer Associates, 1997, Report on Geotechnical Reconnaissance, Canyon Rock Expansion, Forestville, California, November17.

Carlile Macy, 1997, Surface Mining Application and Reclamation Plan for Canyon Rock Company, Western Expansion Alternative, November.

Carlile Macy, 2002, Canyon Rock Company, Inc., Reclamation Plan, Northern Expansion Alternative, September.

California Department of Fish and Game (CDFG), 2000, Stream Inventory Report, Green Valley Creek, Atascadero Creek and Green Valley Creek Subwatershed.

Chorely, R.J., 1969, *Introduction to Fluvial Processes*, Methuen & Co., Ltd.

Goldman, S.J., Jackson, K., Bursztynsky, T.A., 1986, *Erosion and Sediment Control Handbook*, McGraw Hill Book Company.

Higgins, C.G., 1952, Lower Course of the Russian River, California, University of California Press.

Prunuske Chatham, 2003, *Canyon Rock Quarry Expansion Water Quality Sampling Data Package*, submitted to Mike Sotak, Sonoma County PRMD, April 7.

Questa Engineering, 2003, Discharge calculations, written communication with Bruce Abelli-Amen of BASELINE, May 6.

Regional Water Quality Control Board, San Francisco Bay Region (SFRWQCB), 1996, *Erosion and Sediment Control Field Manual*.

Regional Water Quality Control Board (RWQCB), 2000, *Comments on Canyon Rock Quarry Expansion Plan Environmental Document*, letter from John Short, Senior Water Resources Control Engineer, RWQCB to Kenneth Ellison, Sonoma County Permit and Resources Management Department, August 15.

Regional Water Quality Control Board (RWQCB), 2001 (most recent amendment), *Water Quality Control Plan for North Coast Region*, June 28.

Regional Water Quality Control Board (RWQCB), 2003, memorandum from Paul Keiran to John Short, *Industrial Storm Water Inspection, Canyon Rock WDID No 149S001091*, 10 April.

Ryan, Fran, 2003, Volunteer Monitor, Atascadero-Green Valley Creek Watershed Council, written communication with Bruce Abelli-Amen of BASELINE, March and April.

San Francisco Bay Regional Water Quality Control Board (SFRWQCB), 1996, Erosion and Sediment Control Field Manual, November.

Sonoma County Water Agency, 2003.

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

Tracy, John, 2003, Water Quality Specialist, Sonoma County Permit and Resource Management District, personal communication with Bruce Abelli-Amen, May 5.

Trappe, Wendel, 2003, Owner Canyon Rock Company, personal communication with Bruce Abelli-Amen of BASELINE, March 27.

United States Department of Agriculture (USDA), Soil Conservation Service, 1972, Soil survey of Sonoma County, May.

Western Regional Climate Center, 2003, website: http://www.wrcc.dri.edu/summary/climsmsfo.html

CHAPTER V

ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES FOR NORTHERN EXPANSION OPTION ONLY

V.A LAND USE AND PLANNING

INTRODUCTION

This section discusses land use planning issues related to the implementation of the proposed Northern Expansion option, including its consistency with local land use and zoning plans, polices and regulations. The applicable plans and their relevant policies discussed in this section include the *Sonoma County General Plan* (General Plan), the *Sonoma County Zoning Ordinance* (Zoning Ordinance), the *Sonoma County Surface Mining and Reclamation Ordinance* and the *Sonoma County Aggregate Resource Management Plan* (ARM Plan).

SETTING

REGIONAL SETTING

Sonoma County, the most northerly of the nine counties in the San Francisco Bay Region, is located along the Pacific coastline about forty miles north of San Francisco. The county is just over 1,500 square miles, making it the largest of the nine Bay Area counties. Its 2002 population of about 468,750 ranked sixth among the nine Bay Area counties (California Department of Finance, 2002).

Sonoma County is bordered by the Pacific Ocean on 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 transportation route, connecting Sonoma County to San Francisco and Marin Counties to the south and Mendocino County to the north.

PROJECT SITE LOCATION

The project site is located at 7525 Highway 116, in unincorporated Sonoma County, and within Township 7 North, Range 10 West, in the USGS 7.5 Camp Meeker Quadrangle (see Figure III-1 in Chapter III, Project Description). The project site is bounded on the south by Highway 116, and on the east by Martinelli Road.

Figure III-2 in Chapter III, Project Description, shows an aerial photograph of the site. Geographically, the project site is located at the east end of Pocket Canyon and within the eastern fringe of the Coastal Range. Green Valley Creek with its associated habitat zone extends northward within the project site along the east site border. The project site is relatively level in the southeast portion of the site where the existing quarry main facilities are located, with surrounding slopes generally increasing steeply towards the west and northwest. Much of the project site not disturbed by existing quarry operations and other development is heavily wooded with second growth timber, primarily Douglas fir, and tanoak.

ON-SITE LAND USES

Figure III-4 in Chapter III, Project Description, illustrates existing land uses within the project site. Existing quarry facilities include aggregate processing facilities, concrete batch plants, and shop operations. These facilities are located on the quarry floor. The principal existing buildings include an equipment storage and garage building, office building, and a welding and repair shop. Other built features include an internal vehicle road system (paved in the vicinity of the quarry entrance), and sedimentation ponds and containment ponds. The existing concrete batch plan is presently being relocated a few hundred feet to the northwest of its existing location. This will remove it from the flood zone and place it further away from Highway 116 and Green Valley Creek.

There are also a variety of residences and other structures located within the project site. All structures within the project site are currently owned by Canyon Rock Company. One occupied residence is located within the existing vested rights and permitted area just west of Martinelli Road and north of Highway 116. There are two occupied houses on the parcels west of the existing permitted area on the site; one house is a rental unit, and the other house is currently occupied by a Canyon Rock Company employee. There are several occupied houses and a currently vacant, former monastery (originally built in the 1960's) located on the parcels north of the existing vested rights and permitted area. One house and barn on the northern parcels was recently demolished (February 2003) due to its dilapidated condition. Paved and unpaved roads provide access within the project site to these facilities.

The project site is currently served by the Pacific Gas and Electric Company (PG&E) for electricity and natural gas, and by Pacific Bell for telephone service. The site is served by the Forestville County Water District for potable water and for water used in the concrete batch plant on APN 083-130-84. There are a total of five water wells on the project site. One water well is used by the quarry to provide some water for aggregate washing, dust suppression misters at the main plant, equipment washing and irrigation for landscape planting along the berms. The four other water wells serve the existing on-site residences along Martinelli Road. Water for dust suppression at the site also comes from the quarry's sedimentation ponds and the Forestville County Water District. Sewage facilities consist of an on-site septic system and leach fields.

SURROUNDING LAND USES

The project site is located approximately one-half mile west of the Town of Forestville, and approximately one mile southwest of the unincorporated communities of Mirabel Park and Mirabel Heights. Off-site land uses located in proximity to the site include the Blue Rock Quarry (located south of the site across Highway 116), and large residential lots and undeveloped land interspersed to the north, east and west.

APPLICABLE PLANS AND POLICIES

Sonoma County General Plan

To meet the requirements of state law, all cities and counties in California are required to prepare and adopt a General Plan. The *Sonoma County General Plan*, initially adopted in 1989, amended through 1998, is the County's current General Plan. Pursuant to state law, the general plan is a comprehensive, long-term plan for the physical development of the County, and is required to contain development policies, standards, and plan proposals. 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. Each element includes a number of guiding goals and policies, implementing programs to carry out goals and policies, and background data to provide the basis for the goals and policies. In addition to the requirements of California Planning and Zoning Law, the provisions of the California Environmental Quality Act (CEQA) are applicable to the preparation and adoption of the General Plan.

The *Sonoma County General Plan* contains nine sub-county planning regions. The project site is located within the Russian River Planning Area of the *Sonoma County General Plan*.

Land Use Element

The land use element provides the distribution, location, and extent of uses of land for housing, business, industry, open space, agriculture, natural resources, recreation and enjoyment of scenic beauty, education, public building and grounds, solid and liquid waste disposal facilities, and other uses. For each appropriate land use category, it includes standards for population density and building intensity.

The project site, including the existing vested rights and permitted area of the Canyon Rock Quarry and the proposed northern expansion area, is designated by the *Sonoma County General Plan* as Resources and Rural Development (RRD) 160 acre density. This designation is intended, among other things, to protect lands for aggregate resource production as identified in the ARM Plan; and protect natural resource lands including, but not limited, to watershed, fish and wildlife and biotic areas. (General Plan, p. 52).

The RRD designation permits primary uses, such as single family dwellings, resource management and enhancement activities including but not limited to the management of timber, geothermal and aggregate resources, fish and wildlife habitat, and watershed, livestock farming, crop production, firewood harvesting and public and private schools and churches, lodging, campgrounds, resource related employee housing, and processing facilities related to resource production as well as incidental equipment and materials storage. Aggregate resource uses are limited to those consistent with the ARM Plan.

Resource Conservation Element

The Resource Conservation Element provides for the conservation of natural resources including water, forests, soils, rivers, harbors, fisheries, wildlife, minerals, and other natural resources. Some of the Resource Conservation Element's specific goals and policies pertinent to the proposed project are summarized below:

Mineral Resources

- 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 (Goal RC-11).

- 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-11.1).

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

- 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-11a).

- 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-11b).

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

Open Space Element

The General Plan's Open Space Element addresses open space for the preservation of natural resources, for outdoor recreation and for public health and safety. The purpose of the Open Space Element is to preserve the natural and scenic resources, which contribute to the general welfare and quality of life for the residents of Sonoma County and to the maintenance of its tourism industry. The scenic resources component of the Open Space Element includes three open space categories, including community separators, scenic landscape units, and scenic highway corridors. An expanded discussion of the goals contained in the Open Space Element and the project's potential effect on open space/visual resources is discussed in Section V.E, Aesthetics.

Sonoma County Zoning Ordinance

The Sonoma County Zoning Ordinance regulates zoning on the project site. The existing vested rights and permitted quarry, and the Northern Expansion area, are currently designated as *Resources and Rural Development* (RRD) B6, Scenic Resources, by the Zoning Ordinance. The purpose of the *Resources and Rural Development District* is to provide protection of lands needed for commercial timber production, geothermal production, aggregate resources production; lands needed for protection of watershed, fish and wildlife habitat, biotic resources, and for agricultural production activities that are not subject to all of the policies contained in the agricultural resources element of the general plan (Zoning Ordinance, Section 26-10-005).

A *Mineral Resource* (MR) combining district overlay has been applied to the existing vested rights and permitted quarry area. 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 RRD 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).

In addition, the area immediately adjacent to Green Valley Creek (primarily within the existing quarry area) has an F-2 (Secondary Flood Zone) and BR (Biotic Resource) Zoning combining district overlays. 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

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. The following Quarry Mining Standards (Section 26A-09-040) are applicable to the proposed project:

- A mining permit for quarry operations shall be granted for a period not to exceed twenty years, at the end of which time it shall expire, however, that any such permit, upon written request to the County filed prior to its expiration, be reissued for periods not to exceed twenty years if the permittee can establish to the satisfaction of the Planning Commission, or on appeal to the Board of Supervisors, that the use has not been conducted in a manner that is1) detrimental to the environment beyond impacts anticipated at the time of permit approval, or 2) in violation of permit conditions.

- 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.

- Mining operations, stockpiles, and processing operations are to be set back a minimum of 25 feet from the MR zone boundary, the property boundary, and road easements and rights-of-way, whichever is most restrictive. The minimum allowed setback for quarry mining operations from stream banks and critical habitat areas designated in the General Plan is 100 feet.

- 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 or aggregate products. Importation of such materials may be included as ancillary uses allowed with the use permit.
- All quarry sites must have adequate water supplies to support the operation.
- No explosives shall be used except as authorized by a use permit. Blasting activities shall be conducted by a qualified licensed blasting professional in compliance with State blasting regulations.

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. During the process of adoption of the plan, the County considered the aggregate resource areas subsequently classified as MRZ-2 by the State Geologist and transmitted by the Board in compliance with the Act in February, 1985. In addition to compliance with the County ARM Plan, proposed new operations require County approval of a Mining and Reclamation Plan, and a use permit pursuant to County Ordinance 3437, which sets forth local implementation of SMARA.

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:

- <u>Objective 1</u>: Assist existing quarry operations to increase production for high-quality uses in an environmentally sound manner.
- <u>Objective 2</u>: 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.
- <u>Objective 6</u>: Reevaluate gravel extraction methods and production periodically to assess options which would further reduce environmental impacts and land use conflicts or better meet the County's aggregate needs.
- <u>Objective 7</u>: 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 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 SMARO.

California Forest Practice Act

The Z'Berg Nejedly Forest Practice Act (Division 4, Chapter 8 of the Public Resources Code) was enacted in 1973 to regulate logging on privately owned timberlands in California. The Forest Practice Act defines "timberland" as land which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products. The forested lands on the project site meet the definition of timberland as defined in the Forest Practice Act. The intent of the Forest Practice Act is to create and maintain an effective and comprehensive system of regulation and use of timberlands to assure the productivity of timberlands is restored, enhanced, and maintained; and to achieve maximum sustained production of high-quality timber while giving consideration to watershed, wildlife, range and forage, fisheries, recreation, aesthetics, and regional economic vitality. The California Department of Forestry and Fire Protection (CDF) enforces the Forest Practice Act.

The Forest Practice Act specifies that "timber operations" includes, among other categories, the cutting or removal of timber during the conversion of timberlands to other land uses. The Forest Practice Act indicates timber operations require an application for a Timber Conversion Permit and a Timber Harvesting Plan (THP) to be submitted and approved by the CDF. THPs are regulated under the *California Forest Practice Rules* (Title 14, California Code of Regulations, Chapters 4, 4.5 and 10, which implement the provisions of the Forest Practice Act, consistent with CEQA, the Timberland Productivity Act of 1982, the Porter-Cologne Water Quality Act and the California Endangered Species Act. THPs are required to specify the steps that will be taken to prevent damage to the environment, and include, among other requirements, a description of the silvicultural methods[1] to be applied, methods to be used to avoid excessive accelerated erosion from timber operations to be conducted within the proximity of watercourses, and special provisions to protect any unique areas within the within the area of the timber operations.

Consistency with Plans and Policies

As required by CEQA (*Guidelines* Section 15125 (d)), this EIR discusses any apparent inconsistencies between the proposed project and General Plan. For purposes of this EIR, an apparent inconsistency of the proposed project with a county policy reflected in these documents would not, in and of itself,

[1] Silviculture is defined as the theory and practice of controlling the establishment, composition and growth or forests. Silviculture system is the planned program of forest stand treatments during the life of a stand, consisting of a number of integrated steps leading to or maintaining a forest stand of distinctive form.

constitute a significant impact on the environment. Rather, the policies of the Sonoma County General Plan, the Sonoma County Zoning Ordinance, the Sonoma County Surface Mining and Reclamation Ordinance, or the Sonoma County Aggregate Resources Management Plan are used as sources of criteria for assessing any potential environmental effects identified throughout this EIR. Ultimately, the Sonoma County Permit and Resource Management Department (PRMD) 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 site's suitability for the proposed use.

The proposed project appears to be generally consistent with the Sonoma County General Plan. The General Plan's land use designation of Resources and Rural Development (RRD) allows processing facilities related to resource production consistent with the ARM Plan and the County's 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 RRD land use designation. With respect to the General Plan Resource Conservation Element's Mineral Resources goals, objectives and policies, the proposed project would be consistent with the 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 the adverse environmental effects of the project to the extent feasible.

The MR combining district overlay that is proposed under the project would allow mining 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 of the project that require compliance with the operational and reclamation standards of the SMARO. Consequently, the project appears to be consistent with the proposed zoning overlay designation for the site.

The proposed project appears to be generally consistent with the ARM Plan. The ARM Plan anticipated hard rock extraction under the Northern Expansion option; the majority of the proposed 20-year limit of grading under the Northern Expansion option is within the potential "expansion area" identified in the ARM Plan. The proposed project would also be generally consistent with the ARM Plan objectives. The project as designed and mitigated would be consistent with ARM Plan objectives for expanding quarry operations to meet the needs for aggregate in an environmentally sound manner, and would further the objective for continued 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 as described above, the conditions of approval of the project would require compliance with the operational and reclamation standards of the SMARO.

IMPACTS AND MITIGATION MEASURES

APPROACH TO ANALYSIS

The proposed project use was evaluated in terms of its compatibility with other land uses in the vicinity. In addition, the project was evaluated for its compatibility with the applicable plans and policies of Sonoma County, including land use and zoning designations for the area around the project site.

SIGNIFICANCE CRITERIA

According to Appendix G of the *CEQA Guidelines*, a project may be deemed to have a significant land use, or impact on population and housing if it will:

- 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;
- Induce substantial population growth in an area, either directly or indirectly;
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?

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.

LAND USE COMPATIBILITY

Impact V.A.1: The proposed project would result in a change in land use on a portion of the project site. The effect of this change on surrounding existing or future nearby land uses would be less than significant.

The proposed project would introduce long-term, active mining operations and subsequent reclamation within the Northern Expansion area, and result in a corresponding change in the use and appearance of this area. The unmined areas of the proposed project are currently hilly and heavily wooded, and primarily undeveloped with the exception of a few structures, associated utilities, and internal roadways. Under the proposed use permit, mining would first continue westward within the existing permitted and vested rights area of the quarry, and then proceed in a northerly direction within the 20-year limit of grading in the Northern Expansion area. As with existing mining operations within the existing permitted and vested rights area, the proposed mining activities within the Northern Expansion area would include the excavation of the overburden and blue rock materials found on-site using earthmoving equipment, and occasionally blasting. Excavated materials would be transported to, and processed within, the existing permitted area of the quarry. As the overburden is excavated, existing timber would be removed. Large alterations in the topography of the mined areas within the Northern Expansion area would occur as rock is excavated, and new 1½:1 slopes are created.

The project would result in a substantial change in the use and appearance of the unmined portion of the proposed 20-year limit of grading. However, the property and all structures within the area encompassed by the Northern Expansion option are currently owned by Canyon Rock Company, Inc. Consequently, the proposed project would not result in a displacement of any public uses on the site, nor would it physically divide an existing community. The proposed project would also not conflict with any habitat conservation plan or natural community plan. The proposed 20-year limit of grading within the Northern Expansion area is substantially set back approximately 300 feet from Green Valley Creek within the project property.

With respect to the proposed project's compatibility with off-site land uses, the proposed project operations would be considered generally compatible with existing and future aggregate operations of the Blue Rock Quarry (located south of the site across Highway 116); however, the project would be considered comparatively less compatible in terms of use, size and appearance with other surrounding undeveloped land, and existing and future developed rural, residential and recreational uses in the vicinity. However, the project proposes a number of design features to ensure potential incompatibilities would be minimized to the extent feasible. As under existing conditions, and as required by the ARM Plan, a minimum 25-foot setback from parcels not owned by the quarry would be maintained (e.g., setback from Highway 116). Actual proposed setbacks to non-quarry owned parcels in several locations would be substantially greater than that required. West and north of the proposed 20-year limit of grading, the minimum setbacks would be approximately 500 feet. On the parcels north of the existing quarry, the minimum setback to non-quarry owned parcels to the east would be approximately 200 feet. These setbacks would serve as a buffer between on-site quarrying operations and off-site land uses.

All potential physical environmental effects of the proposed mining activities on surrounding existing or future land uses are addressed in their respective sections of the EIR. Section IV.A, discusses potential off-site effects from project-generated truck traffic; Section IV.B. discusses potential off-site air quality impacts (e.g., dust and truck and equipment-generated emissions); Section IV.C discusses potential off-site noise effects from project-generated trucks and equipment; Section IV.D and V.B, discuss potential off-site effects to ground water quality from increases in sedimentation and erosion; Section V.C, discusses potential off-site effects from hazardous materials releases, Section V.D discusses potential effects to biological resources in the project vicinity; Section V.E discusses potential aesthetic effects of proposed mining activities from off-site public vantage points; and Section V.F discusses potential impacts to public services and utilities serving the project vicinity. Mitigation measures are identified in this EIR to mitigate potential impacts to off-site land uses to the extent feasible. As explained in these sections, some impacts would remain significant even with implementation of mitigation measures.

As described under Consistency with Plans and Policies, above, the proposed project would be generally compatible with the Sonoma County General Plan, and would be required to meet all applicable requirements of the SMARO, and the ARM Plan. Both the SMARO and ARM Plan contain a number of standards and controls for active quarries for the purpose of minimizing potential impacts to nearby land uses. In addition, the project sponsor would implement reclamation incrementally as proposed mining activities proceed into the Northern Expansion area, consistent with the reclamation requirements of the SMARO. The proposed reclamation would increase long-term compatibility of the mined areas with surrounding areas after mining activities are completed particularly in terms of visual screening and erosion control.

In addition, the project sponsor would be required to acquire a Timber Conversion Permit and prepare a Timber Harvesting Plan, as determined by the California Department of Forestry (CDF), which would identify additional measures to ameliorate the loss of timber and associated environmental effects on the property due to mining activities.

Mitigation: None required for the proposed change in land use on the project site. However, this EIR identifies a number of mitigation measures that would be required to mitigate specific environmental impacts to land uses; please see those contained in Section IV.A., Traffic and Transportation; Section IV.B., Air Quality; Section IV.C, Noise; Section IV.D, Hydrology and Water Quality; Section V.B, Geology and Soils, Section V.C, Hazards and Hazardous Materials; Section V.D, Biological Resources; and Section V.E, Aesthetics.

Impact V.A.2: The proposed project would not increase employment, or displace a significant amount of housing. Consequently, the proposed project's effect to population and housing would be less than significant.

The proposed project would not increase employment at the project site over existing conditions, and correspondingly, would not result in an increase in population and an associated demand for housing in the area. The project would result in the demolition of one house within proposed footprint of mining operations of the Northern Expansion option. This house is currently owned by the project applicant; the loss of which would not be considered a significant loss of available housing in the area.

Mitigation: None required.

REFERENCES – Land Use and Planning

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

California Code of Regulations, Title 14, Chapters 4, 4.5 and 10.

California Department of Finance website, http://www.dof.ca.gov.

California Public Resources Code, Division 4, Chapter 8.

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.

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

V.B GEOLOGY, SEISMICITY, AND MINERAL RESOURCES

TOPOGRAPHIC SETTING

The Canyon Rock Quarry site is located in an upland area between the Santa Rosa Plain and the Pacific Ocean. Natural slopes within this area range from 30 to 80 percent gradient. Approximately 60 years of quarry operations have altered the natural topography within the existing quarry boundaries, resulting in over-steepened slopes and sheer cliff faces at the quarry boundaries and a relatively flat quarry floor. The quarry has been excavated into a south and southeast-facing slope. The overall elevation change within the quarry ranges from approximately 400 feet above sea level (asl) at the top of the quarry slope to 80 feet asl at the quarry floor.

The Northern Expansion area extends northward and westward of the existing quarry. North of the quarry, the expansion area encompasses most of a northwest-trending ridge, which rises to elevation 475 feet in the northwestern portion of the project site. The ridge consists of three predominant hilltops connected by lower topographic saddles. The southern portion of the Northern Expansion area includes a lower ridge. The slopes of the ridges are moderately steep to very steep (25 to over 150 percent).

GEOLOGIC SETTING

The project site lies within the geologic region of California referred to as the Coast Ranges geomorphic province.[1] This geologic province formed at the boundary between the North American and Pacific crustal plates and from the earlier subduction of the Farallon plate. The contact between these two plates is currently the San Andreas Fault Zone and subsidiary faults of the San Andreas Fault System. Subsequent compression, uplift and faulting occurred during the Miocene and Pliocene epochs of the Tertiary Period (between five and 15 million years ago). The current tectonic setting is related to the movement along the northwest-southeast trending faults such as the San Andreas and Rodgers Creek-Healdsburg faults, with movement of the Pacific plate to the north and west relative to the North American plate.

Discontinuous northwest-trending mountain ranges, ridges, and intervening valleys composed of ancient seafloor rocks characterize this province. The Franciscan Assemblage is the principal rock complex within the Coast Ranges and is composed of marine sedimentary and volcanic rocks. The Franciscan Assemblage in this region of California is Jurassic- to Cretaceous-age (approximately 65 to 150 million years old) and consists primarily of greenstone (altered volcanic rocks), basalt, chert (ancient silica-rich ocean deposits), and marine sedimentary rocks that were deposited as seafloor sediments. Following deposition and lithification (consolidation and cementation), these rock units were folded, faulted, and uplifted during the convergence of the North American and former Farallon plates. During this deformation, the sedimentary rocks were subject to low-grade metamorphism.

[1] A geologic province is an area that possesses similar bedrock, structure, history, and age. California has 11 geologic provinces.

Figure V.B-1 presents a geologic map of the project vicinity. Within the area of the proposed project site, the dominant rock types are interbedded graywacke sandstone and shale (Bauer Associates, 1997; Huffman and Associates, 1982). The bedrock strikes to the north northwestward and generally dips to the east. The structural geological setting is the outer limb of a northwest trending anticline.

The bedrock at the site is deeply weathered. The weathering profile extends from the surface to depth ranging from 10 to 20 feet and consists of residual and colluvial (slope-derived) soils, which are underlain by brown, fractured and sheared, sandstone and siltstone. The weathered rock overlies dark gray, slightly metamorphosed greywacke sandstone, sheared shale and siltstone. The deeper, less weathered to unweathered rocks are locally referred to as "blue rock".

Shear zones within the rocks have a predominantly northeasterly trend and the predominant joint sets trend northwesterly. Huffman (1982) proposed that the trends of the major joint sets and faults in the area possibly control the regional orientation of drainage channels and topographic saddles.

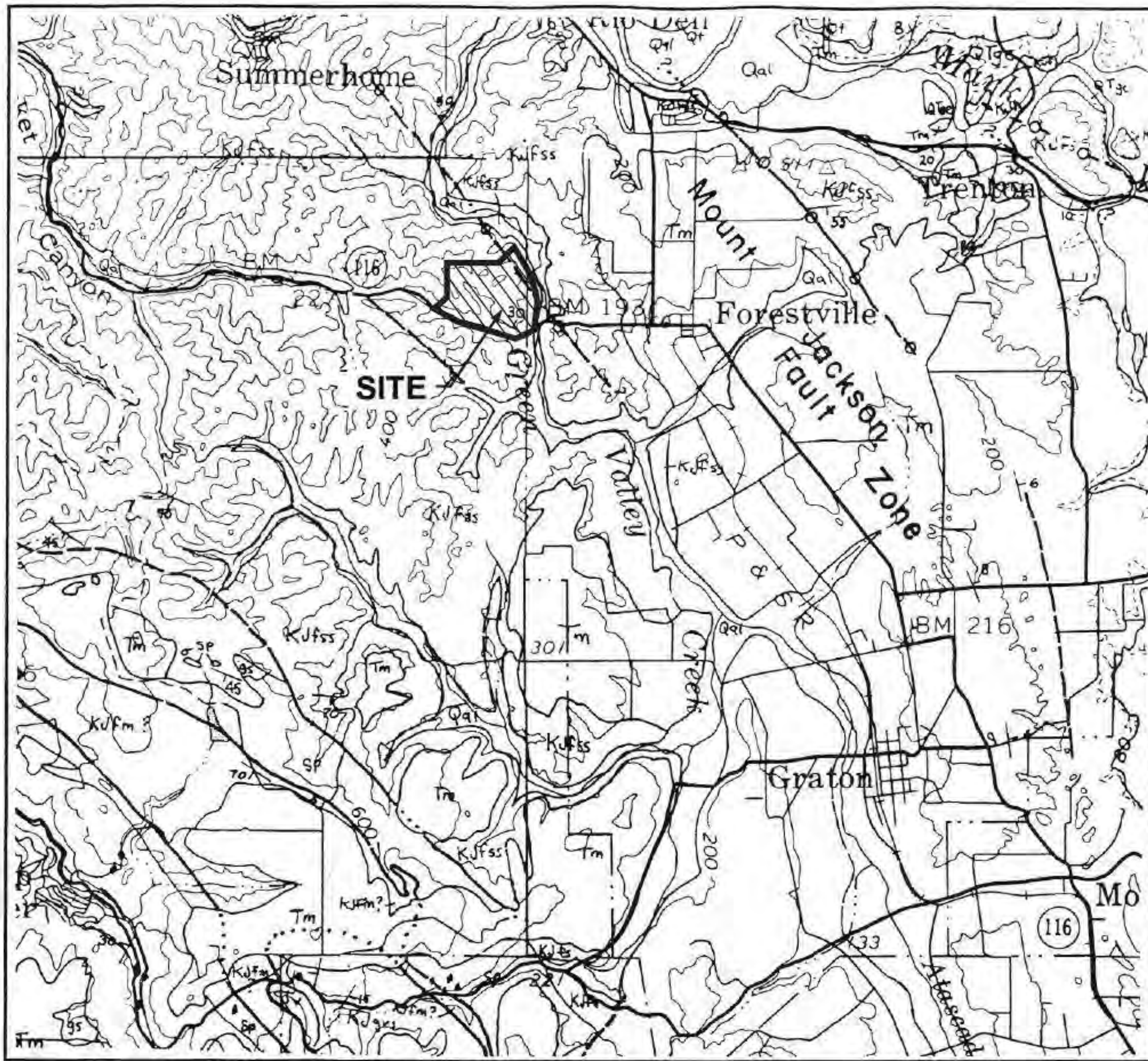
SOILS

Quarry operations have altered native surface soils to such a degree that they are either no longer present or have been extensively graded within the existing quarry. Unmined areas of the project site, including the Northern Expansion Area, are mapped by the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) (formerly known as the Soil Conservation Service) as Hugo very gravelly loam (USDA NRCS, 1972). This soil series is characterized as residual soil developed on very steep slopes underlain by sandstone and shale bedrock. The soil has moderate permeability, very rapid runoff, and very high erosion hazard. The shrink-swell potential and corrosivity are moderate.

SEISMICITY

Figure V.B-2 presents a regional fault map. The San Francisco Bay Area region contains both active and potentially active faults and is considered a region of high seismic activity.[2] The 1997 Uniform Building Code locates the entire Bay Area within Seismic Risk Zone 4. Areas within Zone 4 are expected to experience maximum magnitudes and damage in the event of an earthquake (Lindeburg, 1998). 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 2002 and 2031 (USGS, 2003).

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). A "potentially active" fault is defined as a fault that has shown evidence of surface displacement during the Quaternary (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. "Sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (Hart, 1997).



Reference: Huffman and Armstrong 1980, CDMG Special Report 120.

EXPLANATION

Qal	Alluvium
QTge	Glen Ellen formation
Tm	Merced (Wilson Grove) formation
KJf	Franciscan Complex
Sp	Serpentinite

Contact between geologic units

Fault traces; inactive

10

Attitude of bedding

0 1

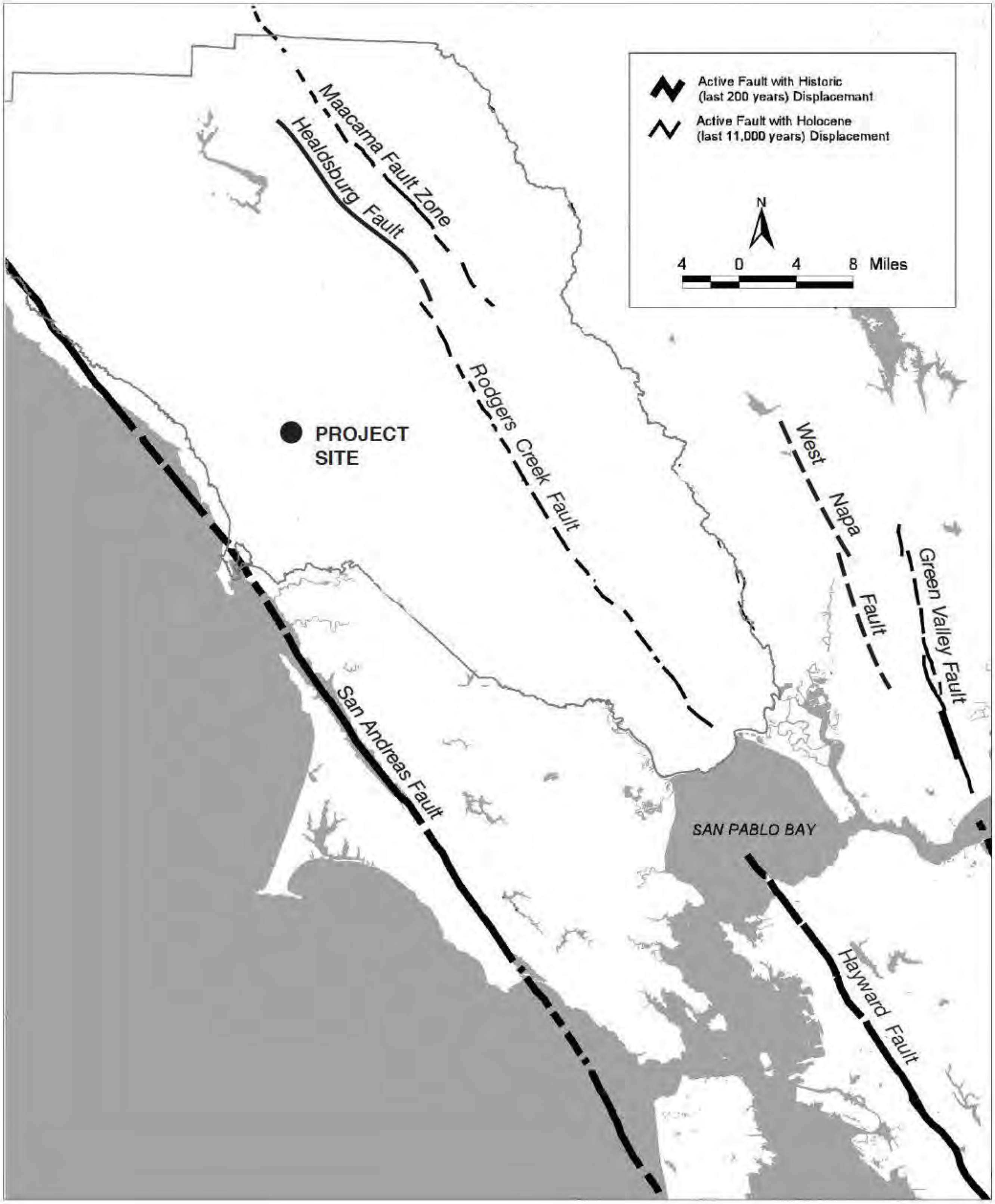
SCALE IN MILES

N

SOURCE: Huffman and Armstrong, 1980
CDMG Special Report 120

Canyon Rock Quarry / 202697

Figure V.B-1
Regional Geologic Map



SOURCE: California Department of Conservation, Division of Mines and Geology (After Jennings, 1994)

Canyon Rock Quarry / 202697

Figure V.B-2
Regional Fault Map

While the magnitude is a measure of the energy released in an earthquake, intensity is a measure of the ground shaking effects at a particular location. The estimated moment magnitudes (Mw) shown in Table V.B-1 represent *characteristic* earthquakes on particular faults.[3] Ground movement during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material. The composition of underlying soils, even those relatively distant from faults, can intensify ground shaking. The Modified Mercalli Intensity (MMI) scale (Table V.B-2) is commonly used to measure earthquake effects due to ground shaking. The MM values for intensity range from I (earthquake not felt) to XII (damage nearly total), and intensities ranging from IV to X could cause moderate to significant structural damage.[4]

TABLE V.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]
Hayward-North	45 miles southeast	Historic (1836; 1868 ruptures) Holocene	Active	M6.8, 1868 Many <M4.5	7.1
San Andreas	13 miles west	Historic (1906; 1989 ruptures) Holocene	Active	M7.1, 1989 M8.25, 1906 M7.0, 1838 Many <M6	7.9
Rodgers Creek	7.3 miles northeast	Historic (1898 ruptures) Holocene	Active	M6.7, 1898 M5.6, 5.7, 1969	7.0
Maacama	14 miles northeast	Potentially Historic Holocene	Active	Historic active creep	7.1

[a] See footnote 6.
[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, 1997b). The Maximum Moment Magnitude Earthquake, derived from the joint CDMG/USGS Probabilistic Seismic Hazard Assessment for the State of California, 1996. (CGS OFR 96-08 and USGS OFR 96-706).

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

[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.

[4] The damage level represents the estimated overall level of damage that will occur for various MM intensity levels. The damage, however, will not be uniform. 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 V.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: Bolt, Bruce A., *Earthquakes*, W.H. Freeman and Company, New York, 1988 and the California Geological Survey.

REGIONAL FAULTS

Canyon Rock Quarry site is approximately 8.5 miles southwest of the active Rodgers Creek fault zone and 13 miles east of the San Andreas fault zone. The Rodgers Creek fault is the northern segment of the Hayward-Rodgers Creek Fault System (H-RCS). The H-RCFS is a 87-mile long fault system extending from the Warm Springs district of Fremont in the south to approximately three miles south of Healdsburg. In addition to the Rodgers Creek fault segment, the system includes the Hayward-North and Hayward-South fault segments. The H-RCS and the San Andreas fault zone exhibit strike-slip orientation and have experienced movement within the last 200 years.[5] Other principal faults capable of producing significant ground shaking at the project site are listed on Table V.B-1 and include the Maacama fault.

Faults that have experienced displacement more than 1.6 million years ago, referred to as "pre-Quaternary," are located throughout the Coast Range and within the area of the Canyon Rock Quarry. An unnamed fault located in the northeastern portion of the project site is one such fault (Huffman and Armstrong, 1980). These faults are not considered active or potentially active; although they cannot be considered inactive, their period of inactivity suggests that they are less likely to generate a considerable seismic event. Occasionally, pre-Quaternary faults exhibit secondary movement during a major event on an active fault.

Rodgers Creek Fault Zone

The Rodgers Creek fault zone (RCFZ) is the southern segment of a fracture zone that includes the Rodgers Creek fault (north of San Pablo Bay) and the Healdsburg fault (northern Sonoma County). As discussed above the RCFZ is the northern segment of the Hayward-Rodgers Creek Fault System. The 80-mile long RCFZ is located approximately 7.3 miles east of the project site. The most recent significant earthquakes on the RCFZ occurred on 1 October 1969. On this date, two earthquakes of Richter magnitude 5.6 and 5.7 occurred in an 83-minute period. Buildings in Santa Rosa sustained serious damage during these quakes. The last major earthquake (estimated Richter magnitude 6.7) was generated in 1898 with an epicenter near Mare Island at the north margin of San Pablo Bay. The USGS estimates the probability of a large earthquake (moment magnitude 6.7 or greater) on the RCFZ during the period 2002 to 2031 to be 20 percent, the highest probability for all San Francisco Bay fault zones (USGS, 2003). An earthquake of this magnitude is similar to the design quake used in a seismic hazard planning scenario prepared by the California Mines and Geology (CDMG, 1994). The expected shaking is anticipated to cause significant damage and interruption of service for transportation (e.g., highways, railroads, and marine facilities) and lifeline (e.g., water supply, communications, and petroleum pipelines) facilities throughout Sonoma County. CGS and ABAG estimate the RCFZ is capable of generating a maximum moment magnitude 7.0 earthquake. An earthquake of this magnitude is expected to cause MMI VI ground shaking in the vicinity of the project site (http://www.abag.ca.gov/cgi-bin).

5 A strike-slip fault is a fault on which movement is parallel to the fault's strike (Bates and Jackson, 1984).

Maacama Fault Zone

The Maacama fault zone (MFZ) extends 114 miles northward from east of Healdsburg to north central Mendocino County. The MFZ is identified by the California Geological Survey as an active fault under the Alquist-Priolo Earthquake Fault Zoning Act on the basis of historic and on-going tectonic creep along the fault and geomorphologic evidence of fault rupture. Recent evidence of moderate earthquakes on the MFZ includes moment magnitude 4.3 and 4.4 events in December 2001. The fault has not generated a known historic earthquake, which resulted in fault rupture. However, on the basis of the length of the fault, creep rates, and evidence of Holocene displacement, the fault is considered capable of generating a moment magnitude 7.1 earthquake (CGS, 1996). An earthquake of moment magnitude 6.6 was estimated by ABAG to be the characteristic earthquake for the MFZ; an earthquake of this magnitude would be expected to generate moderate ground shaking (MMI VI) at the project site (http://www.abag.ca.gov).

Hayward Fault Zone

The Hayward fault trends to the northwest within the East Bay, extending from San Pablo Bay in Richmond, 60 miles south to San Jose. The Hayward fault in San Jose converges with the Calaveras fault, a similar type fault that extends north to Suisun Bay. The Hayward fault is designated by the Alquist-Priolo Earthquake Fault Zoning Act as an active fault.

Historically, the Hayward fault generated two sizable earthquakes, both in the 1800s. In 1836, a Richter magnitude 7 earthquakes caused considerable ground shaking and ruptured the surface for approximately 38 miles, from Lake Merritt to Warm Springs. In 1868, a Richter magnitude 6 earthquake ruptured the ground for a distance of about 30 miles. Lateral ground surface displacement during these events was at least 3 feet. A characteristic feature of the Hayward fault is its well-expressed and relatively consistent fault creep. Although large earthquakes on the Hayward fault have been rare since 1868, slow fault creep has continued to occur and has caused measurable offset. Fault creep on the East Bay segment of the Hayward fault is estimated at 9 millimeters per year (mm/yr.) (Peterson, et al., 1996). However, a large earthquake could occur on the Hayward fault with an estimated magnitude of about Mw 7.1 (Table V.B-1). The USGS Working Group on California Earthquake Probabilities includes the Hayward–Rodgers Creek Fault System in the list of those faults that have the highest probability of generating earthquakes of M 6.7 and greater. The probability of a moment magnitude 6.7 or greater on the three segments of the H-RCFS is 32 percent over the same period. The estimated probability of an earthquake of this magnitude on the Hayward-North segment of the H-RCFS is 16 percent (USGS, 2003).

San Andreas Fault Zone

The San Andreas Fault Zone is the largest in the state, extending from the Salton Sea in Southern California near the border with Mexico to north of Point Arena, where the fault trace extends out into the Pacific Ocean. The main trace of the San Andreas fault through the Bay Area trends northwest through the Santa Cruz Mountains and the eastern side of the San Francisco Peninsula. As the principle strike-slip boundary between the Pacific plate to the west and the North American plate to the east, the San Andreas is often a highly visible topographic feature, such as between Pacifica and San Mateo, where Crystal Springs Reservoir and San Andreas Lake clearly mark the rupture zone.

In the San Francisco Bay Area, the San Andreas Fault Zone was the source of the two major seismic events in recent history that affected the San Francisco Bay region. The 1906 San Francisco earthquake was estimated at M 7.9 and resulted in approximately 170 miles of surface fault rupture. Horizontal displacement along the fault approached 17 feet near the epicenter (Slemmons, 1997; Taylor et al., 1980 *as referenced in* Golder, 1986). The more recent 1989 Loma Prieta earthquake, with a magnitude of Mw 6.9, resulted in widespread damage throughout the Bay Area. The USGS Working Group on California Earthquake Probabilities estimated there is a 21 percent chance of the San Andreas fault experiencing an earthquake of M 6.7 or greater in the next 30 years (USGS,2003). A major seismic event on any of these active faults could cause significant ground shaking at the site, as experienced during earthquakes in recent history, namely the 1906 San Francisco earthquake and the 1989 Loma Prieta earthquake (ABAG, 2001).

The CDMG has predicted peak ground acceleration from all seismic sources for the site to be in the range of 0.4 to 0.5 gravity (g). The spectral acceleration for a 0.3-second period (high frequency) is anticipated to be in the range of 0.6 to 1.2 g. The spectral acceleration for a 1.0-second period (low frequency) is estimated to be in the range of 0.4 to 1.0 g. These values for peak ground acceleration and spectral acceleration are estimated by the CDMG to have a 10-percent probability of being exceeded within the next 50 years (*CDMG Map Sheet 48, 1999*; http://www.consrv.ca.gov). The predicted peak ground acceleration for the site would be the equivalent of Modified Mercalli Intensity VIII shaking (refer to Table IV.B-2 for a qualitative description of this level of shaking).

MINERAL RESOURCES

The California Division of Mines and Geology (now referred to as the California Geological Survey, [CGS]) has classified lands within the San Francisco–Monterey Bay region into Mineral Resource Zones (MRZs) based on guidelines adopted by the California State Mining and Geology Board, as mandated by the Surface Mining and Reclamation Act of 1975 (Stinson and others, 1987). Canyon Rock Quarry is located in the North San Francisco Bay Production-Consumption Region (P-C Region), which encompasses Sonoma, Marin, Napa, and a portion of Solano County. In 1987 when the mineral classification was developed, this region was estimated to contain a total of 2.4 billion tons of aggregate resources within areas classified as Mineral Resource Zone-2(i.e., areas where adequate information indicates that significant mineral resources are present). The aggregate resources within the region include both alluvial sand and gravel deposits and bedrock with characteristics favorable for aggregate production.

The existing Canyon Rock Quarry has been classified as Mineral Resource Zone-2 (MRZ-2) under the provisions of the California Surface Mining and Reclamation Act (SMARA). MRZ-2a classification indicates that the discovered mineral quantities have been measured or delineated by testing and field observation. The existing quarry is designated as Sector O, an MRZ-2 area that has not been urbanized. The amount of aggregate reserves within Sector O was not estimated by CDMG. In 1991, the remaining reserves within the currently permitted quarry area were estimated to be 4.5 to 6.0 million tons (Sonoma County, 1994).

CDMG indicated that the quality of the Franciscan Complex siltstone and sandstone within Sector O is "not durable enough to serve as other than pavement subbase and fill material". By inference, the quality of the rock resources does not meet the standards for Portland Cement Concrete (PCC) production. The applicant has indicated that the aggregate produced from the quarry is only used for subbase and rock fill.

GEOLOGIC HAZARDS

SLOPE FAILURE HAZARDS

Ground failure is dependent on the slope and geology as well as the amount of rainfall, excavation, or seismic activities. A slope failure is a mass of rock, soil, and debris displaced down slope by sliding, flowing, or falling. Steep slopes and downslope creep of surface materials characterize landslide-susceptible areas. In those areas, exposed rock slopes, especially those altered and fractured by mining or quarry extraction, break away from a weakened portion of the slope, causing the rock mass to fall. Weathered rock dislodged from steep quarry slopes, either through static or seismic forces can result in occasional rockfalls that propel individual rocks or rock masses down cliffs at varying velocities. Debris flows consist of a loose mass of rocks and other granular material that, if present on a steep slope and saturated, can move down slope.

Steep slopes covered with overburden, consisting of poorly placed fill, colluvium, or slope wash, have resulted in slope failure and surficial debris flows on steep slopes within the project site. Mass movements on rock slopes can be considered either structural failure, where the failed mass slides along a pre-existing fracture, or rock-mass failure that consists of both translational and rotational movement along a failure surface.

Evidence of past and ongoing slope failures has been identified at the project site. The most significant landslide feature is located north of the current quarry high wall (i.e., the south facing active mining face). This feature was first described in 1982 (Huffman & Associates, 1982) as a series of relatively deep-seated "block-glide" slides formed within the overburden and weathered rock. The base of the slides were interpreted as occurring along the contact between the upper weathered rock and the deeper, relatively unweathered "blue rock." Identification of this extensive area of slope failure led to the establishment of a 250-foot wide setback area at the northern boundary of the existing permitted mining area. The setback was established to provide protection for adjacent landowners from headward migration of the landslides as mining progressed northward. Subsequently, the quarry owners have purchased the adjacent properties. During recent reconnaissance of the project site, the areas of these landslides contain numerous headscarps, some fresh (exposing bare soil and rock) and up to several feet in height.

Additional slope failure areas have been identified within the proposed Northern Expansion area. Bauer Associates (1997) identified several relatively small, shallow rotational landslides on steep slopes within this area. The depth of the slides was estimated to be three to ten feet. Slides of this nature are common on moderate to steep slopes within the Coast Range uplands and are typically characterized as debris slides. This type of slope failure develops in colluvial sediments which mantle bedrock on the slopes. Occurrences of debris slides are most likely to occur in areas of localized thickening of colluvium ("colluvial hollows") and failure is promoted during periods of high groundwater conditions (i.e., during winter rainy season). Landsliding potential is also increased during moderate to strong ground shaking (i.e., seismically induced landslides). Bauer Associates identified areas of relatively thick colluvial deposits that potentially have increased risk of the development of debris slides.

In addition to identified block slide slope failures and debris slides, smaller soil slumps, rock falls, rock and soil slides and debris flows have been identified along the working face of the existing quarry (Huffman & Associates, 1982). Accumulation of rock blocks and colluvial wedges on the floor of the quarry are evidence of these types of failure. Soil slumps and relatively small debris slides have also been identified along the banks of Green Valley Creek at the eastern margin of the project site and along cutbacks on Highway 116 and internal roads within the quarry (Huffman & Associates, 1982; Bauer Associates, 1997).

SETTLEMENT

Settlement is the depression of the bearing soil when a load, such as that of a building or new fill material, is placed upon it. Soils tend to settle at different rates and by varying amounts depending on the load weight, which is referred to as differential settlement. Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill or unconsolidated sediments. As indicated by geologic mapping of the proposed project site, the presence of significant deposits of compressible soils is limited to areas of artificial fill. The remaining areas of the site are underlain by residual and colluvial soils mantling rock that occurs at relatively shallow depths.

EXPANSIVE SOILS

Expansive soils possess a "shrink-swell" characteristic. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may occur over a long period of time, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. The Hugo very gravelly loam soils at the project site have moderate shrink-swell potential. However, the proposed project does not include construction of foundation on these soils. Therefore, expansion and contraction of soils do not present a significant impact to the project.

SOIL EROSION

Soil erosion is a process whereby soil materials are worn away and transported to another area, either by wind or water. Rates of erosion can vary depending on the soil material and structure, placement, and human activity. The erosion potential for soils is variable throughout the project area. Soil containing high amounts of silt can be easily eroded, while sandy soils are less susceptible. Excessive soil erosion can eventually damage building foundations and roadways. Erosion is most likely to occur on sloped areas with exposed soil, especially where unnatural slopes are created by cut-and-fill activities. Soil erosion rates can be higher during the construction phase. Typically, the soil erosion potential is reduced once the soil is graded and covered with concrete, structures, or asphalt.

SEISMIC HAZARDS

Seismic hazards include those hazards that could reasonably be expected to occur at the project site during a major earthquake on any of the Bay Area fault zones, especially the Hayward fault. Some hazards can be more severe than others, depending on the location, underlying materials, and level of ground shaking. Some of the hazards discussed below might not occur after the project is complete, or would occur with minor consequences. Earthquake-induced landslides are considered a potential seismic hazard at the project site; this hazard is included within the slope instability discussion under Geologic Hazards, Slope Failure Hazards.

SURFACE FAULT RUPTURE

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. Surface rupture can damage or collapse buildings, cause severe damage to roads and pavement structures, and cause failure of overhead as well as underground utilities. As a result of the damage, buildings could become uninhabitable, roads closed, and utility service disrupted for an undeterminable length of time. Future faulting is generally expected along different strands of the same fault (CGS, 1997b). Ground rupture is considered more likely along active faults, which are referenced above.

The Canyon Rock Quarry site is not located within an Alquist-Priolo Fault Rupture Hazard Zone (discussed below), as designated through the Alquist-Priolo Earthquake Fault Zoning Act. At its closest distance, the east property line of Canyon Rock Quarry is approximately 8.5 miles from the designated western boundary of the Alquist-Priolo Fault Hazard Zone for the Rodgers Creek Fault, the closest active fault to the project site (CGS, 1983). Since no mapped active or potentially active faults are known to pass through the Canyon Rock Quarry project site, there is a low potential that fault rupture, attributable to the known and mapped active faults, would occur within the site. Inactive shear zones within bedrock at the project site could experience minor sympathetic offsets in the event of major Bay Area earthquakes. However, displacement along these structures would likely represent mass movement (i.e., landsliding, land spreading, or lurching) rather than tectonic rupture. The potential for earthquake fault rupture is considered a less-than-significant impact at the project site.

GROUND SHAKING

Moderate to strong ground shaking could occur at the project site during earthquakes on regional active faults. Earthquakes on the active faults (listed in Table V.B-1) are expected to produce a range of ground-shaking intensities at the project site. Ground shaking may affect areas hundreds of miles distant from the earthquake's epicenter. Historic earthquakes have caused strong ground shaking and damage in the San Francisco Bay Area, the most recent being the M 6.9 Loma Prieta earthquake in October 1989. The epicenter of the Loma Prieta event was approximately 50 miles southeast of the San Francisco Bay Area, but this earthquake nevertheless caused strong ground shaking for about 20 seconds and resulted in varying degrees of structural damage throughout the Bay Area. According to the CGS probabilistic seismic hazard map, peak ground acceleration at the project site could reach or exceed 0.4 g (Peterson, et al., 1996).

A probabilistic seismic hazard map is a map that shows the hazard from earthquakes that geologists and seismologists agree could occur. It is "probabilistic" in the sense that the analysis takes into consideration the uncertainties in the size and location of earthquakes and the resulting ground motions that can affect a particular site.[6] The nonengineered artificial fill that currently overlies portions of the project site could intensify ground shaking effects in the event of an earthquake on one of the aforementioned faults. Areas directly underlain by bedrock, such as the project site, would likely experience less-severe ground shaking due to the ability of the bedrock to attenuate seismic waves.

LIQUEFACTION

Liquefaction is a phenomenon whereby unconsolidated and/or near-saturated loose, granular soils lose strength and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables, and buildings with shallow foundations. The potential for liquefaction is greatest in areas characterized by water-saturated, cohesionless, granular materials at depths less than 40 feet (ABAG, 1996). The depth to groundwater influences the potential for liquefaction in this area; the shallower the groundwater, the higher potential for liquefaction. Liquefaction potential is highest in areas underlain by Bay fills, Bay Mud, and unconsolidated alluvium. The CGS has not delineated the project site within a Seismic Hazard Zone (discussed below) for liquefaction. However, the geologic setting of the proposed project site would not likely present conditions susceptible to liquefaction. The one exception to this conclusion could be fine-grained sediments deposited in storm water detention basins. However, these sediment deposits would not provide structural support to existing or proposed structures or improvements. The potential for liquefaction is considered a less-than-significant impact at the project site.

EARTHQUAKE-INDUCED SETTLEMENT

Settlement of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials (particularly loose, noncompacted, and variable sandy sediments). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). Areas are susceptible to differential settlement if underlain by compressible sediments, such as poorly engineered artificial fill or unconsolidated sediments. Areas underlain by loosely compacted quarry fills could be susceptible to this type of settlement. The final grading plan for the Northern Expansion option does not propose any placement of fill with the exception of soil placed as planting medium for reclamation vegetation. No post-reclamation structures or improvement that could be

[6] The maps are typically expressed in terms of probability of exceeding a certain ground motion. For example, the 10 percent probability of exceedance in 50 years maps depict an annual probability of 1 in 475 of being exceeded each year. This level of ground shaking has been used for designing buildings in high seismic areas. The maps for 10 percent probability of exceedance in 50 years show ground motions that geologists and seismologists do not think will be exceeded in the next 50 years. In fact, there is a 90 percent chance that these ground motions will not be exceeded. This probability level allows engineers to design buildings for larger ground motions that geologists and seismologists think will occur during a 50-year interval, which makes buildings safer than if there were only designed for the ground motions that are expected to occur in the next 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. The maps can also be used for estimating potential economic losses and preparing for emergency response (Peterson et al., 1999).

damaged by settlement (including seismically-induced settlement) are proposed. Therefore, the potential impact of settlement is considered to be less-than-significant.

REGULATORY BACKGROUND

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT

The Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zones Act), signed into law in December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces. Cities and counties must regulate certain development projects within the zones, which include withholding permits until geologic investigations demonstrate that development sites are not threatened by future surface displacement (Hart, 1997). The project site is not located within such a zone.

SEISMIC HAZARDS MAPPING ACT

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a Seismic Hazard Zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. The project site and surrounding area have not been evaluated under the Seismic Hazards Mapping Program and, therefore, no hazard zones have been designated by the CGS.

CALIFORNIA BUILDING CODE

The California Building Code is another name for the body of regulations known as the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code (CBSC, 1995). Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable (Bolt, 1988).

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 California Building Code incorporates the UBC by reference and includes necessary California amendments. These amendments include criteria for seismic design. About one-third of the text within the California Building Code has been tailored for California earthquake conditions (ICBO, 1997). The 1997 UBC, the code currently adopted by Sonoma County, requires extensive geotechnical analysis and engineering for grading, foundations, retaining walls, and structures within zones. The project site is located within Zone 4, which, of the four seismic zones designated in the United States, is expected to experience the greatest effects from earthquake ground shaking and therefore has the most stringent requirements for seismic design.

CALIFORNIA SURFACE MINING AND RECLAMATION ACT

The California Surface Mining and Reclamation Act (SMARA) was initially passed in 1975 and has been amended numerous times since its passage. The primary intent of SMARA was to create effective and comprehensive surface mining and reclamation policies and regulations which would minimize adverse environmental effects and ensure mined lands are reclaimed to a usable condition impacts while encouraging the production and conservation of mineral resources. The project proposes private open space as the end use of the project site following reclamation. This end use would not be incompatible with potential for future mining at the reclaimed project site. Therefore, the project would not adversely affect the availability of remaining mineral resources following reclamation.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

According to Appendix G of the CEQA *Guidelines*, a geologic, seismic, or mineral resource impact is considered significant if it would:

- Expose people or structures to potential substantial adverse effects, including the 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 for the area or based on other substantial evidence of a know fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction; or
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- 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-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- 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 the residents of the state; or
- 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?

This impact analysis focuses on potential project impacts related to seismicity, slope failure, soil failure, and mineral resources. The evaluation considered project plans, current conditions at the project site, and applicable regulations and guidelines.

Impact V.B.1: In the event of a major earthquake in the region, seismic ground shaking could potentially injure people and cause collapse or structural damage to existing structures and extensions of existing structures. This would be a potentially significant impact.

The San Francisco Bay Area would likely experience at least one major earthquake (M 6.7 or higher) within the next 30 years that would affect the project site. The intensity of such an event would depend on the causative fault and the distance to the epicenter, the moment magnitude, and the duration of shaking. A seismic event in the Bay Area could produce ground shaking intensities at the proposed project site ranging from moderate (MM VI) to very strong (MM VIII).

A characteristic earthquake on the San Andreas fault with an estimated M 7.9 could produce strong (VII) to very strong (VIII) shaking intensities at the project site (ABAG, 2001). Based on the Modified Mercalli scale, an earthquake of this intensity would cause considerable structural damage. Substantial cracks could appear in the ground, and the shaking could cause other secondary damaging effects such as the failure of underground pipes. As a comparison, the great 1906 San Francisco earthquake, with an M 7.9, produced very strong (VIII) shaking intensities at the Canyon Rock Quarry site, while the 1989 Loma Prieta event, with an M 6.9, produced only light (V) shaking intensities (ABAG, 2001). A characteristic earthquake on any of the active faults listed in Table IV.B-1, with the exception of the San Andreas Fault, could produce moderate (VI) shaking intensities (ABAG, 2001). Earthquakes of this intensity are felt by everyone and can move heavy furniture or cause instances of fallen chimneys or cracked plaster. Although overall damage levels would be slight, damage to structures (e.g., office and maintenance shop) and equipment could result in injuries to workers or visitors at the site.

Mitigation Measure V.B.1: All structures for the proposed project shall be designed in accordance with the 1997 UBC, which requires structural design that incorporates ground accelerations expected from known active faults. Expected ground motions determined by a registered geotechnical engineer shall be incorporated into the final structural design as part of the project. The final seismic considerations for the site shall be submitted to and approved by the Sonoma County Permit and Resource Management Department.

Predicting seismic events is not possible, nor is providing mitigation that can entirely reduce the potential for injury and damage that can occur during a seismic event. However, using accepted geotechnical evaluation techniques and appropriate engineering practices, potential injury and damage can be diminished, thereby exposing fewer people and less property to the effects of a major damaging earthquake.

Significance after Mitigation: Less than Significant.

Impact V.B.2: Development at the project site could subject people and property to slope instability hazards, including landslides, debris flows, and rockfalls caused by seismic and nonseismic mechanisms. This would be a potentially significant impact.

The Canyon Rock Quarry encompasses high, relatively steep slopes, composed of bedrock in varying stages of weathering. Bedrock contacts, fractures, and shear zones provide areas of weakened rock that can become dislodged and then fall or roll towards the lower areas. Veneers of colluvium, slope wash, and landslide debris cover many areas within the quarry, including the slopes on the north and western slopes. Many of the existing slopes are over-steepened due to quarry operations (i.e., material removal, road building, and undercutting the slope toe) or to previous slope failures. Upon excavation of the subject property, many of the slopes in overburden materials that may be stable under existing conditions could require grading to reduce slope gradients and increase stability. If unstable slopes in weak material are not stabilized during mining and quarrying operations, landsliding, rockfalls, and debris flows could continue to occur over time, potentially exposing people and property to injury and damage to equipment or structures. In the post-mining period, the project site would be reclaimed to restricted (i.e., private) open space use.

Qualitative slope stability analysis has been conducted for previous phases of mining at the project site (Huffman and Associates, 1982) and for the Western Expansion option (Bauer Associates, 1997). Quantitative slope stability analysis (e.g., slope stability modeling) has not been performed for existing or proposed mining or reclaimed slopes. The structural characteristics of the Franciscan bedrock at the site (i.e., pervasive fractures, joints, and shear zones) present significant complications for accurate modeling of slope stability. The potential for debris slides and rock falls presents the possibility that workers at the site could be injured during mining and reclamation activities. The proposed restricted (private) post-reclamation open space use limits the potential for personal injury during slope failures.

Under the Northern Expansion option, mining would initially proceed westward to remove the low ridge in the southern portion of the site. Following completion of mining in that area, the quarrying would proceed northeastward from the existing quarry highwalls. This option would remove most of an existing northwest trending ridge. The base of the excavation would be sloped eastward with an inclination of 2.0 percent. Effectively, the excavation would remove existing landslides and colluvial deposits with potential for debris slides. However, the excavation would remove support for potentially unstable colluvial deposits during mining. Unless managed appropriately, the excavation could potentially initiate debris slides, particularly during the rainy season and/or during moderate to strong ground shaking caused by regional earthquakes. In addition, the east facing excavation would remove support for east-dipping bedrock, presenting adverse slope conditions. The project application is not specific in its description of the proposed inclination of the working face of the quarry but specifies the steepness of the final reclaimed slopes to be 1.5:1 (horizontal: vertical) with 10-feet wide benches at 30-feet vertical intervals.

The stability of the proposed mining and reclaimed slopes for the Northern Expansion option has not been specifically evaluated in a geotechnical analysis. Slope stability in the southern portion of the option was evaluated in a previous geotechnical evaluation (Huffman and Associates, 1982). That evaluation identified the large complex of glide block slope failures described in the setting discussion of this section of the EIR. The mining would effectively remove the landslide complex. However, mining excavation would progressively remove existing support for the existing slides, presenting the potential for slide movement during the mining phase.

The reclaimed slopes are similar to those proposed for the Western Expansion option. The geotechnical analysis previously prepared for the Western Expansion option concluded that "the planned grading will generally remove the areas of landsliding and areas of severe soil creep" and that the "planned grading will be feasible" (Bauer Associates, 1997, p. 7). The analysis conditions these conclusions with following statements:

> "However, considering the variability typically encountered in the Franciscan bedrock materials and local variations noted during reconnaissance, it will be necessary to monitor actual conditions during grading to implement modifications as necessary. Further, slope stability analysis must be performed to determine the most suitable final slope condition. The analysis may include subsurface exploration and laboratory testing. Modifications to [the] existing grading plan may consist of increasing property line setbacks, flattening final slope inclinations, or other changes." (Bauer Associates, 1997, p. 7).

The State Mining and Geology Board Reclamation Regulations establish minimum standards for the stability of reclaimed mining slopes. Section 3704(f) of the regulations requires that "cut slopes, including highwalls and quarry faces, shall have a minimum slope stability factor of safety that is suitable for the proposed end use and conform with the surrounding topography and/or approved end use." The factors of safety for the cut slopes proposed by the project have not been determined. Mitigation of the potential for slope failure is required to reduce this potential impact.

Mitigation Measure V.B.2: Prior to the commencement of mining, a licensed Geotechnical Engineer and Certified Engineering Geologist shall perform a site-specific geotechnical evaluation of the Northern Expansion option area. The evaluation shall include a determination of the factor of safety for proposed mining and reclamation slopes within both overburden materials and the underlying bedrock and a qualified opinion that the factor of safety is consistent with the requirements of Section 3704(d) of the State Mining and Geology Board Reclamation Regulations. The evaluation of seismically-induced landslides shall be consistent with the provisions of the *California Division of Mines and Geology Guidelines for Evaluating and Mitigating Seismic Hazards* (CDMG Special Publication 117, 1997). The evaluation shall be reviewed and approved by PRMD. The recommendations presented in the evaluation shall provide for annual inspection of mining and reclaimed slopes by CALOSHA and the Mine Safety and Health Administration (MSHA). Provisions for corrective action for slope stability or erosion problems identified during annual inspections shall be included in the evaluation.

Significance after Mitigation: Less than Significant.

Impact V.B.3: Soil erosion of exposed cut or fill slopes, native slopes with removed vegetation, and soil stockpiles could result in damage to structures and temporary disruption to rough and final grading operations during and after reclamation activities as well as exacerbate the potential for landslide or debris flow. This would be a potentially significant impact.

Soil erosion hazards could occur during mining and reclamation, especially during initial site grading and stripping, when stock piles of loose soil and rock materials would be present, and during placement and compaction for reclamation features. The majority of soil erosion on construction sites is caused by precipitation and storm water runoff, although wind erosion can increase erosion rates, especially in loose, fine-grained materials. In addition to causing sedimentation problems in on-site and off-site drainage features, rapid water and wind erosion can create deep gullies that increase in size and undermine engineered soils.

Mitigation Measure V.B.3: The project applicant shall incorporate into the grading and construction specifications provisions requiring that all phases of construction implement best management practices (BMPs) to reduce and eliminate soil erosion. The contractor shall implement these BMPs, and the contractor shall be responsible for the inspection and maintenance of the BMPs through all phases of mining and reclamation.

Mitigation IV.B.5 in Section IV.B, Air Quality; and Mitigation IV.D.1b in Section IV.D, Hydrology and Water Quality, also contain a number of measures that would serve to further mitigate potential erosion effects.

Significance after Mitigation: Less than Significant.

Impact V.B.4: The proposed project would make aggregate resources available for consumption. This would be a less than significant impact.

The proposed project would make a source of existing in-the-ground aggregate available for consumption for ongoing community development and maintenance, and would, therefore, make the resource at this site unavailable for use in the future. On a regional basis, aggregate is available in other quarry areas, as well as from instream and terrace sources. The availability and future demand of aggregate throughout the County was evaluated in the 1994 ARM Plan and EIR. This project would be consistent with those requirements. Consequently, the project is not considered an inefficient use of available supplies or a significant impact on the overall availability of mineral resources.

Mitigation: None required.

REFERENCES – Geology, Seismicity, and Mineral Resources

Association of Bay Area Governments (ABAG), *The San Francisco Bay Area -- On Shaky Ground*, Publication Number P95001EQK, 1995.

Association of Bay Area Governments (ABAG), *Excerpts from CDMG Draft Study Guidelines*, 1996.

Association of Bay Area Governments (ABAG), *The San Francisco Bay Area -- On Shaky Ground*, Supplement Report (Excerpts) 1998a.

Association of Bay Area Governments (ABAG), *Earthquake Hazards Maps for the Entire Bay Area*, http://www.abag.ca.gov/cgi-bin. 2001.

Bates, R.L., Jackson, J.A., *Dictionary of Geological Terms,* prepared by American Geological Institute, Garden City, New York, 1984.

Bauer Associates, *Report on Geotechnical Reconnaissance, Canyon Rock Expansion, Forestville, California*, prepared for Wendel Trappe, 11 p. + Appendices, 1997

Bolt, B., *Earthquakes,* W.H. Freeman and Company, New York, New York, 1988.

California Building Standards Commission (CBSC), *California Building Code, Title 24, Part 2*, 1995.

California Geological Survey (CGS), *Fault-Rupture Hazard Zones in California. Santa Rosa Quadrangle,* California Division of Mines and Geology, Revised Official Map, effective July 1, 1983.

California Geological Survey (CGS), *The Loma Prieta (Santa Cruz Mountains), California, Earthquake of 17 October 1989*, Special Publication 104, 1990.

California Geological Survey (CGS), *Guidelines for Evaluating the Hazard of Surface Fault Rupture*, CDMG Note 49, 1997a.

California Geological Survey (CGS), *How Earthquakes Are Measured*, CDMG Note 32, 1997b.

Helley, E.J., LaJoie, K.R., *Flatland Deposits of the San Francisco Bay Region, California.* U.S. Geological Survey Professional Paper 943, 1979.

Huffman, M.E. and Armstrong, C.F., *Geology for Planning in Sonoma County*, California Division of Mines and Geology Special Report 120, 31 p. + Appendices.

Huffman and Associates, *Geologic Investigation, Canyon Rock Quarry, Forestville, Sonoma County, prepared for Field Engineering Associates*, 13 p. + Appendices, 1982.

International Conference of Building Officials (ICBO), Uniform Building Code, Whittier, California, 1997.

Jennings, C.W., *Fault Activity Map of California and Adjacent Areas*, California Division of Mines and Geology Data Map No. 6, 1:750,000, 1994.

Lindeburg, M., *Seismic Design of Building Structures: A Professional's Introduction to Earthquake Forces and Design Details*, Professional Publications Inc., 1998.

Oakeshott, Gordon B., *California's Changing Landscapes*, McGraw-Hill Publishing Company, 1978.

Peterson, M.D., Bryant, W.A., Cramer, C.H., *Probabilistic Seismic Hazard Assessment for the State of California*, California Division of Mines and Geology Open-File Report issued jointly with U.S. Geological Survey, CDMG 96-08 and USGS 96-706, 1996.

Peterson, et.al., *Seismic Shaking Hazard Maps of California*, California Geological Survey (CGS) Map Sheet 48, 1999.

Toppozada, T.R., Borchart, G., Hallstrom, C.L., and L.G., *Planning Scenario for a Major Earthquake on the Rodgers Creek Fault in the Northern San Francisco Bay Area*, California Division of Mines and Geology, Special Publication 112, 1994.

Stinson, M.C., M.W. Manson, J.J. Plappert, and others, *Mineral Land Classification: Aggregate Materials in the San Francisco-Monterey Bay Area, Part III, Classification of Aggregate Resource Areas North San Francisco Bay Production-Consumption Region*, California Division of Mines and Geology Special Report 146, 1987.

U.S. Geological Survey (USGS), *7.5-Minute Quadrangle, Camp Meeker*, 1959, photo revised, 1968.

U.S. Geological Society (USGS) Working Group on California Earthquake Probabilities (WG99), *Earthquake Probabilities in the San Francisco Bay Region: 2002-2031*, Open-File Report 03-214, 2003.

U.S. Department of Agriculture Natural Resource Conservation Service (USDA NRCS), formerly the Soil Conservation Service (SCS), *Soil Survey, Sonoma County, California*, 1972.

V.C HAZARDS AND HAZARDOUS MATERIALS

INTRODUCTION

Large-scale quarry operations have occurred at the project site since the 1940's. This section discusses existing conditions at the project site, and the potential public health and environmental issues related to hazards and the use of hazardous materials in historical quarry operations and under the proposed Northern Expansion option.[1] This section also addresses potential wildfire hazards at the project site. Refer to Public Services (Section V.F) for additional information regarding fire protection services at the project site.

SETTING

HAZARDOUS MATERIALS BACKGROUND AND CURRENT SITE CONDITIONS

Nearby Properties

The existing Canyon Rock Quarry is an industrial site surrounded by isolated residential development and open space. Several properties within one mile of the project site are listed on regulatory hazardous material databases. However, these properties are generally downgradient of the project site or on the opposite (east) side of Green Valley Creek (a regional hydrologic boundary), indicating that environmental conditions at these offsite properties are not anticipated to affect soil or groundwater conditions at the project site.

Project Site

Mining Operations

Mining operations typically involve excavation of the overburden material with heavy, construction equipment (e.g., bulldozers and scrapers). The same equipment is used to remove the underlying marketable bedrock material by a process known as "ripping". Occasionally, the bedrock is sufficiently resistant that it cannot be effectively ripped and blasting is required to loosen the rock for excavation. The excavated rock is then sorted, processed, and stockpiled prior to sale for offsite use as construction materials. Hazardous materials associated with the mining activities include fuel, lubricants, and hydraulic fluid for operation of the excavation equipment as well as blasting materials. Hazardous wastes generated by the quarrying operations are primarily waste oils and spent lubricants and antifreeze. The management of hazardous materials is regulated by the Sonoma County Department of Emergency Services. The operator has a Business Plan on file with SCDES, which provides a hazardous materials inventory, and the facility's Emergency Response Plan. The SCDES periodically inspects the facility's hazardous materials management activities; the most recent inspection was performed in August 2000. The report of the inspection recommended that improvements in waste oil storage, management of the aboveground fuel storage, and revision of the business plan. The County records indicate that the

1 Information used in this report was derived from a Final Phase I Environmental Site Assessment prepared by Uribe & Associates in July 2001.

recommended corrections were made in January and February 2001. The use, storage, and disposal of the hazardous materials and waste are described in the following sections.

Underground and Aboveground Storage Tanks

Three underground storage tanks (USTs) were previously located at the project site. The tanks included one 10,000-gallon and one 5,000-gallon diesel tanks and one 10,000-gallon gasoline tank. The tanks were located west of the existing maintenance shop. These tanks were removed in January 1990. Soil and groundwater samples collected in February 1990 in the tank excavation did not contain total petroleum hydrocarbons as gasoline, motor oil, and diesel at concentrations above laboratory reporting limits. Files at the Sonoma County Division of Environmental Health (SCDEH) include a memorandum ("Request for Action" dated 29 August 1994) which indicates that the closure of the underground tank investigation at the quarry was recommended by SCDEH. The site is not included on County or State lists of currently leaking underground storage tank sites.

Three aboveground storage tanks (ASTs) are currently operated at the project site. The ASTs include one 10,000-gallon and one 5,000-gallon diesel tanks and one 10,000-gallon gasoline tank. Apparently, these tanks were underground storage tanks, which were removed in 1990 and converted to aboveground tanks. These tanks are used to fuel the heavy equipment and vehicles used on-site for mining and reclamation activities. The diesel tanks are located adjacent to one another in an area west of the maintenance shop. The gasoline tank is located east of the maintenance shop. Secondary containment is provided for the tanks to ensure containment of leaks or spills. All of the tanks are operated under permits with the Sonoma County Department of Emergency Services (SCDES).

In addition, a 1,000-gallon AST provides storage for waste oil generated at the project site. The tank is located within the maintenance shop and is provided with secondary containment. The quarry operator contracts with a licensed waste-hauler to periodically remove waste oil from the tank for off-site disposal. These types of waste are transported under a hazardous waste manifest.

Other Hazardous Materials

In addition to diesel fuel and waste oil, other hazardous materials are used and stored at the project site. Most of these materials are used for the operation of the heavy construction equipment maintained at the project site and the on-site rock processing plant. These materials include ethylene glycol (antifreeze), motor oil, hydraulic oil, gear oil, and gear grease. The antifreeze and lubricants are stored in the maintenance shop. Welding operations conducted on-site use compressed gases (including non-flammable mixture of carbon dioxide, oxygen, and argon [non-flammable gas], oxygen [non-flammable gas], and acetylene [flammable gas]), which are stored in the welding shop.

Occasional blasting at the quarry requires the storage and use of explosives. Blasting materials include dynamite and ammonium nitrate-fuel oil mixture, which are stored on-site in a designated explosives magazine located just north of the existing rock processing plant. Title 8, Division 1, Chapter 4, Subchapter 17, Article 51 of the California Code of Regulations regulate storage of explosives. These regulations require that explosives in excess of 100 pounds (applicable to the proposed project and existing operations) be stored in a first-class magazine. The on-site magazine is a certified first-class magazine. The magazine is inspected twice per year by the federal Mine Safety and Health Administration. The project does not propose any changes to the operation or maintenance of the magazine.

Hazardous Materials Sites Databases

Regulation of hazardous material management has resulted in the development of databases, which identify regulated facilities. The project site and nearby properties have been included on such databases (EDR, 2003). The project site is listed on the following local, state, and federal hazardous materials databases:

- U.S. Environmental Protection Agency Facility Index System (FINDS) – general listing of sites regulated for hazardous materials management;
- California Department of Toxic Substances Control HAZNET – listing of sites filing manifests for hazardous materials transport (in this case, aqueous solution with 10% or more total organic residues [i.e., waste oil]);
- State Water Resources Control Board Hazardous Substance Storage Container Database (HIS LUST) – listing of historic (inactive) underground storage tank sites.

The following leaking underground (fuel) storage tanks (LUST) sites have been identified within one mile of the project site:

- Blue Rock Quarry – 7888 Highway 116
- Dave's Pit Stop – 7001 Highway 116
- BP Forestville – 6615 Front Street

In addition to these "active" underground tank sites, two historic (inactive) underground storage tank sites (HIS LUST) have been identified within one mile of the project site:

- H.E. Wood – 7575 Martinelli Road
- Holy Order of Mans – 7777 Martinelli Road

The Holy Order of Mans (7777 Martinelli Road) HIS LIST site is within property now owned by the applicant and within the proposed Mineral Resource Zone. According to the applicant (Trappe, 2003), there are no underground tanks at the site. However, there is a 550-gallon aboveground fuel tank located in the area of the cluster of buildings at the entrance from Martinelli Road to the former retreat center. According to the applicant, the H.E. Wood (7575 Martinelli Road) site is located east of Martinelli Road and east of Green Valley Creek. No records were found at the SCEHS offices for the 7575 and 7777 Martinelli Road sites. However, the sites are on the County's list of "inactive" UST sites and no further investigation of the sites has been required.

The only other site listed on the databases located within one mile of the project site is Seraphim Rose Press (7860 Highway 116). This facility is identified on HAZNET as a generator of photochemical/photo processing waste.

Fire Hazards

The degree of fire hazard for an area is dependent on three major components: (1) the natural setting of the wildland or urban area, (2) the degree of human use and occupancy of the wildland or urban area, and (3) the level and ability of public services to respond to fires that do occur. At the proposed project site, the greatest potential for fire hazard exists from the extensive natural vegetation. Dense stands of mixed evergreen and hardwood trees combined with steep topography and long, dry summers create the potential for wildland fires. The area of the project site is identified in the Sonoma County General Plan as an area with very high or high potential for large wildland fires. The California Department of Forestry and Fire Protection (CDFFP) has mapped the severity of fire hazards in the area of the project site as "very high" (CDFFP, 1985).

The Forestville Fire Protection District (FFPD) provides primary fire protection services for the project site. The closest FFPD fire station is located at 6554 Mirabel Road in Forestville. The estimated existing response time for the department to a call at the Canyon Rock Quarry is two to four minutes from the time of dispatch depending on the time of day, traffic and weather. In the event of a wildfire, the FFPD would respond but would be supported by wildfire control services provided by the CDFFP. The closest CDF fire station is located at 12604 River Road in Guerneville; response time from this station to the quarry site is approximately 10 to 12 minutes (Moore, 2003).

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).[2] 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.

The California Environmental Protection Agency (Cal-EPA), Department of Toxic Substances Control (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

2 Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Article 3.

the area of the project site. Other types of hazardous substance release sites may be overseen by the LOP with proper notification and authorization from the California Regional Water Quality Control Board (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 California EPA (Cal/EPA), which includes the DTSC, the North Coast Regional Water Quality Control Board (RWQCB), the California Air Resources Board (CARB), and other offices. The Northern Sonoma Air Pollution Control District (NSAPCD) has jurisdiction over the air basin, which includes this area of Sonoma County. 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. Environmental Protection Agency. 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.

Department of Toxic Substances Control. The California Department of Toxic Substances Control 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 Regional Water Quality Control Board. 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.

California Air Resources Board and the Northern Sonoma Air Pollution Control District. The project site is in the North Coast Air Basin. The California Air Resources Board (CARB) and the Northern Sonoma Air Pollution Control District (NSAPCD) and 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. NSAPCD 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 further describes the responsibilities of CARB and NSAPCD, air quality conditions in the North Coast 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 Cal/OSHA The applicant filed its most recent business plan and hazardous materials inventory in December 2000, and appears to be in compliance with these requirements (McGuire, 2003).

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 the California Department of Industrial Relations, Division of Occupational Safety and Health (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.

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
- 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.

APPROACH TO IMPACT ANALYSIS AND METHOLODGIES

This impact analysis focused on potential effects of wildland fires, hazardous materials associated with mining and reclamation activities, and soil and groundwater conditions at the project site. The project site is not located within two miles of an airport nor within one-quarter mile of an existing or proposed school and would comply with County regulations regarding adequate access for emergency evacuation or response. The potential impact of hazardous materials sites within the project boundary are discussed in Impact V.C.2, below. The evaluation considered project plans, current conditions at the project site, and applicable regulations and guidelines.

Impact V.C.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.

As under existing conditions, proposed mining and reclamation activities under the Northern Expansion option 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 proposed Northern Expansion option would not result in a substantial change in the hazardous material use, storage, or disposal relative to existing conditions 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 on-going mining and reclamation on activities). The potential impact of releases of hazardous materials at mining sites was evaluated in the EIR for the Sonoma County Aggregate Resources 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. The business plan for the Canyon Rock Quarry facility includes an Emergency Response Plan and Notification Procedures. However, at the time of preparation of this EIR, a SPCCMP for the project site was not available.

The Northern Expansion option does not propose any changes to the management of explosives at the project site. Consistent with past operations, blasting materials would occasionally be transported and used at the quarry, and this could be considered 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 the California Occupational Safety and Health Administration (Cal OSHA). If the blasting contractor mixes blasting agents on site, that contractor must have a license issued by the Federal Bureau of Alcohol, Tobacco and Firearms All blasts must also be controlled by a blaster who has a passed a written licensing examination and met the experience requirements set forth by Cal OSHA. Licensed blasters and contractors are required to be knowledgeable about and to comply with all regulations governing explosives and blasting. With compliance with existing regulations, the potential hazards related to the transport, storage, and use of blasting materials on site is considered mitigated to a less-than-significant level.

Mitigation Measure V.C.1a: Prior to excavation activities in the Northern Expansion areas, 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 V.C.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 V.C.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 V.C.1d: No soil or other material containing hazardous or toxic waste shall be imported to the quarry (Note, this condition is not intended to restrict the recycling of concrete or asphalt on site).

Significance after Mitigation: Less than Significant.

Impact V.C.2: The project site includes the two sites of former leaking underground fuel storage tanks included on the State Water Resources Control Board Hazardous Substance Storage Container Database. Disturbance of soils or groundwater affected by releases of petroleum hydrocarbons could potentially expose workers to increased human health risks. This would be a less than significant impact.

The project site includes two former sites that were previously under investigation for fuel releases from underground storage tanks. The investigations of the two sites are not active and no further investigation or remediation has been required by the Regional Water Quality Control Board or the Sonoma County Department of Environmental Health. Neither site is within the proposed mining area for the proposed Northern and Western Expansion area. No disturbance of this area is proposed by the project. One of the sites was within the existing quarry in the area of the maintenance shop. The other site was at the complex of buildings along Martinelli Road at the former Holy Order of Man retreat center. This area would not be excavated under the Northern Expansion option. Both sites are topographically lower than the proposed depth of mining. Therefore, groundwater below the tank sites would not potentially be exposed (i.e., flow toward the quarry excavation) by the proposed mining. Because 1) no excavation is proposed in the area of the former tanks, 2) no further investigation or remediation of the sites are required by the regulators, and 3) the sites are topographically lower than the floor of the proposed quarry, the potential for workers to be exposed to significant levels of residual petroleum hydrocarbons in soil or groundwater is very low. Additionally, the proposed project would not preclude or interfere with any future investigation of the former tank sites, if required by regulators.

All other listed hazardous waste sites are located more than 500 feet away from the proposed project site. Runoff from those sites would not migrate to the proposed Northern Expansion excavation area. The proposed project would not result in excavation to below the groundwater table. Therefore, exposure to groundwater potentially affected by releases at these other sites would not occur. The impact of human exposure to releases at the off-site sources is less than significant.

Mitigation: None required.

Impact V.C.3: Continued mining and reclamation activities at the project site could expose structures, on-site workers, and nearby residents to hazards associated with wildland fires. This would be a less than significant impact.

The proposed project would result in continued mining and reclamation activities. Under the Northern Expansion option, the project proposes to expand the quarrying operation into the Northern Expansion area. The expansion would require clearing of existing mixed evergreen and deciduous forests. Operation of equipment during clearing operations could potentially increase the possibility of ignition of a wildfire. The potential for wild fire would not substantially increase over existing conditions in which clearing has occurred in the area of permitted mining. The project is required to comply with all County of Sonoma rules, regulations, and guidelines to minimize wildland fire hazards by constructing roads that allow adequate access for fire trucks and emergency personnel. As part of the County's Environmental and Design Review process, prior to project approval, the FFPD will review the project site plans to ensure proper emergency access and fire prevention features are incorporated into the project. See also, Section V.F, Public Service and Utilities, in this EIR for additional discussion on potential impacts to fire protection services.

Mitigation: None required.

REFERENCES – Hazards and Hazardous Materials

California Code of Regulations, Title 22, Division 4.5 "Environmental Health Standards for the Management of Hazardous Wastes," Chapter 11, Article 3 (Characteristics of Hazardous Waste), Sections 66261.20-24.

California Code of Regulations, Title 23, Division 3, Chapter 16 "Underground Tank Regulations."

California Department of Forestry and Fire Protection (CDFFP), 1985, Fire Hazard Severity Zones, 1:1,000,000 scale.

California Department of Water Resources (DWR), Bulletin 79-90 (Supplement to Bulletin 74-81): California Well Standards, Water Wells, Monitoring Wells, Cathodic Protection Wells, June 1991.

California Health and Safety Code, Chapter 6.67, Aboveground Storage of Petroleum, Sections 25270–25270.13.

Environmental Data Resources, Inc. (EDR), 2003, EDR Radius Map, Canyon Rock Quarry, report prepared for BASELINE, June.

McGuire, J., 2002, Inspector, Sonoma County Department of Emergency Services, personal communication with Kevin O'Dea, BASELINE, 17 June.

Moore J., 2003, Staff, Department of Forestry and Fire Protection, personal communication with Kevin O'Dea, BASELINE, 20 June.

National Institute for Occupational Safety and Health and Occupational Safety and Health Administration, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities,* October 1985.

Trappe, W., 2003, President, Canyon Rock Quarry, personal communication with Kevin O'Dea, BASELINE, 15 August.

V.D BIOLOGICAL RESOURCES

INTRODUCTION

This section describes the existing wildlife, botanical and wetland resources at the Canyon Rock Quarry project site, identifies the potential impacts of the proposed project on those resources, and discusses mitigation measures to minimize or eliminate potentially significant impacts imposed by the project. Wildlife, botanical and wetland surveys were conducted within the proposed 20-year limit of grading of the Northern Expansion option. Potentially occurring special status animals, plants, and plant communities on the site were determined from on-site biological surveys, and a review of the list of plant and animal species of concern for the project region provided by the U.S. Fish and Wildlife Service (USFWS) Endangered Species Office (USFWS, 2003), the California Department of Fish and Game's (CDFG) California Natural Diversity Data Base (CNDDB) and the California Native Plant Society's (CNPS) Electronic Inventory for the Camp Meeker U.S. Geological Survey (USGS) 7.5-minute quadrangle and surrounding quadrangles (Guerneville and Duncans Mills).

The proposed project site was examined for the presence of potential wetlands and other waters of the U.S. Jurisdictional waters of the U.S. are regulated by the U.S. Army Corps of Engineers (ACOE). Drainages and low areas were surveyed for the occurrence of an Ordinary High Water Mark (OHWM) and/or wetland indicators such as hydrophytic vegetation and/or hydrology. The ACOE defines OHWM as:

> "That line on the shore established by the fluctuations of water and indicated by physical characteristics, such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." (Clean Water Act §404, 33 CFR 328.3).

Potential wetlands were identified by using the "routine, on-site determination method" described in the *Corps of Engineers Wetlands Delineation Manual*, Environmental Laboratory 1987. This method requires consideration of three environmental parameters: vegetation, hydrology and soil. Drainages and seasonal wetlands occurring in the project area were located and mapped.

SETTING

REGIONAL SETTING

The proposed project site is located in the west-central portion of Sonoma County, approximately 60 miles north of the San Francisco Bay within the Outer North Coast Ranges. The area has a Mediterranean climate with coastal fog which influences the climate. This region is characterized primarily by second and third growth redwood, mixed-evergreen, and mixed-hardwood forests, with chaparral associations on exposed sites and grasslands common on alluvial valleys and coastal terrace communities.

PROJECT SETTING

The Canyon Rock Quarry is located just west of the town of Forestville at the intersection of Martinelli Road and Highway 116. The eastern boundary of the existing quarry roughly parallels Martinelli Road and includes Green Valley Creek. The surrounding land is primarily rural residential with several large ranch estates. Prior to its current ownership, the property north of the existing quarry was historically used as the site of a Russian Orthodox Church and associated single-family residences. Three of these residences are located within the proposed Northern Expansion option area.

The climate in Forestville is characteristically Mediterranean with dry summers and wet winters. Annual precipitation varies between 25 and 70 inches, most of which occurs between November and April. Annual temperature is 52° to 56°, and the frost free season is 220 to 240 days.

Topography of the project site is very steep and soils are of the Hugo Series, consisting of well-drained gravelly loams underlain by sandstone and shale. Topography is steep with 75 percent slopes (Soil Survey, Sonoma County, CA, 1978).

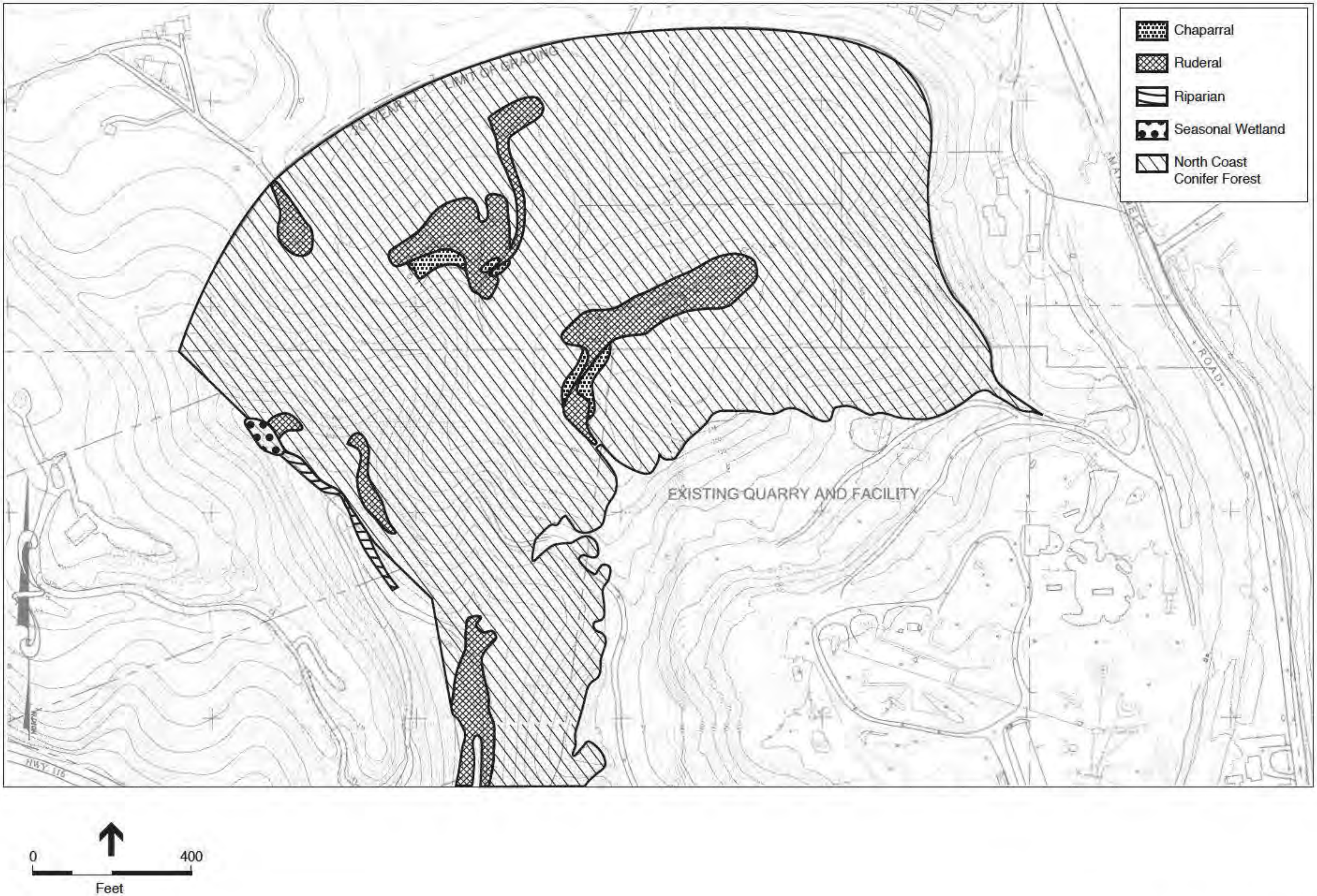
Existing Plant Communities

For the purpose of this EIR, vegetation communities and habitat classifications are based primarily on Holland's (1986) terrestrial vegetation community descriptions and the California Native Plant Society (CNPS) list of habitat types. This classification system describes both natural and human-influenced communities. Vegetation communities observed on the proposed project site have been grouped into five categories that include North Coast conifer forest, chaparral, ruderal, seasonal wetland, and riparian woodland (see Figure V.D-1, "Existing Vegetation").

Focused field surveys for biological resources were conducted within the proposed 20-year limit of grading of the Northern Expansion option.

North Coast Conifer Forest

The greatest portion of the area within the area of the Northern Expansion option consists of steep slopes covered in North Coast conifer forest. The dense multi-tiered tree canopy is dominated by Douglas fir (*Pseudotsuga menziesii* ssp. *menziesii*) in its upper layer. A variety of deciduous and evergreen trees and shrubs make up the understory which ranges from dense on south-facing slopes to open on north-facing slopes. Dominant species include tanoak (*Lithocarpus densiflorus* var. *densiflorus*), black oak (*Quercus kelloggii*), California bay (*Umbellularia californica*), madrone (*Arbutus menzeisii*), California hazelnut (*Corylus cornuta* var. *californica*), and poison oak (*Toxicodendron diversilobum*). In areas where the upper Douglas fir canopy is less dense, black oak becomes more prominent as an understory tree. The forest ground layer is occupied by numerous perennial forbs, vines, and bulbs that include sanicle (*Sanicula crassicaulis*), honeysuckle (*Lonicera hispidula* var. *vacillans*), and calypso orchid (*Calypso bulbosa*).



SOURCE: Prunuske Chatnam, Inc.

Canyon Rock Quarry / 202697 ■

FigureV.D-1

Existing Vegetation

Several steep drainages occur within the North Coast forest. Isolated patches of coast redwood (*Sequoia sempervirens*) occupy the upper portions of some of these drainages. The forest ground layer is open with occasional sword fern (*Polystichum munitum*) as the primary understory plant. These drainages are relatively dry after the rainy season due to the steep topography and rapid runoff. Occasional flat areas maintain moisture for longer periods and support small populations of moisture adapted sedges (*Carex* spp.) See also Figure G-1 of Appendix G.

Chaparral

Chaparral occurs on the upper ridges and south-facing slopes within the proposed 20-year limit of grading of the Northern Expansion option where the tree canopy is sparse. Relatively dense stands of common manzanita (*Arctostaphylos manzanita*) dominate these areas with dry woodland sedges (*Carex* spp.) and iris (*Iris macrosiphon*) occurring as understory vegetation. No other manzanita species were recorded during field surveys.

Ruderal

Patches of ruderal (disturbance-adapted) grasses and forbs occur throughout the proposed 20-year limit of grading, especially in association with residences on the site. Species commonly found in disturbed areas such as ripqut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), and Italian thistle (*Carduus pycnocephalus*) occur in these areas. Invasive French broom (*Genista monspessulana)* and Scotch broom (*Cytisus scoparius*) are frequent in disturbed areas, especially along the sides of the paved, gravel, and dirt roads that transect the site.

Seasonal Pond

A seasonal pond is located at the base of two steep drainages on the very edge of the western boundary of the existing permitted area of the quarry. During the rainy season the area is inundated with flows from the drainages that create ponding. As the season warms, the water recedes and hydrophytic herbs such as smartweed (*Polygonum* sp.) and umbrella sedge (*Cyperus eragrostis*) become evident. Willow thickets (*Salix lasiolepis*) grow along the water's edge with California blackberry (*Rubus ursinus*) and periwinkle (*Vinca major*) covering the moist low-lying flat areas around the pond. The steep slopes that surround the pond are dominated by California buckeye (*Aesculus californica*) and black oak on the south-facing slope, and California bay on the north-facing slope.

Riparian Woodland

Riparian habitat is dominated by shining (*Salix lucida* ssp. *lasiandra*) and arroyo willow (*S. lasiolepis*) with dense thickets of native California blackberry and non-native Himalayan blackberry (*Rubus discolor*). As shown in Figure V.D-1, riparian woodland occurs adjacent to and south of the seasonally wet area described above, adjacent to the western boundary of the existing permitted area of the quarry.

Existing Wildlife Habitats

Three general categories of environmental factors determine the variety and abundance of animal species within an area. These include vegetation, physical factors (soils, climate, etc.), and disturbance factors. Because vegetation reflects the other parameters to a great extent, the previously described vegetation types serve as an appropriate framework to which animal species in the area of the proposed project can be applied. The species described below are those that would be expected to occur on the project site and/or in areas nearby where suitable habitat exists. Although the characteristic assemblages of species occur predictably within certain vegetation types, it should be recognized that relatively few species are restricted to a single habitat, and, indeed, some species may require more than one habitat type.

Among vertebrates, three amphibian, one reptile, and 17 bird species were observed. In addition, two mammal species were visually observed during site visits, but evidence observed on-site suggests the presence of additional species (scat, tracks, and burrows). No special-status animal species were observed during the surveys. Wildlife species common names are used because they are unequivocal. Scientific names of vertebrate species observed or expected to occur are provided in Table G-2 in Appendix G. General or focused surveys for invertebrates (insects, spiders, etc.) were not conducted.

North Coast Conifer Forest

The coniferous forest and adjacent habitats support a large variety of wildlife species. The habitat consists of a dense canopy and understory in areas with southern exposure and an open understory at the upper elevations and north facing slopes.

Coastal coniferous forests support the highest number of bird species when compared with other forest types (Weins, 1975). Bird species most frequently observed and often typical of Douglas fir forests, the dominant canopy species, were chestnut-backed chickadee, ruby and golden-crowned kinglets, Steller's jay, northern flicker, varied thrush, common bushtit, Townsend's warbler, and brown creeper. The most common finch species detected were house finch and lesser goldfinch. The dense understory also provides foraging and nesting habitat for species such as the California towhee, dark-eyed junco, and spotted towhee, all of which were observed during field surveys. Additional migratory species likely to occur and possibly breed within the project area may include hermit thrush, orange crowned-warbler, Pacific-slope flycatcher, and vireos.

Native oaks found on the property serve as a significant resource for many wildlife species. Acorns serve as an important food source especially for mammal and bird species, including the western gray squirrel, Steller's and western scrub jays, acorn woodpecker, and oak titmouse. Oak trees also provide cover, roosting sites, food storage sites, and nesting opportunities for native wildlife.

Potential roosting sites for various bat species exist in the crevices and hollows of the mature bay, fir, and oaks trees found throughout the property. The large trees and snags also provide nesting opportunities for cavity-nesting birds, such as the chestnut-backed chickadee, northern flicker, Nuttall's woodpecker, and white-breasted nuthatch.

The only raptor species observed during field surveys was red-shouldered hawk. Suitable foraging and breeding habitat also exists for other raptor species including Cooper's, sharp-shinned, and red-tailed hawks. Small vertebrates within the habitat are likely to serve as a food source for predatory birds. The large trees on-site are prime habitat for nesting raptors. Nocturnal avian predators may include northern spotted owl, western-screech owl, great horned owl, and northern saw-whet owl.

Woody debris piles and layers of duff provide habitat for amphibians such as California slender salamander and ensatina, both of which were observed at several locations within the forest and adjacent habitats. Additional amphibians such as the rough-skinned newt, arboreal salamander, and western toad, may utilize the property during the breeding and/or non-breeding season. Common reptiles of this community include western fence lizard, northern alligator lizard, and snakes (i.e., gopher and garter snakes).

The North Coast forest also provides habitat for a variety of mammal species. The dense understory and tree cavities provide escape and cover for mammals. The presence of a large number of vertebrate species on the property may serve as a significant food source for larger predatory mammals (i.e., bobcat and mountain lion). Some of the most common species observed included western gray squirrel, black-tailed deer, and dusky-footed woodrat. Evidence suggesting the presence of wild boars was also observed. Red tree voles, a California Special Concern species, may also utilize the large Douglas fir trees for nesting and as a food source.

Chaparral

Species composition across the chaparral and conifer forest habitat was generally the same. Chaparral plants provide additional resources to the wildlife species present in the form of cover, as well as foraging and breeding habitat. Two local species commonly found in this habitat type, but were not observed during field surveys, are the wrentit and California thrasher.

Ruderal

Ruderal grasslands occurring in small areas and in association with the residences on-site provide marginal habitat for wildlife. Ground foraging birds may feed on the vegetation and invertebrates, including California towhee, northern flicker, mourning dove, and resident and migratory sparrows. This habitat type also supports subterranean dwellers such as the Botta's pocket gopher, California mole, and several snake species.

Seasonal Pond, and Riparian Woodlands

The seasonal pond, and riparian woodland habitats within and near the project limits provide nesting opportunities, food, shelter, and may serve as corridors or islands during migration for a variety of wildlife species. They also serve as a water source and provide microclimate conditions required by many species. The pond provides breeding habitat for amphibians such as the Pacific tree frog, which was observed during several site visits. The pond also provide foraging habitat for wading birds (i.e. great blue heron) which forage for aquatic organisms in the shallows. In addition, dabbling ducks, such as the mallard, may forage and nest within the area. Riparian vegetation, such as willows, provides foraging and nesting opportunities for both resident and migratory songbirds (i.e., sparrows, warblers, vireos, and finches).

Wetlands and Other Waters of the United States

Wetlands include a variety of aquatic ecosystems, both permanent and ephemeral. They occur in nearly all continents and climes. The crucial roles of wetlands in promoting biological productivity and diversity and their functions as chemical sinks and filtration systems have been recognized by government agencies and have led to the creation of wetland protections laws. Jurisdictional wetlands and other "waters of the United States" are regulated by the U.S. Army Corps of Engineers (Corps) under the provisions of Section 404 of the Clean Water Act (33 United States Code [USC] § 1344). Any filling of wetlands or waters requires a permit from the Corps. Regional Water Quality Control Board (RWQCB) has review authority of Section 404 permits and requires a Section 401 Water Quality Certification or Waiver for filling Section 404 waters of the United States. In addition to the Corps and RWQCB jurisdictional authority, under Section 1600 of the California Fish and Game Code, CDFG has jurisdiction over any activity in a creek or river in which there is an existing fish or wildlife resource. Projects affecting or potentially affecting such resources must obtain a Streambed Alteration Agreement from CDFG.

Jurisdictional wetlands are indicated by the presence of three parameters; domination of hydrophytic plants, hydrology, and wetland soils. Drainages and seasonal wetlands occurring in the project area were located and mapped. Drainages were examined for the presence of seasonal or permanent wet areas using the indicators described above such as presence of OHWM, dominance of wetland vegetation, hydrology, and soils. A seasonally wet area was identified along the western boundary within the existing permitted area of the quarry (see Figure V.D-1). Wetland indicators occurring at the site include, seasonal pooling with saturated soils and a preponderance of wetland plants such as smartweed, blackberry, and sedge.

Special-Status Species

Special status species are taxa listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), or California Department of Fish and Game (CDFG), taxa designated as candidates for listing, or any species of concern or local concern by USFWS, NMFS, and/or CDFG. In addition, the California Native Plant Society (CNPS) has compiled a list of plant species that it considers to be rare, threatened, or endangered. These plants must be included for consideration during project evaluation in order to comply with the California Environmental Quality Act (CEQA) Guidelines concerning special status species.

Special-status species of California include:

- Plant and animal species designated as threatened, or endangered under Section 4 of the Federal Endangered Species Act;
- Species designated as rare, threatened, or endangered by California Department of Fish and Game under the California Endangered Species Act;
- Species that are recognized as candidates for listing by agencies with resource management responsibilities such as USFWS, U.S. Forest Service (USFS), U.S. Bureau of Land Management (BLM), and California Department of Fish and Game;
- Species defined by the USFWS or CDFG as species of concern;

- Species considered rare, threatened, or endangered pursuant to Section 15380 of the CEQA Guidelines;
- Plant species, subspecies, and varieties defined as rare or threatened by the California Native Plant Protection Act (California Fish & Game Code Section 1900 - 1913);
- Plant species assigned to the California Native Plant Society List: List 1A (plants presumed extinct in California), List 1B (plants rare, threatened, or endangered in California or elsewhere), and List 2 (plants rare, threatened, or endangered in California, but more common elsewhere);
- Species protected by California Fish and Game Code Sections 3503, 3503.5 and 3511;
- Species protected by the federal Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712); and
- Bald and golden eagles protected by the federal Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668a-d).

Special-Status Species within the Project Area

Prior to the field surveys, the most recent printouts and overlays from the California Department of Fish and Game's Natural Diversity Data Base (CNDDB) were obtained for the Camp Meeker, Duncans Mills, and Guerneville quadrangles, and reviewed to determine potentially occurring rare, threatened, or endangered plant and animal species in the project area. The CNDDB reports recent occurrences of special status species that have been entered into the database and does not generally include inventories of more common animals or plants. The absence of a species from the database does not necessarily mean that they do not occur in the area, only that no sightings have been reported. In addition to the CNDDB records, the California Native Plant Society Inventory of Rare and Endangered Vascular Plants of California, 6th Edition (Tibor, 2001) was reviewed for potentially occurring special status plants. Official USFWS lists of species status species were also reviewed for the Camp Meeker quadrangle.

The reviewed records identified the potential presence of 34 special-status plant species and 20 special-status animal species. Table G-3 in Appendix G details potentially occurring special status plant and animal species, their habitats, and status.

A topographic map showing the location of the northern expansion was obtained from *Carlile Macy* and used in the field together with a blueline aerial supplied by Sonoma County Permit and Resource Management Department.

Botanical surveys concentrated on identifiable plant species, their associations, and the possible occurrence of vegetative and physical anomalies such as seeps, serpentine, and bog in the project area. Specific attention was paid to identifying chaparral and grassland habitats where many of the special-status species would be expected to occur. Primary plant communities occurring in the project area were located and mapped. Repeated field visits were made to the project site from early April through July 2002. This insured coverage of the area during the time when spring and early summer-blooming plants are identifiable. Additional surveys were conducted during the winter and early spring of 2003. Surveys were conducted on foot, investigating the boundaries of the proposed northern expansion and focusing on suitable habitats for special-status plant species. A list of the plant species observed on the site is included as Table G-1 in Appendix G.

Wildlife surveys were conducted in the project area from early January to March 2003. During the surveys an inventory of observed animal species was compiled (see Table G-2 in Appendix G). Daytime surveys were conducted with the aid of binoculars. During the surveys, visual cues, calls, and songs were used to identify bird species. Drainages, the intermittent stream channels, woody debris, and other plant material were examined for presence of mammal, amphibian, and reptile species.

Special-Status Plant Species

Thirty-one potentially occurring special-status plant species were identified by the CNDDB and CNPS records within the project area (see the list below and Table G-3 in Appendix G). However, none of the special-status plant species was identified on the project site during focused surveys.

Blasedale's bent grass	*Agrostis blasdalei*
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*
Napa false indigo	*Amorpha californica* var. *napensis*
Baker's manzanita	*Arctostaphylos bakeri* ssp. *bakeri*
Cedars manzanita	*Arctostaphylos bakeri* ssp. *sublaevis*
Rincon manzanita	*Arctostaphylos stanfordiana* ssp. *decumbans*
Vine Hill manzanita	*Arctostaphylos densiflora*
Bolander's reed grass	*Calamagrostis bolanderi*
Coastal bluff morning glory	*Calystegia pupurata* ssp. *saxicola*
swamp harebell	*Campanula californica*
bristley sedge	*Carex comosa*
Rincon Ridge ceanothus	*Ceanothus confusus*
Pennell's bird beak	*Cordylanthus tenuis* ssp. *capillaris*
Baker's larkspur	*Delphinium bakeri*
yellow larkspur	*Delphinium luteum*
narrow-leaved daisy	*Erigeron angustatus*
streamside daisy	*Erigeron bioletti*
Coast fawn lily	*Erythronium revolutum*
fragrant fritillary	*Fritillaria liliacea*
hayfield tarplant	*Hemizonia congesta* ssp. *leucocephala*
short-leaved evax	*Hesperevax sporsiflora* var. *brevifolia*
thin-lobed horkelia	*Horkelia tenuiloba*
Burke's goldfields	*Lasthenia burkei*
perennial goldfields	*Lasthenia macrantha* ssp. *macrantha*
Crystal Springs lessingia	*Lessingia arachnoidea*
wooly-headed lessingia	*Lessingia hololeuca*
Sebastopol meadowfoam	*Limnanthes vinculans*
Tidestrom's lupine	*Lupinus tidestromii*
North Coast semaphore grass	*Pleuropogon hooverianus*
Point Reyes checkerbloom	*Sidalcea calycosa* ssp. *rhizomata*
showy Indian clover	*Trifolium amoenum*

North Coast semaphore grass, state-listed as threatened, and Bolander's reed grass, protected under CEQA, are perennial grasses that can occur in mesic conditions within North Coast conifer forest. Suitable habitat for these species does occur in the seasonally wet area located near the western boundary of the existing permitted area of the quarry. Focused searches for these species were conducted. No occurrences were recorded.

Sonoma alopecurus, a federally-listed endangered perennial grass, blooms in late spring/early summer and occurs naturally in freshwater marsh and riparian scrub habitats. One sighting has been recorded within two miles of the proposed project. Riparian habitat, in association with a seasonally wet area, occurs at the southwestern border of the proposed northern expansion. Focused searches for this species were conducted during the optimum flowering period (May-July). No occurrences were recorded.

Ten special-status species are associates of chaparral, a habitat that occurs in areas on the upper ridges of the project area. Of these, Pennell's bird's beak, an annual herb, is federally-listed as endangered. Eight species are federally-listed as species of concern and include Napa false indigo, Baker's manzanita, Cedar's manzanita, Rincon manzanita, Vine Hill manzanita, Rincon Ridge ceanothus, narrow-leaved daisy, and thin-lobed horkelia. Two of these species, Vine Hill manzanita and Baker's manzanita, are evergreen shrubs that have recorded occurrences within two miles of the proposed project. Focused searches for all of the taxa listed above were conducted in suitable habitats in the northern expansion area. None of the above species were encountered during the field surveys. With regard to the manzanita species, only common manzanita was observed on the site.

Seventeen other species were included in the evaluation but are considered unlikely to occur on the project site due to the absence of suitable habitat. Thirteen of these species–Blasdale's bent grass, Baker's larkspur, yellow larkspur, fragrant fritillary, Point Reyes checkerbloom, coastal bluff morning glory, hayfield tarplant, perennial goldfields, short-leaved evax, purple stemmed checkerbloom, robust monardella, Tidestrom's lupine, and Crystal Springs lessingia are associates of coastal habitats that are not represented in the proposed project area. Showy Indian clover and wooly-headed lessingia can occur in valley and foothill grassland. Fragrant fritillary has a recorded occurrence within one mile of the project site and is known to occur in grassland habitat. Annual grasses are present in small patches throughout the Northern Expansion option area, but true grassland habitat is not present on the site. Burke's goldfields and Sebastopol meadowfoam are associated with vernal pools or mesic swales, another habitat type that does not occur in the project area. Bristly sedge is a marshland/swamp species; suitable habitat is not present in the project area.

Special-Status Animal Species

The CNDDB records identified the potential presence of 20 special-status animal species on the overlays and text reports for the Camp Meeker, Duncans Mills, and Guerneville quadrangles. Additional species were reported on the USFWS species list for the Camp Meeker quadrangle where the project is located. Of the species identified, none were observed on-site during the surveys. However, the following have potential to occur on-site based on habitat requirements and habitat presence. Status and life history characteristics for these species are described below. The observed presence of suitable habitat and potential for occurrence for special status animal species are also described.

Birds

Allen's hummingbird (*Selasphorus sasin*). Allen's hummingbird is a common migrant and summer resident. Locally they are known as one of the earliest spring arrivals, appearing as early as mid-January. This species occurs along the humid coastal belt of the California coast from the Oregon border, up to 20 miles inland. Typical breeding habitat includes any well-vegetated area with suitable foraging habitat. Nests are built on a tree branch or shrub and two white eggs are incubated for 17-22 days. Breeding occurs from mid-February to early August. Like most hummingbirds, this species is an important pollinator of many specially adapted flowers.

Allen's hummingbird is listed as a Federal Species of Concern and has been identified in the Camp Meeker quadrangle by USFWS. Suitable breeding and foraging habitat for this species occurs within the project limits and surrounding areas. This species is known to breed within close proximity to the project area.

California thrasher (*Toxostoma redivivum*). California thrasher is a fairly common year-round resident of dense brushland or thickets in riparian woodlands, coastal scrub, and chaparral habitats. This species feeds on fruits, berries, insects, spiders, and other terrestrial invertebrates. California thrasher forage by scratching and digging in the soil with their long down-curved bills. Nests are normally built in trees or shrubs 2-5 feet above the ground. Pairs are typically monogamous, solitary, and rarely leave the breeding area. Populations are declining along coastal areas due to increasing development.

California thrasher is listed on the USFWS species list for the Camp Meeker quadrangle. It is known to breed locally to the north and south of the project area. Limited but suitable habitat exists for this species in the dense chaparral occurring on the property.

Northern spotted owl (*Strix occidentalis caurina*). Northern spotted owl is an uncommon permanent resident of dense forest habitats in northern California and oak and oak-conifer habitats in southern California. This nocturnal species requires dense, multi-layered canopy cover for roosting sites. Spotted owls feed upon a variety of small mammals, birds, and large arthropods. Nest sites include tree or snag cavities or broken tops of large trees. The typical breeding period lasts from early March through June. Northern spotted owl has experienced a population decline due to the loss and degradation of existing mature and old growth forests.

CNDDB sightings for northern spotted owl are described in the text reports for the Camp Meeker, Duncans Mills, and Guerneville quadrangles. They are also listed on the USFWS species list for the Camp Meeker quadrangle. Suitable foraging and/or breeding habitat for this species occurs within the project limits.

Osprey (*Pandion haliaetus*). Osprey occurs throughout much of California near large fish-bearing water bodies where it requires clear open areas for foraging. This species feeds primarily on fish but will also take invertebrates and other small vertebrates. Osprey utilizes large trees and snags in forest habitats for nesting and cover. It breeds from March to September and nest on platforms of sticks up to 250 feet above ground. Nests are built at the top of snags, human-made structures, dead-topped trees, or similar structures within 15 miles of foraging grounds.

Sightings for the osprey occur on the CNDDB overlays for the Camp Meeker, Duncans Mills, and Guerneville quadrangles. These sightings are mostly confined to a narrow band of habitat along the Russian River. However, osprey is known to nest within 15 miles of foraging habitat and suitable roosting and breeding habitat for this species occurs within the project area.

Vaux's swift (*Chaetura vauxi*). Vaux's swift is an uncommon summer resident of coniferous forests of northern California and a common migrant throughout the state. Nesting sites include hollowed tree and snags and breeding occurs from early May to mid-August. Vaux's swift forage high in the air for insects and over a variety of habitats, with a preference for foraging over rivers and lakes. Wintering grounds include Mexico, Central America, and coastal lowlands of southern California.

Vaux's swift is included on the USFWS species list for the Camp Meeker quadrangle. This species is known to breed locally and confirmed sightings occur within close proximity to the project area. Suitable breeding and foraging habitat for this species occurs within the project area and surrounding habitats.

Mammals

California red tree vole (*Arborimus pomo*). California red tree vole occurs from Sonoma County to the Oregon border in coniferous forest in humid areas where it is reported to be rare or uncommon. California red tree vole is largely nocturnal and active year-round. Its home range generally consists of one to several fir trees. This species primarily feeds on the needles of Douglas fir and grand fir. Nests are typically constructed from 6-150 feet above ground and are made primarily of resin ducts from Douglas fir needles, which they remove before feeding. Males are also known to nest in burrows at the base of trees. Breeding occurs year-round, with peak activity from February to September. The primary predators of California red tree vole are spotted owls, saw-whet owls, and possibly raccoons.

According to CNDDB overlays, sightings of California red tree vole occurs within 4.0 miles of the project area near Camp Meeker and near the towns of Occidental and Freestone. Reconnaissance surveys directed toward identification of red tree vole nests were conducted in the Northern and Western Expansion option areas. No evidence of red tree vole was observed in the Northern Expansion area. Suitable habitat and evidence of past use was observed in the Western Expansion area.

Long-eared myotis bat (*Myotis evotis*). Long-eared myotis bat is widespread in California where it prefers coniferous woodlands and forests. This species is most active in late evening when it can be found foraging for moths, beetles, flies, spiders, and other arthropods. Roosting sites include buildings, crevices, small spaces under bark, and snags. This species generally roosts in small numbers or singly. Mating occurs in the fall and young are born the following May to June.

Long-eared myotis bat is included on the USFWS species list for the Camp Meeker quadrangle. Suitable roosting and foraging habitat for this species occurs within the project area.

Pallid bat (*Antrozous pallidus*). Pallid bat occupies grassland, shrubland, woodland, and forest habitats at low elevations in California. It can most commonly be found in open, dry habitats with suitable rocky areas for roosting. This species can also be found roosting in caves, crevices, mines, hollow trees, and buildings during the day. Night roosts generally consist of more open areas such as porches and open buildings. This species feeds chiefly on a variety of arachnids and insects. The pallid bat is a yearlong resident throughout most of its range. During the non-breeding season, both sexes may be found roosting in groups of 20 or more individuals. Young are born from April to July. As with many bat species, pallid bat is extremely sensitive to roosting site disturbance.

According to CNDDB overlays, there are no recorded sightings of pallid bats within the immediate area. The closest observation is approximately 6.5 miles south of the project site near the town of Occidental on the Camp Meeker quadrangle. However, pallid bat may forage over the site and could use the large trees and buildings as temporary foraging, daytime, or night roosts.

Yuma myotis bat (*Myotis yumanensis*). Yuma myotis bat occurs throughout most of California with the exceptions of the desert regions. This species' preferred habitat types include open forests and woodlands. This species feeds on small flying insects and requires a water source (i.e., ponds, streams, and stock tanks) over which to forage. Roosting occurs in mines, caves, crevices, and buildings. Little information exists on winter hibernation. Like many bat species, Yuma myotis mate in the fall and give birth the following summer.

Yuma myotis bat is included on USFWS species lists for the Camp Meeker quadrangle. Suitable roosting and foraging habitat for this species occurs within the project area.

LOCAL PLANS AND POLICIES

Sonoma County General Plan

Guidelines and policies within the Sonoma County General Plan seek to protect biological resources. Policies considered during the development of this section of the EIR are as follows.

> Goal RC-5: Promote and maintain the County's diverse plant and animal communities and protect biotic resources from development activities.
>
> Objective RC-5.1: Identify and encourage protection of areas with important wildlife habitats and woodland 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.
>
> RC-5e: Encourage landowners to voluntarily participate in the County's Landmark Tree Program.
>
> Goal RC-6: Identify and protect rare and endangered species and their environment.
>
> Objective RC-6.1: Identify the locations of rare and endangered plants and animals.
>
> Objective RC-6.2: Require that any development on lands containing rare and endangered species be done in a manner which protects the resource or mitigates adverse impacts.

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.

Goal RC-7: Protect and conserve the quality of ocean, marine and estuarine environments for their scenic, economic and environmental values.

RC-7c: Use the policies of the Sonoma County Coastal Plan to protect wetlands, estuaries, and other coastal resources.

Goal RC-8: Encourage effective management of freshwater fishery resources and balance competing agricultural, development, and mining needs with protection of the stream environment.

Objective RC-8.1: Identify sources of sediment and erosion and minimize their impact on local water courses.

Objective RC-8.2: Manage riparian corridors along streams to provide protection for fish habitat.

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.

Tree Protection and Replacement Ordinance

Article 88, Ordinance No. 4014, of the Sonoma County Code, describes certain native trees of value to Sonoma County and attempts to preserve these trees on land where a private project is proposed and development approval is required by specified Sonoma County departments or agencies. This ordinance does not apply, however, to trees that are subject to a valid State timber harvesting permit.

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.

In addition to the above, CDFG and USFWS guidelines consider a project to have a significant impact if it were to cause a change in species composition or result in the measurable degradation of sensitive habitats such as wetlands, oak woodlands, and/or perennial grasslands. Impacts would also be considered significant if proposed activities are subject to U.S. Army Corps of Engineers (Corps) permit requirements under Section 404 of the Clean Water Act and/or permit requirements under Sections 1600 of the California Fish and Game Code.

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. Impacts will be classified as significant, potentially significant, or less than significant. Mitigation measures are provided whenever possible to avoid or reduce to the impact to less than significant.

IMPACT OVERVIEW

This EIR identifies adverse, significant, potentially significant, and cumulative impacts to biological resources on the proposed project site. The mitigation measures discussed below are designed to protect habitat quality of surrounding areas and where possible, to offset project impacts to less than significant levels. The mitigation measures presented in this report are based on requirements, recommendations, and guidelines established by the Sonoma County Code, USFWS, CDFG, Corps, RWQCB and *Sonoma County Aggregate Resource Management Plan* (ARM Plan).

In addition to actions considered in this EIR, the forested lands meet the definition of "timberland" as defined in the California Public Resources Code (§4527), and as such are subject to regulation under the *California Forest Practice Rules* (Title 14, California Code of Regulations, Chapters 4, 4.5 and 10). To comply with Forest Practice Rules, the applicant will be required to prepare and submit to the California Department of Forestry and Fire Protection (CDF), an application for Timber Conversion, and will need to prepare and submit a Timber Harvest Plan (THP) in accordance with Subchapter 7, Article 2 of the *Forest Practice Rules.*

The applicant will be required to comply with standard rules related to the evaluation of habitat for sensitive species in general and to comply with provisions for protection of northern spotted owl (§§919.9-919.10). These provisions include identification of owl habitat within the THP area and all lands within 0.7 miles of any THP boundary. Pre-harvest surveys will be required. In consultation with CDFG, CDF will make a determination of whether a "take" of one or more individual owls would occur, and stipulate modifications (temporary and/or permanent modifications to the area of disturbance) to the THP necessary to reduce impacts below the threshold of "take."

Impact V.D.1: Project construction and grading activities within the proposed 20-year limit of grading of the proposed project could disturb or destroy wetland and riparian habitat directly adjacent to the western boundary of the existing permitted area of the quarry. This would be a significant impact under the Western or Northern Expansion options.

Western Expansion Option

Under the Western Expansion option, the project would result in filling and excavating the seasonal pond and associated drainages and vegetation due to grading and quarry expansion. These drainages 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. Removal and filling of potentially jurisdictional wetlands under the Western Expansion Option would result in a significant impact.

Mitigation Measure V.D.1a: If it is infeasible to avoid filling or excavating potentially jurisdictional wetlands under the Western Expansion Option, then 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 a 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.**

Northern Expansion Option

Wetland and riparian habitat occurs adjacent to the western boundary of the existing permitted area of the quarry. CEQA Guidelines indicate that any adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act is considered a significant impact. Grading proposed within the proposed 20-year limit of the Northern Expansion option could potentially degrade or destroy this wetland habitat by causing direct or indirect siltation into the wetland, thus affecting the existing wetland plant and wildlife community.

Mitigation Measure V.D.1b: Avoid all potentially jurisdictional wetlands and riparian habitat located along the western boundary of the existing permitted area of the quarry. Prior to construction activities, the project applicant shall take appropriate measures to protect the wetland and riparian habitat located on the western boundary of the existing permitted area of the quarry. Protection measures to be included in the grading and Reclamation Plan:

- **Installation of exclusionary construction fencing around the seasonally wet area;**
- **Implementation of all measures to control dust in adjacent work areas;**
- **Maintenance of the hydrologic inputs (flow) to the seasonally wet area; and**
- **The project applicant shall maintain the minimum allowed setback for quarry mining operations from stream banks and critical habitat areas designated in the Sonoma County General Plan, which is 100 feet (Chapter 26A, County Code).**

Significance after Mitigation: Less than Significant under the Western and Northern Expansion options.

Impact V.D.2: Project construction and grading activities proposed under the proposed project would result in direct loss and/or disturbance to natural communities. This would be a potentially significant impact under the Western or Northern Expansion options.

The expansion areas contain predominantly north coast conifer forest habitat (and comparatively smaller areas of chaparral) that would be removed by the proposed grading plans of the expansion options. Large trees that would be removed within this habitat would include big leaf maple, black oak, coast live oak, madrone, redwood and California bay. Although north coast conifer habitat is relatively abundant in the area that would remain undisturbed, this reduction of habitat would have adverse effects on distribution and activities of local plant and animal species by creating a barrier to movement between Green Valley Creek and upland areas outside of the project boundaries. Further, the loss of trees would result in a temporary loss of habitat values associated with this habitat type.

Mitigation Measure V.D.2: Though loss of existing natural communities on the site would have an adverse effect on the project area, impacts would be offset by the project applicant's strict adherence to implementation of the reclamation standards for revegetation (Chapter 26A, County Code). The revegetation standards contained in the 1992 Revegetation Technical Report available at the Permit and Resource Management Department will be applicable.

These standards require reclamation to begin as soon as possible during the mining process and completed within the schedule stated within the reclamation plan. Mined lands will be revegetated with grass seed mixtures approved by the CDFG and shrubs and trees native to the project area and appropriate to the topographic, soil, and climatic conditions of the site. Natural regrowth of riparian vegetation shall be encouraged on disturbed areas adjacent to streams.

Revegetation operations will be inspected and monitored at least once a year by the PRMD and need for additional planting will be determined at that time. Unless site specific vegetation performance standards are established in the Reclamation Plan approval, revegetation standards shall be considered met once the established plantings have been in place at least five (5) years, are capable of self-regeneration, and have met the quantified measurements for a period of two (2) years without human intervention such as watering, weeding, fertilizing, replanting, etc.

The proposed planting plan for Phase I and Phase II include certain plant species that are not native to the project area and therefore would not be consistant with the standards set forth in Chapter 26A of the County Code regarding use of native trees and shrubs. Locally occurring native species shall be used.

Significance after Mitigation: Development of replacement vegetation will, over time, result in corresponding development of habitat characteristics comparable to those present on the project site. However, there will be a net loss of forest community that will extend past the operating life of the quarry. Consequently, the impact of loss of North Coast Conifer forest would remain significant.

Impact V.D.3: Disturbance from construction activities and removal of vegetation under the proposed project could increase the occurrence of invasive plant species such as French broom and Scotch broom. This would be a significant impact under the Western or Northern Expansion options.

Physical disturbance to natural areas increases the likelihood of establishment and spread of invasive introduced plant species. If not controlled, these species can reduce habitat quality of the surrounding natural communities by displacing native vegetation. Goal RC-5.1 of the Sonoma County General Plan aims to protect the County's diverse natural habitats by protecting biotic resources from development activities.

Mitigation Measure V.D.3: Reclamation boundaries and adjacent habitats shall be inspected regularly for presence of invasive plants, such as French and Scotch Broom and other relevant species. Occurrences shall be removed immediately by pulling, digging, or other approved invasive plant control methods in an approved manner.

Significance after Mitigation: Less than Significant.

Impact V.D.4: Quarry activities associated with the proposed project may result in erosion and sedimentation of surrounding creeks and drainages which could negatively impact aquatic species. This would be a potentially significant impact under the Western or Northern Expansion options.

Removal of vegetation and soil disturbance increases run-off and erosion especially on steep slopes such as those that characterize the project site. Increased sedimentation into local watercourses would have indirect negative effects on aquatic species. Green Valley Creek, downstream of the project site, is known to harbor federally-protected aquatic species including the California freshwater shrimp and anadromous salmonids.

Mitigation Measure V.D.4: Implement measures contained in Mitigation Measure IV.D.1 contained in Section IV.D, Hydrology and Water Quality, in this EIR.

Significance after Mitigation: Less than Significant.

Impact V.D.5: Proposed quarry expansion may result in nest destruction or abandonment of nesting birds (protected raptors and other birds), if present. This would be a potentially significant impact under the Western or Northern Expansion options.

Bird species identified in Table G-2 in Appendix G would be expected to use the proposed development area. These species are protected by CDFG Code Sections 3503 and/or 3503.5. Removal of suitable habitat and associated construction activities may result in the death of and/or disturbance to nesting birds (including passerines and raptors), if they are found to be breeding on-site (i.e., February through August). If construction activities occur during the non-breeding season (i.e., September through January), then death or disturbance to nesting birds is not likely to occur. Activities during the breeding period would require focused surveys to ensure protected raptors (e.g., Cooper's and sharp-shinned hawks) and other protected birds are not present.

Mitigation Measure V.D.5: If clearing of vegetation occurs outside of the August 15 to March 1 nesting avoidance period, the owner must, prior to commencement of clearing of vegetation activities, retain a qualified biologist to survey the site for nesting raptors within 500 feet of the clearing area and for birds protected by CDFG Sections 3503 within 250 feet of the clearing area. The survey distance for raptors and other birds may be modified by a qualified biologist depending upon the site circumstances. If species are found to be nesting on-site or within close proximity, a buffer area shall be designated by the biologist and all clearing activities shall remain outside of this area until nesting is complete.

Significance after Mitigation: Less than Significant

Impact V.D.6: Proposed quarry expansion may result in the disturbance, displacement, or mortality to special-status wildlife species, including the northern spotted owl, and special-status bat species, if present. Impacts to nesting owls and adjacent foraging and screening habitat would be potentially Significant. The loss of bat foraging and roosting habitat is considered potentially significant impact under the Western or Northern Expansion options.

Removal of suitable habitat may result in disturbance, displacement, or mortality to special-status resident or migratory wildlife species, if present. Focused surveys that follow USFWS and CDFG protocols to determine presence/absence for the Northern spotted owl and potentially special-status bat species may be required prior to any construction activities. This document assumes that northern spotted owl utilizes the site as resident, migrant; for nesting and foraging. The use of the site by special-status bat species is likely limited to foraging and roosting. Each of these impacts is discussed separately below.

Northern Spotted Owl. The loss of spotted owl habitat is considered potentially significant. Impacts to nesting owls, including direct loss of adults, eggs or young, disruption of breeding, nesting, foraging or sheltering would be significant. Focused surveys have not been conducted in the Northern Expansion area. However, the Northern spotted owl is known to occur in similar habitat from multiple observations within 5 miles of the project site. Consequently, the use of the site by northern spotted owl is assumed to occur. For purposes of this analysis, the assessment, documentation and mitigation requirements of §§919.9-919.10 of *California Forest Practice* Rules are used. (Significant)

Sensitive Bat Species. Up to four sensitive species of bats may use the project site for foraging and/or day or nighttime roosting. The site is unlikely to support maternity or nursery roosts. The loss of foraging habitat is considered less than significant. These species are aerial feeders and will tend to concentrate their efforts in areas supporting the highest concentrations of flying insects, which would primarily be in and adjacent to watercourses. Direct impacts (i.e. removal of trees supporting roosts) would adversely affect any of these bat species. (Potentially Significant)

Mitigation Measure V.D.6a: For northern spotted owl, approved protocol surveys, consistent with §§919.9-919.10 of *California Forest Practice Rules* will be necessary. This effort requires: identification of functional owl nesting, roosting and foraging habitat on, and within 0.7 miles of any project boundary; review of known owl surveys that have been conducted within 1.3 miles of the project site; surveys, by a qualified biologist on the project site and within 0.7 miles of any boundary, in accordance with *Guidelines for Surveying Proposed Management Activities Which May Impact Northern Spotted Owls* (USFWS 1991).

Surveys of the proposed project area may be required and would include a 1-year (6 visit) survey valid only until the beginning of the following breeding season or 2-year (3 visits/year) survey valid for 2 additional years, if owls are detected. The 2-year survey is preferable and is more likely to accurately determine presence or absence. Surveys shall be conducted between 15 March and 31 August, 1 to 2 years prior to commencing activities, depending on the survey type.

In general, any activity that is determined by CDF to constitute "take" would not be approved. Modifications to the THP would be required to avoid harassment or direct impacts to nesting owls. In addition, CDF will require that the THP meet specific requirements, including: no timber operations within 500 feet of an active nest site or pair activity center; maintenance of functional habitat (limited timber operations) between 500 and 1,000 feet of an active nest site or pair activity site; identification and retention of 500 or more acres of owl habitat within a 0.7-mile radius of an active nest site or pair activity center ; 1,336 or more acres of owl habitat within a 1.3-mile radius of an active nest site or pair activity center (including lands retained within a 0.7-mile radius); areas retained to be adjusted by CDF and CDFG to conform to natural landscape attributes such as draws and streamcourses.

Mitigation Measure V.D.6b: Prior to commencement of tree harvesting, the applicant will need to commission a survey of the site by a CDFG-approved biologist specializing in local bat species. If occupied roosting habitat is identified, mitigation would consist of establishment of artificial roosts (wood structures) at suitable locations specified by a CDFG biologist, as near as possible to the site of the existing roosts. Removal of roost trees would not be allowed until the roost was unoccupied.

Significance after Mitigation: Less than Significant.

Impact V.D.7: Proposed quarry expansion may result in the disturbance, displacement, or mortality to the red tree vole (a special-status wildlife species). The direct loss of red tree voles and nests is considered a potentially significant impact for the Western Expansion option and a less than significant impact for the Northern Expansion option.

Removal of suitable habitat may result in disturbance, displacement, or mortality to this special-status resident wildlife or migratory wildlife species, if present. The red tree vole (RTV) has historically been identified with old-growth Douglas fir forest. Recent surveys have recorded RTV in trees as young as 47 years (Parmer, 2000). Douglas fir trees of this age and older are common in the Northern Expansion option area.

Reconnaissance surveys of areas supporting Douglas fir were conducted in the Northern and Western Expansion option areas, as described below (Prunuske Chatham, Inc. 2003):

Western Expansion Option

This Western Expansion area supports forest stands where Douglas fir is the dominant canopy species, primarily in areas in an elevational band above (northeast and upslope of) Highway 116, within 500 feet of the road. Evidence of one inactive nest was found in the understory of a stand of Douglas fir. The evidence consisted of weathered fir needle resin ducts. RTV was not directly observed, nor was any evidence of recent activity such as active nests or resin duct balls in the understory.

Northern Expansion Option

Western gray squirrel nests were commonly observed in the Northern Expansion area, evident by woody structure and evidence of foraging (bark peeling, cone scales and acorn shells) in nest trees and nearby trees. No "wolf" trees (large old Douglas fir specimens with large side branches) were observed in this area. No evidence of RTV (nests, resin duct balls) was observed in the Northern Expansion area. RTV is considered absent from the Northern Expansion area, and the habitat is judged to be marginal for the future occurrence of this species, owing to a lack of connection with typical habitat.

Western Expansion Option

Mitigation V.D.7: Within the Western Expansion option area, a portion of the area provides habitat features associated with the red tree vole. Areas supporting large Douglas fir trees should be retained. Retention actual or potential nest trees and a 100-meter (328 foot) radius buffer area around each nest site are identified as necessary in the *Northwest Forest Plan* (Biswell *et al* 2002). The majority of suitable red tree vole habitat in the Western Expansion option area is within 500 feet of Highway 116, and thus, much of the habitat would be within the buffer area between the road and the quarry. The setback area would need to be expanded to provide the necessary distance suitable habitat and quarry operations. This area shall be permanently preserved to eliminate potential impacts to red tree vole. This measure shall apply only if the Western Expansion option is approved.

Significance after Mitigation: Less than Significant.

Northern Expansion Option

Mitigation: None required.

REFERENCES – Biological Resources

Biswell, B., M. Blow, R. Breckel, L. Finley and J. Lint, 2002. *Survey Protocol for the Red Tree Vole,* Arborimus longicaudus. Attachment to U.S.D.A.-Forest Service and U.S.D.I.-Bureau of Land Management Memorandum 1630/1736-PFP [BLM-OR931]P, 1920/2600 [FS], BLM Instruction Memorandum No. OR-2000-037). Version 2.1. October.

Bolander, G. L., B. D. Parameter. 2000. Birds of Sonoma County: an annotated checklist and birding gazetteer. Napa, CA, Redwood Region Ornithological Society.

Burridge, B., Ed. 1995. Sonoma County Breeding Bird Atlas, Detailed maps and accounts of our nesting birds. Santa Rosa, CA, Madrone Audubon Society.

California Department of Fish and Game. 2003. California Natural Diversity Database. Sacramento, CA.

California Department of Forestry and Fire Protection, 2003. *California Forest Practice Rules (Title 14, California Code of Regulations; Chapters 4, 4.5 and 10).* January 2003 Version.

California Native Plant Society. 2001. *Inventory of Rare and Endangered Plants of California* (Sixth Edition). California Native Plant Society. Sacramento, CA.

Hickman, J. C., Ed. 1993. *The Jepson Manual: Higher Plants of California.*
University of California Press. Berkeley, CA.

Mayer, K.E. and W.F. Laudenslayer (Eds.). (1988) *A Guide to Wildlife Habitats of California,* California Department of Fish and Game, Sacramento, CA, 166 pp.

Parmer, R., 2000. California's Treetop Dwelling Rodent: The Red Vole. In *Outdoor California*, Volume 61 No. 2, March-April.

Tibor, D. P. 2001. *California Native Plant Society's Inventory of Rare and Endangered Plants of California*. Sixth Edition. California Native Plant Society, Sacramento, CA

U.S. Dept. of Agriculture. 1978. *Soil Survey of Napa County, California.* In cooperation with the University of California.

U.S. Department of Interior-Fish and Wildlife Service, 1991. *Guidelines for Surveying Proposed Management Activities Which May Impact Northern Spotted Owls.* 20pp. March.

U.S. Department of Interior- Fish and Wildlife Service. 2003. Species List for Expansion of an Existing Rock Quarry on Highway 116, Sonoma County, California. Letter from Michael Fris.

Zeiner, D.C., W.F. Laudenslayer, K.E. Mayer, and M. White. 1990. *California's Wildlife: Volumes I, II, & III.* California Department of Fish and Game. Sacramento, California.

V.E. AESTHETICS

INTRODUCTION

This section addresses existing visual conditions at the project site and the potential for the proposed Northern Expansion option to affect those conditions, focusing on the visual character of the project site and views from surrounding public areas. The physical characteristics of the site and surrounding areas are discussed briefly. For further discussion regarding a detailed physical description of the land uses mentioned below, refer to Section V.A, Land Use and Planning.

SETTING

EXISTING VISUAL CHARACTER

The existing visual character of the project site is determined by the attributes (color, form, texture) of specific site features and by the patterns that the features have assumed as a result of natural, and/or manmade processes. Evaluation of potential project impacts on the existing visual character of the site requires analysis of the type and degree of change in visual attributes and patterns that could result from implementation of the project. Because perceptions of changes in the physical characteristics of a site may differ with respect to issues of importance and value, visual analysis methods may incorporate evaluation of the attributes and patterns of site features as well as measures of visual sensitivity. This analysis also incorporates publicly available views of the project site.

Visual Quality

The assessment of existing visual quality is organized according to the following general descriptive categories: site location; landform; vegetation; and land use.

Site Location

The project site is located at 7525 Highway 116, in unincorporated Sonoma County, and within Township 7 North, Range 10 West, in the USGS 7.5 Camp Meeker Quadrangle (See Figure III-1 in Chapter III, Project Description).

Landform

Figure III-2 in Chapter III, Project Description, shows an aerial photograph of the site. Geographically, the project site is located at the east end of Pocket Canyon and within the eastern fringe of the Coastal Range. The project site is relatively level in the southeast portion where the existing quarry main facilities are located, with surrounding slopes generally increasing steeply towards the west and northwest. Much of the original natural landform in this main quarry area has been topographically altered by quarrying operations, including excavated hillsides and the creation of berms along Highway 116 and Martinelli Road. The landform of the unmined areas within the existing vested rights and use permitted area, and the proposed Northern Expansion option area, are primarily unaltered (other than access roads, structures, etc.). Elevations range from a low of approximately 75 feet above sea level (asl) along Green Valley Creek, an average of about 100 feet asl on the quarry floor, to a high of approximately 475 feet asl along a ridge in the northwest portion of the site.

Vegetation

Much of the original vegetation in the active quarry area has been removed as part of quarrying operations. Reclamation activities that have been occurring incrementally at the quarry has resulted in new vegetation planted in some of the previously mined areas, in bermed areas, as well as within the Green Valley Creek corridor. The majority of the unmined area within the existing vested rights and use permitted area, and the proposed Northern Expansion option area, is heavily wooded with second growth timber, primarily Douglas fir, and tanoak. (Please refer to Section V.D, Biological Resources, for a detailed description of vegetative communities on the project site.)

On-Site Land Uses

Figure III-4 in Chapter III, Project Description, illustrates existing land uses within the project site. Existing quarry facilities include aggregate processing facilities, concrete batch plants, and shop operations. These facilities are located on the quarry floor. The principal existing buildings include an equipment storage and garage building, office building, and a welding and repair shop. Other built features include an internal vehicle circulation system (paved in the vicinity of the quarry entrance), and sedimentation ponds and containment ponds.

There are also a variety of residences and other structures located within the project site. One occupied residence is located within the existing vested rights and permitted area just west of Martinelli Road and north of Highway 116. There are two occupied houses on the parcels west of the existing permitted area. There are several occupied houses and a currently vacant, former monastery located on the parcels north of the existing vested rights and permitted area. Paved and unpaved roads provide access within the project site to these facilities. Please see Chapter III, Project Description for a more detailed description of on-site land facilities.

Surrounding Land Uses

The project site is located approximately one-half mile west of the Town of Forestville, and approximately one mile southwest of the unincorporated communities of Mirabel Park and Mirabel Heights. Off-site land uses located in proximity to the site include the Blue Rock Quarry (located south of the site on the opposite side of Highway 116), and large lot residences and undeveloped land on all sides.

Existing Visual Quality Determination

The majority of the existing active quarry is considered to be of low visual quality, primarily due to the negative visual changes to the site that have occurred from historic quarrying operations. The quarry contains large open mining areas cut into hillsides that exhibit substantial topographic alterations, stripped vegetation and exposed blue rock and overburden that is visible to westbound traffic on Highway 116 and other viewpoints in the vicinity. In addition, stockpiled materials storage, quarrying and concrete processing equipment and vehicles, and other miscellaneous on-site structures, visually detract from the site. The reclamation that has occurred at the quarry and within the Green Valley Creek corridor does provide some positive visual attributes on the site.

The unmined areas within the existing vested rights and use permitted area west of the active quarry, and the proposed Northern Expansion option area, however, are considered to be of a high visual quality. These areas are picturesque and rural, containing large areas of natural hillsides and dense vegetation. Although of high visual quality, the appearance is diminished in part due to the adjacent quarrying operations and other miscellaneous development in the surrounding area.

Views of the Site

The existing quarry operations and project site are primarily visible from roads and land uses adjacent to the site, and from surrounding hills and mountains. For the purposes of analysis in this document, views of the site can be placed in one of two categories: short-range (views adjacent to the site) and long-range (views over one-quarter mile from the site) from publicly accessible viewpoints. The following describes the views of the project site from a variety of perspectives and from these two ranges.

To aid the understanding of existing conditions and to facilitate a visualization of the proposed project once built, "existing" images are provided from ten viewpoints (see Figures V.E-1 through V.E-5) and are referenced throughout this document. A discussion of proposed views is provided for these viewpoints in the impact analysis. The "existing" photographs were taken in March 2003 using a digital camera.

Short-Range Views

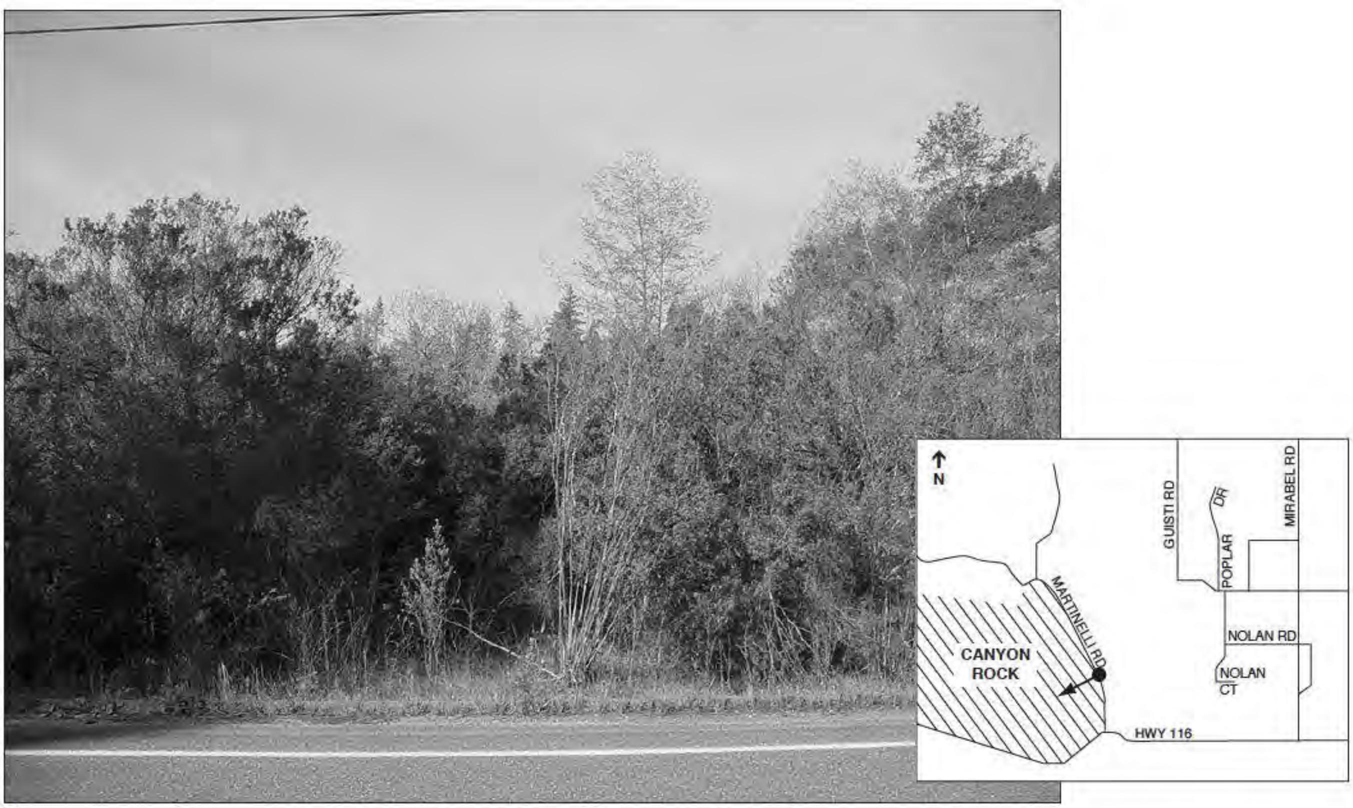
The project site is visible at certain short-range vantage points from private land uses and public roads adjacent to the site, including from Martinelli Road east of the site and Highway 116 south of the site (see Figures V.E-1 through V.E-3). Berms constructed of overburden have been built up between Martinelli Road and Green Valley Creek, and along Highway 116, and planted with redwood and fir, to provide visual screening of the current operation. Consequently, many westerly views of the project site from Martinelli Road are partially or fully obstructed by the site's topography and dense vegetation, particularly the lower elevations of the site (see Figures V.E-1b, V.E-2a, and V.E-2b).

Views of the project site from Highway 116 are generally more available from Highway 116 between Martinelli Road and the site entrance (see Figures V.E-3a and V.E-3b). Northwesterly views of the project site from the intersection of Highway 116 and Martinelli Road consist of a small single-story structure and the excavated slopes of the quarry (see Figure V.E-3a). Certain northerly views of the project site from Highway 116 consist of the quarry floor and its equipment and the excavated slopes of the quarry (see Figure V.E-3b). Steep topography generally precludes views north into the project site from Highway 116 west of the site entrance.

Long-Range Views

Discernable, long-range views of the project site are possible to the east of the project site from Guisti Road, Nolan Road, and Highway 116. Southwesterly views from Guisti Road do not show the quarry floor. However, the excavated slopes of the quarry and portions of the Northern Expansion area are

A

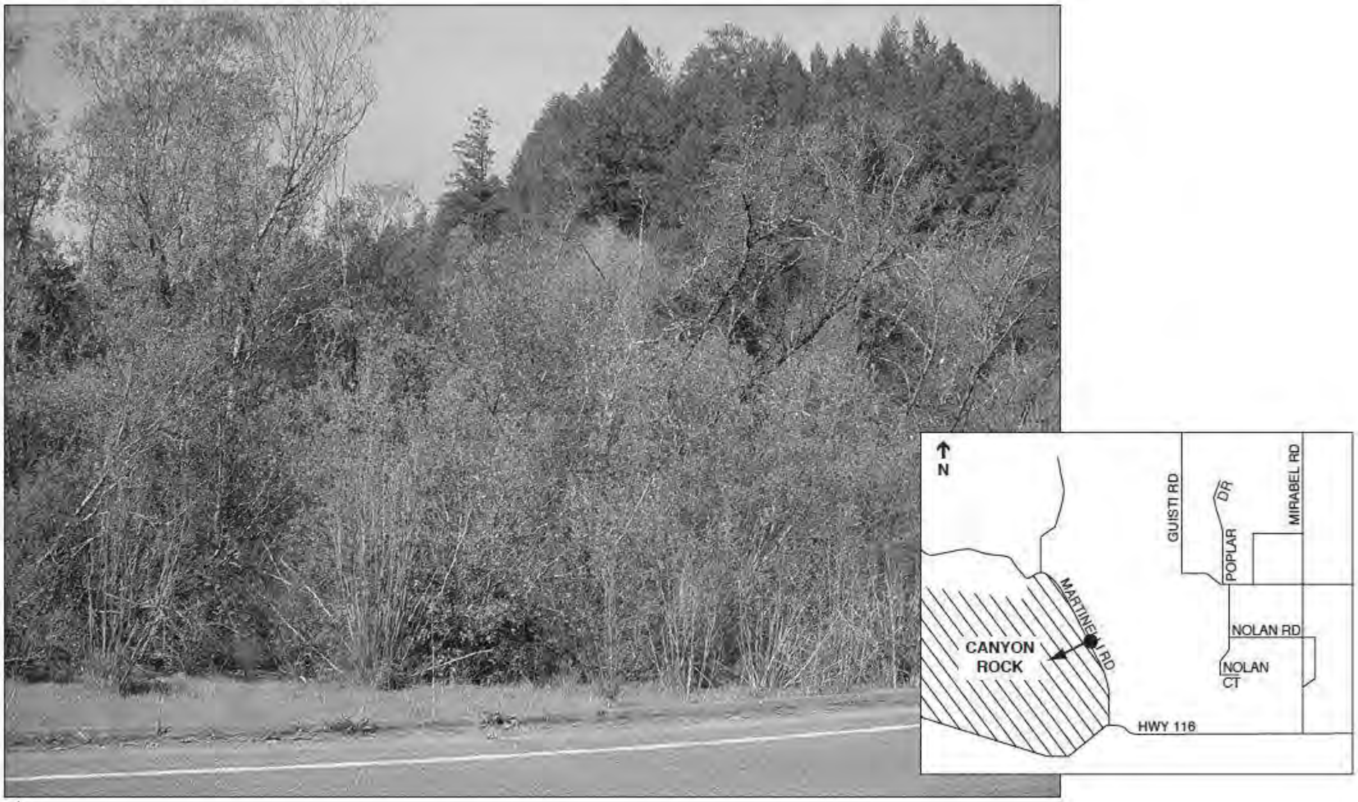


B

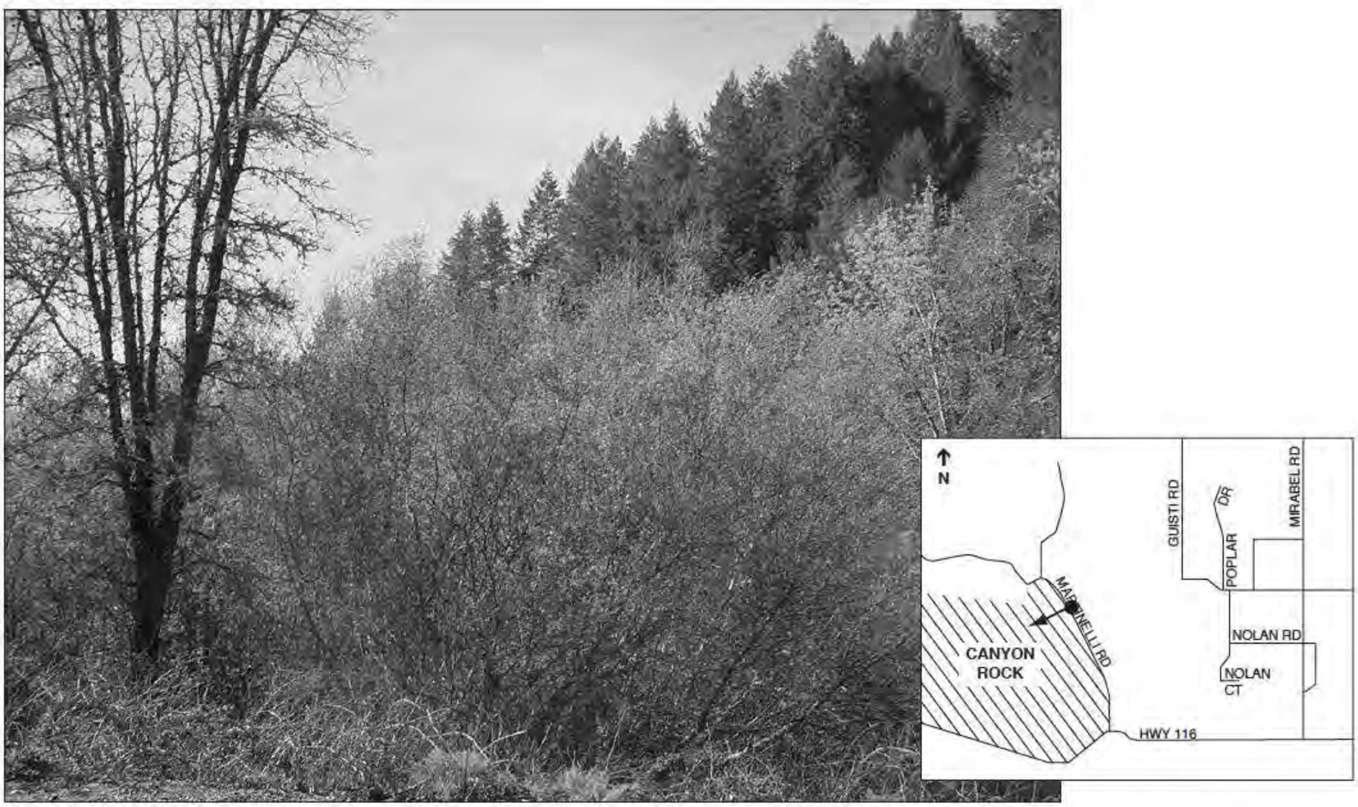
SOURCE: Environmental Science Associates

Canyon Rock Quarry / 202697 ■

Figure V.E-1
Short-Range Views



A



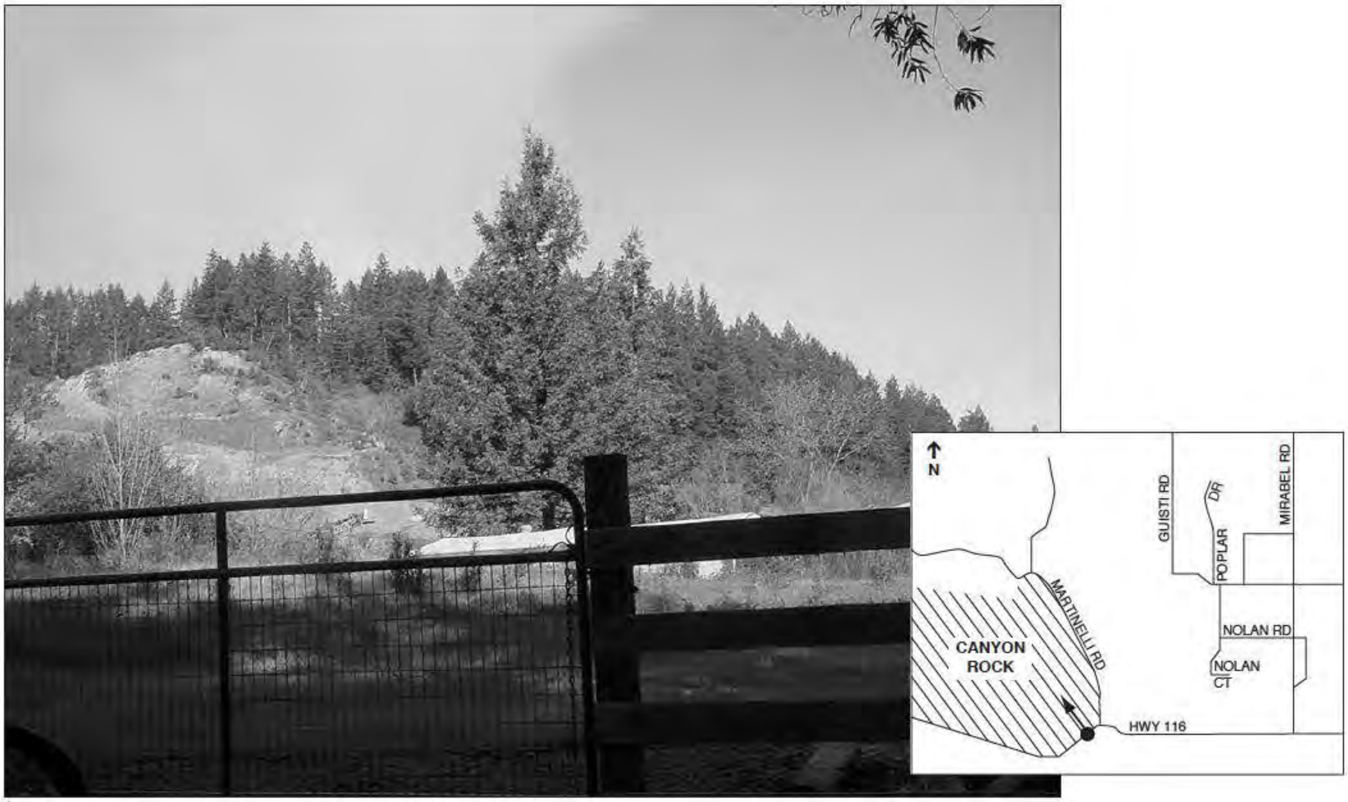
B

SOURCE: Environmental Science Associates

Canyon Rock Quarry / 202697 ■

Figure V.E-2

Short-Range Views



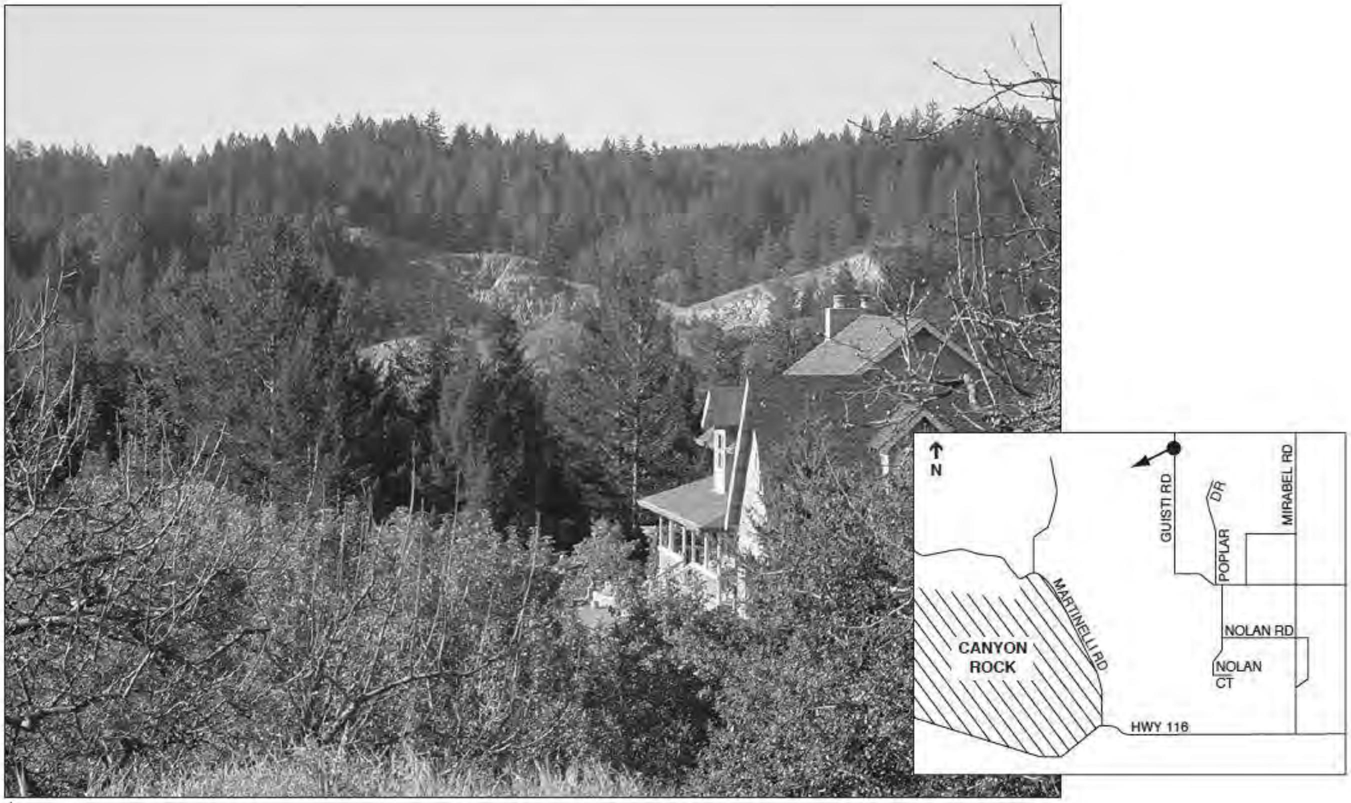
A

B

SOURCE: Environmental Science Associates

Canyon Rock Quarry / 202697 ■

Figure V.E-3
Short-Range Views



A

B

SOURCE: Environmental Science Associates

Canyon Rock Quarry / 202697

Figure V.E-4
Long-Range Views

A

B

SOURCE: Environmental Science Associates

Canyon Rock Quarry / 202697

Figure V.E-5
Long-Range Views

visible (see Figures V.E-4a and V.E-4b). Westerly views from Nolan Road are partially blocked by dense interceding vegetation; however, the excavated quarry slopes and portions of the Northern Expansion area are still visible (see Figure V.E-5a). The excavated quarry slopes are also visible from Highway 116 at Mirabel Road, approximately 0.6 miles west of the site (see Figure V.E-5b).

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:

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 site is located in a scenic landscape unit and on a scenic corridor, is on or near ridgelines, and has visible slopes greater than 40%. This would normally qualify as a site of maximum sensitivity. However, as discussed above, views of the existing quarry detract from the overall visual quality of the site and immediate surroundings. Consequently, the site is classified as one of high sensitivity.

REGULATORY ENVIRONMENT

Sonoma County General Plan

The Open Space Element of the *Sonoma County General Plan* provides for scenic resources as one of its classifications for open space. Scenic resources within Sonoma County are divided into three resource categories, including scenic corridors, community separators, and scenic landscape units.

Scenic corridors are defined by the Open Space Element as important landscapes viewable from roadways with a high visual quality. As shown on Figure OS-2 of the General Plan, the Open Space Element designates Highway 116 as a scenic corridor and the project site as a scenic landscape unit. The General Plan defines a scenic corridor as, "a strip of land of high visual quality along a certain roadway" and defines a scenic landscape unit as, "a landscape of special scenic importance in Sonoma County which provides important visual relief from urban densities (p. 412)."

The following General Plan Open Space Element policies are pertinent to proposed project:

- Avoid commercial or industrial uses in scenic landscape units other than those which are permitted by the agricultural or resource land use categories (Policy OS-2b).
- Require that new structures meet the following criteria:

  1. they are sited below exposed ridgelines
  2. they use natural landforms and existing vegetation to screen them from view from public roads. On exposed sites, screening with native, fire retardant plants may be required.
  3. cuts and fills are discouraged and where practical, driveways are screened from public view.
  4. utilities are undergrounded where economically practical.

  Exempt agricultural accessory structures from this policy if their use does not require a use permit in the zoning ordinance. If compliance with these standards would make a parcel unbuildable, site structures where minimum visual impacts would result. (Policy OS-2b).

- Establish a rural scenic setback of 30 percent of the depth of the lot to a maximum of 200 feet from the centerline of the road unless a different setback is provided in the planning policies of the Land Use Element. Prohibit development within the setback with the following exceptions:

  – Maintenance, restoration, reconstruction, or minor expansion of existing structures.

  – Other new structures if they are subject to design review and:

    they are associated with existing structures,
    there is no other reasonable location for the structure,
    the location within the setback is necessary for the use, or
    the existing vegetation and topography screen the use.

  – Compliance with the setback would render the parcel unbuildable :

- Recognize Highway 116 from Highway 1 to the southern edge of Sebastopol as an official state scenic highway (OS-3i).

California Scenic Highway Program and Scenic Corridor Protection Program

California's Scenic Highway Program was created by the Legislature in 1963. Its purpose is to preserve and protect scenic highway corridors from change which 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. A scenic corridor is the land generally adjacent to and visible from the highway. A scenic corridor is identified using a motorist's line of vision. A reasonable boundary is selected when the view extends to the distant horizon. While the corridor protection program seeks to encourage quality development that does not degrade the scenic value of the corridor, it does not entirely preclude development. Jurisdictional boundaries of the nominating agency are also considered. The agency must also adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. These ordinances make up the scenic corridor protection program.

Highway 116 between Highway 1 and the southern city limit of Sebastopol became an "officially designated scenic highway" in 1988.

IMPACTS AND MITIGATION MEASURES

The existing visual character of the site and 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 surroundings requires analysis of the elements of the project that would be introduced and how those changes (separately or collectively) would affect the 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 damage to scenic resources including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway;
- substantial degradation of the existing visual character or quality of the site and its surroundings; or
- the production of substantial light or glare.

The County has developed the following method for determining 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) Determining significance of the visual impact by comparing site sensitivity with visual dominance of the project.

The visual dominance of the project is determined comparing the contrast of the following elements or characteristics of the project with its surroundings and giving a rating of 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 visual dominance 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 VISUAL IMPACTS

Impact V.E.1: The proposed quarry expansion would substantially alter the visual character of the project site. This would be a significant impact.

As discussed in the Setting, the Northern Expansion area is identified in this EIR to contain high visual quality, and the general surrounding area is considered to have a high visual sensitivity. In addition, adjacent to the quarry, Highway 116 is a State designated scenic highway, and County designated scenic corridor. The County further designates the area in the project vicinity as a scenic landscape unit.

The proposed project would result in both permanent and temporary visual changes on the project site. The proposed project would dramatically and permanently alter the topography in the proposed 20-year limit of grading north of the existing vested rights and permitted mining area. The proposed project would also strip a substantial amount of existing timber and other vegetation from this area, and create large areas of exposed blue rock and overburden in this area while mining was occurring. In addition, the proposed expansion would also result in the placement and/or operation of construction equipment and vehicles within the proposed 20-year limit of grading while mining. The proposed permanent alteration in the landscape, and introduction of active industrial operations in the northern parcels during the life of the permit, would significantly alter the current natural, rural open-space appearance and visual character of the Northern Expansion area of the site as seen from surrounding areas.

Under the County's significance criteria the project would be classified as dominant, because the changes described above would appear in high contrast to the existing elements of the surrounding landscape. Since the sensitivity of the site is high (as described in the Setting) and the project would be dominant, the visual impact would be significant.

Figure III-12 in Chapter III, Project Description, presents a number of representative existing and proposed topographical cross-sections; Figure III-13 presents proposed mine staging; and Figure III-15 presents proposed reclamation planting for the Northern Expansion option. The mining operations at the quarry are currently moving in a westerly direction within the existing vested rights and use permitted area. It is the intention of the project applicant to completely remove the westerly hill within the existing vested rights and use permitted area that is currently being mined, prior to the proposed mining within the Northern Expansion area. In approximately five to seven years, the area of the 1991 Conditional Use Permit is anticipated to be exhausted. At that time, views through this area toward the Northern Expansion area would be opened up as viewed from south of the westerly hill. In addition, views to the west from areas east of the project site would be opened up to the hillside behind the westerly hill. Views of the lower portion of the quarry, including the quarry floor and proposed new egress road, would be hidden from most of the public vantage points south and east of project by berms along Highway 116 and Martinelli Road.

Upon completion of mining operations in a westerly direction, proposed mining under the Northern Expansion option would proceed north. Sections of the mining bench left from the westerly mining operation (currently located across the northerly hill in a northwest/southeast direction) would be reformed as mining cuts into the hill, resulting in a direct east/west line. The proposed straightening of the bench to an east-west direction is proposed by the project sponsor in part to decrease views of these operations from Highway 116 south of the site. The amount of time it is anticipated to take to cut and reshape the existing bench and new working quarry face is anticipated to be approximately four to five years. The final phases of mining within the 20-year grading limit under the Northern Expansion option would move back and forth across the northerly hill, mining from the top of the hill down.

As under existing conditions, and as required by the ARM Plan, a minimum 25-foot setback from parcels not owned by the quarry would be maintained (e.g., setback from Highway 116). Actual proposed setbacks to non-quarry owned parcels in several locations would be substantially greater than that required. West and north of the proposed 20-year limit of grading, the minimum setbacks would be approximately 500 feet. On the parcels north of the existing quarry, the minimum setback to non-quarry owned parcels to the east would be approximately 200 feet.

While the proposed mining staging, setbacks, and existing and proposed topographic screening along the project perimeter would serve to substantially screen negative visual impacts on the site, the proposed cut slopes within the Northern Expansion area would be visible from certain public vantage points south and east of the site due to the breadth and height of the cut. As viewed from short-range public viewpoints near the intersection Highway 116 and Martinelli Road (see Figures V.E-1, top photograph, and V.E-3, top photograph), and near the project entrance (see Figure V.E-3, bottom photograph) visible changes would include the gradual alteration of the topography and removal of the existing vegetation within a portion of the Northern Expansion Area hillside, quarry face exposure within the Northern Expansion area, and mobile equipment movement on the quarry face within the Northern Expansion area, although over time, mining operations would move further north and west, away from these locations.

As viewed from short-range public viewpoints further north on Martinelli Road (see Figures V.E-1, bottom photograph, and Figure V.E-2), the topography of a portion of the hillside within the Northern Expansion area would be altered, including the upper reach that is currently visible from Martinelli Road, and its vegetation removed, as a result of clearing and mining operations. However, westerly views of the majority of the expansion area from this location would continue to be largely screened by existing berms and vegetation. In addition, newer trees that have been planted within this buffer area on the site would continue to grow in height over time, which would further screen westerly views from these vantage points. As viewed from short-range viewpoints on Highway 116 west of the project entrance, existing berms and vegetation along Highway 116 would continue to largely screen northerly views of the Northern Expansion area.

As viewed from certain long-range public viewpoints located east of the project site (see Figures V.E-4 and V.E-5), where partial views of the Northern Expansion area are available due to the elevation of the vantage points, visible changes would include the gradual alteration of the topography and removal of the existing vegetation of portions of the Northern Expansion Area hillside, and increased quarry face exposure. As with all viewpoints east of the project site, over time, mining operations would move further north and west, away from these locations. In addition, certain viewpoints, such as near the intersection Highway 116 and Mirabel Road, are largely screened by existing vegetation which would limit views into the Northern Expansion area.

As under existing conditions, incremental planting of the slopes would occur as mining progresses to cover the exposed slope surfaces. As mining is completed in one area, the operator would perform temporary reclamation every fall by hydroseeding the open slopes to reduce erosion and improve the appearance of the mine by minimizing the open area of the working face. Due to the topography, as the mine proceeds north there would be resulting slopes facing both west and east that could be cut, shaped and reformed so that the final reclamation could take place. Over time, when all quarry operations are complete and final grading is being implemented, the flat valley floor where the quarry now exists would by hydroseeded and the remaining slopes would be re-vegetated as part of the 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 (verified with aerial photographs or detailed site plans), etc., would minimize visual impacts while the site is being actively mined. In addition, the berm approximately 30 feet high would remain along the highway, which would help further reduce visual impacts.

It should be noted that visual impacts of the Western Expansion option were analyzed in the Initial Study for that project and also found to be significant. The following mitigation measure would apply to both Northern and Western Expansion options.

Mitigation Measure V.E.1: All mining stockpiles, spoils, and recycled material shall be stored at least 200 feet away from Highway 116 unless it is fully screened by a berm and/or vegetation. All new structures shall be located at least 200 feet away from Highway 116. No junk, debris, non-operative vehicles, or equipment unrelated to the quarry shall be stored anywhere on the quarry property, unless visually screened from off-site views.

Significance after Mitigation: Significant and Unavoidable for both the Western and Northern Expansion options. Even with measures proposed by the project sponsor and in this EIR, 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 V.E.2: The proposed project would extend the potential for production of light and glare at the project site. This would be a less than significant impact.

The existing quarry uses lighting for general security purposes at the project site. These lights are located along the quarry floor in the vicinity of the main plant facilities. No substantial expansion of security lighting is proposed at the project site under the project.

As under existing conditions, the quarry may occasionally work into the evening until the 10:00 p.m. deadline imposed by the County Surface Mining Ordinance. However, activities at the quarry would not typically occur outside its regular hours of operation; such a condition would likely occur when a quarry client requires the materials after regular quarry hours for a nighttime construction project. Nighttime operations would be limited to the loading and weighing of material (sales). The lights used for this operation would be located both on the mobile and fixed pieces of equipment on site. While it is possible that some of the lights could be visible from off-site locations during the events, given the infrequency of use of these lights, and the setback and substantial screening from view by the constructed berms, vegetation and other hills surrounding the work area, no significant glare or spillover lighting effects are anticipated. Consistent with County standard conditions of approval condition, the project applicant has agreed to screen all nightlighting associated with the proposed project to prohibit direct light or glare onto adjacent properties.

Mitigation: None required.

CUMULATIVE

Impact V.E.3: The proposed quarry expansion, in conjunction with other cumulative development in the project vicinity, would substantially alter the visual character of the project vicinity. This would be a significant cumulative impact.

The principal other cumulative project that would result in visual impacts in the immediate project vicinity is the Blue Rock Quarry, located just south of the Canyon Rock Quarry across Highway 116. The Blue Rock Quarry is currently proposing to acquire a new use permit to increase its permitted production and expand its quarry to the west.

The proposed Canyon Rock Quarry expansion project, in conjunction with existing and proposed quarry operations associated with the Blue Rock Quarry, would contribute to a significant cumulative aesthetic impact, particularly as viewed from Highway 116. As with the project visual impacts, cumulative visual impacts would include both permanent impacts associated with the alteration in the topography and landscape, and temporary impacts associated with industrial operations during the duration of the proposed mining use permits for the quarries.

Mitigation V.E.3: Implement Mitigation V.E.1.

Significance after Mitigation: Significant and Unavoidable for both the Western and Northern Expansion options. Even with measures proposed by the project sponsor and in this EIR, and implementation of conditions contained in the ARM Plan and SMARO, cumulative visual impacts would not be reduced to a level of insignificance.

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.*)

California Department of Transportation, http://www.dot.ca.gov/hq/LandArch/scenic/, accessed March 19, 2003.

Carlile Macy, *Surface Mining Application and Reclamation Plan* (Western Expansion option), November 1997.

Carlile Macy, *Canyon Rock Company, Inc. Reclamation Plan* (Northern Expansion option), September, 2002.

Site visit, March 18, 2003.

Sonoma County, *Sonoma County General Plan*, 1994.

Sonoma County, *Sonoma County General Plan Environmental Impact Report*, 1986.

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

V.F PUBLIC SERVICES AND UTILITIES

This section discusses public service issues, including the proposed project's relationship to existing police, fire, park, and other public services provided in unincorporated areas of Sonoma County as well as water supply, wastewater treatment, and solid waste disposal requirements for the northern expansion area of the Canyon Rock Quarry. This section discusses impacts of the proposed Northern Expansion option only.

SETTING

FIRE PROTECTION

The Sonoma County Department of Emergency Services Fire Division coordinates fire service activities in the unincorporated areas of Sonoma County (County Service Area #40), assists with disaster program planning and emergency response planning, responds to emergency situations, and reviews program and policy matters with the Board of Supervisors. The Fire Division administers contracts for fire prevention, code enforcement, and plan review with local fire districts. The Fire Division also responds to emergency incidents in its assigned area and with local fire agencies and the California Department of Forestry (CDF). The CDF responds to State responsibility wildland areas within the county. The project site is listed in the General Plan's Schematic Map of Areas Subject to Safety Policy Requirements (General Plan, Figure PS-1d) for areas with very high or high potential for large wildland fires.

The project site is also located within the Forestville Fire Protection District (FFPD). The FFPD operates out of one station located in Forestville at 6554 Mirabel Road and provides fire suppression services to the project site and other locations within southern Sonoma County. The FFPD currently has four paid staff members and approximately 35 volunteer members. The FFPD responded to 601 calls in 2002 within its service area. See Table V.F-1 for a breakdown of these calls. Current response times to the project site are approximately two to four minutes from the time of dispatch depending on the time of day, traffic, and weather.

The Forestville County Water District provides water for fire flow in the project area. A fire hydrant is located near the corner of Highway 116 and Martinelli Road. There is currently adequate pressure (1,554 gallons per minute) for fire flow at this hydrant (Roberts, 2003).

POLICE PROTECTION

The Sonoma County Sheriff's Department provides law enforcement services to unincorporated areas of the county, including the project site. The project site is located in the department's Zone One, which consists of approximately 446 square miles. This zone is staffed from the Guerneville substation and covers the Sonoma Coast and unincorporated areas surrounding Guerneville. In 2002, there were no calls for service to the Sheriff's Department from the project site. Emergency response time for Sheriff's deputies to the project site is approximately ten minutes (McMenomey, 2003).

TABLE V.F-1
FORESTVILLE FIRE PROTECTION DISTRICT: CALLS FOR SERVICE

Type of Call	Number of Calls	Percentage of Total
Medical	247	41.1%
Public Assistance	84	14.0%
Vehicle	65	10.8%
Mutual Aid	59	9.8%
Smoke Checks	46	7.7%
Public Utility	36	6.0%
Structure Fires	19	3.2%
Wildland Fires	16	2.7%
Hazardous Materials	12	2.0%
Vehicle Fires	10	1.7%
Miscellaneous Fires	7	1.2%

SOURCE: Forestville Fire District, 2003

The California Highway Patrol (CHP) provide law enforcement along all state routes within California, including Highway 116 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 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 Russian River Planning Area of the Sonoma County General Plan. The Russian River Planning Area has a total of 5,035 acres of parklands owned and operated by state and local agencies, 99 percent of which is located in Austin Creek and Armstrong Redwoods State Parks (Sonoma County, 1986).

Public park and recreational facilities located within a mile of the project site include the Russian River, Steel Head Beach County Park and the American Legion Park (in the community of Rio Dell) approximately one mile to the north, and a youth park approximately 0.75 mile east of the site.

PUBLIC WATER SUPPLY

Part of Assessor's Parcel Number 83-130-84 within the quarry is within, and served by, the Forestville County Water District (FCWD). The FCWD service area extends roughly west to Giovanetti Road, north to Mirabel Heights, south to Kay Lane and east to Wohler Road). The FCWD provides potable water service and fire flow within its service district. In the project vicinity, a six-inch FCWD water line is located within Highway 116 adjacent to the site. The existing maximum water use (maximum day during maximum month) within the total FCWD service area is estimated to be approximately 800,000 gallons per day (gpd) (Roberts, 2003).

The FCWD receives its water from the Sonoma County Water Agency (SCWA). The SCWA serves as the wholesale supplier of water for eight retail contractors within Sonoma County, including the FCWD. The FCWD water allotment from the SCWA is currently 1½ million gpd (Roberts, 2003).

Water from the FCWD is used in the concrete batch plant for producing concrete, and is also used as potable water at the office. The quarry used approximately 4.3 million gallons of FCWD water in 2002, amounting to an average of approximately 358,000 gallons per month (FCWD, 2003).

There are also a total of five water wells on the project site. One water well, capable of producing 100 gallons per minute is located on-site and is used by the quarry to provide water for aggregate washing, dust suppression misters, equipment washing and irrigation for landscape planting along the berms. The four other water wells on the site serve the existing on-site residences along Martinelli Road.

SEWAGE DISPOSAL

The project site is not served by a public sanitary sewer service. Sanitary sewer facilities consist of an onsite septic system and leach fields.

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 Public Works Department 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.

As discussed in Chapter III, Project Description, quarry operations include the recycling of old concrete, asphalt and building materials that are brought to the site. These materials are crushed and then mixed with crushed rock and sold as road base material.

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;
- 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 sufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- comply with federal, state, and local statutes and regulations related to solid waste?

FIRE PROTECTION

Impact V.F.1: The proposed project would require the fire suppression and/or emergency medical services of the Forestville Fire Protection District. This would be a less than significant impact.

As under existing conditions, operation of the proposed Northern Expansion option could require response by the Forestville Fire Protection District (FFPD) and/or California Department of Forestry (CDF) for a fire or medical emergency. The existing quarry does not currently result in a significant demand for fire protection services. Under the Northern Expansion option, the project would not change its existing mining or batch plant techniques, hours of operation, or permitted production, nor increase employee staffing or equipment at the quarry. The quarry would maintain its existing main driveway access off Highway 116 for emergency access. Moreover, the additional egress from the site to Highway 116 proposed under the project would provide an additional emergency access point at the quarry if needed. Consequently, there are no project elements that could increase the potential for fire or medical emergency response over existing conditions.

Based on the project characteristics, the Forestville FFPD does not anticipate that the proposed project would result in the need for additional personnel or equipment (Duignan, 2003). As part of the County's Environmental and Design Review process, prior to project approval, the FFPD will review the project site plans to ensure proper emergency access and fire prevention features are incorporated into the project.

Accordingly, the proposed project would not substantially hinder the Forestville Fire District'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 services, would be less than significant.

Mitigation: None required.

POLICE PROTECTION

Impact V.F.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.

As under existing conditions, operation of the proposed Northern Expansion option could require response by the Sonoma County Sheriff's Department for police protection services (e.g., for medical emergency traffic enforcement, or traffic control in the event of vehicular accident). The existing quarry does not currently result in a significant demand for police protection services (no calls in 2002). Under the Northern Expansion option, the project would not change its existing mining or batch plant techniques, hours of operation, or permitted production, or an increase employee staffing or equipment at the quarry. As under existing conditions, the quarry would continue to be gated at night and continue to use nighttime security lighting. As discussed in Section IV.A, Transportation and Traffic, the additional proposed egress to Highway 116 would improve overall sight distance for vehicles exiting the facility. Consequently, there are no project elements that could increase the potential for police response to the site over existing conditions.

The Sonoma County Sheriff's Department states that the proposed project would not prevent the Department from providing adequate law enforcement services to the site and surrounding area. The department also does not anticipate the need for any new or physically altered facilities because of the proposed development (McMenomey, 2003). 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.

Mitigation: None required.

PARKS

Impact V.F.3: The proposed project could create a demand for use of park and recreation facilities in the area. This would be a less than significant impact.

As discussed in the Setting, the nearest recreational facilities and/or parks are Russian River, the Steel Head Beach County Park and the American Legion Park (in the community of Rio Dell) approximately one mile to the north, and a youth park approximately 0.75 mile east of the site. As under existing conditions, employees of the proposed Northern Expansion option could create a demand for use of these or other local parks and recreational facilities in the area. However, the existing number of quarry employees is relatively modest, and the number of employees under the proposed Northern Expansion option would not increase above existing conditions. Consequently, any incidental use of surrounding parks and recreational facilities would not be significant.

The existing permitted area of the quarry and all parcels proposed be rezoned to Mineral District under the Northern Expansion option, as well as all adjacent off-site parcels, are privately owned, and do not contain any public parks or recreational facilities. Additionally, there are no park or recreational facilities currently proposed or planned in the immediate vicinity of the expansion area. As such the proposed Northern Expansion option would not reduce the amount of land currently designated, or proposed or planned for use as public parks or recreation area.

The Draft Sonoma County Outdoor Recreation Plan identifies existing and future parkland and recreation needs, recommends specific projects that could address these needs, and identifies policies and financing options to assist with implementation of projects. Although the Draft Outdoor Recreation Plan identifies a shortage of parklands that serve the population in the vicinity of the project site, the proposed northern expansion of the Canyon Rock Quarry would not negatively impact these surrounding parks. Consequently, the project's impact to public park and recreational areas, including potential contribution to cumulative impacts, would be less than significant.

Mitigation: None required.

WATER

Impact V.F.4: The proposed project would require water from the Forestville County Water District. This would be a less than significant impact.

As under existing conditions, quarry operations would use a combination of water sources under the Northern Expansion option, including water from the Forestville County Water District (FCWD), and to a lesser extent, groundwater from an on-site water well, as well as reuse of water from on-site sedimentation ponds. As discussed in the Setting, water from the FCWD is used in the concrete batch plant for producing concrete, and is also used as potable water at the quarry office. Currently, the quarry, which uses approximately 358,000 gallons of FCWD water per month, does not create a substantial demand for water from the FCWD (Roberts, 2003). Under the Northern Expansion option, operation of the project would not result in a change in existing operations or techniques, permitted production, or an increase in employee staffing, and therefore would not result in additional use in FCWD water at the quarry over existing conditions.

If, under the Northern Expansion option, the quarry operated at the maximum annual permitted production rate of 500,000 cubic yards (currently permitted under its conditional use permit), the amount of FCWD water use at the quarry would increase over both existing conditions and the five-year annual average rate of 375,000 cubic yards. Assuming a water increase proportional to existing water use, this would amount to an increase of an average of about 48,800 gallons per month above existing conditions, and approximately 101,700 gallons per month above the five-year annual average rate, for a total of approximately 406,800 gallons per month. This potential increase would not be considered a substantial new demand for water or substantially affect the FCWD's existing or planned unused allotment of water from the Sonoma County Water Agency (Roberts, 2003).

As such, the project's impact to public water supply, including potential cumulative contribution to public water supply impacts, would be less than significant. See Section IV.D, Hydrology and Water Quality, for potential impacts to groundwater.

Mitigation: None required.

SOLID WASTE

Impact V.F.5: The proposed project would generate amounts of solid waste, and would involve the continuation of recycling operations at the quarry. This would be a less than significant impact.

Under the Northern expansion option, small quantities of debris would result from the demolition of a number of existing structures, some of which materials would not be recyclable; non-recyclable debris would be sent by the quarry owner to a landfill. As under existing conditions, the quarry would continue to generate minor amounts of trash generated by quarry employees and general administrative functions at the site which would be also be sent to a landfill. The amount of solid waste generated onsite from these sources would be relatively small (and consistent with a use of this type and size). Moreover, this would not be considered a considerable cumulative contribution to solid waste generated within the county.

As under existing conditions, quarry operations under the Northern Expansion option would continue to include the recycling of old concrete brought to the quarry. This continued 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: No mitigation required.

REFERENCES – Public Services and Utilities

Carlile Macy, letter to Environmental Science Associates, April 4, 2003.

Duignan, Gary, Chief, Forestville Fire Protection District, personal communication, February 28, 2003.

Duignan, Gary, Chief, Forestville Fire Protection District, written communication, April, 2003.

Forestville County Water District, 2002 monthly water bills.

McMenomey, C.R., Lieutenant, Sonoma County Sheriff's Department, written communication, March 27, 2003.

Roberts, George, General Manager, Forestville County Water District, personal communication, April 9, 2003.

Sonoma County Sheriff's Department website, http://sonomasheriff.org, accessed February 24, 2003.

Sonoma County, *Draft Outdoor Recreation Plan*, www.sonoma-county.org/parks, June 16, 2000.

Sonoma County, *General Plan*, 1989 (amended through 1994).

Sonoma County General Plan EIR, 1986.

V.G CULTURAL RESOURCES

INTRODUCTION

This section is based on a cultural study and paleontological study of the project site and vicinity prepared by Tom Origer & Associates [*A Cultural Resources Survey for the Canyon Rock Quarry Environmental Impact Report (Northern Expansion Area), Forestville, Sonoma County, California;* and *Paleontological Survey of Canyon Rock Quarry, Forestville, California*]. These studies included archival research at the Northwest Information Center, Sonoma State University (NWIC File No. 02-654), 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 location. These studies addressed all aspects of cultural resources including prehistoric and historic-period archaeological sites, the built environment (i.e., historical buildings and structures), and paleontological resources.

These studies supplement a cultural resources evaluation previously prepared in support of the Western Expansion option (Archaeological Resource Service, 1997). Consequently, the study area encompassed by these studies includes all unmined areas within the existing permitted and vested rights area, as well as areas proposed to be rezoned to Mineral Resource District under the Northern Expansion option. This section discusses potential impacts of the proposed Northern Expansion option only.

SETTING

STUDY AREA LOCATION AND DESCRIPTION

The study area is located about one-half mile west of Forestville, as shown on the Camp Meeker 7.5' USGS topographic quadrangle. Several modern residences and a complex of buildings from a defunct monastery are located within the limits of the Northern Expansion option. The nearest year-round water source is Green Valley Creek, which flows to the north along the east boundary of the existing quarry and Northern Expansion area.

Soils within the study area are of the Hugo Series and are well-drained, very gravelly loams usually found on mountainous uplands (Miller 1972:Sheet 72, 44-45). These soils generally lack bedrock outcrops, and this is true of the project area. When uncultivated, Hugo soils support the growth of Douglas fir, redwood, California laurel trees, a variety of shrubs and vines, and grasses and forbs. Historically, parcels with Hugo soils were used for timber production and grazing (Miller 1972:45).

The study area is marked by steep slopes, with the majority having grades of greater than 30 percent. While it is situated near a freshwater source and has well-drained soils that support a variety of plants and animals, which archaeologically are desirable attributes, the steepness of the terrain makes it unlikely that prehistoric occupants would have used this area for habitation. While many upland areas of Sonoma County contain large rock outcrops, used by prehistoric occupants of the area for rock art or bedrock mortars, the study area lacks outcrops. The most likely prehistoric resource types to be found in the study area would be isolated artifacts lost during hunting or gathering forays into the area.

GEOLOGICAL AND PALEONTOLOGICAL SETTING

Rocks of the Franciscan Complex have undergone a long and complex geologic history. The Franciscan Complex, the basement rock in most of the Coast Ranges, is Jurassic to Tertiary in age with the younger rocks generally exposed in the northern Coast Ranges. The Franciscan Complex is composed mostly of oceanic sedimentary and volcanic rocks which have been subducted beneath the west coast of North America and have been subjected to various grades of metamorphism. The subduction process also has caused the rock unit to be broken up into discrete blocks of various sizes ranging from less than a meter to more than a kilometer in scale. The broken, discontinuous nature of the Franciscan Complex is called a melange and characterizes the rock unit wherever it is exposed. The Franciscan Complex has been subdivided into several terranes based on the structural and stratigraphic differences of the rocks in different areas (Blake et. al., 1984). The subduction process ceased as the San Andreas Fault developed during the last 25 million years and the rocks of the Franciscan Complex have been uplifted and exposed during this time interval.

Reports of fossils, particularly megafossils, from the Franciscan Complex are very rare. The lack of fossil localities is not surprising considering the fact that the sedimentary rocks in the Franciscan Complex were deposited in a deep marine environment and even undeformed rocks of this origin are not generally fossiliferous. In addition, any fossils that were originally present in the sediments probably have been destroyed during the complex tectonic and metamorphic history to which the rocks have been subjected. The most recent compilation of fossil occurrences in the Franciscan complex is by Bailey et. al. (1964). This paper reports 14 localities where megafossils have been collected ranging from north of Santa Barbara to Eureka. Pelecypods, mostly Buchia and Inoceramus, are the most abundant forms. The ammonites (Mantelliceras, Douvilleiceras) have been reported from two localities near the Golden Gate Bridge and a fragment of the marine reptile, Icthyosaurus, was collected from cobbles in a stream gravel from a locality on the east side of the Diablo Range. The ages of these fossils range from Late Jurassic to Late Cretaceous in age.

Microfossils, particularly foraminifera and radiolarians, are more abundant in the Franciscan Complex. Several forms of foraminifera have been reported from the Calera Limestone which crops out south of San Francisco and the Laytonville Limestone which crops out in the area of Laytonville in Mendocino County. Bailey et. al. (1964) describe 11 localities where foraminifera have been collected, all in limestones of mid-Cretaceous age. The closest localities to the Canyon Rock Quarry are in the Cazadero and Annapolis area approximately 12 miles northwest of the quarry. The fossils in the Cazadero area occur in limestone blocks in sheared Franciscan graywacke and, near Annapolis, fossils are found in a limestone lense in greenstone, a metamorphosed basalt.

Radiolarians are common microfossils in the chert blocks which are common in the Franciscan melange. Early reports of radiolarian collections came from cherts and siliceous shales from Angel Island in San Francisco Bay and the San Francisco Peninsula. However, once the techniques necessary to separate the radiolarians from the chert matrix became perfected (Pessagno, 1972), radiolarians were found in many of the chert outcrops in the Franciscan Complex (Murchey and Jones, 1984; Murchey, 1984; Pessagno, 1977).

GEOLOGY OF THE CANYON ROCK QUARRY

The rocks of the Franciscan Complex exposed in the Canyon Rock Quarry and underlying the proposed expansion area are part of the Rio Nido Terrane (Blake et. al., 1984). The exposed rocks are deformed, but generally unmetamorphosed graywacke sandstones interbedded with shales. Blake et. al. (1971) have mapped the rocks as part of a belt of unmetamorphosed sandstone that extends to the northwest into the Russian River area. These rocks are overlain to the southeast by the younger Wilson Grove Formation of Plio-Pleistocene age. In detail, the rocks in the quarry are discontinuous, but well-defined beds of graywacke sandstone interbedded with shale. At the western end of the quarry, the shales are the most abundant rock type. Locally, the shales are extremely carbonaceous and create the obvious black bands in the quarry above the graywacke sandstones. Locally, blocks of metabasalt occur. The rocks are pervasively sheared and shattered in narrow zones with veins of laumontite.

The proposed expansion area is north of the active quarry operations. Outcrops in this area are rare because of soil and vegetative cover. Study of exposures in the available roadcuts in the area revealed the presence of the same sandstones exposed in the quarry but here they are extremely weathered, soft, and friable. One probable fault trends through the proposed expansion area at the extreme northern end (Blake et. al., 1971).

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 Southern Pomo (Barrett 1908; McLendon and Oswalt 1978). The Southern Pomo were hunter-gatherers who lived in rich environments with large carrying capacities 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. For more information about the Pomo, see Bean and Theodoratus (1978), Kniffen (1939), and Stewart (1943).

Historically, the study area is situated within a section of public lands (Township 7 North Range 10 West, Section 1) adjacent to the Mexican-era El Molino Rancho.

STUDY PROCEDURES

ARCHIVAL STUDY PROCEDURES

Cultural Resources

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. 02-654). 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 2003). Ethnographic literature that describes appropriate Native American groups, county histories, and other primary and secondary sources were also reviewed.

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).

Paleontological Resources

Archival research included a review of the paleontological literature, particularly the more recent literature, to see if any recent fossil localities have been reported in the Franciscan Complex. GeoRef, the common geological data base was used.

CONSULTATION

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 March 12, 2003, 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 Diane Seidner of the Lytton Band of Pomo Indians and to Tim Campbell of the Federated Indians of Graton Rancheria. Ms. Seidner responded in writing on March 13, 2003, and indicated that they knew of nothing in that area. Mr. Campbell was contacted by telephone on March 19, 2003, and indicated that he would respond in writing.

Community Responses to Notice of Preparation. Three letters responding to the Notice of Preparation expressed concern for cultural resources. Two of the letters mention that many arrowheads have been found in the local area. The third letter indicates a belief that the expansion area contains sacred ground, including, at one time, the presence of a monastery.

FIELD PROCEDURES

Cultural Resources

A mixed-strategy survey was completed on March 1, 2003. All areas with slopes less than about 30 percent were examined intensively by walking in a zigzag fashion within corridors 15 to 20 meters wide. Where slopes were greater than 30 percent, survey was limited to searching out environmental attributes conducive to human use (e.g., flats and springs). When found, these areas were surveyed more carefully. All buildings within the expansion area were examined, and an assessment made regarding their potential eligibility for inclusion on the California Register of Historical Resources.

Surface visibility ranged from excellent to poor with chief hindrances being, duff, vegetation, and fill deposits. A hoe was used, as needed, to clear small patches of duff, forbs, and grass so that the soil could be inspected, and forays were made into the underbrush so as to achieve a thorough inspection of the study area.

Paleontological Survey

On March 1, 2003, a field survey was conducted in the existing permitted area of the quarry and the area of the proposed expansion plan looking for fossils. Both fresh outcrops exposed by quarry blasting operations, piles of stockpiled rock, and bedrock in the proposed expansion area were examined for fossils. This survey only considered the possible occurrence of megafossils in the existing permitted area of the quarry and the expansion area. However, based on a literature survey and the geology of reported microfossil localities, a reasonable conclusion can be reached regarding the likelihood of microfossil occurrences in the quarry area.

STUDY FINDINGS

ARCHIVAL STUDY FINDINGS

Cultural Resources

Archival research indicated that there are no recorded cultural resources within the study area; however, the area had not been subjected to prior cultural resources investigation. Previous surveys in the vicinity found no archaeological sites or historic-period resources that extend into the current study area (da Rosa 1999; Flaherty 1989; Flynn 1987; Gross 1984; King 1978; Roop 1997; Schroder and Origer 2000).

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 2003; Sonoma County Planning Department 1984; State of California Department of Parks and Recreation 1976).

Review of historical maps found no buildings depicted within the study area prior to 1942 (Bell and Heymans 1888; Bowers 1867; GLO 1868, 1883, 1886; McIntire and Lewis 1908; Reynolds and Proctor 1898; Thompson 1877; USACE 1922; USGS 1933, 1942). The 1954 USGS map shows residences in the easternmost portion of the study area near Martinelli Road. The Sonoma County Assessor's Office files indicate that construction of the residences on parcels near Martinelli Road date to 1929 and 1980. The parcel (APN 083-013-040) on which that records indicate a house had been built in 1929 is currently vacant. County records show that the house on parcel APN 083-021-015 was constructed in 1968; this house is no longer standing. Other buildings within the Northern Expansion option area, including the monastery complex, are reported to have been built without permits during the 1960s and later (Trappe, personal communication), which is supported by the fact that County records indicate that the buildings exist but have no dates of construction or other information, and also confirmed during the site field surveys.

Paleontological Resources

Thirty-five GeoRef entries were found when a search was done for Franciscan Complex paleontology. Some of the localities already noted in this report were present and many of the citations were to microfossil localities. No references were found to any new megafossil localities in the northern California area in general and the Forestville area in particular. Most of the more recent references are to foraminifera, Radiolaria, megaphytocyst, and dinoflagellate localities, none of which are close to the Canyon Rock Quarry in Forestville.

Two older publications which include a description of the geology in the Forestville area are by Cardwell (1958) and Travis (1952). Cardwell mentions that no fossils are present in the Franciscan Complex. Travis describes a megafossil locality near Occidental, approximately 8 miles from Forestville, which contains a <u>Buchia</u> sp. The fossil was found in the sandy matrix of a conglomerate. Travis also mentions that cherts in the area contain abundant Radiolaria although preservation is poor. The observations in these two reports support the conclusion that fossils, particularly megafossils, are extremely rare in the area of the project site.

FIELD SURVEY FINDINGS

Cultural Resources

The field survey conducted on the project site found no prehistoric or historic-period archaeological sites within the study area.

There are several buildings within the study area. Field observations suggest that most were constructed during the 1960s or later. Because the buildings remaining within the study area appear to be less than 45 years old, and lack architectural distinction, they do not meet criteria for inclusion on the California Register of Historic Resources.

Paleontological Resources

Based on the field survey, which include examining the rocks in the quarry and the proposed expansion area for fossil occurrences, no definitive fossils were found. One unidentifiable structure was located in the black carbonaceous shales exposed above the deformed interbedded graywackes and shales in the main quarry face. In this shale, one occurrence of small (mm scale) curled and cup-shaped carbonaceous structures were present. These structures are very subtle markings of carbon which are darker than the shaly matrix and are only apparent when the light reflects off them at just the right angle. The markings contain no internal structure or fabric. If these features were originally fossils, the severe conditions that the shale matrix has undergone has destroyed any distinguishing characteristics. No other specimens were observed. Otherwise, no megafossils were observed in the quarry. No blocks of chert, siliceous shale, or limestone which commonly contain microfossils at other localities were present in the quarry or the surrounding area.

The rocks in the proposed expansion area are highly weathered, at least at the surface where they could be examined, and no fossils were located in this area. The rocks here are so highly weathered that it is likely that any fossils that might have been present originally have been degraded by the severe weathering processes. The unweathered rocks beneath the weathered zone are the same rocks that are presently exposed in the quarry and presumably will not be any more fossiliferous than the rocks exposed in the present quarry.

IMPACTS AND MITIGATION MEASURES

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.

Impact V.G.1: Land alternation proposed under the proposed 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 undiscovered buried resources could be present and would be encountered during land alteration activities proposed under the Northern Expansion option.

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 V.G.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 V.G.1b: During quarry 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 V.G.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.

Impact V.G.2: Land alternation proposed under the proposed project could affect previously undiscovered paleontological resources. This would be a potentially significant impact.

Megafossils are rare in the Franciscan Complex as a whole, and an intensive survey of the active Canyon Rock Quarry and the poor exposures in the proposed quarry expansion area did not identify any new megafossils localities. Several unidentifiable problematic carbon markings with distinctive shapes were located in a black shale in a very small area; however, no similar markings were located in other areas despite a focused search for more specimens.

Microfossils such as foraminifera and Radiolaria are common in the Franciscan Complex when specific rock types, namely limestone and bedded chert, are present. However, these rock types were not observed in either the active quarry or the proposed quarry expansion area. Thus, the expectation that foraminifera or Radiolaria would be found in the quarry area is minimal.

Nevertheless, the fact that fossils of any kind are extremely rare in the Franciscan Complex in the Sonoma County area means that any fossil occurrence in this rock unit would have considerable scientific significance. While the geology and paleontology of the active quarry and the proposed expansion area do not suggest that fossil localities are likely to be present, the possibility of future finds does exist.

Mitigation Measure V.G.2a: The cultural resources orientation and awareness training program identified in Mitigation V.G.1a shall also include familiarization with paleontological resources.

Mitigation Measure V.G.2b: During quarry operations, should any undiscovered evidence of paleontological resources be encountered, work at the place of discovery shall be halted, and a qualified paleontologist 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.

Significance after Mitigation: Less than Significant.

REFERENCES – Cultural Resources

Bailey, E.H., Irwin, W.P., and Jones, D.L.,
1964 Franciscan *and Related Rocks, and their Significance in the Geology of Western California: California Division of Mines and Geology*, Bulletin 183, 177 p.

Barrett, S.
1908 *The Ethno-Geography of the Pomo and Neighboring Indians.* University of California Publications in American Archaeology and Ethnology Vol. 6, No. 1. University of California Press, Berkeley.

Blake, M.C., Smith J.T., Wentworth, C.M., and Wright, R.H.
1971 *Preliminary Geologic Map of Western Sonoma County and Northernmost Marin County*, California: U.S. Geological Survey, Basic Data Contribution 12.

Blake, M.C., Howell, D.G., and Jayko, A.S.
1984 *Tectonostratigraphic Terranes of the San Francisco Bay Region*: in Blake, M.C. (ed.), Franciscan Geology of Northern California, Pacific Section, Society of Economic Paleontologists and Mineralogists, p. 5-22.

Bean, L. and D. Theodoratus
1978 Western Pomo and Northeast Pomo. In *California*, edited by R. Heizer pp. 289-305, Handbook of North American Indians, Vol. 8, W. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Bell and Heymans
1888 Map of Sonoma County. Bell and Heymans, San Francisco.

Bowers, A.
1867 Map of Sonoma County, California. 2nd edition. A. Bowers.

Cardwell, G.T.
1958 Geology and ground water in the Santa Rosa and Petaluma Valley areas. Sonoma County, California: U.S. Geological Survey, Water Supply Paper 1427, 273 p.

da Rosa, E.

1999 *Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California: Dry Creek THP*. Document S-26036 on file at the Northwest Information Center, Rohnert Park, California.

Flaherty, Jay M.

1989 *An Archaeological Survey of AP#'s 83-200-52, 53, near Forestville, Sonoma County, California*. Document S-11563 on file at the Northwest Information Center, Rohnert Park, California.

Flynn, K.

1987 Letter report of an archaeological survey of the Nolan Road Subdivision, Forestville, Sonoma County. Document S-11545 on file at the Northwest Information Center, Rohnert Park, California.

Fredrickson, D.

1984 The North Coastal Region. In *California Archaeology*, edited by M. Moratto. Academic Press, San Francisco.

General Land Office

1857 Plat of the Molinos Rancho. Department of the Interior, Washington, D.C.

1868 Survey plat for T7N/R10W, MDBM. Department of the Interior, Washington, D.C.

1883 Survey plat for T8N/R10W, MDBM. Department of the Interior, Washington, D.C.

1886 Survey plat for T7N/R10W, MDBM. Department of the Interior, Washington, D.C.

Gross, R.

1984 *Archaeological Study Report, road rehabilitation and widening, 04-SON-116 P.M. 12.1/18.7 04334-108830*. Document S-6604 on file at the Northwest Information Center, Rohnert Park, California.

Hoover, M., H. Rensch, E. Rensch, W. Abeloe

1966 *Historic Spots in California*. 3rd edition. Stanford University Press. Stanford.

Hoover, M., H. Rensch, E. Rensch, W. Abeloe, and D. Kyle

1990 *Historic Spots in California*. 4th edition, Stanford University Press. Stanford.

King, A.

1978 *An Archaeological Investigation of the Thompson Property, 7000 Guisti Road, Forestville, Sonoma County, California*. Document S-1282 on file at the Northwest Information Center, Rohnert Park, California.

Kroeber, A.

1925 *Handbook of the Indians of California*. Bureau of American Ethnology, Bulletin 78, Smithsonian Institution, Washington, D.C.

McLendon, S. and R. Oswalt

1978 Pomo: Introduction. In *California*, edited by R. Heizer, pp. 274-288. Handbook of North American Indians, Vol. 8, W. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Meighan, C.
1955 *Archaeology of the North Coast Ranges, California.* Reports of the University of California Archaeological Survey No. 30. University of California, Berkeley.

Miller, V.
1972 *Soil Survey of Sonoma County, California.* U.S. Department of Agriculture in co-operation with the University of California Agricultural Experiment Station.

Moratto, M.
1984 *California Archaeology.* Academic Press, San Francisco.

Murchey, B.
1984 *Biostratigraphy and Lithostratigraphy of Chert in the Franciscan Complex, Marin Headlands, California:* in Blake, M.C. (ed.), Franciscan Geology of Northern California, Pacific Section, Society of Economic Paleontologists and Mineralogists, p. 51-70.

Murchey, B.L. and Jones, D.L.
1984 *Age and Significance of Chert in the Franciscan Complex, in the San Francisco Bay Region*: in Blake, M.C. (ed.), Franciscan Geology of Northern California, Pacific section, Society of Economic Paleontologists and Mineralogists, p. 23-30.

Office of Historic Preservation
1995 *Instructions for Recording Historic Resources*. Office of Historic Preservation, Sacramento.
2003 *Historic Property Directory*. Office of Historic Preservation, Sacramento.

Pessagno, E.A.
1977 *Upper Jurassic Radiolaria and Radiolarian Biostratigraphy of the California Coast Ranges*: Micropaleontology, v. 23, p. 56-113.

Pessagno, E.A. and Newport, R.L.
1972 *A Technique for Extracting Radiolaria from Radiolarian Cherts*: Micropaleontology, v. 18, p. 231-234.

Reynolds, W. and T. Proctor
1898 *Illustrated Atlas of Sonoma County, California.* Reynolds and Proctor, Santa Rosa, California.

Roop, W.
1997 *A Cultural Resources Evaluation of the Proposed Expansion of Canyon Rock Quarry, Forestville, Sonoma County, California.* Document on file at the Northwest Information Center, Rohnert Park, California.

Schroder, S. and T. Origer
2000 *A Cultural Resources Study of the Bartolomei Property, 7000 Giovanetti Road, Forestville, Sonoma County, California*. Document S-22850 on file at the Northwest Information Center, Rohnert Park, California.

Sonoma County Planning Department
1984 *Sonoma County Landmarks.* Sonoma County Planning Department, Santa Rosa, California.

State of California Department of Parks and Recreation
1976 *California Inventory of Historic Resources.* Department of Parks and Recreation, Sacramento.

Thompson, T.H. & Co.
1877 *Historical Atlas Map of Sonoma County, California.* T.H. Thompson & Co., Oakland.

Trappe, W.
2003 Personal communication January 22, 2003.

Travis, R.B.
1952 *Geology of the Sebastopol Quadrangle, California*: California Division of Mines and geology, Bulletin 162, 33 p.

United States Army Corps of Engineers
1922 Sebastopol, California. 15' tactical map. Department of the Interior, Washington, D.C.

United States Geological Survey
1933 Sebastopol, California 15' advance sheet. Geological Survey, Washington, D.C.

1942 Sebastopol, California. 15' series map. Geological Survey, Washington, D.C.

1954 Sebastopol, California. 15' series map. Geological Survey, Washington, D.C.

CHAPTER VI

ENVIRONMENTAL EFFECTS OF POTENTIAL SUBSEQUENT MINING BEYOND THE PROPOSED 20-YEAR LIMIT OF GRADING

If either the Western or Northern Expansion option were approved, the proposed use permit would be limited to a 20 year mining duration, the maximum allowed under the ARM Plan. The project also would require a reclamation plan for this 20-year supply of aggregate. Accordingly, this EIR addresses all potential environmental impacts that would occur from mining within the 20-year limits of grading under proposed use permit and reclamation plan for either expansion option.

However, under either the Western or Northern Expansion option, the Mineral Resource District zone would be placed over a larger area than would be mined under the proposed 20-year use permit for either expansion option. Consequently, if the proposed project is approved, the possibility exists that the owner could apply for a new permit to allow additional mining outside the approved 20-year limit of grading and within the approved Mineral Resource District. It is estimated that under either expansion option, the surplus area in the northern and western parcels (outside the proposed 20-year grading limit of the options) could provide an additional 50 years of mining (assuming continuation of baseline production levels). However, any new request to mine beyond the proposed 20-year grading limits in the use permit and reclamation plans would require a new application, new use permit, new Reclamation Plan, and would entail new environmental review under CEQA of potential environmental effects. Furthermore, implementation of any additional use permit or reclamation plan to permit potential further mining would not commence until after the 20-year life of the proposed use permit expires.

The following provides a discussion of potential environmental effects that could be expected if a subsequent use permit and reclamation plan were sought at some point in the future to permit mining within the remainder of the Mineral Resources District. Given the speculative nature as to the specific production levels and timing of any potential future mining activities, potential effects are described qualitatively.

TRANSPORTATION AND TRAFFIC

Assuming maximum annual production levels for potential subsequent mining would be the same as for project conditions, potential subsequent mining beyond the proposed 20-year grading limit would generate an amount of daily and peak-hour traffic similar to that proposed under the project. However, non-quarry regional traffic is expected to increase in the study area beyond that assessed in the 20-year horizon scope of the traffic analysis conducted for project conditions, consequently, potential cumulative transportation impacts beyond the 20-year horizon could be worse than under the cumulative scenario assessed in this EIR. However, implementation of long-range planned transportation improvements expected to be implemented by the County, and implementation of mitigation measures identified for the proposed project, would serve to reduce the quarry's contribution to cumulative transportation effects.

AIR QUALITY

Assuming maximum annual production levels for potential subsequent mining beyond the 20-year limit of grading would be the same as for project conditions, the level of operation of on-site stationary and mobile equipment, and number of off-site generated vehicle trips, associated with subsequent mining beyond the proposed 20-year limit of grading would be similar to the proposed project. Emissions of criteria air pollutants associated with subsequent mining activities beyond the 20-year horizon scope would be similarly expected to be under applicable regulatory thresholds. Quarry operations under subsequent mining in the northern parcels could move on-site sources of diesel emissions closer to certain off-site receptors than that which would occur with the proposed expansion options, and extend the duration of exposure to these emissions beyond that which would occur with the proposed project. However, future decreases in emission factors for project equipment and mobile sources beyond that identified in the 20-year horizon scope of the air quality analysis conducted for project conditions, as well as future replacement of older equipment, and future proposed and planned emission reduction programs would continue to have would have positive effect on the potential air quality impacts. Implementation of mitigation measures identified for the proposed project, if applied to potential subsequent mining, would also serve to reduce the subsequent mining contribution to air quality effects.

NOISE

Subsequent mining beyond the proposed 20-year limit of grading would move on-site noise sources including initial clearing, on-going extraction on the quarry faces, and blasting) closer to certain off-site residences compared to the proposed Northern Expansion option. Assuming production sales at the quarry with potential subsequent mining beyond the 20-year limit of grading were similar to the proposed project, it would result in similar increases in off-site truck activity as the project. However, potential increases in non-quarry regional traffic beyond the 20-year horizon scope of the noise analysis could increase ambient noise levels in the study area. Implementation of mitigation measures identified for the proposed project, if applied to potential subsequent mining, would also serve to reduce the subsequent mining noise impacts to off-site receptors.

HYDROLOGY AND WATER QUALITY

Potential subsequent mining beyond the proposed 20-year limit of grading could result in similar types of hydrology and water quality impacts as those identified for the proposed project (e.g., discharges of pollutants in stormwater to Green Valley Creek, potential increase flood water capacity in the floodplain on the site, potential depletion of groundwater resources, increases in runoff to Green Valley Creek, and potential contributions to cumulative impacts to the hydrology of Green Valley Creek. The level of impact would be largely dependent on the specific location and duration of potential subsequent mining. Implementation of mitigation measures identified for the proposed project, if applied to potential subsequent mining, would also serve to reduce the subsequent hydrology and water quality impacts.

LAND USE AND PLANNING

Potential effects under subsequent mining would, as with the project, result in a substantial change in the land use in the new expansion area, and as discussed throughout this section, result in potential disruptions to certain land uses surrounding the subsequent grading limit. As discussed above, any potential subsequent mining beyond the proposed 20-year limit of grading would require a new use permit, reclamation plan, other applicable permits, and environmental review.

GEOLOGY AND SOILS

Mining beyond the 20-year limit of grading could involve the additional construction of on-site structures and equipment; these would be expected to be similar in nature to those identified for the proposed project. Consequently, mining beyond the 20-year limit of grading would also have the potential to expose new quarry structures to effects from seismic groundshaking. Mining beyond the 20-year limit of grading would also have the potential to create slope instability hazards, and soil erosion within the project that area as well. The level of impact would be largely dependent on the specific location and duration of potential subsequent mining. Implementation of mitigation measures identified for the proposed project, if applied to potential subsequent mining, would also serve to reduce the subsequent geologic and soil impacts within that area.

HAZARDS AND HAZARDOUS MATERIALS

Mining beyond the 20-year limit of grading could involve the use hazardous materials similar to the proposed project. Therefore, the potential effects from the potential spill or release of hazardous materials that would occur under the project would also exist if mining were to occur beyond the 20-year limit of grading. Potential impacts (albeit less than significant) to wildland fire risks would also be similar to the proposed project. Implementation of mitigation measures identified for the proposed project, if applied to potential subsequent mining, would also serve to reduce the potential impacts.

BIOLOGICAL RESOURCES

Field surveys for biological resources were conducted on the site within the northern parcels outside proposed 20-year limit of grading to determine the presence of sensitive habitats and/or special status species occur in the area. The area within the northern parcels outside the 20-year limit of grading, as with the majority of the northern parcels, primarily consists of steep slopes covered in North Coast conifer forest, with chaparral occurring on the upper ridges and south-facing slopes, and patches of ruderal (disturbance-adapted) grasses and forbs occur throughout area. Surveys did not indicate the presence of seasonal wetlands or riparian habitat within these parcels. Nevertheless, subsequent grading activities within the parcels outside the 20-year limit of grading would result in an additional loss of forest habitat, potential displacement or mortality to special-status wildlife species, potential effects to nesting birds, and potential effects to aquatic species in Green Valley Creek, as with the proposed project. As with the proposed project, mitigation measures identified in the EIR could be implemented for any subsequent mining outside the proposed 20-year limit of grading to reduce impacts to biological resources.

AESTHETICS

Any potential subsequent mining within the northern parcels outside the 20-year limit of grading would result in greater alteration of topography and/or introduction of active industrial operations beyond that which would occur with the proposed project. Correspondingly, a significant alteration in visual character of the Northern Expansion area would also be expected under potential subsequent mining. Any such potential subsequent mining would also contribute to the cumulative alteration in visual character of the project vicinity.

PUBLIC SERVICES AND UTILITIES

Demand for public services and utilities from potential subsequent mining outside the 20-year limit of grading would likely be similar to the proposed project.

CULTURAL RESOURCES

Since potential subsequent mining outside the 20-year limit of grading would result in additional areas of disturbance compared to the proposed project, potentially significant but mitigable effects from encountering undiscovered cultural and/or paleontological resources could occur.

CHAPTER VII
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)). Evaluation of a No Project Alternative, and identification of an environmentally superior alternative are required. 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)).

Chapter III, Project Description, described two expansion options for the proposed project – the Western Expansion option and the Northern Expansion option. The Western Expansion option would mine land immediately west of the existing quarry area; the Northern Expansion option would mine land north of the existing quarry. Potential impacts and mitigation associated with each of these expansion options are described in Chapter IV (Western and Northern Expansion options) and Chapter V (Northern Expansion Option only). This chapter discusses the following alternatives to the proposed project:

- 1) a No Project Alternative consisting of 1A) a No Project - No Subsequent Development Alternative, and 1B) a No Project – Reasonably Foreseeable Development Alternative,
- 2) Reduced Production Alternative; and
- 3) Revised Project Configuration Alternative.

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. Table VII-1 (at the end of this chapter) summarizes the impacts and significance levels of the proposed project, and the relative comparison of impacts of the alternatives to the proposed project. This chapter also includes a discussion of the environmentally superior alternative.

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, neither the proposed Western or Northern Expansion options would occur, and the project applicant would continue to mine under its current use permit, within the existing approved mining area, and at the current allowed vested rights and production rate. No quarry expansion would occur into any area outside of the applicant's existing approved mining area (i.e., outside of APNs 83-130-82, -83, -84, -85; and 4.6 acres of APN 83-210-19).

As a result, no approval would be required by the County for development in the Western or Northern Expansion areas. Specifically, no Zone Change to add the Mineral Resource (MR) combining zone to the base zone of Resources and Rural Development (RRD), and no Use Permit/Reclamation Plan to allow an expansion of the mining operation within the Western or Northern expansion areas, would occur.

The material remaining in the currently approved mining area contains between two and three million cubic yards (CY). That material is expected to last from four to six years, assuming the existing production rate continues unchanged. Once this material is depleted, it is assumed that mining at the quarry would cease, and final reclamation would be implemented pursuant to the existing reclamation plan. Final reclamation would return the mined area to wildlife habitat and meadows. Potential development within the current approved mining portion of the site subsequent to final reclamation would not be different than what could occur under the proposed project.

Under this alternative, the Western and Northern Expansion option areas would be left in their current condition (i.e., primarily undeveloped with the exception of the existing structures, utilities and roads). The Western and Northern Expansion option areas would continue to be owned by Canyon Rock Company, Inc. Although this alternative would not preclude the potential for future sale or lease of the expansion areas, nor the potential for future private or public development, these potential activities would be subject to separate approvals and environmental review process, as applicable. See description of Alternative 1B: No Project - Reasonably Foreseeable Development, below.

It is assumed that following cessation of mining at the Canyon Rock Quarry under this alternative, the aggregate demand in Sonoma County would be accommodated by one or more existing in-county aggregate sources (e.g., Blue Rock Quarry, Bohan and Canelis Quarry, and/or Mark West Quarry), new in-county aggregate sources (e.g., Roblar Road Quarry), and/or out-of-county aggregate sources. A detailed discussion of these resources is presented in Appendix I.

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, neither the proposed Western or Northern Expansion options would occur, and the project applicant would continue to mine under its current use permit, within the existing approved mining area, and at the current allowed production rate. No quarry expansion would occur into any area outside of the applicant's existing approved mining area (APNs 83-130-82, -83, -84, -85; and 4.6 acres of APN 83-210-19).

Under this alternative, no Zone Change to add the Mineral Resource (MR) combining zone to the base zone of Resources and Rural Development (RRD), and no Use Permit/Reclamation Plan to allow an expansion of the mining operation within the Western or Northern expansion areas, would occur.

The material remaining in the currently approved mining area contains between two and three million CY. That material is expected to last from four to six years, assuming the existing production rate continues unchanged. Once this material is depleted, it is assumed that mining at the quarry would cease, and final reclamation would be implemented pursuant to the existing reclamation plan. As with Alternative 1A, final reclamation would return the mined area to wildlife habitat and meadows. Potential development within the current vested rights portion subsequent to final reclamation would not be different that what could occur under the proposed project.

Under this alternative, unlike Alternative 1A, it is assumed the Western and Northern Expansion option areas 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 RRD zoning, and the existing terrain and resources within the Western and Northern expansion areas, potential permitted uses (without a use permit) could include new, low density residential uses (one residential unit per parcel, amounting to up to four new residences in the Western Expansion parcels, and five new residences in the Northern Expansion 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.

It is assumed that following cessation of mining at the Canyon Rock Quarry under this alternative, the aggregate demand in Sonoma County would be accommodated by one or more other existing in-county aggregate sources (e.g., Blue Rock Quarry, Bohan and Canelis Quarry, and/or Mark West Quarry), new in-county aggregate sources (e.g., Roblar Road Quarry), and/or out-of-county aggregate sources. A detailed discussion of these resources is presented in Appendix I.

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: REDUCED PRODUCTION ALTERNATIVE

DESCRIPTION

Under the Reduced Production Alternative, quarry expansion would occur in either the Western or Northern Expansion option areas. However, once the quarry expands beyond the limits of its existing approved mining area, aggregate production sales at the quarry would be restricted to a maximum of 375,000 CY per year (i.e., the most recent five-year average), instead of the existing and project-proposed maximum permitted annual sales of 500,000 CY.

Depending on market conditions, and the associated demand for aggregate, the potential total aggregate sales at the quarry during the life of the Use Permit under this alternative would be in the range of 0%-25% less than the proposed project. (Total aggregate production sales at the quarry under this alternative would be equal to the proposed project if the actual maximum aggregate demand each year was less than or equal to 375,000 CY. Total aggregate production sales at the quarry under this alternative would be 25 percent less than the proposed project if the actual maximum annual aggregate demand each year was 500,000 CY, but only 375,000 CY aggregate production sales were permitted.)

Correspondingly, the total volume of aggregate mined at the quarry, and the associated extent of area affected by mining operations under this alternative would be equal to or less than that which would occur with the proposed project. It is assumed proposed mining staging under this alternative would be similar in design to the proposed project, and the proposed site drainage and sediment control facilities and proposed interim and final reclamation activities would be implemented at a level required to support this alternative, but similar in design and technique to the proposed project.

Under this alternative, as with the proposed project, a Zone Change to add the Mineral Resource (MR) combining zone to the base zone of Resources and Rural Development (RRD), and a Use Permit/Reclamation Plan to allow an expansion of the mining operation within the Western or Northern expansion areas would occur. As allowed under the existing conditions and as proposed by the project, the quarry would continue to be able to import a maximum of 25 percent of the aggregate materials processed or sold in each calendar year without obtaining a new use permit (excluding materials brought to quarries for recycling).

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 (e.g., Blue Rock Quarry, Bohan and Canelis Quarry, and/or the Mark West Quarry), new in-county aggregate sources (e.g., Roblar Road Quarry), and/or out-of-county aggregate sources. A detailed discussion of these resources is presented in Appendix I.

BASIS FOR SELECTION

The Reduced Production Alternative was included to provide an alternative that would reduce environmental impacts compared to the proposed project, particularly with respect to traffic impacts.

Any maximum permitted annual production sales levels below the proposed 500,000 CY would reduce traffic-related environmental impacts compared to the proposed project. The 375,000 CY per year sales level was selected because it would reduce traffic related impacts to zero (i.e., this alternative would not increase traffic above baseline levels).

ALTERNATIVE 3: REVISED PROJECT CONFIGURATION ALTERNATIVE

DESCRIPTION

Under the Revised Project Configuration Alternative, quarry expansion would occur in either the Western or Northern Expansion areas, but, the total area of the quarry directly affected by existing or future quarry operations would be reduced. This alternative would incorporate two mitigation measures identified in the EIR (Mitigation Measures IV.D.1a and V.D.1) into the project design. These measures are designed to protect and reduce potential impacts to particularly biologically sensitive areas (i.e., seasonal wetland and riparian areas, and Green Valley Creek).

As part of this alternative, and consistent with Mitigation Measure V.D.1, no future mining would occur in, and adequate buffering would be included around, the wetland and riparian habitat areas (located along the western boundary of the existing Mineral Resources zoned portion of the project site. (This measure could only be incorporated into the Northern Expansion variant of this alternative. Under the Western Expansion variant, the subject wetland and riparian/buffer area would be completely surrounded by the proposed mining footprint, and therefore, this measure would not be feasible to implement.) The appropriate minimum allowed setback would be consistent with that specified in the County General Plan and zoning ordinance.

Furthermore, consistent with Mitigation Measure IV.D.1a, all aggregate storage facilities and processing facilities would be moved out of the Green Valley Creek floodplain (Western or Northern Expansion variant). The floodplain boundary at the project site would be demarcated to prevent potential encroachment of site activities into the floodplain area. The buffer zone would be reconfigured so that flood water flowing across Highway 116 could enter the floodplain buffer zone at the site and flow unobstructed back into Green Valley Creek. The southeast portion of the site currently subject to flooding and used as an unimproved parking area would be paved, and other areas within the floodplain vegetated to reduce erosion.

Under this alternative, as with the proposed project, a Zone Change to add the Mineral Resource (MR) combining zone to the base zone of Resources and Rural Development (RRD), and a Use Permit/Reclamation Plan to allow an expansion of the mining operation within the Western or Northern expansion areas would occur.

BASIS FOR SELECTION

The basis for selection of the Revised Project Configuration Alternative is to provide an alternative that would achieve less environmental impacts of the proposed project (particularly with respect to certain significant hydrologic and biological effects) through reconfiguration of the site plan, including avoidance of particularly environmentally sensitive areas on the site.

D. ALTERNATIVES CONSIDERED BUT REJECTED AS INFEASIBLE

Other alternatives would 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.

OFF-SITE LOCATION

This potential alternative would develop the project at an off-site location. The County determined that a specific "alternative location" analysis was not warranted because the applicant's ability to purchase another quarry and expand that quarry is not feasible. Furthermore, the applicant does not currently own other properties suitable for the production of aggregate. It should be noted that under either of these scenarios, development into any potential undeveloped and natural areas would have the potential to result in new environmental effects to biological resources, hydrology and water quality, geology, land use conflicts and cultural resources, depending on the physical characteristics of the off-site location. Furthermore, aggregate production that would occur at an off-site location would be expected to result in a shift of potential environmental effects (e.g., quarry traffic effects, air emissions, noise) of a similar nature and magnitude to those which would have otherwise occurred at Canyon Rock Quarry.

QUARRY TRUCK ROUTE RESTRICTIONS

This potential alternative would restrict trucks accessing the project site to use only Mirabel Road as the access route to and from the Canyon Rock Quarry, rather than Highway 116 through Forestville. However, the trucks that pick up and deliver aggregate from the quarry are not owned by Canyon Rock Quarry. Accordingly, since the County does not have the authority to prohibit independent truckers from using a State highway, this potential alternative is not considered legally feasible. Furthermore, while this alternative would avoid potentially significant impacts in Forestville (e.g., intersection level of service, effects on bicycle and pedestrian circulation), it would shift truck traffic through communities north of the project site (e.g. Mirabel Park), and therefore, could introduce new significant environmental impacts in these locations. For these reasons, this alternative is not assessed further. (See also discussion of planned Forestville Bypass in Chapter IV.A, Transportation and Traffic).

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 Highway 116 through Forestville, in order to reduce potentially significant safety impacts when children were present near the highway before and after school. However, since the County does not have the authority to restrict the time when individuals or businesses can use a State highway, this potential alternative is not considered legally feasible, and is not assessed further.

APPLICANT-OWNED OR -LEASED TRUCK FLEET

This potential alternative would require the applicant to purchase or lease a fleet of trucks to haul all aggregate from the quarry. This alternative would allow the County to impose upon the applicant potential truck access restrictions to Mirabel Road, or impose truck time restrictions on Highway 116 through Forestville. However, the costs to the applicant for a truck fleet purchase or lease makes this alternative economically unviable. In addition, prohibiting aggregate sales to the general public or contractors who have their own fleets would not meet a quarry operational objective. For these reasons, this alternative is not assessed further. It should be noted that the County does not pose such a requirement on any other aggregate producer in the County.

QUARRY TRUCK MECHANICAL IMPROVEMENTS

This potential alternative would require new standards for diesel engine emissions, mufflers, and brakes on a county-wide basis for all trucks hauling aggregate to reduce air pollution and noise. However, since these matters are regulated at the state and federal level (and not the County level), this potential alternative is considered legally infeasible. For this reason, this alternative is not assessed further.

E. DISTINCTIVE ENVIRONMENTAL CHARACTERISTICS

ALTERNATIVE 1A: NO PROJECT – NO SUBSEQUENT DEVELOPMENT ALTERNATIVE

DIRECT ENVIRONMENTAL IMPACTS

Transportation and Traffic

Under this alternative, the quarry owner would continue to mine the vested rights and use permitted area of the quarry for the next four to six years until aggregate resources within that area are depleted; during this period, no new vehicle trip-generating uses would occur (vehicle trips generated by the quarry during this period would be equal to baseline conditions). Following the mining of remaining aggregate within the current approved mining area, and subsequent final reclamation of this area no quarry-associated vehicle trip-generating uses would occur. Therefore, this alternative would avoid contributing to potentially significant and unavoidable cumulative impacts at the intersections of Highway 116/Covey-Forestville Roads, Highway 116/Mirabel Road and River Road/Mirabel Road; would avoid potentially significant and unavoidable cumulative impacts to peak-hour level of service on Mirabel Road; would avoid potentially significant and unavoidable cumulative impacts to pedestrian and safety flow in the project area; would avoid increases in need for road maintenance; and would avoid significant (and in certain cases, unavoidable) secondary impacts associated with implementation of off-site transportation improvements identified in mitigation measures that would occur with the proposed project. This alternative would also avoid the potential (albeit less than significant) for increases in conflicts of quarry trucks with other vehicular traffic that could occur with the proposed project.

Moreover, since no quarry-associated vehicle trip-generating uses would occur following reclamation of the quarry, potential existing transportational effects currently generated by the quarry would not occur after reclamation.

Air Quality

Under this alternative, the level of mining operations of the remaining use permitted area of the quarry would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. Following final reclamation of the existing use permitted area, no mining operations or development of vehicle trip-generating uses would occur on the project site. Consequently, this alternative would avoid potentially significant but mitigable project impacts and contribution to cumulative impacts from diesel emissions associated with movement of on-site mobile equipment closer to individual receptors; and avoid potentially significant but mitigable episodes of dust nuisance in the quarry vicinity that would occur with the proposed project. This alternative would also avoid project increases, and contribution to cumulative increases, in criteria air pollutants (albeit less than significant and below regulatory thresholds) that would occur under the proposed project.

Furthermore, since no mining operations would occur following reclamation of the quarry, potential existing air quality effects currently generated by the quarry would not occur after reclamation.

Noise

The level of mining operations of the remaining use permitted area of the quarry under this alternative would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. After the remaining aggregate within the existing approved mining area has been mined and subsequent final reclamation has been implemented, no mining operations or development of any vehicle trip-generating uses would occur. As a result, this alternative would avoid potentially significant and unavoidable project contribution to cumulative increases on off-site ambient noise levels due to quarry trucks. This alternative would also avoid significant but mitigable project noise impacts at sensitive receptors in the site vicinity from both temporary and on-going operation of certain on-site mobile equipment operations[1] and would avoid potentially significant but mitigable noise and vibration impacts from blasting. It would also avoid project contribution to cumulative increases in ambient noise levels in the site vicinity from operation of on-site sources.

In addition, since no mining operations would occur following reclamation of the quarry, potential existing noise effects currently generated by the quarry would not occur after reclamation.

Hydrology and Water Quality

Under this alternative, the level of mining operations of the remaining use permitted area of the quarry would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. Following the mining of remaining aggregate within the existing approved mining area and subsequent final reclamation, no subsequent mining, grading, or other site disturbance would occur. Therefore, this alternative would avoid potentially significant but mitigable project and contribution to cumulative effects from discharges of pollutants (including sediment, metals, and petroleum hydrocarbons) in stormwater to Green Valley Creek that would occur with the project. This alternative would also avoid potentially significant but mitigable project and contribution to cumulative flooding impacts to Green Valley Creek downstream of the site; potential project and contribution to cumulative increases in runoff to Green Valley Creek; potential significant but mitigable reductions in recharge to groundwater wells or groundwater levels in nearby wells and potential impacts (albeit less than significant) to regional groundwater resources.

Moreover, since no mining operations would occur following reclamation of the quarry, potential existing effects to hydrology and water quality currently generated by the quarry would not occur after reclamation.

Land Use and Planning

Under this alternative, the quarry area to be mined would be that allowed under its existing use permit. After mining and final reclamation of the existing use permitted area, no mining operations or development of any land uses would occur on the project site. Consequently, the zone change and use permits that are required under the proposed project would not occur under this alternative. This alternative would avoid a substantial change in the land use in the expansion area on the site, and would

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[1] As discussed in Section IV.C, Noise potentially significant impacts would occur from temporary on-site clearing and initial vegetation material removal operations, and from on-going extraction on the quarry faces and movement of material on the quarry floor, within 1,200 feet of receptors where no intervening terrain would shield the receptors.

avoid the potential disruptions to land uses surrounding the project site from the expansion of quarry operations into the expansion area. This alternative would also avoid the timber conversion in the expansion area that would occur with the proposed project, and thus avoid the potential need for a timber harvest conversion permit and timber harvest plan to serve that area.

Furthermore, since no mining operations would occur following reclamation of the quarry, potential existing effects to land use currently generated by the quarry would not occur after reclamation.

Geology and Soils

Under this alternative, the level of mining operations of the remaining use permitted area of the quarry would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. After the remaining aggregate within the existing approved mining area has been mined and subsequent final reclamation has been implemented, no mining, grading or other site disturbance would occur. As a result, this alternative would avoid potentially significant but mitigable effects from seismic groundshaking to quarry structures that could occur with the project. This alternative would also avoid potentially significant but mitigable impacts from slope instability hazards (e.g., landslides, debris flow, rockfalls), and soil erosion that could occur in the expansion area.

In addition, since no mining operations would occur following reclamation of the quarry, potential existing effects to geology and soils currently generated by the quarry would not occur after reclamation.

Hazards and Hazardous Materials

Under this alternative, the level of use of hazardous materials and threat of hazards from the remaining use permitted area of the quarry would be equal to baseline conditions. Following the mining of remaining aggregate within the existing approved mining area and subsequent final reclamation, no subsequent mining, grading, or other site disturbance would occur. Therefore, this alternative would avoid significant but mitigable effect from the potential spill or release of hazardous materials (e.g., petroleum products, blasting materials) at the site. This alternative would also avoid potential impacts (albeit less than significant) to wildland fire risks.

Moreover, since no mining operations would occur following reclamation of the quarry, potential existing effects associated with existing hazardous materials use at the quarry would not occur after reclamation.

Biological Resources

Under this alternative, the level of mining operations of the remaining use permitted area of the quarry would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. After mining and final reclamation of the existing use permitted area, no mining, grading or other site disturbance would occur on the project site. Consequently, this alternative would avoid potentially significant and unavoidable impacts with destruction of north coast conifer forest habitat (either expansion option), and potentially significant but mitigable impacts to the red tree vole within the Western Expansion area. It would avoid significant but mitigable impacts associated with disturbance or destruction of wetland and riparian habitat; the disturbance, displacement or mortality to special-status wildlife species (e.g., northern spotted owl and special-status bat species) and habitat; potential effects to nesting/breeding birds protected by the California Department of Fish and Game (CDFG) (Code Sections 3503 and 3503.5), and potential effects to aquatic species in Green Valley Creek (e.g., California freshwater shrimp and anadromous fish). In addition, this alternative would avoid the significant but mitigable potential for increase in occurrence of invasive plant species on the project site.

Furthermore, since no mining operations would occur following reclamation of the quarry, potential existing effects to biological resources currently generated by the quarry would not occur after reclamation.

Aesthetics

With this alternative, mining and subsequent reclamation would be limited to the existing permitted area. Mining under the existing permit would remove the hill currently being mined, and open up northerly views to the Northern Expansion area from south of the project site, and westerly views to the Western Expansion area from the east of the project site. However, no temporary or permanent quarry operations, including alteration of topography and/or introduction of active industrial operations, would occur within the expansion area under this alternative. As such, this alternative would avoid the significant alteration in visual character of the expansion area that would occur under the proposed project. This alternative would also avoid the contribution to cumulative alteration in visual character of the project vicinity created by mining within the expansion area.

In addition, since no mining operations would occur following reclamation of the quarry, potential existing aesthetic effects currently generated by the quarry would not occur after reclamation.

Public Services and Utilities

The level of mining operations of the remaining use permitted area of the quarry under this alternative would be equal to baseline conditions. No mining operations or development of land uses would occur on the project site after mining and final reclamation of the existing use permitted area. Therefore, this alternative would avoid any potential demand (albeit less than significant) for public fire, police and emergency services, parks, and demands on public utilities (including water distribution, and solid waste collection and disposal) that would occur under the expansion options.

Moreover, since no mining operations would occur following reclamation of the quarry, potential existing effects to public services and utilities currently generated by the quarry would not occur after reclamation.

Cultural Resources

No subsurface disturbance would occur within the expansion area under this alternative. As a result, this alternative would avoid potentially significant but mitigable effects from encountering undiscovered cultural and/or paleontological resources within the expansion area.

POTENTIAL INDIRECT IMPACTS

Under the No Project – No Subsequent Development alternative, up to 500,000 CY (750,000 tons) of aggregate that could be produced each year at the Canyon Rock Quarry under the proposed use permit would not be produced. This would account for an aggregate supply that could otherwise accommodate up to approximately 14 percent of the total annual anticipated demand for aggregate in Sonoma County in 2007 (the earliest year that aggregate supplies within the existing permitted area of the quarry would be depleted assuming continuation of baseline production rates). Over the long term, up to 10 million CY (15 million tons) of aggregate that could be produced at the quarry over the 20-year life of the proposed use permit would not be produced under this alternative.

It is assumed that following cessation of mining within the existing permitted area at the Canyon Rock Quarry under this alternative, the aggregate supplies within the Western or Northern Expansion area that would otherwise assist in accommodating future aggregate demand in Sonoma County would instead by provided by one or more existing in-county aggregate sources (e.g., Blue Rock Quarry, Bohan and Canelis Quarry, and/or Mark West Quarry), new in-county aggregate sources (e.g., Roblar Road Quarry), and/or out-of-county aggregate sources.

Under the No Project – No Subsequent Development Alternative, and assuming no approvals within the County for the expansion of existing quarries or new quarries, and no out-of-county import, other existing quarries within Sonoma County would need to increase production (to the extent allowed in their use permits) to replace the deficit at Canyon Rock Quarry after its existing permitted aggregate supplies are depleted in 2007. The increases in production that would be required at these quarries would be expected to result in shift of potential environmental effects (e.g., quarry traffic effects, air emissions, noise) of a similar nature and magnitude to those that would otherwise occur at Canyon Rock Quarry under baseline plus project conditions. As discussed in Appendix I, Aggregate Demand, Production and Supply in Sonoma County, if the County must rely solely on existing permitted aggregate sources within the County, it would have insufficient aggregate supplies to fulfill demand for aggregate as early as 2009, and thus, would require other in-county and/or out-of county aggregate sources to supplement the aggregate demand.

As discussed in Appendix I, it is speculative whether expansion of any existing quarries or development of new quarries within Sonoma County would occur. However, any potential expansion into undeveloped and natural areas not currently permitted for mining would have the potential to result in new environmental effects to biological resources, hydrology and water quality, geology, land use conflicts and cultural resources, depending on the physical characteristics of each site. Furthermore, under the No Project – No Subsequent Development Alternative, and assuming County approval of one or more quarry expansion or new quarries, aggregate production that would occur at those sites to replace the deficit at Canyon Rock Quarry would be expected to result in a shift of potential environmental effects (e.g., quarry traffic effects, air emissions, noise) of a similar nature and magnitude to those which would have otherwise occurred at Canyon Rock Quarry under baseline plus project conditions.

As discussed in Appendix I, 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 once terrace mining in the County is terminated. Under the No Project – No Subsequent

Development Alternative, and assuming out-of-County import occurs, site-specific environmental effects associated with production of these out-of-county sources to replace the deficit that would be created at Canyon Rock Quarry cannot be determined, given the wide range of out-of-county (including out-of-country) mining types and locations. However, it is reasonable to assume out-of-county import travel distances would be greater than in-county aggregate sources travel distances. If trucking were to be the predominant form of transport into the County, air emissions associated with haul trucks, potential increases in traffic, and associated relative increases in traffic safety risks 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), as well as overall lower traffic safety risks. 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. Import by ship would be expected to generate greater contribution to regional air quality emissions than trucks, particularly with NOx emissions. As discussed in Appendix I, both rail and ship import will need truck transport to move aggregate to and from the quarry to the rail/ship loading points and/or from the rail/ship unloading points to the consumer.

ALTERNATIVE 1B: NO PROJECT – REASONABLY FORESEEABLE DEVELOPMENT ALTERNATIVE

DIRECT ENVIRONMENTAL IMPACTS

Transportation and Traffic

Under this alternative, the quarry owner would continue to mine the vested rights and use permitted area of the quarry for the next four to six years until aggregate resources within that area are depleted; during this period, no new vehicle trip-generating uses would occur (vehicle trips generated by the quarry during this period would be equal to baseline conditions). Following the mining of remaining aggregate within the current approved mining area and subsequent final reclamation of this area, no quarry-associated vehicle trip-generating uses would occur, however, this alternative would generate new off-site vehicle trips associated with new residential development on the site (i.e., up to four new residences in the Western Expansion parcels and five new residences in the Northern Expansion parcels). These residential land uses would not generate a significant amount of daily or peak-hour vehicle trips.[2] As a result, this alternative would avoid contributing to potentially significant and unavoidable cumulative impacts at the intersections of Highway 116/Covey-Forestville Roads, Highway 116/Mirabel Road and River Road/Mirabel Road; would avoid potentially significant and unavoidable cumulative impacts to peak-hour level of service on Mirabel Road; would avoid potentially significant and unavoidable cumulative impacts to pedestrian and safety flow in the project area; would avoid increases in need for road maintenance; and would avoid significant (and in certain cases, unavoidable) secondary impacts associated with implementation of off-site transportation improvements identified in mitigation measures

[2] Based on vehicle trip generation rates contained in Institute of Transportation Engineers *Trip Generation, 6th Edition*, the residences would generate less than 100 daily vehicle trips, and less than 10 peak-hour vehicle trips.

that would occur with the proposed project. Since the land use would generate principally passenger vehicles instead of quarry trucks, this alternative would also avoid the potential (albeit less than significant) for increases in conflicts of quarry trucks with other vehicular traffic that could occur with the proposed project.

Since no quarry-associated vehicle trip-generating uses would occur following reclamation of the quarry, potential existing transportational effects currently generated by the quarry would not occur after reclamation.

Air Quality

Under this alternative, the level of mining operations of the remaining use permitted area of the quarry would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. Following final reclamation of the existing use permitted area, no mining operations or development of quarry-associated vehicle trip-generating uses would occur on the project site. In addition, the residential land use that could be developed on the site under this alternative would not generate a substantial amount of on- or off-site emissions. Consequently, this alternative would avoid potentially significant but mitigable project impacts and contribution to cumulative impacts from diesel emissions associated with movement of on-site mobile equipment closer to individual receptors; and avoid potentially significant but mitigable episodes of dust nuisance in the quarry vicinity that would occur with the proposed project. This alternative would also avoid project increases, and contribution to cumulative increases, in criteria air pollutants (albeit less than significant and below regulatory thresholds) that would occur under the proposed project.

Since no mining operations would occur following reclamation of the quarry, potential existing air quality effects currently generated by the quarry would not occur after reclamation.

Noise

The level of mining operations of the remaining use permitted area of the quarry under this alternative would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. After the remaining aggregate within the existing approved mining area has been mined and subsequent final reclamation has been implemented, no mining operations and associated quarry noise would occur under this alternative. In addition, the residential land use that would be developed on the site under this alternative would not likely generate a substantial amount of on- or off-site noise. As a result, this alternative would avoid potentially significant and unavoidable project contribution to cumulative increases on off-site ambient noise levels due to quarry trucks. This alternative would also avoid significant but mitigable project noise impacts at sensitive receptors in the site vicinity from both temporary and on-going operation of certain on-site mobile equipment operations; and would avoid potentially significant but mitigable noise and vibration impacts from blasting. It would also avoid project contribution to cumulative increases in ambient noise levels in the site vicinity from operation of on-site sources.

Since no mining operations would occur following reclamation of the quarry, potential existing noise effects currently generated by the quarry would not occur after reclamation.

Hydrology and Water Quality

Under this alternative, the level of mining operations of the remaining use permitted area of the quarry would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. Following the mining of remaining aggregate within the existing approved mining area and subsequent final reclamation, no subsequent mining effects on hydrology would occur. The residential land use that could be developed on the site under this alternative would result in an incremental increase in impervious surfaces, and on-site land uses could contribute to incremental increases in pollutants to Green Valley Creek. However, given the type and density of land use permitted, effects associated with potential discharges of pollutants in stormwater and flooding potential to Green Valley Creek would be substantially less than the proposed project, as would potential effects to groundwater resources.

Since no mining operations would occur following reclamation of the quarry, potential existing effects to hydrology and water quality currently generated by the quarry would not occur after reclamation.

Land Use and Planning

Under this alternative, the quarry area to be mined would be that allowed under its existing use permit. After mining and final reclamation of the existing use permitted area, no mining operations would occur on the project site. Furthermore, the residential land use that could be developed on the site under this alternative would be consistent with the existing General Plan land use designation and zoning. Consequently, the zone change and use permits that are required under the proposed project would not occur under this alternative. The change in land use from residential development would also be less disruptive to surrounding land uses than the quarry expansion proposed under the project. This alternative would also have fewer timber conversion effects than the proposed project.

Since no mining operations would occur following reclamation of the quarry, potential existing effects to land use currently generated by the quarry would not occur after reclamation.

Geology and Soils

Under this alternative, the level of mining operations of the remaining use permitted area of the quarry would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. After the remaining aggregate within the existing approved mining area has been mined and subsequent final reclamation has been implemented, no new mining activities would occur. New residential development that could occur under this alternative would involve additional grading and introduce long-term population on the site. Given the existing steep site topography, site development and access would require special geotechnical and seismic considerations. However, the overall site disturbance that could occur under this alternative would be considerably less than that which would occur with the quarry expansion under the proposed project. As a result, this alternative would have substantially less impacts from potential slope instability hazards, and soil erosion than which could occur in the expansion area.

Since no mining operations would occur following reclamation of the quarry, potential existing effects to geology and soils currently generated by the quarry would not occur after reclamation.

Hazards and Hazardous Materials

Under this alternative, the level of use of hazardous materials and threat of hazards from the remaining use permitted area of the quarry would be equal to baseline conditions. Following the mining of remaining aggregate within the existing approved mining area and subsequent final reclamation, no subsequent mining activities would occur on-site. Therefore, this alternative would avoid significant but mitigable effects from the potential spill or release of quarry-associated hazardous materials at the site. However, with an introduction of long-term population on the site, this alternative would have a wildland fire risk. This would be mitigable to a less than significant level through proper site development, including emergency access, incorporation of fire prevention infrastructure (e.g., fire hydrants, etc.), and use of fire retardant building materials.

Since no mining operations would occur following reclamation of the quarry, potential effects associated with existing hazardous materials use at the quarry would not occur after reclamation.

Biological Resources

Under this alternative, the level of mining operations of the remaining use permitted area of the quarry would be equal to baseline conditions, and the quarry area to be mined would be that allowed under its existing use permit. After mining and final reclamation of the existing use permitted area, no mining, grading or other site disturbance would occur on the project site. Given the land use type and density, overall site disturbance would likely be much less than that which would occur under the proposed project. Consequently, under this alternative, potentially significant and unavoidable impacts with destruction of north coast conifer forest habitat (either expansion option), and potentially significant but mitigable impacts to the red tree vole within the Northern Expansion area, and significant but mitigable impacts associated with disturbance or destruction of wetland and riparian habitat would be less than the proposed project. In addition, under this alternative, associated potentially significant but mitigable effects in the disturbance, displacement or mortality to special-status wildlife species (e.g., northern spotted owl and special-status bat species) and habitat; potential effects to nesting/breeding birds protected by CDFG Code Sections 3503 and 3503.5; and potential effects to aquatic species in Green Valley Creek (e.g., California freshwater shrimp and anadromous fish); and potential for increase in occurrence of invasive plant species on the project site would be less than the proposed project.

Since no mining operations would occur following reclamation of the quarry, potential existing effects to biological resources currently generated by the quarry would not occur after reclamation.

Aesthetics

With this alternative, mining and subsequent reclamation would be limited to the existing permitted area. Mining under the existing permit would remove the hill currently being mined, and open up northerly views to the Northern Expansion area from south of the project site, and westerly views to the Western Expansion area from the east of the project site. However, no temporary or permanent quarry operations, including alteration of topography and/or introduction of active industrial operations would occur within the expansion area under this alternative. The development of up to nine residences on the project site would be visually consistent with other low-density housing development in the surrounding area. Moreover, overall land use disturbance would likely be much less than that which would occur under the proposed project. As such, under this alternative, potential significant alteration in visual character of the site and contribution to cumulative alteration in visual character, would be less than the proposed project.

Since no mining operations would occur following reclamation of the quarry, potential existing aesthetic effects currently generated by the quarry would not occur after reclamation.

Public Services and Utilities

The level of mining operations of the remaining use permitted area of the quarry under this alternative would be equal to baseline conditions. Under this alternative, after mining and final reclamation of the existing use permitted area, residential development on the site would create an incremental, long-term demand for public services, including fire police protection, emergency medical services, and public schools and parks; and utilities, including water, sanitary sewer, stormwater collection, solid waste collection and disposal, and electrical and natural gas. The demand for public services and utilities from the addition of up to nine residences would not be considered substantial. Therefore, this alternative would have be expected to have a less than significant impact on public services and utilities.

Since no mining operations would occur following reclamation of the quarry, potential existing effects to public services and utilities currently generated by the quarry would not occur after reclamation.

Cultural Resources

Given the low-density residential land use assumed under this alternative, overall on-site land use disturbance (including subsurface disturbance) would be less than that which would occur with the proposed project. As a result, this alternative would have less potential for encountering undiscovered cultural and/or paleontological resources compared to the proposed project.

POTENTIAL INDIRECT IMPACTS

Potential indirect impacts under the No Project – Reasonably Foreseeable Development Alternative, including those associated with increased operation of other in-county aggregate sources and/or out-of-county aggregate sources would be identical to those identified for the No Project – No Subsequent Development Alternative, described above. Please refer to that discussion.

ALTERNATIVE 2: REDUCED PRODUCTION ALTERNATIVE

DIRECT ENVIRONMENTAL IMPACTS

Transportation and Traffic

Following the mining of remaining aggregate within the current approved mining area, aggregate production sales at the quarry under this alternative would be restricted to a maximum of 375,000 CY per year (i.e., the 1998-2002 baseline). As a result, the estimated maximum vehicle trip generation under this alternative would be identical to baseline traffic generated at the quarry, and accordingly, less than the proposed project. Therefore, this alternative would not result in any new traffic impacts compared to baseline conditions. Correspondingly, this alternative would avoid contributing to potentially significant and unavoidable cumulative impacts at the intersections of Highway 116/Covey-Forestville Roads, Highway 116/Mirabel Road and River Road/Mirabel Road; would avoid potentially significant and unavoidable cumulative impacts to peak-hour level of service on Mirabel Road; would avoid potentially significant and unavoidable cumulative impacts to pedestrian and safety flow in the project area; would avoid increases in need for road maintenance; and would avoid significant (and in certain cases, unavoidable) secondary impacts associated with implementation of off-site transportation improvements identified in mitigation measures that would occur with the proposed project. This alternative would also avoid the potential (albeit less than significant) for increases in conflicts of quarry trucks with other vehicular traffic that could occur with the proposed project. However, these transportation facilities would continue to be used by on-going baseline quarry traffic.

Air Quality

Since the proposed grading plan for the Western or Northern Expansion option for this alternative would be similar to the proposed project, this alternative would also be expected to have potentially significant but mitigable project impacts and contribution to cumulative impacts from diesel emissions associated with movement of on-site mobile equipment within the expansion area closer to individual off-site receptors. However, since maximum permitted production levels at the quarry under this alternative would be restricted to a maximum of 375,000 CY per year (the 1998-2002 baseline), resultant total diesel emissions generated by the quarry over the life of the use permit would be less than the proposed project. In addition, since on-site operations and the number of off-site generated vehicle trips would be identical to baseline conditions at the quarry, and accordingly, less than the proposed project, this alternative would avoid project increases, and contribution to cumulative increases, in criteria air pollutants (albeit less than significant and below regulatory thresholds) that would occur under the proposed project. Lower production levels would also result in less episodes of dust nuisance in the quarry vicinity compared to the proposed project.

Noise

Since production sales at the quarry under this alternative would be restricted to a maximum of 375,000 CY per year (the 1998-2002 baseline), no increase in off-site truck activity would occur under this alternative compared to baseline conditions. Consequently, this alternative would avoid potentially significant and unavoidable project contribution to cumulative increases in off-site ambient noise levels due to quarry trucks. Since the proposed grading plan for the Western or Northern Expansion option for this alternative would be similar to the proposed project, the potentially significant but mitigable project noise impacts at sensitive receptors in the site vicinity from both temporary and on-going operation of certain on-site mobile equipment operations would also occur under this alternative. However, given the lower maximum permitted production levels at the quarry under this alternative, total number of days where noise would be generated on-site over the life of the use permit would be less than the proposed project. Potentially significant but mitigable noise and vibration impacts from blasting under this alternative would be similar to the proposed project.

Hydrology and Water Quality

The proposed grading plan for the Western or Northern Expansion option for this alternative would be similar to the proposed project; however, the maximum rate that the quarry would be mined would be less (up to 25 percent less) than the proposed project. Consequently, potentially significant but mitigable project and contribution to cumulative effects from discharges of pollutants in stormwater to Green Valley Creek on any given day could be similar to the proposed project, although over the 20-year life of the permit would occur at a slower rate than the proposed project. In addition, potentially significant but mitigable project and contribution to cumulative flooding impacts to Green Valley Creek downstream of the site, potential project and contribution to cumulative increases in runoff to Green Valley Creek, potential significant but mitigable reductions in recharge to groundwater wells, groundwater levels in nearby wells and potential impacts (albeit less than significant) to regional groundwater resources would also occur under this alternative, but at a slower rate over the 20-year life of the permit compared to the project.

Land Use and Planning

The zone change and use permits that are required under the proposed project would also occur under this alternative. Since the proposed grading plan for this alternative would be similar to the proposed project, effects associated with a substantial change in the land use on the site and the potential disruptions to land uses surrounding the project site from the expansion of quarry operations into the expansion area would also occur under this alternative.

Geology and Soils

This alternative would have on-site structures and equipment similar to the proposed project. Consequently, potentially significant but mitigable effects from seismic groundshaking to quarry structures that would occur with the project could also occur under this alternative. Since the proposed grading plan for this alternative would be similar to the proposed project, the potentially significant but mitigable impacts from slope instability hazards and soil erosion on any given day would be similar to the proposed project. However, since the maximum rate that the quarry would be mined would be less (up to 25 percent less) than the proposed project, these impacts would occur at a slower rate over the 20-year life of the permit than the proposed project.

Hazards and Hazardous Materials

This alternative would involve the use of hazardous materials similar to the proposed project, although given that the maximum rate that the quarry would be mined would be less (up to 25 percent less) than the proposed project, it is assumed incrementally less overall hazardous materials would be stored and used on site. Potentially significant but mitigable effect from the potential spill or release of hazardous materials at the site that could occur under the project would also occur under this alternative. In addition potential impacts (albeit less than significant) to wildland fire risks would be similar to the proposed project.

Biological Resources

The proposed grading plan under this alternative would be similar to the proposed project. Consequently, potentially significant and unavoidable impacts with destruction of north coast conifer forest habitat (either expansion option); and potentially significant but mitigable impacts to the red tree vole within the Northern Expansion area would also occur under this alternative. Significant but mitigable impacts associated with disturbance or destruction of wetland and riparian habitat; potential effects in the disturbance, displacement or mortality to special-status wildlife species (e.g., northern spotted owl and special-status bat species) and habitat, potential effects to nesting/breeding birds protected by the CDFG (Code Sections 3503 and 3503.5),and potential effects to aquatic species in Green Valley Creek would also occur under this alternative. In addition, the potential for increase in occurrence of invasive plant species on the project site would be also be expected to occur under this alternative. However, since the maximum rate that the quarry would be mined would be less (up to 25 percent less) than the proposed project, these impacts would occur at a slower rate over the 20-year life of the permit than the proposed project.

Aesthetics

The proposed grading plan for the expansion options under this alternative would be similar to the proposed project. Consequently, the alteration of topography and/or introduction of active industrial operations identified to occur under the project would also occur under this alternative. A significant alteration in visual character of the expansion area, as under the proposed project, would occur under this alternative. This alternative would also contribute to the cumulative alteration in visual character of the project vicinity, as would the proposed project.

Public Services and Utilities

Given the lower maximum production rate, it is assumed that the demand for public utilities, such as water from Forestville County Water District, would be less than the proposed project and remain less than significant. Similarly, impacts to public fire, police and emergency services, and parks would not be greater than those that would occur for the proposed project and would remain less than significant.

Cultural Resources

Under this alternative, the proposed grading plan for the expansion options would be similar to the proposed project. Consequently, potentially significant but mitigable effects from encountering undiscovered cultural and/or paleontological resources within the expansion area under this alternative, would be similar to the proposed project.

POTENTIAL INDIRECT IMPACTS

The Reduced Project Production Alternative would allow an annual maximum aggregate sales rate 375,000 CY (563,000 tons), 25 percent less than the maximum annual sales rate allowed under the quarry's existing vested rights and use permit. The 125,000 CY (188,000 tons) aggregate sales reduction (compared to the proposed project) would account for an aggregate supply that could otherwise accommodate up to approximately 3.5 percent of the total anticipated demand for aggregate in Sonoma County in 2007 (the earliest year that aggregate supplies within the existing permitted area of the quarry would be depleted, assuming continuation of baseline production rates). Over the long term, up to 2.5 million CY (3.75 million tons) of aggregate that could be produced at the quarry over the 20-year life of the proposed use permit would not be produced under this alternative.

It is assumed that following cessation of mining within the existing permitted area at the Canyon Rock Quarry under this alternative, the 188,000 ton per year maximum production reduction within the Western or Northern Expansion area that would otherwise assist in accommodating future aggregate demand in Sonoma County would instead by provided by one or more existing in-county aggregate sources (e.g., Blue Rock Quarry, Bohan and Canelis Quarry, and/or Mark West Quarry), new in-county aggregate sources, and/or out-of-county aggregate sources.

Increased aggregate production by other in- and/or out-of-county aggregate sources to replace the potential production reduction at Canyon Rock Quarry under this alternative would be expected to result in a shift of potential environmental effects to those sources, and depending on site, introduction of new environmental impacts. Relative indirect environmental effects associated with increased operation of those sources are discussed under the No-Project – No Subsequent Development Alternative, above.

ALTERNATIVE 3: REVISED PROJECT CONFIGURATION ALTERNATIVE

DIRECT ENVIRONMENTAL IMPACTS

Transportation and Traffic

This alternative would generate an amount of daily and peak-hour traffic similar to the proposed project. Consequently, potential traffic impacts would be identical to the proposed project. This would include the potentially significant and unavoidable cumulative impacts at the intersections of Highway 116/Covey-Forestville Roads, Highway 116/Mirabel Road and River Road/Mirabel Road; potentially significant and unavoidable cumulative impacts to peak-hour level of service on Mirabel Road; potentially significant and unavoidable cumulative impacts to pedestrian and safety flow in the project area; increases in need for road maintenance; and significant (and in certain cases, unavoidable) secondary impacts associated with implementation of off-site transportation improvements identified in mitigation measures that would occur with the proposed project. This alternative could also result in similar (albeit less than significant) impacts associated with potential increases in conflicts of quarry trucks with other vehicular traffic.

Air Quality

Since production sales at the quarry under this alternative would be identical to the project, the level of operation of on-site stationary and mobile equipment and the number of off-site generated vehicle trips would be identical to the proposed project. Consequently, this alternative would result in similar potentially significant but mitigable project impacts and contribution to cumulative impacts from diesel emissions associated with movement of on-site mobile equipment closer to individual receptors; and potentially significant but mitigable episodes of dust nuisance in the quarry vicinity as the proposed project. It would also result in similar increases and contribution to cumulative increases in criteria air pollutants (albeit less than significant and below regulatory thresholds) that would occur under the proposed project.

Noise

Since the proposed grading plan for the Western or Northern Expansion option under this alternative would be similar to the proposed project in terms of distance to sensitive receptors, it would result in potentially significant and unavoidable project contribution to cumulative increases in off-site ambient noise levels due to quarry trucks similar to the proposed project. This alternative would also result in significant but mitigable noise impacts to sensitive receptors in the site vicinity from both temporary and on-going operation of certain on-site mobile equipment operations; and significant but mitigable noise and vibration impacts from blasting similar to the proposed project. This alternative would also result in a contribution to cumulative increases in ambient noise levels in the site vicinity from operation of on-site stationary sources similar to the proposed project.

Hydrology and Water Quality

As part of this alternative, all existing aggregate storage facilities and processing facilities would be moved out the Green Valley Creek floodplain (Western or Northern Expansion variant). The floodplain boundary at the project site would be demarcated to prevent potential encroachment of site activities into the floodplain area. The buffer zone would be reconfigured so that flood water flowing across Highway 116 could enter the floodplain buffer zone at the site and flow unobstructed back into Green Valley Creek. The southeast portion of the site currently subject to flooding and used as an unimproved parking area would be paved, and other areas within the floodplain would be vegetated to reduce erosion. These measures incorporated into this alternative would serve, in part, to reduce potentially significant effects from discharges of pollutants in stormwater to Green Valley Creek, and would increase flood water capacity in the floodplain on the site. However, all other mitigation measures identified in the EIR for the proposed project for reducing pollutants would also be required to ensure all significant potential effects from related to this issue would be mitigated to a less than significant level. Potentially significant but mitigable effects to depletions in groundwater resources, increases in runoff to Green Valley Creek, and potential contributions to cumulative impacts to the hydrology of Green Valley Creek would also occur under this alternative and would be similar to the proposed project.

Land Use and Planning

The zone change and use permits that are required under the proposed project would also be required under this alternative. Potential effects under this alternative associated with a substantial change in the land use on the site, and the potential disruptions to land uses surrounding the project site from the expansion of quarry operations into the expansion area, would be similar to the proposed project.

Geology and Soils

This alternative would have on-site structures and equipment similar to the proposed project. Consequently, potentially significant but mitigable effects from seismic groundshaking to quarry structures that would occur with the project would also occur under this alternative. In addition, potentially significant but mitigable impacts from slope instability hazards and soil erosion under this alternative would be similar to the proposed project.

Hazards and Hazardous Materials

This alternative would involve the use of hazardous materials similar to the proposed project. Therefore, the significant but mitigable effects from the potential spill or release of hazardous materials at the site that could occur under the project would also occur under this alternative. In addition, potential impacts (albeit less than significant) to wildland fire risks would be similar to the proposed project.

Biological Resources

Under this alternative, no mining would occur in, and adequate buffering would be included around, the wetland and riparian habitat areas on the project site (located along the western boundary of the existing Mineral Resources zoned portion of the site). The project applicant would maintain the appropriate minimum allowed setback (100 feet) identified in the County General Plan and zoning ordinance. This measure could only be incorporated into a Northern Expansion variant of this alternative. Under a Western Expansion variant, the subject wetland and riparian/buffer area would be completely surrounded by the proposed mining footprint, and therefore this measure would not be feasible to implement. This alternative would therefore avoid significant impacts associated with disturbance or destruction of wetland and riparian habitat on the site for the Northern Expansion option.

As part of this alternative, all existing aggregate storage facilities and processing facilities would be moved out the Green Valley Creek floodplain (Western or Northern Expansion variant); the floodplain would be revegetated using appropriate native species and act as a buffer between the site activities and the riparian corridor. Incorporation of these measures incorporated into this alternative would serve, in part, to reduce potentially significant effects from discharges of pollutants in stormwater to Green Valley Creek and corresponding impacts to aquatic species in the creek. However, all other mitigation measures identified in the EIR for the proposed project for reducing pollutants would also be required to ensure all significant potential effects related to this issue would be mitigated to a less than significant level.

Potentially significant and unavoidable impacts to the destruction of north coast conifer forest habitat (either expansion option); and potentially significant but mitigable impacts to the red tree vole within the Northern Expansion area would be similar to the proposed project. In addition, significant but mitigable effects in the disturbance, displacement or mortality to special-status wildlife species (e.g., northern spotted owl and special-status bat species) and habitat, potential effects to nesting/breeding birds protected by CDFG(Code Sections 3503 and 3503.5), and potential for increase in occurrence of invasive plant species on the project site would be expected to occur similar to the proposed project.

Aesthetics

From a visual perspective, the proposed grading plan for the expansion options for this alternative would be similar to the proposed project. The alteration of topography and/or introduction of active industrial operations that would occur within the expansion area under this alternative would be similar to the proposed project. Correspondingly, a significant alteration in visual character of the expansion area under this alternative would be similar to the proposed project. This alternative would also contribute to the cumulative alteration in visual character of the project vicinity, as would the proposed project.

Public Services and Utilities

Demand for public services and utilities under this alternative would be similar to the proposed project and would remain less than significant.

Cultural Resources

Since the relative areas of disturbance of this alternative are similar to the proposed project, potentially significant but mitigable effects from encountering undiscovered cultural and/or paleontological resources within the expansion area would be similar to those for the proposed project.

POTENTIAL INDIRECT IMPACTS

Since production sales under this alternative would be similar to the proposed project, it would have no effect on production at other in-county aggregate sources and/or out-of-county aggregate sources that would be different than those associated with the proposed project.

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 potentially significant environmental impacts that would occur under the proposed project. As discussed in detail under E., Distinctive Environmental Characteristics, above, this alternative would avoid those significant effects associated with increases in traffic in Forestville (e.g., level of service effects at off-site intersections and on roadway segments, potential effects on bicycle and pedestrian flow; increases in road maintenance; and secondary impacts associated with implementation of off-site transportation improvements identified in mitigation measures); would avoid those potentially significant effects to nearby receptors associated with on-site mobile equipment operations (e.g., exposure to diesel emissions, noise); would avoid potentially significant dust nuisances and potential effects from blasting; would avoid potentially significant effects to biological resources (including forest habitat, wetland and riparian habitat, aquatic species in Green Valley Creek, nesting and breeding birds, and the red tree vole); would avoid potential effects to Green Valley Creek (including water quality effects and hydrology) and groundwater resources; would avoid substantial changes in visual character; and would avoid potential significant impacts to undiscovered cultural resources. This alternative would not, however, 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, the Reduced Production Alternative is determined to be the environmentally superior alternative. As discussed under E., Distinctive Environmental Characteristics, above, operation of the quarry at baseline levels under this alternative would also avoid a number of significant project effects, including avoidance of the project's contribution to effects associated with increases in traffic in Forestville (e.g., level of service effects at off-site intersections and on roadway segments, potential effects on bicycle and pedestrian flow, increases in road maintenance; and secondary impacts associated with implementation of off-site transportation improvements identified in mitigation measures that would occur with the proposed project); and would avoid potentially significant contribution to cumulative increases in off-site ambient noise levels due to quarry trucks. In addition, this alternative would not increase criteria pollutant emissions compared to baseline conditions. Since the overall rate of production would be lower than the proposed project over the 20-year life of the use permit, it could result in less dust nuisance issues, biological resources and well as fewer effects to Green Valley Creek (including water quality effects) than the proposed project.

REFERENCES – Alternatives

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

Sonoma County, *General Plan*, 1989, amended through 1998.

Sonoma County, *Annual Report on Aggregate Production in Sonoma County in 2002,* August 2003.

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

TABLE VII-1
COMPARISON OF IMPACTS AND IMPACT SIGNIFICANCE LEVELS OF THE PROPOSED PROJECT AND THE ALTERNATIVES [a]

Impact	Proposed Project	Alternative 1 No Project: 1A: No Subsequent Development	Alternative 1 No Project: 1B: Reasonably Foreseeable Development	Alternative 2: Reduced Production Alternative	Alternative 3: Revised Project Configuration Alternative
IV.A Traffic and Transportation					
1. Cumulative increases in traffic at intersections	S/U	-N	-N	-N	=S/U
2. Cumulative increases in traffic on roadways	S/U	-N	-N	-N	=S/U
3. Cumulative effects on pedestrian and bicycle flow from increases in truck traffic	S/U	-N	-N	-N	=S/U
4. Increases in potential conflicts among vehicles	LS	-N	-N	-N	=LS
5. Increase in need for road maintenance	S/M	-N	-N		=S/M
6. Temporary construction-related impacts on air quality, water quality and noise from implementation of Mitigation Measures IV.A.1-3.	S/M	-N	-N	-N	=S/M
7. Temporary or long-term erosion effects from road cuts or other graded areas from implementation of Mitigation Measures IV.A.1-3.	S/M	-N	-N	-N	=S/M

Comparisons to Project

+	Greater impact than that of the proposed project	LS	Less than significant adverse impact
–	Lesser impact than that of the proposed project	S/M	Significant (or Potentially Significant) prior to mitigation; however, mitigable to a less than significant level
=	Same (or similar) impact as that of the proposed project	S/U	Significant and unavoidable (or Potentially Significant and Unavoidable), even with mitigation.
+/=	Approximately the same impact as or potentially greater impact than that of the proposed project	N	No impact or negligible impact
–/=	Approximately the same impact as or potentially lesser impact than that of the proposed project		

[a] Note: The comparisons in this table focus on the direct environmental impacts of the alternatives compared to the proposed project, due to the speculative nature of potential indirect impacts. A discussion of potential indirect environmental effects of the alternatives are discussed in the text in this chapter.

(Continued)

TABLE VII-1 (Continued)
COMPARISON OF IMPACTS AND IMPACT SIGNIFICANCE LEVELS OF THE PROPOSED PROJECT AND THE ALTERNATIVES [a]

Impact	Proposed Project	Alternative 1 No Project: 1A: No Subsequent Development	Alternative 1 No Project: 1B: Reasonably Foreseeable Development	Alternative 2: Reduced Production Alternative	Alternative 3: Revised Project Configuration Alternative
IV.A Traffic and Transportation (cont.)					
8. Potential visual impact along portion of Highway 116 from implementing Mitigation Measure IV.A.1	S/M	-N	-N	-N	=S/M
9. Potential disturbance of undiscovered archaeological resources from implementing off-site transportation improvements identified in this EIR.	S/M	-N	-N	-N	=S/M
10. Loss of on-street parking spaces on Highway 116 west of Covey Road from implementation of Mitigation Measures IV.A.1a and IV.A.3b.	S/U	-N	-N	-N	=S/U
11. Potential significant long term environmental impacts on transportation and traffic, air quality, noise, hydrology and water quality, land use, biological resources, aesthetics and cultural resources from implementation of Mitigation Measure IV.A.3e.	S/U	-N	-N	-N	=S/U
IV.B Air Quality					
1. Project increases in criteria pollutants	LS	-N	-N	-N	=LS
2. CO emissions associated with project at intersections	LS	-N	-N	-N	=LS
3. DPM emissions associated with project along haul routes	LS	-N	-N	-N	=LS
4. DPM emissions exposure at individual receptors from on-site mobile sources	S/M	-N	-N	-/=S/M	=S/M

(Continued)

TABLE VII-1 (Continued)
COMPARISON OF IMPACTS AND IMPACT SIGNIFICANCE LEVELS OF THE PROPOSED PROJECT AND THE ALTERNATIVES [a]

Impact	Proposed Project	Alternative 1 No Project: 1A: No Subsequent Development	Alternative 1 No Project: 1B: Reasonably Foreseeable Development	Alternative 2: Reduced Production Alternative	Alternative 3: Revised Project Configuration Alternative
IV.B Air Quality (cont.)					
5. Localized dust nuisance episodes	S/M	-N	-N	-S/M	=S/M
6. Contribution to regional criteria pollutants	LS	-N	-N	-N	=LS
7. Contribution to cumulative DPM emissions exposure at individual receptors	S/M	-N	-N	-/=S/M	=S/M
IV.C. Noise					
1. Noise effects from on-site stationary equipment	LS	-N	-N	-LS	=LS
2. Noise effects from clearing and initial vegetation material removal operations	S/M	-N	-N	-/=S/M	=S/M
3. Noise effects from on-going extraction on the quarry faces, and movement of materials on the quarry floor	S/M	-N	-N	-/=S/M	=S/M
4. Airborne and groundborne noise and vibration effects from occasional blasting	S/M	-N	-N	-/=S/M	=S/M
5. Noise effects from increases in off-site project traffic	LS	-N	-N	-N	=LS
6. On-site quarry operation contribution to cumulative noise effects	LS	-N	-N	-/=LS	=LS
7. Off-site project traffic contribution to cumulative noise increase effects	S/U	-N	-N	-N	=S/U

(Continued)

TABLE VII-1 (Continued)
COMPARISON OF IMPACTS AND IMPACT SIGNIFICANCE LEVELS OF THE PROPOSED PROJECT AND THE ALTERNATIVES [a]

Impact	Proposed Project	Alternative 1 No Project: 1A: No Subsequent Development	Alternative 1 No Project: 1B: Reasonably Foreseeable Development	Alternative 2: Reduced Production Alternative	Alternative 3: Revised Project Configuration Alternative
IV.D Hydrology and Water Quality					
1. Project discharges in pollutants in stormwater to Green Valley Creek	S/M	-N	-S/M	-/=S/M	-S/M
2. Potential exacerbation of flooding impacts downstream of project site	S/M	-N	-S/M	-/=S/M	-S/M
3. Potential reduction in recharge to groundwater wells or unrecoverable groundwater levels in nearby wells	S/M	-N	-S/M	-/=S/M	=S/M
4. Potential alteration in hydrology of Green Valley Creek	S/M	-N	-S/M	-/=S/M	=S/M
5. Potential water quality effects to Green Valley Creek from continued operation of septic system	S/M	-N	-S/M	-/=S/M	=S/M
6. Project contribution to cumulative effects to hydrology of Green Valley Creek	S/M	-N	-S/M	-/=S/M	=S/M
7. Project contribution to cumulative effects to regional groundwater resources	LS	-N	-N	-/=LS	=LS
8. Project contribution to cumulative effects to water quality in Green Valley Creek	S/M	-N	-N	-/=S/M	-S/M
V.A Land Use and Planning					
1. Change in land use effect on surrounding land uses.	LS	-N	-LS	-LS	=LS
2. Project effect on population and housing	LS	-N	-LS	-LS	=LS

(Continued)

TABLE VII-1 (Continued)
COMPARISON OF IMPACTS AND IMPACT SIGNIFICANCE LEVELS OF THE PROPOSED PROJECT AND THE ALTERNATIVES [a]

Impact	Proposed Project	Alternative 1 No Project		Alternative 2	Alternative 3
		1A: No Subsequent Development	1B: Reasonably Foreseeable Development	Reduced Production Alternative	Revised Project Configuration Alternative
V.B Geology, Seismicity and Mineral Resources					
1. Potential impacts to on-site people and structures from seismic groundshaking	S/M	-N	-S/M	-/=S/M	=S/M
2. Potential impacts to on-site people and structures from slope instability, landslides, debris flow and rockfalls	S/M	-N	-S/M	-/=S/M	=S/M
3. Potential impacts from soil erosion	S/M	-N	-S/M	-/=S/M	=S/M
4. Potential effect to mineral resources	LS	-N	-N	=LS	=LS
V.C Hazards and Hazardous Materials					
1. Potential effects from handling and storage of hazardous materials	S/M	-N	-N	-/=LS	=LS
2. Potential exposure of on-site workers to health risks from underground fuel storage tank sites.	LS	-N	-N	=LS	=LS
3. Exposure of structures and people to hazards associated with wildland fires	LS	-LS	-LS	=LS	=LS
V.D Biological Resources					
1. Disturbance of wetland and riparian habitat	S/M	-N	-S/M	=S/M	-LS
2. Direct loss and/or disturbance of natural communities on-site	S/U	-N	-S/M	-/=S/U	=S/U
3. Potential increase in occurrence of invasive plant species	S/M	-N	-S/M	-/=S/M	=S/M

(Continued)

TABLE VII-1 (Continued)
COMPARISON OF IMPACTS AND IMPACT SIGNIFICANCE LEVELS OF THE PROPOSED PROJECT AND THE ALTERNATIVES [a]

		Alternative 1 No Project		Alternative 2	Alternative 3
Impact	Proposed Project	1A: No Subsequent Development	1B: Reasonably Foreseeable Development	Reduced Production Alternative	Revised Project Configuration Alternative
V.D Biological Resources (cont.)					
4. Potential erosion and sedimentation effects on aquatic species	S/M	-N	-S/M	-/=S/M	-S/M
5. Potential impacts to nesting/breeding birds	S/M	-N	-S/M	-/=S/M	=S/M
6. Potential impacts to nesting owls and adjacent foraging habitat; loss of bat foraging and roosting habitat	S/M	-N	-S/M	-/=S/M	=S/M
7. Potential direct loss of red tree voles and nests					
Western:	S/M	-N	-S/M	-/=S/M	=S/M
Northern:	LS	-N	-LS	-/=LS	=LS
V.E Aesthetics					
1. Substantial alteration in visual character of project site	S/U	-N	-LS	=S/U	=S/U
2. Potential light and glare effects	LS	-N	-LS	=LS	=LS
3. Substantial cumulative alteration in visual character of the project vicinity	S/U	-N	-LS	-/=S/U	=S/U
V.F Public Services and Utilities					
1. Effects to fire suppression and/or emergency medical services of the Forestville Fire Protection District	LS	-N	-/=LS	-LS	=LS

(Continued)

**TABLE VII-1 (Continued)
COMPARISON OF IMPACTS AND IMPACT SIGNIFICANCE LEVELS OF
THE PROPOSED PROJECT AND THE ALTERNATIVES [a]**

Impact	Proposed Project	Alternative 1 No Project: 1A: No Subsequent Development	Alternative 1 No Project: 1B: Reasonably Foreseeable Development	Alternative 2: Reduced Production Alternative	Alternative 3: Revised Project Configuration Alternative
V.F Public Services and Utilities (cont.)					
2. Effects to police protection and traffic enforcement services of the Sonoma County Sheriff's Department and California Highway Patrol	LS	-N	-/=LS	-LS	=LS
4. Effects on water demand from the Forestville County Water District	LS	-N	-/=LS	-LS	=LS
4. Effects on park and recreational facilities	LS	-N	-/=LS	=LS	=LS
5. Project effects on solid waste collection and disposal	LS	-N	-/=LS	-LS	=LS
V.G Cultural Resources					
1. Potential for encountering undiscovered cultural resources	S/M	-N	-LS	-/=S/M	=S/M
2. Potential for encountering undiscovered paleontological resources	S/M	-N	-LS	-/=S/M	=S/M

(Continued)

CHAPTER VIII
IMPACT OVERVIEW

A. SIGNIFICANT 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:

- Project contribution to cumulative increases in traffic volumes at intersections in the project area (Western or Northern Expansion options) (*Impact IV.A.1*)
- Project contribution to cumulative increases in traffic volumes on roadways in the project area (Western or Northern Expansion options) (*Impact IV.A.2*)
- Project contribution to cumulative effects on pedestrian and bicycle flow conditions in the project area (Western or Northern Expansion options) (*Impact IV.A.3*)
- Loss of on-street parking spaces on Highway 116 west of Covey Road from implementation of Mitigation Measure IV.A.1.a and IV.A.3b (Western or Northern Expansion options) (*Impact IV.A.10*)
- Potential long-term effects to transportation and traffic, air quality, noise, hydrology and water quality, land use, biological resources, aesthetics and cultural resources from implementation of Mitigation Measure IV.A.3e (Western or Northern Expansion options) (*Impact IV.A.11*)
- Project contribution to cumulative increase in ambient noise levels on roadways serving the project. (Western or Northern Expansion options) (*Impact IV.C.7*)
- Direct loss and/or disturbance to natural communities from proposed project construction and grading activities. (Western or Northern Expansion option) (*Impact V.D.2*)
- Alteration in the visual character of the project site from proposed quarry expansion. (Western or Northern Expansion options) (*Impact V.E.1*)
- Project contribution to cumulative alteration in the visual character of the project vicinity. (Western or Northern Expansion options) (*Impact V.E.3*)

B. CUMULATIVE IMPACTS SUMMARY

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 projects in Sonoma County and forecasts of regional employment and population growth. Near-term proposed or approved projects within the project area considered included the following:

1. Blue Rock Quarry Expansion. This project would permit an increase in annual production at this quarry from 115,000 cubic yards to 400,000 cubic yards. Status: Currently undergoing environmental review.

2. Graton Winery. 1.5 million case winery, located at 9119 Graton Road in Sebastopol. Status: Approved.

3 Burbank Self-Help Project. 30 attached and detached homes. Status: Application filed.

4. Mini Storage. Self Storage project constructed in two phases (Phase 1- 44,805 square feet., Phase 2 – 28,555 square feet; total of 469 storage units. Status: Approved.

5. Crinella Property. Development of 25,000-case (per year) winery, with 20,000 square-foot. commercial development. Status of Crinella Winery: Application filed; status of Crinella Residential: Application filed / to be modified.

6. Thiessen Property. Commercial/residential application pending.

Long-term traffic projections in this EIR included year 2021 areawide growth in traffic volumes, (developed using growth rates projected for Forestville by the Sonoma County PRMD and for the Russian River corridor in a recently completed redevelopment plan for an area extending from Rio Nido to Monte Rio).

The traffic projections result in an average growth rate of 42 percent in ambient traffic on Mirabel Road from the year 2001 to 2021. For comparison, the traffic model for the County General Plan revision (currently under preparation) predicts a 35 percent growth in ambient traffic on Mirabel Road from the year 2000 to 2020 (Angus Latta, April 2004). The County General Plan traffic model considers development of all parcels in accordance with land use designation. Since the EIR projections are somewhat higher than the General Plan projections, it is concluded that the EIR projections adequately account for all foreseeable development in the Forestville area, including the above-listed projects.

Each topical analysis presented in Chapter III, 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.

In summary, cumulative effects to which the project would contribute include: Project contribution to cumulative increases in traffic volumes at intersections and roadways in the project area (Impacts IV.A.1 and IV.A.2); cumulative effects on pedestrian and bicycle flow in the project area (Impacts IV.A.3); project contribution to cumulative increases in PM10 at nearby receptors (Impact IV.B.5); project contribution to regional criteria pollutants (Impact IV.B.6); project contribution to cumulative increases in DPM exposure at individual receptors in the quarry vicinity (IV.B.7); on-site project noise contribution to cumulative noise in project vicinity (Impact IV.C.6); project contribution to cumulative ambient noise levels on roadways serving the project (Impact IV.C.7); cumulative impacts to hydrology of Green Valley Creek (Impact IV.D.6); cumulative impacts to regional groundwater resources (Impact IV.D.7); cumulative impacts to water quality in Green Valley Creek due to soil erosion (Impact IV.D.8); and contribution to cumulative alteration of visual character of the project vicinity (Impact V.E.3).

C. GROWTH-INDUCING IMPACTS

The proposed quarry expansion 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 Program EIR was also assessed in the ARM Plan Program EIR and found to not induce substantial growth in the County. As discussed in Section V.A, Land Use and Planning, the proposed project would not increase employment at the project site over existing conditions, 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.A, Traffic and Transportation, in the EIR to improve intersection level of service and decrease potential conflicts between project trucks and bicyclists/pedestrians. 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 Canyon Rock Quarry expansion project are identified and discussed in detail in Chapters IV and V. Except for the significant unavoidable effects identified above, all other identified environmental effects of the project would be less than significant, or less than significant after implementation of identified mitigation measures.

The following topics of analysis were found to have environmental effects that would be less than significant, or less than significant after implementation of the identified mitigation measures.

- Land Use
- Population and Housing
- Air Quality
- Geology, Soils and Seismicity
- Hydrology and Water Quality
- Hazardous Materials
- Public Services and Utilities
- Cultural Resources
- Agricultural Resources
- Mineral Resources
- Recreation

CHAPTER IX
REPORT PREPARATION

A. EIR PREPARERS

REPORT AUTHORS

County of Sonoma
Permit and Resource Management Department
2550 Ventura Avenue
Santa Rosa, California 95403-2829

EIR Manager: Michael Sotak, Planner III
Tim Mayer, Environmental Review Manager

EIR CONSULTANTS

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Project Director: Marty Abell, AICP, Vice President

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	Jack Hutchison, P.E.	Ron Teitel
	Jyothi Iyer	Heidi Vonblum
	Yolanda Molette	Bob Vranka, Ph.D.

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Susan Holve

Transportation and Circulation
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Principal Analyst: Mark Crane, P.E.

Noise

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Petaluma, CA 94952
Principal Analyst: Paul Donovan, Sc.D.

Geology, Soils and Seismicity; Hydrology and Water Quality; Hazardous Materials

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Petaluma, CA 94952-5100
Principal Analysts: Bruce Abelli-Amen
Kevin O'Dea

Additional assistance on Hydrology provided by Peter Hudson, R.G.-ESA

Cultural Resources

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Rohnert Park, CA 94928
Principal Analysts: Tom Origer
Janine Loyd

B. PROJECT SPONSOR'S TECHNICAL CONSULTANTS

Project Engineer

Carlile Macy
15 Third Street
Santa Rosa, CA 95401
Primary Contact: Zora Welborn

C. PERSONS AND ORGANIZATIONS CONSULTED

Duignan, Gary, Chief, Forestville Fire Protection District, personal and written communication, February and April 2003.

McMenomey, C.R., Lieutenant, Sonoma County Sheriff's Department, written communication, March, 2003.

McGuire, J., 2002, Inspector, Sonoma County Department of Emergency Services, personal communication with Baseline, 17 June.

Moore J., 2003, Staff, Department of Forestry and Fire Protection, personal communication with Baseline, 20 June.

Roberts, George, General Manager, Forestville County Water District, personal communication, April, 2003.

Ryan, Fran, 2003, Volunteer Monitor, Atascadero-Green Valley Creek Watershed Council, written communication with Baseline, March and April.

Tracy, John, 2003, Water Quality Specialist, Sonoma County Permit and Resource Management District, personal communication with Bruce Abelli-Amen, May 5.

Trappe, Wendel, 2003, owner, Canyon Rock Company, various personal communication with ESA and Baseline.

APPENDIX A

NOTICE OF PREPRATION

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: Canyon Rock Quarry Expansion Project - PLP 97-0046

Project Applicant: Wendel Trappe

Environmental Impact Report: Sonoma County will be the lead agency and will prepare an Environmental Impact Report (EIR) for the above project. We are asking for your views regarding the scope of the environmental issues that should be addressed in the EIR.

The project description, location, and the probable environmental effects are contained in the attached materials.

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. Please send your response to Ken Ellison at the address above.

Public Scoping Meeting: A public scoping meeting will be held from 7:30 pm to 9:30 pm on December 17, 2002 to allow additional opportunity for people to express their views regarding the scope of the environmental issues to be addressed in the EIR. The meeting will be held at the Odd Fellows Hall at 6530 Covey Road in Forestville.

For additional information, please email Ken Ellison at (kellison@sonoma-county.org) or call him at (707) 565-1928.

Date: 12/6/2

Tim Mayer

Tim Mayer
Environmental Review Manager
(707) 565-8351

CAMP MEEKER QUADRANGLE
CALIFORNIA-SONOMA CO.
7.5-MINUTE SERIES (TOPOGRAPHIC)

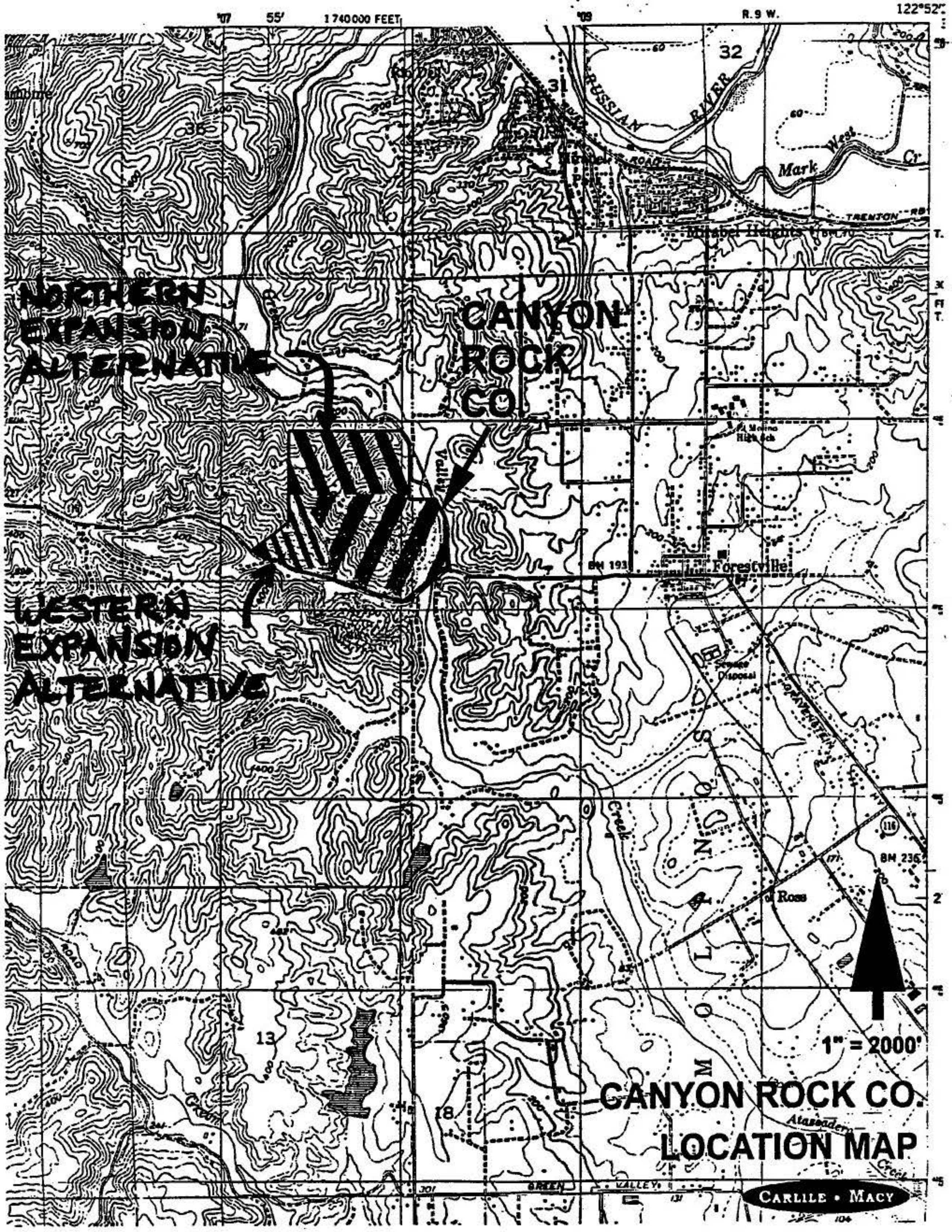


EXHIBIT 2

CANYON ROCK QUARRY EXPANSION

Project Description

Canyon Rock Quarry is located at 7525 Highway 116 North, approximately one mile west of Forestville. The quarry has been operating since the early 1940's. The proposed project is to expand the site either to the west by approximately 30 acres (the western expansion), or to the north by approximately 83 acres (the northern expansion). The annual production would continue to be 500,000 cubic yards per year. Both expansion sites are owned by the quarry.

Expansion Alternatives

The western alternate expansion would place Mineral Resource zoning on Assessor Parcels 83-210-13, -16, -17, and -18, located immediately to the west of the existing quarry and totaling approximately 30.3 acres. The quarry would be expanded onto those parcels and onto Assessor Parcel 083-210-019, which already has Mineral Resource zoning.

The northern alternate expansion would place Mineral Resource zoning on Assessor Parcels 83-210-06, -15, -20, and 83-130-33 and 40, located immediately to the north of the existing quarry and totaling approximately 83 acres. With this alternative the quarry would be expanded onto these parcels and onto Assessor Parcel 083-210-019, which already has Mineral Resource zoning.

The owner has prepared a draft Reclamation Plan for each alternative showing the area to be mined during the 20 year life of the permit and how the mined area would be reclaimed. With either alternative, the County would grant a use permit to allow mining for a period of 20 years. The existing use permit, approved in 1991, would remain valid until the new use permit is granted. At that time, the new use permit would supersede the 1991 use permit.

It is estimated that the material remaining in the currently approved mining area contains between 3.0 and 4.5 million tons. That material would last from 5 to 8 years, assuming the production rate continues unchanged. Once the mining operations reach the edge of the currently approved mining area, mining of one or the other proposed expansion areas would be initiated. Operations on either expansion area would be subject to all applicable requirements of the State and County mining regulations. Production would not exceed 500,000 cubic yards per year, which is the current permitted/vested maximum annual production rate. At the maximum rate, the quarry could produce 10 million cubic yards of mined materials over the 20 year life of the permit. There is no new permanent employment anticipated with either expansion.

For either alternative expansion area, the new use permit and approved reclamation plan would supersede the prior (1991) approval. The maximum period of time for a Use Permit is 20-years under the County's regulations. The expansion area is proposed to be mined in compliance with the requirements and restrictions of the State Surface Mining and Reclamation Act and the Sonoma Surface Mining and Reclamation Ordinance No. 5165 (as set forth in County Code Section 26A).

Probable Environmental Impacts

The western alternative was originally proposed as the project. In February of 2001, following review of an Initial Study and hearing by the Planning Commission, the Board of Supervisors found that a focused EIR should be prepared to analyze impacts in four areas: traffic, air quality (potential diesel emissions), noise (impacts from on-site sources), and water quality (potential sedimentation into Green Valley Creek).

In 2002 the project proposal was amended to include the northern alternative. Since no Initial Study had been prepared for this alternative, it was determined that a full EIR would need to be prepared for the amended project. The EIR will address the four impact areas described above for the western expansion alternative, and will address a full range of impact areas for the northern alternative. The northern alternative is expected to have impacts in the following areas:

Traffic and Transportation: The northern alternative would have impacts similar to the western alternative. It could increase traffic over existing levels, possibly resulting in traffic congestion and traffic safety problems.

Air Quality: Similar to the western alternative, the northern alternative could increase dust and diesel emissions at the quarry, and could increase the concentrations of diesel emissions along some local roads.

Noise: Similar to the western alternative, the northern alternative would require blasting, which could cause noise and vibration impacts. Increased truck traffic could result in noise impacts along local roads. Quarry operations could increase noise levels at residences near the quarry, although the northern alternative would affect different residences than the western alternative.

Hydrology and Water Quality: Similar to the western alternative, the northern alternative could result in soil erosion and deposition of sediment in Green Valley Creek.

Biological Resources: The northern expansion alternative could result in loss of habitat for sensitive species, should any habitat be present in the proposed mining area.

Cultural Resources: The northern expansion alternative could damage archaeological resources, if any are present in the proposed mining area.

Aesthetics: The northern expansion alternative could have adverse visual impacts.

Geology and Soils: The northern expansion alternative could result in unstable slopes.

Hazards and Hazardous Materials: The quarry would use hazardous materials such as fuels, lubricants, solvents, etc. Spills of these materials could contaminate ground or surface water.

Public Services and Utilities: The quarry could increase demand for fire, police, or emergency medical services.

APPENDIX B

SUMMARY OF WRITTEN RESPONSES TO NOTICE OF PREPARATION

The following identifies the agencies and individuals that responded to the Notice of Preparation for the Canyon Rock Quarry EIR, and provides a summary of their responses.

AGENCIES

US Fish and Wildlife Service, December 11, 2002 - Provided species list for sensitive and threatened species and species of concern.

Northern Sonoma County Air Pollution Control Board, December 10, 2002 - Questions whether asbestos is naturally occurring in quarry material.

Corps of Engineers, December 20, 2002 - Dredge and fill, Section 404.

California Department of Fish and Game, January 2, 2003 - Acquisition/preservation of open space, habitat restoration, identification of rare and sensitive plant and animal species, Federally listed northern spotted owl, Green Valley Creek water shed impacts, erosion and deposition to Green Valley Creek, coho salmon in Green Valley Creek, no net loss of wetlands, wetlands buffer, Stream Bed Alteration Permit if applicable.

INDIVIDUALS

Tom Padrick, e-mail of December 16, 2002 - Opposes project, concerns - traffic, air, noise, water, and services.

Mike Krivoruchko, two e-mails, December 18, 2002 - Opposes project, concerns - increase truck traffic, safety of children going to school, concerned about wildlife, specifically coho salmon, impacts to Green Valley Creek restoration/preservation, enforcement of Endangered and Threatened Species Act, change in water temperature Green Valley Creek due to clearing, pond volume/containment during rainfall events.

Chris Peterson, December 18, 2002 - Opposes project, key concerns - traffic particularly as relates to Forestville Elementary School, air quality mainly diesel as it affects school children, water quality and water quality impacts to Green Valley Creek and its coho salmon populations

Poppy Hill Farm, Patricia and Joe Sims, December 20, 2002 - Opposes project, concerns - water quality and quantity, erosion, silting of Green Valley Creek, noise, traffic and aesthetics. Impact to their farm.

Joe Martinelli, December 21, 2002 - Opposes project, concerns - silt and gravel washing into Green Valley Creek impaction the salmon population, traffic on SR 116 and Martinelli Road, noise, air quality, dust, wildlife habitat, soil erosion and slippage, aesthetics, quality of water in Green Valley Creek, public services overextended.

Barbara Shilo, e-mail December 27, 2002 - Opposes project, concerns - the wildlife habitat on the Northern Expansion area, truck traffic on Martinelli Road, pollution, adverse effect on the school and downtown area.

Barbara Shilo, December 27, 2002 - Letter repeats e-mail concerns above.

Eve Martinelli Hoar, December 29, 2002 - Opposes project, concerns - 30 years of silt and impacts to Green Valley Creek, loss of wildlife.

Sharon Martinelli, December 29, 2002 - Opposes project, key concerns - traffic increase and traffic safety issues, hydrology and water quality to Green Valley Creek, Cumulative impacts of Canyon Rock Quarry, restoration of Green Valley Creek, hazardous materials, slope stability and soil runoff, noise, archaeological values.

Poppy Hill Farm, Patricia and Joe Sims, December 30, 2002 - Opposes project, comments - damage to flora and fauna, watershed impacts, visual impacts, impacts to Green Valley Creek and forest wildlife, increase in air pollution, noise and traffic, diesel fumes and dust, adjacent progressive land management.

Lee Sannella, M.D. & Gary Starr, December 30, 2002 - Oppose project, comments - health effects caused by emissions from quarry, traffic, visual and aesthetics-scenic devastation, property and land value decreases, noise, severe health effects from emissions and hazardous materials - quarry emissions operations, fuel emissions(trucks and heavy equipment), and particulates, other comments on public services, road impacts, proximity to schools and parks, biological resources, water shed, water quality, geology and soils, flooding, seismic activity, climate change, cultural resources, public nuisance and sociological economics.

Louis Sloss, December 30, 2002 - Opposes project, concerns - pollution and truck traffic, shipping material out of County.

Neil Covington, January 2, 2003 - Opposes project, concerns - has monitored increased truck traffic, air quality contamination caused by diesel, question on number of businesses operating on-site.

Cam Parry, January 5, 2003 - Opposes project, concerns - concerns - diesel emissions and public health effects, total truck trips, particulate pollution, blasting noise and aesthetic destruction, effects upon Green Valley Creek and watershed, wildlife and endangered species, trace elements and leaching, the realities of reclamation, Federal, state and agency jurisdictions..

Shute, Nihaly & Weinberger, Laurel Impett, January 6, 2003 - Submitted on behalf of the Forestville Citizens for Sensible Growth, concerns - full compliance with CEQA, document Quarry violations of permits and reclamation plan, compliance with approvals and permits, identify noise complaints, identify and assess proposed project's potentially significant impacts, alternatives analysis.

Theresa Martinelli- Jones, e-mail, January 6, 2003 - Opposes project, concerns - dirt/dust impacts, noise, erosion, truck traffic and related air pollution, road damage, accidents, diesel fumes, concern for Green Valley Creek, loss of wildlife and fish habitat, penalties assessed if not complying with permits, scenic road regulations, zoning, health impacts, chemical contamination.

Heather Rawson, January 10, 2003 - Opposes project, concerns - Green Valley Creek Restoration not be degraded, cutting of conifers and old trees, archaeological values, visual and noise effects.

Joyce Homenko, January 11, 2003 - Opposes project, concerns - dust particles causing asthma, oppose project.

Robert Young, January 13, 2003 - Opposes project, concerns - businesses on Martinelli Road, impacts to Green Valley Creek and already completed restoration, Martinelli Road not compatible with heavy truck traffic.

Herb Nurmi, January 14, 2003 - Oppose project, concerns - existing vested rights, number of truck trips, route of trucks and issues with various intersections, health hazards of diesel particularly with respect to school, accidents, acreage to be cleared, discharge and disposal of waste, hazardous materials, water quality and conditions of Green Valley Creek, restoration plan adequacy, visual aspects of a quarry, wildlife impacts.

APPENDIX C

INITIAL STUDY AND MITIGATION MEASURES/CONDITIONS OF APPROVAL FOR WESTERN EXPANSION OPTION

COUNTY OF SONOMA
PERMIT AND RESOURCE MANAGEMENT DEPARTMENT

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

ENVIRONMENTAL CHECKLIST FORM

FILE #: PLP 97-0046 **PLANNER:** Kenneth Ellison

PROJECT: Canyon Rock Quarry Expansion **DATE:** 7/17/2000
LEAD AGENCY: Sonoma County Permit and Resource Management Department

PROJECT LOCATION: 7525 Hwy 116 North, Forestville

APPLICANT NAME: Wendel Trappe

APPLICANT ADDRESS: 7525 Hwy 116 North, Forestville, Ca 95436

GENERAL PLAN DESIGNATION: Resources and Rural Development 160 acre density

SPECIFIC/AREA PLAN: NA

ZONING: RRD (Resources and Rural Development) - B6 - 160 acre density - Scenic Resources

DESCRIPTION OF PROJECT: Request for a Use Permit/Reclamation Plan to expand the existing Canyon Rock Quarry (located on AP's 083-130-042, 043, 006, and 083-210-019) by approximately 30 acres to the west (onto AP's 083-210-013, 016, 017, 018), and a Zone Change to add the MR (Mineral Resource) combining district to the expansion area, on property located at 7525 Hwy 116 North, Forestville, Supervisorial District #5. See project application for detailed description and mining/reclamation plans and procedures.

A Program Environmental Impact Report (the "PEIR") has been prepared, publicly heard and certified and adopted by the Board of Supervisors in accordance with all legal requirements on November 1, 1994 as part of the adoption of the Sonoma County Aggregate Resources Management Plan and Environmental Impact Report, November, 1994 (the "ARM Plan"). Pursuant to the California Environmental Quality Act (CEQA) and the Administrative Guidelines developed to implement the Act (the "CEQA Guidelines"), the PEIR has been certified as adequate for consideration of applications for aggregate mining and reclamation operations found to be consistent with the ARM Plan. The purposes of this Initial Study are as follows: (1) To determine whether the proposed project and all of its elements are within the scope of the ARM Plan; (2) To determine whether the PEIR adequately analyzes the impacts of the proposed project and all of its elements and provides a range of mitigation measures sufficient to mitigate the significant environmental impacts of the proposed project, or that the adopted statements of overriding considerations are applicable to this project; (3) To determine whether the proposed project and all of its constituent elements could result in any site-specific impacts not analyzed in the PEIR; and (4) To identify and suggest appropriate mitigation measures for any such additional environmental impacts.

Pursuant to the California Environmental Quality Act, the Sonoma County Permit and Resource Management Department conducted this Initial Study to make the determinations set out above. On the basis of the Initial Study the following findings are recommended to the decision making body:

A. The proposed project is within the scope and intent of the ARM Plan.

B. The PEIR adequately analyzes the impacts of the proposed project and provides a range of mitigation measures sufficient to mitigate significant environmental impacts of the proposed project, except as noted below.

C. Although the proposed project could have a significant effect on the environment, there WILL NOT be a significant effect in this case (except as described below) because all potentially significant effects (a) have been analyzed adequately in an earlier EIR and this Initial Study pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR and this Initial Study, and the mitigation measures have been added to the project and agreed to by the applicant prior to release of this Initial Study and Mitigated Negative Declaration for public review.

The Initial Study has also determined that the proposed project may have impacts which are individually limited but cumulatively considerable or impacts which are unavoidable but acceptable. The cumulative or other impacts can be and are partially mitigated through the imposition of the attached conditions of approval/mitigation monitoring plan. However, certain of the impacts were found by the Board of Supervisors to be unavoidable when it adopted the ARM Plan and it's PEIR. Pursuant to Sections 36 and 37 and Exhibit "B" of Resolution 94-1569, the Board of Supervisors adopted Findings of Overriding Considerations and determined that the benefits of the adoption and implementation of the ARM Plan outweighed the unavoidable adverse impacts. These findings apply to the impacts of this project.

The environmental documents which constitute the Initial Study and provide the basis and reasons for this determination are attached or referenced herein, and hereby made a part of this document. The documents referenced/developed, and which are available for review in the project file or other files at the Permit Processing Division of the Permit and Resource Management Department, are listed below under "Incorporated Source Documents".

SURROUNDING LAND USES AND SETTING: Briefly describe the project's surroundings:

North, East, and West - Large lot rural residential uses, with Green Valley Creek and Martinelli Road passing along the eastern boundary of the property.
South - Across Hwy 116 is Blue Rock Quarry, with additional rural residential uses to the south-east.

Other Public Agencies whose approval is or may be required (e.g. permits, financing approval, or participation agreement): State Department of Conservation (Office of Mine Reclamation), State Fish and Game, Regional Water Quality Control Board, Regional Air Quality Control Board, U. S. Army Corps

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

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

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

DETERMINATION

On the basis of this initial evaluation:

___ The proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

___ Although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

___ The proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

___ The proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed by in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

_X_ Although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier PROGRAM EIR and this INITIAL STUDY pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR or this INITIAL STUDY, including revisions or mitigation measures that are imposed upon the proposed project and agreed to by the applicant, or a Statement of Overriding Considerations has already been adopted for said impacts along with certification of the Program EIR, a MITIGATED NEGATIVE DECLARATION Tiered on the PROGRAM EIR will be prepared.

The environmental documents which constitute the Initial Study and provide the basis and reasons for this determination are attached or referenced herein, and hereby made a part of this document.

Incorporated Source Documents

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

_x_ Project Application and Description
___ County Planning Department's Sources and Criteria Manual
_x_ Sonoma County General Plan and Associated EIR
_X_ Sonoma County Zoning Ordinance
_X_ Sonoma County Rare Plant Site Identification Study
_X_ Project Referrals from Responsible Agencies
_X_ State and Local Environmental Quality Acts (CEQA)
_X_ Full record of previous hearings on property located at the PRMD
_X_ Correspondence received on project.
_X_ 1980 ARM Plan and EIR
_X_ 1994 Aggregate Resources Management Plan and Program EIR
_X_ Roblar Road Quarry Draft EIR
_X_ 1998 Sonoma County Central Disposal Site Improvement Program EIR and associated Study on Impacts of Blasting Operations and Recommended Practices and Controls for the Central Disposal Site Improvement and Rock Extraction Projects Report of Investigations, by Gordon Revey (GEOTEK & Associates, Inc.), dated 7/98
_X_ Resolution No. 94-1569, November 1, 1994 of the Sonoma County Board of Supervisor (certifying the 1994 ARM Plan Program EIR and adopting the 1994 ARM Plan)
_X_ Resolution No. 95-0450, April 11, 1995 of the Sonoma County Board of Supervisors (establishing the Gravel Mitigation Fund)

X A Cultural Resources Evaluation of the Proposed Expansion of Canyon Rock Quarry, Forestville, Sonoma County, California by William Roop, dated 11/14/97

X Canyon Rock Quarry Expansion Botanical and Wildlife Assessment and Survey, by Prunuske Chatham, Inc., dated 11/97, and Follow up Report dated "Summer 1999"

X Report Geotechnical Reconnaissance Canyon Rock Expansion Forestville, California, by Bauer Associates, dated 11/17/97

X Canyon Rock Company Conditional Use Permit Application Forestville, California Environmental Noise Assessment, by Richard Rodkin, PE (Illingworth & Rodkin, Inc.), dated 11/13/97, and Follow up letter from Richard Rodkin dated 12/24/98, and Follow up letter from Richard Rodkin dated 7/16/99

X Letter on Truck Activity in Forestville Related to the Canyon Rock Company from Steve Weinberger, PE (Whitlock & Weinberger Transportation, Inc.), dated 12/21/98

X Material Safety Data Sheet for Dust Suppressant CDS 8040 and Follow up letter from Zora Welborn dated 2/18/98

X Blue Rock Canyon Expansion request (File PLP 97-0069), including noise and traffic reports (Biological Impact Assessment Proposed Expansion of the Blue Rock Quarry by Marco Waaland dated 1/30/98, and Traffic Impact Study for the Expansion of Blue Rock Quarry by TJKM dated January 1998)

X Study on Truck Traffic Impacts along Mark West Quarry Haul Route by the County Department of Transportation and Public Works dated July 1997

X County of Sonoma Traffic Volumes report January 1994 through December 1998 by the County Department of Transportation and Public Works

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section 17 at the end of the checklist, "Earlier Analysis" may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:

a) Earlier Analysis Used. Identify and state where they are available for review.

b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of an adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated", describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:
a) the significance criteria or threshold, if any, used to evaluate each question; and
b) the mitigation measure identified, if any, to reduce the impact to less than significance.

Baseline Determination

To evaluate the potential environmental impacts of the proposed project (to extend the life of the quarry by at least 20 years at a 500,000 cubic yard maximum annual production limit) a determination must be made as to what the 'baseline' for the environmental analysis will be. The 'baseline condition' is the environmental condition that would exist if the project is not commenced. Potential project impacts can then be compared against the baseline condition to determine their significance. For potential impacts which are primarily created to on site resources, and/or can be mitigated by on site actions, the baseline determination is reasonably straightforward - all newly created impacts that are identified must be fully mitigated. For example, the proposed project will directly impact biological resources on the project site, so conditions must be developed which will mitigate those impacts. In general, for this project impacts to Aesthetics, Biological Resources, Hazards & Hazardous Materials, Minerals Resources, Public Services, Utilities/Service Systems, Agricultural Resources, Cultural Resources, Hydrology/Water Quality, Recreation, Geology/Soils, Land use and Planning, and Population/Housing, all fall into this category and are relatively straightforward to identify and mitigate.

However, for impacts to Transportation/Traffic, Noise, Air Quality, and to a much lesser extent some of the other categories of impacts, the baseline issue is more complicated if the intent of CEQA to mitigate all potential impacts of the project is to be met. This is because Canyon Rock Quarry is already operating and producing noise, truck traffic, and dust, from the adjacent vested right processing plant area, and mining in the proposed expansion area would extend the lifetime of those offsite created impacts by at least 20 years (by providing additional materials to be processed in the existing {offsite} quarry processing plant). Analyzing this issue is further complicated by the fact that mining of the expansion area would not begin for a number of years, potentially allowing changes in circumstances in the existing environment to occur before the mining commenced in the expansion area. For example, if the existing quarry reserves were exhausted and the off site processing plant shut down prior to mining in the project area beginning (with no traffic, noise, or dust occurring), and those impacts were reestablished at the offsite processing plant because mining began on this site, then that would be an impact of this project that must be mitigated.

While evaluating this baseline issue, letters on the legal issues involving it were received and taken into account from the applicant's attorney, the opposition's attorney, and County Counsel's office. While these letters and the following analysis focus on the issue of traffic because it is the most significant and the easiest to quantify of the existing quarry's impacts, the determination of the proper baseline to use for evaluating the environmental impacts of this project would equally apply to noise, air quality, and other concerns from the existing offsite quarry that may be extended in life.

The applicant has proposed that the environmental baseline for the project should include all of the existing quarry traffic (and other associated impacts). The applicant has also indicated that since the proposal is to maintain the same level of traffic (and impacts) as presently exist, such a baseline would result in there being very few significant traffic (and other) impacts being found for the project (Essentially the project traffic would be 'replacement' as opposed to 'new' traffic.). However, using such a baseline leaves out a number of critical factors, including 1) the majority of the existing traffic (and other impacts) being generated by the quarry has never been subject to an environmental analysis under CEQA, and 2) the existing traffic (and other impacts) being generated by the quarry has a finite lifetime, and will cease to exist in the relatively near future if an expansion proposal is not approved, and 3) the proposed expansion area would not begin to be mined for a number of years (a large portion of the existing permitted area would need to be mined first to reach the expansion area).

In regard to point #2, to evaluate the potential lifetime of the existing quarry and associated truck traffic (and other impacts), the total available quarry reserves must be estimated. Three methods were used to estimate the remaining reserves on site. The first method used was taking the 1994 County ARM Plan estimate for the reserves left in the permitted quarry (vested right area plus 1991 expansion area), which was 4.5 to 6.0 million tons, and subtract an estimated annual production figure from the quarry from 1993 to the present date (Note: 1993 was used as a starting point since the 1994 ARM Plan was primarily written using 1992 data). For the purposes of this analysis, it was estimated the quarry on average operated at 50% capacity (or 375,000 tons per year) for the last 7 years, for a total of approximately 2.6 million tons mined since the reserve estimate was made. Using the high end of the reserve range (which for the purposes of this analysis would be the most conservative estimate), 6.0 million tons reserve minus 2.6 million tons mined would give an estimated total remaining reserve of 3.4 million tons.

The second method used to estimate the reserves of the existing quarry, was to take the quarry reserve figures from the applicant's approved 1991 reclamation plan, which was approximately 5,000,000 cubic yards (or 7.5 million tons), and subtract an estimated annual production figure from the quarry from 1988 to the present date (Note: 1988 was used as a starting point since the 1991 reclamation plan was based on a 1987 topographic map of the quarry). For the purposes of this analysis, it was once again estimated the quarry on average operated at 50% capacity (or 375,000 tons per year) for the last 12 years, for a total of approximately 4.5 million tons mined since the reserve estimate was made. Using this method, 7.5 million tons reserve minus 4.5 million tons mined would give an estimated total remaining reserve of 3.0 million tons.

The third method used to estimate the reserves of the existing quarry, was to take the latest available topographic map of the quarry submitted by the applicant (dated 1996), and divide the quarry reserve area into 130 rectangular grids (100 foot square each). The final elevation of the existing approved reclamation plan for the quarry at each of the 130 grid points was then subtracted from the 1996 elevation at the same point, to give depths of material to be removed. The 130 depth data points were then averaged, which resulted in an average depth of material to be removed of 86 feet. This 86 feet of average depth was then multiplied by the 1,300,000 square feet of the quarry reserve area, and then divided by 27 to result in a estimate of 4,153,740 cubic yards of material to be removed (or approximately 6.2 million tons). This 6.2 million ton figure then had an estimated annual production figure from the quarry from 1997 to the present date subtracted (Note: 1997 was used as a starting point since the topo map used was dated 1996). Given the significant upswing in economic and building activity during the last 3 years, this time it was estimated the quarry on average operated at 75% capacity (or 562,500 tons per year) for the last 3 years, for a total of approximately 1.7 million tons mined. Using this method, 6.2 million tons reserve minus 1.7 million tons mined would give an estimated total remaining reserve of 4.5 million tons.

Therefore, the three methods used to estimate quarry reserves came up with 3.4, 3.0, and 4.5 million tons. (Note: The 4.5 million ton figure may actually be high because it includes overburden material that might be left on site) At the maximum annual production rate of 500,000 cubic yards per year (or 750,000 tons), this means the existing permitted quarry reserve (vested right area plus 1991 expansion area) would be completely exhausted and the facility closed down in approximately 4 to 6 years. If the quarry were to operate at 75% of capacity (or 562,500 tons per year), the quarry reserve would be completely exhausted in 5 to 8 years. If the present economic and building boom were to stop immediately and quarry production drop to 50% of capacity (375,000 tons per year), the quarry would be completely exhausted and the facility closed down in approximately 8 to 12 years. Note that it is likely that such production rates (and associated truck traffic) would not be maintained right up until closure of the quarry. A more likely scenario is that as the quarry neared the end of the reserves, production (and related truck traffic), would drop off significantly because of problems with areas of poor quality rock, and necessary reclamation activities that would need to be ongoing at the same time as the facility began to close down.

In reviewing the above, it is clear that the existing quarry and related traffic it produces will cease to exist in the relatively near future (most likely in the 5-8 year range). In addition, when it is considered that mining in the proposed expansion area would not begin for a number of years (not until a significant portion of the existing quarry reserves are already gone), the timing between when the existing quarry might be shut down and the beginning of mining in the proposed expansion area may be as short as 2-5 years. These facts (and that the majority of the existing quarry traffic has never been subject to a full CEQA review), indicate that the proper environmental baseline to use in evaluating traffic impacts of the proposed expansion, is one where all traffic from the proposed expansion area is considered "new" traffic (that is not offset by the soon to be reduced existing quarry traffic levels). This baseline analysis would also hold true for noise, air quality, and other impacts from the existing quarry that would have their lifetime extended by this application, and was how this Initial Study analyzed potential impacts of the project and mitigation measures for them.

1. **AESTHETICS** Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?			x	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	X			
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	X			
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?		X		

Comment:

a) The existing quarry work area is presently, and with the proposed expansion would continue to be, visible from some hillside residential properties in the area until final reclamation of the site is completed. However, there are no officially designated scenic vistas in the area.

b-c) The 1994 ARM Plan Program EIR found that quarry mining activities could result in significant visual impacts where such operations are clearly visible to passersby in scenic corridors and landscape units or where several operations are located in close proximity and/or present an industrial atmosphere which is in contrast with the surrounding rural landscape. The proposed project expansion area is located directly adjacent to the Hwy 116 scenic corridor, and the quarry work area would be visible from it. The proposed mining site is also adjacent to Blue Rock Quarry. Ultimately, the site is proposed to be reclaimed back to wildlife habitat.

During operation of the quarry, the visual impacts are greatest during the mining phase when the heavy equipment and extensive earthwork and excavation creates the impression of industrial operations or development in an otherwise rural setting. This initial impact is lessened with the successful reclamation of the site to a more natural wildlife habitat setting. A significant long term visual impact is still possible though. Adherence to standards set forth in the ARM Plan, i.e. setbacks, revegetation/screening wherever possible, limiting the total amount of disturbed area on site prior to final reclamation of the area (verified with aerial photographs or detailed site plans), etc., will minimize visual impacts while the site is being actively mined. In addition, the mining plan has been designed so that work occurs on the back side of the ridge as it approaches Hwy 116, and a berm approximately 30 feet high will be left along the highway, both of which will further help reduce visual impacts. Strictly limiting the storage of unnecessary junk, debris, and parts unnecessary to the mining operation on site can also help control visual impacts. However, even with these mitigations, visual impacts cannot be reduced to a level of insignificance.

In adopting the 1994 ARM Plan Program EIR, the Board of Supervisors recognized that aggregate mining had potential unmitigable visual impacts, and adopted a "Statement of Overriding Consideration" indicating why the benefits of aggregate mining projects outweighed the disadvantages of the unavoidable visual impact. This statement is contained in Resolution No. 94-1569 and is applicable to the proposed project.

d) The quarry may occasionally work into the evening until the 10:00 p.m. deadline imposed by the County Surface Mining Ordinance. The lights used for this operation would be located both on the mobile and fixed pieces of equipment on site, and would normally be screened from view by the berms and hills surrounding the work area. However it is possible that some of the lights will be visible at different times. The County standard conditions of approval prohibit direct light or glare onto adjacent properties. As such, the potential for light or glare on adjacent roadways or residences is concluded to be mitigated to less than significant.

2. **AGRICULTURE RESOURCES**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	___	___	___	X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	___	___	___	X
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	___	___	___	X

Comment:

a)-c)The subject property is located in an area of steep terrain with poor soils which is designated Resources and Rural Development in the County General Plan. There is no agricultural land or significant agricultural uses adjacent to the site that would be significantly impacted by the project.

3. **AIR QUALITY**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	___	___	___	X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	___	X	___	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	___	___	X	
d) Expose sensitive receptors to substantial pollutant concentrations?	___	X	___	
e) Create objectionable odors affecting a substantial number of people?	___	___	___	X

Comment: For assessing air quality impacts, a baseline as described in the beginning of this initial study was used (essentially, all air quality impacts created by the project on or off site are 'new' impacts that must be mitigated).

a) There are no air quality plans for the project area that would be impacted by this application. (Note: The project will have to be in compliance with standard Northern Sonoma County Air Pollution Control District regulations. For a discussion of this see items 3b and 3d of this Initial Study)

b) The proposed mining operations could generate air emissions through equipment and truck exhausts and fugitive dust. This could impact both residences/uses adjacent to the quarry and residences/uses located close to the primary haul route. Consistent with SMARO, dust can be controlled to acceptable levels through routine watering of any dirt or gravel roadways/work areas where dust may be raised. In addition, the existing gravel processing plant is already in full compliance with the standards and regulations of the Northern Sonoma County Air Pollution Management District (NSCAPCD) which acts as the lead regulatory agency on stationary sources. These standards require the existing plant to be equipped with spray misters to keep dust down during the aggregate processing.

The ARM Plan PEIR also indicates that truck exhaust emissions can be reduced through frequent inspection and maintenance and by reducing idling or operational time. The project will reduce the operational time to a minimum by processing the aggregate onsite using the existing plant, and eventually using a conveyor belt system to move materials to the plant (instead of haul trucks), resulting in less overall truck trips and truck emissions. Unlike passenger vehicles, Diesel haul trucks do not have to pass regular SMOG tests. The State Air Resources Board is the lead agency regulating exhaust emissions from mobile sources and routinely conducts random truck emission checks on major trucking routes. In addition, the California Highway Patrol can cite trucks where the exhaust exceeds the allowable opacity standards.

In any case, the level of trucking is not anticipated to be higher than historic levels of trucking, and a review of air quality monitoring data over the last 15 years indicates that the attainment levels for test constituents normally associated with vehicle exhausts have not been substantially exceeded in this area (For example, during the worst case period, 1996 to 1998, Federal Ozone levels were only exceeded 6 times). This is partly due to the fact that even though there are more vehicles on the road each year, newer trucks and vehicles have had to meet stricter emission standards over time. New proposed (5/17/2000) Federal Environmental Protection Agency regulations would further reduce the emissions from new diesel trucks starting in 2007 (which is about the time significant mining would be starting to occur in the requested expansion area) by requiring that soot and nitrogen oxide levels be reduced. In addition, the amount of sulfur in diesel fuel would have to be cut to no more than 15 parts per million, from the current 340 to 500 parts per million, which would reduce emissions from existing trucks. Drawing conclusions similar to the ARM Plan Program EIR, this initial study finds that the air quality impacts can be reduced to a less-than-significant level by requiring dust control and full compliance with the air quality standards of the NSCAPCD (Northern Sonoma County Air Pollution Control District) which acts as the lead regulatory and monitoring agency. (Note, see also discussion under item 3d below)

c) The project would not involve any air quality pollutants for which the area is not in substantial compliance with federal or state air quality standards.

d) Only a few sensitive receptors in the form of residences or other privately owned offsite structures are located adjacent to or near the site, the closest of which is about 300-400 feet to the north of the project site, and 200 feet to the south-west of the project site on the other side of Hwy 116. Although these residences are not directly adjacent to where the mining and reclamation activity will be conducted, there remains the potential for impact during high winds. Also, the adjacent roadways could be affected by excessive dust, or gravel dragged up onto the highway by haul trucks. Therefore, the approval for the proposed project must include standard measures requiring the applicant to use water sprays, avoid disturbing soils in high winds, etc. as necessary to prevent excessive dust generation. In addition, tire scrapers on site must be kept in good working order, paved areas on site and on Hwy 116 adjacent to the driveway intersection must be kept clear of excessive dust and loose materials, and the total amount of disturbed area on site prior to final reclamation be limited to no more than what presently exists (verified with aerial photographs or detailed site plans). These measures are consistent with the ARM Plan and SMARO requirements and would reduce the potential impact to a level that is less than significant. (Note: For a discussion of off site air quality impacts from truck emissions see discussion under item 3b)

e) Aggregate mining is not known to generate objectionable odors.

4. **BIOLOGICAL RESOURCES** Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	___	X	___	
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	___	X	___	
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal filling, hydrological interruption, or other means?	___	X	___	
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	___	X	___	
e) Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?	___	___	___	X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat conservation plan?	___	___	___	X

Comment:

a)-d)The project site consists of steeply sloping terrain with a few small seasonal drainages, covered primarily with North Coast conifer forest, riparian scrub, chaparral, and seasonal wetland. Green Valley Creek with its associated riparian habitat zone also passes along the east side of the existing quarry property. Green Valley Creek is a designated riparian corridor in the County General Plan.

Coho, Steelhead, and Chinook Salmon have been listed by the Federal Government as threatened (in the Russian River area and tributaries) under the Federal Endangered Species Act. In addition, the Russian River area and tributaries have been listed as Critical Habitat Area for the Coho Salmon.

Mining of the subject property would result in the loss of all native vegetation and wildlife within the proposed mining area until such time as the property has been fully reclaimed to wildlife habitat. All natural drainage features in the mining area would be permanently removed, and the flow of water into drainage ways leading off site could be changed leading to possible downstream impacts (While most of the site drains directly to Green Valley Creek through the existing quarry sediment ponds, some of the proposed expansion area drains under Hwy 116 and then towards Green Valley Creek). Although the proposed mining area is farther away from Green Valley Creek than the existing quarry area, incorrect mining techniques could lead to erosion control problems and excessive siltation and/or water temperature impacts on the creek. The use of chemical dust suppressants and the use of small amounts of hazardous materials to maintain the heavy equipment on site (i.e. diesel, gasoline, oil, cleaning solvents, etc.) could also lead to contamination of the creek. Excessive siltation, contamination, or water temperature impacts on the creek could have adverse impacts on the Federally listed species of Coho, Steelhead, and Chinook Salmon and/or their habitat.

A botanical and wildlife survey of the property was conducted by Prunuske Chatham, Inc. in November of 1997, and a Follow up report was conducted the summer of 1999. No special status plant species were observed on the site during the surveys. A number of small seasonal wetlands and seasonal/ephemeral streams were identified on site. Modification of these sites may require U.S. Army Corps of Engineers permits and/or Stream Bed Alteration Agreements with the State of California Department of Fish and Game. No special status animal species were observed on site during the surveys. However, the survey did recommend that the monitoring for Spotted Owl be repeated just prior to mining according to U.S. Fish and Wildlife protocol (6 visits in one year, or 3 visits per year for two years).

The ARM Plan Program EIR reviewed the potential biological impacts of typical quarry development and found they could cause the removal of riparian vegetation which can reduce the amount of cover and food supply available to fish and raise water temperatures within a stream and may increase the amount of erosion and fine sediment in streams. These potential impacts were found to be mitigable to less than significant by requiring all quarry operations to be set back a minimum of 100 feet from stream banks and other designated critical habitat areas, and adoption of standards to control erosion and sedimentation. In this particular case, the proposed mining area is located well over 100' from Green Valley Creek (Note that the existing quarry operation does not meet this standard), and the applicant has agreed to meet all ARM Plan standards for controlling erosion, sedimentation, and revegetation (including the stockpiling of existing topsoil, State Fish and Game review of the Final Reclamation Plan, and assessment surveys of damage to reclaimed areas). In addition, the existing buffer zone/riparian corridor located between the existing quarry and Green Valley Creek can be upgraded though working with the State Department of Fish and Game and PRMD to insure all quarry related materials have been removed from the area, and any replanting necessary to insure the continued health of the buffer/riparian zone is conducted.

The ARM Program EIR also found that quarry development could remove upland habitat areas of relatively limited value and may affect some riparian and other habitats of greater significance. These potential impacts were found to be mitigable to less than significant by requiring all quarry operations to include minimum setbacks from stream corridors, avoidance of riparian vegetation and habitat areas, and eventual revegetation of upland vegetation. However the ARM Plan noted that significant impacts on rare or endangered plants or animals or other valuable habitats could occur on a case by case basis and would require further studies and mitigation through avoidance, equivalent offsite replacement, or other potential mitigations.

In this particular case, as previously described, the project would meet all ARM Plan required creek setback, erosion control, and revegetation standards, and go further in actually enhancing the riparian corridor along Green Valley Creek that lies within the existing quarry operation. In addition biological surveys of the property were conducted to identify any potential site specific rare or endangered species or their habitats, and none were found on site (Note that further monitoring for Spotted Owl would be required just prior to mining pursuant to U.S. Fish and Wildlife standards, and U.S. Army Corps and State Fish and Game permits/approvals may be necessary for removal of the small seasonal wetlands on site, and State Department of Forestry Permits may be necessary for timber harvest). The project would also be required to meet reclamation plan timing and bonding standards established by PRMD and the State Department of Conservation to insure that all final reclamation grading and replanting activities take place in a timely manner.

Specific to this site, it has also been noted that while most of the property drains through the existing quarry and sediment control ponds before reaching Green Valley Creek, a portion of the proposed mining area drains under Hwy 116 and then down a road side drainage ditch to Green Valley Creek. Disruption of water supplies to off site drainages could potentially have downstream impacts. Mitigation requires that the quarry drainage and sediment control plan retain the same overall water levels flowing off site into the Hwy 116 crossing as naturally occurs unless otherwise approved by the State Department of Fish and Game.

It is also noted that since adoption of the ARM Plan the Coho, Steelhead, and Chinook Salmon have been listed as threatened under the Federal Endangered Species Act, and critical habitat area for the Coho have been established. However, given the distance between the proposed mining area and Green Valley Creek, and that the existing quarry operation lies between the two, potential impacts to the species and/or their habitat would be limited to excessive siltation adversely impacting water quality/temperature, and potential hazardous materials spills.

In regard to siltation, as stated above strict standards controlling erosion and siltation are required by the ARM Plan, in addition to obtaining all required Regional Water Quality Control Board Permits. This includes proper design and regular maintenance of all drainage ditches and sedimentation ponds on site, and operation of equipment in a manner to minimize erosion/sedimentation problems. In regard to hazardous materials (diesel, gasoline, oil, cleaning solvents, etc.) a standard spill prevention plan meeting all Federal, State, and local standards is required, and importation of any other hazardous materials or soils is prohibited. Excessive use of fertilizer high in nitrogen or phosphorus during reclamation activities could also impact runoff water quality (and aquatic life), and must be limited.

A chemical dust suppressant is also proposed (though not required) to help meet air quality standards. The proposed suppressant CDS 8040 could in large quantities have adverse impacts on water quality. However, it is also known to readily biodegrade. Given that the proposed use of the suppressant is exactly the same as has historically occurred (to be sprayed in diluted form only occasionally into the crusher or on the ground, with any runoff collected and passing though two sedimentation ponds before draining towards the creek), with no known adverse water quality impacts, that State Department of Fish and Game review will be required of the suppressant, and that dust suppressant water will be recycled from the sedimentation ponds to help minimize water flow to the creek, no significant water quality impact is expected from it.

Given the above discussion, no significant unmitigated impacts to Federally listed species of concern or their habitat, or biological resources in general are expected from the proposed project.

e) The project is proposed to be fully consistent with all local policies and ordinances protecting biological resources.

f) The proposed project does not conflict with any adopted Habitat Conservation Plan, or other adopted Natural Community Conservation Plans.

5. **CULTURAL RESOURCES** Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	___	X	___	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	___	X	___	
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	___	X	___	
d) Disturb any human remains, including those interred outside of formal cemeteries?	___	X	___	

Comment:

a)-d) A Cultural Resources Evaluation of the Proposed Expansion of the Canyon Rock Quarry was prepared by William Roop of Archaeological Resource Service, dated November 14, 1997. There were no historical, archaeological, paleontological, unique geological, or human remains sites identified in the project area, and the likelihood of finding buried archaeological resources was considered very low due to the steep terrain and lack of available water on site. However, grading and earthmoving activities could have a potential impact on such resources if any are uncovered during the mining process. This impact is mitigated by requiring the operator to adhere to a series of training, noticing, and handling requirements established in the 1994 ARM Plan Program EIR with the assistance of the Native American community and the Sonoma State Archaeological Center. The potential impacts in this area are therefore determined to be mitigated to less than significant.

6. **GEOLOGY AND SOILS** Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
I) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	___	X	___	
ii) Strong seismic ground shaking?	___	X	___	
iii) Seismic-related ground failure, including liquefaction?	___	X	___	
iv) Landslides?	___	X	___	
b) Result in substantial soil erosion or the loss of topsoil?	___	X	___	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	___	X	___	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	___	___	X	
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	___	___	X	

Comment:

a)-c)Terrain in the project area consists of steep slopes, with unstable soils, and the potential for high rates of erosion. The project is also located in a region that is known to be seismically active, and significant ground shaking can occur at any time. This type of terrain and geological features are typical of most steep hillsides and hard rock quarry operations in Sonoma County.

The ARM Plan Program EIR analyzed the type of geological/soil impacts that typical quarry operations might have, and found that there is the potential to create steep slopes which can lead to landslides, erosion, and slope stability problems, and further, that seismic activity on site could also affect slope stability. The ARM Plan Program EIR found that these impacts could be mitigated to a level of insignificance if standards in the Management Plan for slope steepness, benching, and revegetation of quarry slopes and site drainage were met. The Plan also required that a geotechnical reconnaissance be preformed by a qualified individual to identify any site specific issues that may require additional mitigation such as gentler working or final slopes, constructed slope protection, or other geotechnical solutions which would be incorporated as part of any mining and reclamation plan permit process. The

Plan also required continued monitoring by the County of all working quarries to identify any problems as they arise in the field.

Consistent with Arm Plan requirements, the applicant had a Geotechnical Reconnaissance prepared by Bauer Associates dated November 17, 1997, for the site. That report indicates the proposed property is suitable for quarry operations following ARM Plan standards. The report also indicated that as mining and reclamation plans are finalized, monitoring by a geotechnical engineer of the exposed site and slope conditions be continued to insure there are no unmitigated impacts. On that portion of the project site that has an existing approved mining plan (APN 083-210-019), a separate geological investigation was prepared by Huffman and Associates, Inc. dated April 1982. That report also indicates the site is suitable for mining following ARM Plan standards, as long as a 250 foot setback is maintained from the north property line. Consistent with that report, the 250 foot setback along the north property line must continue to be maintained on APN 083-210-019.

The ARM Plan Program EIR also found that due to the steepness of slopes normally left after mining, quarry operations have the potential to increase soil erosion. This potential impact was found mitigable by implementing a series of standards regarding drainage, steepness, benching, and revegetation of steep slopes. In addition a Storm Water Pollution Prevention Plan is prepared for all sites requiring a National Pollutant Discharge Elimination System permit, and Regional Water Quality Control Board "Best Management Practices" are to be used to prevent erosion and siltation problems.

Consistent with these requirements, the proposed mining operation would be required to meet all ARM Plan, State, and Federal standards. In addition, due to the close proximity of Green Valley Creek in this case and concerns over any impact to it (see Biological section of this Initial Study), specific means of erosion control must be enumerated to insure that every possible step is taken to prevent problems. This includes a complete drainage analysis of the sediment ponds on site to insure their adequacy, draining all runoff water through two consecutive sediment ponds before releasing it from the site, a schedule for regularly maintaining the sediment ponds capacity, monitoring of the sediment control system, requirements to shut down all operations on site if erosion control measures are not followed, operating standards that minimize heavy equipment creating large amounts of sediment, and analysis/reporting on all reclaimed areas that suffer significant storm damage that could lead to future erosion control problems.

d) Significantly expansive soils are not known to be present on the project site. Even if present, it would be inconsequential because there would be no risk to people or property.

f) The proposed reclaimed use of the site will be to wildlife habitat, therefore septic system disposal is not applicable on the project site. Portable toilets may be used in the project area on a temporary basis during mining operations. Note: Outside of the project area, the existing quarry operation does contain restrooms and a septic system which must be verified as in proper working order pursuant to County Health Standards.

7. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	___	X	___	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	___	X	___	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	___	___	___	X

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	___	___	___	X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	___	___	___	X
f) For a project located within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	___	___	___	X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	___	___	___	X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	___	___	X	

Comment:

a)-b) Operation of heavy equipment on site will require refueling and minor maintenance activities which involve small amount of hazardous materials (i.e. oil, grease, cleaning solvents). No fuel is proposed to be stored at the project site (fuel is stored at the existing quarry facility, and is subject to existing Federal, State, and Local laws for storage of hazardous materials). Fueling may occur on site with a fuel truck. All significant maintenance will occur offsite. A small amount of chemical dust suppressant may also be stored and used on site. All of these uses of hazardous materials are typical of quarry operations, and if fuel or other hazardous materials are spilled on site, contamination of the localized soil and water (surface and groundwater) could occur.

The Arm Plan Program EIR analyzed the potential impacts that the storage and use of diesel fuel and other hazardous materials at mining and processing operations may create. The Program EIR found that mitigation to a less than significant impact level could be obtained by meeting the existing hazardous materials handling requirements of State and County law as enforced by the Sonoma County Public Health Department, PRMD, and Local fire protection agencies. In addition, all hazardous materials and wastes are required to be removed from areas within the 100 year flood plain by November 1 of each year and each mining site where hazardous materials are used or hazardous wastes are stored will be required to have a Spill Prevention and Counter Measures Plan as part of its permit. These plans require such things as double lined storage tanks, retention basins, and onsite storage of chemical absorbents. Consistent with ARM Plan requirements, all of these mitigations are required of the applicant.

The ARM Plan Program EIR also identified that aggregate operations may create an “attractive nuisance” which could be a hazard to visitors or the general public. This was found to be mitigable though by requiring operators to install fencing, post warning signs, provide site patrol, and/or take any other actions required to insure adequate security of the site and control private access thereto. In this particular case, no significant problems have historically been reported to the PRMD regarding the existing quarry operation. However, it is still required that access to the site be controlled by maintaining security fencing and locking gates with posted trespass signs at all vehicular access points to the site, and that any potentially dangerous structures (such as the existing single family dwelling, outbuildings, and well on site) be properly demolished/abandoned under County permits prior to mining encroaching upon them.

It should also be noted, consistent with past operations, blasting materials will occasionally be transported and used on site, and that this could be considered hazardous. However, the transport of blasting materials to the site is regulated 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 and Health Administration and by the California Occupational Safety and Health Administration (Cal OSHA). If the blasting contractor mixes blasting agents on site, they must have a license issued by the Federal Bureau of Alcohol Tobacco and Firearms. All blasts must also be controlled by a blaster who has passed a written licensing examination and met the experience requirements set forth by Cal OSHA. Licensed blasters and contractors are required to be knowledgeable about and to comply with all regulations governing explosives and blasting. For these reasons, the potential hazards from transport and use of blasting materials on site is considered mitigated to a less than significant level.

c) There are no schools within one quarter mile of the proposed operation.

d) The project site has no existing hazardous materials on it. If any sources are uncovered during mining activity, the operator is required by Health Department regulations to notify the County and cease work until the potential hazard is determined to be safe or is cleaned up.

e) There are no public airports within two miles of the project site.

f) There are no private airstrips within the vicinity that could be affected by the project.

g) The proposed project would not interfere with any emergency response or evacuation plans.

h) It is possible that heavy equipment or personnel working in the field could accidentally ignite a wildland fire. However, since the proposed project will result in the temporary removal of all flammable vegetation from the mining area an overall net decrease in the potential for fire danger is expected. Therefore this potential impact is considered less than significant.

8. **HYDROLOGY AND WATER QUALITY** Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	___	X	___	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?	___	___	X	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	___	X	___	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	___	X	___	
e) Create or contribute runoff water which would exceed				

the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	___	X	___	
f) Otherwise substantially degrade water quality?	___	X	___	
g) Place housing within a 100-year hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	___	___	___	X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	___	___	___	X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	___	___	___	X
j) Inundation by seiche, tsunami, or mudflow?	___	X	___	

Comment:

a)-f) and j) Terrain in the project area consists of steep slopes with unstable soils, which has the potential for mudslides and high rates of erosion if disturbed, which could lead to impacts on drainage water quality and eventually Green Valley Creek. Mining of the area will also permanently change the natural drainage patterns on site, which if done incorrectly could lead to increased erosion and/or flooding both on site and off site. The use of small quantities of hazardous materials on site (diesel fuel, gasoline, oil, solvents, dust suppressants, etc.) could also result in accidental spills, with the resulting surface and groundwater contamination. Finally, mining of the area may intersect groundwater, which could impact ground water levels on site and in the immediate vicinity. All of these issues are common for hard rock quarry operations in Sonoma County.

The ARM Plan Program EIR analyzed the type of erosional impacts that typical quarry operations might have, and found that there is the potential to create steep slopes which can lead to landslides/mudslides, slope stability problems, and high rates of erosion. This potential impact was found mitigable by implementing a series of standards regarding drainage, steepness, benching, and revegetation of steep slopes. In addition a Storm Water Pollution Prevention Plan is prepared for all sites requiring a National Pollutant Discharge Elimination System permit, and Regional Water Quality Control Board "Best Management Practices" are to be used to prevent erosion and siltation problems. The Plan also required continued monitoring by the County of all working quarries to identify any problems as they arise in the field.

Consistent with these requirements, the proposed mining operation would be required to meet all ARM Plan, State, and Federal standards. In addition, due to the close proximity of Green Valley Creek in this case and concerns over any impact to it (see Biological section of this Initial Study), specific means of erosion control must be enumerated to insure that every possible step is taken to prevent erosion problems. This includes a complete drainage analysis of the sediment ponds on site to insure their adequacy, draining all runoff water through two consecutive sediment ponds before releasing it from the site, a schedule for regularly maintaining the sediment ponds capacity, monitoring of the sediment control system, requirements to shut down all operations on site if erosion control measures are not followed, operating requirements that prohibit heavy equipment routinely crossing drainage ditches and creating large amounts of sediment, and analysis/reporting on all reclaimed areas that suffer significant storm damage that could lead to future erosion control problems.

The ARM Plan Program EIR also analyzed the potential for hazardous materials on site to impact water quality, and recommended mitigation measures to reduce the potential impacts to less than significant. For further discussion on this issue, please see the Hazards and Hazardous Materials section of this Initial Study. Excessive use of fertilizer high in nitrogen or phosphorus during reclamation activities could also impact water quality, and must be limited.

It is also noted that mining of the area may intersect groundwater, which could impact groundwater levels on site and in the immediate vicinity. However, there is no evidence in the record to indicate that this is a significant impact, and all material to be removed from the quarry would be well above the primary ground water level established by the adjacent Green Valley Creek, which is the largest natural drainage feature in the area.

g) The project does not involve any housing within the flood plain.

h) A small portion of the existing quarry is located within the Flood Plain of Green Valley Creek, however none of the project site is located within the flood plain zone and so would have no impact on it.

I) None of the project area is located within the Flood Plain, and the project does not involve the construction of a levee or dam.

9. **LAND USE AND PLANNING** Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Physically divide an established community?	___	___	___	X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	___	X	___	
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	___	___	___	X

Comment:

a) There is no established community on the project site that could be impacted. The property is presently undeveloped except for a single family residence (and the existing quarry on the adjacent property). The surrounding land is developed in a rural residential pattern, with the community of Forestville to the east.

b) GENERAL PLAN/Zoning: The General Plan and Zoning ordinance designate all of the project site "Resources and Rural Development" which permits surface mining operations if they are consistent with the Aggregate Resources Management (ARM) Plan and the County's Surface Mining and Reclamation Ordinance (SMARO). The ARM Plan requires specific standards to be met by the proposed mining and reclamation plan, and that a Mineral Resource combining zone be added to the property, to mitigate potential conflicts/impacts. The applicant has proposed meeting all ARM Plan standards with this request, and has filed the appropriate application to have the Mineral Resource Combining zone added to the property. SMARO requires mining operations to have a permit (or vested right), reclamation plan, and financial assurance approved prior to commencing mining operations, to mitigate potential impacts. If the project is approved, this requirement will be met by imposing conditions of approval that require compliance with the operational and reclamation standards of SMARO.

The Open Space Element of the General Plan designates the Green Valley Creek as a riparian corridor. The proposed mining site is located on the far side of the existing quarry from the creek, and will not disturb riparian vegetation.

General Plan Policy RC-11 b applies to mineral resources and states "Review projects for environmental impacts 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." The potential for impacts within these areas are assessed in this initial study and mitigations are identified where appropriate.

1994 ARM PLAN: The Sonoma County Aggregate Resources Management (ARM) Plan and Program Environmental

Impact Report (PEIR) was adopted by the Board of Supervisors on November 1, 1994 and revised and updated the 1980 ARM Plan. The PEIR has been used as the primary source CEQA document for evaluation of the proposed pit expansion project. The project Conditions of Approval/Mitigation Monitoring Plan have been prepared in conformance with the PEIR.

The ARM Plan/PEIR specifically anticipated hard rock aggregate extraction in areas such as the proposed project site. Sections 5.1 to 5.4 discuss quarries in the County in General, while section 5.2 includes a specific section on the existing Canyon Rock Quarry and the potential that it may apply to expand in the future. This section also notes potential 'expansion areas' (within which this project is partially located), although these 'areas' are not meant to specifically direct or restrict where quarry expansion requests may be filed. Section 7.3 , 7.4.2, and 7.4.3 establish operating standards, mitigation measures, and reclamation procedures for hardrock mining activities, and Section 7.7 establishes a monitoring program for all mining and reclamation related activities. The mitigation measures and monitoring activities identified in these sections include, but are not limited to, standards for erosion control, slope and bench standards, hazardous materials control, noise standards, days and hours of operation, revegetation standards, successful reclamation standards, and numerous other criteria.

While it is understood in Section 9.7 that the ARM Plan/EIR cannot anticipate every site-specific impact, the scope of the document and its cumulative impact analysis clearly includes requests to expand existing hard rock quarry operations that are specifically identified in the Plan. Section 8.0 states: "The related physical 'project' which has the potential to actually cause these possible effects is the total set of mining and reclamation activities which could be allowed by the Management Plan presented in Chapter 7 of the ARM Plan . . . . The level of CEQA impact analysis required for subsequent individual applications will be guided by the more generalized analysis in the Program EIR and the mitigation provided by the policies and standards for mining and reclamation stated here in chapter 7... The analysis presented in this Chapter focuses on the environmental impacts which would take place to the existing environment if the mining operations allowed by the Management Plan were to occur pursuant to the revised designations and standards proposed. The extent of mining evaluated in this EIR is based on a 'worst case' analysis of what might occur without mitigation measures."

As previously stated, Section 5 of the ARM Plan/PEIR includes a specific discussion of Canyon Rock Quarry including that it may expand at some point, and section 7 (the management plan) of the ARM Plan/PEIR establishes mitigation measures for hard rock quarries. Therefore, this Initial Study finds that the proposed project falls within the scope of the ARM Plan/Program EIR and that the cumulative impact analysis in it can be used in evaluating this project. Further, that site specific impacts are to be fully analyzed and potential mitigations listed in this initial study.

It is also noted that implementation of the proposed project pursuant to ARM Plan standards will not require any land or easement acquisition by the applicant.

c) The proposed project is consistent with the County's 1994 ARM Plan for both mining and reclamation. Proposed reclamation to wildlife habitat is also consistent with general environmental goals and policies established by agencies such as the U.S. Fish and Wildlife Service and Regional Water Quality Control Board. The proposed project complies with the goals and policies of the California Department of Conservation by meeting requirements of the Surface Mining and Reclamation Act (SMARA). Therefore, no adopted environmental plan/policy inconsistencies are known to exist.

10. **MINERAL RESOURCES** Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	____	____	X	
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	____	____	X	

Comment:

a)-b) The project will cause the consumption of existing in-the-ground aggregate for ongoing community development and maintenance and will, therefore, make the resource at this particular site unavailable for use in the future. However, on a regional basis, aggregate is available in other quarry areas, and from instream and terrace sources, so the project would not result in the depletion of the resource on a regional basis. The availability and future demand of aggregate throughout the County was evaluated in the 1994 ARM Plan and program EIR. This project is consistent with those requirements and is therefore not considered to be an inefficient use of available supplies or a significant impact on the overall availability of mineral resources.

11. **NOISE** Would the project result in:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	X			
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?		X		
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	X			
e) For a project located within an airport land use plan or, where such plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

Comment: For assessing noise impacts, a baseline as described in the beginning of this initial study was used (essentially, all noise impacts created by the project on or off site are 'new' impacts that must be mitigated).

a)-d)The ARM Plan Program EIR analyzed noise impacts of typical mining operations, and found they result in temporary (for the life of the quarry): 1) Site Specific noise impacts from earthmoving operations, potential blasting operations, the sorting/crushing facilities, and loading of outgoing trucks, and 2) Non Site Specific noise impacts along haul routes from aggregate truck traffic on the road. At the conclusion of mining and reclamation activities when the project site is returned to wildlife habitat, noise impacts would cease.

In analyzing these potential impacts the ARM Plan Program EIR adopted specific quantitative standards of significance that must be adhered to by all mining operations. Specifically, noise exposure levels within the work area are considered significant if they exceed regulations adopted and administered by CalOSHA and the Mine Safety and Health Administration (MSHA). Therefore mitigation of potential impacts to workers requires full compliance with those standards and regulations. Further, noise impacts offsite are considered significant if the noise levels exceed the quantitative noise standards established in the General Plan. Table NE-2 in the General Plan Noise Element stipulates that noise of cumulative duration not exceed 50 dBA and momentary noises of 1 minute or less not exceed 70 dBA during the daytime hours of 7 a.m. to 10 p.m.. Nighttime noise standards, which would be in effect for the quarry from 6 a.m. to 7 a.m. are approximately 5 dBA lower than the daytime noise standards. Note that pursuant to General Plan Noise Policy NE-1c(1), fixed legal sources of noise (such as the processing plant which is operating under use permit 2291 approved in 1957) are considered part of the ambient noise levels in determining compliance with Table NE-2 (This is slightly different from other potential impacts related to operation of the quarry such as truck traffic noise, because it involves a fixed legal physical structure). Policy NE-1c(3) further states that the noise standards should be reduced by 5 decibels if they exceed the ambient level by 10 or more decibels.

Note that adoption of these quantitative standards of significance means that some people may experience a qualitative difference in their noise environment, but not be 'significantly' impacted. For example, a site which may have once been dominated by sounds of natural wildlife (birds, crickets, etc.), could be changed so that the dominant sound is one of heavy machinery, yet if the dBA standards of the General Plan are not exceeded there would be no 'significant' impact.

A previous Use Permit expansion request that was granted to Canyon Rock Quarry in 1991 (file UP 90-362) required compliance with General Plan noise standards for the expansion area (however mining has not proceeded that far west at this time). This application includes the previously approved expansion area, plus an additional 4 parcels to the west. Similar to that previous permit, this application must require compliance with the General Plan noise standards for the expansion area as detailed below.

<u>Off Site - Site Specific Noise (Quarry Noise)</u>: To analyze the potential noise impacts of the proposed expansion and existing quarry operation an Environmental Noise Assessment was prepared by Richard Rodkin of the firm Illingworth & Rodkin, Inc. on November 13, 1997. In addition, two follow up letters/assessments were received dated 12/24/98 and 7/16/98. These studies analyzed noise data collected over a number of years (from 1991 to the present), and took measurements from a variety of points near the closest residences that are most likely to be impacted by quarry noise. These noise studies included noise produced from the near by Blue Rock Quarry as part of their baseline measurements.

The noise measurements taken in the early 1990's measured noise impacts to the south-east of the existing quarry at a residence which was located in direct line of sight of it (McCall), and at a residence at the top of the ridge to the north (St. Paisius Abbey). At both of these locations day time ambient noise without the quarry operating was 35-45 dBA, and with the quarry operating was 52-62 dBA at the McCall site and 49-59 dBA at the St. Paisius Abbey site. Noise measurements at a third location to the west (over the ridge) indicated that Canyon Rock quarry was inaudible at that point (although the adjacent Blue Rock quarry could be heard). On site generators to power the crushing and sorting equipment were being used at the time these measurements were taken.

In 1997 on site measurements were taken which indicated that noise levels from the quarry had dropped about 3 dBA on average by converting from on site power generation to PG&E line power for the crushing and sorting equipment.

The potential effects of noise from the proposed extended mining area were evaluated based on the assumptions that total quarry production would remain the same as has historically occurred (a 500,000 cubic yard annual limit - excluding recycled materials), and best available noise attenuation technology would be used (high performance mufflers, etc.). The analysis looked at a total of 7 sites/locations (which would be the closest and/or the most impacted areas). Four sites were at residences along the top of the ridge to the north, one at a residence over the ridge to the west, one at a residence across Hwy 116 to the south-west, and one directly to the south towards Giovanetti Road. For four of the seven sites/locations, noise levels were found to remain unchanged and/or within General Plan noise standards. However, for three of the locations (two along the top of the ridge to the north, and one at the residence across Hwy 116 to the south-west) noise levels were found to exceed General Plan standards if mining proceeded without mitigation to the full extent proposed.

Identifying potential mitigations for the three locations which would exceed General Plan noise standards is complicated due to a number of factors, including that noise impacts will vary depending on exactly how the quarry expansion is mined, that the potential impact may not occur until 10-20 years from the present, that Hwy 116 noise impacts will alter over time (for the residence adjacent to the Hwy), heavy machinery technology may change over time resulting in quieter equipment, noise attenuation technology in general may change, ambient noise levels may change due to Blue Rock Quarry expanding operations, and property ownerships/physical development may change (for example dwellings may be removed, or the quarry expand its property ownership). However in no case can noise levels be allowed to exceed General Plan noise standards.

To mitigate the potential noise impact at the three locations given the variables involved, a number of possibilities exist that may partially mitigate the impact. Quieter equipment could be used, hours of operation could be restricted to the middle of the day, the production limit of the quarry could be reduced or recycling of materials prohibited on site, residences could be sound insulated, or larger berms could be left/constructed between the mining area and the residences.

However the only potential mitigation that provides complete assurance that General Plan noise standards will not be exceeded is to establish a specific noise monitoring program, which will regularly track noise levels near the three residences, and require cessation of mining in a particular direction when the General Plan standards are reached. Essentially, this mitigation would leave as large a buffer zone as necessary to maintain General Plan noise standards, while allowing the quarry operator flexibility in which specific steps would be taken (if any) to reduce noise from the existing equipment. The more steps an operator takes to reduce mining noise, the less likely General Plan noise standards would be reached (as shown through the monitoring program), which would allow the mining to proceed farther in requested areas.

The noise analysis/report indicates that such a monitoring program should be initiated when mining is within 950 feet of the residence in question, and there is a direct line of sight between the two. Since mining could proceed much closer in some cases without coming into a direct line of sight, a minimum distance to trigger monitoring, such as 600 feet regardless of line of sight, must also be established to insure General Plan noise standards are not exceeded. Once the appropriate distance has been reached, then regular sound monitoring at least once per month while mining operations are ongoing would need to be maintained. Monitoring reports must be prepared by a qualified acoustical consultant, and be provided to the PRMD in a timely manner. This mitigation and monitoring program, because it would prevent General Plan noise standards from being exceeded, would reduce the potential noise impact on the residences to a less than significant level.

Another potential noise related impact of hard rock mining operations is occasional blasting producing a low frequency airblast and ground vibration that could impact surrounding residences, wells, wildlife, and other uses. The potential impacts of blasting were analyzed extensively in the 1998 Sonoma County Central Disposal Site Improvement Program EIR and associated report entitled "Impacts of Blasting Operations and Recommended Practices and Controls for the Central Disposal Site Improvement and Rock Extraction Projects" by Gordon Revey of GEOTEK, dated July 1998.

That report indicates that blasting creates noise at a broad range of frequencies, however the highest intensity blast noise usually occurs at frequencies below that of human hearing (<20Hz). Because of this, instruments that measure impulsive blast noise or "airblast" are capable of recording at very low frequencies, typically down to 2 Hz. When measurements include low frequency noise with a flat response, they are called "linear scale" measurements. Linear scale airblast measurements are typically expressed as dB-L. Regular acoustical noise measurements taken for the purpose of monitoring compliance with industrial sound-pressure-level standards almost always use weighted scales that discriminate against low frequency noise. Therefore, for a similar noise source, A-weighted and C-weighted scales will usually record significantly lower levels of noise. For example, a linear peak noise of 120 dB-L could equate to only 12 dB-C and 85 dB-A for a typical blast noise. Since full range recording of blast-induced noise can only be done with linear scale instruments, it is imperative that compliance specifications for blast measurements also be expressed in linear scale (dB-L).

The regulatory limit defined by the U.S. Bureau of Mines for airblast measured with 2-Hz response seismographs is 133 dB-L (This is similar to the pressure produced by a 20 mph wind). Damage to old or poorly glazed windows does not typically occur until over pressure reaches about 150 dB-L, and most windows will break at 170 dB-L. The report concludes that a performance standard of 130 dB-L should be set, and recommends various methods of blasting that can achieve this standard. The 130 dB-L limit was also noted to produce no adverse impacts to wildlife. Adopting this same airblast performance standard for the Canyon Rock quarry would reduce any potential adverse impacts regarding blasting to less than significant.

The other potential impact of blasting is ground vibration. When a blast is detonated, a small portion of the energy travels outward as seismic waves which decay with distance as they travel through the surrounding area. The seismic waves will vary somewhat with changes in local geology, but the rate at which they die out is reasonably consistent. Each time the distance is doubled, the vibration intensity drops to about one-third of its former value. The average person is quite sensitive to ground motion, and can feel vibration at levels several orders of magnitude lower than motion at damage threshold levels. Ground motion occurring at velocities as low as 0.50 mm/s (or 0.02 in/s) can be detected by the human body.

The U.S. Bureau of Mines has made the following conclusions regarding the potential for damage caused by blast-induced ground motion: "Practical safe criteria for blasts that generate low frequency ground vibrations are 19 mm/s (0.75 in/s) for modern gypsum board houses and 12.7 mm/s (0.50 in/s) for plaster on lath interiors. For frequencies above 40 Hz, a safe particle velocity maximum of 51 mm/s (2.0 in/s) is recommended for all houses" It should be noted that the U.S. Bureau of Mines recommendations are designed to prevent even threshold damage in residences of lower-quality construction. Threshold damage was defined as the occurrence of cosmetic damage; that it, the most superficial interior cracking of the type that develops in all homes independent of blasting. The report concludes that a ground vibration performance standard should be set at 12.7 mm/s (0.50 in/s), and recommends various methods of blasting that can achieve this standard. The 12.7 mm/s (0.50 in/s) standard was also noted to produce no adverse impacts on wildlife. Adopting this same performance standard for the Canyon Rock quarry would reduce any potential adverse impacts in this area to less than significant.

It should be noted that similar to the General Plan standards established for typical noise events, adoption of these quantitative standards of significance for blasting means that some people may experience a qualitative difference in their noise environment, but not be 'significantly' impacted. For example, a site which may have once been dominated by sounds of natural wildlife (birds, crickets, etc.), could be changed so that occasionally a blasting noise is heard and the windows/walls of structures may vibrate slightly, yet if the dB-L or ground vibration standards are not exceeded there would be no 'significant' impact.

Off Site - Non Site Specific Noise (Truck Noise): The proposed project would continue the existing level of annual production (500,000 cubic yards/yr) and truck traffic. The noise generated by aggregate haul trucks was measured on December 19, 1986 by the firm of Engineering-Science as part of the EIR prepared for the unrelated Roblar Road Quarry proposal. These measurements indicate that the maximum noise level produced due to the passage of one loaded truck and trailer at a speed of 45 mph is approximately 82 dBA at a distance of 50 feet. These noise levels would fully comply with the noise standards of the California Vehicle Code. However, at such levels, anyone within a few hundred feet of a haul road may be subject to environmentally significant noise impacts. Since the primary haul route of the quarry is Hwy 116 which passes through downtown Forestville, a significant number of people are currently, and with this proposal would continue to be, subject to these truck noise impacts for the life of the permit (20 years).

Noise impacts from trucking will be partially mitigated by limiting trucking to the primarily daytime hours of 6:00 a.m. to 10:00 p.m. under normal operating conditions (note that truck impacts usually begin reducing by 5 pm due to construction sites closing for the day). In addition, it is possible that the annual production limit could be lowered, or recycling of materials on site prohibited. However, the remaining noise impacts from trucks would still be significant. The 1994 ARM Plan Program EIR found that significant unavoidable noise impacts may result from aggregate truck traffic. In its adoption of the Program EIR, the Board of Supervisors adopted findings of overriding consideration indicating why the benefits of the aggregate industry outweigh the adverse unavoidable noise impacts. These findings are contained in Resolution No. 94-1569 and are applicable to the proposed project.

e) The project is not located within an airport land use plan or within two miles of a public airport.

f) The project is not located in the vicinity of a private airstrip that could cause a significant noise impact to the project site.

12. **POPULATION AND HOUSING** Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	___	___	___	X
b) Displace substantial numbers of existing housing necessitating the construction of replacement				

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

Comment:

a) The proposed project does not include any new housing and will not result in any population increase.

b) The site is currently developed with one single family dwelling. Removal of this single residence is not considered a significant housing impact.

c) The site is currently developed with one single family dwelling. Removal of this single residence and relocation of its residents is not considered a significant displacement impact.

13. PUBLIC SERVICES

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	___	___	X	
Police protection?	___	___	X	
Schools?	___	___	X	
Parks?	___	___	X	
Other public facilities?	___	X	___	

Comment:

a) There will be no foreseeable significant impact from the project on fire, police, schools, or park services. The east parcel of the existing quarry is within the water district and already served by public water. The project will continue to use State and County roadways for truck delivery of aggregate materials. The ARM Plan Program EIR analyzed the potential impacts of aggregate truck traffic and found it could result in adverse impacts to road maintenance. To mitigate this potential impact to a less than significant level, the ARM Plan established a gravel truck road maintenance mitigation fee to be paid by the gravel operators. The project will also require staff time by the County's Permit and Resource Management Department to do ongoing monitoring of the mining and reclamation activities on site. The ARM Plan Program EIR analyzed this potential impact and found it could result in an adverse impact. To mitigate this impact to a less than significant level the operator shall be responsible for reimbursing the County for all staff time spent monitoring the project.

14. RECREATION

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Would the project increase the use of existing				

neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	____	____	____	X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	____	____	____	X

Comment:

a)-b)The project does not involve any known impacts to recreational uses. Upon completion of reclamation, the site will be wildlife habitat.

15. **TRANSPORTATION/TRAFFIC** Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections?	____	X	____	
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	____	____	X	
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	____	____	____	X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment?	____	X	____	
e) Result in inadequate emergency access?	____	X	____	
f) Result in inadequate parking capacity?	____	____	____	X
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	____	____	____	X

Comment:

a), b), d), and E) Using a baseline for evaluating traffic impacts as described in the beginning of this initial study (essentially, all traffic created by the project is 'new' traffic that must be mitigated), the first step in the traffic impact analysis is to estimate the amount of traffic that would be generated by the proposed expansion area, and then to assess any potential impacts it may have. To achieve this, a close analysis of the existing quarry operations in the area is necessary.

Canyon Rock Quarry presently has a maximum annual production limit of 500,000 cubic yards. The adjacent Blue Rock Quarry presently has a maximum annual production of 150,000 cubic yards (a request to expand that to 400,000 cubic yards has been filed with the County of Sonoma).

A variety of truck sizes is used to haul material from the quarries, and production can vary greatly on a day to day basis, peaking in summer. Based on counts of actual truck size from Canyon Rock Quarry, the average volume of material carried by a single truck/trailer is approximately 21.3 tons. For estimating loads, a conversion factor of 1.5 tons to a cubic yard of aggregate is used by the County, and 270 working days per year is estimated (quarry operation does not occur on Sundays, specific holidays, or days with inclement weather).

Given these conversion factors, Canyon Rock Quarry can produce a maximum 750,000 tons per year, for a total of 35,211 outgoing truck trips, or an average of 130 outgoing truck trips per day (*for a total of 260 average truck trips per day including both incoming empty trucks and outgoing full trucks*). Blue Rock Quarry can produce a maximum of 225,000 tons per year (600,000 tons has been proposed), for a total of 10,563 outgoing truck trips (28,169 proposed), or an average of 39 (104 proposed) truck trips per day (*for a total of 78 (208 proposed) average truck trips per day including incoming empty trucks and outgoing full trucks*).

In addition to truck trips produced by actual quarry production, the recycling of materials (concrete, rock, sawdust, etc.) and importation of other aggregate materials (large boulders, sand, round aggregate for concrete, etc.) occurs at Canyon Rock Quarry as an ancillary use (but not at Blue Rock Quarry). If it is estimated that Canyon Rock Quarry recycle's approximately 50,000 cubic yards of material per year, and it is further estimated that other aggregate imports account for approximately an additional 50,000 cubic yards of material per year, a total of 100,000 cubic yards of additional material being moved by trucks to/from the site must be accounted for. Using the same assumptions as for movement of mined aggregate materials (1.5 tons per cubic yard, 21.3 average tons per truck, and 270 working days), *a total of 70 average truck trips per day* is generated (Note that this number appears high because for recycle and imported materials it must include both inbound trucks delivering materials (which arrive full and potentially leave empty) and outbound trucks delivering materials (which potentially arrive empty and leave full).

Quarry employee traffic is relatively light, and may result in approximately 20 trips per day per quarry.

Given the above, in total Canyon Rock Quarry can produce an average of 330 truck trips plus 20 employee trips per working day, and Blue Rock Quarry 78 truck trips (208 proposed) plus 20 employee trips per working day. It must be noted however, that for a peak traffic day in late summer, the actual truck count for a quarry may more than double (Canyon Rock has been measured at 785 truck trips on a peak day). In addition, for each peak traffic day, there are correspondingly slower days with lower amounts of truck trips (below the average number). Overall, this quarry truck traffic is spread out fairly evenly over the course of a working day (typically 7 am to 5 pm for truck deliveries).

Both Canyon Rock Quarry and the adjacent Blue Rock Quarry use Hwy 116 and Mirabel Road as their primary haul route. Approximately 98% of both quarries truck traffic travels east on Hwy 116, with approximately 36% turning off onto Mirabel Road and 62% continuing on Hwy 116 through downtown Forestville. Currently, average daily traffic counts on Hwy 116 are approximately 5,000 vehicles per day west of Mirabel Road and 10,700 vehicles per day east of Mirabel Road. Mirabel Road has approximately 7,100 vehicles per day in summer. These average figures will vary somewhat month to month, with peak traffic flows occurring around summer.

The County of Sonoma General Plan has designated both Hwy 116 and Mirabel Road as primary arterials. The General Plan further states that an objective is to maintain through traffic on primary arterial and collector roadways at Level of Service (LOS) C or better. However, the General Plan does not contain a LOS standard for intersections. An intersection LOS of D represents total approach delays between 20 and 30 seconds per vehicle. For the purposes of Initial Studies, if a LOS drops below LOS D it will typically be considered a significant impact that must be mitigated. This is because a delay of more than 20-30 seconds would exceed the delay caused by a standard traffic signal's timing (i.e. a red light).

There are three primary intersections in the Forestville area that are on the quarry haul routes, Hwy 116/Mirabel Road, Mirabel Road/River Road, and Hwy 116/Covey. Presently, all three of these intersections operate at a LOS C or better during the morning, midday, and evening peak hours, except for the southbound approach to the intersection of Hwy 116 and Covey Road which operates at a LOS of D during the evening peak traffic hour.

If the project were not approved, heavy truck traffic passing through these intersections would decrease significantly when the existing quarry shut down. Using the above described maximum average daily trip rates for the quarry, Canyon Rock may produce 6.6% of the total traffic (cars and trucks) on Hwy 116 west of Mirabel Road, 1.9% of the total traffic on Hwy 116 East of Mirabel Road, and 1.7% of the total traffic on Mirabel road. The percentage of heavy truck traffic that Canyon Rock produces would be much higher. These numbers may also double during summer days when the quarry is operating at peak levels. If the proposed Blue Rock project were also denied and that Quarry shut down as well, it is possible that the reduction in overall heavy truck traffic in the Forestville area would be enough to offset cumulative traffic increases for the foreseeable future, maintaining present traffic LOS operations.

If the project were approved and gravel truck traffic from Canyon Rock was maintained at present levels and the potential for Blue Rock truck traffic to increase is included, the LOS at the three intersections of concern is not expected to change during peak hours. However, if a 10% cumulative traffic increase is included in the analysis, then the south bound approach to the Hwy 116/Covey Road intersection is expected to drop to LOS F, which is a significant impact. {For further detail on this issue see Table 11 and associated text discussion in the Traffic Impact Study of the Expansion of Blue Rock Quarry by TJKM dated January 1998}

In addition to LOS operation, eleven traffic signal 'warrants' have been established by the United Sates Department of Transportation, and adopted by the California Department of Transportation (CalTrans) in a published traffic manual. These warrants include such things as Minimum Vehicular Volume, Interruption of Continuous Traffic, Minimum Pedestrian Volume, School Crossings, Progressive Movement, Accident Experience, etc.. However, traffic signals are not recommended to be installed solely on the basis of warrants, as other measures such as signs, markings, or channelization, may provide the necessary operational improvements without signalization.

Using the above criteria, all three intersections of concern presently warrant a traffic signal or other improvement to them. Of particular concern in this regard is the limited sight distance available to Hwy 116 eastbound traffic to allow it to identify and react to traffic making left-turns onto Mirabel Road. The length and slow movement of aggregate trucks that stop or slow to make this turn aggravate the situation. As described above, if the project were not approved, heavy truck traffic passing through the intersections would decrease significantly, reducing but not eliminating the need for intersection improvements. Maintaining the same level of truck activity from Canyon Rock Quarry for an extended period of time, and potentially increasing the amount of truck activity from Blue Rock Quarry, and/or adding additional cumulative traffic, will increase the need for improvements at all 3 intersections, and is a significant impact.

Of additional concern is that Hwy 116 between the quarries and Mirabel Road, and the segment of Mirabel Road between the Youth Park and the south end of the 4 foot shoulder improvements, and the segment of Mirabel Road between Trenton Road and River Road, are extremely narrow with limited or no shoulder room for pedestrians and/or bicyclists. Although this is an existing situation, the continued long term use of these sections of roadways for heavy truck traffic use is a significant impact on pedestrian/bicycle safety.

There have also been occasional complaints over aggregate truck traffic exceeding speed limits in the Forestville area. The California Highway Patrol is responsible for patrolling roadways in the County and enforcing traffic safety issues, and complaints may be made to them. While there is no specific evidence in the record to indicate that this issue warrants additional mitigation given the nature of the proposal to continue existing traffic levels, it is noted that a similar concern at the County solid waste facility resulted in a special contract with the Highway Patrol being implemented at operator expense for more traffic safety patrols in that area.

Heavy truck traffic from quarries and other sources of aggregate also has an impact on road maintenance. On average, one truck has approximately the same wear and tear impact as the passing of approximately 10,000 automobiles. This issue was analyzed by the ARM Plan Program EIR and found significant. To mitigate this potential impact, a road maintenance impact fee system was to be established pursuant to the ARM Plan. Presently, the road maintenance fee system is under development by the County Department of Transportation and Public Works, and a standard fee condition has been applied to all new aggregate permits requiring payment of the fee when it is finalized. It is expected that the final fee figure will take into account such items as the number of trucks generated and length of haul route over County roadways). Payment into this fee system is required for the project to mitigate this impact to a less than significant level.

The existing driveway into Canyon Rock Quarry off of Hwy 116 has marginal sight distance to the west. To mitigate this problem, the operator was previously required to relocate a berm along the west side of their driveway entrance. That work has not yet been completed, and must continue to be required to insure adequate traffic safety given the proposed continued truck traffic levels and traffic speeds. It is also noted that the proposal eventually includes a 2nd driveway location farther westward on Hwy 116 which has much greater sight distance and would help increase overall traffic safety. However, construction of any new driveway must be conditioned to meet all County and CalTrans traffic safety standards to insure there are no unsafe situations created.

In summary, continuing project traffic levels the same as presently exist will:

a. Not significantly change the levels of service of any intersections, however, cumulative traffic increases in the area in combination with the proposed project (and potentially the Blue Rock project) will result in the southbound approach to the Hwy 116/Covey Road intersection dropping to LOS F which is a significant impact.

b. Potentially increase the need for improvements at three intersections which already warrant signalization or other improvements, which is a significant impact.

c. Potentially increase long term safety issues on substandard sections of Hwy 116 from the quarry entrance to Mirabel Road and portions of Mirabel Road for pedestrians/bicyclists, which is a significant impact.

d. Continue impacts to road maintenance which can be mitigated to a less than significant level through payment of mitigation fees.

e. Continue the need to require all driveway intersections with Hwy 116 meet State and County standards, to ensure all potential on site adverse traffic safety impacts are reduced to a less than significant level.

In regard to points a), b), and c) above, a number of potential mitigations or partial mitigations exist. These include, the amount of annual production from the expansion area could reduced from the proposed (and existing) 500,000 cubic yard limit thereby reducing overall truck traffic, a maximum per day cap could be placed on the amount of aggregate sold per day or on trucks filled per day thereby reducing peak traffic impacts, hours of operation could be restricted, the recycling/importation of materials on site could be reduced or prohibited, the concrete plant at Canyon Rock could be closed, or payment into a new road/intersection mitigation fund specific to improving the Forestville area could be required.

The simplest of these mitigations to impose would be reducing the annual quarry production limit from the expansion area, or restricting the number of trucks on site in a given day (an automatic daily counter could be required to be placed at the driveway with records turned over to the County, or accounting records used, etc.). However, neither of these potential mitigations fully address the existing traffic safety problems in Forestville (that are partially caused by the level of truck traffic already allowed to be generated by the two adjacent quarries). Reducing the amount of recycling/importation on site would also help reduce local truck traffic, but is not recommended because it would increase the County's overall need for new aggregate and result in potential adverse impacts to the County's solid waste disposal facilities.

Therefore the most effective way to reduce the identified impacts to a less than significant level is to require improvements to the identified substandard road segments and intersections, via payment into a mitigation fund for the quarries fair share of the traffic generated. This mitigation is more difficult to put into effect since it would require coordination with CalTrans (which has direct jurisdiction on Hwy 116), and the remaining portion of the money needed for full improvements (from impacts not caused by the quarries) would still need to be obtained. However, since it may take the operator of the quarry a number of years to reach the proposed expansion area (thereby triggering payment of the fees), there is sufficient time to coordinate the necessary fee structure and improvements with CalTrans.

Specifically, this mitigation must require that prior to mining in the expanded quarry area, the Operator shall be responsible for:

1. Preparing an engineered cost estimate to the satisfaction of CalTrans and the PRMD for:

   A. Adding a minimum 4 foot wide shoulder where needed to both sides of: Hwy 116 between the quarries and Mirabel Road; and the segment of Mirabel Road between the Youth Park and the south end of the existing 4 foot shoulder improvements; and the segment of Mirabel Road between Trenton Road and River Road, and

B. Improving the sight distance for east bound Hwy 116 traffic approaching Mirabel Road to AASHTO standards or constructing a left turn pocket at this location, and

C. Improving the River Rd/Mirabel Rd intersection and the Hwy 116/Covey Rd intersection to meet AASHTO standards for the volume/speed of traffic present.

2. Determining to the satisfaction of the PRMD and County Department of Transportation and Public Works the percentage of the total amount of traffic passing through these road sections/intersections that the quarry is responsible for:

3. Entering into an agreement (subject to review and approval of PRMD) with the County for payment of the quarry's fair share cost of the total amount of the estimated improvements. The 'fair share' shall be based on the quarry's percentage of total traffic at each location times three (to account for the increased hazard and impact of large aggregate trucks compared to automobiles). Said agreement may at the discretion of the County allow the fee to be paid over a 10 year amortized time period.

In this particular case, amortization of the fee over an extended time period is appropriate (rather than requiring full payment and improvements up front), because the actual impact will be created gradually as the quarry work slowly moves into the proposed expansion area. With each year, an increasing percentage of the total volume of material produced coming from the expansion area compared to the existing quarry area.

c) The project will have no possible impact on air traffic.

f) The existing quarry contains adequate on site parking and the proposed expansion area is not expected to impact this.

g) The proposed quarry expansion will not conflict with any adopted alternative transportation policies.

16. **UTILITIES AND SERVICE SYSTEMS** Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	___	___	___	X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	___	___	___	X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	___	___	___	X
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	___	___	___	X
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	___	___	___	X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	___	___	___	X

g) Comply with federal, state, and local statutes and regulations related to solid waste?	____	____	____	X

Comment:

a)-g)The project does not result in the need for any new public utility or services, and no alterations to those systems is proposed or required as part of this application. Note: For a discussion of potential water quality impacts see the discussion under Hydrology and Water Quality in this Initial Study.

17. MANDATORY FINDINGS OF SIGNIFICANCE

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

Comment:

a)-b) As analyzed by this Initial Study, the proposed mining operation could have a number of significant adverse impacts on the environment, but appropriate mitigation measures for each impact have been identified and included in the Conditions of Approval/Mitigation Monitoring Plan and agreed to by the applicant which reduce these potential impacts to less than significant. Implementation of the reclamation plan will eventually return the site to wildlife habitat.

Chapter 8 and Section 9.3 of the ARM Plan Program EIR described potential cumulative and other impacts which might result from implementation of the ARM Plan. It was determined that there would be no significant adverse cumulative impacts caused by the implementation of the ARM Plan through approvals of projects such as the proposed one in areas of geology, hydrology, groundwater, fisheries, vegetation and wildlife, demographics and socioeconomics, traffic and circulation, energy and natural resources, air quality, public services and utilities, cultural resources, and public health and safety if recommended mitigation measures were required. These mitigation measures are either required by ARM Plan standards or have been incorporated into the project design as conditions of approval which have been agreed to by the applicant. In addition, all site specific impacts have been analyzed in this Initial Study and mitigations measures for them have been incorporated into the project design as conditions of approval which have been agreed to by the applicant. Therefore, all potential adverse cumulative impacts in these areas have been mitigated to a level that is less than significant.

The ARM Plan Program EIR identified the following cumulative or other impacts of adoption and implementation of the ARM Plan which could not be fully mitigated:

1) The possibility of excessive noise along haul routes as analyzed and set out in Sections 8.11 and 9.3.13.

2) The possibility of adverse visual impacts from mining and processing activities as analyzed and set out in Sections 8.13 and 9.3.13.

As to these two possible adverse impacts, the Board adopted findings of overriding considerations in Sections 36 and 37 of Resolution No. 94-1569 determining that specific economic, legal, social, technological or other considerations, including the provision of employment opportunities for highly trained workers, make unfeasible the full mitigation of those impacts or the adoption of alternatives. The Board weighed the benefits of adoption and implementation of the ARM Plan against its unavoidable adverse environmental impacts and determined that the identified benefits outweighed its adverse impacts and adopted the Statement of Overriding Considerations for the 1994 ARM Plan Revision set out in Exhibit B to that Resolution. This Finding of Overriding Considerations is applicable to the unavoidable impacts of the proposed project, which is herein deemed to be within the scope of the ARM Plan as examined in the Program EIR. Except for those unavoidable impacts identified above, there are no adverse impacts, either cumulative or otherwise, which are not fully mitigated by the attached conditions of approval/mitigation monitoring plan.

c) As analyzed in this initial study, all potential significant adverse impacts directly on humans can be mitigated to a level of insignificance.

EXHIBIT "A"

7/17/2000

CONDITIONS OF APPROVAL AND MITIGATION MONITORING PLAN AGREED TO BY THE APPLICANT FOR THE CANYON ROCK MINING AND RECLAMATION EXPANSION PLAN
FILE NO. PLP 97-0046 - WENDEL TRAPPE

The California Environmental Quality Act (CEQA), Section 21081.6, requires that a local agency adopt a mitigation monitoring plan to ensure an operators compliance with any project changes or conditions of approval when the local agency approves a project for which an EIR or Negative Declaration has been completed and bases the approval upon findings that any or all significant adverse environmental effects have been mitigated or avoided by changes that have been required of the project or by conditions of approval. If the changes and conditions have been incorporated at the request of agency with legal jurisdiction over the natural resources affected by the project, the lead agency may request that agency to prepare a monitoring program.

The Program Environmental Impact Report prepared for the 1994 ARM Plan ("the PEIR") and Mitigated Negative Declaration prepared for the above project identified several significant adverse effects. They recommended mitigations for each impact and monitoring activities for each mitigation which were included in the Conditions of Approval. It is the responsibility of the Sonoma County Board of Supervisors as the hearing body to approve a monitoring plan to ensure that all changes or conditions are complied with.

The Permit and Resource Management Department is responsible for monitoring the compliance of aggregate operations with all permit conditions and ordinance requirements as part of the ongoing inspection, enforcement, mitigation and monitoring program established by the Aggregate Resources Management (ARM) Plan. In addition, the County conducts an annual inspection of every mining site to fulfill the requirement of the State Surface Mining and Reclamation Act (SMARA). Some of the monitoring for the following conditions of approval will be carried out concurrently through the above activities; In other cases more frequent monitoring or monitoring by a qualified professional or responsible agency has been deemed necessary and added to the ongoing monitoring activities.

The monitoring activities planned for each condition of approval along with the responsible person or agency, the frequency or schedule of monitoring are provided after each applicable condition in the following conditions of approval.

The requirements of this Plan run with the real property that is the subject of the project. Successive owners, heirs, and assigns of this real property are bound to comply with all the requirements of this Mitigation Monitoring Plan. Prior to any lease, sale, transfer, or conveyance of any portion of the real property that is the subject of the project, the owner shall provide a copy of the adopted plan to the prospective lessee, buyer, transferee, or one to whom the conveyance is made.

1. The operator and subsequent owners or operators of the above-referenced project may proceed with the approved development and use only if the conditions of approval which follow have been complied with fully. This use permit and the conditions of approval run with the project site and are binding on future owners, heirs and assigns. Prior to the lease, sale or other conveyance of any portion of the real property occupied by this project, the owner shall provide a copy of this exhibit to the prospective lessee, buyer or other recipient of such conveyance. The County has the power to revoke a permit, entitlement, or project approval if the conditions are not met.

2. Mining and Reclamation shall in all cases be completed substantially in accordance with the approved Mining and Reclamation Plan as revised by the Conditions of Approval.

   Mitigation Monitoring: Permit and Resource Management Department staff shall be responsible for reviewing the mining and reclamation operation for compliance with the approved plans and conditions during regular site inspections every 90 days during mining.

3. Unless otherwise specified herein, the activities authorized by this Mining Permit and Reclamation Plan are subject to the provisions of the 1994 ARM Plan, Chapter 26A of the Sonoma County Code, the Building Code, Fire Code, and other County ordinances, regulations, rules, orders and requirements regulating surface mining and reclamation in existence or hereafter adopted pursuant to the 1994 ARM Plan.

   Mitigation Monitoring: Permit and Resource Management Department staff shall be responsible for reviewing the mining and reclamation operation for compliance with all County Codes during regular site inspections every 90 days during mining.

4. This Use Permit and Reclamation Plan is approved over APN's 083-210-013, 016, 017, 018, and 019. This Use Permit and Reclamation Plan shall supersede the previously approved Use Permit and Reclamation Plan for expansion of Canyon Rock Quarry (County File 90-362) on APN 083-210-019. The approved mining area shall not be within 25 feet of the boundary of the Mineral Resources District. The boundaries of the approved mining area shall be surveyed and staked prior to the commencement of mining.

   Mitigation Monitoring: The staked boundaries of the mining area shall be confirmed by field inspection prior to the commencement of mining. An Inspection report will be placed in the file.

5. This Use Permit shall expire when all reclamation work has been completed in the expansion area and approved by the Permit and Resource Management Department, or 20 years from date of permit approval, whichever occurs first (except as noted below). The applicant shall be responsible for applying for any necessary permit renewals/extensions as necessary. Note: If the conditions of this permit have not been met and mining activity has not reached the expansion area within 10 years from date of permit approval, and the existing quarry area shows a history of permit violations as determined by the Permit and Resource Management Department, then this expansion permit shall expire at 10 (ten) years from date of approval.

   Mitigation Monitoring: Permit and Resource Management Department staff shall review the permit status in 5 years from date of approval, and when all reclamation work on the expansion site is done, and conduct a final inspection on or before 20 years from date of approval of this permit.

6. In no case shall the amount of material sold or exported in any one year from the entire quarry operation exceed the 500,000 cubic yard limit (excluding recycled materials) that was established in the existing quarry's original vested right determination. Only mining and directly related activities (no storage of equipment, non-aggregate materials or junk) may take place on APN's 083-210-013, 016, 017, 018, and 019. Portable aggregate processing materials on these parcels is also prohibited unless the applicant can demonstrate all General Plan Noise Standards will be met.

   Mitigation Monitoring: The Permit and Resource Management Department Planning Specialist shall review annual production reports by the applicant to insure compliance with the mining limitations, and shall review the uses on site during site inspections every 90 days during mining as required by the ARM plan.

7. Payment of ARM Plan Fees for Monitoring, Administration, and Other Mitigation: The operator shall contribute to the funds established by the County pursuant to the ARM Plan and shall otherwise mitigate identified impacts as follows:

Inspection Enforcement and Monitoring Fees: Annual inspection, enforcement and monitoring fees shall be paid by operator in order to cover all actual costs incurred by the County and the inspection, monitoring, and enforcement of the applicable reclamation plan and conditions thereof in accordance with the ARM Plan. Where the monitoring service of a qualified professional is required by the Mitigation Monitoring Plan, additional monitoring fees may be levied on the operator to cover such costs.

Mitigation Monitoring: Permit and Resource Management Department staff shall be responsible for determining compliance with this condition. PRMD staff shall also be responsible for billing the applicant for all monitoring work done in compliance with ARM Plan and County ordinance requirements. Violations of the condition may result in revocation of the use permit for mining.

8. The operator shall submit to the Sonoma County Permit and Resource Management Department financial assurance(s) payable to the County of Sonoma and, in the alternative, the State Department of Conservation, in an amount and format to be reviewed and approved by the Permit and Resource Management Department and State Department of Conservation - Mines and Geology Division, to assure compliance with the approved Reclamation Plan and conditions thereof for the entire expansion area of the quarry (i.e. not including the existing vested right area - Optionally the applicant may include the entire quarry, vested right and expansion area, under a single financial assurance). A valid financial assurance shall be maintained on file until the Permit and Resource Management Department determines that all reclamation has been successfully carried out in compliance with the reclamation and final conditions. Financial assurance shall renew automatically and shall not expire without 90-days advance written notice being provided to the Permit and Resource Management Department. A continuation Certificate or other proof of extended coverage shall be forwarded to the Permit and Resource Management Department no less than 30 days prior to the expiration date of the financial assurance. The Permit and Resource Management Department may adjust the amount of the security on an annual basis to account for additional lands disturbed or reclaimed, inflation, or revised cost estimates. The financial assurance shall reference the name of the mining site, the resolution number of the County approval, and the Permit and Resource Management Department file number.

The County may pursue redemption of the securities if 1) the final reclamation does not meet the performance standards, 2) satisfactory progress is not made towards completing the reclamation in a timely manner, or 3) The operator is financially incapable of carrying out the reclamation.

Mitigation Monitoring: Permit and Resource Management Department staff shall not give clearance for mining to begin in the expansion area until the required securities have been provided.

9. To the extent required by applicable law, the operator shall obtain any and all permits or approvals required by other agencies having jurisdiction over the project and shall provide copies of same to the Permit and Resource Management Department. This permit is subject to the conditions of said permits and any violation of other such permits shall constitute a violation of this permit. Such agencies may include, but are not limited to:

a. Sonoma County Water Agency
b. Sonoma County Public Health Department
c. Sonoma County Air Pollution Control District
d. California Department of Fish and Game
e. California Water Resources Control Board and Water Quality Control Board
f. Army Corps of Engineers
g. U.S. Fish and Wildlife Service

h. U.S. EPA
I. State Department of Forestry

Mitigation Monitoring: Permit and Resource Management Department staff may respond to any agency's complaint that conditions are not being met at the mining site. Such response may include revocation of the use permit.

10. Within five days after approval of this project and the adoption of a Negative Declaration, the operator shall pay to the County Permit and Resource Management Department a mandatory $35.00 filing fee and $1250 State Fish and Game Fee because a Negative Declaration was prepared, for a total of $1285. Checks shall be made payable to "Sonoma County Clerk". This fee must be paid or the approval of this project is not valid.

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for notifying the applicant the State fee is due. Failure to pay the fee will result in the project approval being void.

11. This permit and plan approval shall be subject to revocation or modification by the Planning Commission if the Commission finds that there has been a) noncompliance with any of these conditions of approval or b) the Commission finds that the use for which approval is hereby granted is so exercised as to be substantially detrimental to persons or property in the neighborhood of the use, recognizing that the project as approved may result in some unavoidable environmental impacts. Any such revocation shall be preceded by a public hearing noticed and heard pursuant to the Sonoma County Code.

    Mitigation Monitoring: The Permit and Resource Management Department Planning Specialist shall be responsible for responding to any complaints made about the operation. If violations of the conditions of approval are verified, the permit may be scheduled for revocation.

12. Unless other criteria are established by state or local regulations prior to the approval of this reclamation plan, the following performance standards shall be used to determine when the reclamation has been successfully completed.

    A. Success of revegetation will be analyzed by comparing quantified measures of vegetative cover, density, and species richness of the reclaimed area to similar parameters of naturally occurring vegetation in the area. The quantitative measures shall be made by the Department of Fish and Game and/or a qualified professional. The revegetation performance standards shall be considered met once the established plantings have been in place at least 5 years, and are capable of self-regeneration and have met the quantified measurements for a period of two years without human intervention such as watering, weeding, fertilizing, replanting, etc.

    B. All slopes, benches, and berms shall be graded to the finished slopes as established by the approved plan with such variations as recommended in advance by the Department of Fish and Game, the Permit and Resource Management Department and a qualified professional (generally within a 1.0 foot variation of relief). There should be no "gully-washes" evident on the graded slopes (generally greater than 1.5 feet deep).

    C. Slopes and terraces shall be resoiled with a minimum of 12 inches of topsoil (or the equivalent depth of what exists on site premining) saved from the site prior to revegetating the slopes. All planting areas on terraces previously packed by equipment or vehicle travel shall be ripped and scarified prior to resoiling or replanting.

D. All mining debris, inoperative equipment, tires, barrels, etc. shall be removed.

E. The State Department of Fish and Game verifies that the riparian corridor reclamation along Green Valley Creek has continued to be successful.

Mitigation Monitoring: Permit and Resource Management Department staff shall be responsible for reviewing all reclamation work through field inspections. Reclamation securities shall not be fully released until the reclamation is successful, as defined in this condition. Reclamation may be accepted in phases and security reduced as appropriate.

13. Grading of slopes, replacement of soil, and replanting shall be completed concurrently with the mining activities where possible rather than be delayed until after the completion of all mining. No more than 15 acres of working (unreclaimed) land shall be graded/exposed at any one time (This requirement excludes the existing 20 acre processing/stockpile/loading area and an access way approximately 100 feet wide from it to the 15 acre working slope area). In addition, in no case shall the planting of vegetation and final reclamation of slopes take more than two years past cessation of mining in that area unless weather conditions or other conditions beyond the control of the operator make performance within this time period unreasonable. To insure accurate monitoring of this condition the operator shall be responsible for submitting a site plan or aerial photographs by October first of every second year (after mining in the expansion area has begun) that clearly depicts the total extent of the mining and reclamation areas on the property. Failure to comply with this condition shall result in the immediate cessation of all mining, processing, and sales of material (reclamation work may continue).

Mitigation Monitoring: Permit and Resource Management Department staff shall review the progress of reclamation activities during field inspections every 90 days during mining operations and by review of submitted documentation.

14. Operations at the site shall be limited to the following hours, 6:00 a.m. to 10:00 p.m. weekdays and 6:00 a.m. to 4:30 p.m. Saturdays. There shall be no mining operations on Sundays or Federal Holidays.

Mitigation Monitoring: Permit and Resource Management Department staff shall respond to complaints over violations of this condition within one week.

15. The generation of air borne dust from mining or processing activities onsite, or transport activities off site (along the haul roads and Hwy 116), shall be controlled by frequent water misting/spraying during dry conditions, and/or the use of a dust suppressant that has been reviewed by the State Department of Fish and Game and approved by Permit and Resource Management Department. Chemical dust suppressants shall not be used on the ground during the wet season when runoff may be a problem. The applicant shall also be responsible for maintaining compliance with all Regional Air Quality Control Board permit requirements.
Mitigation Monitoring: The adequacy of dust control shall be monitored by the Regional Air Quality Control Board. In addition, the adequacy of dust control shall also be monitored on site and along roads by Permit and Resource Management Department staff at the time of site inspections every 90 days. All complaints will be responded to within one week. Copies of the inspection reports shall be placed in the project file.

16. To minimize gravel and other materials from being spread onto the Hwy 116, the tire scrapers on site shall be kept in good working order, and paved areas on site and on Hwy 116 adjacent to the driveway intersection shall be kept clear of loose materials. When a spill does occur, the operator shall be responsible for taking quick remedial action. In addition, all trucks leaving the site shall

be loaded so as not to exceed California State aggregate vehicle requirements (23114 VC or latest amendment).

Mitigation Monitoring: The adequacy of the control of loose aggregate material on site and along roads shall be reviewed by Permit and Resource Management Department staff at the time of site inspections every 90 days. All complaints will be responded to within one week. Copies of the inspection reports shall be placed in the project file.

17. Prior to the commencement of mining, the grading, drainage, and revegetation plan shall be submitted to the Permit and Resource Management Department for final review and approval. The Permit and Resource Management Department will refer the plans to the Department of Fish and Game for their review and recommendation. The plan shall include the following mandatory features to ensure that the impacts identified in the EIR are mitigated:

a) A Certified Engineering Geologist or Registered Geotechnical Engineer shall specifically approve the maximum working slopes of the mine face. In all cases, the slope or height of the active working face shall not exceed the safety standards established by CALOSHA and MSHA.

b) Benches in final slopes are required every 25 to 30 vertical feet for access and drainage control. Final reclamation slopes shall not exceed a steepness of 1.5:1.

c) Drainage plans and facilities must minimize slope erosion and off site sedimentation. All drainage from the quarry floor, slopes, berms, and access roads shall pass through a sediment pond/trap prior to discharge from the site. All drainage from the processing area, concrete batch plant area and truck/equipment wash area shall pass through at least two sediment pond/traps in series prior to discharge from the site. All outlets of the sedimentation ponds draining offsite shall have a screen to catch debris and foreign matter.

d) All drainage plans and facilities including sediment ponds/traps shall be designed and certified by a registered civil engineer as adequately sized and designed to meet County standards.

e) Provision for a monitoring report prepared by a qualified expert to be submitted to the Permit and Resource Management Department by December 31, of the first year mining begins in the expanded area. Said report shall include verification that all on site drainage and erosion control measures have been followed, drainage water quality measurements, and that there has been no adverse downstream impacts (on Green Valley Creek) from excess sedimentation. At least three site visits following storm events must be detailed in the report.

e) Revegetation effort shall use primarily native species. The initial planting plan shall be dense enough to allow for some plant die off and still meet reclamation standards.

f) A drip or other irrigation plan to water all new plantings for at least two years, unless specifically waved by the PRMD after consultation with California Department of Fish and Game.

g) The quarry drainage and sediment control plan shall retain the same overall water levels flowing off site into the Hwy 116 crossing as naturally occurs unless otherwise approved by the State Department of Fish and Game.

The applicant shall be responsible for hiring a qualified expert(s) to verify the above described drainage and erosion control performance standards are being met in the field at any time if requested by the Permit and Resource Management Department.

Mitigation Monitoring Measures: CALOSHA and MSHA conduct annual inspections and shall act as the lead agency responsible for monitoring the safety of working slopes. The Permit and Resource Management Department staff shall monitor the compliance with this condition by 1) requiring review from Fish and Game of the final revised grading and planting scheme, 2) reviewing the submitted monitoring report(s), 3) inspecting the site during reclamation work, upon the completion of the initial reclamation work, and every 90 days during the mining season to assess the need for remedial grading, drainage, and revegetation efforts, and 4) responding to any complaints over violation of the condition within one week .

Inspections shall be verified by inspection reports placed in the project file on the scheduled basis. A copy of the revised planting and grading scheme with the Fish and Game letter or stamp of approval shall be placed in the project file. The annual assessment of the reclaimed areas compliance with the performance standards shall be placed in the Project file by Permit and Resource Management Department staff until such time that the performance standards are met and the reclamation plan is deemed complete.

18. Following storm events which significantly damage the reclamation areas, the operator shall have a qualified professional conduct a damage survey of the reclamation improvements, and recommend remedial actions as necessary to help assure that the performance standards will be met. A report shall be submitted to the Sonoma County Permit and Resource Management Department regarding the effects of such damage, including recommendations for replanting, if necessary.

    Mitigation Monitoring: Permit and Resource Management Department staff shall be responsible for reviewing the damage report and insuring the operator complies with any required replanting or other work necessary.

19. To minimize the introduction of contaminants which may degrade the quality of water discharged from the site, the following measures shall be taken:

    A) 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.

    B) Prior to commencing mining activities a spill prevention and emergency/countermeasure response plan shall be prepared and submitted to the County Hazardous Materials Division for review and approval. The operator shall provide a copy of the approved plan to the Permit and Resource Management Department.

    C) Access to the site shall be controlled by maintaining security fencing and locking gates and posted trespass signs at all vehicular access points to the site.

    D) Runoff from the access roads shall be collected and passed through the sediment pond/trap system on site.

E) Planting methods used in reclamation shall avoid the surface application of fertilizers high in nitrogen or phosphorus that might contribute to contamination of downstream waters.

Mitigation Monitoring: The Permit and Resource Management Department shall monitor the compliance by requiring the operator to submit a copy of the spill prevention plan for inclusion in the project file prior to the start of mining. Other features of the mitigation will be reviewed in inspections conducted during reclamation work, upon the completion of the initial reclamation work, and every 90 days during the operating season. Inspection reports placed in the project file will address the compliance.

20. If buried archaeological indicators (including but not limited to marine shell, obsidian flakes, burned or fragmented animal bone, ash, charcoal, fire cracked rock, localized darkened soil, or human burials) are uncovered all work shall stop and a qualified archaeologist and the County Permit and Resource Management Department shall be consulted.

Mitigation Monitoring: The Permit and Resource Management Department Planning Specialist shall be responsible for coordinating with the qualified archaeologist and insuring the stop work order is complied with if archaeological indicators are uncovered.

21. 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 Monitoring: The Permit and Resource Management Department will monitor the mitigation by requiring the operator to submit to the Permit and Resource Management Department a written list of the employees and the date of their participation in the required training sessions.

22. Night lighting shall be screened so as not to produce glare onto adjacent properties and roadways.

Mitigation Monitoring: Permit and Resource Management Department staff shall respond to any complaints over violation of this condition within one week.

23. The operator shall provide to the California Department of Conservation and the Permit and Resource Management Department, in the manner specified by said agencies, annual reports on the mining and reclamation activities on the site until the project is completed.

Mitigation Monitoring: Permit and Resource Management Department staff shall be responsible for reviewing said reports for compliance with the approved project and conditions and ARM Plan standards. Staff shall also be responsible for responding to any complaints from State agencies that their required inspection reports have not been submitted.

24. The operator shall require all its drivers to participate in a truck driver education/safety orientation which indicates preferred routes, and establishes procedures to reduce public conflicts and ensure traffic safety. A list of employees undergoing the orientation shall be submitted to the Permit and Resource Management Department prior to the commencement of mining operations

at the site. The training and list shall be updated by the operator as new employees are added.

Mitigation Monitoring: The Permit and Resource Management Department will monitor the mitigation by requiring the operator to submit to the Permit and Resource Management Department a written list of the employees and the date of their participation in the required training sessions.

25. Prior to the commencement of plant operations, the applicant shall apply for a National Pollutant Discharge Elimination System (NPDES) Permit with the State Water Quality Control Board. The applicant shall provide a copy of the permit approval to the Permit and Resource Management Department.

Mitigation Monitoring: The Regional Water Quality Control Board will monitor compliance with the NPDES permit. A copy of the permit approval shall be placed in the project file at the Permit and Resource Management Department. In addition, the Permit and Resource Management Department shall inspect drainage and storm water discharge as part of its regular inspection of the quarry site and report any potential violations to the RWQCB.

26. Sediment pond/traps and drainage systems shall be cleaned out pursuant to the standards stated in the approved erosion and sediment control plan. Further, the sediments shall be stockpiled for use as top soil in the reclamation process. The slope of the pond/trap banks (below water) shall be equal to or greater than a 3:1 (horizontal/vertical) slope to discourage shallow water areas which promote plant growth and mosquito breeding. If upon inspection, all of the sediment pond/traps and drainage systems on site have not been cleaned out pursuant to the standards stated in the approved erosion and sediment control plan, all crushing, screening, grading, and sales of material on site shall immediately cease until the ponds/traps and drainage system have been cleaned out. (Note: If existing sediment ponds/traps are unable to be cleaned out due to U.S. or State Fish and Game restrictions, new sediment ponds/traps shall be created)

Mitigation Monitoring: The Permit and Resource Management Department Planning Specialist shall be responsible for reviewing the status of the sediment pond/traps and drainage systems during regular site inspections every 90 days. In addition, a field inspection shall be scheduled as soon as possible after October first of each year to insure compliance with this condition. A stop work order shall immediately be posted if violations of this condition exist.

27. Topsoil suitable for use in revegetation shall be stockpiled for use in reclamation and replanting of cut slopes. Prior to each years rains, all topsoil stockpiled for future use in revegetation shall be seeded and mulched in order to prevent soil loss through erosion.

Mitigation Monitoring: The Permit and Resource Management Department Planning Specialist shall be responsible for reviewing the status of the stockpile areas during regular site inspections every 90 days during mining.

28. The operator shall notify the Permit and Resource Management Department in writing at least fifteen (15) days before the conclusion of each phase of reclamation.

Mitigation Monitoring: the Permit and Resource Management Department shall inspect the site periodically in accordance with the inspection, enforcement, monitoring, and mitigation program of the ARM Plan and also within thirty (30) days of receiving the operators notification of completion of each phase of reclamation. A written inspection report on each site visit shall be placed in the project file, which shall be used to determine the official start date of reclamation effort time frames for each area as established in these conditions of approval.

29. On APN 083-210-019 all of the recommendations made in the geological investigation entitled "Geologic Investigation Canyon Rock Quarry Forestville, Sonoma County" prepared by Huffman and Associates, Inc., dated April 1982 shall be adhered to. No mining shall occur within the 250 foot setback zone established along the North Boundary of 083-130-006 and 083-210-019 as detailed in the report and shown on the preliminary grading plans. This setback area shall be retained in its natural state as a buffer. The setback shall be clearly marked in the field by at least 10 brightly colored stakes projecting at least 4 feet above ground level at both a) 250 feet from the property line, and b) at the location of the toe of final reclamation slope below the setback line.

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for reviewing mining activities and the staked setback area during regular site inspections every 90 days during mining.

30. On APN's 083-210-013, 016, 017, and 018 all recommendations made in the geological investigation entitled "Report Geotechnical Reconnaissance Canyon Rock Expansion Forestville, California" prepared by Bauer Associates, dated November 17,1997 shall be adhered to.

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for reviewing mining activities during regular site inspections every 90 days during mining.

31. All mining stockpiles, spoils, and recycled material shall be stored at least 200 feet away from Hwy 116 unless it is fully screened by a berm and/or vegetation. All new structures shall be located at least 200 feet away from Hwy 116. No junk, debris, non-operative vehicles, or construction equipment unrelated to the quarry shall be stored anywhere on the quarry property. (Note, this condition is not intended to restrict the applicant from storing personal and hobby related equipment on site)

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for reviewing all uses in the quarry during regular site inspections every 90 days during mining.

32. All extraction shall be carried out in a manner so that all runoff and loose materials are removed from and/or diverted to the quarry side of the ridge, leaving the other side of the ridge undisturbed until it is mined.

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for reviewing how the mining operation is proceeding during regular site inspections every 90 days while mining is occurring.

33. No soil or other material containing hazardous or toxic waste shall be imported to the quarry (Note, this condition is not intended to restrict the recycling of concrete or asphalt on site).

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for responding to complaints over violation of this condition within one working day.

34. Water used for processing activities and dust suppression shall be recycled from the sediment pond/traps whenever possible.

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for reviewing the status of water supplies during regular site inspections every 90 days when mining is occurring.

35. Blasting shall be limited to daytime hours from 10:00 am to 4:00 pm only. A blasting permit shall be obtained from the Sonoma County Sheriff's Department prior to any blasting. Blasting shall only be conducted by licensed certified personnel consistent with Federal, State, and local regulations. In no case shall blasting noise (airblast), measured near residential buildings, exceed 130 dBL. In no case shall particle velocity of blast-induced ground motion exceed 0.5 in/sec near any private off-site structures. The applicant shall be responsible for hiring a qualified expert to verify the above described noise and vibration performance standards are being met if requested by the Permit and Resource Management Department.

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for responding to any complaints over violations of this condition within one working day.

36. Mining activities and the operation of heavy equipment on site shall be done in such a manner as to avoid repeated crossing of drainage ways or puddles that are actively flowing into the sediment pond/traps and offsite.

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for reviewing the activity patterns of all heavy equipment and their relationship to the drainage system during regular site inspections every 90 days while mining is occurring.

37. When mining encroaches within 200 feet of any property line, the approved top of final reclamation slope in that area shall be clearly marked in the field by brightly colored stakes projecting at least 4 feet above ground level spaced every 200 feet. When mining encroaches within 100 feet of the approved toe of final reclamation slope in any area, the toe shall be clearly marked in the field by brightly colored stakes projecting at least 4 feet above ground level spaced every 200 feet. The applicant shall be responsible for submitting a site plan or aerial photograph showing the extent of existing mining in relationship to all property lines if requested by the Permit and Resource Management Department to verify the need for, or location of, the required stakes.

    Mitigation Monitoring: The Permit and Resource Management Department Staff shall be responsible for reviewing the stake locations, and that mining does not encroach beyond them during regular site inspections every 90 days when mining is ongoing.

38. Mining operations shall not commence in the expanded mining (APN's 083-210-013, 016, 017, 018, and 019) area until the following activities are completed:

    a) the reclamation plan text and exhibits have been modified to conform to the changes made through this approval, and

    b) a final grading and revegetation plan is recommended by Fish and Game and included in the reclamation plan, and the sediment ponds/drainage system have been installed/cleaned out as required by the erosion and sediment control plan, and

    c) a verification list of the workers and/or employees which have undergone a truck driver education/safety orientation as specified in these conditions is supplied to the Permit and Resource Management Department by the operator, and

    d) a financial assurance bond is supplied to the Permit and Resource Management Department, sufficient to cover the reclamation costs as required by SMARA, and as provided for in the above conditions, and

e) a Spill Prevention Plan is approved by the County Environmental Health Department's Hazardous Materials Division and made part of the reclamation plan, and

f) a verification list of the workers and/or employees which have undergone a cultural resources orientation and awareness training is supplied to the Permit and Resource Management Department by the operator, and

g) the operator has filed a "Notice of Intent" Form and applied for a Storm Water Permit with the State Water Resources Control Board or such application has be deemed unnecessary by the Control Board, and

h) the required Traffic impact fees under the Public Works section of these conditions have been paid or otherwise met as stated in these conditions, and

I) an erosion and sediment control plan prepared by a certified Erosion and Sediment Control Specialist, which meets all requirements of the conditions of approval and states specific criteria for clean out of all sediment ponds/traps, is approved by the PRMD and included in the reclamation plan, and

j) all recommendations of the Canyon Rock Quarry Expansion Botanical and Wildlife Assessment and Survey Follow Up Report prepared by Prunuske Chatham, Inc., dated summer 1999 shall be met prior to commencement of mining in the expansion area. If the follow up monitoring does indicate that additional mitigations are required beyond the scope of those already required by the permit, work shall not be allowed to commence on site, and the project shall be returned to public hearing, and

k) the 250 foot geological setback zone is staked as specified in these conditions, and

l) reclamation work has expanded the riparian corridor along Green Valley Creek (in the existing quarry area) to 100 feet from top bank, meeting all ARM Plan standards. The reclamation work shall have included but not be limited to removing all mining equipment, stockpiles, spoils, bins, barrels, tires, inoperative vehicles and any other debris from the berm along the creek, regrading of the berm so that the west toe of the berm is no less than 50 feet from top of bank of the creek and the berm slope does not exceed 2:1 (horizontal to vertical) or as otherwise approved by PRMD, completion of planting of the area with natural riparian or other appropriate type vegetation, and installation of a physical barrier (i.e. old railroad ties/poles, or fencing, etc.) to protect the area from encroachment of mining equipment, and

m) the applicant has obtained a Cal Trans Encroachment Permit if necessary and completed all work necessary to relocate the existing bank west of the driveway entrance to provide adequate vehicular sight distance. Said work shall include the revegetation of the Hwy 116 side of the bank and slope stabilization of the quarry side of the bank. Prior to commencing work in or adjacent to the right-of-way, the State Highway Patrol and CalTrans shall be notified so that proper safety precautions can be taken, and

n) additional tree plantings have been made at the southeast corner of APN 083-130-043 (near the intersection of Martinelli Road and Hwy 116), and on both sides of the quarry entrance, to help visually screen the quarry face from west bound traffic. All trees planted shall be a minimum of 15 gallons in size and provision for watering shall be made, and

o) final reclamation of all quarry slopes and the quarry floor (excluding a 15 acre working area and a 20 acre processing/stockpile/loading area, and an access way approximately 100 feet wide connecting them) on APN's 083-130-043 & 006 has been completed, and the operator is up to date with all required reporting forms and fees, and has no outstanding violations anywhere within the quarry. To insure accurate compliance with this condition the applicant shall submit a site plan or aerial photograph clearly depicting the extent of mining and reclamation on the site, and

p) all junk, debris, non-operative vehicles, and construction equipment unrelated to the quarry operation have been removed from the site. To insure accurate compliance with this condition the applicant shall submit to the PRMD a list with associated site plan identifying the quarry related uses of all equipment and materials currently stored on site (Note, this condition is not intended to restrict the applicant from storing personal and hobby related equipment on site), and

q) evidence that the septic system on site is adequate as specified in these conditions has been submitted to the Permit and Resource Management Department Health Specialist, and

r) written verification from a qualified noise consultant that all loaders and equipment have had high performance mufflers and special engine noise control housings installed as specified in these conditions has been submitted to the Permit and Resource Management Department Health Specialist, and

s) written confirmation is received from the Regional Water Quality Control Board and Regional Air Pollution Control Board that the existing site is in full compliance with all of their existing permit requirements.

Mitigation Monitoring: Permit and Resource Management Department staff shall not give clearance for the mining to begin until the above condition has been fully met.

HEALTH:

39. Public water connection to the Forestville Water District shall be maintained.

Mitigation Monitoring: The Permit and Resource Management Department Health Specialist shall be responsible for responding to any complaints over violations of this condition within one week.

40. Upon encroachment by mining activities, abandon existing wells under permit from the Well and Septic Section of the Permit and Resource Management Department. This division may review a request to upgrade any adjacent wells to current standards relating to setbacks and annular well seals. This requirement applies to all wells.

Mitigation Monitoring: The Permit and Resource Management Department Planning Specialist shall be responsible for reviewing the encroachment of mining on any existing wells, and requiring the operator obtain the appropriate permits, during regular site inspections every 90 days during mining. The Permit and Resource Management Department Health Specialist shall be responsible for reviewing any permit requests for well abandonment or upgrade with County standards.

41. An analysis shall be made by a Registered Civil Engineer or Registered Environmental Health Specialist regarding the existing septic system's ability to accommodate the proposed sewage loading. Any necessary system expansion or modifications shall be done under permit from the Well and Septic Section of the Permit and Resource Management Department and may require

both soils analysis and percolation testing. (Note: Application shows an increase from 10 employees (1992) to 15 employees.)

Mitigation Monitoring: The Permit and Resource Management Department Health Specialist shall not give clearance for mining to begin in the expansion area until the analysis has been submitted and any necessary upgrades to the septic system (pursuant to County standards) are completed.

42. Toilets with hand washing facilities shall be provided for employees.

Mitigation Monitoring: The Permit and Resource Management Department Health Specialist shall be responsible for reviewing the status of hand washing facilities when reviewing the required septic system analysis.

43. If hazardous waste is generated or hazardous materials 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. (Additional information and fees may be required). The applicant may submit a copy of a current permit to the Permit and Resource Management Department Health Specialist to verify compliance.

Mitigation Monitoring: The Permit and Resource Management Department Health Specialist shall be responsible for reviewing the applicants existing and/or new permits prior to giving clearance for mining to begin in the expansion area, and for responding to any complaints over violation of this condition within one week.

44. If applicable, operator shall obtain approval from the Regional Water Quality Control Board for any hazardous materials stored in above ground tanks. The applicant may submit a copy of a current permit to the Permit and Resource Management Department Health Specialist to verify compliance.

Mitigation Monitoring: The Permit and Resource Management Department Health Specialist shall be responsible for reviewing the applicants existing and/or new permits prior to giving clearance for mining to begin in the expansion area, and for responding to any complaints over violation of this condition within one week.

45. 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 Monitoring: The Permit and Resource Management Department Health Specialist shall be responsible for responding to any complaints over violations of this condition within one week.

46. Noise shall be controlled in accordance with the standards set in the Noise Element of the Sonoma County General Plan. The operator shall adequately muffle and maintain all equipment used on the project site. The applicant shall be responsible for hiring a qualified expert to verify the above described noise performance standards are being met if requested by the Permit and Resource Management Department. A written report of the noise consultants findings shall be submitted to the Permit and Resource Management Department Health and Planning Specialists. If noise measurements indicate that General Plan Noise Element limits are being reached or exceeded, that portion of the operation causing the violation shall cease activity.

Mitigation Monitoring: The Permit and Resource Management Department Planning Specialist shall be responsible for reviewing the presence or absence of inadequately mufflered equipment during field inspections every 90 days during the operating season. The Permit and Resource Management Department Health Specialist shall be responsible for responding to all complaints over violation of this condition within one week, and for requiring and reviewing any necessary noise monitoring reports. All inspection and monitoring reports will be placed in the project file.

47. Prior to any mining in the expansion area a qualified noise consultant shall certify that all loaders and equipment have had high performance mufflers, special engine noise control housings, and low toned backup beepers installed which comply with the latest available technological improvements to reduce noise impacts to sensitive receptor sites.

Mitigation Monitoring: The Permit and Resource Management Department Health Specialist shall not give clearance for mining to begin in the expansion area until the required certification has been received.

48. When mining activities encroach within either 1) 950 feet where there is a direct line of sight, or 2) 600 feet regardless of the line of sight, of the of the two residences on APN 083-210-020 that were identified as being potentially impacted by noise (In the noise study entitled "Canyon Rock Company Conditional Use Permit Application Forestville, California Environmental Noise Assessment" by Illingworth & Rodkin, Inc., dated November 13, 1997), or the residence on APN 084-220-014 that was identified as being potentially impacted by noise (In the letter from Richard Rodkin, Illingworth & Rodkin, Inc., dated July 16, 1999), the applicant shall have a qualified acoustical consultant take noise measurements on site once a month during active mining operations in that area. If determined necessary by PRMD, the applicant shall have the 600 and 950 foot limits staked with easily visible poles at least 4 feet tall. Written reports of the noise consultants findings shall be submitted to the Permit and Resource Management Department Health and Planning Specialists. If noise measurements indicate that General Plan Noise Element limits are being reached or exceeded at the residences, all further mining in the direction of the residences shall be halted. The applicant shall then be responsible for submitting a revised reclamation plan which allows for any necessary buffer zone that has been identified through on site monitoring.

Mitigation Monitoring: The Permit and Resource Management Department Planning Specialist shall be responsible for reviewing the encroachment of mining on the existing two residences does drop below the minimum distances without the required noise monitoring reports being submitted. The Permit and Resource Management Department Health Specialist shall be responsible for reviewing the submitted noise monitoring reports, and for responding to any complaints over violations of this condition within one week.

PUBLIC WORKS:

49. Prior to proceeding with construction of any driveway improvements on Hwy 116, the operator shall obtain a State Encroachment Permit from CalTrans if necessary and make improvements to the State Highway as required by the Encroachment Permit.

Mitigation Monitoring: The Permit and Resource Management Department Public Works Specialist shall not give clearance for mining to begin in the expansion area until the required permit has been obtained (or determined not necessary), and all work completed.

50. The operator shall pay a development fee (Traffic Mitigation) to the County of Sonoma, as required by Sections 26-494 through 26-494.9, of the Sonoma County Code, inclusive.

Mitigation Monitoring: The Permit and Resource Management Department Public Works Specialist shall not give clearance for mining to begin in the expansion area until the required fee has been paid or waved.

51. The operator will annually pay a Road Fee per ARM Plan standards (p. 7-6, #11) to mitigate the wear and tear to County maintained roads and the safety impacts to the County maintained roads caused by the operation's truck traffic from the expanded mining area on the primary haul route(s). The County will develop the Road Fee from information about the County road segments that the primary haul route uses. It will also be based on the quantity of aggregate produced from the expanded mining area.

More specifically: The wear portion of the Road Fee will be based on the sales volume in tons as shown in the "Annual Aggregate Industry Production Summary." The County will convert the sales volume to Equivalent Single Axel Loads (ESAL) that impact each road segment used in the primary haul route. The County then converts the ESALs into pavement thickness consumed that year by the hauling operation. The amortized annual cost of restoring this pavement thickness becomes the maintenance portion of the Road Fee. The safety portion of the Road Fee shall be based on the operator's fair share of bringing deficient portions of the haul route(s) up to the AASHTO recommended standards. For the purposes of this fee, the minimum recommended width for safe operation of large commercial trucks is 28 feet. The aggregate operator's fair share is based on the percentage of total truck traffic on the haul route that belongs to the subject aggregate operation, amortized over the life of the improvements. **NOTE: If the above formula for determining road impact fees is modified by the Board of Supervisors the applicant shall be responsible for paying the amount specified by the new fee formula.**

The County shall assess the Road Fee each year for the life of this Permit. If the County Department of Transportation and Public Works holds billing the applicant until a final road mitigation fee formula is set by the Board of Supervisors, then the first bill shall include all years from the date mining begins in the expanded quarry area to the time of billing. The operator shall pay the mitigation fee within six (6) months of receiving notice of the fee amount. If the developer does not make payment within six (6) months, the operator will be in violation of the conditions of approval of this permit, and the permit will be subject to revocation or modification.

<u>Mitigation Monitoring:</u> The County Department of Transportation and Public Works will be responsible for: 1) determining the operator's annual road mitigation fee; 2) formally billing and collecting from the operator; 3) notifying the Permit and Resource Management Department's ARM Plan compliance inspector of the fee status.

52. Prior to mining in the expanded quarry area, the Operator shall be responsible for:

1. Preparing an engineered cost estimate to the satisfaction of CalTrans and the PRMD for:

A. Adding a minimum 4 foot wide shoulder where needed to both sides of: Hwy 116 between the quarries and Mirabel Road; and the segment of Mirabel Road between the Youth Park and the south end of the existing 4 foot shoulder improvements; and the segment of Mirabel Road between Trenton Road and River Road, and

B. Improving the sight distance for east bound Hwy 116 traffic approaching Mirabel Road to AASHTO standards or constructing a left turn pocket at this location, and

C. Improving the River Rd/Mirabel Rd intersection and the Hwy 116/Covey Rd intersection to meet AASHTO standards for the volume/speed of traffic present.

2. Determining to the satisfaction of the PRMD and County Department of Transportation and Public Works the percentage of the total amount of traffic passing through these road sections/intersections that the quarry is responsible for:

3. Entering into an agreement (subject to review and approval of PRMD) with the County for payment of the quarry's fair share cost of the total amount of the estimated improvements. The 'fair share' shall be based on the quarry's percentage of total traffic at each location times three (to account for the increased hazard and impact of large aggregate trucks compared to automobiles). Said agreement may at the discretion of the County allow the fee to be paid over a 10 year amortized time period.

Mitigation Monitoring: The County Department of Transportation and Public Works will be responsible for: 1) reviewing the operators cost estimates; 2) reviewing the applicants traffic data and determining their fair share of the costs; 3) preparing an agreement for payment of the operators fair share of the costs; 4) formally billing and collecting from the operator; 5) notifying the Permit and Resource Management Department's ARM Plan compliance inspector of the agreement and fee status.

FLOOD AND DRAINAGE:

53. Drainage improvements shall be designed by a civil engineer in accordance with the Water Agency's Flood Control Design Criteria for approval by the Permit and Resource Management Drainage Review Specialist and shall be shown on the reclamation and grading plans.

Mitigation Monitoring: The Drainage Review Specialist of the Permit and Resource Management Department shall review all drainage plans for compliance with County Standards prior to giving clearance for mining to begin in the expansion area.

APPENDIX D
HYDROLOGY AND WATER QUALITY

APPENDIX D-1

State

Storm Water Pollutant Benchmark Levels

Pollutant	Acceptable Range	units
pH	6.5 - 8.5	
TSS	0 - 100	mg/l
Specific Conductance	0 - 200	umhos/cm
Total Organic Carbon	0 - 110	mg/l
Oil & Grease	0 - 10	mg/l

		Freshwater	Saltwater	units
Al	Aluminum	0.0870		mg/l
NH_3	Ammonia	1.0000	1.0000	mg N/l
As	Arsenic*	0.1500	0.0360	mg/l
Cd	Cadmium*	0.0022	0.0093	mg/l
Cu	Copper*	0.0090	0.0031	mg/l
CN	Cyanide*	0.0052	0.0010	mg/l
Fe	Iron	0.3000		mg/l
Pb	Lead*	0.0025	0.0081	mg/l
Hg	Mercury*	0.00005	0.00005	mg/l
P	Phosphorus*	0.0001	0.0000	mg/l
Se	Selenium*	0.0050	0.0710	mg/l
Ag	Silver*	0.0034	0.0019	mg/l
Zn	Zinc*	0.1200	0.0810	mg/l
Cr	chromium			

Benchmark values represent concentrations of constituents which should be attainable by storm water discharges. If sample results show results outside of the acceptable range, steps should be taken to minimize pollutants.

Not all constituents are required to be analyzed by all permittees. See Table D of the General Storm Water Permit for additional parameters required for differend SIC codes.

Constituents with an "*" are regulated by the California Toxics Rule. These values are not benchmarks, but criteria applicable to inland surface waters of the state.

Metals are expressed as dissolved fractions.
Freshwater criteria assume an ambient total hardness of 100 mg/l.

TABLE B

U.S. EPA Multi-Sector Permit

Parameter Benchmark Values[1,2]

Parameter Name	Benchmark Value
Biochemical Oxygen Demand(5)	30 mg/L
Chemical Oxygen Demand	120 mg/L
Total Suspended Solids	100 mg/L
Oil and Grease	15 mg/L
Nitrate + Nitrite Nitrogen	0.68 mg/L
Total Phosphorus	2.0 mg/L
pH	6.0-9.0 s.u.
Acrylonitrile (c)	7.55 mg/L
Aluminum, Total (pH 6.5-9)	0.75 mg/L
Ammonia	19 mg/L
Antimony, Total	0.636 mg/L
Arsenic, Total (c)	0.16854 mg/L
Benzene	0.01 mg/L
Beryllium, Total (c)	0.13 mg/L
Butylbenzyl Phthalate	3 mg/L
Cadium, Total (H)	0.0159 mg/L
Chloride	860 mg/L
Copper, Total (H)	0.0636 mg/L
Dimethyl Phthalate	1.0 mg/L
Ethylbenzene	3.1 mg/L
Fluoranthene	0.042 mg/L
Fluoride	1.8 mg/L
Iron, Total	1.0 mg/L
Lead, Total (H)	0.0816 mg/L
Manganese	1.0 mg/L
Mercury, Total	0.0024 mg/L
Nickel, Total (H)	1.417 mg/L
PCB-1016 (c)	0.000127 mg/L
PCB-1221 (c)	0.10 mg/L
PCB-1232 (c)	0.000318 mg/L
PCB-1242 (c)	0.00020 mg/L
PCB-1248 (c)	0.002544 mg/L
PCB-1254 (c)	0.10 mg/L
PCB-1260 (c)	0.000477 mg/L
Phenols, Total	1.0 mg/L
Pyrene (PAH,c)	0.01 mg/L
Selenium, Total (*)	0.2385 mg/L
Silver, Total (H)	0.0318 mg/L
Toluene	10.0 mg/L
Trichloroethylene (c)	0.0027 mg/L
Zinc, Total (H)	0.117 mg/L or 117 ug/L
TDS Ca + USEPA MCL secondary standard 500 ppm (Avg. 420 ppm)	
Turbidity 5 units Ca secondary MCL; 1.0/.5/.3 Fed Pri. MCL not more than 10% above background.	

STATE AND REGIONAL BOARD CONTACT LIST

[1] If storm water samples have been analyzed for parameters without Parameter Benchmark Values, contact your Regional Water Board.

[2] Regional Water Boards may adopt Parameter Benchmark Values that are different than those listed in this Table.

APPENDIX D-2

FORESTVILLE 2003 SELF MONITORING SUMMARY REPORTS

ORDER NO. 95-54 ID NO. 1B831000SON

JONES CREEK - UPSTREAM DURING DISCHARGE TO RECEIVING WATERS

BOD Grab Monthly	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(avg mg/L)	< 5	< 5	< 5	0	0	0	0	0	0	0	0	0
pH Grab Monthly												
(avg)	7.4	8.6	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turbidity Grab Monthly												
(avg NTU)	7.1	9.0	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Temperature Grab Monthly												
(avg °Celsius)	9.1	10.5	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D.O. Grab Monthly												
(avg mg/L)	8.8	8.3	9.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrate Grab Monthly												
(avg mg/L)	0.72	0.37	0.44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hardness Grab Monthly												
(avg mg/L)	97	104	112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

JONES CREEK - DOWNSTREAM DURING DISCHARGE TO RECEIVING WATERS

BOD Grab Monthly	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
(avg mg/L)	< 5	< 5	< 5	0	0	0	0	0	0	0	0	0
pH Grab Monthly												
(avg)	7.2	7.4	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turbidity Grab Monthly												
(avg NTU)	10.3	10.1	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Temperature Grab Monthly												
(avg °Celsius)	10.9	9.7	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D.O. Grab Monthly												
(avg mg/L)	8.0	8.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrate Grab Monthly												
(avg mg/L)	0.39	0.41	0.38	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Hardness Grab Monthly												
(avg mg/L)	99	106	108	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MONITORING TRANSFER 004 FROM FORESTVILLE TO GRATON

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean Daily Flow												
(min mgd)	0.000	0.261	0.141	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(max mgd)	0.000	0.883	0.313	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(avg mgd)	0.000	0.657	0.259	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(total mg)	0.000	1.972	1.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
BOD Grab												
(min mg/L)	0.0	14.0	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(max mg/L)	0.0	19.0	14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(avg mg/L)	0.0	15.3	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TSS Grab												
(min mg/L)	0.0	4.9	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(max mg/L)	0.0	11.4	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(avg mg/L)	0.0	8.7	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Settleable Solids Grab												
(min ml/L/hr)	0.0	< 0.1	< 0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(max ml/L/hr)	0.0	< 0.1	< 0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(avg ml/L/hr)	0.0	< 0.1	< 0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
pH Daily												
(min)	0.0	7.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(max)	0.0	7.3	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(avg)	0.0	7.2	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cl_2 Residual Daily												
(min mg/L)	0.0	< 0.1	< 0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(max mg/L)	0.0	< 0.1	< 0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(avg mg/L)	0.0	< 0.1	< 0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FORESTVILLE 2002 SELF MONITORING SUMMARY REPORTS

ORDER NO. 95-54 ID NO. 1B831000SON

JONES CREEK - UPSTREAM DURING DISCHARGE TO RECEIVING WATERS

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BOD Grab Monthly (avg mg/L)	< 5	< 5	< 5	< 5	< 5	0	0	0	0	0	< 5	< 5
pH Grab Monthly (avg)	7.3	6.8	7.3	7.4	7.4	0.0	0.0	0.0	0.0	0.0	7.6	7.4
Turbidity Grab Monthly (avg NTU)	9.6	6.9	11.8	10.4	6.9	0.0	0.0	0.0	0.0	0.0	4.7	3.3
Temperature Grab Monthly (avg °Celsius)	13.3	8.3	12.0	12.0	12.6	0.0	0.0	0.0	0.0	0.0	13.2	9.6
D.O. Grab Monthly (avg mg/L)	6.8	10.2	9.2	8.6	7.8	0.0	0.0	0.0	0.0	0.0	5.5	9.5
Nitrate Grab Monthly (avg mg/L)	1.20	0.84	0.42	0.36	0.30	0.0	0.0	0.0	0.0	0.0	0.37	0.29
Hardness Grab Monthly (avg mg/L)	102	100	108	96	125	0.0	0.0	0.0	0.0	0.0	119	150

JONES CREEK - DOWNSTREAM DURING DISCHARGE TO RECEIVING WATERS

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BOD Grab Monthly (avg mg/L)	< 5	< 5	< 5	< 5	< 5	0	0	0	0	0	< 5	9
pH Grab Monthly (avg)	7.4	6.8	7.4	7.3	7.4	0.0	0.0	0.0	0.0	0.0	7.6	7.4
Turbidity Grab Monthly (avg NTU)	9.9	4.0	10.2	7.1	7.2	0.0	0.0	0.0	0.0	0.0	8.0	5.0
Temperature Grab Monthly (avg °Celsius)	13.5	7.6	12.1	13.0	12.5	0.0	0.0	0.0	0.0	0.0	13.2	9.9
D.O. Grab Monthly (avg mg/L)	8.9	10.6	9.5	8.7	8.4	0.0	0.0	0.0	0.0	0.0	5.5	9.3
Nitrate Grab Monthly (avg mg/L)	1.10	< 0.2	0.45	0.34	0.25	0	0.0	0.0	0.0	0.0	0.42	0.49
Hardness Grab Monthly (avg mg/L)	106	98	109	96	138	0.0	0.0	0.0	0.0	0.0	121	152

MONITORING TRANSFER 004 FROM FORESTVILLE TO GRATON

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean Daily Flow												
(min mgd)	0.000	0.000	0.000	0.115	0.024	0.000	0.111	0.721	0.713	0.000	0.138	0.554
(max mgd)	0.000	0.000	0.000	0.797	0.680	0.000	0.764	0.767	0.713	0.000	0.334	0.779
(avg mgd)	0.000	0.000	0.000	0.303	0.357	0.000	0.438	0.744	0.713	0.000	0.275	0.667
(total mg)	0.000	0.000	0.000	2.423	2.142	0.000	0.875	1.488	0.713	0.000	2.751	1.333
BOD Grab												
(min mg/L)	0	0	0	10	13	0.0	10	10	10	0	11	11
(max mg/L)	0	0	0	15	16	0.0	39	12	13	0	16	17
(avg mg/L)	0.0	0.0	0.0	12	16	0.0	18	11	11	0.0	13	14
TSS Grab												
(min mg/L)	0	0	0	8	11	0	10	8	10	0	6	7
(max mg/L)	0	0	0	13	19	0	21	10	13	0	12	14
(avg mg/L)	0.0	0.0	0.0	10	15	0.0	15	9	11	0.0	10	10
Settleable Solids Grab												
(min ml/L/hr)	0.0	0.0	0.0	< 0.1	< 0.1	0.0	< 0.1	< 0.1	< 0.1	0.0	< 0.1	< 0.1
(max ml/L/hr)	0.0	0.0	0.0	< 0.1	< 0.1	0.0	< 0.1	< 0.1	< 0.1	0.0	< 0.1	< 0.1
(avg ml/L/hr)	0.0	0.0	0.0	< 0.1	< 0.1	0.0	< 0.1	< 0.1	< 0.1	0.0	< 0.1	< 0.1
pH Daily												
(min)	0.0	0.0	0.0	6.7	6.8	0.0	6.9	6.8	6.8	0.0	7.0	6.8
(max)	0.0	0.0	0.0	7.2	7.4	0.0	7.5	7.5	7.2	0.0	7.3	7.5
(avg)	0.0	0.0	0.0	7.0	7.0	0.0	7.0	7.0	7.0	0.0	7.1	7.1
Cl_2 Residual Daily												
(min mg/L)	0.0	0.0	0.0	< 0.1	< 0.1	0.0	< 0.1	< 0.1	< 0.1	0.0	< 0.1	< 0.1
(max mg/L)	0.0	0.0	0.0	< 0.1	< 0.1	0.0	< 0.1	< 0.1	< 0.1	0.0	0.2	< 0.1
(avg mg/L)	0.0	0.0	0.0	< 0.1	< 0.1	0.0	< 0.1	< 0.1	< 0.1	0.0	0.1	< 0.1

FORESTVILLE 2001 SELF MONITORING SUMMARY REPORTS

ORDER NO. 95-54 ID NO. 1B831000SON

JONES CREEK - UPSTREAM DURING DISCHARGE TO RECEIVING WATERS

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BOD Grab Monthly (avg mg/L)	< 5	< 5	< 5	< 5	< 5	0	0	0	0	0	< 5	< 5
pH Grab Monthly (avg)	7.2	7.4	7.3	7.2	7.4	0.0	0.0	0.0	0.0	0.0	7.0	7.3
Turbidity Grab Monthly (avg NTU)	64.0	6.7	11.7	4.0	4.8	0.0	0.0	0.0	0.0	0.0	8.9	17.6
Temperature Grab Monthly (avg °Celsius)	8.5	6.8	9.7	10.4	12.6	0.0	0.0	0.0	0.0	0.0	13.6	13.5
D.O. Grab Monthly (avg mg/L)	9.5	10.7	9.5	8.4	8.1	0.0	0.0	0.0	0.0	0.0	6.4	13.5
Nitrate Grab Monthly (avg mg/L)	0.95	0.80	0.85	0.63	0.46	0.0	0.0	0.0	0.0	0.0	3.50	1.50
Hardness Grab Monthly (avg mg/L)	90	118	100	104	94	0.0	0.0	0.0	0.0	0.0	140	86

JONES CREEK - DOWNSTREAM DURING DISCHARGE TO RECEIVING WATERS

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BOD Grab Monthly (avg mg/L)	< 5	< 5	< 5	< 5	< 5	0	0	0	0	0	7	< 5
pH Grab Monthly (avg)	7.2	7.5	7.3	7.3	7.4	0.0	0.0	0.0	0.0	0.0	6.9	7.2
Turbidity Grab Monthly (avg NTU)	70.8	6.6	9.9	5.8	4.7	0.0	0.0	0.0	0.0	0.0	11.4	14.9
Temperature Grab Monthly (avg °Celsius)	8.5	6.7	9.9	11.7	12.6	0.0	0.0	0.0	0.0	0.0	8.3	12.8
D.O. Grab Monthly (avg mg/L)	10.1	10.2	8.7	9.3	8.2	0.0	0.0	0.0	0.0	0.0	13.8	12.8
Nitrate Grab Monthly (avg mg/L)	0.90	0.88	0.92	0.57	0.41	0	0.0	0.0	0.0	0.0	3.40	1.40
Hardness Grab Monthly (avg mg/L)	105	132	102	102	96	0.0	0.0	0.0	0.0	0.0	144	96

MONITORING TRANSFER 004 FROM FORESTVILLE TO GRATON

Mean Daily Flow												
(min mgd)	0.319	0.518	0.100	0.000	0.723	0.000	0.000	0.000	0.000	0.000	0.080	0.533
(max mgd)	0.319	0.518	0.775	0.000	0.723	0.000	0.000	0.000	0.000	0.000	0.601	0.563
(avg mgd)	0.319	0.518	0.380	0.000	0.723	0.000	0.000	0.000	0.000	0.000	0.341	0.548
(total mg)	0.319	0.518	1.140	0.000	0.723	0.000	0.000	0.000	0.000	0.000	0.681	1.644
BOD Grab												
(min mg/L)	< 5	< 5	< 5	0.0	< 5	0.0	0.0	0	0.0	0	7	< 5.0
(max mg/L)	5	7	8	0.0	8	0.0	0.0	0	0.0	0	13	5.3
(avg mg/L)	5	6	7	0.0	6	0.0	0.0	0.0	0.0	0.0	10	5.1
TSS Grab												
(min mg/L)	3	2	4	0	5	0	0	0	0	0	4	3
(max mg/L)	4	5	7	0	20	0	0	0	0	0	8	5
(avg mg/L)	4	4	6	0.0	9	0.0	0.0	0.0	0.0	0.0	5	3
Settleable Solids Grab												
(min ml/L/hr)	< 0.1	< 0.1	< 0.1	0.0	< 0.1	0.0	0.0	0.0	0.0	0.0	< 0.1	< 0.1
(max ml/L/hr)	< 0.1	< 0.1	< 0.1	0.0	< 0.1	0.0	0.0	0.0	0.0	0.0	< 0.1	< 0.1
(avg ml/L/hr)	< 0.1	< 0.1	< 0.1	0.0	< 0.1	0.0	0.0	0.0	0.0	0.0	< 0.1	< 0.1
pH Daily												
(min)	6.9	6.9	6.8	0.0	6.8	0.0	0.0	0.0	0.0	0.0	6.8	6.8
(max)	7.2	7.3	7.3	0.0	7.5	0.0	0.0	0.0	0.0	0.0	7.6	7.3
(avg)	7.0	7.0	7.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	7.1	7.0
Cl_2 Residual Daily												
(min mg/L)	< 0.1	< 0.1	< 0.1	0.0	< 0.1	0.0	0.0	0.0	0.0	0.0	< 0.1	< 0.1
(max mg/L)	1.3	0.5	< 0.1	0.0	< 0.1	0.0	0.0	0.0	0.0	0.0	< 0.1	1.4
(avg mg/L)	0.1	0.1	< 0.1	0.0	< 0.1	0.0	0.0	0.0	0.0	0.0	< 0.1	0.3

FORESTVILLE 2000 SELF MONITORING SUMMARY REPORTS

ORDER NO. 95-54 ID NO. 1B831000SON

GREEN VALLEY CREEK - UPSTREAM

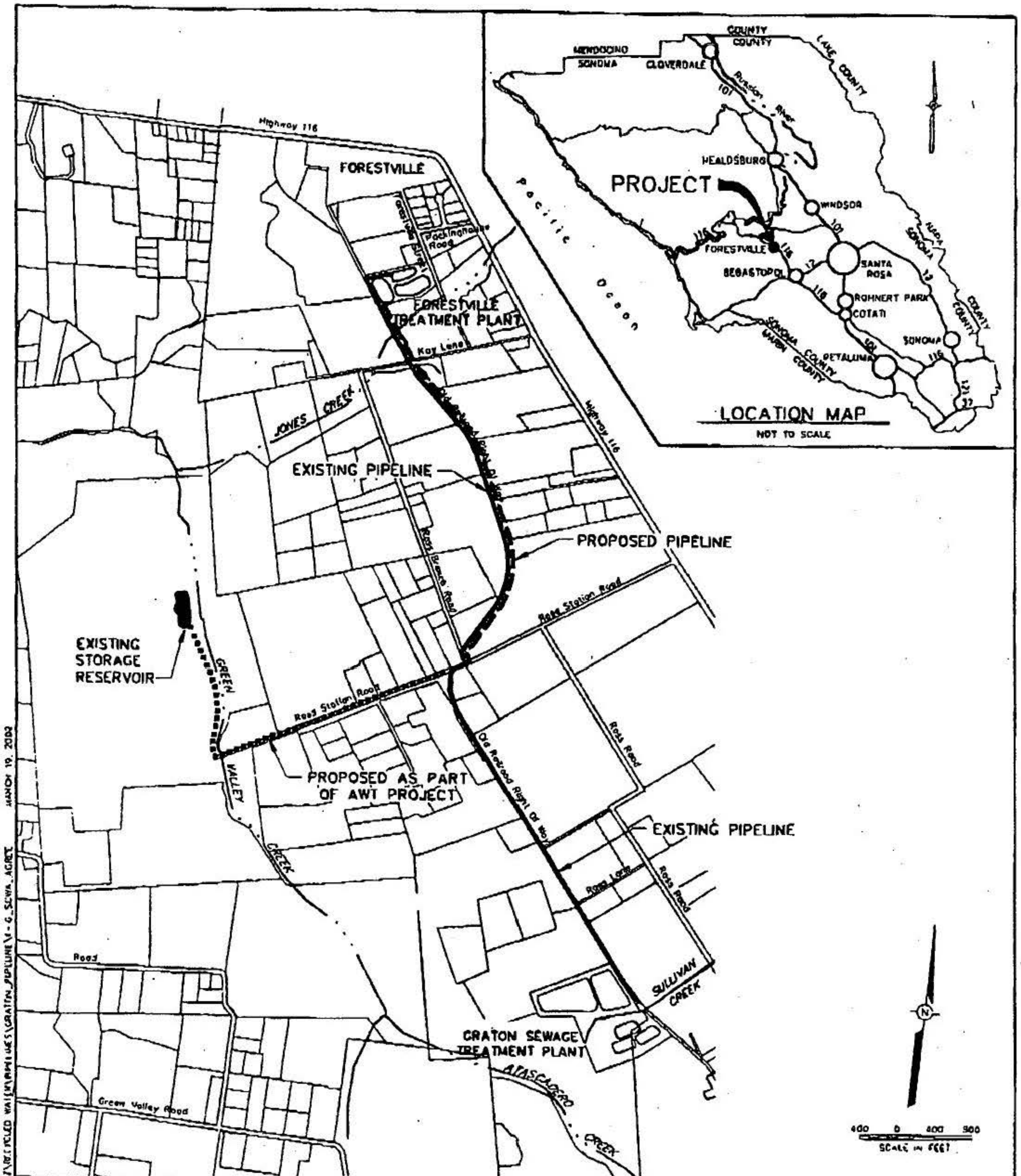
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BOD Grab Monthly												
(avg mg/L)	< 5	< 5	< 5	< 5	< 5	0	0	0	0	< 5	< 5	< 5
pH Grab Monthly												
(avg)	7.1	6.7	7.2	7.3	7.5	0.0	0.0	0.0	0.0	6.9	6.8	7.2
Turbidity Grab Monthly												
(avg NTU)	14.2	6.3	28.3	2.6	3.1	0.0	0.0	0.0	0.0	13.0	2.0	1.3
Temperature Grab Monthly												
(avg °Celcius)	8.8	11.6	10.7	12.6	14.1	0.0	0.0	0.0	0.0	10.5	7.9	6.6
D.O. Grab Monthly												
(avg mg/L)	6.5	6.0	8.1	7.0	6.8	0.0	0.0	0.0	0.0	5.7	5.8	6.6
Nitrate Grab Monthly												
(avg mg/L)	0.31	0.32	0.24	< 0.2	< 0.2	0.0	0.0	0.0	0.0	0.37	< 0.2	< 0.2
Hardness Grab Monthly												
(avg mg/L)	92	88	75	94	108	0.0	0.0	0.0	0.0	136	138	138

GREEN VALLEY CREEK - DOWNSTREAM

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BOD Grab Monthly												
(avg mg/L)	< 5	< 5	< 5	< 5	< 5	0	0	0	0	< 5	< 5	< 5
pH Grab Monthly												
(avg)	7.3	6.9	7.3	7.5	7.5	0.0	0.0	0.0	0.0	7.3	7.3	7.7
Turbidity Grab Monthly												
(avg NTU)	15.5	7.5	52.5	2.7	3.2	0.0	0.0	0.0	0.0	6.3	1.7	1.6
Temperature Grab Monthly												
(avg °Celcius)	9.6	11.7	10.6	12.7	14.5	0.0	0.0	0.0	0.0	10.6	7.7	6.4
D.O. Grab Monthly												
(avg mg/L)	9.4	7.1	8.5	8.7	8.7	0.0	0.0	0.0	0.0	8.4	10.0	11.2
Nitrate Grab Monthly												
(avg mg/L)	0.31	0.36	0.27	< 0.2	0.20	0.0	0.0	0.0	0.0	0.30	< 0.2	< 0.2
Hardness Grab Monthly												
(avg mg/L)	106	88	72	90	98	0.0	0.0	0.0	0.0	128	124	112

MONITORING TRANSFER 004 FROM FORESTVILLE TO GRATON

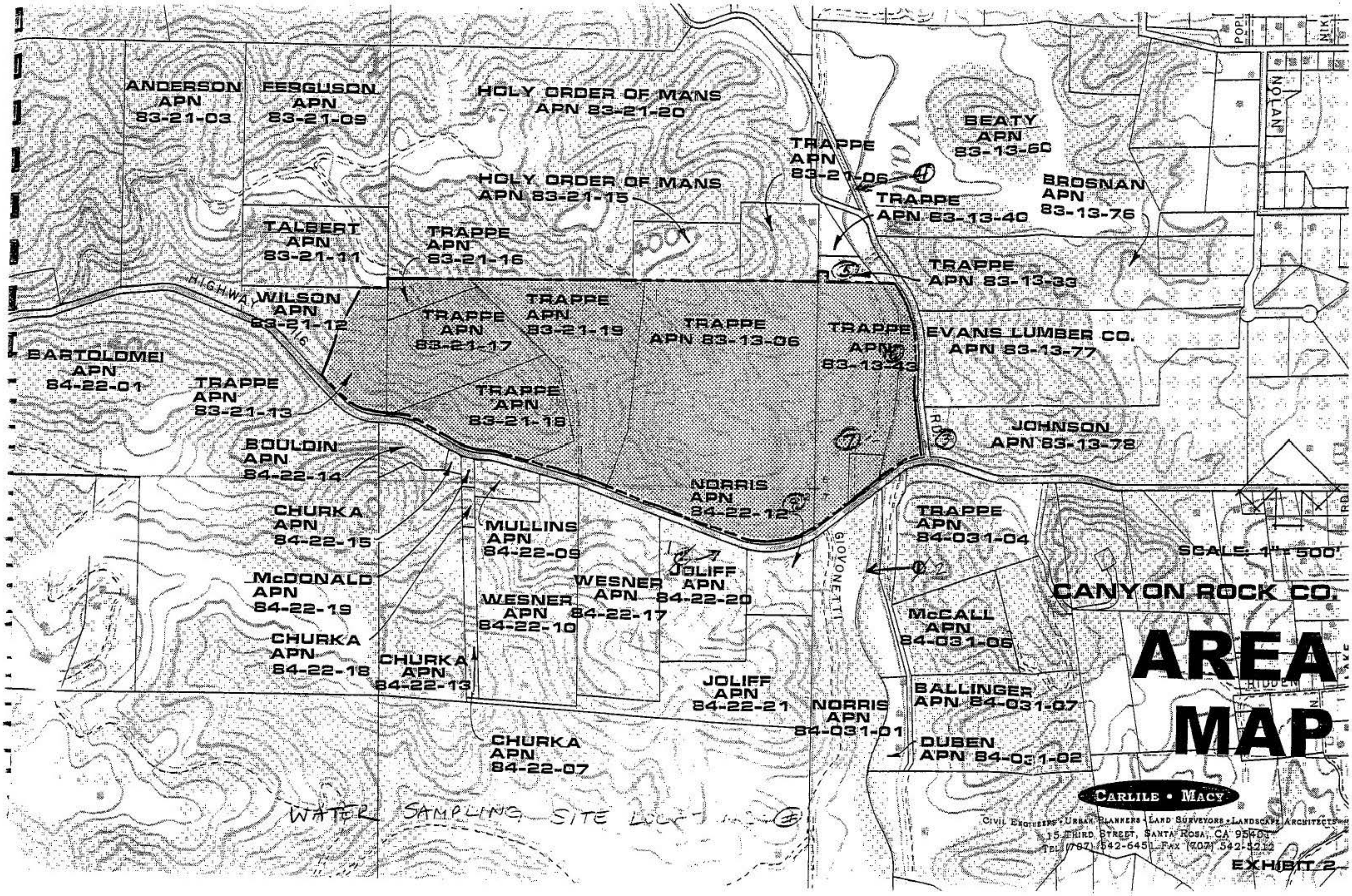
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mean Daily Flow												
(min mgd)	0.625	0.000	0.518	0.000	0.168	0.000	0.000	0.355	0.000	0.412	0.150	0.492
(max mgd)	1.670	0.000	0.593	0.000	0.192	0.000	0.000	0.457	0.000	0.519	0.309	0.638
(avg mgd)	1.313	0.000	0.565	0.000	0.180	0.000	0.000	0.406	0.000	0.466	0.265	0.565
(total mg)	3.938	0.000	1.696	0.000	0.360	0.000	0.000	0.812	0.000	0.931	1.059	1.130
BOD Grab												
(min mg/L)	5	0.0	< 5	0.0	< 5	0.0	0.0	< 5	0.0	< 5	< 5	5
(max mg/L)	9	0.0	13	0.0	7	0.0	0.0	18	0.0	< 6	< 5	7
(avg mg/L)	7	0.0	7	0.0	6	0.0	0.0	11	0.0	< 5	< 5	6
TSS Grab												
(min mg/L)	2	0	3	0	3	0	0	3	0	3	3	3
(max mg/L)	4	0	11	0	24	0	0	8	0	5	14	4
(avg mg/L)	3	0.0	6	0.0	8	0.0	0.0	6	0.0	4	6	4
Settleable Solids Grab												
(min ml/L/hr)	< 0.1	0.0	< 0.1	0.0	< 0.1	0.0	0.0	< 0.1	0.0	< 0.1	< 0.1	< 0.1
(max ml/L/hr)	< 0.1	0.0	< 0.1	0.0	< 0.1	0.0	0.0	< 0.1	0.0	< 0.1	< 0.1	< 0.1
(avg ml/L/hr)	< 0.1	0.0	< 0.1	0.0	< 0.1	0.0	0.0	< 0.1	0.0	< 0.1	< 0.1	< 0.1
pH Daily												
(min)	6.6	6.5	6.3	6.7	6.5	0.0	0.0	7.0	0.0	6.5	6.7	6.8
(max)	7.0	6.5	7.0	6.7	6.6	0.0	0.0	7.5	0.0	7.0	7.2	7.1
(avg)	6.8	6.5	6.5	6.7	6.6	0.0	0.0	7.3	0.0	6.8	6.9	7.0
Cl_2 Residual Daily												
(min mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.0	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
(max mg/L)	0.3	< 0.1	< 0.1	< 0.1	< 0.1	0.0	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
(avg mg/L)	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.0	0.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1



FORESTVILLE TREATMENT PLANT TO ROSS STATION ROAD PIPELINE PROJECT

ATTACH. A

MARCH 19, 2002


ANDERSON APN 83-21-03
FERGUSON APN 83-21-09
HOLY ORDER OF MANS APN 83-21-20
HOLY ORDER OF MANS APN 83-21-15
TALBERT APN 83-21-11
TRAPPE APN 83-21-16
TRAPPE APN 83-21-06
TRAPPE APN 83-13-40
BEATY APN 83-13-60
BROSNAN APN 83-13-76
TRAPPE APN 83-13-33
HIGHWAY 116
WILSON APN 83-21-12
TRAPPE APN 83-21-17
TRAPPE APN 83-21-19
TRAPPE APN 83-13-06
TRAPPE APN 83-13-43
EVANS LUMBER CO. APN 83-13-77
BARTOLOMEI APN 84-22-01
TRAPPE APN 83-21-13
TRAPPE APN 83-21-18
JOHNSON APN 83-13-78
RD.
BOULDIN APN 84-22-14
NORRIS APN 84-22-12
CHURKA APN 84-22-15
MULLINS APN 84-22-09
TRAPPE APN 84-031-04
GIOVONETTI
SCALE: 1" = 500'
McDONALD APN 84-22-19
WESNER APN 84-22-17
JOLIFF APN 84-22-20
WESNER APN 84-22-10
CANYON ROCK CO.
McCALL APN 84-031-06
CHURKA APN 84-22-18
CHURKA APN 84-22-13
JOLIFF APN 84-22-21
NORRIS APN 84-031-01
BALLINGER APN 84-031-07
DUBEN APN 84-031-02
AREA MAP
CHURKA APN 84-22-07
WATER SAMPLING SITE
CARLILE • MACY
CIVIL ENGINEERS • URBAN PLANNERS • LAND SURVEYORS • LANDSCAPE ARCHITECTS
15 THIRD STREET, SANTA ROSA, CA 95401
TEL (707) 542-6451 FAX (707) 542-5212
EXHIBIT 2

SAMPLE LOCATION (1)
IS TO RIGHT OF
ROAD IN GREEN VALLEY
CREEK UPSTREAM OF
SITE

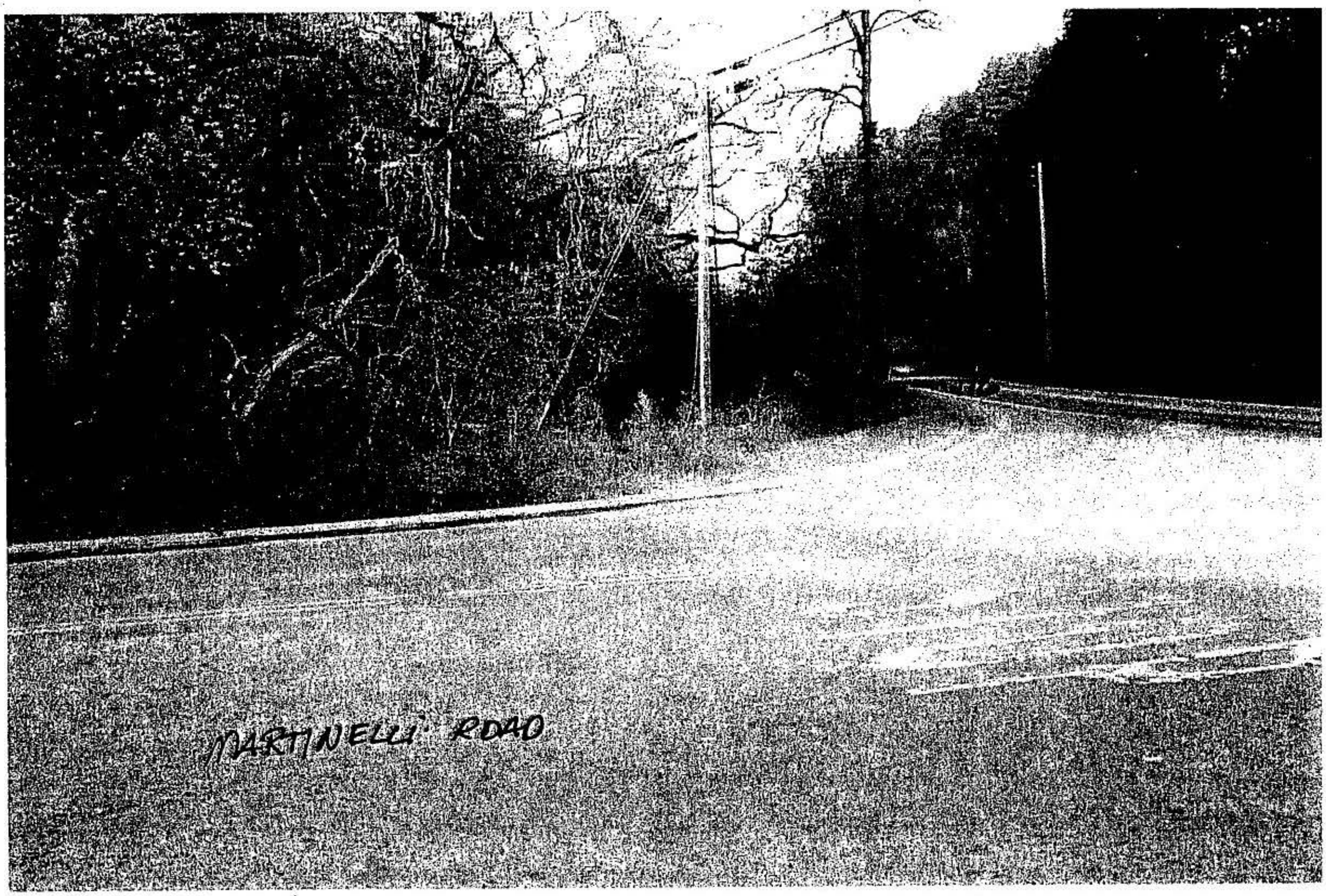
Aul_2888.jpg

SAMPLE LOCATION
2
BLUE ROCK TRIBUTARY
SOUTH SIDE OF
ROAD

Aul_2885.jpg

SAMPLE LOCATION 3
TRIB ENTERING FROM
EAST ALONG ~~116~~ HWY
116

Aul_2909.jpg



SAMPLE LOCATION

3

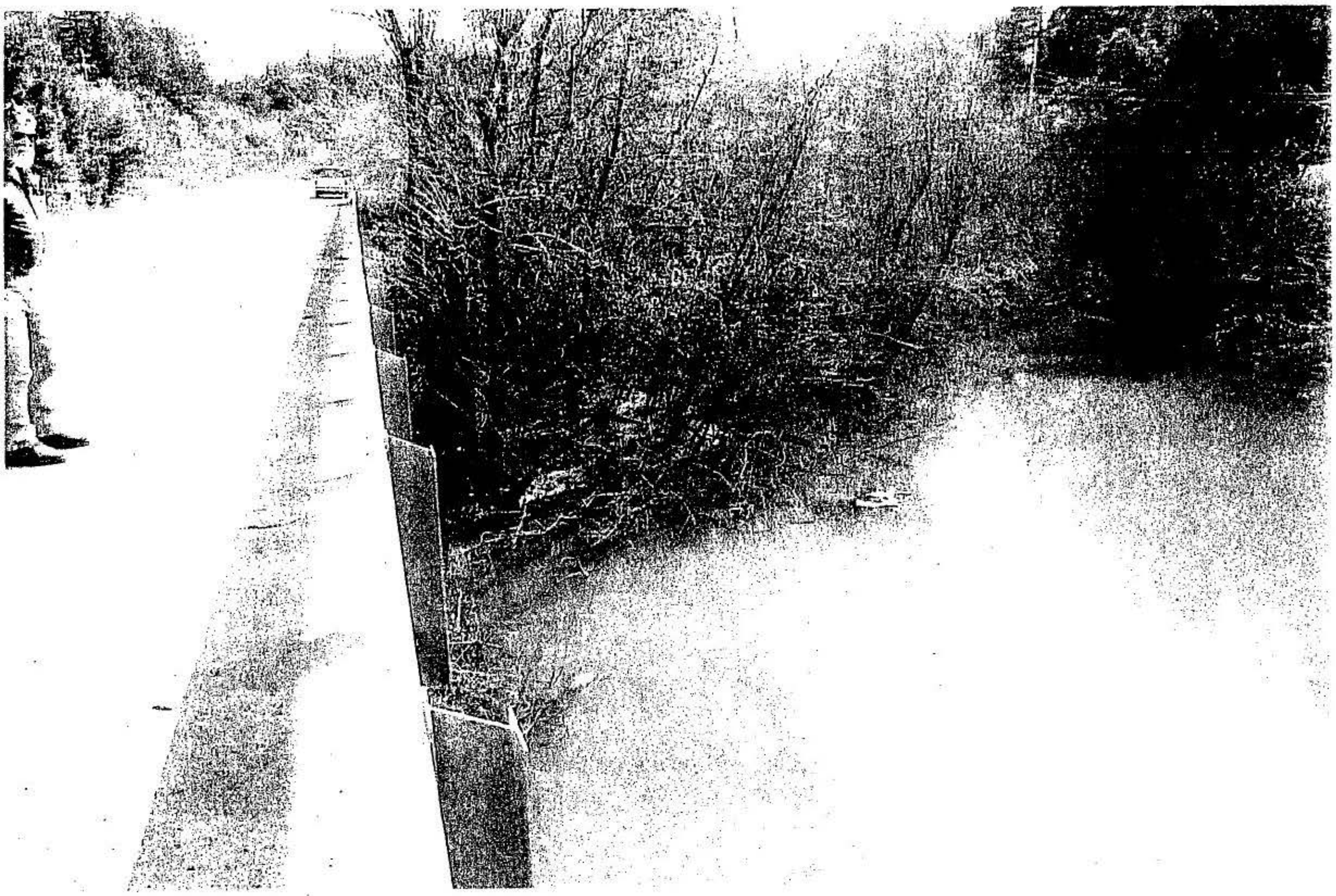
PHOTO IS LOOKING EAST

Aul 2910.jpg

SAMPLE LOCATION
~~SITE~~ 4 @ Arrow

DOWNSTREAM OF
QUARRY

Aut_2884.jpg

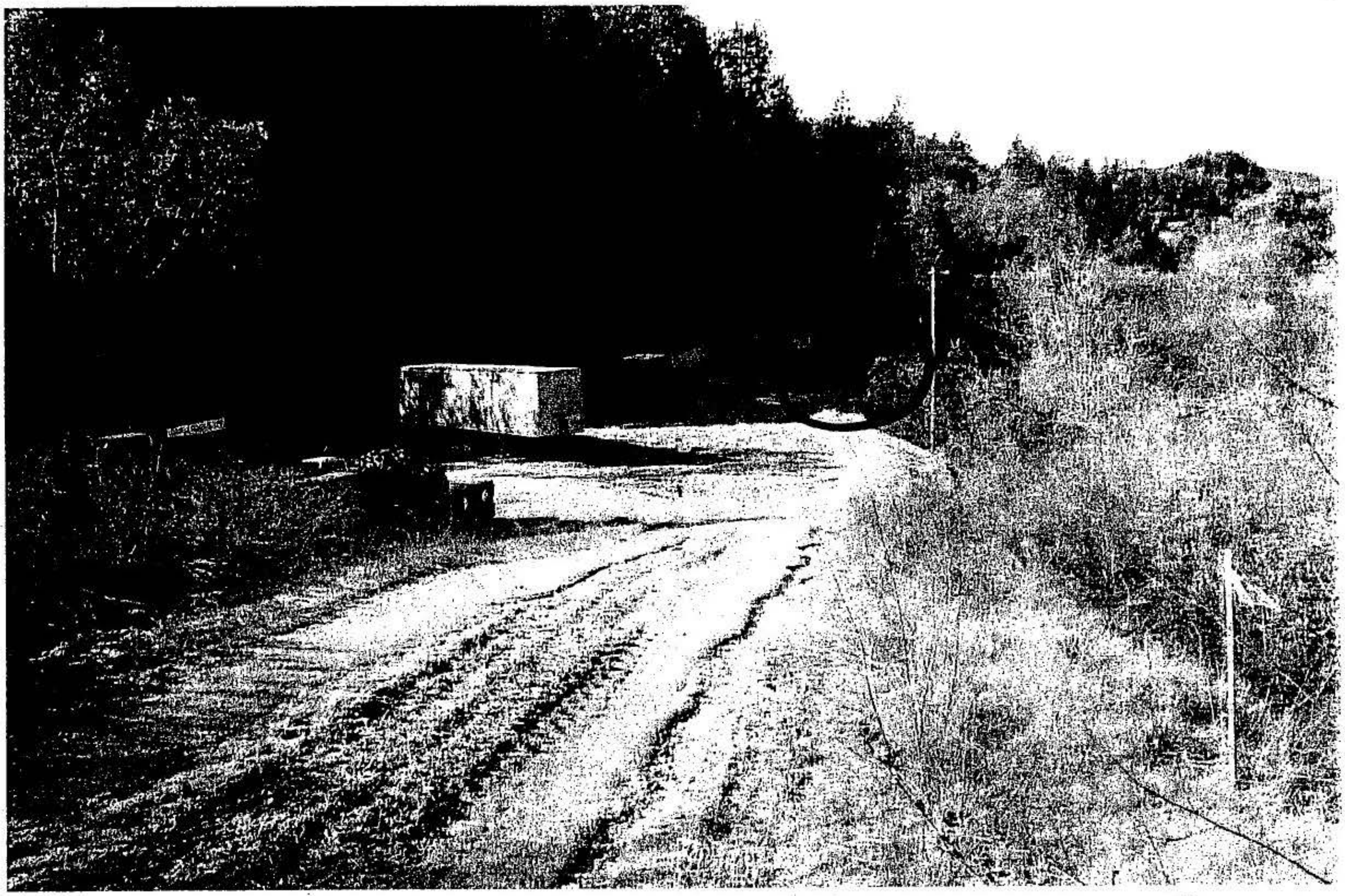


SITE (4)

SAMPLE FROM BRIDGE
IF POSSIBLE

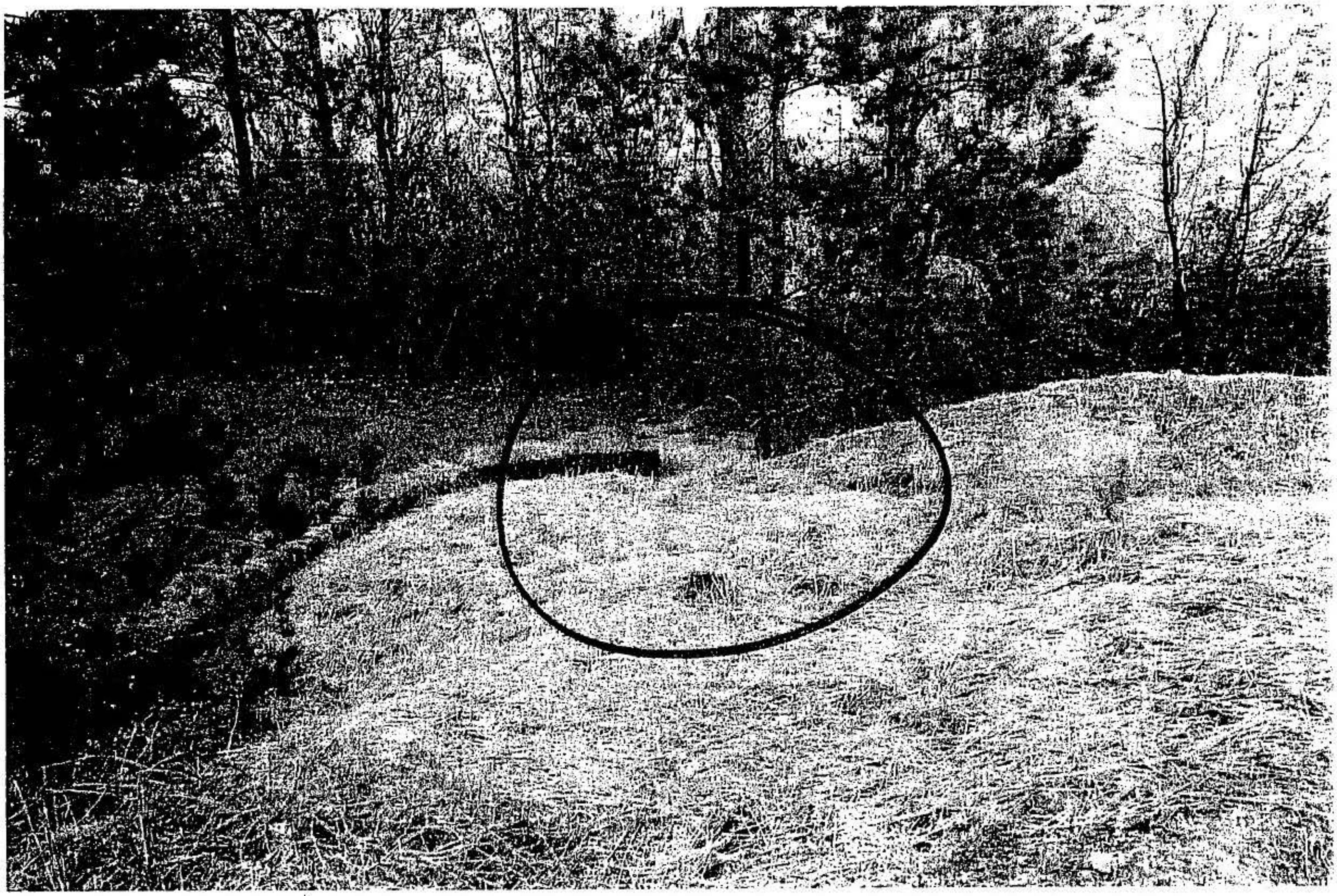
DOWNSTREAM OF QUARRY
PHOTO IS LOOKING SOUTH, UPSTREAM

Aut 2883.jpg



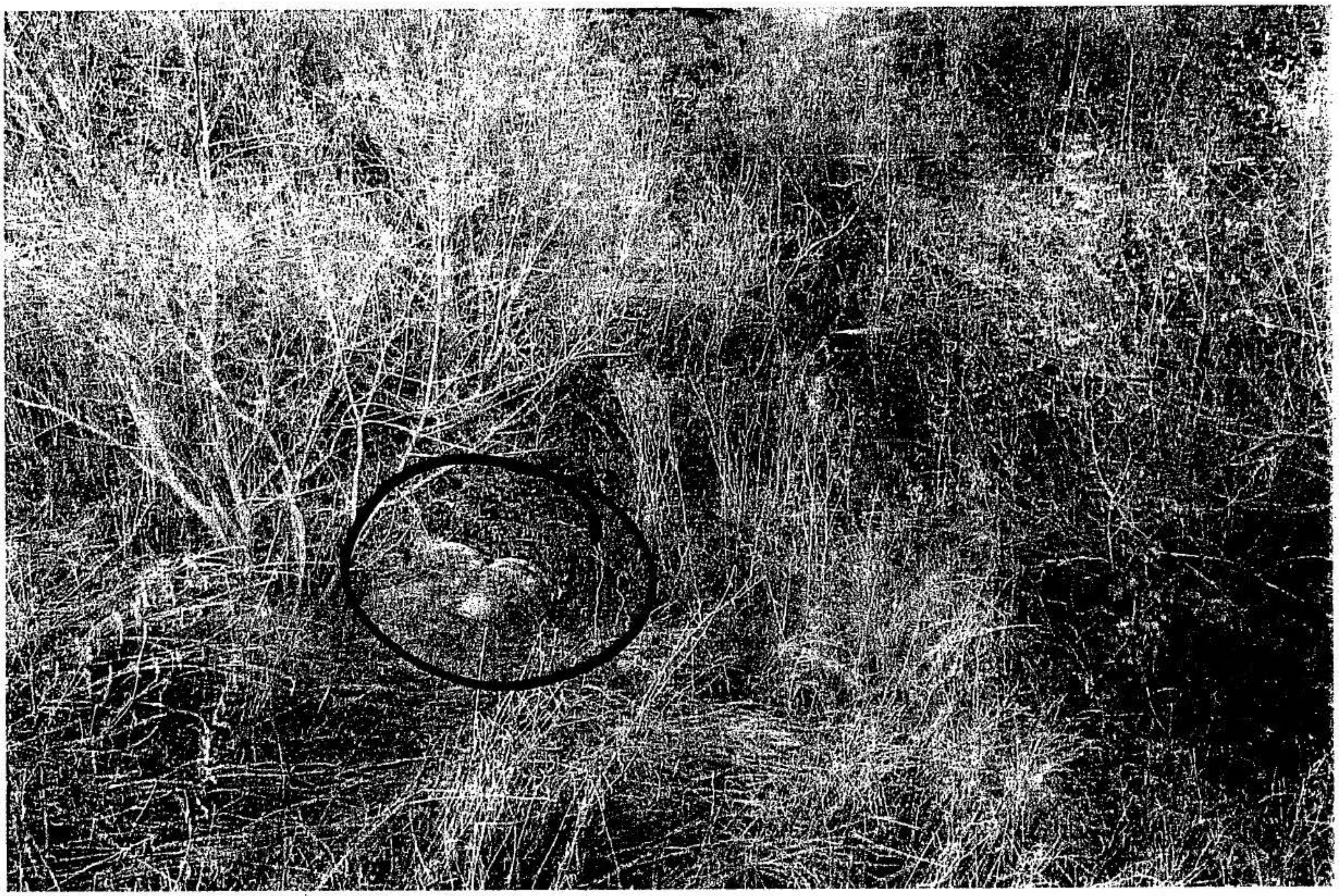
SAMPLE LOCATION 5

PHOTO IS LOOKING NORTH



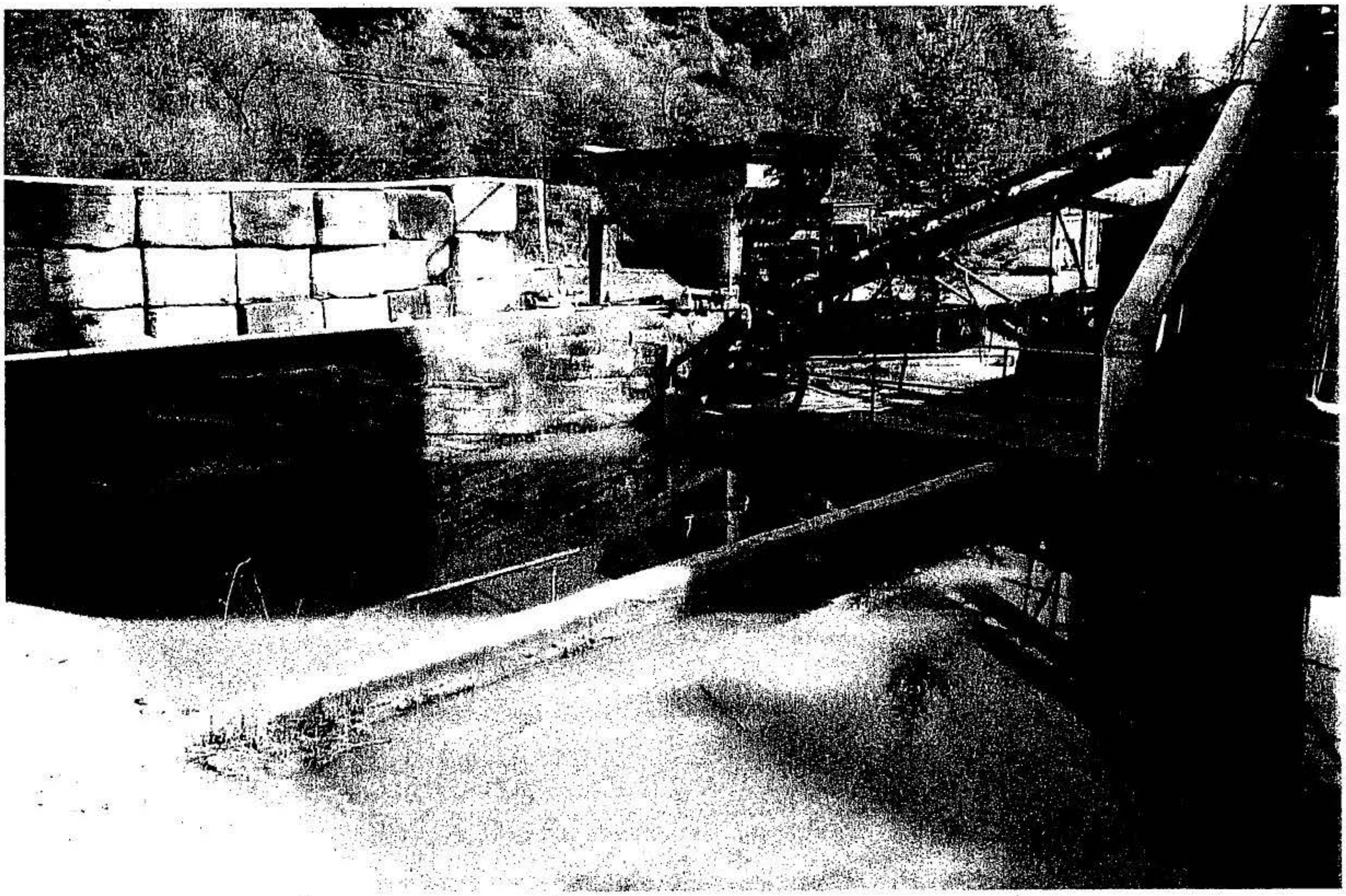
SAMPLE LOCATION
5

Aul_2894.jpg



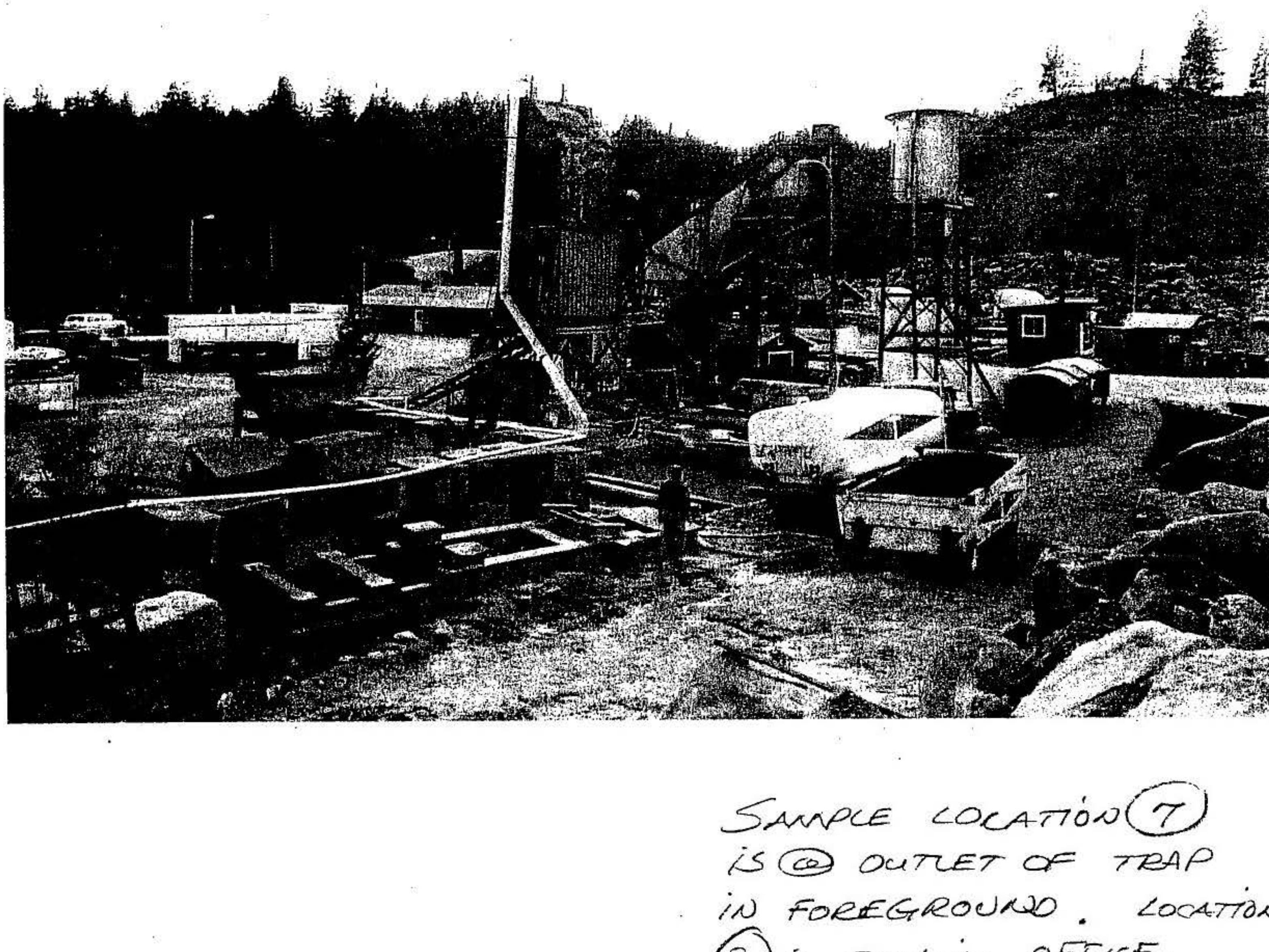
SAMPLE LOCATION (6)
OUTFALL OF PRIMARY
SEDIMENT BASIN FROM
SITE

Aut_2904.jpg



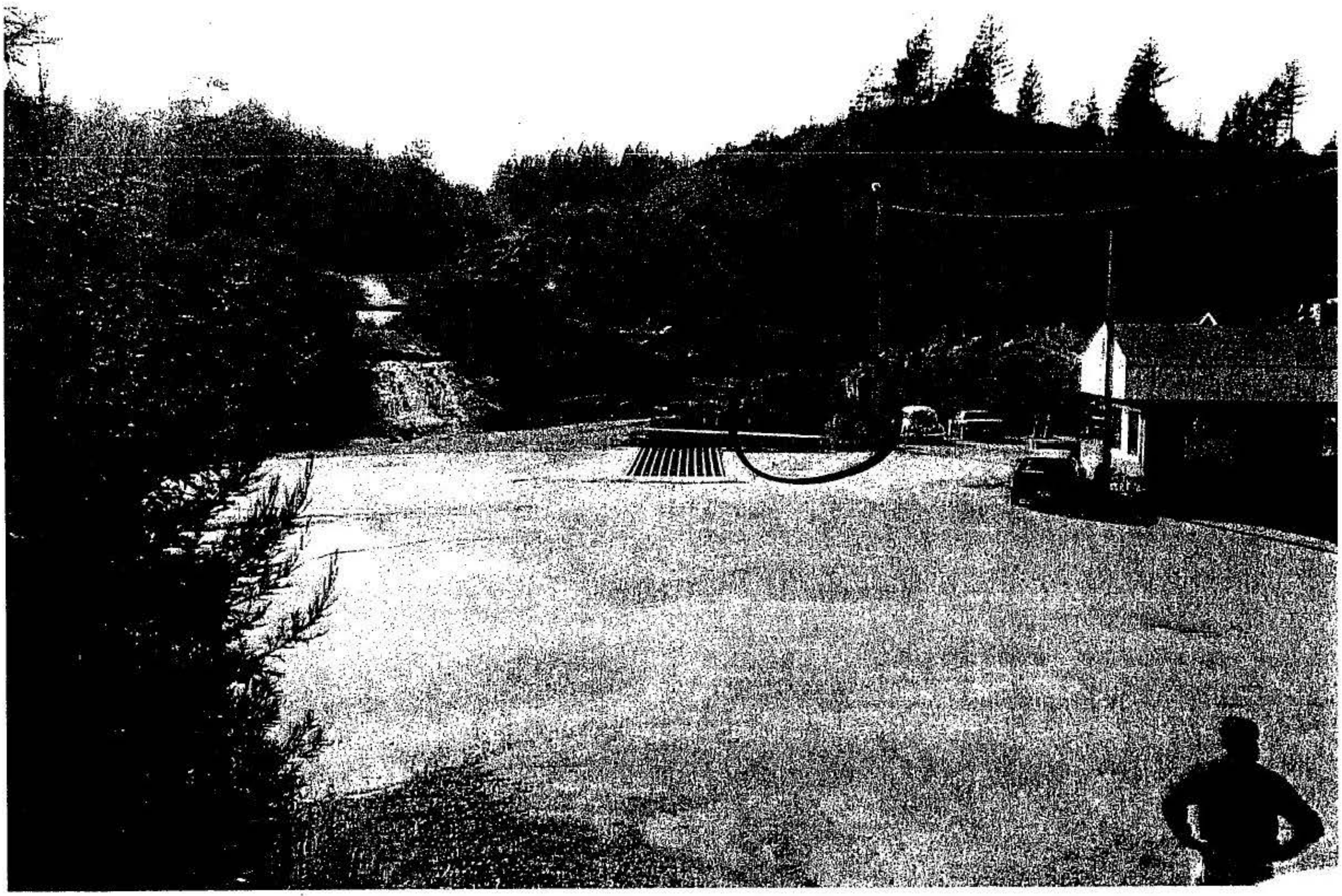
SAMPLE LOCATION
7 @
CULVERT OUTLET

Aul_2889.jpg



SAMPLE LOCATION (7)
IS @ OUTLET OF TRAP
IN FOREGROUND. LOCATION
(8) IS BEHIND OFFICE

Aul. 2907.jpg



SAMPLE LOCATION
8

Aul_2908.jpg

WATER QUALITY DATA

Canyon Rock Project   Data Collected 3/4/01

STATION	DO%	DO mg/l	Cont.	PH	Temp. ^{0}C
C-1	96.4	11.02	217.8	6.7	10.0
C-2	84.2	9.25	128.1	7.6	9.9
C-3	88.1	9.88	119.6	7.8	10.3
C-4	83.8	9.45	132.7	7.8	10.0
Y-5	85.2	9.48	99.3	7.7	10.5
Y-6	62.8	6.96	376.5	7.3	10.1
Y-7	75.9	8.73	135.7	7.3	10.4
Y-8	87.3	9.50	680.0	6.8	10.8

Flow Data

STATION	Pipe ID	Flow	Depth	Width	Matrix
C-1		2.92 ft/s	0.8'	57"	Stream
C-2					Not Measured
C-3		1.83 ft/s	23"	53"	Stream
C-4					Not Measured
Y-5					Not Measured
Y-6	36"	3.82	1.5"		Metal Culvert
Y-6	36"	3.15	1.5"		Metal Culvert
Y-7	12"	2.74	4"		Concrete
Y-8	18"	1.26	7.5		Concrete

Flow Calculations

Station C-1 = 8.9 CFS
Station C-3 = 12.8 CFS
Station Y-6 Culvert 1 = 0.36 CFS
Station Y-6 Culvert 2 = 0.30 CFS
Total flow at Station Y-6 = 0.66 CFS
Station Y-7 = 0.64 CFS
Station Y-8 = 0.86 CFS
Total estimated flow from all measured Canyon Rock yard discharges = 2.16 CFS
Total estimated flow from two un-named tributaries to Green Valley Creek = 21.7 CFS

Description of Stations

Station C-1 Un-named tributary to Green Valley Creek flowing along Hwy 116 downstream from Blue Rock Quarry. Station located just upstream of Giovonett Road along Hwy 116.

Station C-2 Located on Green Valley Creek upstream from the Hwy 116 Bridge about 250 feet. Upstream of the Canyon Rock Quarry and the entrance of the un-named stream sampled at station C-1.

Station C-3 Located at the corner of Hwy 116 and Martinelli Road upstream of the culvert under Martinelli Road leading the Green Valley Creek.

Station C-4 Located on Green Valley Creek downstream from the Canyon Rock Quarry at the bridge on Martinelli Road.

Station Y-5 Located at the far end of the Canyon Rock Quarry in a newly constructed landing covered with straw. The sample was taken at a small rill running along a newly established barrier. A road leads uphill into the Quarry from this landing.

Station Y-6 Located at the site where two metal culverts discharge into Green Valley Creek. Sample was taken from the pool where both flows from the two culverts mixed before entering Green Valley Creek.

Station Y-7 Located at the outlet from the sediment retention pond adjacent to the wash down area. Samples were taken out of the overflow box just before the discharge entered the concrete pipe leading to Green Valley Creek.

Station Y-8 Located at the outlet pipe from the sediment retention pond to Green Valley Creek near the main entrance to the Quarry and the weight scale.

Sample Collection Staff: Edmund H. Smith and Harold Appleton.

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RECEIVED
MAR 2 3 2001
PRUNUSKE CHATHAM INC

March 23 , 2001

Steve Chatham
Prunvske Chatham, Inc
P.O. Box 828
Occidental, CA 95465
RE: Canyon Rock / P103119

Enclosed are the results of analyses for samples received by the laboratory on 03/05/01. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Angelee Cari

Angelee Cari
Client Services Representative

CA ELAP Certificate Number 2374

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	Reported:
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
C 1	P103119-01	Water	03/04/01 11:30	03/05/01 09:55
C 2	P103119-02	Water	03/04/01 14:00	03/05/01 09:55
C 3	P103119-03	Water	03/04/01 14:30	03/05/01 09:55
C 4	P103119-04	Water	03/04/01 15:00	03/05/01 09:55
Y 5	P103119-05	Water	03/04/01 13:30	03/05/01 09:55
Y 6	P103119-06	Water	03/04/01 13:00	03/05/01 09:55
Y 7	P103119-07	Water	03/04/01 12:40	03/05/01 09:55
Y 8	P103119-08	Water	03/04/01 12:10	03/05/01 09:55

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	Reported:
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Total Petroleum Hydrocarbons as Gasoline by EPA 8015M
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C 1 (P103119-01) Water Sampled: 03/04/01 11:30 Received: 03/05/01 09:55									**HDSP**
Gasoline	ND	50.0	ug/l	1	1030124	03/07/01	03/07/01	EPA 8015M-VOA	
Surrogate: 4-Bromofluorobenzene		*100 %*	*65-135*		"	"	"	"	
C 2 (P103119-02) Water Sampled: 03/04/01 14:00 Received: 03/05/01 09:55									**HDSP**
Gasoline	ND	50.0	ug/l	1	1030124	03/07/01	03/07/01	EPA 8015M-VOA	
Surrogate: 4-Bromofluorobenzene		*101 %*	*65-135*		"	"	"	"	
C 3 (P103119-03) Water Sampled: 03/04/01 14:30 Received: 03/05/01 09:55									**HDSP**
Gasoline	ND	50.0	ug/l	1	1030124	03/07/01	03/07/01	EPA 8015M-VOA	
Surrogate: 4-Bromofluorobenzene		*101 %*	*65-135*		"	"	"	"	
C 4 (P103119-04) Water Sampled: 03/04/01 15:00 Received: 03/05/01 09:55									**HDSP**
Gasoline	ND	50.0	ug/l	1	1030124	03/07/01	03/07/01	EPA 8015M-VOA	
Surrogate: 4-Bromofluorobenzene		*101 %*	*65-135*		"	"	"	"	
Y 5 (P103119-05) Water Sampled: 03/04/01 13:30 Received: 03/05/01 09:55									**HDSP**
Gasoline	ND	50.0	ug/l	1	1030124	03/07/01	03/07/01	EPA 8015M-VOA	
Surrogate: 4-Bromofluorobenzene		*98.7 %*	*65-135*		"	"	"	"	
Y 6 (P103119-06) Water Sampled: 03/04/01 13:00 Received: 03/05/01 09:55									**HDSP**
Gasoline	ND	50.0	ug/l	1	1030160	03/07/01	03/07/01	EPA 8015M-VOA	
Surrogate: 4-Bromofluorobenzene		*98.3 %*	*65-135*		"	"	"	"	
Y 7 (P103119-07) Water Sampled: 03/04/01 12:40 Received: 03/05/01 09:55									**HDSP**
Gasoline	ND	50.0	ug/l	1	1030160	03/07/01	03/07/01	EPA 8015M-VOA	
Surrogate: 4-Bromofluorobenzene		*102 %*	*65-135*		"	"	"	"	

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	**Reported:**
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Total Petroleum Hydrocarbons as Gasoline by EPA 8015M

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Y 8 (P103119-08) Water Sampled: 03/04/01 12:10 Received: 03/05/01 09:55									**HDSP**
Gasoline	ND	50.0	ug/l	1	1030160	03/07/01	03/07/01	EPA 8015M-VOA	
Surrogate: 4-Bromofluorobenzene		*100 %*	*65-135*		"	"	"	"	

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Prunvske Chatham, Inc P.O. Box 828 Occidental CA, 95465	Project: Canyon Rock Project Number: na Project Manager: Steve Chatham	Reported: 03/23/01 17:18

Total Petroleum Hydrocarbons as Diesel & others by EPA 8015M w/ S.G. Clean-up

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C 1 (P103119-01) Water Sampled: 03/04/01 11:30 Received: 03/05/01 09:55									
Diesel (C10-C24)	**0.0877**	0.0500	mg/l	1	1030221	03/08/01	03/09/01	EPA 8015M-SVOA	HC-12
Motor Oil (C24-C36)	ND	0.250	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*89.1 %*	*50-150*		"	"	"	"	
C 2 (P103119-02) Water Sampled: 03/04/01 14:00 Received: 03/05/01 09:55									
Diesel (C10-C24)	**0.0580**	0.0500	mg/l	1	1030221	03/08/01	03/09/01	EPA 8015M-SVOA	HC-12
Motor Oil (C24-C36)	ND	0.250	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*82.7 %*	*50-150*		"	"	"	"	
C 3 (P103119-03) Water Sampled: 03/04/01 14:30 Received: 03/05/01 09:55									
Diesel (C10-C24)	**0.0697**	0.0500	mg/l	1	1030221	03/08/01	03/09/01	EPA 8015M-SVOA	HC-12
Motor Oil (C24-C36)	ND	0.250	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*86.6 %*	*50-150*		"	"	"	"	
C 4 (P103119-04) Water Sampled: 03/04/01 15:00 Received: 03/05/01 09:55									
Diesel (C10-C24)	**0.103**	0.0500	mg/l	1	1030221	03/08/01	03/09/01	EPA 8015M-SVOA	HC-12
Motor Oil (C24-C36)	ND	0.250	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*80.2 %*	*50-150*		"	"	"	"	
Y 5 (P103119-05RE1) Water Sampled: 03/04/01 13:30 Received: 03/05/01 09:55									
Diesel (C10-C24)	**0.228**	0.0500	mg/l	1	1030380	03/15/01	03/16/01	EPA 8015M-SVOA	HC-12
Motor Oil (C24-C36)	ND	0.250	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*91.2 %*	*50-150*		"	"	"	"	
Y 6 (P103119-06RE1) Water Sampled: 03/04/01 13:00 Received: 03/05/01 09:55									
Diesel (C10-C24)	**0.193**	0.0500	mg/l	1	1030417	03/16/01	03/20/01	EPA 8015M-SVOA	HC-12
Motor Oil (C24-C36)	**0.628**	0.250	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*91.7 %*	*50-150*		"	"	"	"	

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	**Reported:**
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Total Petroleum Hydrocarbons as Diesel & others by EPA 8015M w/ S.G. Clean-up

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Y 7 (P103119-07) Water	**Sampled: 03/04/01 12:40**	**Received: 03/05/01 09:55**							
Diesel (C10-C24)	**0.214**	0.0500	mg/l	1	1030221	03/08/01	03/09/01	EPA 8015M-SVOA	HC-12
Motor Oil (C24-C36)	**0.593**	0.250	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*79.8 %*	*50-150*		"	"	"	"	
Y 8 (P103119-08) Water	**Sampled: 03/04/01 12:10**	**Received: 03/05/01 09:55**							
Diesel (C10-C24)	**0.0829**	0.0500	mg/l	1	1030221	03/08/01	03/09/01	EPA 8015M-SVOA	HC-12
Motor Oil (C24-C36)	ND	0.250	"	"	"	"	"	"	
Surrogate: o-Terphenyl		*93.8 %*	*50-150*		"	"	"	"	

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Prunvske Chatham, Inc P.O. Box 828 Occidental CA, 95465	Project: Canyon Rock Project Number: na Project Manager: Steve Chatham	**Reported:** 03/23/01 17:18

Total Metals by EPA 6000/7000 Series Methods
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C 1 (P103119-01) Water	**Sampled: 03/04/01 11:30**	**Received: 03/05/01 09:55**							
Mercury	ND	0.200	ug/l	1	1030374	03/20/01	03/20/01	EPA 7470A	
Antimony	ND	60.0	"	"	1030367	03/20/01	03/20/01	EPA 6010B	
Arsenic	ND	100	"	"	"	"	"	"	
Barium	**99.2**	10.0	"	"	"	"	"	"	
Beryllium	ND	1.00	"	"	"	"	"	"	
Cadmium	ND	10.0	"	"	"	"	"	"	
Chromium	ND	10.0	"	"	"	"	"	"	
Cobalt	ND	7.00	"	"	"	"	"	"	
Copper	**11.9**	10.0	"	"	"	"	"	"	
Lead	ND	75.0	"	"	"	"	"	"	
Molybdenum	ND	20.0	"	"	"	"	"	"	
Nickel	ND	30.0	"	"	"	"	"	"	
Selenium	ND	100	"	"	"	"	"	"	
Silver	ND	7.00	"	"	"	"	"	"	
Thallium	ND	100	"	"	"	"	"	"	
Vanadium	ND	10.0	"	"	"	"	"	"	
Zinc	**30.4**	20.0	"	"	"	"	"	"	
C 2 (P103119-02) Water	**Sampled: 03/04/01 14:00**	**Received: 03/05/01 09:55**							
Mercury	ND	0.200	ug/l	1	1030374	03/20/01	03/20/01	EPA 7470A	
Antimony	ND	60.0	"	"	1030367	03/20/01	03/20/01	EPA 6010B	
Arsenic	ND	100	"	"	"	"	"	"	
Barium	**104**	10.0	"	"	"	"	"	"	
Beryllium	ND	1.00	"	"	"	"	"	"	
Cadmium	ND	10.0	"	"	"	"	"	"	
Chromium	**14.7**	10.0	"	"	"	"	"	"	
Cobalt	ND	7.00	"	"	"	"	"	"	
Copper	**11.6**	10.0	"	"	"	"	"	"	
Lead	ND	75.0	"	"	"	"	"	"	
Molybdenum	ND	20.0	"	"	"	"	"	"	
Nickel	**34.3**	30.0	"	"	"	"	"	"	
Selenium	ND	100	"	"	"	"	"	"	
Silver	ND	7.00	"	"	"	"	"	"	
Thallium	ND	100	"	"	"	"	"	"	
Vanadium	**14.7**	10.0	"	"	"	"	"	"	
Zinc	**30.8**	20.0	"	"	"	"	"	"	

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	**Reported:**
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Total Metals by EPA 6000/7000 Series Methods
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C 3 (P103119-03) Water	**Sampled: 03/04/01 14:30**	**Received: 03/05/01 09:55**							
Mercury	ND	0.200	ug/l	1	1030374	03/20/01	03/20/01	EPA 7470A	
Antimony	ND	60.0	"	"	1030367	03/20/01	03/20/01	EPA 6010B	
Arsenic	ND	100	"	"	"	"	"	"	
Barium	**47.7**	10.0	"	"	"	"	"	"	
Beryllium	ND	1.00	"	"	"	"	"	"	
Cadmium	ND	10.0	"	"	"	"	"	"	
Chromium	ND	10.0	"	"	"	"	"	"	
Cobalt	ND	7.00	"	"	"	"	"	"	
Copper	ND	10.0	"	"	"	"	"	"	
Lead	ND	75.0	"	"	"	"	"	"	
Molybdenum	ND	20.0	"	"	"	"	"	"	
Nickel	ND	30.0	"	"	"	"	"	"	
Selenium	ND	100	"	"	"	"	"	"	
Silver	ND	7.00	"	"	"	"	"	"	
Thallium	ND	100	"	"	"	"	"	"	
Vanadium	ND	10.0	"	"	"	"	"	"	
Zinc	ND	20.0	"	"	"	"	"	"	
C 4 (P103119-04) Water	**Sampled: 03/04/01 15:00**	**Received: 03/05/01 09:55**							
Mercury	ND	0.200	ug/l	1	1030374	03/20/01	03/20/01	EPA 7470A	
Antimony	ND	60.0	"	"	1030367	03/20/01	03/20/01	EPA 6010B	
Arsenic	ND	100	"	"	"	"	"	"	
Barium	**104**	10.0	"	"	"	"	"	"	
Beryllium	ND	1.00	"	"	"	"	"	"	
Cadmium	ND	10.0	"	"	"	"	"	"	
Chromium	**15.8**	10.0	"	"	"	"	"	"	
Cobalt	ND	7.00	"	"	"	"	"	"	
Copper	**11.6**	10.0	"	"	"	"	"	"	
Lead	ND	75.0	"	"	"	"	"	"	
Molybdenum	ND	20.0	"	"	"	"	"	"	
Nickel	**39.2**	30.0	"	"	"	"	"	"	
Selenium	ND	100	"	"	"	"	"	"	
Silver	ND	7.00	"	"	"	"	"	"	
Thallium	ND	100	"	"	"	"	"	"	
Vanadium	**13.6**	10.0	"	"	"	"	"	"	
Zinc	**33.2**	20.0	"	"	"	"	"	"	

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Prunvske Chatham, Inc P.O. Box 828 Occidental CA, 95465	Project: Canyon Rock Project Number: na Project Manager: Steve Chatham	**Reported:** 03/23/01 17:18

Total Metals by EPA 6000/7000 Series Methods

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Y 5 (P103119-05) Water	**Sampled: 03/04/01 13:30**	**Received: 03/05/01 09:55**							
Mercury	ND	0.200	ug/l	1	1030374	03/20/01	03/20/01	EPA 7470A	
Antimony	ND	60.0	"	"	1030367	03/20/01	03/20/01	EPA 6010B	
Arsenic	ND	100	"	"	"	"	"	"	
Barium	**70.8**	10.0	"	"	"	"	"	"	
Beryllium	ND	1.00	"	"	"	"	"	"	
Cadmium	ND	10.0	"	"	"	"	"	"	
Chromium	ND	10.0	"	"	"	"	"	"	
Cobalt	ND	7.00	"	"	"	"	"	"	
Copper	ND	10.0	"	"	"	"	"	"	
Lead	ND	75.0	"	"	"	"	"	"	
Molybdenum	ND	20.0	"	"	"	"	"	"	
Nickel	ND	30.0	"	"	"	"	"	"	
Selenium	ND	100	"	"	"	"	"	"	
Silver	ND	7.00	"	"	"	"	"	"	
Thallium	ND	100	"	"	"	"	"	"	
Vanadium	**10.2**	10.0	"	"	"	"	"	"	
Zinc	**20.6**	20.0	"	"	"	"	"	"	
Y 6 (P103119-06) Water	**Sampled: 03/04/01 13:00**	**Received: 03/05/01 09:55**							
Mercury	ND	0.200	ug/l	1	1030374	03/20/01	03/20/01	EPA 7470A	
Antimony	ND	60.0	"	"	1030367	03/20/01	03/20/01	EPA 6010B	
Arsenic	ND	100	"	"	"	"	"	"	
Barium	**99.9**	10.0	"	"	"	"	"	"	
Beryllium	ND	1.00	"	"	"	"	"	"	
Cadmium	ND	10.0	"	"	"	"	"	"	
Chromium	ND	10.0	"	"	"	"	"	"	
Cobalt	ND	7.00	"	"	"	"	"	"	
Copper	ND	10.0	"	"	"	"	"	"	
Lead	ND	75.0	"	"	"	"	"	"	
Molybdenum	ND	20.0	"	"	"	"	"	"	
Nickel	ND	30.0	"	"	"	"	"	"	
Selenium	ND	100	"	"	"	"	"	"	
Silver	ND	7.00	"	"	"	"	"	"	
Thallium	ND	100	"	"	"	"	"	"	
Vanadium	**10.6**	10.0	"	"	"	"	"	"	
Zinc	**42.0**	20.0	"	"	"	"	"	"	

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Prunvske Chatham, Inc P.O. Box 828 Occidental CA, 95465	Project: Canyon Rock Project Number: na Project Manager: Steve Chatham	**Reported:** 03/23/01 17:18

Total Metals by EPA 6000/7000 Series Methods

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Y 7 (P103119-07) Water	**Sampled: 03/04/01 12:40**	**Received: 03/05/01 09:55**							
Mercury	ND	0.200	ug/l	1	1030374	03/20/01	03/20/01	EPA 7470A	
Antimony	ND	60.0	"	"	1030367	03/20/01	03/20/01	EPA 6010B	
Arsenic	ND	100	"	"	"	"	"	"	
Barium	**137**	10.0	"	"	"	"	"	"	
Beryllium	ND	1.00	"	"	"	"	"	"	
Cadmium	ND	10.0	"	"	"	"	"	"	
Chromium	**10.9**	10.0	"	"	"	"	"	"	
Cobalt	**7.62**	7.00	"	"	"	"	"	"	
Copper	**14.7**	10.0	"	"	"	"	"	"	
Lead	ND	75.0	"	"	"	"	"	"	
Molybdenum	ND	20.0	"	"	"	"	"	"	
Nickel	ND	30.0	"	"	"	"	"	"	
Selenium	ND	100	"	"	"	"	"	"	
Silver	ND	7.00	"	"	"	"	"	"	
Thallium	ND	100	"	"	"	"	"	"	
Vanadium	**22.2**	10.0	"	"	"	"	"	"	
Zinc	**59.3**	20.0	"	"	"	"	"	"	
Y 8 (P103119-08) Water	**Sampled: 03/04/01 12:10**	**Received: 03/05/01 09:55**							
Mercury	ND	0.200	ug/l	1	1030374	03/20/01	03/20/01	EPA 7470A	
Antimony	ND	60.0	"	"	1030367	03/20/01	03/20/01	EPA 6010B	
Arsenic	ND	100	"	"	"	"	"	"	
Barium	**88.3**	10.0	"	"	"	"	"	"	
Beryllium	ND	1.00	"	"	"	"	"	"	
Cadmium	ND	10.0	"	"	"	"	"	"	
Chromium	ND	10.0	"	"	"	"	"	"	
Cobalt	ND	7.00	"	"	"	"	"	"	
Copper	ND	10.0	"	"	"	"	"	"	
Lead	ND	75.0	"	"	"	"	"	"	
Molybdenum	ND	20.0	"	"	"	"	"	"	
Nickel	ND	30.0	"	"	"	"	"	"	
Selenium	ND	100	"	"	"	"	"	"	
Silver	ND	7.00	"	"	"	"	"	"	
Thallium	ND	100	"	"	"	"	"	"	
Vanadium	**12.0**	10.0	"	"	"	"	"	"	
Zinc	**26.5**	20.0	"	"	"	"	"	"	

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Prunvske Chatham, Inc P.O. Box 828 Occidental CA, 95465	Project: Canyon Rock Project Number: na Project Manager: Steve Chatham	**Reported:** 03/23/01 17:18

Conventional Chemistry Parameters by APHA/EPA Methods

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C 1 (P103119-01) Water	**Sampled: 03/04/01 11:30**	**Received: 03/05/01 09:55**							
Total Suspended Solids	**170**	10.0	mg/l	1	1030175	03/06/01	03/07/01	EPA 160.2	
Turbidity	**77.6**	5.00	NTU	5	1030179	03/05/01	03/05/01	EPA 180.1	
C 2 (P103119-02) Water	**Sampled: 03/04/01 14:00**	**Received: 03/05/01 09:55**							
Total Suspended Solids	**180**	10.0	mg/l	1	1030175	03/06/01	03/07/01	EPA 160.2	
Turbidity	**88.3**	5.00	NTU	5	1030179	03/05/01	03/05/01	EPA 180.1	
C 3 (P103119-03) Water	**Sampled: 03/04/01 14:30**	**Received: 03/05/01 09:55**							
Total Suspended Solids	**40.0**	10.0	mg/l	1	1030175	03/06/01	03/07/01	EPA 160.2	
Turbidity	**27.2**	2.00	NTU	2	1030179	03/05/01	03/05/01	EPA 180.1	
C 4 (P103119-04) Water	**Sampled: 03/04/01 15:00**	**Received: 03/05/01 09:55**							
Total Suspended Solids	**150**	10.0	mg/l	1	1030175	03/06/01	03/07/01	EPA 160.2	
Turbidity	**88.8**	5.00	NTU	5	1030179	03/05/01	03/05/01	EPA 180.1	
Y 5 (P103119-05) Water	**Sampled: 03/04/01 13:30**	**Received: 03/05/01 09:55**							
Total Suspended Solids	**46.0**	10.0	mg/l	1	1030175	03/06/01	03/07/01	EPA 160.2	
Turbidity	**99.0**	5.00	NTU	5	1030179	03/05/01	03/05/01	EPA 180.1	
Y 6 (P103119-06) Water	**Sampled: 03/04/01 13:00**	**Received: 03/05/01 09:55**							
Total Suspended Solids	**120**	10.0	mg/l	1	1030175	03/06/01	03/07/01	EPA 160.2	
Turbidity	**81.5**	5.00	NTU	5	1030179	03/05/01	03/05/01	EPA 180.1	
Y 7 (P103119-07) Water	**Sampled: 03/04/01 12:40**	**Received: 03/05/01 09:55**							
Total Suspended Solids	**274**	10.0	mg/l	1	1030175	03/06/01	03/07/01	EPA 160.2	
Turbidity	**168**	5.00	NTU	5	1030179	03/05/01	03/05/01	EPA 180.1	

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	**Reported:**
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Conventional Chemistry Parameters by APHA/EPA Methods
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Y 8 (P103119-08) Water	**Sampled: 03/04/01 12:10**	**Received: 03/05/01 09:55**							
Total Suspended Solids	**154**	10.0	mg/l	1	1030175	03/06/01	03/07/01	EPA 160.2	
Turbidity	**23.7**	1.00	NTU	"	1030179	03/05/01	03/05/01	EPA 180.1	

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Prunvske Chatham, Inc P.O. Box 828 Occidental CA, 95465	Project: Canyon Rock Project Number: na Project Manager: Steve Chatham	**Reported:** 03/23/01 17:18

Total Petroleum Hydrocarbons as Gasoline by EPA 8015M - Quality Control
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030124 - EPA 5030, waters										
Blank (1030124-BLK2)				Prepared & Analyzed: 03/07/01						
Gasoline	ND	50.0	ug/l							
Surrogate: 4-Bromofluorobenzene	*293*		*"*	*300*		*97.7*	*65-135*			
LCS (1030124-BS2)				Prepared & Analyzed: 03/07/01						
Gasoline	2610	50.0	ug/l	2750		94.9	65-135			
Surrogate: 4-Bromofluorobenzene	*310*		*"*	*300*		*103*	*65-135*			
Matrix Spike (1030124-MS1)	**Source: P103088-03**			Prepared & Analyzed: 03/06/01						
Gasoline	2850	50.0	ug/l	2750	ND	104	65-135			
Surrogate: 4-Bromofluorobenzene	*316*		*"*	*300*		*105*	*65-135*			
Matrix Spike Dup (1030124-MSD1)	**Source: P103088-03**			Prepared & Analyzed: 03/06/01						
Gasoline	2750	50.0	ug/l	2750	ND	100	65-135	3.57	20	
Surrogate: 4-Bromofluorobenzene	*314*		*"*	*300*		*105*	*65-135*			
Batch 1030160 - EPA 5030, waters										
Blank (1030160-BLK1)				Prepared & Analyzed: 03/07/01						
Gasoline	ND	50.0	ug/l							
Surrogate: 4-Bromofluorobenzene	*288*		*"*	*300*		*96.0*	*65-135*			
LCS (1030160-BS1)				Prepared & Analyzed: 03/07/01						
Gasoline	2510	50.0	ug/l	2750		91.3	65-135			
Surrogate: 4-Bromofluorobenzene	*311*		*"*	*300*		*104*	*65-135*			
Matrix Spike (1030160-MS1)	**Source: P103117-01**			Prepared & Analyzed: 03/07/01						
Gasoline	162000	2500	ug/l	138000	29600	95.9	65-135			
Surrogate: 4-Bromofluorobenzene	*317*		*"*	*300*		*106*	*65-135*			

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	**Reported:**
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Total Petroleum Hydrocarbons as Gasoline by EPA 8015M - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030160 - EPA 5030, waters										
Matrix Spike Dup (1030160-MSD1)		**Source: P103117-01**		Prepared & Analyzed: 03/07/01						
Gasoline	165000	2500	ug/l	138000	29600	98.1	65-135	1.83	20	
Surrogate: 4-Bromofluorobenzene	*319*		"	*300*		*106*	*65-135*			

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Prunvske Chatham, Inc P.O. Box 828 Occidental CA, 95465	Project: Canyon Rock Project Number: na Project Manager: Steve Chatham	**Reported:** 03/23/01 17:18

Total Petroleum Hydrocarbons as Diesel & others by EPA 8015M w/ S.G. Clean-up - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030221 - EPA 3510B										
Blank (1030221-BLK1)				Prepared: 03/08/01 Analyzed: 03/09/01						
Diesel (C10-C24)	ND	0.0500	mg/l							
Motor Oil (C24-C36)	ND	0.250	"							
Surrogate: o-Terphenyl	*0.0784*		"	*0.100*		*78.4*	*50-150*			
LCS (1030221-BS1)				Prepared: 03/08/01 Analyzed: 03/13/01						
Diesel (C10-C24)	0.632	0.0500	mg/l	1.00		63.2	50-150			
Surrogate: o-Terphenyl	*0.0840*		"	*0.100*		*84.0*	*50-150*			
LCS Dup (1030221-BSD1)				Prepared: 03/08/01 Analyzed: 03/09/01						
Diesel (C10-C24)	0.753	0.0500	mg/l	1.00		75.3	50-150	17.5	20	
Surrogate: o-Terphenyl	*0.0861*		"	*0.100*		*86.1*	*50-150*			
Batch 1030380 - EPA 3510B										
Blank (1030380-BLK1)				Prepared: 03/15/01 Analyzed: 03/16/01						
Diesel (C10-C24)	ND	0.0500	mg/l							
Motor Oil (C24-C36)	ND	0.250	"							
Surrogate: o-Terphenyl	*0.0956*		"	*0.100*		*95.6*	*50-150*			
LCS (1030380-BS1)				Prepared: 03/15/01 Analyzed: 03/16/01						
Diesel (C10-C24)	0.959	0.0500	mg/l	1.00		95.9	50-150			
Surrogate: o-Terphenyl	*0.108*		"	*0.100*		*108*	*50-150*			
LCS Dup (1030380-BSD1)				Prepared: 03/15/01 Analyzed: 03/16/01						
Diesel (C10-C24)	0.892	0.0500	mg/l	1.00		89.2	50-150	7.24	20	
Surrogate: o-Terphenyl	*0.0988*		"	*0.100*		*98.8*	*50-150*			

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Prunvske Chatham, Inc	Project: Canyon Rock	Reported:
P.O. Box 828	Project Number: na	
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Total Petroleum Hydrocarbons as Diesel & others by EPA 8015M w/ S.G. Clean-up - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030417 - EPA 3510B										
Blank (1030417-BLK1)				Prepared: 03/16/01	Analyzed: 03/20/01					
Diesel (C10-C24)	ND	0.0500	mg/l							
Motor Oil (C24-C36)	ND	0.250	"							
Surrogate: o-Terphenyl	*0.110*		"	*0.100*		*110*	*50-150*			
LCS (1030417-BS1)				Prepared: 03/16/01	Analyzed: 03/20/01					
Diesel (C10-C24)	0.961	0.0500	mg/l	1.00		96.1	50-150			
Surrogate: o-Terphenyl	*0.100*		"	*0.100*		*100*	*50-150*			
LCS Dup (1030417-BSD1)				Prepared: 03/16/01	Analyzed: 03/20/01					
Diesel (C10-C24)	0.998	0.0500	mg/l	1.00		99.8	50-150	3.78	20	
Surrogate: o-Terphenyl	*0.101*		"	*0.100*		*101*	*50-150*			

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	**Reported:**
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Total Metals by EPA 6000/7000 Series Methods - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030367 - EPA 3010A										
Blank (1030367-BLK1)				Prepared & Analyzed: 03/20/01						
Antimony	ND	60.0	ug/l							
Arsenic	ND	100	"							
Barium	ND	10.0	"							
Beryllium	ND	1.00	"							
Cadmium	ND	10.0	"							
Chromium	ND	10.0	"							
Cobalt	ND	7.00	"							
Copper	ND	10.0	"							
Lead	ND	75.0	"							
Molybdenum	ND	20.0	"							
Nickel	ND	30.0	"							
Selenium	ND	100	"							
Silver	ND	7.00	"							
Thallium	ND	100	"							
Vanadium	ND	10.0	"							
Zinc	ND	20.0	"							
LCS (1030367-BS1)				Prepared & Analyzed: 03/20/01						
Antimony	481	60.0	ug/l	500		96.2	80-120			
Arsenic	492	100	"	500		98.4	80-120			
Barium	473	10.0	"	500		94.6	80-120			
Beryllium	47.4	1.00	"	50.0		94.8	80-120			
Cadmium	50.3	10.0	"	50.0		101	80-120			
Chromium	471	10.0	"	500		94.2	80-120			
Cobalt	475	7.00	"	500		95.0	80-120			
Copper	479	10.0	"	500		95.8	80-120			
Lead	485	75.0	"	500		97.0	80-120			
Molybdenum	465	20.0	"	500		93.0	80-120			
Nickel	485	30.0	"	500		97.0	80-120			
Selenium	508	100	"	500		102	80-120			
Silver	43.6	7.00	"	50.0		87.2	80-120			
Thallium	477	100	"	500		95.4	80-120			
Vanadium	475	10.0	"	500		95.0	80-120			
Zinc	472	20.0	"	500		94.4	80-120			

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Total Metals by EPA 6000/7000 Series Methods - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030367 - EPA 3010A										
Matrix Spike (1030367-MS1)		**Source: P103178-01**		Prepared & Analyzed: 03/20/01						
Antimony	453	60.0	ug/l	500	ND	90.6	75-125			
Arsenic	501	100	"	500	ND	100	75-125			
Barium	485	10.0	"	500	18.5	93.3	75-125			
Beryllium	47.7	1.00	"	50.0	ND	93.8	75-125			
Cadmium	73.9	10.0	"	50.0	25.0	97.8	75-125			
Chromium	455	10.0	"	500	ND	91.0	75-125			
Cobalt	493	7.00	"	500	38.3	90.9	75-125			
Copper	6730	10.0	"	500	6090	128	75-125			QM-4X
Lead	465	75.0	"	500	ND	89.1	75-125			
Molybdenum	450	20.0	"	500	ND	87.7	75-125			
Nickel	485	30.0	"	500	48.0	87.4	75-125			
Selenium	498	100	"	500	ND	90.6	75-125			
Silver	41.5	7.00	"	50.0	ND	83.0	75-125			
Thallium	472	100	"	500	ND	94.4	75-125			
Vanadium	460	10.0	"	500	ND	92.0	75-125			
Zinc	5480	20.0	"	500	4900	116	75-125			
Matrix Spike Dup (1030367-MSD1)		**Source: P103178-01**		Prepared & Analyzed: 03/20/01						
Antimony	479	60.0	ug/l	500	ND	95.8	75-125	5.58	20	
Arsenic	497	100	"	500	ND	99.4	75-125	0.802	20	
Barium	484	10.0	"	500	18.5	93.1	75-125	0.206	20	
Beryllium	47.8	1.00	"	50.0	ND	94.0	75-125	0.209	20	
Cadmium	72.9	10.0	"	50.0	25.0	95.8	75-125	1.36	20	
Chromium	454	10.0	"	500	ND	90.8	75-125	0.220	20	
Cobalt	495	7.00	"	500	38.3	91.3	75-125	0.405	20	
Copper	6550	10.0	"	500	6090	92.0	75-125	2.71	20	
Lead	475	75.0	"	500	ND	91.1	75-125	2.13	20	
Molybdenum	461	20.0	"	500	ND	89.9	75-125	2.41	20	
Nickel	500	30.0	"	500	48.0	90.4	75-125	3.05	20	
Selenium	553	100	"	500	ND	102	75-125	10.5	20	
Silver	42.7	7.00	"	50.0	ND	85.4	75-125	2.85	20	
Thallium	486	100	"	500	ND	97.2	75-125	2.92	20	
Vanadium	461	10.0	"	500	ND	92.2	75-125	0.217	20	
Zinc	5340	20.0	"	500	4900	88.0	75-125	2.59	20	

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Prunvske Chatham, Inc P.O. Box 828 Occidental CA, 95465	Project: Canyon Rock Project Number: na Project Manager: Steve Chatham	**Reported:** 03/23/01 17:18

Total Metals by EPA 6000/7000 Series Methods - Quality Control
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030374 - EPA 7470A										
Blank (1030374-BLK1)				Prepared & Analyzed: 03/20/01						
Mercury	ND	0.200	ug/l							
LCS (1030374-BS1)				Prepared & Analyzed: 03/20/01						
Mercury	1.66	0.200	ug/l	1.60		104	80-120			
Matrix Spike (1030374-MS1)	**Source: P103119-05**			Prepared & Analyzed: 03/20/01						
Mercury	1.69	0.200	ug/l	1.60	ND	105	75-125			
Matrix Spike Dup (1030374-MSD1)	**Source: P103119-05**			Prepared & Analyzed: 03/20/01						
Mercury	1.67	0.200	ug/l	1.60	ND	103	75-125	1.19	20	

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	Reported:
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030175 - General Preparation										
Blank (1030175-BLK1)				Prepared: 03/06/01 Analyzed: 03/07/01						
Total Suspended Solids	ND	10.0	mg/l							
Duplicate (1030175-DUP1)	**Source: P103054-01**			Prepared: 03/06/01 Analyzed: 03/07/01						
Total Suspended Solids	144	10.0	mg/l		186			25.5	20	QR-07
Batch 1030179 - General Preparation										
Blank (1030179-BLK1)				Prepared & Analyzed: 03/05/01						
Turbidity	ND	1.00	NTU							
LCS (1030179-BS1)				Prepared & Analyzed: 03/05/01						
Turbidity	21.0	1.00	NTU	20.0		105	80-120			
Duplicate (1030179-DUP1)	**Source: P103088-01**			Prepared & Analyzed: 03/05/01						
Turbidity	28.6	1.00	NTU		28.6			0	20	

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Prunvske Chatham, Inc	Project: Canyon Rock	
P.O. Box 828	Project Number: na	Reported:
Occidental CA, 95465	Project Manager: Steve Chatham	03/23/01 17:18

Notes and Definitions

HC-12	Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel.
HDSP	Sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).
QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
QR-07	The RPD was outside QC acceptance limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

SEQUOIA ANALYTICAL CHAIN OF CUSTODY

❑ 885 Jarvis Drive • Morgan Hill, CA 95037 • (408) 776-9600 • FAX (408) 782-6308
❑ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600 FAX (916) 921-0100
❑ 404 N. Wiget Lane • Walnut Creek, CA 94598 • (925) 988-9600 FAX (925) 988-9673
❑ 1455 McDowell Blvd. North, Suite D • Petaluma, CA 94954 • (707) 792-1865 FAX (707) 792-0342
❑ 1551 Industrial Road • San Carlos, CA 94070 • (650) 232-9600 FAX (650) 232-9612

Company Name: PRUNUSKE CHATHAM, INC	Project Name: CANYON ROCK
Mailing Address: P.O. BOX 828	Billing Address (if different):
City: Occidental State: CA Zip Code: 95465	
Telephone: 707-874-0100 FAX #: 707-874-1440	P.O. #:
Report To: STEVE CHATHAM Sampler: E.H. SMITH	QC Data: ❑ Level D (Standard) ❑ Level C ❑ Level B ❑ Level A

Turnaround Time: ❑ 10 Working Days ❑ 3 Working Days ❑ 2 - 8 Hours ❑ 7 Working Days ❑ 2 Working Days ❑ 5 Working Days ❑ 24 Hours

❑ Drinking Water ❑ Waste Water ❑ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	TPH-D/MO w SG	Metals	TPH-G	TSS	TURBIDITY				Comments
1. C1	3/4/01 11:30AM				P103119-01	X	X	X	X	X				
2. C2	2:PM 3/4/01				2	↓	↓	↓	↓	↓				
3. C3	3/4/01 2:30 PM				3									
4. C4	3:00 PM 3/4/01				4									
5. Y5	1:30 3/4/01				5									COOLER CUSTODY SEALS INTACT ☐
6. Y6	1:00 PM 3/4/01				6									NOT INTACT ☐
7. Y7	12:40 3/4/01				7									COOLER TEMPERATURE 5? °C
8. Y8	12:10AM 3/4/01				8	↓	↓	↓	↓	↓				
9.														
10.														

Relinquished By: [signature]	Date: 3/5/01	Time: 9:55a	Received By: [signature]	Date: 3/5/01	Time: 9:55
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

Were Samples Received in Good Condition? ❑ Yes ❑ No Samples on Ice? ❑ Yes ❑ No Method of Shipment______

Page ___ of ___

Pink - Client Yellow - Sequoia White - Sequoia

Sequoia Analytical

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18 April, 2003

Steve Chatham
zzzPrunvske Chatham, Inc
P.O. Box 828
Occidental, CA 95465

RE: Canyon Rock
Sequoia Work Order: P103119

Enclosed are the results of analyses for samples received by the laboratory on 03/05/01 09:55. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Angelee Cari

Angelee Cari
Project Manager

CA ELAP Certificate #2374

Sequoia Analytical

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zzzPrunvske Chatham, Inc	Project: Canyon Rock	P103119
P.O. Box 828	Project Number: na	**Reported:**
Occidental CA, 95465	Project Manager: Steve Chatham	04/18/03 18:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
C 1	P103119-01	Water	03/04/01 11:30	03/05/01 09:55
C 2	P103119-02	Water	03/04/01 14:00	03/05/01 09:55
C 3	P103119-03	Water	03/04/01 14:30	03/05/01 09:55
C 4	P103119-04	Water	03/04/01 15:00	03/05/01 09:55
Y 5	P103119-05	Water	03/04/01 13:30	03/05/01 09:55
Y 6	P103119-06	Water	03/04/01 13:00	03/05/01 09:55
Y 7	P103119-07	Water	03/04/01 12:40	03/05/01 09:55
Y 8	P103119-08	Water	03/04/01 12:10	03/05/01 09:55

The results in this report apply to the samples analyzed in accordance with the chain of custody document. Unless otherwise stated, results are reported on a wet weight basis. This analytical report must be reproduced in its entirety.

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zzzPrunvske Chatham, Inc P.O. Box 828 Occidental CA, 95465	Project: Canyon Rock Project Number: na Project Manager: Steve Chatham	P103119 **Reported:** 04/18/03 18:43

Total Metals by EPA 6000/7000 Series Methods

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C 1 (P103119-01) Water	**Sampled: 03/04/01 11:30**	**Received: 03/05/01 09:55**							
Iron	**6100**	300	ug/l	1	1030367	03/20/01	03/20/01	EPA 6010B	
C 2 (P103119-02) Water	**Sampled: 03/04/01 14:00**	**Received: 03/05/01 09:55**							
Iron	**8300**	300	ug/l	1	1030367	03/20/01	03/20/01	EPA 6010B	
C 3 (P103119-03) Water	**Sampled: 03/04/01 14:30**	**Received: 03/05/01 09:55**							
Iron	**800**	300	ug/l	1	1030367	03/20/01	03/20/01	EPA 6010B	
C 4 (P103119-04) Water	**Sampled: 03/04/01 15:00**	**Received: 03/05/01 09:55**							
Iron	**7800**	300	ug/l	1	1030367	03/20/01	03/20/01	EPA 6010B	
Y 5 (P103119-05) Water	**Sampled: 03/04/01 13:30**	**Received: 03/05/01 09:55**							
Iron	**5100**	300	ug/l	1	1030367	03/20/01	03/20/01	EPA 6010B	
Y 6 (P103119-06) Water	**Sampled: 03/04/01 13:00**	**Received: 03/05/01 09:55**							
Iron	**6500**	300	ug/l	1	1030367	03/20/01	03/20/01	EPA 6010B	
Y 7 (P103119-07) Water	**Sampled: 03/04/01 12:40**	**Received: 03/05/01 09:55**							
Iron	**14000**	300	ug/l	1	1030367	03/20/01	03/20/01	EPA 6010B	
Y 8 (P103119-08) Water	**Sampled: 03/04/01 12:10**	**Received: 03/05/01 09:55**							
Iron	**7000**	300	ug/l	1	1030367	03/20/01	03/20/01	EPA 6010B	

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zzzPrunvske Chatham, Inc	Project: Canyon Rock	P103119
P.O. Box 828	Project Number: na	**Reported:**
Occidental CA, 95465	Project Manager: Steve Chatham	04/18/03 18:43

Total Metals by EPA 6000/7000 Series Methods - Quality Control
Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030367 - EPA 3010A										
Blank (1030367-BLK1)				Prepared & Analyzed: 03/20/01						
Iron	ND	500	ug/l							
Laboratory Control Sample (1030367-BS1)				Prepared & Analyzed: 03/20/01						
Iron	5100	500	ug/l	5000		102	80-120			
Matrix Spike (1030367-MS1)		**Source: P103178-01**		Prepared & Analyzed: 03/20/01						
Iron	198000	500	ug/l	5000	190000	160	75-125			QM-4X
Matrix Spike Dup (1030367-MSD1)		**Source: P103178-01**		Prepared & Analyzed: 03/20/01						
Iron	193000	500	ug/l	5000	190000	60	75-125	3	20	QM-4X

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Notes and Definitions

QM-4X	The spike recovery was outside of control limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

APPENDIX D-3

QUESTA
Civil, Environmental & Water Resources
ENGINEERING CORP.

RECEIVED
JUN 1 2 2003
BASELINE

June 11, 2003

Bruce Abelli-Amen
Baseline Environmental Consulting
101 H Street, Suite C
Petaluma, California 94952

Subject: BLUE ROCK AND CANYON ROCK QUARRY SOIL LOSS RATE TECHNICAL APPENDIX

Dear Bruce:

Enclosed is our technical appendix for estimating changes in soil loss for the Blue Rock Quarry and Canyon Rock Quarry proposed expansion projects. The analysis is based on the five-year average and current production levels. The five-year production average (baseline) and current production levels for Blue Rock Quarry are 114,603 and 150,000 cubic yards per year, respectively; for Canyon Rock Quarry the baseline and current production levels are 375,000 and 500,000 cubic yards per year, respectively.

The estimates of average annual soil loss were made using the Universal Soil Loss Equation (USLE) provide a relative comparison of erosion problems at different phases of mining and reclamation, but the results should not be interpreted to do not represent the amount of annual sediment delivered to Green Valley Creek. Because the baseline condition includes actively mined areas, the total post-reclamation soil loss (i.e., combined soil loss in the existing quarry area and proposed expansion area following completion of mining and all reclamation activities) will likely be less than baseline conditions. However, for the worst-case scenario, annual soil loss (during actual mining over the next 5 to 10 years) is predicted to be significantly greater than baseline conditions. Since average annual soil loss does not account for the difference in sediment delivery ratio between undisturbed and actively mined areas, the results provided analysis likely overestimate the difference between the phases. However, the results do provide a general sense of how sediment yield compares between each of the project phases. It should be stressed that the USLE analysis does not factor in sediment detention ponds that are planned at Blue Rock Quarry and Canyon Rock Quarry. Coarser materials and silts would settle out in these ponds and would not be transported to Green Valley Creek.

A simple equation to estimate the size of a sediment basin required to settle out sediment of a certain size is

$$A_s = \frac{1.2Q}{V_s} \qquad \textbf{Equation 1}$$

where: A_s is the pond surface area, square feet (ft^2)

Q is average discharge, cubic feet per second (cfs)

Vs is the settling velocity of a particle, feet per second (ft/s)

The State Surface Mining and Reclamation Act (SMARA) requires that erosion control practices be designed for the 20-year, 1-hour storm event. It should be noted that Canyon Rock Quarry's engineer used a 10-year, 6-hour storm event to size the proposed sediment basins, consistent with

Regional Board guidelines applicable to construction sites. For fine silts and clays, settling velocities of 0.00024 ft/s and 0.00006 ft/s were used; for medium silts, a settling velocity of 0.00096 was used (Goldman, S.J. et al, *Erosion and Sediment Control Handbook*, McGraw-Hill, 1986, Page 8.16). It should be noted that both of the applicants' engineers used a settling velocity of 0.00096 ft/s in their sediment basin sizing calculations.

Table 1 compares the proposed sediment detention basin sizes to those basin sizes required to remove fine silts and clays. As can be seen in the results, the proposed sediment basins at both quarries are undersized to remove clays and, at Canyon Rock Quarry, the basins are generally undersized to remove medium silts and fine silts. If constructed as proposed, the quarries would cumulatively increase the amount of fine suspended sediments to Green Valley Creek, and Canyon Rock Quarry would increase the amount of medium and fine silts, particularly in the case of the Northern Expansion Alternative, and especially during and following relatively intense winter storms.

Table 1. Proposed and required sediment basin surface area (acres).

Quarry	Proposed Area (acres)	Area (acres) required to remove:		
		Medium Silts	Fine Silts	Clays
Blue Rock Quarry	11 ±	2.2	5.5	22
Canyon Rock – Northern	3.2 ±	1.5	6.1	25
Canyon Rock – Western	1.6 ±	2.2	8.9	35

We can conclude from the analysis that there is a good chance that the Basin Plans turbidity standard and the stormwater discharge benchmark criteria for suspended sediments would likely be exceeded. The Erosion Control Plans should place greater emphasis on stabilizing and protecting disturbed surfaces, and not rely principally on entrapment and detention of eroded particles.

Please feel free to contact us if you have any questions regarding this analysis.

Sincerely,

Jeffrey H Peters

Jeffrey Peters
Senior Soil Scientist

Jeni McGregor

Jeni McGregor
Environmental Engineer

ESTIMATING SOIL LOSS RATES AT BLUE ROCK QUARRY AND CANYON ROCK QUARRY WITH THE UNIVERSAL SOIL LOSS EQUATION

INTRODUCTION

The Sonoma County ARM Plan discusses the potential increase of soil erosion by steep slopes that are left after quarrying operations. Changes in soil loss to the site were estimated to compare the potential changes in sediment load to Green Valley Creek over baseline conditions. The Universal Soil Loss Equation was used to estimate soil loss on the site for present, baseline, "worst-case", and post-reclamation conditions. Each of the conditions is defined as follows:

Present conditions – The present conditions are based upon the current amount of actively mined areas, undisturbed areas, and reclaimed areas. Based upon recent aerial photographs, the amount of actively mined, undisturbed or recently reclaimed areas were measured and used to estimate soil loss. Presently, 22.5 acres and 33 acres are actively mined at Blue Rock Quarry and at Canyon Rock Quarry, respectively.

Baseline conditions – The baseline condition is assumed to be the soil loss for present conditions reduced by a factor to account for lower average production levels. The estimate for baseline soil loss assumes that soil loss under present conditions is directly correlated to the production rate (in tons per year). The factor used for the Blue Rock Quarry analysis uses a five-year production average of 173,050 tons per year (114,603 cubic yards per year)[1] and a current production level of (226,500 tons per year (150,000 cubic yards per year); for Canyon Rock Quarry the five-year average is 566,250 tons per year (375,000 cubic yards per year) and the current production rate is 604,000 tons per year (500,000 cubic yards per year). The baseline condition is a more conservative estimate of the background level of soil loss from the quarry area. Since no quarrying is currently performed in the expansion areas, the baseline and present conditions is the same. This condition is used to compare future soil loss against.

Worst-case conditions – The "worst-case" condition assumes that the maximum allowable area (10 percent higher than present actively mined area acres) is actively mined, and that the remaining area is a combination of newly reclaimed or undisturbed land (some areas of the quarry, such as buffer areas, will remain undisturbed for the life of the quarry). The maximum allowable active mining area for Blue Rock Quarry and Canyon Rock Quarry are 25 acres and 36 acres, respectively.

Post-reclamation conditions – The post-reclamation condition is after all quarry activities have ceased, and reclamation plantings have had time to mature.

Accurately predicting soil loss rates is difficult and requires extensive long-term monitoring data. Erosion rates can vary radically annually in response to rainfall

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[1] 1 cubic yard of material is roughly 1.51 tons.

frequency and intensity, total precipitation amounts, soils and slopes, land cover and soil conservation practices, and many other factors.

METHODOLOGY

The Universal Soil Loss Equation (USLE) was used to provide a semi-quantitative estimate of annual soil "loss" in tons per acre for the existing, "worst-case", and 100 percent reclamation conditions. The equation calculates the movement of soil onsite, **not** loss of soil to waterways (i.e., sediment delivery). The limitations of USLE are acknowledged. It has been used here principally as a screening tool to determine the sensitivity of the land to disturbance and to facilitate a comparison of the relative before and after soil "loss" rates from the expansion and reclamation activities, rather than as an absolute predictor of soil "loss".

The Universal Soil Loss Equation (USLE) was developed in the late 1950s by the US Department of Agriculture (USDA) for the purpose of estimating rates of soil erosion caused by rainfall and associated overland flow on agricultural fields. It is used by the USDA Natural Resource Conservation Service (NRCS) principally for planning and evaluating farm plans for consistency with the goals and requirements of the Food Security Act and other USDA farm programs. Since its inception the equation has been updated and applied to many other land types, including the evaluation of various phases of surface mining and reclamation in various geographic regions.[2] The USLE uses physical factors, such as amount and severity of rainfall, slope length, steepness, vegetation cover, and inherent soil erodibility to quantify the amount of soil "loss" per acre per year. The equation is empirical and based on over 10,000 plot-years of data gathered from runoff-erosion studies on small agricultural plots, both under natural and under simulated rainfall conditions. The standard plot on which the USLE is based is on fallow ground, 72.5 ft in length with a slope of 9%. The factors of the equation are designed to adjust for deviation from the standard condition.

The USLE is defined as $A = RK(LS)CP$, where:

A = soil loss per unit area (tons/ac/yr)

R = rainfall and erosion factor

K = soil erodibility factor

LS = slope length and steepness factor

C = cover and management factor

P = support practice factor

---

2 T.J. Toy and W.R. Osterkamp. The applicability of RUSLE to geomorphic studies. In: Journal of Soil and Water Conservation, v. 50, no. 5, 1995.

A brief description of each of the factors and the values that were used in the study is presented below.

Soil Loss, A

The soil loss, *A*, is an estimated annual average. Measured soil loss for reclaimed hillslopes at a coal mining site in Wyoming ranged from less than 1 ton/acre/year, to over 10 tons/acre/year; natural (undisturbed) hillslopes at the site had measures soils loss rates ranging between 3 and 8 tons/acre/year[3]. Because climate, topographic, and soil conditions vary greatly between project sites and geographic regions, soil loss rates can also vary greatly.

***Rainfall,* R**

The rainfall factor, *R*, is a measure of the frequency of severe rainfall combined with total annual rainfall. Areas with high *R* values require more erosion control features that those with low *R* values. For this study, an *R* of 70 was used, based the average rainfall value for a 2-year, 6-hour storm (2.4 inches/hour)[4].

***Soil Erodibility,* K**

The soil erodibility factor, *K*, is a measure of the susceptibility of soil particles to detachment and transport by rainfall and runoff. Texture is the principal factor affecting *K*, but structure, organic matter, and permeability also contribute. The soil types were determined from the USDA Soil Survey of Sonoma County (1972). The soil erodibility factor was adjusted based upon the phase of land use. Reclaimed or actively mined areas have a higher percentage of rock content than the undisturbed soils, and therefore are less erodible. **Table 1** summarizes the soil types and corresponding soil erodibility factor used in the USLE analysis.

Table 1. Soil types and soil erodibility factor (K) values.

Soil Type	*K* Factor	
	Undisturbed	Reclaimed or Actively Mined
Hugo very gravelly loam	0.15	0.12
Blucher	0.32	0.25

[3] T.J. Toy and W.R. Osterkamp. "The applicability of RUSLE to geomorphic studies." *Journal of Soil and Water Conservation*, v. 50, no. 5, 1995.

[4] For the Forestville area, $R = 10.2p^{2.2}$, where p is the 2-year, 6-hour rainfall in inches (Goldman, *et al. Erosion and Sediment Control Handbook*, 1986. The 2-year, 6-hour rainfall (2.4 inches/hour) was obtained from the NOAA Atlas 2, Western U.S. Precipitation Frequency Maps, 1973.

Length-Slope Factor, LS

The slope length-gradient factor[5], *LS*, describes the combined effect of slope length and slope gradient. It is the ratio of soil loss per unit area on a site to the corresponding loss from the standard plot of 72.5 ft and 9% slope. Although the effect of length is not as great as the effect of slope angle, very long slopes and, especially, very long steep slopes should not be constructed. The slope gradients and slope lengths were determined from the finish grading plans. The site is characterized by steep slopes in both the undisturbed landscape and in the actively mined hillside. It is not uncommon for the natural (undisturbed) hill slopes on the site to exceed the 1.5:1 (Horizontal : Vertical) hillslopes proposed in some of the proposed expansion and reclamation area (i.e., the natural hillslopes are steeper than the slope proposed reclaimed hillslope gradient). Due to the proposed benches in some of the reclaimed areas, slope lengths in those areas following reclamation will be shorter than those in the currently undisturbed areas. Along the southern half of Canyon Rock Quarry, where the hillsides would be mined and the ground would be graded to a relatively flat condition, the slope length would be significantly increased. The proposed mining and reclamation plan would generally decrease the length-slope (*LS*) factor at both quarries; therefore, the contribution to soil loss slope length and gradient would be expected to decrease over the natural (undisturbed) conditions.

Cover Factor, C

The cover factor, *C*, is defined as the ratio of soil loss from land under specified crop conditions to the corresponding loss from tilled, bare soil. The following cover conditions were assumed to occur at the quarry: (1) Native (undisturbed) vegetation; (2) actively mined areas; (3) newly reclaimed hillslopes; and (4) mature reclaimed hillslopes. **Table 2** summarizes the *C* values that were used for this assessment.

Table 2. Cover factor (*C*) values.

Condition	*C*
Native (undisturbed)	0.01
Actively mined	0.80
Newly reclaimed	0.33
Mature reclaimed	0.18

[5] The length-slope factor was calculated from the equation (Goldman, *et al.*, 1986)

$$LS = \left(\frac{65.41s^2}{s^2 + 10.000} + \frac{4.56s}{\sqrt{s^2 + 10.000}} + 0.065\right)\left(\frac{l}{72.5}\right)^m$$

where: LS = length-slope factor, s = slope steepness, l = slope length, ft, m = exponent dependent upon slope steepness (0.5 for slopes > 5%). Note that all slopes within the study area were greater than 5%.

Erosion Control Practice, P

The erosion control practice factor, *P*, is a parameter representing the reduction of soil loss resulting from soil conservation measures such as contour tillage, contour strip cropping, terracing, and stabilizing waterways. A *P* factor of 1.0 was used for the native (undisturbed) areas, as erosion control practices are not currently being implemented in these areas. For reclaimed and actively mined areas a *P* factor of 0.90 was used because of the terracing and diversions or slope breaks that will be constructed.

Results and Discussion

The Universal Soil Loss Equation is used to predict the amount of gross sheet and rill erosion. It does not, however, predict the amount of eroded sediment reaching downstream areas. Much of the eroded sediment will be deposited in other areas of the quarry before reaching the drainage system, including behind straw bales, silt fences, and within planned sediment retention structures. The sediment delivery ratio is the ratio of sediment delivered to a particular location in the stream system to the gross erosion within the drainage area above that location. There are no good equations available for computing this ratio, other than a general relationship noted between watershed size and sediment delivery (i.e., the larger the drainage area the greater the opportunity for sediment storage somewhere in the system). The hydrologist is left to estimate a sediment delivery ratio based on calibration using rates of sediment detained behind reservoirs, and to subjectively estimate the effects of erosion control and on-site sediment detention measures. Generally for small non-urban or agricultural watersheds between 1 and 5 square miles in size, a sediment delivery ratio of between 25 to 33% of gross erosion can be used (Boyce, R.C. (1975). "Sediment Routing with Sediment Delivery Ratios." In: Present and Prospective Technology for ARS, USDA, Washington, D.C.).

The estimates of average annual soil loss presented in **Tables 3** through **5** provide relative comparison at different phases of mining and reclamation, and do not represent the amount of sediment delivered to Green Valley Creek. Because the baseline condition includes actively mined areas, the total post-reclamation soil loss (i.e., combine soil loss in the existing quarry area and proposed expansion area) will likely be less than baseline conditions. However, for the worst-case scenario, soil loss is significantly greater than baseline conditions. Since average annual soil loss does not account for the difference in sediment delivery ratio between undisturbed and actively mined areas, the results provided in the tables below likely overestimate the difference between the phases. However, the results do provide a general sense of how sediment loss compares between each of the project phases. Further, where sediment detention ponds are planned, such as at Blue Rock Quarry and Canyon Rock Quarry, coarser materials and silts would settle out and would not be transported downstream. However, the finest sediments (i.e., clays) would not likely settle out and would be transported downstream.

Table 3. Average Annual Soil Loss (tons/year) – Cumulative (Blue Rock Quarry and Canyon Rock Quarry).

Canyon Rock Expansion Alternative	Present Condition	Baseline Condition	Worst-Case	Post-Reclamation
Northern	3,205	2,705	5,270	1,430
Western	3,165	2,765	5,410	1,360

Table 4. Average Annual Soil Loss (tons/acre/year) – Blue Rock Quarry.

BLUE ROCK QUARRY				
Existing Area	Present Condition	Baseline Condition	Worst-Case	Post-Reclamation
Average Annual Soil Loss (tons/acre/year)	39	---	71	22
Area (acres)	32	32	25	21
Soil Loss - Subtotal (tons/year)	*1,250*	*950* [a]	*1,780*	*460*
Expansion Area	Present Condition	Baseline Condition	Worst-Case	Post-Reclamation
Average Annual Soil Loss (tons/acre/year)	2.5	2.5	65	15
Area (acres)	22	22	22	22
Soil Loss - Subtotal (tons/year)	*55*	*55*	*1,430*	*330*
Total Area (Existing + Expansion)	Present Condition	Baseline Condition	Worst-Case [b]	Post-Reclamation [b]
Area (acres)	54	54	47	43
Total Soil Loss (tons/year)	***1,305***	***1,005***	***3,210***	***790***

[a] The baseline soil loss is estimate by comparing soil loss at present production levels to production levels at the baseline conditions.

$$\frac{1{,}250 \text{ tons/yr}}{226{,}500 \text{ tons/yr}} \times 173{,}050 \text{ tons/year} = 951 \text{ tons/yr (call 950 tons/yr)}$$

[b] Up to 11-acres on the site would be converted to a small pond/sediment basin and are not included in total area (54 acres).

Table 5. Average Annual Soil Loss (tons/acre/year) – Canyon Rock Quarry.

CANYON ROCK QUARRY NORTHERN EXPANSION ALTERNATIVE				
Existing Area	Present Condition	Baseline Condition	Worst-Case	Post-Reclamation
Average Annual Soil Loss (tons/acre/year)	30	---	6	4
Area (acres)	60	60	60	60
Soil Loss - Subtotal (tons/year)	*1,800*	*1,700* [a]	*360*	*240*
Expansion Area	Present Condition	Baseline Condition	Worst-Case	Post-Reclamation
Average Annual Soil Loss (tons/acre/year)	2	2	34	8
Area (acres)	50	50	50	50
Soil Loss - Subtotal (tons/year)	*100*	*100*	*1,700*	*400*
Total Area (Existing + Expansion)	Present Condition	Baseline Condition	Worst-Case	Post-Reclamation
Area (acres)	110	110	110	110
Total Soil Loss (tons/year)	***1,900***	***1,800***	***2,060***	***640***
CANYON ROCK QUARRY WESTERN EXPANSION ALTERNATIVE				
Existing Area	Present Condition	Baseline Condition	Worst-Case	Post-Reclamation
Average Annual Soil Loss (tons/acre/year)	30	---	18	6
Area (acres)	60	60	60	60
Soil Loss - Subtotal (tons/year)	*1,800*	*1,700* [a]	*1,080*	*360*
Expansion Area	Present Condition	Baseline Condition	Worst-Case	Post-Reclamation
Average Annual Soil Loss (tons/acre/year)	2	2	38	7
Area (acres)	30	30	30	30
Soil Loss - Subtotal (tons/year)	*60*	*60*	*1,140*	*210*
Total Area (Existing + Expansion)	Present Condition	Baseline Condition	Worst-Case	Post-Reclamation
Area (acres)	90	90	90	90
Total Soil Loss (tons/year)	***1,860***	***1,760***	***2,220***	***570***

[a]

$$\frac{1{,}800 \text{ tons/yr}}{604{,}000 \text{ tons/yr}} \times 566{,}250 \text{ tons/year} = 1{,}699 \text{ tons/yr (call } 1{,}700 \text{ tons/yr)}$$

June 12, 2003

Bruce Abelli-Amen
Baseline Environmental Consulting
101 H Street, Suite C
Petaluma, California 94952

Subject: BLUE ROCK AND CANYON ROCK QUARRY RATIONAL METHOD CALCULATIONS

Dear Bruce:

Enclosed is the supporting documentation for our peak discharge analysis for the Blue Rock Quarry and Canyon Rock Quarry proposed reclamation and expansion projects. An explanation of the methodology, potential impacts, and recommended mitigations are summarized in this letter.

The quarry expansion and reclamation process includes the removal of vegetation, overburden material, and significant changes to the topography at the project site. The removal of vegetation and overburden material (i.e., soil) will reduce infiltration on the site by exposing bedrock to rainfall. Although hillslopes and benches will be revegetated as part of the reclamation, the soil plant cover will be significantly different from native conditions, and post-reclamation infiltration will likely be decreased compared to that of the existing undisturbed slopes and rainfall runoff increased markedly. Also, storm drains will capture runoff and route it to proposed sediment detention ponds. Runoff at the project site will also be increased by changes to the existing watershed boundaries and drainage patterns through topographic alteration (see attached **Figure HYD-5**).

The Rational Method was used to estimate potential cumulative changes in peak discharge (considering Blue Rock and Canyon Rock Quarry expansions together) to the tributary watershed and Green Valley Creek. Detention of stormwater runoff will occur in the proposed ponds at both sites, and it is likely that the increase in peak discharge from the project site would be significantly less than that estimated in the Rational Method analysis. The detention basins are designed primarily for sediment detention from smaller storms and not attenuation of peak runoff during larger storm events. However, without design information on the outlet structures from the ponds, it would be conjecture to estimate the discharge from the ponds into the receiving drainage (i.e., Highway 116 drainage ditch and Green Valley Creek). Therefore, the cumulative peak discharge analysis provided in this DEIR is the most conservative approach to assessing the impact on peak discharge from the quarries.

The Rational Method is one of the simplest and best-known methods routinely used to estimate peak discharge from small watersheds. Peak discharge is computed from the equation:

$$Q = kCiA \qquad \textbf{Equation 1}$$

where: Q is peak discharge, cubic feet per second (cfs)

k is a conversion factor, unitless

C is the runoff coefficient, unitless

i is the rainfall intensity, inches/hour (in/hr)

A is the contributing watershed area, acres

The peak discharge was estimated for the 10-, 20-, and 100-year design storms. The rainfall intensity was based upon the rainfall intensity/duration curve equations used by the Sonoma County Water Agency (SCWA, *Flood Control Design Criteria Manual for Waterways, Channels and Closed Conduits*, 1983. Plate No. B-2). The conversion factor, k, is based upon mean seasonal rainfall. Mean seasonal rainfall in the area of the quarry is approximately 40 to 45 inches per year, which corresponds to a k of 1.35 to 1.50 (SCWA, *Flood Control Design Criteria Manual for Waterways, Channels and Closed Conduits*, 1983. Plate No. B-1 and B-4). The higher k value (1.50) was used in the analyses for a more conservative estimate of peak discharge.[1] The runoff coefficients used in the analysis are summarized **Table 1**. The contributing watershed area was divided into several smaller drainage areas for a more accurate estimate of runoff (see attached maps). **Tables 2** and **3** summarize the results of the Rational Method analysis.

Table 1. Runoff coefficients used in Rational Method analysis.

Land Type	Runoff Coefficient
Undisturbed (forest)	0.15
Undisturbed (pasture)	0.30
Reclaimed	0.65
Actively mined / bare earth	0.80
Paved roadway	0.90

[1] The Blue Rock Quarry's engineer also used a k factor of 1.50 in their preliminary drainage design calculations (Sandine & Associates, Inc. – Consulting Civil Engineers, facsimile to Questa Engineering Corp., February 15, 2001).

Table 2. Impacts to peak discharge (cfs) estimates, Watershed.

Storm Frequency	Existing Discharge, cfs	Project Impacts [a] Estimated Discharge, cfs [b]			Cumulative Impacts Estimated Discharge, cfs [b]	
		Blue Rock	Canyon Rock		Blue Rock and Canyon Rock	
			Northern Expansion	Western Expansion	Northern Expansion	Western Expansion
10-Year	170	185	230	210	255	235
20-Year	190	210	255	235	285	265
100-Year	240	260	320	300	355	330
Average percent increase in runoff		10±%	35±%	25±%	50±%	40±%

[a] Includes only the contribution from the individual projects (i.e., considers only the expansion of one quarry).

[b] The estimated discharge is at 100% expansion and reclamation, and assumes a worst-case scenario, in which the settling ponds are at capacity and peak discharge is not detained on the site.

Table 3. Impacts to peak discharge (cfs) in the Green Valley Watershed at point immediately downstream of Canyon Rock Quarry.

Storm Frequency	Existing Discharge, cfs [a]	Project Impacts [c] Estimated Discharge, cfs [d]			Cumulative Impacts Estimated Discharge, cfs [d]	
		Blue Rock	Canyon Rock		Blue Rock and Canyon Rock	
			Northern Expansion	Western Expansion	Northern Expansion	Western Expansion
10-Year	8,537	8,552	8,597	8,577	8,622	8,602
20-Year	9,953 [b]	9,973	10,018	9,998	10,048	10,028
100-Year	12,550	12,570	12,630	12,610	12,665	12,640
Average percent increase in runoff		0.2±%	0.7±%	0.5±%	1±%	0.7±%

[a] Sonoma County Water Agency

[b] The 25-year discharge is used as an approximation of the 20-year discharge, as it is the only available estimate for Green Valley Creek (along with the 10- and 100-year discharge). The 25-year discharge is similar to, though slightly higher than the expected 20-year discharge.

[c] Includes only the contribution from the individual projects (i.e., considers only the expansion of one quarry).

[d] The estimated discharge is at 100% expansion and reclamation, and assumes a worst-case scenario, in which the settling ponds are at capacity and peak discharge is not detained on the site.

The cumulative increase in discharge in the tributary subwatershed over the existing conditions is on the order of 40 to 50 percent (**Table 2**). In the context of the Green Valley Creek, the increase in discharge represents a much smaller change over the existing conditions, on the order of 0.5 to 1 percent (**Table 3**). The increase discharge is unlikely to cause increased channel bottom or bank erosion in the receiving channels. The projected floodwater surface elevation in Green Valley Creek would likely be very small and is likely controlled by the attenuation capacity of the sediment detention basins. Further, the cumulative increase in peak discharge in the tributary watershed (i.e., the Highway 116 watershed) could cause flooding of Highway 116 during large storm events, if the drainage ditch does not have adequate capacity. These would represent potentially significant impacts.

We recommend the following mitigation measures to reduce impacts to the hydrology of the receiving waters (i.e., Green Valley Creek and the Highway 116 drainage) to less-than-significant levels:

1. The applicant shall prepare, for the review and approval by the Sonoma County Permit and Resource Management Department, a drainage plan (including appropriate hydrologic and hydraulic information) that minimizes changes in post-reclamation runoff, site peak flows, and stream velocities as compared with existing conditions at downstream discharge points along Highway 116 and Green Valley Creek. The design calculations shall demonstrate that the post-reclamation 2-, 10-, 20-, and 100-year discharge would not exceed existing discharge levels by more than 5 percent, and that increased flooding of the Highway 116 drainage ditch would not occur for a storm with a frequency 100 years or more.

2. The drainage plan shall be prepared by a Registered Civil Engineer and in conformance with the Sonoma County Water Agency's Flood Control Design Criteria.

3. All on-site drainage facilities shall be constructed according to Sonoma County Water Agency's Flood Control Design Criteria and the County of Sonoma Permit and Resource Management Department standards and requirements.

Please feel free to contact us if you have any questions regarding this analysis.

Sincerely,

Jeffrey Peters
Senior Soil Scientist

Jeni McGregor
Environmental Engineer

APPENDIX E
AIR QUALITY

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 increases (from 375,000 CY to 500,000 CY), 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 AP-42. Table E-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. Nine of the conveyors have air emissions controls applied to them. None of the feeders have air emissions controls applied to them. Five of the screeners have air emissions controls applied to them.

TABLE E-1
EMISSION FACTORS FOR STONE PROCESSING

Emission Point	Number of Equipment	Uncontrolled Emission Factor (lbs/ton of material)	Controlled Emission Factor (lbs/ton of material)
Conveyor Belt	48	0.0014	0.000048
Feeder/Hopper	4	0.0055	0.0014
Screens	7	0.015	0.00084
Crushers	10	0.0024	0.00059
Truck Loading	3	0.000016	NA
Truck Unloading	3	0.0001	NA

NA = Not applicable.

SOURCE: Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 11.19.2 Crushed Stone Processing, January, 1995.

Four of the crushers have air emissions controls applied to them. Hourly emissions are based on a production level of 8,000 tons per day.

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 sand and aggregate depends primarily on the surface moisture content of these materials.

Annual project emissions from the primary crushing circuit were calculated based on the tons of material handled per year, as follows:

$$\mathrm{PM}\left(\frac{tons}{year}\right) = [\text{uncontrolled emission factor}\left(\frac{lb}{ton\ raw\ material\ handled}\right) \cdot 750{,}000\left(\frac{tons\ raw\ material\ handled}{year}\right) \cdot 8\ (\text{number of uncontrolled units}) + \text{controlled emission factor}\left(\frac{lb}{ton\ raw\ material\ handled}\right) \cdot 750{,}000\left(\frac{tons\ raw\ material\ handled}{year}\right) \cdot 3\ (\text{number of controlled units})]\ /\ 2000\left(\frac{lbs}{tons}\right)$$

CONCRETE BATCH PLANT

Concrete is composed essentially of water, cement, sand (fine aggregate), and coarse aggregate, consisting of crushed stone. Sand, aggregate, cement, and water are all gravity fed from a weigh hopper into the mixer trucks. The cement is transferred to elevated storage silos. The sand and coarse aggregate are transferred to elevated bins. From these elevated bins, the constituents are fed by gravity or screw conveyor to weigh hoppers, which combine the proper amounts of each material.

Air emissions were determined for the operation of the concrete batching plants. The air emission calculations accounted for the proposed production level increases (from 25,000 CY to 33,333 CY), the number, types, and size of equipment. The emission factors can be calculated using the methodology found in Section 11.12 of AP-42. Table E-2 presents the emission factors for the concrete batching operations. The cement unloading and truck loading points have air emission controls applied to them.

TABLE E-2
EMISSION FACTORS FOR CONCRETE BATCHING

Emission Point	Number of Equipment	Uncontrolled Emission Factor (lbs/ton of material)	Controlled Emission Factor (lbs/ton of material)
Aggregate Transfer	2	0.0033	0.0033
Sand Transfer	2	0.00099	0.00099
Cement Unloading	2	0.46	0.00034
Weigh Hopper Loading	2	0.0024	0.0024
Mixer Loading	2	0.078	0.0038
Truck Loading	2	0.15	0.051

SOURCE: Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: *Stationary Point and Area Sources*, Section 11.12 Concrete Batching, October, 2001.

Annual project emissions from the aggregate transfer circuit were calculated based on the tons of material handled per year, as follows:

$$\text{PM}\left(\frac{tons}{year}\right) = [\text{controlled emission factor}\left(\frac{lb}{ton\ raw\ material\ handled}\right) \cdot 50{,}000\left(\frac{tons\ raw\ material\ handled}{year}\right) \cdot 2\ (\text{number of units})] \,/\, 2000\left(\frac{lbs}{tons}\right)$$

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. Ten to 15 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 year. 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* (dated November 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. During the baseline condition, up to two blasts per year are expected and during the project condition, up to three blasts per year are expected.

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 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% 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. 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/m^2) per year. The following equations were used to calculate the emission factor.

$$EF = k\sum_{i=1}^{N} P_i$$

$$P_i = 58(u^{\bullet} - u_t^{\bullet})^2 + 25(u^{\bullet} - u_t^{\bullet}); P_i = 0 \ for \ u^{\bullet} \le u_t^{\bullet}$$

$$u^{\bullet} = 0.4\, u_{10} / \ln(z/zo)$$

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)
$u^{\bullet}$	=	friction velocity (m/s)
$u_t^{\bullet}$	=	threshold friction velocity (1.02 m/s) (AP42, 1995)
u_{10}	=	fastest mile wind speed (33 mph) for Santa Rosa, California
z	=	10 m
zo	=	0.1 m (Wieninga, 1998)

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 2003 (http://www.wrh.noaa.gov/Monterey/f6/index.htm), this occurred 20 days.

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 1.31 grams per square meter of stockpile (controlled). To account for emission controls, a control efficiency of 75% 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 emission factors were calculated using the methodology found in CARB 1997. Based on available data, the emission factor for unpaved roads is 2.27 pounds of PM10 per vehicle mile traveled (uncontrolled). To account for emission controls, a control efficiency of 75% was applied. Natural mitigation (days of measurable precipitation: 72) was also used to account for precipitation (http://www.wrcc.dri.edu/summary for Healdsburg, California). A controlled emission factor of 0.568 and 0.456 pounds of PM10 per vehicle mile for daily and annual periods were used. The baseline condition provides for 678 and 63,380 (see Transportation and Traffic section) daily and annual one-way vehicle trips, respectively, each presumed to be traveling a distance of 0.25 miles on unpaved roads (per trip). During the expansion alternatives, the number of daily and annual vehicle trips (one-way) would be 940 and 88,028, respectively (an increase of 262 and 24,648), each presumed to be traveling a distance of 0.25 miles on unpaved roads, based on the size of the quarry vehicular circulation area.

NONROAD EQUIPMENT AND MOBILE VEHICLES

The types of nonroad equipment at the project site include loaders, excavators, off-highway trucks (such as water trucks, dump trucks, and rock and concrete trucks), drill rigs, haul trucks, and pickup trucks. Emission factors for all equipment except haul trucks and pickup trucks were obtained from the EPA's NONROAD model (Version 2.2.0) and documentation and databases prepared in support of NONROAD. The NONROAD model considers the rules of 40 CFR Part 89 that establish standards for emissions of CO, VOC, NO_x, and PM10 on equipment of the type used in the construction and other industries. Emission factors for each equipment type were applied to the anticipated equipment work output (horsepower-hours of expected equipment use). Average horsepower, hours of operations, and load factors were developed based on NONROAD databases, specifically for California. Eight daily hours of operation was assumed for each nonroad equipment (unless its annual hours of operation are less than eight hours). Also assumed all equipment is operated simultaneously (conservative assumption).

Emission factors for haul and pickup trucks were obtained from the EMFAC2002 model. Ambient conditions assumed a temperature of 85ºF, a humidity of 30%, and a vehicle speed of 20 mph). Pickup trucks were assumed to be trucks with a gross vehicle weight less than 6,000 pounds (pickup trucks) and haul trucks with a gross vehicle weight of approximately 20 tons. The pickup trucks were conservatively assumed to travel 50 miles each day, although they are mainly used for inspection and supply/personnel transport purposes at the site. The haul trucks were assumed to travel 50 miles each way between the facility and the aggregate markets, a conservative estimate given the distance between the project site and typical markets. Table E-3 presents the nonroad usage data. Table E-4 through E-6 present the emission factors used of nonroad equipment and motor vehicles for the five-year baseline, 2007, and 2021, respectively. The rate at which low-emission diesel engines were incorporated in to the mix of trucks and equipment was based on factors within EMFAC2002 and data from Canyon Rock Quarry; this has a profound affect on overall diesel emissions from the Project.

Annual project emissions from the rock drill rig were calculated based on the annual hours of operation, as follows:

$$\text{PM}\left(\frac{tons}{year}\right) = [0.18 \text{ emission factor}\left(\frac{g}{hp\text{-}hr}\right) \cdot 410 \text{ (horsepower)} \cdot 621 \text{ (hours)} \cdot 0.75 \text{ (load factor)} \cdot 3 \text{ (number of units)}] / 453.59\left(\frac{g}{lbs}\right) / 2000\left(\frac{lbs}{tons}\right)$$

Annual project emissions from the pickup trucks were calculated based on the annual mileage, as follows:

$$\text{PM}\left(\frac{tons}{year}\right) = [0.04 \text{ emission factor}\left(\frac{g}{miles}\right) \cdot 20{,}000 \text{ (miles)} \cdot 6 \text{ (number of units)}] / 453.59\left(\frac{g}{lbs}\right) / 2000\left(\frac{lbs}{tons}\right)$$

TABLE E-3
SUMMARY DATA FOR NONROAD EQUIPMENT AND ON- AND OFF-SITE MOTOR VEHICLES

Equipment Type	Number[a]	Load Factor[b]	Baseline Annual Hours[a,b]	Project Annual Hours[a,b]	Average Size (hp)[a]
Air Compressors	2	0.48	815[b]	1087[b]	225
Sweepers/Scrubbers	1	0.68	41[a]	55[a]	80
2-Wheel Tractor	1	0.70	7[a]	9[a]	90
2-Wheel Tractor	1	0.70	7[a]	9[a]	150
Generators	2	0.74	17[a]	22.5[a]	190
Generators	1	0.74	938[a]	1250[a]	500
Pumps (gasoline)	1	0.56	450[b]	600[b]	5
Pumps (gasoline)	1	0.56	450[b]	600[b]	10
Log Skidder	1	0.71	21[a]	28[a]	195
Rock Drills	3	0.75	466[b]	621[b]	410
Excavators	3	0.70	331[a]	441[a]	238
Forklifts (gasoline)	1	0.60	2[a]	2[a]	9
Forklifts (diesel)	1	0.63	2[a]	2[a]	185
Crawler Cat/Bob Cat	2	0.64	89[a]	119[a]	69
Crawler Cat/Bob Cat	1	0.64	153[a]	205[a]	200
Crawler Cat/Bob Cat	2	0.64	213[a]	284[a]	460
Loaders/Backhoes	1	0.55	298[a]	398[a]	95
Loaders/Backhoes	8	0.55	844[a]	1126[a]	331
On-site Haul Trucks	7	0.57	265[b]	353[b]	250
Off-site Haul Trucks	11	0.57	1641[b]	2344[b]	250
Haul Trucks			3,169,000 miles	4,401,400 miles	
Pickup Trucks	6		15,000 miles	20,000 miles	

SOURCE: [a]Canyon Rock Company, List of Plant Equipment, May 31, 2002 and [b]Nonroad Engine and Vehicle Emission Study. November 1991.
[c] Per piece of equipment.

TABLE E-4
EMISSION FACTORS (1998-2002) FOR NONROAD EQUIPMENT AND ON-AND OFF-SITE MOTOR VEHICLES

Equipment Type	Average Size (hp)	Units	ROG	CO	NOx	SO2	PM10
Air Compressors	225	g/hp-hr	0.24	0.91	2.14	0.65	0.66
Sweepers/Scrubbers	80	g/hp-hr	1.06	4.55	4.87	1.36	0.84
2-Wheel Tractor	90	g/hp-hr	0.60	1.13	5.47	1.17	0.45
2-Wheel Tractor	150	g/hp-hr	0.44	0.84	5.47	1.05	0.27
Generators	190	g/hp-hr	0.40	1.62	3.38	0.65	0.28
Generators	500	g/hp-hr	0.44	1.69	3.78	0.74	0.29
Pumps (gasoline)	5	g/hp-hr	22.6	363	2.27	0.25	0.16
Pumps (gasoline)	10	g/hp-hr	7.34	358	2.68	0.25	0.16
Log Skidder	195	g/hp-hr	0.32	2.40	3.04	0.76	0.38
Rock Drills	410	g/hp-hr	0.32	1.43	3.28	0.63	0.29
Excavators	238	g/hp-hr	0.42	1.75	3.16	0.75	0.19
Forklifts (gasoline)	9	g/hp-hr	8.40	393	2.98	0.26	0.09
Forklifts (diesel)	185	g/hp-hr	0.39	2.12	2.50	0.67	0.02
Crawler Cat/Bob Cat	69	g/hp-hr	0.69	3.48	3.86	1.17	0.72
Crawler Cat/Bob Cat	200	g/hp-hr	0.18	1.02	2.59	0.62	0.23
Crawler Cat/Bob Cat	460	g/hp-hr	0.28	1.68	4.55	1.06	0.25
Loaders/Backhoes	95	g/hp-hr	0.93	3.93	4.09	1.37	0.76
Loaders/Backhoes	331	g/hp-hr	0.50	1.94	3.99	1.22	0.32
On-site Haul Trucks	250	g/hp-hr	0.20	0.93	3.41	1.07	0.23
Haul Trucks		g/mile	2.71	31.7	15.2	0.14	0.65
Pickup Trucks		g/mile	1.25	20.1	1.63	0.01	0.05

SOURCE: California Air Resource Board. 2002. EMFAC2002 Version 2.2 and Environmental Protection Agency. 1991. Nonroad Engine and Vehicle Emission Study.

TABLE E-5
EMISSION FACTORS (2007) FOR NONROAD EQUIPMENT AND ON- AND OFF-SITE MOTOR VEHICLES

Equipment Type	Average Size (hp)	Units	ROG	CO	NOx	SO2	PM10
Air Compressors	225	g/hp-hr	0.26	0.97	1.73	0.74	0.19
Sweepers/Scrubbers	80	g/hp-hr	0.53	3.31	3.81	1.34	0.51
2-Wheel Tractor	90	g/hp-hr	0.38	1.02	3.92	1.18	0.35
2-Wheel Tractor	150	g/hp-hr	0.27	0.60	3.72	1.06	0.20
Generators	190	g/hp-hr	0.40	1.52	2.91	0.72	0.23
Generators	500	g/hp-hr	0.41	1.37	3.16	0.82	0.21
Pumps (gasoline)	5	g/hp-hr	16.88	359	1.82	0.24	0.13
Pumps (gasoline)	10	g/hp-hr	4.41	383	1.78	0.22	0.06
Log Skidder	195	g/hp-hr	0.15	2.07	1.87	0.73	0.24
Rock Drills	410	g/hp-hr	0.34	1.13	2.55	0.71	0.18
Excavators	238	g/hp-hr	0.26	1.15	2.08	0.74	0.20
Forklifts (gasoline)	9	g/hp-hr	4.91	416	2.02	0.22	0.07
Forklifts (diesel)	185	g/hp-hr	0.15	1.55	1.69	0.63	0.01
Crawler Cat/Bob Cat	69	g/hp-hr	0.13	2.03	2.80	1.19	0.52
Crawler Cat/Bob Cat	200	g/hp-hr	0.12	0.68	1.67	0.63	0.15
Crawler Cat/Bob Cat	460	g/hp-hr	0.14	0.94	2.90	1.07	0.14
Loaders/Backhoes	95	g/hp-hr	0.47	2.71	3.16	1.35	0.47
Loaders/Backhoes	331	g/hp-hr	0.30	1.07	2.65	1.21	0.19
On-site Haul Trucks	250	g/hp-hr	0.14	0.75	2.03	1.07	0.13
Haul Trucks		g/mile	1.77	17.8	11.1	0.02	0.42
Pickup Trucks		g/mile	0.78	12.8	1.09	0.01	0.05

SOURCE: California Air Resource Board. 2002. EMFAC2002 Version 2.2 and Environmental Protection Agency. 1991. Nonroad Engine and Vehicle Emission Study.

TABLE E-6
EMISSION FACTORS (2021) FOR NONROAD EQUIPMENT AND ON- AND OFF-SITE MOTOR VEHICLES

Equipment Type	Average Size (hp)	Units	ROG	CO	NOx	SO2	PM10
Air Compressors	225	g/hp-hr	0.13	1.01	0.88	0.75	0.15
Sweepers/Scrubbers	80	g/hp-hr	0.22	3.36	2.31	1.35	0.45
2-Wheel Tractor	90	g/hp-hr	0.13	0.99	2.09	1.18	0.27
2-Wheel Tractor	150	g/hp-hr	0.12	0.55	1.75	1.06	0.17
Generators	190	g/hp-hr	0.24	1.58	1.58	0.77	0.21
Generators	500	g/hp-hr	0.26	1.30	1.74	0.87	0.15
Pumps (gasoline)	5	g/hp-hr	8.54	353	1.17	0.23	0.08
Pumps (gasoline)	10	g/hp-hr	4.42	383	1.78	0.22	0.06
Log Skidder	195	g/hp-hr	0.08	2.10	1.12	0.73	0.22
Rock Drills	410	g/hp-hr	0.20	1.10	1.34	0.72	0.13
Excavators	238	g/hp-hr	0.14	1.17	1.22	0.74	0.18
Forklifts (gasoline)	9	g/hp-hr	4.82	417	2.00	0.22	0.07
Forklifts (diesel)	185	g/hp-hr	0.06	1.50	0.82	0.62	0.01
Crawler Cat/Bob Cat	69	g/hp-hr	0.07	1.88	2.66	1.19	0.49
Crawler Cat/Bob Cat	200	g/hp-hr	0.06	0.68	0.90	0.63	0.13
Crawler Cat/Bob Cat	460	g/hp-hr	0.10	0.85	1.56	1.07	0.12
Loaders/Backhoes	95	g/hp-hr	0.18	2.72	1.87	1.35	0.39
Loaders/Backhoes	331	g/hp-hr	0.18	1.09	1.56	1.21	0.16
On-site Haul Trucks	250	g/hp-hr	0.09	0.76	1.37	1.07	0.13
Haul Trucks		g/mile	0.46	3.77	2.31	0.02	0.16
Pickup Trucks		g/mile	0.16	3.36	0.29	0.01	0.05

SOURCE: California Air Resource Board. 2002. EMFAC2002 Version 2.2 and Environmental Protection Agency. 1991. Nonroad Engine and Vehicle Emission Study.

SCREENING DISPERSION MODELING AND HEALTH RISK ASSESSMENT

EPA's SCREEN3 model (Version 96043) was used for the screening modeling analysis. The SCREEN3 model is an appropriate model for this analysis based on the coverage of simple and complex terrain. It also predicts 1-hour maximum concentrations and can predict 24-hour average concentrations in the complex terrain mode. The SCREEN3 model was executed using the regulatory default options (stack-tip downwash, buoyancy induced dispersion, final plume rise), default wind speed profile categories, default potential temperature gradients, no pollutant decay, using rural dispersion coefficients.

Receptors were located at residences nearest existing and project operations accounting for typical annual average operations. The full meteorology option was used in the modeling analysis. SCREEN3 examines a range of stability classes and wind speeds to identify the worst-case meteorological conditions. The ambient temperature was assumed to be 68 degrees F (293 K). Emission sources were based on typical annual equipment usage of those type of equipment with the worst case daily emission rates.

The SCREEN3 model was used to calculate 1-hour concentrations. Maximum concentrations for an annual averaging time were determined by multiplying the 1-hour maximum impacts by a conversion factor of 0.1. The incremental health risk was determined by addressing the difference between the annual concentration during the existing and project conditions.

The BAAQMD has a significance threshold for health risk exposure to diesel emissions of 10 cancers per million for 70-year exposure. Accordingly, the BAAQMD CEQA Guidelines indicate the primary concern from diesel engine exhaust emissions is a potential long-term health risk to sensitive receptors.

CANCER RISKS

The cancer risks from DPM occur exclusively through the inhalation pathway; therefore the cancer risks can be estimated from the following equation:

$CR_{DPM} = C_{DPM} \cdot URF_{DPM} \cdot LEA$

where,

CR_{DPM} Cancer risk from DPM; the probability of an individual developing cancer as a result of exposure to DPM.

C_{DPM} Annual average DPM concentration in μg/m^3.

URF_{DPM} Unit risk factor for DPM; estimated probability that a person will contract cancer as a result of inhalation of a DPM concentration of 1 μg/m^3 continuously over a period pf 70 years.

LEA Lifetime exposure adjustment; values range from 0.14 to 1.0.

The inhalation unit risk factor for diesel particulate was established by CARB as 300 in one million per continuous exposure of 1 µg/m3 of DPM over a 70-year period. In order to protect public health, and in accordance with the recommendations of the State of California Office of Environmental Health Hazard Assessment (OEHHA), a 70-year lifetime exposure is assumed for receptor locations. The LEA for most residential or sensitive receptors is 1.0. However, exposure adjustments were made based on the exposure duration based on annual and daily quarry operations.

Non-cancer Risks

The relationship for the non-cancer health effects of DPM is given by the following equation:

$HI_{DPM} = C_{DPM}/REL_{DPM}$

where,

HI_{DPM}	Hazard Index; an expression of the potential for non-cancer health effects.
C_{DPM}	Annual average DPM concentration ($\mu g/m^3$).
REL_{DPM}	Reference exposure level (REL) for DPM; the DPM concentration at which no adverse health effects are anticipated.

The chronic REL for DPM was established by OEHHA as 5 $\mu g/m^3$.

Auer, 1978. "Correlation of Land Use and Cover with Meteorological Anomalies", August H. Auer, Jr., American Meteorological Society, *Journal of Applied Meteorology*, Vol. 17, pp. 636-643, May 1978.

EPA, 1993. *Guideline on Air Quality Models (Revised, including Supplements)*, EPA-450/2-78-027R, U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, February 1993.

California Air Resource Board, 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. October 2000.

Refer to the following link to ARB's website for the latest toxicity values: http://www.arb.ca.gov/toxics/healthval/healthval.htm.

Environmental Protection Agency. 2002. Health Assessment Document for Diesel Engine Exhaust (EPA/600/8-90/057F), May 2002.

TABLE E-7
RULES AND REGULATIONS APPLICABLE TO THE PROJECT

District	Regulation	Title	Rule	Title
Northern Sonoma	I	General Requirements	1	General Provisions
Northern Sonoma	I	General Requirements	2	Permits
Northern Sonoma	I	General Requirements	3	Fees
Northern Sonoma	I	General Requirements	4	Prohibitions
Northern Sonoma	II	Open Burning		
Northern Sonoma	III	Toxics Control Rules		
Northern Sonoma	V	Title V		

SOURCE: Northern Sonoma County APCD, *Rules and Regulations*.

NORTHERN SONOMA COUNTY AIR POLLUTION CONTROL DISTRICT, *FORESTVILLE AIR QUALITY SUMMARY* (PRESENTED BY SONOMA COUNTY SUPERVISOR MIKE RILEY AT OCTOBER 4, 2003 MEETING IN FORESTVILLE)

Forestville Air Quality Summary

The Air Pollution Control District established an ambient particle monitoring station in Forestville in 2001. The station was sited to provide representative sampling for the community, and the site selection was reviewed by air monitoring specialists at the California Air Resources Board and at Region IX of the U.S. Environmental Protection Agency. The station is approved as a neighborhood scale ambient air quality monitoring site and meets all criteria established for such sites under the federal Clean Air Act.

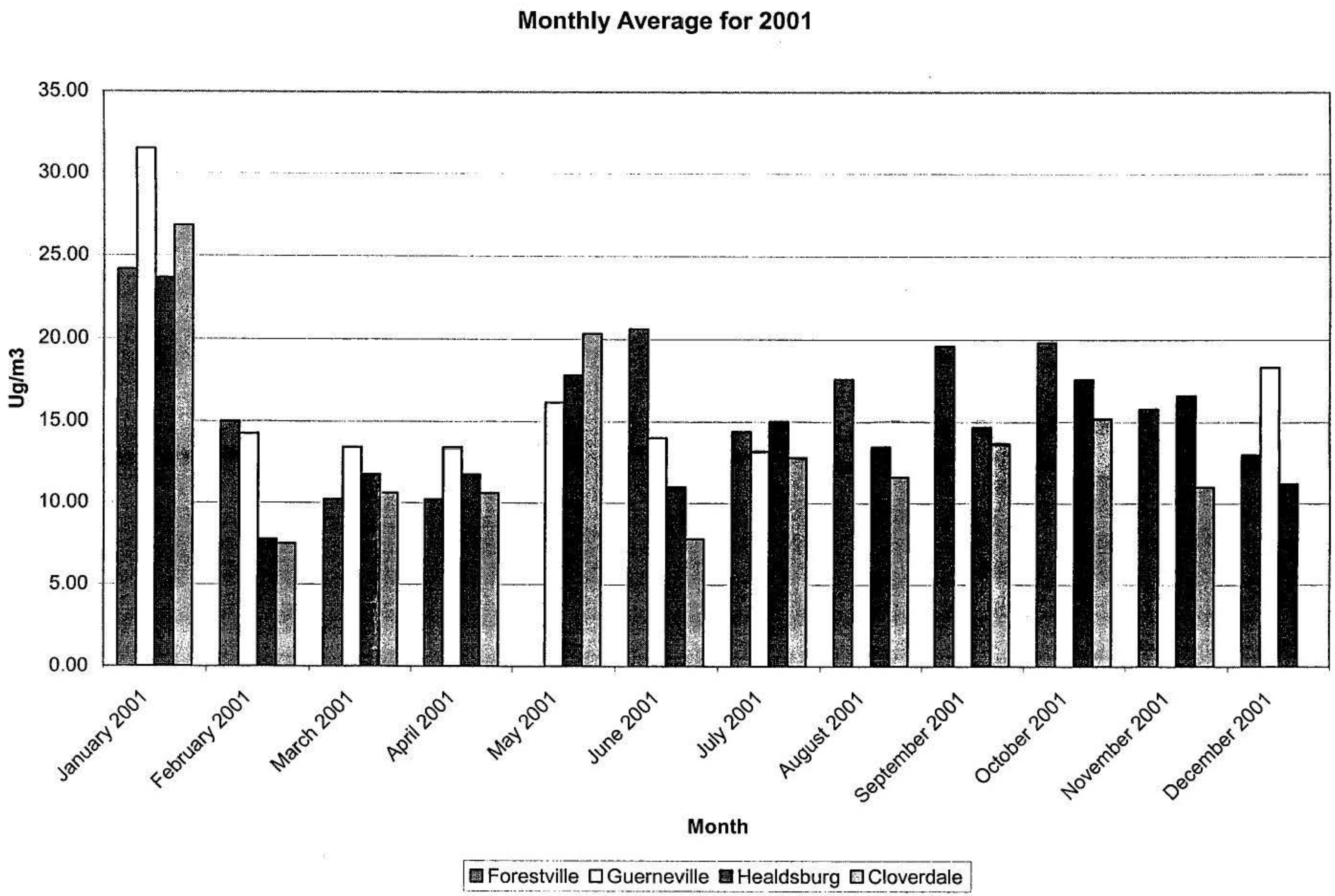
The Forestville monitoring site was equipped with measuring devices to measure ambient particles in two size ranges: particles smaller than 10 um in size (PM_{10}), and particles smaller than 2.5 um in size ($PM_{2.5}$). Due to funding cuts at the state level, the $PM_{2.5}$ monitor was discontinued in November of 2002; PM_{10} monitoring continues.

PM_{10} Monitoring Results: This measuring device takes a sample for 24 hours, once every six days. The air sample passes through a crystalline filter medium, that traps the particles. The filter is weighed before and after sampling, and the ambient levels are calculated from the mass collected on the filter. This type of monitoring provides a snapshot of the air quality at regular intervals. Measured levels of particulate matter in the ambient air in Forestville are within the same range measured at other similar communities where the Air District monitors air quality (i.e., Cloverdale, Healdsburg, and Guerneville). Highest particle levels are detected in winter-time months, and are generally attributable to seasonal use of woodstoves and fireplaces. District staff compared particle levels in the summer to those seen in the winter, and looked for differences between communities; no clear trends can be shown. Generally, however, particle levels in Forestville are slightly lower than those measured in Guerneville.

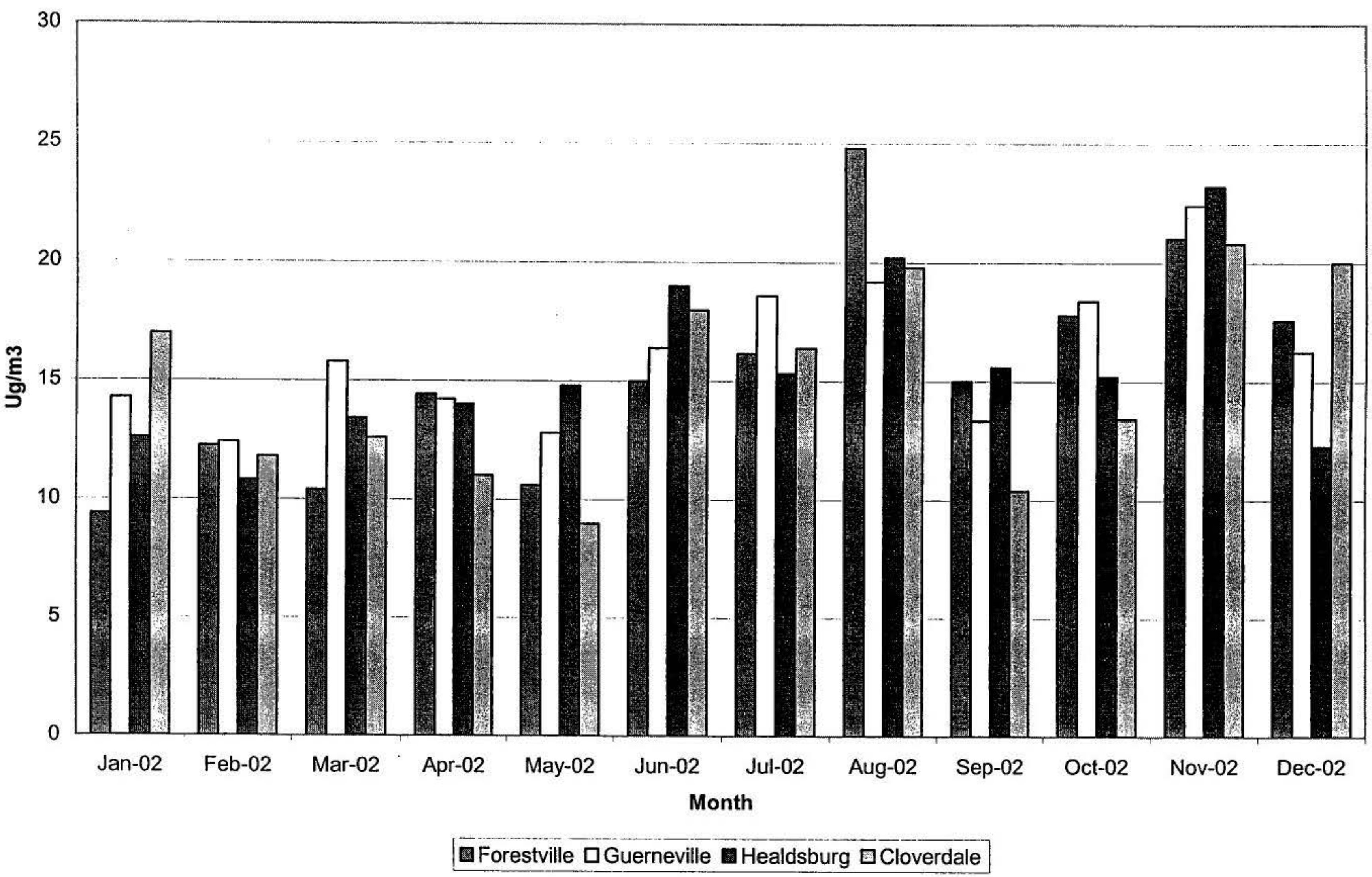
$PM_{2.5}$ Monitoring Results: This measuring device does not trap particles on a filter medium; instead, it sends a signal through the air sample stream; particles in the air sample interfere with the signal, and the device measures the degree to which the signal is affected. This type of monitoring is more like a real-time broadcast of the air quality. The results from this measurement were more erratic than the results from the PM_{10} sampling. There were weak trends showing higher particle levels between 7:00 and 8:00 in the morning, and then again between 5:00 and 9:00 in the evening, with the trends being stronger in the wintertime. District staff compared weekday patterns to weekend patterns, but the data here were inconclusive.

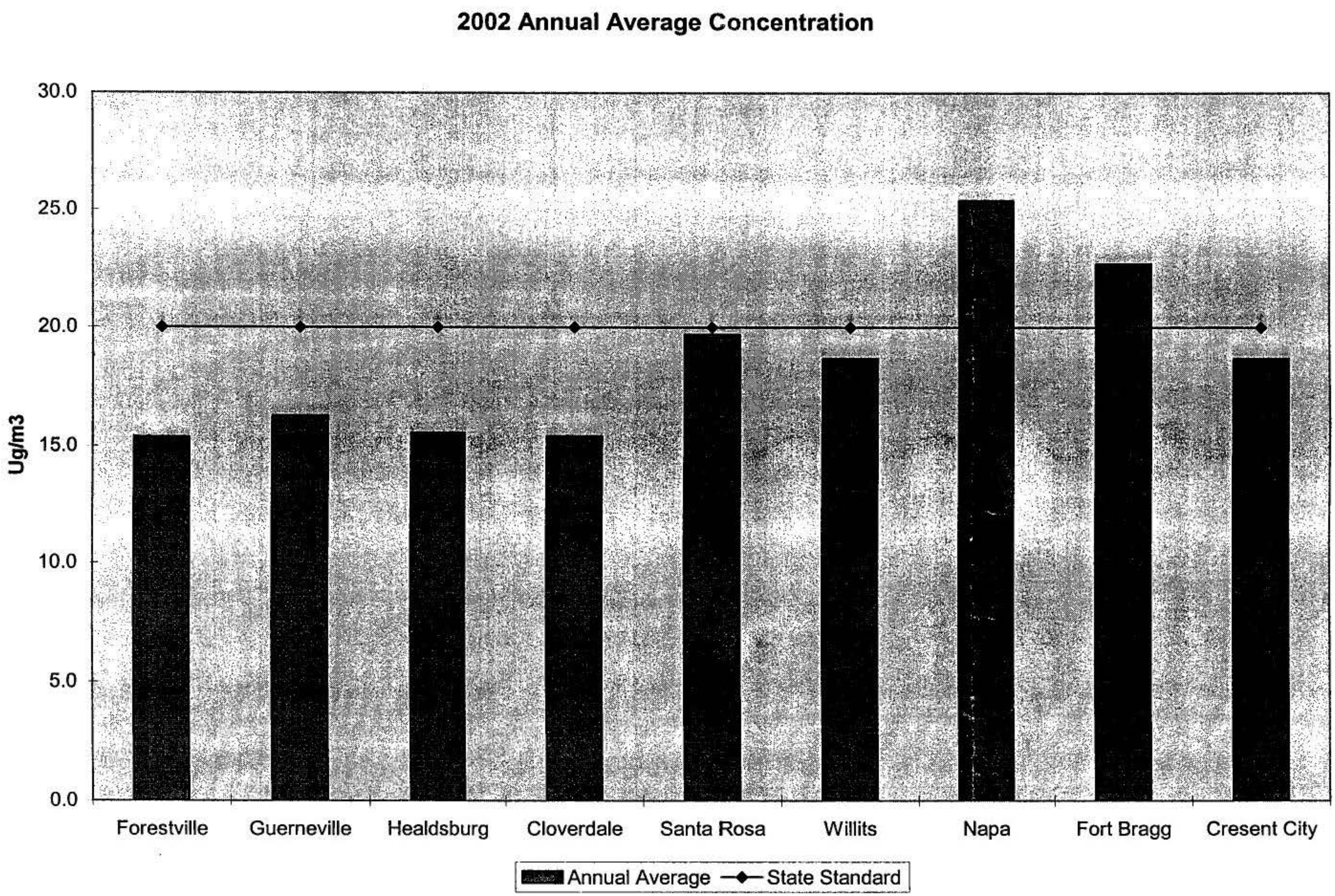
Conclusions: The data collected to date in Forestville suggest the air quality meets all health-based standards established by the federal Clean Air Act and the California Clean Air Act for particulate matter, however both Acts require a minimum of three years of data before a finding of attainment can be made. Although there may be differences in the air quality resulting from seasonal differences in truck traffic, these differences are overwhelmed by seasonal differences in residential wood combustion.

Further Investigation: The original monitoring study in Forestville included analysis of the crystalline filter media to determine the age of the carbon present in the sample for a limited set of filters. Due to budget cuts, the state labs no longer conduct this analysis, and District staff have not yet located another laboratory that can carry out this portion of the study. District staff are consulting with other experts in the field to determine the best course of analysis, considering current technical and funding limitations.


Monthly Average for 2001
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Ug/m3
January 2001
February 2001
March 2001
April 2001
May 2001
June 2001
July 2001
August 2001
September 2001
October 2001
November 2001
December 2001
Month
Forestville
Guerneville
Healdsburg
Cloverdale

2002 Monthly Average



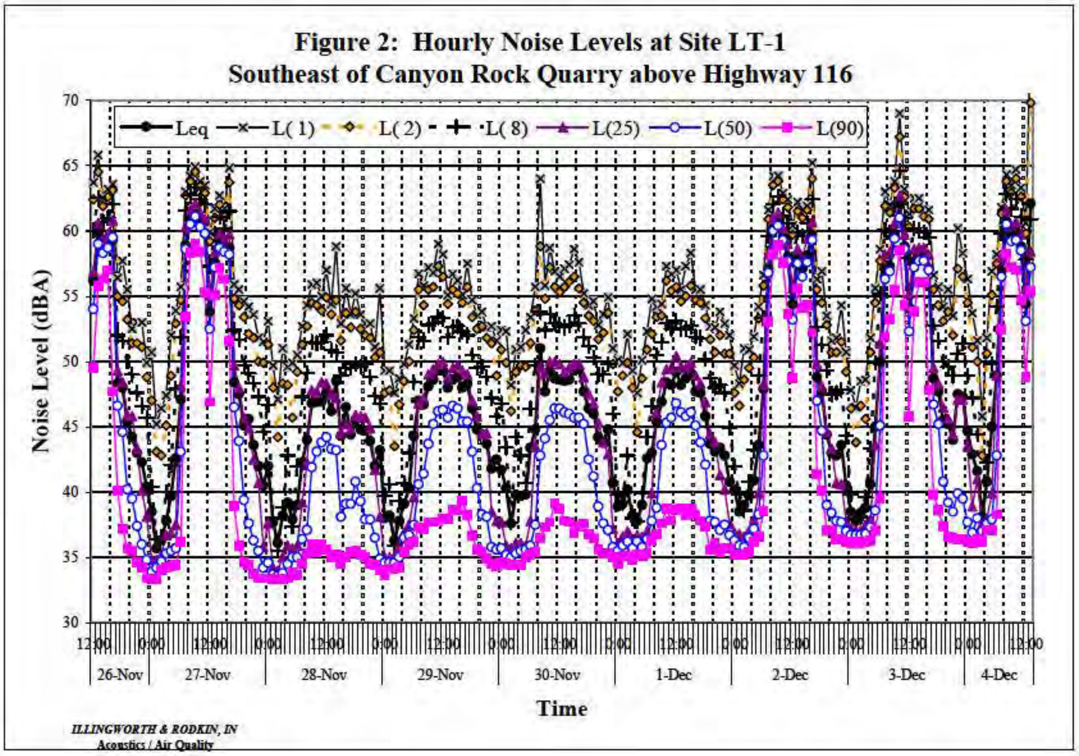

2002 Annual Average Concentration
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Ug/m3
Forestville
Guerneville
Healdsburg
Cloverdale
Santa Rosa
Willits
Napa
Fort Bragg
Cresent City
Annual Average
State Standard

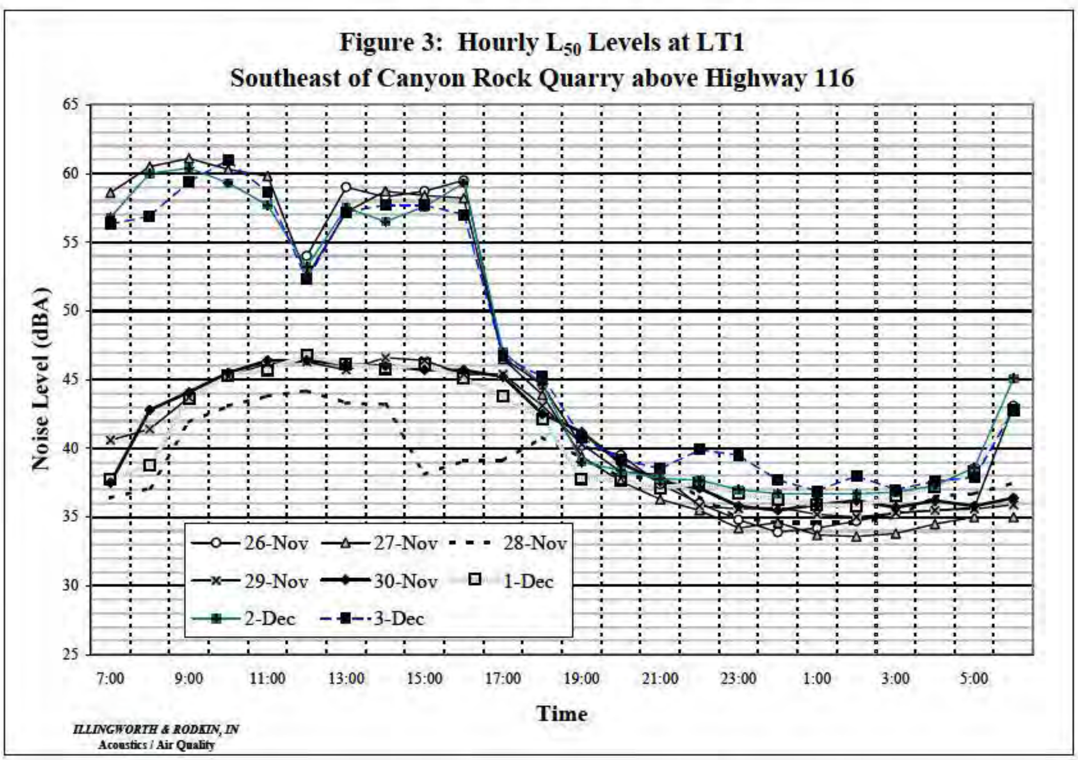
APPENDIX F
NOISE

TABLE A: Definition of Acoustical Terms

TERM	DEFINITIONS
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
C-Weighted Sound Level, dB	The sound pressure level in decibels as measured using the C-weighting filter network. The C-weighting is very close to an unweighted or "flat" response. C-weighting is only used in special cases when low frequency noise is of particular importance.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

TABLES 2 THROUGH 11:
Noise Level Plots for 24-Hour Long Term Measurement Sites





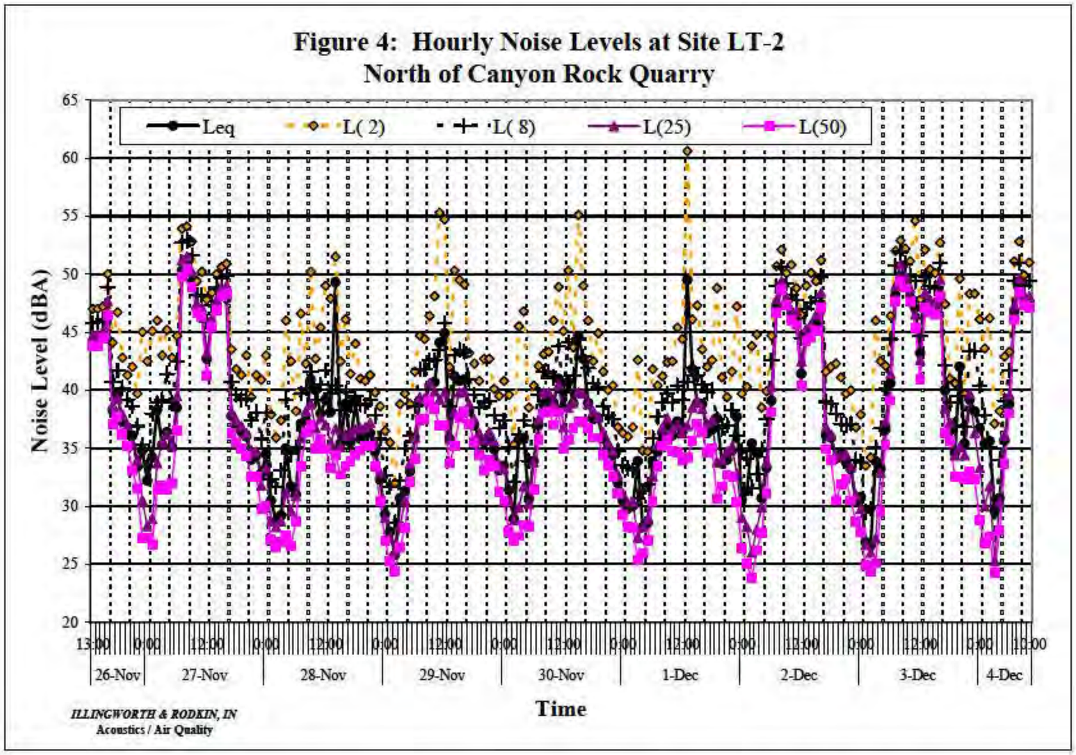


Figure 4: Hourly Noise Levels at Site LT-2
North of Canyon Rock Quarry
Leq
L(2)
L(8)
L(25)
L(50)
Noise Level (dBA)
65
60
55
50
45
40
35
30
25
20
13:00
0:00
12:00
26-Nov
27-Nov
28-Nov
29-Nov
30-Nov
1-Dec
2-Dec
3-Dec
4-Dec
Time
ILLINGWORTH & RODKIN, IN
Acoustics / Air Quality

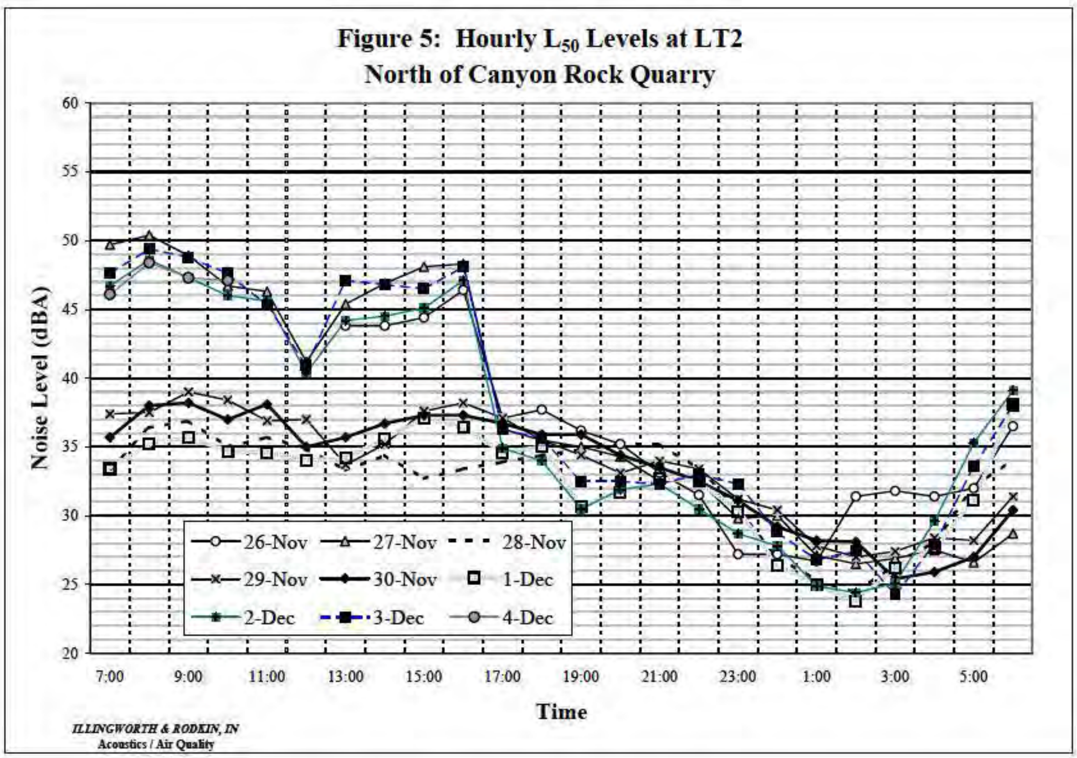


Figure 5: Hourly L_{50} Levels at LT2
North of Canyon Rock Quarry
Noise Level (dBA)
60
55
50
45
40
35
30
25
20
7:00
9:00
11:00
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
26-Nov
27-Nov
28-Nov
29-Nov
30-Nov
1-Dec
2-Dec
3-Dec
4-Dec
Time
ILLINGWORTH & RODKIN, IN
Acoustics / Air Quality

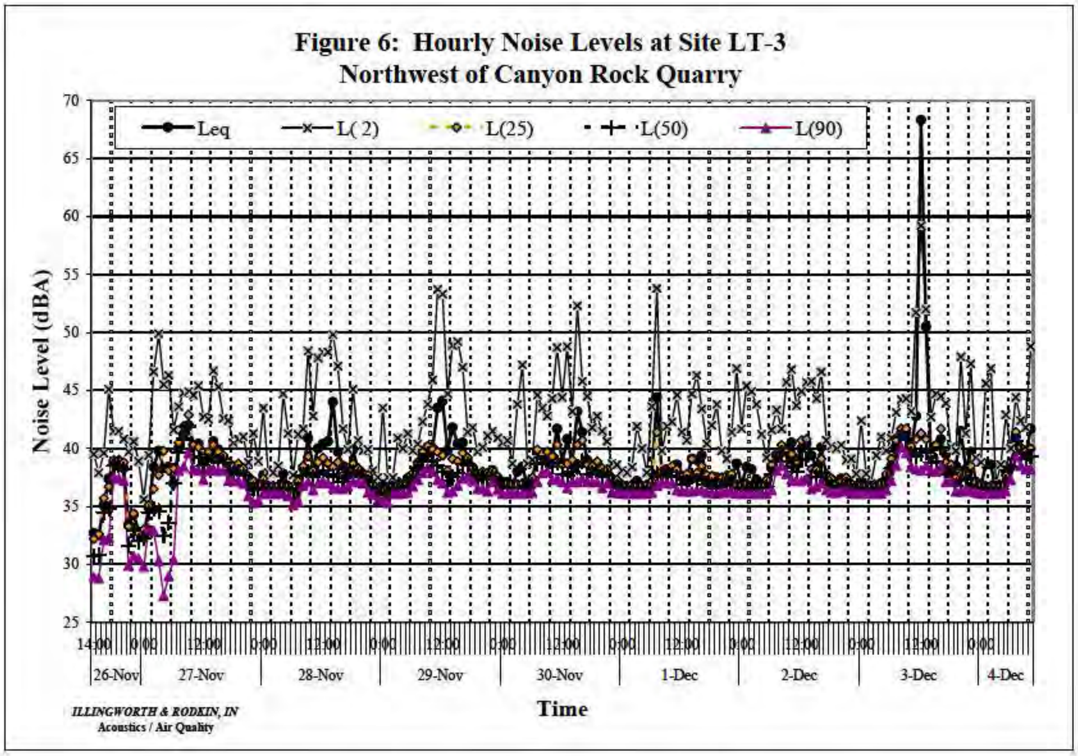


Figure 6: Hourly Noise Levels at Site LT-3
Northwest of Canyon Rock Quarry
Leq
L(2)
L(25)
L(50)
L(90)
Noise Level (dBA)
70
65
60
55
50
45
40
35
30
25
14:00
0:00
12:00
26-Nov
27-Nov
28-Nov
29-Nov
30-Nov
1-Dec
2-Dec
3-Dec
4-Dec
Time
ILLINGWORTH & RODKIN, INC
Acoustics / Air Quality

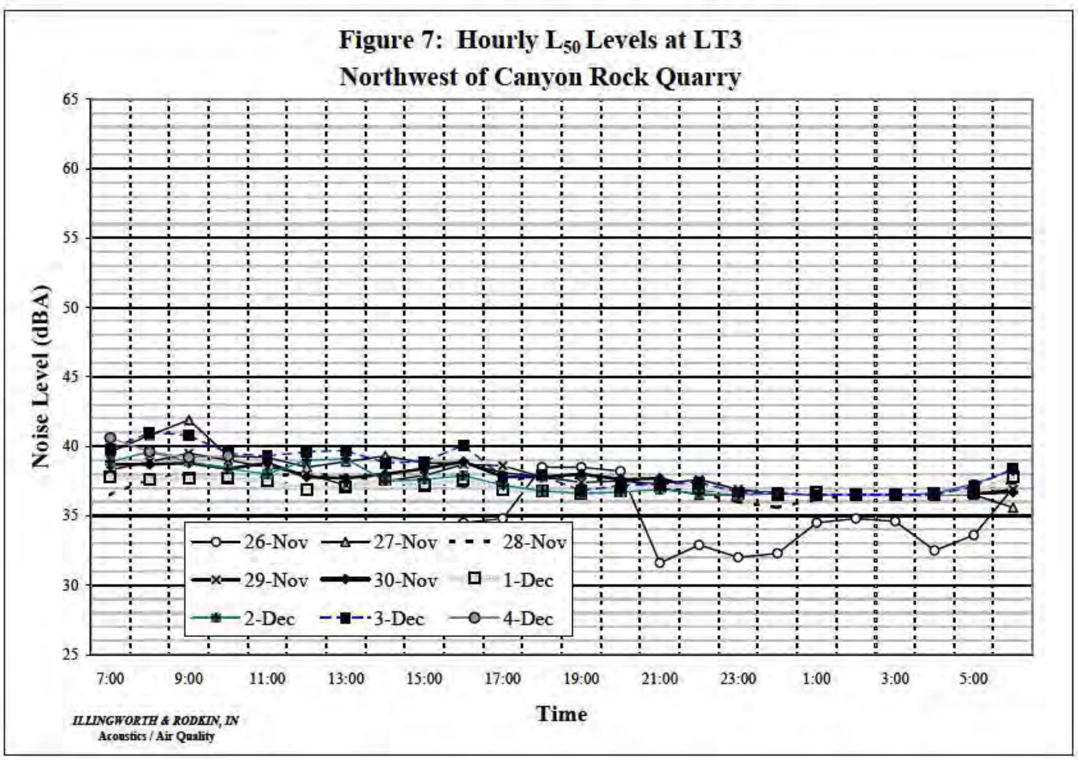


Figure 7: Hourly L50 Levels at LT3
Northwest of Canyon Rock Quarry
Noise Level (dBA)
65
60
55
50
45
40
35
30
25
26-Nov
27-Nov
28-Nov
29-Nov
30-Nov
1-Dec
2-Dec
3-Dec
4-Dec
7:00
9:00
11:00
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
Time
ILLINGWORTH & RODKIN, INC
Acoustics / Air Quality

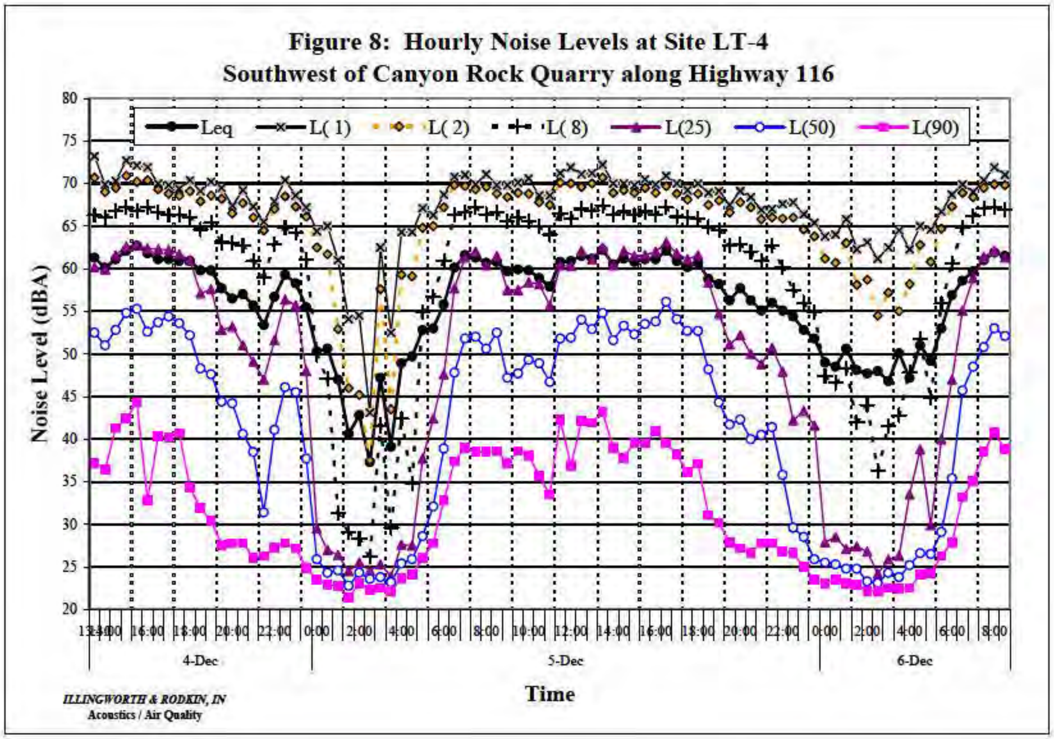


Figure 8: Hourly Noise Levels at Site LT-4
Southwest of Canyon Rock Quarry along Highway 116
Leq
L(1)
L(2)
L(8)
L(25)
L(50)
L(90)
Noise Level (dBA)
80
75
70
65
60
55
50
45
40
35
30
25
20
16:00
18:00
20:00
22:00
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
2:00
4:00
6:00
8:00
4-Dec
5-Dec
6-Dec
Time
ILLINGWORTH & RODKIN, IN
Acoustics / Air Quality

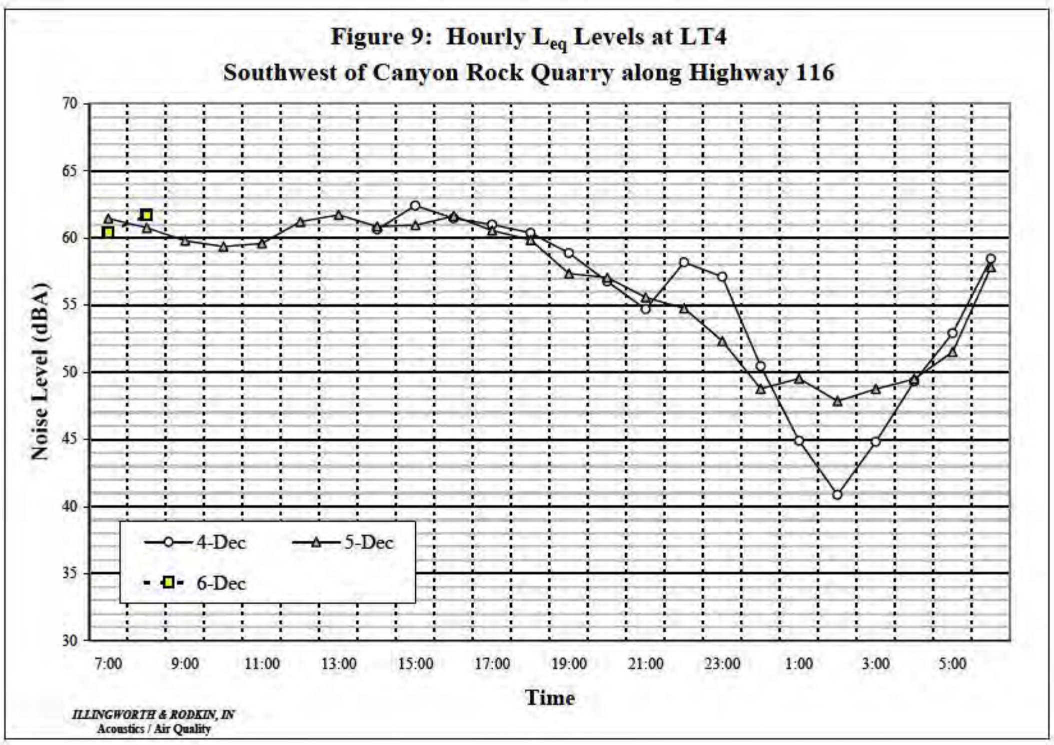


Figure 9: Hourly Leq Levels at LT4
Southwest of Canyon Rock Quarry along Highway 116
Noise Level (dBA)
70
65
60
55
50
45
40
35
30
4-Dec
5-Dec
6-Dec
7:00
9:00
11:00
13:00
15:00
17:00
19:00
21:00
23:00
1:00
3:00
5:00
Time
ILLINGWORTH & RODKIN, IN
Acoustics / Air Quality

Figure 10: Hourly Noise Levels at Site LT-5
Blue Rock Quarry - Southeast Corner

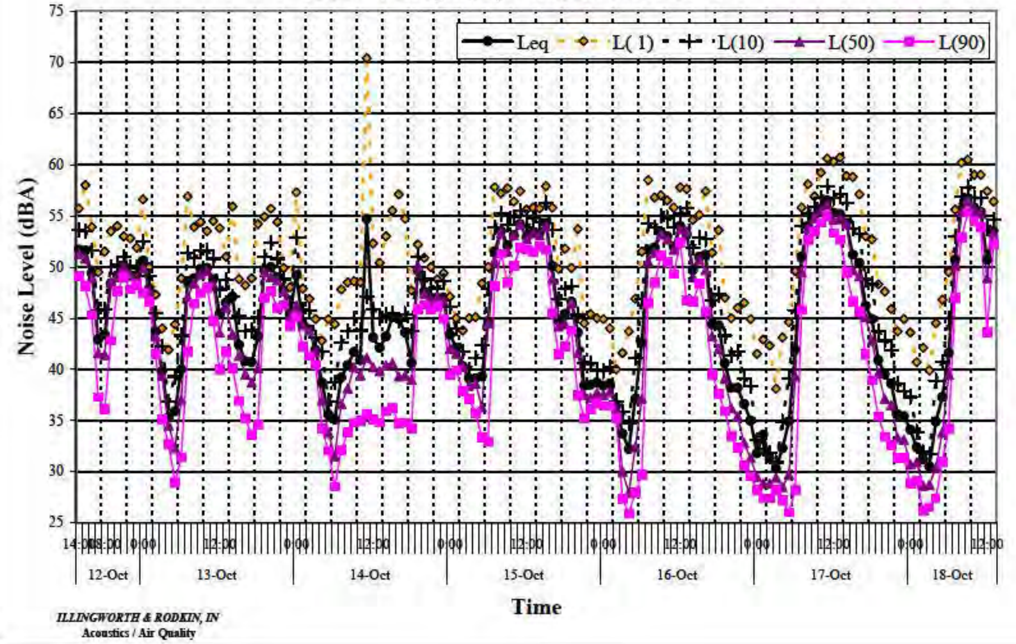
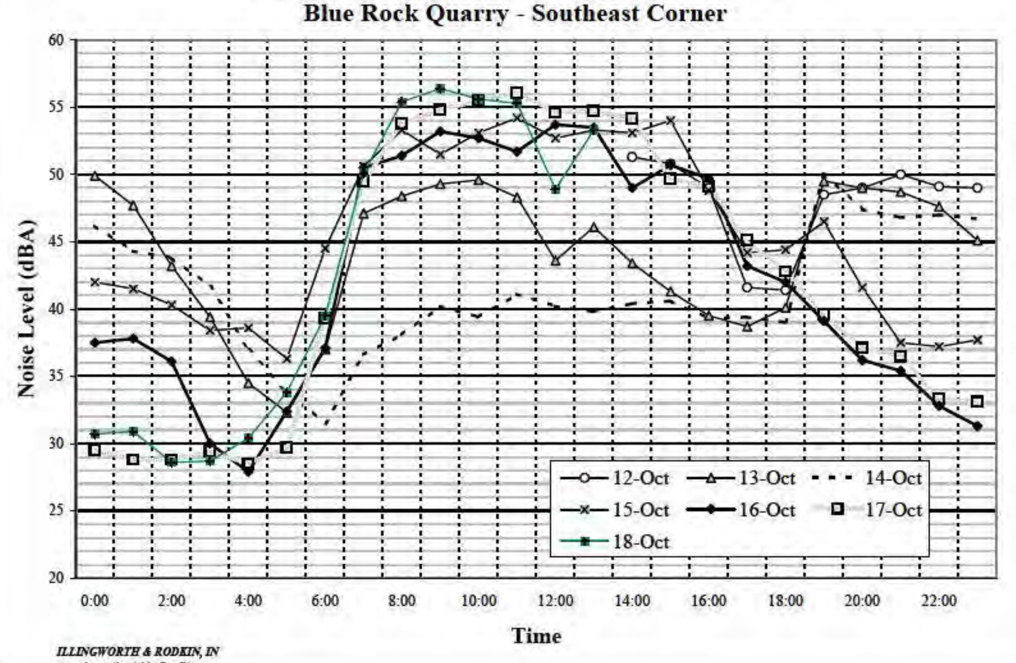


Figure 11: Hourly L_{50} Noise Levels at Site LT-5
Blue Rock Quarry - Southeast Corner



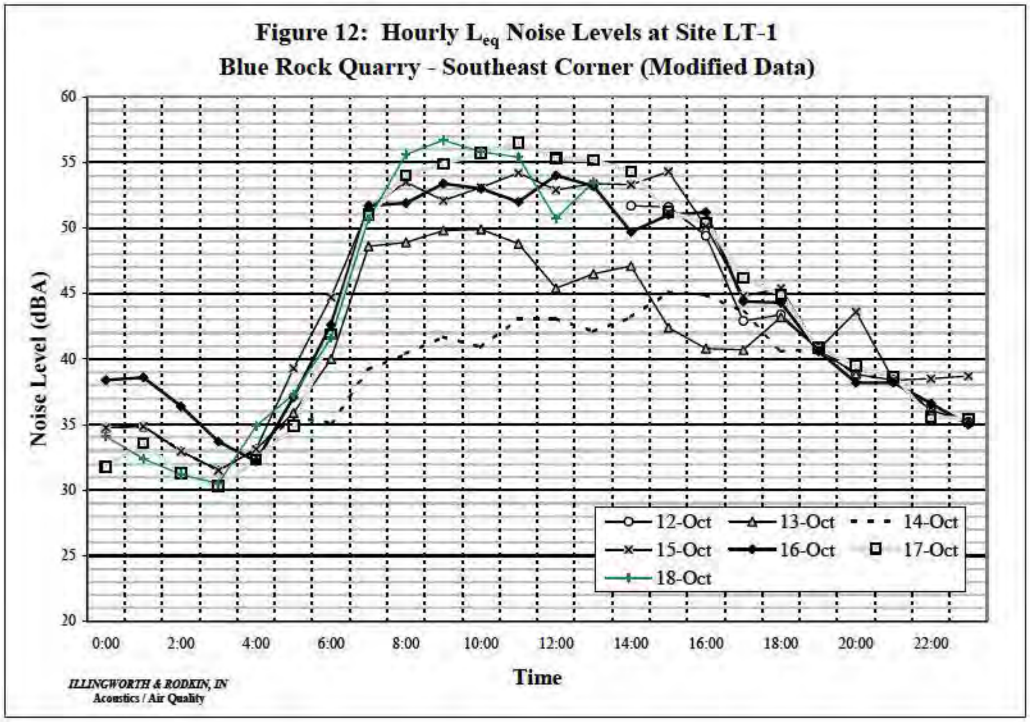


Figure 12: Hourly L_{eq} Noise Levels at Site LT-1
Blue Rock Quarry - Southeast Corner (Modified Data)
Noise Level (dBA)
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Time
12-Oct
13-Oct
14-Oct
15-Oct
16-Oct
17-Oct
18-Oct
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TABLES A1 THROUGH A5:
Average, Maximum, and Minimum Hourly Noise Levels for 24-Hour Long Term Measurement Sites

Table A1: Hourly Noise Levels for LT1 – Opposite Southeast Corner of Canyon Rock Quarry above Highway 116

Location LT1		Noise Level in dBA					
		L_{eq}	L_2	L_8	L_{25}	L_{50}	L_{90}
Daytime - Quarry Operating	**Avg**	**59**	**62**	**61**	**60**	**59**	**55**
	Max	62	67	65	63	61	59
	Min	57	61	60	58	56	48
Daytime - Quarry Not Operating	**Avg**	**43**	**52**	**47**	**42**	**39**	**36**
	Max	46	54	51	45	41	37
	Min	40	48	43	39	36	35
Nightime	**Avg**	**41**	**49**	**43**	**38**	**37**	**35**
	Max	47	55	51	46	42	39
	Min	37	45	37	36	35	34

Table A2: Hourly Noise Levels for LT2 – North of Canyon Rock Quarry

Location LT2		Noise Level in dBA				
		L_{eq}	L_2	L_8	L_{25}	L_{50}
Daytime - Quarry Operating	**Avg**	**47**	**51**	**50**	**48**	**47**
	Max	51	55	53	52	50
	Min	45	48	47	45	44
Daytime - Quarry Not Operating	**Avg**	**36**	**43**	**38**	**34**	**32**
	Max	42	50	41	37	35
	Min	32	38	35	32	30
Nightime	**Avg**	**33**	**41**	**36**	**32**	**30**
	Max	39	47	41	39	36
	Min	29	36	31	27	25

Table A3: Hourly Noise Levels for LT3 – Northwest of Canyon Rock Quarry

Location LT3		Noise Level in dBA				
		L_{eq}	L_2	L_{25}	L_{50}	L_{90}
Daytime - Quarry Operating	**Avg**	**41**	**45**	**40**	**39**	**38**
	Max	51	52	43	42	40
	Min	38	42	38	38	37
Daytime - Quarry Not Operating	**Avg**	**38**	**43**	**38**	**37**	**37**
	Max	41	49	39	38	37
	Min	37	39	37	37	36
Nightime	**Avg**	**37**	**41**	**37**	**36**	**35**
	Max	39	46	38	38	37
	Min	36	38	36	36	35

Table A4: Hourly Noise Levels for LT4 – Opposite Southwest of Boundary of Canyon Rock Quarry along Highway 116

Location LT4		Noise Level in dBA					
		L_{eq}	L_2	L_8	L_{25}	L_{50}	L_{90}
Daytime - Quarry Operating	**Avg**	**61**	**69**	**66**	**61**	**52**	**39**
	Max	62	71	67	63	55	43
	Min	59	68	65	58	47	37
Daytime - Quarry Not Operating	**Avg**	**60**	**68**	**65**	**58**	**49**	**35**
	Max	62	71	67	63	55	43
	Min	55	65	60	48	35	26
Nightime	**Avg**	**51**	**60**	**49**	**36**	**30**	**25**
	Max	58	69	64	54	44	35
	Min	41	41	27	25	23	22

Table A5: Hourly Noise Levels for LT5 –Southeast of Boundary of Blue Rock Quarry

Location LT5		Noise Level in dBA				
		L_{eq}	L_1	L_{10}	L_{50}	L_{90}
Daytime - Both Quarries Operating	**Avg**	**53**	**58**	**55**	**53**	**50**
	Max	57	61	58	56	55
	Min	50	55	52	49	44
Daytime - Canyon Rock Only Operating	**Avg**	**48**	**54**	**50**	**47**	**43**
	Max	50	57	52	50	48
	Min	40	49	43	37	31
Daytime - Quarries Not Operating	**Avg**	**46**	**53**	**48**	**45**	**41**
	Max	50	57	52	50	48
	Min	40	48	43	37	31
Nightime	**Avg**	**37**	**45**	**40**	**34**	**31**
	Max	45	52	48	45	37
	Min	30	38	31	28	26

FIGURES B1 THROUGH B10 : Noise Measurements on the Quarry Floor

Figure B1: Short-Term Noise Measurements on Quarry Floor – Location ST1

Desciption - ST1	A-weighted Noise Level, dB					
Steady sound from Plant #3 (262 ft), intermittent equipment sounds near plant #2 (240 ft)	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
	66.8	69.6	68.7	68.2	67.7	66.8

Figure B2: Short-Term Noise Measurements on Quarry Floor – Location ST2

Desciption - ST2	A-weighted Noise Level, dB					
Steady sound from Plant #3 (151 ft), intermittent sounds from front-end loader (73 dBA @ 174 ft)	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
	70.7	73.9	72.5	72.1	71.3	66.8
Increase in Plant #3 sound after rock feed, intermittent sounds: water truck (72 dBA @ 100 ft), medium truck (74 dBA @ 16 ft)	71.7	75.2	74.0	73.2	72.6	71.5

Figure B3: Short-Tern Noise Measurements on the Quarry Floor – Location ST3

Desciption - ST3	A-weighted Noise Level, dB					
Intermittent sounds from front-end loader (230 ft), steady sound from Plant #3 (430 ft)	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
	62.7	65.6	64.1	63.9	63.3	62.6

Figure B4: Short-Term Noise Measurements on Quarry Floor – Location ST4

Desciption - ST4	A-weighted Noise Level, dB					
	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Intermittent sounds from front-end loader (660 ft), steady sound from Plant #3 (565 ft)	62.5	67.7	63.8	63.4	62.8	62.4

Figure B5: Short-Term Noise Measurements on Quarry Floor – Location ST5 & ST 6

Desciption - ST5	A-weighted Noise Level, dB					
	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Steady sound from Plant #3 (702 ft) with some from Plant #1 (680 ft, partially shielded), intermittent sounds from front-end loaders (up to 57 dB),	56.4	57.9	57.7	57.3	56.8	56.3

Desciption - ST6	A-weighted Noise Level, dB					
	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Steady sound from Plant #3 (660 ft) and Plant #1 (575 ft), faint front-end loader sounds	61.2	68.3	63.0	62.4	61.7	61.1

Figure B6: Short-Term Noise Measurements on Quarry Floor – Location ST7

Desciption - ST7	A-weighted Noise Level, dB					
Noise level from Plant #1 (385 ft) varies with feed & occasional squeal, faint front-end loader sounds	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
	65.8	73.2	68.7	67.7	66.4	65.5

Figure 7: Short-Term Nose Measurements on Quarry Floor – Location ST8

Desciption - ST8	A-weighted Noise Level, dB					
Line of sight to Plant #3 (550 ft) & Plant #1 (310 ft), noise level from Plant #1 varies up to 74 dBA	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
	70.3	74.6	72.2	71.4	69.4	69.7

Figure B8: Short-Term Noise Measurements on Quarry Floor – Location ST9

Desciption - ST9	A-weighted Noise Level, dB					
	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Noise from Plant #1 (180 ft) varies gravel rate from low of 74 dBA to high of 79 dBA	76.2	79.6	77.8	77.3	76.7	75.9

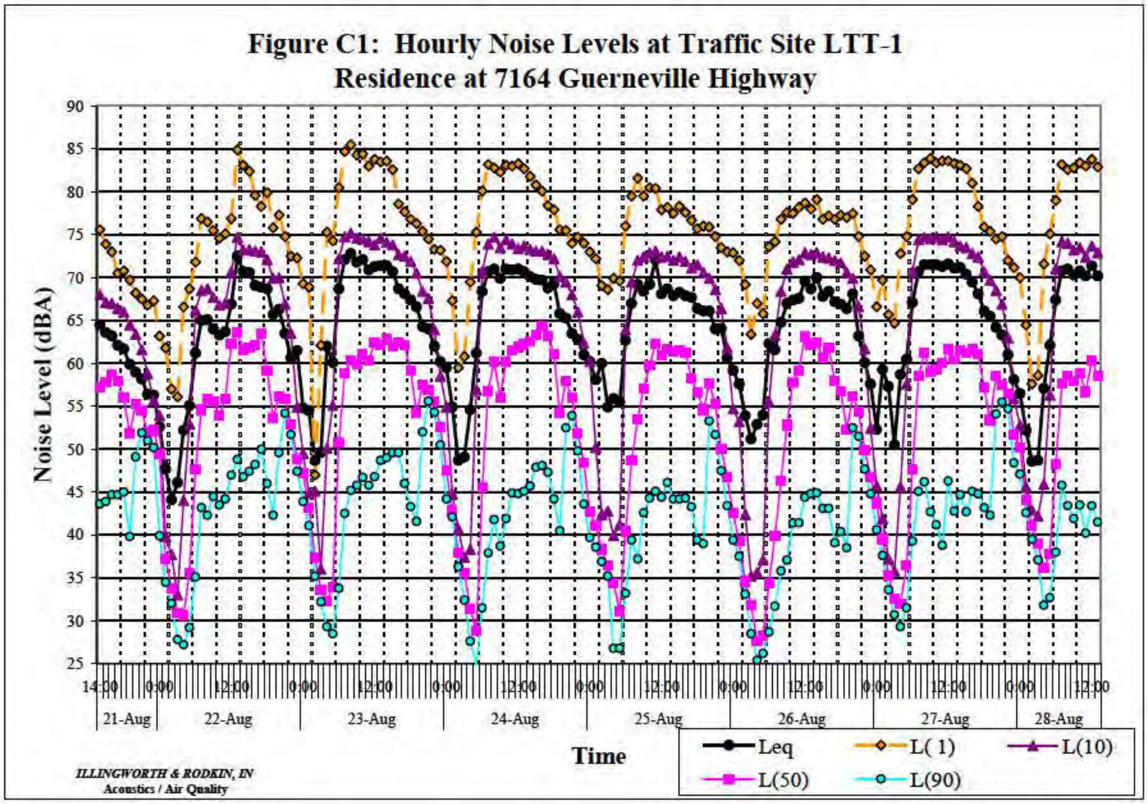
Figure B9: Short-Term Noise Measurements on Quarry Floor – Location ST12

Desciption - ST12	A-weighted Noise Level, dB					
	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Steady sound from Plants (85^+ ft), intermittent sounds from concrete recycler and front-end loaders (116 ft)	77.1	80.1	78.9		78.0	77.2

Figure B10: Short Term Noise Measurements on Quarry Floor – Location ST13

Desciption - ST13	A-weighted Noise Level, dB					
	L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}
Intermittent sounds from crusher/loader at 116 ft & concrete recycler at 85 ft, trucks at 21 ft	81.5	84.7	84.1		82.4	81.6
Concrete recycler operating (85 ft) with front-end loader passby & feeding operations at 30 ft	86.8	95	94.1		82.4	83.3

FIGURES C1 THROUGH C3:
Long-Term, 24-hour Traffic Noise Measurements



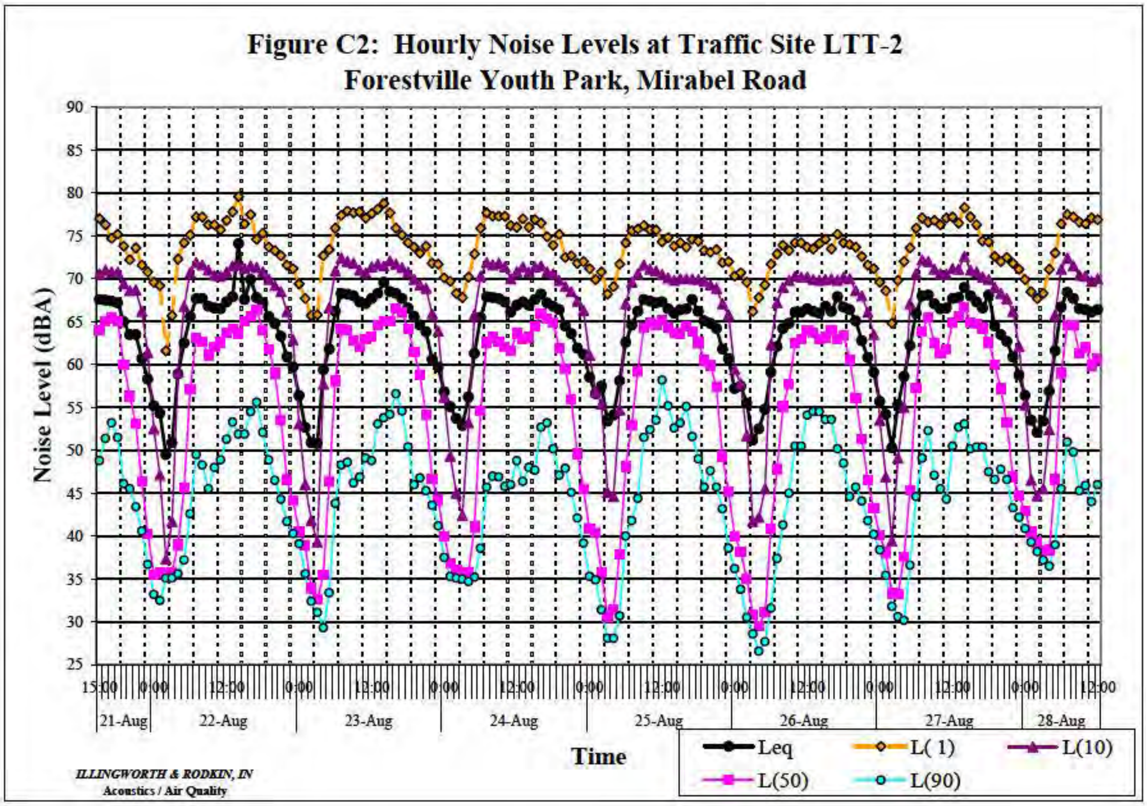


Figure C2: Hourly Noise Levels at Traffic Site LTT-2
Forestville Youth Park, Mirabel Road
Noise Level (dBA)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
15:00
0:00
12:00
21-Aug
22-Aug
23-Aug
24-Aug
25-Aug
26-Aug
27-Aug
28-Aug
Time
Leq
L(1)
L(10)
L(50)
L(90)
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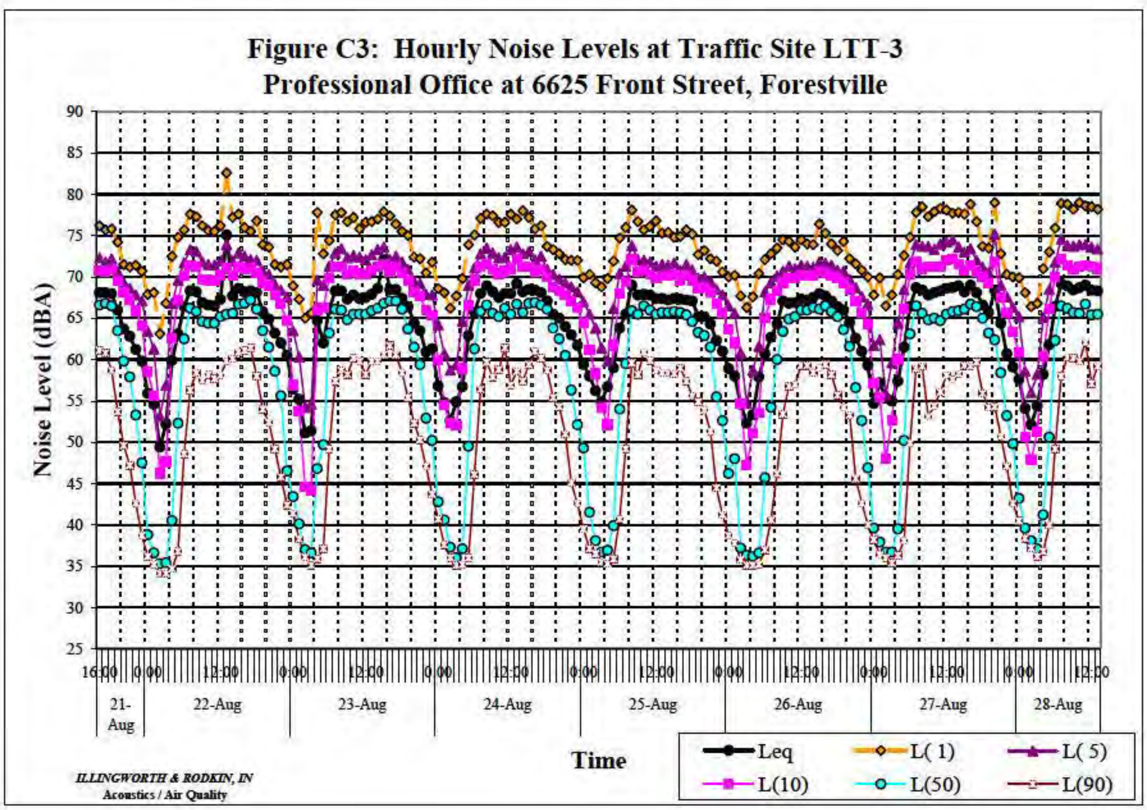
Figure C3: Hourly Noise Levels at Traffic Site LTT-3
Professional Office at 6625 Front Street, Forestville
Noise Level (dBA)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
16:00
0:00
12:00
21-Aug
22-Aug
23-Aug
24-Aug
25-Aug
26-Aug
27-Aug
28-Aug
Time
Leq
L(1)
L(5)
L(10)
L(50)
L(90)
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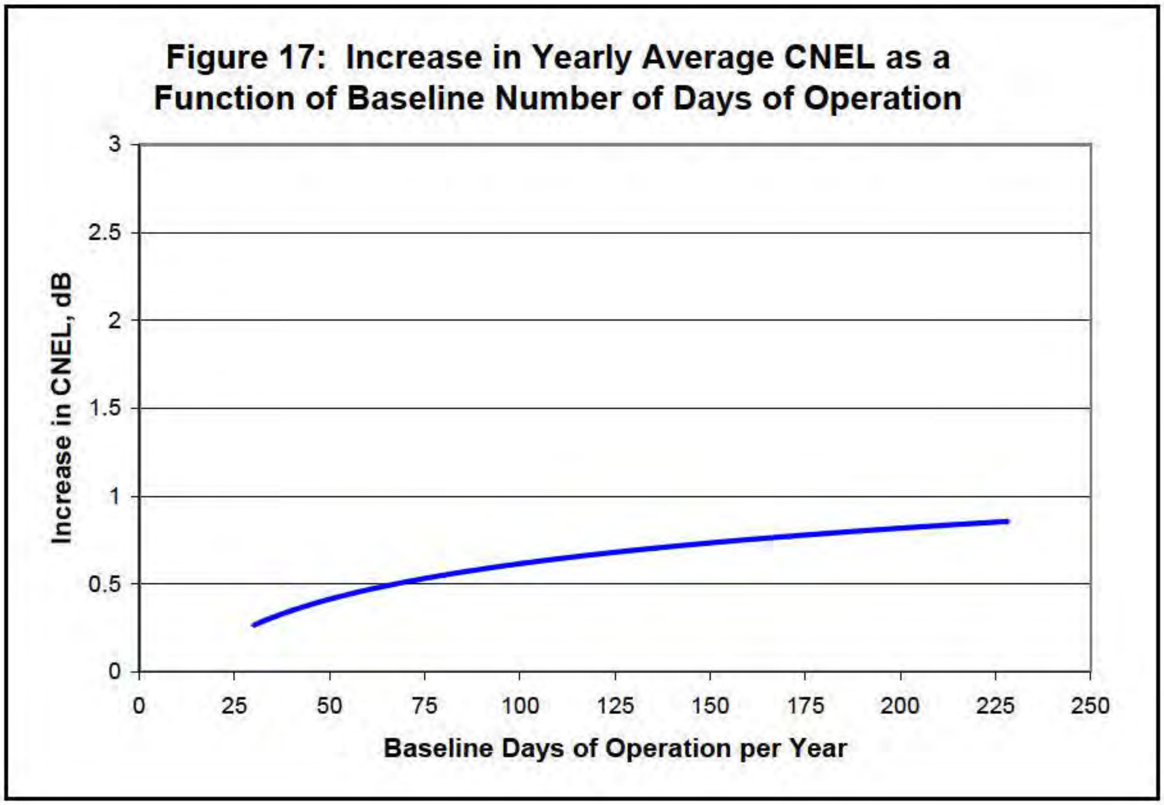


Figure 17: Increase in Yearly Average CNEL as a Function of Baseline Number of Days of Operation
Increase in CNEL, dB
0
0.5
1
1.5
2
2.5
3
0
25
50
75
100
125
150
175
200
225
250
Baseline Days of Operation per Year

APPENDIX G

BIOLOGICAL RESOURCES

TABLE G-1
PLANT SPECIES OBSERVED WITHIN THE PROJECT AREA

Family	Species	Common Name	Native
FERNS & FERN ALLIES			
DRYOPTERIDACEAE	*Polystichum munitum*	western sword fern	yes
POLYPODIACEAE	*Polypodium californicum*	California polypody	yes
PTERIDIACEAE	*Adiantum jordanii*	California maiden-hair fern	yes
	Athyrium filix-femina	lady fern	yes
	Pentagramma triangularis ssp. *triangularis*	goldback fern	yes
	Pteridium aquilinum var. *pubescens*	bracken fern	yes
GYMNOSPERMS			
PINACEAE	*Pseudotsuga menziesii* var. *menziesii*	Douglas fir	yes
TAXICODIACEAE	*Sequoia sempervirens*	redwood	yes
MONOCOTS			
ALISMATACEAE	*Alisma plantago-aquatica*	water plantain	yes
CYPERACEAE	*Carex* sp.	sedge	yes
	Cyperus eragrostis	nutsedge	yes
	Eleocharis macrostachya	spikerush	yes
IRIDACEAE	*Iris macrosiphon*	iris	yes
JUNCACEAE	*Juncus patens*	spreading rush	yes
	Luzula comosa	hairy wood rush	yes
	Sisyrinchium bellum	blue-eyed grass	yes
LILIACEAE	*Dichelostemma capitatum*	blue dicks	yes
ORCHIDACEAE	*Calypso bulbosa*	calypso orchid	yes
POACEAE	*Agrostis stolonifera*	creeping bent grass	no
	Avena fatua	wild oat	no
	Briza maxima	rattlesnake grass	no
	Bromus carinatus	California brome	yes
	Bromus diandrus	rip-gut brome	no
	Bromus laevipes	woodland brome	yes
	Bromus hordeaceous	soft chess brome	no
	Cynosurus echinatus	hedgehog dogtail	no
	Elymus glaucus	blue wildrye	yes

TABLE G-1
PLANT SPECIES OBSERVED WITHIN THE PROJECT AREA

Family	Species	Common Name	Native
	Festuca californica	California fescue	yes
	Gastridium ventricosum	nit grass	no
	Melica torreyana	melic	yes
	Melica californica	California melic	yes
	Phalaris sp.	harding grass	no
	Vulpia myuros	rat tail grass	no
DICOTS			
ACERACEAE	*Acer macrophyllum*	big-leaf maple	yes
ANACARDIACEAE	*Toxicodendron diversilobum*	western poison oak	yes
APIACEAE	*Angelica californica*	angelica	yes
	Conium maculatum	poison hemlock	no
	Foeniculum vulgare	sweet fennel	no
	Osmorhiza chilensis	cicely	yes
	Sanicula crassicaulis	pacific canicle	yes
APOCYNACEAE	*Vinca major*	periwinkle	no
ASTERACEAE	*Baccharis pilularis*	coyote bush	yes
	Carduus pycnocephalus	Italian thistle	no
	Eriophyllum sp.	wooly sunflower	yes
	Gnaphalium purpureum	everlasting	yes
	Hypochaeris radicata	rough cat's ear	no
	Madia gracilis	slender tarweed	yes
	Silybum marianum	milk thistle	no
	Sonchus asper	prickly sow thistle	no
BETULACEAE	*Corylus cornuta* var. *californica*	hazelnut	yes
BRASSICACEAE	*Cardamine californica*	milk maids	yes
	Brassica nigra	Black mustard	no
	Raphanus sativus	wild radish	no
BORAGINACEAE	*Cynoglossum grande*	hound's tongue	yes
CARYOPHYLLACEAE	*Cerastium glomeratum*	mouse-ear chickweed	no
CAPRIFOLIACEAE	*Lonicera hispidula* var. *vacillans*	honeysuckle	yes
	Symphoricarpos albus var. *laevigatus*	snowberry	yes

TABLE G-1
PLANT SPECIES OBSERVED WITHIN THE PROJECT AREA

Family	Species	Common Name	Native
	Symkphoricarpus mollis	creeping snowberry	yes
CONVOLVULACEAE	*Calystegia* sp.	morning glory	yes
ERICACEAE	*Arbutus menziesii*	madrone	yes
	Arctostaphylos manzanita	common manzanita	yes
FABACEAE	*Cytisus scoparius*	Scotch broom	no
	Genista monspessulana	broom	no
	Lathyrus vestitus	sweetpea	yes
	Lotus humistratus	lotus	yes
	Lupinus bicolor	dwarf lupine	yes
	Medicago polymorpha	burclover	no
	Rupertia physodes	California-tea	yes
FAGACEAE	*Lithocarpus densiflorus* var. *densiflorus*	tanoak	yes
	Quercus agrifolia	coast live oak	yes
	Quercus kelloggii	black oak	yes
GERANIACEAE	*Geranium molle*	wild geranium	no
HIPPOCASTANACEAE	*Aesculus californica*	California buckeye	yes
HYDROPHYLLACEAE	*Nemophila heterophylla*	nemophila	yes
HYPERICACEAE	*Hypericum perforatum*	Klamath weed	no
LAMIACEAE	*Mentha pulegium*	pennyroyal	yes
	Satureja douglasii	yerba buena	yes
	Stachys ajugoides	hedge nettle	yes
MALVACEAE	*Malva* sp.	mallow	no
OLEACEAE	*Fraxinus latifolia*	Oregon ash	yes
ONAGRACEAE	*Epilobium ciliatum* ssp. *glandulosum*	willow herb	yes
PHILIDELPHACEAE	*Whipplea modesta*	modesty	yes
PLANTAGINACEAE	*Plantago lanceolata*	English plantain	no
POLEMONIACEAE	*Navarretia squarrosa*	skunkweed	yes
POLYGALACEAE	*Polygala californica*	milkwort	yes
POLYGONACEAE	*Eriogonum nudum*	nude buckwheat	yes
	Rumex crispus	curly dock	no
	Polygonum sp.	knotweed	no
PORTULACACEAE	*Clatonia perfoliata* ssp. *perfoliata*	miner's lettuce	yes
RANUNCULACEAE	*Delphinium cardinale*	scarlet larkspur	yes
	Delphinium hesperium	western larkspur	yes

TABLE G-1
PLANT SPECIES OBSERVED WITHIN THE PROJECT AREA

Family	Species	Common Name	Native
	Ranunculus occidentalis	buttercup	yes
RHAMNACEAE	*Rhamnus californica*	California coffeeberry	yes
ROSACEAE	*Amelanchier alnifolia*	service berry	yes
	Fragaria vesca	wood strawberry	yes
	Heteromeles arbutifolia	toyon	yes
	Holodiscus discolor	oceanspray	yes
	Rosa gymnocarpa	wood rose	yes
	Rubus discolor	Himalayan blackberry	no
	Rubus parviflorus	thimbleberry	yes
	Rubus ursinus	California blackberry	yes
RUBIACEAE	*Galium aparine*	goose grass	yes
SALICACEAE	*Salix lucida* ssp. *lasiandra*	shinning willow	yes
SAXIFRAGACEAE	*Lithophragma affine*	woodland star	yes
SCROPHULARIACEAE	*Antirrhinum vexillo-calyculatum*	snapdragon	yes
	Mimulus aurantiacus	monkey flower	yes
UMBELLULARIACEAE	*Umbellularia californica*	California bay	yes

TABLE G-2
WILDLIFE SPECIES OBSERVED, DETECTED, OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

Common Name	*Scientific Name*	Observed/Detected (O) or Potentially Occurring (P)
Amphibians		
arboreal salamander	*Aneides lugubris*	P
bullfrog	*Rana catesbeiana*	P
California slender salamander	*Batrachoseps attenuatus*	O
Ensatina	*Ensatina eschscholtzi*	O
Pacific treefrog	*Hyla regilla*	O
rough-skinned newt	*Taricha granulosa*	P
western toad	*Bufo boreas*	P
Reptiles		
common garter snake	*Thamnophis sirtalis*	P
gopher snake	*Pituophis melanoleucus*	P
northern alligator lizard	*Gerrhonotus coeruleus*	P
ringneck snake	*Diadophis punctatus*	P
rubber boa	*Charina bottae*	P
southern alligator lizard	*Gerrhonotus multicarinatus*	P
western fence lizard	*Sceloporus occidentalis*	O
western terrestrial garter snake	*Thamnophis elegans*	P
Mammals		
big brown bat	*Eptesicus fuscus*	P
black-tailed deer	*Odocoileus hemionus columbianus*	O
bobcat	*Felis rufus*	P
Botta's pocket gopher	*Thomomys bottae*	O
brush rabbit	*Sylvilagus bachmani*	P
California mole	*Scapanus latimanus*	P
California myotis	*Myotis californicus*	P
chickaree (Douglas' squirrel)	*Tamiasciurus douglasii*	P
coyote	*Canis latrans*	P
deer mouse	*Peromyscus maniculatus*	P
dusky-footed woodrat	*Neotoma fuscipes*	O
gray fox	*Urocyon cinereoargenteus*	P
hoary bat	*Lasiurus cinereus*	P
long-eared myotis bat	*Myotis evotis*	P
mountain lion	*Felis concolor*	P
ornate shrew	*Sorex ornatus*	P
Mammals cont.		

TABLE G-2 (continued)
WILDLIFE SPECIES OBSERVED, DETECTED, OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

Common Name	*Scientific Name*	Observed/Detected (O) or Potentially Occurring (P)
pallid bat	*Antrozous pallidus*	P
raccoon	*Procyon lotor*	P
red bat	*Lasiurus borealis*	P
red tree vole	*Phenacomys longicaudus*	P
Sonoma chipmunk	*Eutamias sonomae*	P
striped skunk	*Mephitis mephitis*	P
Trowbridge's shrew	*Sorex trowbridgii*	P
Virginia opossum	*Didelphis virginiana*	P
western gray squirrel	*Sciurus griseus*	O
wild boar	*Sus scrofa*	O
Yuma myotis	*Myotis yumanensis*	P
Birds		
acorn woodpecker	*Melanerpes formicivorous*	P
Allen's hummingbird	*Selasphorus sasin*	P
American crow	*Corvus brachyrhynchos*	P
American robin	*Turdus migratorius*	O
Anna's hummingbird	*Calypte anna*	O
band-tailed pigeon	*Columba fasciata*	P
barn owl	*Tyto alba*	P
barn swallow	*Hirundo rustica*	P
black phoebe	*Sayornis nigricans*	P
black-headed grosbeak	*Pheucticus melanocephalus*	P
brown creeper	*Certhia americana*	O
California quail	*Callipepla californica*	P
California towhee	*Pipilo crissalis*	P
Cassin's vireo	*Vireo cassinii*	P
chestnut-backed chickadee	*Parus rufescens*	O
common bushtit	*Psaltriparus minimus*	P
common raven	*Corvus corax*	O
Cooper's hawk	*Accipiter cooperii*	P
dark-eyed junco	*Junco hyemalis*	O
downy woodpecker	*Picoides pubescens*	P
golden-crowned kinglet	*Regulus satrapa*	O
golden-crowned sparrow	*Zonotrichia atricapilla*	P
great horned owl	*Bubo virginianus*	P
hairy woodpecker	*Picoides villosus*	P
Birds cont.		
house finch	*Carpodacus mexicanus*	O

TABLE G-2 (continued)
WILDLIFE SPECIES OBSERVED, DETECTED, OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

Common Name	*Scientific Name*	Observed/Detected (O) or Potentially Occurring (P)
hermit thrush	*Catharus guttatus*	O
lesser goldfinch	*Carduelis psaltria*	O
mourning dove	*Zenaida macroura*	P
northern flicker	*Colaptes auratus*	O
northern pygmy owl	*Glaucidium gnoma*	P
northern saw-whet owl	*Aegolius acadicus*	P
northern spotted owl	*Strix occidentalis*	P
Nuttall's woodpecker	*Picoides nuttallii*	P
oak titmouse	*Baeolophus inornatus*	P
olive-sided flycatcher	*Contopus cooperi*	P
orange-crowned warbler	*Vermivora celata*	P
osprey	*Pandion haliaetus*	P
Pacific-slope flycatcher	*Empidonax difficilis*	P
pileated woodpecker	*Dryocopus pileatus*	P
pine siskin	*Carduelis pinus*	P
purple finch	*Carpodacus purpureus*	P
red-breasted nuthatch	*Sitta canadensis*	P
red-shouldered hawk	*Buteo lineatus*	O
red-tailed hawk	*Buteo jamaicensis*	O
rock dove	*Columba livia*	P
ruby-crowned kinglet	*Regulus calendula*	O
rufous hummingbird	*Selasphorus rufus*	P
sharp-shinned hawk	*Accipiter striatus*	P
song sparrow	*Melospiza melodia*	P
spotted towhee	*Pipilo maculatus*	O
Steller's jay	*Cyanocitta stelleri*	O
Townsend's warbler	*Dendroica townsendi*	O
turkey vulture	*Cathartes aura*	O
varied thrush	*Ixoreus naevius*	O
Vaux's swift	*Chaetura vauxi*	P
violet-green swallow	*Tachycineta thalassina*	P
warbling vireo	*Vireo gilvus*	P
western screech-owl	*Otus kennicottii*	P
western scrub-jay	*Aphelocoma californica*	P
western tanager	*Piranga ludoviciana*	P
Birds cont.		
western wood-pewee	*Contopus sordidulus*	P
white-breasted nuthatch	*Sitta carolinensis*	P

TABLE G-2 (continued)
WILDLIFE SPECIES OBSERVED, DETECTED, OR POTENTIALLY OCCURRING WITHIN THE PROJECT AREA

Common Name	*Scientific Name*	Observed/Detected (O) or Potentially Occurring (P)
white-crowned sparrow	*Zonotrichia leucophrys*	P
Wilson's warbler	*Wilsonia pusilla*	P
wrentit	*Chamaea fasciata*	P
yellow-rumped warbler	*Dendroica coronata*	P

TABLE G-3
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE PROJECT SITE

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area	Period of Identification
SPECIES LISTED OR PROPOSED FOR LISTING				
Invertebrates				
California freshwater shrimp *Syncaris pacifica*	FE/CE/--	Low elevation and gradient streams in Marin, Sonoma, and Napa counties.	**Not present.** Suitable aquatic habitat does not occur on-site. Erosion and sedimentation from quarry activities may impact shrimp downstream.	Year-round
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	FE/--/--	Coastal dune and prairie habitat.	**Not present.** Suitable habitat does not occur within the project area. This species is generally found within 3 miles of the coast.	June-September
Fish				
Steelhead-Central California Coast ESU *Oncorhynchus mykiss*	FT/--/--	Coastal streams and rivers.	**Not present.** Suitable aquatic habitat does not occur on-site. Erosion and sedimentation from quarry activities may impact steelhead downstream.	Year-round
Coho salmon-Central California Coast ESU *Oncorhynchus kisutch*	FT/CSC/--	Coastal streams and rivers.	**Not present.** Suitable aquatic habitat does not occur on-site. Erosion and sedimentation from quarry activities may impact species downstream. The Russian River watershed is designated critical habitat for coho salmon.	Year-round
Chinook salmon-California coastal *Oncorhynchus tshawytscha*	FT/--/--	Coastal streams and rivers.	**Not present.** Suitable aquatic habitat does not on-site. Erosion and sedimentation from quarry activities may impact chinook salmon downstream.	Fall–early Summer
Amphibians				
California red-legged frog *Rana aurora draytonii*	FT/CSC/--	Dense shrubby vegetation associated with deep-water ponds and upland habitat for aestivation.	**Low potential.** Marginal habitat for CRLF occurs within or near project area. No local sightings for this species have been documented.	May–November
Birds				
Bank swallow *Riparia riparia*	FSC/CT/--	Nests in steep banks or bluffs in riparian and lowland habitats.	**Low potential.** Marginal breeding habitat within project area. No records in Sonoma County since 1986 (CDFG).	April-September

TABLE G-3 (continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE PROJECT SITE

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area	Period of Identification
Northern spotted owl *Strix occidentalis caurina*	FT/--/--	Dense forest habitats.	**Moderate potential.** Suitable foraging and breeding habitat occurs within the project area. Survey protocols for this species are recommended.	March-September
Plants				
Sonoma alopecurus *Alopecurus aequalis* var. *sonomensis*	FE/--/1B	Freshwater marshes and swamps and in wet areas in riparian scrub	**High potential.** A seasonally wet area occurs in the southwest boundary of the Existing Mineral Resourse area. Why no further surveys?	May-July
Baker's manzanita *Arctostaphylos bakeri* ssp. *bakeri*	FSC/CR/1B	Chaparral, broadleafed upland forest, often on serpentine	**High potential.** Chaparral and woodland may provide potential habitat in the project area. CNDDB records indicate one recorded occurrence within two miles of the project site. Why no further surveys?	February-April
Cedar's manzanita *Arctostaphylos bakeri* ssp. *sublaevis*	FSC/CR/1B	Closed-cone coniferous forest, in serpentine chaparral and sergeant cypress woodland	**Low potential.** Endemic to the cedars area in Sonoma County. Neither serpentine habitat nor sergeant cypress woodland were observed in the project area.	April-May
Vine Hill manzanita *Arctostaphylos densiflora*	FSC/CE/1B	Chaparral (acid marine sand)	**Moderate potential.** Chaparral may provide potential habitat in the project area. However, the species is only known from one site in Sonoma County. Suitable soils do not occur in the project area. No further surveys are recommended.	February-March
Pennell's bird beak *Cordylanthus tenuis* ssp. *capillaris*	FE/CR/1B	Closed-cone coniferous forest and chaparral often on serpentine	**Moderate potential.** Chaparral provides potential habitat in the project area. However, no serpentine habitat was observed in the project area. No further surveys are recommended.	June-September
Baker's larkspur *Delphinium bakeri*	FE/CR/1B	Coastal scrub and valley and foothill grassland	**Low potential.** Suitable habitat does not occur in the project area.	March-May
Yellow larkspur *Delphinium luteum*	FE/CR/1B	Coastal prairie and coastal scrub on north-facing rocky slopes.	**Low potential** Suitable habitat does not occur in the project area.	March-May

TABLE G-3 (continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE PROJECT SITE

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area	Period of Identification
Burke's goldfields *Lasthenia burkei*	FE/CE/1B	Meadows and vernal pools	**Low potential.** Suitable habitat does not occur in the project area.	April-June
Sebastopol meadowfoam *Limnanthes vinculans*	FE/CE/1B	Swales and mesic meadows, vernal pools, and valley and foothill grassland	**Low potential.** Suitable habitat does not occur in the project area.	April-May
Tidestrom's lupine *Lupinus tidestromii*	FE/CE/1B	Coastal dunes	**Low potential.** Suitable habitat does not occur in the project area.	May-June
North Coast semaphore grass *Pleuropogon hooverianus*	--/CT/1B	Broadleafed upland forest, meadows and seeps, and North Coast coniferous forest	**Moderate to High potential.** Mesic areas in North Coast conifer forest may provide potential habitat in the project area. Why no further surveys?	April-June
Showy Indian clover *Trifolium amoenum*	FE/--/1B	Valley and foothill grassland and coastal bluff scrub, sometimes on serpentine.	**Low potential.** Suitable habitat is not present in the project area.	April-June

FEDERAL OR STATE SPECIES OF CONCERN

Fish				
Pacific lamprey *Lampetra tridentata*	FSC/--/--	Coastal stream and ocean habitats.	**Not present.** Suitable aquatic habitat does not occur on-site. Erosion and sedimentation from the site may impact lamprey downstream.	Year-round
Russian River tule perch *Hysterocarpus traski pomo*	FSC/CSC/--	Low-elevation lakes and rivers near emergent vegetation and overhanging vegetation.	**Not present.** Suitable aquatic habitat does not occur on-site. Erosion and sedimentation from the site may impact tule perch downstream.	Year-round
Amphibians				
Foothill yellow-legged frog *Rana boylii*	FSC/CSC/--	In or near partly shaded rocky streams.	**Low potential.** Suitable habitat does not occur within the project area. Drainages within the project area are steep and water retention is low. Breeding in these areas is unlikely.	April–June

TABLE G-3 (continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE PROJECT SITE

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area	Period of Identification
Northern red-legged frog *Rana aurora aurora*	FSC/CSC/--	Dense shrubby vegetation associated with deep-water ponds and upland habitat for aestivation.	**Low potential.** Marginal habitat for NRLF occurs within or near project area. No local sightings for this species have been documented.	May–November
Reptiles				
Northwestern pond turtle *Clemmys marmorata marmorata*	FCS/CSC/--	In or near permanent or semi-permanent water sources.	**Low potential.** Suitable habitat does not occur within the project area. Adjacent ponds provide only marginal habitat for this species. Erosion and sedimentation from quarry activities may impact turtles downstream.	Year-round
Birds				
Allen's hummingbird *Selasphorus sasis*	FSC/--/--	Breed in woodlands, redwood, and scrub habitats of coastal fog belt (up to 20 miles inland).	**High potential.** Suitable habitat occurs within project area.	January–August
American peregrine falcon *Falco peregrinus anatum*	FSC/Fully Protected-CE/--	Breeds in woodland, forest, and coastal habitats with cliffs and canyons near water. Riparian and wetland areas also important foraging habitat.	**Low potential.** Marginal foraging habitat within or near the project area. Breeding could occur along steep quarry cliffs but unlikely due to constant human disturbance.	Year-round
California thrasher *Toxostoma redivivum*	FSC/--/--	Year-round resident of inland and coastal scrub and riparian thickets.	**Moderate potential.** Suitable habitat exists for this species in the dense chaparral habitat occurring on the property.	Year-round
Tricolored blackbird *Agelaius tricolor*	FSC/CSC/--	Freshwater marsh habitat with emergent tules, cattails, or other vegetation for nesting and open areas for foraging.	**Low potential.** Suitable breeding and foraging habitat for this species does not occur within the project area. No local sightings for this species have been documented.	April – July
Osprey *Pandion haliaetus*	--/CSC/--	Nest on exposed treetops or other man made structures. Forage over clean	**Moderate potential.** Suitable roosting and breeding habitat for this species occurs within the	Year-round

TABLE G-3 (continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE PROJECT SITE

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat**	**Potential for Species Occurrence Within the Project Area**	**Period of Identification**
		open waters.	project area.	
White-tailed kite *Elanus leucurus*	FSC/Fully Protected/--	Nest in tall trees or shrubs in open areas. Forage over fields, grassland, marshes, and savannah habitats.	**Low potential.** Suitable foraging and breeding for this species does not occur within the project area.	Year-round
Vaux's swift *Chaetura vauxi*	FSC/CSC/--	Nest in burnt out or rotted tree snags in heavily forested areas.	**Moderate potential.** Limited suitable breeding habitat on-site.	Late April-September
Mammals				
Fringed myotis *Myotis thysanodes*	FSC/--/--	Inhabits pinion-juniper, valley foothill hardwood, and hardwood-conifer, generally at elevation of 4,000 to 7,000 ft.	**Low potential.** Suitable habitat may occur on-site but project site is not within elevation range of this species.	March-August
Long-eared myotis bat *Myotis evotis*	FSC/--/--	Preferred habitats include conifer forests and woodlands. Utilizes small buildings, crevices, snags, and small spaces under bark for roosting.	**Moderate potential.** Suitable roosting and foraging habitat occurs within the project area.	March-August
Long-legged myotis *Myotis evotis*	FSC/--/--	Inhabits woodland and forest habitats above 4,000 ft.	**Low potential.** Suitable habitat may occur on-site but project site is not within elevation range of this species.	March-August
Pallid bat *Antrozous pallidus*	--/CSC/--	Occupies grassland, shrubland, forest, and woodland habitats at low elevations.	**Moderate potential.** Suitable roosting and foraging habitat occurs within the project area.	March-August
Red tree vole *Arborimus pomo*	FSC/CSC/--	Inhabits coniferous forest in humid areas. Requires fir trees for foraging and nesting.	**Moderate potential.** Suitable nesting and foraging habitat exists within the project area.	Year-round
Yuma myotis bat *Myotis yumanensis*	FSC/--/--	Preferred habitat types include open forests and woodlands. Mines, caves, crevices, and buildings used for roosting.	**Moderate potential.** Suitable roosting and foraging habitat occurs within the project area.	March-August
Plants				

TABLE G-3 (continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE PROJECT SITE

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area	Period of Identification
Blasdale's bent grass *Agrostis blasdalei*	FSC/--/1B	Coastal dunes, coastal bluff scrub, coastal prairie	**Low potential** Suitable habitat does not occur in the project area.	May-July
Napa false indigo *Amorpha californica* var. *napensis*	FSC/--/1B	In openings in chaparral, cismontane woodland, and broadleafed upland forest	**High potential.** Chaparral and woodland may provide potential habitat in the project area. Why no further surveys?	April-July
Rincon manzanita *Arctostaphylos stanfordiana* ssp. *decumbans*	FSC/--/1B	Chaparral in red rhyolites	**Low to Moderate potential.** Chaparral may provide potential habitat in the project area, though highly restricted to red rhyolites in Sonoma County. No red rhyolites observed in chaparral within the project area. Further surveys are not recommended.	February-April
Swamp harebell *Campanula californica*	FSC/--/1B	Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, freshwater marsh, North Coast coniferous forest.	**Low potential.** Suitable marsh habitat does not occur in the North Coast conifer forest within the project area.	June-September
Rincon Ridge ceanothus *Ceanothus confusus*	FSC/--/1B	Chaparral, cismontane woodland, and closed-cone coniferous forest in volcanic or serpentine soils	**Moderate to High potential.** Chaparral provides potential habitat in the project area. However, no serpentine habitat was observed in the project area. Further surveys are not recommended.	February-April
Narrow-leaved daisy *Erigeron angustatus*	FSC/--/1B	Chaparral in serpentine	**Moderate to High potential.** Chaparral may provide potential habitat in the project area. However, no serpentine habitat was observed in the project area. . Further surveys are not recommended.	May-September
Fragrant fritillary *Fritillaria liliacea*	FSC/--/1B	Cismontane woodland, coastal	**Moderate potential.** CNDDB records indicate	February–April

TABLE G-3 (continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE PROJECT SITE

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area	Period of Identification
		prairie and scrub, valley and foothill grasslands, often on serpentine soils	one recorded occurrence within two miles of the project site. However, suitable habitat does not occur in the project area. . Further surveys are not recommended.	
Thin-lobed horkelia *Horkelia tenuiloba*	FSC/--/1B	In sandy soils in chaparral and coastal scrub	**Moderate potential.** Chaparral may provide potential habitat in the project area. However, sandy soils are not common in the project area. Further surveys are not recommended.	May-July
Crystal springs lessingia *Lessingia arachnoidea*	FSC/--/1B	Coastal sage scrub, valley and foothill grassland, and cismontane woodland, commonly on serpentine	**Low potential.** Suitable habitat does not occur in the project area.	July-October
Point Reyes checkerbloom *Sidalcea calycosa* ssp. *rhizomata*	FSC/--/1B	Marshes and swamps near the coast	**Low potential.** Suitable habitat does not occur in the project area.	April-September
SPECIES ON OTHER LISTS				
Invertebrates				
Monarch butterfly *Danaus plexippus*	--/*/--	Winters in wind-protected tree groves (eucalyptus, Monterey pine, cypress) along coast.	**Not present.** Suitable tree grooves do not occur within or near the project area.	Winter
Plants				
Bolander's reed grass *Calamagrostis bolanderi*	--/--/1B	Broadleafed upland forest, bogs and fens, closed-cone coniferous forest, meadows and seeps, marshes and swamps, North Coast coniferous forest, and coastal scrub	**Moderate to High potential**. Mesic areas in North Coast conifer forest may provide potential habitat in the project area. Why no further surveys?	May-August
Coastal bluff morning glory *Calystegia purpurata* ssp. *saxicola*	--/--/1B	Coastal dunes, coastal scrub	**Low potential.** Suitable habitat is not present in the project area.	May-August
Bristly sedge *Carex comosa*	--/--/2	Marshes and swamps, wet places in coastal prairie and valley and foothill grassland	**Low to Moderate potential.** Suitable habitat is not present in the project area. Why no further surveys?	May-July

TABLE G-3 (continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE PROJECT SITE

Common Name *Scientific Name*	Listing Status USFWS/CDFG/ CNPS	General Habitat	Potential for Species Occurrence Within the Project Area	Period of Identification
Streamside daisy *Erigeron bioletti*	--/--/3	Broadleafed upland forest, cismontane woodland, North Coast coniferous forest in rocky, mesic soils	**Moderate to High potential.** Mesic areas in North Coast conifer forest may provide potential habitat in the project area. Why no further surveys?	June-September
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	--/--/3	Chaparral, coastal prairie and valley and foothill grassland.	**High potential.** Chaparral may provide potential habitat in the project area. Why no further surveys?	June-September
Coast fawn lily *Erythronium revolutum*	--/--/2	Bogs and fens, broadleafed upland forest, mesic areas in North Coast coniferous forest	**Low potential.** Suitable habitat is not present in the project area.	March- June
Hayfield tarplant *Hemizonia congesta* ssp. *leucocephala*	--/--/3	Coastal scrub and valley and foothill grassland	**Low potential.** Suitable habitat is not present in the project area.	April-October
Short-leaved evax *Hesperevax sporsiflora* var. *brevifolia*	--/--/2	Coastal bluffs, coastal dunes	**Low potential.** Suitable habitat is not present in the project area.	March-June
Perennial goldfields *Lasthenia macrantha* ssp. *macrantha*	--/--/1B	Coastal bluff scrub, coastal dunes, coastal scrub	**Low potential.** Suitable habitat is not present in the project area.	January-November
Wooly-headed lessingia *Lessingia hololeuca*	--/--/3	Broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland in clay or serpentine soils	**Low potential.** Suitable habitat is not present in the project area.	June-October
Robust monardella *Monardella villosa ssp. globosa*	--/--/1B	In clay or sandy soils of coastal prairie and scrub, and valley and foothill grassland	**Low potential.** Suitable habitat is not present in the project area.	June–July
Purple stemmed checkerbloom *Sidalcea malviflora* ssp. *purpurea*	--/--/1B	Broadleafed upland forest, coastal prairie	**Low potential.** Suitable habitat is not present in the project area.	May

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
FP = Proposed for listing as endangered or 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

TABLE G-3 (continued)
SPECIAL-STATUS SPECIES CONSIDERED IN THE EVALUATION OF THE PROJECT SITE

Common Name ***Scientific Name***	**Listing Status USFWS/CDFG/ CNPS**	**General Habitat**	**Potential for Species Occurrence Within the Project Area**	**Period of Identification**

PCH = Proposed critical habitat

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
Fully Protected = Fully protected
* = Special Animals

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

APPENDIX H
TRANSPORTATION AND TRAFFIC

APPENDIX H-1

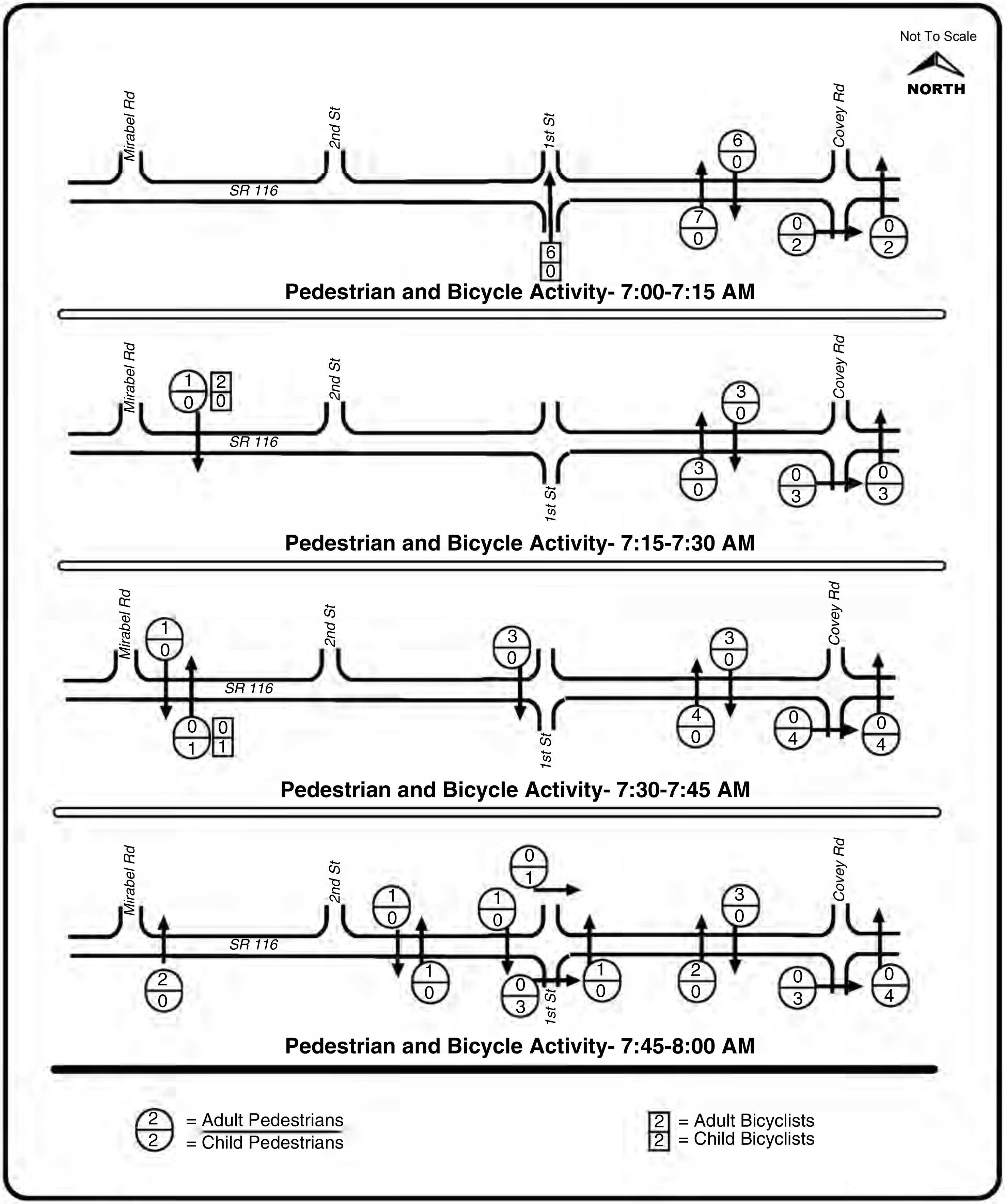
PEDESTRIAN AND BIKE RIDER COUNTS (JUNE 12, 2002)

As described in Section IV.A in the body of the EIR, supplemental pedestrian and bicycle rider counts were conducted on Wednesday, June 12, 2002 along Highway 116 between Covey Road and Mirabel Road; Forestville Elementary School was in session during these surveys. Count results are presented in Figures A-1 to A-4.

PARKING ALONG HIGHWAY 116 IN FORESTVILLE

On- and off-street parking surveys were conducted by Crane Transportation Group along Highway 116 between Covey Road and Mirabel Road on Wednesday, June 12, 2002, and on Saturday, June 15, 2002. Results are presented in Figures A-5 to A-14. Weekdays surveys extended from 7:30 to 9:00 a.m. and from 2:00 to 5:30 p.m., while the Saturday survey extended from 7:00 a.m. to 8:00 p.m.

The greatest percent use of on-street parking was found to occur along the south side of Highway 116 just west of Covey Road – Forestville Street, where most parking spaces were occupied from 8:30 to 9:00 a.m. on a weekday, and at 8:30 a.m., 1:00 p.m. and 2:00 p.m. on a Saturday. The greatest percent use of off-street parking was found to occur in the same location, where most or all spaces were occupied from 8:30 to 9:00 a.m. on a weekday, and from 8:00 to 11:00 a.m., as well as 3:30 to 4:00 p.m. on a Saturday.



CRANE TRANSPORTATION GROUP

Figure A-1
Pedestrian and Bicycle Activity
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Wednesday, June 12/2002

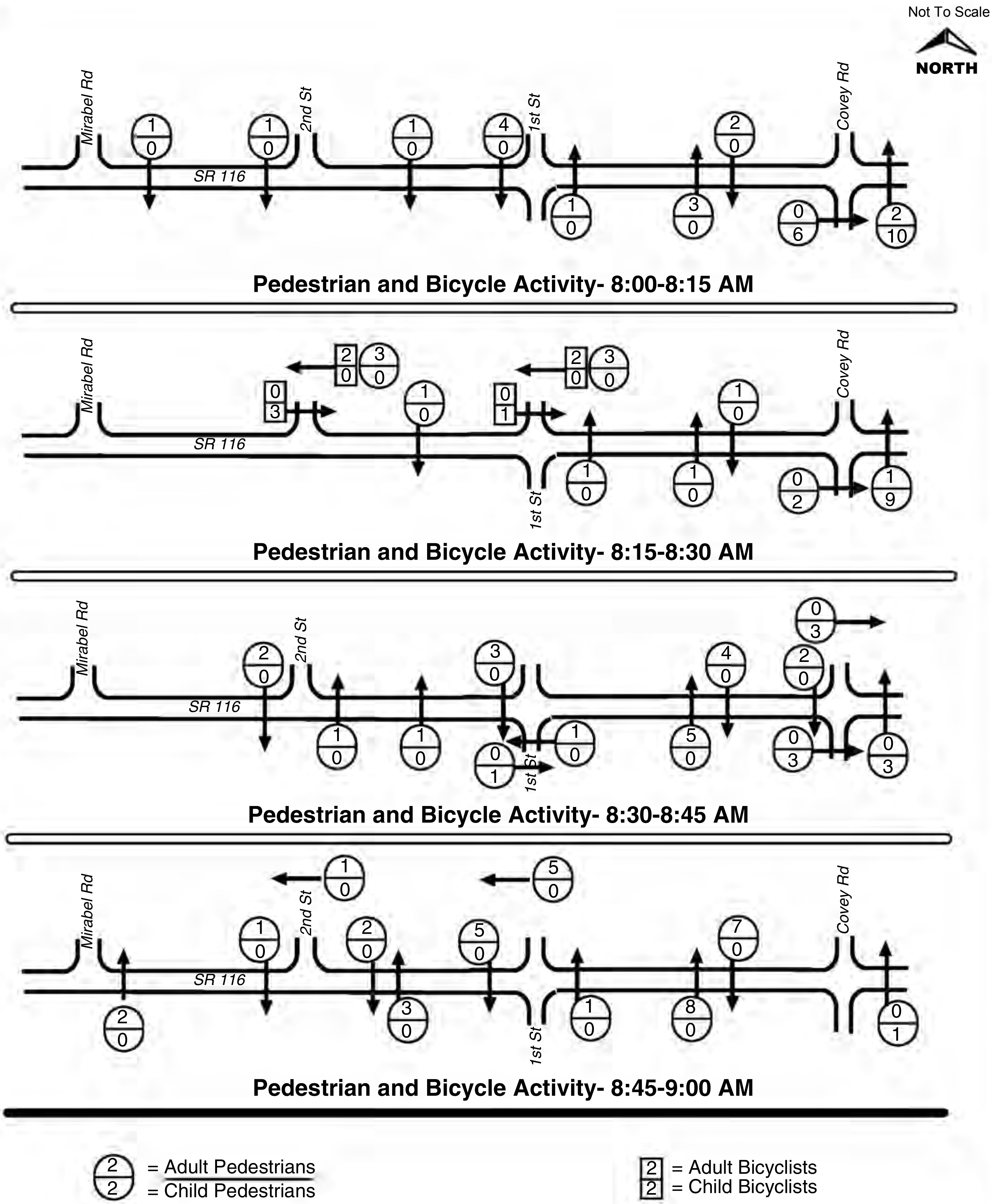


Figure A-2
Pedestrian and Bicycle Activity
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Wednesday, June 12/2002

CRANE TRANSPORTATION GROUP

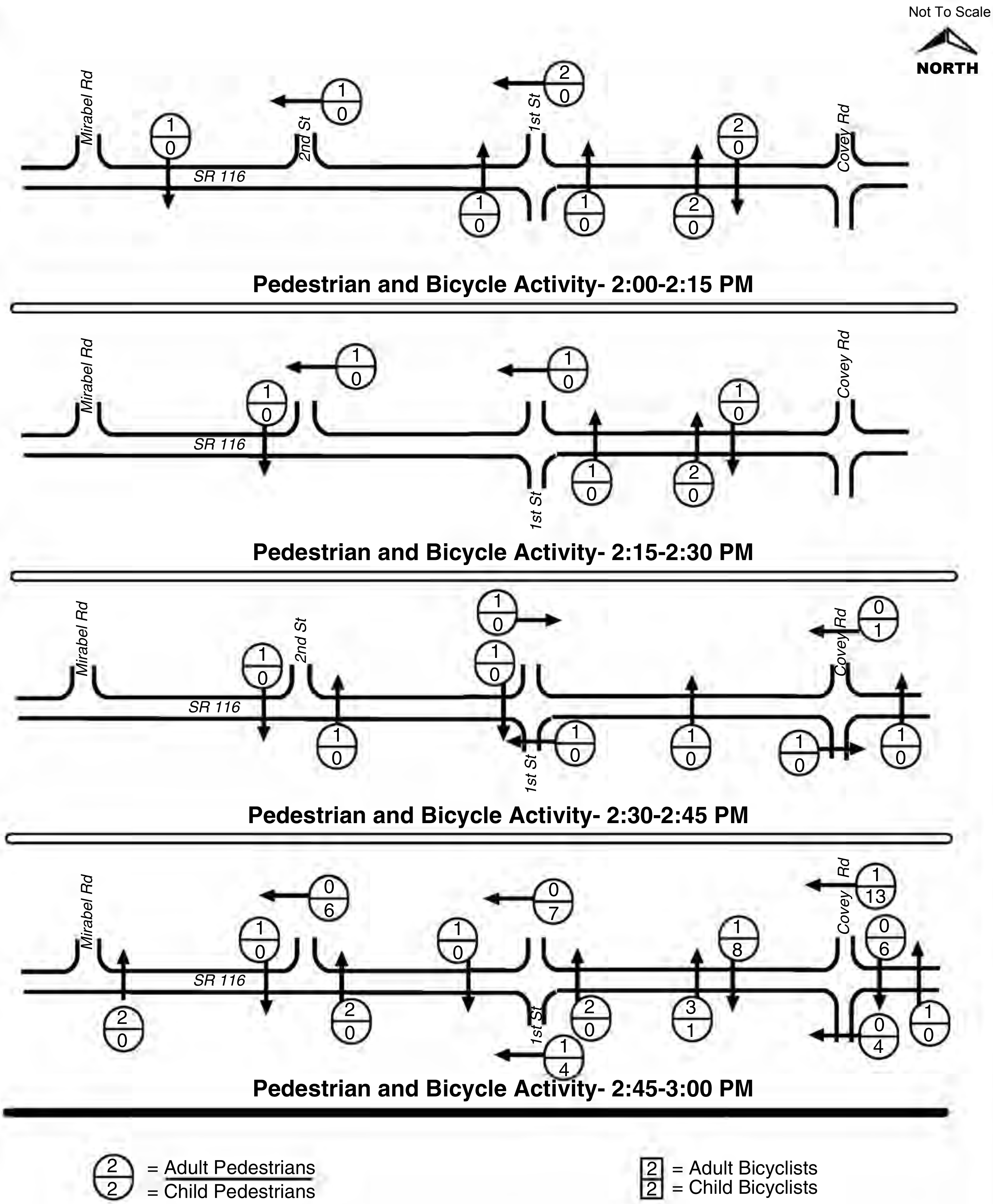
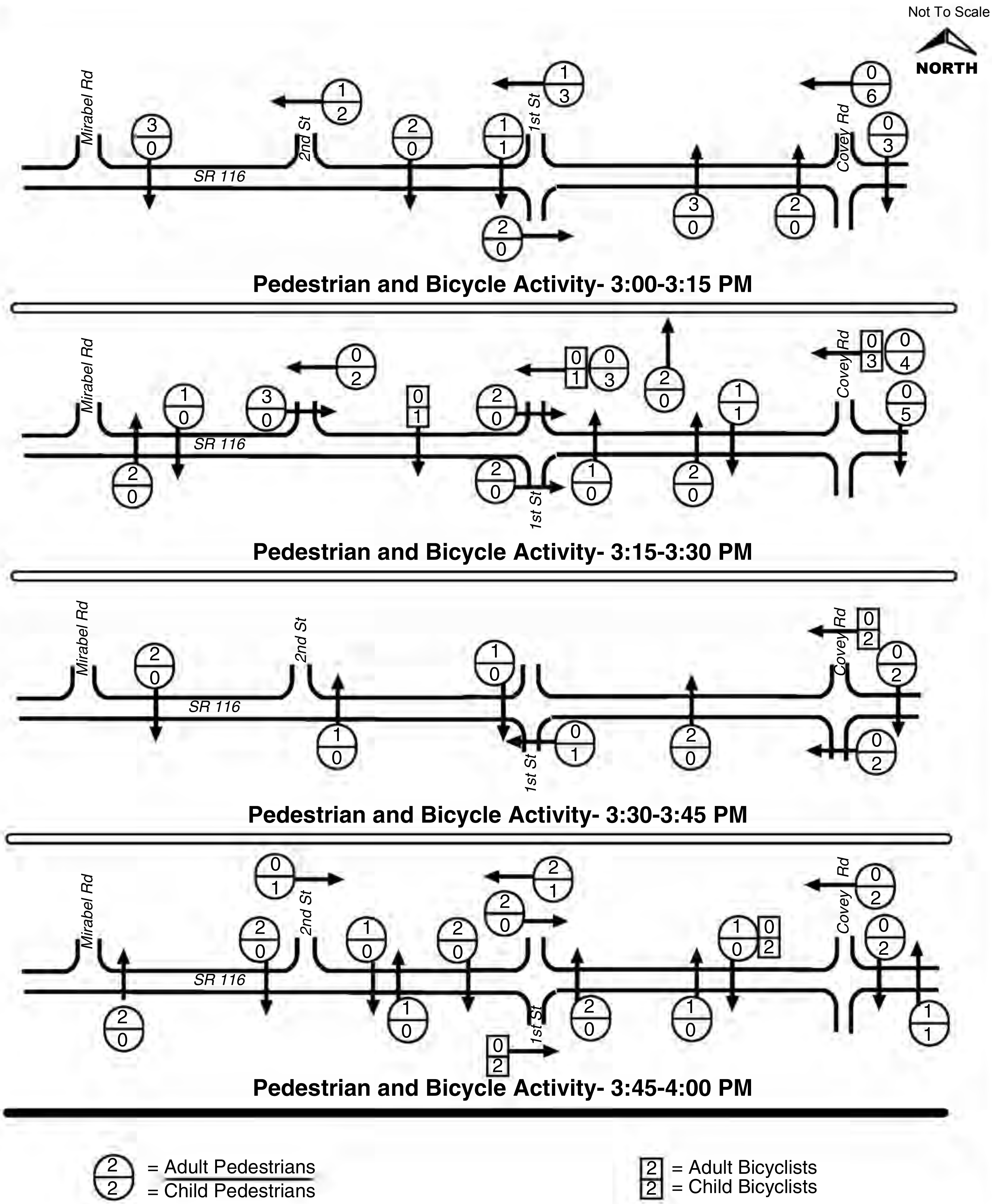


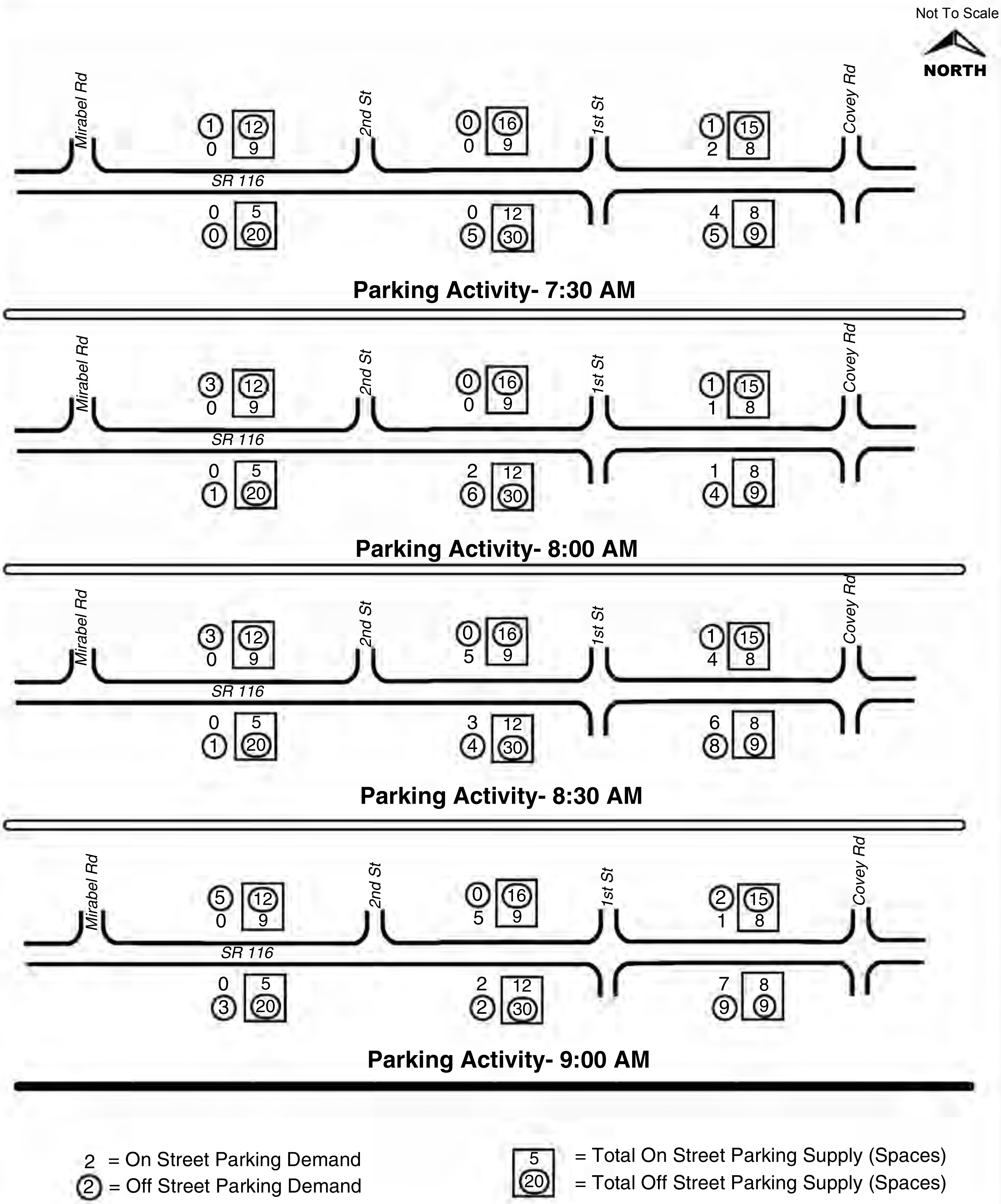
Figure A-3
Pedestrian and Bicycle Activity
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Wednesday, June 12/2002

CRANE TRANSPORTATION GROUP



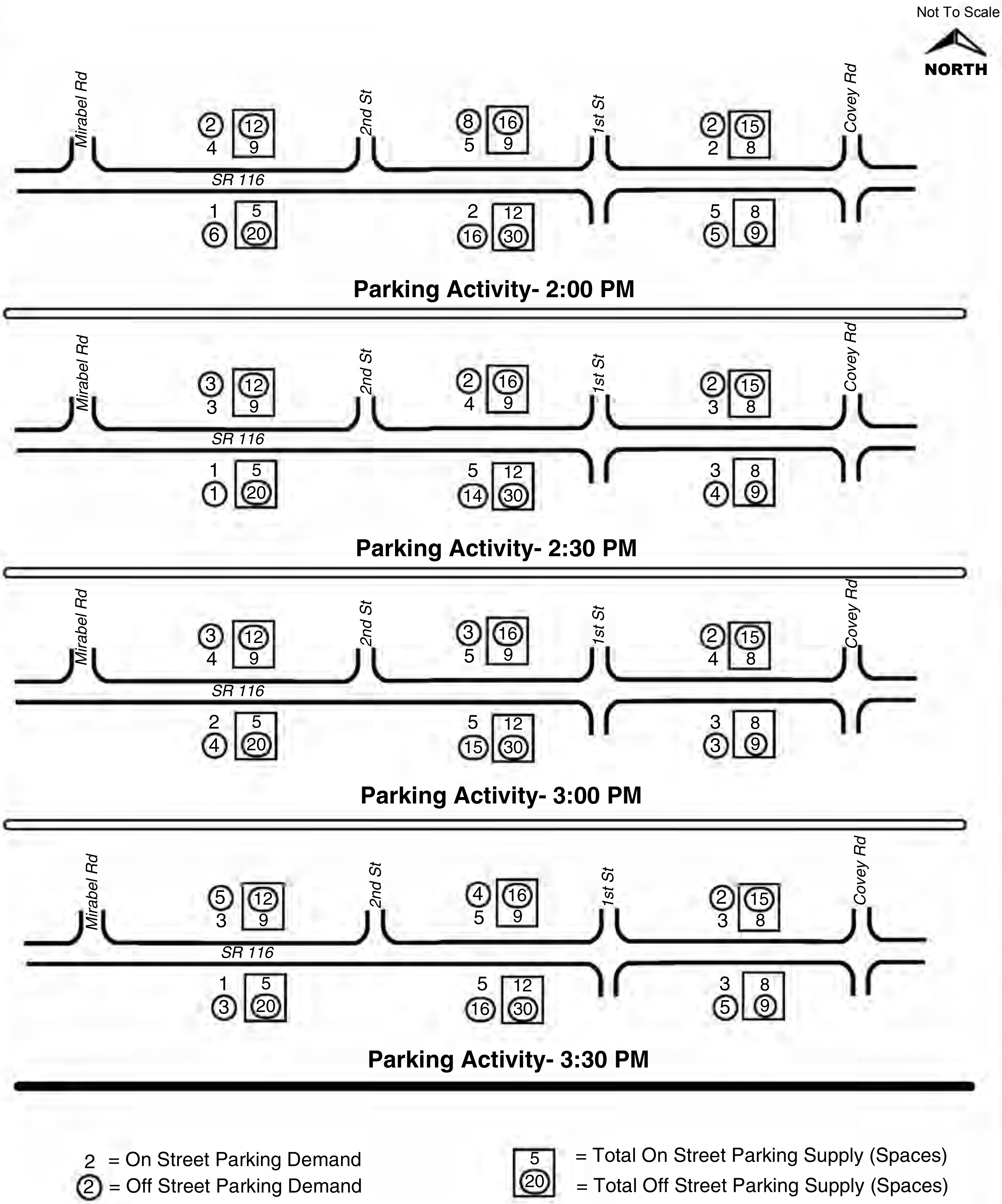
CRANE TRANSPORTATION GROUP

Figure A-4
Pedestrian and Bicycle Activity
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Wednesday, June 12/2002



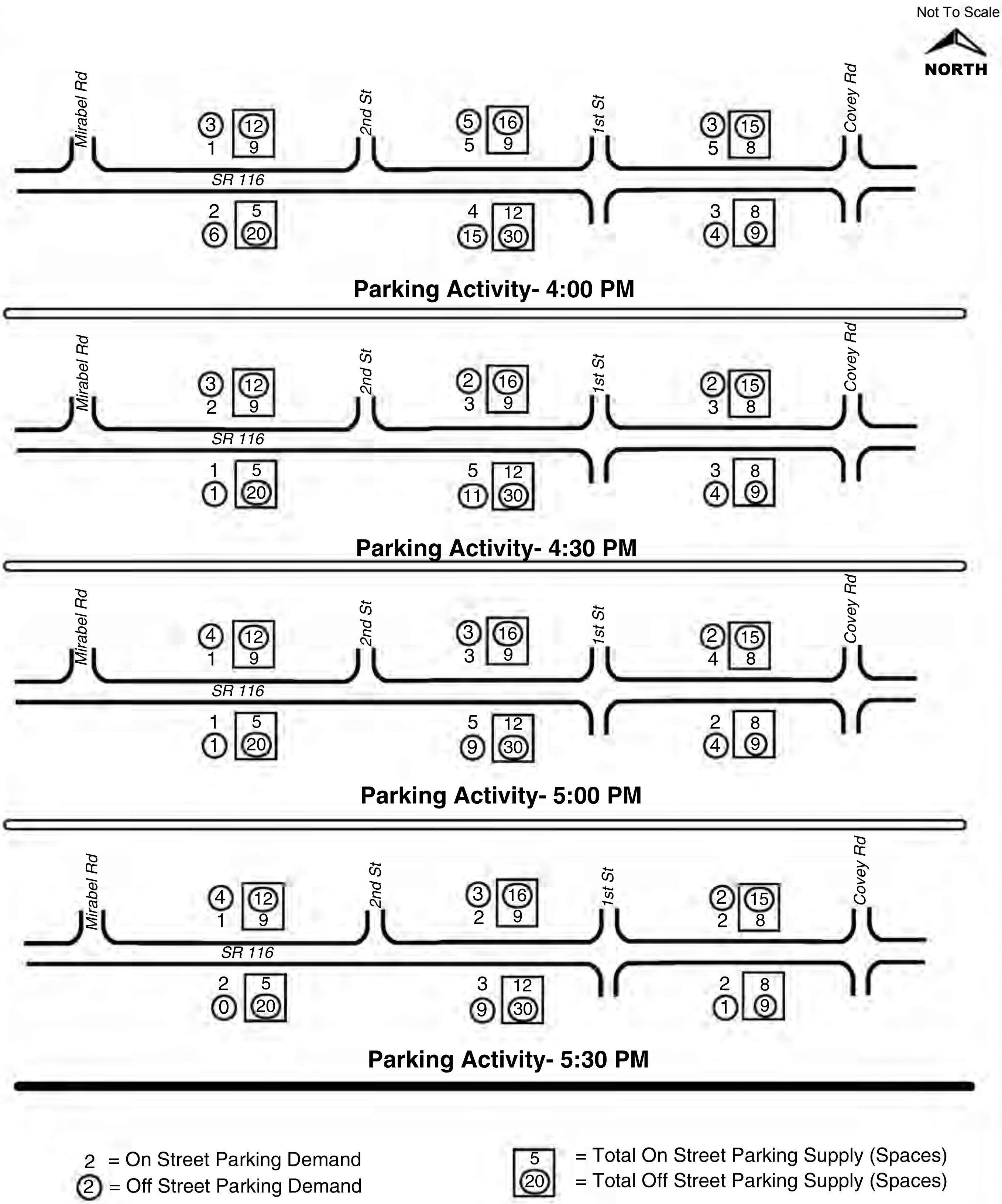
CRANE TRANSPORTATION GROUP

Figure A-5
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Wednesday, June 12/2002



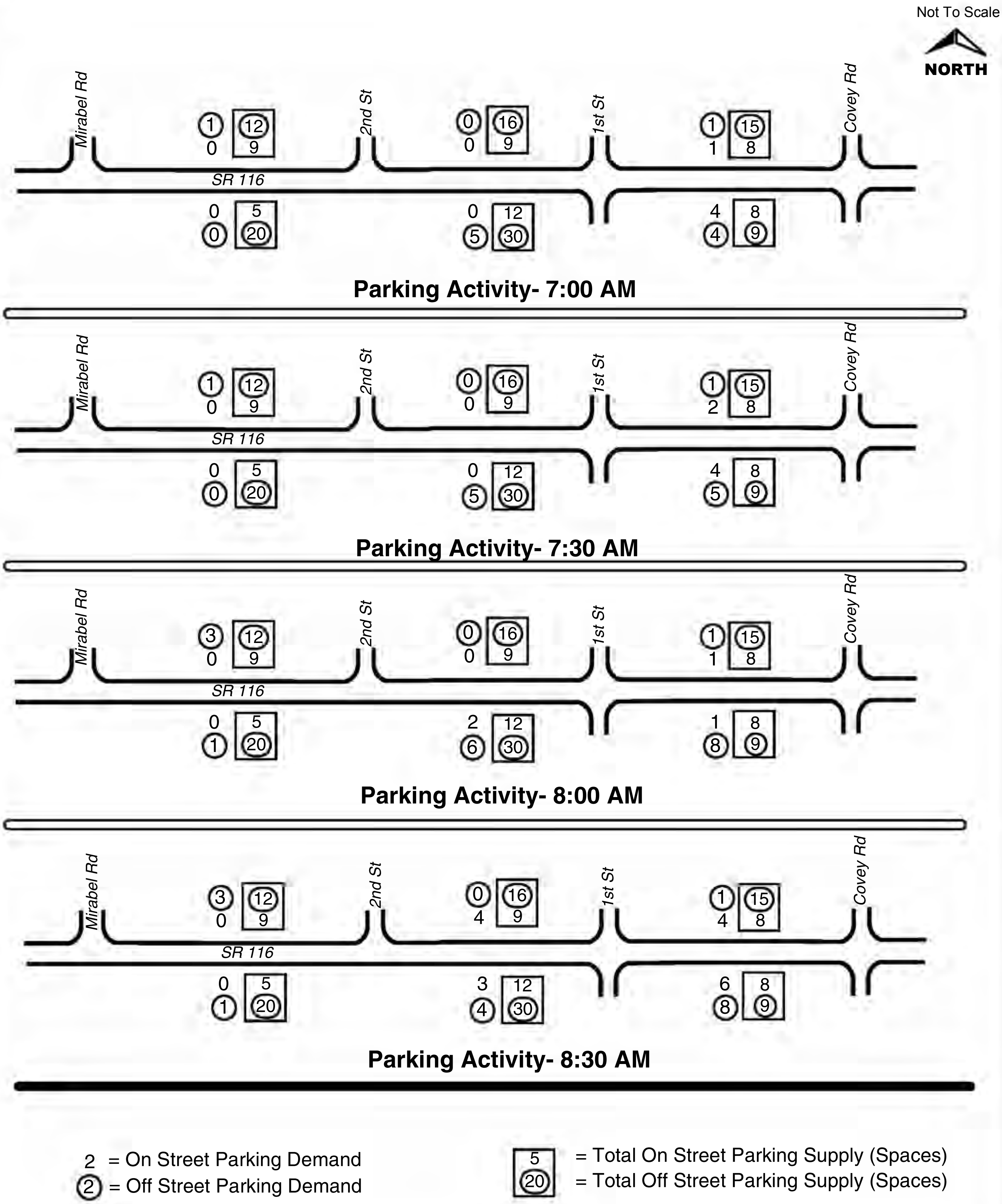
CRANE TRANSPORTATION GROUP

Figure A-6
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville Between Mirabel Rd and Covey Rd
Wednesday, June 12/2002



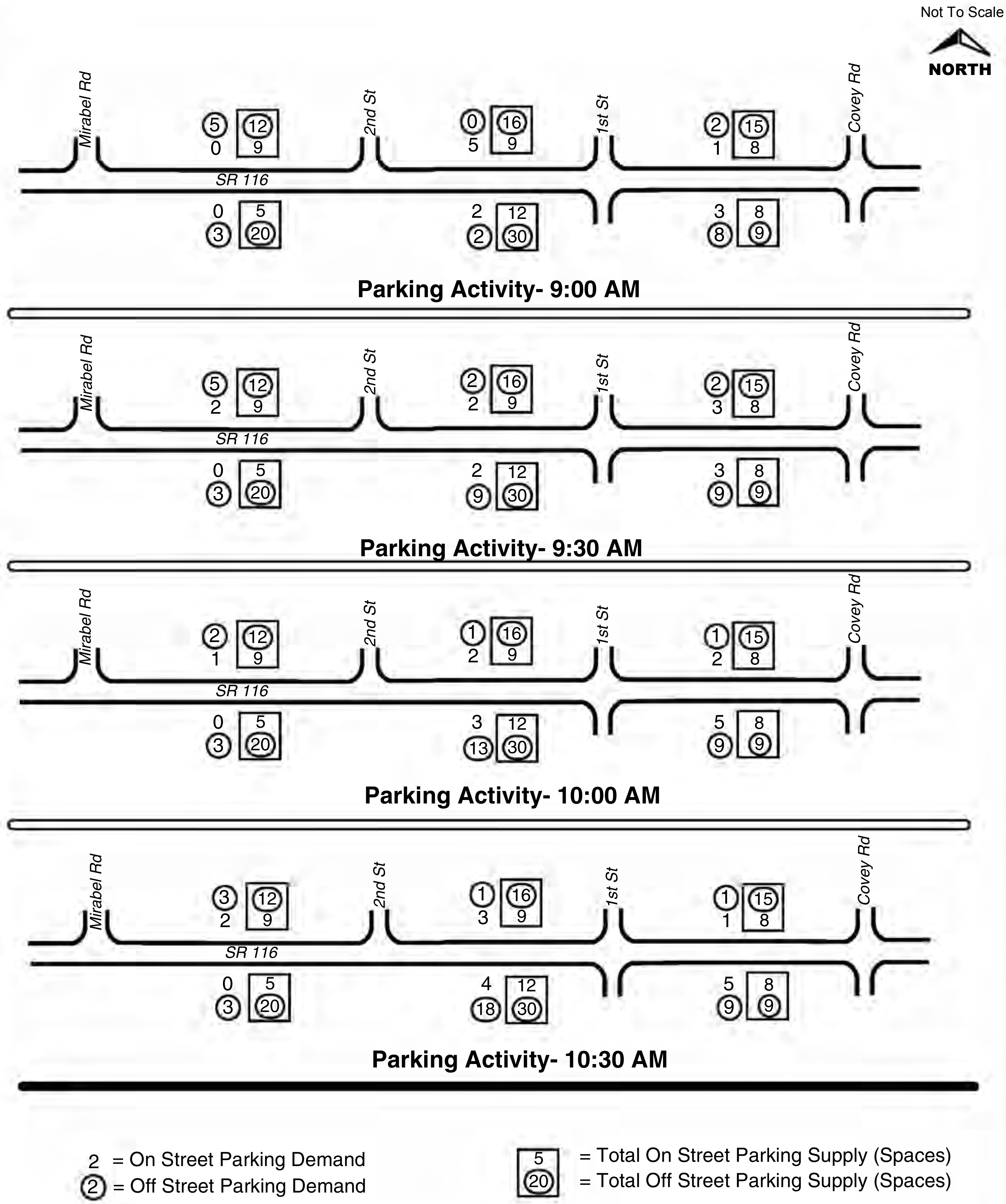
CRANE TRANSPORTATION GROUP

Figure A-7
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Wednesday, June 12/2002



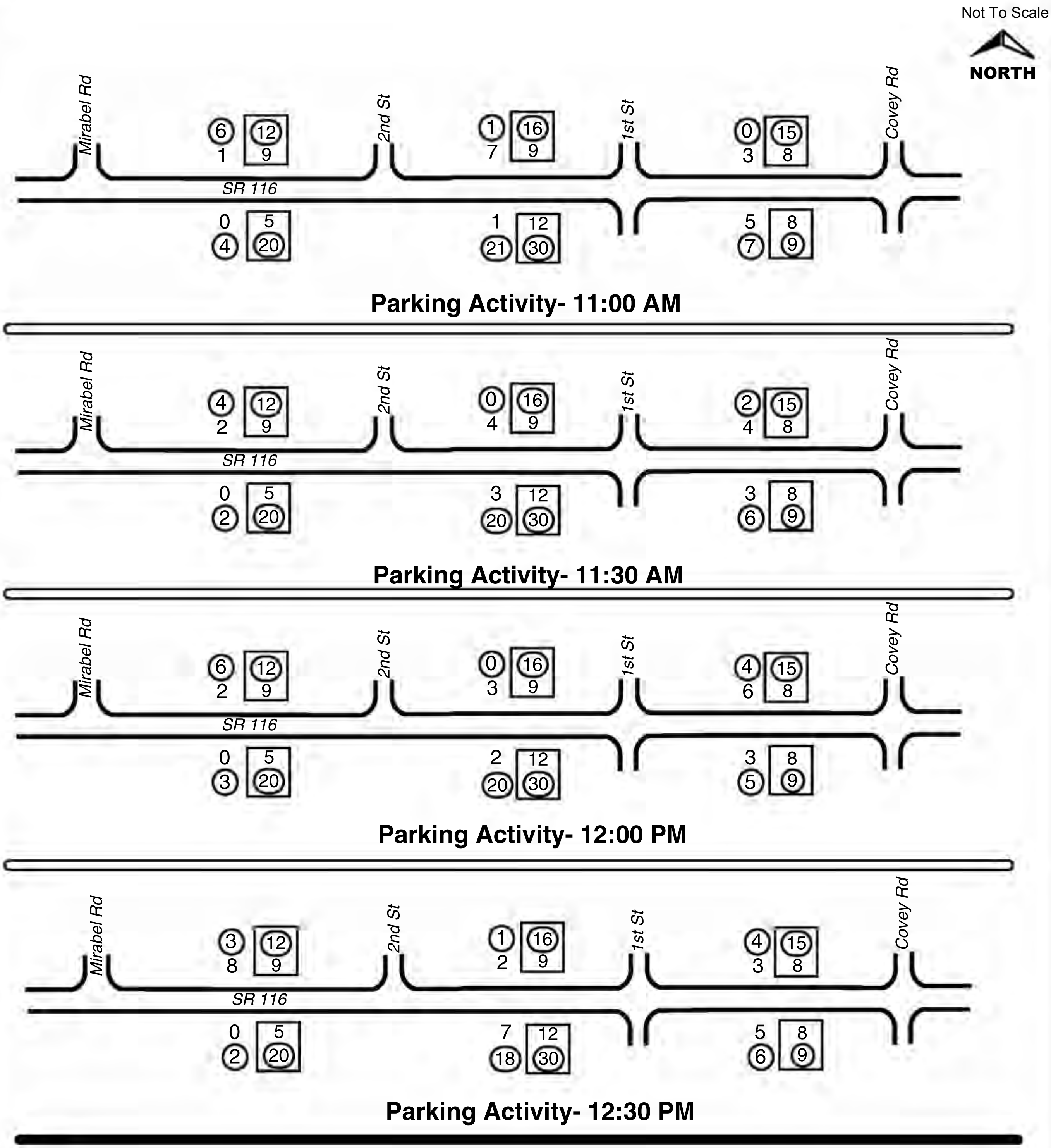
CRANE TRANSPORTATION GROUP

Figure A-8
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Saturday, June 15/2002



CRANE TRANSPORTATION GROUP

Figure A-9
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Saturday, June 15/2002



2 = On Street Parking Demand

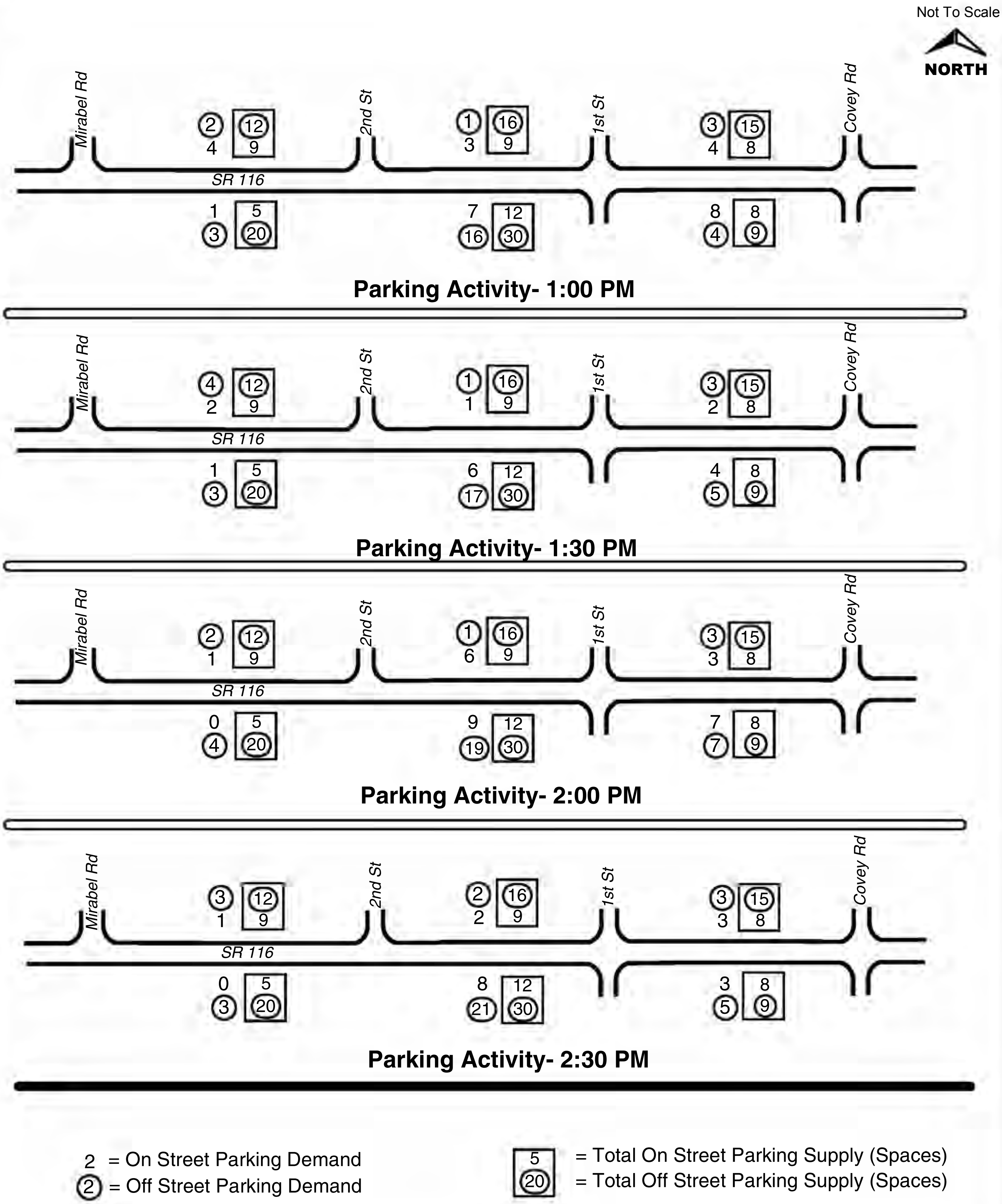
2 = Off Street Parking Demand

5 = Total On Street Parking Supply (Spaces)

20 = Total Off Street Parking Supply (Spaces)

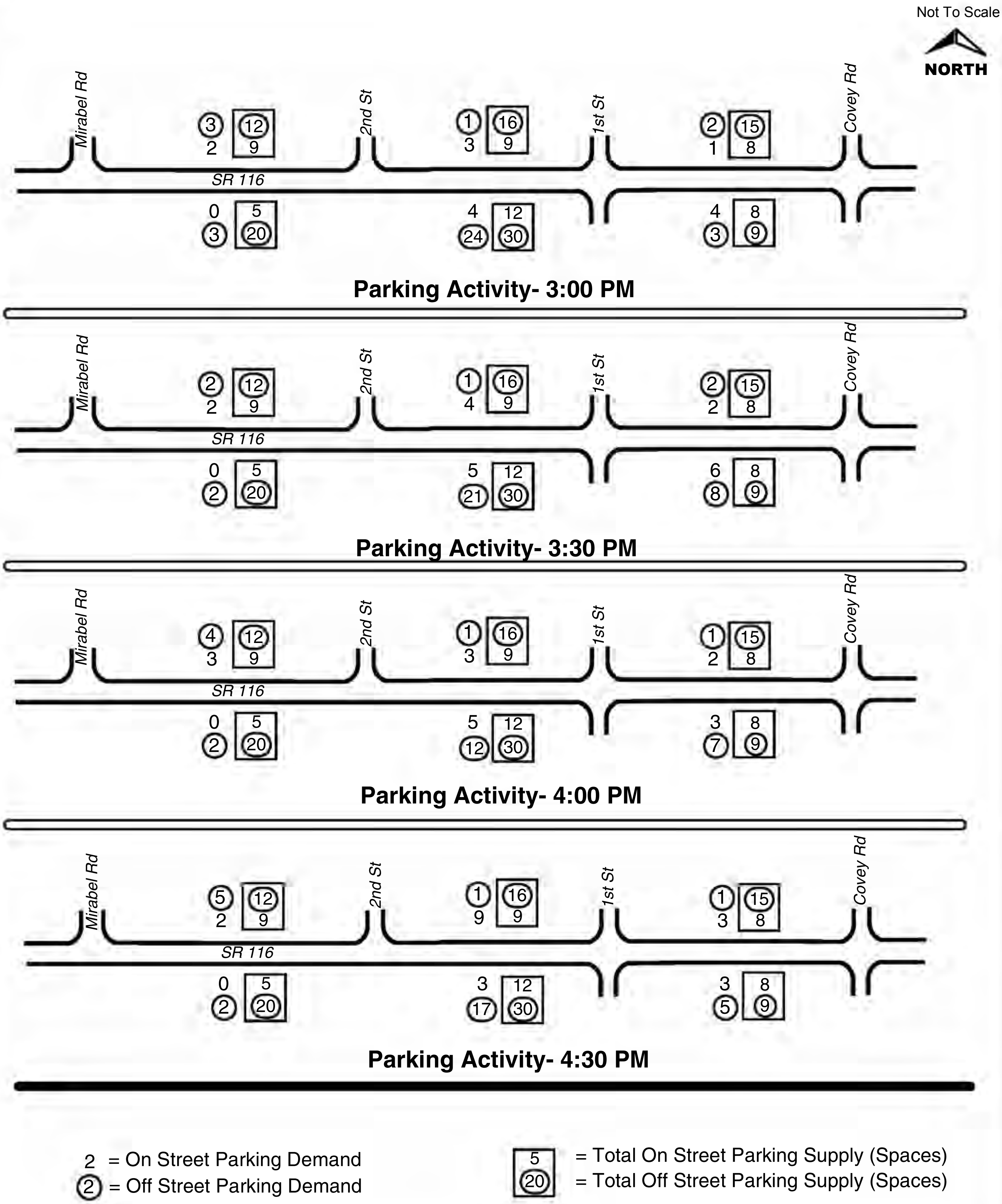
CRANE TRANSPORTATION GROUP

Figure A-10
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Saturday, June 15/2002



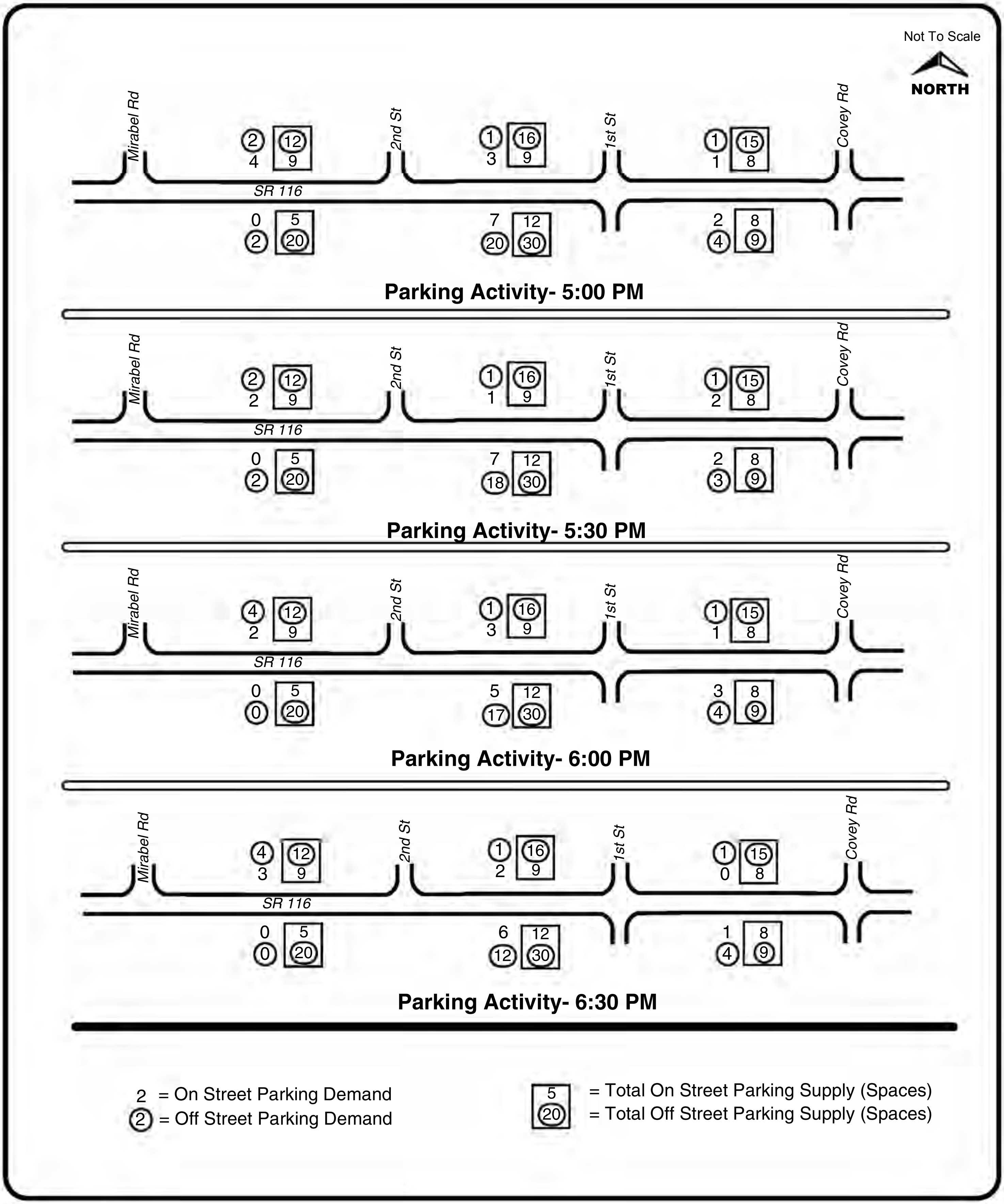
CRANE TRANSPORTATION GROUP

Figure A-11
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Saturday, June 15/2002



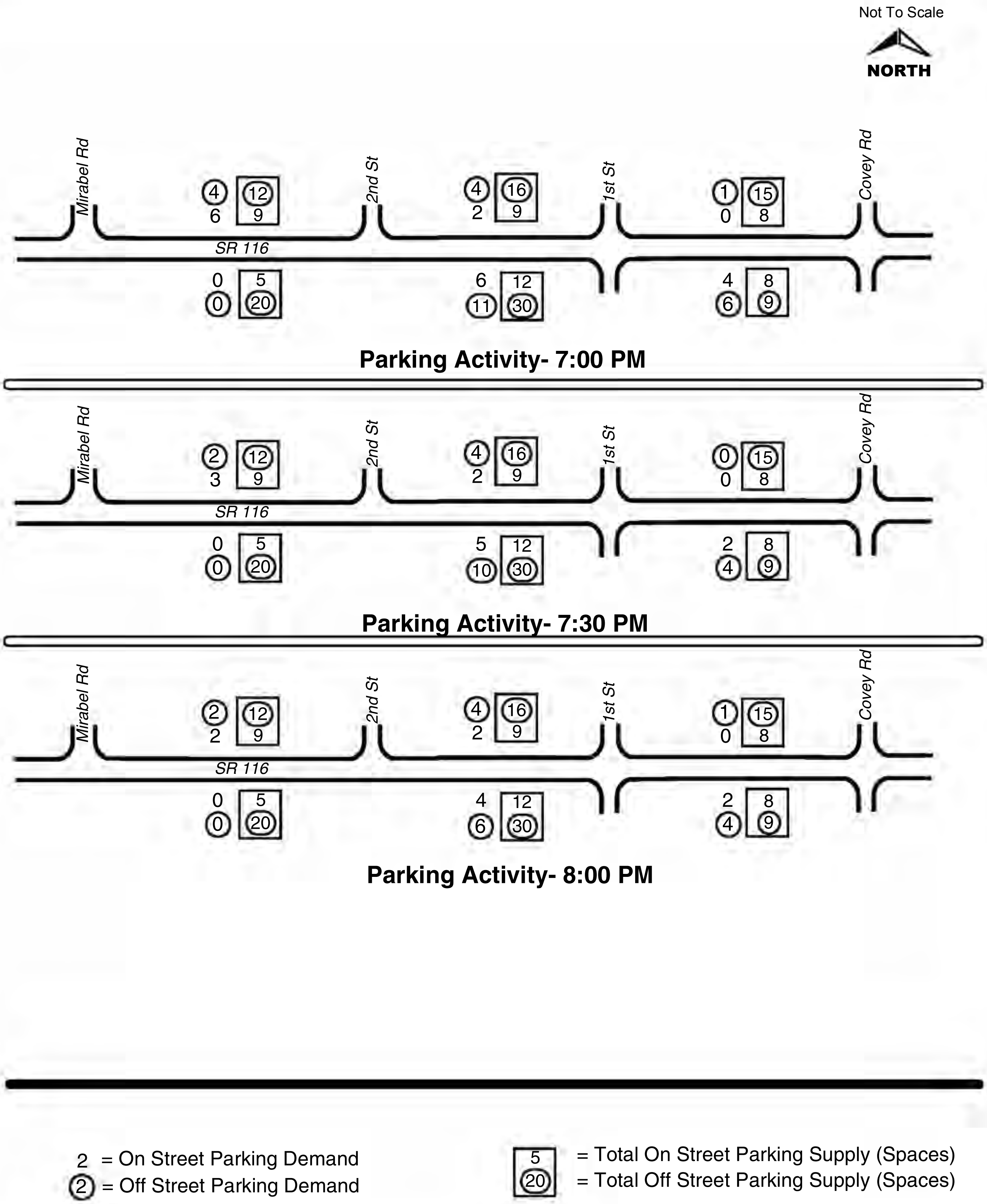
CRANE TRANSPORTATION GROUP

Figure A-12
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Saturday, June 15/2002



CRANE TRANSPORTATION GROUP

Figure A-13
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Saturday, June 15/2002



CRANE TRANSPORTATION GROUP

Figure A-14
On and Off Street Parking Demand and Supply
Along SR 116 in Forestville between Mirabel Rd and Covey Rd
Saturday, June 15/2002

APPENDIX H-2

Table 3

INTERSECTION LEVEL OF SERVICE
OCTOBER 2004 (W/O POTENTIAL GROWTH IN FORESTVILLE AREA)

AM PEAK HOUR

INTERSECTION	BASE CASE	BASE CASE + PROJECT
River Rd./Mirabel Rd.	C-19.6/D-34.5/ A-7.5/B-11.0(1)	C-23.2/E-39.5/ A-7.6/B-11.5
S.R.116/Mirabel Rd.	F-110.5/A-8.3(2)	F-194.8/A-8.6
S.R.116/Covey Rd.-Forestville St.	E-48.4/F-452/ A-9.3/A-9.1(1)	F-50.7/F-490/ A-9.4/A-9.2
S.R.116/Canyon Rock Quarry	B-14.3/A-7.6(3)	C-15.5/A-7.8
S.R.116/Blue Rock Quarry	B-11.0/A-7.9(4)	B-11.6/A—8.3

PM PEAK HOUR

INTERSECTION	BASE CASE	BASE CASE + PROJECT
River Rd./Mirabel Rd.	B-14.5/C-17.5/ A-7.7/A-8.5(1)	C-19.1/C-18.8/ A-7.7/A-8.7
S.R.116/Mirabel Rd.	E-38.8/A-9.3(2)	F-66.8/A-9.8
S.R.116/Covey Rd.-Forestville St.	E-38.4/F-378.9/ B-10.0/A-8.6(1)	E-40.2/F-412.5/ B-10.2/A-8.6
S.R.116/Canyon Rock Quarry	C-15.4/NA(3)	C-17.0/NA
S.R.116/Blue Rock Quarry	B-10.2/A-7.6(4)	B-11.2/A-7.9

SATURDAY PEAK HOUR

INTERSECTION	BASE CASE	BASE CASE + PROJECT
River Rd./Mirabel Rd.	C-17.6/A-9.3/ A-8.1/A-9.0(1)	D-25.7/A-9.4/ A-8.1/A-9.1
S.R.116/Mirabel Rd.	D-27.6/A-8.6(2)	E-40.2/A—8.9
S.R.116/Covey Rd.-Forestville St.	C-19.6/E-37.6/ A-8.6/A-8.6(1)	C-20.3/E-40.6/ A-8.6/A-8.7
S.R.116/Canyon Rock Quarry	B-13.1/A-7.7(3)	B-14.1/A-7.9
S.R.116/Blue Rock Quarry	NA*	B-10.3/A-7.7

* Not applicable—Quarry not open on Saturday for Base Case condition.

(1) Side street stop sign controlled level of service—average vehicle control delay (in seconds). Northbound stop sign controlled approach/Southbound stop sign controlled approach/Eastbound left turn/Westbound left turn.
(2) Side street stop sign controlled level of service—average vehicle control delay (in seconds). Southbound stop sign controlled left turn from Mirabel/Eastbound left turn from S.R.116 to Mirabel.
(3) Side street stop sign controlled level of service—average vehicle control delay (in seconds). Southbound stop sign controlled Canyon Rock exit approach/Eastbound left turn into Canyon Rock.
(4) Side street stop sign controlled level of service—average vehicle control delay (in seconds). Northbound stop sign controlled Blue Rock exit approach/Westbound left turn into Blue Rock.

Year 2000 Highway Capacity Manual Analysis Methodology.
Source: Crane Transportation Group

Table 7
INTERSECTION LEVEL OF SERVICE
OCTOBER 2004 CUMULATIVE CONDITIONS
WITH POTENTIAL GROWTH IN FORESTVILLE AREA

AM PEAK HOUR

INTERSECTION	CUMULATIVE BASE CASE*	CUMULATIVE BASE CASE + PROJECT
River Rd./Mirabel Rd.	C-18.3/E-38.9/ A-7.6/B-11.4(1)	D-26.8/E-44.5/ A-7.6/B-11.9
S.R.116/Mirabel Rd.	F-151.7/A-8.4(2)	F-252.3/A-8.7
S.R.116/Covey Rd.-Forestville St.	F-121.9/F-710/ A-9.5/A-9.2(1)	F-133/F-763/ A-9.5/A-9.3
S.R.116/Canyon Rock Quarry	C-15.1/A-7.7(3)	C-16.5/A-7.9
S.R.116/Blue Rock Quarry	B-11.0/A-7.9(4)	B-11.6/A-8.3

PM PEAK HOUR

INTERSECTION	CUMULATIVE BASE CASE*	CUMULATIVE BASE CASE + PROJECT
River Rd./Mirabel Rd.	C-18.6/C-18.7/ A-7.7/A-8.6(1)	D-25.8/C-20.0/ A-7.7/A-8.8
S.R.116/Mirabel Rd.	F-61.0/A-9.6(2)	F-110.7/B-10.1
S.R.116/Covey Rd.-Forestville St.	F-133.2/F-591/ B-10.2/A-8.7(1)	F-147.5/F-640/ B-10.3/A-8.7
S.R.116/Canyon Rock Quarry	C-16.7/NA(3)	C-18.6/NA
S.R.116/Blue Rock Quarry	B-10.2/A-7.6(4)	B-11.1/A-7.9

SATURDAY PEAK HOUR

INTERSECTION	CUMULATIVE BASE CASE*	CUMULATIVE BASE CASE + PROJECT
River Rd./Mirabel Rd.	D-29.5/A-9.4/ A-8.1/A-9.1(1)	E-43.2/A-9.5/ A-8.1/A-9.2
S.R.116/Mirabel Rd.	D-38.0/A-8.8(2)	F-61.7/A-9.1
S.R.116/Covey Rd.-Forestville St.	D-30.3/E-46.8/ A-8.7/A-8.7(1)	D-31.9/F-51.4/ A-8.7/A-8.8
S.R.116/Canyon Rock Quarry	B-13.8/A-7.7(3)	B-14.9/A-8.0
S.R.116/Blue Rock Quarry	NA**	B-10.5/A-7.7

* Includes Crinella, Burbank Housing and Mini Storage projects + Canyon Rock Quarry at maximum allowable production.
** Not applicable—Quarry not open on Saturday for Base Case condition.
(1) Side street stop sign controlled level of service—average vehicle control delay (in seconds). Northbound stop sign controlled approach/Southbound stop sign controlled approach/Eastbound left turn/Westbound left turn.
(2) Side street stop sign controlled level of service—average vehicle control delay (in seconds). Southbound stop sign controlled left turn from Mirabel/Eastbound left turn from S.R.116 to Mirabel.
(3) Side street stop sign controlled level of service—average vehicle control delay (in seconds). Southbound stop sign controlled Canyon Rock exit approach/Eastbound left turn into Canyon Rock.
(4) Side street stop sign controlled level of service—average vehicle control delay (in seconds). Northbound stop sign controlled Blue Rock exit approach/Westbound left turn into Blue Rock.

Year 2000 Highway Capacity Manual Analysis Methodology.
Source: Crane Transportation Group

APPENDIX I

AGGREGATE DEMAND, PRODUCTION AND SUPPLY IN SONOMA COUNTY

EXISTING AGGREGATE SUPPLY AND DEMAND IN SONOMA COUNTY

AGGREGATE USES

Aggregates are used extensively for virtually all type of construction in Sonoma County. The Sonoma County *Aggregate Resources Management Plan* (ARM Plan) divides aggregate into two general categories: "construction grade aggregate" and "other." Construction aggregate refers to aggregate used for road base, road sub-base, cement, and asphalt. In loose form with no binding ingredient, aggregates are used primarily as road base and subbase materials for road and building construction, as well as railroad beds, backfill for trenches and other uses. Aggregate is also mixed with binding agents for certain construction applications. Aggregates are combined with cement to produce concrete for a variety of building structures, and with asphalt binding to produce surfacing and structural material for streets, roofing and other uses. Specifications for aggregates used in cement and asphalt are more stringent than for most other uses. "Other" uses for aggregate include decorative functions, erosion control and other purposes.

References to aggregate resources and aggregate reserves are made in this discussion. Consistent with the ARM Plan, this discussion defines an aggregate resource as a concentration of naturally occurring rock in such form and amount that economic extraction is currently or potentially feasible; these include identified resources whose location, grade, quality and quantity are known or estimated from specific geologic evidence. Aggregate reserve is a more restrictive term, and defined as an aggregate resource whose presence and feasibility of economic extraction is better supported by the available geologic, operational and production information.[1]

EXISTING AGGREGATE MINING RESOURCES IN SONOMA COUNTY

There are three types of aggregate mining operations in Sonoma County: quarry, terrace and instream. Quarry mining refers to open earth excavation, typically within hillsides. Terrace mining refers to mining that occurs within relatively level land areas of older alluvial deposits near a stream. Instream mining refers to mining that occurs within a stream channel.

[1] The ARM Plan states this includes geologic observations and interpretations resulting on-site reconnaissance and aerial photo study; geologic operational, and production information provided by the quarry operators/owners in response to a 1991 questionnaire; information contained in the reclamation plans prepared for the individual operational quarries; and other published or unpublished information, including geologic maps and reports.

The following are the principal existing quarry mines in Sonoma County:

- Blue Rock Quarry
- Bohan and Canellis Quarry
- Canyon Rock Quarry
- Lakeville Quarry
- Mark West Quarry
- Petaluma Quarry
- Sonoma Rock Quarry
- Stony Point Quarry

Four of these quarries (Blue Rock, Canyon Rock, Mark West, and Bohan and Canelis) are currently capable of producing high quality aggregate suitable for cement and asphalt production. There are also twelve smaller quarries identified in the ARM Plan. Additional information on the status of existing quarries in Sonoma County is presented below.

EXISTING AGGREGATE DEMAND AND PRODUCTION IN SONOMA COUNTY

The *Annual Report on Aggregate Production in Sonoma County in 2002* (Sonoma County PRMD, August 2003) reports that in 2002, a total of 4.926 million tons of aggregate were sold in Sonoma County.[2] Of this, hard rock quarries provided 2.737 million tons of aggregate, terrace sources provided 1.745 million, and instream sources provided 438,000 tons. Instream production has recently increased due in part to recommencement of instream mining on vested sites in the Middle Reach. A recent decline in terrace levels of production is also evident, and attributable to decreased production of one of the terrace operations in the County.

Terrace and instream sources are favored for asphalt and particularly for cement production due to various factors including: the hardness of the rock, the proximity of cement plants to alluvial sources, the ease in pumping and finishing cement made with the rounded alluvial aggregate, and cost. In 2002, 31.3% (1.54 million tons) of the aggregate sold in the county was used for cement concrete. Of this, 83% (1.28 million tons) was produced by terrace operations, about 16% (246,000 tons) was produced by instream sources, and 1% (15,400 tons) was produced by hard rock quarries.[3]

For asphalt concrete, all sources produced about 261,000 tons in 2002. Hard rock quarries met 50% of this demand (131,000 tons), terrace mines produced 40% (about 104,000 tons), and instream sources produced 10% (about 26,000 tons). During the period when terrace mining was restricted (1995-1997), hard rock quarries produced considerably more of the aggregate used for asphalt concrete (66-68% during those three years). As terrace mining expanded after 1997, the amount of hard rock quarry-produced aggregate used for asphalt has decreased.

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2 This is approximately 10% less than the estimated 5.5 million ton aggregate demand predicted by the ARM Plan for 2002 ("moderate demand" scenario).

3 Reviewing production back to 1981, hard rock quarries have produced between 0-2% of the aggregate used for cement concrete in any one year.

Recycling is another source of aggregate in Sonoma County. In 2002, aggregate processing facilities reported a total of about 277,000 tons of recycling. Almost all asphalt and cement is reused or recycled; very little was disposed of at the County Landfill in 2002.

EXISTING AGGREGATE RESERVES IN SONOMA COUNTY

Hard rock quarry reserves in Sonoma County in 2002 were estimated at approximately 27-32 million tons.[4] Approximately 12-14 million tons of these reserves are judged to be construction grade aggregate. While the ARM Plan does not provide estimates, it is evident that considerably less aggregate is suitable for asphalt or cement production.

FUTURE AGGREGATE DEMAND AND SUPPLY IN SONOMA COUNTY

PREDICTED AGGREGATE DEMAND IN SONOMA COUNTY IN 2010

The ARM Plan projection for the year 2010 under the "moderate demand" scenario is approximately 5.3 million tons. However, the actual amount of future demand is speculative as it will ultimately be influenced by the state and local economic conditions, the amount of construction, and the number of large public works projects (Sonoma County PRMD, December 2002). Large projects under consideration that could substantially increase actual future demand include the widening of U.S Highway 101 (U.S. 101), and the South Transmission System Water Supply Project.

For purposes of this discussion, it is assumed that the total aggregate demand in the year 2010 will be approximately the same as the ARM Plan projection for 2010, or about 5.3 million tons. It is further assumed the aggregate demand would be broken down as follows: 1.7 million tons for cement, 300,000 tons for asphalt, 1.6 million tons for road base, 300,000 tons for road subbase, and 1.5 million tons for other uses (based on percentages of total aggregate described in the *Annual Report on Aggregate Production in Sonoma County in 2002*).

The ARM Plan calls for terrace mining to be terminated by March 28, 2005 for terraces on the east side of the Russian River, and by April 16, 2006 on the west side of the river. Consequently, by 2006, aggregate produced by these terrace sources will need to be replaced by hard rock quarries or instream mining if County sources are to continue to be the primary source of aggregates used in the county.

Although instream mining has recently provided little of the aggregate produced in Sonoma County, recent approvals of instream mining (including for Syar to mine gravel bars in the Middle Reach, and for Shamrock Materials to mine the upper half of gravel bars near Cloverdale) will ensure the derivation of future aggregate from instream sources. It is assumed instream sources would provide an average of about 300,000 tons per year in 2010. Recycling is also anticipated to continue to be a source of

4 Total hard rock quarry reserves in 1993 were estimated at 50.04 to 55.31 million tons (ARM Plan, page 5-80). Between 1994 and 2002, about 19.2 million tons have been produced from these quarries (*Annual Report on Aggregate Production in Sonoma County in 2002*, page 2). As reported production rates are not as reliable as sales records, it is assumed the actual production approximated 23 million tons. Consequently hard rock quarry reserves in 2002 were estimated at approximately 27-32 million tons.

aggregate. It will also be assumed that approximately 300,000 tons a year of aggregate will be derived from recycling in 2010.[5]

The remaining 4.7million tons of total aggregate demand in 2010, including about 1.2 million tons of cement grade aggregate and about 200,000 tons of asphalt grade aggregate, would need to be supplied by county hard rock quarries or out of county sources.

POTENTIAL FOR EXPANSION OF EXISTING QUARRIES IN SONOMA COUNTY

The ARM Plan states that the areas where existing quarries could be expanded include an additional 44.9-54.5 million tons of aggregate reserves, with about 43% of that total being construction grade (ARM Plan, page 5-80). Since adoption of the ARM Plan, no expansions of existing quarries have been approved.

PRMD staff has stated that there are four existing quarries in Sonoma County (Canyon Rock, Blue Rock, Mark West, and Bohan and Canelis) that are capable of producing high quality aggregate suitable for cement and asphalt production (Mayer, personal communication, 8/5/01). There are numerous other quarries in the County, but they are either relatively small with no significant expansion potential, have nearly exhausted their reserves, or do not produce hard enough rock for asphalt and concrete production. A brief description of the reserves and production potential of each of these quarries is provided below (based on descriptions in the ARM Plan and additional information provided by PRMD).

BLUE ROCK QUARRY

This quarry contains approximately 1.5 million tons of aggregate. Virtually all the aggregate is construction grade, and, as noted, above, it is one of the four existing quarries capable of producing aggregate suitable for cement and asphalt production. If the proposed Blue Rock Expansion project is approved, it would add an estimated 8 million tons of aggregate, including 5-6 million tons of construction grade aggregate. PRMD staff estimates that Blue Rock currently produces about 4% of the County's aggregate output. If the project were approved, the quarry would generate about 10 to 11% of the County output (Schiltgen, personal communication, 8/24/01). The Blue Rock applicant states that rock available at Blue Rock Quarry can be used for Asphalt Cement Concrete (ACC) and Portland Cement Concrete (PCC). The Blue Rock applicant has stated that they currently do not sell PCC aggregate because there is insufficient market demand and they need to add an aggregate washing plant to produce PCC quality aggregate. The applicant has the required Air Quality Permit to add this washing plant, but has not yet added that facility.

CANYON ROCK QUARRY

As described in Chapter III in this EIR, the applicant is proposing to expand the mining area. Currently, the quarry produces about 375,000 cubic yards (CY) per year, or 562,000 tons per year. The quarry is currently permitted to produce up to 500,000 CY or 750,000 tons per year. Mining of the current quarry

[5] Of the 600,000 tons predicted to be produced by instream and recycling sources, it will be assumed that 500,000 tons per year would be available for cement production, and 100,000 tons per year for asphalt production.

at current rates would exhaust quarry supplies in 4 to 6 years. The proposed expansion of this quarry would not increase the production rate, but it would extend the useful life of the quarry for an additional 20 years. The rock at Canyon Rock Quarry is similar to that found at the Blue Rock Quarry and could be used for high grade aggregate. Some aggregate produced on the site is used for making cement concrete. There is a small batch plant on the site which makes cement from on-site materials plus imported aggregate and Portland cement; this plant produces up to 20,000 CY of concrete cement per year. If the proposed expansion were approved, this quarry could supply over 14% of the total 2010 aggregate demand.

BODEGA QUARRY

PRMD staff states that the aggregate at this quarry has been depleted. Active mining of the quarry has ceased, and final reclamation is expected to be completed by the end of 2003.

MARK WEST QUARRY

This quarry contains relatively extensive reserves (approximately 5-7 million tons currently). This quarry produces high quality aggregate suitable for cement and asphalt production. The ARM Plan states that possible future expansion could provide an additional 26.5-30.5 million tons. A new use permit application to allow expansion of the quarry was filed with PRMD at the end of 2003.

SONOMA ROCK QUARRY

This quarry produces high quality aggregate but its reserves are nearly exhausted and there is no expansion room. PRMD staff expects this quarry to cease operations in the next year.

STONY POINT QUARRY

This quarry has limited expansion room, and the rock that is produced is generally used for road subbase, fill, and drain rock. However, the operators are currently proposing to excavate the floor of the existing quarry, and it is possible that this underlying material may be of sufficient hardness to provide at least construction grade aggregate, if not asphalt and cement grade aggregate. The quantity and quality of aggregate is currently unknown. An EIR is being prepared on this proposed project.

LAKEVILLE QUARRY

This quarry provides sub-construction grade aggregate which is used primarily for fill. The operators have submitted an application to expand this quarry (an environmental review document will be prepared), but even if approved, the quarry would not produce construction grade aggregate. Current reserves are nearly exhausted, and expansion would add up to 4 million tons of sub-construction grade aggregate per year.

PETALUMA QUARRY

This quarry is primarily used to process aggregate and recycled asphalt and concrete that is barged up the Petaluma River and transported to the quarry site. The floor of the quarry could be excavated to provide as much as 2.0 million tons of construction grade aggregate. However, this would require removing the processing equipment and a large amount of overburden from the site. PRMD staff does not foresee expansion at this site to occur. The site has recently been purchased by a developer who plans to cease all aggregate operations on the site and reclaim the site for other forms of development.

BOHAN AND CANELLIS (AUSTIN CREEK)

This quarry currently has limited production though it can produce high quality sand and aggregate. Reserves on the existing quarry site and the expansion site which is now owned by the quarry owner are 6.0 to 9.0 million tons. This quarry is situated in a location that could serve the needs of western Sonoma County and projects along Highway One and the Russian River communities.

OTHER QUARRIES

Twelve smaller quarries listed in the ARM Plan are either small borrow pits, small one person operations, no longer in operation, have limited reserves, or have poor access (meaning that the quarries are located on narrow County roads at some distance from major arterials or highways). Aggregate from these quarries is primarily used for fill, drain backfill, surface treatments, landscaping, and rip-rap.

It is speculative to estimate how much aggregate could be produced from these twelve quarries. They could potentially produce very little high quality aggregate. Most are situated in locations distant from the main demand. Several have access constraints. In addition, aggregate from these quarries is suitable mainly for non construction grade aggregate (e.g., fill, surface treatments, and landscaping).

The ARM Plan reported that in 1993 these quarries had existing reserves of approximately 18.5-20.8 million tons of which only about 0.5 million tons were considered construction grade. Identified expansion areas would add 5.2-6.8 million tons of additional reserves of which 1.7-3.0 million tons could be construction grade (ARM Plan, pages 5-77 to 5-79). It is assumed that existing reserves are less than described in 1993.

These quarries could provide aggregate used for "other" uses. The year 2000 demand for such aggregate was 1.4 million tons. Assuming that all these quarries were active, it is likely that they could meet the "other" uses demand for approximately ten years. This is a liberal estimate given the status and location of these quarries. It is more likely that these quarries will mainly serve local customers requiring non-construction grade aggregate. It is speculative that these quarries would expand. Even if full expansion were to occur, this would provide the County's demand for non-construction grade aggregate for an additional 3-4 years.

POTENTIAL FOR INCREASED RECYCLING AT SONOMA COUNTY LANDFILL

The only significant new source of aggregate developed in the past few years is aggregate removed from the County's landfill, which was removed to make room for disposal of solid waste. About 700,000 CY were removed from the landfill site and processed at the Stony Point Quarry. Additional material could be removed from the landfill site, and some of this material is high quality aggregate. PRMD reports that a study of developing additional aggregate sources at the landfill is being prepared. It is unknown how much aggregate or the quality of aggregate that may be proposed for development in this forthcoming report.

POTENTIAL NEW HARD ROCK QUARRY SITES IN SONOMA COUNTY

The ARM Plan estimates that seven potential quarry sites exist in Sonoma County. These potential sites are estimated to contain 25.6 to 31.0 million tons of aggregate reserves, of which 17-20% is construction grade.[6] An application has been submitted to construct quarries on one of these potential sites since adoption of the ARM Plan. A description of each site is provided below.

BEEBE RANCH

This site is located off Manor Lane, northeast of Petaluma. The site is estimated to have 1.0-1.5 million tons of reserves of which 1.0-1.4 million tons would be construction grade. Access to this site is by a narrow County road that leads to Adobe Road, a high volume roadway.

KAWANA SPRINGS

This site is immediately south/southeast of Santa Rosa near the intersection of Kawana Springs Road and Petaluma Hill Road. Estimated reserves are 9.0-11.7 million tons of which 1.4 million tons are classified as construction grade. Access would be via a residential street and an already heavily traveled and frequently congested arterial (Petaluma Hill Road).

PORTER CREEK

This site is actually three areas to the east and west of the existing Mark West Quarry. This area contains extensive reserves estimated 20.0-25.0 million tons of which 11.0-14.0 million tons are estimated to be construction grade. Access would be via Petrified Forest Road and Porter Creek Road and possibly Calistoga Road. The main access would be west on Porter Creek Road to Mark West Springs Road and to U.S 101.

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6 The actual amount of reserves is likely higher, because the ARM Plan did not estimate reserves for quarries where there was insufficient geologic data available.

ROBLAR ROAD

This site is located on the south side of Roblar Road. Reserves are estimated to be 4.5 million tons. Recent mining at the County Landfill near this site indicates the rock at the site to likely be of high enough quality to be used for asphalt and cement production. A quarry was proposed for this site, and it was not approved by the County. Access would be via Roblar Road to Valley Ford Road to Pepper Road and U.S. 101 or Roblar Road to Stony Point Road and U.S. 101. An application for a Mining Permit and Reclamation Plan was filed by North Bay Construction in December, 2003.

RODGERS CREEK

This site is on a property that is currently proposed as a residential development (White Oak estates); the site is part of the remainder parcel of this proposed subdivision. The EIR prepared for an earlier version of the White Oak Estates project did not mention any potential quarry development on the site. The site has estimated total resources of 11.5-13.3 million tons of which 4.0-4.7 million tons are estimated to be construction grade.

WALKER ROAD

This site is north of Walker Road and south of the potential Roblar Road site. Rock from the nearby County Landfill indicates that rock at this site would be of high quality. Reserves are estimated to be 30-40 million tons of which 15-20 million tons would be construction grade. Access would be via Walker Road to Pepper Road, Stony Point Road, and U.S. 101, though other access routes are possible.

WILDCAT MOUNTAIN

This site is located 2.5 miles north/northwest of the existing Sonoma Rock Quarry. Access is provided by private unpaved road that extends to State Route (SR) 121. Total resources are estimated to be 33 million tons of which 2-3 million tons are estimated to be of construction grade.

POTENTIAL OPTIONS OF MEETING FUTURE DEMAND FOR AGGREGATE IN SONOMA COUNTY

As discussed under "Existing Aggregate Demand and Production in Sonoma County," above, hard rock quarry reserves in Sonoma County in 2002 were estimated at approximately 27-32 million tons, with approximately 12-14 million tons of these reserves judged to be construction grade aggregate.

By early 2006, when the last terrace mines are closed, an additional approximately 15 million tons of aggregate would have been produced (assuming hard rock quarry production maintained the same level of production as occurred in the year 2002). Thus, in 2006, existing reserves in all hard rock quarries would total approximately 12-17 million tons. Construction grade reserves in 2006 are estimated to be about 9-14 million tons (assuming terraces and instream mining operations continue to provide high grade aggregate until closure of the terraces).

After 2006, when terrace mines close, it is estimated that aggregate demand would be about 5.3 million tons per year. Instream sources and recycling would meet 0.6 million tons of this demand. The additional aggregate would be provided by hard rock quarries. Thus, existing quarries would need to supply 4.7 million tons per year. Existing quarries would be able to supply this demand for about 3-4 years, assuming full development of all existing quarries. These projections are speculative, since the exact amount of reserves is unknown, but the projection indicates that there are not sufficient reserves to supply County needs for more than a few years.

Consequently, if no approvals or existing quarry expansion or new quarries in Sonoma County occur, the County would have insufficient aggregate supplies meet the full demand for aggregate between approximately 2009 and 2010. To meet future demand one or more of the following would be required:

- Expansion of other existing quarries
- Development of new quarry sources
- Allow continued mining of terraces
- Allow additional instream mining
- Restricting sales of aggregate to out of county users
- Import aggregate from out of county sources

POTENTIAL EFFECT OF FUTURE DEMAND ON RESERVES IN SONOMA COUNTY ASSUMING EXPANSION OF EXISTING QUARRIES AND/OR DEVELOPMENT OF NEW HARD ROCK QUARRIES

Additional supplies could be realized by expanding the existing quarries into the expansion areas identified in the ARM Plan. The ARM Plan estimated that the expansion areas could provide an additional 44.9-54.5 million tons of reserves. Thus, even if all quarries were expanded per the ARM Plan, the additional resources would be sufficient to meet demand for an additional 10-12 years (beyond the 3-4 years provided by existing quarry reserves). However, it is speculative that such expansion would be sought at all quarries or, if sought, approved.

Additional supplies could also be provided by developing one or more of the potential quarry sites discussed previously. If all these quarries were developed, they could provide sufficient total aggregate to meet projected demands for an additional 5-6 years. However, it is also speculative whether one or more of these quarries would be proposed for development and that the proposal would be approved.

Another consideration is the potential for adequate future supplies of construction grade aggregate to accommodate demand. The year 2002 demand for such aggregate was approximately 3.6 million tons. Existing quarries have reserves that could meet this demand for 3-4 years after terrace mines close. The expansion areas have 46.4-58.4 million tons of such aggregate. If all expansion areas were quarried, then quarries could meet demand for construction grade aggregate for an additional 13-16 years (beyond the 3-4 years provided by existing quarry construction aggregate reserves). Development of these identified expansion areas is speculative as is the exact amount of construction grade aggregate present in these expansion areas.

While it is likely that quarries could meet the future demand for asphalt, it is unknown whether the material is suitable to meet future demand for cement. Assuming that some quarry aggregate could be processed to be suitable for concrete cement production, it is unknown how much of the existing quarry reserves are suitable. In 2002, the demand for cement concrete aggregate was 1.54 million tons, of which instream sources could provide approximately 250,000 tons. Thus, quarries would need to provide approximately 1.3 million tons per year. It is unknown whether this amount can be produced by quarries and how many reserves the quarries have to meet this demand.

POTENTIAL EFFECTS OF ALLOWING CONTINUED MINING OF TERRACES OR ADDITIONAL INSTREAM MINING

Allowing terrace mining after 2006 is not considered feasible given the adopted ARM Plan and the well documented environmental impacts associated with that mining. Similarly, environmental restrictions on instream mining mean that substantial expansion of that type of mining is unlikely.

POTENTIAL EFFECTS OF RESTRICTING SALES OF AGGREGATE TO OUT OF COUNTY USERS

Currently, 13% of the aggregate produced in the county is sold outside the county (94% of this amount went to Napa and Marin Counties). This amount is partially offset by the approximate 5% of marketed aggregate that was imported into the county. While the County could entertain requiring that aggregate produced in the county remain in the county, this would not significantly increase the amount of time until aggregates are exhausted. In addition, it is speculative that restrictions on buying and selling aggregate is within the purview of the County.

POTENTIAL EFFECTS OF IMPORT OF AGGREGATE FROM OUT OF COUNTY SOURCES

Without expansion of existing quarries and/or development of new quarries, the County would need to import more aggregate between 2009 and 2010, especially to meet the demand for cement production. Several aggregate producers and users have already begun to import sand and gravel to meet their needs. Even with potential expansion of existing quarries and development of new quarries, it is likely that such imports of aggregate will be required on an ongoing basis once terrace mining in the County is terminated.

The following provides a discussion of the various potential modes of transportation from out of county sources into Sonoma County.[7]

Road Transport

More than 95 percent of aggregate mined within the North San Francisco Bay region[8] in currently trucked from the plant to the consumer. Trucks are the preferred mode of aggregate transport in the North San Francisco Bay because they are efficient and versatile. Trucks are quickly loaded with varied aggregate

7 Information contained in this section summarized from the unpublished *Potential Aggregate Transport into the North San Francisco Bay Region via Road, Rail or Water,* California Division of Mines and Geology, and supplemented by information from Sonoma County.

8 North San Francisco Bay Region includes Marin, Sonoma, Napa and Solano Counties.

products, and driven to their destination where they can rapidly unload. Truck rates, contracts, and hauls are often completed in a single day. Standard 3-axle aggregate dump trucks haul between 9 and 12.5 tons. Larger tandem-trailer five-axle trucks can haul about 24 to 25 tons.

Typically, aggregate transported by truck to consumers in Northern California rarely exceeds 50 miles. However, road traffic and haul distances in the region can be an impediment to economically trucking aggregate from existing quarries to consumers. Other potential adverse effects from trucking include increased wear and tear on road surfaces, increased air pollution, increased noise and dust, increased traffic congestion and traffic safety.

Rail Transport

The use of heavy-haul rail transport is an alternative method to move aggregate over long distances compared to truck hauling. In the U.S., aggregate rail transport has grown over 30 percent in the last 18 years. Aggregate is the largest industrial mineral transported by rail in the U.S., and tonnages of railing crushed stone have more than doubled between 1996 and 2001. The farther the aggregate source, the most cost effective rail transport becomes and at distances of 100 miles or more, freight trains are capable of hauling large loads more economically than by truck. An average open-top four-axle railcar carries about 100 tons of aggregate. An average aggregate dedicated unit train carries about 60 to 80 freight cars at a time.

Aggregate that is currently economically shipped by rail in Northern California is moved by owner-operated or operator unit trains on routes that have been in operation for many years. An example is the Graniterock Company crushed stone plant in northwest San Benito County, which ships unit trains of aggregate into the South San Francisco Bay region.

Because aggregate is high bulk, high-weight, low-value commodity, it order for it to be economically transported by rail, it is necessary to have a large continuous market demand, obtain a sufficiently large source of minable high quality aggregate, employ dedicated unit trains, have fast loading and unloading facilities and have sufficient rail track capacity at the origin and destination.

A potential major constraint for rail option are expenses for constructing and maintaining rail facilities and equipment. There are currently no major in-place rail capabilities and related rail infrastructure for importing aggregate by unit train into the North San Francisco Bay region. In order to economically transport large volumes of aggregate over existing rail lines into this area, some existing branch lines would have to be upgraded with improved track, widened railbeds and reinforced bridges. There would also a large initial capital investment for constructing new track and related facilities to ship, receive and stockpile aggregate, and with buying or leasing rolling stock.

Potential future aggregate rail scenarios are the freight of sand and gravel from the Yuba River dredge fields deposits into the North San Francisco Bay region via Union Pacific Railroad and North Coast Railroad Authority rights-of-way; and freight of alluvial gravels from deposits located near the mouth of the Eel and Mad Rivers, near Eureka in Humboldt County, via Northwestern Pacific Railroad (NWP), or via a short NWP rail line from existing crushed stone aggregate resources within Northern Sonoma County or southern Mendocino County to a restored portion of the NWP. With respect to the NWP scenarios, major sections of the NWP trackage would need to be realigned and rebuilt, and existing portions of rail, ties, and railbed undergo extensive restoration.

It should be noted that Shamrock Materials, Inc. is currently proposing a ready-mix concrete plant, concrete and asphalt recycling operation, sand and gravel processing and topsoil composting facility to a site south of Santa Rosa on Todd Road. Shamrock is considering the potential for shipment of gravel via rail along the NWP rail line located adjacent to this site, although no specific information is available at this time. Even with rail transport, trucks may still be needed to move aggregate from where it is mined to a rail receiving terminal, and/or from rail distribution yards to the consumer.

Water Transport

For distances over 100 miles, the most inexpensive way to move aggregate is by barge or ship. Barges are generally designed for hauling bulk products in shallow water passages, such as rivers, inland lakes and embayments, where shallow drafts are a concern. Barge transport is less expensive than truck and rail, but not as efficient as deep water ship transport over distances of hundreds of miles. Flat deck barges currently transport gravel across the San Pablo Bay into the North San Francisco Bay region to the Petaluma River, for off-loading of sand and gravel in the City of Petaluma docks. However, most mines are not directly located on waterways, and most customers do not have access to waterways. Consequently, trucks or other alternative transport methods may still be needed to move aggregate to and from the barge loading and unloading points requiring sufficient receiving and stockpiling areas.

The use of large bulk ships for moving aggregate is a relatively recent development in California. The supply and demand for high-quality aggregate in the San Francisco Bay region has currently made shipping aggregate more competitive. Foreign aggregate is now profitably imported from Mexico and Canada into the San Francisco Bay region, with costs competitive with local supplies. Large modern ships can haul up to 70,000 tons of aggregate. Loading and or unloading of ships can either depend on shore-based facilities or are self-loading/unloading facilities. Some modern ships can offload aggregate at up to 6,000 tons per hour. There are no deep-water docks with dedicated port facilities and space to support importing aggregate via ship in the North San Francisco Bay region. As with barge transport, trucks or other alternative transport methods may still be needed to move aggregate to and from the ship loading and unloading points.

Another consideration of moving tonnages of aggregate via barge or ship into California ports is the federally mandated Jones Act, which restricts transports between U.S. ports to be carried by U.S.-built, U.S.-manned, and U.S.-citizen owned vessels. However, California aggregate companies are free to contract with foreign-owned companies that may use foreign-built and/or-manned ships to transport aggregate into California ports, without restrictions from the Jones Act. In comparison, the largest, fastest, and most technologically advanced aggregate ships in the world are foreign-built, foreign-manned, and foreign-owned. Consequently, economic implications associated with the Jones Act could potentially hamper or prevent California aggregate sources located near marine ports from successfully competing with foreign sources of aggregate.